



EMS Technologies Canada Ltd.  
EMS Aviation - Ottawa  
400 Maple Grove Road  
Ottawa, ON K2V 1B8  
Canada

Tel. +1 613 591 9064  
Fax. +1 613 591 9120  
www.emsaviation.com

4 May 2010

Federal Aviation Administration  
Office of Spectrum Policy and Management  
ASR-1  
800 Independence Avenue, SW  
Washington D.C. 20591

Reference: FAA Notification of FCC Equipment under FCC Part 87  
**A781, A781-MK2, and A781-MK3, Aeronautical Earth Station  
Satellite Communications Transceivers  
FCC I.D.'s K6KA781, K6KA781-MK2, and K6KA781-MK3**

Dear Sir,

In accordance with Federal Communications Commission (FCC) Rules and Regulations, Part 87.147(d), EMS Technologies Canada, Ltd. (EMS) hereby notifies the Federal Aviation Administration of its filing with the FCC of an application for certification of the A781 Aeronautical Earth Station Satellite Communications Transceiver models referenced above.

Please find below the information required pursuant to Part 87.147(d)(1).

#### **1) Description of Equipment**

The EMS A781 Aeronautical Earth Station (AES) satellite communication transceiver supports the Inmarsat Classic-Aero H+, Swift64, and SwiftBroadband aeronautical satellite communications services. The A781 meets the applicable requirements of ARINC Characteristic 781 "Mark 3 Aviation Satellite Communication Systems" and RTCA/DO-210D "Minimum Operational Performance Standards for Geosynchronous Orbit Aeronautical Mobile Satellite Services (AMSS) Avionics".

The A781 transceiver system consists of an A781 Satellite Data Unit (SDU), an SDU Configuration Module (SCM), and an optional Flange Mount Power Amplifier (FMPA). The SDU is packaged in a six Modular Concept Unit (6-MCU) enclosure as defined in ARINC Specification 600. The SDU contains 2 channel card circuit card assemblies (CCA), an RF power amplifier, a voice and data processor CCA, a control processor CCA, a multi-voltage output power supply, and interconnection wiring. The channel cards provide the interface between the user voice or data and the Inmarsat L-band satellite signal. Multiple L-band signals are produced on each channel card. The various models of the A781 (A781, A781-MK2, and A781-MK3) differ in the type and capability of channel card used. The voice and data processor CCA provides the interface between user data and voice circuits and the channel cards. The control processor CCA provides the interface to the aircraft and controls the overall operation of the SDU. The power amplifier combines the RF signals from the channel cards and provides signal gain. The amount of gain depends upon whether or not the SDU is configured to operate with the external the Flange Mount Power Amplifier (FMPA). The FMPA provides additional RF gain with a nominal maximum output power of 32 watts. The SDU Configuration Module provides configuration information for the SDU, and the Universal Subscriber Identity Module (USIM) cards necessary for SwiftBroadband operation.

The interconnection between the A781 transceiver and the other sub-systems of the Aeronautical Earth Station is illustrated in Figure 1 and Figure 2 for operation with and without the FMPA respectively.

