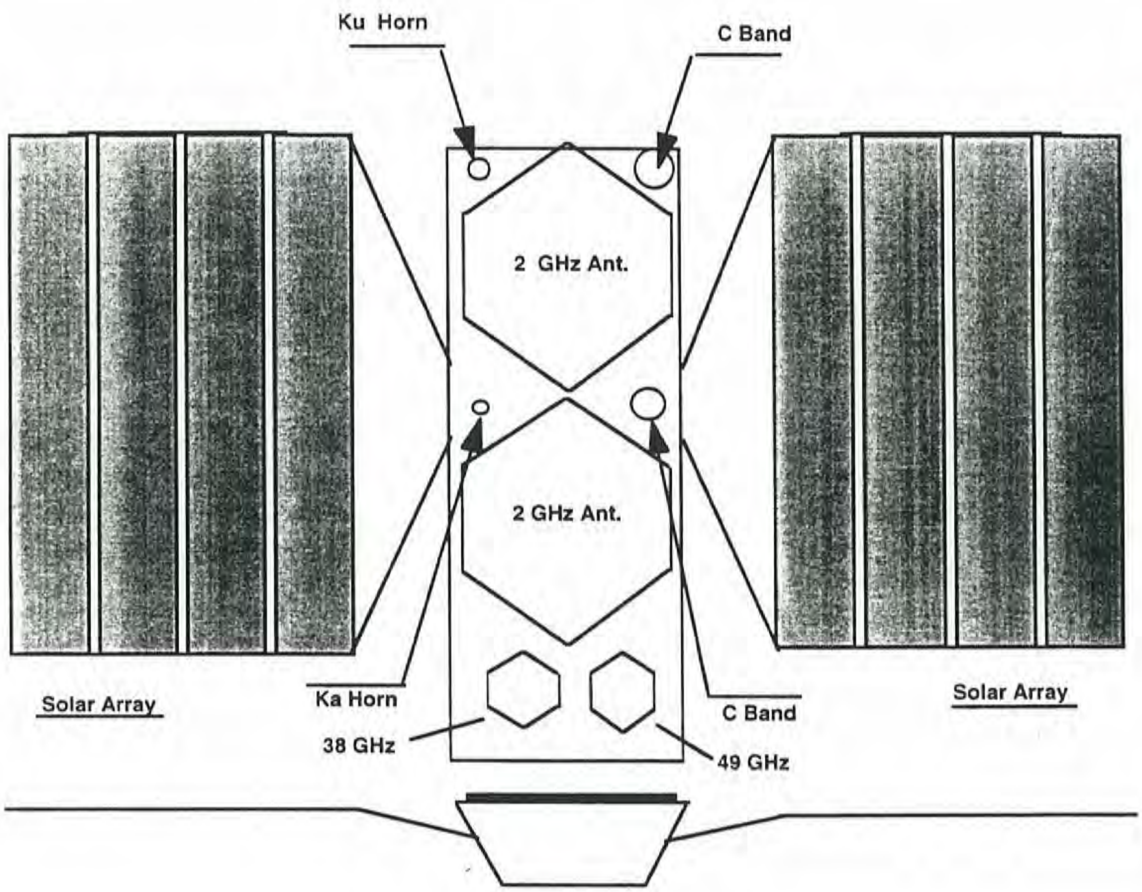

Figure 5.2-C. Spacecraft Configuration for 38/49 GHz + 2 GHz

5.2.5. Services to be Provided and Areas to be Served. The 38/49 GHz + 2 GHz system is capable of offering the same array of services provided by the 38/49 GHz stand-alone system (see Section 4.8). In addition, it can offer mobile voice, data and facsimile services such as those provided by the Globalstar system as well as high speed data services (2.048 Mbps) to fixed stations.

5.2.6. Communications Link Analysis. Appendix D shows the link budgets for various configurations of the 38/49 GHz + 2 GHz system.

5.3. Augmentation Option 3: 38/49 GHz + 1.6/2.4 GHz + 2 GHz System

5.3.1. Frequency Plan and Transmission Parameters. The system uses the same uplink (48,200 - 49,200 MHz) and downlink frequencies (37,500 - 38,500 MHz) as the 38/49 GHz system described in this application. In addition, it is capable of operating in the 1.6/2.4 GHz MSS bands, 1610 - 1626.5 MHz for uplink communications and 2483.5 - 2500 MHz for downlink communications, as well as the 2 GHz MSS bands, 1990 - 2025 MHz (within the U.S.) and 1980 - 2025 MHz (where available) for uplink communications and 2165 - 2200 MHz (within the U.S.) and 2160 - 2200 MHz (where available) for downlink communications.[13]

For feeder uplink communications, Globalstar would request the C-band spectrum of 5150 - 5250 MHz as well as 300 MHz of spectrum within the Ku-band

[13] Globalstar's proposed 2 GHz system includes four geostationary satellites, which would be interconnected with each other and the NGSO satellites through 60 GHz intersatellite crosslinks. This configuration would also be used in Augmentation Option 3.

allocation of 15.45 - 15.65 GHz, and/or the Ka-band allocations of 19.3 - 19.6 GHz,[14] and/or 49 GHz, or other available spectrum. Alternatively, the system could use 500 MHz of spectrum within the Ku-band allocation of 15.45 - 15.65 GHz and the Ka-band allocation of 19.3 - 19.6 GHz, and/or 49 GHz, or other available spectrum. For the feeder downlink, Globalstar would request the C-band allocation of 6700 - 7075 MHz and/or 38 GHz, or other available spectrum. Table 5.3-1 describes the frequency and polarization plan for the 38/49 GHz + 1.6/2.4 GHz + 2 GHz system. In this table, and the tables that follow, HRT refers to High-Rate Terminals providing 2.048 Mbps service in the 38/49 GHz band; MRT refers to Medium-Rate Terminals providing 128 kbps service in the 2 GHz band; and UT refers to User Terminals providing mobile service in the 2 GHz band.

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[14] As a result of the WRC-97 conference, these allocations might change to 15.43 - 15.63 GHz and 19.3 - 19.7 GHz respectively.

Satellite Link	Frequency Band	Polarization
HRT to Satellite Gateway to Satellite	48,200 - 49,200 MHz	LHCP
Satellite to HRT Satellite to Gateway	37,500 - 38,500 MHz	RHCP
UT to Satellite MRT to Satellite	US: 1990 - 2025 MHz and where available: 1980 - 2025 MHz	LHCP
Satellite to UT Satellite to MRT	US: 2165 - 2200 MHz and where available: 2160 - 2200 MHz	LHCP
UT to Satellite	1610 - 1626.5 MHz	LHCP
Satellite to User	2483.5 - 2500 MHz	LHCP
Gateway to Satellite	5150 - 5250 MHz and/or 300 MHz in Ku and/or Ka Band; and/or 500 MHz in Ku- and Ka-Band	LHCP and RHCP LHCP or RHCP LHCP or RHCP
Satellite to Gateway	6700 - 7075 MHz	LHCP and RHCP

Table 5.3-1. Frequency and Polarization Plan

Table 5.3-2 summarizes the transmission rates and modulation characteristics for the service and feeder link carriers as well as the command and telemetry carriers. The carriers with transmission rates of multiples of 1.23 Mbps are capable of occupying common segments of the service and feeder link spectrum, thereby providing significant spectrum efficiency and system flexibility. The corresponding emission designators are shown in Table 5.3-3.

Satellite Link	Transmission Rate, Mbps	Modulation Format	Channel Bandwidth, MHz
UT to Satellite and Satellite to UT	1.23	QPSK	1.23
MRT to Satellite and Satellite to MRT	2.048 *	QPSK	3.8
HRT to Satellite and Satellite to HRT	10.24 *	QPSK	18
Gateway to Satellite and Satellite to Gateway	1.23 2.048 * 10.24 * 51.84 *	QPSK QPSK QPSK QPSK	1.23 3.8 18 90
Telemetry Carrier	1 kbps	PCM/Bi-ϕ-L/BPSK	0.007
Command Carrier	2 kbps	PCM/NRZ/BPSK/FM	0.076

* Uncoded burst rate; coding is K=9, r=1/2 convolutional, concatenated with Reed-Solomon.

Table 5.3-2. Summary of Transmission Rates and Modulation Characteristics

Satellite Link	Emission Designators
UT to Satellite and Satellite to UT	1M23G7W
MRT to Satellite and Satellite to MRT	3M80G7W
HRT to Satellite and Satellite to HRT	18M0G7W
Gateway to Satellite and Satellite to Gateway	1M23G7W 3M80G7W 18M0G7W 90M0G7W
Telemetry Channel	7K00G1D
Command Channel	76K0F2D

Table 5.3-3. Emission Designators

5.3.2. Communications Subsystem. The communications payload for the 38/49 GHz + 1.6/2.4 GHz + 2 GHz system combines the payload for the 38/49 GHz + 2 GHz system described above with the payload for the Globalstar system (1.6/2.4 GHz). The 1.6/2.4 GHz payload is connected to the 38/49 GHz + 2 GHz payload through the feeder link channels, or to the feeder links in the 38/49 GHz band. Bandwidth demands might force the feeder link frequencies into the Ka-band.

The block diagram for this option consists of Figure 5.2-A as well as the payload block diagrams relating to the Globalstar system already on file with the Commission. The major communications payload parameters are summarized in Table 5.3-4.

Number of beams 49 GHz Uplink 38 GHz Downlink 2 GHz Uplink 2 GHz Downlink 1.6 GHz Uplink 2.4 GHz Downlink 5 GHz feeder downlink 15 or 30 GHz feeder uplink	 30 (electronically steered phased array) 30 (electronically steered phased array) 96 (phased array) 96 (phased array) 16 (phased array) 16 (phased array) 1 (global coverage) 1 (global coverage)
Bandwidth per 38/49 GHz beam	1 GHz
Bandwidth per 2 GHz beam	45 MHz
Bandwidth per 1.6/2.4 GHz beam	16.5 MHz
Polarization	Circular
Polarization Frequency Reuse	Yes: 5 GHz No: 2, 15, 19, 38, 49 GHz
Satellite Receive G/T	4.5 dB/K (49 GHz) -14 dB/K (2 GHz) -19 dB/K (1.6 GHz) -24 to -28 dB/K (feeder link)
Maximum EIRP capability per beam	52 dBW (38 GHz) 30 dBW (2.2 GHz) 30 dBW (2.4 GHz) 20 dBW (feeder link)

Table 5.3-4. Communications Payload Summary

5.3.3. Power Flux Density Compliance. Estimates of power flux density (pfd) have been determined for this possible augmentation of the 38/49 GHz system. For the space-to-earth links in the band 37,500 - 38,500 MHz, the system operating levels will not exceed the pfd values in ITU Radio Regulation 2581. For the space-to-earth links in the band 2165 - 2200 MHz (within the U.S.) and 2160 - 2200 MHz (where available), the system operating levels will not exceed the pfd values in the table of A2.1.2.3.1 of ITU Resolution 46 (WRC-95).

For the space-to-earth links in the band 6700 - 7075 MHz, the system operating levels will not exceed the pfd limits in the table of A2.2.1 of ITU Resolution 46 (WRC-95). For the space-to-earth links in the band 2483.5 - 2500 MHz, the system operating levels will not exceed the pfd limits in the table of A2.1.2.3.1 of ITU Resolution 46 (WRC-95).

5.3.4. Space Station Characteristics. Figure 5.3-A depicts the spacecraft configuration for the 38/49 GHz + 1.6/2.4 GHz + 2 GHz system. The key weight and power parameters of this option have been described in Table 5.3-5.

PARAMETER	38/49 GHz	38/49 GHz + 1.6/2.4 + 2 GHz
Dry Mass (kg)	992	1624
EOL Ave. Power (kW)	2.28	3.80
Spacecraft Length (m)	3.5	6.0

Table 5.3-5. Spacecraft Mass and Power Budgets

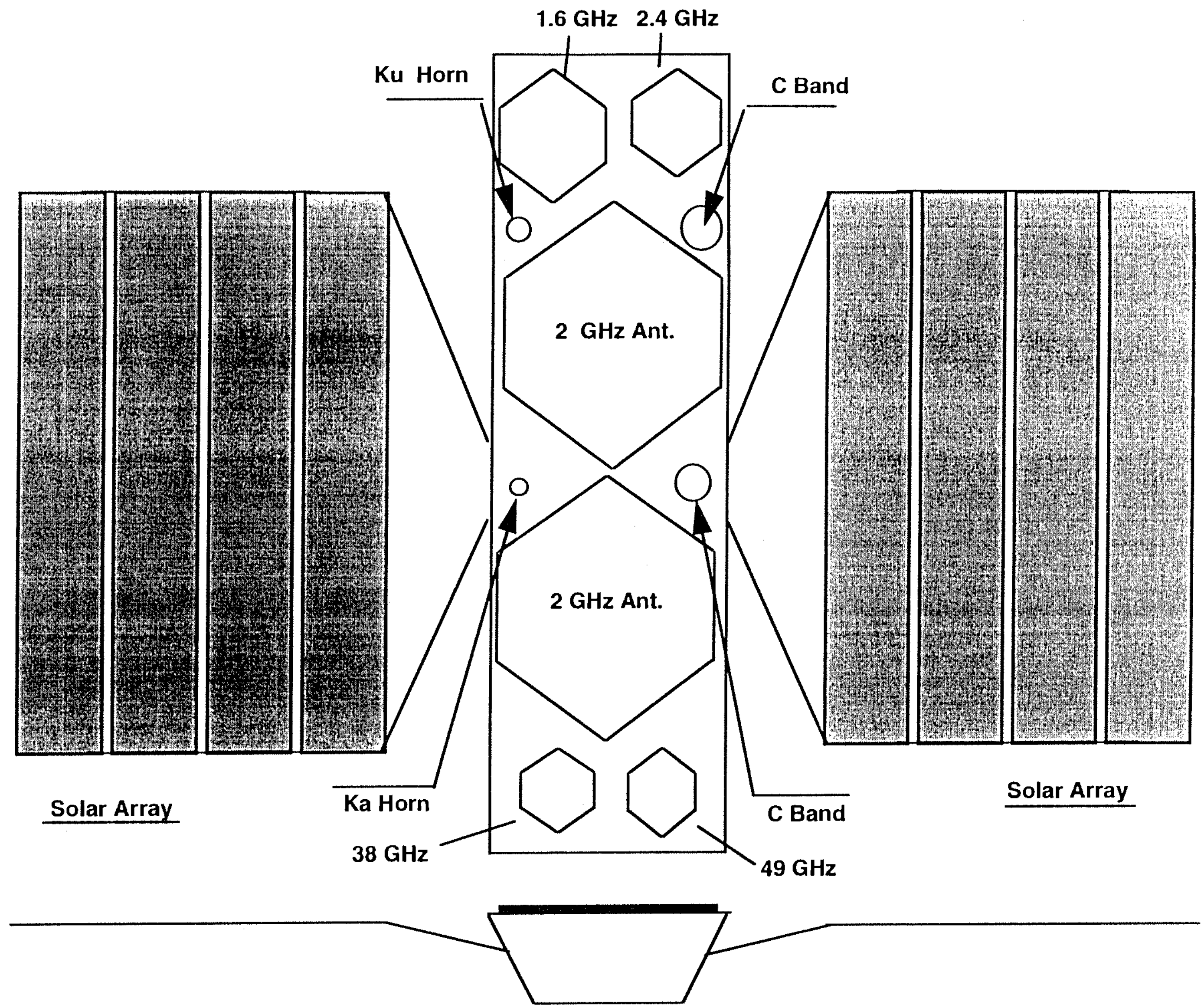

Figure 5.3-A. Spacecraft Configuration for 38/49 GHz + 1.6/2.4 + 2 GHz

5.3.5. Services to be Provided and Areas to be Served. The 38/49 GHz + 1.6/2.4 GHz + 2 GHz system offers the combined array of services described for the dual FSS/MSS systems. In addition, this system provides high speed (2.048 Mbps) data services to fixed individual home and office sites as well as high data rate trunking between fixed points.

