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November 22, 2013

FILED ELECTRONICALLY

Marlene H. Dortch, Secretary
Federal Communications Commission
Office of the Secretary
445 12th Street, SW
Room TW-A325
Washington, DC 20554

Re: O3b Limited
File No. SES-LIC-20130618-00516

Dear Ms. Dortch:

This document provides responses to the questions posed by the International Bureau concerning the application filed by O3b Limited ("O3b") for authority to operate a fixed earth station in Bristow, Virginia.

1. *The September 25 letter to O3b regarding the Blanket Application contained a number of information requests that are relevant to the Bristow Application. As a result, O3b should provide the same kind of information requested in paragraphs 2, 3, 4, 6, 11, and 12 of the September 25 letter in its amendment to the Bristow Application.*

Responses to the questions in paragraphs 2, 3, 4, 6, 11, and 12 of the September 25 letter, in this case as relates to the Bristow Application rather than the Blanket Application, are attached.

2. *Please provide a showing that demonstrates that the O3b satellite system complies with No. 22.5D of the ITU Radio Regulations.*

The EPFD(up) limits in No. 22.5D of the Radio Regulations take the form of a single EPFD(up) value that must never be exceeded (-162 dBW/m^2/40 kHz in the 27.5-28.6 GHz band). O3b complies with this limit, in the O3b frequency ranges where such EPFD limits apply, by controlling the maximum power spectral density into transmitting earth stations as a function of their latitude and their antenna size and off-axis gain towards the GSO.

The maximum EIRP density transmitted by the Bristow earth station is 24.6 dBW/4kHz, which is equivalent to 34.6 dBW/40kHz (*i.e.*, the reference bandwidth used for the EPFD(up) limit). The peak earth station transmit antenna gain is 55.2 dBi, giving a maximum input power spectral density of -20.6 dBW/40kHz. From the Bristow earth station, which is at a latitude of 38.75°N, the minimum separation angle between the GSO and O3b orbits varies from 12.3° to 16.7° depending on the difference in longitude between Bristow and the GSO/O3b satellites. The lower value applies to the case in which the GSO and O3b satellites are at very low elevation angles (~8° for the GSO and 0° for the O3b orbit) as viewed from Bristow. For the minimum separation angle of 12.3°, the off-axis gain of the transmitting

earth station is 4.7 dBi, assuming a 32-25log(θ) gain mask. That results in a worst-case off-axis EIRP density towards the GSO of -15.9 dBW/40kHz (i.e., -20.6+4.7). Taking the range to the GSO orbit from Bristow corresponding to a zero degree elevation angle (41,382.7 km), the spreading loss to the GSO would be 163.3 dB, resulting in a worst case EPFD(up) level at the GSO of -179.2 dBW/m^2/40kHz. This is below the EPFD(up) limit value of -162 dBW/m^2/40kHz specified in No. 22.5D of the ITU's Radio Regulations, so compliance exists with margin for this low-elevation case. At higher elevation angles the increase in the separation angle between the GSO and the O3b orbit more than offsets the reduced path length to the GSO, resulting in even more margin relative to the EPFD(up) limit.

3. *Please provide the measured antenna performance data for the 2.4-meter antenna. Please provide a series of radiation pattern measurements, performed on a calibrated antenna range. To facilitate processing, we request O3b to provide pattern measurements at the bottom, middle, and top frequencies of the 27.6-29.1 GHz (Earth-to-space) frequency band, as described in Section 25.138(d) of the Commission's rules applicable to GSO FSS earth stations.*

Measured 30 GHz band antenna performance data for the 2.4-meter Bristow antenna is attached. We are providing a series of radiation pattern measurements that have been performed on a calibrated antenna range. Per discussions with the Satellite Division, pattern measurements are provided for the bottom, middle, and top frequencies of O3b's overall 30 GHz band frequency range, i.e., 27.6-29.1 GHz, in accordance with the description in Section 25.138(d) of the FCC's rules that applies to GSO FSS earth stations.

4. *O3b seeks to operate in the 27.6-28.35 GHz band on a secondary basis. The Commission has indicated that FSS operations in this band are limited to gateway-like operations. Please explain how O3b's operations are consistent with the Commission's statements regarding this band.*

The Commission's references to "gateway-type service" in the 27.5-28.35 GHz band are not intended as a requirement that earth stations in the band serve as gateway earth stations. Rather, the references to "gateway-type service" in the 27.5-28.35 GHz band reflect the Commission's expectation as to the type of services that FSS operators would be able to provide on a secondary basis, *i.e.*, services the FSS operators can provide without causing interference to LMDS stations that are primary in the 27.5-28.35 GHz band.

No requirement that earth stations serve as gateways. The Commission's rules support the above interpretation. Although the rules limit operations in some bands to gateway earth stations, the 27.5-28.35 GHz band is not among them.

Commission's expectation as to the type of services that FSS operators would be able to provide. The Commission's findings in the Ka-band rulemaking proceeding shed light upon what qualifies as a gateway-type earth station that an FSS licensee may operate in the 27.5-28.35 GHz band. These findings show that the Commission's concern is with ubiquitous user terminals that could interfere with LMDS operations. The Commission stated, for example, that: "Gateways are earth stations generally larger than user terminals that support multiple carriers. …

By their nature, they are not deployed in the same ubiquitous way as the user transceivers."[1] Similarly, the Commission stated in the Third Report and Order, which is cited in IB's letter to O3b, that: "As a practical matter, it is unlikely that FSS can operate ubiquitous terminals on an unprotected non-interference basis to LMDS."[2]

O3b's proposed operations satisfy these standards. O3b seeks authority to operate a single earth station consisting of two 2.4m antenna. Comsearch, on O3b's behalf, notified 28 GHz LMDS licensees and lessees of O3b's Bristow Application, and none of them objected to it.[3] O3b's Bristow earth station, therefore, is compatible with LMDS operations and is consistent with the views expressed by the Commission as to what qualifies as gateway-like.

