STORY ANNOTATIONS

Annotation Tuesday! Ron Rosenbaum and "The Secrets of the Little Blue Box"

The writer talks about his eerily prescient 1971 Esquire classic about "phone phreaks," and how it inspired Steve Jobs (who later said, "If we hadn't made blue boxes, there would have been no Apple.")

by Tom McNichol

A busy telephone exchange, somewhere in England, in 1943.

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Some writers work for decades before one of their pieces gets widespread attention. Ron Rosenbaum managed to pull it off with his second long-form magazine article.

Rosenbaum's 1971 Esquire piece, "Secrets of the Little Blue Box," tells the story of an underground network of telephone hackers – dubbed "phone phreaks" – who devised a small box that enabled them to control the long-distance phone network. Rosenbaum's article quickly became a cult classic and made overnight celebrities of the phone phreaks, especially a character named Captain Crunch, who made the phone network dance to his tune by blowing a toy whistle given away in boxes of Cap'n Crunch cereal.

It touched a nerve maybe because it combines old-fashioned underground sci-fi intrigue vs. the tech

surveillance state. And everybody likes the band of little guys taking on the Big Money Goliath using brains instead of tanks.

Rosenbaum's article is the rare magazine story that not only chronicled history, it also shaped it. A tech enthusiast named Steve Wozniak read Rosenbaum's piece, and then showed it to his friend Steve Jobs. Before long, the two collaborated on building and selling their own blue boxes. It was the first product release of what would eventually become one of the world's most valuable companies – Apple.

The piece also would turn out to be remarkably prescient, revealing how some of the phone hackers were already turning their attention to an even more tempting target – computer networks.

With the apparent Russian hack of the U.S. presidential election dominating headlines worldwide, it seemed a perfect time to revisit this 46-year-old gem, which helped launch a career that has included the publication of several books, including "Explaining Hitler," "The Shakespeare Wars," "How the End Begins" and a collection of his longform essays and reporting, "The Secret Parts of Fortune," with nonfiction from The New Yorker, The New York Times Magazine, Harper's, Slate and The New York

Observer, among others.

I chatted with Rosenbaum about "The Secrets of the Little Blue Box," which was recently republished as part of the Amazon Singles Classics series. His answers have been slightly edited.

What was the genesis of this piece?

It came from Esquire. Just for context, this was during the last couple years of the editorship of the late Harold Hayes, part Marine sergeant, part avant, avant gardiste. A great editor on all levels who, more than anyone of the other claimants, deserves credit as a founder of what we now think of as “The New Journalism." There was no such name or aesthetic doctrine written down when I was there, just a lot of writers given freedom to tell their stories in sometimes unconventional ways. But it was still at its heart about intensive reporting, immersive storytelling, not stylistic tricks. Read Terry Southern's knockout hilarious evocation of the place in the short story called "Blood of a Wig." I advise every journalist to read it. It's in one of his collections, “Red Dirt Marijuana and Other Tastes.”

The Blue Box piece was only my second magazine story. I had been writing for the Village Voice for a year and a half after the prospect of a snoozy academic career drove me out of the study of English lit at Yale graduate school, where they were grinding literature into theory. I thought

journalism offered adventure and excitement to a kid from a relatively sheltered background. I wanted to hang out with cops and criminals. I stumbled into a couple of lucky breaks – right place at the right time – and got to do it.

A friend and colleague from the Voice and Esquire, Craig S. Karpel, had spent the summer in Northern California and met a lawyer named Metzger who was repping the blue box maker and dealer I called "Al Gilbertson" (the real person wanted anonymity). Craig sent a memo to the East Coast about this underground network of phone phreaks.

Anyway, I went out to San Francisco and Metzger (very colorful, now dead) and Gilbertson gave me an overview of the phone phreak realm on Metzger's Sausalito houseboat, I think. They also gave me a list of the nation's most prominent phone phreaks. Many had gotten in touch with Gilbertson after his bust hit the papers. (They were not very security conscious, mainly lonely at the time). I started going down the list, talking to them on the phone via the Bering Strait or some exotic "loop-around" they would usually insist on, with each contact getting more and more of a Looking Glass feeling the more I entered into their world.

BELL
SYSTEM

Long-distance operator Elizabeth Keener poses with Princess phones in 1959. Horace Cort/Associated Press

Did you immediately think it was a great story, or did the subject grow on you as you reported it?

Both. It got better than I could have imagined.

Did the phone phreaks like the story or dispute it in any way? Did your reporting cause them any problems, legal or otherwise?

As far as I can gather, some were conflicted. Most liked the publicity, the David and Goliath narrative viz a viz AT&T. They were like underground resistance heroes, intelligence being their super power. Some feared/suffered from a crackdown. Up until then, the Feds and the phone company were not especially eager to let people know how vulnerable long-distance communications were, so there was no high-publicity bust. I only recently found out that an internal phone company memo vouched for the accuracy of the story, and estimated $50 million a year in

losses from phreaking.

Were you surprised to see what kind of impact your story later had on the emerging computer culture, including Steve Wozniak and Steve Jobs? Did Wozniak really think at first that your piece was a work of fiction?

Yes, that's funny. I only learned about the Apple connection when I happened to have lunch with Jobs while doing a piece on his ad guru Jay Chiat (who did the Apple "1984" ad). Jobs told me that Woz's mother sent Woz the Esquire piece, and Woz couldn't believe it could be real. (The piece had been fact-checked and lawyered to the max.) He thought it was fiction, and even said so in the first edition of his memoir until I convinced him to change that in later editions.

They were like underground resistance heroes, intelligence being their super power.

Anyway, Woz showed it to his pal Jobs and they got all excited and found the missing phone code combinations – the ones that I'd deliberately left out of the story -- in an engineering journal, which allowed them to build a first-gen Blue Box of their own. It was the beginning of the Apple partnership, even though as far as I can tell they

weren't very good at it then. And then they met the master of it all, Captain Crunch, and it all went viral in a subdued underground way.

Crunch is a different story in terms of response. The story made him an underground star, a Great American Gyro Gearloose character. While I was doing the reporting, he'd find ways of breaking into the conversations I'd have with other phone phreaks to assert his primacy and detail his many achievements and then claim unconvincingly that he "never did it anymore." But he'd call me illicitly from the Sierra Mountains from remote phone booths to which he'd hooked up his celebrated "unit."

At first, after the story came out, he reveled in being a star, an idiosyncratic role model for the new wave of hackers emerging from phone phreakdom. I recall a celebratory meeting with him and the journalist Maureen Orth at a McDonald's in San Jose. (Maureen did a story that came out a few weeks after mine.) And he was thrilled to be in the orbit of Jobs and Wozniak, who it seems learned a lot from him; he worked on the early Apple and Microsoft products. It was a two-way street. Jobs has been quoted saying, "If we hadn't made blue boxes, there would have been no Apple."

But apparently, Captain Crunch couldn't stop himself from phreaking, and not long after Maureen's story came out, he got hauled in by the Feds and afterward (baselessly) tried

to blame me. I think we have a fragile friendship now, but I think he likes to use me as an excuse. I should say for the record that I've never spoken to the Feds or any authority about his identity, which I only learned long after the piece came out.

Why did this story resonate with so many people and why has it stood the test of time? Do people still come up to you wanting to talk about it?

I still get pretty frequent requests to do documentaries/ interviews. It touched a nerve maybe because it combines old-fashioned underground sci-fi intrigue vs. the tech surveillance state. And everybody likes the band of little guys taking on the Big Money Goliath using brains instead of tanks.

My questions are in red, his responses in blue.

The Secrets of the Little Blue Box

By Ron Rosenbaum
Esquire

October 1971

Is this your title or Esquire's? It seems like it sets up the reader for a story about a device when in fact it's more a story about a subterranean network of phone hackers and their passion for technology. I'd disagree. I think the key word is "Secrets," and it suggests all sorts of remarkable things emerging from that box when you open it up. Pandora's Box. I'm seeing Blue Box in the title conjuring up a magic rabbit hole.

The Blue Box Is Introduced: Its Qualities Are Remarked

Did you have a literary model for how you wrote this piece? Well, in this deliberately archaic subhead, sort of. I'd read a lot of 18th century novel/sagas from Fielding etc. in college and I always liked the tongue-in-cheek formality of the subtitles, for want of a better phrase. In a larger sense, there's a picaresque (in the Cervantes sense) feel, I think.