5.4. Feeder Link Considerations. The 38/49 GHz-only system does not employ feeder links. The three system configurations described in this section require feeder link spectrum.

5.4.1. Feeder Link Spectrum. Possible choices for feeder link spectrum have been identified as spectrum which has been allocated at WRC-95 to feeder links for NGSO satellite systems in the MSS. The possibility of feeder links at 38 and 49 GHz is also considered either within the Commission's proposed band segment for NGSO FSS or other available bands. It is worth noting that the Commission has suggested a pairing of the 38.5 - 38.6 GHz band with the 46.9 - 47 GHz band for wireless services. These 100 MHz band segments could serve as feeder links for the 2 GHz and/or 1.6/2.4 GHz MSS payloads including those which have been added to satellites operating as part of 40 GHz NGSO FSS systems. Selection of final feeder link spectrum will be based upon availability of spectrum and the ability to share the spectrum.

Primary telemetry and command channels will be located in the feeder link bands. Secondary telemetry and command channels used for launch and emergency scenarios are preferred at C-band similar to the existing Globalstar frequency plan.

The satellite feeder link antenna beams have generally been described as full Earth coverage beams; however, depending upon final system configurations and sharing considerations these beams may be of steerable spot beam design.

5.4.2. Beam and Payload Interconnection. The systems will incorporate a beam-to-beam connectivity feature for the optional configurations, such as feeder link turn-around, to enable gateway-to-gateway links. As described, the system configurations with multiple payloads incorporate interconnection between the 2 GHz and 40 GHz payloads, and 1.6/2.4 GHz and 40 GHz payloads. The 2 GHz bands and the 1.6/2.4 GHz bands would also be interconnected.

VI. ADVANCE PUBLICATION AND ITU COORDINATION

Globalstar is submitting at Appendix E all of the information required to advance publish the GS-40 system with the ITU. Globalstar respectfully requests that the Commission forward this information to the ITU for publication, subject to any applicable constraints on the timing of such submissions regarding a portion of the spectrum requested for the system. See WRC-95, Resolution PLEN-1.

VII. REGULATORY STATUS

7.1. Compliance with Treaty Obligations. Globalstar recognizes that the 38/49 GHz NGSO System may be subject to consultation requirements under Article XIV of the INTELSAT Agreement and Article 8 of the INMARSAT Convention and will provide appropriate information to facilitate any such consultation. See 47 C.F.R. § 25.111(b).

7.2. Non-Common Carrier Status. Globalstar intends to operate the GS-40 system on a non-common carrier basis. Under the NARUC test, the Commission should find that common carrier regulation of 38/49 GHz FSS is not necessary.[15] First, Globalstar intends to offer space segment capacity at 38/49 GHz to a reseller or another entity that will offer commercial service to end users. Accordingly, the services to be provided by the licensee will not be offered indifferently to the public. Rather, Globalstar proposes to market its space segment capacity to one or a very few resellers, and to tailor its offerings to the individual requirements of these few customers.

Second, there will be significant competition for FSS which obviates any need to impose common carrier regulation on 38/49 GHz FSS operators. The Commission has licensed numerous geostationary FSS systems in the C-, Ku-, and

[15] See National Ass'n of Regulatory Util. Comm'rs v. FCC, 525 F.2d 630, 642 (D.C. Cir.), cert. denied, 425 U.S. 992 (1976). Pursuant to NARUC, the Commission considers (1) the likelihood that the service will be offered indifferently to the public, and (2), if there is no such likelihood, the need for a legal compulsion for providers to serve the public indifferently.

Ka-bands, and recently licensed a non-geostationary Fixed-Satellite Service system.[16] From among these systems, sufficient competitive capacity will be available to assure the public of ample access to FSS.[17] The Commission has already determined that GSO FSS may be offered on a non-common carrier basis at the election of the Applicant.[18] Based on these facts, there is no reason to require the provision of space segment capacity to be offered to resellers on a common carrier basis.

VIII. FINANCIAL QUALIFICATIONS

8.1. **No Financial Standard for FSS Systems at 38/49 GHz.** The GS-40 system described in this application is an NGSO FSS system designed to operate at 38/49 GHz. The Commission's Rules currently do not contain a financial standard applicable to such systems.[19] Although the Commission has stated that

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[16] See Teledesic Corporation, 12 FCC Rcd 3154 (Int'l Bur. 1997).

[17] See 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, 9 FCC Rcd 5936, 6003-04 (1994) ("Big LEO Rules Order").

[18] Amendment to the Commission's Regulatory Policies Governing Domestic Fixed Satellites and Separate International Satellite Systems, 11 FCC Rcd 2429, 2436 (1996).

[19] Section 25.140 on its face applies only to individual space stations operating in frequencies allocated to the Fixed-Satellite Service. Section 25.143 applies to NGSO systems, but is limited on its face to systems operating in the 1.6/2.4 GHz bands. No other provision of the Commission's Rules is relevant for current purposes. See also Application of TRW Inc. for Authority to Launch and Operate TRW Global EHF Satellite Network, at 71 (File Nos.

Section 25.140 governs applications in the FSS without regard to frequency band,[20] in the 40 GHz NPRM, the Commission stated that "[s]ervice and licensing rules for specific subbands in the 36 - 51.4 GHz band . . . are the subject of separate ongoing and future proceedings."[21] Therefore, as with 2 GHz MSS,[22] there is no currently applicable financial standard for the GS-40 application.

In any event, it would be premature for any applicant for FSS at 38/49 GHz to provide a demonstration of its financial qualifications. The Commission has repeatedly stated that the financial standard to be applied to a new satellite service, such as FSS at 38/49 GHz, depends, in part, upon entry opportunities.[23] The availability of entry opportunities for any particular spectrum depends upon the number of applicants, the rules adopted for use of the frequencies, and the capability of and any requirements imposed upon systems operating in the frequencies to share with other systems. The Commission does not yet have a

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112-SAT-P/LA-97(15), 113 to 116-SAT-P/LA-97) (filed Sept. 4, 1997).

[20] See Public Notice, Report No. SPB-95, ¶ 3 (released Aug. 13, 1997).

[21] 40 GHz NPRM, ¶ 9. The Commission has initiated a proceeding for commercial use of the 47.4 - 48.2 GHz and 47.2 - 47.4 GHZ bands. See Amendment of Parts 2, 15 and 97 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications (ET Docket No. 94-124), Second Report and Order (released July 21, 1997).

[22] See Public Notice, Report No. SPB-95, ¶ 3 (released Aug. 13, 1997).

[23] See Big LEO Rules Order at 5948; Amendment of the Commission's Rules to Establish Rules and Policies Pertaining to a Non-Voice, Non-Geostationary Mobile Satellite Service, 8 FCC Rcd 6330, 6333-34 (1993).

record upon which to determine the availability of entry opportunities for FSS systems at 38/49 GHz. Indeed, the allocation itself remains pending,[24] and the Commission has not even proposed service and licensing rules for FSS systems in the bands.

Moreover, the Commission has traditionally not required an applicant to meet a financial standard prior to adoption of rules for a new service, such as FSS at 38/49 GHz. In the Non-Voice, Non-Geostationary Satellite Service, the Commission gave all pending applicants an opportunity to amend their applications to meet the financial standard adopted for the service, without regard to whether their initial applications had met any particular standard.[25] Similarly, for MSS Above 1 GHz, the Commission provided applicants an opportunity to amend to meet the eligibility standards adopted for the service, even though those applications had been pending for over three years.[26] In Report No. SPB-89 regarding the filing of applications for use of the 38/49 GHz band, the Commission stated that applicants filing by the cut-off date for applications "will be afforded an opportunity to amend their applications, if necessary, to conform with any

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[24] See 40 GHz NPRM, FCC 97-85.

[25] See Amendment of the Commission's Rules to Establish Rules and Policies Pertaining to a Non-Voice, Non-Geostationary Mobile Satellite Service, 8 FCC Rcd 8450, 8457 (1993).

[26] See Big LEO Rules Order, 9 FCC Rcd at 6023; see also Public Notice, 6 FCC Rcd 2083, 2084 (1991) (stating that MSS applicants filing by the cut-off date would be allowed to amend their applications to conform to the rules adopted for the new service).

requirements and policies that may be adopted subsequently for space stations in these bands."[27] Accordingly, requiring new applicants for FSS at 38/49 GHz to meet any financial standard is inconsistent with the Commission's established policies and precedents.

8.2. **Sources of Funds.** As has been accomplished with the Globalstar MSS Above 1 GHz system, Globalstar intends to finance the GS-40 system directly through funds raised in the financial markets. To date, Globalstar has raised hundreds of millions of dollars in equity contributions from its general and limited partners to finance the Globalstar system; hundreds of millions of additional dollars were raised from a public stock offering; vendor financing was obtained from suppliers; a $250 million revolving line of credit was secured from a consortium of banks; and $350 million was placed in high-yield debt. In total, $2.3 billion has been raised through investment and the financial markets for the construction and operation of the Globalstar system.

To raise the amount needed for construction and launch of GS-40, Globalstar may rely upon the assets of its strategic partners to provide the necessary financial capability to obtain such financing. Globalstar itself is a Delaware limited partnership, composed of a broad array of international telecommunications companies.[28] The strategic partners in the Globalstar project include:

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[27] Public Notice, Report No. SPB-89, at 4 (released July 22, 1997).

[28] See supra § I.

-- AirTouch Communications, Inc. (Delaware), a leading wireless telecommunications company with over 1.5 million cellular customers worldwide and also the service provider for Globalstar MSS in the United States;

-- Alcatel, N.V. (Netherlands), the world's largest manufacturer of telecommunications equipment with operations in 32 countries;

-- Alenia S.p.A., a subsidiary of Finmeccanica, Italy's largest aerospace company with broad experience in complete space systems, telecommunications, remote sensing, weather and scientific satellites, manned space systems, launch and re-entry systems, and fixed and mobile ground systems for spacecraft support;

-- Dacom, a leading South Korean telecommunications company providing a broad range of services, including international telephone service connections to 169 countries with South Korea;

-- Daimler-Benz Aerospace, A.G. (Germany), a leader in development and production of aerospace, defense technology and propulsion systems, and the manufacturer of military and commercial aircraft, satellites, space transportation and propulsion systems;

-- Finmeccanica, S.p.A. (Italy), parent of Alenia;

-- France Telecom, the world's fourth largest telecommunications operator with 30 million subscribers and operations in over 19 countries;

-- Hyundai Electronics Industries Co. Ltd., a leading South Korean manufacturer of telecommunications equipment, including the development and production of portable and mobile cellular telephones, and multimedia systems;

-- Loral Space & Communications Ltd., a Bermuda company, which ultimately controls the Globalstar system, owns Loral Skynet®, a leading FSS operator, and is developing an FSS system called CyberStar™ in Ka-band; Loral Space is also the parent of Space Systems/Loral, Inc. (Delaware), a leading manufacturer of commercial communications satellites;

-- Qualcomm Incorporated (Delaware), a leader in CDMA technology, which owns and operates OmniTRACS, an international satellite-based truck fleet and position location service; and,

-- Vodafone Group plc (United Kingdom), one of the largest providers of mobile telecommunications services in the world with 1.4 million cellular subscribers worldwide.

With the group of international partners identified above, Globalstar reflects the nature of the proposed global FSS service and has access to the financial resources necessary to implement the GS-40 system expeditiously. If and when the Commission adopts a financial standard for NGSO systems at 38/49 GHz, Globalstar will provide a demonstration of its ability to finance GS-40. In the event that the Commission finally adopts the financial standard in Section 25.140 or Section 25.143 for 38/49 GHz NGSO systems, then Globalstar requests either an opportunity to amend this application or a waiver of the rule to the extent necessary to perfect this application.

IX. SCHEDULE AND PROGRAM MILESTONES

Table 9-1 sets forth the construction and launch milestones for the proposed 38/49 GHz system.

Authorization, Construction and Launch Milestones	Date of Event
FCC Application Filed	September, 1997
FCC Grant of License	September, 1999*
Satellite Construction Begins	Grant of Application**
First Two Satellites Constructed	Grant plus 36 months
First Satellites Launched	Grant plus 40 months
All Satellites Constructed	Grant plus 48 months
All Satellites Launched	Grant plus 58 months
Full Operational Service	Grant plus 60 months

* Projected.
** Construction may commence prior to grant pursuant to Section 25.113(f).

Table 9-1. GS-40 Construction and Launch Milestones

X. PUBLIC INTEREST CONSIDERATIONS

The proposed GS-40 satellite system will further the public interest, in a variety of ways, by providing benefits and services that enhance "rapid, efficient, nationwide, and world-wide wire and radio communication services."[29]

[29] 47 U.S.C. § 151.

First, with its flexible technical design, the GS-40 system will provide low-cost global communications services to users in the United States and around the world. Once the initial infrastructure is in place, the incremental costs to support new users or new applications will be marginal. As a result, the benefits of the GS-40 system will be highly affordable, easy to use, and widely available. Thus, the public interest will be served through efficient and flexible use of the valuable public spectrum.

Second, the GS-40 system will enhance competition in domestic and international telecommunications markets. As designed, the GS-40 system will compete with both terrestrial providers as well as other existing and planned FSS systems. The increased competition among telecommunications providers will lead to lower-cost, more efficient and more widely available services.

Third, the GS-40 system can be designed to share the available spectrum with other FSS networks. Thus, the Commission's objectives of encouraging multiple entry,[30] and ensuring that the spectrum will be used efficiently[31] for a wide range of services offering is served. Globalstar welcomes the opportunity to compete for subscribers with other NGSO FSS systems.

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[30] Licensing of Space Stations in the Domestic Fixed-Satellite Service and Related Revisions of Part 25 of the Rules and Regulations, 54 RR 2d 577, 581 (1983).

[31] See Big LEO Rules Order, 9 FCC Rcd at 5950; see also Licensing Space Stations in the Domestic Fixed-Satellite Service, 58 RR 2d 1267, 1270 (1985).

Fourth, grant of this application has the potential to stimulate economic growth. Investment in the network will create many high-paying jobs for skilled workers in the United States and thus should contribute significantly to the U.S. economy. In addition, access to the advanced telecommunications services offered by the system will stimulate secondary economic growth by increasing the efficiency of existing businesses and leading to the development of new ones.

Fifth, by enhancing the worldwide free flow of information, the GS-40 system promotes the domestic and international communications and information policy goals of the United States. It is designed to provide continuous modern communications service to all areas of the globe including many regions which are still not covered by terrestrial services. Service will be provided to remote and rural areas, including sparsely populated areas where land-line and mobile radio are not operating or cannot operate. Persons currently living or traveling in remote areas will, with the implementation of GS-40, be able to communicate anywhere in the world. Moreover, the GS-40 system would enhance and complement existing satellite and terrestrial networks. Thus, GS-40 will allow the provision of seamless service nationwide.

Finally, the GS-40 system will further the Commission's stated goal of establishing the United States' leadership in satellite communications.[32] The

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[32] See 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, 9 FCC Rcd 1094, 1097 (1994); see also Big LEO Rules Order, 9 FCC Rcd at 5941.

system will promote expansion of the United States private sector investment and involvement in civil space and related activities. The system will establish United States leadership in these technologies for decades to come. Such leadership will provide public interest and economic growth benefits.

