

EXHIBIT B
HNS License Sub, LLC
Application for Earth Station Blanket License
Response to Question 35
October 2011

WAIVER REQUESTS

1. Petition For Partial Waiver Of Data Submission Requirement Of Section 25.115(E)

Pursuant to Sections 1.3 of the Commission's rules, 47 C.F.R. § 1.3, HNS License Sub, LLC ("Hughes") respectfully requests a partial waiver of Section 25.115(e) of the Commission's Rules, 47 C.F.R. § 25.115(e), with respect to some of the information that is required to be submitted with all applications for 20/30 GHz band fixed-satellite service ("FSS") earth station applications. This waiver is requested for the new 6.3m and 8.1m earth station antennas that will be proposed in the instant license application.

Hughes' proposed 6.3m and 8.1m earth station antennas will be used to provide gateway services for Hughes' Jupiter 107W satellite that is scheduled to be launched in 2012 to the 107.1° W.L. orbital location. Hughes seeks this limited waiver in order to allow the processing and grant of authority for its new antennas prior to the submission of certain data elements from Section 25.138 that are called for in Section 25.115(e) of the rules. The required data will not be available to Hughes until after the first of each type of earth station antenna is constructed and readied for operation. As explained more fully below, there is good cause to waive this rule and doing so would not be inconsistent with Commission precedent – in particular, because Hughes will supply the information required as soon as it is able to generate the data.¹ Grant of this request will serve the public interest

¹ The Commission previously granted a similar waiver request. *See Satellite Communications Services Information Re: Actions Taken*, Report No. SES-00748, File No. SES-AMD-20050901-01203 (Sept. 14, 2005) (Public Notice) (granting DirecTV a waiver of Section 25.138 information requirements). Moreover, when it granted the initial applications under Call Signs E060382 and E060383 for the TT&C earth station antennas for operation with Hughes' SPACEWAY 3 satellite, it granted waivers identical to those requested here. *See, e.g.*, License for Call Sign E060382 at Condition 253.

by allowing the provision of additional satellite broadband communication services in the United States without undermining the purpose of the Commission's rules.

Under Section 25.115(e) of the Commission's rules, applications for earth station licenses in the in the FSS in the 20/30 GHz bands are required to include the information described in Section 25.138. Section 25.138(a) specifies GSO FSS earth station antenna off-axis EIRP spectral density requirements for transmissions in the 28.35-28.6 GHz and 29.25-30 GHz bands, while Section 25.138(d) specifies that a series of measured antenna radiation patterns are to be provided for the purpose of determining compliance with the off-axis EIRP density levels in Section 25.138(a). Similar data for the receive band is called for in Section 25.138(e). The requirements of Sections 25.138(a), (d), and (e) are aimed at ensuring that an earth station transmitting to a satellite in the geostationary arc does not cause excessive interference to neighboring satellites.²

As discussed in more detail below, Hughes is seeking a partial and limited waiver of the obligation to provide with the instant blanket license earth station applications the information called for in Sections 25.138(d) and (e) of the Commission's rules, and instead to allow Hughes to provide the required data in connection with its post-grant certification of earth station construction pursuant to Section 25.133(b) of the Commission's rules, 47 C.F.R. § 25.133(b), on the basis that:

- the specific new model of antenna specified for the two locations has not previously been field deployed (meaning that the measured data required by Section 25.138(d) of the FCC rules is not available);
- the proposed antennas are not "production" antennas in the mass-production, ubiquitous deployment of small terminal sense of the word. Instead, the two antenna types for which waivers are sought are non-consumer gateway antennas that should be subjected to a

² As explained below, Hughes proposes to operate in the 28.6-29.1 GHz band. While this band is allocated primarily for non-geostationary fixed-satellite service transmissions in the Earth-to-space direction, Hughes seeks a waiver of Section 25.138 to include the 28.6-29.1 GHz band in its blanket authorization. The showings made under this rule with respect to off-axis EIRP limits and Section 25.209 relate to the ability of an earth station to operate successfully in a two-degree spacing environment. To the extent that Hughes can do this in the 28.6-29.1 GHz band, it should be able to be blanket licensed with respect to any other geostationary networks that are operating in the fixed-satellite service on a secondary basis to non-geostationary systems in the band.

different level of scrutiny than potentially problematic small antennas targeted for ubiquitous deployment to commercial and consumer users;

- Hughes will provide currently-unavailable data per the specifications in Sections 25.138(d) and (e) of the FCC's rules for each type of antenna after the first of each type of antenna is built in connection with its required certification under Section 25.133(b) of the Commission's rules.

