SECTION 25.114 (c) TECHNICAL INFORMATION

SECTION 25.114 (c) INFORMATION FOR HISPASAT 1C SPACE STATION

(1) Name, address, and telephone number of the applicant;

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(2) Name, address, and telephone number of the person(s), to whom inquiries or correspondence should be directed;

(3) Type of authorization requested (e.g., launch authority, station license, modification of authorization);

(4) (i) Radio frequencies and polarization plan (including beacon, telemetry and telecommand functions); center frequency and polarization of transponders (both receiving and transmitting frequencies); transponder bandwidth;

The frequency and polarization plan of the HISPASAT-1C satellite as well as the receive and transmit center frequencies and polarizations of the 24 transponders are shown in Figure 1 and recapped in Table 1.

The bandwidth of each transponder is 36 MHz.

Polarization V and H are orthogonal linear polarizations and are defined as follows:

- Horizontal polarization (H) is defined as being parallel to the equatorial plane.
- Vertical polarization (V) is orthogonal to that of polarization H

The total number of operating transponders in the HISPASAT-1C satellite is 24, which can be selected by ground co mmand.

The following frequencies and polarizations will be used for the telecommand and telemetry and beacon functions:

-Ku band:

TC frequency: 14000.0 MHz , horizontal polarization.
TM/Ranging frequency (IBERIA/EUROPE): 12748.25 MHz, horizontal polarization.
Beacon frequency (IBERIA/EUROPE): 11702 MHz, vertical polarization
Beacon frequency (AMERICA): 11702 MHz, horizontal polarization.

-S band (emergency):

TC frequency: 2052.0 MHz, Dual RHCP/LHCP polarization
TM frequency: 2228.4163 MHz, Dual RHCP/LHCP polarization

(ii) Emission designators and allocated bandwidth of emission; final amplifier output power (identify any net losses between output of final amplifier and input of antenna and specify the maximum EIRP for each antenna beam),

Emission designators: 76K8G1X-- to 36M0G7X--

Allocated bandwidth: 76.8 KHz to 36 MHz

Final amplifier output power IBERIA/EUROPE beam: 17.1 dBW (net losses between output of final amplifier and input of antenna: 2.9 dB)

Final amplifier output power AMERICA beam: 17.3 dBW (net losses between output of final amplifier and input of antenna: 1.7 dB)

Maximum EIRP at saturation in each transmit beam:

- IBERIA/EUROPE transmit beam: 54 dBW
- AMERICA transmit beam: 48 dBW

(iii) Identification of which antenna beams are connected or switchable to each transponder and TT&C function,

The HISPASAT-1C satellite uses fixed receive and transmit beams over Europe (IBERIA/EUROPE beam) and over the Americas (AMERICA beam) for the Fixed Satellite Service.

The HISPASAT-1C satellite is able to simultaneously operate within the different coverage zones, which are defined here in.

These coverage zones are:

- IBERIA/EUROPE Coverage, that covers Iberian Peninsula, Balearics, Canaries, Azores/Madeira Islands and most part of Europe and North of Africa

- AMERICA Coverage, that includes a large part of America, from South of Argentina to Canada.

Figure 1 and Table 1 show which receive beam and transmit beam can be connected to each transponder.

(iv) Receiving system noise temperature,

525K for IBERIA/EUROPE receive antenna and 530K for AMERICA receive antenna.

(v) Relationship between satellite receive antenna gain patter and gain-to-temperature ratio and saturation flux density for each antenna beam (may be indicated on antenna gain plot),

The G/T beam peak for the IBERIA/EUROPE receive beam is 10.2 dB/K and 4.1 dB/K for the AMERICA receive beam respectively.

Saturation flux density for IBERIA/EUROPE receive beam is:

-(82.0 - X) dBW/m^2 at minimum gain setting (see 4(vi) below)
-(97.0 - X) dBW/m^2 at maximum gain setting (see 4(vi) below)

where X is the difference between the gain peak value and the gain value in the direction considered

Saturation flux density for AMERICA receive beam is:

-(81.0 - X) dBW/m^2 at minimum gain setting (see 4(vi) below)
-(96.0 - X) dBW/m^2 at maximum gain setting (see 4(vi) below)

where X is the difference between the gain peak value and the gain value in the direction considered

(vi) Gain of each transponder channel (between output of receiving antenna and input of transmitting antenna) including any adjustable gain step capabilities,

The gain of each transponder channel, between output of receiving antenna and input of transmitting antenna, will be adjustable by lower than 1 dB between a minimum gain of 105.5 dB and a maximum gain of 125 dB for IBERIA/EUROPE-IBERIA/EUROPE or IBERIA/EUROPE-AMERICA receive-transmit connectivities and between a minimum gain of 107.5 dB and a maximum gain of 127 dB for AMERICA-AMERICA or AMERICA-IBERIA/EUROPE receive-transmit connectivities.

(vii) Predicted receiver and transmitted channel filter response characteristics;

Channel filter response characteristics are described in tables 2 and 3.

