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PAYOR INFORMATION

(1) FCC ACCOUNT NUMBER: 0 5 2 1 3 0 9 3 4 9

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(2) TOTAL AMOUNT PAID (dollars and cents): $ 3,445.00

(3) PAYOR NAME (If paying by credit card, enter name exactly as it appears on your card)

Goldberg, Godles, Wiener & Wright

FEB - 2 1995

(4) STREET ADDRESS LINE NO. 1
1229 19th Street, N.W.

(5) STREET ADDRESS LINE NO. 2

(6) CITY: Washington

(7) STATE: DC

(8) ZIP CODE: 20036

(9) DAYTIME TELEPHONE NUMBER (Include area code)
202-490-4900

(10) COUNTRY CODE (if not U.S.A.)

ITEM #1 INFORMATION

(11A) NAME OF APPLICANT, LICENSEE, REGULATEE, OR DEBTOR
PanAmSat Licensee Corp.

FCC USE ONLY
56 SAT-AMEND-96

(12A) FCC CALL SIGN/OTHER ID	(13A) ZIP CODE	(14A) PAYMENT TYPE CODE	(15A) QUANTITY	(16A) FEE DUE FOR PAYMENT TYPE CODE IN BLOCK 14
PAS-13	06830	C A W	1	$ 3,445.00

(17A) FCC CODE 1

(18A) FCC CODE 2

(19A) ADDRESS LINE NO. 1: One Pickwick Plaza

(20A) ADDRESS LINE NO. 2

(21A) CITY/STATE OR COUNTRY CODE: Greenwich, CT

ITEM #2 INFORMATION

(11B) NAME OF APPLICANT, LICENSEE, REGULATEE, OR DEBTOR

FCC USE ONLY

(12B) FCC CALL SIGN/OTHER ID	(13B) ZIP CODE	(14B) PAYMENT TYPE CODE	(15B) QUANTITY	(16B) FEE DUE FOR PAYMENT TYPE CODE IN BLOCK 14
				$

(17B) FCC CODE 1

(18B) FCC CODE 2

(19B) ADDRESS LINE NO. 1

(20B) ADDRESS LINE NO. 2

(21B) CITY/STATE OR COUNTRY CODE

CREDIT CARD PAYMENT INFORMATION

(22) MASTERCARD/VISA ACCOUNT NUMBER:

☐ Mastercard

EXPIRATION DATE: Month Year

☐ Visa

(23) **I hereby authorize the FCC to charge my VISA or Mastercard for the service(s)/authorization(s) herein describe.**

AUTHORIZED SIGNATURE DATE

See public burden estimate on reverse.

FCC FORM
April 1994

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of Application of	)	
	)	
PANAMSAT LICENSEE CORP.	)	File No.
	)	
Amendment to Application For Authority to Construct, Launch, and Operate a Hybrid Satellite in its Separate International Communications Satellite System	)	

AMENDMENT

Henry Goldberg
Joseph A. Godles
Daniel S. Goldberg
GOLDBERG, GODLES, WIENER & WRIGHT
1229 Nineteenth Street, N.W.
Washington, D.C. 20036
(202) 429-4900

Attorney for
PanAmSat Licensee Corp.

February 2, 1996

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of Application of	)	
	)	
PANAMSAT LICENSEE CORP.	)	File No.
	)	
Amendment to Application For Authority to Construct, Launch, and Operate a Hybrid Satellite in its Separate International Communications Satellite System	)	

AMENDMENT

PanAmSat Licensee Corp. ("PanAmSat"), pursuant to Sections 308, 309, and 319 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 308, 309, and 319, hereby submits this amendment to its application to construct, launch, and operate a new hybrid satellite — PAS-13 — as part of its separate international communications satellite system.

In support of this amendment, PanAmSat submits the following information.

I. APPLICANT

PanAmSat Licensee Corp.
One Pickwick Plaza
Greenwich, CT 06830
(203) 622-6664

II. CORRESPONDENCE

Correspondence with respect to this amendment should be sent to the following person at the above address and telephone number:

Frederick Landman
President

with a copy to:

Henry Goldberg, Esq.
Goldberg, Godles, Wiener & Wright
1229 Nineteenth Street, N.W.
Washington, D.C. 20036
(202) 429-4900

III. PROPOSED AMENDMENT

PAS-13, a state-of-the-art C-/Ku-band hybrid communications satellite that will be the first PanAmSat satellite to command a complete, usable view of the entire United States, will play a vital role in PanAmSat's global satellite system. The original application for PAS-13, submitted to the Commission on October 10, 1995, proposed that the satellite would be located at 103° W.L. Since the time that the PAS-13 application was submitted to the Commission, PanAmSat has learned that the 103° W.L. orbital position has been assigned to GE Americom's GE-H1 satellite. Accordingly, PanAmSat must now seek a new orbital location from which PAS-13 will be capable of providing full U.S. coverage.

After undertaking a careful review of the available orbital locations compatible with PAS-13's technical design and service objectives, PanAmSat has identified 93° W.L. as an orbital location well-suited for the PAS-13 satellite. As a result of the change in proposed orbital locations, PanAmSat is attaching hereto as Exhibit 1 a revised Engineering Statement for PAS-13. A certification of the person responsible for preparing the Engineering Statement is attached hereto as Exhibit 2. The other exhibits attached to the original PAS-13 application — Exhibit 2 (Construction Milestones), Exhibit 3 (Capital Requirements), Exhibit 4 (FCC Form 430), and Exhibit 5 (Confirmation Letter from Morgan Stanley & Co. Incorporated) — remain accurate and, as such, are incorporated by reference herein.

PanAmSat is aware that both AT&T and GE Americom have applications on file in the current domestic satellite processing round requesting the 93° W.L. orbital position for their respective domestic service satellites. In the event that the Commission ultimately assigns one of these satellites to the 93° W.L. orbital position and, therefore, precludes the assignment of PAS-13 to this location,

PanAmSat requests that the Commission assign PAS-13 to an orbital position between 90° W.L. and 115° W.L. PanAmSat believes that any available orbital position located between these endpoints will allow PAS-13 to achieve its full coverage objectives. Assigning PAS-13 to an alternative, comparable orbital location is, moreover, consistent with the Commission's longstanding orbital assignment policies, pursuant to which all orbital locations are deemed fungible and the Commission strives to accommodate all qualified applicants from the pool of available locations.

IV. WAIVER OF CLAIMS

PanAmSat waives any claim to the use of any particular frequency or of the electromagnetic spectrum as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise, and requests construction authority in accordance with this amendment. All statements made in the attached exhibits are a material part hereof, and are incorporated herein as if set out in full in this amendment.

The undersigned certifies individually and for PanAmSat that the statements made in this amendment are true, complete, and correct to the best of his knowledge and belief, and are made in good faith.

The undersigned also certifies that neither PanAmSat nor any party to this amendment is subject to a denial of federal benefits pursuant to Section 5301 of the Anti-drug Abuse Act of 1988, 21 U.S.C. § 853a.

Respectfully submitted,

By: _____
Frederick Landman

Date: 2/2/96

EXHIBIT 1

ENGINEERING STATEMENT: PAS-13

EXHIBIT 1

PAS-13
Technical Description

1.0 Introduction

PAS-13 will be the thirteenth satellite in the PanAmSat Corporation system of PanAmSat satellites, the first private international satellite system. PAS-13 is based on the latest technology available from America's satellite manufacturing industry. The satellite design will be based on either the Hughes Aircraft Company's HS-601HP and Hughes 702 series, or the Space Systems Loral (SSL) 1300 series. The satellite will be a three-axis stabilized spacecraft combining high powered amplifiers with large spacecraft-mounted antennas capable of producing high EIRP's on earth in both C-Band and Ku-Band. PAS-13 is an international satellite designed to operate from the 93°WL orbital slot and allowing communications between the United States and Latin America.

1.1 The 93°WL Orbital Slot

At present no US satellite registered with the ITU to operate from the 93°WL location. USASAT-12B is registered for 93.5°WL and this slot has been occupied by Galaxy III, a C-Band only satellite launched in September 1984. The Brazilian satellites B-SAT-H (advanced published at the 92° in K-Band) and SBTS B4 (advanced published at 92° at C-Band) are adjacent

by one degree. USASAT-24L and USASAT-24K are adjacent at 95° and 91° by two degrees each.

1.2 PAS-13 Will be an Integral Link in the PanAmSat Network

PAS-13 will provide a new and vital link in the PanAmSat's worldwide network of satellites and terrestrial facilities. PAS-13 will be the first PanAmSat satellite to command a complete useable view of the entire fifty states. As such, PAS-13 is an opportunity to provide a range of new services to its customers who wish to communicate between the North and South continents. Through the use of its Ku-Band uplink from South America, PAS-13 will be the first satellite to provide such capability from the Latin American continent to Hawaii and Alaska. Late breaking news stories from remote locations within South America can be covered for the first time with this capability. Cross-strapped C-Band to Ku-Band capability between South America he US could make possible program exchanges and direct data links not previously feasible. Because of its central location in the US domestic arc, PAS-13 will not be able to reach into Europe or Africa, however the ability to see Hawaii and Alaska provides new opportunities which overcome this limitation.

1.2 Services to be Offered

PAS-13 transponders will be state-of-the-art repeaters which will offer low cost video interconnection and distribution, data services of all types, voice services and a variety of specialized services which have grown out of the marketing experience of PanAmSat's existing satellites,

PAS-1 through -4. As the first private separate international satellite system in existence, PanAmSat has accumulated a wide body of communications marketing expertise and has in the process identified markets not previously explored by Intelsat and other operators. These specialized and unique services will be offered by PanAmSat from the PAS-13 satellite in the 93°WL orbital position.

2.0 Satellite Description

PAS-13 will be an advanced hybrid communication satellite with C- and Ku-Band transponders, to be located at 93°WL. The satellite design will be based on either the Hughes-601HP, the Hughes 702 spacecraft or the SS Loral 1300. Satellite lifetime is estimated to be fifteen years. The satellite will be equipped with sufficient battery power to enable operation at full capacity during periods of solar eclipse. End-of-life (EOL) solar power will be sufficient to operate all active transponders after at least fifteen years in orbit.

2.1 Telemetry and Command Subsystem

The PAS-13 Telemetry and Command (TT&C) subsystem will provide high-quality two-way interaction with the spacecraft throughout all mission phases and lifetime of the satellite. In the transfer orbit portion of launch, when the communication payload antennas are stowed, the TT&C links will be operated through an omni antenna. After the satellite reaches its permanent station at 93°WL, the primary TT&C links will be established through the dedicated horn antenna. Should an anomaly occur

which results in a pointing error for the main antennas, there is an automatic transfer of control to the omni-antenna which is able to maintain communications with the earth at any angle. In its high power mode, the omni antenna is capable of reaching any location visible from 93°WL.

Uplink command signals will be received by redundant command receivers which are cross-strapped to the command decoder units. The command receivers demodulate the uplinked carrier and route the command tones to the decoder units. Ranging tones are routed to the telemetry transmitters.

Commands will be transmitted in an encrypted (secure) mode. The command receivers process the digital data in parallel. After a command is verified or authenticated (clear or secure mode) the address is checked to ensure the command is intended for PAS-13 and to determine which decoder will execute the desired command. Execution is completed only after an execute-enable signal is received from the TT&C station.

2.2 Attitude and Orbit Control Subsystem

The Attitude and Orbit Control system maintains the satellite's attitude during transfer orbit; points the satellite's antennas at the earth locations designated during the design; and executes stationkeeping maneuvers during the life of the satellite. The Attitude and Orbit Control system uses an earth sensor as the primary on-station sensor; a three-axis gyro for yaw sensing; a two-axis momentum wheel as the primary on-station actuator; and the satellite computer as the control system processor.

Each of these units is redundant (including the momentum wheel), while the earth sensor is internally redundant. North-South maneuvers will be required no more than every three to three and one-half weeks while the solar tracking eliminates momentum wheel dumping more often than that.

2.3 Propulsion System

The satellite will be actively controlled by a bi-propellant propulsion system suppling the impulse required for insertion into geostationary orbit as well as normal orbital maneuvers. A tankage system will supply fuel to the liquid apogee engine and the thrusters. This tankage system will operate in a pressurized mode in transfer orbit and in a blowdown mode on-orbit. All thrusters will be constructed with double seat protection against leakage. Most thrusters will be configured so that functions are doubly redundant and all are at least singly redundant.

2.4 Electric Power Subsystem

Payload power is provided by two solar array wings oriented North-South and pointed at the sun by the satellite computer. Secondary power during eclipse will be provided by battery cells sized for 80 percent depth of discharge for end-of-life (EOL) loads. The spacecraft will utilize a single bus operating at 50 volts to save weight and facilitate thermal control. The satellite computer will automatically initiate charging each day depending on voltage or pressure readings from the battery cells. Both the batteries and the solar array have been designed to match the payload

on PAS-13 and constitute an efficient system minimizing weight, cost and complexity, while providing ample redundancy.

2.5 Thermal Control

The satellite's thermal control system will be designed to provide all necessary margins for thermal control using a system of heat pipes, passive radiators, and heaters (computer controlled and thermostatic). High heat dissipating payload units will be mounted on the North and South facing radiators. Uniform thermal conditions will be maintained by heat pipes which are integral to these radiators, and which pass directly behind the high power amplifiers. Redundant heat pipes allow any header pipe to fail without compromising communications performance. In addition dynamically controlled heater panels will be used to maintain the high power amplifiers within their required temperature range.

Lower powered units will be mounted on a subnadir shelf which will provide a benign stable thermal environment. Propulsion tanks and other bus equipment will be housed in an aft location which is relatively cool in comparison.

Exterior surfaces of the radiators will be covered with optical solar reflectors (OSR's). Thermal barriers and multilayer insulation will control internal spacecraft temperatures. Batteries and propulsion lines will be heated by solid state thermostatically controlled heaters.

2.6 Structure

The spacecraft structure will be a cubical enclosure with a series of equipment panels. Within the cubical enclosure, a cruciform will provide lateral tank support and transfer loads from the tanks. Equipment shelves will be aluminum-faced honeycomb while panels, struts and supports will be composite graphite-epoxy. This lightweight structure allows precise pointing of spacecraft antennas, while simultaneously providing support for all of the loads which the launch vehicles will subject upon the satellite.

3.0 Communication Payload Description

PAS-13 is an advanced hybrid communication satellite with C- and Ku-Band transponders which will be located at 93°WL. From its location at 93°WL, the PAS-13 will provide communications capacity between and within the United States and between and within the nations of Latin America. Using its C-Band transponders, PAS-13 will provide regional and domestic service for Latin America and domestic service for the US. Using its Ku-Band transponders, the satellite will provide communications capacity regionally and domestically throughout the Latin America; domestically in the US; and intercontinentally between the US and Latin America. Using its C- and Ku-Band transponders which have the option of being cross-strapped, PAS-13 will also permit telecommunications traffic flow between Latin America and the US in either band. In addition, a special Ku-Band uplink beam centered over South America has been designed so that small-terminal Ku-Band uplinking (including SNG type

services), will be possible with downlinking in either in the United States or South America.

Figure 1 is an overall view of the possible coverages of a satellite located at 93°WL, showing elevation angles for different locations. In this figure, elevation angles of 0°, 5° and 25° are shown. It can be seen from Figure 1 that PAS-13 will have the potential to reach from the Pacific Northwest of the US to the southern-most tip of South America as well as from Southeastern Alaska to the Antarctic and from Hawaii to Brazil. Footprints have been provided to represent the coverage patterns which are planned for this satellite. Not all of the patterns may eventually be used.

3.1 US/Latin American Capacity and Coverage at C-Band

The PAS-13 satellite will employ twenty-four C-Band transponders, each 36MHz in bandwidth. These transponders will be used for serving the United States and Latin America. In total, 1000MHz of bandwidth are used in this configuration. Each transponder operating in this frequency band will utilize an amplifier rated at 55 watts. The services will be directed through independent downlink antenna beams covering the entire North and South American continents as shown in Figure 2.

C-Band uplinking from the US and Latin America will be accomplished by independent beams co-coverage with the downlink beam and linearly orthogonally polarized to the downlink beam as shown in Figure 3.

FIGURE 1 - SPACECRAFT VIEW FROM 93WL-ELEVATION CONTOURS 0, 5 AND 25 DEG

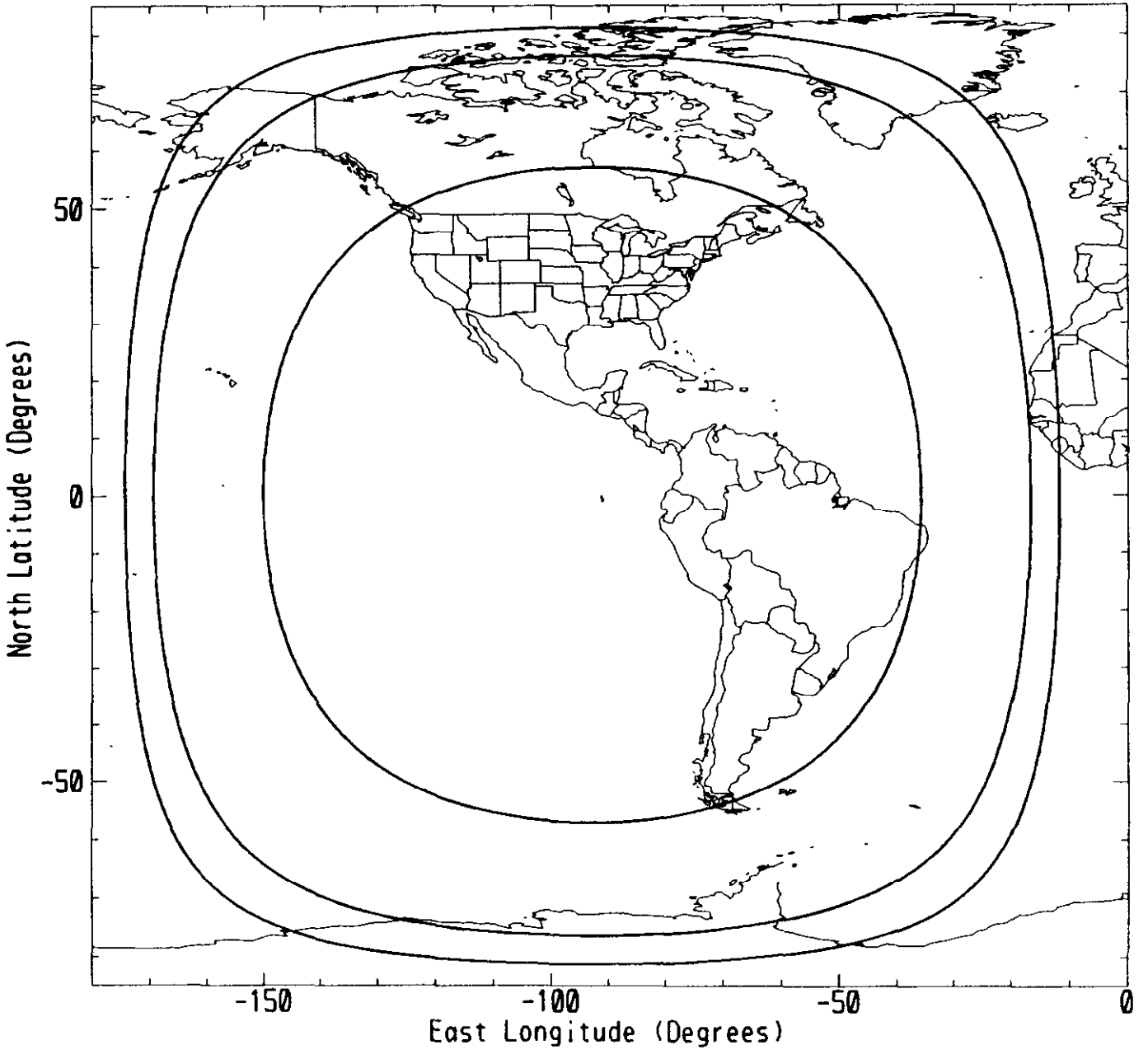


FIGURE 2 - C-BAND US/LATIN TRANSMIT BEAM

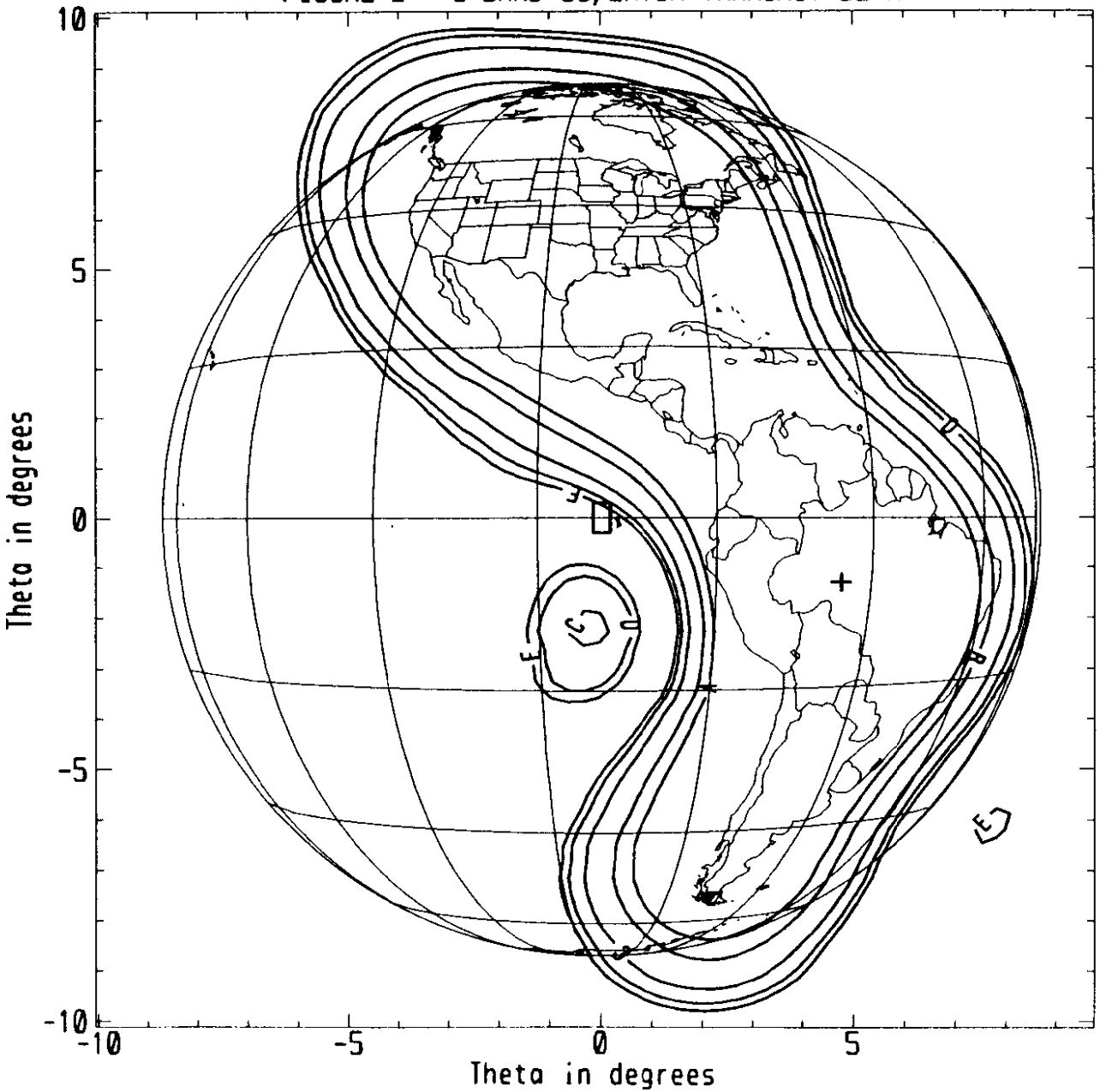
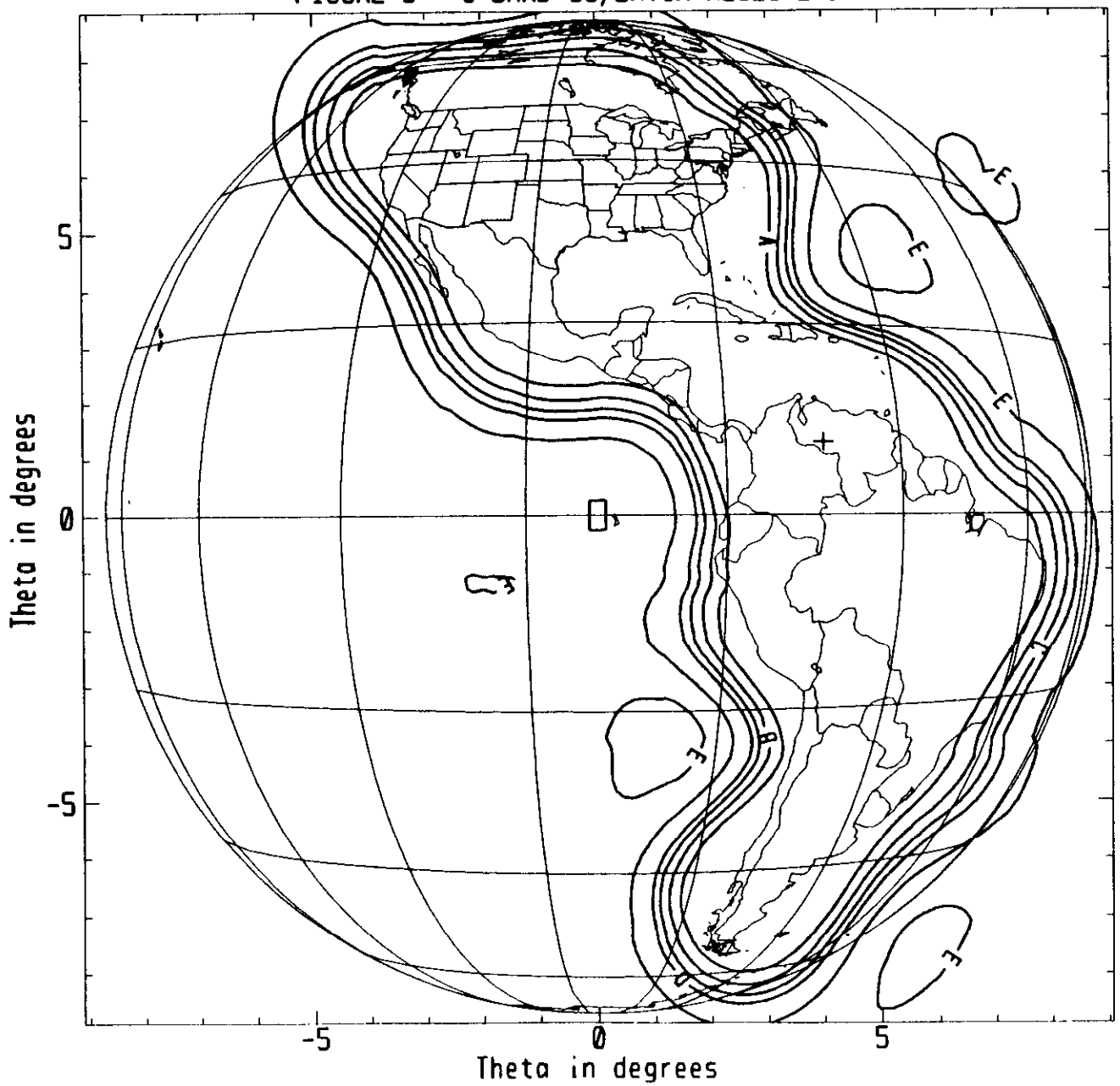


FIGURE 3 - C-BAND US/LATIN RECEIVE BEAM



3.2 US, Latin American Capacity and Coverage at Ku-Band

Ku-Band service in the North and South American continents will be provided by thirty-two traveling wave tube amplifiers and various uplink and downlink beams. Each Ku-Band amplifier will be powered by a traveling wave amplifier of one hundred and ten watts. The various Ku-Band beams are principally intended to provide regional and domestic service in Latin America and the US, but in many cases may be cross-strapped to C-Band beams allowing a wide variety of interconnections. The proposed downlink coverages are shown in Figures 4-9 and described as follows:

the US Beam - domestic coverage to US and Caribbean (Figure 4);
the South American Beam - covers all of South America (Figure 5);
the Brazil Beam - cover Brazil (Figure 6);
the Mexico/Central America Beam - cover Mexico and the nations of Central America (Figure 7);
the Andean Beam - covers Venezuela, Colombia, Ecuador and Peru and areas in-between and nearby (Figure 8);
the Southern Beam - covers Argentina, Bolivia, Chile and areas in-between and nearby (Figure 9);

Three uplink beams are provided at Ku-Band and shown in Figures 10-11.

the US/Carib/Mex/CAUplink Beam - providing US domestic, Caribbean, Mexico and Central America coverage (Figure 10);
the South American Uplink Beam - covers South America (Figure 11);

