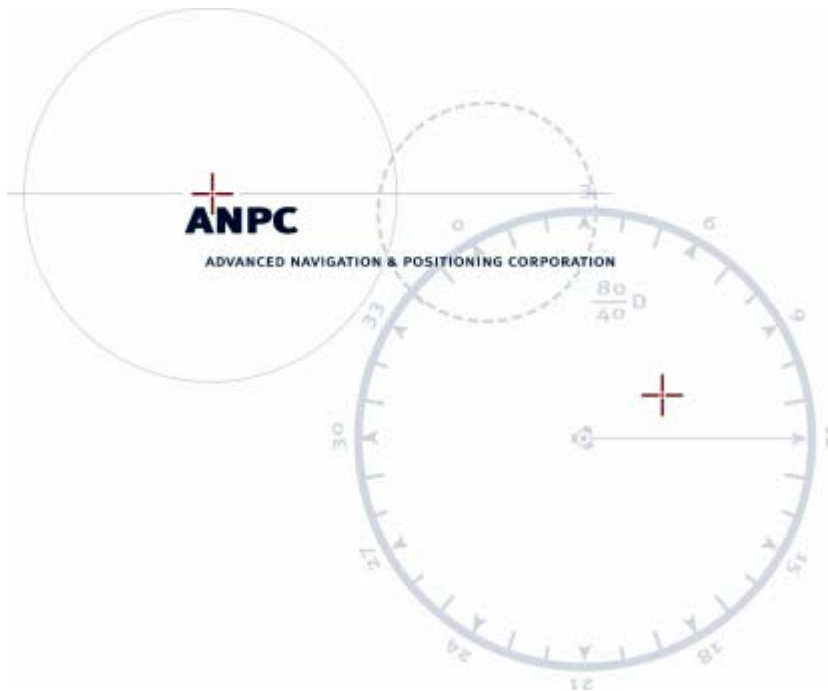




# **Description of TTLS Surveillance Demonstration At Truckee-Tahoe Airport**

April 25, 2006

## SECTION 1: INTRODUCTION

### 1.1 Purpose

A sub set of the Transportable Transponder Landing System (model Rhino III), developed by ANPC under NAVAIR contract with the U.S. Marines, is being deployed to Truckee-Tahoe Airport for system evaluation. The deployment will only be utilizing the surveillance functionality of the equipment. This project is an initial step in the joint TSAS project between ANPC and the FAA. The Special Transmit Authority is requested to support this activity occurring summer 2006. This document elaborates on system functions relevant to the STA application.

### 1.2 Aircraft Surveillance Interrogation Algorithm

The Rhino III uses SSR frequencies to accomplish 360° surveillance around the installation. The current implementation uses a sectorized interrogator of six slightly overlapping antenna beams. An omni-directional antenna is used to radiate a P2 pulse to suppress replies from the back and side lobes.

The baseline interrogation scheme is the same scheme that was implemented for the Rhino III demonstration in December 2005 at The Dalles, the deployment at Klamath Falls in January 2006 and the follow on tests in February 2006 at The Dalles, except that the guidance interrogations will be omitted. It is summarized below.

There are three basic types of interrogations. These are:

- . • Full – This is a full power interrogation in a particular sector
- . • Guidance – This is a full power interrogation in the guidance sector (if guidance enabled)
- . • Whisper/Shout – This is a series of two whisper/shout interrogations (mode A followed by a mode C) at six different power levels, for a total of 12 interrogations

The various interrogations to be used at Truckee-Tahoe follow a fixed sequence as defined in Table 1 below, with each interrogation given a fixed time slot. Whisper/shout interrogations are not required if there is minimal overlap within 12 nm. If interrogations are not required, then the system does not interrogate during the given timeslot and waits until it is time for the next required interrogation. The interrogation sequence defined below is for a single sector and this sequence is repeated for all 6 sectors. The Time column shows the relative time slot for each interrogation type. The overall time for a sector is 0.411 seconds, so the entire cycle takes 2.466 seconds.

Table 1. Interrogation Sequence for One Sector

| Type               | Time  | Mode                  |
|--------------------|-------|-----------------------|
| Full               | 0.000 | A                     |
| Full               | 0.059 | C                     |
| Whisper/Shout      | 0.176 | A/C at 6 power levels |
| Full (next sector) | 0.411 | A                     |

### 1.3 **Regional Considerations**

The facility elevation will be 5900 feet and surrounded by higher terrain. The site is bounded to the east by 10,000+ foot mountains within 10 NM of the airport. There are 8000+ peaks 5 NM south and 8 NM west of the airport.