



# Sparing a **STRIKE:** New Bird Detection Radar Helps Reduce Bird Strikes

*By Maj Jacob Rosser, AMC/SEF*

# W

e have known about the hazards associated with bird strikes since the beginning of manned flight. The E-3B crash

near Elmendorf AFB, Alaska, in 1995 was the milestone event that made the Air Force realize that large, heavy aircraft are as vulnerable to bird strikes as their smaller counterparts are. The E-3B flew into a large flock of Canadian geese shortly after rotation, hitting multiple engines. Within seconds, the aircraft struck a hill, killing everyone on the plane. Unlike smaller aircraft, a single bird strike is not normally a threat to large aircraft, though there are significant costs in repairing damages to aircraft following any bird strike. However, large flocks of birds, particular waterfowl, present a grave risk to our aircrews.

The bird detection radar (BDR) is the newest leading-edge technology weapon in the Bird/Wildlife Aircraft Strike Hazard (BASH) program arsenal. The bird detection radar finds airborne birds



## Bird/Wildlife Aircraft Strike Hazard

*Opposite: SSgt Jerry Westlake, USAFR, 39th Operations Support Squadron, uses a pair of binoculars to search the sky for birds in flight. He is seated on an all-terrain vehicle conducting the Bird/Wildlife and Strike Hazard (BASH) program at Incirlik AB, Turkey.*

USAF PHOTO BY SRA JAMES HARPER

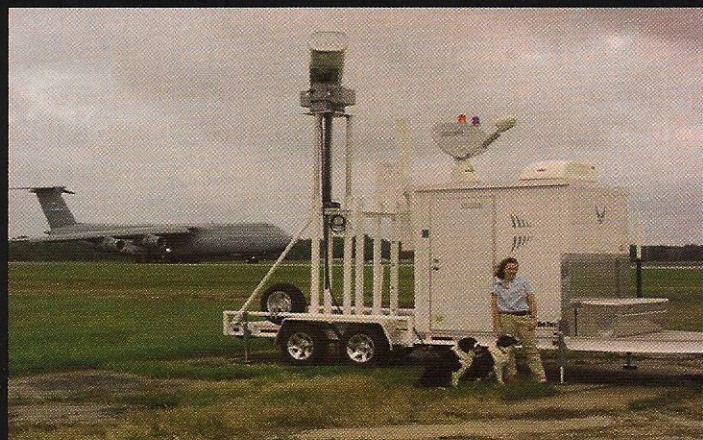
and displays them on a monitor. It is particularly effective in low visibility and nighttime conditions. In 2005, the Air Force Safety Center (AFSC) began the process of acquiring and testing this kind of radar. In order to establish the validity of the BDR, the AFSC chose Dover AFB as its AMC test bed location. Dover has had two "close calls" in the last 20 years with its C-5 aircraft. Both incidents involved C-5s flying into large flocks of geese shortly after takeoff, damaging multiple engines. Bird strikes are a significant threat to all of the aircraft that utilize the busy Dover AFB airspace.

Dover AFB is located on the Delmarva Peninsula, underneath several major bird migratory routes. There are also several wildlife refuges and quarry ponds within 10 miles of the base. Between October and March, several hundred thousand snow and Canada geese call Dover home, not to mention a very large resident gull population. The BASH challenge at Dover AFB is one of the largest in AMC. The 436 AW Safety Office manages an aggressive and diverse BASH program to mitigate the risk. The BDR is a welcome addition to their tool bag.

AMC received its first bird radar at Dover AFB in October 2006. Since then, Dover Wing Safety has worked with the 436 OSS, AFSC, AMC, AFFSA, Flyaway Farms and Kennels, and DeTect, Inc., (the BDR manufacturer), incorporating the radar into the base BASH program.

Several hurdles needed to be cleared to set up the radar. The radar had to be located on the airfield, have a readily accessible power source, and approval through the communications staffing process. Dover is fortunate that the location of the former GCA facility was in the middle of the airfield at the intersection of the two crossing runways. Although Dover removed the old GCA structure, electrical power and a concrete pad still existed at the site. Due to the similarities of the bird radar and the radar used by the GCA, Dover gained quick approval.

The next large hurdle was deciding where to display the data from the radar. Neither the FAA



Top and above: Bird radar at Dover AFB.

PHOTO COURTESY OF AMC

nor AFFSA has approved the use of the bird radar in its ATC facilities. Aircraft controllers working in a control tower or GCA facility are unable to monitor a BDR display. Another challenge was the lack of fiber optics at the former GCA site, the preferred method of connecting the BDR to a display. Finally, the software for the bird radar is not approved to operate



# Bird/Wildlife Aircraft Strike Hazard

on AF local area networks (LAN). To overcome these issues, DeTect installed a satellite feed to a non-military laptop in the Wing Safety office. The stability of this connection proved to be problematic, but after replacing the satellite feed with a wireless Internet card, the display became very reliable. Unfortunately, the display itself was not user friendly.


The Wing safety office hosted several working groups to gather input on what the Air Force would want a display to look like from an aircraft controller's perspective. After several months of research and development, DeTect changed the software in October 2007. The new display included actual bird threat assessments (low, moderate, or severe) and an audible alarm to get user attention for elevated risk conditions. Though the display was greatly improved, the information was only getting to the Wing safety office until a breakthrough occurred.

Dover AFB is in the process of building a new control tower. As a part of the building process, Dover installed new fiber optic cable on several

areas of the airfield. This involved connecting the BDR to a non-military laptop computer in base operations using the backbone of the LAN but not on the LAN itself. Bird threat information was now getting closer to the operator—but not close enough to keep aircraft from striking birds.

During a visit to Dover, a member from DeTect noticed a monitor that was displaying information in the control tower that was similar to a monitor in base operations. The display gave information such as active runway and NAVAID status. Personnel from 436 OSS added a "BDR box" to the display. Thus, an operator viewing the bird radar display can now instantly pass on bird threat awareness, with the limiting factor being the airfield operations personnel having to make a manual input to the display. Work is now underway to connect the BDR software directly to the display software used throughout the OSS airfield and airspace management team. Like most leading-edge technology, advancing the BDR is a baby-step process.

The ideal place for the BDR display is in front of GCA and tower controllers for real-time situational awareness. The AFSC, AFFSA, and DeTect are working to get the display approved for controller use. The paperwork for the Certificate to Operate (CTO) on AF LANs is waiting on approval, and clearing these hurdles is in the near future. There are also areas where the current BDR is not effective. Precipitation washes out the display, and the only vertical information currently given to BDR operators is a cone aligned along the runway, not a 360-degree view around the airfield.

Despite the obstacles that remain and the deficiencies discussed, the BDR will one day be an effective risk mitigation tool. The BDR will not stop all bird strikes from occurring, but it will be a great asset in preventing our aircraft from flying into large bird formations during takeoff and landing when aircraft are at their highest level of vulnerability, particularly in low visibility and night conditions. There is still a long way to go and much work to accomplish in making the BDR what it can be and needs to be for Air Force operations. However, the enormous benefit of reducing the risks to our aircrews makes the continued development, with the associated investment of dollars and manpower, of the BDR worth it. 

## Think you know BASH?

Name the five birds involved in the most strikes.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

Name the five birds that cost the USAF the most money.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

See page 19 for the correct answers