SECTION 25.114 (c) TECHNICAL INFORMATION

SECTION 25.114 (c) INFORMATION FOR AMAZONAS-3 SPACE STATION IN THE Ka BAND

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

HISPAMAR SATÉLITES
Praia do Flamengo, 200
17º andar
Distrito Centro – Rio de Janeiro Cep 2204
TEL: + 55 21 2555 4800

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

Donald Jansky
JANSKY/BARMAT TELECOM INC.
7703 Arrowood Court,
Bethesda, Md. 20817
Tel: 202 467 46 00
Fax: 202 296 68 92

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

HISPAMAR SATÉLITES, S.A. (hereinafter HISPAMAR SATÉLITES) requests the Commission to add the AMAZONAS-3 satellite on the "Permitted Space Station List" created by the Commission in *Amendment of the Commission's Regulatory Policies to Allow Non-U.S. Licensed Space Stations to Provide Domestic and International Satellite Service in the United States.*

The AMAZONAS-3 satellite is foreseen to be launched on 4rd Q. 2012 and be operated at the 61 W.L. orbital location.

The AMAZONAS-3 satellite will be a replacement of the AMAZONAS-1 satellite, located in the same orbital location. The AMAZONAS-3 will keep the same C and Ku frequency bands as AMAZONAS-1 and will add extra capacity in the Ka frequency band.

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

The receive and transmit center frequencies and polarizations of the AMAZONAS-3 transponders which will provide service to America in the Ka bands are shown in Figures 1 and 2 and Table 1.

Ka Band

The bandwidth of each transponder is given in Table 1.

Polarization LHCP and RHCP are orthogonal circular polarizations and are defined as follows:

- RHCP: Right Hand Circular Polarization. The electric field vector, observed in any fixed plane, normal to the direction of propagation, whilst looking in the direction of propagation, rotates with time in a right hand or clockwise direction.
- LHCP: Left Hand Circular Polarization. The electric field vector, observed in any fixed plane, normal to the direction of propagation, whilst looking in the direction of propagation, rotates with time in a left hand or counter clockwise direction.

The total number of operating Ka-band transponders in the Amazonas-3 satellite is 13 (as a maximum of 4 of them can provide service to USA), which can be selected by ground command.

The following frequency and polarization will be used for the beacon function:

TM/Ranging 1: 20.1995 GHz RHCP 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),

Ka Band

Emission designators: 1M0G7-- to 450M0G7X--
Allocated bandwidth: 1 MHz to 450 MHz

Final amplifier output power SPOT beams: 17 dBW (net losses between output of final amplifier and input of antenna: 2.5 dB)

Maximum EIRP at saturation in each transmit beam:

- SPOT BEAMS transmit beam: 65 dBW

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

Ka Band

The AMAZONAS-3 includes several spot beams in Ka band over the main cities of South America: Sao Paulo, Rio de Janeiro, Buenos Aires, Santiago de Chile, Piura (Peru), Bogota, Brasilia, Mexico DF, and three gateways: Gateway 1 is defined as Laredo, Gateway 2 is defined as Tucson and Gilbert and Gateway 3 as Arica (Chile).

The Ka-Band coverage zone is:

- The cities of South America and North America referenced in the paragraph above.

Figures 1, 2 and Table 1 show which receive beam and transmit beam can be connected to each transponder.

(iv) Receiving system noise temperature,

- 2570K for the spots, receive antennas in Ka band.

(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),

Ka Band

The G/T beam peak for the SPOT receive beams is 18 dB/K.

Saturation flux density for SPOT receive beams is:

-(75.0 + X) dBW/m^2 at maximum minimum gain setting (see 4 (vi) below)
-(95.0 + X) dBW/m^2 at minimum gain setting (see 4 (vi) below)

where X is the G/T 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,

Ka Band

The gain of each transponder channel, between output of receiving antenna and input of transmitting antenna, will be adjustable by lower than 0.5 dB between a minimum gain of 93.4 dB and a maximum gain of 113.4 dB for SPOT – SPOT receive-transmit connectivity.

(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,

(i) Orbital location, or locations if alternatives are proposed, requested for the satellite,

The AMAZONAS-3 satellite will be operated at the 61ºW.L. orbital location.

