EXHIBIT 1

TECHNICAL DATA AND ANSWERS TO FCC FORM 493 QUESTIONS

EXHIBIT 1: ANSWERS TO FCC FORM 493 QUESTIONS

Responses to Questions 11-26 of FCC Form 493 (as necessary).

Question 11. Points of communication

These transceivers will operate in conjunction with the constellation of IRIDIUM System satellites.

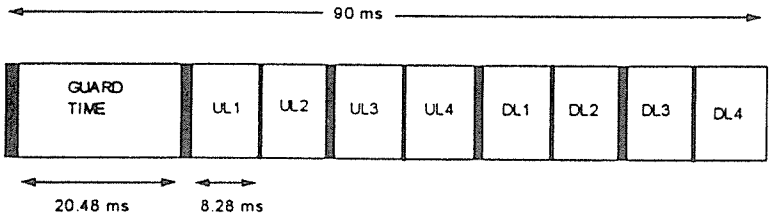
Question 13. Transmitting equipment

a) Number of high power amplifiers (HPAs).

Each unit will be equipped with an HPA supplied by one of three vendors. There are no model numbers associated with this equipment to date. The manufacturers are:

Texas Instruments
Raytheon
Motorola Inc..

The maximum power developed by the HPA is 10 W averaged over the time slot and the maximum power delivered into the antennas after circuit losses is 7W average during a time slot. The frame timing is described in the figure below.



Question 14. Antenna facilities

The antenna designs are currently under development by Motorola and may be built by a third party manufacturer. These antennas are essentially hemispherical antennas with omni directional gain patterns. There will be one antenna per radio. Antenna patterns are not precisely defined. Since the system is a TDD (time domain duplex) system, the receiver and transmit gain characteristics are the same. The antennas will have the following general parameters.

Frequency range	1616 to 1626.5 MHz[1]
Polarization	Right Hand Circular
Peak Gain	<3.5dBic
Elevation angle above horizon coverage	8.2 to 90 degrees
Azimuth angle coverage	360 degrees

[1] Initially, in the U.S. these transceivers will operate in the 1621.35-1626.5 MHz range.

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Gain over coverage angles	< 3.5dBic
Gain at 0 degrees elevation angle above horizon	<0 dBic
Size	< 1 inch diameter by <7 inches length

Question 15. Antenna heights

The antenna heights above the local ground are dictated by the radio under consideration. The portable radio antenna height will be roughly just above the head of the user and at approximately 6 ft. above ground level.

Question 16. Particulars of operation

a) Frequency of operation

1616 to 1626.5 MHz (See note to question 14)

b) Polarization

RHCP

c) Emission designator

41k7Q7W

d) & e) Maximum EIRP and EIRP density

The maximum EIRP is determined by the maximum power into the antenna, the antenna gain and the time averaging due to the TDM/TDD frame structure. The antenna gain pattern is not precisely defined at this time so the maximum EIRP limit applies to all elevation and azimuth angles (see Question 14). However, the antennas will have less gain at low elevation angles than at high elevation angles so the maximum EIRP value overstates the limit at low elevation angles. The primary EIRP of significance is the time averaged over the 90 ms frame since this generates the average interference levels.

The EIRP density is defined as the EIRP divided by the noise bandwidth which is 25 kHz. The table below gives these values.

Averaging time	Tx Power dBW	Gain Ant dBic	EIRP dBW	EIRP dBW/4 kHz
1slot (burst)	8.45	3.5	11.95	3.99
frame 1 slot	-1.91	3.5	1.59	-6.37
frame 2 slots	1.09	3.5	4.6	-3.36

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f) Modulation description

The modulation is described by the following parameters:

Parameter	Description
Multiplex Method	TDMA/FDMA
Duplex method	Time Domain Duplex
Modulation format	QPSK
Data rate	50 kbps
Symbol rate	25 ksps
Modulation Prefiltering	square root raised cos filtering synthesized in the spectral domain; roll off factor = 0.4
Occupied BW per channel	31.5 kHz
Channel Spacing	41.6666 kHz

Question 17. Receiving system noise temperature. $T_E = 321\ ^\circ K$

$NF = 10 \log\left(\frac{321}{290} + 1\right) = 3.2364$

The receiving system noise temperature is 321 degrees K. at all elevation angles and over the entire frequency range.

Question 19. Remote Control Operation

The radios are individually operated by subscribers using the transceivers and are not in the strictest sense remote control facilities. However, each transceiver is controlled by both its home gateway and the visiting gateway, which serves and manages the area the subscriber is in. Both of these facilities will have the capability to allow or disallow service to any subscriber in its jurisdiction. The first U.S. gateway will be located near Tempe, Arizona.