I am in the expensively furnished living room of Al Gilbertson, * [*His real name has been changed.] the creator of the "blue box." What sort of agreement did you have with "Al Gilbertson" about protecting his anonymity? Did Gilbertson get into any trouble as a result of your story? Has his real name been revealed since your story was published? My agreement was just to leave identifiable details (name, court jurisdictions etc.) out. After the story came out, we stayed out of touch for security reasons. I didn't want to know anything that I might be asked about under oath in a court. He was the initiator. I've kept my promise never to reveal the real name. That's especially easy now that I've forgotten it, but I don't even recall if I'd ever known his real name.

Gilbertson is holding one of his shiny black-and-silver "blue boxes" comfortably in the palm of his hand, pointing out the thirteen little red push buttons sticking up from the console. Why didn't you explain here why the device is called a "blue box" when it's black-and-silver? Good point. I guess by that point, everyone I was talking to was referring to it as a "blue box" and think I had a section tracing the box typology that must have been cut. I added a footnote to the collected version in [the collection] "The Secret Parts of Fortune." But I guess I didn't think it's a big enough deal to stop the flow of the narrative, especially since there was no ordained color.

He is dancing his fingers over the buttons, tapping our discordant beeping electronic jingles. He is trying to explain to me how his little blue box does nothing less than place the entire telephone system of the world, satellites, cables, and all, at the service of the blue-box operator, free of charge. Esquire prominently featured a photo of a box with multiple buttons on the opening page of your story. Was that a real blue box? If so, how did Esquire get it, and what happened to it? For self-protective legal reasons, I tried to stay out of the actual procurement. I do seem to recall an afternoon when it was handed around the office. I don't know where it came from, but I think it was real.

"That's what it does. Essentially it gives you the power of a super operator. You seize a tandem with this top button," he presses the top button with his index finger and the blue

box emits a high-pitched cheep, “and like that”—cheep goes the blue box again—“you control the phone company’s long-distance switching systems from your cute little Princess phone or any old pay phone. And you’ve got anonymity. An operator has to operate from a definite location: the phone company knows where she is and what she’s doing. But with your beeper box, once you hop onto a trunk, say from a Holiday Inn 800 [toll-free] number, they don’t know where you are, or where you’re coming from, they don’t know how you slipped into their lines and popped up in that 800 number. They don’t even know anything illegal is going on. And you can obscure your origins through as many levels as you like. You can call next door by way of White Plains, then over to Liverpool by cable, and then back here by satellite. You can call yourself from one pay phone all the way around the world to a pay phone next to you. And you get your dime back too.”

This is great detail that immediately gives the reader not only information about how the blue box works, but also a sense of the passionate connection Gilbertson has to the device. How did you manage to capture such long and technically detailed quotes faithfully? Did you take notes or use a tape recorder?

Tape recorder. I almost always use a tape recorder. Everyone should use tape recorder if at all possible. Not using a tape recorder for quotes cheats the reader and the subject of his/her full dimensionality and substitutes subjective reconstruction. Sure, take some notes while listening and taping. Knock yourself out. It drives me crazy to hear writers I respect – in addition to ones I don’t – boast of their note-taking ability. No, sorry, nothing like the real thing. You’re

giving us your already skewed personal angle on what is said. People who say they can get it as good taking notes are just wrong. They're fooling themselves, deceiving the reader, missing deeper aspects. (I have strong feelings about this.) Nothing like the real tone of voice. Get it transcribed. It's NOT that expensive, and some magazines will pay for it and it pays off to have a text rather than an unreliable pliable memory. Study it like a sacred text and truths will emerge. The thing that surprised me is that after awhile they'll forget the recorder is there, or if there's something they don't want a record of, they'll tell you to shut it off.

"And they can't trace the calls? They can't charge you?"

"Not if you do it the right way. But you'll find that the free-call thing isn't really as exciting at first as the feeling of power you get from having one of these babies in your hand. Is a sense of power one of the central motivations of the phone phreaks? Do you think that the driving forces of today's computer hackers are much the same? Yes, definitely. Crunch, Gilbertson, Jobs/Wozniak made hacking glamorous to the subset of tech geniuses out there.

"I've watched people when they first get hold of one of these things and start using it, and discover they can make connections, set up crisscross and zigzag switching patterns back and forth across the world. They hardly talk to the people they finally reach. They say hello and start thinking of what kind of call to make next. They go a little crazy." He looks down at the neat little package in his palm. His fingers are still dancing, tapping out beeper patterns.

“I think it’s something to do with how small my models are. There are lots of blue boxes around, but mine are the smallest and most sophisticated electronically. I wish I could show you the prototype we made for our big syndicate order.”

He sighs. “We had this order for a thousand beeper boxes from a syndicate front man in Las Vegas. Does he mean a front man for Las Vegas mobsters? That was my impression. His words on tape.

They use them to place bets coast-to-coast, keep lines open for hours, all of which can get expensive if you have to pay. The deal was a thousand blue boxes for $300 apiece. Before then we retailed them for $1,500 apiece, but $300,000 in one lump was hard to turn down. We had a manufacturing deal worked out in the Philippines. Everything was ready to go. Anyway, the model I had ready for limited mass production was small enough to fit inside a flip-top Marlboro box. It had flush touch panels for a keyboard, rather than these unsightly buttons sticking out.

The comment about the “unsightly buttons” sounds like something Steve Jobs might have said. The elegance of the blue box’s design is as important as its function. I agree. There was from the beginning, the cult of the cool-looking device. Wallet or credit card-sized.

“Looked just like a tiny portable radio. In fact, I had designed it with a tiny transistor receiver to get one AM

channel so in case the law became suspicious the owner could switch on the radio part, start snapping his fingers, and no one could tell anything illegal was going on. I thought of everything for this model—I had it lined with a band of thermite which could be ignited by radio signal from a tiny button transmitter on your belt, so it could be burned to ashes instantly in case of a bust. It was beautiful. A beautiful little machine. You should have seen the faces on these syndicate guys when they came back after trying it out. They'd hold it in their palm like they never wanted to let it go, and they'd say, 'I can't believe it. I can't believe it.' You probably won't believe it until you try it." One of the signature elements of this piece is that you present a lot of very long quotes, letting your characters tell their stories in their own words. Some nonfiction writers, such as Gay Talese, avoid long quotes (or any quotes at all) because they want to present the uninterrupted voice of the writer. What's your feeling about the use and length of quotes? Really depends. I love Gay Talese; he almost always gets to the heart of the matter – or convinces you he has – by whatever means, usually an amazing intuition about people that no kind of notes can capture, but you just trust. But I was teaching a writing seminar at Columbia J-school awhile back and he visited and demonstrated how his inside jacket pockets were tailored to perfectly encapsulate the idiosyncratic shape of his notepads. So he attributes his genius to tailoring. I think it's his specially wired brain. I couldn't take notes the way he does. And I do think it makes a difference, often a big difference.

You Can Call Long Distance For Less

than You Think

“You see, a few years ago the phone company made one big mistake,” Gilbertson explains two days later in his apartment. “They were careless enough to let some technical journal publish the actual frequencies used to create all their multi-frequency tones. Just a theoretical article some Bell Telephone Laboratories engineer was doing about switching theory, and he listed the tones in passing. At - - - - - [a well-known technical school]

Did you decide to omit the school name or did Gilbertson insist on it? Did he review the story before it went into print? I think I decided to omit the name. Esquire's lawyers might (don't remember for sure) have asked I not give every single combination code so you couldn’t pick up the mag and start building blue boxes. Jobs found the complete set in Stanford's Engineering Lab library (I think). Gilbertson didn't ask and I didn't show him the story.

“I had been fooling around with phones for several years before I came across a copy of the journal in the engineering library. I ran back to the lab and it took maybe twelve hours from the time I saw that article to put together the first working blue box. It was bigger and clumsier than this little baby, but it worked.”

“It’s all there on public record in that technical journal written mainly by Bell Lab people for other telephone engineers. Or at least it was public. “Just try and get a copy

of that issue at some engineering-school library now. Bell has had them all red-tagged and withdrawn from circulation," Gilbertson tells me. Did this detail set off a scramble among engineers to track down the technical journal after your piece was published? Were Steve Wozniak and Steve Jobs among them? Yes. Jobs told me about it when I had lunch with him in the mid-'80s.