FIGURE 4 - KU-BAND US/CARIBBEAN TRANSMIT BEAM

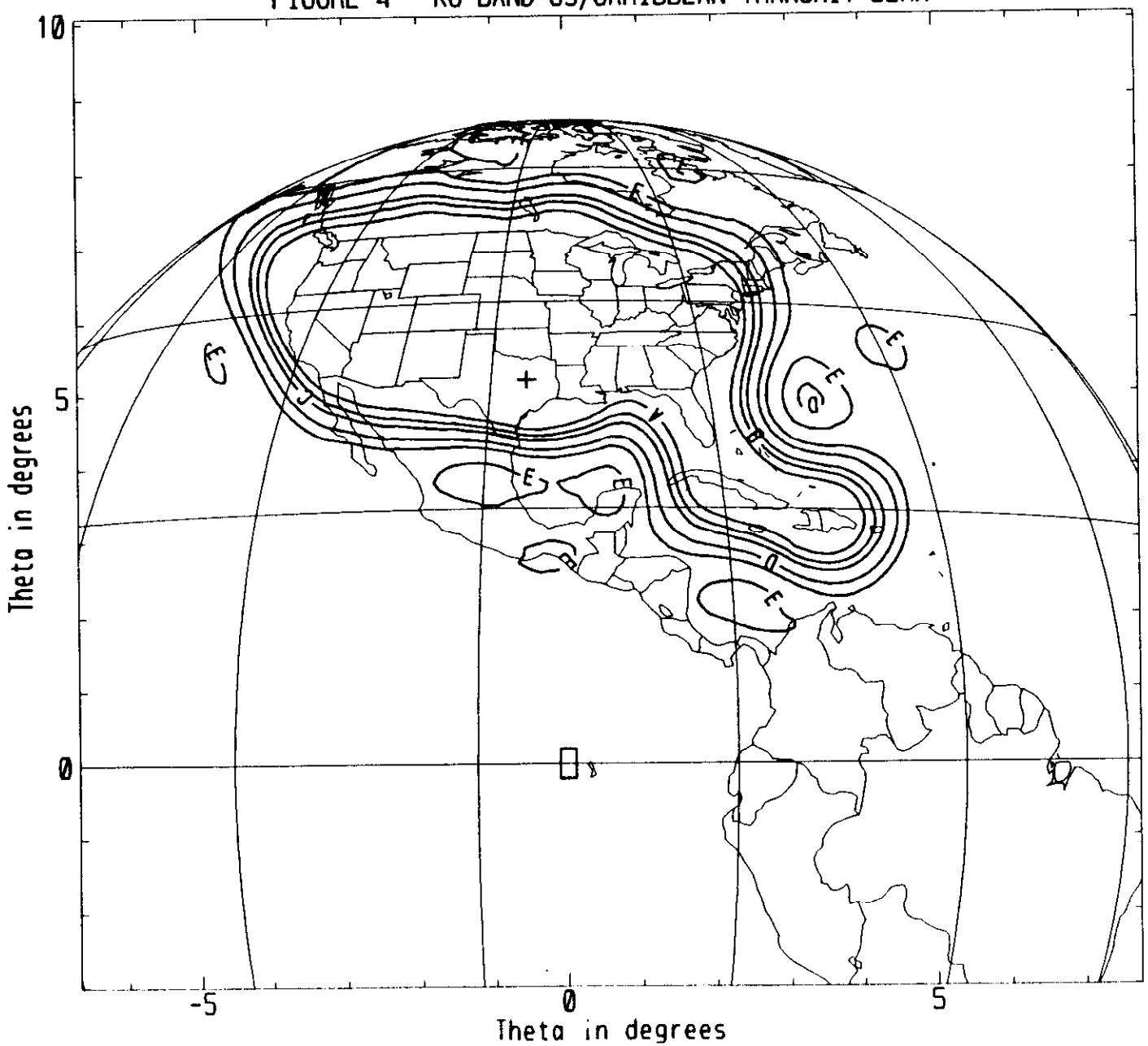


FIGURE 5 - KU-BAND SOUTH AMERICAN BEAM

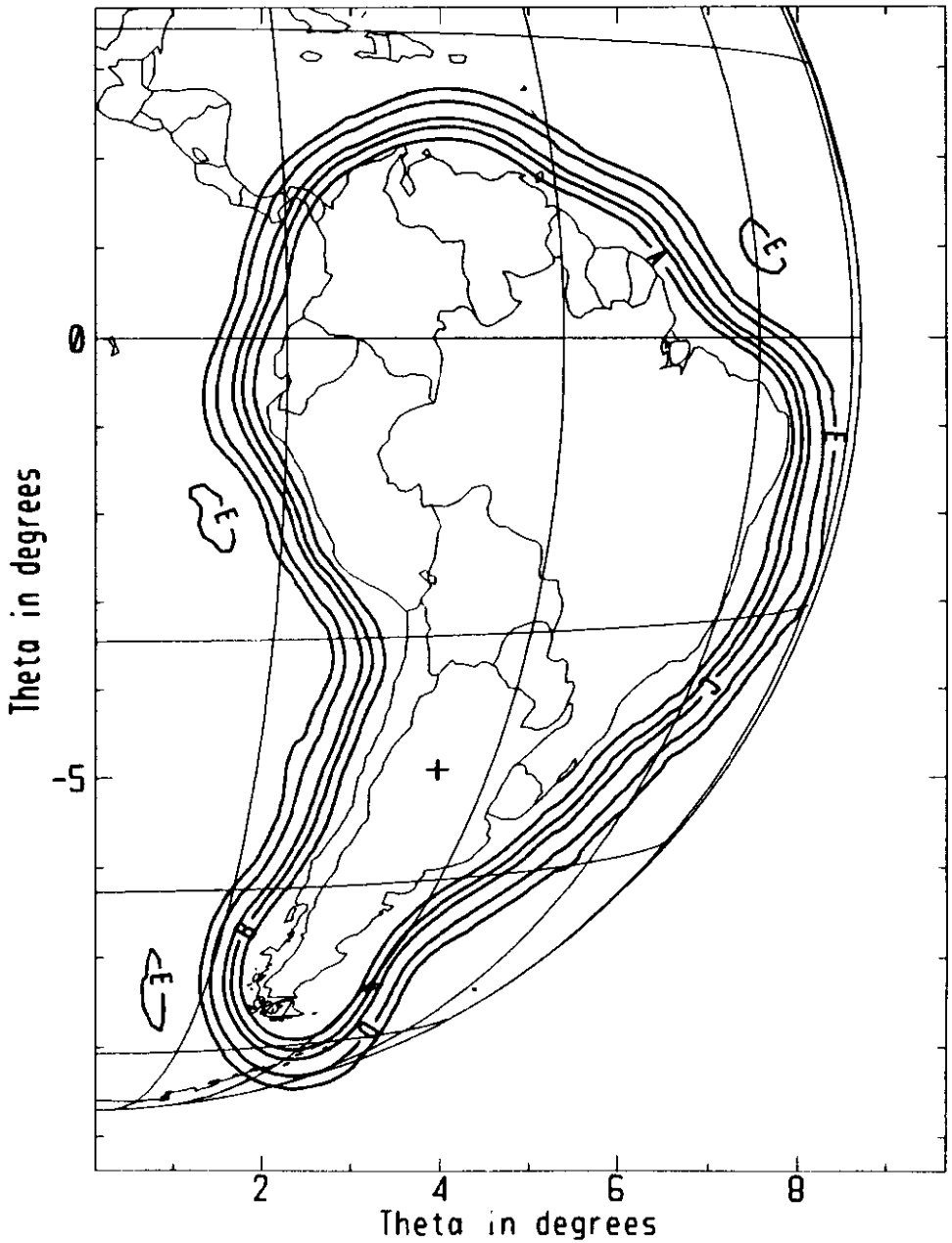


FIGURE 6 - KU-BAND BRAZIL BEAM

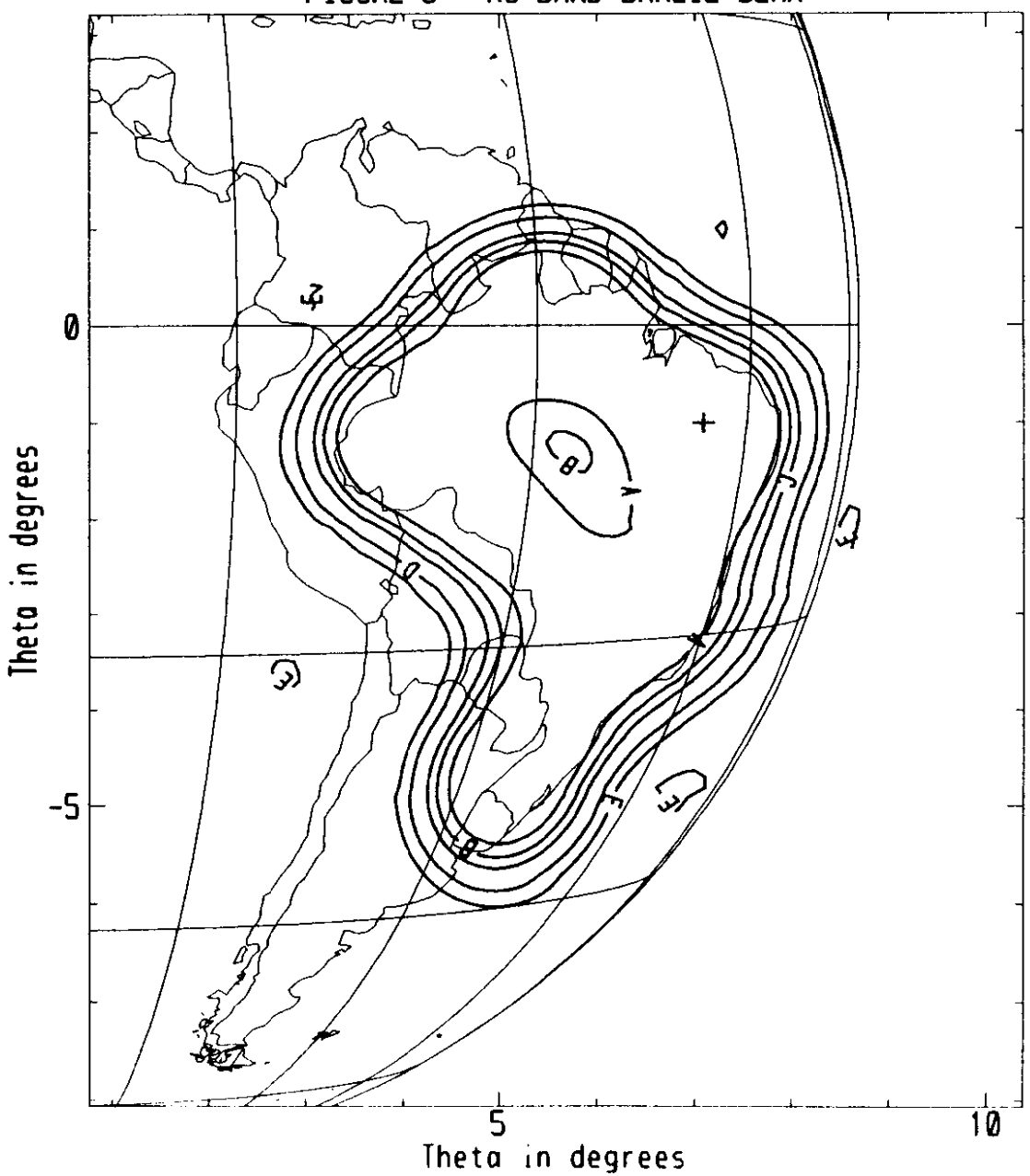


FIGURE 7 - KU-BAND MEXICO/CENTRAL AMERICA BEAM

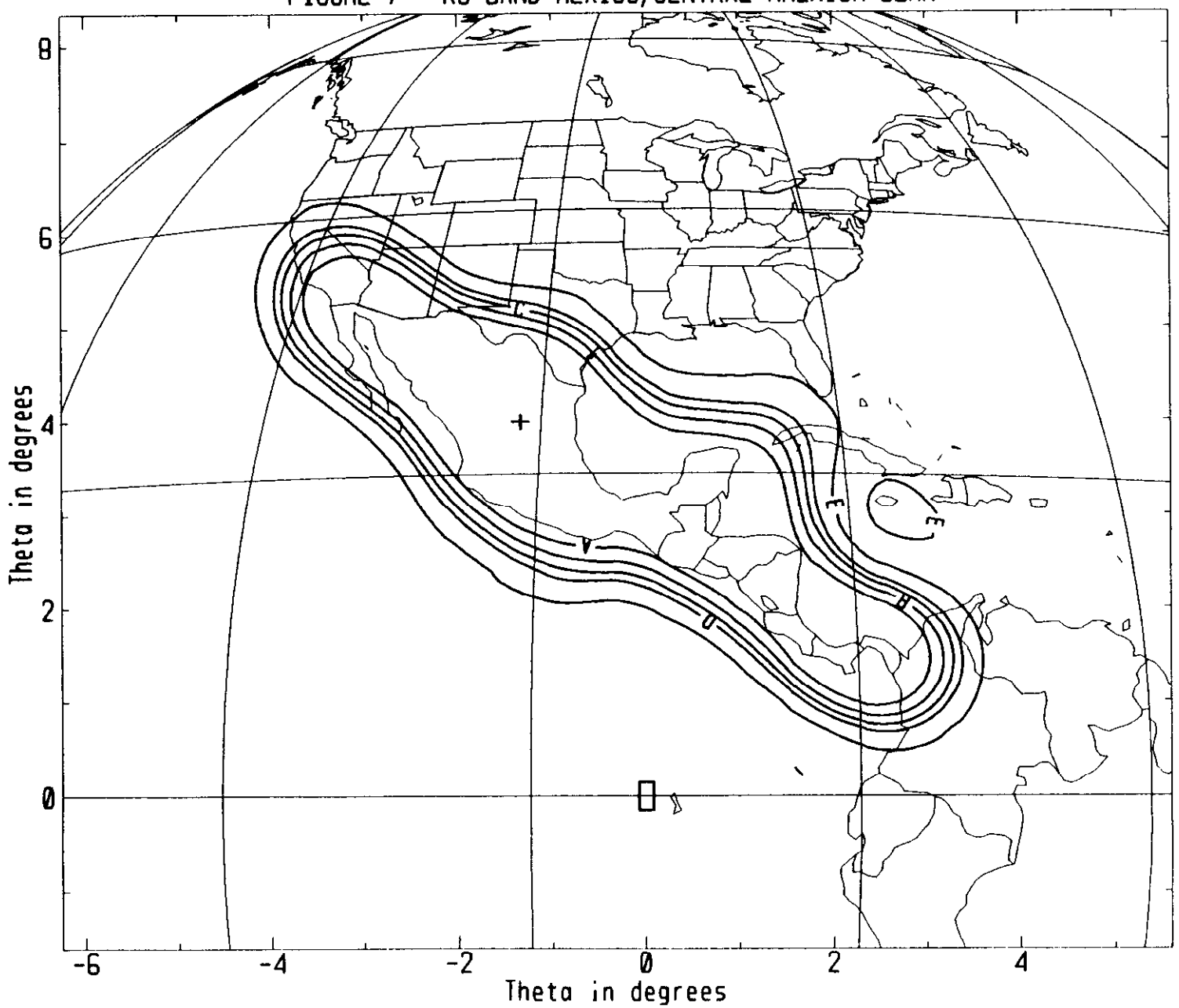


FIGURE 8 - KU-BAND ANDEAN BEAM

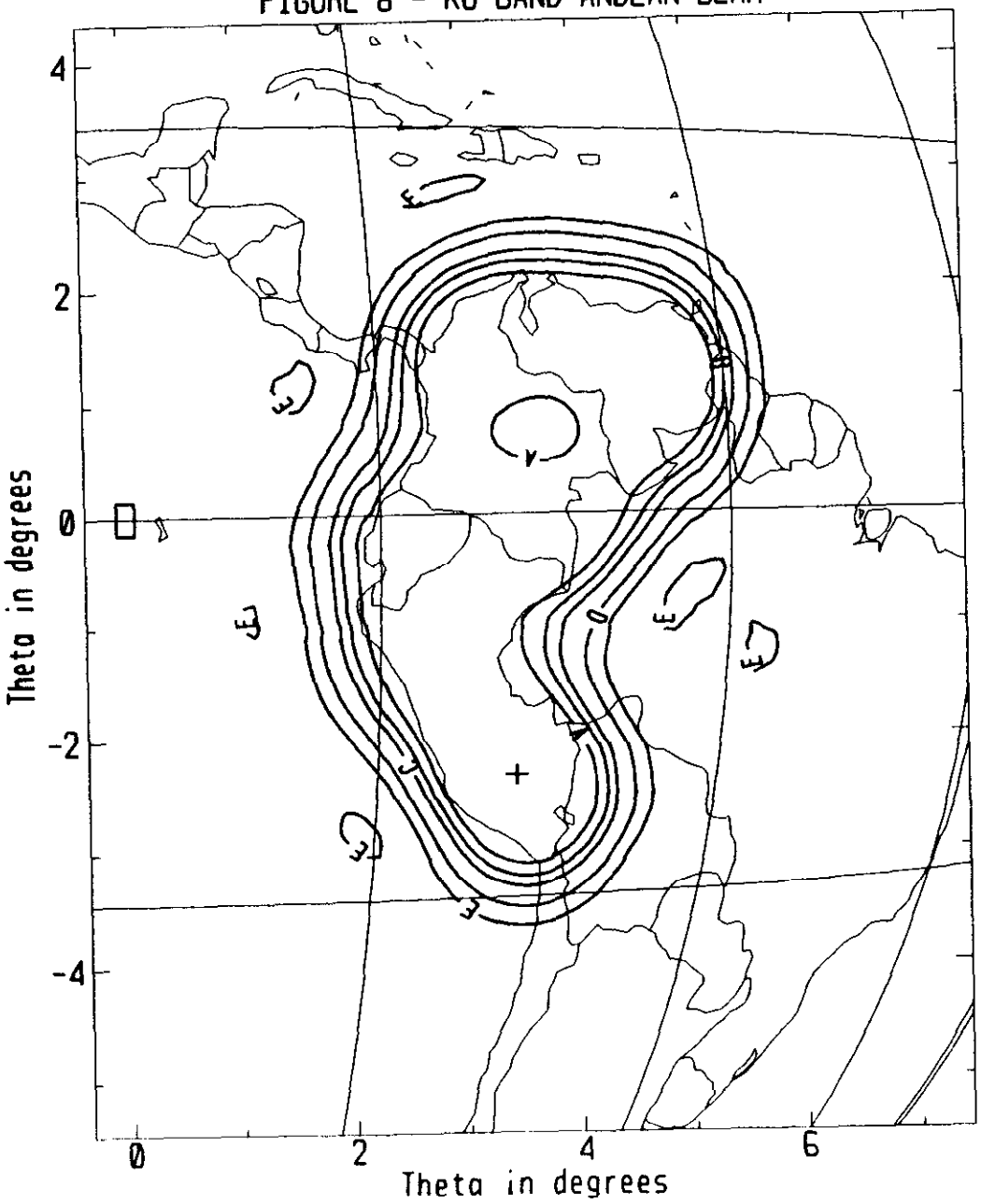


FIGURE 9 - KU-BAND SOUTHERN BEAM

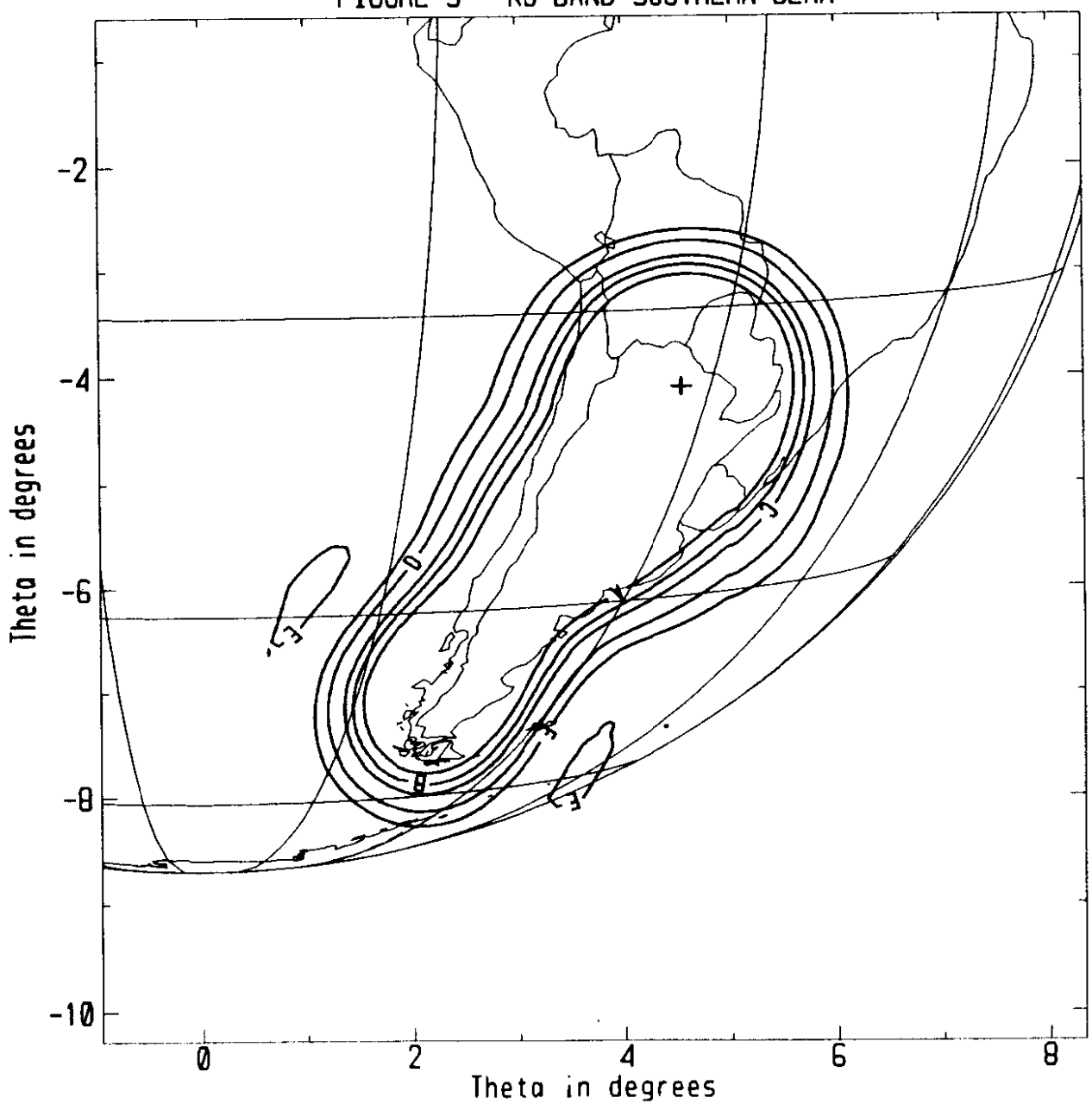


FIGURE 10 - KU-BAND US/CARIBBEAN/MEXICO/CA RECEIVE BEAM

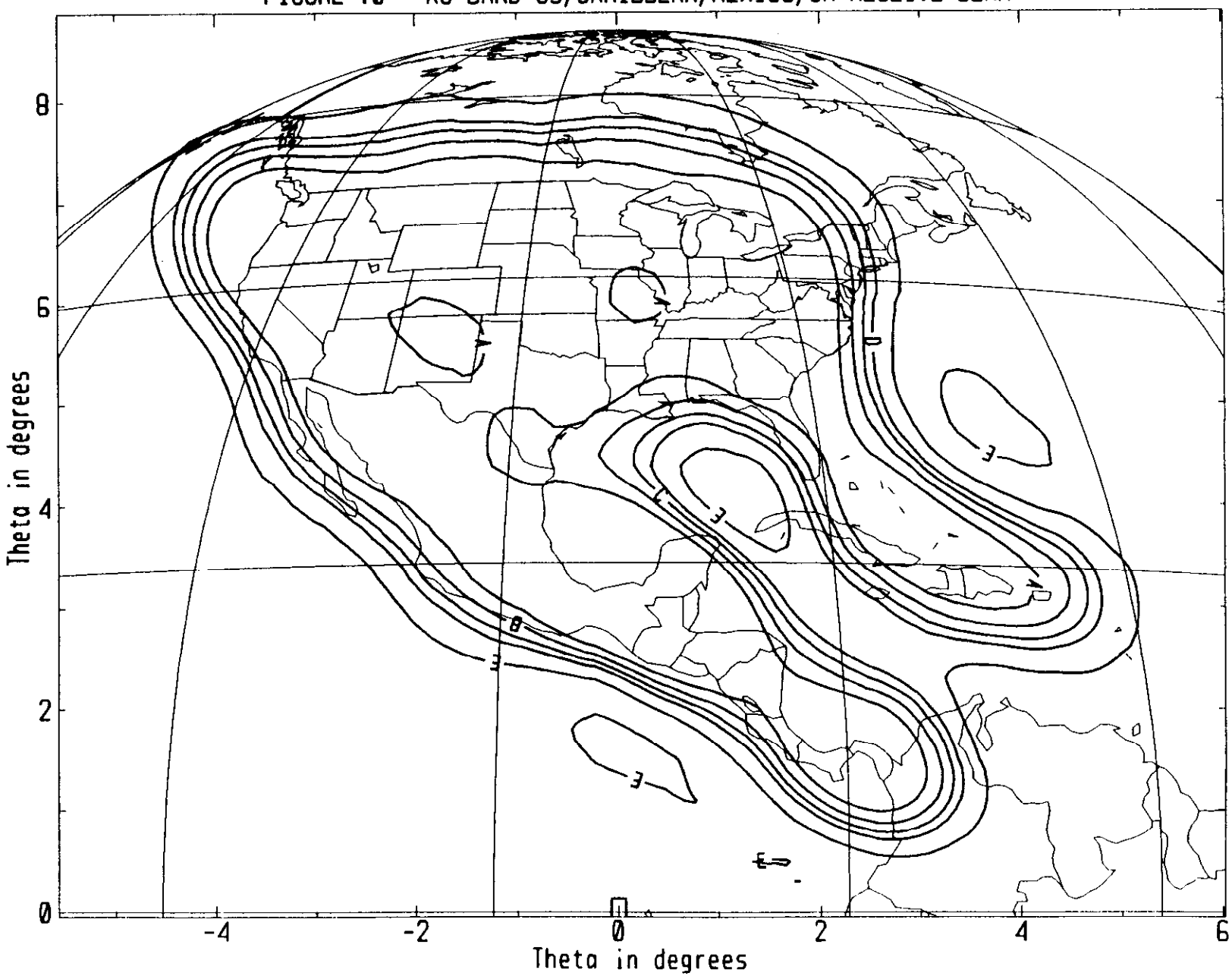
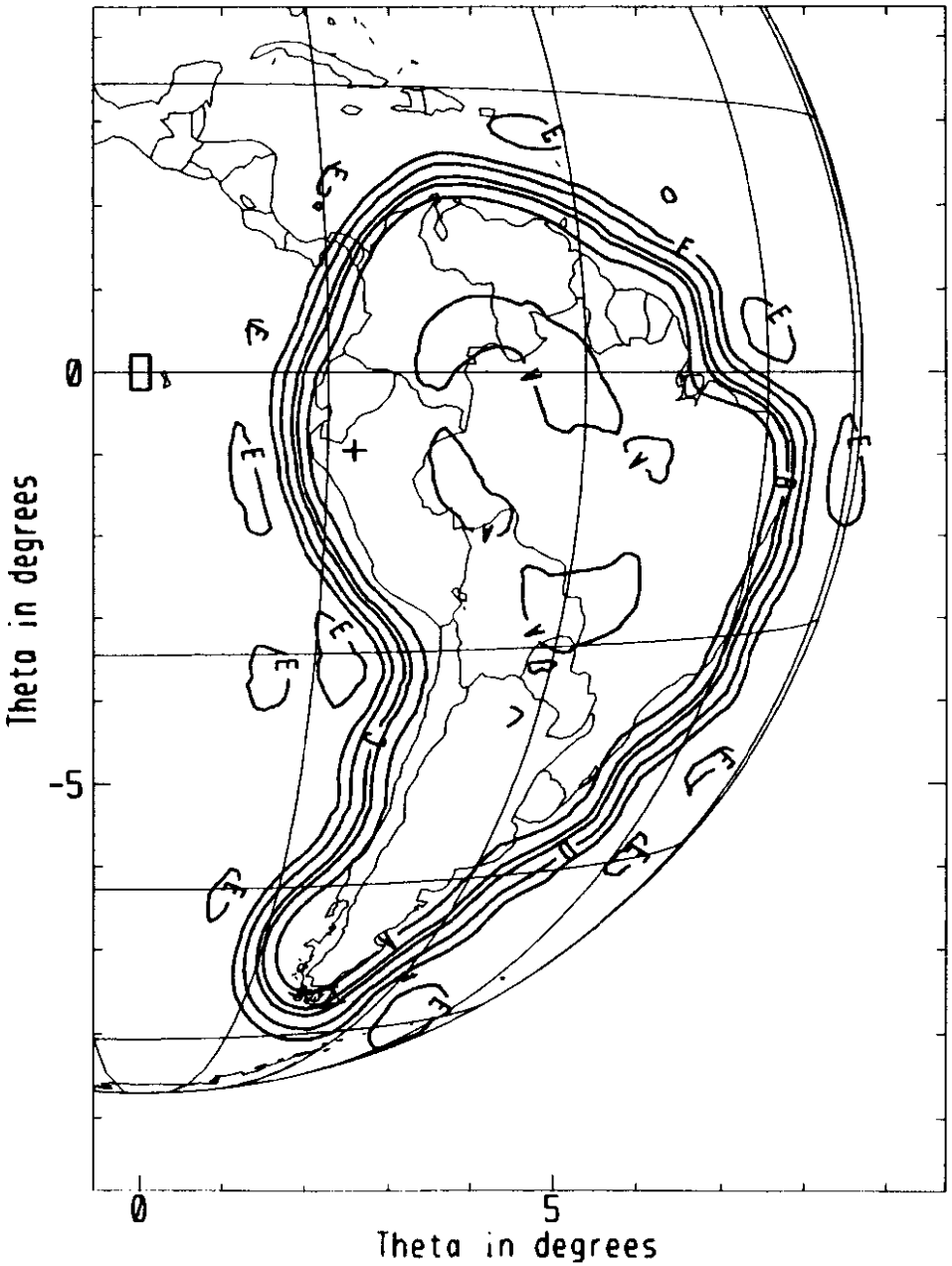


FIGURE 11 - KU-BAND SOUTH AMERICAN RECEIVE BEAM



3.3 Communication System Operation at C-Band

A vertical receive antenna and a horizontal receive antenna, both of which are shaped and gridded would be sandwiched on the same support structure. These antennas would feed 6GHz receivers, (three active, two spare) and subsequently be downconverted and fed to the input multiplexer which would separate out the channels for switching and amplification. The outputs of all C-Band amplifiers are fed through low-pass filters, switches and into the output multiplexers for each beam. Step attenuators allow the saturation flux density for each channel to be adjusted to twenty distinct values. These values would be set as a function of the traffic assigned to that transponder and the conditions assigned to its use.

3.4 Communication System Operation at Ku-Band

The communications system at Ku-Band consists of shaped vertical and horizontal gridded antennas which receive ground originated transmissions and feed these signals into a bank of receivers. The frequency translations provided by these receivers are geared to the US and the Latin American downlink bands. The downconverted output is connected to input multiplexers, then to step attenuators, driver amps, switches and finally the traveling wave tube amplifiers. The outputs of these amplifiers are combined in one of the output multiplexers for downlinking in the various transmit beams. The traveling wave tube amplifiers (including the spares) are nominally one hundred and ten watts output power.

