

Teralink's Project Mayhem NTIA Space Record Data

communications links in the Bishop Air Lock on the International Space Station

File Number: 0758 -EX-CN-2026

NTIA requires the following data for space related experiments using government shared spectrum. For each transmit frequency, please provide the data for both ends of the transmit-receive link.

Part A: Space to Space – all communications are intra-Bishop airlock on the ISS

Part A: Space to Space Transmitter Data

Operations on the ISS in Bishop Airlock		
Transmit (Beam 1)		
Transmit Frequency: 133 GHz space to space link, no associated ground operations		
Data Field	Data Answer	Description/Comments
Transmit Power (PWR)	PWR01 _.001 W ____	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT
Necessary Bandwidth	20 GHz	THE WIDTH OF FREQUENCY BAND WHICH IS JUST SUFFICIENT TO SUCCESSFULLY TRANSFER DATA. FORMULAS CAN BE FOUND IN ANNEX J OF THE NTIA MANUAL.
RF Emissions Data		2-SIDED EMISSION BANDWIDTH VALUES
-3 dB bandwidth	6 GHz	
-20 dB bandwidth		
-40 dB bandwidth		
-60 dB bandwidth		
Modulation Type	OFDM	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	100 Gbps	INFORMATION DATA RATE

Forward Error Correction Coding	Is FEC used? Yes ☐ NO XX	
Total Symbol Rate	20 Gsym/s	DATA RATE COMBINED WITH FEC AND FRAME OVERHEAD RESULTING IN THE TOTAL SYMBOL RATE AT THE INPUT TO THE SYMBOL MAPPER/MODULATOR.
Does transmitter have a beacon mode?	No ☐ XX	BEACON MODE IS NORMALLY CONSIDERED A REGULAR AND PERIODIC SHORT DURATION TRANSMISSION THAT IS OFTEN USED TO ASSIST WITH TRACKING, DOPPLER COMPENSATION, OR SMALL SATELLITE IDENTIFICATION WHOSE TRANSMISSIONS ARE NOT LIMITED TO DURATIONS WHEN SUPPORTING GROUND STATIONS ARE VISIBLE.
If transmitter has a beacon mode, can the beacon be commanded off?	Yes ☐ No X	
Transmit Antenna Polarization (XAP)	XAP = XAP01 J	POLARIZATIONS INCLUDE: H = HORIZONTAL, V = VERTICAL, S = HORIZONTAL AND VERTICAL, L = LEFT HAND CIRCULAR, R = RIGHT HAND CIRCULAR, T = RIGHT AND LEFT HAND CIRCULAR, J = LINEAR POLARIZATION
Transmit Antenna Orientation (XAZ)	XAZ = XAZ01 NB	NB= NARROWBEAM EC = EARTH COVERAGE
Transmit Antenna Dimension (XAD)	ANTENNA GAIN__24 dBi_____, BEAMWIDTH __12 deg_____, XAD = XAD01 24G012B Aperture diameter is 5.6 millimeters	NTIA FORMAT (XAD), EXAMPLE, FOR 16 DBI ANTENNA GAIN AND 30 DEGREE BEAMWIDTH XAD01 16G030B

Type of satellite (State = SPCE) (City = Geo or Nongeo)	Radio will be installed on ISS. It is in non-geostationary orbit.	CHOOSE EITHER: GEOSTATIONARY OR NONGEOSTATIONARY
For Geostationary Satellites	Longitude =	IF ANY SATELLITES ARE GEOSTATIONARY, REPORT ITS LATITUDE AS 000000N (XLA AND/OR RLA) AND REPORT ITS LONGITUDE IN DDDMMSS FORMAT (XLG AND/OR RLG).
For Nongeostationary (Orbital Data)	INCLINATION ANGLE ____ 51.6 ____, APOGEE IN KILOMETERS ____ 400 ____, PERIGEE IN KILOMETERS ____ 400 ____, ORBITAL PERIOD IN HOURS ____ 1 ____ AND FRACTIONS OF HOURS IN DECIMAL ____ .55 ____, THE NUMBER OF SATELLITES IN THE SYSTEM ____ 0 ____, ORB = ORB,51.6IN00400AP00400PE001.55H01N RT00 Radio is in Bishop Airlock on ISS, it does not have its own orbit, and it is not on a satellite	IF ANY SATELLITES ARE NONGEOSTATIONARY, REPORT ITS INCLINATION ANGLE, APOGEE IN KILOMETERS, PERIGEE IN KILOMETERS, ORBITAL PERIOD IN HOURS AND FRACTIONS OF HOURS IN DECIMAL, THE NUMBER OF SATELLITES IN THE SYSTEM, THEN T01, EXAMPLE, REM04 *ORB,98.0IN00510AP00510PE001.58H01NRT01, AND FOR SPACE-TO-SPACE COMMUNICATIONS WITH ANOTHER NONGEOSTATIONARY SATELLITE ADD AN ADDITIONAL *ORB FOR IT ENDING IN R01, EXAMPLE, REM05 *ORB,72.9IN03209AP00655PE013.46H01NRR01
For SunSynchronous Nongeostationary Orbits	Mean Local Time of Ascending Node (MLTAN) =	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM)