Section 25.138(d) specifies that an applicant shall provide, for each earth station antenna type, a series of radiation patterns measured on a production antenna performed on a calibrated antenna range and, as a minimum, shall be made at the bottom, middle, and top frequencies of the 30 GHz band. The radiation patterns are:

- (1) Co-polarized patterns for each of two orthogonal senses of polarizations in two orthogonal planes of the antenna.
 - (i) In the azimuth plane, plus and minus 10 degrees and plus and minus 180 degrees.
 - (ii) In the elevation plane, zero to 30 degrees.
- (2) Cross-polarization patterns in the E- and H-planes, plus and minus 10 degrees.
- (3) Main beam gain.³

Section 25.138(e) imposes similar information requirements for the 20 GHz band receiving earth station antenna.⁴

By virtue of Section 25.115(e) of the Commission's rules, Hughes is obliged to submit, as part of its applications for any Ka-band earth station, measured antenna patterns from a production antenna of the type it proposes to deploy. This requirement causes a dilemma that has precipitated the instant limited waiver request. The 6.3m antennas that are the subject of this instant license application have not been built yet. While the model of antenna is available, these are not ordinary

³ See 47 C.F.R. § 25.138(d).

⁴ See *id.* at § 25.138(e).

“production” antennas, and measured data for this new Vertex antenna model as used in the Hughes gateway network will only be available after the first unit is constructed and tested on site. The same is true for the 8.1m GDSATCOM antenna model.

Although Hughes seeks a waiver of the requirement to provide unavailable data with its application, Hughes does provide other detailed information here in order to show that the protection of adjacent satellites will be ensured. Specifically, Hughes provides antenna patterns for the proposed antenna types, as measured by the manufacturer in the case of the 6.3 meter antenna and by a system integrator in the case of the 8.1 meter antenna. (*See Annexes 1 and 2 to this Exhibit B.*) These submissions strongly suggest that the antenna performance for both types of proposed antenna will comply with the requirements of Section 25.209 of the Commission’s rules.

Under the Commission’s rules and associated decisions, a waiver of the Commission’s rules is warranted when “good cause” is shown.⁵ A waiver may be granted if the grant “would not undermine the policy objective of the rule in question and would otherwise serve the public interest.”⁶

Hughes’ request for a partial waiver of Section 25.115(e) with respect to some of the information called for in Section 25.138 satisfies these criteria. As explained above, the required measurements of the Ka-band antennas that are the subject of the modification applications are not feasible because the antennas in question have not been built and tested.

The purpose of the Section 25.115(e) is to ensure that FSS earth station operations in the 20/30 GHz frequency band do not subject neighboring satellite networks to harmful interference. As interference to other GSO FSS satellites will be within the levels permitted by the Commission’s rules,

⁵ 47 C.F.R. § 1.3. *See also WAIT Radio v. FCC*, 418 F.2d 1153, 1157 (D.C. Cir. 1969).

⁶ *EchoStar KuX Corp. Application for Authority to Construct, Launch and Operate a Geostationary Satellite Using the Extended Ku-band Frequencies in the Fixed-Satellite Service at the 83° W.L. Orbital Location*, Order and Authorization, 20 FCC Rcd 919, 923 (¶ 12) (2004) (Commission waiver for “good cause shown”).

and GSO operations of other satellite operators will not be subject to harmful interference.

Additionally, Hughes stands prepared to provide the additional data per the specifications in Sections 25.138(d) and (e) of the Commission's rules after each type of antenna is built.

Furthermore, Section 25.138 was intended to address blanket licensing of ubiquitously deployed production antennas. As correctly noted in another application for licensing of a fixed transmit receive earth stations in the 30/20 GHz band, "the wide range of measurement parameters specified in the rule was meant to account for the wide range of installation possibilities for such mass marketed antennas, and for the fact that not every antenna would be tested after installation."⁷ In the instant case, there are only 15 earth stations, and each antenna will be used to provide gateway services in support of traffic carried on the new Jupiter 107W satellite. The gateway antennas will be very carefully installed and tested – much more so than user terminal antennas used for communications services. The available antenna data points to the fact that co-frequency FSS operations of adjacent satellites will not be subject to harmful interference. Moreover, Hughes notes that the gateway service functions for Jupiter 107W can and will meet the levels in Section 25.138(a) during all routine operations.

