License is needed to conduct technical demonstrations of equipment to satisfy FAA certification requirements of Traffic Alert/Collision Avoidance System (T/CAS) equipped aircraft.

10a. In an effort to improve air safety, the Federal Government has developed requirements for large passenger carrying airplanes to be equipped with (T/CAS). Federal law required that a portion of such airplanes be equipped with approved (T/CAS) in 1991. The (T/CAS) equipped airplane relies on other aircraft in the vicinity to be equipped with a Mode C transponder in order to determine relative position and provide the desired information to the pilot. Developmental and certification testing of (T/CAS) equipped airplanes requires the use of a Mode C transponder located either on the ground or on another aircraft. Boeing has chosen to use a ground located Mode C transponder as a result of operational and economic studies. The ground transponder will be located at the Mansfield City Airport per a Memorandum of Agreement (MOA) between The Boeing Company and The Seattle Air Route Traffic Control Center. The Mode C transponder to be used is currently FCC Type Accepted, and will be operated by qualified Company radio operators. The transponder will have an external modification to allow the altitude signal which is transmitted to be arbitrarily set to any desired test altitude. This allows (T/CAS) evaluation with the airplane at a safe altitude (between 500 and 10,000 feet AGL) while the transponder is ground located but transmitting an altitude of the airplane. The (T/CAS) will then think that the transponder is at the airplane's altitude and provide the pilot with the intended information without requireing another aircraft to be involved. This method has already been successfully used by both (T/CAS) equipment manufacturers and Boeing flight test engineers.

Two basic types of (T/CAS) tests are necessary. The first is a bearing calibration of the lower (T/CAS) antenna. This calibration will be accomplished by flying a circular path offset from the ground transponder. The second test evaluates the (T/CAS) displays, annunciation's, and aural's, by flying the test aircraft toward the ground transponder until all responses are observed.

The frequency of these tests is dependent on the number of new derivations of Boeing produced aircraft requiring certification and possible retrofitting of customer aircraft. The ground transponder will only be active short periods during the time test aircraft are executing the planned flight pattern.

10b. The ground transponder will provide the basis for timely and economical development and certification of current and future Boeing aircraft. These tests were initiated in June of 1990 under Experimental FCC licensing (KB2XWP) in Everett, WA. The testing was relocated to Mansfield, WA. to ensure testing did not interfere with commercial air traffic in the Puget Sound area.

10c. The ground transponder is a prime tool in the development and certification of (T/CAS) equipped aircraft.