"But it's too late. It's all public now. And once they became public the technology needed to create your own beeper device is within the range of any twelve-year-old kid, any twelve-year-old blind kid as a matter of fact. And he can do it in less than the twelve hours it took us. Blind kids do it all the time. They can't build anything as precise and compact as my beeper box, but theirs can do anything mine can do."

"How?"

"Okay. About twenty years ago A.T.&T. made a multi-billion-dollar decision to operate its entire long-distance switching system on twelve electronically generated combinations of six master tones. Those are the tones you sometimes hear in the background after you've dialed a long-distance number. They decided to use some very simple tones—the tone for each number is just two fixed single-frequency tones played simultaneously to create a certain beat frequency. Like 1,300 cycles per second and 900 cycles per second played together give you the tone

for digit 5. Now, what some of these phone phreaks have done is get themselves access to an electric organ. Any cheap family home-entertainment organ. Since the frequencies are public knowledge now—one blind phone phreak has even had them recorded in one of those talking books for the blind—they just have to find the musical notes on the organ which correspond to the phone tones. Then they tape them. For instance, to get Ma Bell's tone for the number 1, you press down organ keys F5 and A5 [900 and 700 cycles per second] at the same time. To produce the tone for 2 it's F5 and C6 [1100 and 700 c.p.s.]. The phone phreaks circulate the whole list of notes so there's no trial and error anymore.

He shows me a list of the rest of the phone numbers and the two electric organ keys that produce them. Did you deliberately not include the keys to the rest of the phone numbers to avoid running afoul of AT&T? How concerned were you that the phone company might take action against you? I was definitely concerned and took measures to distance myself from the device and used only pseudonyms of the phreaks. It was tissue-thin security. But as far as I know, no break-ins.

"Actually, you have to record these notes at 3¾ inches-per-second tape speed and double it to 7½ 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.

Did you come up with the spelling of “phreak,” or was it already in use? I've been asked that a lot and I can't be sure. I don't think I saw it before my story. There is a logic to it: phone+freak. (The book-length treatment of the phone phreak underground, “Exploding the Phone,” by Phil Lapsley, claims I was in fact the first to use it.) 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.” Why do you think Gilbertson keeps bringing up how easy it is to hack the phone system? It seems like he has a very conflicted relationship with the phone company – a deep respect for its technical complexity and an equally profound disdain for its shortcomings. At the time, my feeling was that the desire for revenge for his legal troubles after he got caught predominated, although he was still able to see the attractions of secretly outwitting a giant corporate machine. So yes, it's something I noticed about a lot of them. They loved the idea of a grand complicated system they could navigate, but were always bitching about this or that flaw that allowed them to navigate it. Or bring them together! Often claiming that what they were doing was Perfecting the System.

“You mean you just hold the cassette recorder up to 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 2,600-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. Sounds a lot like another network that would later become very popular – the Internet. Gilbertson even refers to the network as a web. Yeah, it does, doesn't it? I like that sentence.

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 back up to Los Angeles. Were you comprehending all of this technical detail as Gilbertson was recounting it, or were you just nodding your head and hoping to understand it later? Mostly the latter. Though I had the tapes to study afterward.

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 2,600 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 2,600 c.p.s. 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 2,600 into its trunk line. When a tandem stops the 2,600 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 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 beep tones to a tandem it

has discovered idly whistling 2,600 cycles in Los Angeles. The receiving end of that L.A. tandem is seized, stops whistling 2,600, listens to the beep tones which tell it which L.A. phone to ring, and starts ringing the 800 number. Meanwhile a mark made on the New Orleans office accounting tape notes that a call from your New Orleans phone to the 800 number in L.A. 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 2,600-cycle button, sending 2,600 out from New Orleans tandem to the L.A. tandem. The L.A. tandem notices 2,600 cycles are coming over the line again and assumes that New Orleans has hung up because the trunk is whistling as if idle. The L.A. tandem immediately ceases ringing the L.A. 800 number. But as soon as the phreak takes his finger off the 2,600 button, the L.A. tandem assumes the trunk is once again being used because the 2,600 is gone, so it listens for a new series of digit tones—to find out where it must send the call.

There's a lot of technical detail in the paragraphs above, and more to come. Were you or your editor worried about losing the reader by going too deep in the weeds on the technology? Why did you decide to present the technology here and not later in the piece? If you submitted this piece to a magazine or website today, do you think they would simply cram the technical details into an infographic? I don't know. I know what you mean about it being a big chunk of tech, but on the other hand, there had been a lot of big claims made about its

power and I thought it important that people take it seriously. Didn't want the phone company saying it was fantasy. Don't know about how it would be handled now. Lots of documentaries, so maybe it's cinematic. Feature films too – "War Games," "Sneakers." Just about every thriller these days has a moment when they turn to a geeky hacker to save the world.

Thus the blue-box operator in New Orleans now is in touch with a tandem in L.A. 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 L.A. tandem to relay a call to New York City. Which it promptly does. As soon as your party picks up the phone in New York, the side of the New Orleans tandem facing you stops sending 2,600 cycles to you and starts carrying his voice to you by way of the L.A. tandem. A notation is made on the accounting tape that the connection has been made on the 800 call which had been initiated and noted earlier. When you stop talking to New York a notation is made that the 800 call has ended.

At three the next morning, when the phone company's accounting computer starts reading back over the master accounting tape for the past day, it records that a call of a certain length of time was made from your New Orleans home to an L.A. 800 number and, of course, the accounting computer has been trained to ignore these toll-free 800 calls when compiling your monthly bill. The

eight paragraphs you just spent recounting how the blue box works aren't set

off with quotation marks, so you're apparently paraphrasing Gilbertson. But you're sort of writing in his voice. What made you decide to present the information that way? I don't recall. The info/description is from Gilbertson, as the next sentence makes crystal clear.

"All they can prove is that you made an 800 toll-free call," Gilbertson the inventor concludes. "Of course, if you're foolish enough to talk for two hours on an 800 call, and they've installed one of their special antifraud computer programs to watch out for such things, they may spot you and ask you why you took two hours talking to Army Recruiting's 800 number when you're 4-F. But if you do it from a pay phone, they may discover something peculiar the next day—if they've got a blue-box hunting program in their computer—but you'll be a long time gone from the pay phone by then. Using a pay phone is almost guaranteed safe."

"What about the recent series of blue-box arrests all across the country—New York, Cleveland, and so on," I asked. "How were they caught so easily?"

"From what I can tell, they made one big mistake: they were seizing trunks using an area code plus 555-1212 instead of an 800 number. Using 555 is easy to detect because when you send multi-frequency beep tones off 555 you get a charge for it on your tape and the accounting computer knows there's something wrong when it tries to

bill you for a two-hour call to Akron, Ohio, information, and it drops a trouble card which goes right into the hands of the security agent if they're looking for the blue-box users.

How did Gilbertson know so much about the inner workings of the phone company and their security procedures? Were you able to verify any of this, or did you just have to take his word? That's a good question. These guys were in essence an illegal gang. Not to be dramatic, but do you go to El Chapo's gang and ask if he really knew how to make blow? Or ask Talese's mafia characters, "Was that a Louisville slugger you used on MoMo?" I think some things you have to take on trust. (It later came out that internal phone company memos confirmed the accuracy of my account.) Multiple sources and real-life demos are important. I think I'm good at detecting bullshit and conspiracy theory frauds. And I trusted Metzger, the lawyer, who was still in the picture, though out of the frame. He had a sharp lawyer's eye for dissembling. Gilbertson didn't take me through his learning process, but I watched and listened as he phone phreaked and used an early modem for computer hacking from his living room.

"Whoever sold those guys their blue boxes didn't tell them how to use them properly, which is fairly irresponsible. And they were fairly stupid to use them at home all the time.

"But what those arrests really mean is that an awful lot of blue boxes are flooding into the country and that people are finding them so easy to make that they know how to make them before they know how to use them. Ma Bell is

in trouble." His use of the term "Ma Bell" reveals his view of the phone company as a personified entity rather than as a network of inanimate wires and switches. Yes, a lot of mother issues unresolved in there.