3.5 Cross-Strapping of C and Ku-Band Transponders

Some portion (which will be decided upon at a later date) of the transponders on the satellite will be capable of being cross-strapped. Cross-strapping will occur when part of the signal energy for both Ku-Band and C-Band is coupled off to provide input to the cross-connected channels. In the C-Band repeaters, redundant C/Ku upconverters are followed by Ku-Band channelizing filters. In the Ku-Band repeater, redundant Ku/C down-converters are followed by C-Band channel filters. Converted signals are then switched into the opposite repeater, which follows the array of input multiplexers. From that point onward, the information signals are treated exactly the same as non-cross-strapped channels.

3.6 Communication System Redundancy

At C-Band, the power amplifier chains are arranged in two groups in such a way as to provide 15-12 ring redundancy which is implemented using R switches. In Ku-Band, the traveling wave tube amplifiers are arranged in two 20-16 ring redundancy groups. When using this approach to sparing, any amplifier is capable of using any available spare.

3.7 EIRP and G/T Performance

The C-Band and Ku-Band payload performance is described in Table 1 which is shown below:

Table 1

Beam	Directivity	EIRP/G/T
C-Band Transmit V/Pol Beam	26.8dBi	42.7dBW
C-Band Transmit H/Pol Beam	26.8dBi	42.7dBW
C-Band Receive V/Pol Beam	27.5dBi	0.5dB/°K
C-Band Receive H/Pol Beam	27.5dBi	0.5dB/°K
Ku-Band Transmit US/Car Beam	35.0dBi	53.0dBW
Ku-Band Transmit Brazil Beam	33.0dBi	50.5dBW
Ku-Band Transmit Southern Beam	36.7dBi	54.6dBW
Ku-Band Transmit Andean Beam	36.9dBi	54.8dBW
Ku-Band Transmit Mex/CA Beam	36.5dBi	54.4dBW
Ku-Band Transmit South America Beam	30.0dBi	48.5dBW
Ku-Band Receive US/Car/Mex/CA Beam	35.6dBi	7.6dB/°K
Ku-Band Receive South America Beam	30.6dBi	2.6dB/°K

The gain values shown in Table 1 are for beam center and may be used with the footprints shown in Figures 2-11 to determine exact EIRP or G/T for any specific locations of interest. Saturation Flux Density (SFD) will be controlled by a gain step attenuator which is variable in 1dB increments for a range of up to 20dB.

3.8 Cross-Polarization Isolation

At any point in the coverage regions of the various beams shown in Figures 2-11, and at any receive or transmit frequency, the cross-

polarization isolation between any channel and any other cross-polarized channel will be at least 27dB.

3.9 Other Communication System Parameters

The other parameters for both the C-Band and Ku-Band communications systems including:

1. Short-term frequency stability
2. Transponder channel gain flatness
3. Transponder channel gain slope
4. Transponder channel input out-of-band response
5. Transponder channel output out-of-band response
6. Wideband out-of-band response
7. Input group delay
8. Total group delay
9. Group delay stability
10. Transponder phase shift vs. level
11. Amplitude linearity
12. Intelligible crosstalk
13. Small signal gain stability
14. Spurious outputs

shall all be specified between PanAmSat and the spacecraft contractor and comply with good engineering practices and any applicable rules of the FCC Part 25 Rules and Regulations.

3.10 Cessation of Emissions

It shall be possible to turn on and off by ground command, each transponder channel independently of all other channels. PanAmSat shall constantly monitor its channels to make certain that no undue interference results from their operation. In addition, all analog video uplinks operating through PAS-13 shall be equipped with an ATIS system, monitored by the PanAmSat's Atlanta and Homestead Teleport.

4.0 Frequency and Polarization Plan

PAS-13 is a large hybrid satellite with fifty-six transponders operating in both C-Band and Ku-Band. The satellite is cross-polarized (i.e., uplink and downlink transmissions are polarized orthogonally) in both C-Band and Ku-Band.

4.1 C-Band Operation

At C-Band, the satellite will have twenty-four operating transponders which provide full frequency reuse in that band. The C-Band transponders will follow the center frequency assignments shown in Table 2. Each transponder in this plan is 36MHz in bandwidth. Satellite reception occurs from 5.925GHz to 6.425GHz, while satellite transmission is at 3.7GHz to 4.2GHz. Signals are received in both polarizations and the band is reused for the full 500MHz.

Table 2 - C-Band Frequency Assignments

Transmission Channel	Freq Up/Dn	Pol	Transmission Channel	Freq Up/Dn	Pol
1	5965/3740	V/H	13	5945/3720	H/V
2	6005/3780	V/H	14	5985/3760	H/V
3	6045/3820	V/H	15	6025/3800	H/V
4	6085/3860	V/H	16	6065/3840	H/V
5	6125/3900	V/H	17	6105/3880	H/V
6	6165/3940	V/H	18	6145/3920	H/V
7	6205/3980	V/H	19	6185/3960	H/V
8	6245/4020	V/H	20	6225/4000	H/V
9	6285/4060	V/H	21	6265/4040	H/V
10	6325/4100	V/H	22	6305/4080	H/V
11	6365/4140	V/H	23	6345/4120	H/V
12	6405/4180	V/H	24	6385/4160	H/V

4.2 Ku-Band Operation

Thirty-six transponders, each 36MHz in bandwidth, will be employed at Ku-Band. These transponders will operate at the Ku-Band frequencies shown in Table 3.

Table 3 - Ku-Band Frequency Assignments

Transmission Channel	Freq Up/Dn	Pol	Transmission Channel	Freq Up/Dn	Pol

1	13775/11475	V/H	19	13795/11495	H/V
2	13815/11515	V/H	20	13835/11535	H/V
3	13855/11555	V/H	21	13875/11575	H/V
4	13895/11595	V/H	22	13915/11615	H/V
5	13935/11635	V/H	23	13955/11655	H/V
6	13975/11675	V/H	24	13995/11695	H/V
7	14015/11715	V/H	25	14035/11735	H/V
8	14055/11755	V/H	26	14075/11775	H/V
9	14095/11795	V/H	27	14115/11815	H/V
10	14135/11835	V/H	28	14155/11855	H/V
11	14175/11875	V/H	29	14195/11895	H/V
12	14215/11915	V/H	30	14235/11935	H/V
13	14255/11955	V/H	31	14275/11975	H/V
14	14295/11995	V/H	32	14315/12015	H/V
15	14335/12035	V/H	33	14355/12055	H/V
16	14375/12075	V/H	34	14395/12095	H/V
17	14415/12115	V/H	35	14435/12135	H/V
18	14455/12155	V/H	36	14475/12175	H/V

4.3 C-Band and Ku-Band Beacons

PAS-13 will utilize beacons at both C-Band and Ku-Band for the purpose of allowing large and small stations to track the motion of the satellite when required. Although it is unlikely that many C-Band stations will require a beacon, this carrier is provided in the form of the telemetry channel. Earth stations requiring a beacon in the absence of programming

or for use with UPC functions will find that beacon at approximately 12.2GHz (exact frequency to be filed with AP-3 materials).

5.0 Technical Analysis of Various Services to be Offered

A full range of domestic and international communications services are anticipated for PAS-13. This includes:

Video services :

1. Full bandwidth analog video;
2. Reduced bandwidth analog video;
3. Wideband high definition video and audio;
4. TDM compressed digital video
5. SCPC compressed digital video
6. MCPC compressed digital video
7. SNG between Latin America and the US;

Audio services:

8. SCPC-FM 15kHz audio;
9. SCPC-FM 7.5kHz audio;
10. subcarrier audio;
11. digital audio;

Digital services in the mode of IBS and IDR:

12. 56/64kBps;
13. 128kBps;
14. 256kBps;

15. 512kBps;
16. 768kBps;
17. T1 (1.544MBps);
18. CEPT (2.048MBps);
19. 45MBps.

VSat services

20. Using Hub stations and TDM/TDMA modulation;
21. Using mesh operations.

as well as other newer types of communications offerings as will be available in the 1997-98 time frame.

Sample link analyses provided examine how some of these services would utilize satellite bandwidth and power when operating with different types of earth stations in the various beams which will be available.

No effort has been made to examine every possible case which could occur and the analyses are meant to offer a general picture of how the satellite will be operated when in-orbit. Links are shown for individual beams and services in order to be illustrative of each type of service.

5.1 Assumptions Used in the Calculations

In general link analyses at C-Band are computed for stations within the satellite's -3dB uplink and -4dB downlink contours. At Ku-Band the link

PANAMSAT-13

SATELLITE DATA	Satellite : PAS-			
	Uplink Beam: C-Band		Dnlink Beam: C-Band	
	Uplink POL: H		Dnlink POL: V	
	G/T:-3.5* dB/K, SFD:* dBW/m2		Dnlink EIRP: 38.7* dBW	
TRANSPONDER DATA	Trans Bandwidth :36.0 MHz		Trans Type: SSPA	
	Uplink Frequency:6.175 GHz		Dnlink Freq: 3.950 GHz	
	Aggregate IBO : 6.5* dB		Aggregate OBO: 4.5 dB	
CARRIER DATA	Type: IBS, Info Rate: 64 kbps, Mod: QPSK, Code Rate: R1/2			
	BWo: 82kHz, BWa: 112.5kHz, C/Nnom: 6.8dB, C/Nmin: 5.7dB			
	LINK BUDGET		CLR SKY	UP FADE	DN FADE
UPLINK PERFORMANCE	Earth Station EIRP	(dBW)	46.1	n/a	n/a
	- Uplink Path Loss, clear sky	(dB)	-200.2	n/a	n/a
	- Uplink Rain Attenuation	(dB)	0.0	n/a	n/a
	+ Satellite G/T	(dB/K)	-3.5	n/a	n/a
	- Boltzman's Constant	(dBW/K-Hz)	228.6	n/a	n/a
	- Carrier Noise Bandwidth	(dB-Hz)	-49.1	n/a	n/a
	C/N Uplink	(dB)	21.9	n/a	n/a
DOWNLINK PERFORMANCE	Satellite Saturation EIRP	(dBW)	38.7	n/a	n/a
	- Output Backoff per carrier	(dB)	-29.8	n/a	n/a
	- Dnlink Path Loss, clear sky	(dB)	-196.3	n/a	n/a
	- Dnlink Rain Degradation	(dB)	0.0	n/a	n/a
	- Antenna Pointing Error	(dB)	-.5	n/a	n/a
	+ Earth Station G/T, clear sky	(dB/K)	17.2	n/a	n/a
	- Boltzman's Constant	(dBW/K-Hz)	228.6	n/a	n/a
	- Carrier Noise Bandwidth	(dB-Hz)	-49.1	n/a	n/a
	C/N Dnlink	(dB)	8.7	n/a	n/a
COMPOSITE PERFORMANCE	C/N Uplink	(dB)	21.9	n/a	n/a
	C/N Dnlink	(dB)	8.7	n/a	n/a
	C/I Intermod	(dB)	19.5	n/a	n/a
	C/I Uplink Co-channel	(dB)	26.8	n/a	n/a
	C/I Dnlink Co-Channel	(dB)	26.8	n/a	n/a
	C/I Uplink Adj. Sat. (SAT 1)	(dB)	23.0	n/a	n/a
	C/I Dnlink Adj. Sat. (SAT 1)	(dB)	23.0	n/a	n/a
	C/(N+I) COMPOSITE	(dB)	7.8	n/a	n/a
	Minimum Required C/N	(dB)	6.8	n/a	n/a
	Link Margin	(dB)	1.0	n/a	n/a
TRANS USAGE	% BW/CARR: 0.31, % PWR/CARR: 0.3, Max No. Carriers: 320.0				
TX ES INFO.	Loc: EOC_1 ID:C2.4 AZ: 0.0 Elev: 20.0				
	EIRP per carrier: 46.1 dBW, Carrier Pwr: 2.6 watts				
RX ES INFO.	Loc: EOC_2 ID:C2.4 AZ: 0.0 Elev: 20.0				
INTF. INFO.	Uplink Pwr Den: -45.0 dBW/Hz, Dnlink EIRP Den: -36.2 dBW/Hz				

TABLE 4
PAS-13
64KBPS CARRIER ON C-BAND US/LATIN BEAM

PANAMSAT CORPORATION
Engineering and Operations
Washington, D.C.

PANAMSAT-13

SATELLITE DATA	Satellite : PAS-			
	Uplink Beam: C-Band		Dnlink Beam: C-Band	
	Uplink POL: H		Dnlink POL: V	
	G/T:-3.5* dB/K, SFD:* dBW/m2		Dnlink EIRP: 38.7* dBW	
TRANSPONDER DATA	Trans Bandwidth :36.0 MHz		Trans Type: SSPA	
	Uplink Frequency:6.175 GHz		Dnlink Freq: 3.950 GHz	
	Aggregate IBO : 6.5* dB		Aggregate OBO: 4.5 dB	
CARRIER DATA	Type: IBS, Info Rate: 1544 kbps, Mod: QPSK, Code Rate: R3/4			
	BWo: 1311kHz, BWa: 1553.0kHz, C/Nnom: 10.1dB, C/Nmin: 9.0dB			

	LINK BUDGET		CLR SKY	UP FADE	DN FADE
UPLINK PERFORMANCE	Earth Station EIRP	(dBW)	60.8	n/a	n/a
	- Uplink Path Loss, clear sky	(dB)	-200.2	n/a	n/a
	- Uplink Rain Attenuation	(dB)	0.0	n/a	n/a
	+ Satellite G/T	(dB/K)	-3.5	n/a	n/a
	- Boltzman's Constant	(dBW/K-Hz)	228.6	n/a	n/a
	- Carrier Noise Bandwidth	(dB-Hz)	-61.2	n/a	n/a
	C/N Uplink	(dB)	24.6	n/a	n/a
DOWNLINK PERFORMANCE	Satellite Saturation EIRP	(dBW)	38.7	n/a	n/a
	- Output Backoff per carrier	(dB)	-18.1	n/a	n/a
	- Dnlink Path Loss, clear sky	(dB)	-196.3	n/a	n/a
	- Dnlink Rain Degradation	(dB)	0.0	n/a	n/a
	- Antenna Pointing Error	(dB)	-.5	n/a	n/a
	+ Earth Station G/T, clear sky	(dB/K)	21.5	n/a	n/a
	- Boltzman's Constant	(dBW/K-Hz)	228.6	n/a	n/a
	- Carrier Noise Bandwidth	(dB-Hz)	-61.2	n/a	n/a
	C/N Dnlink	(dB)	12.7	n/a	n/a
COMPOSITE PERFORMANCE	C/N Uplink	(dB)	24.6	n/a	n/a
	C/N Dnlink	(dB)	12.7	n/a	n/a
	C/I Intermod	(dB)	19.2	n/a	n/a
	C/I Uplink Co-channel	(dB)	27.1	n/a	n/a
	C/I Dnlink Co-Channel	(dB)	27.1	n/a	n/a
	C/I Uplink Adj. Sat. (SAT 1)	(dB)	26.3	n/a	n/a
	C/I Dnlink Adj. Sat. (SAT 1)	(dB)	26.3	n/a	n/a
	C/(N+I) COMPOSITE	(dB)	11.1	n/a	n/a
	Minimum Required C/N	(dB)	10.1	n/a	n/a
	Link Margin	(dB)	1.0	n/a	n/a

TRANS USAGE	% BW/CARR: 4.31, % PWR/CARR: 4.42, Max No. Carriers: 22.6		
TX ES INFO.	Loc: EOC_1	ID:C3.7	AZ: 0.0 Elev: 20.0
	EIRP per carrier: 60.8 dBW,	Carrier Pwr: 32.7 watts	
RX ES INFO.	Loc: EOC_2	ID:C3.7	AZ: 0.0 Elev: 20.0
INTF. INFO.	Uplink Pwr Den: -46.0 dBW/Hz, Dnlink EIRP Den: -36.6 dBW/Hz		

Figure 5
PAS-13
T1 CARRIER ON C-BAND US/LATIN BEAM

PANAMSAT CORPORATION
Engineering and Operations
Washington, D.C.

SATELLITE DATA	Satellite : PAS-				
	Uplink Beam: C-Band		Dnlink Beam: C-Band		
	Uplink POL: H		Dnlink POL: V		
	G/T:-3.5* dB/K, SFD:* dBW/m2		Dnlink EIRP: 38.7* dBW		
TRANSPONDER DATA	Trans Bandwidth :36.0 MHz		Trans Type: SSPA		
	Uplink Frequency:6.175 GHz		Dnlink Freq: 3.950 GHz		
	Aggregate IBO : 6.5* dB		Aggregate OBO: 4.5 dB		
CARRIER DATA	Type: TV/PSK/SCPC, Info Rate: 3000 kbps, Mod: QPSK, R2/3				
	BWo: 3130kHz, BWa: 3425kHz, C/Nnom: 5.8dB, C/Nmin: 5.8dB				
	LINK BUDGET			CLR SKY	UP FADE	DN FADE
UPLINK PERFORMANCE	Earth Station EIRP	(dBW)		61.4	n/a	n/a
	- Uplink Path Loss, clear sky	(dB)		-200.2	n/a	n/a
	- Uplink Rain Attenuation	(dB)		0.0	n/a	n/a
	+ Satellite G/T	(dB/K)		-3.5	n/a	n/a
	- Boltzman's Constant	(dBW/K-Hz)		228.6	n/a	n/a
	- Carrier Noise Bandwidth	(dB-Hz)		-65.0	n/a	n/a
	C/N Uplink	(dB)		21.3	n/a	n/a
DOWNLINK PERFORMANCE	Satellite Saturation EIRP	(dBW)		38.7	n/a	n/a
	- Output Backoff per carrier	(dB)		-13.6	n/a	n/a
	- Dnlink Path Loss, clear sky	(dB)		-196.3	n/a	n/a
	- Dnlink Rain Degradation	(dB)		0.0	n/a	n/a
	- Antenna Pointing Error	(dB)		-.5	n/a	n/a
	+ Earth Station G/T, clear sky	(dB/K)		15.5	n/a	n/a
	- Boltzman's Constant	(dBW/K-Hz)		228.6	n/a	n/a
	- Carrier Noise Bandwidth	(dB-Hz)		-65.0	n/a	n/a
	C/N Dnlink	(dB)		7.5	n/a	n/a
COMPOSITE PERFORMANCE	C/N Uplink	(dB)		21.3	n/a	n/a
	C/N Dnlink	(dB)		7.5	n/a	n/a
	C/I Intermod	(dB)		19.9	n/a	n/a
	C/I Uplink Co-channel	(dB)		28.2	n/a	n/a
	C/I Dnlink Co-Channel	(dB)		28.2	n/a	n/a
	C/I Uplink Adj. Sat. (SAT 1)	(dB)		22.0	n/a	n/a
	C/I Dnlink Adj. Sat. (SAT 1)	(dB)		22.0	n/a	n/a
	C/(N+I) COMPOSITE	(dB)		6.7	n/a	n/a
	Minimum Required C/N	(dB)		5.8	n/a	n/a
	Link Margin	(dB)		.9	n/a	n/a
TRANS USAGE	% BW/CARR: 9.51, % PWR/CARR: 12.5, Max No. Carriers: 8.0					
TX ES INFO.	Loc: EOC_1	ID:C4.6	AZ: 0.0 Elev: 20.0			
	EIRP per carrier: 61.4 dBW,	Carrier Pwr: 23.8 watts				
RX ES INFO.	Loc: EOC_2	ID:C1.8_TVRO	AZ: 0.0 Elev: 20.0			
INTF. INFO.	Uplink Pwr Den: -51.2 dBW/Hz, Dnlink EIRP Den: -35.8 dBW/Hz					

TABLE 6
PAS-13
TV/PSK-SCPC CARRIER ON C-BAND US/LATIN BEAM

PANAMSAT CORPORATION
Engineering and Operations
Washington, D.C.

SATELLITE DATA	Satellite : PAS-				
	Uplink Beam: C-Band			Dnlink Beam: C-Band	
	Uplink POL: H			Dnlink POL: V	
	G/T:-3.5* dB/K, SFD:* dBW/m2			Dnlink EIRP: 38.7* dBW	
TRANSPONDER DATA	Trans Bandwidth :36.0 MHz			Trans Type: SSPA	
	Uplink Frequency:6.175 GHz			Dnlink Freq: 3.950 GHz	
	Aggregate IBO : 0.0 dB			Aggregate OBO: 0.0 dB	
CARRIER DATA	Type: TV/PSK/MCPC, Info Rate: 45358 kbps, Mod: QPSK, R7/8				
	BWo: 36000kHz, BWa: 36000kHz, C/Nnom: 8.4dB, C/Nmin: 8.4dB				
LINK BUDGET			CLR SKY	UP FADE	DN FADE
UPLINK PERFORMANCE	Earth Station EIRP	(dBW)	72.9	n/a	n/a
	- Uplink Path Loss, clear sky	(dB)	-200.2	n/a	n/a
	- Uplink Rain Attenuation	(dB)	0.0	n/a	n/a
	+ Satellite G/T	(dB/K)	-3.5	n/a	n/a
	- Boltzman's Constant	(dBW/K-Hz)	228.6	n/a	n/a
	- Carrier Noise Bandwidth	(dB-Hz)	-75.6	n/a	n/a
	C/N Uplink	(dB)	22.2	n/a	n/a
DOWNLINK PERFORMANCE	Satellite Saturation EIRP	(dBW)	38.7	n/a	n/a
	- Output Backoff per carrier	(dB)	0.0	n/a	n/a
	- Dnlink Path Loss, clear sky	(dB)	-196.3	n/a	n/a
	- Dnlink Rain Degradation	(dB)	0.0	n/a	n/a
	- Antenna Pointing Error	(dB)	-.5	n/a	n/a
	+ Earth Station G/T, clear sky	(dB/K)	15.5	n/a	n/a
	- Boltzman's Constant	(dBW/K-Hz)	228.6	n/a	n/a
	- Carrier Noise Bandwidth	(dB-Hz)	-75.6	n/a	n/a
	C/N Dnlink	(dB)	10.4	n/a	n/a
COMPOSITE PERFORMANCE	C/N Uplink	(dB)	22.2	n/a	n/a
	C/N Dnlink	(dB)	10.4	n/a	n/a
	C/I Uplink Co-channel	(dB)	27.0	n/a	n/a
	C/I Dnlink Co-Channel	(dB)	27.0	n/a	n/a
	C/I Uplink Adj. Sat. (SAT 1)	(dB)	24.6	n/a	n/a
	C/I Dnlink Adj. Sat. (SAT 1)	(dB)	24.6	n/a	n/a
	C/(N+I) COMPOSITE	(dB)	9.7	n/a	n/a
	Minimum Required C/N	(dB)	8.4	n/a	n/a
	Link Margin	(dB)	1.3	n/a	n/a
TRANS USAGE	% BW/CARR: 100.00, % PWR/CARR: 100.00, Max No. Carriers: 1.0				
TX ES INFO.	Loc: EOC_1 ID:C4.6 AZ: 0.0 Elev: 20.0				
	EIRP per carrier: 72.9 dBW, Carrier Pwr: 338.7 watts				
RX ES INFO.	Loc: EOC_2 ID:C1.8_TVRO AZ: 0.0 Elev: 20.0				
INTF. INFO.	Uplink Pwr Den: -50.3 dBW/Hz, Dnlink EIRP Den: -32.9 dBW/Hz				

TABLE 7
PAS-13
TV/PSK- MCPC CARRIER ON C-BAND US/LATIN BEAM

PANAMSAT CORPORATION
Engineering and Operations
Washington, D.C.

SATELLITE DATA	Satellite : PAS-				
	Uplink Beam: Ku-Band_US		Dnlink Beam: Ku-Band_US		
	Uplink POL: V		Dnlink POL: H		
	G/T:5.6 dB/K, SFD:* dBW/m2		Dnlink EIRP: 51.0 dBW		
TRANSPONDER DATA	Trans Bandwidth :27.0 MHz		Trans Type: TWTA		
	Uplink Frequency:14.250 GHz		Dnlink Freq: 11.950 GHz		
	Aggregate IBO : 9* dB		Aggregate OBO: 5.3 dB		
CARRIER DATA	Type: IBS, Info Rate: 64 kbps, Mod: QPSK, Code Rate: R1/2				
	BWo: 82kHz, BWa: 112.5kHz, C/Nnom: 6.8dB, C/Nmin: 5.7dB				
	LINK BUDGET		CLR SKY	UP FADE	DN FADE
UPLINK PERFORMANCE	Earth Station EIRP	(dBW)	47.1	47.1	47.1
	- Uplink Path Loss, clear sky	(dB)	-207.5	-207.5	-207.5
	- Uplink Rain Attenuation	(dB)	0.0	-4.2	0.0
	+ Satellite G/T	(dB/K)	5.6	5.6	5.6
	- Boltzman's Constant	(dBW/K-Hz)	228.6	228.6	228.6
	- Carrier Noise Bandwidth	(dB-Hz)	-49.1	-49.1	-49.1
	C/N Uplink	(dB)	24.7	20.5	24.7
DOWNLINK PERFORMANCE	Satellite Saturation EIRP	(dBW)	51.0	51.0	51.0
	- Output Backoff per carrier	(dB)	-29.0	-33.2	-29.0
	- Dnlink Path Loss, clear sky	(dB)	-205.9	-205.9	-205.9
	- Dnlink Rain Degradation	(dB)	0.0	0.0	-6.0
	- Antenna Pointing Error	(dB)	-.5	-.5	-.5
	+ Earth Station G/T, clear sky	(dB/K)	18.5	18.5	18.5
	- Boltzman's Constant	(dBW/K-Hz)	228.6	228.6	228.6
	- Carrier Noise Bandwidth	(dB-Hz)	-49.1	-49.1	-49.1
	C/N Dnlink	(dB)	13.5	9.3	7.5
COMPOSITE PERFORMANCE	C/N Uplink	(dB)	24.7	20.5	24.7
	C/N Dnlink	(dB)	13.5	9.3	7.5
	C/I Intermod	(dB)	16.1	11.9	16.1
	C/I Uplink Co-channel	(dB)	27.1	22.9	27.1
	C/I Dnlink Co-Channel	(dB)	27.1	22.9	27.1
	C/I Uplink Adj. Sat. (SAT 1)	(dB)	25.5	21.3	25.5
	C/I Dnlink Adj. Sat. (SAT 1)	(dB)	26.5	22.3	26.5
	C/(N+I) COMPOSITE	(dB)	10.9	6.7	6.7
	Minimum Required C/N	(dB)	6.8	5.7	5.7
	Link Margin	(dB)	4.1	1.0	1.0
TRANS USAGE	% BW/CARR: 0.42, % PWR/CARR: 0.42, Max No. Carriers: 237.1				
TX ES INFO.	Loc: EOC_1 ID:K2.4 AZ: 0.0 Elev: 20.0				
	EIRP per carrier: 47.1 dBW, Carrier Pwr: 0.6 watts				
RX ES INFO.	Loc: EOC_2 ID:K1.2 AZ: 0.0 Elev: 20.0				
INTF. INFO.	Uplink Pwr Den: -51.2 dBW/Hz, Dnlink EIRP Den: -25.1 dBW/Hz				
AVAILABILITY	Uplink: 99.86 %, Dnlink: 99.87 %, Composite Link: 99.73 %				

TABLE 8
PAS-13
64KBPS CARRIER ON KU-BAND US BEAM

PANAMSAT CORPORATION
Engineering and Operations
Washington, D.C.

PANAMSAT-13

SATELLITE DATA	Satellite : PAS-			
	Uplink Beam: Ku-Band_US		Dnlink Beam: Ku-Band_US	
	Uplink POL: V		Dnlink POL: H	
	G/T:5.6 dB/K, SFD:* dBW/m2		Dnlink EIRP: 51.0 dBW	
TRANSPONDER DATA	Trans Bandwidth :27.0 MHz		Trans Type: TWTA	
	Uplink Frequency:14.250 GHz		Dnlink Freq: 11.950 GHz	
	Aggregate IBO : 9* dB		Aggregate OBO: 5.3 dB	
CARRIER DATA	Type: IBS, Info Rate: 1544 kbps, Mod: QPSK, Code Rate: R1/2			
	BWo: 1970kHz, BWa: 2318.0kHz, C/Nnom: 6.8dB, C/Nmin: 5.7dB			
LINK BUDGET			CLR SKY	UP FADE	DN FADE
UPLINK PERFORMANCE	Earth Station EIRP	(dBW)	60.3	60.3	60.3
	- Uplink Path Loss, clear sky	(dB)	-207.5	-207.5	-207.5
	- Uplink Rain Attenuation	(dB)	0.0	-3.8	0.0
	+ Satellite G/T	(dB/K)	5.6	5.6	5.6
	- Boltzman's Constant	(dBW/K-Hz)	228.6	228.6	228.6
	- Carrier Noise Bandwidth	(dB-Hz)	-62.9	-62.9	-62.9
	C/N Uplink	(dB)	24.1	20.2	24.1
DOWNLINK PERFORMANCE	Satellite Saturation EIRP	(dBW)	51.0	51.0	51.0
	- Output Backoff per carrier	(dB)	-15.9	-19.6	-15.9
	- Dnlink Path Loss, clear sky	(dB)	-205.9	-205.9	-205.9
	- Dnlink Rain Degradation	(dB)	0.0	0.0	-5.3
	- Antenna Pointing Error	(dB)	-.5	-.5	-.5
	+ Earth Station G/T, clear sky	(dB/K)	18.5	18.5	18.5
	- Boltzman's Constant	(dBW/K-Hz)	228.6	228.6	228.6
	- Carrier Noise Bandwidth	(dB-Hz)	-62.9	-62.9	-62.9
	C/N Dnlink	(dB)	12.9	9.1	7.6
COMPOSITE PERFORMANCE	C/N Uplink	(dB)	24.1	20.2	24.1
	C/N Dnlink	(dB)	12.9	9.1	7.6
	C/I Intermod	(dB)	15.4	11.9	15.4
	C/I Uplink Co-channel	(dB)	27.1	23.2	27.1
	C/I Dnlink Co-Channel	(dB)	27.1	23.3	27.1
	C/I Uplink Adj. Sat. (SAT 1)	(dB)	27.0	23.2	27.0
	C/I Dnlink Adj. Sat. (SAT 1)	(dB)	29.0	25.2	29.0
	C/(N+I) COMPOSITE	(dB)	10.4	6.7	6.7
	Minimum Required C/N	(dB)	6.8	5.7	5.7
	Link Margin	(dB)	3.6	1.0	1.0
TRANS USAGE	% BW/CARR: 8.59, % PWR/CARR: 8.72, Max No. Carriers: 11.5				
TX ES INFO.	Loc: EOC_1 ID:K2.4 AZ: 0.0 Elev: 20.0				
	EIRP per carrier: 60.3 dBW, Carrier Pwr: 12.9 watts				
RX ES INFO.	Loc: EOC_2 ID:K1.2 AZ: 0.0 Elev: 20.0				
INTF. INFO.	Uplink Pwr Den: -51.8 dBW/Hz, Dnlink EIRP Den: -25.8 dBW/Hz				
AVAILABILITY	Uplink: 99.83 %, Dnlink: 99.82 %, Composite Link: 99.66 %				

TABLE 9
PAS-13
T1 CARRIER ON KU-BAND US BEAM

PANAMSAT CORPORATION
Engineering and Operations
Washington, D.C.