> 5. *Based on our review of 03b's Hawaii application, portions of which 03b incorporates by reference in the Bristow Application, it appears that there is a possibility that 03b space stations could receive signals from terrestrial Fixed Service stations operating in the 03b uplink frequency bands and retransmit these signals in the 03b downlink frequency bands that are used by other Fixed Service systems. Please provide an interference analysis that demonstrates that retransmission of Fixed Service signals by 03b space stations will not occur or will not cause unacceptable interference to any potentially-affected radiocommunication systems. One method of satisfying this request would be to explain whether 03b can shut off transponders transmitting in the 17.8-18.3 GHz frequency band in any beams that are illuminating geographic areas from which the satellite is at a low elevation angle.*

Retransmission of terrestrial signals by satellites operating in bands shared with terrestrial services is a possibility for both geostationary satellites and non-geostationary satellites. As envisioned in question 5, therefore, it is conceivable that an LMDS transmission in the 27.6-28.35 GHz band could be picked up by an O3b satellite receive beam that is pointed towards Bristow and could be retransmitted in the 17.8-18.3 GHz downlink band. In practice, however, such retransmission is unlikely; even if retransmission were to occur, its duration would be brief and its impact would be insignificant; and the pfd produced by any retransmission would be within acceptable levels.

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[1] *In the Matter of Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5 – 29.5 GHz Frequency Band, to Reallocate the 29.5 - 30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services and Suite 12 Group Petition for Pioneer's Preference, Third Notice of Proposed Rulemaking and Supplemental Tentative Decision*, 11 FCC Rcd 53, 60, n. 8 (1995).

[2] *In the Matter of Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services, Third Report and Order*, 12 FCC Rcd 22310, 22327, ¶42 (1997). Notwithstanding its concern with ubiquitous user terminals, moreover, the Commission authorized Teledesic to provide services in the 27.5-28.35 GHz band that had ubiquitous elements. In 1997, the Commission authorized Teledesic to operate 27.5-28.35 GHz band NGSO FSS "Gigalink" terminals on a secondary basis that were to be used, among other things, "in privately owned networks and as high-rate terminals." *In the Matter of Teledesic Corporation Application for Authority to Construct, Launch, and Operate a Low Earth Orbit Satellite System in the Domestic and International Fixed Satellite Service*, 12 FCC Rcd. 3154 at ¶2156, n.6 (Chief IB 1997).

[3] *See* Bristow Application, Legal Narrative at 4.

1.) **Retransmission is unlikely.** Retransmission cannot occur unless an O3b receive beam and a transmitting terrestrial station perfectly align, but the operating characteristics of O3b's system are such that the chances of such an alignment are remote. The minimum look angle for O3b earth stations is about 10 degrees. Once the look angle of the intended earth station falls below 10 degrees, another O3b satellite will come into view and the outgoing satellite will be inhibited while being reconfigured to serve the next region.

2.) **Retransmission, even if it were to occur, would be brief.** Retransmission is most likely to occur, albeit unlikely to occur, in the case of terrestrial earth stations that are located between the 0 and 5 degree elevation contours of the O3b satellite receive beam and where the O3b G/T values are on par with the nominal operational values. These conditions occur only during the limited periods when the O3b satellite is at either edge of the usable arc from the perspective of the Bristow earth station.

3.) **The impact of retransmission, even if it were to occur, would be insignificant.** Generally speaking, and particularly in the case of Bristow, the O3b satellite beams do not operate in a loop-back mode. Rather, signals picked up by the satellite receive beam pointed towards Bristow will be retransmitted to a gateway earth station that is likely to have a much higher elevation angle than the earth station at Bristow (this is akin to cross-strapping of beams in geostationary satellites). Therefore, even if retransmission were to occur, the angle of arrival of the O3b downlink beam at the gateway earth station location would orthogonal, more or less, to the direction of terrestrial signals (which tend to be parallel to the earth's surface).

4.) **The pfd produced by any retransmission would be within acceptable levels.** The maximum transmit EIRP levels of 27.6-28.35 GHz band LMDS stations (55 dBW, 42 dBW/MHz) are at least 10 dB below the nominal uplink EIRP levels of O3b's earth stations. All things being equal, therefore, the downlink EIRP levels of any LMDS signal retransmitted by O3b would be at least 10 dB below the EIRP levels of O3b's intentionally-transmitted downlink signals. And the EIRP levels of O3b's intentionally-transmitted downlink signals produce a pfd that is at least 10 dB below the pfd limits that are called for in Article 21 of the ITU's Radio Regulations in order to protect terrestrial services. Consequently, any LMDS signals retransmitted by O3b would be below these pfd limits by at least 20 dB, and terrestrial stations would be protected.

Moreover, a retransmitted LMDS signal is likely to produce an even lower pfd level than is suggested by the above analysis. First, it is unlikely that all LMDS stations will transmit up to the maximum EIRP allowed by the FCC (i.e., 55 dBW). Second, the path loss between the LMDS station and the O3b satellite is greater than the path loss for the wanted earth station due to the longer slant range between the LMDS station and the O3b satellite.

Respectfully submitted,

Joslyn Read
Vice-President, Regulatory Affairs
Joslyn.Read@o3bnetworks.com

ATTACHMENT: Responses to questions in paragraphs 2, 3, 4, 6, 11, and 12 of the September 25 letter

> *2. O3b seeks a waiver of Section 25.145(c) of the Commission's rules, which requires Ka-band NGSO FSS systems to be capable of: (1) serving locations as far north as 70 degrees latitude and as far south as 55 degrees latitude for at least 75 percent of every 24-hour period; and (2) providing FSS on a continuous basis throughout the 50 states, Puerto Rico and the U.S. Virgin Islands. Please indicate whether O3b intends to provide other consumer services in the United States besides the services proposed in its Blanket Application.*

All of O3b's services are based on individually negotiated arrangements O3b enters into with customers (*i.e.* services will be provided on a non-common carrier basis). Neither the services covered by O3b's Bristow Application nor O3b's other maritime and non-maritime services will be direct-to-consumer services.

