

# Antenna Tilt: The Key Radar Control

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*Tilt management skills are critical to using airborne radar properly, but first you must understand the academics.*

*by Archie Trammell*

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We in aviation have known since first flight that a poor attitude—an incorrect mind set can kill. Not quite so obvious, however, is that someone else's faulty attitude may cause your accident. We now have a crystal clear example that the latter can be true.

In its investigation of the Delta Lockheed L-1011 crash in a thunder-storm at Dallas/Fort Worth Airport in August 1985, the NTSB interviewed Delta's systems manager for training, who said “. . . with any airborne radar device, written instructions and classroom academics are highly in-adequate . . . .” It's largely something that has to be learned by experience.”

The NTSB let the statement go un-challenged in its report on the accident, but we must not.

To let it be said that classroom instruction in the fundamentals of radar need not precede knob twiddling is to leave a dangerous attitude uncorrected. Such a belief is no different than thinking that the only way to teach a captain how to use a flight director is to load the airplane with 200 unsuspecting souls and dispatch him into an area of 200-and-a-quarter weather. Moreover, the statement is totally contrary to historical experience. It says that each succeeding generation of pilots must start from zero and learn from his or her own mistakes, never benefiting from radar operating techniques and methods worked out by others in thousands of hours. The truth is that without a background in the basics, no amount of trial and error will teach you how to use an airborne radar.

It's also revealing of the abilities of the Delta systems manager himself, who has not learned the first fundamental about airborne radar operation. He doesn't understand tilt management, the prerequisite to all other radar skills. If he did, he would have never said in a follow-on statement to the NTSB interviewer, *“The primary use of this type of radar, or any airborne radar with which I have any experience, is en-route weather avoidance. When you get into the approach environment . . . to get any useful work out of the radar, you have to do an awful lot of playing with the antenna tilt, and [since] you are also very close to the ground . . . you get a lot of ground return. So, it's least useful in the approach phase of the flight.”*

About 20 minutes of radar ground school - of 'classroom academics' - will prove him totally wrong. Setting up a radar so that ground returns are eliminated from the display is nothing more than applied sixth-grade geometry and fourth-grade mathematics.

Let's examine just two of the "academic" facts and see how they might have prevented the Delta 191 accident if they had been passed on to the crew in a ground school. Incidentally,