

Date: May 1, 2020

Mobility Division
Wireless Telecommunication Bureau
Federal Communication Commission
445 12th Street, SW
Washington, DC 20554
USA

WAIVER – REQUEST FOR WAIVER OF PART 87 RULES TO ALLOW EQUIPMENT CERTIFICATION OF AERONAUTICAL MOBILE SATELLITE SERVICE TRANSCEIVERS.

FCC ID: ROJ-AVIATOR700S (Pending)

APPLICANT: Thrane & Thrane A/S

To whom it may concern:

Description of **ROJ-AVIATOR700S**

The AVIATOR 700S system is comprised of four units: the SDU-5045 Compact Satellite Data Unit (CSDU), the HPA-5015 Multi Channel High Power Amplifier (MCHPA), the TT-5013A Diplexer Low Noise Amplifier (DLNA) and the SCM-5055 System Configuration Module (SCM).

The system supports Inmarsat SwiftBroadband signals using QPSK, 16QAM, 32QAM & 64QAM. The CSDU supports up to two bearer channels which are amplified for transmission by the HPA-5015 MCHPA.

The AVIATOR 700S system provides two channels of SwiftBroadband functionality. The system functions in the 1525 - 1559MHz receive band and 1626.5 - 1660.5MHz transmit band.

Waiver request

The transceiver is an Inmarsat SwiftBroadband transceiver and meets the technical requirement of Part 87 AMSS rules with respect to output power, spurious emissions, intermodulation and frequency stability. Inmarsat's SwiftBroadband service offer higher data rates by utilizing more efficient modulation techniques. The Part 87 rules have not yet been updated to reflect these emission types and bandwidths.

87.131 Authorized Emissions

Section 87.131 authorizes G1D, G1E and G1W for aircraft earth stations. The SwiftBroadband services however use 16, 32 & 64 point Quadrature Amplitude Modulation (16QAM, 32QAM & 64QAM) and QPSK modulation schemes, with emission types D1W, G7W and D7W. Therefore Thrane & Thrane A/S requests a waiver for the authorized emissions in section 87.131 of the Commission's rules.

87.137 Types of Emission

Section 87.137(a) of the Commission's rules authorizes for aircraft earth stations emission designator 21K0G1D. As explained above, however, SwiftBroadband utilize QPSK and 16QAM, 32QAM & 64QAM modulation with emission classes G7W, D1W and D7W. In addition, the authorized bandwidth under Part 87.137(a) for aircraft earth station emissions above 50MHz is 25kHz. Due to the increased symbol rates for 16QAM, 32QAM & 64QAM, a larger authorized bandwidth is necessary. An adequate bandwidth for SwiftBroadband is 200kHz.

Therefore, Thrane & Thrane A/S seeks a waiver for Section 87.137(a) of the Commission's rules to authorize the following emissions designators for the AVIATOR 700S

SwiftBroadband	
Emission Designator	Authorized Bandwidth [Hz] (Above 50MHz)
25K0G7W	25k
50K0G7W	50k
100KG7W	100k
200KG7W	200k
50K0D7W	50k
100KD7W	100k
200KD7W	200k

87.139(i)(1) note 2 Emission limitations

Section 87.139(i)(1) of the Commission's rules provides the required attenuation for a modulated carrier and note 2 provides an absolute offset of +/-35kHz. Under the required designs for the new modulation techniques, in many cases, ninety-nine percent of the occupied bandwidth exceeds the +/-35kHz offset. In other words, the modulation schemes SwiftBroadband make meeting the offset impossible. In Accordance with Inmarsat requirements, Thrane & Thrane A/S requests a waiver for Section 87.139(i)(1) note 2 to permit an absolute offset of +/-560kHz due to a maximum SwiftBroadband symbol rate of 168 kS/s.

See Inmarsat BGAN SDM Release 4.13.0 Vol. 5 Ch3, 2.4.8.

87.141(j) Modulation Requirements

Section 87.141(j) of the Commission's rules require transmitters used as aircraft earth stations to employ BPSK for transmission rates up to and including 2.4kbps and to employ QPSK for higher rates. Due to Inmarsat requirements of the SwiftBroadband services, the AVIATOR 700S transceiver 5045A (CSDU) uses additional modulation schemes that do not meet this requirement. SwiftBroadband services require the use of 16QAM, 32QAM & 64QAM at transmission rates higher than 2.4kbps. Thrane & Thrane A/S therefore requests a waiver for Section 87.141(j) of the Commission's rules to permit these modulations.

Conclusion

Thrane & Thrane A/S requests that the Commission waive the requirements of Part 87 as described to permit certification of its Inmarsat AVIATOR 700S system. Such waiver will not cause harmful interference to other services and is in the public interest.

Sincerely,



Christian Hansen
Qualification Engineer
Cobham Aerospace Communications

Thrane & Thrane A/S
Lundtoftegaardsvej 93 D
DK-2800 Kgs. Lyngby
Denmark

Phone: +45 39 55 87 25

Fax: +45 39 55 88 88

E-mail: christian.hansen@cobham.com