Bristow services. O3b will not use its Bristow earth station to provide services directly to consumers. As stated in the Bristow Application, the earth station will be used for satellite monitoring, network troubleshooting, and customer demonstrations.

Maritime services. O3b will not provide maritime ESV services directly to consumers. Rather, O3b will install a limited number of ESV antennas on large individual ships. An O3b customer, such as a cruise line, may connect its passengers to O3b's network via hard wired connections in the cabin or via WiFi networks. But O3b's customer in such cases is the ship operator or a service provider to the ship operator, not individual consumers.

Non-maritime services. O3b does not expect to provide any of its non-maritime services directly to individual consumers. O3b anticipates that its non-maritime U.S. customers will be local carriers, ISPs, the U.S. government, and other large entities that need high-capacity backhaul in places that are unserved or underserved by terrestrial infrastructure. For each U.S. non-maritime service, O3b or its U.S. customer will submit one or more earth station applications specifying the particular locations to which O3b service will be provided, the detailed technical parameters of the operations, and the frequencies that will be used. O3b's customers will make O3b satellite access available to multiple users on a campus-wide or similar basis.

Waiver of Section 25.145(c). As O3b explained in its Bristow Application:

"It is unclear whether a waiver of the coverage requirements of Section 25.145(c) is needed to add an earth station in Virginia, given that this earth station will be used for (among other things) satellite monitoring and network troubleshooting purposes. Such functions are substantially similar to the TT&C and gateway functions performed by the Hawaii gateway, and for which a waiver already has been granted. To the extent that an additional waiver is required, however, O3b hereby requests one. O3b's request is supported by good cause. The public interest considerations that led the Commission to grant a waiver of the coverage requirements to permit operation of a gateway in Hawaii also are applicable to operation of a single earth station in Virginia that will be used to identify and resolve space station and system anomalies and to test various modems and service offerings."[4]

[4] Bristow Application, Legal Narrative at 8.

3. Sections 25.137(c) and 25.157 of the Commission's rules require the Commission to process applications for NGSO-like systems under a "modified processing round" framework, which divides spectrum among competing applicants. O3b sought, and was granted, a waiver of these provisions in its Haleiwa, Hawaii earth station authorization. O3b incorporates this waiver showing by reference in the Blanket Application. In the Hawaii application, O3b described the technical aspects of its system that would allow for subsequent entry of additional NGSO FSS Ka-band systems. At the same time, O3b explained that, in certain limited situations, some of its interference avoidance techniques would not work. For example, O3b explained that when an earth station is operating at the highest latitudes of O3b's service area, it might be unable to switch target satellites to avoid interference and would need to rely upon other techniques to avoid interference with additional NGSO FSS Ka-band systems. Please confirm that the services O3b requests authority to provide in its Blanket Application will not preclude the operation of another NGSO FSS system operating in the same frequency bands. Please also confirm that the technical showing provided in the Haleiwa, Hawaii application to support the waiver of Sections 25.13 7 (c) and 25.157 of the Commission's rules remains accurate, taking into consideration the new services and service areas proposed in the Blanket Application. To the extent O3b's rationale for waiver is modified or changed as a result of the new services requested in this application, O3b should provide an amended rational, together with an associated technical showing.

O3b's response is identical to the response it gave to this question in the context of the Blanket Application. O3b's prior response is hereby incorporated by reference. It should be noted in this regard that the latitude of the Bristow earth station is 38.75°N, which puts it somewhat higher in latitude than the Hawaii or Texas gateway earth stations, but not as high in latitude as the most northern part of the O3b service area to be used for ESVs.

4. O3b indicates that it intends to provide fiber quality satellite broadband service to maritime passengers and crew. In the CALEA First Report and Order, the Commission concluded that the Communications Assistance for Law Enforcement Act (CALEA) applies to facilities-based broadband Internet access providers and providers of interconnected voice over Internet Protocol (VoiP) service. To the extent O3b will provide services within the scope of CALEA, O3b should explain the steps taken to ensure compliance with CALEA.

O3b's response is identical to the response it gave to this question in the context of the Blanket Application. O3b's prior response is hereby incorporated by reference.

6. O3b incorporates by reference the Schedule S submitted in its Hawaii application (Hawaii Schedule S). The Hawaii Schedule S contains different power flux density (pfd) limits and service areas than those proposed in O3b's Blanket Application. For example, the Hawaii Schedule S does not reflect the Vernon, Texas gateway earth station. It also does not include pfd limits for the proposed maritime services or the applicable technical parameters for all earth station antenna types with which O3b intends to operate in the United States (i.e., 7.3-meter, 2.4-meter, 2.2-meter, and 1.2-meter antennas). Please provide a new Schedule S for O3b's system that accurately represents all services O3b intends to provide in its Blanket Application.

As stated in the response given to this question in the context of the Blanket Application, the original Schedule S O3b submitted as part of its Hawaii application correctly described the O3b satellite system for that application, as well as numerically enveloping all the necessary parameters for future earth station

applications. In order to assist the Commission in processing present and future applications, however, O3b provided with its Blanket Application response a modified Schedule S (as requested) for the O3b NGSO satellite system in .mdb database format that incorporates additional information submitted to the Commission since the Hawaii application was filed. With that modified Schedule S, which is hereby incorporated by reference, and the Bristow-specific link budget and other information in the technical supplement that O3b submitted on July 24, 2013, O3b's technical showing for Bristow should be complete.[5]

11. Please provide either the space station nadir-pointing antenna pattern contour diagrams for the user and gateway antenna beams or a mathematical description of the antenna beams necessary to derive the antenna pattern contour diagram for any O3b satellite location and earth station location.