Finally, grant of this waiver would be consistent with commission precedent, as the antenna sidelobe performance is expected to be similar to that of other large-diameter Ka-band antennas from the same manufacturer, and the Commission issued a waiver to Hughes for the large-diameter earth station antennas it uses successfully today with SPACEWAY 3.

In short, Hughes's request for a partial, limited waiver of the information requirements in Section 25.115(e) in connection with its proposed gateway earth stations for Jupiter 107W are fully consistent with the purposes of the underlying rule. Moreover, grant of Hughes's waiver request will

⁷ See *supra* n.1.

serve the public interest by expanding the range and quality of communication services that are available in the United States.

For the reasons stated herein, grant of Hughes's waiver request will serve the public interest without undermining the purpose of the Commission's rules. Accordingly, and for good cause shown, Hughes asks that the Commission grant this waiver request.

2. Petition For Partial Waiver Of Section 25.138

As Hughes noted above, it requests a waiver of Section 25.138 to allow blanket licensing of the 15 antennas proposed here in the 28.6-29.1 GHz bands. The rule does not currently apply to blanket licensing of earth stations in this band segment. Good cause exists for Hughes's request.

The 28.6-29.1 GHz band is designated for primary non-geostationary fixed-satellite service operation, and geostationary operations in this band are on a secondary basis to such non-geostationary operations. Section 25.138 is intended to ensure that a geostationary fixed-satellite service satellite network's earth station transmissions are within levels permitted by the Commission's rules and do not subject operations of other geostationary fixed-satellite service networks to harmful interference. Since Hughes will be operating earth stations in the 28.6-29.1 GHz band on the condition that non-geostationary networks are protected from harmful interference, as will any other earth stations operating with geostationary satellites, it makes sense to extend and apply the blanket licensing provisions (including off-axis power limits) of Section 25.138 to the earth station antennas Hughes proposes here for operation in the 28.6-29.1 GHz band.

This will ensure a proper interference relationship between Hughes's Jupiter 107W satellite and any other geostationary satellites with secondary non-geostationary capability. It will also advance the public interest by maximizing the efficiency with which secondary geostationary satellite networks can successfully use the band (and its non-interference-basis corresponding downlink band

at 18.8-19.3 GHz). Finally, grant of the waiver requested here will not compromise or undermine in any way the purpose of the frequency allocation determinations the Commission made regarding the 28.6-29.1 GHz and 18.8-19.3 GHz bands, as the obligation to operate without causing harmful interference to/claiming protection from non-geostationary systems in the fixed-satellite service in these bands is unaffected by the waiver grant requested here.

For the reasons stated herein, grant of Hughes's waiver request will serve the public interest without undermining the purpose of the Commission's rules. Accordingly, and for good cause shown, Hughes asks that the Commission grant this waiver request.