And if a blue-box operator or a cassette-recorder phone phreak sticks to pay phones and 800 numbers, the phone company can't stop them?

"Not unless they change their entire nationwide long-lines technology, which will take them a few billion dollars and twenty years. Right now they can't do a thing. They're screwed.

Captain Crunch Demonstrates His Famous Unit

There is an underground telephone network in this country. In a more conventional feature story, this sentence might have been the lede. Did you consider that approach instead of the long anecdotal opening you ended up writing? How did you have such a strong sense of how to pace a 14,000-word magazine story when this was only the second long-form magazine piece you had written? One simple trick about pacing is use of subheads. I love subheads. Less scary and more fun for the reader and writer than miles of unbroken text, and they can be important storytelling devices. Sharp perception about the lede. You know, when Esquire did some kind of "Best of" collection, I actually did use that lede to make it more reader-friendly. Tucked the heavy tech stuff in elsewhere or cut some. Maybe

what emerged – its undergroundness – seemed more significant in the Age of Surveillance than the details of the tech by then.

Gilbertson discovered it the very day news of his own arrest hit the papers. That evening his phone began ringing. Phone phreaks from Seattle, from Florida, from New York, from San Jose, and from Los Angeles began calling him and telling him about the phone-phreak network. He'd get a call from a phone phreak who'd say nothing but, "Hang up and call this number."

When he dialed the number he'd find himself tied into a conference of a dozen phone phreaks arranged through a quirky switching station in British Columbia. They identified themselves as phone phreaks, they demonstrated their homemade blue boxes which they called "M-F-ers" (for "multi-frequency," among other things) for him, they talked shop about phone-phreak devices. They let him in on their secrets on the theory that if the phone company was after him he must be trustworthy. And, Gilbertson recalls, they stunned him with their technical sophistication.

I ask him how to get in touch with the phone-phreak network. He digs around through a file of old schematics and comes up with about a dozen numbers in three widely separated area codes.

"Those are the centers," he tells me. Alongside some of the numbers he writes in first names or nicknames: names like Captain Crunch, Dr. No, Frank Carson (also a code word for free call), Marty Freeman (code word for M-F device), Peter Perpendicular Pimple, Alefnull, and The Cheshire Cat. He makes checks alongside the names of those among these top twelve who are blind. There are five checks.

This is as good a place as any to bring this up. Around the same time, Gilbertson apparently supplied a similar list to journalist Maureen Orth (now a Special Correspondent for Vanity Fair), who wrote a detailed story about the phone phreaks that was syndicated nationwide by the Los Angeles Times and appeared a few weeks after your story ran in Esquire. Orth's story quotes many of the same phone phreaks that you talked to, sometimes saying the same things. Were you aware at the time that Gilbertson and some of the other phone phreaks were talking to Orth? I was not aware of Maureen's story until some months after it came out. In that case, did you feel somewhat betrayed by your sources? I didn't ask or expect any exclusivity from them or that the story wouldn't be followed up, so it didn't surprise me or displease me that the story was followed up. It added to its credibility. Why do you think your phone phreaks article has survived as a celebrated magazine story, while Orth's piece is largely forgotten? I don't know. I hadn't read Maureen's story at the time (or even now). This was way before Google. Newspaper syndication stories are easy to miss, unlike social media now. I think I finished my story before I met her. I know we became casual friends when I was later staying out in San Francisco for another story and learned that she had written about it, which was why we both made a drive down to a McDonald's in San Jose to meet Crunch.

I ask him who this Captain Crunch person is.

"Oh. The Captain. He's probably the most legendary phone phreak. He calls himself Captain Crunch after the notorious Cap'n Crunch 2,600 whistle." (Several years ago, Gilbertson explains, the makers of Cap'n Crunch breakfast cereal offered a toy-whistle prize in every box as a treat for the Cap'n Crunch set. Somehow a phone phreak discovered that the toy whistle just happened to produce a perfect 2,600-cycle tone. When the man who calls himself Captain Crunch was transferred overseas to England with his Air Force unit, he would receive scores of calls from his friends and "mute" them—make them free of charge to them—by blowing his Cap'n Crunch whistle into his end.)

> We now know that Captain Crunch's real name is John Draper, a somewhat eccentric figure who later became a prominent if itinerant computer programmer. Draper befriended Steve Wozniak and Steve Jobs, worked briefly as an independent contractor for Apple and has led a mostly nomadic lifestyle as a programmer. Did you keep in touch with him after your story was published? Are you aware that he's now in poor health and recently launched a crowdfunding campaign to help him pay his medical bills? We've talked (on the phone) a few times. I know he's had health problems. Didn't know about the crowdfunding.

"Captain Crunch is one of the older phone phreaks," Gilbertson tells me. "He's an engineer who once got in a little trouble for fooling around with the phone, but he can't stop. Well, this guy drives across country in a

Volkswagen van with an entire switchboard and a computerized super-sophisticated M-F-er in the back. He'll pull up to a phone booth on a lonely highway somewhere, snake a cable out of his bus, hook it onto the phone and sit for hours, days sometimes, sending calls zipping back and forth across the country, all over the world...."

Back at my motel, I dialed the number he gave me for "Captain Crunch" and asked for G- - - - - T- - - - -, the name he uses when he's not dashing into a phone booth beeping out M-F tones faster than a speeding bullet, and zipping phantomlike through the phone company's long-distance lines.

When G- - - - - T- - - - - answered the phone and I told him I was preparing a story for Esquire about phone phreaks, he became very indignant.

"I don't do that. I don't do that anymore at all. And if I do it, I do it for one reason and one reason only. I'm learning about a system. It's odd but perhaps revealing that that in the space of four sentences, Captain Crunch both denies and confirms that he's an active phone phreak. EXACTLY!! Thank you. That's how every once in a while I see something about him blaming me or the story for his troubles when throughout the story he denies, then admits he's still doing it. He wanted his exploits to be the star of the story. I did manage to track down Captain Crunch in Nevada and he's still blaming you for his troubles. He told me that your story caused him "serious legal hassles." He also said, "I knew that as soon as I read

the article that phone phreaking will never be the same again," and that he called you at one point and "pleaded" with you not to run the story. And in case you're wondering whether he's still interested in the phone network after all these years, he also told me, "SS7 is the network that ties all phones all over the world together in a separate network, but is very insecure and I know how to hack it." So he claims he doesn't do it anymore and simultaneously boasts, "I know how to hack" this SS7 or whatever it is? I wonder how he learned. I have no recollection of his asking not to be in the story. Quite the opposite, he virtually demanded to be the center of it. It's possible he's remembering boasting of the dangerous consequences of revealing what he did. But it was his lack of caution in continuing to phreak/hack after the story came out that got him into trouble. Look at the way he's boasting to you.

The phone company is a System. A computer is a System. Do you understand? If I do what I do, it is only to explore a System. Computers. Systems. That's my bag. The phone company is nothing but a computer."

A tone of tightly restrained excitement enters the Captain's voice when he starts talking about Systems. He begins to pronounce each syllable with the husked deliberation of an obscene caller. That's a terrific description. Did that just come to you or did you have to work on it? How much rewriting did you do on this piece? How heavily was it edited? That's Crunch speaking. I had so much good stuff on tape I didn't need to do a lot of re-writing here especially. (I'd never use the phrase "my bag.7rd) I did a lot of restructuring and rethinking about what were the most salient of the many aspects of the story. I probably had to cut some

stuff, but I can't recall anything I regret the loss of.

"Ma Bell is a system I want to explore. It's a beautiful system, you know, but Ma Bell screwed up. It's terrible because Ma Bell is such a beautiful system, but she screwed up. Like Gilbertson, Captain Crunch personifies the phone system as a beautiful but deeply flawed individual. Yes. Flaws he can ride to the rescue and fix if they'd give him a chance.

I learned how she screwed up from a couple of blind kids who wanted me to build a device. A certain device. They said it could make free calls. I wasn't interested in free calls. But when these blind kids told me I could make calls into a computer, my eyes lit up. I wanted to learn about computers. I wanted to learn about Ma Bell's computers. So I built the little device. Only I built it wrong and Ma Bell found out. Ma Bell can detect things like that. Ma Bell knows. So I'm strictly out of it now. I didn't do it. Except for learning purposes." He pauses. "So you want to write an article. Are you paying for this call? Hang up and call this number."

