



SP-2310 **HF DATA LINK (HF DL)**

The SP 2310 Airborne HF DL system provides main airborne platforms with the capability for HF voice and data communications. Together with an ACARS Management Unit or Communications Management Unit (CMU), the SP2310 HF DL provides the capability to exchange data with other aircraft or ground station supporting AOC, ATS and ATC services.

The SP-2310 comprises the following units:

- HF transceiver (HF RT) or HF Data Radio (HFDR) SP-2311
- Antenna Tuning Unit ATU-2005

The HFDR SP-2311 includes an internal modem for data communications in accordance with Arinc 635.

The ATU-2005 is a digital antenna coupler for shunt/notch antennas in accordance with ARINC 753/719.

The transceiver operates on frequencies spaced 100Hz in 2-30MHz High Frequency range allowing Single Side Band (SSB) voice, Amplitude Modulated Equivalent (AME), Continuous Wave (CW), Selective Calling (SELCAL) and data functions.

The transceiver is form, fit and function compliant with ARINC standard including interfaces and connectors. The HF data radio is designed to satisfy interoperability requirements.

FEATURES

- Full Digital Architecture
- Low Power Consumptions
- High Reliability
- RTCA-DO/163 Functional Compliance
- RTCA-DO/265 Functional Compliance
- RTCA-DO/160F Environmental Compliance
- RTCA-DO/178B Software Compliance
- RTCA-DO/254 Hardware Compliance
- ARINC 615 Loadable
- Comprehensive Built-in Test (PBIT, CBIT, IBIT) for fault detection and isolation
- ARINC 600 Form/Fit/Function
- Extended frequency range available for military and non-standard aviation applications
- Available in configuration 400 Watt PEP COMMUNICATION
- Single Transmitter / Receiver
- ARINC 753 and ARINC 719 compatible
- HFDR Mode data mode compliant with relevant ICAO, RTCA & EUROCAE Standards
- Interfaces: MU/CMU, OMS, BITE, Cross Link, HFDCF

HF DATA RADIO SP-2311

The SP-2311 performs Communication voice functionalities (ARINC 753/719 Mode) or data functionalities (ARINC 753 and ARINC 635).

In a double configuration, two SP-2311 can be linked together (via Cross Link) to automatically provide hot backup of data functions in case of failure. Thanks to this connection the two radios are always synchronized (configurations, addresses table, etc) and are able to detect immediately the failure on the other one.

OPERATION – COMMUNICATION

The SP-2311 has three modes of Operations:

- Voice (ARINC 753/719 Mode)
- Analog Data (ARINC 753 Mode)
- Digital Data (HFDR as per ARINC 635)

In Voice mode the SP-2311 behaves as a standard AM-SSB Transceiver. Voice signals are provided via normal audio I/O, with transmit and receive conditions initiated by the operator with the microphone.

In Analog data mode, the HFDR receives data audio and data key line from analog data unit and send back received data audio. In Data mode the SP-2311 provides services for Physical, Link and partially Network layers of OSI model.

CONTROL

The SP-2311 is designed to be controlled by the following interfaces:

- ARINC 429 Standard (High/Low Speed)
- Other standard avionics interfaces (upon request)

DISCRETE CONTROLS AND INDICATIONS

The SP-2311 provides the necessary discrete interfaces with the platform. Indications and relevant discrete regarding the equipment status are also provided.

DESIGN AND CONSTRUCTION

The SP-2311 is fully digital equipment; it makes extensive use of large-scale programmable components (DSP) and state of art technologies, in order to reduce volume, power consumption and weight, while maximising the reliability. Its structure is modular and includes a powerful BITE (Power-up, Continuous and Initiated BIT).

SOFTWARE

The SP-2311 is designed according to flexible software architecture and with a design development in accordance with RTCA DO-178B.

TECHNICAL SPECIFICATION

Environmental conditions	RTCA DO-160F
Operating temperature	- 40 °C to +70 °C
Ground survival temperature	- 55 °C to +85 °C
Altitude	-15000 to 50000 feet
Frequency range	2MHz to 30MHz
Frequency stability	± 20Hz
Output power	
AME	125 W average, nominal +1.0dB, -1.5dB
SSB	400 W PEP, 125 W average, nominal +1.0 dB, -1.5 dB
CW	125W
Load	50 ohm
Data link rates	300, 600, 1200, 1800 bit/s
RX sensitivity	
SSB	passband variation: 3dB for fc +350Hz to fc +2500Hz 40dB, from fc to fc -300Hz and from fc +2900Hz to fc +3300Hz 60dB, for frequencies less than fc -300Hz and greater than fc+3300Hz
RX sensitivity	
SSB	1µV for 10dB (s+n)/n
AM	4µV for 10dB (s+n)/n (30%mod@1KHz)
RX dynamic range	-98dBm to -7dBm
Cooling	ARINC 600 with cooling air
Dimensions	ARINC 600, 6 MCU for HFDR ARINC 600, 4 MCU for ATU
Weight SP-2310	less than 20Kg
LRU connector	ARINC 600, size 2
Power supply	115 VAC, 400Hz, 3 phase
Software developments	RTCA/DO-178B (Level C as guideline)