PANAMSAT-13

SATELLITE DATA	Satellite : PAS- Uplink Beam: Ku-Band_US Uplink POL: V G/T:5.6 dB/K, SFD:* dBW/m2			Dnlink Beam: Ku-Band_US Dnlink POL: H Dnlink EIRP: 51.0 dBW	
TRANSPONDER DATA	Trans Bandwidth :27.0 MHz Uplink Frequency:14.250 GHz Aggregate IBO : 6.5 dB			Trans Type: TWTA Dnlink Freq: 11.950 GHz Aggregate OBO: 3.8 dB	
CARRIER DATA	Type: TV/PSK/SCPC, Info Rate: 3000 kbps, Mod: QPSK, R1/2 BWo: 4174kHz, BWa: 4575kHz, C/Nnom: 4.1dB, C/Nmin: 4.1dB				
	LINK BUDGET			CLR SKY	UP FADE	DN FADE
UPLINK PERFORMANCE	Earth Station EIRP	(dBW)		61.4	61.4	61.4
	- Uplink Path Loss, clear sky	(dB)		-207.5	-207.5	-207.5
	- Uplink Rain Attenuation	(dB)		0.0	-4.5	0.0
	+ Satellite G/T	(dB/K)		5.6	5.6	5.6
	- Boltzman's Constant	(dBW/K-Hz)		228.6	228.6	228.6
	- Carrier Noise Bandwidth	(dB-Hz)		-66.2	-66.2	-66.2
	C/N Uplink	(dB)		21.9	17.4	21.9
DOWNLINK PERFORMANCE	Satellite Saturation EIRP	(dBW)		51.0	51.0	51.0
	- Output Backoff per carrier	(dB)		-9.8	-14.0	-9.8
	- Dnlink Path Loss, clear sky	(dB)		-205.9	-205.9	-205.9
	- Dnlink Rain Degradation	(dB)		0.0	0.0	-5.3
	- Antenna Pointing Error	(dB)		-.5	-.5	-.5
	+ Earth Station G/T, clear sky	(dB/K)		13.9	13.9	13.9
	- Boltzman's Constant	(dBW/K-Hz)		228.6	228.6	228.6
	- Carrier Noise Bandwidth	(dB-Hz)		-66.2	-66.2	-66.2
	C/N Dnlink	(dB)		11.1	6.9	5.8
COMPOSITE PERFORMANCE	C/N Uplink	(dB)		21.9	17.4	21.9
	C/N Dnlink	(dB)		11.1	6.9	5.8
	C/I Intermod	(dB)		15.4	12.1	15.4
	C/I Uplink Co-channel	(dB)		28.7	24.2	28.7
	C/I Dnlink Co-Channel	(dB)		28.7	24.5	28.7
	C/I Uplink Adj. Sat. (SAT 1)	(dB)		24.3	19.8	24.3
	C/I Dnlink Adj. Sat. (SAT 1)	(dB)		26.3	22.1	26.3
	C/(N+I) COMPOSITE	(dB)		9.1	5.1	5.1
	Minimum Required C/N	(dB)		4.1	4.1	4.1
	Link Margin	(dB)		5.0	1.0	1.0
TRANS USAGE	% BW/CARR: 16.94, % PWR/CARR: 25.00, Max No. Carriers: 4.0					
TX ES INFO.	Loc: EOC_1 ID:K4.6 AZ: 0.0 Elev: 20.0 EIRP per carrier: 61.4 dBW, Carrier Pwr: 4.4 watts					
RX ES INFO.	Loc: EOC_2 ID:K0.6_TVRO AZ: 0.0 Elev: 20.0					
INTF. INFO.	Uplink Pwr Den: -59.7 dBW/Hz, Dnlink EIRP Den: -23.0 dBW/Hz					
AVAILABILITY	Uplink: 99.88 %, Dnlink: 99.77 %, Composite Link: 99.65 %					

TABLE 10
PAS-13
TV/PSK-SCPC CARRIER ON KU-BAND US BEAM

PANAMSAT CORPORATION
Engineering and Operations
Washington, D.C.

PANAMSAT-13

SATELLITE DATA	Satellite : PAS-			
	Uplink Beam: Ku-Band_US		Dnlink Beam: Ku-Band_US	
	Uplink POL: V		Dnlink POL: H	
	G/T:5.6 dB/K, SFD:* dBW/m2		Dnlink EIRP: 51.0 dBW	
TRANSPONDER DATA	Trans Bandwidth :27.0 MHz		Trans Type: TWTA	
	Uplink Frequency:14.250 GHz		Dnlink Freq: 11.950 GHz	
	Aggregate IBO : 0.0 dB		Aggregate OBO: 0.0 dB	
CARRIER DATA	Type: TV/PSK/MCPC, Info Rate: 25919 kbps, Mod: QPSK, R2/3			
	BWo: 27000kHz, BWa: 27000kHz, C/Nnom: 5.8dB, C/Nmin: 5.8dB			

LINK BUDGET			CLR SKY	UP FADE	DN FADE
UPLINK PERFORMANCE	Earth Station EIRP	(dBW)	68.9	68.9	68.9
	- Uplink Path Loss, clear sky	(dB)	-207.5	-207.5	-207.5
	- Uplink Rain Attenuation	(dB)	0.0	-8.2	0.0
	+ Satellite G/T	(dB/K)	5.6	5.6	5.6
	- Boltzman's Constant	(dBW/K-Hz)	228.6	228.6	228.6
	- Carrier Noise Bandwidth	(dB-Hz)	-74.3	-74.3	-74.3
	C/N Uplink	(dB)	21.3	13.1	21.3
DOWNLINK PERFORMANCE	Satellite Saturation EIRP	(dBW)	51.0	51.0	51.0
	- Output Backoff per carrier	(dB)	0.0	-3.2	0.0
	- Dnlink Path Loss, clear sky	(dB)	-205.9	-205.9	-205.9
	- Dnlink Rain Degradation	(dB)	0.0	0.0	-5.6
	- Antenna Pointing Error	(dB)	-.5	-.5	-.5
	+ Earth Station G/T, clear sky	(dB/K)	13.9	13.9	13.9
	- Boltzman's Constant	(dBW/K-Hz)	228.6	228.6	228.6
	- Carrier Noise Bandwidth	(dB-Hz)	-74.3	-74.3	-74.3
	C/N Dnlink	(dB)	12.8	9.6	7.2
COMPOSITE PERFORMANCE	C/N Uplink	(dB)	21.3	13.1	21.3
	C/N Dnlink	(dB)	12.8	9.6	7.2
	C/I Uplink Co-channel	(dB)	27.0	18.8	27.0
	C/I Dnlink Co-Channel	(dB)	27.0	23.8	27.0
	C/I Uplink Adj. Sat. (SAT 1)	(dB)	24.5	16.3	24.5
	C/I Dnlink Adj. Sat. (SAT 1)	(dB)	25.5	22.3	25.5
	C/(N+I) COMPOSITE	(dB)	11.5	6.9	6.8
	Minimum Required C/N	(dB)	5.8	5.8	5.8
	Link Margin	(dB)	5.7	1.1	1.0

TRANS USAGE	% BW/CARR: 100.00, % PWR/CARR: 100.00, Max No. Carriers: 1.0
TX ES INFO.	Loc: EOC_1 ID:K4.6 AZ: 0.0 Elev: 20.0
	EIRP per carrier: 68.9 dBW, Carrier Pwr: 25.1 watts
RX ES INFO.	Loc: EOC_2 ID:K0.6_TVRO AZ: 0.0 Elev: 20.0
INTF. INFO.	Uplink Pwr Den: -60.3 dBW/Hz, Dnlink EIRP Den: -21.3 dBW/Hz
AVAILABILITY	Uplink: 99.97 %, Dnlink: 99.8 %, Composite Link: 99.77 %

TABLE 11
PAS-13
TV/PSK-MCPC CARRIER ON KU-BAND US BEAM

PANAMSAT CORPORATION
Engineering and Operations
Washington, D.C.

SATELLITE DATA	Satellite : PAS-				
	Uplink Beam: Ku-Band_So.Am		Dnlink Beam: Ku-Band_So.Am		
	Uplink POL: H		Dnlink POL: V		
	G/T:0.6 dB/K, SFD:* dBW/m2		Dnlink EIRP: 46.5 dBW		
TRANSPONDER DATA	Trans Bandwidth :27.0 MHz		Trans Type: TWTA		
	Uplink Frequency:14.250 GHz		Dnlink Freq: 11.950 GHz		
	Aggregate IBO : 9.0 dB		Aggregate OBO: 5.3 dB		
CARRIER DATA	Type: IBS, Info Rate: 64 kbps, Mod: QPSK, Code Rate: R1/2				
	BWo: 82kHz, BWa: 112.5kHz, C/Nnom: 6.8dB, C/Nmin: 5.7dB				
	LINK BUDGET		CLR SKY	UP FADE	DN FADE
UPLINK PERFORMANCE	Earth Station EIRP	(dBW)	50.0	50.0	50.0
	- Uplink Path Loss, clear sky	(dB)	-207.5	-207.5	-207.5
	- Uplink Rain Attenuation	(dB)	0.0	-3.5	0.0
	+ Satellite G/T	(dB/K)	.6	.6	.6
	- Boltzman's Constant	(dBW/K-Hz)	228.6	228.6	228.6
	- Carrier Noise Bandwidth	(dB-Hz)	-49.1	-49.1	-49.1
	C/N Uplink	(dB)	22.6	19.1	22.6
DOWNLINK PERFORMANCE	Satellite Saturation EIRP	(dBW)	46.5	46.5	46.5
	- Output Backoff per carrier	(dB)	-29.2	-32.6	-29.2
	- Dnlink Path Loss, clear sky	(dB)	-205.9	-205.9	-205.9
	- Dnlink Rain Degradation	(dB)	0.0	0.0	-4.9
	- Antenna Pointing Error	(dB)	-.5	-.5	-.5
	+ Earth Station G/T, clear sky	(dB/K)	22.1	22.1	22.1
	- Boltzman's Constant	(dBW/K-Hz)	228.6	228.6	228.6
	- Carrier Noise Bandwidth	(dB-Hz)	-49.1	-49.1	-49.1
	C/N Dnlink	(dB)	12.5	9.0	7.6
COMPOSITE PERFORMANCE	C/N Uplink	(dB)	22.6	19.1	22.6
	C/N Dnlink	(dB)	12.5	9.0	7.6
	C/I Intermod	(dB)	15.9	12.5	15.9
	C/I Uplink Co-channel	(dB)	26.9	23.5	26.9
	C/I Dnlink Co-Channel	(dB)	26.9	23.5	26.9
	C/I Uplink Adj. Sat. (SAT 1)	(dB)	25.5	22.0	25.5
	C/I Dnlink Adj. Sat. (SAT 1)	(dB)	26.5	23.0	26.5
	C/(N+I) COMPOSITE	(dB)	10.1	6.7	6.7
	Minimum Required C/N	(dB)	6.8	5.7	5.7
	Link Margin	(dB)	3.3	1.0	1.0
TRANS USAGE	% BW/CARR: 0.42, % PWR/CARR: 0.41, Max No. Carriers: 240.0				
TX ES INFO.	Loc: EOC_1 ID:K2.4 AZ: 0.0 Elev: 20.0				
	EIRP per carrier: 50.0 dBW, Carrier Pwr: 1.2 watts				
RX ES INFO.	Loc: EOC_2 ID:K1.8 AZ: 0.0 Elev: 20.0				
INTF. INFO.	Uplink Pwr Den: -48.3 dBW/Hz, Dnlink EIRP Den: -29.8 dBW/Hz				
AVAILABILITY	Uplink: 99.71 %, Dnlink: 99.84 %, Composite Link: 99.56 %				

TABLE 12
PAS-13
64KBPS CARRIER ON KU-BAND S.AMERICA BEAM

PANAMSAT CORPORATION
Engineering and Operations
Washington, D.C.

PANAMSAT-13

SATELLITE DATA	Satellite : PAS-			
	Uplink Beam: Ku-Band_So.Am		Dnlink Beam: Ku-Band_So.Am	
	Uplink POL: H		Dnlink POL: V	
	G/T:0.6 dB/K, SFD:* dBW/m2		Dnlink EIRP: 46.5 dBW	
TRANSPONDER DATA	Trans Bandwidth :27.0 MHz		Trans Type: TWTA	
	Uplink Frequency:14.250 GHz		Dnlink Freq: 11.950 GHz	
	Aggregate IBO : 8* dB		Aggregate OBO: 4.6 dB	
CARRIER DATA	Type: IBS, Info Rate: 1544 kbps, Mod: QPSK, Code Rate: R1/2			
	BWo: 1970kHz, BWa: 2318.0kHz, C/Nnom: 6.8dB, C/Nmin: 5.7dB			
	LINK BUDGET		CLR SKY	UP FADE	DN FADE
UPLINK PERFORMANCE	Earth Station EIRP	(dBW)	63.3	63.3	63.3
	- Uplink Path Loss, clear sky	(dB)	-207.5	-207.5	-207.5
	- Uplink Rain Attenuation	(dB)	0.0	-3.3	0.0
	+ Satellite G/T	(dB/K)	.6	.6	.6
	- Boltzman's Constant	(dBW/K-Hz)	228.6	228.6	228.6
	- Carrier Noise Bandwidth	(dB-Hz)	-62.9	-62.9	-62.9
	C/N Uplink	(dB)	22.0	18.7	22.0
DOWNLINK PERFORMANCE	Satellite Saturation EIRP	(dBW)	46.5	46.5	46.5
	- Output Backoff per carrier	(dB)	-15.3	-18.5	-15.3
	- Dnlink Path Loss, clear sky	(dB)	-205.9	-205.9	-205.9
	- Dnlink Rain Degradation	(dB)	0.0	0.0	-4.8
	- Antenna Pointing Error	(dB)	-.5	-.5	-.5
	+ Earth Station G/T, clear sky	(dB/K)	22.1	22.1	22.1
	- Boltzman's Constant	(dBW/K-Hz)	228.6	228.6	228.6
	- Carrier Noise Bandwidth	(dB-Hz)	-62.9	-62.9	-62.9
	C/N Dnlink	(dB)	12.6	9.3	7.8
COMPOSITE PERFORMANCE	C/N Uplink	(dB)	22.0	18.7	22.0
	C/N Dnlink	(dB)	12.6	9.3	7.8
	C/I Intermod	(dB)	14.9	11.9	14.9
	C/I Uplink Co-channel	(dB)	27.0	23.7	27.0
	C/I Dnlink Co-Channel	(dB)	27.0	23.8	27.0
	C/I Uplink Adj. Sat. (SAT 1)	(dB)	25.5	22.2	25.5
	C/I Dnlink Adj. Sat. (SAT 1)	(dB)	26.5	23.3	26.5
	C/(N+I) COMPOSITE	(dB)	9.9	6.7	6.7
	Minimum Required C/N	(dB)	6.8	5.7	5.7
	Link Margin	(dB)	3.1	1.0	1.0
TRANS USAGE	% BW/CARR: 8.59, % PWR/CARR: 8.64, Max No. Carriers: 11.6				
TX ES INFO.	Loc: EOC_1 ID:K2.4 AZ: 0.0 Elev: 20.0				
	EIRP per carrier: 63.3 dBW, Carrier Pwr: 25.5 watts				
RX ES INFO.	Loc: EOC_2 ID:K1.8 AZ: 0.0 Elev: 20.0				
INTF. INFO.	Uplink Pwr Den: -48.9 dBW/Hz, Dnlink EIRP Den: -29.7 dBW/Hz				
AVAILABILITY	Uplink: 99.69 %, Dnlink: 99.83 %, Composite Link: 99.52 %				

TABLE 13
PAS-13
T1 CARRIER ON KU-BAND S. AMERICAN BEAM

PANAMSAT CORPORATION
Engineering and Operations
Washington, D.C.

PANAMSAT-13

SATELLITE DATA	Satellite : PAS-			
	Uplink Beam: Ku-Band_So.Am		Dnlink Beam: Ku-Band_So.Am	
	Uplink POL: H		Dnlink POL: V	
	G/T:0.6 dB/K, SFD:* dBW/m2		Dnlink EIRP: 46.5 dBW	
TRANSPONDER DATA	Trans Bandwidth :27.0 MHz		Trans Type: TWTA	
	Uplink Frequency:14.250 GHz		Dnlink Freq: 11.950 GHz	
	Aggregate IBO : 6.5* dB		Aggregate OBO: 3.8 dB	
CARRIER DATA	Type: TV/PSK/SCPC, Info Rate: 3000 kbps, Mod: QPSK, R1/2			
	BWo: 4174kHz, BWa: 4575kHz, C/Nnom: 4.1dB, C/Nmin: 4.1dB			
LINK BUDGET			CLR SKY	UP FADE	DN FADE
UPLINK PERFORMANCE	Earth Station EIRP	(dBW)	66.4	66.4	66.4
	- Uplink Path Loss, clear sky	(dB)	-207.5	-207.5	-207.5
	- Uplink Rain Attenuation	(dB)	0.0	-3.7	0.0
	+ Satellite G/T	(dB/K)	.6	.6	.6
	- Boltzman's Constant	(dBW/K-Hz)	228.6	228.6	228.6
	- Carrier Noise Bandwidth	(dB-Hz)	-66.2	-66.2	-66.2
	C/N Uplink	(dB)	21.9	18.2	21.9
DOWNLINK PERFORMANCE	Satellite Saturation EIRP	(dBW)	46.5	46.5	46.5
	- Output Backoff per carrier	(dB)	-9.8	-13.2	-9.8
	- Dnlink Path Loss, clear sky	(dB)	-205.9	-205.9	-205.9
	- Dnlink Rain Degradation	(dB)	0.0	0.0	-4.2
	- Antenna Pointing Error	(dB)	-.5	-.5	-.5
	+ Earth Station G/T, clear sky	(dB/K)	17.4	17.4	17.4
	- Boltzman's Constant	(dBW/K-Hz)	228.6	228.6	228.6
	- Carrier Noise Bandwidth	(dB-Hz)	-66.2	-66.2	-66.2
	C/N Dnlink	(dB)	10.1	6.7	5.8
COMPOSITE PERFORMANCE	C/N Uplink	(dB)	21.9	18.2	21.9
	C/N Dnlink	(dB)	10.1	6.7	5.8
	C/I Intermod	(dB)	15.4	12.8	15.4
	C/I Uplink Co-channel	(dB)	28.7	25.0	28.7
	C/I Dnlink Co-Channel	(dB)	28.7	25.3	28.7
	C/I Uplink Adj. Sat. (SAT 1)	(dB)	22.8	19.1	22.8
	C/I Dnlink Adj. Sat. (SAT 1)	(dB)	23.8	20.4	23.8
	C/(N+I) COMPOSITE	(dB)	8.4	5.1	5.1
	Minimum Required C/N	(dB)	4.1	4.1	4.1
	Link Margin	(dB)	4.3	1.0	1.0
TRANS USAGE	% BW/CARR: 16.94, % PWR/CARR: 25.00, Max No. Carriers: 4.0				
TX ES INFO.	Loc: EOC_1 ID:K4.6 AZ: 0.0 Elev: 20.0				
	EIRP per carrier: 66.4 dBW, Carrier Pwr: 14.1 watts				
RX ES INFO.	Loc: EOC_2 ID:K0.90_TVRO AZ: 0.0 Elev: 20.0				
INTF. INFO.	Uplink Pwr Den: -54.7 dBW/Hz, Dnlink EIRP Den: -27.5 dBW/Hz				
AVAILABILITY	Uplink: 99.75 %, Dnlink: 99.7 %, Composite Link: 99.45 %				

TABLE 14
PAS-13
TV/PSK-SCPC CARRIER ON KU-BAND S.AMERICA BEAM

PANAMSAT CORPORATION
Engineering and Operations
Washington, D.C.

PANAMSAT-13

SATELLITE DATA	Satellite : PAS-			
	Uplink Beam: Ku-Band_So.Am		Dnlink Beam: Ku-Band_So.Am	
	Uplink POL: H		Dnlink POL: V	
	G/T:0.6 dB/K, SFD:* dBW/m2		Dnlink EIRP: 46.5 dBW	
TRANSPONDER DATA	Trans Bandwidth :27.0 MHz		Trans Type: TWTA	
	Uplink Frequency:14.250 GHz		Dnlink Freq: 11.950 GHz	
	Aggregate IBO : 0.0 dB		Aggregate OBO: 0.0 dB	
CARRIER DATA	Type: TV/PSK/MCPC, Info Rate: 19439 kbps, Mod: QPSK, R1/2			
	BWo: 27000kHz, BWa: 27000kHz, C/Nnom: 4.1dB, C/Nmin: 4.1dB			
LINK BUDGET			CLR SKY	UP FADE	DN FADE
UPLINK PERFORMANCE	Earth Station EIRP	(dBW)	72.9	72.9	72.9
	- Uplink Path Loss, clear sky	(dB)	-207.5	-207.5	-207.5
	- Uplink Rain Attenuation	(dB)	0.0	-7.8	0.0
	+ Satellite G/T	(dB/K)	.6	.6	.6
	- Boltzman's Constant	(dBW/K-Hz)	228.6	228.6	228.6
	- Carrier Noise Bandwidth	(dB-Hz)	-74.3	-74.3	-74.3
	C/N Uplink	(dB)	20.3	12.5	20.3
DOWNLINK PERFORMANCE	Satellite Saturation EIRP	(dBW)	46.5	46.5	46.5
	- Output Backoff per carrier	(dB)	0.0	-2.9	0.0
	- Dnlink Path Loss, clear sky	(dB)	-205.9	-205.9	-205.9
	- Dnlink Rain Degradation	(dB)	0.0	0.0	-4.7
	- Antenna Pointing Error	(dB)	-.5	-.5	-.5
	+ Earth Station G/T, clear sky	(dB/K)	15.8	15.8	15.8
	- Boltzman's Constant	(dBW/K-Hz)	228.6	228.6	228.6
	- Carrier Noise Bandwidth	(dB-Hz)	-74.3	-74.3	-74.3
	C/N Dnlink	(dB)	10.2	7.3	5.4
COMPOSITE PERFORMANCE	C/N Uplink	(dB)	20.3	12.5	20.3
	C/N Dnlink	(dB)	10.2	7.3	5.4
	C/I Uplink Co-channel	(dB)	27.0	19.2	27.0
	C/I Dnlink Co-Channel	(dB)	27.0	24.1	27.0
	C/I Uplink Adj. Sat. (SAT 1)	(dB)	22.8	15.0	22.8
	C/I Dnlink Adj. Sat. (SAT 1)	(dB)	23.8	20.9	23.8
	C/(N+I) COMPOSITE	(dB)	9.2	5.2	5.1
	Minimum Required C/N	(dB)	4.1	4.1	4.1
	Link Margin	(dB)	5.1	1.1	1.0
TRANS USAGE	% BW/CARR: 100.00, % PWR/CARR: 100.00, Max No. Carriers: 1.0				
TX ES INFO.	Loc: EOC_1 ID:K4.6 AZ: 0.0 Elev: 20.0				
	EIRP per carrier: 72.9 dBW, Carrier Pwr: 63.1 watts				
RX ES INFO.	Loc: EOC_2 ID:K0.75_TVRO AZ: 0.0 Elev: 20.0				
INTF. INFO.	Uplink Pwr Den: -56.3 dBW/Hz, Dnlink EIRP Den: -25.8 dBW/Hz				
AVAILABILITY	Uplink: 99.95 %, Dnlink: 99.78 %, Composite Link: 99.73 %				

TABLE 15
PAS-13
TV/PSK-MCPC CARRIER ON KU-BAND S.AMERICA BEAM

PANAMSAT CORPORATION
Engineering and Operations
Washington, D.C.

analyses assume edge of coverage is the -2dB contour for both the uplink and the downlink. These contours include most locations of interest, and certainly all of the major cities in the areas covered. Indeed, the same full range of services out to higher contour levels is possible when required by customers. Thus these calculations are not meant to preclude the usability of locations outside the contours where larger earth terminals might be required to effect the efficient use of PAS-13 space segment.

As in the case of PAS-1-4, PanAmSat's transoceanic and regional satellites, all earth stations utilizing the PAS-13 satellite will be required to observe the FCC's improved sidelobe envelope of [29-25 logø] for uplinking and when possible, for reception. Based on our experience with PAS-1-4, this should not be a problem.

5.2 Service Analysis

The link budgets provide a picture of how the PAS-13 communication's capability will be used. Each link budget is describes all of the input values used in the actual analysis.

5.2.1 Video Services

PanAmSat plans to make a wide variety of video services available to its customers. It is expected that the major portion of TV will be carried as digitally compressed video which is also the most economical method. Thus link analyses for single-channel-per carrier video (SCPC) and multiple-carrier-per-channel (MCPC) transmissions have been included for various beams. The link budget

included examines how high quality compressed video signals could be delivered to earth stations covered by the US/Latin Beam C-Band beam and the US Ku-Band beam providing excellent video quality. It is believed that with the CCITT standardization (H261) and MPEG-1, MPEG-2 and DVB, that compressed video will play a large and important role in the delivery of television in the US and internationally eventually replacing all analog TV. Finally, the ability to deliver high definition television by satellite is critical to the future development of television worldwide. PAS transponders will be capable of providing an HDTV signal anywhere in Latin America or the United States.

While not analyzed in this filing, the presence of a Ku-Band uplink beam over South America will allow SNG transmissions with small terminals from remote areas of Latin America to Latin American capitals or the United States and it is expected such a service will be useful to many television operations in both Latin America and the US.

5.2.2 Audio Services

Various types of SCPC audio services can be provided based on exact customer interest. In one case audio could be a part of the TV signal base-bandwidth which represents the traditional method. In another case, as many as 8-10 separate audio or data carriers can be accommodated in the spectrum 5.8 to 8.90MHz beyond the video baseband spectrum. These sub-carriers have been providing low cost audio and data services to users for many years. Various other SCPC audio services could be available including the traditional 15kHz and 7.5kHz services. In addition, digital audio services are in great demand at present. Other PAS satellites

presently carry these types of audio services and as such, we expect similar usage on PAS-13.

5.2.3 Digital Services

A wide variety of digital services will be accommodated by the PAS-13 transponders. These range from the basic 64kBps circuits, all the way to the T1 and the European CEPT carrier (2.048MBps). These carriers can be delivered anywhere a PAS-13 footprint exists in South America, Central America or the United States. Typically a Latin Beam transponder should be capable of accommodating three-hundred and sixty 64kBps carriers when operating into a 3.7-meter antenna. T1 (1.544MBps) carriers can also be efficiently carried in a transponder when operating between 3.0-meter terminals. As a final example, a 45MBps carrier could operate by using a 4.5-meter receiving station.

In this PAS-13 filing, technical analyses have been included for the 64kBps carrier and the T1 carriers, both of which are considered to be the most popular formats in use and indicative of expected satellite performance.

5.2.4 FDM/FM Telephony Services

Traditional FDM/FM telephony in 60 channel and 360 channel loadings can be handled by any of the PAS-13 transponders. These are not shown since telephony is largely handled in a digital fashion at present.

5.2.5 VSat Services

VSat services are possible including the traditional Hub to remote approach. Here a centrally located hub station (a large antenna and the control software), communicates with its remotes by transmitting a TDM carrier at, e.g., 512kBps. Remote respond, when necessary, in a TDMA format, typically at either 64kBps or 128kBps. As traffic growth warrants, additional "outbound" (TDM) carriers and additional "inbound" (TDMA) carriers can be added.

Although such systems have traditionally operated at Ku-Band, because of the high power of the PAS-13 C-Band beams, such operation should be possible in all areas covered by PAS-13 beams.

Other VSat services could occur in hubless systems where mesh operation is utilized, i.e., communication directly between remotes where no traffic needs to be relayed through a hub. In these systems, small antennas are used at remote sites, while larger stations are used at a central location. Intelligence in each remote allows the selection of carrier frequencies between stations on a burst basis so that addressed packets of information are constantly going through the satellite and being received only at the station of choice.

6.0 Power Flux Density Levels

The power flux density limits for space stations are specified in Section 25.208 of the Commissions Rules and Regulations . This section of the PAS-13 application will demonstrate compliance with the Commission's

rules regarding power flux density limits in the bands of use where the rules apply.

6.1 C-Band Flux Density Limits

Section 25.208 of the FCC Rules state, that in the band 3700-4200 MHz, the power flux density at the Earth's surface produced by emissions from a space station shall not exceed the following values:

a) $-152 dBW/m^2$ in any 4kHz band for angles of arrival between 0 and 5 degrees above the horizon;

b) $-152 + (\delta - 5) / 2$ dBW/m^2 for any 4kHz band for angles of arrival δ between 5 and 25 degrees above the horizon;

c) $-142 dBW/m^2$ in any 4kHz band for angles of arrival between 25 and 90 degrees above the horizon.

6.2 Calculating Flux Density Limits at C-Band

Using the PAS-4 satellite's C-Band antenna contours as shown in Figures 2 and 3 and the values computed for C-Band beam center maximum EIRPs in Table 1, it is possible to demonstrate that the PAS-13 design meets the Commission's regulations for C-Band flux emissions.

Power flux density at the earth's surface is calculated by computing the path loss (in dB) from the satellite to the earth's surface and adding to that the gain of a $1 m^2$ antenna (in dB). This value is then subtracted from the maximum EIRP of the satellite to determine the boresite maximum flux

density. Since the most powerful signal emitted by the satellite occurs when an unmodulated TV/FM carrier is transmitted to earth, we note that an artificial energy dispersal signal of 2 MHz is applied to these signals.