XI. REQUESTS FOR WAIVER OF THE COMMISSION'S RULES [33]

In connection with obtaining the authority for the system proposed herein, Globalstar respectfully requests waiver of certain of the Commission's Rules.

11.1. Waiver of Sections 2.106 and 25.202. The Applicant proposes use of frequencies which have not yet been allocated for FSS.[34] To the extent required, Globalstar requests a waiver of Sections 2.106 and 25.202 of the Commission's rules to use any of the bands proposed herein.

11.2. Waiver of Section 25.210. The GS-40 system proposed herein satisfies the intent of Section 25.210 by using the required bandwidth in the uplink and downlink bands in a manner that maximizes system capacity. However, because the proposed system is an NGSO design, it is incapable of satisfying the explicit requirements of this section, which was intended to apply to GSO systems. Accordingly, Globalstar requests a waiver of Section 25.210 to the extent that the GS-40 system is incapable of complying with the rule pending a modification of the rule to meet the design needs of NGSO systems.

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[33] See FCC 312, Ex. D.

[34] See 40 GHz NPRM, FCC 97-85.

11.3. Waiver of Section 25.140. The Applicant has provided a complete description of the GS-40 system and all information required by Section 25.114. The Applicant requests a waiver of Section 25.140 of the Commission's Rules to the extent that the requirements of Section 25.140 -- other than those incorporated by reference to Section 25.114 -- may be deemed applicable to NGSO FSS systems at 38/49 GHz. By its express terms, Section 25.140 refers only to GSO satellite systems, which were the systems for which the rule was originally adopted;[35] therefore, the requirements specified in Section 25.140 are not applicable to NGSO FSS systems. Moreover, the Commission has stated that the specific licensing and service requirements FSS systems at 38/49 GHz will be considered in a future proceeding.[36] Accordingly, Globalstar requests a waiver of any Section 25.140 requirements for FSS systems which are inconsistent with, or not required by, the information requests in Section 25.114.

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[35] See, e.g., 47 C.F.R. § 25.140(b)(2) (discussing orbital locations for FSS systems).

[36] See 40 GHz NPRM, ¶ 9.

XII. CONCLUSION

For the reasons set forth above, Globalstar requests that this application to launch and operate the GS-40 system be granted.

Respectfully submitted,

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ENGINEERING CERTIFICATION

I hereby certify that I am the technically qualified person responsible for preparation of the engineering information contained in the foregoing satellite system Application, along with appendices and exhibits; that I am familiar with Parts 2 and 25 of the Commission's Rules and Regulations; and that I have either prepared or reviewed the engineering information contained in the Application, appendices and exhibits; and that it is complete and accurate to the best of my knowledge.

By: [signature]

Robert A. Wiedeman
Vice President of Engineering
Globalstar, L.P.

Date: 9-24-97

APPENDIX A

GLOBALSTAR, L.P. PARTNERS

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Appendix B

TELEMETRY AND COMMAND LINK BUDGETS

Table B-1: 38 GHz TELEMETRY LINK BUDGET

Item	Units	Earth Ant		Anti-Earth
		20° elev.	90° elev.	20° elev.
Frequency	GHz	37.510	37.510	37.510
Data rate	bps	1000	1000	1000
Satellite EIRP	dBW	-8	-5	-11
Elevation Angle	deg.	20	90	20
Range	km	2800	1440	2800
Space loss	dB	-192.5	-186.5	-192.5
Pointing loss	dB	-0.5	-0.5	-0.5
Polarization loss	dB	-0.5	-0.5	-0.5
Signal received into isotrope	dBW	-201.5	-192.5	-204.5
G/T	dB/K	30.8	31.0	30.8
Received Signal-to-noise	dB	57.9	67.1	54.9
bit rate (1 kbps Manchester encoded)	dB-Hz	30	30	30
Required Eb/No for 10^{-6} BER	dB	14	14	14
Eb/No	dB	27.9	37.1	24.9
Downlink margin	dB	13.9	23.1	10.9

Note: There is no rain loss in the budget.

Table B-2: 49 GHz COMMAND LINK BUDGET

Item	Units	Earth Ant.		Anti-Earth
		20° elev.	90° elev.	20° elev.
Frequency	GHz	48.210	48.210	48.210
Data Rate	bps	2000	2000	2000
Ground Station Tx EIRP	dBW	71.2	71.2	81.2
Elevation Angle	deg.	20	90	20
Range (D)	km	2800	1440	2800
Path loss	dB	196.8	188.7	196.8
Pointing loss	dB	0.5	0.5	0.5
Polarization loss	dB	0.5	0.5	0.5
Total loss to satellite	dB	197.8	189.7	189.8
Received signal into isotrope	dBW	-126.4	-118.5	-108.6
Rcv antenna Gain	dBi	2.0	5.0	-1.0
RF line loss	dB	-3	-3	-3
Signal level at Rcvr Input	dBm	-97.4	-86.5	-82.6
Power req. for 10^{-6} BER	dBm	-104	-104	-104
Predicted margin	dB	7.4	17.5	21.4

Note: There is no rain loss in the budget.

Table B-3: 6.9 GHz TELEMETRY LINK BUDGET

Item	Units	Earth Ant		Anti-Earth
		10° elev.	90° elev.	10° elev.
Frequency	GHz	6.879	6.879	6.879
Data rate	bps	1000	1000	1000
Satellite EIRP	dBW	-16.5	-19.5	-15
Elevation Angle	deg.	10	90	10
Range	km	3480	1440	3480
Flux on Gnd.	dBW/m^2	-159.7	-153.3	-157.1
$lambda^2/4$ pi	$dB\text{-}m^2$	-38.2	-38.2	-38.2
Space loss	dB	-180.2	-172.2	-180.2
Pointing loss	dB	-0.5	-0.5	-0.5
Rcvd signal into isotrope	dBW	-206.3	-192.2	-195.8
G/T	dB/K	27.5	29	27.5
Received signal-to-noise	dB/Hz	58.9	65.4	60.3
bit rate (1 kbps Manchester encoded)	dB-Hz	30	30	30
Eb/No	dB	28.9	35.4	30.3
Required Eb/No for 10^{-6} BER	dB	14.0	14.0	14.0
Downlink margin	dB	14.9	21.4	16.3

Note: There is no rain loss in the budget.

Table B-4: 5 GHz COMMAND BUDGET

Item	Units	Earth Ant.		Anti-Earth
		10° elev.	90° elev.	10° elev.
Frequency	GHz	5092.5	5092.5	5092.5
Data rate	bps	1000	1000	1000
Ground Station Tx EIRP	dBW	53	53	68
Elevation Angle	deg.	10	90	10
Range (D)	km	3480	1440	3480
Path loss	dB	-177.3	-170.3	-177.3
Pointing loss	dB	0.5	0.5	0.5
Polarization loss	dB	0.5	0.5	0.5
Total loss to satellite	dB	-178.3	-171.3	-178.3
Rcvd signal into isotrope	dBW	-125.3	-117.3	-110.3
Rcv antenna Gain	dBi	3.0	10.0	-1.0
RF line loss	dB	-10.5	-10.5	-7.5
Signal level at Rcvr Input	dBm	-102.8	-97.8	-88.6
Power req. for 10^{-6} BER	dBm	-111	-111	-111
Predicted margin	dB	8.2	13.2	22.4

Note: There is no rain attenuation in the budget.

Table B-5: 15 GHz COMMAND BUDGET

Item	Units	Earth Ant.		Anti-Earth
		10° elev.	90° elev.	10° elev.
Frequency	GHz	15.451	15.451	15.451
Data rate	bps	2000	2000	2000
Ground Station Tx EIRP	dBW	67.7	67.7	77.7
Elevation Angle	deg.	10	90	10
Range (D)	km	3480	1440	3480
Path loss	dB	187	180	187
Pointing loss	dB	0.5	0.5	0.5
Polarization loss	dB	0.5	0.5	0.5
Total loss to satellite	dB	188	181	188
Rcvd signal into isotrope	dBW	-120.3	-113.3	-110.3
Rcv antenna Gain	dBi	3.0	1.0	-1.0
RF line loss	dB	-10.5	-10.5	-7.5
Signal level at Rcvr Input	dBm	-97.8	-92.8	-88.8
Power req. for 10^{-6} BER	dBm	-108	-108	-108
Predicted margin	dB	10.2	15.2	19.2

Note: There is no rain attenuation in budget.

APPENDIX C

LINK ANALYSES (38/49 GHz LINKS ONLY)

Table C-1: 38/49 GHz, 10.24 Mbps FORWARD LINK

	With Rain	No Rain	Units
Burst Data Rate	10.24	10.24	Mbps
Altitude	1440	1440	km
<u>Uplink Analysis</u>			
Frequency	48.7	48.7	GHz
Elevation Angle	20	20	deg
Slant Range	2824	2824	km
TX power at antenna flange	8.1	-4.3	dBW
TX Antenna diameter	1.0	1.0	m
Antenna gain	52.3	52.3	dBi
EIRP	60.4	48.0	dBW
Path loss	195.2	195.2	dB
Atmos. loss (incl. scintillation)	4	4	dB
Rain loss	8	0	dB
RX antenna gain	33.5	33.5	dBi
RX signal at antenna flange	-113.3	-117.8	dBW
RX noise Temp. at antenna flange	800	800	K
Effective G/T	4.5	4.5	dB/K
RX noise power density, No	-199.6	-199.6	dBW/Hz
Rx interference density, Io	-207	-207	dBW/Hz
Uplink (No+Io)	-198.8	-198.8	dBW/Hx
Uplink Eb/(No+Io)	15.4	11.0	dB
Nominal transponder gain	109.7	109.7	dB
<u>Downlink Analysis</u>			
Frequency	38	38	GHz
Elevation Angle	20	20	deg
Slant Range	2824.1	2824.1	km
TX power at antenna flange	-3.6	-8.1	dBW
Antenna gain	33.5	33.5	dBi
EIRP	29.9	25.4	dBW
Path loss	193.1	193.1	dB
Atmos. loss (incl. scintillation)	3	3	dB
Rain loss	5	0	dB
RX antenna diameter	0.5	0.5	m
RX antenna gain	44.1	44.1	dBi
RX signal at antenna flange	-127.1	-126.5	dBW
RX noise Temp. at antenna flange	500	500	K
Effective G/T	17.1	17.1	dB/K
RX noise power density, No	-201.6	-201.6	dBW/Hz
Rx interference density, Io	-208.9	-208.9	dBW/Hz
Downlink (No+Io)	-200.9	-200.9	dBW/Hz
Downlink Eb/(No+Io)	3.7	4.2	dB
Overall Eb/(No+Io)	3.4	3.4	dB
Required Eb/(No+Io)	3.4	3.4	dB

Table C-2: 38/49 GHz, 10.24 Mbps RETURN LINK

	With Rain	No Rain	Units
Burst Rate	10.24	10.24	Mbps
Altitude	1440	1440	km
<u>Uplink Analysis</u>			
Frequency	48.7	48.7	GHz
Elevation Angle	20	20	deg
Slant Range	2824	2824	km
TX power at antenna flange	14.1	1.7	dBW
TX Antenna diameter	0.5	0.5	m
TX Antenna gain	46	46	dBi
EIRP	60	48	dBW
Path loss	195	195	dB
Atmos. loss (incl. scintillation)	4	4	dB
Rain loss	8	0	dB
RX antenna gain	33.5	33.5	dBi
RX signal at antenna flange	-113.4	-117.8	dBW
RX noise Temp. at antenna flange	800	800	K
Effective G/T	4.5	4.5	dB/K
RX noise power density, No	-199.6	-199.6	dBW/Hz
Rx interference density, Io	-207	-207	dBW/Hz
Uplink (No+Io)	-198.8	-198.8	dBW/Hz
Uplink Eb/(No+Io)	15.4	11.0	dB
Nominal transponder gain	103.7	103.7	dB
<u>Downlink Analysis</u>			
Frequency	38	38	GHz
Elevation Angle	20	20	deg
Slant Range	2824	2824	km
TX power at antenna flange	-9.7	-14.1	dBW
TX Antenna gain	33.5	33.5	dBi
EIRP	23.8	19.4	dBW
Path loss	193	193	dB
Atmos. loss (incl. scintillation)	3	3	dB
Rain loss	5	0	dB
RX antenna diameter	1.0	1.0	m
RX antenna gain	50	50	dBi
RX signal at antenna flange	-127	-127	dBW
RX noise Temp. at antenna flange	500	500	K
Effective G/T	23.1	23.1	dB/K
RX noise power density, No	-201.6	-201.6	dBW/Hz
Rx interference density, Io	-208.9	-208.9	dBW/Hz
Downlink (No+Io)	-200.9	-200.9	dBW/Hz
Downlink Eb/(No+Io)	3.7	4.2	dB
Overall Eb/(No+Io)	3.4	3.4	dB
Required Eb/(No+Io)	3.4	3.4	dB

Table C-3: 38/49 GHz HIGH DATA RATE (51.84 Mbps) GATEWAY LINKS

	With Rain	No Rain	Units
Data Rate	51.84	51.84	Mbps
Altitude	1440	1440	km
<u>Uplink Analysis</u>			
Frequency	48.7	48.7	GHz
Elevation Angle	20	20	deg
Slant Angle	2824	2824	km
TX power at antenna flange	16.2	3.6	dBW
TX antenna diameter	1.0	1.0	m
TX Antenna gain	52	52	dBi
EIRP	68	56	dBW
Path loss	195	195	dB
Atmos. loss (incl. scintillation)	4	4	dB
Rain Loss	8	0	dB
RX antenna gain	33.5	33.5	dBi
RX signal at antenna flange	-105.3	-110	dBW
RX noise Temp. at antenna flange	800	800	K
Effective G/T	4.5	4.5	dB/K
RX noise power density, No	-199.6	-199.6	dBW/Hz
RX interference density, Io	-207	-207	dBW/Hz
Uplink (No+Io)	-198.8	-198.8	dBW/Hz
Uplink Eb/(No+Io)	16.4	11.9	dB
Nominal Transponder Gain	102.6	102.6	dB
<u>Downlink Analysis</u>			
Frequency	38	38	GHz
Elevation Angle	20	20	deg
Slant Angle	2824	2824	km
TX power at antenna flange	-2.7	-7.2	dBW
TX antenna diameter	33.5	33.5	dBi
EIRP	30.8	26.3	dBW
Path loss	193	193	dB
Atmos. loss (incl. scintillation)	3	3	dB
Rain Loss	5	0	dB
Rx antenna diameter	1.0	1.0	m
RX antenna gain	50	50	dBi
RX signal at antenna flange	-120	-119	dBW
RX noise Temp. at antenna flange	500	500	K
Effective G/T	23.1	23.1	dB/K
RX noise power density, No	-201.6	-201.6	dBW/Hz
RX interference density, Io	-208.9	-208.9	dBW/Hz
Overall (No+Io)	-200.9	-200.9	dBW/Hz
Downlink Eb/(No+Io)	3.6	4.1	dB
Downlink Eb/(No+Io)	3.4	3.4	dB
Required Eb/(No+Io)	3.4	3.4	dB

APPENDIX D

LINK ANALYSES (38/49 GHz + 2 GHz SYSTEM)