Operations on the ISS in Bishop airlock**Transmit (beam 2)****Transmit Frequency: 215 GHz - space to space link, no associated ground operations**

Data Field	Data Answer	Description/Comments
Transmit Power (PWR)	PWR01 0.001 W	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT
Necessary Bandwidth	20 GHz	THE WIDTH OF FREQUENCY BAND WHICH IS JUST SUFFICIENT TO SUCCESSFULLY TRANSFER DATA. FORMULAS CAN BE FOUND IN ANNEX J OF THE NTIA MANUAL.
RF Emissions Data		2-SIDED EMISSION BANDWIDTH VALUES
-3 dB bandwidth	6 GHz	
-20 dB bandwidth		
-40 dB bandwidth		
-60 dB bandwidth		
Modulation Type	OFDM	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	100 Gbps	INFORMATION DATA RATE
Forward Error Correction Coding	Is FEC used? NO	
Total Symbol Rate	20 Gsym/s	DATA RATE COMBINED WITH FEC AND FRAME OVERHEAD RESULTING IN THE TOTAL SYMBOL RATE AT THE INPUT TO THE SYMBOL MAPPER/MODULATOR.

Does transmitter have a beacon mode?	No ☐	BEACON MODE IS NORMALLY CONSIDERED A REGULAR AND PERIODIC SHORT DURATION TRANSMISSION THAT IS OFTEN USED TO ASSIST WITH TRACKING, DOPPLER COMPENSATION, OR SMALL SATELLITE IDENTIFICATION WHOSE TRANSMISSIONS ARE NOT LIMITED TO DURATIONS WHEN SUPPORTING GROUND STATIONS ARE VISIBLE.
If transmitter has a beacon mode, can the beacon be commanded off?	Yes ☐ No ☐	
Transmit Antenna Polarization (XAP)	XAP = XAP01 J	POLARIZATIONS INCLUDE: H = HORIZONTAL, V = VERTICAL, S = HORIZONTAL AND VERTICAL, L = LEFT HAND CIRCULAR, R = RIGHT HAND CIRCULAR, T = RIGHT AND LEFT HAND CIRCULAR, J = LINEAR POLARIZATION
Transmit Antenna Orientation (XAZ)	XAZ = XAZ101 NB	NB= NARROWBEAM EC = EARTH COVERAGE
Transmit Antenna Dimension (XAD)	ANTENNA GAIN ____24 dBi____, BEAMWIDTH ____12deg____, XAD = XAD01 24G012B Aperture diameter is 5.6 millimeters	NTIA FORMAT (XAD), EXAMPLE, FOR 16 DBI ANTENNA GAIN AND 30 DEGREE BEAMWIDTH XAD01 16G030B
Type of satellite (State = SPCE) (City = Geo or Nongeo)	Radio will be installed on ISS. It is in non-geostationary orbit.	CHOOSE EITHER: GEOSTATIONARY OR NONGEOSTATIONARY

