Mr. Keister video
Summer 1989
Tic Tac Toe Machine

The Bell Laboratories got me a patent on a machine to play tic-tac-toe.

Oh did they?

In 19--… Actually I designed the thing in 1937 but it wasn't patented until after the war. It's a relay machine.

Do you have that at home?

I don't have a copy of it. They had several of them made. They used for…

And I had one I used to carry around to play, to demonstrate when I'd give talks, on machine thinking and things like that.

Did they have at the World's Fair?

Yeah they had it at the World's Fair.

When, 1956?

No… 1965? Whenever it was…

Didn't you say it was in Disneyland as well?

It was in Disneyland also.

Electronic tic-tac-toe? There we go.

It was a relay machine.

That would be really fun. To have a little travel electronic tic-tac-toe game.

Now you were asking, the question… it all depends on who's calling the shots. Now when Shannon came out with his thesis on Boolean algebra, I had been doing some horsing around and had gotten a little attention that I liked that sort of thing.

And so, one of our Vice Presidents, who was a long forward looking guy, was A. B. Clark, and I had come into contact with A. B. Clark because of some of the things I had done. So he knew about me.

And I was low as you can get in the Bell Laboratories at that point in time. Not even in the Design Group, I was in a testing group. But I had always… when something exciting came along I always saw that I was the one that said "Oh yeah"… my boss knew I would like that so he'd give it to me.

I got all the oddball things.

And so… and I got a charter with several of the… John Gruden was one of them… to work on Boolean algebra.

When it happened… I was given this… take him off whatever he's doing and have him work on this. And boy, my boss, my boss's boss, and his boss, didn't like that worth a damn.

The vice president… told him… well I worked for a year, and that's when I designed the tic-tac-toe machine. I said…

If I'd used Boolean algebra to design a trunk circuit, they'd say "Hell, I already knew what a trunk circuit looked like", so that was easy enough for you to show how to do it with Boolean algebra, because you already know how it worked.

So I said well I'll take a problem that has bears no relation, I will take tic-tac-toe… I'll design a tic-tac-toe machine using Boolean algebra.

And so… and then they can't say I already knew what the circuit looked like before I applied the algorithm to it. And so I produced it.

So this is the interesting thing… it really is the interesting thing… after a year, my boss's boss called me up to his office and says, tells me… what I was doing…

This was a year… apparently he had said a year's long enough… says, what have you been doing?

I says, "Well, playing tic-tac-toe. And I designed a machine, I did this, I designed a machine that plays tic-tac…"

"Tic-tac-toe! What the hell are you doing wasting your time playing games?"

And he snapped me off of that and says, "Now here's some people over here designing relays, you remember Barger's group that engineered relays?" He says, "They don't know what the hell they're doing. Now what I want you to go in there and see, if you can't figure out how to engineer a relay."

But… after the war was over, the circuit design group was in a terrible fix because they hadn't designed anything, everyone had been taken off the telephone systems and put on war work, and so for five years no new design work had been done on the telephone system. And all of the people who knew how to do it had either retired or had forgotten how.

So they had to bring up a whole new generation of them?

And so there was a great big…

A. B. Clark said we got to get some more people and we'll teach them… that's when he put Al (Ritchie) and I and Amos Joel… well we got Seth Washburn out of our first class.

But Al and I and Amos Joel actually started off… he said you are going to figure out how to teach this to new people…

So Mr. Washburn was in your first class?

He (Seth Washburn) was in our first class, and we needed the help. And so we said we were going to ask him to join the group.

And so, that was it.

And then, they started going out and recruiting, and the emphasis to the recruiters was, "Now you take something out there to talk about, your speaker's bureau, let them tell about switching."

And so they, the publications department, decided well they would build this tic-tac-toe machine as a demonstration of the sorts of machines that do logical processing.

And so they came to me… I had said that I had designed the circuits…

I gave them the Boolean expressions… this really was remarkable to me… I gave them the Boolean expressions in my pink memorandum…

I never had been allowed to take it to its final form… the pink draft of this memorandum…

The Boolean expressions… for the machine to play tic-tac-toe… and gave it to them.

And they went out on Long Island and hired some independent craftspeople out there to build this machine, and they built it, and they turned it on, and it worked!

I was as amazed as they…

And they never discussed it with me – in the pink… I had enough for them to translate the Boolean expressions to relay circuits, and they wired them together, and they worked.

And they came back to me and they said that, "One thing that we don't understand, and I looked at it, and I… at that point it had been four or five years since I'd… couldn't remember why… I said, "I don't know what it does", so they said "Well, we'll leave it out."

They left it out, then discovered that was the thing I had put in there to keep the thing from making a forced play if you pressed two buttons at the same time. And so they had to put it back in.