ANNEX 1: RF SPECIFICATION FOR VERTEX ANTENNA (6.3m)⁸

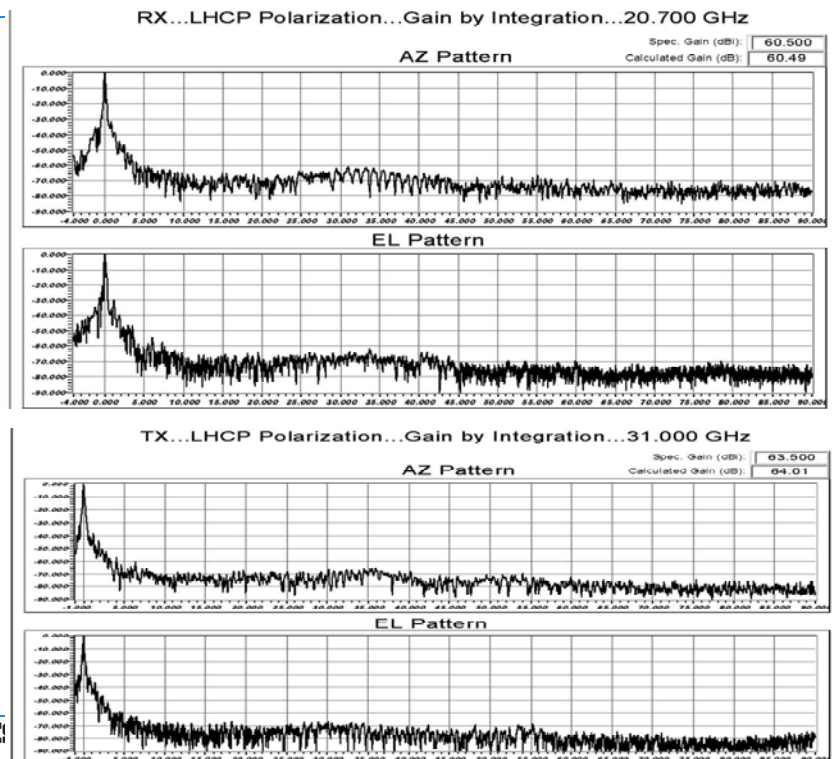


6.3m Performance - Gain

Gain Summary:

- RX Gain: 60.49dBi
Spec = 60.50dBi
- TX Gain: 64.01dBi
Spec = 63.50dBi

GENERAL DYNAMIC
SATCOM Technologies

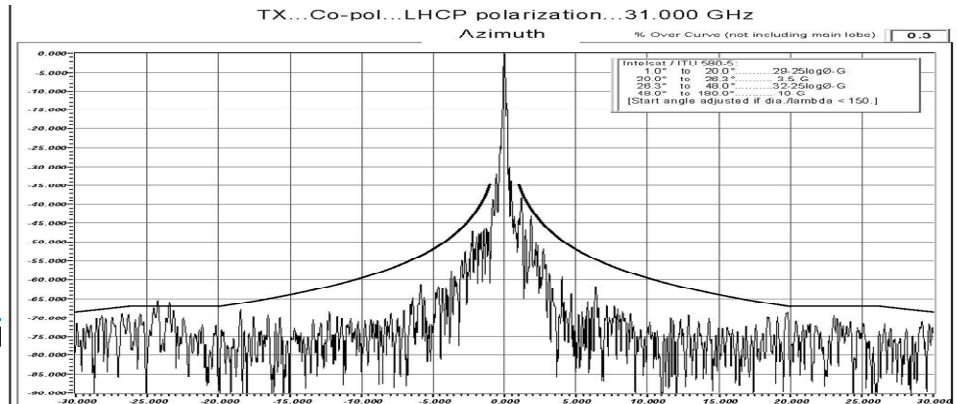
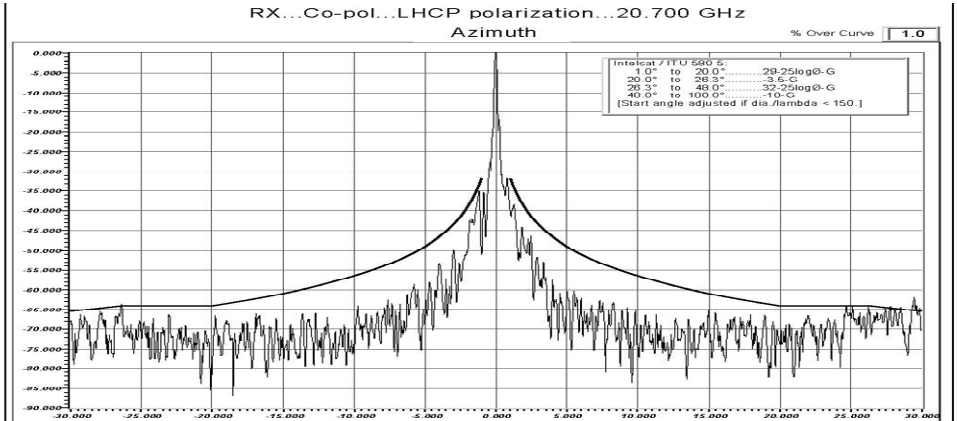


⁸ As provided by Vertex. Measurement data from same type of antenna Hughes proposes.