For Geostationary Satellites	Longitude =	IF ANY SATELLITES ARE GEOSTATIONARY, REPORT ITS LATITUDE AS 000000N (XLA AND/OR RLA) AND REPORT ITS LONGITUDE IN DDDMMSS FORMAT (XLG AND/OR RLG).
For Nongeostationary (Orbital Data)	INCLINATION ANGLE____51.6____, APOGEE IN KILOMETERS____400____, PERIGEE IN KILOMETERS____400____, ORBITAL PERIOD IN HOURS ____1____AND FRACTIONS OF HOURS IN DECIMAL____.55____, THE NUMBER OF SATELLITES IN THE SYSTEM____0____, ORB = ORB,51.6IN00400AP00400PE001.55H01NRT00 Radio is in Bishop Airlock on ISS, it does not have its own orbit, and it is not on a satellite	IF ANY SATELLITES ARE NONGEOSTATIONARY, REPORT ITS INCLINATION ANGLE, APOGEE IN KILOMETERS, PERIGEE IN KILOMETERS, ORBITAL PERIOD IN HOURS AND FRACTIONS OF HOURS IN DECIMAL, THE NUMBER OF SATELLITES IN THE SYSTEM, THEN T01, EXAMPLE, REM04 *ORB,98.0IN00510AP00510PE001.58H01NRT01, AND FOR SPACE-TO-SPACE COMMUNICATIONS WITH ANOTHER NONGEOSTATIONARY SATELLITE ADD AN ADDITIONAL *ORB FOR IT ENDING IN R01, EXAMPLE, REM05 *ORB,72.9IN03209AP00655PE013.46H01NRR01
For SunSynchronous Nongeostationary Orbits	Mean Local Time of Ascending Node (MLTAN) =	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM)
Operations on ISS in the Bishop Airlock Transmit (beam 3) 262 GHz – space to space link, no associated ground operations		
Data Field	Data Answer	Description/Comments

Transmit Power (PWR)	PWR01 0.001 W	TRANSMIT POWER SUPPLIED TO THE ANTENNA INPUT TERMINAL, EXAMPLE, PWR01 W2 TRANSMIT POWER UNITS INCLUDE: W = WATT, K = KILOWATT, M = MEGAWATT
Necessary Bandwidth	20 GHz	THE WIDTH OF FREQUENCY BAND WHICH IS JUST SUFFICIENT TO SUCCESSFULLY TRANSFER DATA. FORMULAS CAN BE FOUND IN ANNEX J OF THE NTIA MANUAL.
RF Emissions Data		2-SIDED EMISSION BANDWIDTH VALUES
-3 dB bandwidth	6 GHz	
-20 dB bandwidth		
-40 dB bandwidth		
-60 dB bandwidth		
Modulation Type	OFDM	THE METHOD USED TO SUPERIMPOSE DATA ON THE CARRIER, EXAMPLE, BPSK, QPSK, GMSK.
Data Rate	100 GBits/sec	INFORMATION DATA RATE
Forward Error Correction Coding	Is FEC used? ☐ No	
Total Symbol Rate	100 Gsymbols/sec	DATA RATE COMBINED WITH FEC AND FRAME OVERHEAD RESULTING IN THE TOTAL SYMBOL RATE AT THE INPUT TO THE SYMBOL MAPPER/MODULATOR.
Does transmitter have a beacon mode?	Yes No ☒	BEACON MODE IS NORMALLY CONSIDERED A REGULAR AND PERIODIC SHORT DURATION TRANSMISSION THAT IS OFTEN USED TO ASSIST WITH TRACKING, DOPPLER COMPENSATION, OR SMALL SATELLITE IDENTIFICATION WHOSE TRANSMISSIONS ARE NOT LIMITED TO DURATIONS WHEN SUPPORTING GROUND STATIONS ARE VISIBLE.
If transmitter has a beacon mode, can the beacon be commanded off?	Yes No ☐	