O3b's response is identical to the response it gave to this question in the context of the Blanket Application. O3b's prior response is hereby incorporated by reference.

12. Please provide a map showing how many space station antenna beams may operate in the United States at the same time. If there is a situation where multiple co-frequency emissions from the same satellite will use overlapping beams, please describe the overlap in detail, including how many of these beams can overlap within the -3dB contour of each beam at the same location in the United States.

O3b's response is identical to the response it gave to this question in the context of the Blanket Application, as supplemented on November 19, 2013.

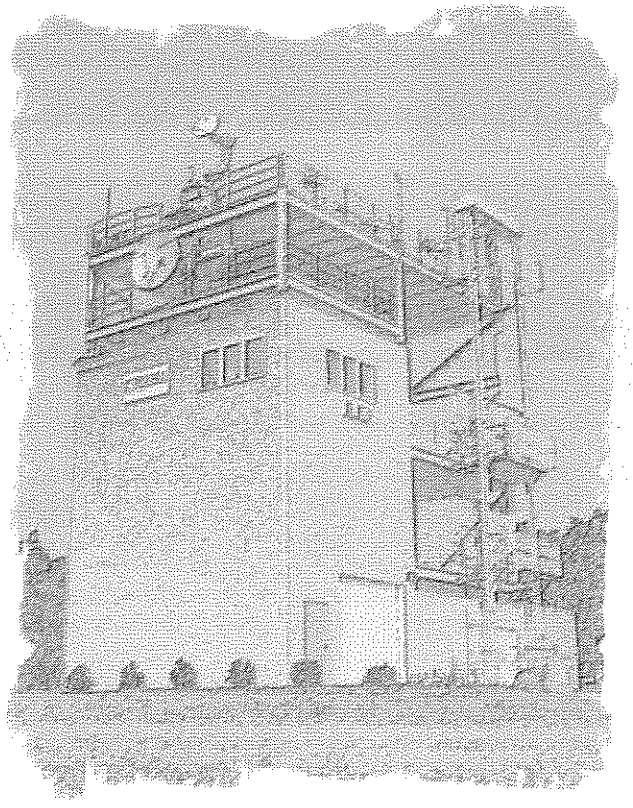
[5] Please note that the PFD levels in O3b's Schedule S and the PFD levels in the Bristow Application, as supplemented, are consistent. The PFD levels in the Bristow Application are fully encompassed by the worst-case PFD levels submitted in O3b's Schedule S and all such levels are below the applicable FCC limits in § 25.208.

GENERAL DYNAMICS
SATCOM Technologies

2.4M Ka-Band Antenna System

O3b Terminal

2288-B Test Report



East Maiden Antenna Test Facility
4488 Lawing Chapel Church Road
Maiden, North Carolina 28650
828-428-1485 / 828-428-1488 fax

GENERAL DYNAMICS
SATCOM Technologies

2.4M Ka-Band Antenna System

O3b Terminal

Contents

Gain

Gain Analysis

Frequency (GHz)	Gain (dB) LHCP	Gain (dB) RHCP
27.60	55.4	55.6
28.35	55.6	55.7
29.10	55.8	55.7