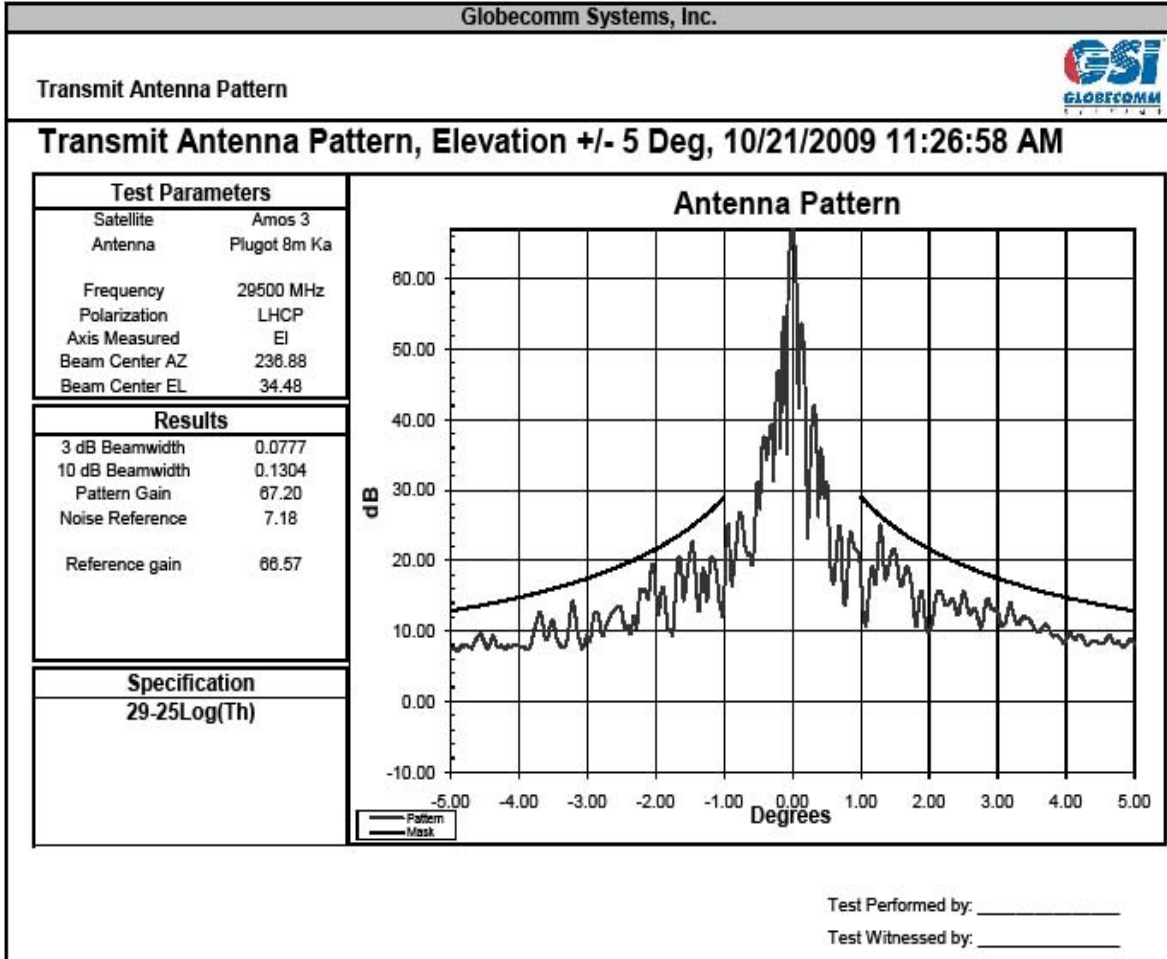
6.3m Performance – Sidelobes

Summary:
100% Compliant
with WGS/MIL Std.
188-164A

GENERAL DYNAMICS
SATCOM Technologies



ANNEX 2: RF SPECIFICATION FOR GDSATCOM ANTENNA (8.1m)⁹



PatternTX29500_EL_5deg

Globecomm Systems, Inc.
45 Oser Avenue
Hauppauge, NY 11788 USA

12/14/2009 5:11 PM

⁹ As provided by Globecomm Systems, Inc. (system integrator). Measurement data from same type of antenna Hughes proposes.



