

Engineering Statement

1 Introduction

Intelsat License LLC (“Intelsat”) herein amends its Application for Authority to Launch and Operate Intelsat 40e at 91.0° W.L. to revise the telemetry, tracking, and control (“TT&C”) frequencies. The characteristics of the Intelsat 40e satellite as related to the TT&C, as well as its relevant compliance with the various provisions of Part 25 of the Federal Communications Commission’s (“Commission”) rules, are provided in this amended Engineering Statement. All other information remains unchanged and is incorporated by reference.¹

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2.3 Telemetry, Command, and Ranging (“TC&R”) Subsystem

The TC&R subsystem provides the following functions:

- 1) acquisition, processing, and transmission of spacecraft telemetry data;
- 2) reception and retransmission of ground station generated ranging signals; and
- 3) reception, processing, and distribution of telecommands.

Intelsat 40e is equipped with three tunable command receivers. The center command frequency on each receiver is selectable via ground command in 100 kHz steps within the 14000-14030 MHz frequency range.

Intelsat 40e uses telemetry channels centered at the following fixed frequencies: 12197.5 MHz, 12198.0 MHz, 12198.5 MHz, and 12199.0 MHz. Additionally, Intelsat 40e is equipped with one tunable telemetry transponder, which allows the center frequency to be selectable via ground command in 100 kHz steps within the with 12170-12200 MHz frequency range.

The command and telemetry subsystem performance is summarized in Exhibit 5 and in Schedule S. The beams used for orbital maneuvers and on-station emergencies as well as the on-station beams have gain contours that vary by less than 8 dB across the surface of the Earth, and accordingly the gain at 8 dB below the peak falls beyond the edge of the

¹ See Intelsat License LLC, as debtor-in-possession, Application for Authority to Launch and Operate Intelsat 40e at 91° W.L., File No. SAT-LOA-20200413-00035, Engineering Statement (filed Apr. 13, 2020).

Earth. Therefore, pursuant to Section 25.114(c)(4)(vi)(A) of the Commission's rules, contours for these beams are not required to be provided and the associated GXT files have not been included in Schedule S.

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Certification Statement

I hereby certify that I am a technically qualified person and am familiar with Part 25 of the Commission's rules. The contents of this engineering statement were prepared by me or under my direct supervision and to the best of my knowledge are complete and accurate.

/s/ Giselle Creeser

April 8, 2022

Giselle Creeser
Intelsat US LLC
Director, Spectrum Policy &
Engineering

Date

EXHIBIT 2
Beam Polarizations and GXT File Names

Beam Description	Schedule S Beam GXT File Names							
	Linear Polarization				Circular Polarization			
	Uplink (H-Pol.)	Uplink (V-Pol.)	Downlink (H-Pol.)	Downlink (V-Pol.)	Uplink (LHCP)	Uplink (RHCP)	Downlink (LHCP)	Downlink (RHCP)
Ku-Band Beams								
42 Ku User beams	KUHU	KUVU	KUHD	KUVD	----	----	----	----
ULPC1	----	----	----	----	----	----	----	CLRD*
ULPC2	----	----	----	----	----	----	----	GLRD*
ULPC3	----	----	----	----	----	----	----	KLRD*
Telemetry 1	----	----	----	----	----	----	----	TGRD*
Telemetry 2	----	----	----	----	----	----	----	TPRD*
Telemetry 3	----	----	----	----	----	----	----	THRD*
Telemetry 4	----	----	----	----	----	----	----	TMRR*
Telemetry 5**	----	----	----	----	----	----	----	TMRD*
Command 1**	----	----	----	----	CMLD*	----	----	----
Command 2**	----	----	----	----	CPLU*	----	----	----
Command 3**	----	----	----	----	CHLU*	----	----	----
Ka-Band Beams								
Ka Gateway1	----	----	----	----	A1LU A1LK	A1RU A1RK	A1LD A1LE	A1RD A1RE
Ka Gateway 2	----	----	----	----	A2LU A2LK	A2RU A2RK	A2LD A2LE	A2RD A2RE
Ka Gateway 3	----	----	----	----	A3LU A3LK	A3RU A3RK	A3LD A3LE	A3RD A3RE
ULPC4	----	----	ALHD*	----	----	----	----	----

* GXT files are not provided for the indicated beams because their -8 dB gain contours extend beyond the edge of the Earth.

** Tunable frequency. See § 2.3.

EXHIBIT 5
TC&R SUBSYSTEM CHARACTERISTICS

Beam Name	Command Global Tunable 1	Command Global Tunable 2	Command Global Tunable 3
Schedule S Beam ID	CMLD	CPLU	CHLU
Center Frequencies (MHz)	14000.5*	14003*	14000.5*
Allocated bandwidth (MHz)	14000-14030	14000-14030	14000-14030
Command Carrier Bandwidth (MHz)	1.0	1.0	1.0
Polarization	LCHP	LHCP	LHCP
Peak Flux Density at Command Threshold (dBW/m²-Hz)	-96.9	-96.9	-96.9

* The center frequencies used are representative. See § 2.3.

Beam Name	Telemetry Global Fixed	Telemetry Global Fixed	Telemetry Global Fixed	Telemetry Global Tunable	Telemetry Global Fixed
Schedule S Beam ID	TGRD	TPRD	THRD	TMRD	TMRR
Frequencies (MHz)	12199.0	12198.5	12198.0	12198.0*	12197.5
Polarization	RHCP	RHCP	RHCP	RHCP	RHCP
Maximum Channel EIRP (dBW)	10.5	10.5	10.5	10.5	10.5
Maximum Beam Peak EIRP Density (dBW/4kHz)	-10.5	-10.5	-10.5	-10.5	-10.5
Maximum Beam Peak EIRP Density (dBW/Hz)	-46.5	-46.5	-46.5	-46.5	-46.5

* The center frequencies used are representative. See § 2.3.

Beam Name	ULPC 1 Ku-band Global	ULPC 2 Ku-band Global	ULPC3 Ku-band Global	ULPC4 Ka-band Global
Schedule S Beam ID	CLRD	GLRD	KLRD	ALHD
Frequencies (MHz)	10950.25	11700.5	12199.5	20199.5
Polarization	RHCP	RHCP	RHCP	Horizontal
Maximum Channel EIRP (dBW)	14	14	14	16.5
Maximum Beam Peak EIRP Density (dBW/4kHz)	6.0	6.0	6.0	8.5
Maximum Beam Peak EIRP Density (dBW/Hz)	-30	-30	-30	-27.5

Note: RHCP: Right Hand Circular Polarization, LHCP: Left Hand Circular Polarization