

# Chasing Sputnik

## Forty-two years ago this week, UNH professors helped calm Cold War fears

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DURHAM, N.H. -- It was 2 o'clock on a cold winter morning, Al Frost recalls. Throwing on boots and a coat, he kissed his sleeping wife good-bye. Driving over to Kingsbury Hall, he rushed into his lab, threw a few switches and drove back home.

Climbing back into bed, he recalls his groggy wife asking, "Did you get the pass-over?"

"Yup," said Frost, rolling over and going back to sleep.

It was 1957. Frost, then a young electrical engineering professor at the University of New Hampshire, was tracking the Soviet Union satellite Sputnik as it passed over North America during its orbit. Forty-two years ago this week, Sputnik, the first manmade object ever launched into space, had thrown American Cold War paranoia into bonafide panic.

In response, U.S. scientists were hurriedly drafted into helping track the satellite during its passes. One day after Sputnik's launch, Frost and UNH colleagues Ron Clark and Don Melvin were assigned to rig an antenna to pick up the satellite's 'beeps' as it orbited Earth.

"We at least wanted to know where it was," Frost explains. He chuckles recalling the request from the Air Force to track Sputnik. "They asked if we could do something -- and they had no equipment, no money and no suggestions." What Frost, Clark and Melvin did have was a cooperative department chair, Alden Winn. "He told us, 'I'll help you out of petty cash as much as I can. I can't change your teaching schedules, but we'll work around your workloads.'"

Not much of a budget or free time, Frost figured, but the trio's research included work with receiving antennae. And since Sputnik, traveling at 18,000 miles-per-hour, emitted a regular series of beeps, all the UNH antenna had to do was pick up those signals and record them. Changes in their sound as Sputnik approached and disappeared over the horizon -- the Doppler effect -- would help estimate its speed and approximate trajectory.

The UNH receiver was one of three in the region -- the other two were in Rhode Island and Massachusetts. "With three locations, you can build a trajectory," explains Frost. "Within a week, we had pulled together a tape recording of the measurements." Frost would take the tape home and his wife would plot it, outlining the Doppler curve, the inflection and the time of the pass-over.

For almost two years, Frost, Clark and Melvin, with the help of other volunteers, maintained the antenna atop the roof at Kingsbury. Their equipment was in the corner of a top floor teaching lab, locked in a steel cage built by a UNH custodian. Checking the antenna meant climbing up a ladder affixed to the wall, pushing open a trap door, and clambering onto the roof.

"After a while, it became routine," Frost recalls, "but we did establish the fact that UNH had a viable research staff. Our research was pretty thin back in 1956, 1957."

Frost today dismisses the lack of funds or high tech equipment. "We were simply doing this for the love of being involved. It was a labor of enthusiasm," says Frost, who retired in 1995. "We considered ourselves on the frontier of the space age."

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