

TBAD, the Transponder-Based Aircraft Detector, is a passive device listening to aircraft chatter at 1090 MHz in response to external interrogations. A directionally-sensitive antenna can determine if an aircraft is near the telescope boresight direction independent of signal strength. TBAD units are now installed on the two Keck 10 meter telescopes, the two Gemini 8.1 meter telescopes, and the Apache Point 3.5 meter telescope. Units are soon to be installed on the Subaru 8.2 meter telescope and the Large Binocular Telescope twin 8.4 meter telescopes. Most of these telescopes transmit lasers to create artificial guide stars for adaptive optics purposes, but TBAD is equally effective at protecting SLR or LIDAR beams. The false alarm rate is exceptionally low, while thus far demonstrating a perfect record in shuttering for real aircraft in operational conditions. This talk will describe the basic principle and physical realization of the device.