Table D-1: 49/2.2 GHz FORWARD LINK, 2.048 Mbps

	With Rain	No Rain	Units
Burst Rate	2.048	2.048	Mbps
Altitude	1440	1440	km
Uplink Analysis			
Frequency	48.7	48.7	GHz
Elevation Angle	20	20	deg
Slant Range	2824	2824	km
TX power at antenna flange	1.5	-6.5	dBW
TX Antenna diameter	1.0	1.0	m
Antenna gain	52	52	dBi
EIRP	54	46	dBW
Path loss	195	195	dB
Atmos. loss (incl. scintillation)	4	4	dB
Rain loss	8	0	dB
RX antenna gain	33.5	33.5	dBi
RX signal at antenna flange	-120.0	-120.0	dBW
RX noise Temp. at antenna flange	800	800	K
Effective G/T	4.5	4.5	dB/K
RX noise power density, No	-199.6	-199.6	dBW/Hz
Rx interference density, Io	-207	-207	dBW/Hz
Uplink (No+Io)	-198.8	-198.8	dBW/Hz
Uplink Eb/(No+Io)	15.8	15.8	dB
Nominal transponder gain	108.9	108.9	dB
Downlink Analysis			
Frequency	2.18	2.18	GHz
Elevation Angle	40	40	deg
Slant Range	1993	1993	km
TX power at antenna flange	-11.1	-11.1	dBW
TX Antenna gain	22.0	22.0	dBi
EIRP	10.9	10.9	dBW
Path loss	165	165	dB
Polarization & tracking loss	1	1	dB
Antenna diameter	0.6	0.6	m
RX antenna gain (incl. line loss)	21	21	dBi
RX signal at antenna flange	-134	-134	dBW
RX noise Temp. at antenna flange	293.7	293.7	K
RX noise power density, No	-203.9	-203.9	dBW/Hz
Rx interference density, Io	-209.7	-209.7	dBW/Hz
Downlink (No+Io)	-202.9	-202.9	dBW/Hz
Downlink Eb/(No+Io)	5.4	5.4	dB
Overall Eb/(No+Io)	5.0	5.0	dB
Required Eb/(No+Io)	5.0	5.0	dB

Table D-2: 2.0/38 GHz RETURN LINK, 2.048 Mbps

	With Rain	No Rain	Units
Burst Rate	2.048	2.048	Mbps
Altitude	1440	1440	km
Uplink Analysis			
Frequency	2	2	GHz
Elevation Angle	40	40	deg
Slant Range	1993	1993	km
TX power at antenna flange	-4.1	-6.3	dBW
Antenna diameter	0.6	0.6	m
TX antenna gain (incl. line loss)	20	20	dBi
EIRP	16.0	13.8	dBW
Path loss	164	164	dB
Polarization & tracking loss	1	1	dB
RX antenna gain (incl. line loss)	22	22	dBi
RX signal at antenna flange	-127.5	-129.6	dBW
RX noise Temp. at antenna flange	549.5	549.5	K
RX noise power density, No	-201.2	-201.2	dBW/Hz
Rx interference density, Io	-209.7	-209.7	dBW/Hz
Uplink (No+Io)	-200.6	-200.6	dBW/Hz
Uplink Eb/(No+Io)	10.1	7.9	dB
Nominal transponder gain	115.8	115.8	dB
Downlink Analysis			
Frequency	38	38	GHz
Elevation Angle	20	20	deg
Slant Range	2824	2824	km
TX power at antenna flange	-11.7	-13.8	dBW
TX Antenna gain	33.5	33.5	dBi
EIRP	22	20	dBW
Path loss	193	193	dB
Atmos. loss(incl. scintillation)	3	3	dB
Rain loss	5	0	dB
Antenna diameter	1.0	1.0	m
RX antenna gain	50	50	dBi
RX signal at antenna flange	-129	-126	dBW
RX noise Temp. at antenna flange	500	500	K
Effective G/T	23.1	23.1	dB/K
RX noise power density, No	-201.6	-201.6	dBW/Hz
Rx interference density, Io	-208.9	-208.9	dBW/Hz
Downlink (No+Io)	-200.9	-200.9	dBW/Hz
Downlink Eb/(No+Io)	8.7	11.5	dB
Overall Eb/(No+Io)	6.3	6.3	dB
Required Eb/(No+Io)	6.3	6.3	dB

Table D-3: 15/2.2 GHz, 128 kbps FORWARD LINK WITH DIVERSITY

		Units
Uplink Analysis		
Frequency	15.5	GHz
Satellite altitude	1440	km
GW Elevation	20	deg
Slant Range	2839	km
EIRP per user	50.9	dBW
Path Loss	185.3	dB
Polarization loss	0.1	dB
Pointing loss	1.0	dB
Satellite antenna gain	4.0	dBi
RX power/user at the ant. output	-131.5	dBW
Average user data rate	128	kbps
System noise temperature	549.5	K
Thermal noise density, No	-201.2	dBW/Hz
Interference density, Io	-198.2	dBW/Hz
Uplink Eb/(No+Io)	13.9	dB
Nominal transponder gain	126.4	dB
Downlink Analysis		
Frequency	2.18	GHz
TX power per user	-5.1	dBW
Satellite antenna gain	22.0	dBi
EIRP per user	16.9	dBW
User elevation angle	40	deg
Range	2004	km
Free space loss	165.2	dB
Polarization & tracking loss	1.0	dB
RX signal/user/satellite	-149.3	dBW
User antenna gain	0.8	dBi
RX signal at antenna output	-148.5	dBW
System noise temperature	338.2	K
Thermal noise density, No	-203.3	dBW/Hz
Average data rate	128	kbps
Downlink Eb/No	3.7	dB
Interference per channel	-148.8	dBW
Spreading bandwidth	1.23	MHz
1/10 log (spreading bandwidth))	-60.9	dB/Hz
Interference Density, Io	-209.7	dBW/Hz
Downlink Eb/(No+Io)	2.8	dB
Coherent Combining Gain	2.5	dB
Overall (up & down) Eb/(No+Io)	5.0	dB
Required Eb/No w/ power control	5.0	dB

Table D-4: 2.0/6.9 GHz, 128 kbps RETURN LINK WITH DIVERSITY

		Units
Uplink Analysis		
Frequency	2.0	GHz
Altitude	1440	km
User Elevation angle	40	deg
Slant Range	2004	km
EIRP per user	1.8	dBW
Path Loss	164.5	dB
Polarization loss	0.1	dB
Pointing loss	1.0	dB
Satellite antenna gain	22.0	dBi
RX power/user at the ant. output	-141.8	dBW
Average user data rate	128	kbps
System noise temperature	500	K
Thermal noise density, No	-201.6	dBW/Hz
Interference density, Io	-200.2	dBW/Hz
Uplink Eb/(No+Io)	5.0	dB
Nominal transponder gain	126	dB
Downlink Analysis		
Frequency	6.80	GHz
TX power per user	-15.8	dBW
Satellite antenna gain	4.6	dBi
EIRP per user	-11.2	dBW
GW elevation angle	20	deg
Range	2839	km
Free space loss	178.2	dB
Polarization & tracking loss	1.1	dB
RX signal/user/satellite	-190.4	dBW
GW antenna gain (incl. line losses)	49.5	dBi
RX signal at antenna output/user/sat/	-140.9	dBW
System noise temperature	127.7	K
Thermal noise density, No	-207.5	dBW/Hz
Average data rate	128	kbps
Downlink Eb/No	15.5	dB
Interference per channel	-151.4	dBW
Spreading bandwidth	1.23	MHz
1/10 log (spreading bandwidth))	-60.9	dB/Hz
Interference Density, Io	-212.3	dBW/Hz
Downlink Eb/(No+Io)	14.3	dB
Coherent Combining Gain	1.8	dB
Overall (up & down) Eb/(No+Io)	6.3	dB
Required Eb/No w/ power control	6.3	dB

Table D-5: 15/2.2 GHz, FORWARD LINK WITH DIVERSITY, 2.4 kbps VOICE

		Units
Uplink Analysis		
Frequency	15.5	GHz
Satellite altitude	1440	km
GW Elevation	20	deg
Slant Range	2839	km
EIRP per user	33.7	dBW
Path Loss	185.3	dB
Polarization loss	0.1	dB
Pointing loss	1.0	dB
Satellite antenna gain	4.0	dBi
RX power/user at the ant. output	-148.7	dBW
Average user data rate	2400	bps
System noise temperature	549.5	K
Thermal noise density, No	-201.2	dBW/Hz
Interference density, Io	-198.2	dBW/Hz
Uplink Eb/(No+Io)	13.9	dB
Nominal transponder gain	126.4	dB
Downlink Analysis		
Frequency	2.18	GHz
TX power per user	-22.3	dBW
Satellite antenna gain	22.0	dBi
EIRP per user	-0.3	dBW
User elevation angle	40	deg
Range	2004	km
Free space loss	165.2	dB
Polarization & tracking loss	1.0	dB
RX signal/user/satellite	-166.6	dBW
User antenna gain	0.8	dBi
RX signal at antenna output	-165.8	dBW
System noise temperature	338.2	K
Thermal noise density, No	-203.9	dBW/Hz
Average data rate	2400	bps
Downlink Eb/No	3.7	dB
Interference per channel	-148.8	dBW
Spreading bandwidth	1.23	MHz
1/10 log (spreading bandwidth))	-60.9	dB/Hz
Interference Density, Io	-209.7	dBW/Hz
Downlink Eb/(No+Io)	2.8	dB
Coherent Combining Gain	2.5	dB
Overall (up & down) Eb/(No+Io)	5.0	dB
Required Eb/No w/ power control	5.0	dB

Table D-6: 2.0/6.9 GHz, RETURN LINK WITH DIVERSITY, 2.4 kbps VOICE

		Units
Uplink Analysis		
Frequency	2.0	GHz
Altitude	1440	km
User Elevation angle	40	deg
Slant Range	2004	km
EIRP per user	-15.5	dBW
Path Loss	164.5	dB
Polarization loss	0.1	dB
Pointing loss	1.0	dB
Satellite antenna gain	22.0	dBi
RX power/user at the ant. output	-159.1	dBW
Average user data rate	2400	bps
System noise temperature	500	K
Thermal noise density, No	-201.6	dBW/Hz
Interference density, Io	-200.2	dBW/Hz
Uplink Eb/(No+Io)	5.0	dB
Nominal transponder gain	126	dB
Downlink Analysis		
Frequency	6.80	GHz
TX power per user	-33.1	dBW
Satellite antenna gain	4.6	dBi
EIRP per user	-28.5	dBW
GW elevation angle	20	deg
Range	2839	km
Free space loss	178.2	dB
Polarization & tracking loss	1.1	dB
RX signal/user/satellite	-207.7	dBW
GW antenna gain (incl. line losses)	49.5	dBi
RX signal at antenna output/user/sat/	-158.2	dBW
System noise temperature	127.7	K
Thermal noise density, No	-207.5	dBW/Hz
Average data rate	2400	bps
Downlink Eb/No	15.5	dB
Interference per channel	-151.4	dBW
Spreading bandwidth	1.23	MHz
1/10 log (spreading bandwidth))	-60.9	dB/Hz
Interference Density, Io	-212.3	dBW/Hz
Downlink Eb/(No+Io)	14.3	dB
Coherent Combining Gain	1.8	dB
Overall (up & down) Eb/(No+Io)	6.3	dB
Required Eb/No w/ power control	6.3	dB

APPENDIX E

ADVANCE PUBLICATION INFORMATION

DATE Day/Month/Year	/ /	FORM OF NOTICE SATELLITE NETWORK APPENDIX S4 - ANNEX 2A)	PAGE 1 OF 19	ApS4/II
Administration Serial Number				

A1 NOTIFYING ADMINISTRATION	RR1488	RR1060	RR1610	Request for Assistance of the BR for	NOTIFICATION INTENDED FOR
U S A	Notification X	Request for Coordination	Agreement under Art 14	RR1060 ___ and/or RR1610 ___	ADDITION / MODIFICATION / SUPPRESSION: A

FIRST NOTIFICATION X	RS46	BR IDENTIFICATION NO. OF NETWORK TO BE MODIFIED / SUPPRESSED	
RESUBMISSION	Request for Coordination		

1. CHARACTERISTICS OF THE NETWORK

A1a. IDENTITY OF THE SATELLITE NETWORK G S - 4 0

A4. ORBITAL INFORMATION

a. FOR GEOSTATIONARY SATELLITES ONLY

1. NOMINAL ORBITAL LONGITUDE Degrees	E/W	2a. LONGITUDINAL TOLERANCE Degrees To West	To East	2b. INCLINATION EXCURSION Degrees	3. VISIBILITY ARC Degrees From W	E/W	To E	E/W	4. SERVICE ARC Degrees From W	E/W	To E	E/W
•		•	•	•								

5. REASON FOR SERVICE ARC < VISIBILITY ARC, SEE ATTACHMENT NO ___

b. FOR NON-GEOSTATIONARY SATELLITES ONLY (see also page ApS4/II-1b & Resolution 46 annexes)

INCLINATION ANGLE Degrees	2. PERIOD Days / Hours / Min	2a. APOGEE (km)	2b. PERIGEE (km)	4. NUMBER OF SATELLITES	REFERENCE BODY
52•0	00 01 55	1440•00	1440•00	80	T
		provide exponent to base 10 if value > 99999:	provide exponent to base 10 if value > 99999:		

GENERAL NOTES

This form of notice consists of four parts - 1, 2, 3 and 4 - as indicated below:

1 - Characteristics of the network
2 - Satellite network characteristics for reception at the space station
3 - Satellite network characteristics for transmission from the space station and
4 - Overall link characteristics.

In each part, each information item/data field includes a number in its label. This number is the same as that used for the same item in Appendix S4 (WRC-95). For example, on the page labelled 'Form ApS4/II - 2a' (at the bottom), the field 'A2a. Date of bringing into use' is the item numbered 2a in Part A of Annex 2A to Appendix S4.

ii. Data items that are related are grouped together in a box. For example, the page labelled 'Form ApS4/II - 2b' (at the bottom) contains a box titled 'Emissions of the associated transmitting station(s)'. It is possible to specify 7 different emission values (with associated power, power density and C/N values) in this box. If there are more emissions, use another page of the same type to provide additional data, after checking (√) the field labelled 'More emissions on next page' on the preceding page. In all cases where there is more information than can fit in a box, follow this procedure.

iii. This form can be used to add, modify or suppress an existing station, by entering A, M or S in the box at the top right-hand corner of this page in the area titled "Notification intended for". In the case of a modification of an existing station, where certain data fields are to be added, modified or suppressed, provide ALL the data in the particular box as they would look after the change. In addition, indicate that the corresponding beam, associated station or group of assigned frequencies is being modified by entering M or R in the field that has been provided for this purpose at these levels.

iv. Certain fields in this notice form have a superscript '1' as part of their labels. This has the following meaning:
1 - This information is not required for the notification of a typical earth station.