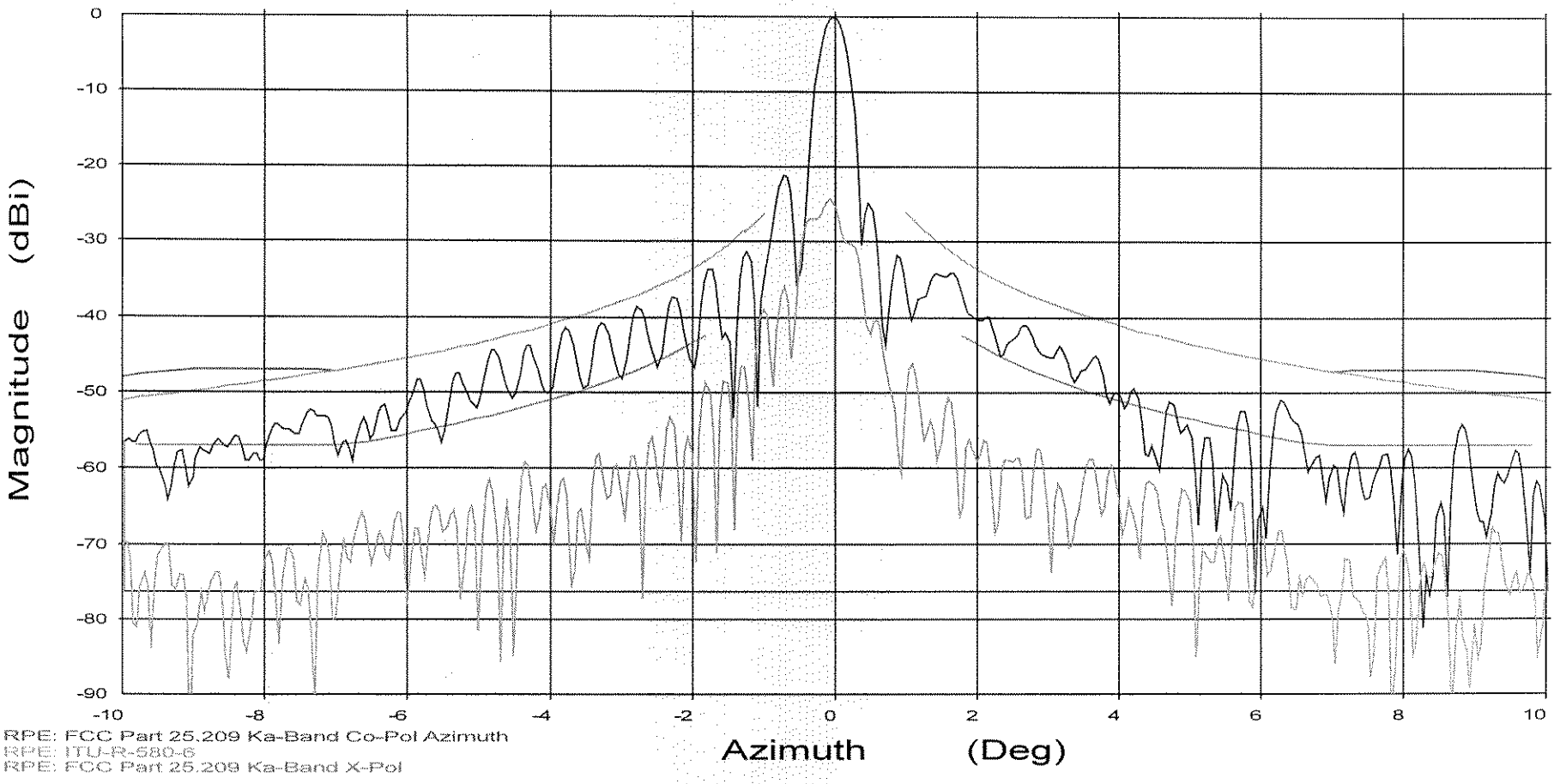
LHCP Transmit Radiation Patterns

2.4M Ka-Band Antenna System
O3b Terminal

Frequency : 27.600 GHz

Operator: J Hartness

Channel: AUT Tx pol: LHCP Rx pol: LHCP



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RPE: ITU-R-580-6
RPE: FCC Part 25.209 Ka-Band X-Pol

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2288 47.dat-ant_under_test	2288 47.dat

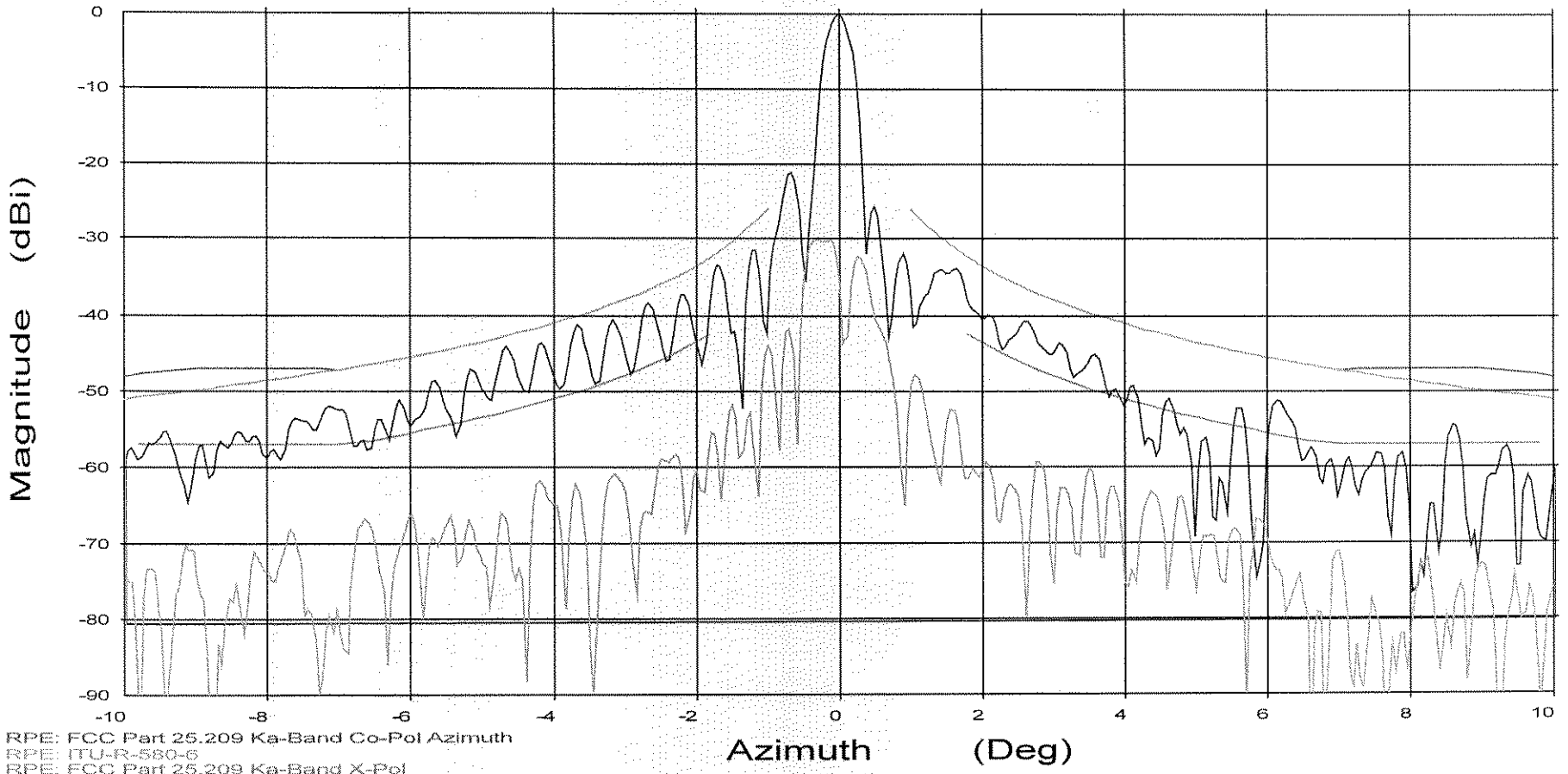
General Dynamics SATCOM Technologies
East Malden Test Facility
4488 Lawing Chapel Church Road
Malden, North Carolina 28650