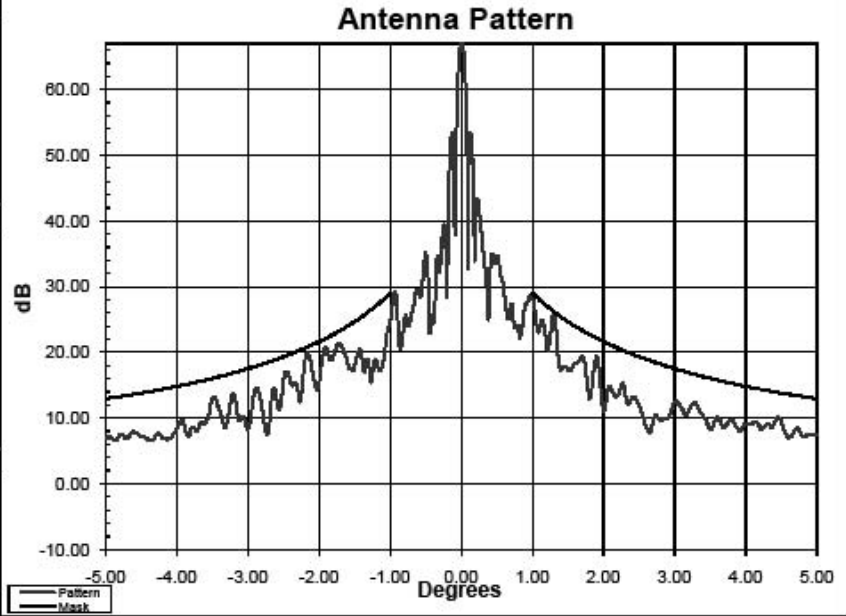
Transmit Antenna Pattern

Transmit Antenna Pattern, Azimuth +/- 5 Deg, 10/21/2009 11:12:54 AM

Test Parameters	
Satellite	Amos 3
Antenna	Plugot 8m Ka
Frequency	29500 MHz
Polarization	LHCP
Axis Measured	AZ
Beam Center AZ	238.85
Beam Center EL	34.48

Results	
3 dB Beamwidth	0.0788
10 dB Beamwidth	0.1301
Pattern Gain	67.15
Noise Reference	7.46
Reference gain	66.57

Specification	
29-25Log(Th)	



Test Performed by: _____
 Test Witnessed by: _____



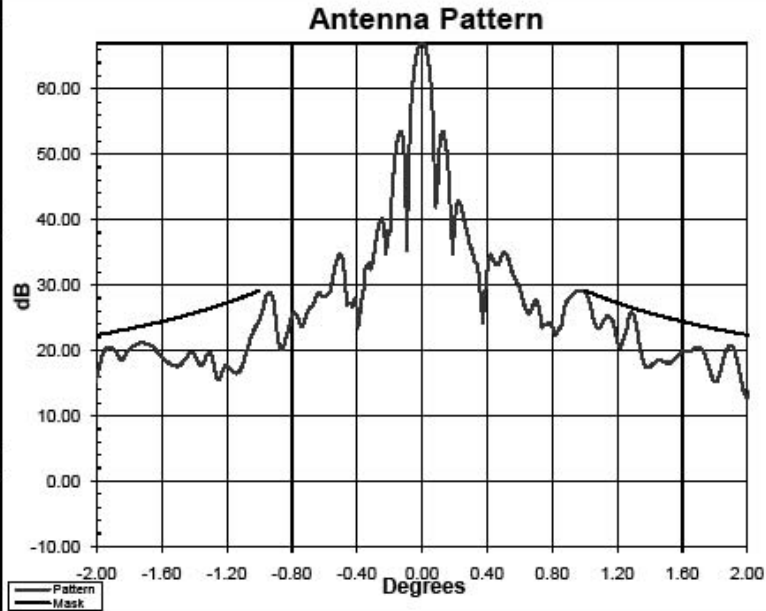
Transmit Antenna Pattern

Transmit Antenna Pattern, Azimuth +/- 2 Deg, 10/21/2009 10:54:17 AM

Test Parameters	
Satellite	Amos 3
Antenna	Plugot 8m Ka
Frequency	29500 MHz
Polarization	LHCP
Axis Measured	AZ
Beam Center AZ	236.87
Beam Center EL	34.48

Results	
3 dB Beamwidth	0.0804
10 dB Beamwidth	0.1320
Pattern Gain	67.00
Noise Reference	14.96
Feed Loss	0.50
Refl surf error loss	0.052
Gain	66.57