He gives me a number in an area code a thousand miles north of his own. I dial the number.

"Hello again. This is Captain Crunch. You are speaking to me on a toll-free loop-around in Portland, Oregon. Do you know what a toll-free loop-around is? I'll tell you."

He explains to me that almost every exchange in the country has open test numbers which allow other exchanges to test their connections with it. Most of these numbers occur in consecutive pairs, such as 302 956-0041 and 956-0042. Well, certain phone phreaks discovered that if two people from anywhere in the country dial those two consecutive numbers they can talk together just as if one had called the other's number, with no charge to either of them, of course.

"Your voice is looping around in a 4A switching machine up there in Canada, zipping back down to me," the Captain tells me. "My voice is looping around up there and back down to you. And it can't ever cost anyone money. The phone phreaks and I have compiled a list of many many of these numbers. You would be surprised if you saw the list. I could show it to you. But I won't. I'm out of that now. I'm not out to screw Ma Bell. I know better. If I do anything it's for the pure knowledge of the System.

There is a sort of purity to Captain Crunch's quest – knowledge for the sake of knowledge. Were all the phone phreaks like this? Do you see parallels with today's computer hackers? Or are today's hackers more selfish and malicious than the phone phreaks? You know about the alleged difference between black-hat and white-hat hacking, right? There's a lot of interchange between them. I think there are some pure visionaries left, but the money and power on the black-hat side seem enormous by comparison. And now post-Snowden, post-November 2016, we can see political power too.

You can learn to do fantastic things. Have you ever heard eight tandems stacked up? Do you know the sound of tandems stacking and unstacking? Give me your phone number. Okay. Hang up now and wait a minute."

Slightly less than a minute later the phone rang and the Captain was on the line, his voice sounding far more excited, almost aroused.

"I wanted to show you what it's like to stack up tandems. To stack up tandems." (Whenever the Captain says "stack up" it sounds as if he is licking his lips.)

"How do you like the connection you're on now?" the Captain asks me. "It's a raw tandem. A raw tandem. Ain't nothin' up to it but a tandem. Now I'm going to show you what it's like to stack up. Blow off. Land in a faraway place. To stack that tandem up, whip back and forth across the country a few times, then shoot on up to Moscow.

"Listen," Captain Crunch continues. "Listen. I've got a line tie on my switchboard here, and I'm gonna let you hear me stack and unstack tandems. Listen to this. I'm gonna blow your mind."

First I hear a super rapid-fire pulsing of the flutelike phone tones, then a pause, then another popping burst of tones,

then another, then another. Each burst is followed by a beep-kachink sound.

“We have now stacked up four tandems,” said Captain Crunch, sounding somewhat remote. “That’s four tandems stacked up. Do you know what that means? That means I’m whipping back and forth, back and forth twice, across the country, before coming to you. I’ve been known to stack up twenty tandems at a time. Now, just like I said, I’m going to shoot up to Moscow.”

There is a new, longer series of beeper pulses over the line, a brief silence, then a ring.

“Hello,” answers a far-off voice.

“Hello. Is this the American Embassy Moscow?”

“Yes, sir. Who is this calling?” says the voice.

“Yes. This is test board here in New York. We’re calling to check out the circuits, see what kind of lines you’ve got. Everything okay there in Moscow?”

“Okay?”

“Well, yes, how are things there?”

“Oh. Well, everything okay, I guess.”

“Okay. Thank you.” They hang up, leaving a confused series of beep-kachink sounds hanging in mid-ether in the wake of the call before dissolving away.

The Captain is pleased. “You believe me now, don’t you? Do you know what I’d like to do? I’d like to call up your editor at Esquire and show him just what it sounds like to stack and unstack tandems. I’ll give him a show that will blow his mind. What’s his number?” This was only your second piece for Esquire. Were you uncomfortable with Captain Crunch calling your editor? Is that why the call never goes through, or if it did, why you left it out of your story? As I recall, I told him the number was publicly listed, so feel free. I told Lee Eisenberg to expect a call, but I never heard anything more. I think he just wanted to show off more tandem stacking tricks and that he was real.

I ask the Captain what kind of device he was using to accomplish all his feats. The Captain is pleased at the question.

“You could tell it was special, couldn’t you? Ten pulses per second. That’s faster than the phone company’s equipment. Believe me, this unit is the most famous unit in the country. There is no other unit like it. Believe me.”

“Yes, I’ve heard about it. Some other phone phreaks have told me about it.”

“They have been referring to my, ahem, unit? What is it they said? Just out of curiosity, did they tell you it was a highly sophisticated computer-operated unit, with acoustical coupling for receiving outputs and switchboard with multiple-line capability? Did they tell you that the frequency tolerance is guaranteed to be not more than .05 percent? The amplitude tolerance less than .01 decibel? Those pulses you heard were perfect. They just come faster than the phone company. Those were high-precision op-amps. Op-amps are instrumentation amplifiers designed for ultra-stable amplification, super-low distortion and accurate frequency response. Did they tell you it can operate in temperatures from –55°C to +125°C?” Again, you present a lot of technical information that you need to get right. Did you do any outside research about phone technology to get up to speed? You don't strike me as very technically inclined since I know that although you own a Mac, you don't own a word-processing program – an unusual circumstance for someone who writes for a living. OMG a pariah for not using Word. If you'd suffered early losses of hard work from Word programs you might prefer to rely on draft function that is preserved in the cloud. I recall the mag outsourced the technical examination of the claims to a tech- savvy lawyer. I don't remember. And we know the FBI doesn't waste its time on fables.

I admit that they did not tell me all that.

“I built it myself,” the Captain goes on. “If you were to go out and buy the components from an industrial wholesaler

it would cost you at least $1,500. I once worked for a semiconductor company and all this didn't cost me a cent. Do you know what I mean? Did they tell you about how I put a call completely around the world? I'll tell you how I did it. I M-F-ed Tokyo inward, who connected me to India, India connected me to Greece, Greece connected me to Pretoria, South Africa, South Africa connected me to South America, I went from South America to London, I had a London operator connect me to a New York operator, I had New York connect me to a California operator who rang the phone next to me. Needless to say I had to shout to hear myself. But the echo was far out. Fantastic. Delayed. It was delayed twenty seconds, but I could hear myself talk to myself."

You really give the reader a clear sense of how Captain Crunch initially didn't want to tell you about his exploits, but now he can't help himself. He was dying to be the Big Kahuna.

"You mean you were speaking into the mouthpiece of one phone sending your voice around the world into your ear through a phone on the other side of your head?" I asked the Captain. I had a vision of something vaguely autoerotic going on, in a complex electronic way.

"That's right," said the Captain. "I've also sent my voice around the world one way, going east on one phone, and going west on the other, going through cable one way, satellite the other, coming back together at the same time, ringing the two phones simultaneously and picking them

up and whipping my voice both ways around the world and back to me. Wow. That was a mind blower."

"You mean you sit there with both phones on your ear and talk to yourself around the world," I said incredulously.

"Yeah. Um hum. That's what I do. I connect the phones together and sit there and talk."

"What do you say? What do you say to yourself when you're connected?"

"Oh, you know. Hello test one two three," he says in a low-pitched voice.

"Hello test one two three," he replies to himself in a high-pitched voice.

"Hello test one two three," he repeats again, low-pitched.

"Hello test one two three," he replies, high-pitched.

"I sometimes do this: Hello hello hello hello, hello, hello," he trails off and breaks into laughter. This strikes me as one of the definitive scenes of the entire piece, with Captain Crunch sending his voice around the world just so he can say hello to himself. In some ways, it presages today's cellphone culture that's entranced with the sound of its own voice. Agree!

Why Captain Crunch Hardly Ever Taps Phones Anymore

Using internal phone-company codes, phone phreaks have learned a simple method for tapping phones. Phone-company operators have in front of them a board that holds verification jacks. It allows them to plug into conversations in case of emergency, to listen in to a line to determine if the line is busy or the circuits are busy. Phone phreaks have learned to beep out the codes which lead them to a verification operator, tell the verification operator they are switchmen from some other area code testing out verification trunks. Once the operator hooks them into the verification trunk, they disappear into the board for all practical purposes, slip unnoticed into any one of the 10,000 to 100,000 numbers in that central office without the verification operator knowing what they're doing, and of course without the two parties to the connection knowing there is a phantom listener present on their line.