Transmit Antenna Polarization (XAP)	XAP =XAP01 J	POLARIZATIONS INCLUDE: H = HORIZONTAL, V = VERTICAL, S = HORIZONTAL AND VERTICAL, L = LEFT HAND CIRCULAR, R = RIGHT HAND CIRCULAR, T = RIGHT AND LEFT HAND CIRCULAR, J = LINEAR POLARIZATION
Transmit Antenna Orientation (XAZ)	XAZ = XAZ01 NB	NB= NARROWBEAM EC = EARTH COVERAGE
Transmit Antenna Dimension (XAD)	ANTENNA GAIN____24 dBi_____, BEAMWIDTH ____12_____, XAD = XAD01 24G012B Aperture diameter is 5.6 millimeters	NTIA FORMAT (XAD), EXAMPLE, FOR 16 DBI ANTENNA GAIN AND 30 DEGREE BEAMWIDTH XAD01 16G030B
Type of satellite (State = SPCE) (City = Geo or Nongeo)	Radio will be installed on ISS. It is in non-geostationary orbit.	CHOOSE EITHER: GEOSTATIONARY OR NONGEOSTATIONARY
For Geostationary Satellites	Longitude =	IF ANY SATELLITES ARE GEOSTATIONARY, REPORT ITS LATITUDE AS 000000N (XLA AND/OR RLA) AND REPORT ITS LONGITUDE IN DDDMMSS FORMAT (XLG AND/OR RLG).

For Nongeostationary (Orbital Data)	INCLINATION ANGLE____51.6____, APOGEE IN KILOMETERS____400____, PERIGEE IN KILOMETERS____400____, ORBITAL PERIOD IN HOURS ____1____AND FRACTIONS OF HOURS IN DECIMAL____.55____, THE NUMBER OF SATELLITES IN THE SYSTEM____0____, ORB = ORB,56.1IN00400AP00400PE001.55H01N RT00 Radio is in Bishop Airlock on ISS, it does not have its own orbit, and it is not on a satellite	IF ANY SATELLITES ARE NONGEOSTATIONARY, REPORT ITS INCLINATION ANGLE, APOGEE IN KILOMETERS, PERIGEE IN KILOMETERS, ORBITAL PERIOD IN HOURS AND FRACTIONS OF HOURS IN DECIMAL, THE NUMBER OF SATELLITES IN THE SYSTEM, THEN T01, EXAMPLE, REM04 *ORB,98.0IN00510AP00510PE001.58H01NRT01, AND FOR SPACE-TO-SPACE COMMUNICATIONS WITH ANOTHER NONGEOSTATIONARY SATELLITE ADD AN ADDITIONAL *ORB FOR IT ENDING IN R01, EXAMPLE, REM05 *ORB,72.9IN03209AP00655PE013.46H01NRR01
For SunSynchronous Nongeostationary Orbits	Mean Local Time of Ascending Node (MLTAN) =	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM)
Ground Station Receiver information:	The section is not applicable as this is a space-to-space link.	

Section IIIB: Space to Space

Part B: Receiver Data on Space to Space radio link:

Transmitter Data – for signal to be received within the Bishop Airlock <u>Transmit Frequencies:</u> 133 GHz, 215 GHz, and 262 GHz		
Satellite Name: N/A, this radio will be riding on the ISS in the Bishop Airlock		
Data Field	Data Answer	Description/Comments
Polarization (XAP)	XAP = XAP01 J	POLARIZATIONS INCLUDE : H = HORIZONTAL, V = VERTICAL, S = HORIZONTAL AND VERTICAL, L = LEFT HAND CIRCULAR, R = RIGHT HAND CIRCULAR, T = RIGHT AND LEFT HAND CIRCULAR, J = LINEAR POLARIZATION
Orientation (XAZ)	XAZ = XAZ01 NB	NB= NARROWBEAM EC = EARTH COVERAGE

Antenna	ANTENNA GAIN_24_____	(NTIA format (XAD), EXAMPLE, XAD01 16G030B)
Dimension (XAD)	BEAMWIDTH ____12____ XAD = XAD01 24G012B Aperture diameter is 5.6 millimeters	
Type of satellite (State = SP) (City = geo or non)	Type = non N/A, the radio will be inside the Bishop Airlock attached to the International Space Station	Choose either: Geostationary or Nongeostationary
For Geostationary	Longitude =	IF ANY SATELLITES ARE GEOSTATIONARY, REPORT ITS LATITUDE AS 000000N (XLA AND/OR RLA) AND REPORT ITS LONGITUDE (XLG AND/OR RLG).