Specification	
29-25Log(Th)	



Gain by Beamwidth dBi =

$$10\text{Log}((31000/(AZ \text{ 3dB BW} * EL \text{ 3dB BW})) + (91000/(AZ \text{ 10 dB BW} * EL \text{ 10 dB BW}))) / 2) - \text{Feed Loss dB} - 4.923 \text{ (RMS inches * Freq GHz)}^2$$

Test Performed by: _____

Test Witnessed by: _____



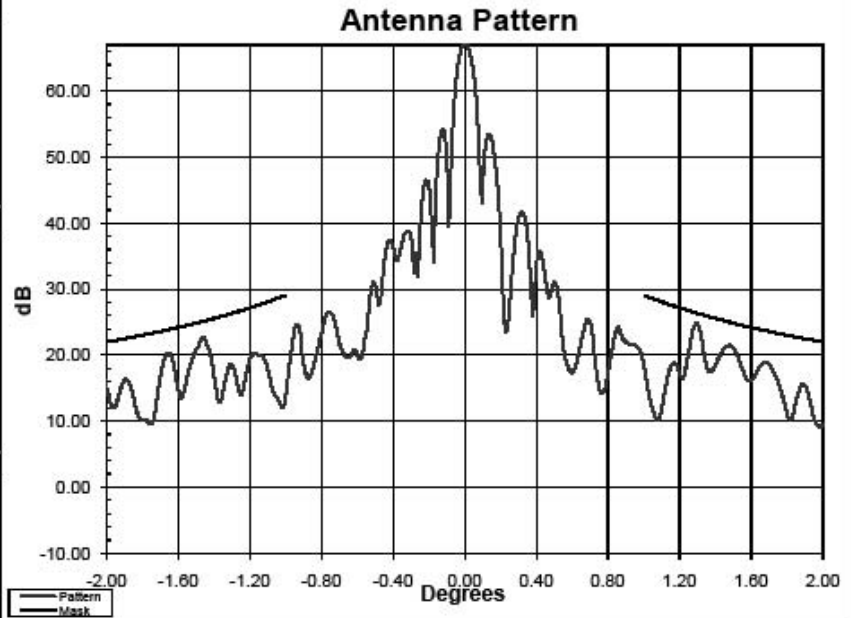
Transmit Antenna Pattern

Transmit Antenna Pattern, Elevation +/- 2 Deg, 10/21/2009 10:45:30 AM

Test Parameters	
Satellite	Amos 3
Antenna	Plugot 8m Ka
Frequency	29500 MHz
Polarization	LHCP
Axis Measured	EI
Beam Center AZ	238.87
Beam Center EL	34.48

Results	
3 dB Beamwidth	0.0773
10 dB Beamwidth	0.1293
Pattern Gain	67.26
Noise Reference	12.60
Gain	66.57

Specification	
29-25Log(Th)	



