

### Narrative Statement of Proposed Experiment

The HFS-900D is a part of an airborne communication network consisting of airborne HF Receiver/Transmitters and HF Data Link (HFDL) Ground Stations. The HF Data Link Ground Station and airborne station are both segments of the HF Data Link System. The HF Data Link System is a segment of the Aircraft Communications Addressing and Reporting System (ACARS). HFDL is part of an end-to-end communications system used to exchange Airline Operational Control (AOC) and Air Traffic Service (ATS) messages between aircraft end-systems and corresponding ground-based peers. The HFDL Ground Station provides ground-to-air digital communications with aircraft.

The HFS-900D communication function implements the ARINC 635 signal-in-space waveform as defined in ARINC 635 Characteristic, paragraph 4.2.3, and provides air-to-ground digital communication back to the HFDL Ground Station. The receive frequency is automatically selected by an algorithm that searches the list of known HF Ground Station frequencies until it is able to identify the presence of a squitter transmission from a ground station on one of the possible frequencies. Once a station is located, the choice of frequency and data rate for transmitting is automatic, without user intervention. For development and improvements to the HFDL software in the airborne segment, the HFS-900D is put on the air as though it were installed in an aircraft, where it identifies and connects to one of several available HFDL Ground Stations, via a tower-mounted outside antenna. In this application, the HFS-900D is used as an airborne transceiver and appears to the HF Ground Station network as a logged-in member of the current user set of aircraft.

This station license will be used support the development of software and test of software for the High Frequency Data Link (HFDL) function of the HFS-900D HF Receiver / Transmitter (Transceiver). The list of requested frequencies for this station license maps directly to a frequency of the HF Ground Station network. In this way, the HFS-900D can log in and operate as a peer on the HFDL system. This license is essential to permit actual on-network testing of the HFS-900D behaviors in HF Data Link mode.