TETHERED AEROSTAT RADAR SYSTEM (TARS)

Figure 1. Tethered Aerostat

Frequently you will see a tethered aerostat (balloon) near the north end of the Huachuca Mountains. This aerostat is one of a series that was installed along the southern approaches to the United States to interdict the flow of illegal drugs into the U.S. by air. The military radar systems in effect in the 1980s were focused on high altitude high-speed incursions of our air space and were not effective against the tactics of the drug runners who were flying low and slow. The Air force established the first TARS at Cudjoe Key Florida in December1980. Subsequently the U.S. Customs Service established a requirement for the Tethered Aerostat Radar System in 1984 and the first aerostat went operational at High Rock Grand Bahama Island in 1985. Their second site to go operational was at Fort Huachuca in 1986. Prior to 1992, three different agencies operated the TARS network: the Air force, the Customs Service and the US Coast Guard. In 1992, the Air Force was assigned responsibility for managing the TARS network. .Fourteen sites were initially activated. By 2000, two of these sites had been deactivated. In July 2001, the Air Force announced that three more sites had become non-operational. In July 2013, management of the TARS network was transferred to US Customs and Border Protection, an agency under the Department of Homeland Security. As of October 2016, eight TARS sites were still operational. These locations were Yuma AZ, Fort Huachuca AZ, Deming NM, Marfa TX, Eagle Pass TX, Rio Grande City TX, Cudjoe Key FL and Lajas PR. Their locations are depicted in Figure 2.

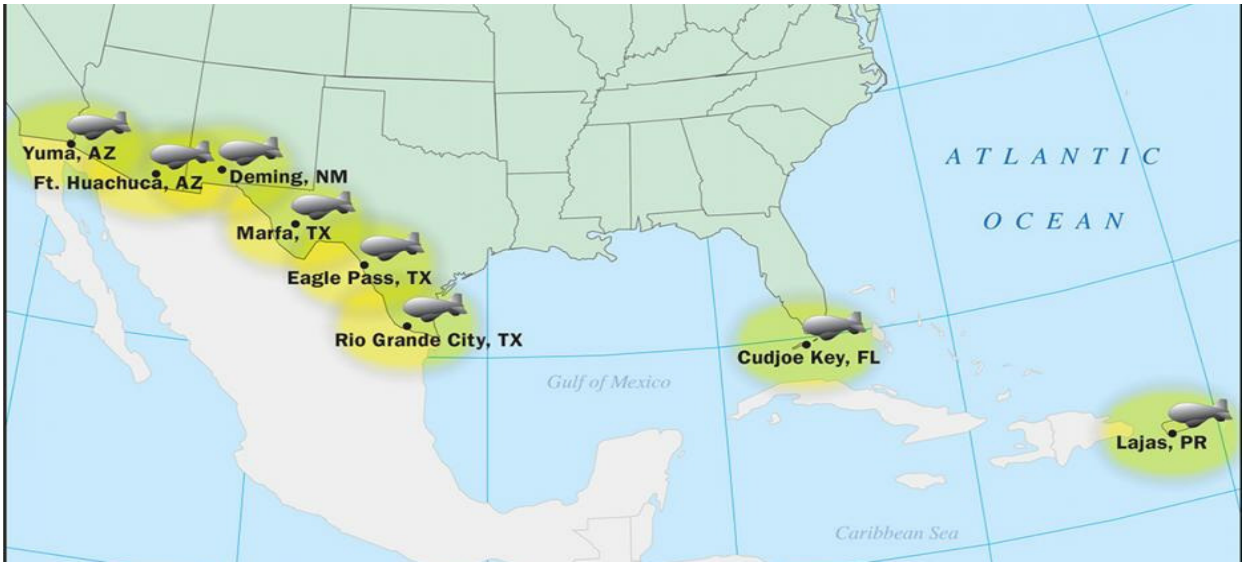

Figure 2. Tethered Aerostat Radar System Site Locations

The aerostat consists of four major parts or assemblies: the hull, the windscreen and radar platform, the airborne power generator, and the rigging and tether assembly. The radar weighs

about 2200 pounds and has a detection range of 200 miles. The hull contains two parts separated by a gas tight fabric partition. The upper part is filled with helium and provides the lifting capability. The lower chamber is a pressurized air compartment that maintains the shape of the hull at all altitudes. The aerostat is generally deployed at altitudes of around 10,000 feet and is tethered to the ground by a nylon fiber cable with a tension strength of 35 000 pounds.

The aerostat is raised and lowered using a powered winch system. During the launch sequence, the power winch releases the tether until the aerostat reaches altitude. When the aerostat reaches operational altitude, the radar is activated and begins transmitting. Wireless transmitters send TARS radar data from each balloon into the Internet cloud where it is combined with other TARS radar data. Radar data is downloaded from the cloud at the Air and Marine Operations Center, (AMOC), in Riverside, California. Using the Air and Marine Operations Surveillance System, the AMOC can integrate more than 700 sensor feeds to simultaneously track 50,000 aircraft in flight over the U.S., Mexico, Central America, the Caribbean and South America.

Before the advent of the TARS, it is estimated that up to 8,500 illegal flights per year were transporting drugs across the border. During the 2016 fiscal year the TARS identified only 330 suspected cross-border incursion attempts, exemplifying the deterrent effect of TARS. The tracking of unidentified aircraft is also coordinated with the Mexican Government. For example, in 2014, a light aircraft was tracked heading north from Hermosillo. The Mexican Air force was notified and responded with the result that over 5,000 pounds of marijuana was recovered south of the border.

The aerostat program is dependent on weather conditions. Specific flying weather restrictions are established for each system to ensure safe flight. However, accidents have happened. On 30 March 2002, a sudden windstorm developed in the vicinity of the aerostat site near Rio Grande City Texas and the tether snapped before the crew was able to retrieve the aerostat. The aerostat drifted more than 300 miles before coming to rest near Burnet Texas. Along the way, the remains of its tether damaged power lines and caused power outages in several Texas counties.

Fort Huachuca Aerostat Accident – Another example of the aerostat's vulnerability to high winds occurred on the afternoon of 9 May 2011 when the aerostat broke loose from its tether and disintegrated over the city of Sierra Vista. Components of the aerostat came down in the Canyon Del Flores neighborhood of Sierra Vista. The Fort Huachuca Garrison Commander indicated that aerostat debris was recovered from about ten different locations in the neighborhood. The accident resulted in no personnel injuries and only minor property damage. The aerostat was replaced in August 2011 and was returned to service in September (see Figure 3).

Figure 3. Replacement Aerostat Being Checked Out & Returned to Service

A similar aerostat system was installed near Aberdeen Proving Grounds in Maryland in December 2014 by the U. S. Army to provide protection for the Washington D.C. area. That system now consists of two aerostats. Their radar is a little more powerful than those of the CBP in that they can detect aircraft up to 340 miles away. One of these aerostats also had a "wandering" problem. On 28 October 2015, it broke its tether, travelled about 300 miles into Pennsylvania and caused a number of power outages with its tether. This aerostat was finally brought down by an auto-deflate system.

Summary prepared by T. Johnson, September 2006. Article updated by T. Johnson in October 2016 from material in the Air Combat Command, Customs & Border Protection, Wikipedia and other assorted websites. Pictures (Figures 1 & 3) by T. Johnson, Figure 2 from the CBP web site.

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