Toward the end of my hour-long first conversation with him, I asked the Captain if he ever tapped phones. How long in total did you spend with Captain Crunch? I didn't spend any time face-to-face with Crunch during the story. Loads of time over the phone. He was somehow tracking me through other phone freaks, I think. He invited me up to his Sierra Nevada refuge, but I got lost in a snowstorm.

“Oh no. I don’t do that. I don’t think it’s right,” he told me firmly. “I have the power to do it but I don’t....Well, one time, just one time, I have to admit that I did. Without saying so explicitly, you're showing the reader that Captain Crunch is very ambivalent about phone phreaking. You're showing the reader, not telling him. Did you set out to do that deliberately, or was it just instinctive? It was a constantly repeated self-contradictory refrain. So much good stuff there on tape, didn't want to dilute it.

There was this girl Linda, and I wanted to find out...you know. I tried to call her up for a date. I had a date with her the last weekend and I thought she liked me. I called her up, man, and her line was busy, and I kept calling and it was still busy. Well, I had just learned about this system of jumping into lines and I said to myself, ‘Hmmm. Why not just see if it works. It’ll surprise her if all of a sudden I should pop up on her line. It’ll impress her, if anything.’ So I went ahead and did it. I M-F-ed into the line. My M-F-er is powerful enough when patched directly into the mouthpiece to trigger a verification trunk without using an operator the way the other phone phreaks have to.

“I slipped into the line and there she was talking to another boyfriend. Making sweet talk to him. I didn’t make a sound because I was so disgusted. So I waited there for her to hang up, listening to her making sweet talk to another guy. You know. So as soon as she hung up I instantly M-F-ed

her up and all I said was, 'Linda, we're through.' And I hung up. And it blew her head off. She couldn't figure out what the hell had happened. Isn't one of Captain Crunch's primary motivations simply to – as he puts it– blow people's minds? He wanted to blow your mind by calling the embassy in Moscow, blow your editor's mind by demonstrating stacked tandems, and now he just blew his girlfriend's mind. Even though he wants to keep his phone phreaking secret, he has a compulsion to show the world how smart he is. Yes. Jobs made billions, Crunch made calls.

"But that was the only time. I did it thinking I would surprise her, impress her. Those were all my intentions were, and well, it really kind of hurt me pretty badly, and... and ever since then I don't go into verification trunks."

Moments later my first conversation with the Captain comes to a close.

"Listen," he says, his spirits somewhat cheered, "listen. What you are going to hear when I hang up is the sound of tandems unstacking. Layer after layer of tandems unstacking until there's nothing left of the stack, until it melts away into nothing. Cheep, cheep, cheep, cheep," he concludes, his voice descending to a whisper with each cheep.

He hangs up. The phone suddenly goes into four spasms: kachink cheep. Kachink cheep kachink cheep kachink cheep, and the complex connection has wiped itself out

like the Cheshire cat's smile. It seems like you took great care to have all of the sections of the piece end with a memorable scene or phrase. It's very much a novelistic approach. I've always thought that the best nonfiction is just storytelling that happens to be true. It often has a shape of its own that's worth looking for and frequently has episodes of a sort embedded in it.

The MF Boogie Blues

The next number I choose from the select list of phone-phreak illuminati prepared for me by the blue-box inventor is a Memphis number. It is the number of Joe Engressia, the first and still perhaps the most accomplished blind phone phreak. Is this actually the order in which you interviewed the phone phreaks, or did you shuffle the order in the service of a stronger narrative? As I recall, I contacted Joe from San Francisco before I flew to Memphis at the end of the trip, which may explain the apparent shuffle.

Three years ago Engressia was a nine-day wonder in newspapers and magazines all over America because he had been discovered whistling free long-distance connections for fellow students at the University of South Florida. Engressia was born with perfect pitch; he could whistle phone tones better than the phone-company equipment.

Engressia might have gone on whistling in the dark for a

few friends for the rest of his life if the phone company hadn't decided to expose him. He was warned, disciplined by the college, and the whole case became public. In the months following media reports of his talent, Engressia began receiving strange calls. There were calls from a group of kids in Los Angeles who could do some very strange things with the quirky General Telephone and Electronics circuitry in L.A. suburbs. There were calls from a group of mostly blind kids in - - - -, California, Was this a town located in what we now call Silicon Valley? Yes, in one of the surrounding suburbs. A lot of the early action fueled by growing tech frenzy. who had been doing some interesting experiments with Cap'n Crunch whistles and test loops. There was a group in Seattle, a group in Cambridge, Massachusetts, a few from New York, a few scattered across the country. Some of them had already equipped themselves with cassette and electronic M-F devices. For some o f these groups, it was the first time they knew of the others.

The exposure of Engressia was the catalyst that linked the separate phone-phreak centers together. They all called Engressia. They talked to him about what he was doing and what they were doing. And then he told them—the scattered regional centers and lonely independent phone phreakers—about each other, gave them each other's numbers to call, and within a year the scattered phone-phreak centers had grown into a nationwide underground.

Of course today, hackers don't need a news story to be the catalyst that

brings them together. They can link up on their own instantly over the Internet. The news media have been disintermediated even from hacking. True. I was there at a time when they had to find the cracks in the system (the ones that "let the light in," as Leonard Cohen wrote).

Joe Engressia is only twenty-two years old now, but along the phone-phreak network he is "the old man," accorded by phone phreaks something of the reverence the phone company bestows on Alexander Graham Bell. He seldom needs to make calls anymore. The phone phreaks all call him and let him know what new tricks, new codes, new techniques they have learned. Every night he sits like a sightless spider in his little apartment receiving messages from every tendril of his web. It is almost a point of pride with Joe that they call him.

But when I reached him in his Memphis apartment that night, Joe Engressia was lonely, jumpy, and upset. Did Esquire pay for you to go anywhere you wanted to pursue this story? How long did it take you to report the story and then to write it? Do you remember how much Esquire paid you for the piece? They paid for all expenses. Really wasn't super-costly. Was paid in the low four figures. Don't recall how long I worked on it all told.

"God, I'm glad somebody called. I don't know why tonight of all nights I don't get any calls. This guy around here got drunk again tonight and propositioned me again. I keep telling him we'll never see eye to eye on this subject, if you

know what I mean. I try to make light of it, you know, but he doesn't get it. I can hear him out there getting drunker and I don't know what he'll do next. It's just that I'm really all alone here. I just moved to Memphis, it's the first time I'm living out on my own, and I'd hate for it all to collapse now. But I won't go to bed with him. I'm just not very interested in sex and even if I can't see him I know he's ugly.

"Did you heart that? That's him banging a bottle against the wall outside. He's nice. Well forget about it. You're doing a story on phone phreaks? Listen to this. It's the MF Boogie blues." If Engressia had already been in trouble with the law for phone phreaking, why was he so amenable to talking to a writer from a national magazine? It seems like someone in his position would have said "no comment" and slammed the door in your face. Well, we had established a phone relationship previously, he knew the people I was talking to and he knew that whatever the consequences, he belonged in this story. And it might even get him his dream job – as a phone tech – if he impressed the phone company.

Sure enough, a jumpy version of Muskrat Ramble boogies its way over the line, each note one of those long-distance phone tones. The music stops. A huge roaring voice blasts the phone off my ear: "and the question is..." roars the voice, "can a blind person hook up an amplifier on his own?"

The roar ceases. A high-pitched operator-type voice

replaces it. “This is Southern Braille Tel. & Tel. Have tone, will phone.”

This is succeeded by a quick series of M-F tones, a swift “kachink” and a deep reassuring voice: “If you need home care, call the visiting-nurses association. First National time in Honolulu is four thirty-two p.m.”

Joe back in his Joe voice again: “Are we seeing eye to eye? ‘Si, si,’ said the blind Mexican. Ahem. Yes. Would you like to know the weather in Tokyo?”

This swift manic sequence of phone-phreak vaudeville stunts and blind-boy jokes manages to keep Joe’s mind off his tormentor only as long as it lasts. Joe's personality seems to be a strange combination of Steve Wozniak and Henny Youngman. Yes, he was almost always on.