6.2.1 Calculating Flux Density Limits for the US/Latin Beam

Using the satellite's C-Band antenna contours as shown in Figure 2, and the values computed for beam center maximum EIRPs in Table 1, it will be shown that the PAS-13 design meets the ITU regulations for C-Band emissions. Thus:

Maximum EIRP in US/Latin Beam (dBW)	42.7
Path Loss to US/Latin Beam Boresite (dB)	-196.0
Gain of $1m^2$ Antenna (dB)	33.4
Energy dispersal of 2MHz (dB)	-63.0
Conversion to 4kHz bandwidth (dB)	36.0
Maximum Power Flux Density (dBW/m2 per 4kHz)	-146.9

The results show that a power flux density of -146.9dBW/m^2 will be incident at the boresite point. The boresite of the US/Latin Beam falls in Venezuela can be seen from Figure 2. The elevation angle to the satellite at the boresight point is well above 25° as is evident from Figure 1. At this elevation angle, the maximum allowable flux density is -142dBW/m^2, which is greater than the projected -146.9dBW/m^2 by more than 4dB.

6.3 Ku-Band Flux Density Limits

Part 25.208 of the FCC Rules state, that in the band 11.70-12.20 GHz, the power flux density at the Earth's surface produced by emissions from a space station shall not exceed the following values:

a) $-150 dBW/m^2$ in any 4kHz band for angles of arrival between 0 and 5 degrees above the horizon;

b) $-150 + (\delta - 5) / 2$ dBW/m^2 for any 4kHz band for angles of arrival δ between 5 and 25 degrees above the horizon;

c) $-140 dBW/m^2$ in any 4kHz band for angles of arrival between 25 and 90 degrees above the horizon.

6.3.1 Calculating Flux Density Limits for the US/Car Beam

Using the satellite's Ku-Band antenna contours as shown in Figure 4, and the values computed for beam center maximum EIRPs in Table 1, it is possible to determine whether the PAS-4 design meets the FCC regulations for Ku-Band emissions.

Power flux density at the earth's surface for the US Beam is calculated by computing the path loss (in dB) from the satellite to the earth's surface and adding to that the gain of a $1 m^2$ antenna (in dB). This value is then subtracted from the maximum EIRP of the satellite to determine the boresite maximum flux density. Since the most powerful signal emitted by the satellite occurs when an unmodulated TV/FM carrier

is transmitted to earth, we noted that in this condition, an artificial energy dispersal signal of 4 MHz is applied which reduces the power flux density value by 66dB. Therefore:

Maximum EIRP in US Beam (dBW)	53.0
Path Loss to US Beam (dB)	-205.9
Gain of $1m^2$ Antenna (dB)	42.8
Energy dispersal of 4MHz (dB)	-66.0
Conversion to 4kHz bandwidth (dB)	36.0
Maximum Power Flux Density (dBW/m^2 per 4kHz)	-140.1

Since the boresite of the US Beam falls in the mid-Southern states area where the elevation angle is above a well above 25° and where the maximum allowable flux density is $-140dBW/m^2$, we find this is 0.1dB greater than the $-140.1dBW/m^2$ calculated above. Based on this analysis, the US Beam flux density for analog video signals complies with FCC rules.

7.0 Adjacent Satellite Interference

An analysis of interference to US domestic satellits has been carried out using the FCC's Sharp program as described in FCC/OST R83-2 and paper given by Mr. Sharp at the AIAA satellite conference in 1984 entitled Reduced Domestic Satellite Orbit Spacing. The Sharp program was used to analyze PanAmsat's potential of interference with other systems located in

the United States 2° away. All of the assumptions used in the analysis are contained in the printout of the program which is attached as Appendix A to this application. No analysis has been conducted with respect to PanAmSat's potential interference to non-US satellites since none that are in the coordination process are located adjacent to the 93°WL orbital slot.

Based on previous analyses carried out by PanAmSat it should be noted that the PanAmSat US coverages are not significantly different from other US domestic systems currently in orbit. The design presented here is in line with other existing and future systems and as such should cause no more interference than these systems.

8.0 Launch Services

PAS-13 as has been described in Section 2 of this exhibit as a large satellite containing fifty-six transponders. Based on a projected satellite weight there are four launch vehicles which can be used to launch PAS-13. PanAmSat has been in discussions with three manufacturers, Lockheed Martin regarding the Atlas 2AS; Arianespace regarding the Ariane 4 and 5; and LKE International for the Russian Proton.

The satellite's compatibility with the three latter launch vehicles means that further discussions with the three companies will lead to a final selection. This selection will depend on launcher manifests, desired lifetime, launch price, reliability and other tradeoffs which must be considered. Launch support arrangements would be concluded with the satellite's manufacturer.

Once the liquid apogee motor has been fired the required number of times and the satellite successfully inserted into the geosynchronous orbit, a drift phase will be initiated to be terminated once the satellite reaches 93°WL. At this location, the In-Orbit Test Phase (IOT) will commence. It is anticipated that this phase will last three to four weeks. During that period the satellite will be checked out by its manufacturer from the manufacturer's facilities. Once the spacecraft has completed its test phase, it will be turned over to PanAmSat by the manufacturer to begin regular operations.

APPENDIX A

PAS-13

ADJACENT SATELLITE INTERFERENCE ANALYSIS

17:54:05 9-OCT-95

Desired Signals from File: v:\fcc2deg\panamsat\data1.dat

Interfering Signals from File: v:\fcc2deg\panamsat\panamsat.dat

14/12 GHz Carrier Listing from PanAmSat Satellite
into Revised Doc 81-704 Appendix C

14/12 GHz Carrier Listing from PanAmSat Satellite
into Revised Doc 81-704 Appendix C

Carrier Number	Signal Type & (channels)	Bandwidth (MHz)	E.S. Antennas (m) up/down	EIRP (dBW) up/down
1: RCAc	CFDM/FM (3800)	54.000	10.0/10.0	81.2/45.0
2: RCAw	TV/FM (1)	24.000	7.7/ 2.0	81.2/51.0
3: RCAw	TV/FM (1)	24.000	7.7/ 1.0	81.2/51.0
4: RCAe	TV/FM (1)	24.000	7.7/ 2.0	81.2/48.0
5: RCAe	TV/FM (1)	24.000	7.7/ 1.0	81.2/48.0
6: RCAc	TV/FM (1)	30.000	7.7/ 5.5	81.2/45.0
7: RCAc	TV/FM (1)	24.000	7.7/ 3.0	81.2/45.0
8: RCAc	TV/FM (2)	26.000	7.7/ 5.5	76.2/40.5
9: RCAc	TV/FM (2)	26.000	7.7/ 5.5	76.2/40.5
10: RCAc	QPSK/ 80 MBPS	45.714	10.0/10.0	81.2/45.0
11: RCAc	QPSK/ 1.544 MBPS (20)	1.029	10.0/10.0	57.2/26.0
12: RCAc	BPSK/ 56 KBPS (100)	.064	5.0/ 5.0	51.2/20.0
13: RCAc	BPSK/ 56 KBPS (400)	.064	5.0/ 5.0	45.2/14.0
14: RCAc	SCPC/FM (500)	.037	7.7/ 7.7	43.2/12.0
15: RCAo	CFDM/FM (3800)	54.000	10.0/10.0	85.3/41.0
16: RCAm	TV/FM (1)	26.000	7.7/ 3.0	85.1/41.0
17: RCAo	TV/FM (2)	26.000	5.5/ 5.5	80.1/36.5
18: RCAm	TV/FM (2)	26.000	5.5/ 5.5	80.1/36.5
19: RCAo	QPSK/ 80 MBPS	54.000	10.0/10.0	85.3/41.0
20: RCAo	QPSK/ 1.544 MBPS (20)	1.030	10.0/10.0	61.1/22.0
21: RCAo	BPSK/ 56 KBPS (100)	.064	5.0/ 5.0	55.1/16.0
22: RCAo	BPSK/ 56 KBPS (400)	.064	5.0/ 5.0	49.1/10.0
23: RCAo	SCPC/FM (500)	.037	7.7/ 7.7	47.1/ 8.0
24: RCA+	BPSK/ 56 KBPS (110)	.140	1.2/ 7.0	46.7/17.8
25: RCA+	BPSK/ 56 KBPS (131)	.140	7.0/ 1.2	49.5/22.4
26: SBSo	QPSK/ 50 MBPS	43.000	5.5/ 5.5	79.8/46.7
27: SBS&	QPSK/ 50 MBPS	25.000	5.5/ 5.5	79.8/46.7
28: SBSo	QPSK/ 50 MBPS	43.000	7.7/ 7.7	82.7/43.7
29: SBS&	QPSK/ 50 MBPS	25.000	7.7/ 7.7	82.7/43.7
30: SBSo	QPSK/ 50 MBPS	43.000	5.5/ 5.5	79.8/43.7
31: SBS&	QPSK/ 50 MBPS	25.000	5.5/ 5.5	79.8/43.7
32: SBSu	QPSK/ 50 MBPS	28.600	5.5/ 5.5	79.8/43.7
33: SBS+	TV/FM (1)	16.000	5.5/ .8	79.0/50.0
34: SBS+	TV/FM (1)	16.000	5.5/ 1.2	79.0/47.0
35: SBS+	QPSK/120 MBPS	60.000	7.7/ 7.7	82.7/47.0

14/12 GHz Carrier Listing from PanAmSat Satellite
into Revised Doc 81-704 Appendix C

Carrier Number	Signal Type & (channels)	Bandwidth (MHz)	E.S. Antennas (m) up/down	EIRP (dBW) up/down
1: ASC+	QPSK/ 90 MBPS	54.000	7.0/ 7.0	82.0/50.0
2: ASC+	QPSK/ 60 MBPS	36.000	7.0/ 7.0	82.0/42.0
3: ASC+	QPSK/ 12 MBPS (4)	10.000	7.0/ 7.0	70.0/33.0
4: ASCo	BPSK/ 6 MBPS (4)	15.000	7.0/ 7.0	71.2/33.0
5: ASCm	BPSK/ 1.544 MBPS (16)	3.900	7.0/ 7.0	65.2/27.0
6: ASCm	BPSK/ 56 KBPS (126)	.140	5.0/ 5.0	53.2/15.0
7: GTEs	TV/FM (1)	36.000	7.5/ 7.5	79.5/47.0
8: GTEs	TV/FM (1)	36.000	5.5/ 5.5	79.5/47.0
9: GTE+	TV/FM (1)	22.000	5.0/ 1.2	79.5/47.0
10: GTE+	QPSK/ 90 MBPS	54.000	5.0/ 5.0	79.5/47.0
11: GTEs	QPSK/ 60 MBPS	36.000	7.5/ 7.5	79.5/47.0
12: GTEs	QPSK/ 60 MBPS	36.000	5.5/ 5.5	79.5/47.0
13: GTEs	QPSK/ 56 KBPS (562)	.039	7.5/ 7.5	51.5/14.5
14: GTEs	QPSK/ 56 KBPS (562)	.039	5.5/ 5,5	51.5/14.5
15: GTEm	TV/FM (1)	36.000	7.5/ 7.5	79.5/42.0
16: GTEm	TV/FM (1)	36.000	5.5/ 5.5	79.5/42.0
17: GTE+	QPSK/ 90 MBPS	54.000	5.0/ 5.0	79.5/43.0
18: GTEm	QPSK/ 60 MBPS	36.000	7.5/ 7.5	79.5/42.0
19: GTEm	QPSK/ 60 MBPS	36.000	5.5/ 5.5	79.5/42.0
20: GTEm	QPSK/ 56 KBPS (562)	.039	7.5/ 7.5	51.5/ 9.5
21: GTEm	QPSK/ 56 KBPS (562)	.039	5.5/ 5.5	51.5/ 9.5
22: GAL+	CSSB/AM (6700)	31.200	8.0/ 8.0	75.6/45.0
23: GAL+	CFDM/FM (4000)	52.000	8.0/ 8.0	79.0/49.0
24: GAL+	TV/FM (1)	24.000	6.0/ 1.0	79.0/49.0
25: GAL+	TV/FM (2)	25.000	7.0/ 7.0	73.6/44.0
26: GAL+	TV/FM (2)	25.000	7.0/ 7.0	73.6/44.0
27: GAL+	QPSK/ 80 MBPS	45.700	4.5/ 4.5	76.5/48.5
28: GAL+	QPSK/ 50 MBPS	28.600	2.0/ 2.0	76.5/48.5
29: GAL+	QPSK/ 1.544 MBPS (24)	.882	3.5/ 3.5	58.9/30.2
30: GAL+	QPSK/ 1.544 MBPS (10)	.882	2.0/ 2.0	62.7/34.0
31: GAL+	BPSK/ 56 KBPS (600)	.064	3.0/ 3.0	44.9/16.2
32: GAL+	QPSK/ 1.544 MBPS (32)	1.544	2.0/ .0	57.9/ .0
33: GAL+	QPSK/ 50 MBPS	28.600	.0/ 2.0	.0/49.0
34: PAM1	QPSK/ 25.900 MBPS	27.000	4.6/ .6	68.9/53.0
35: PAM1	QPSK/ 3 MBPS (4)	4.170	4.6/ .6	61.3/43.2

36: PAM1 QPSK/ 1.544 MBPS (11)	1.970	2.4/ 1.2	60.3/37.1
37: PAM1 QPSK/ 64 KBPS (237)	.064	2.4/ 1.2	47.0/24.0

DESIRED SATELLITE: Revised Doc 81-704 Appendix C
INTERFERING SATELLITE: PanAmSat Satellite

L I N K P A R A M E T E R S 17:54:05 9-OCT-95

CARRIER	COMPANY	TYPE	RF BANDWIDTH (MHz)	NO. OF CHAN	CODE RATE/ MOD. INDEX	BOT MOD. FREQ. (MHz)	TOP MOD. FREQ. (MHz)	AVE. TALKER LEVEL (dBm0)	CPAND PREMP NOISE WEIGH (dB)	P N A S E	DATA RATE (MBPS)	CHAN. SPACE (MHz)	TRANSPONDER FREQUENCY UP (GHz)	DN (GHz)	POL U P	POL D N	EARTH STATION TRANSMITTER POWR (dBW)	DIAM (m)	GAIN (dB)	--SATELLITE--- RECEIVER GAIN (dB)	TEMP (K)	XMTR EIRP (dBW)	-EARTH STATION RECEIVER DIAM (m)	GAIN (dB)	TEMP (K)
1	ASC*	2	54.000	1	.000	.000	.000	.0	.0	4	90.000	.000	14.250	11.950	0	1	24.0	7.0	58.0	27.5	900.	50.0	7.0	57.0	251
2	ASC*	2	36.000	1	.000	.000	.000	.0	.0	4	60.000	.000	14.250	11.950	0	1	24.0	7.0	58.0	27.5	900.	42.0	7.0	57.0	251
3	ASC*	2	10.000	4	.750	.000	.000	.0	.0	4	12.000	12.000	14.250	11.950	0	1	12.0	7.0	58.0	27.5	900.	33.0	7.0	57.0	251
4	ASCo	2	15.000	4	.500	.000	.000	.0	.0	2	6.000	18.000	14.250	11.950	0	1	13.7	7.0	57.5	27.3	1000.	33.0	7.0	56.0	316
5	ASCm	2	3.900	14	.500	.000	.000	.0	.0	2	1.544	4.500	14.250	11.950	0	1	7.7	7.0	57.5	27.3	1000.	27.0	7.0	56.0	316
6	ASCm	3	.140	126	.500	.000	.000	.0	.0	2	.056	.571*	14.250	11.950	0	1	-1.8	5.0	55.0	27.3	1000.	15.0	5.0	53.5	316
7	GTEs	1	36.000	1	3.286	.025	4.200	.0	12.8	0	.000	.000	14.250	11.950	0	1	20.5	7.5	59.0	29.3	540.	47.0	7.5	57.4	145
8	GTEs	1	36.000	1	3.286	.025	4.200	.0	12.8	0	.000	.000	14.250	11.950	0	1	23.2	5.5	56.3	29.3	540.	47.0	5.5	54.7	145
9	GTE*	1	22.000	1	1.619	.025	4.200	.0	12.8	0	.000	.000	14.250	11.950	0	1	24.3	5.0	55.2	29.3	540.	47.0	1.2	41.3	250
10	GTE*	2	54.000	1	.000	.000	.000	.0	.0	4	90.000	.000	14.250	11.950	0	1	24.3	5.0	55.2	29.3	540.	47.0	5.0	53.7	145
11	GTEs	2	36.000	1	.000	.000	.000	.0	.0	4	60.000	.000	14.250	11.950	0	1	20.5	7.5	59.0	29.3	540.	47.0	7.5	57.4	145
12	GTEs	2	36.000	1	.000	.000	.000	.0	.0	4	60.000	.000	14.250	11.950	0	1	23.2	5.5	56.3	29.3	540.	47.0	5.5	54.7	145
13	GTEs	3	.039	562	.875	.000	.000	.0	.0	4	.056	.096*	14.250	11.950	0	1	-7.5	7.5	59.0	29.3	540.	14.5	7.5	57.4	145
14	GTEs	3	.039	562	.875	.000	.000	.0	.0	4	.056	.096*	14.250	11.950	0	1	-4.8	5.5	56.3	29.3	540.	14.5	5.5	54.7	145
15	GTEm	1	36.000	1	3.286	.025	4.200	.0	12.8	0	.000	.000	14.250	11.950	0	1	20.5	7.5	59.0	28.1	800.	42.0	7.5	57.4	145
16	GTEm	1	36.000	1	3.286	.025	4.200	.0	12.8	0	.000	.000	14.250	11.950	0	1	23.2	5.5	56.3	28.1	800.	42.0	5.5	54.7	145
17	GTE*	2	54.000	1	.875	.000	.000	.0	.0	4	90.000	.000	14.250	11.950	0	1	24.3	5.0	55.2	28.1	800.	43.0	5.0	53.7	145
18	GTEm	2	36.000	1	.000	.000	.000	.0	.0	4	60.000	.000	14.250	11.950	0	1	20.5	7.5	59.0	28.1	800.	42.0	7.5	57.4	145
19	GTEm	2	36.000	1	.000	.000	.000	.0	.0	4	60.000	.000	14.250	11.950	0	1	23.2	5.5	56.3	28.1	800.	42.0	5.5	54.7	145
20	GTEm	3	.039	562	.875	.000	.000	.0	.0	4	.056	.096*	14.250	11.950	0	1	-7.5	7.5	59.0	28.1	800.	9.5	7.5	57.4	145
21	GTEm	3	.039	562	.875	.000	.000	.0	.0	4	.056	.096*	14.250	11.950	0	1	-4.8	5.5	56.3	28.1	800.	9.5	5.5	54.7	145
22	GAL*	5	31.200	6700	.000	1.500	15.600	-21.5	7.4	0	.000	.000	14.250	11.950	0	1	15.9	8.0	59.7	30.0	1000.	45.0	8.0	58.2	260
23	GAL*	0	52.000	6000	.406	.012	16.800	-17.0	-10.2	0	.000	.000	14.250	11.950	0	1	19.3	8.0	59.7	30.0	1000.	49.0	8.0	58.2	260
24	GAL*	1	24.000	1	1.857	.025	4.200	.0	12.8	0	.000	.000	14.250	11.950	0	1	21.8	6.0	57.2	30.0	1000.	49.0	1.0	40.4	260
25	GAL*	1	25.000	2	2.143	.025	4.200	.0	12.8	0	.000	26.000	14.250	11.950	0	1	15.1	7.0	58.5	30.0	1000.	44.0	7.0	57.0	260
26	GAL*	1	25.000	2	2.143	.025	4.200	.0	12.8	0	.000	26.000	14.263	11.963	0	1	15.1	7.0	58.5	30.0	1000.	44.0	7.0	57.0	260
27	GAL*	2	45.700	1	.875	.000	.000	.0	.0	4	80.000	.000	14.250	11.950	0	1	21.8	4.5	54.7	30.0	1000.	48.5	4.5	53.2	260
28	GAL*	2	28.600	1	.875	.000	.000	.0	.0	4	50.000	.000	14.250	11.950	0	1	28.9	2.0	47.6	30.0	1000.	48.5	2.0	45.4	204
29	GAL*	2	.882	24	.875	.000	.000	.0	.0	4	1.544	1.500*	14.250	11.950	0	1	6.5	3.5	52.4	30.0	1000.	30.2	3.5	50.9	260
30	GAL*	2	.882	10	.875	.000	.000	.0	.0	4	1.544	2.000*	14.250	11.950	0	1	15.1	2.0	47.6	30.0	1000.	34.0	2.0	46.1	260
31	GAL*	3	.064	600	.875	.000	.000	.0	.0	2	.056	.080*	14.250	11.950	0	1	-6.2	3.0	51.1	30.0	1000.	16.2	3.0	49.6	260
32	GAL*	2	1.544	32	.000	.000	.000	.0	.0	4	1.544	1.544	14.250	.000	0	1	10.3	2.0	47.6	30.0	1000.	.0	.0	.0	0
33	GAL*	2	28.600	1	.875	.000	.000	.0	.0	4	50.000	.000	.000	11.950	0	1	.0	.0	.0	.0	0.	49.0	2.0	46.1	200
34	PAN1	2	27.000	1	.667	.000	.030	.0	.0	4	25.900	.000	4.250	1.950	1	0	14.0	4.6	54.9	22.4	630.	53.0	.6	36.1	148
35	PAN1	2	4.170	4	.667	.000	.006	.0	.0	4	3.000	.000	4.250	1.950	1	0	6.4	4.6	54.9	22.4	630.	43.2	.6	36.1	148

36	PAN1	2	1.970	11	.500	.000	.002	.0	.0	4	1.544	.000	4.250	1.950	1	0	11.1	2.4	49.2	22.4	630.	37.1	1.2	42.1	204
37	PAN1	2	.064	237	.500	.000	.000	.0	.0	4	.064	.000	4.250	1.950	1	0	-2.2	2.4	49.2	22.4	630.	24.0	1.2	42.1	204

THERMAL NOISE SUMMARY

17:54:05 9-OCT-95

CARRIER	COMPANY	EARTH-TO-SPACE EIRP (dBW)	EARTH-TO-SPACE PATH LOSS* (dB)	EARTH-TO-SPACE RCV G/T (dB/K)	SPACE-TO-EARTH EIRP (dBW)	SPACE-TO-EARTH PATH LOSS* (dB)	SPACE-TO-EARTH RCV G/T (dB/K)	C/No - (dB-Hz) UP	C/No - (dB-Hz) DN	C/No - (dB-Hz) TOTAL	C/N - (dB) UP	C/N - (dB) DN	C/N - (dB) TOTAL	LINK THERMAL NOISE (pW0p)	S/N (dB)	Eb/No (dB)	SINGLE ENTRY INTERFERENCE OBJ+ (pW0p)	S/I (dB)	C/In (dB)	C/Itv (dB)	IMPAIRMENT GRADE
1	ASC+	82.0	208.1	-2.0	50.0	206.3	33.0	100.5	105.3	99.2	23.1	28.0	21.9			19.7			78.0		
2	ASC+	82.0	208.1	-2.0	42.0	206.3	33.0	100.5	97.3	95.6	24.9	21.7	20.0			17.8			78.0		
3	ASC+	70.0	208.1	-2.0	33.0	206.3	33.0	88.5	88.3	85.4	18.5	18.3	15.4			14.6			76.0		
4	ASCo	71.2	208.1	-2.7	33.0	206.3	31.0	89.0	86.3	84.4	17.2	14.5	12.7			16.7			69.0		
5	ASCm	65.2	208.1	-2.7	27.0	206.3	31.0	83.0	80.3	78.4	17.1	14.4	12.5			16.5			69.0		
6	ASCm	53.2	208.1	-2.7	15.0	206.3	28.5	71.0	65.8	64.7	19.5	14.3	13.2			17.2			69.0		
7	GTEs	79.5	208.1	2.0	47.0	206.3	35.8	102.0	105.1	100.2	26.4	29.5	24.7		64.9			62.1	=21.9	=28.8	<4.60>
8	GTEs	79.5	208.1	2.0	47.0	206.3	33.1	102.0	102.4	99.2	26.4	26.8	23.6		63.8			62.1	=21.9	=28.8	<4.60>
9	GTE+	79.5	208.1	2.0	47.0	206.1	17.3	102.0	86.8	86.7	28.6	13.4	13.3		45.2			51.3	=19.4	=24.1	<4.16>
10	GTE+	79.5	208.1	2.0	47.0	206.3	32.1	102.0	101.4	98.7	24.7	24.1	21.3			19.1			78.0		
11	GTEs	79.5	208.1	2.0	47.0	206.3	35.8	102.0	105.1	100.2	26.4	29.5	24.7			22.5			77.9		
12	GTEs	79.5	208.1	2.0	47.0	206.3	33.1	102.0	102.4	99.2	26.4	26.8	23.6			21.4			77.9		
13	GTEs	51.5	208.1	2.0	14.5	206.3	35.8	74.0	72.6	70.2	28.1	26.7	24.3			22.7			76.7		
14	GTEs	51.5	208.1	2.0	14.5	206.3	33.1	74.0	69.9	68.5	28.1	24.0	22.5			21.0			76.7		
15	GTEm	79.5	208.1	-.9	42.0	206.3	35.8	99.1	100.1	96.5	23.5	24.5	21.0		61.2			62.1	=21.9	=28.8	<4.60>
16	GTEm	79.5	208.1	-.9	42.0	206.3	33.1	99.1	97.4	95.1	23.5	21.8	19.6		59.8			62.1	=21.9	=28.8	<4.60>
17	GTE+	79.5	208.1	-.9	43.0	206.3	32.1	99.1	97.4	95.1	21.7	20.1	17.8			15.6			75.6		
18	GTEm	79.5	208.1	-.9	42.0	206.3	35.8	99.1	100.1	96.5	23.5	24.5	21.0			18.8			77.9		
19	GTEm	79.5	208.1	-.9	42.0	206.3	33.1	99.1	97.4	95.1	23.5	21.8	19.6			17.4			77.9		
20	GTEm	51.5	208.1	-.9	9.5	206.3	35.8	71.1	67.6	66.0	25.2	21.7	20.1			18.5			76.7		
21	GTEm	51.5	208.1	-.9	9.5	206.3	33.1	71.1	64.9	63.9	25.2	19.0	18.0			16.5			76.7		
22	GAL+	75.6	208.1	.0	45.0	206.3	34.1	57.8	63.1	56.7	21.8	27.1	20.7	4796.	53.2		1165.	59.3			
23	GAL+	79.0	208.1	.0	49.0	206.3	34.1	99.5	105.4	98.5	22.3	28.2	21.3	4537.	53.4		600.	62.2			
24	GAL+	79.0	208.1	.0	49.0	206.1	16.3	99.5	87.8	87.5	25.7	13.9	13.7		47.2			54.1	=20.6	=25.7	<4.36>
25	GAL+	73.6	208.1	.0	44.0	206.3	32.9	94.1	99.2	92.9	20.1	25.2	18.9		54.1			60.1	=24.9	=30.5	<4.54>
26	GAL+	73.6	208.1	.0	44.0	206.3	32.9	94.1	99.2	92.9	20.1	25.2	18.9		54.1			60.1	=24.9	=30.5	<4.54>
27	GAL+	76.5	208.1	.0	48.5	206.3	29.1	97.0	99.9	95.2	20.4	23.3	18.6			16.2			79.0		
28	GAL+	76.5	207.8	.0	48.5	206.2	22.3	97.3	93.2	91.8	22.7	18.6	17.2			14.8			75.7		
29	GAL+	58.9	208.1	.0	30.2	206.3	26.8	79.4	79.3	76.3	19.9	19.8	16.9			14.4			75.8		
30	GAL+	62.7	207.8	.0	34.0	206.2	22.0	83.5	78.4	77.2	24.0	18.9	17.7			15.3			75.8		
31	GAL+	44.9	208.1	.0	16.2	206.2	25.5	65.4	64.1	61.7	17.3	16.0	13.6			14.2			72.8		
32	GAL+	57.9	207.8	.0	.0	196.2	.0	78.7	999.9	78.7	16.8	99.9	16.8			16.8			74.4		
33	GAL+	.0	199.8	.0	49.0	206.2	23.1	999.9	96.5	96.5	99.9	19.9	19.9			17.5			76.8		
34	PAM1	68.9	200.1	-5.6	53.0	196.2	14.4	91.8	99.8	91.2	17.5	25.5	16.9			17.0			22.5		
35	PAM1	61.3	200.1	-5.6	43.2	196.2	14.4	84.2	90.0	83.2	18.0	23.8	17.0			18.4			20.8		
36	PAM1	60.3	199.8	-5.6	37.1	196.2	19.0	83.5	88.5	82.3	20.6	25.6	19.4			20.4			23.5		
37	PAM1	47.0	199.8	-5.6	24.0	196.2	19.0	70.2	75.4	69.1	22.1	27.3	21.0			21.0			23.5		

*** FOOTNOTES ***

LINK PARAMETERS

SIGNAL TYPE INDEX	POLARIZATION TYPE INDEX
0 = FDM/FM	0 = HORIZONTAL
1 = TV/FM	1 = VERTICAL
2 = DIGITAL	
3 = SCPC/PSK	2 = 20 DEG CANTED HORIZONTAL
4 = SCPC/FM	3 = 20 DEG CANTED VERTICAL
5 = CSSB/AM	
6 = SS/PSK	4 = LEFT-HAND CIRCULAR
	5 = RIGHT-HAND CIRCULAR

POLARIZATION ISOLATION MATRIX (dB)

DESIRED SENSE \ INTERFERING SENSE	0	1	2	3	4	5
0	10.0	10.0	10.0	10.0	10.0	10.0
1	10.0	10.0	10.0	10.0	10.0	10.0
2	10.0	10.0	10.0	10.0	10.0	10.0
3	10.0	10.0	10.0	10.0	10.0	10.0
4	10.0	10.0	10.0	10.0	10.0	10.0
5	10.0	10.0	10.0	10.0	10.0	10.0

SPECTRA ASSUMED FOR INTERFERENCE INTO SCPC & PSK

TV/FM: .000 MHz PEAK SPREADING ONLY

FDM/FM: GAUSSIAN, EXCEPT FOR THOSE MARKED WITH "*" UNDER SIGNAL TYPE

* INDICATES SCPC AND SMALL FDMA CARRIERS WHOSE TRANSPONDER FREQUENCY PLANS AVOID +- .0 MHz AT THE TRANSPONDER CENTER.

"PLAN" UNDER CHANNEL SPACING INDICATES A FIXED FREQUENCY PLAN.

THERMAL NOISE SUMMARY

* PATH LOSSES INCLUDE FREE SPACE LOSS FOR A 20 DEGREE ELEVATION ANGLE, CLEAR SKY ATMOSPHERIC LOSSES, AND ANTENNA POINTING LOSSES IN THE RANGE OF 0.0-0.5 dB. POINTING LOSSES ARE INCLUDED ONLY FOR THE THERMAL NOISE C/N, NOT IN INTERFERENCE CALCULATIONS.