A4. ORBITAL INFORMATION (CONTINUED)

b5 FOR NON-GEOSTATIONARY SATELLITES ONLY
IF NOTIFIED UNDER RESOLUTION NO. 46 (WRC-95) PROVIDE

NUMBER OF ORBITAL PLANES: 10

FOR EACH ORBITAL PLANE PROVIDE

ORBITAL PLANE NUMBER	NUMBER OF SATELLITES IN THIS PLANE	RIGHT ASCENSION (Degrees)	INCLINATION ANGLE (Degrees)	SEMI-MAJOR AXIS (km)	ECCENTRICITY	ARGUMENT OF PERIGEE (Degrees)
01	08	0.00	52.0	7818	0.00	90.0

FOR EACH SATELLITE IN THE ORBITAL PLANE PROVIDE THE INITIAL PHASE ANGLE

SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)
01	0.0
02	45.0
03	90.0
04	135.0
05	180.0
06	225.0
07	270.0
08	315.0

ORBITAL PLANE NUMBER	NUMBER OF SATELLITES IN THIS PLANE	RIGHT ASCENSION (Degrees)	INCLINATION ANGLE (Degrees)	SEMI-MAJOR AXIS (km)	ECCENTRICITY	ARGUMENT OF PERIGEE (Degrees)
02	08	36.00	52.0	7818	0.00	90.0

FOR EACH SATELLITE IN THE ORBITAL PLANE PROVIDE THE INITIAL PHASE ANGLE

SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)
01	4.5
02	49.5
03	94.5
04	139.5
05	184.5
06	229.5
07	274.5
08	319.5

ORBITAL PLANE NUMBER	NUMBER OF SATELLITES IN THIS PLANE	RIGHT ASCENSION (Degrees)	INCLINATION ANGLE (Degrees)	SEMI-MAJOR AXIS (km)	ECCENTRICITY	ARGUMENT OF PERIGEE (Degrees)
03	08	72.00	52.0	7818	0.00	90.0

FOR EACH SATELLITE IN THE ORBITAL PLANE PROVIDE THE INITIAL PHASE ANGLE

SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)
01	9.0
02	54.0
03	99.0
04	144.0
05	189.0
06	234.0
07	279.0
08	324.0

ORBITAL PLANE NUMBER	NUMBER OF SATELLITES IN THIS PLANE	RIGHT ASCENSION (Degrees)	INCLINATION ANGLE (Degrees)	SEMI-MAJOR AXIS (km)	ECCENTRICITY	ARGUMENT OF PERIGEE (Degrees)
04	08	108.00	52.0	7818	0.00	90.0

FOR EACH SATELLITE IN THE ORBITAL PLANE PROVIDE THE INITIAL PHASE ANGLE

SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)
01	13.5
02	58.5
03	103.5
04	148.5
05	193.5
06	238.5
07	283.5
08	328.5

MORE ON NEXT PAGE [X]

A4. ORBITAL INFORMATION (CONTINUED)

5) FOR NON-GEOSTATIONARY SATELLITES ONLY
IF NOTIFIED UNDER RESOLUTION NO. 46 (WRC 95) PROVIDE

NUMBER OF ORBITAL PLANES: 10

FOR EACH ORBITAL PLANE PROVIDE

ORBITAL PLANE NUMBER	NUMBER OF SATELLITES IN THIS PLANE	RIGHT ASCENSION (Degrees)	INCLINATION ANGLE (Degrees)	SEMI-MAJOR AXIS (km)	ECCENTRICITY	ARGUMENT OF PERIGEE (Degrees)
05	08	144.00	52.0	7818	0.00	90.0

FOR EACH SATELLITE IN THE ORBITAL PLANE PROVIDE THE INITIAL PHASE ANGLE

SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)
01	18.0	04	153.0	07	288.0		.		.
02	63.0	05	198.0	08	333.0		.		.
03	108.0	06	243.0		.		.		.

ORBITAL PLANE NUMBER	NUMBER OF SATELLITES IN THIS PLANE	RIGHT ASCENSION (Degrees)	INCLINATION ANGLE (Degrees)	SEMI-MAJOR AXIS (km)	ECCENTRICITY	ARGUMENT OF PERIGEE (Degrees)
06	08	180.00	52.0	7818	0.00	90.0

FOR EACH SATELLITE IN THE ORBITAL PLANE PROVIDE THE INITIAL PHASE ANGLE

SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)
01	22.5	04	157.5	07	292.5		.		.
02	67.5	05	202.5	08	337.5		.		.
03	112.5	06	247.5		.		.		.

ORBITAL PLANE NUMBER	NUMBER OF SATELLITES IN THIS PLANE	RIGHT ASCENSION (Degrees)	INCLINATION ANGLE (Degrees)	SEMI-MAJOR AXIS (km)	ECCENTRICITY	ARGUMENT OF PERIGEE (Degrees)
07	08	216.00	52.0	7818	0.00	90.0

FOR EACH SATELLITE IN THE ORBITAL PLANE PROVIDE THE INITIAL PHASE ANGLE

SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)
01	27.0	04	162.0	07	297.0		.		.
02	72.0	05	207.0	08	342.0		.		.
03	117.0	06	252.0		.		.		.

ORBITAL PLANE NUMBER	NUMBER OF SATELLITES IN THIS PLANE	RIGHT ASCENSION (Degrees)	INCLINATION ANGLE (Degrees)	SEMI-MAJOR AXIS (km)	ECCENTRICITY	ARGUMENT OF PERIGEE (Degrees)
08	08	252.00	52.0	7818	0.00	90.0

FOR EACH SATELLITE IN THE ORBITAL PLANE PROVIDE THE INITIAL PHASE ANGLE

SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)
01	31.5	04	166.5	07	301.5		.		.
02	76.5	05	211.5	08	346.5		.		.
03	121.5	06	256.5		.		.		.

MORE ON NEXT PAGE [X]

A4. ORBITAL INFORMATION (CONTINUED)

5) FOR NON-GEOSTATIONARY SATELLITES ONLY
IF NOTIFIED UNDER RESOLUTION NO. 46 (WRC-95) PROVIDE

NUMBER OF ORBITAL PLANES: 10

FOR EACH ORBITAL PLANE PROVIDE

ORBITAL PLANE NUMBER	NUMBER OF SATELLITES IN THIS PLANE	RIGHT ASCENSION (Degrees)	INCLINATION ANGLE (Degrees)	SEMI-MAJOR AXIS (km)	ECCENTRICITY	ARGUMENT OF PERIGEE (Degrees)
09	08	288.00	52.0	7818	0.00	90.0

FOR EACH SATELLITE IN THE ORBITAL PLANE PROVIDE THE INITIAL PHASE ANGLE

SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)
01	36.0	04	171.0	07	306.0		.		.
02	81.0	05	216.0	08	351.0		.		.
03	126.0	06	261.0		.		.		.

ORBITAL PLANE NUMBER	NUMBER OF SATELLITES IN THIS PLANE	RIGHT ASCENSION (Degrees)	INCLINATION ANGLE (Degrees)	SEMI-MAJOR AXIS (km)	ECCENTRICITY	ARGUMENT OF PERIGEE (Degrees)
10	08	324.00	52.0	7818	0.00	90.0

FOR EACH SATELLITE IN THE ORBITAL PLANE PROVIDE THE INITIAL PHASE ANGLE

SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)
01	40.5	04	175.5	07	310.5		.		.
02	85.5	05	220.5	08	355.5		.		.
03	130.5	06	265.5		.		.		.

ORBITAL PLANE NUMBER	NUMBER OF SATELLITES IN THIS PLANE	RIGHT ASCENSION (Degrees)	INCLINATION ANGLE (Degrees)	SEMI-MAJOR AXIS (km)	ECCENTRICITY	ARGUMENT OF PERIGEE (Degrees)
		.	.		.	.

FOR EACH SATELLITE IN THE ORBITAL PLANE PROVIDE THE INITIAL PHASE ANGLE

SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)
	.		.		.		.		.
	.		.		.		.		.
	.		.		.		.		.

ORBITAL PLANE NUMBER	NUMBER OF SATELLITES IN THIS PLANE	RIGHT ASCENSION (Degrees)	INCLINATION ANGLE (Degrees)	SEMI-MAJOR AXIS (km)	ECCENTRICITY	ARGUMENT OF PERIGEE (Degrees)
		.	.		.	.

FOR EACH SATELLITE IN THE ORBITAL PLANE PROVIDE THE INITIAL PHASE ANGLE

SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)	SATELLITE NUMBER	INITIAL PHASE ANGLE (Degrees)
	.		.		.		.		.
	.		.		.		.		.
	.		.		.		.		.

MORE ON NEXT PAGE

2. SATELLITE NETWORK CHARACTERISTICS FOR RECEPTION AT THE SPACE STATION

SATELLITE RECEIVING ANTENNA BEAM DETAILS

CHARACTERISTICS OF THE BEAM

ADD / MOD / SUP / REP of the beam: A

B1 RECEIVING BEAM DESIGNATION: RXNR

NOTE: For a steerable beam the last character of the beam designation shall be "R"

OLD BEAM DESIGNATION (if changed):

B3/B4 ANTENNA CHARACTERISTICS

3a/3b/4a MAXIMUM ISOTROPIC GAIN (dBi)	3d POINTING ACCURACY (Degrees ±)	3a/3b ANTENNA GAIN CONTOURS DIAGRAM SEE ATTACHMENT NO	3e/4a/4b ANTENNA RADIATION PATTERN REFERENCE PATTERN
+37.3	•	01	

3f ANTENNA GAIN VS ORBIT LONGITUDE DIAGRAM SEE ATTACHMENT NO:

RADIATION DIAGRAM SEE ATTACHMENT NO:

FOR NON-STANDARD ANTENNA PROVIDE

Coefficient A (dBi)	Coefficient B (dBi)
•	•

4b FOR NON-GEOSTATIONARY SATELLITES UNDER RESOLUTION 46 (WRC-95)

SATELLITE BEAM ORIENTATION

ANGLE ALPHA (Degrees)	ANGLE BETA (Degrees)
•	•

INFORMATION COMMON TO THE FOLLOWING GROUPS (LISTS) OF ASSIGNED FREQUENCIES IN THIS BEAM

A2a. DATE OF BRINGING INTO USE (Day | Month | Year): 01 | 09 | 04

A2b. PERIOD OF VALIDITY: Years

A3a. OPERATING AGENCY OR COMPANY (Refer to Table 12A/12B of the Preface to the IFL & SRS)

A3b. ADMINISTRATION RESPONSIBLE FOR THE STATION (Refer to Table 12A/12B of the Preface to the IFL & SRS)

SPECIAL SECTION AR11/A (RR1042) Number: AR11/A/

SPECIAL SECTION AR11/C (RR1060) Number: AR11/C/

SPECIAL SECTION ART.14 (RR1610) Number: AR14/C/

OTHER SPECIAL SECTIONS

	Reference	Number
(1)		
(2)		
(3)		
(4)		
(5)		

A5/A6. COORDINATED WITH OR AGREEMENT REACHED WITH

RR Provision	Symbols of the Administrations concerned
RR	
RR	
RR	
RR	
RR	

A5/A6. COORDINATION REQUESTED WITH OR AGREEMENT SOUGHT WITH

RR Provision	Symbols of the Administrations concerned
RR	
RR	
RR	
RR	
RR	

REMARKS

NOTES ON FILLING IN THE NEXT PAGES:

FOR EACH BEAM YOU MAY PROVIDE ONE OR MORE GROUPS (LISTS) OF ASSIGNED FREQUENCIES, EACH GROUP (LIST) HAVING ONE SET OF COMMON CHARACTERISTICS. THE BOTTOM HALF OF THIS PAGE CONTAINS COMMON DATA THAT IS APPLICABLE TO ONE OR MORE GROUPS (LISTS) OF FREQUENCIES IN THIS BEAM. FOR EACH GROUP (LIST) OF FREQUENCIES IN THIS BEAM, FIRST FILL IN THE SET OF COMMON CHARACTERISTICS, INCLUDING ALL THE ASSOCIATED EARTH (OR SPACE) STATIONS AND THEIR EMISSIONS, FOLLOWED BY THE GROUP (LIST) OF FREQUENCIES TO WHICH THE SET APPLIES. USE AS MANY PAGES AS NECESSARY.

6R IDENTIFICATION NUMBER OF GROUP (LIST) OF FREQUENCIES TO BE MODIFIED / SUPPRESSED / REPLACED

ADD / MOD / SUP / REP of the group: A

CHARACTERISTICS COMMON TO THE FOLLOWING GROUP (LIST) OF ASSIGNED FREQUENCIES

C4a CLASS OF STATION: EC

C4b NATURE OF SERVICE: OT

C5 POLARIZATION: CL (type; if linear provide angle in degrees)

C2a ASSIGNED FREQUENCY BAND: 1000000 kHz

C2d RECEIVING SYSTEM NOISE TEMPERATURE: 800 kelvins

C3g MAXIMUM AGGREGATE POWER: dBW

C11a SERVICE AREA: AAB

C8 SERVICE AREA DIAGRAM SEE ATTACHMENT NO

C3d TYPE OF MODULATION AND MULTIPLE ACCESS DATA SEE ATTACHMENT NO

C3c SPECTRUM MASK DIAGRAM SEE ATTACHMENT NO

C11b AFFECTED REGION SEE ATTACHMENT NO

SERVICE AREA NUMBER

TRANSMITTING STATION(S) ASSOCIATED WITH THE FOLLOWING GROUP (LIST) OF ASSIGNED FREQUENCIES

EMISSIONS OF THE ASSOCIATED TRANSMITTING STATION(S)

C7a DESIGNATION OF EMISSION	C3a1/C8b1 [1] MAXIMUM PEAK POWER (+/- dBW)	C3a2/C8b2 [1] MAXIMUM POWER DENSITY (+/- dBW/Hz)	C3c1 MINIMUM PEAK POWER (+/- dBW)	C3c2 MINIMUM POWER DENSITY (+/- dBW/Hz)	C3e C/N objective (total - clear sky) (dB)
18M0G7W	+11.1	-61.4	-5.3	-77.8	.
90M0G7W	+19.2	-60.3	+2.6	-76.9	.
	.	.	.	.	.
	.	.	.	.	.
	.	.	.	.	.
	.	.	.	.	.
	.	.	.	.	.

[1] if maximum peak power and maximum power density values are of type C8b check this box

MORE EMISSIONS ON NEXT PAGE

Reason for minimum peak power and minimum power density (C3c) values being absent: see attachment No.

EARTH STATION

ADD / MOD / SUP / REP of the station: A

C10b1 EARTH STATION NAME: GATEWAY

OLD EARTH STATION NAME (if changed)

COUNTRY

C10 TYPE OF STATION Specific/Typical: T

C10b2 GEOGRAPHICAL COORDINATES

Longitude				Latitude			
Degrees	E/W	Min	Sec	Deg	N/S	Min	Sec

C10c1a CLASS OF STATION	TK	TC		
C10c1b NATURE OF SERVICE	OT	OT		

C10c ANTENNA CHARACTERISTICS

C MAXIMUM ISOTROPIC GAIN (+/- dBi): +52.0

D BEAMWIDTH (Degrees): 0.44

C10c ANTENNA CHARACTERISTICS (continued)

4a RADIATION PATTERN (give reference pattern or provide diagram): REC-465

4b ANTENNA RADIATION DIAGRAM SEE ATTACHMENT NO.

FOR NON-STANDARD ANTENNA PROVIDE:

Coefficient A (dBi)	Coefficient B (dBi)	Coefficient C (dBi)	Coefficient D (dBi)	Phi1 (Degrees)
.	.	.	.	.

SPACE STATION

ADD / MOD / SUP / REP of the station

C10a SPACE STATION NAME

OLD SPACE STATION NAME (if changed)

TRANSMITTING BEAM DESIGNATION

C10 TYPE OF STATION (Geo/Non-geo)

OLD BEAM DESIGNATION (if changed)

MORE ASSOCIATED TRANSMITTING STATIONS ON NEXT PAGE

GROUP (LIST) OF ASSIGNED FREQUENCIES HAVING THE ABOVE COMMON CHARACTERISTICS

C2a ASSIGNED FREQUENCY	k/M/G Hz	C2a ASSIGNED FREQUENCY	k/M/G Hz
48.7	G	.	
.		.	
.		.	
.		.	
.		.	
.		.	