2.4M Ka-Band Antenna System
O3b Terminal

Frequency : 28.350 GHz

Operator: J Hartness

Channel: AUT Tx pol: LHCP Rx pol: LHCP



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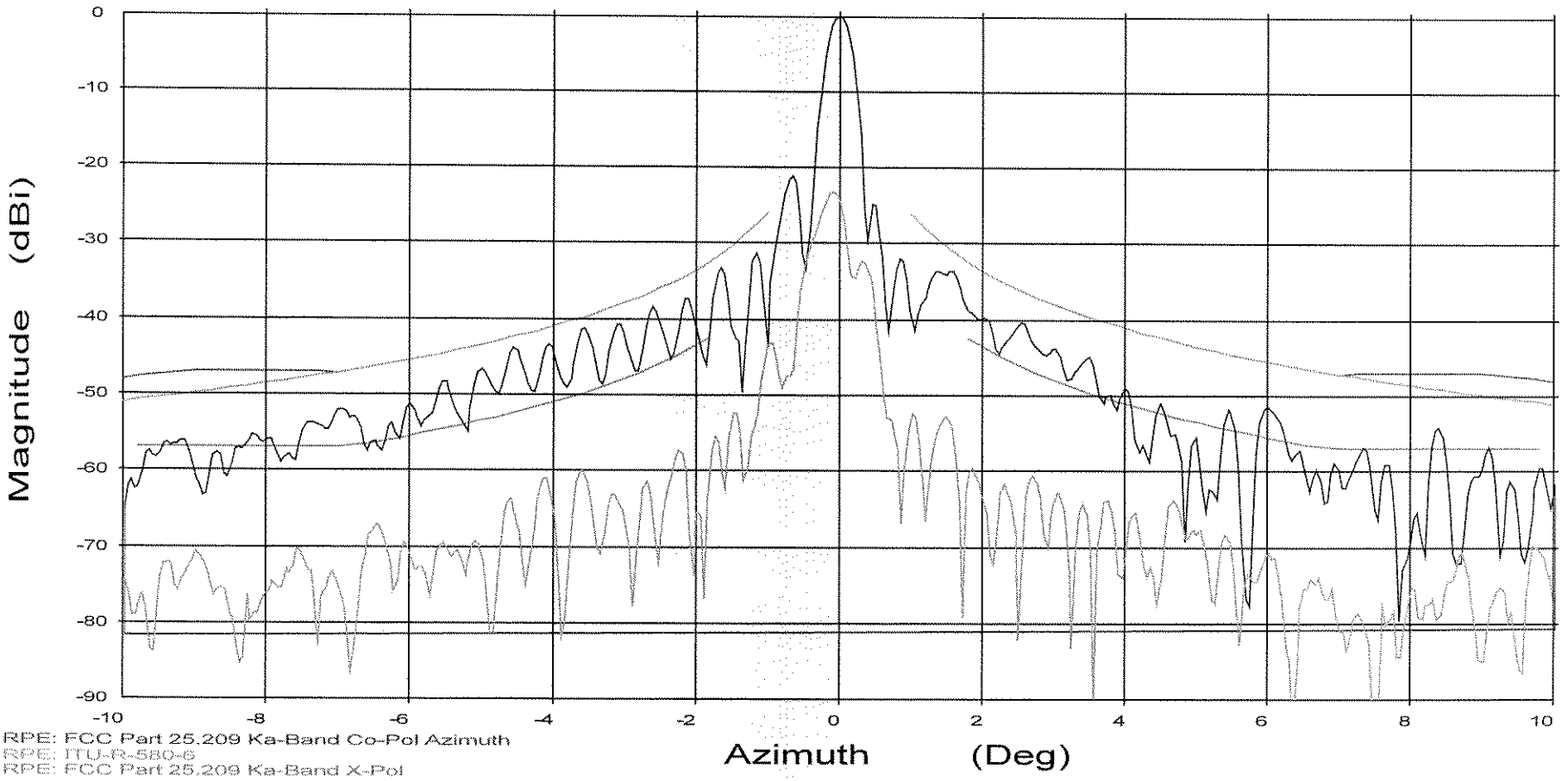
General Dynamics SATCOM Technologies
East Malden Test Facility
4488 Lawing Chapel Church Road
Malden, North Carolina 28650

