

EXPLANATORY STATEMENT

By this amendment, R2 Space, LLC (“R2 Space”)¹ seeks authority to make additional modifications to its satellite license issued under Call Sign S3067 (IBFS File No. SAT-LOA-20200511-00042) to conform its authorization to the full capabilities of its in-orbit XR-1 satellite. The currently pending modification application seeks simply to correct an error in the original identification of the satellite’s telecommand uplink channel. This amendment seeks to add the additional changes described below while also making corrections to its Schedule S to provide information on specific operating frequencies and parameters.

The additional modification being sought via this amendment is access to a wider X-band channel from 8025-8400 MHz in addition to the narrower 8225-8375 MHz channel initially authorized. The XR-1 satellite has the capability to operate over this wider bandwidth, and R2 Space can make use of this additional bandwidth in carrying out its service mission. Accordingly, the revised Schedule S included with this application includes this wider channel and the required operational parameters for this expanded frequency use, identified under Beam ID PDL. With the addition of this broader data downlink band the XR-1 frequency use is summarized in the table below, an updated version of the information originally included at page 9 of the Technical Annex to its original application with changes from the original information shaded in yellow –

Communication Link Channel	Payload Data Downlink #1	Payload Data Downlink #2	Command Uplink	TT&C Downlink
Center Frequency	8300 MHz	8212.5 MHz	2086.9 MHz	2263.5 MHz
Bandwidth	150 MHz	375 MHz	128 kHz	1.5 MHz
Modulation	OQPSK	OQPSK/8PSK	PCM/PM/SP-L	OQPSK
Polarization	RHCP	RHCP	RCHP	RHCP
Tx Power	5.8 W	9.7 W	N/A	.8 W
EIRP	15.9 dBW	19.8 dBW	N/A	3.68 dBW

¹ Licensee R2 Space, Inc. was converted to a limited liability company on March 25, 2021.

The revised parameters for the existing X-band downlink are operational refinements of original engineering estimates based on the payload design specifications. The values contained in this amendment are adjusted to describe the system as measured through actual ground-testing by the manufacturer. These values also align with the emission designators *150MG1D* and *375MG1D* of the *XTX* beam found in the API submitted to the ITU (which was referenced in the original modification explanatory statement).

The revised Schedule S also includes the changes to the S-band telecommand channel sought in the initial modification application (filed without a schedule), including the corrected frequencies, beam type, polarization, and pole alignment and mode, as well as corresponding changes in the telemetry channel polarization. The S-band frequency usage had been refined to specify the specific operating channels being used, as initially authorized for telemetry and as requested in the modification application for telecommand (the latter use is currently covered by special temporary authority issued in IBFS File Nos. SAT-STA-20210415-00051 and SAT-STA-20210628-00084). Also updated is the designation of the frequency use to reflect categorization of the service as Earth-Exploration Satellite Service in all frequency bands.² The orbital epoch has been revised to reflect the actual launch date of the XR-1 satellite of January 24, 2021 and the orbit definition in Plane 1 has also been updated. Finally, the power-flux density tables have been revised to reflect operational values, which maintain consistency with the limits in No. 22.5 and Table 21-4 of the ITU Radio Regulations, the limits/protection criteria in ITU Recommendation ITU-R SA.1157-1, and the guidelines in Recommendation ITU-R SA. 1810, as required by R2 Space's license.

² The S-band spectrum use had originally been identified under the Space Operations service, for which the relevant bands are also allocated.