UPLINK LOSSES = 207.6 + .2 dB + Pointing Loss

DOWNLINK LOSSES = 205.9 + .2 dB + Pointing Loss

- THE TV/FM INTERFERENCE OBJECTIVE IS EITHER THE S/I OR C/I VALUE(S) WITHOUT THE "=". THE VALUE(S) WITH THE "=" ARE FOR COMPARISON ONLY. IF THE S/I HAS THE "=", THEN THE C/I OBJECTIVE IS USED AND THE S/I IS THE EQUIVALENT LEVEL FROM A CO-CHANNEL TV/FM INTERFERER. IF THE C/Is HAVE "=", THEN THE S/I OBJECTIVE IS USED AND THE C/Is INDICATE THE EQUIVALENT SINGLE ENTRY LEVELS IN FOR A NOISE-LIKE INTERFERER (C/In) AND FOR A CO-CHANNEL TV/FM INTERFERER (C/Itv). CCIR Rec. 500-1 IMPAIRMENT GRADES ARE GIVEN FOR THE AGGREGATE TV/FM C/I = C/Itv - 4 dB INTO A "REASONABLELY CRITICAL STILL SCENE". THE IMPAIRMENT GRADES ARE:

  - 5.0 = IMPERCEPTIBLE (Never achieved)
  - 4.6 = JUST PERCEPTIBLE OR JUST UNPERCEPTIBLE (Highest achievable grade)
  - 4.3 = APPROXIMATE GRADE FOR CATV AGGREGATE OBJECTIVE OF 18 dB
  - 4.0 = PERCEPTIBLE, BUT NOT ANNOYING
  - 3.0 = SLIGHTLY ANNOYING
  - 2.0 = ANNOYING
  - 1.0 = VERY ANNOYING

COMBINATIONS FAILING TO MEET SINGLE ENTRY INTERFERENCE OBJECTIVES (dB) 17:54:05 9-OCT-95

(2.00 DEGREE SPACING) Antenna Patterns as given ; A = Geocentric Angle

| INTERFERING LINK -->

WANTED LINK	3 3 3 3 4 5 6 7
ASC+ 1	
ASC+ 2	
ASC+ 3	
ASCo 4	
ASCm 5	
ASCm 6	
GTEs 7	
GTEs 8	
GTE+ 9	
GTE+ 10	
GTEs 11	
GTEs 12	
GTEs 13	
GTEs 14	
GTEm 15	
GTEm 16	
GTE+ 17	
GTEm 18	
GTEm 19	
GTEm 20	
GTEm 21	
GAL+ 22	
GAL+ 23	
GAL+ 24	
GAL+ 25	
GAL+ 26	
GAL+ 27	
GAL+ 28	
GAL+ 29	
GAL+ 30	
GAL+ 31	
GAL+ 32	
GAL+ 33	

LOWEST C/I RATIO IN: "U"=Uplink, "D"=Downlink, "0"=Equal 17:54:05 9-OCT-95

(2.00 DEGREE SPACING) Antenna Patterns as given; A = Geocentric Angle

| INTERFERING LINK -->

WANTED LINK	3 3 3 3 / 4 5 6 7
ASC+ 1	
ASC+ 2	
ASC+ 3	
ASCo 4	
ASCm 5	
ASCm 6	
GTEs 7	
GTEs 8	
GTE+ 9	
GTE+ 10	
GTEs 11	
GTEs 12	
GTEs 13	
GTEs 14	
GTEm 15	
GTEm 16	
GTE+ 17	
GTEm 18	
GTEm 19	
GTEm 20	
GTEm 21	
GAL+ 22	
GAL+ 23	
GAL+ 24	
GAL+ 25	
GAL+ 26	
GAL+ 27	
GAL+ 28	
GAL+ 29	
GAL+ 30	
GAL+ 31	
GAL+ 32	
GAL+ 33	

POTENTIAL INTERFERENCE from PanAmSat Satellite
into Revised Doc 81-704 Appendix C
Orbit Separation 2.00 degrees. 14/12 GHz

DESIRED SIGNAL, Carrier No. 1: 1 QPSK/ 90 MBPS 7.0/ 7.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS				78.0	299.0
35:	4 QPSK/ 3 MBPS				78.0	299.0
36:	11 QPSK/ 1.544 MBPS				78.0	299.0
37:	237 QPSK/ 64 KBPS				78.0	299.0

DESIRED SIGNAL, Carrier No. 2: 1 QPSK/ 60 MBPS 7.0/ 7.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS				78.0	299.0
35:	4 QPSK/ 3 MBPS				78.0	299.0
36:	11 QPSK/ 1.544 MBPS				78.0	299.0
37:	237 QPSK/ 64 KBPS				78.0	299.0

DESIRED SIGNAL, Carrier No. 3: 4 QPSK/ 12 MBPS 7.0/ 7.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS				76.0	999.9
35:	4 QPSK/ 3 MBPS				76.0	999.9
36:	11 QPSK/ 1.544 MBPS				76.0	999.9
37:	237 QPSK/ 64 KBPS				76.0	999.9

DESIRED SIGNAL, Carrier No. 4: 4 BPSK/ 6 MBPS 7.0/ 7.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)

34:	1 QPSK/ 25.900 MBPS				69.0	999.9
35:	4 QPSK/ 3 MBPS				69.0	999.9
36:	11 QPSK/ 1.544 MBPS				69.0	999.9
37:	237 QPSK/ 64 KBPS				69.0	999.9

DESIRED SIGNAL, Carrier No. 5: 16 QPSK/ 1.544 MBPS 7.0/ 7.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS				69.0	999.9
35:	4 QPSK/ 3 MBPS				69.0	999.9
36:	11 QPSK/ 1.544 MBPS				69.0	999.9
37:	237 QPSK/ 64 KBPS				69.0	999.9

POTENTIAL INTERFERENCE from PanAmSat Satellite
into Revised Doc 81-704 Appendix C
Orbit Separation 2.00 degrees. 14/12 GHz

DESIRED SIGNAL, Carrier No. 6: 126 SCPC/SCPC/SCPC/SCP 5.0/ 5.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS				69.0	999.9
35:	4 QPSK/ 3 MBPS				69.0	999.9
36:	11 QPSK/ 1.544 MBPS				69.0	999.9
37:	237 QPSK/ 64 KBPS				69.0	999.9

DESIRED SIGNAL, Carrier No. 7: 1 TV/FM 36.0 MHz 7.5/ 7.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS							62.1	999.9
35:	4 QPSK/ 3 MBPS							62.1	999.9
36:	11 QPSK/ 1.544 MBPS							62.1	999.9
37:	237 QPSK/ 64 KBPS							62.1	999.9

DESIRED SIGNAL, Carrier No. 8: 1 TV/FM 36.0 MHz 5.5/ 5.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS							62.1	999.9
35:	4 QPSK/ 3 MBPS							62.1	999.9
36:	11 QPSK/ 1.544 MBPS							62.1	999.9
37:	237 QPSK/ 64 KBPS							62.1	999.9

DESIRED SIGNAL, Carrier No. 9: 1 TV/FM 22.0 MHz 5.0/ 1.2 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)

34:	1 QPSK/ 25.900 MBPS				51.3	999.9
35:	4 QPSK/ 3 MBPS				51.3	999.9
36:	11 QPSK/ 1.544 MBPS				51.3	999.9
37:	237 QPSK/ 64 KBPS				51.3	999.9

DESIRED SIGNAL, Carrier No. 10: 1 QPSK/ 90 MBPS 5.0/ 5.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS				78.0	299.0
35:	4 QPSK/ 3 MBPS				78.0	299.0
36:	11 QPSK/ 1.544 MBPS				78.0	299.0
37:	237 QPSK/ 64 KBPS				78.0	299.0

POTENTIAL INTERFERENCE from PanAmSat Satellite
into Revised Doc 81-704 Appendix C
Orbit Separation 2.00 *degrees.* 14/12 GHz

DESIRED SIGNAL, Carrier No. 11: 1 QPSK/ 60 MBPS 7.5/ 7.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. Margin (dB)	(dB)
34:	1 QPSK/ 25.900 MBPS				77.9	299.1
35:	4 QPSK/ 3 MBPS				77.9	299.1
36:	11 QPSK/ 1.544 MBPS				77.9	299.1
37:	237 QPSK/ 64 KBPS				77.9	299.1

DESIRED SIGNAL, Carrier No. 12: 1 QPSK/ 60 MBPS 5.5/ 5.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. Margin (dB)	(dB)
34:	1 QPSK/ 25.900 MBPS				77.9	299.1
35:	4 QPSK/ 3 MBPS				77.9	299.1
36:	11 QPSK/ 1.544 MBPS				77.9	299.1
37:	237 QPSK/ 64 KBPS				77.9	299.1

DESIRED SIGNAL, Carrier No. 13: 562 SCPC/SCPC/SCPC/SCP 7.5/ 7.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. Margin (dB)	(dB)
34:	1 QPSK/ 25.900 MBPS				76.7	999.9
35:	4 QPSK/ 3 MBPS				76.7	999.9
36:	11 QPSK/ 1.544 MBPS				76.7	999.9
37:	237 QPSK/ 64 KBPS				76.7	999.9

DESIRED SIGNAL, Carrier No. 14: 562 SCPC/SCPC/SCPC/SCP 5.5/ 5.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. Margin (dB)	(dB)

34:	1 QPSK/ 25.900 MBPS							76.7	999.9
35:	4 QPSK/ 3 MBPS							76.7	999.9
36:	11 QPSK/ 1.544 MBPS							76.7	999.9
37:	237 QPSK/ 64 KBPS							76.7	999.9

DESIRED SIGNAL, Carrier No. 15: 1 TV/FM 36.0 MHz 7.5/ 7.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS							62.1	999.9
35:	4 QPSK/ 3 MBPS							62.1	999.9
36:	11 QPSK/ 1.544 MBPS							62.1	999.9
37:	237 QPSK/ 64 KBPS							62.1	999.9

POTENTIAL INTERFERENCE from PanAmSat Satellite
into Revised Doc 81-704 Appendix C
Orbit Separation 2.00 degrees. 14/12 GHz

DESIRED SIGNAL, Carrier No. 16: 1 TV/FM 36.0 MHz 5.5/ 5.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS							62.1	999.9
35:	4 QPSK/ 3 MBPS							62.1	999.9
36:	11 QPSK/ 1.544 MBPS							62.1	999.9
37:	237 QPSK/ 64 KBPS							62.1	999.9

DESIRED SIGNAL, Carrier No. 17: 1 QPSK/ 90 MBPS 5.0/ 5.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS				75.6	999.9
35:	4 QPSK/ 3 MBPS				75.6	999.9
36:	11 QPSK/ 1.544 MBPS				75.6	999.9
37:	237 QPSK/ 64 KBPS				75.6	999.9

DESIRED SIGNAL, Carrier No. 18: 1 QPSK/ 60 MBPS 7.5/ 7.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS				77.9	299.1
35:	4 QPSK/ 3 MBPS				77.9	299.1
36:	11 QPSK/ 1.544 MBPS				77.9	299.1
37:	237 QPSK/ 64 KBPS				77.9	299.1

DESIRED SIGNAL, Carrier No. 19: 1 QPSK/ 60 MBPS 5.5/ 5.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)

34:	1 QPSK/ 25.900 MBPS	77.9	299.1
35:	4 QPSK/ 3 MBPS	77.9	299.1
36:	11 QPSK/ 1.544 MBPS	77.9	299.1
37:	237 QPSK/ 64 KBPS	77.9	299.1

DESIRED SIGNAL, Carrier No. 20: 562 SCPC/SCPC/SCPC/SCP 7.5/ 7.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS				76.7	999.9
35:	4 QPSK/ 3 MBPS				76.7	999.9
36:	11 QPSK/ 1.544 MBPS				76.7	999.9
37:	237 QPSK/ 64 KBPS				76.7	999.9

POTENTIAL INTERFERENCE from PanAmSat Satellite
into Revised Doc 81-704 Appendix C
Orbit Separation 2.00 degrees. 14/12 GHz

DESIRED SIGNAL, Carrier No. 21: 562 SCPC/SCPC/SCPC/SCP 5.5/ 5.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS				76.7	999.9
35:	4 QPSK/ 3 MBPS				76.7	999.9
36:	11 QPSK/ 1.544 MBPS				76.7	999.9
37:	237 QPSK/ 64 KBPS				76.7	999.9

DESIRED SIGNAL, Carrier No. 22: 1 CSSB/AM 6700/4 kHz 8.0/ 8.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Up (pW0p)	Dn (pW0p)	Total (pW0p)	Object. (pW0p)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS							1165	999.9
35:	4 QPSK/ 3 MBPS							1165	999.9
36:	11 QPSK/ 1.544 MBPS							1165	999.9
37:	237 QPSK/ 64 KBPS							1165	999.9

DESIRED SIGNAL, Carrier No. 23: 1 CFDM/FM 4000/52.0 8.0/ 8.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Up (pW0p)	Dn (pW0p)	Total (pW0p)	Object. (pW0p)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS							600	999.9
35:	4 QPSK/ 3 MBPS							600	999.9
36:	11 QPSK/ 1.544 MBPS							600	999.9
37:	237 QPSK/ 64 KBPS							600	999.9

DESIRED SIGNAL, Carrier No. 24: 1 TV/FM 24.0 MHz 6.0/ 1.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)

34:	1 QPSK/ 25.900 MBPS							54.1	999.9
35:	4 QPSK/ 3 MBPS							54.1	999.9
36:	11 QPSK/ 1.544 MBPS							54.1	999.9
37:	237 QPSK/ 64 KBPS							54.1	999.9

DESIRED SIGNAL, Carrier No. 25: 2 TV/FM 25.0 MHz 7.0/ 7.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS							60.1	999.9
35:	4 QPSK/ 3 MBPS							60.1	999.9
36:	11 QPSK/ 1.544 MBPS							60.1	999.9
37:	237 QPSK/ 64 KBPS							60.1	999.9

POTENTIAL INTERFERENCE from PanAmSat Satellite
into Revised Doc 81-704 Appendix C
Orbit Separation 2.00 degrees. 14/12 GHz

DESIRED SIGNAL, Carrier No. 26: 2 TV/FM 25.0 MHz 7.0/ 7.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS							60.1	999.9
35:	4 QPSK/ 3 MBPS							60.1	999.9
36:	11 QPSK/ 1.544 MBPS							60.1	999.9
37:	237 QPSK/ 64 KBPS							60.1	999.9

DESIRED SIGNAL, Carrier No. 27: 1 QPSK/ 80 MBPS 4.5/ 4.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS				79.0	298.0
35:	4 QPSK/ 3 MBPS				79.0	298.0
36:	11 QPSK/ 1.544 MBPS				79.0	298.0
37:	237 QPSK/ 64 KBPS				79.0	298.0

DESIRED SIGNAL, Carrier No. 28: 1 QPSK/ 50 MBPS 2.0/ 2.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS				75.7	999.9
35:	4 QPSK/ 3 MBPS				75.7	999.9
36:	11 QPSK/ 1.544 MBPS				75.7	999.9
37:	237 QPSK/ 64 KBPS				75.7	999.9

DESIRED SIGNAL, Carrier No. 29: 24 QPSK/ 1.544 MBPS 3.5/ 3.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)

POTENTIAL INTERFERENCE from PanAmSat Satellite
into Revised Doc 81-704 Appendix C
Orbit Separation 2.00 degrees. 14/12 GHz

DESIRED SIGNAL, Carrier No. 26: 2 TV/FM 25.0 MHz 7.0/ 7.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS							60.1	999.9
35:	4 QPSK/ 3 MBPS							60.1	999.9
36:	11 QPSK/ 1.544 MBPS							60.1	999.9
37:	237 QPSK/ 64 KBPS							60.1	999.9

DESIRED SIGNAL, Carrier No. 27: 1 QPSK/ 80 MBPS 4.5/ 4.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS				79.0	298.0
35:	4 QPSK/ 3 MBPS				79.0	298.0
36:	11 QPSK/ 1.544 MBPS				79.0	298.0
37:	237 QPSK/ 64 KBPS				79.0	298.0

DESIRED SIGNAL, Carrier No. 28: 1 QPSK/ 50 MBPS 2.0/ 2.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS				75.7	999.9
35:	4 QPSK/ 3 MBPS				75.7	999.9
36:	11 QPSK/ 1.544 MBPS				75.7	999.9
37:	237 QPSK/ 64 KBPS				75.7	999.9

DESIRED SIGNAL, Carrier No. 29: 24 QPSK/ 1.544 MBPS 3.5/ 3.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)

POTENTIAL INTERFERENCE from PanAmSat Satellite
into Revised Doc 81-704 Appendix C
Orbit Separation 2.00 degrees. 14/12 GHz

DESIRED SIGNAL, Carrier No. 31: 600 SCPC/SCPC/SCPC/SCP 3.0/ 3.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS				72.8	999.9
35:	4 QPSK/ 3 MBPS				72.8	999.9
36:	11 QPSK/ 1.544 MBPS				72.8	999.9
37:	237 QPSK/ 64 KBPS				72.8	999.9

DESIRED SIGNAL, Carrier No. 32: 32 QPSK/ 1.544 MBPS 2.0/ .0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS				74.4	999.9
35:	4 QPSK/ 3 MBPS				74.4	999.9
36:	11 QPSK/ 1.544 MBPS				74.4	999.9
37:	237 QPSK/ 64 KBPS				74.4	999.9

DESIRED SIGNAL, Carrier No. 33: 1 QPSK/ 50 MBPS .0/ 2.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS				76.8	999.9
35:	4 QPSK/ 3 MBPS				76.8	999.9
36:	11 QPSK/ 1.544 MBPS				76.8	999.9
37:	237 QPSK/ 64 KBPS				76.8	999.9

34:	1 QPSK/ 25.900 MBPS				75.8	999.9
35:	4 QPSK/ 3 MBPS				75.8	999.9
36:	11 QPSK/ 1.544 MBPS				75.8	999.9
37:	237 QPSK/ 64 KBPS				75.8	999.9

DESIRED SIGNAL, Carrier No. 30: 10 QPSK/ 1.544 MBPS 2.0/ 2.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
34:	1 QPSK/ 25.900 MBPS				75.8	999.9
35:	4 QPSK/ 3 MBPS				75.8	999.9
36:	11 QPSK/ 1.544 MBPS				75.8	999.9
37:	237 QPSK/ 64 KBPS				75.8	999.9

17:59:07 9-OCT-95

Desired Signals from File: v:\fcc2deg\panamsat\data2.dat

Interfering Signals from File: v:\fcc2deg\panamsat\panamsat.dat

14/12 GHz Carrier Listing from PanAmSat Satellite at
into Revised Doc 81-704 Appendix C at

36: PAM1 QPSK/ 25.900 MBPS	27.000	4.6/ .6	68.9/53.0
37: PAM1 QPSK/ 3 MBPS (4)	4.170	4.6/ .6	61.3/43.2
38: PAM1 QPSK/ 1.544 MBPS (11)	1.970	2.4/ 1.2	60.3/37.1
39: PAM1 QPSK/ 64 KBPS (237)	.064	2.4/ 1.2	47.0/24.0

DESIRED SATELLITE: Revised Doc 81-704 Appendix C at
INTERFERING SATELLITE: PanAmSat Satellite at

L I N K P A R A M E T E R S 17:59:07 9-OCT-95

CAR	COM-PANY	T Y P E	RF BAND-WIDTH (MHz)	NO. OF CHAN	CODE RATE/ MOD. INDEX	BOT MOD. FREQ. (MHz)	TOP MOD. FREQ. (MHz)	AVE. TALKER LEVEL (dBm0)	CPAMO PREMP NOISE WEIGH (dB)	P N A S E	DATA RATE (MBPS)	CHAN. SPACE (MHz)	TRANSPONDER FREQUENCY UP (GHz)	DN (GHz)	POL U P	D N	EARTH STATION TRANSMITTER POWR (dBW)	DIAM (m)	GAIN (dB)	--SATELLITE--- RECEIVER GAIN (dB)	TEMP (K)	EARTH STATION XMTR EIRP (dBW)	DIAM (m)	RECEIVER GAIN (dB)	TEMP (K)
1	RCAc	0	54.000	3800	.451	.012	16.516	-15.0	-11.3	0	.000	.000	14.250	11.950	0	1	19.6	10.0	61.6	30.1	650.	45.0	10.0	60.4	165
2	RCAm	1	24.000	1	2.538	.025	4.200	.0	12.8	0	.000	.000	14.250	11.950	0	1	21.7	7.7	59.5	30.1	650.	51.0	2.0	46.4	365
3	RCAm	1	24.000	1	2.538	.025	4.200	.0	12.8	0	.000	.000	14.250	11.950	0	1	21.7	7.7	59.5	30.1	650.	51.0	1.0	40.4	365
4	RCAe	1	24.000	1	2.538	.025	4.200	.0	12.8	0	.000	.000	14.250	11.950	0	1	21.7	7.7	59.5	30.1	650.	48.0	2.0	46.4	365
5	RCAe	1	24.000	1	2.538	.025	4.200	.0	12.8	0	.000	.000	14.250	11.950	0	1	21.7	7.7	59.5	30.1	650.	48.0	1.0	40.4	365
6	RCAc	1	30.000	1	2.619	.025	4.200	.0	12.8	0	.000	.000	14.250	11.950	0	1	21.7	7.7	59.5	30.1	650.	45.0	5.5	55.0	365
7	RCAc	1	24.000	1	2.538	.025	4.200	.0	12.8	0	.000	.000	14.250	11.950	0	1	21.7	7.7	59.5	30.1	650.	45.0	3.0	50.0	365
8	RCAc	1	26.000	2	2.438	.025	4.200	.0	12.8	0	.00026	.000	14.250	11.950	0	1	16.7	7.7	59.5	30.1	650.	40.5	5.5	55.0	165
9	RCAc	1	26.000	2	2.438	.025	4.200	.0	12.8	0	.00026	.000	14.263	11.963	0	1	16.7	7.7	59.5	30.1	650.	40.5	5.5	55.0	165
10	RCAc	2	45.714	1	.875	.000	.000	.0	.0	4	80.000	.000	14.250	11.950	0	1	19.6	10.0	61.6	30.1	650.	45.0	10.0	60.4	165
11	RCAc	2	1.029	20	.750	.000	.000	.0	.0	4	1.544	1.500*	14.250	11.950	0	1	-4.4	10.0	61.6	30.1	650.	26.0	10.0	60.4	165
12	RCAc	3	.064	100	.875	.000	.000	.0	.0	2	.056	.500*	14.250	11.950	0	1	-4.4	5.0	55.6	30.1	650.	20.0	5.0	54.4	165
13	RCAc	3	.064	400	.875	.000	.000	.0	.0	2	.056	.125*	14.250	11.950	0	1	-10.4	5.0	55.6	30.1	650.	14.0	5.0	54.4	165
14	RCAc	4	.037	500	4.412	.000	.003	.0	25.8	0	.000	.100*	14.250	11.950	0	1	-16.3	7.7	59.5	30.1	650.	12.0	7.7	58.0	165
15	RCAo	0	54.000	3800	.451	.012	16.516	-15.0	-11.3	0	.000	.000	14.250	11.950	0	1	24.7	10.0	60.6	27.5	800.	41.0	10.0	59.3	145
16	RCAm	1	26.000	1	2.143	.025	4.200	.0	12.8	0	.000	.000	14.250	11.950	0	1	26.9	7.7	58.2	27.5	800.	41.0	3.0	49.0	186
17	RCAo	1	26.000	2	2.143	.025	4.200	.0	12.8	0	.00027	.000	14.250	11.950	0	1	24.6	5.5	55.5	27.5	800.	36.5	5.5	54.7	145
18	RCAm	1	26.000	2	2.143	.025	4.200	.0	12.8	0	.00027	.000	14.263	11.963	0	1	24.6	5.5	55.5	27.5	800.	36.5	5.5	54.7	145
19	RCAo	2	54.000	1	.875	.000	.000	.0	.0	4	80.000	.000	14.250	11.950	0	1	24.7	10.0	60.6	27.5	800.	41.0	10.0	59.3	145
20	RCAo	2	1.030	20	.750	.000	.000	.0	.0	4	1.544	2.500*	14.250	11.950	0	1	.5	10.0	60.6	27.5	800.	22.0	10.0	59.3	145
21	RCAo	3	.064	100	.875	.000	.000	.0	.0	2	.056	.500*	14.250	11.950	0	1	.6	5.0	54.5	27.5	800.	16.0	5.0	53.4	145
22	RCAo	3	.064	400	.875	.000	.000	.0	.0	2	.056	.125*	14.250	11.950	0	1	-5.4	5.0	54.5	27.5	800.	10.0	5.0	53.4	145
23	RCAo	4	.037	500	4.412	.000	.003	.0	25.8	0	.000	.100*	14.250	11.950	0	1	-11.1	7.7	58.2	27.5	800.	8.0	7.7	57.4	145
24	RCA+	3	.140	110	.500	.000	.000	.0	.0	2	.056	.225*	14.250	11.950	0	1	3.8	1.2	42.9	27.5	800.	17.8	7.0	56.6	180
25	RCA+	3	.140	131	.500	.000	.000	.0	.0	2	.056	.225*	14.250	11.950	0	1	-8.6	7.0	58.1	27.5	800.	22.4	1.2	41.5	290
26	SBSo	2	43.000	1	.000	.000	.000	.0	.0	4	50.000	.000	14.250	11.950	0	1	24.5	5.5	55.3	30.0	1000.	46.7	5.5	54.7	269
27	SBS&	2	25.000	1	.000	.000	.000	.0	.0	4	50.000	.000	14.250	11.950	0	1	24.5	5.5	55.3	30.0	1000.	46.7	5.5	54.7	269
28	SBSo	2	43.000	1	.000	.000	.000	.0	.0	4	50.000	.000	14.250	11.950	0	1	24.5	7.7	58.2	30.0	1000.	43.7	7.7	57.4	257
29	SBS&	2	25.000	1	.000	.000	.000	.0	.0	4	50.000	.000	14.250	11.950	0	1	24.5	7.7	58.2	30.0	1000.	43.7	7.7	57.4	257
30	SBSo	2	43.000	1	.000	.000	.000	.0	.0	4	50.000	.000	14.250	11.950	0	1	24.5	5.5	55.3	30.0	1000.	43.7	5.5	54.7	269
31	SBS&	2	25.000	1	.000	.000	.000	.0	.0	4	50.000	.000	14.250	11.950	0	1	24.5	5.5	55.3	30.0	1000.	43.7	5.5	54.7	269
32	SBSu	2	28.600	1	.875	.000	.000	.0	.0	4	50.000	.000	14.250	11.950	0	1	24.5	5.5	55.3	30.0	1000.	43.7	5.5	54.7	269
33	SBS+	1	16.000	1	1.429	.025	4.200	.0	12.8	0	.000	.000	14.250	11.950	0	1	23.7	5.5	55.3	30.0	1000.	50.0	.8	37.4	339
34	SBS+	1	16.000	1	1.429	.025	4.200	.0	12.8	0	.000	.000	14.250	11.950	0	1	23.7	5.5	55.3	29.5	890.	47.0	1.2	42.4	339
35	SBS+	2	60.000	1	.000	.000	.000	.0	.0	4	120.000	.000	14.250	11.950	0	1	24.5	7.7	58.2	30.0	1000.	47.0	7.7	57.4	257

36	PAN1	2	27.000	1	.667	.000	.030	.0	.0	4	25.900	.000	4.250	1.950	1	0	14.0	4.6	54.9	22.4	630.	53.0	.6	36.1	148
37	PAN1	2	4.170	4	.667	.000	.006	.0	.0	4	3.000	.000	4.250	1.950	1	0	6.4	4.6	54.9	22.4	630.	43.2	.6	36.1	148
38	PAN1	2	1.970	11	.500	.000	.002	.0	.0	4	1.544	.000	4.250	1.950	1	0	11.1	2.4	49.2	22.4	630.	37.1	1.2	42.1	204
39	PAN1	2	.064	237	.500	.000	.000	.0	.0	4	.064	.000	4.250	1.950	1	0	-2.2	2.4	49.2	22.4	630.	24.0	1.2	42.1	204