(5) For satellites in geostationary-satellite orbit, orbital location or locations, and factors that support the orbital assignment or assignments proposed

The HISPASAT-1C satellite is operated at the 30º W longitude orbital location. Operation of the HISPASAT-1C satellite has been coordinated with United States. In fact the American beams have already notified in from of the ITU under the HISPASAT 2C3 KU filing.

(6) For satellites in non-geostationary-satellite orbit,

(N/A)

(7) For satellite in geostationary-satellite orbit, accuracy with which the orbital inclination, the antenna axis attitude, and longitudinal drift will be maintained;

The HISPASAT-1C satellite will be maintained at 30º W.L. with an accuracy of +/-0.07 degree. Its orbital inclination will be maintained within +/- 0.05 degree.

Antenna axis stability: 0.1 degree.

(8) Calculation of power flux density levels within each coverage area and of the energy dispersal, if any, needed for compliance with Sec.25.208;

N/A considering the HISPASAT-1C downlink frequency range. Anyway, the power flux density levels will not exceed -152 dBW/m^2 per 4 KHz over the U.S. territory and all the Americas and -148.4 dBW/m^2 per 4 KHz over Europe.

(9) Arrangement for tracking, telemetry and control;

TTC functions are performed at Arganda, Spain (Longitude 3.72ºW, Latitude 40.3ºN)

(10) Physical characteristics of the space station including weight and dimensions of spacecraft, detailed mass (on ground and in-orbit) and power (beginning and end of life) budgets, and estimated operational lifetime and reliability of the space station and the basis for that estimate;

Physical characteristics of the HISPASAT-1C satellite:

Dimensions	stoned:	3.27m x 2.5m x 5.1m
	Deployed:	6.95m x 28.9m x 5.1m
Mass	on ground	1304 Kg
	at launch	3112.5 Kg
Power	beginning of life	7.3 Kw
	end of life	6.3 Kw
Estimated operational lifetime		15 years
Reliability		>0.75

(11) Clear and detailed statement of whether the space station is to be operated on a common carrier basis, or whether non-common carrier transactions are proposed. If non-common carrier transactions are proposed, describe the nature of the transactions and specify the number of transponders to be offered on a non-common carrier basis;

The HISPASAT-1C satellite is operated on a non-common carrier basis and all the transponders will be available for use on a non-common carrier basis. HISPASAT leases capacity pursuant to commercial contracts.

It is not HISPASAT's customary practice to hold itself out as a common carrier for hire, and HISPASAT does not intend to make capacity available on a common carrier basis.

(12) Dates by which construction will be commenced and completed, launch date, and estimated date of placement into service;

The HISPASAT-1C satellite was launched on February 3rd, 2000 and nowadays is into service.

(13) The polarization information specified in §§25.210(a)(1), (a)(3), and (i), to the extent applicable.

Polarization V and H are orthogonal linear polarizations and are defined as follows:

- Horizontal polarization (H) is defined as being parallel to the equatorial plane.
- Vertical polarization (V) is orthogonal to that of polarization H

	FREQUENCY (MHz)		POLARIZATION		COVERAGE	
TRANSPONDER	UPLINK	DOWNLINK	UPLINK	DOWNLINK	UPLINK	DOWNLINK
41	13020	11731	V	H	IB/EUR	IB/EUR
42	13060	11771	V	H	IB/EUR	IB/EUR
43	13100	11811	V	H	IB/EUR	IB/EUR
44	13140	11851	V	H	IB/EUR	IB/EUR
45	13180	11891	V	H	IB/EUR	IB/EUR
46	13220	11931	V	H	IB/EUR	IB/EUR
47	13020	11731	H	V	IB/EUR	IB/EUR
48	13060	11771	H	V	IB/EUR	IB/EUR
49	13100	11811	H	V	IB/EUR	IB/EUR
50	13140	11851	H	V	IB/EUR	IB/EUR
51	13180	11891	H	V	IB/EUR	IB/EUR
52	13220	11931	H	V	IB/EUR	IB/EUR
53	13772	11972	V	H	IB/EUR IB/EUR AME AME	IBE/EUR AME AME IBE/EUR
54	13812	12012	V	H	IB/EUR IB/EUR AME AME	IBE/EUR AME AME IBE/EUR
55	13852	12052	V	H	IB/EUR IB/EUR AME AME	IBE/EUR AME AME IBE/EUR
56	13892	12092	V	H	IB/EUR IB/EUR AME AME	IBE/EUR AME AME IBE/EUR
57	13772	11972	H	V	IB/EUR IB/EUR AME AME	IBE/EUR AME AME IBE/EUR
58	13812	12012	H	V	IB/EUR IB/EUR AME AME	IBE/EUR AME AME IBE/EUR
59	13852	12052	H	V	IB/EUR IB/EUR AME AME	IBE/EUR AME AME IBE/EUR
60	13892	12092	H	V	IB/EUR IB/EUR AME AME	IBE/EUR AME AME IBE/EUR
61	13932	12132	V	H	IBE/EUR AME	AME AME
62	13972	12172	V	H	IBE/EUR AME	AME AME
63	13932	12132	H	V	IBE/EUR AME	AME AME
64	13972	12172	H	V	IBE/EUR AME	AME AME