MORE ON NEXT PAGE

2. SATELLITE NETWORK CHARACTERISTICS FOR RECEPTION AT THE SPACE STATION

SATELLITE RECEIVING ANTENNA BEAM DETAILS

CHARACTERISTICS OF THE BEAM

ADD / MOD / SUP / REP of the beam: A

B1 RECEIVING BEAM DESIGNATION: R XE R

NOTE For a steerable beam the last character of the beam designation shall be "R"

OLD BEAM DESIGNATION (if changed):

B3/B4 ANTENNA CHARACTERISTICS

3a/3b/4a MAXIMUM ISOTROPIC GAIN (dBi)	3d POINTING ACCURACY (Degrees ±)	3a/3b ANTENNA GAIN CONTOURS DIAGRAM SEE ATTACHMENT NO	3e/4a/4b ANTENNA RADIATION PATTERN REFERENCE PATTERN
+33.5	.	02	

3f ANTENNA GAIN VS ORBIT LONGITUDE DIAGRAM SEE ATTACHMENT NO:

4b FOR NON-GEOSTATIONARY SATELLITES UNDER RESOLUTION 46 (WRC-95)
SATELLITE BEAM ORIENTATION

ANGLE ALPHA (Degrees)	ANGLE BETA (Degrees)
.	.

RADIATION DIAGRAM SEE ATTACHMENT NO:

FOR NON-STANDARD ANTENNA PROVIDE

Coefficient A (dBi)	Coefficient B (dBi)
.	.

INFORMATION COMMON TO THE FOLLOWING GROUPS (LISTS) OF ASSIGNED FREQUENCIES IN THIS BEAM

A2a. DATE OF BRINGING INTO USE (Day / Month / Year): 01 09 04

A2b. PERIOD OF VALIDITY: Years

A3a. OPERATING AGENCY OR COMPANY (Refer to Table 12A/12B of the Preface to the IFL & SRS):

A3b. ADMINISTRATION RESPONSIBLE FOR THE STATION (Refer to Table 12A/12B of the Preface to the IFL & SRS):

SPECIAL SECTION AR11/A (RR1042): AR11/A/ Number:

SPECIAL SECTION AR11/C (RR1060): AR11/C/ Number:

SPECIAL SECTION ART 14 (RR1610): AR14/C/ Number:

OTHER SPECIAL SECTIONS

	Reference	Number
(1)		
(2)		
(3)		
(4)		
(5)		

A5/A6 COORDINATED WITH OR AGREEMENT REACHED WITH

RR Provision	Symbols of the Administrations concerned
RR	
RR	
RR	
RR	
RR	

A5/A6. COORDINATION REQUESTED WITH OR AGREEMENT SOUGHT WITH

RR Provision	Symbols of the Administrations concerned
RR	
RR	
RR	
RR	
RR	

REMARKS

NOTES ON FILLING IN THE NEXT PAGES:

FOR EACH BEAM YOU MAY PROVIDE ONE OR MORE GROUPS (LISTS) OF ASSIGNED FREQUENCIES, EACH GROUP (LIST) HAVING ONE SET OF COMMON CHARACTERISTICS. THE BOTTOM HALF OF THIS PAGE CONTAINS COMMON DATA THAT IS APPLICABLE TO ONE OR MORE GROUPS (LISTS) OF FREQUENCIES IN THIS BEAM. FOR EACH GROUP (LIST) OF FREQUENCIES IN THIS BEAM, FIRST FILL IN THE SET OF COMMON CHARACTERISTICS, INCLUDING ALL THE ASSOCIATED EARTH (OR SPACE) STATIONS AND THEIR EMISSIONS, FOLLOWED BY THE GROUP (LIST) OF FREQUENCIES TO WHICH THE SET APPLIES. USE AS MANY PAGES AS NECESSARY.

BR IDENTIFICATION NUMBER OF GROUP (LIST) OF FREQUENCIES TO BE MODIFIED / SUPPRESSED / REPLACED

ADD / MOD / SUP / REP of the group: A

CHARACTERISTICS COMMON TO THE FOLLOWING GROUP (LIST) OF ASSIGNED FREQUENCIES

CLASS OF STATION: EC

NATURE OF SERVICE: OT

POLARIZATION TYPE: CL (if linear provide angle in degrees)

ASSIGNED FREQUENCY BAND: 1000000 (kHz)

RECEIVING SYSTEM NOISE TEMPERATURE: 800 kelvins

MAXIMUM AGGREGATE POWER: dBW

SERVICE AREA: AAB

SERVICE AREA DIAGRAM SEE ATTACHMENT NO

TYPE OF MODULATION AND MULTIPLE ACCESS DATA SEE ATTACHMENT NO

SPECTRUM MASK DIAGRAM SEE ATTACHMENT NO

AFFECTED REGION SEE ATTACHMENT NO

SERVICE AREA NUMBER

TRANSMITTING STATION(S) ASSOCIATED WITH THE FOLLOWING GROUP (LIST) OF ASSIGNED FREQUENCIES

EMISSIONS OF THE ASSOCIATED TRANSMITTING STATION(S)

DESIGNATION OF EMISSION	MAXIMUM PEAK POWER (+/-) dBW	MAXIMUM POWER DENSITY (+/-) dBW/Hz	MINIMUM PEAK POWER (+/-) dBW	MINIMUM POWER DENSITY (+/-) dBW/Hz	C/N objective (total - clear sky) dB
18M0G7W	+11.1	-61.4	-5.3	-77.8	.
90M0G7W	+19.2	-60.3	+2.6	-76.9	.
	.	.	.	.	.
	.	.	.	.	.
	.	.	.	.	.
	.	.	.	.	.
	.	.	.	.	.

If maximum peak power and maximum power density values are of type C3b check this box

MORE EMISSIONS ON NEXT PAGE

Reason for minimum peak power and minimum power density (C3c) values being absent: see attachment No

EARTH STATION

ADD / MOD / SUP / REP of the station: A

EARTH STATION NAME: GATEWAY

OLD EARTH STATION NAME (if changed)

COUNTRY

TYPE OF STATION Specific/Typical: T

GEOGRAPHICAL COORDINATES

Longitude				Latitude			
Degrees	E/W	Min	Sec	Deg	N/S	Min	Sec

CLASS OF STATION: TK, TC

NATURE OF SERVICE: OT, OT

ANTENNA CHARACTERISTICS

MAXIMUM ISOTROPIC GAIN (+/-) dBi: +52.0

BEAMWIDTH Degrees: 0.44

ANTENNA CHARACTERISTICS (continued)

RADIATION PATTERN (give reference pattern or provide diagram): REC-465

ANTENNA RADIATION DIAGRAM SEE ATTACHMENT NO

FOR NON-STANDARD ANTENNA PROVIDE:

Coefficient A dBi	Coefficient B dBi	Coefficient C dBi	Coefficient D dBi	Phi Degrees
.	.	.	.	.

SPACE STATION

ADD / MOD / SUP / REP of the station

SPACE STATION NAME

OLD SPACE STATION NAME (if changed)

TRANSMITTING BEAM DESIGNATION

TYPE OF STATION Geo/Non-geo

OLD BEAM DESIGNATION (if changed)

MORE ASSOCIATED TRANSMITTING STATIONS ON NEXT PAGE

GROUP (LIST) OF ASSIGNED FREQUENCIES HAVING THE ABOVE COMMON CHARACTERISTICS

ASSIGNED FREQUENCY	k/M/G Hz	ASSIGNED FREQUENCY	k/M/G Hz
48.7	G	.	
.		.	
.		.	
.		.	
.		.	
.		.	

MORE ON NEXT PAGE

2. SATELLITE NETWORK CHARACTERISTICS FOR RECEPTION AT THE SPACE STATION

SATELLITE RECEIVING ANTENNA BEAM DETAILS

CHARACTERISTICS OF THE BEAM

ADD / MOD / SUP / REP of the beam: A

B1. RECEIVING BEAM DESIGNATION: GLBC

NOTE: For a steerable beam the last character of the beam designation shall be "R"

OLD BEAM DESIGNATION (if changed):

B3/B4 ANTENNA CHARACTERISTICS

3a/3b/4a MAXIMUM ISOTROPIC GAIN (dBi)	3d POINTING ACCURACY (Degrees ±)	3a/3b ANTENNA GAIN CONTOURS DIAGRAM SEE ATTACHMENT NO	3e/4a/4b ANTENNA RADIATION PATTERN
+ 5.0	.	03	REFERENCE PATTERN:

3f ANTENNA GAIN VS ORBIT LONGITUDE DIAGRAM SEE ATTACHMENT NO:

4b FOR NON-GEOSTATIONARY SATELLITES UNDER RESOLUTION 46 (WRC-95)

SATELLITE BEAM ORIENTATION

ANGLE ALPHA (Degrees)	ANGLE BETA (Degrees)
.	.

RADIATION DIAGRAM SEE ATTACHMENT NO:

FOR NON-STANDARD ANTENNA PROVIDE

Coefficient A (dBi)	Coefficient B (dBi)
.	.

INFORMATION COMMON TO THE FOLLOWING GROUPS (LISTS) OF ASSIGNED FREQUENCIES IN THIS BEAM

A2a. DATE OF BRINGING INTO USE: Day 01 / Month 09 / Year 04

A2b. PERIOD OF VALIDITY: Years

A3a. OPERATING AGENCY OR COMPANY (Refer to Table 12A/12B of the Preface to the IFL & SRS):

A3b. ADMINISTRATION RESPONSIBLE FOR THE STATION (Refer to Table 12A/12B of the Preface to the IFL & SRS):

SPECIAL SECTION AR11/A (RR1042): AR11/A/ Number:

SPECIAL SECTION AR11/C (RR1060): AR11/C/ Number:

SPECIAL SECTION ART 14 (RR1610): AR14/C/ Number:

OTHER SPECIAL SECTIONS

	Reference	Number
(1)		
(2)		
(3)		
(4)		
(5)		

A5/A6. COORDINATED WITH OR AGREEMENT REACHED WITH

RR Provision	Symbols of the Administrations concerned
RR	
RR	
RR	
RR	
RR	

A5/A6. COORDINATION REQUESTED WITH OR AGREEMENT SOUGHT WITH

RR Provision	Symbols of the Administrations concerned
RR	
RR	
RR	
RR	
RR	

REMARKS

NOTES ON FILLING IN THE NEXT PAGES:

FOR EACH BEAM YOU MAY PROVIDE ONE OR MORE GROUPS (LISTS) OF ASSIGNED FREQUENCIES. EACH GROUP (LIST) HAVING ONE SET OF COMMON CHARACTERISTICS. THE BOTTOM HALF OF THIS PAGE CONTAINS COMMON DATA THAT IS APPLICABLE TO ONE OR MORE GROUPS (LISTS) OF FREQUENCIES IN THIS BEAM. FOR EACH GROUP (LIST) OF FREQUENCIES IN THIS BEAM, FIRST FILL IN THE SET OF COMMON CHARACTERISTICS, INCLUDING ALL THE ASSOCIATED EARTH (OR SPACE) STATIONS AND THEIR EMISSIONS, FOLLOWED BY THE GROUP (LIST) OF FREQUENCIES TO WHICH THE SET APPLIES. USE AS MANY PAGES AS NECESSARY

B1 IDENTIFICATION NUMBER OF GROUP (LIST) OF FREQUENCIES TO BE MODIFIED / SUPPRESSED / REPLACED — ADD / MOD / SUP / REP of the group: A

CHARACTERISTICS COMMON TO THE FOLLOWING GROUP (LIST) OF ASSIGNED FREQUENCIES

- C4a CLASS OF STATION: ED
- C4b NATURE OF SERVICE: OT
- C5 POLARIZATION — TYPE (if linear provide angle in degrees): CL
- C3a ASSIGNED FREQUENCY BAND: 76 (kHz)
- C5a RECEIVING SYSTEM NOISE TEMPERATURE: 800 kelvins
- C3g MAXIMUM AGGREGATE POWER: dBW
- C11a SERVICE AREA: AAB — OR SERVICE AREA DIAGRAM SEE ATTACHMENT NO
- C3c TYPE OF MODULATION AND MULTIPLE ACCESS DATA SEE ATTACHMENT NO
- C3c SPECTRUM MASK DIAGRAM SEE ATTACHMENT NO
- C11d AFFECTED REGION SEE ATTACHMENT NO
- SERVICE AREA NUMBER

TRANSMITTING STATION(S) ASSOCIATED WITH THE FOLLOWING GROUP (LIST) OF ASSIGNED FREQUENCIES

EMISSIONS OF THE ASSOCIATED TRANSMITTING STATION(S)

C7a DESIGNATION OF EMISSION	C8a1/C8b1 * MAXIMUM PEAK POWER (+/-) dBW	C8a2/C8b2 * MAXIMUM POWER DENSITY (+/-) dBW/Hz	C8c1 MINIMUM PEAK POWER (+/-) dBW	C8c2 MINIMUM POWER DENSITY (+/-) dBW/Hz	C8e C/N objective (total - clear sky) dB
76K0F2D	+19.2	-29.6	+19.2	-29.6	

* If maximum peak power and maximum power density values are of type C8b, check this box

MORE EMISSIONS ON NEXT PAGE

Reason for minimum peak power and minimum power density (C8c) values being absent: see attachment No.

EARTH STATION

ADD / MOD / SUP / REP of the station: A

- C10b1 EARTH STATION NAME: GATEWAY
- OLD EARTH STATION NAME (if changed)
- COUNTRY
- C10 TYPE OF STATION (Specific/Typical): T
- C10b2 GEOGRAPHICAL COORDINATES: Longitude (Degrees (E/W) Min Sec); Latitude (Deg (N/S) Min Sec)
- C10c1a CLASS OF STATION: TR, TC, TK
- C10c1b NATURE OF SERVICE: OT, OT, OT

C10c ANTENNA CHARACTERISTICS

- 2. MAXIMUM ISOTROPIC GAIN (+/-) dBi: +52.0
- 3. BEAMWIDTH Degrees: 0.44

C10c ANTENNA CHARACTERISTICS (continued)

- 4a RADIATION PATTERN (give reference pattern or provide diagram): REC-465
- 4b ANTENNA RADIATION DIAGRAM SEE ATTACHMENT NO.

FOR NON-STANDARD ANTENNA PROVIDE:

Coefficient A dBi	Coefficient B dBi	Coefficient C dBi	Coefficient D dBi	Phi1 Degrees

MORE ASSOCIATED TRANSMITTING STATIONS ON NEXT PAGE

SPACE STATION

ADD / MOD / SUP / REP of the station

- C10a SPACE STATION NAME
- OLD SPACE STATION NAME (if changed)
- TRANSMITTING BEAM DESIGNATION
- C10 TYPE OF STATION (Geo/Non-geo)
- OLD BEAM DESIGNATION (if changed)

GROUP (LIST) OF ASSIGNED FREQUENCIES HAVING THE ABOVE COMMON CHARACTERISTICS

C2a ASSIGNED FREQUENCY	k/M/G Hz	C2a ASSIGNED FREQUENCY	k/M/G Hz
48.210	G		

MORE ON NEXT PAGE

SATELLITE TRANSMITTING ANTENNA BEAM DETAILS

CHARACTERISTICS OF THE BEAM

ADD / MOD / SUP / REP of the beam: A

B1 TRANSMITTING BEAM DESIGNATION: TXNR

NOTE: For a steerable beam the last character of the beam designation shall be "R"

OLD BEAM DESIGNATION (if changed):

B3/B4 ANTENNA CHARACTERISTICS

3a/3b/4a MAXIMUM ISOTROPIC GAIN (+/- dBi)	3 POINTING ACCURACY (Degrees +-)	3a/3b ANTENNA GAIN CONTOURS DIAGRAM SEE ATTACHMENT NO	3a/4a/4b ANTENNA RADIATION PATTERN REFERENCE PATTERN
-37.3	.	01	

3 ANTENNA GAIN VS ORBIT LONGITUDE DIAGRAM SEE ATTACHMENT NO:

RADIATION DIAGRAM SEE ATTACHMENT NO:

4b FOR NON-GEOSTATIONARY SATELLITES UNDER RESOLUTION 46 (WRC-95)

SATELLITE BEAM ORIENTATION

ANGLE ALPHA (Degrees)	ANGLE BETA (Degrees)
.	.