THERMAL NOISE SUMMARY

17:59:07 9-OCT-95

CAR- RIER	CON- PANY	EARTH-TO-SPACE EIRP (dBW)	PATH LOSS* (dB)	RCV G/T (dB/K)	SPACE-TO-EARTH EIRP (dBW)	PATH LOSS* (dB)	RCV G/T (dB/K)	C/No - (dB-Hz) UP	DN	TOTAL	C/N - (dB) UP	DN	TOTAL	LINK THERMAL NOISE (pW0p)	S/N (dB)	Eb/No (dB)	SINGLE ENTRY INTERFERENCE OBJ+ (pW0p)	S/I (dB)	C/In (dB)	C/Itv (dB)	IMPAIR- MENT GRADE
1	RCAc	81.2	208.3	2.0	45.0	206.3	38.2	103.5	105.5	101.4	26.1	28.2	24.0	2220.	56.5		600.	62.2			
2	RCAm	81.2	208.1	2.0	51.0	206.2	20.8	103.7	94.2	93.7	29.9	20.4	19.9		57.1			56.1	*18.9	*25.0	<4.43>
3	RCAm	81.2	208.1	2.0	51.0	206.1	14.8	103.7	88.3	88.2	29.9	14.5	14.4		51.5			54.1	*16.9	*23.0	<4.36>
4	RCAe	81.2	208.1	2.0	48.0	206.2	20.8	103.7	91.2	90.9	29.9	17.4	17.1		54.3			56.1	*18.9	*25.0	<4.43>
5	RCAe	81.2	208.1	2.0	48.0	206.1	14.8	103.7	85.3	85.2	29.9	11.5	11.4		48.6			54.1	*16.9	*23.0	<4.36>
6	RCAc	81.2	208.1	2.0	45.0	206.3	29.4	103.7	96.7	95.9	28.9	21.9	21.1		58.7			62.1	*24.6	*30.7	<4.60>
7	RCAc	81.2	208.1	2.0	45.0	206.3	24.4	103.7	91.7	91.4	29.9	17.9	17.6		54.8			56.1	*18.9	*25.0	<4.43>
8	RCAc	76.2	208.1	2.0	40.5	206.3	32.8	98.7	95.6	93.9	24.5	21.5	19.7		56.4			62.1	*25.4	*31.4	<4.60>
9	RCAc	76.2	208.1	2.0	40.5	206.3	32.8	98.7	95.6	93.9	24.5	21.5	19.7		56.4			62.1	*25.4	*31.4	<4.60>
10	RCAc	81.2	208.3	2.0	45.0	206.3	38.2	103.5	105.5	101.4	26.9	28.9	26.8			22.3			78.2		
11	RCAc	57.2	208.3	2.0	26.0	206.3	38.2	79.5	86.5	78.7	19.3	26.4	18.6			16.8			73.3		
12	RCAc	51.2	208.1	2.0	20.0	206.3	32.2	73.7	74.5	71.1	25.6	26.5	23.0			23.6			73.5		
13	RCAc	45.2	208.1	2.0	14.0	206.3	32.2	67.7	68.5	65.1	19.6	20.5	17.0			17.6			73.5		
14	RCAc	43.2	208.1	2.0	12.0	206.3	35.8	65.7	70.1	64.3	20.0	24.4	18.7	103.	69.9				73.3		
15	RCAo	85.3	208.3	-1.5	41.0	206.3	37.7	104.1	101.0	99.2	26.7	23.7	21.9	3616.	54.4		600.	62.2			
16	RCAm	85.1	208.1	-1.5	41.0	206.2	26.3	104.1	89.7	89.5	29.9	15.6	15.4		50.6			53.1	*17.9	*23.5	<4.29>
17	RCAo	80.1	208.1	-1.5	36.5	206.3	33.1	99.1	91.9	91.1	24.9	17.7	17.0		52.2			61.6	*26.4	*32.0	<4.59>
18	RCAm	80.1	208.1	-1.5	36.5	206.3	33.1	99.1	91.9	91.1	24.9	17.7	17.0		52.2			61.6	*26.4	*32.0	<4.59>
19	RCAo	85.3	208.3	-1.5	41.0	206.3	37.7	104.1	101.0	99.2	26.7	23.7	21.9			20.2			28.2		
20	RCAo	61.1	208.3	-1.5	22.0	206.3	37.7	79.9	82.0	77.8	19.7	21.9	17.7			15.9			23.3		
21	RCAo	55.1	208.1	-1.5	16.0	206.3	31.8	74.1	70.1	68.6	26.0	22.0	20.6			21.1			23.5		
22	RCAo	49.1	208.1	-1.5	10.0	206.3	31.8	68.1	64.1	62.6	20.0	16.0	14.6			15.1			23.5		
23	RCAo	47.1	208.1	-1.5	8.0	206.3	35.8	66.1	66.1	63.1	20.4	20.4	17.4	138.	68.6				23.3		
24	RCA+	46.7	207.8	-1.5	17.8	206.3	34.0	66.0	74.1	65.4	14.5	22.7	13.9			17.9			20.5		
25	RCA+	49.5	208.1	-1.5	22.4	206.1	16.9	68.5	61.8	60.9	17.0	10.3	9.5			13.5			17.1		
26	SBSo	79.8	208.1	.0	46.7	206.3	30.4	100.3	99.4	96.8	24.0	23.1	20.5			19.8			28.0		
27	SBSâ	79.8	208.1	.0	46.7	206.3	30.4	100.3	99.4	96.8	26.3	25.4	22.8			19.8			78.4		
28	SBSo	82.7	208.1	.0	43.7	206.3	33.3	103.2	99.3	97.8	26.9	23.0	21.5			20.8			28.0		
29	SBSâ	82.7	208.1	.0	43.7	206.3	33.3	103.2	99.3	97.8	29.2	25.3	23.8			20.8			78.4		
30	SBSo	79.8	208.1	.0	43.7	206.3	30.4	100.3	96.4	94.9	24.0	20.1	18.6			17.9			28.0		
31	SBSâ	79.8	208.1	.0	43.7	206.3	30.4	100.3	96.4	94.9	26.3	22.4	20.9			17.9			78.4		
32	SBSu	79.8	208.1	.0	43.7	206.3	30.4	100.3	96.4	94.9	25.7	21.8	20.4			17.9			75.7		
33	SBS+	79.0	208.1	.0	50.0	206.1	12.1	99.5	84.6	84.5	27.5	12.6	12.4		43.0			49.1	*18.5	*23.0	<4.00>
34	SBS+	79.0	208.1	.0	47.0	206.1	17.1	99.5	86.6	86.4	27.5	14.6	14.3		44.9			51.1	*20.6	*25.0	<4.16>
35	SBS+	82.7	208.1	.0	47.0	206.3	33.3	103.2	102.6	99.9	25.4	24.8	22.1			19.1			78.4		
36	PAM1	68.9	200.1	-5.6	53.0	196.2	14.4	91.8	99.8	91.2	17.5	25.5	16.9			17.0			22.5		
37	PAM1	61.3	200.1	-5.6	43.2	196.2	14.4	84.2	90.0	83.2	18.0	23.8	17.0			18.4			20.8		
38	PAM+	60.3	199.8	-5.6	37.1	196.2	19.0	83.5	88.5	82.3	20.6	25.6	19.4			20.4			23.5		

39 PAN1	47.0	199.8	-5.6	24.0	196.2	19.0	70.2	75.4	69.1	22.1	27.3	21.0	21.0	23.5

*** FOOTNOTES ***

LINK PARAMETERS

SIGNAL TYPE INDEX	POLARIZATION TYPE INDEX
0 = FDM/FM	0 = HORIZONTAL
1 = TV/FM	1 = VERTICAL
2 = DIGITAL	
3 = SCPC/PSK	2 = 20 DEG CANTED HORIZONTAL
4 = SCPC/FM	3 = 20 DEG CANTED VERTICAL
5 = CSSB/AM	
6 = SS/PSK	4 = LEFT-HAND CIRCULAR
	5 = RIGHT-HAND CIRCULAR

POLARIZATION ISOLATION MATRIX (dB)

DESIRED SENSE	INTERFERING SENSE 0	1	2	3	4	5
0	10.0	10.0	10.0	10.0	10.0	10.0
1	10.0	10.0	10.0	10.0	10.0	10.0
2	10.0	10.0	10.0	10.0	10.0	10.0
3	10.0	10.0	10.0	10.0	10.0	10.0
4	10.0	10.0	10.0	10.0	10.0	10.0
5	10.0	10.0	10.0	10.0	10.0	10.0

SPECTRA ASSUMED FOR INTERFERENCE INTO SCPC & PSK

TV/FM: .000 MHz PEAK SPREADING ONLY

FDM/FM: GAUSSIAN, EXCEPT FOR THOSE MARKED WITH "+" UNDER SIGNAL TYPE

* INDICATES SCPC AND SMALL FDMA CARRIERS WHOSE TRANSPONDER FREQUENCY PLANS AVOID +- .0 MHz AT THE TRANSPONDER CENTER.

"PLAN" UNDER CHANNEL SPACING INDICATES A FIXED FREQUENCY PLAN.

THERMAL NOISE SUMMARY

* PATH LOSSES INCLUDE FREE SPACE LOSS FOR A 20 DEGREE ELEVATION ANGLE, CLEAR SKY ATMOSPHERIC LOSSES, AND ANTENNA POINTING LOSSES IN THE RANGE OF 0.0-0.5 dB. POINTING LOSSES ARE INCLUDED ONLY FOR THE THERMAL NOISE C/N, NOT IN INTERFERENCE CALCULATIONS.

UPLINK LOSSES = 207.6 + .2 dB + Pointing Loss

DOWNLINK LOSSES = 205.9 + .2 dB + Pointing Loss

- THE TV/FM INTERFERENCE OBJECTIVE IS EITHER THE S/I OR C/I VALUE(S) WITHOUT THE "≈". THE VALUE(S) WITH THE "≈" ARE FOR COMPARISON ONLY. IF THE S/I HAS THE "≈", THEN THE C/I OBJECTIVE IS USED AND THE S/I IS THE EQUIVALENT LEVEL FROM A CO-CHANNEL TV/FM INTERFERER. IF THE C/Is HAVE "≈", THEN THE S/I OBJECTIVE IS USED AND THE C/Is INDICATE THE EQUIVALENT SINGLE ENTRY LEVELS IN FOR A NOISE-LIKE INTERFERER (C/In) AND FOR A CO-CHANNEL TV/FM INTERFERER (C/Itv). CCIR Rec. 500-1 IMPAIRMENT GRADES ARE GIVEN FOR THE AGGREGATE TV/FM C/I = C/Itv - 4 dB INTO A "REASONABLELY CRITICAL STILL SCENE". THE IMPAIRMENT GRADES ARE:

  5.0 = IMPERCEPTIBLE (Never achieved)
  4.6 = JUST PERCEPTIBLE OR JUST UNPERCEPTIBLE (Highest achievable grade)
  4.3 = APPROXIMATE GRADE FOR CATV AGGREGATE OBJECTIVE OF 18 dB
  4.0 = PERCEPTIBLE, BUT NOT ANNOYING
  3.0 = SLIGHTLY ANNOYING
  2.0 = ANNOYING
  1.0 = VERY ANNOYING

COMBINATIONS FAILING TO MEET SINGLE ENTRY INTERFERENCE OBJECTIVES (dB) 17:59:07 9-OCT-95

(2.00 DEGREE SPACING) Antenna Patterns as given ; A = Geocentric Angle

| INTERFERING LINK -->

WANTED	3 3 3 3
LINK	6 7 8 9
RCAc 1	
RCAw 2	
RCAw 3	
RCAe 4	
RCAe 5	
RCAc 6	
RCAc 7	
RCAc 8	
RCAc 9	
RCAc 10	
RCAc 11	
RCAc 12	
RCAc 13	
RCAc 14	
RCAo 15	
RCAm 16	
RCAo 17	
RCAm 18	
RCAo 19	
RCAo 20	
RCAo 21	
RCAo 22	
RCAo 23	
RCA+ 24	
RCA+ 25	
SBSo 26	
SBS& 27	
SBSo 28	
SBS& 29	
SBSo 30	
SBS& 31	
SBSu 32	
SBS+ 33	
SBS+ 34	
SBS+ 35	

LOWEST C/I RATIO IN: "U"=Uplink, "D"=Downlink, "O"=Equal 17:59:07 9-OCT-95

(2.00 DEGREE SPACING) Antenna Patterns as given; A = Geocentric Angle

| INTERFERING LINK -->

WANTED LINK	3 3 3 3 / 6 7 8 9
RCAc 1	
RCAm 2	
RCAm 3	
RCAo 4	
RCAo 5	
RCAc 6	
RCAc 7	
RCAc 8	
RCAc 9	
RCAc 10	
RCAc 11	
RCAc 12	
RCAc 13	
RCAc 14	
RCAo 15	
RCAm 16	
RCAo 17	
RCAm 18	
RCAo 19	
RCAo 20	
RCAo 21	
RCAo 22	
RCAo 23	
RCA+ 24	
RCA+ 25	
SBSo 26	
SBSm 27	
SBSo 28	
SBSm 29	
SBSo 30	
SBSm 31	
SBSu 32	
SBS+ 33	
SBS+ 34	
SBS+ 35	

POTENTIAL INTERFERENCE from PanAmSat Satellite
into Revised Doc 81-704 Appendix C
Orbit Separation 2.00 degrees. 14/12 GHz

DESIRED SIGNAL, Carrier No. 1: 1 CFDM/FM 3800/54.0 10.0/10.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Up (pW0p)	Dn (pW0p)	Total (pW0p)	Object. Margin (dB)
36:	1 QPSK/ 25.900 MBPS						600	999.9
37:	4 QPSK/ 3 MBPS						600	999.9
38:	11 QPSK/ 1.544 MBPS						600	999.9
39:	237 QPSK/ 64 KBPS						600	999.9

DESIRED SIGNAL, Carrier No. 2: 1 TV/FM 24.0 MHz 7.7/ 2.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS							56.1	999.9
37:	4 QPSK/ 3 MBPS							56.1	999.9
38:	11 QPSK/ 1.544 MBPS							56.1	999.9
39:	237 QPSK/ 64 KBPS							56.1	999.9

DESIRED SIGNAL, Carrier No. 3: 1 TV/FM 24.0 MHz 7.7/ 1.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS							54.1	999.9
37:	4 QPSK/ 3 MBPS							54.1	999.9
38:	11 QPSK/ 1.544 MBPS							54.1	999.9
39:	237 QPSK/ 64 KBPS							54.1	999.9

DESIRED SIGNAL, Carrier No. 4: 1 TV/FM 24.0 MHz 7.7/ 2.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS							56.1	999.9
37:	4 QPSK/ 3 MBPS							56.1	999.9
38:	11 QPSK/ 1.544 MBPS							56.1	999.9
39:	237 QPSK/ 64 KBPS							56.1	999.9

DESIRED SIGNAL, Carrier No. 5: 1 TV/FM 24.0 MHz 7.7/ 1.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS							54.1	999.9
37:	4 QPSK/ 3 MBPS							54.1	999.9
38:	11 QPSK/ 1.544 MBPS							54.1	999.9
39:	237 QPSK/ 64 KBPS							54.1	999.9

POTENTIAL INTERFERENCE from PanAmSat Satellite
into Revised Doc 81-704 Appendix C
Orbit Separation 2.00 degrees. 14/12 GHz

DESIRED SIGNAL, Carrier No. 6: 1 TV/FM 30.0 MHz 7.7/ 5.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS							62.1	999.9
37:	4 QPSK/ 3 MBPS							62.1	999.9
38:	11 QPSK/ 1.544 MBPS							62.1	999.9
39:	237 QPSK/ 64 KBPS							62.1	999.9

DESIRED SIGNAL, Carrier No. 7: 1 TV/FM 24.0 MHz 7.7/ 3.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS							56.1	999.9
37:	4 QPSK/ 3 MBPS							56.1	999.9
38:	11 QPSK/ 1.544 MBPS							56.1	999.9
39:	237 QPSK/ 64 KBPS							56.1	999.9

DESIRED SIGNAL, Carrier No. 8: 2 TV/FM 26.0 MHz 7.7/ 5.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS							62.1	999.9
37:	4 QPSK/ 3 MBPS							62.1	999.9
38:	11 QPSK/ 1.544 MBPS							62.1	999.9
39:	237 QPSK/ 64 KBPS							62.1	999.9

DESIRED SIGNAL, Carrier No. 9: 2 TV/FM 26.0 MHz 7.7/ 5.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)

36:	1 QPSK/ 25.900 MBPS				62.1	999.9
37:	4 QPSK/ 3 MBPS				62.1	999.9
38:	11 QPSK/ 1.544 MBPS				62.1	999.9
39:	237 QPSK/ 64 KBPS				62.1	999.9

DESIRED SIGNAL, Carrier No. 10: 1 QPSK/ 80 MBPS 10.0/10.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS				78.2	298.8
37:	4 QPSK/ 3 MBPS				78.2	298.8
38:	11 QPSK/ 1.544 MBPS				78.2	298.8
39:	237 QPSK/ 64 KBPS				78.2	298.8

POTENTIAL INTERFERENCE from PanAmSat Satellite
into Revised Doc 81-704 Appendix C
Orbit Separation 2.00 degrees. 14/12 GHz

DESIRED SIGNAL, Carrier No. 11: 20 QPSK/ 1.544 MBPS 10.0/10.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS				73.3	999.9
37:	4 QPSK/ 3 MBPS				73.3	999.9
38:	11 QPSK/ 1.544 MBPS				73.3	999.9
39:	237 QPSK/ 64 KBPS				73.3	999.9

DESIRED SIGNAL, Carrier No. 12: 100 SCPC/SCPC/SCPC/SCP 5.0/ 5.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS				73.5	999.9
37:	4 QPSK/ 3 MBPS				73.5	999.9
38:	11 QPSK/ 1.544 MBPS				73.5	999.9
39:	237 QPSK/ 64 KBPS				73.5	999.9

DESIRED SIGNAL, Carrier No. 13: 400 SCPC/SCPC/SCPC/SCP 5.0/ 5.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS				73.5	999.9
37:	4 QPSK/ 3 MBPS				73.5	999.9
38:	11 QPSK/ 1.544 MBPS				73.5	999.9
39:	237 QPSK/ 64 KBPS				73.5	999.9

DESIRED SIGNAL, Carrier No. 14: 500 SCPC/FM .037 MHz 7.7/ 7.7 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)

36:	1 QPSK/ 25.900 MBPS	73.3	999.9
37:	4 QPSK/ 3 MBPS	73.3	999.9
38:	11 QPSK/ 1.544 MBPS	73.3	999.9
39:	237 QPSK/ 64 KBPS	73.3	999.9

DESIRED SIGNAL, Carrier No. 15: 1 CFDM/FM 3800/54.0 10.0/10.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Up (pW0p)	Dn (pW0p)	Total (pW0p)	Object. (pW0p)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS							600	999.9
37:	4 QPSK/ 3 MBPS							600	999.9
38:	11 QPSK/ 1.544 MBPS							600	999.9
39:	237 QPSK/ 64 KBPS							600	999.9

POTENTIAL INTERFERENCE from PanAmSat Satellite
into Revised Doc 81-704 Appendix C
Orbit Separation 2.00 degrees. 14/12 GHz

DESIRED SIGNAL, Carrier No. 16: 1 TV/FM 26.0 MHz 7.7/ 3.0 meters Up/Dn

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Car. C/Iu C

/Id No.	C/It Interfering Signals	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS				53.1	999.9
37:	4 QPSK/ 3 MBPS				53.1	999.9
38:	11 QPSK/ 1.544 MBPS				53.1	999.9
39:	237 QPSK/ 64 KBPS				53.1	999.9

DESIRED SIGNAL, Carrier No. 17: 2 TV/FM 26.0 MHz 5.5/ 5.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS							61.6	999.9
37:	4 QPSK/ 3 MBPS							61.6	999.9
38:	11 QPSK/ 1.544 MBPS							61.6	999.9
39:	237 QPSK/ 64 KBPS							61.6	999.9

DESIRED SIGNAL, Carrier No. 18: 2 TV/FM 26.0 MHz 5.5/ 5.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS							61.6	999.9
37:	4 QPSK/ 3 MBPS							61.6	999.9
38:	11 QPSK/ 1.544 MBPS							61.6	999.9
39:	237 QPSK/ 64 KBPS							61.6	999.9

DESIRED SIGNAL, Carrier No. 19: 1 QPSK/ 80 MBPS 10.0/10.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS				28.2	999.9
37:	4 QPSK/ 3 MBPS				28.2	999.9
38:	11 QPSK/ 1.544 MBPS				28.2	999.9
39:	237 QPSK/ 64 KBPS				28.2	999.9

DESIRED SIGNAL, Carrier No. 20: 20 QPSK/ 1.544 MBPS 10.0/10.0 meters Up/Dn

Car.		C/Iu	C/Id	C/It	Object.	Margin

No.	Interfering Signals	(dB)	(dB)	(dB)	(dB)	(dB)
36:	1 QPSK/ 25.900 MBPS				23.3	999.9
37:	4 QPSK/ 3 MBPS				23.3	999.9
38:	11 QPSK/ 1.544 MBPS				23.3	999.9
39:	237 QPSK/ 64 KBPS				23.3	999.9

POTENTIAL INTERFERENCE from PanAmSat Satellite
into Revised Doc 81-704 Appendix C
Orbit Separation 2.00 degrees. 14/12 GHz

DESIRED SIGNAL, Carrier No. 21: 100 SCPC/SCPC/SCPC/SCP 5.0/ 5.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS				23.5	999.9
37:	4 QPSK/ 3 MBPS				23.5	999.9
38:	11 QPSK/ 1.544 MBPS				23.5	999.9
39:	237 QPSK/ 64 KBPS				23.5	999.9

DESIRED SIGNAL, Carrier No. 22: 400 SCPC/SCPC/SCPC/SCP 5.0/ 5.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS				23.5	999.9
37:	4 QPSK/ 3 MBPS				23.5	999.9
38:	11 QPSK/ 1.544 MBPS				23.5	999.9
39:	237 QPSK/ 64 KBPS				23.5	999.9

DESIRED SIGNAL, Carrier No. 23: 500 SCPC/FM .037 MHz 7.7/ 7.7 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS				23.3	999.9
37:	4 QPSK/ 3 MBPS				23.3	999.9
38:	11 QPSK/ 1.544 MBPS				23.3	999.9
39:	237 QPSK/ 64 KBPS				23.3	999.9

DESIRED SIGNAL, Carrier No. 24: 110 SCPC/SCPC/SCPC/SCP 1.2/ 7.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)

36:	1 QPSK/ 25.900 MBPS				20.5	999.9
37:	4 QPSK/ 3 MBPS				20.5	999.9
38:	11 QPSK/ 1.544 MBPS				20.5	999.9
39:	237 QPSK/ 64 KBPS				20.5	999.9

DESIRED SIGNAL, Carrier No. 25: 131 SCPC/SCPC/SCPC/SCP 7.0/ 1.2 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS				17.1	999.9
37:	4 QPSK/ 3 MBPS				17.1	999.9
38:	11 QPSK/ 1.544 MBPS				17.1	999.9
39:	237 QPSK/ 64 KBPS				17.1	999.9

POTENTIAL INTERFERENCE from PanAmSat Satellite
into Revised Doc 81-704 Appendix C
Orbit Separation 2.00 degrees. 14/12 GHz

DESIRED SIGNAL, Carrier No. 26: 1 QPSK/ 50 MBPS 5.5/ 5.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS				28.0	999.9
37:	4 QPSK/ 3 MBPS				28.0	999.9
38:	11 QPSK/ 1.544 MBPS				28.0	999.9
39:	237 QPSK/ 64 KBPS				28.0	999.9

DESIRED SIGNAL, Carrier No. 27: 1 QPSK/ 50 MBPS 5.5/ 5.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS				78.4	298.6
37:	4 QPSK/ 3 MBPS				78.4	298.6
38:	11 QPSK/ 1.544 MBPS				78.4	298.6
39:	237 QPSK/ 64 KBPS				78.4	298.6

DESIRED SIGNAL, Carrier No. 28: 1 QPSK/ 50 MBPS 7.7/ 7.7 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS				28.0	999.9
37:	4 QPSK/ 3 MBPS				28.0	999.9
38:	11 QPSK/ 1.544 MBPS				28.0	999.9
39:	237 QPSK/ 64 KBPS				28.0	999.9

DESIRED SIGNAL, Carrier No. 29: 1 QPSK/ 50 MBPS 7.7/ 7.7 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)

36:	1 QPSK/ 25.900 MBPS				78.4	298.6
37:	4 QPSK/ 3 MBPS				78.4	298.6
38:	11 QPSK/ 1.544 MBPS				78.4	298.6
39:	237 QPSK/ 64 KBPS				78.4	298.6

DESIRED SIGNAL, Carrier No. 30: 1 QPSK/ 50 MBPS 5.5/ 5.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS				28.0	999.9
37:	4 QPSK/ 3 MBPS				28.0	999.9
38:	11 QPSK/ 1.544 MBPS				28.0	999.9
39:	237 QPSK/ 64 KBPS				28.0	999.9

POTENTIAL INTERFERENCE from PanAmSat Satellite
into Revised Doc 81-704 Appendix C
Orbit Separation 2.00 degrees. 14/12 GHz

DESIRED SIGNAL, Carrier No. 31: 1 QPSK/ 50 MBPS 5.5/ 5.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS				78.4	298.6
37:	4 QPSK/ 3 MBPS				78.4	298.6
38:	11 QPSK/ 1.544 MBPS				78.4	298.6
39:	237 QPSK/ 64 KBPS				78.4	298.6

DESIRED SIGNAL, Carrier No. 32: 1 QPSK/ 50 MBPS 5.5/ 5.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS				75.7	999.9
37:	4 QPSK/ 3 MBPS				75.7	999.9
38:	11 QPSK/ 1.544 MBPS				75.7	999.9
39:	237 QPSK/ 64 KBPS				75.7	999.9

DESIRED SIGNAL, Carrier No. 33: 1 TV/FM 16.0 MHz 5.5/ .8 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS							49.1	999.9
37:	4 QPSK/ 3 MBPS							49.1	999.9
38:	11 QPSK/ 1.544 MBPS							49.1	999.9
39:	237 QPSK/ 64 KBPS							49.1	999.9

DESIRED SIGNAL, Carrier No. 34: 1 TV/FM 16.0 MHz 5.5/ 1.2 meters Up/Dn

Car. no.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)

36:	1 QPSK/ 25.900 MBPS			51.1	999.9
37:	4 QPSK/ 3 MBPS			51.1	999.9
38:	11 QPSK/ 1.544 MBPS			51.1	999.9
39:	237 QPSK/ 64 KBPS			51.1	999.9

DESIRED SIGNAL, Carrier No. 35: 1 QPSK/120 MBPS 7.7/ 7.7 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
36:	1 QPSK/ 25.900 MBPS				78.4	298.6
37:	4 QPSK/ 3 MBPS				78.4	298.6
38:	11 QPSK/ 1.544 MBPS				78.4	298.6
39:	237 QPSK/ 64 KBPS				78.4	298.6

18:07:57 9-OCT-95

Desired Signals from File: v:\fcc2deg\panamsat\data3.dat

Interfering Signals from File: v:\fcc2deg\panamsat\panamsat.dat

14/12 GHz Carrier Listing from PanAmSat Satellite
into Revised Doc 81-704 Appendix C

14/12 GHz Carrier Listing from PanAmSat Satellite
into Revised Doc 81-704 Appendix C

Carrier Number	Signal Type & (channels)	Bandwidth (MHz)	E.S. Antennas (m) up/down	EIRP (dBW) up/down
1: SPCo	CFDM/FM (1872)	36.000	10.0/10.0	87.2/37.9
2: SPCo	CFDM/FM (1872)	36.000	10.0/10.0	87.2/37.9
3: SPCu	CFDM/FM (1872)	36.000	10.0/10.0	78.0/38.2
4: SPCu	CFDM/FM (1872)	36.000	10.0/10.0	78.0/38.2
5: SPCo	FDM/FM (432)	17.500	7.0/ 7.0	72.2/32.4
6: SPCu	FDM/FM (432)	20.700	7.0/ 7.0	72.2/32.4
7: SPCo	QPSK/125 MBPS	72.000	7.0/ 7.0	87.2/42.4
8: SPCu	QPSK/125 MBPS	72.000	10.0/10.0	87.2/42.4
9: SPCo	BPSK/ 6.312 MBPS (8)	7.600	4.5/ 4.5	72.1/30.0
10: SPCu	BPSK/ 6.312 MBPS (4)	15.150	4.5/ 4.5	72.1/33.0
11: SPCo	QPSK/ 1.544 MBPS (46)	1.030	9.2/ 9.2	57.4/23.4
12: SPCo	TV/FM (2)	26.000	9.2/ 7.0	77.9/37.5
13: SPCo	TV/FM (2)	26.000	9.2/ 7.0	77.9/37.5
14: SPCo	QPSK/ 60 MBPS	36.000	9.2/ 9.2	80.9/41.8
15: SPCo	QPSK/ 1.544 MBPS (20)	1.029	5.0/ 5.0	61.9/25.0
16: WUc	TV/FM (1)	54.000	6.0/ 3.0	84.0/45.0
17: WUc	TV/FM (1)	54.000	6.0/ 6.0	78.0/45.0
18: WUc	TV/FM (1)	24.000	6.0/ 1.4	78.0/48.5
19: WUc	TV/FM (2)	24.000	6.0/ 6.0	79.0/40.5
20: WUc	TV/FM (2)	24.000	6.0/ 6.0	79.0/40.5
21: WUc	QPSK/ 80 MBPS	45.714	7.0/ 7.0	78.5/44.5
22: WUcu	QPSK/ 80 MBPS	45.714	7.0/ 5.0	78.5/44.5
23: WUc	QPSK/ 1.544 MBPS (14)	1.190	5.0/ 5.0	58.5/30.5
24: WUc	QPSK/ 1.544 MBPS (16)	1.190	5.0/ 7.0	58.0/30.0
25: WUc	QPSK/ 56 KBPS (300)	.037	5.0/ 3.0	45.5/17.5
26: WUc	QPSK/ 56 KBPS (425)	.037	5.0/ 5.0	44.0/16.0
27: WUc	SCPC/FM (75)	.180	5.0/ 3.0	51.0/23.0
28: PAM1	QPSK/ 25.900 MBPS	27.000	4.6/ .6	68.9/53.0
29: PAM1	QPSK/ 3 MBPS (4)	4.170	4.6/ .6	61.3/43.2
30: PAM1	QPSK/ 1.544 MBPS (11)	1.970	2.4/ 1.2	60.3/37.1
31: PAM1	QPSK/ 64 KBPS (237)	.064	2.4/ 1.2	47.0/24.0