Test Performed by: _____
 Test Witnessed by: _____



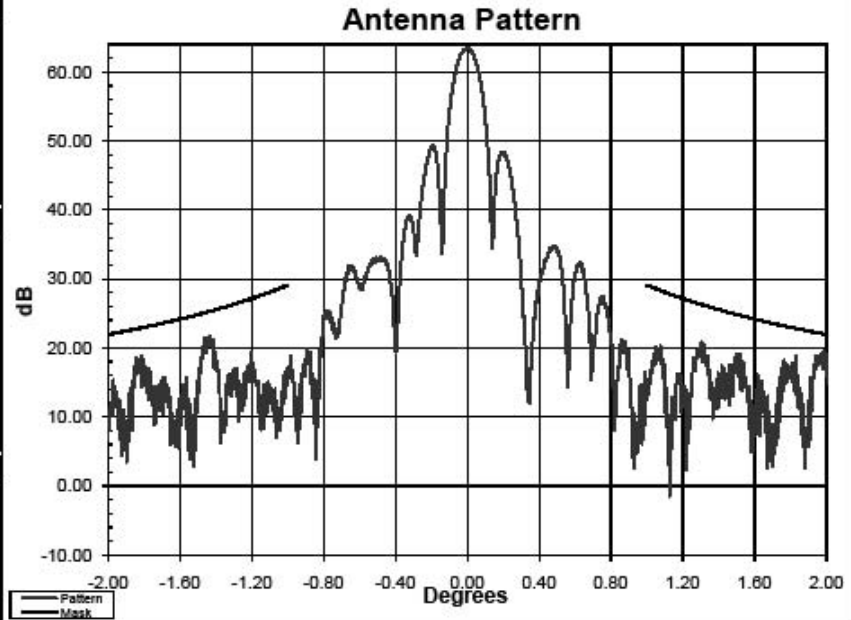
Receive Antenna Pattern

Receive Antenna Pattern, Elevation +/- 2 Deg, 10/20/2009 3:48:37 AM

Test Parameters	
Satellite	Amos 3
Antenna	Plugot 8m Ka
Frequency	19250 MHz
Polarization	RHCP
Axis Measured	EI
Beam Center AZ	236.91
Beam Center EL	34.47

Results	
3 dB Beamwidth	0.1195
10 dB Beamwidth	0.2024
Pattern Gain	63.42
Noise Reference	12.13
Gain: 62.78	

Specification
29-25Log(Th)



Test Performed by: _____

Test Witnessed by: _____

Globecomm Systems, Inc.
45 Oser Avenue
Hauppauge, NY 11788 USA

PatternRX19.25_EL_RH

12/14/2009 5:13 PM



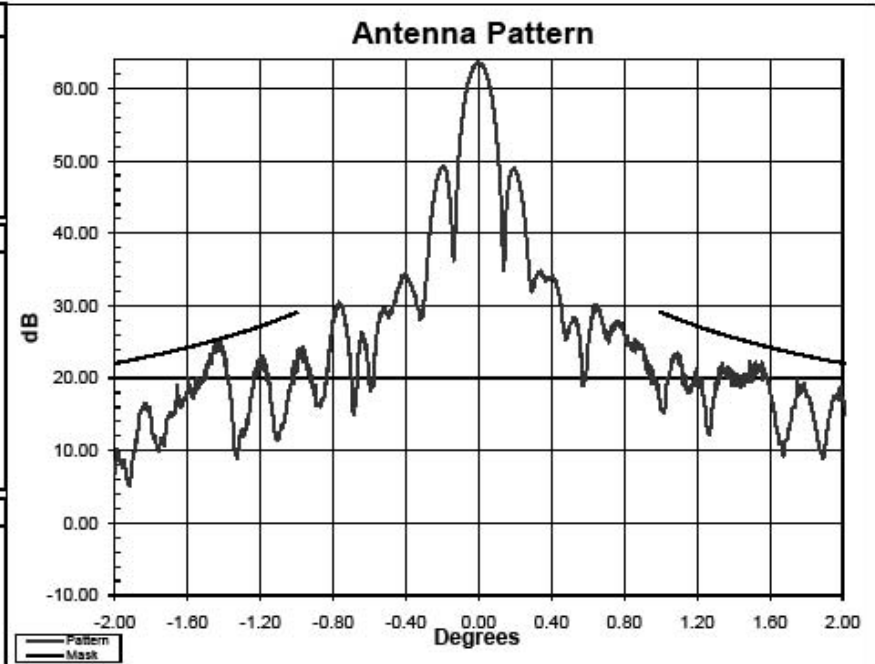
Receive Antenna Pattern

Receive Antenna Pattern, Azimuth +/- 2 Deg, 10/20/2009 4:07:03 AM

Test Parameters	
Satellite	Amos 3
Antenna	Plugot 8m Ka
Frequency	19250 MHz
Polarization	RHCP
Axis Measured	AZ
Beam Center AZ	238.91
Beam Center EL	34.48

Results	
3 dB Beamwidth	0.1181
10 dB Beamwidth	0.1972
Pattern Gain	63.58
Noise Reference	13.13
Feed Loss	0.70
Refi surf error loss	0.02
Gain	62.78

Specification	
29-25Log(Th)	



Gain by Beamwidth dBi = $10\log\left(\frac{31000(AZ\ 3dB\ BW * EL\ 3dB\ BW)}{(91000(AZ\ 10\ dB\ BW * EL\ 10\ dB\ BW)) / 2}\right) - Feed\ Loss\ dB - 4.923\ (RMS\ inches * Freq\ GHz)^2$

Test Performed by: _____
 Test Witnessed by: _____

Globecomm Systems, Inc.
 45 Oser Avenue
 Hauppauge, NY 11788 USA