(ii) The factors that support the orbital assignment or assignments proposed in paragraph (c)(5)(i) of this section,

This position was granted by the Administration of Brasil. Operation is being coordinated with United States.

(iii) Longitudinal tolerance or east-west station-keeping capability;

The AMAZONAS-3 satellite will be maintained at 61º W.L. with an accuracy of +/-0.05 degree.

(iv) Inclination incursion or north-south station-keeping capability.

Its orbital inclination will be maintained within +/- 0.07 degree.

(6) For satellites in non-geostationary-satellite orbit,
(i) The number of space stations and applicable information relating to the number of orbital planes,
(ii) The inclination of the orbital plane(s),
(iii) The orbital period,
(iv) The apogee,
(v) The perigee,
(vi) The argument(s) of perigee,
(vii) Active service arc(s), and
(viii) Right ascension of the ascending node(s).

(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 AMAZONAS-3 satellite will be maintained at 61º W.L. with an accuracy of +/-0.05 degree. Its orbital inclination will be maintained within +/- 0.05 degree.

Antenna axis stability: 0.05 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;

Ka Band

In all the Ka downlink frequency range, the power flux density at the Earth's surface produced by emissions from a space station for all conditions and for all methods will not exceed -123.5 dBW/m2 1 MHz over the US territory and all the Americas:

-69.5 dBW/Hz max psd + 48 (max gain dBi) - 162 spreading losses (dB) (worst case).

(9) Arrangement for tracking, telemetry and control;

TTC functions are performed at Rio de Janeiro, Brazil (Longitude -43.28ºW, Latitude -22.88ºN)

(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 AMAZONAS-3 satellite:

Dimensions Deployed:		8.11m x 8.82m x 26m
Mass	on ground	2778 Kg
	at launch	6254Kg
Power	beginning of life	17.5 Kw (Equinox)
	end of life	15.9 Kw (Equinox)
Estimated operational lifetime		15 years
Reliability		0.75 for 15 years

(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 AMAZONAS-3 satellite will be operated on a non-common carrier basis and all the transponders will be available for use on a non-common carrier basis. HISPAMAR leases capacity pursuant to commercial contracts.

It is not HISPAMAR's customary practice to hold itself out as a common carrier for hire, and HISPAMAR 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 AMAZONAS-3 construction was commenced on 3rd Quarter 2010.
The AMAZONAS-3 satellite is foreseen to be launched at the end of 2012, and its foreseen date of placement into service will be on March 2013.

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

Polarization LHCP and RHCP (used in Ka band) are orthogonal circular polarizations and are defined as follows:

- RHCP: Right Hand Circular Polarization. The electric field vector, observed in any fixed plane, normal to the direction of propagation, whilst looking in the direction of propagation, rotates with time in a right hand or clockwise direction.
- LHCP: Left Hand Circular Polarization. The electric field vector, observed in any fixed plane, normal to the direction of propagation, whilst looking in the direction of propagation, rotates with time in a left hand or counter clockwise direction.

Ka Band

TRANSPONDER	BW(MHZ)	FREQUENCY (MHz)		POLARIZATION		COVERAGE	
		UPLINK	DOWNLINK	UPLINK	DOWNLINK	UPLINK	DOWNLINK
1	450	28350	19950	RHCP	RHCP	Laredo USA	Mexico MEX
2	450	28350	19950	LHCP	LHCP	Laredo USA	Mexico MEX
3	450	29750	19950	RHCP	RHCP	Laredo USA	B. Aires ARG
4	450	29750	19950	LHCP	LHCP	Laredo USA	Rio BR
5	450	28350	19950	RHCP	RHCP	Tucson USA/Arica CHL	Sao Paulo BR
6	450	28350	19950	LHCP	LHCP	Tucson USA/Arica CHL	Santiago CHL
7	450	29750	19950	RHCP	RHCP	Tucson USA/Arica CHL	Bogota CLM
8	450	29750	19950	LHCP	RHCP	Tucson USA/Arica CHL	Lima PRU
9	450	29750	18550	LHCP	LHCP	Mexico MEX	Laredo USA
10	450	29750	18550	RHCP	RHCP	Mexico MEX	Laredo USA
11	450	29750	19950	LHCP	LHCP	B. Aires ARG	Laredo USA
12	450	29750	19950	RHCP	RHCP	Rio BR	Laredo USA
13	450	29750	18550	LHCP	LHCP	Sao Paulo BR	Tucson USA/Arica CHL
14	450	29750	18550	RHCP	RHCP	Santiago CHL	Tucson USA/Arica CHL
15	450	29750	19950	LHCP	LHCP	Bogota CLM	Tucson USA/Arica CHL
16	450	29750	19950	LHCP	RHCP	Lima PRU	Tucson USA/Arica CHL