“The reason I’m in Memphis, the reason I have to depend on that homosexual guy, is that this is the first time I’ve been able to live on my own and make phone trips on my own. I’ve been banned from all central offices around home in Florida, they knew me too well, and at the University some of my fellow scholars were always harassing me because of my fat ass, which of course I do have, it’s my physical fatness program, but I don’t like to hear it every day, and if I can’t phone trip and I can’t phone phreak, I can’t imagine what I’d do, I’ve been devoting

three quarters of my life to it. Isn't this sort of obsessive behavior much like what we'll see later with computer fanatics? Did you have any sense at the time that this sort of compulsive attraction to technology would be the wave of the future rather than an anomaly? I was getting an intimation of it. But not really to the extent it has, especially if you include the iPhone. The fact that the story became a cult favorite might have been a tipoff.

"I moved to Memphis because I wanted to be on my own as well as because it has a Number 5 crossbar switching system and some interesting little independent phone-company districts nearby and so far they don't seem to know who I am so I can go on phone tripping, and for me phone tripping is just as important as phone phreaking."

Phone tripping, Joe explains, begins with calling up a central-office switch room. He tells the switchman in a polite earnest voice that he's a blind college student interested in telephones, and could he perhaps have a guided tour of the switching station? Each step of the tour Joe likes to touch and feel relays, caress switching circuits, switchboards, crossbar arrangements.

So when Joe Engressia phone phreaks he feels his way through the circuitry of the country. In this electronic garden of forking paths, he feels switches shift, relays shunt, crossbars swivel, tandems engage and disengage even as he hears—with perfect pitch—his M-F pulses make the entire Bell system dance to his tune. Several other

phone phreaks were also blind. What made blind people particularly drawn to phreaking? Well, this is just speculation. But theirs is a world of sound alone, and they delight in their ability to play with it.

Just one month ago Joe took all his savings out of his bank and left home, over the emotional protests of his mother. “I ran away from home almost,” he likes to say. Joe found a small apartment house on Union Avenue and began making phone trips. He’d take a bus a hundred miles south into Mississippi to see some old-fashioned Bell equipment still in use in several states, which had been puzzling him. He’d take a bus three hundred miles to Charlotte, North Carolina, to look at some brand-new experimental equipment. He hired a taxi to drive him twelve miles to a suburb to tour the office of a small phone company with some interesting idiosyncrasies in its routing system. He was having the time of his life, he said, the most freedom and pleasure he had known.

In that month he had done very little long-distance phone phreaking from his own phone. He had begun to apply for a job with the phone company, he told me, and he wanted to stay away from anything illegal.

“Any kind of job will do, anything as menial as the most lowly operator. That’s probably all they’d give me because I’m blind. Even thought I probably knew more than most switchmen. But that’s okay. I want to work for Ma Bell. I

don't hate Ma Bell the way Gilbertson and some phone phreaks do. It's interesting that Joe thinks that Gilbertson and other phreaks hate the phone company when in fact most of them either like it or are somewhat ambivalent. It shows the reader just how deeply Joe loves Ma Bell. True. There were deep conflicts, which made for a better story.

I don't want to screw Ma Bell. With me it's the pleasure of pure knowledge. There's something beautiful about the system when you know it intimately the way I do. But I don't know how much they know about me here. I have a very intuitive feel for the condition of the line I'm on, and I think they're monitoring me off and on lately, but I haven't been doing much illegal. I have to make a few calls to switchmen once in a while which aren't strictly legal, and once I took an acid trip and was having these auditory hallucinations as if I were trapped and these planes were dive-bombing me, and all of a sudden I had to phone phreak out of there. For some reason I had to call Kansas City, but that's all." That's such a funny and revealing vignette. Did it take awhile for you to gain Joe's trust so that he offered up such illuminating information? I just don't know, but he told me this on my first or second visit to his apartment.

A Warning Is Delivered

At this point—one o'clock in my time zone—a loud knock on my motel-room door interrupts our conversation.

Outside the door I find a uniformed security guard who informs me that there has been an “emergency phone call” for me while I have been on the line and that the front desk has sent him up to let me know.

You recently revealed that during this scene, you were under the influence of a “mind-altering” substance (LSD?) that someone had given to you at a party earlier that evening. In fact, when the security guard knocked at the door, you were staring at the “snow” on the hotel TV set – the pixelated electronic noise of a channel that’s signed off for the evening. Why didn’t you include this detail in the piece? Wasn’t Esquire hip enough to print it? Or were you worried about your reputation since you were just starting your journalism career?

It seemed a bit of fanciful mind spinning and I wanted people to take the story seriously, which this might have undermined. You have to understand, it was a different era -- these guys were not only under FBI surveillance, they could be vulnerable to DEA subpoenas in an instant.

Two seconds after I say good-bye to Joe and hang up, the phone rings.

“Who were you talking to?” the agitated voice demands. The voice belongs to Captain Crunch. “I called because I decided to warn you of something. I decided to warn you to be careful. I don’t want this information you get to get to the radical underground. I don’t want it to get into the wrong hands. What would you say if I told you it’s possible for three phone phreaks to saturate the phone system of the nation. Saturate it. Busy it out. All of it. I know how to

do this. I'm not gonna tell. A friend of mine has already saturated the trunks between Seattle and New York. He did it with a computerized M-F-er hitched into a special Manitoba exchange. But there are other, easier ways to do it."

Just three people? I ask. How is that possible?

"Have you ever heard of the long-lines guard frequency? Do you know about stacking tandems with 17 and 2,600? Well, I'd advise you to find out about it. I'm not gonna tell you. But whatever you do, don't let this get into the hands of the radical underground."

(Later Gilbertson the inventor confessed that while he had always been skeptical about the Captain's claim of the sabotage potential of trunk-tying phone phreaks, he had recently heard certain demonstrations which convinced him the Captain was not speaking idly. "I think it might take more than three people, depending on how many machines like Captain Crunch's were available. But even though the Captain sounds a little weird, he generally turns out to know what he's talking about.")

"You know," Captain Crunch continues in his admonitory tone, "you know the younger phone phreaks call Moscow all the time. Suppose everybody were to call Moscow. I'm no right-winger. But I value my life. I don't want the

Commies coming over and dropping a bomb on my head. That's why I say you've got to be careful about who gets this information."

The Captain suddenly shifts into a diatribe against those phone phreaks who don't like the phone company. It's interesting how so many phone phreaks believe that all the other phreaks don't like the phone company. Only they have the proper relationship with Ma Bell. I hadn't thought of that, but it's true.

"They don't understand, but Ma Bell knows everything they do. Ma Bell knows. Listen, is this line hot? I just heard someone tap in. I'm not paranoid, but I can detect things like that. Well, even if it is, they know that I know that they know that I have a bulk eraser. I'm very clean." The Captain pauses, evidently torn between wanting to prove to the phone-company monitors that he does nothing illegal, and the desire to impress Ma Bell with his prowess.

"Ma Bell knows the things I can do," he continues. "Ma Bell knows how good I am. And I am quite good. I can detect reversals, tandem switching, everything that goes on a line. I have relative pitch now. Do you know what that means? My ears are a $20,000 piece of equipment. With my ears I can detect things they can't hear with their equipment. I've had employment problems. I've lost jobs. But I want to show Ma Bell how good I am. I don't want to screw her, I want to work for her. I want to do good for her.

I want to help her get rid of her flaws and become perfect. That's my number-one goal in life now." The Captain concludes his warnings and tells me he has to be going. "I've got a little action lined up for tonight," he explains and hangs up.

Before I hang up for the night, I call Joe Engressia back. He reports that his tormentor has finally gone to sleep—He's not blind drunk, that's the way I get, ahem, yes; but you might say he's in a drunken stupor." I make a date to visit Joe in Memphis in two days.

A Phone Phreak Cell Takes Care of Business

The next morning I attend a gathering of four phone phreaks in - - - - - (a California suburb).

The gathering takes place in a comfortable split-level home in an upper-middle-class subdivision. Heaped on the kitchen table are the portable cassette recorders, M-F cassettes, phone patches, and line ties of the four phone phreaks present. How did you arrange getting four phone phreaks together to talk to you? Why were they so anxious to get their story out? Did this spoil you for subsequent magazine pieces in which your sources weren't nearly so eager to talk? Well, I'd be talking to them for a while and they wanted me to see them at work. Not sure it was about "getting their story out" as much as the

pure pleasure of sophisticated tech accomplishment that allowed them to link up to like-minded blind kids all over the world. Made things easier. To me, the high point of the story is the urgency they felt about preserving and losing their best means of mutual contact – the "historic" 2111 conference mentioned below.