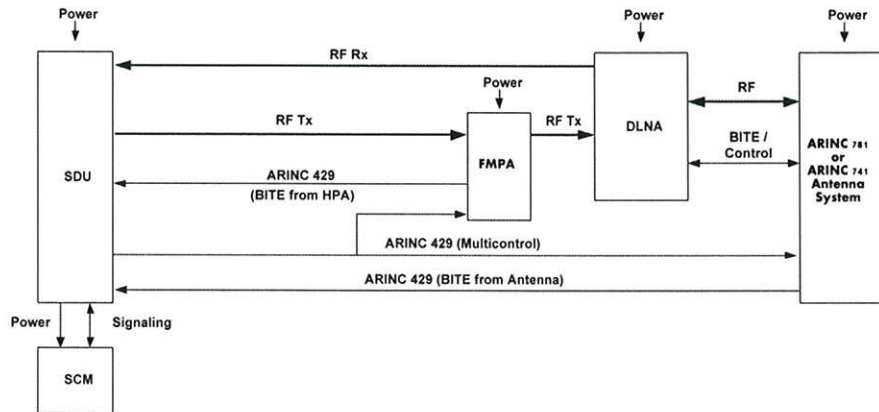


Figure 1: A781 Transceiver with External Power Amplifier

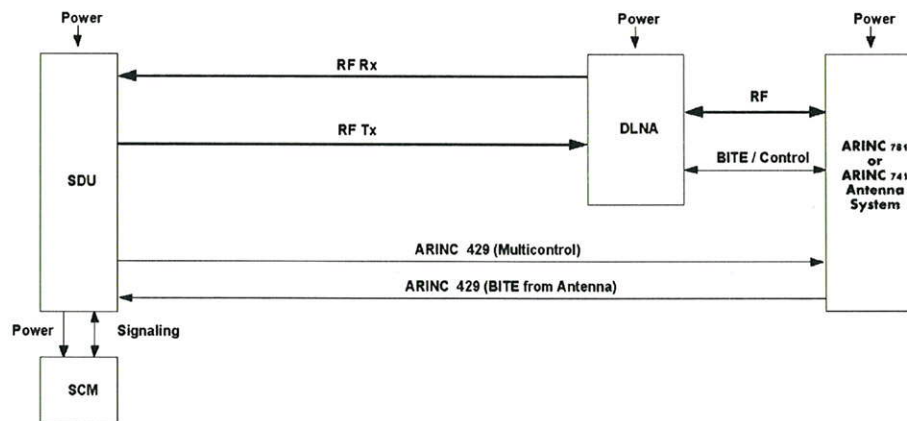


Figure 2: A781 Transceiver without FMPA Power Amplifier

## 2) Manufacturer's Identification

The EMS model identification and the FCC Identifier for the A781 equipment are presented in Table 1. For reference, the supported Inmarsat services are included.



EMS Technologies Canada Ltd.  
 EMS Aviation - Ottawa  
 400 Maple Grove Road  
 Ottawa, ON K2V 1B8  
 Canada

Tel. +1 613 591 9064  
 Fax. +1 613 591 9120  
 www.emsaviation.com

Table 1: Equipment Identification

Equipment Identification		Inmarsat Services		
EMS Model	FCC ID	Classic Aero	Swift64	SwiftBroadband
A781	K6KA781	PRT Data 1 SCPC voice	64kbps MPDS 64kbps ISDN voice (optional) 64kbps CS data (optional) ABME 4.8kbps voice (optional)	PS Background Class PS Streaming Class 64kbps CS data AMBE 4kbps voice
A781-MK2	K6KA781-MK2	PRT Data 2 SCPC voice	64kbps MPDS 64kbps ISDN voice (optional) 64kbps CS data (optional) ABME 4.8kbps voice (optional)	PS Background Class PS Streaming Class 64kbps CS data AMBE 4kbps voice
A781-MK3	K6KA781-MK3	PRT Data 1 SCPC voice	64kbps MPDS 64kbps ISDN voice (optional) 64kbps CS data (optional) ABME 4.8kbps voice (optional)	2 of the following: PS Background Class PS Streaming Class 64kbps CS data AMBE 4kbps voice

**3) Antenna Characteristics**

The A781 equipment is designed to operate with Inmarsat approved Satcom aeronautical antenna systems. These antennas meet the requirements of ARINC Characteristic 741 and/or ARINC Characteristic 781, and RTCA/DO-210.

**4) Rated Output Power**

32 watts

**5) Emission Types and Characteristics**

The A781 equipment emission types and characteristics are summarized in Table 2.





EMS Technologies Canada Ltd.  
 EMS Aviation - Ottawa  
 400 Maple Grove Road  
 Ottawa, ON K2V 1B8  
 Canada

Tel. +1 613 591 9064  
 Fax. +1 613 591 9120  
 www.emsaviation.com

Table 2: Emission Types and Characteristics

Inmarsat Service	Data Rate (kbps)	Symbol Rate ksym/s	Modulation Type	Necessary Bandwidth (kHz)	FCC Designator	Authorized Bandwidth (kHz)
Classic R/T	0.6	0.6	P/2 BPSK	0.840	840HG1D	25
Classic R/T	1.2	1.2	P/2 BPSK	1.68	1K68G1D	25
Classic R/T	10.5	5.25	Aviation QPSK	10.5	10K5G1D	25
Classic C	8.4	4.2	Aviation QPSK	6.80	6K80G1E	25
Swift64: TDM Signaling	3	3	BPSK	21.0	21K0G1D	25
Swift64: Mini M AMBE Voice	5.6	2.8	Offset QPSK	7.20	7K20G1E	45
Swift64	134.4	33.6	16 QAM	40.0	40K0G1E	45
Swift64 MPDS	134.4	33.6	16 QAM	40.0	40K0G1D	45
SwiftBroadband	33.6	16.8	QPSK	25.0	25K0G7W	225
SwiftBroadband	67.2	33.6	QPSK	50.0	50K0G7W	225
SwiftBroadband	134.4	67.2	QPSK	100	100K0G7W	225
SwiftBroadband	302.4	151.2	QPSK	200	200K0G7W	225
SwiftBroadband	134.4	33.6	16 QAM	50.0	50K0D7W	225
SwiftBroadband	268.8	67.2	16 QAM	100	100K0D7W	225
SwiftBroadband	604.8	151.2	16 QAM	200	200K0D7W	225

**6) Frequencies of Operation**

1626.5 to 1660.5 MHz transmitting  
 1525 to 1559 MHz receiving

**7) Receiver Characteristics**

The receiving characteristics of the A781 equipment meet the applicable requirements of the Inmarsat System Definition Manuals (SDMs) and RTCA/DO-210.

If this information meets with your approval, EMS herein requests that your office notify the FCC's Office of Engineering and Technology Laboratory, Authorization and Evaluation Division, in order to indicate that, pursuant to Section 87.147(d)(2) of the FCC's rules, the FAA does not have an objection to the certification of the equipment described in this letter.

If you have any questions on the above information, please feel free to contact me directly.

Sincerely,

Ron Halka  
 Director of Business Process Improvement and Quality  
 EMS Aviation Ottawa