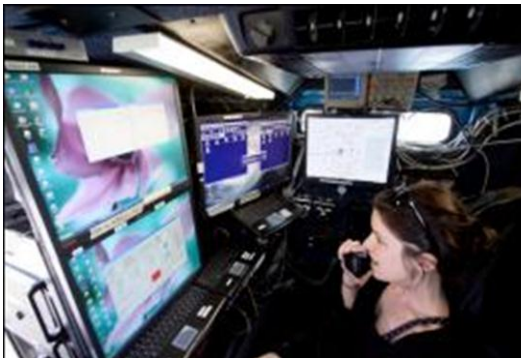
Doppler on Wheels (DOW)

About the DOWs

Tornadoes occur infrequently and often form very near the ground, making them difficult to measure with traditional stationary radars. Doppler On Wheels (DOWs), featured prominently in *Tornado Alley*, are mobile Doppler weather radars mounted on trucks that bring instruments directly into supercell thunderstorms, allowing scientists to scan tornadoes from close up, making 3D maps of the wind and debris. DOWs have mapped out multiple vortices, debris clouds, and the birth process ("genesis") of tornadoes. The DOW fleet is a national resource for scientists, funded by NSF.



As seen in *Tornado Alley,* the DOW is not only a research instrument, but also a mission control for other radars and teams of scientists. The DOWs served as the backbone of VORTEX2, mapping the overall structure and dynamics of storms being chased, identifying locations where tornadoes might form, and helping researchers to position their vehicles and instruments in a tornado's path. With a crew of up to 5 scientists, 15 computers, satellite and cell data systems, terabytes of disk, powerful radios operating at 3 different frequencies, a 56 foot-high communications and weather instrument mast, and 13 monitors, DOW scientists ambitiously guided VORTEX2 teams to the storms and kept them safe from danger.

With help from the DOW radar operators, some of the VORTEX2 teams dropped "tornado pods," hardened weather stations designed to be run over by tornadoes. Safely deploying rows of tornado pods is an effort that requires speed, coordination, and lots of practice: teams have about 45 seconds to set each pod, then run away to safety. The tornado pods each have waterproof steel cases, like aircraft "black boxes," so scientists can retrieve information on wind speed and direction at ground level, even if a violent tornado destroys the pod containing the instruments.

Fun Facts:

- A DOW measured the highest wind speed ever recorded, 301 mph, in a violent F5 tornado in Oklahoma.
- A DOW also documented the largest tornado circulation ever, in a huge tornado with damaging winds extending over approximately 4 miles, and a mile-wide "core."
- The DOWs weigh approximately 26,000 lbs and stand about 14 feet high. They only gets about 4 miles per gallon in gas mileage because they're big and it's windy!
- DOWs have observed 170 tornadoes, 12 hurricanes, and hundreds of thunderstorms which did not make tornadoes.
- The DOWs have been hit twice by tornadoes.....accidentally.
- DOWs and their designer, Dr. Josh Wurman, have logged over 100,000 miles chasing tornadoes.
- The DOW has experienced a direct lightning strike. The computers all crashed, but the team was back up and collecting data within in a matter of minutes.
- The DOW team has never seen flying cows, but they *have* seen snakes flying by in hurricanes.
- The DOWs, and their teams, lose lots of windshields—not to mention several wind meters (anemometers)—to hail every year.