Question 22. (See Attachment 1)

Question 25. (See Section G of Narrative Application)

Question 26. (See Attachment 1)

EXHIBIT 1: ANSWERS TO FCC FORM 493 QUESTIONS

Additional Technical Information

a. FREQUENCY STABILITY

The fundamental frequency stability of the reference oscillator used in the transceivers is 1.5 ppm.

b. OUT OF BAND SPURIOUS EMISSIONS

The subscriber radios will adhere to all relevant regulatory standards regarding unwanted emissions established by the FCC, ITU and other government organizations, including 25.202(f) of the Rules.

1. Protection of Radio Astronomy (RAS)

Section 25.213(a) of the Rules establishes protection criteria for the radio astronony service. The MSS system will be capable of determining the position of the user transceivers through radiodetermination calculations. Each subscriber radio under this license will be capable of radiodetermination through the IRIDIUM System design. The design supports both passive location determination measured on down links only and active determination through special up-link and down-link channel configurations, messaging and calculations.

The subscriber equipment operated under this license will be capable of transmitting in the 1616 to 1626.5 MHz band. Section 25.213(a)(1)(iii) of the Rules indicates that there are no special restrictions on subscriber radios when operating in this band for the Radio Astronomy Service.

Furthermore, the NRAO (National Radio Astronomy Organization) has agreed to study the use of beacon transmitters which could be located at any RAS site. The beacon concept will be assessed to determine if it has value in providing further protection to RAS sites. If adopted, each subscriber radio would be required to first monitor for an RAS beacon channel before it attempts to register or access the satellite system. The subscriber radios will be designed and manufactured with the ability to utilize the beacon concept.

2. Protection of Radio Navigation (GPS)

Section 25.213(b) of the Rules mandates that out of band emissions into the 1574.397-1576.443 MHz band be limited according to the table below. These levels will be achieved in the subscriber units.

EIRP density	< -70 dBW/MHz averaged over 20 ms
EIRP discrete spurious	<-80 dBW/600 Hz

3. Protection of Radio Navigation(GLONASS)

Section 25.213(c) of the Rules mandates that the transceivers limit e.i.r.p. levels to no greater than -15 dB (W/4kHz) on frequencies being used by systems operating in conformance with RR 732 and -3 dB (W/4kHz) on frequencies that are not being so used.[2] The e.i.r.p. density levels set out in response to question 16 d) & e) above indicate that the transceivers will meet these e.i.r.p. levels.

The FCC has not issued any specific regulations regarding protection of GLONASS. In the RTCA special committee 159 WG6, there is an on-going study of emission levels required to protect this service. The subscriber radios will be designed to conform to any reasonable levels established by the FCC.

4. European Requirements

The European community also does not have any current out-of-band emission standards that apply to mobile satellite terminals. However, in ETSI SES-5 on S-PCN the issue has been worked vigorously for several years and there is a current agreement within SES-5. These levels are described in terms of absolute power limits. The document that defines these levels is Draft ETS 05009, Version 1.0.0. The emission limits for frequency offsets close to the band edge are given below.

Frequency Offset from edge of band (kHz)	Carrier on EIRP dBW	Carrier on measurement bw kHz	Carrier off EIRP (Measurement bw= 100 kHz)
0 to 166	-(16.25+38.75*f/166)	3	-77
166 to 575	-55	3	-77
575 to 1175	-60	3	-77
1175 to 1525	-(50+5*(f-1175)/350)	30	-77
1525 to 16500	-55	30	-77

(Where f is the offset in kHz and the power measurements are averaged during the on or off time.)

Generally, for offsets past 2 MHz in the 1610 to 1626.5 MHz MSS band, the emission levels are -60 dBW/30kHz, with some exceptions. A full copy of the draft ETS 05009 is attached for reference.

The above table can be converted to offset-from-channel-center-frequency by adding 24 kHz to the frequency values to describe the transmitter spectrum limits with no frequency

[2] At WRC-95, it was clarified that the -3 dB(W/4kHz) value was a mean limit whereas the -15 dB (W/4kHz) number was a peak value.

offset in order to access the close-to-carrier performance limits. These emissions are primarily due to the modulation.

Frequency Offset from channel center (kHz)	Carrier on EIRP dBW	Carrier on measurement bw kHz	Carrier off EIRP (Measurement bw= 100 kHz)
24 to 190	-(16.25+38.75*(f-24)/166)	3	-77
190 to 599	-55	3	-77
599 to 1199	-60	3	-77
1199 to 1549	-(50+5*(f-1199)/350)	30	-77
>1549	-55	30	-77

The subscriber radios will meet these levels.