2.4M Ka-Band Antenna System
O3b Terminal

Frequency : 29.100 GHz

Operator: J Hartness

Channel: AUT Tx pol: LHCP Rx pol: LHCP



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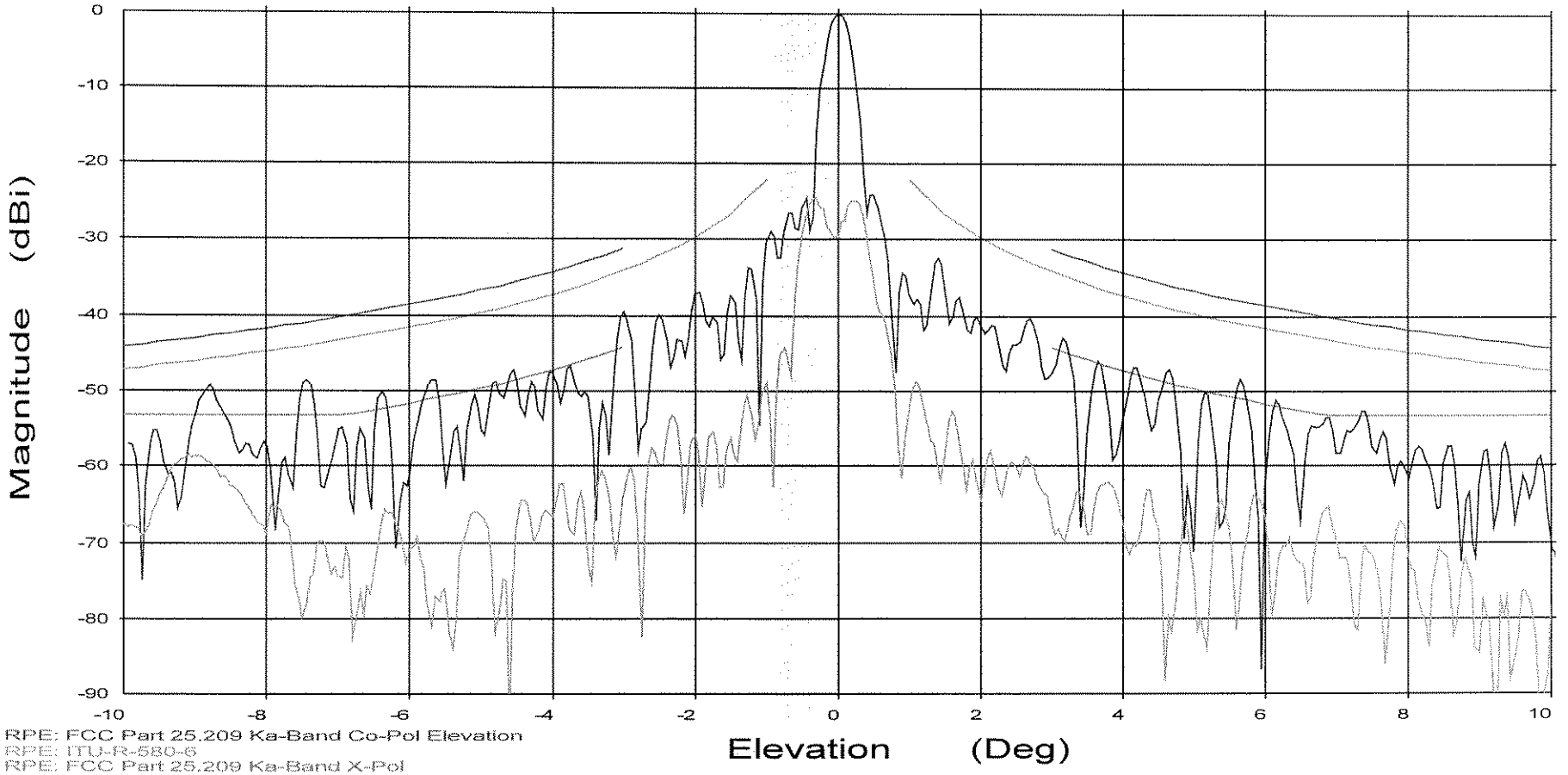
2.4M Ka-Band Antenna System
O3b Terminal

Frequency : 27.600 GHz

Operator: J Hartness

Channel: AUT Tx pol: LHCP Rx pol: LHCP



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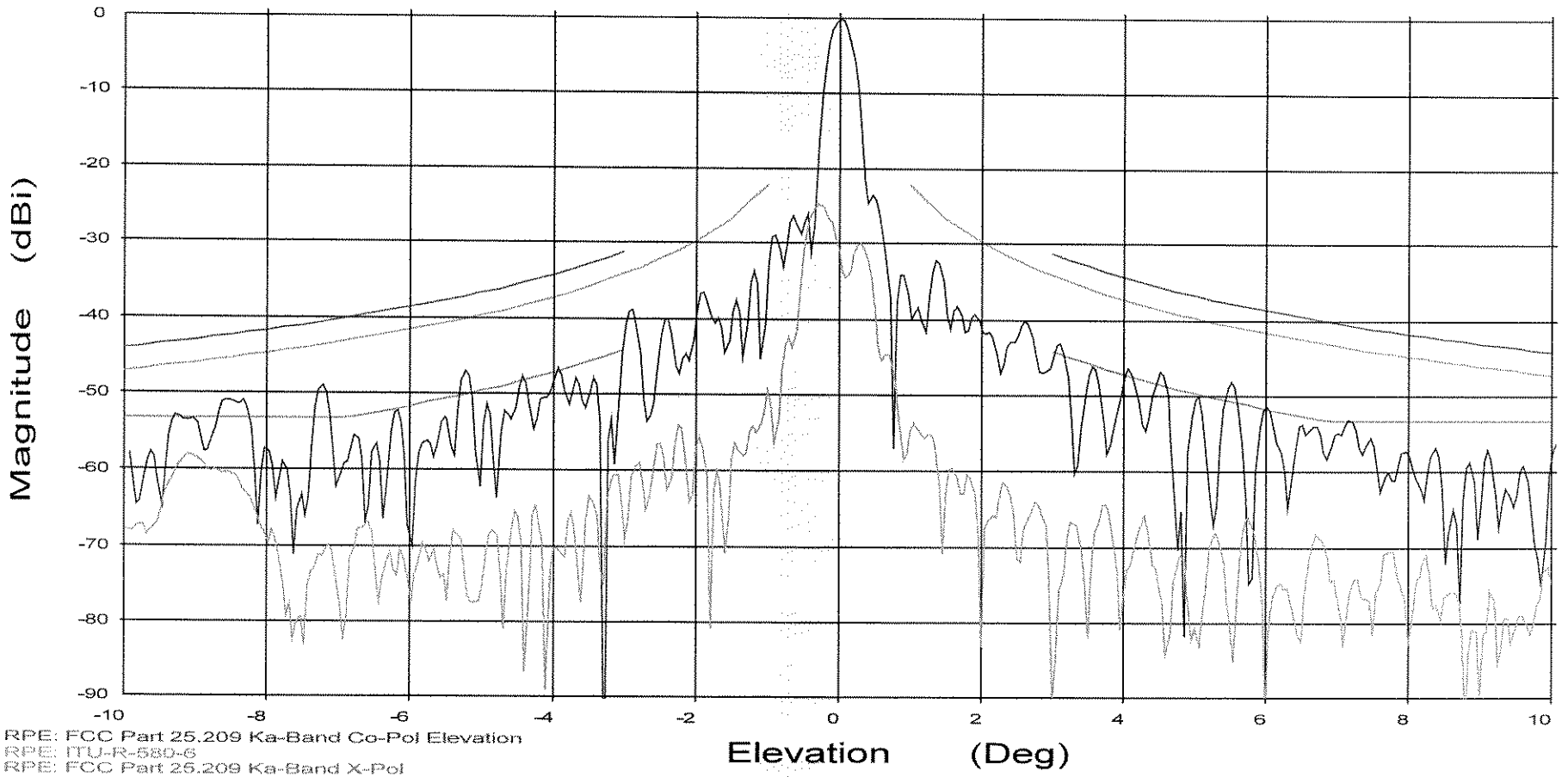
General Dynamics SATCOM Technologies
East Malden Test Facility
4488 Living Chapel Church Road
Malden, North Carolina 28650

