

Lightning!

— a case history

If you're not careful, it's one strike and you're out.

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This is the story of what happened to Bernie Witherspoon W8GKM during the storm of July 14, 1978. It will show you what can happen even without a direct lightning strike to your antenna. Very few amateurs realize that a distant strike on a power line can cause more damage than a direct strike on your antenna. This is Bernie's story:

"At 4:30 am on July 14th, there was a sudden double click, together with a flash of lightning, in the radio room which is just off the kitchen where I was standing.

"I went into the radio room to check and saw that the pilot light on the two meter rig was out. It is left on all of the time so that the memory will hold the channels on which it is set.

"When I saw that the light was out, I knew that something was amiss. The antenna was switched off for storm protection, and it was free. Otherwise, the damage to the equipment (about \$5000 worth), if connected to the antenna, would have been extensive.

"The lightning surge apparently came through the entrance panel and knocked out the fuse for the radio room. It then went through the NCR 12-volt regulated power supply, which originally sold for about \$200, and now runs between \$50 and \$60 as NCR surplus. The inside of the power supply showed extensive damage. It was completely useless.

"The surge then travelled through the equipment via a common ground. It knocked out several transistors and a diode in the Yaesu FT-227R, knocked out a keying circuit in the TR-4CW, and burn-damaged the low voltage circuit in the L4B amplifier.

"It knocked out the power circuits in the R4C receiver. It went through the control box of the Ham III rotator and through one of the screws holding a rubber foot on the control box. The box was sitting on top of a transmatch. It jumped about one-half inch to the case of the transmatch and made a punched hole the size of a ten-penny nail. The surge burned a spot on the transmatch about the size of a silver dollar. It went through the transmatch to the outside, doing a little damage to the inside of the transmatch by

burning some of the wiring.

"The amazing thing about this whole bit is that it went through the L4B low voltage panel and R4C control box, and then jumped to the chassis through the transformers without damage to the transformers. It went through several other transformers and did not damage them, although it did knock out two other transformers.

"The ground braid on the coax was welded to the Cantenna dummy load. Although the switch was off on the L4B, the filaments on the 3-500Zs were lit, but not at full brilliance. There were carbon deposits on the switch contacts making a high resistance connection.

"The fuse on the wiring for the rest of the house was not blown. However, it did burn out the transformer on the furnace and the doorbell transformer, plus various small items around the house.

"Since there were two cracks of thunder, I went out to see if the antenna showed any damage. I found half of an insulator on the ground. A neighbor who had been watching said that it looked as if little fireballs were dancing all over the antenna.

"I found that one of the insulating blocks, which

hold the center conductor, was broken in two and showed burns. On the metal inserts, which hold the insulators, one of the screws was burned and badly melted. Also, there was some melting where the insulator block was burned in two.

"That strike went down the coaxial line, and each one of the wires in the RG-8 showed signs of being burned. It was not charred, but discolored. When I took the jacket off some of the coax and looked at the clear insulation, it looked like a dark streak inside. Stripping that off, I found that on the inside of the cable each stranded wire was burned.

"Where the coax entered the house under the porch there was a 15-foot length of RG-8, and in that, a PL-259 and a PL-258 were fused together. I was finally able to pry them apart. It short circuited three other PL-259s, badly burned a PL-258, and melted metal on the outside so that it was not usable. There were short circuits in three places in the 15-foot length of RG-8 under the house.

"The estimate of total damage was most fortunate—\$332.67. However, I did much of the repair work myself. I replaced the bell transformer and the cable to the dum-

my load.

"The coax switch to the antenna was burned but usable.

"The transmatch was homemade, and a replacement cabinet and panel would cost from \$55 to \$60. I listed it as \$15. I fixed the rotator and L4B myself, and sent the R4B to Drake.

"I also fixed the TR-4CW myself and the VTVM. If all that had been sent out, the cost would have been much more.

"I sent the Yaesu FT-227R to Columbus to be fixed, and they had to send for parts. It took me one month to get it back.

"Except for the Yaesu, I was on the air in a few hours. I have had this setup, and it has always been connected through storms, since 1959, and nothing ever happened, but after 28 years it finally did. I guess if you wait long enough, something will happen.

"Some years ago my father was in the yard holding a steel rim off a buggy, and a cat. Lightning struck the steel rim and went through him, struck the cat, and then hit a boy standing nearby. It killed the cat and the boy, but did not kill my father.

"I have seen lightning strike the ground in an open field less than forty feet from a tree which was thirty or forty feet tall, so it isn't always the highest point that gets hit.

"I have seen it strike water. Once, when I was in the army, I saw it hit a telephone pole. The top third of the pole disintegrated.

"A man on a farm was once hit by lightning and killed. The nails in his shoes were formed into little balls which were rammed up into his feet all the way to his ankles."

Some years ago, W8MPJ, a friend of mine in

Dayton, Ohio, had his antenna hit by lightning and it went through the wiring in the house. It burned a pattern on the wall all the way through the house, wherever there was wiring. Strangest of all, in the bathroom, it stripped all the mercury coating off the mirror. On the little side lights by that mirror, there were little knurled nuts that held the lights to the brackets. Those little nuts were unscrewed by the strike and were found on the floor.

The light fixtures were hanging by the wires, still connected. The total damage to the house, for replacing the wiring and fixtures, was over \$2000.

Some years ago I had an NCL-2000 amplifier, which was on, and at the same time I was seeing in the distance what we usually call heat lightning. It was a clear day, and there were no clouds in the

local sky. But in the distance, miles away, these little flashes could be seen, but no thunder was heard. I noticed that every time I saw these little distant flashes, my NCL-2000 tank would flash over. I disconnected it and stayed off the air until the storm passed.

There is only one word for lightning—unpredictable.

I now have across my 220 line in the radio room a General Electric, 2-pole valve-type secondary lightning arrestor. It should be connected at the input box to the house. It would then protect every appliance in the house. I have it connected across the line to my radio room for the protection of my equipment, since putting it across the input fuse panel would require extensive wiring. GE says that it would completely protect one against these lightning surges. ■