On the kitchen counter next to the telephone is a shoe-box-size blue box with thirteen large toggle switches for the tones. The parents of the host phone phreak, Ralph, who is blind, stay in the living room with their sighted children. They are not sure exactly what Ralph and his friends do with the phone or if it's strictly legal, but he is blind and they are pleased he has a hobby which keeps him busy.

The group has been working at reestablishing the historic "2111" conference, reopening some toll-free loops, and trying to discover the dimensions of what seem to be new initiatives against phone phreaks by phone-company security agents.

It is not long before I get a chance to see, to hear, Randy at work. Randy is known among the phone phreaks as perhaps the finest con man in the game. Randy is blind. He is pale, soft, and pear-shaped, he wears baggy pants and a wrinkly nylon white sport shirt, pushes his head forward from hunched shoulders somewhat like a turtle inching out of its shell. His eyes wander, crossing and recrossing, and his forehead is somewhat pimply. He is only sixteen years old.

But when Randy starts speaking into a telephone mouthpiece his voice becomes so stunningly authoritative it is necessary to look again to convince yourself it comes from chubby adolescent Randy. Imagine the voice of a crack oil-rig foreman, a tough, sharp, weather-beaten Marlboro man of forty. Imagine the voice of a brilliant performance-fund gunslinger explaining how he beats the Dow Jones by thirty percent. Then imagine a voice that could make those two sound like Stepin Fetchit. That is sixteen-year-old Randy's voice.

He is speaking to a switchman in Detroit. The phone company is Detroit had closed up two toll-free loop pairs for no apparent reason, although heavy use by phone phreaks all over the country may have been detected. Randy is telling the switchman how to open up the loop and make it free again:

"How are you, buddy. Yeah, I'm on the board out here in Tulsa, Oklahoma, and we've been trying to run some tests on your loop-arounds, and we find 'em busied out on both sides....Yeah, we've been getting a 'BY' on them, what d'ya say, can you drop cards on 'em? Do you have 08 on your number group? Oh that's okay, we've had this trouble before, we may have to go after the circuit. Here, lemme give 'em to you: your frame is 05, vertical group 03, horizontal 5, vertical file 3. Yeah, we'll hang on here....Okay,

found it? Good. Right, yeah, we'd like to clear that busy out. Right. Now pull your key from NOR over to LCT. Yeah. I don't know why that happened, but we've been having trouble with that one. Okay. Thanks a lot, fella. Be seein' ya."

You clearly made a decision to include technical information that the reader wouldn't understand, and maybe you didn't either. What was your thinking behind this? Did you get any pushback from editors who wrote in the margin, "I don't understand this, you need to explain it"?

I think it gave people the flavor of the level at which these guys operated. It would require an electrical engineering degree for me or the reader to understand completely. Don't recall any objection.

Randy hangs up, reports that the switchman was a little inexperienced with the loop-around circuits on the miscellaneous trunk frame, but that the loop has been returned to its free-call status.

Delighted, phone phreak Ed returns the pair of numbers to the active-status column in his directory. Ed is a superb and painstaking researcher. With almost Talmudic thoroughness he will trace tendrils of hints through soft-wired mazes of intervening phone-company circuitry back through complex linkages of switching relays to find the location and identity of just one toll-free loop.

This sentence strikes me as very Rosenbaumian. Most of your subsequent writing has a kind of Talmudic thoroughness to it as you trace tendrils of meaning. Do you see glimpses of your later writing in this piece?

Probably, I do enjoy

exegesis. In college, I found I loved William Empson's "Seven Types of Ambiguity," the Bible of "close reading" of the sort encouraged at Yale. And after a few years, I realized that a lot of the reporting I've done involves close reading of documents, trial records, interview transcripts, etc.

He spends hours and hours, every day, doing this sort of thing. He has compiled a directory of eight hundred "Band-six in-WATS number" located in over forty states. Band-six in-WATS numbers are the big 800 numbers—the ones that can be dialed into free from anywhere in the country.

Ed the researcher, a nineteen-year-old engineering student, is also a superb technician. He put together his own working blue box from scratch at age seventeen. (He is sighted.) This evening after distributing the latest issues of his in-WATS directory (which has been typed into Braille for the blind phone phreaks), he announces he has made a major new breakthrough:

"I finally tested it and it works, perfectly. I've got this switching matrix which converts any touch-tone phone into an M-F-er."

The tones you hear in touch-tone phones are not the M-F tones that operate the long-distance switching system. Phone phreaks believe A.T.&T. had deliberately equipped touch tones with a different set of frequencies to avoid

putting the six master M-F tones in the hands of every touch-tone owner. Ed's complex switching matrix puts the six master tones, in effect puts a blue box, in the hands of every touch-tone owner.

Ed shows me pages of schematics, specifications, and parts lists. "It's not easy to build, but everything here is in the Heathkit catalog." This DIY ethic would soon be taken up by computer hobbyist groups such as the Homebrew Computer Club, which counted Steve Wozniak and Captain Crunch among its members.

Ed asks Ralph what progress he has made in his attempts to reestablish a long-term open conference line for phone phreaks. The last big conference—the historic "2111" conference—had been arranged through an unused Telex test-board trunk somewhere in the innards of a 4A switching machine in Vancouver, Canada. For months phone phreaks could M-F their way into Vancouver, beep out 604 (the Vancouver code) and then beep out 2111 (the internal phone-company code for Telex testing), and find themselves at any time, day or night, on an open wire talking with an array of phone phreaks from coast to coast, operators from Bermuda, Tokyo, and London who are phone-phreak sympathizers, and miscellaneous guests and technical experts. The conference was a massive exchange of information. Phone phreaks picked each other's brains clean, then developed new ways to pick the phone

company's brains clean. Ralph gave MF Boogie concerts with his home-entertainment-type electric organ, Captain Crunch demonstrated his round-the-world prowess with his notorious computerized unit and dropped leering hints of the "action" he was getting with his girl friends. (The Captain lives out or pretends to live out several kinds of fantasies to the gossipy delight of the blind phone phreaks who urge him on to further triumphs on behalf of all of them.) The somewhat rowdy Northwest phone-phreak crowd let their bitter internal feud spill over into the peaceable conference line, escalating shortly into guerrilla warfare. Already, the revolution is starting to fracture into warring splinter groups. Sad, but there was often genuine communion initially.

Carl the East Coast international phone relations expert demonstrated newly opened direct M-F routes to central offices on the island of Bahrain in the Persian Gulf, introduced a new phone-phreak friend of his in Pretoria, and explained the technical operation of the new Oakland-to-Vietnam linkages. (Many phone phreaks pick up spending money by M-F-ing calls from relatives to Vietnam G.I.'s, charging $5 for a whole hour of trans-Pacific conversation.)

Day and night the conference line was never dead. Blind phone phreaks all over the country, lonely and isolated in homes filled with active sighted brothers and sisters, or trapped with slow and unimaginative blind kids in

straightjacket schools for the blind, knew that no matter how late it got they could dial up the conference and find instant electronic communion with two or three other blind kids awake over on the other side of America. Talking together on a phone hookup, the blind phone phreaks say, is not much different from being there together. Physically, there was nothing more than a two-inch-square wafer of titanium inside a vast machine on Vancouver Island. For the blind kids there meant an exhilarating feeling of being in touch, through a kind of skill and magic which was peculiarly their own. You can see here an early example of how electronics can connect people worldwide. There's not much difference between the phone phreaks' two-inch-square wafer of titanium and today's microscopic wafer of silicon. True.

Last April 1, however, the long Vancouver Conference was shut off. The phone phreaks knew it was coming. Vancouver was in the process of converting from a step-by-step system to a 4A machine and the 2111 Telex circuit was to be wiped out in the process. The phone phreaks learned the actual day on which the conference would be erased about a week ahead of time over the phone company's internal-news-and-shop-talk recording.

For the next frantic seven days every phone phreak in America was on and off the 2111 conference twenty-four hours a day. Phone phreaks who were just learning the game or didn't have M-F capability were boosted up to the