For Nongeostationary (Orbital Data)	INCLINATION ANGLE ____ 51.6 ____ , APOGEE IN KILOMETERS _ 400 ____ , PERIGEE IN KILOMETERS ____ 400 ____ , ORBITAL PERIOD IN HOURS _ 1 _ AND FRACTIONS OF HOURS IN DECIMAL _ .55 ____ , THE NUMBER OF SATELLITES IN THE SYSTEM ____ 0 ____ , n/a, radio will be riding on the ISS inside the Bishop airlock.	IF ANY SATELLITES ARE NONGEOSTATIONARY, REPORT ITS INCLINATION ANGLE, APOGEE IN KILOMETERS, PERIGEE IN KILOMETERS, ORBITAL PERIOD IN HOURS AND FRACTIONS OF HOURS IN DECIMAL, THE NUMBER OF SATELLITES IN THE SYSTEM, THEN T01, EXAMPLE, REM04 *ORB,98.0IN00510AP00510PE001.58H01NRT0 1, AND FOR SPACE-TO-SPACE COMMUNICATIONS WITH ANOTHER NONGEOSTATIONARY SATELLITE ADD AN ADDITIONAL *ORB FOR IT ENDING IN R01, EXAMPLE, REM05 *ORB,72.9IN03209AP00655PE013.46H01NRT0 1
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Receiver Data – Same as transmitter data, all inside the Bishop Airlock on the ISS

Frequency bands: 133 GHz, 215 GHz, and 262 GHz

Receive Antenna RAP = RAP01 J
 Polarization (RAP)

POLARIZATIONS INCLUDE:

 H = HORIZONTAL,

 V = VERTICAL,

S = HORIZONTAL AND VERTICAL,

L = LEFT HAND CIRCULAR,

R = RIGHT HAND CIRCULAR,

T = RIGHT AND LEFT HAND CIRCULAR,

J = LINEAR POLARIZATION

Receive Antenna Orientation (RAZ)	RAZ = RAZ01 NB	NB= NARROWBEAM EC = EARTH COVERAGE
Receive Antenna Dimension (RAD)	ANTENNA GAIN_24 dBi____, BEAMWIDTH __12 deg____, RAD01 24G012B Aperture diameter is 5.6 millimeters	NTIA FORMAT(RAD), EXAMPLE, FOR 16 DBI ANTENNA GAIN AND 30 DEGREE BEAMWIDTH RAD01 16G030B
Type of satellite (State = SPCE) City = Geo or Nongeo	n/a radio is riding on the ISS, installed inside the Bishop airlock	CHOOSE EITHER: GEOSTATIONARY OR NONGEOSTATIONARY
For Geostationary Satellites	Longitude =	IF ANY SATELLITES ARE GEOSTATIONARY, REPORT ITS LATITUDE AS 000000N (XLA AND/OR RLA) AND REPORT ITS LONGITUDE IN DDDMMSS FORMAT (XLG AND/OR RLG).

For Nongeostationary (Orbital Data)	INCLINATION ANGLE _____, APOGEE IN KILOMETERS _____, PERIGEE IN KILOMETERS _____, ORBITAL PERIOD IN HOURS _____ AND FRACTIONS OF HOURS IN DECIMAL _____, THE NUMBER OF SATELLITES IN THE SYSTEM _____, *ORB ORB,51.6IN00400AP00400PE001.55H0 1NRR00	IF ANY SATELLITES ARE NONGEOSTATIONARY, REPORT ITS INCLINATION ANGLE, APOGEE IN KILOMETERS, PERIGEE IN KILOMETERS, ORBITAL PERIOD IN HOURS AND FRACTIONS OF HOURS IN DECIMAL, THE NUMBER OF SATELLITES IN THE SYSTEM, THEN T01, EXAMPLE, REM04 *ORB,98.0IN00510AP00510PE001.58H01NRT01 , AND FOR SPACE-TO-SPACE COMMUNICATIONS WITH ANOTHER NONGEOSTATIONARY SATELLITE ADD AN ADDITIONAL *ORB FOR IT ENDING IN R01, EXAMPLE, REM05 *ORB,72.9IN03209AP00655PE013.46H01NRR01
For SunSynchronous Nongeostationary Orbits	Mean Local Time of Ascending Node (MLTAN) =	MLTAN IS THE ANGLE BETWEEN AN ORBIT'S ASCENDING NODE AND THE MEAN SUN, OFTEN EXPRESSED AS UNIT OF TIME (HH:MM)