GAIN VS ELEVATION ANGLE DIAGRAM SEE ATTACHMENT NO:

SPREADING LOSS DATA SEE ATTACHMENT NO:

FOR NON-STANDARD ANTENNA PROVIDE

Coefficient A (dBi)	Coefficient B (dBi)
.	.

MAXIMUM E.I.R.P AT 4 kHz (+/- dBW/4kHz)	AVERAGE E.I.R.P AT 4 kHz (+/- dBW/4kHz)	MAXIMUM E.I.R.P AT 1 MHz (+/- dBW/1MHz)	AVERAGE E.I.R.P AT 1 MHz (+/- dBW/1MHz)
.	.	.	.

INFORMATION COMMON TO THE FOLLOWING GROUPS (LISTS) OF ASSIGNED FREQUENCIES IN THIS BEAM

A2a. DATE OF BRINGING INTO USE (Day | Month | Year): 01 09 04

A2b. PERIOD OF VALIDITY: Years

A3a. OPERATING AGENCY OR COMPANY (Refer to Table 12A/12B of the Preface to the IFL & SRS)

A3b. ADMINISTRATION RESPONSIBLE FOR THE STATION (Refer to Table 12A/12B of the Preface to the IFL & SRS)

SPECIAL SECTION AR11/A (RR1042) Number: AR11/A/

SPECIAL SECTION AR11/C (RR1060) Number: AR11/C/

SPECIAL SECTION ART 14 (RR1610) Number: AR14/C/

OTHER SPECIAL SECTIONS

	Reference	Number
(1)		
(2)		
(3)		
(4)		
(5)		

A5/A6. COORDINATED WITH OR AGREEMENT REACHED WITH

RR Provision	Symbols of the Administrations concerned
RR	
RR	
RR	
RR	
RR	

A5/A6. COORDINATION REQUESTED WITH OR AGREEMENT SOUGHT WITH

RR Provision	Symbols of the Administrations concerned
RR	
RR	
RR	
RR	
RR	

REMARKS

NOTES ON FILLING IN THE NEXT PAGES:

FOR EACH BEAM YOU MAY PROVIDE ONE OR MORE GROUPS (LISTS) OF ASSIGNED FREQUENCIES, EACH GROUP (LIST) HAVING ONE SET OF COMMON CHARACTERISTICS. THE BOTTOM HALF OF THIS PAGE CONTAINS COMMON DATA THAT IS APPLICABLE TO ONE OR MORE GROUPS (LISTS) OF FREQUENCIES IN THIS BEAM. FOR EACH GROUP (LIST) OF FREQUENCIES IN THIS BEAM, FIRST FILL IN THE SET OF COMMON CHARACTERISTICS, INCLUDING ALL THE ASSOCIATED EARTH (OR SPACE) STATIONS AND THEIR EMISSIONS, FOLLOWED BY THE GROUP (LIST) OF FREQUENCIES TO WHICH THE SET APPLIES. USE AS MANY PAGES AS NECESSARY

BR IDENTIFICATION NUMBER OF GROUP (LIST) OF FREQUENCIES TO BE MODIFIED / SUPPRESSED / REPLACED

ADD / MOD / SUP / REP of the group: A

CHARACTERISTICS COMMON TO THE FOLLOWING GROUP (LIST) OF ASSIGNED FREQUENCIES

C4a CLASS OF STATION: EC, ER

C4b NATURE OF SERVICE: OT, OT

C5 POLARIZATION type: CR

C2d ASSIGNED FREQUENCY BAND (MHz): 1000000

C3d MAXIMUM TOTAL PEAK POWER (dBW):

C11a SERVICE AREA: AAB

OR SERVICE AREA DIAGRAM SEE ATTACHMENT NO

C3c TYPE OF MODULATION AND MULTIPLE ACCESS DATA - SEE ATTACHMENT NO

C3c SPECTRUM MASK DIAGRAM SEE ATTACHMENT NO

C11d AFFECTED REGION SEE ATTACHMENT NO

SERVICE AREA NUMBER

SPACE STATION EMISSIONS AND ASSOCIATED RECEIVING STATION(S) COMMON TO THE FOLLOWING GROUP (LIST) OF ASSIGNED FREQUENCIES

SPACE STATION EMISSIONS

C7a DESIGNATION OF EMISSION	C8a1/C8b1 MAXIMUM PEAK POWER (+/-) dBW	C8a2/C8b2 MAXIMUM POWER DENSITY (+/-) dBW/Hz	C8c1 MINIMUM PEAK POWER (+/-) dBW	C8c2 MINIMUM POWER DENSITY (+/-) dBW/Hz	C8e C/N objective total - clear sky dB
18M0G7W	+4.4	-68.2	-17.8	-97.3	
90M0G7W	+11.4	-68.2	-16.9	-94.4	

If maximum peak power and maximum power density values are of type C8b, check this box

MORE EMISSIONS ON NEXT PAGE

Reason for minimum peak power and minimum power density (C8c) values being absent; see attachment No

EARTH STATION

ADD / MOD / SUP / REP of the station: A

C10b1 EARTH STATION NAME: GATEWAY

OLD EARTH STATION NAME (if changed)

COUNTRY

C10 TYPE OF STATION (Specific/Typical): T

C10b2 GEOGRAPHICAL COORDINATES — Longitude: Degrees, E/W, Min, Sec; Latitude: Deg, N/S, Min, Sec

C10c5 RECEIVING SYSTEM NOISE TEMPERATURE (kelvins): 500

C10c1a CLASS OF STATION: TK, TC

C10c1b NATURE OF SERVICE: OT, OT

C10c ANTENNA CHARACTERISTICS

2 MAXIMUM ISOTROPIC GAIN (+/- dBi): +48.0

3 BEAMWIDTH (Degrees): 0.56

C10c ANTENNA CHARACTERISTICS (continued)

4a RADIATION PATTERN (give reference pattern or provide diagram): REC-465

4b ANTENNA RADIATION DIAGRAM SEE ATTACHMENT NO

FOR NON-STANDARD ANTENNA PROVIDE: Coefficient A (dBi), Coefficient B (dBi), Coefficient C (dBi), Coefficient D (dBi), Phi1 (Degrees)

SPACE STATION

ADD / MOD / SUP / REP of the station

C10a SPACE STATION NAME

OLD SPACE STATION NAME (if changed)

RECEIVING BEAM DESIGNATION

C10 TYPE OF STATION (Geo/Non-geo)

OLD BEAM DESIGNATION (if changed)

MORE ASSOCIATED RECEIVING STATIONS ON NEXT PAGE

GROUP (LIST) OF ASSIGNED FREQUENCIES HAVING THE ABOVE COMMON CHARACTERISTICS

C2a ASSIGNED FREQUENCY	k/M/G Hz	C2a ASSIGNED FREQUENCY	k/M/G Hz
38.0	G		

MORE ON NEXT PAGE

SATELLITE TRANSMITTING ANTENNA BEAM DETAILS

CHARACTERISTICS OF THE BEAM

ADD / MOD / SUP / REP of the beam: A

B1 TRANSMITTING BEAM DESIGNATION: TXER

NOTE: For a steerable beam the last character of the beam designation shall be "R"

OLD BEAM DESIGNATION (if changed):

B3/B4 ANTENNA CHARACTERISTICS

B3a/B3b/B4a MAXIMUM ISOTROPIC GAIN (+/- dBi)	POINTING ACCURACY (Degrees +)
-33.5	.

B3b ANTENNA GAIN CONTOURS DIAGRAM: SEE ATTACHMENT NO: 02

ANTENNA GAIN VS ORBIT LONGITUDE DIAGRAM: SEE ATTACHMENT NO

B3c/B4a/B4b ANTENNA RADIATION PATTERN

REFERENCE PATTERN

RADIATION DIAGRAM: SEE ATTACHMENT NO

B5 FOR NON-GEOSTATIONARY SATELLITES UNDER RESOLUTION 46 (WRC-95)

SATELLITE BEAM ORIENTATION

ANGLE ALPHA (Degrees)	ANGLE BETA (Degrees)
.	.

GAIN VS ELEVATION ANGLE DIAGRAM: SEE ATTACHMENT NO

SPREADING LOSS DATA: SEE ATTACHMENT NO

FOR NON-STANDARD ANTENNA PROVIDE

Coefficient A (dB)	Coefficient B (dB)
.	.

MAXIMUM E.I.R.P AT 4 kHz (+/- dBW/4kHz)	AVERAGE E.I.R.P AT 4 kHz (+/- dBW/4kHz)	MAXIMUM E.I.R.P AT 1 MHz (+/- dBW/1MHz)	AVERAGE E.I.R.P AT 1 MHz (+/- dBW/1MHz)
.	.	.	.

INFORMATION COMMON TO THE FOLLOWING GROUPS (LISTS) OF ASSIGNED FREQUENCIES IN THIS BEAM

A2a. DATE OF BRINGING INTO USE (Day / Month / Year): 01 09 04

A2b. PERIOD OF VALIDITY: Years

A3a. OPERATING AGENCY OR COMPANY (Refer to Table 12A/12B of the Preface to the IFL & SRS):

A3b. ADMINISTRATION RESPONSIBLE FOR THE STATION (Refer to Table 12A/12B of the Preface to the IFL & SRS):

SPECIAL SECTION AR11/A (RR1042): AR11/A/ Number:

SPECIAL SECTION AR11/C (RR1060): AR11/C/ Number:

SPECIAL SECTION ART 14 (RR1610): AR14/C/ Number:

OTHER SPECIAL SECTIONS

	Reference	Number
(1)		
(2)		
(3)		
(4)		
(5)		

A5/A6. COORDINATED WITH OR AGREEMENT REACHED WITH

RR Provision	Symbols of the Administrations concerned
RR	
RR	
RR	
RR	
RR	

A5/A6. COORDINATION REQUESTED WITH OR AGREEMENT SOUGHT WITH

RR Provision	Symbols of the Administrations concerned
RR	
RR	
RR	
RR	
RR	

REMARKS

NOTES ON FILLING IN THE NEXT PAGES:

FOR EACH BEAM YOU MAY PROVIDE ONE OR MORE GROUPS (LISTS) OF ASSIGNED FREQUENCIES, EACH GROUP (LIST) HAVING ONE SET OF COMMON CHARACTERISTICS. THE BOTTOM HALF OF THIS PAGE CONTAINS COMMON DATA THAT IS APPLICABLE TO ONE OR MORE GROUPS (LISTS) OF FREQUENCIES IN THIS BEAM. FOR EACH GROUP (LIST) OF FREQUENCIES IN THIS BEAM, FIRST FILL IN THE SET OF COMMON CHARACTERISTICS, INCLUDING ALL THE ASSOCIATED EARTH (OR SPACE) STATIONS AND THEIR EMISSIONS, FOLLOWED BY THE GROUP (LIST) OF FREQUENCIES TO WHICH THE SET APPLIES. USE AS MANY PAGES AS NECESSARY.

3B IDENTIFICATION NUMBER OF GROUP (LIST) OF FREQUENCIES TO BE MODIFIED / SUPPRESSED / REPLACED		ADD / MOD / SUP / REP of the group	A

CHARACTERISTICS COMMON TO THE FOLLOWING GROUP (LIST) OF ASSIGNED FREQUENCIES

C4a CLASS OF STATION	EC	ER				
C4b NATURE OF SERVICE	OT	OT				
C6 POLARIZATION Type	CR	Linear: provide angle in degrees	•			
C2d ASSIGNED FREQUENCY BAND (kHz)	1000000					
C3d MAXIMUM TOTAL PEAK POWER (+/- dBW)	•					

C11a SERVICE AREA AAB OR SERVICE AREA DIAGRAM SEE ATTACHMENT NO

C3c TYPE OF MODULATION AND MULTIPLE ACCESS DATA (SEE ATTACHMENT NO) — C3c SPECTRUM MASK DIAGRAM SEE ATTACHMENT NO — C11d AFFECTED REGION SEE ATTACHMENT NO — SERVICE AREA NUMBER

SPACE STATION EMISSIONS AND ASSOCIATED RECEIVING STATION(S) COMMON TO THE FOLLOWING GROUP (LIST) OF ASSIGNED FREQUENCIES

SPACE STATION EMISSIONS

C7a DESIGNATION OF EMISSION	C3a1/C8b1 (MAXIMUM) PEAK POWER +/- dBW	C3a2/C8b2 (MAXIMUM) POWER DENSITY +/- dBW/Hz	C8c1 MINIMUM PEAK POWER +/- dBW	C8c2 MINIMUM POWER DENSITY +/- dBW/Hz	C8e C/N objective (total - clear sky) dB
18M0G7W	+11.5	-61.0	-8.1	-87.6	.
90M0G7W	+18.5	-61.0	-7.2	-86.7	.
	.	.	.	.	.
	.	.	.	.	.
	.	.	.	.	.
	.	.	.	.	.
	.	.	.	.	.

(1) maximum peak power and maximum power density values are of type C8b, check this box — MORE EMISSIONS ON NEXT PAGE — Reason for minimum peak power and minimum power density (C8c) values being absent: see attachment No

EARTH STATION

ADD / MOD / SUP / REP of the station: A

C10b1 EARTH STATION NAME: GATEWAY

OLD EARTH STATION NAME (if changed):

COUNTRY:

C10 TYPE OF STATION (Specific/Typical): T

C10b2 GEOGRAPHICAL COORDINATES: Longitude (Degrees (E/W) Min Sec) — Latitude (Deg (N/S) Min Sec)

C10c5 RECEIVING SYSTEM NOISE TEMPERATURE (kelvins): 500

C10c1a CLASS OF STATION	TK	TC		
C10c1b NATURE OF SERVICE	OT	OT		

C10c ANTENNA CHARACTERISTICS

2 MAXIMUM ISOTROPIC GAIN (+/- dBi): +48.0

3 BEAMWIDTH (Degrees): 0.56

C10c ANTENNA CHARACTERISTICS (continued)

4a RADIATION PATTERN (give reference pattern or provide diagram): REC-465

4b ANTENNA RADIATION DIAGRAM SEE ATTACHMENT NO

FOR NON-STANDARD ANTENNA PROVIDE:

Coefficient A (dBi)	Coefficient B (dBi)	Coefficient C (dBi)	Coefficient D (dBi)	Phi1 (Degrees)
.	.	.	.	.

SPACE STATION

ADD / MOD / SUP / REP of the station:

C10a SPACE STATION NAME:

OLD SPACE STATION NAME (if changed):

RECEIVING BEAM DESIGNATION:

C10 TYPE OF STATION (Geo/Non-geo):

OLD BEAM DESIGNATION (if changed):

MORE ASSOCIATED RECEIVING STATIONS ON NEXT PAGE

GROUP (LIST) OF ASSIGNED FREQUENCIES HAVING THE ABOVE COMMON CHARACTERISTICS

C2a. ASSIGNED FREQUENCY	k/M/G Hz	C2a. ASSIGNED FREQUENCY	k/M/G Hz
38.0	G	.	
.		.	
.		.	
.		.	
.		.	
.		.	