DESIRED SATELLITE: Revised Doc 81-704 Appendix C

INTERFERING SATELLITE: PanAmSat Satellite

L I N K P A R A M E T E R S 18:07:57 9-OCT-95

CARRIER	COMPANY	TYPE	RF BANDWIDTH (MHz)	NO. OF CHAN	CODE RATE/ MOD. INDEX	BOT MOD. FREQ. (MHz)	TOP MOD. FREQ. (MHz)	AVE. TALKER LEVEL (dBm0)	CPAND PREMP NOISE WEIGH (dB)	H A S E	DATA RATE (MBPS)	CHAN. SPACE (MHz)	TRANSPONDER FREQUENCY UP (GHz)	DN (GHz)	POL U P	POL D N	EARTH STATION TRANSMITTER POWR (dBW)	DIAM (m)	GAIN (dB)	--SATELLITE--- RECEIVER GAIN (dB)	TEMP (K)	EARTH STATION XMTR EIRP (dBW)	DIAM (m)	RECEIVER GAIN (dB)	TEMP (K)
1	SPCo	0	36.000	1872	.407	.012	7.868	-15.0	-10.3	0	.000	36.000	14.250	11.950	0	1	25.9	10.0	61.3	27.3	1000.	37.9	10.0	59.3	214
2	SPCo	0	36.000	1872	.407	.012	7.868	-15.0	-10.3	0	.000	36.000	14.268	11.968	0	1	25.9	10.0	61.3	27.3	1000.	37.9	10.0	59.3	214
3	SPCu	0	36.000	1872	.727	.012	7.868	-17.0	-10.3	0	.000	36.000	14.268	11.968	0	1	16.7	10.0	61.3	27.3	1000.	38.2	10.0	59.3	214
4	SPCu	0	36.000	1872	.727	.012	7.868	-17.0	-10.3	0	.000	36.000	14.250	11.950	0	1	16.7	10.0	61.3	27.3	1000.	38.2	10.0	59.3	214
5	SPCo	0	17.500	432	1.224	.012	1.796	-20.0	.0	0	.000	18.000	14.250	11.950	0	1	14.0	7.0	58.2	27.3	1000.	32.4	7.0	56.0	251
6	SPCu	0	20.700	432	1.690	.012	1.796	-20.0	.0	0	.000	18.000	14.250	11.950	0	1	14.0	7.0	58.2	27.3	1000.	32.4	7.0	56.0	251
7	SPCo	2	72.000	1	.000	.000	.000	.0	.0	4	125.000	.000	14.250	11.950	0	1	29.0	7.0	58.2	27.3	1000.	42.4	7.0	56.0	251
8	SPCo	2	72.000	1	.000	.000	.000	.0	.0	4	125.000	.000	14.250	11.950	0	1	25.9	10.0	61.3	27.3	1000.	42.4	10.0	59.3	214
9	SPCo	2	7.600	8	.000	.000	.000	.0	.0	2	6.312	9.000	14.250	11.950	0	1	17.8	4.5	54.3	27.3	1000.	30.0	4.5	53.0	316
10	SPCu	2	15.150	4	.500	.000	.000	.0	.0	2	6.312	18.000	14.250	11.950	0	1	17.8	4.5	54.3	27.3	1000.	33.0	4.5	53.0	316
11	SPC+	2	1.030	46	.750	.000	.000	.0	.0	4	1.544	1.500*	14.250	11.950	0	1	-3.1	9.2	60.5	27.3	1000.	23.4	9.2	59.0	250
12	SPC+	1	26.000	2	2.143	.025	4.200	.0	12.8	0	.000	40.000	14.250	11.950	0	1	17.4	9.2	60.5	27.3	750.	37.5	7.0	56.0	204
13	SPC+	1	26.000	2	2.143	.025	4.200	.0	12.8	0	.000	40.000	14.270	11.970	0	1	17.4	9.2	60.5	27.3	750.	37.5	7.0	56.0	204
14	SPC+	2	36.000	1	.000	.000	.000	.0	.0	4	60.000	.000	14.250	11.950	0	1	20.4	9.2	60.5	27.3	750.	41.8	9.2	59.0	257
15	SPC+	2	1.029	20	.750	.000	.000	.0	.0	4	1.544	1.300*	14.250	11.950	0	1	6.6	5.0	55.3	27.3	750.	25.0	5.0	53.8	234
16	MUc+	1	54.000	1	3.571	.025	4.200	.0	13.0	0	.000	.000	14.250	11.950	0	1	27.3	6.0	56.7	29.0	870.	45.0	3.0	49.3	200
17	MUc+	1	54.000	1	3.571	.025	4.200	.0	13.0	0	.000	.000	14.250	11.950	0	1	21.3	6.0	56.7	29.0	870.	45.0	6.0	55.4	275
18	MUc+	1	24.000	1	1.857	.025	4.200	.0	13.0	0	.000	.000	14.250	11.950	0	1	21.3	6.0	56.7	29.0	870.	48.5	1.4	42.4	162
19	MUc+	1	24.000	2	2.143	.025	4.200	.0	13.0	0	.000	26.000	14.250	11.950	0	1	22.3	6.0	56.7	29.0	870.	40.5	6.0	55.4	275
20	MUc+	1	24.000	2	2.143	.025	4.200	.0	13.0	0	.000	26.000	14.263	11.963	0	1	22.3	6.0	56.7	29.0	870.	40.5	6.0	55.4	275
21	MUc+	2	45.714	1	.000	.000	.000	.0	.0	4	80.000	.000	14.250	11.950	0	1	20.5	7.0	58.0	29.0	870.	44.5	7.0	56.7	263
22	MUcu	2	45.714	1	.875	.000	.000	.0	.0	4	80.000	.000	14.250	11.950	0	1	20.5	7.0	58.0	29.0	870.	44.5	5.0	53.7	263
23	MUc+	2	1.190	16	.875	.000	.000	.0	.0	4	1.544	1.500*	14.250	11.950	0	1	3.4	5.0	55.1	29.0	870.	30.5	5.0	53.7	263
24	MUc+	2	1.190	16	.875	.000	.000	.0	.0	4	1.544	1.500*	14.250	11.950	0	1	2.9	5.0	55.1	29.0	870.	30.0	7.0	56.7	263
25	MUc+	3	.037	300	.875	.000	.000	.0	.0	4	.056	.080*	14.250	11.950	0	1	-9.6	5.0	55.1	29.0	870.	17.5	3.0	49.3	200
26	MUc+	3	.037	425	.875	.000	.000	.0	.0	4	.056	.080*	14.250	11.950	0	1	-11.1	5.0	55.1	29.0	870.	16.0	5.0	53.7	263
27	MUc+	4	.180	75	5.000	.000	.015	.0	13.0	0	.000	.360*	14.250	11.950	0	1	-4.1	5.0	55.1	29.0	870.	23.0	3.0	49.3	200
28	PAM1	2	27.000	1	.667	.000	.030	.0	.0	4	25.900	.000	4.250	1.950	1	0	14.0	4.6	54.9	22.4	630.	53.0	.6	36.1	148
29	PAM1	2	4.170	4	.667	.000	.006	.0	.0	4	3.000	.000	4.250	1.950	1	0	6.4	4.6	54.9	22.4	630.	43.2	.6	36.1	148
30	PAM1	2	1.970	11	.500	.000	.002	.0	.0	4	1.544	.000	4.250	1.950	1	0	11.1	2.4	49.2	22.4	630.	37.1	1.2	42.1	204
31	PAM1	2	.064	237	.500	.000	.000	.0	.0	4	.064	.000	4.250	1.950	1	0	-2.2	2.4	49.2	22.4	630.	24.0	1.2	42.1	204

THERMAL NOISE SUMMARY

18:07:57 9-OCT-95

CAR- RIER	COM- PANY	EARTH-TO-SPACE EIRP (dBW)	PATH LOSS* (dB)	RCV G/T (dB/K)	SPACE-TO-EARTH EIRP (dBW)	PATH LOSS* (dB)	RCV G/T (dB/K)	C/No - (dB-Hz) UP	DN	TOTAL	C/N - (dB) UP	DN	TOTAL	LINK THERMAL NOISE (pW0p)	S/N (dB)	Eb/No (dB)	SINGLE ENTRY INTERFERENCE OBJ+ (pW0p)	S/I (dB)	C/In (dB)	C/Itv (dB)	IMPAIR- MENT GRADE
1	SPCo	87.2	208.3	-2.7	37.9	206.3	36.0	104.8	96.2	95.6	29.2	20.6	20.1	6324.	52.0		600.	62.2			
2	SPCo	87.2	208.3	-2.7	37.9	206.3	36.0	104.8	96.2	95.6	29.2	20.6	20.1	6324.	52.0		600.	62.2			
3	SPCu	78.0	208.3	-2.7	38.2	206.3	36.0	95.6	96.5	93.0	20.0	20.9	17.5	2286.	56.4		600.	62.2			
4	SPCu	78.0	208.3	-2.7	38.2	206.3	36.0	95.6	96.5	93.0	20.0	20.9	17.5	2286.	56.4		600.	62.2			
5	SPCo	72.2	208.1	-2.7	32.4	206.3	32.0	90.0	86.7	85.0	17.6	14.3	12.6	6276.	52.0		600.	62.2			
6	SPCu	72.2	208.1	-2.7	32.4	206.3	32.0	90.0	86.7	85.0	16.8	13.5	11.9	3292.	54.8		600.	62.2			
7	SPCo	87.2	208.1	-2.7	42.4	206.3	32.0	105.0	96.7	96.1	26.4	18.1	17.5			15.1			76.7		
8	SPC&	87.2	208.3	-2.7	42.4	206.3	36.0	104.8	100.7	99.3	26.2	22.1	20.7			18.3			76.7		
9	SPCo	72.1	208.1	-2.7	30.0	206.3	28.0	89.9	80.3	79.9	21.1	11.5	11.0			11.8			23.8		
10	SPCu	72.1	208.1	-2.7	33.0	206.3	28.0	89.9	83.3	82.4	18.1	11.5	10.6			14.4			20.2		
11	SPC+	57.4	208.3	-2.7	23.4	206.3	35.0	75.0	80.7	74.0	14.9	20.6	13.8			12.1			73.3		
12	SPC+	77.9	208.3	-1.5	37.5	206.3	32.9	96.7	92.7	91.3	22.6	18.6	17.1		52.3			59.1	=23.9	=29.5<4.51>	
13	SPC+	77.9	208.3	-1.5	37.5	206.3	32.9	96.7	92.7	91.3	22.6	18.6	17.1		52.3			59.1	=23.9	=29.5<4.51>	
14	SPC+	80.9	208.3	-1.5	41.8	206.3	34.9	99.7	99.0	96.3	24.2	23.4	20.8			18.6			78.5		
15	SPC+	61.9	208.1	-1.5	25.0	206.3	30.1	80.9	77.4	75.8	20.8	17.3	15.7			13.9			73.3		
16	WUc+	84.0	208.1	-.4	45.0	206.2	26.3	104.1	93.7	93.3	26.8	16.4	16.0		57.4			62.1	=20.7	=28.0<4.60>	
17	WUc+	78.0	208.1	-.4	45.0	206.3	31.0	98.1	98.3	95.2	20.8	21.0	17.9		59.3			62.1	=20.7	=28.0<4.60>	
18	WUc+	78.0	208.1	-.4	48.5	206.1	20.3	98.1	91.3	90.5	24.3	17.5	16.7		50.4			54.1	=20.4	=25.7<4.36>	
19	WUc+	79.0	208.1	-.4	40.5	206.3	31.0	99.1	93.8	92.7	25.3	20.0	18.9		54.3			58.1	=22.7	=28.5<4.49>	
20	WUc+	79.0	208.1	-.4	40.5	206.3	31.0	99.1	93.8	92.7	25.3	20.0	18.9		54.3			58.1	=22.7	=28.5<4.49>	
21	WUc+	78.5	208.1	-.4	44.5	206.3	32.5	98.6	99.3	95.9	22.0	22.7	19.3			16.9			79.6		
22	WUcu	78.5	208.1	-.4	44.5	206.3	29.5	98.6	96.3	94.3	22.0	19.7	17.7			15.3			78.2		
23	WUc+	58.5	208.1	-.4	30.5	206.3	29.5	78.6	82.3	77.1	17.8	21.5	16.3			15.2			74.2		
24	WUc+	58.0	208.1	-.4	30.0	206.3	32.5	78.1	84.8	77.3	17.3	24.0	16.5			15.4			74.2		
25	WUc+	45.5	208.1	-.4	17.5	206.2	26.3	65.6	66.2	62.9	19.9	20.5	17.2			15.4			74.6		
26	WUc+	44.0	208.1	-.4	16.0	206.3	29.5	64.1	67.8	62.6	18.4	22.1	16.9			15.1			74.6		
27	WUc+	51.0	208.1	-.4	23.0	206.2	26.3	71.1	71.7	68.4	18.6	19.1	15.8	2913.	55.4				73.3		
28	PAM1	68.9	200.1	-5.6	53.0	196.2	14.4	91.8	99.8	91.2	17.5	25.5	16.9			17.0			22.5		
29	PAM1	61.3	200.1	-5.6	43.2	196.2	14.4	84.2	90.0	83.2	18.0	23.8	17.0			18.4			20.8		
30	PAM1	60.3	199.8	-5.6	37.1	196.2	19.0	83.5	88.5	82.3	20.6	25.6	19.4			20.4			23.5		
31	PAM1	47.0	199.8	-5.6	24.0	196.2	19.0	70.2	75.4	69.1	22.1	27.3	21.0			21.0			23.5		

*** F O O T N O T E S ***

L I N K P A R A M E T E R S

SIGNAL TYPE INDEX	POLARIZATION TYPE INDEX
0 = FDM/FM	0 = HORIZONTAL
1 = TV/FM	1 = VERTICAL
2 = DIGITAL	
3 = SCPC/PSK	2 = 20 DEG CANTED HORIZONTAL
4 = SCPC/FM	3 = 20 DEG CANTED VERTICAL
5 = CSSB/AM	
6 = SS/PSK	4 = LEFT-HAND CIRCULAR
	5 = RIGHT-HAND CIRCULAR

POLARIZATION ISOLATION MATRIX (dB)

		INTERFERING SENSE 0	1	2	3	4	5
	0	10.0	10.0	10.0	10.0	10.0	10.0
D	1	10.0	10.0	10.0	10.0	10.0	10.0
E							
S	2	10.0	10.0	10.0	10.0	10.0	10.0
I							
R	3	10.0	10.0	10.0	10.0	10.0	10.0
E							
D	4	10.0	10.0	10.0	10.0	10.0	10.0
	5	10.0	10.0	10.0	10.0	10.0	10.0

SPECTRA ASSUMED FOR INTERFERENCE INTO SCPC & PSK

TV/FM: .000 MHz PEAK SPREADING ONLY

FDM/FM: GAUSSIAN, EXCEPT FOR THOSE MARKED WITH "+" UNDER SIGNAL TYPE

* INDICATES SCPC AND SMALL FDMA CARRIERS WHOSE TRANSPONDER FREQUENCY PLANS AVOID +- .0 MHz AT THE TRANSPONDER CENTER.

"PLAN" UNDER CHANNEL SPACING INDICATES A FIXED FREQUENCY PLAN.

T H E R M A L N O I S E S U M M A R Y

* PATH LOSSES INCLUDE FREE SPACE LOSS FOR A 20 DEGREE ELEVATION ANGLE, CLEAR SKY ATMOSPHERIC LOSSES, AND ANTENNA POINTING LOSSES IN THE RANGE OF 0.0-0.5 dB. POINTING LOSSES ARE INCLUDED ONLY FOR THE THERMAL NOISE C/N, NOT IN INTERFERENCE CALCULATIONS.

UPLINK LOSSES = 207.6 + .2 dB + Pointing Loss
DOWNLINK LOSSES = 205.9 + .2 dB + Pointing Loss

- THE TV/FM INTERFERENCE OBJECTIVE IS EITHER THE S/I OR C/I VALUE(S) WITHOUT THE "≈". THE VALUE(S) WITH THE "≈" ARE FOR COMPARISON ONLY. IF THE S/I HAS THE "≈", THEN THE C/I OBJECTIVE IS USED AND THE S/I IS THE EQUIVALENT LEVEL FROM A CO-CHANNEL TV/FM INTERFERER. IF THE C/Is HAVE "≈", THEN THE S/I OBJECTIVE IS USED AND THE C/Is INDICATE THE EQUIVALENT SINGLE ENTRY LEVELS IN FOR A NOISE-LIKE INTERFERER (C/In) AND FOR A CO-CHANNEL TV/FM INTERFERER (C/Itv). CCIR Rec. 500-1 IMPAIRMENT GRADES ARE GIVEN FOR THE AGGREGATE TV/FM C/I = C/Itv - 4 dB INTO A "REASONABLELY CRITICAL STILL SCENE". THE IMPAIRMENT GRADES ARE:

  5.0 = IMPERCEPTIBLE (Never achieved)
  4.6 = JUST PERCEPTIBLE OR JUST UNPERCEPTIBLE (Highest achievable grade)
  4.3 = APPROXIMATE GRADE FOR CATV AGGREGATE OBJECTIVE OF 18 dB
  4.0 = PERCEPTIBLE, BUT NOT ANNOYING
  3.0 = SLIGHTLY ANNOYING
  2.0 = ANNOYING
  1.0 = VERY ANNOYING

COMBINATIONS FAILING TO MEET SINGLE ENTRY INTERFERENCE OBJECTIVES (dB) 18:07:57 9-OCT-95

(2.00 DEGREE SPACING) Antenna Patterns as given ; A = Geocentric Angle

| INTERFERING LINK -->

WANTED LINK	2 2 3 3 / 8 9 0 1
SPCo 1	
SPCo 2	
SPCu 3	
SPCu 4	
SPCo 5	
SPCu 6	
SPCo 7	
SPC& 8	
SPCo 9	
SPCu 10	
SPC+ 11	
SPC+ 12	
SPC+ 13	
SPC+ 14	
SPC+ 15	
MJc+ 16	
MJc+ 17	
MJc+ 18	
MJc+ 19	
MJc+ 20	
MJc+ 21	
MJcu 22	
MJc+ 23	
MJc+ 24	
MJc+ 25	
MJc+ 26	
MJc+ 27	

LOWEST C/I RATIO IN: "U"=Uplink, "D"=Downlink, "O"=Equal 18:07:57 9-OCT-95

(2.00 DEGREE SPACING) Antenna Patterns as given; A = Geocentric Angle

| INTERFERING LINK -->

WANTED LINK	2 2 3 3 8 9 0 1
SPCo 1	
SPCo 2	
SPCu 3	
SPCu 4	
SPCo 5	
SPCu 6	
SPCo 7	
SPC& 8	
SPCo 9	
SPCu 10	
SPC+ 11	
SPC+ 12	
SPC+ 13	
SPC+ 14	
SPC+ 15	
WUc+ 16	
WUc+ 17	
WUc+ 18	
WUc+ 19	
WUc+ 20	
WUc+ 21	
WUcu 22	
WUc+ 23	
WUc+ 24	
WUc+ 25	
WUc+ 26	
WUc+ 27	

POTENTIAL INTERFERENCE from PanAmSat Satellite
into Revised Doc 81-704 Appendix C
Orbit Separation 2.00 degrees. 14/12 GHz

DESIRED SIGNAL, Carrier No. 1: 2 CFDM/FM 1872/36.0 10.0/10.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Up (pW0p)	Dn (pW0p)	Total (pW0p)	Object. Margin (dB)
28:	1 QPSK/ 25.900 MBPS						600	999.9
29:	4 QPSK/ 3 MBPS						600	999.9
30:	11 QPSK/ 1.544 MBPS						600	999.9
31:	237 QPSK/ 64 KBPS						600	999.9

DESIRED SIGNAL, Carrier No. 2: 2 CFDM/FM 1872/36.0 10.0/10.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Up (pW0p)	Dn (pW0p)	Total (pW0p)	Object. Margin (dB)
28:	1 QPSK/ 25.900 MBPS						600	999.9
29:	4 QPSK/ 3 MBPS						600	999.9
30:	11 QPSK/ 1.544 MBPS						600	999.9
31:	237 QPSK/ 64 KBPS						600	999.9

DESIRED SIGNAL, Carrier No. 3: 2 CFDM/FM 1872/36.0 10.0/10.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Up (pW0p)	Dn (pW0p)	Total (pW0p)	Object. Margin (dB)
28:	1 QPSK/ 25.900 MBPS						600	999.9
29:	4 QPSK/ 3 MBPS						600	999.9
30:	11 QPSK/ 1.544 MBPS						600	999.9
31:	237 QPSK/ 64 KBPS						600	999.9

DESIRED SIGNAL, Carrier No. 4: 2 CFDM/FM 1872/36.0 10.0/10.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Up (pW0p)	Dn (pW0p)	Total (pW0p)	Object. Margin (dB)

28:	1 QPSK/ 25.900 MBPS							600	999.9
29:	4 QPSK/ 3 MBPS							600	999.9
30:	11 QPSK/ 1.544 MBPS							600	999.9
31:	237 QPSK/ 64 KBPS							600	999.9

DESIRED SIGNAL, Carrier No. 5: 4 FDM/FM 432/17.5 7.0/ 7.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Up (pW0p)	Dn (pW0p)	Total (pW0p)	Object. (pW0p)	Margin (dB)
28:	1 QPSK/ 25.900 MBPS							600	999.9
29:	4 QPSK/ 3 MBPS							600	999.9
30:	11 QPSK/ 1.544 MBPS							600	999.9
31:	237 QPSK/ 64 KBPS							600	999.9

POTENTIAL INTERFERENCE from PanAmSat Satellite
into Revised Doc 81-704 Appendix C
Orbit Separation 2.00 degrees. 14/12 GHz

DESIRED SIGNAL, Carrier No. 6: 4 FDM/FM 432/20.7 7.0/ 7.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Up (pW0p)	Dn (pW0p)	Total (pW0p)	Object. (pW0p)	Margin (dB)
28:	1 QPSK/ 25.900 MBPS							600	999.9
29:	4 QPSK/ 3 MBPS							600	999.9
30:	11 QPSK/ 1.544 MBPS							600	999.9
31:	237 QPSK/ 64 KBPS							600	999.9

DESIRED SIGNAL, Carrier No. 7: 1 QPSK/125 MBPS 7.0/ 7.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
28:	1 QPSK/ 25.900 MBPS				76.7	999.9
29:	4 QPSK/ 3 MBPS				76.7	999.9
30:	11 QPSK/ 1.544 MBPS				76.7	999.9
31:	237 QPSK/ 64 KBPS				76.7	999.9

DESIRED SIGNAL, Carrier No. 8: 1 QPSK/125 MBPS 10.0/10.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
28:	1 QPSK/ 25.900 MBPS				76.7	999.9
29:	4 QPSK/ 3 MBPS				76.7	999.9
30:	11 QPSK/ 1.544 MBPS				76.7	999.9
31:	237 QPSK/ 64 KBPS				76.7	999.9

DESIRED SIGNAL, Carrier No. 9: 8 BPSK/ 6.312 MBPS 4.5/ 4.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)

28:	1 QPSK/ 25.900 MBPS				23.8	999.9
29:	4 QPSK/ 3 MBPS				23.8	999.9
30:	11 QPSK/ 1.544 MBPS				23.8	999.9
31:	237 QPSK/ 64 KBPS				23.8	999.9

DESIRED SIGNAL, Carrier No. 10: 4 BPSK/ 6.312 MBPS 4.5/ 4.5 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
28:	1 QPSK/ 25.900 MBPS				20.2	999.9
29:	4 QPSK/ 3 MBPS				20.2	999.9
30:	11 QPSK/ 1.544 MBPS				20.2	999.9
31:	237 QPSK/ 64 KBPS				20.2	999.9

POTENTIAL INTERFERENCE from PanAmSat Satellite
into Revised Doc 81-704 Appendix C
Orbit Separation 2.00 degrees. 14/12 GHz

DESIRED SIGNAL, Carrier No. 11: 46 QPSK/ 1.544 MBPS 9.2/ 9.2 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB).	Object. (dB)	Margin (dB)
28:	1 QPSK/ 25.900 MBPS				73.3	999.9
29:	4 QPSK/ 3 MBPS				73.3	999.9
30:	11 QPSK/ 1.544 MBPS				73.3	999.9
31:	237 QPSK/ 64 KBPS				73.3	999.9

DESIRED SIGNAL, Carrier No. 12: 2 TV/FM 26.0 MHz 9.2/ 7.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)
28:	1 QPSK/ 25.900 MBPS							59.1	999.9
29:	4 QPSK/ 3 MBPS							59.1	999.9
30:	11 QPSK/ 1.544 MBPS							59.1	999.9
31:	237 QPSK/ 64 KBPS							59.1	999.9

DESIRED SIGNAL, Carrier No. 13: 2 TV/FM 26.0 MHz 9.2/ 7.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object.. (dB)	Margin (dB)
28:	1 QPSK/ 25.900 MBPS							59.1	999.9
29:	4 QPSK/ 3 MBPS							59.1	999.9
30:	11 QPSK/ 1.544 MBPS							59.1	999.9
31:	237 QPSK/ 64 KBPS							59.1	999.9

DESIRED SIGNAL, Carrier No. 14: 1 QPSK/ 60 MBPS 9.2/ 9.2 meters Up/Dn

Car. no	Interferin... als	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)

28:	1 QPSK/ 25.900 MBPS	78.5 298.5
29:	4 QPSK/ 3 MBPS	78.5 298.5
30:	11 QPSK/ 1.544 MBPS	78.5 298.5
31:	237 QPSK/ 64 KBPS	78.5 298.5

DESIRED SIGNAL, Carrier No. 15: 20 QPSK/ 1.544 MBPS 5.0/ 5.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
28:	1 QPSK/ 25.900 MBPS				73.3	999.9
29:	4 QPSK/ 3 MBPS				73.3	999.9
30:	11 QPSK/ 1.544 MBPS				73.3	999.9
31:	237 QPSK/ 64 KBPS				73.3	999.9

POTENTIAL INTERFERENCE from PanAmSat Satellite
into Revised Doc 81-704 Appendix C
Orbit Separation 2.00 degrees. 14/12 GHz

DESIRED SIGNAL, Carrier No. 16: 1 TV/FM 54.0 MHz 6.0/ 3.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)
28:	1 QPSK/ 25.900 MBPS							62.1	999.9
29:	4 QPSK/ 3 MBPS							62.1	999.9
30:	11 QPSK/ 1.544 MBPS							62.1	999.9
31:	237 QPSK/ 64 KBPS							62.1	999.9

DESIRED SIGNAL, Carrier No. 17: 1 TV/FM 54.0 MHz 6.0/ 6.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)
28:	1 QPSK/ 25.900 MBPS							62.1	999.9
29:	4 QPSK/ 3 MBPS							62.1	999.9
30:	11 QPSK/ 1.544 MBPS							62.1	999.9
31:	237 QPSK/ 64 KBPS							62.1	999.9

DESIRED SIGNAL, Carrier No. 18: 1 TV/FM 24.0 MHz 6.0/ 1.4 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)
28:	1 QPSK/ 25.900 MBPS							54.1	999.9
29:	4 QPSK/ 3 MBPS							54.1	999.9
30:	11 QPSK/ 1.544 MBPS							54.1	999.9
31:	237 QPSK/ 64 KBPS							54.1	999.9

DESIRED SIGNAL, Carrier No. 19: 2 TV/FM 24.0 MHz 6.0/ 6.0 meters Up/Dn

Car. No	Interfering	als	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)

POTENTIAL INTERFERENCE from PanAmSat Satellite
into Revised Doc 81-704 Appendix C
Orbit Separation 2.00 degrees. 14/12 GHz

DESIRED SIGNAL, Carrier No. 21: 1 QPSK/ 80 MBPS 7.0/ 7.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
28:	1 QPSK/ 25.900 MBPS				79.6	297.4
29:	4 QPSK/ 3 MBPS				79.6	297.4
30:	11 QPSK/ 1.544 MBPS				79.6	297.4
31:	237 QPSK/ 64 KBPS				79.6	297.4

DESIRED SIGNAL, Carrier No. 22: 1 QPSK/ 80 MBPS 7.0/ 5.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
28:	1 QPSK/ 25.900 MBPS				78.2	298.8
29:	4 QPSK/ 3 MBPS				78.2	298.8
30:	11 QPSK/ 1.544 MBPS				78.2	298.8
31:	237 QPSK/ 64 KBPS				78.2	298.8

DESIRED SIGNAL, Carrier No. 23: 16 QPSK/ 1.544 MBPS 5.0/ 5.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
28:	1 QPSK/ 25.900 MBPS				74.2	999.9
29:	4 QPSK/ 3 MBPS				74.2	999.9
30:	11 QPSK/ 1.544 MBPS				74.2	999.9
31:	237 QPSK/ 64 KBPS				74.2	999.9

DESIRED SIGNAL, Carrier No. 24: 16 QPSK/ 1.544 MBPS 5.0/ 7.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)

28:	1 QPSK/ 25.900 MBPS							58.1	999.9
29:	4 QPSK/ 3 MBPS							58.1	999.9
30:	11 QPSK/ 1.544 MBPS							58.1	999.9
31:	237 QPSK/ 64 KBPS							58.1	999.9

DESIRED SIGNAL, Carrier No. 20: 2 TV/FM 24.0 MHz 6.0/ 6.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	S/Iu (dB)	S/Id (dB)	S/It (dB)	Object. (dB)	Margin (dB)
28:	1 QPSK/ 25.900 MBPS							58.1	999.9
29:	4 QPSK/ 3 MBPS							58.1	999.9
30:	11 QPSK/ 1.544 MBPS							58.1	999.9
31:	237 QPSK/ 64 KBPS							58.1	999.9

28:	1 QPSK/ 25.900 MBPS				74.2	999.9
29:	4 QPSK/ 3 MBPS				74.2	999.9
30:	11 QPSK/ 1.544 MBPS				74.2	999.9
31:	237 QPSK/ 64 KBPS				74.2	999.9

DESIRED SIGNAL, Carrier No. 25: 300 SCPC/SCPC/SCPC/SCP 5.0/ 3.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
28:	1 QPSK/ 25.900 MBPS				74.6	999.9
29:	4 QPSK/ 3 MBPS				74.6	999.9
30:	11 QPSK/ 1.544 MBPS				74.6	999.9
31:	237 QPSK/ 64 KBPS				74.6	999.9

POTENTIAL INTERFERENCE from PanAmSat Satellite
into Revised Doc 81-704 Appendix C
Orbit Separation 2.00 degrees. 14/12 GHz

DESIRED SIGNAL, Carrier No. 26: 425 SCPC/SCPC/SCPC/SCP 5.0/ 5.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
28:	1 QPSK/ 25.900 MBPS				74.6	999.9
29:	4 QPSK/ 3 MBPS				74.6	999.9
30:	11 QPSK/ 1.544 MBPS				74.6	999.9
31:	237 QPSK/ 64 KBPS				74.6	999.9

DESIRED SIGNAL, Carrier No. 27: 75 SCPC/FM .180 MHz 5.0/ 3.0 meters Up/Dn

Car. No.	Interfering Signals	C/Iu (dB)	C/Id (dB)	C/It (dB)	Object. (dB)	Margin (dB)
28:	1 QPSK/ 25.900 MBPS				73.3	999.9
29:	4 QPSK/ 3 MBPS				73.3	999.9
30:	11 QPSK/ 1.544 MBPS				73.3	999.9
31:	237 QPSK/ 64 KBPS				73.3	999.9

EXHIBIT 2

CERTIFICATION OF PERSON RESPONSIBLE FOR PREPARING ENGINEERING INFORMATION

PanAmSat

1350 Connecticut Ave., NW • Suite 610
Washington, DC 20036 • USA
Telephone 1/202/223/3511
Fax 1/202/296/9383

ENGINEERING CERTIFICATION

I, Philip A. Rubin, a principal in the engineering consulting firm of Philip A. Rubin and Associates, and Chief Scientist of PanAmSat Corporation, do hereby certify that I am the technically qualified person responsible for the preparation of the engineering information contained in this application, and that I am familiar with Parts 21 and 25 of the FCC Rules and Regulations. I am a registered Professional Engineer in Washington, D.C. and my seal appears on this certification. I certify that the technical material contained herein is complete and accurate to the best of my knowledge.

By: _____
Philip A. Rubin

Date: 2/2/96