He shows me a list of the rest of the phone numbers and the two electric organ keys that produce them.

"Actually, you have to record these notes at 3 3/4 inches-per-second tape speed and double it to 7 « inches-per-second when you play them back, to get the proper tones," he adds.

"So once you have all the tones recorded, how do you plug them into the phone system?"

"Well, they take their organ and their cassette recorder, and start banging out entire phone numbers in tones on the organ, including country codes, routing instructions, 'KP' and 'Start' tones.  Or, if they don't have an organ, someone in the phone-phreak network sends them a cassette with all the tones recorded, with a voice saying 'Number one,' then you have the tone, 'Number two,' then the tone and so on. So with two cassette recorders they can put together a series of phone numbers by switching back and forth from number to number. Any idiot in the country with a cheap cassette recorder can make all the free calls he wants."

"You mean you just hold the cassette recorder up the mouthpiece and switch in a series of beeps you've recorded? The phone thinks that anything that makes these tones must be its own equipment?"

"Right. As long as you get the frequency within thirty cycles per second of the phone company's tones, the phone equipment thinks it hears its own voice talking to it. The original granddaddy phone phreak was this blind kid with perfect pitch, Joe Engressia, who used to whistle into the phone. An operator could tell the difference between his whistle and the phone company's electronic tone generator, but the phone company's switching circuit can't tell them apart. The bigger the phone company gets and the further away from human operators it gets, the more vulnerable it becomes to all sorts of phone phreaking."

A Guide for the Perplexed

"But wait a minute," I stop Gilbertson. "If everything you do sounds like phone-company equipment, why doesn't the phone company charge you for the call the way it charges its own equipment?"

"Okay. That's where the 2600-cycle tone comes in. I better start from the beginning."

The beginning he describes for me is a vision of the phone system of the continent as thousands of webs, of long-line trunks radiating from each of the hundreds of toll switching offices to the other toll switching offices. Each toll switching office is a hive compacted of thousands of long-distance tandems constantly whistling and beeping to tandems in far-off toll switching offices.

The tandem is the key to the whole system. Each tandem is a line with some relays with the capability of signaling any other tandem in any other toll switching office on the continent, either directly one-to-one or by programming a roundabout route through several other tandems if all the direct routes are busy. For instance, if you want to call from New York to Los Angeles and traffic is heavy on all direct trunks between the two cities, your tandem in New York is programmed to try the next best route, which may send you down to a tandem in New Orleans, then up to San Francisco, or down to a New Orleans tandem, back to an Atlanta tandem, over to an Albuquerque tandem and finally up to Los Angeles.

When a tandem is not being used, when it's sitting there waiting for someone to make a long-distance call, it whistles. One side of the tandem, the side "facing" your home phone, whistles at 2600 cycles per second toward all the home phones serviced by the exchange, telling them it is at their service, should they be interested in making a long-distance call. The other side of the tandem is whistling 2600 cps. into one or more long-distance trunk lines, telling the rest of the phone system that it is neither sending nor receiving a call through that trunk at the moment, that it has no use for that trunk at the moment.

"When you dial a long-distance number the first thing that happens is that you are hooked into a tandem. A register comes up to the side of the tandem facing away from you and presents that side with the number you dialed. This sending side of the tandem stops whistling 2600 into its trunk line. When a tandem stops the 2600 tone it has been sending through a trunk, the trunk is said to be "seized," and is now ready to carry the number you have dialed -- converted into multi-frequency beep tones -- to a tandem in the area code and central office you want.

Now when a blue-box operator wants to make a call from New Orleans to New York he starts by dialing the 800 number of a company which might happen to have its headquarters in Los Angeles. The sending side of the New Orleans tandem stops sending 2600 out over the trunk to the central office in Los Angeles, thereby seizing the trunk. Your New Orleans tandem begins sending beep tones to a tandem it has discovered idly whistling 2600 cycles in Los Angeles. The receiving end of that LA tandem is seized, stops whistling 2600, listens to the beep tones which tell it which LA phone to ring, and starts ringing the 800 number.  Meanwhile a mark made in the New Orleans office accounting tape notes that a call from your New Orleans phone to the 800 number in LA has been initiated and gives the call a code number. Everything is routine so far.

But then the phone phreak presses his blue box to the mouthpiece and pushes the 2600-cycle button, sending 2600 out from the New Orleans tandem to the LA tandem. The LA tandem notices 2600 cycles are coming over the line again and assumes that New Orleans has hung up because the trunk is whistling as if idle. The LA tandem immediately ceases ringing the LA 800 number. But as soon as the phreak takes his finger off the 2600 button, the LA tandem assumes the trunk is once again being used because the 2600 is gone, so it listens for a new series of digit tones - to find out where it must send the call.

Thus the blue-box operator in New Orleans now is in touch with a tandem in LA which is waiting like an obedient genie to be told what to do next. The blue-box owner then beeps out the ten digits of the New York number which tell the LA tandem to relay a call to New York City.