MORE ON NEXT PAGE

SATELLITE TRANSMITTING ANTENNA BEAM DETAILS

CHARACTERISTICS OF THE BEAM

ADD / MOD / SUP / REP of the beam: A

B1 TRANSMITTING BEAM DESIGNATION: GLBT

NOTE. For a steerable beam the last character of the beam designation shall be "R"

OLD BEAM DESIGNATION (if changed):

B3/B4 ANTENNA CHARACTERISTICS

B3a/B3b/B4a MAXIMUM ISOTROPIC GAIN (+/- dBi): +5•0

B3 POINTING ACCURACY (Degrees ±): •

B3a/B3b ANTENNA GAIN CONTOURS DIAGRAM. SEE ATTACHMENT NO: 03

B3/B4a/B4b ANTENNA RADIATION PATTERN

REFERENCE PATTERN:

B7 ANTENNA GAIN VS ORBIT LONGITUDE DIAGRAM. SEE ATTACHMENT NO:

RADIATION DIAGRAM. SEE ATTACHMENT NO:

B6 FOR NON-GEOSTATIONARY SATELLITES UNDER RESOLUTION 46 (WRC-95)

SATELLITE BEAM ORIENTATION

ANGLE ALPHA (Degrees): •

ANGLE BETA (Degrees): •

GAIN VS ELEVATION ANGLE DIAGRAM. SEE ATTACHMENT NO:

SPREADING LOSS DATA. SEE ATTACHMENT NO:

FOR NON-STANDARD ANTENNA PROVIDE

Coefficient A (dBi): •

Coefficient B (dBi): •

MAXIMUM E.I.R.P. AT 4 kHz (+/- dBW/4kHz): •

AVERAGE E.I.R.P. AT 4 kHz (+/- dBW/4kHz): •

MAXIMUM E.I.R.P. AT 1 MHz (+/- dBW/1MHz): •

AVERAGE E.I.R.P. AT 1 MHz (+/- dBW/1MHz): •

INFORMATION COMMON TO THE FOLLOWING GROUPS (LISTS) OF ASSIGNED FREQUENCIES IN THIS BEAM

A2a. DATE OF BRINGING INTO USE (Day / Month / Year): 01 09 04

A2b. PERIOD OF VALIDITY: Years

A3a. OPERATING AGENCY OR COMPANY (Refer to Table 12A/12B of the Preface to the IFL & SRS):

A3b. ADMINISTRATION RESPONSIBLE FOR THE STATION (Refer to Table 12A/12B of the Preface to the IFL & SRS):

SPECIAL SECTION AR11/A (RR1042): AR11/A/ Number:

SPECIAL SECTION AR11/C (RR1060): AR11/C/ Number:

SPECIAL SECTION ART 14 (RR1610): AR14/C/ Number:

OTHER SPECIAL SECTIONS

	Reference	Number
1)		
2)		
3)		
4)		
5)		

A5/A6. COORDINATED WITH OR AGREEMENT REACHED WITH

RR Provision	Symbols of the Administrations concerned
RR	
RR	
RR	
RR	
RR	

A5/A6. COORDINATION REQUESTED WITH OR AGREEMENT SOUGHT WITH

RR Provision	Symbols of the Administrations concerned
RR	
RR	
RR	
RR	
RR	

REMARKS

NOTES ON FILLING IN THE NEXT PAGES:

FOR EACH BEAM YOU MAY PROVIDE ONE OR MORE GROUPS (LISTS) OF ASSIGNED FREQUENCIES, EACH GROUP (LIST) HAVING ONE SET OF COMMON CHARACTERISTICS. THE BOTTOM HALF OF THIS PAGE CONTAINS COMMON DATA THAT IS APPLICABLE TO ONE OR MORE GROUPS (LISTS) OF FREQUENCIES IN THIS BEAM. FOR EACH GROUP (LIST) OF FREQUENCIES IN THIS BEAM, FIRST FILL IN THE SET OF COMMON CHARACTERISTICS, INCLUDING ALL THE ASSOCIATED EARTH (OR SPACE) STATIONS AND THEIR EMISSIONS, FOLLOWED BY THE GROUP (LIST) OF FREQUENCIES TO WHICH THE SET APPLIES. USE AS MANY PAGES AS NECESSARY.

3R IDENTIFICATION NUMBER OF GROUP (LIST) OF FREQUENCIES TO BE MODIFIED / SUPPRESSED / REPLACED

ADD / MOD / SUP / REP of the group: A

CHARACTERISTICS COMMON TO THE FOLLOWING GROUP (LIST) OF ASSIGNED FREQUENCIES

C4a CLASS OF STATION	EC	ED		
C4b NATURE OF SERVICE	OT	OT		

C6 POLARIZATION — TYPE: CR; (linear provide angle) in degrees: •

C2d ASSIGNED FREQUENCY BAND (kHz): 100

C8d MAXIMUM TOTAL PEAK POWER (+/- dBW): •

C11a SERVICE AREA: AAB

OR SERVICE AREA DIAGRAM SEE ATTACHMENT NO

C3c TYPE OF MODULATION AND MULTIPLE ACCESS DATA SEE ATTACHMENT NO

C3c SPECTRUM MASK DIAGRAM SEE ATTACHMENT NO

C11d AFFECTED REGION SEE ATTACHMENT NO

SERVICE AREA NUMBER

SPACE STATION EMISSIONS AND ASSOCIATED RECEIVING STATION(S) COMMON TO THE FOLLOWING GROUP (LIST) OF ASSIGNED FREQUENCIES

SPACE STATION EMISSIONS

C7a DESIGNATION OF EMISSION	C8a1/C8b1 (*) MAXIMUM PEAK POWER +/- dBW	C8a2/C8b2 (*) MAXIMUM POWER DENSITY +/- dBW/Hz	C8c1 MINIMUM PEAK POWER +/- dBW	C8c2 MINIMUM POWER DENSITY +/- dBW/Hz	C8e C/N objective (total - clear sky) dB
7K00G1D	-10•0	-48•5	-10•0	-48•5	•
	•	•	•	•	•
	•	•	•	•	•
	•	•	•	•	•
	•	•	•	•	•
	•	•	•	•	•
	•	•	•	•	•

(*) maximum peak power and maximum power density values are of type C8b, check this box

MORE EMISSIONS ON NEXT PAGE

Reason for minimum peak power and minimum power density (C8c) values being absent; see attachment No

EARTH STATION

ADD / MOD / SUP / REP of the station: A

C10b1 EARTH STATION NAME: GATEWAY

OLD EARTH STATION NAME (if changed)

COUNTRY

C10 TYPE OF STATION Specific/Typical: T

C10b2 GEOGRAPHICAL COORDINATES

Longitude Degrees	E/W	Min	Sec	Latitude Deg	N/S	Min	Sec

C10c5 RECEIVING SYSTEM NOISE TEMPERATURE (kelvins): 500

C10c1a CLASS OF STATION	TR	TC	TK	
C10c1b NATURE OF SERVICE	OT	OT	OT	

C10c ANTENNA CHARACTERISTICS

2 MAXIMUM ISOTROPIC GAIN (+/- dBi): +48•0

3 BEAMWIDTH (Degrees): 0•56

C10c ANTENNA CHARACTERISTICS (continued)

4a RADIATION PATTERN (give reference pattern or provide diagram): REC-465

4b ANTENNA RADIATION DIAGRAM SEE ATTACHMENT NO

FOR NON-STANDARD ANTENNA PROVIDE:

Coefficient A dBi	Coefficient B dBi	Coefficient C dBi	Coefficient D dBi	Phi1 Degrees
•	•	•	•	•

MORE ASSOCIATED RECEIVING STATIONS ON NEXT PAGE

SPACE STATION

ADD / MOD / SUP / REP of the station

C10a SPACE STATION NAME

OLD SPACE STATION NAME (if changed)

RECEIVING BEAM DESIGNATION

C10 TYPE OF STATION Geo/Non-geo

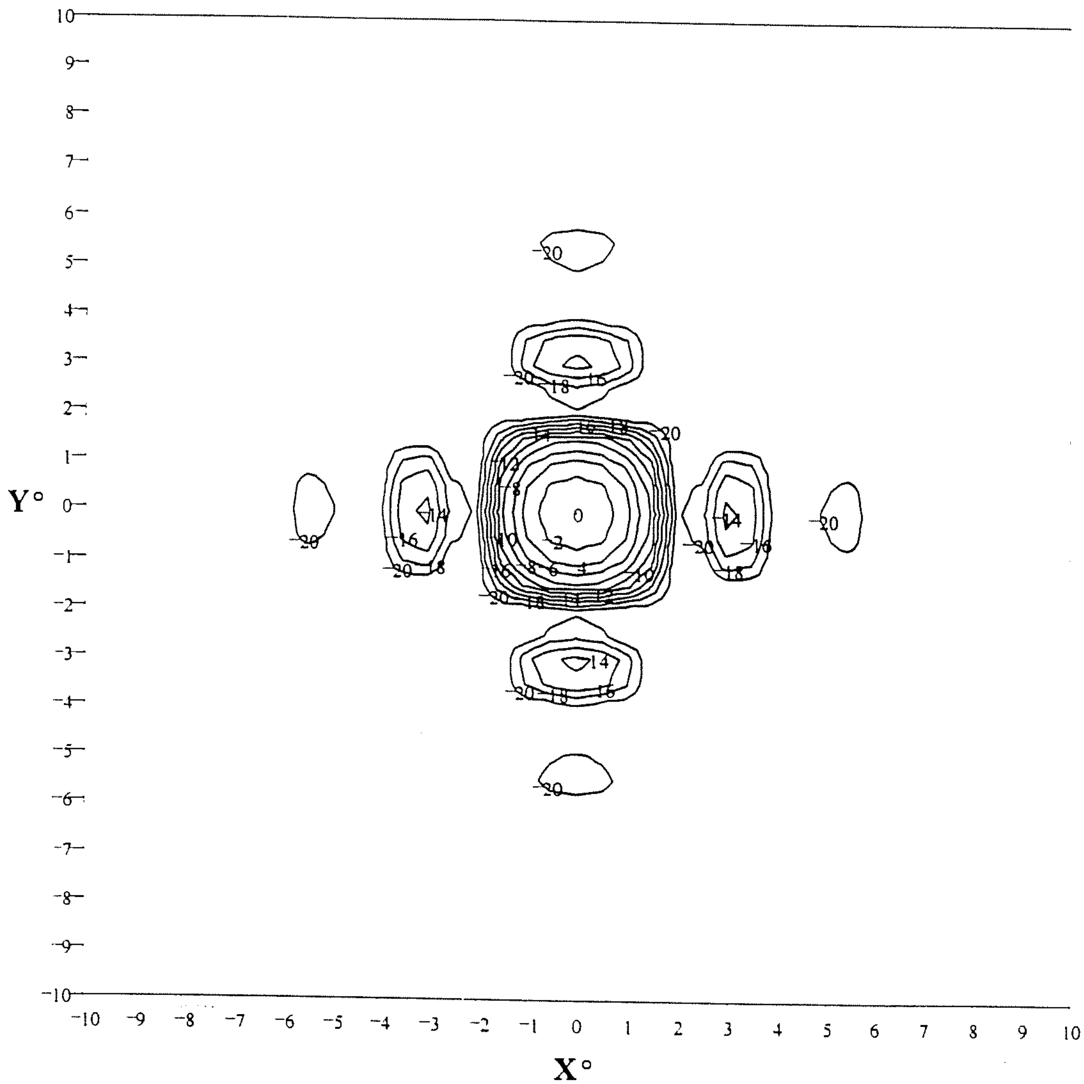
OLD BEAM DESIGNATION (if changed)

GROUP (LIST) OF ASSIGNED FREQUENCIES HAVING THE ABOVE COMMON CHARACTERISTICS

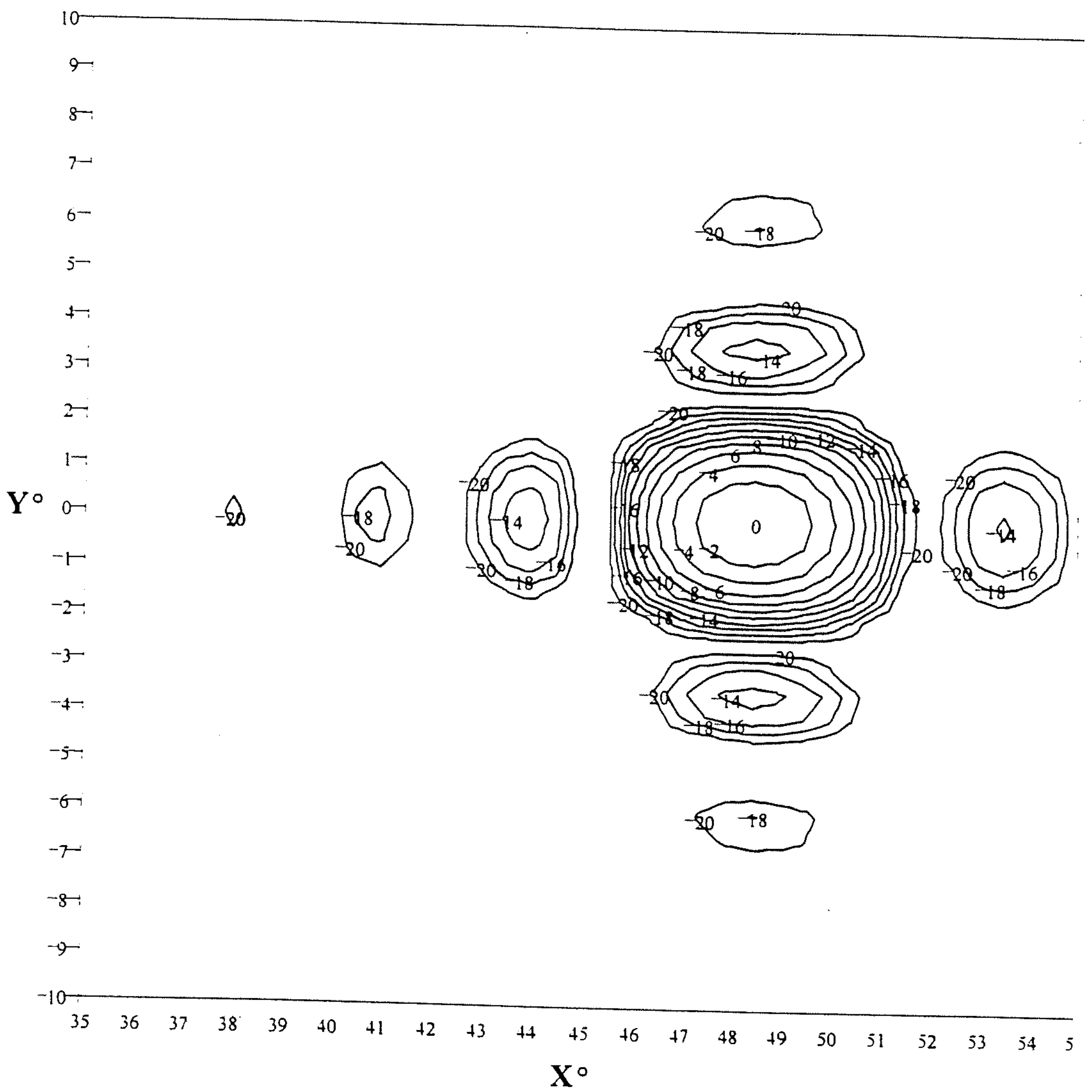
C2a. ASSIGNED FREQUENCY	k/M/G Hz	C2a. ASSIGNED FREQUENCY	k/M/G Hz
38•51000	G	38•51060	G
38•51010	G	38•51070	G
38•51020	G	38•51080	G
38•51030	G	38•51090	G
38•51040	G	38•51100	G
38•51050	G	38•51110	G

MORE ON NEXT PAGE

ATTACHMENT 01



ATTACHMENT 02



ATTACHMENT 03