NOTES: BR = Brazil / MEX = Mexico / ARG = Argentina / CHL = Chile / CLM = Colombia / PRU = Peru

Table 1.- AMAZONAS-3 Ka-band Frequency Plan Definition. American transponders.

% OF CHANNEL BANDWIDTH		55%	85%	90%	100%
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 Ka-band response

Frequency Spacing from Fc (± MHz)	BW·0.61	BW·0.83	BW·1.25	TM/Beacon
Input Demultiplexer (dB)	18	35	40	>25
Output Multiplexer (dB) (contiguous channels)	11	25	30	>25
Output Multiplexer (dB) (non contiguous channels)	5	20	27	>25
Overall Out of Band Response(dB)	23	50	65	>25

NOTES: BW means transponder bandwidth

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

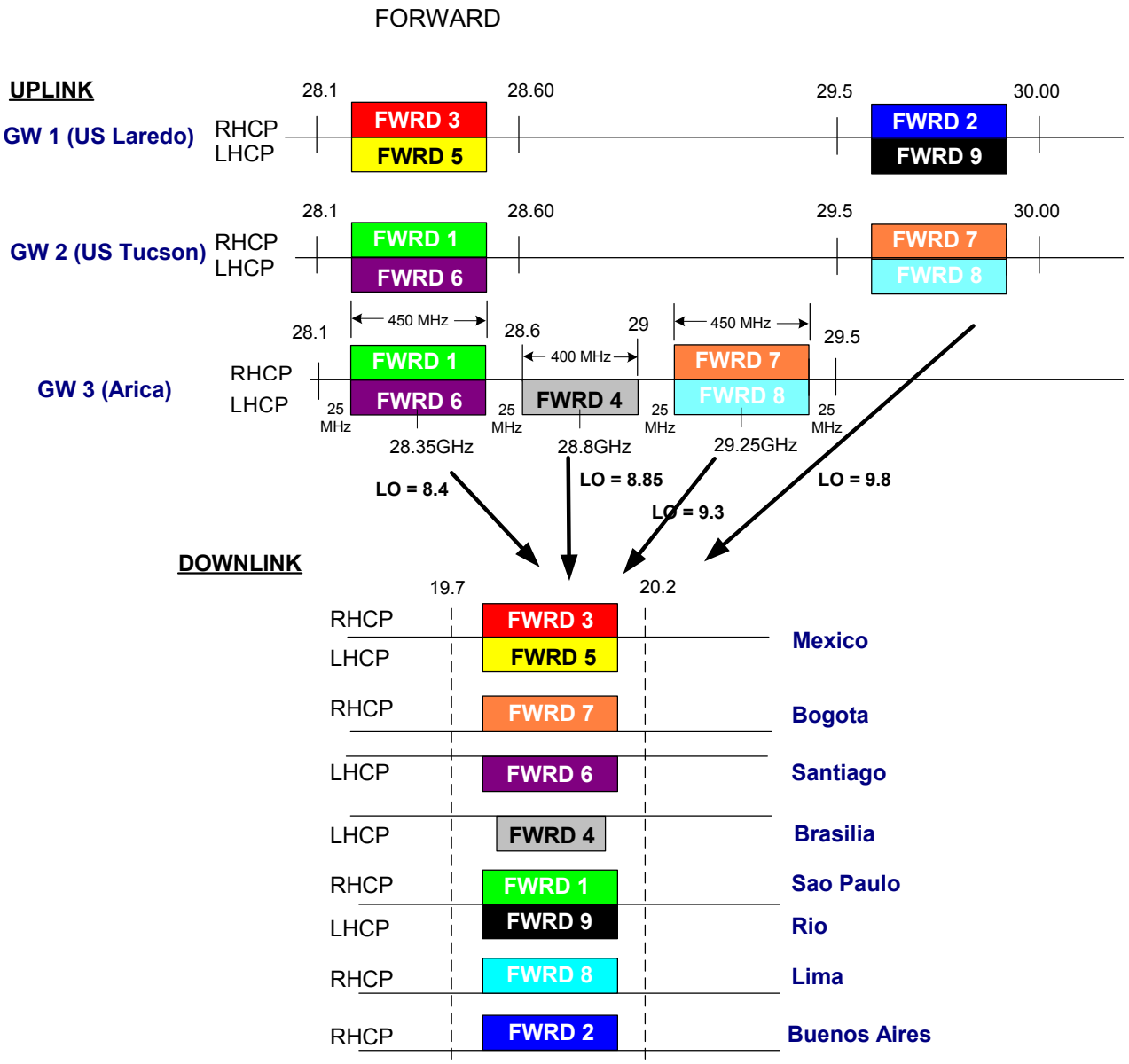

Figure 1- AMAZONAS-3 Ka-Band Forward Frequency Plan.

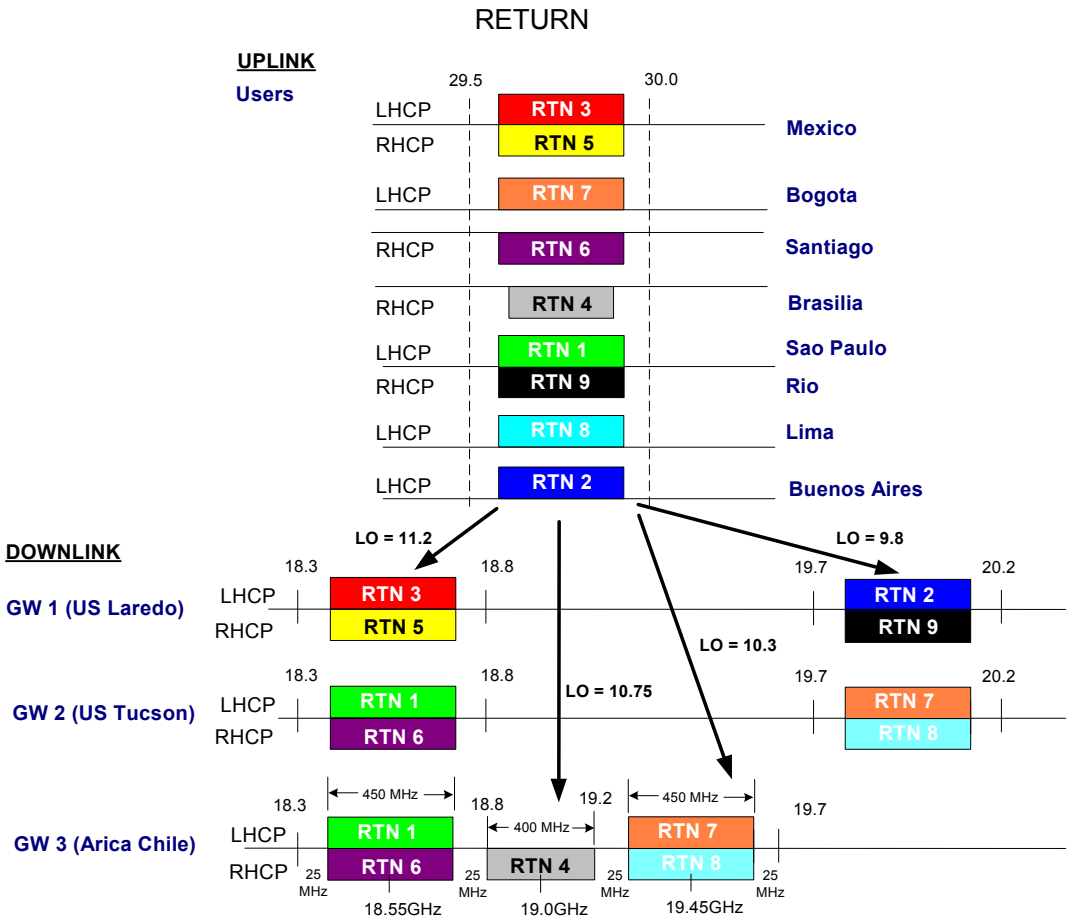

Figure 2- AMAZONAS-3 Ka-Band Return Frequency Plan.