Table 1.- Frequency Plan Definition of HISPASAT-1C

PART OF BAND, $f_c \pm$ MHz		10	15	16.5	18
Input Section gain flatness	dBpp	0.65	0.7	1.2	2.3
Total gain flatness	dBpp	0.85	1.3	2.4	4.6
Input Section gain slope	dB/MHz	0.15	0.2	0.5	1.3
Total gain slope	dB/MHz	0.25	0.4	1.0	2.9

Table 2.- Amplitude in band response

Frequency Spacing from Fc ($\pm$ MHz)	22	22.75	30	35	45
Input Demultiplexer (dB)	18	N/A	35	N/A	40
Output Multiplexer (dB)	11 (5)	18 (9)	25 (20)	N/A (23)	30 (27)

NOTE: Values in brackets ( ) applied only to end channels.

Table 3.- Minimum out of band rejection (dB)

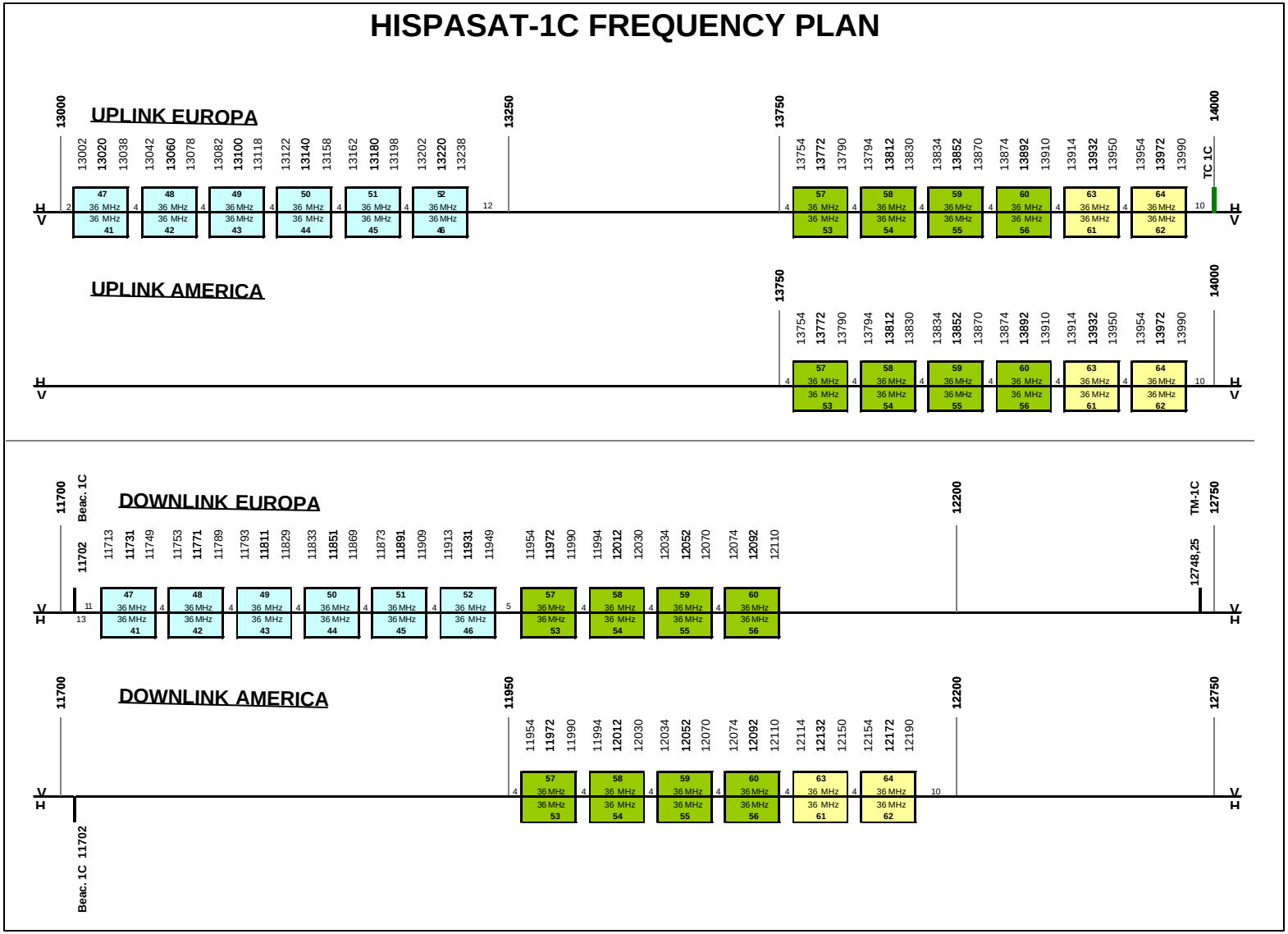

Figure 1.- HISPASAT-1C Frequency Plan