

General Purpose and Description

These radio station installations are required to accomplish FAA certification, system development and production check-out of an aircraft Terrestrial Flight Telephone System (TFTS). To support system development, DAC intends to activate the system in a laboratory environment in late '96 (Sept - Oct) and follow with certification flight in mid '97 (June - Sept). Subsequent deliveries of this system will include system check out procedures which will activate the system.

There are two radio stations involved, an aircraft station and a ground station. The aircraft station will be implemented in two configurations, one in a fixed based laboratory facility and subsequent mobile installations in the MD-90 aircraft. The ground station is needed to exercise the aircraft system and will be a portable test set or for more complex testing, a rack of test equipment. The ground station, although portable, will be used as a fixed based installation and will generally be located on the flight ramp or in a laboratory facility at Douglas Aircraft Company in Long Beach California.

The system is in compliance with ARINC (Aeronautical Radio Incorporated) characteristic 752 "Terrestrial Flight Telephone System" and ETSI 300-326 (European Telecommunication Standard Institute) as developed for line-of-sight communications for commercial aircraft passenger telephone systems. Currently this system is operational in Europe and may grow to include other geographic areas such as Asia and the Middle East.

Spectrum Planning Information

Transmitter Frequency Band

Air-to-Ground - 1800.0303 to 1804.9697
 Ground-to-Air - 1670.0303 to 1674.9697 MHz
 Channel Spacing - 30.3 KHz

RF Power Output

Air-to-Ground - Transceiver output = +44 dBm. max
 EIRP = +44 dBm - 2 dB (Cable loss) + 3 dB (max ant gain) = +45 dBm (Mean)

Ground-to-Air - Transceiver output = +40 dBm max
 EIRP = +40 dBm - 0.5dB (Cable loss) + 3 dB (max ant gain) = +43 dBm
 (Mean)

Antenna

The radiation pattern of both antennas will be omnidirectional and will be predominantly vertically polarized. Antenna Gain typically ranges from -15 dBi or less at certain azimuth and elevation angles to a maximum of 3 dBi

Emission Type

Emission Type	Modulation Type	Symbol Rate
44K2G7W	$\pi/4$ DQPSK	44.2 kbps

Emission type is as defined in FCC rule making reports section 2.201.

Site Data

For the fixed based aircraft station configuration, the antenna is a 5 inch blade type antenna and will be installed on a flat aluminum ground plane. The antenna will be approximately 4 stories above the ground on the roof of Building 36 and will be less than 6 ft above the existing structure. The transmitter and associated equipment will be located adjacent (typically within 5 to 10 meters) to the antenna in an existing laboratory facility.

The mobile aircraft installation (see Figure 1) will be operated within 350 Km of the ground station located at Douglas Aircraft Company in Long Beach California.

The ground station is a portable test set or rack of test equipment depending on the extent of testing being performed and will be located typically on the roof of Bldg. 36 or on the flight ramp at Douglas Aircraft Company in Long Beach California.

Table 1 below summarizes the four station configurations required and the planned activity for each.

Station Description	Type	Activity	Location
ARINC 752 TFTS Aircraft Station, Building 36 installation	Fixed	System development and checkout October '96 thru October 97	DAC Roof of Building 36
TFTS Ground Station Emulator, Building 36 installation	Fixed	Development and Certification Flight Test October '96 thru October '97	DAC Roof of Building 36
ARINC 752 TFTS Aircraft Station, MD-90 installation	Mobile	MD-90 production system installation checkout Aug '97 thru Feb 2000	Within 350 Km of DAC on MD-90 Aircraft
TFTS Ground station test set, portable.	Fixed	MD-90 production system installation checkout Aug '97 thru Feb 2000	DAC Roof of Building 36, Flight Ramp or other location on the production line. .

Table 1. Radio Station Configurations Locations and Planned Activity

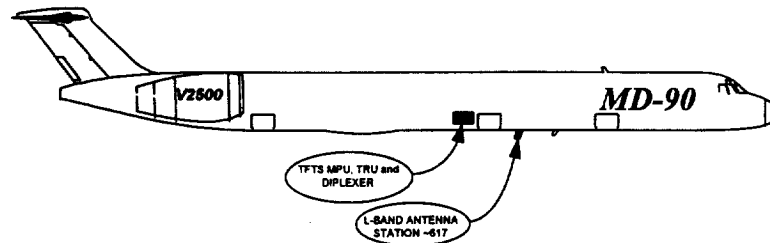


Figure 1 Terrestrial Flight Telephone System Aircraft Station Equipment Locations (Mobile Station)

Technical Description

Figure 2 shows a block diagram of the aircraft station. The aircraft stations for both fixed and mobile configurations are identical and consist of the following equipment.

Quantity	Description	Manufacturer	Part Number
1	L-Band Antenna	GEC Marconi	AA52003-02
1	Diplexer	GEC Marconi	AA52004-01
1	Transceiver Unit	GEC Marconi	AA52001-01
1	Modem Processor Unit	GEC Marconi	AA52002-02

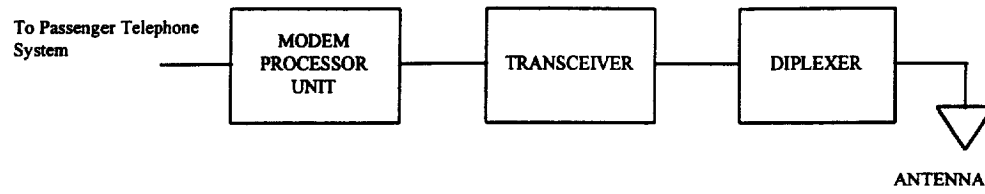


Figure 2 Terrestrial Flight Telephone System Aircraft Station Block Diagram

The ground station is very similar to the aircraft station with modifications to transmit and receive on opposing frequencies and added equipment for activity monitoring and control.