In addition to the emissions caused by the modulation process, there are limits placed on narrow band spurious signals by ETSI. The limits can be simply described by the table below.

Spurious Emissions Limits

Frequency in MHz	Carrier on EIRP dBW	Carrier off EIRP (Measurement bw= 100 kHz)
0.1 to 1000	-66	-87
1000 to 1608	-60	-77
1608 to 1628.5	above table applies	above table applies
1628.5 to 12750	-60	-77

The subscriber radios will meet these levels.

EXHIBIT 1: ATTACHMENT 1

Form 493
Questions 22, 26

Nature of the Application and Services to be Provided

This application is for a blanket license for portable handheld subscriber earth terminals ("transceivers") that are part of the IRIDIUM® System's world-wide non-geostationary mobile satellite service (MSS). The Applicant is seeking a license to construct and operate these transceivers in the U.S.

A. Consistency With MSS Spectrum Allocation and Assignment

On January 31, 1995, the FCC's International Bureau authorized Motorola Satellite Communications, Inc. to construct, launch and operate a low-Earth orbit satellite system called the IRIDIUM System.[1/] Specifically, Motorola was authorized to construct the IRIDIUM System over the 1616-1626.5 MHz band and to operate initially in the 1621.35-1626.5 MHz portion of the band. The system was authoriized to utilize the 23.18-23.38 GHz band for inter-satellite links. Motorola was also given conditional authority to construct, at its own risk, feeder links in the 19.4-19.6 GHz (space-to-Earth) and 29.1-29.3 GHz (Earth-to-space) bands.[2/] The Commission explicitly stated that this authorization did not cover the MSS earth terminals or gateway earth terminals required to complete the IRIDIUM System.[3/]

In its Big LEO MSS Allocation Order of 1994, the Commission recognized that the low power requirements of MSS LEO space stations and their associated portable ground units would result in a host of new communications services such as cellular-like radiotelephone (offering voice, data and facsimile), radiolocation and radionavigation made available at a relatively low cost.[4/]

In its subsequent Big LEO Licensing Order, the Commission adopted a blanket licensing approach for user transceivers. Under this approach, the Applicant

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1/ In re Application of Motorola Satellite Communications, Inc. for Authority to Construct, Launch and Operate a Low Earth Orbit Satellite System in the 1616-1626.5 MHz Band, Order and Authorization, 10 FCC Rcd 2268 (1995).

2/ Id. at ¶ ¶17 & 27.

3/ Id. at ¶ 21.

4/ Amendment of Section 2.106 of the Commission's Rules to Allocate the 1610-1626.5 MHz and 2483.5-2500 MHz Bands for Use by the Mobile-Satellite Service, Including Non-geostationary Satellites, 9 FCC Rcd 536, 539 (1994).

would hold the authorization and be responsible for a specified number of similar transceiver units. The license term would be for ten (10) years and requests to add additional user transceivers would be treated as minor modifications. End users who wish to use the satellite system must first obtain authorization from the space station operator. Once that authorization is obtained, the end user's operation of a transceiver would fall under the blanket license of the service vendor.[5/]

B. The IRIDIUM System Portable Handheld Transceivers

The Applicant is seeking authority to license up to 200,000 portable handheld transceivers. The transceivers will be full duplex, L-band transceivers capable of communicating with the IRIDIUM System satellites and through them with other transceivers in the system or the public switched telephone network (via the IRIDIUM System gateway earth stations). The transceivers transmit voice and data at a channel rate of 50 kilobits per second using QPSK modulation with nyquist filtering to minimize spectral occupany. The transceivers are capable of tuning in channel steps of 41.66 kHz across the 1616-1626.5 GHz range and nominally provide 11.45 dBW of effective isotropic radiated power (EIRP). Reliable reception of the downlink signal is required before the transceiver's transmitter is enabled. This is done via the software that controls the transceiver. The gateway earth station facility can also remotely disable transmissions from the transceivers. The transceivers can tune to any assigned channel which is defined by an FDM frequency and TDM time slot.

The transceivers will provide services such as two-way voice and data communications to other transceivers anywhere in the world and between the transceivers and the public switched telephone network. The transceivers can also provide radiodetermination services. The Applicant expects that these transceivers initially will be manufactured by Motorola, Inc., but that other manufacturers will consider developing them once the MSS market matures.

5/ Amendment of the Commission's Rules to Establish Rules and Policies Pertaining to a Mobile Satellite Service in the 1610-1626.5/2483.5-2500 MHz Frequency Bands, Report and Order, 9 FCC Rcd 5936, 6016-6017 (1994)