2.4M Ka-Band Antenna System
O3b Terminal

Frequency : 28.350 GHz

Operator: J Hartness

Channel: AUT Tx pol: LHCP Rx pol: LHCP



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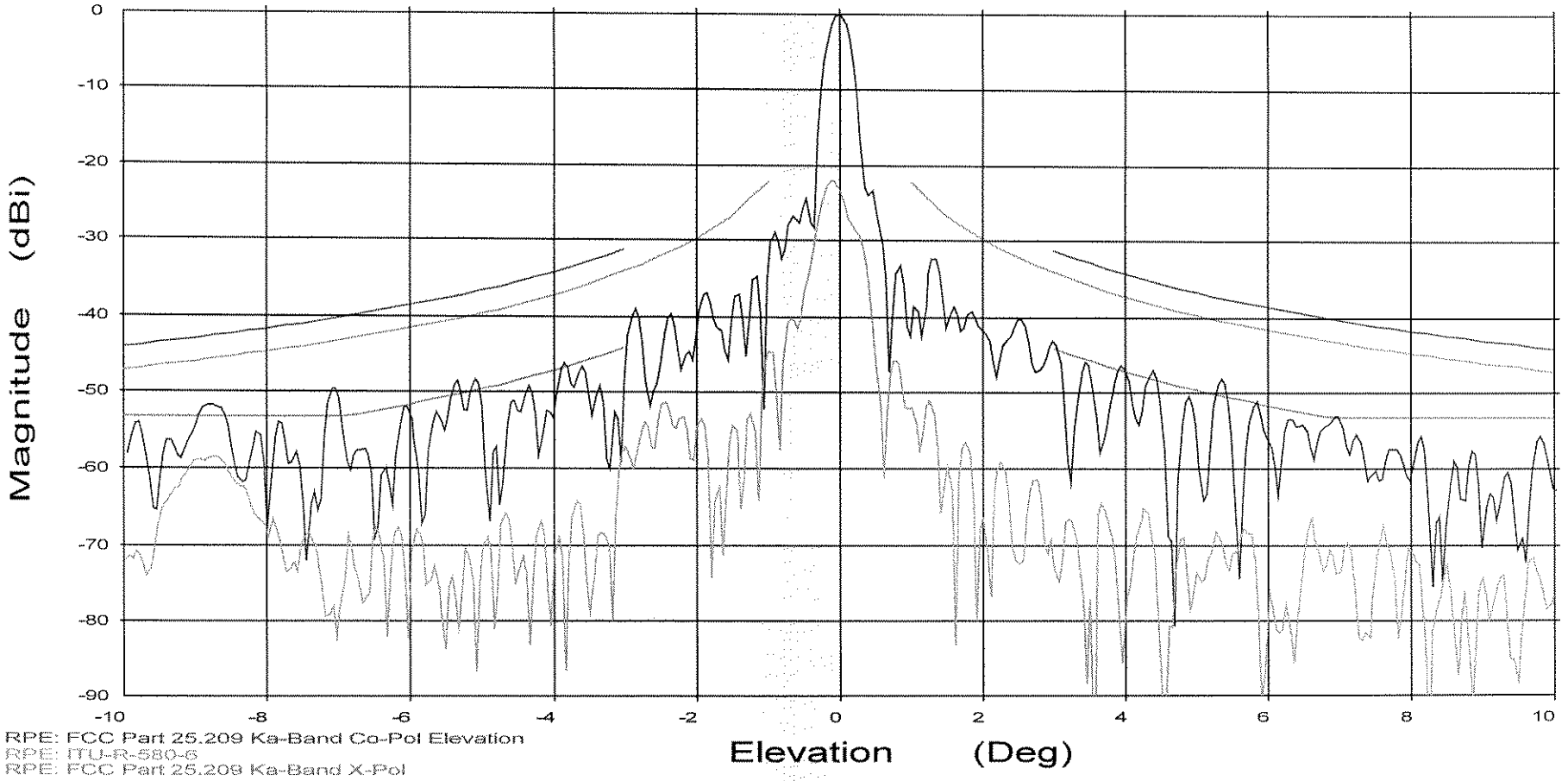
General Dynamics SATCOM Technologies
Near Malden Test Facility
4488 Lawing Chapel Church Road
Malden, North Carolina 28650

2.4M Ka-Band Antenna System
O3b Terminal

Frequency : 29.100 GHz

Operator: J Hartness

Channel: AUT Tx pol: LHCP Rx pol: LHCP



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General Dynamics SATCOM Technologies
East Malden Test Facility
4488 Lawing Chapel Church Road
Malden, North Carolina 28650

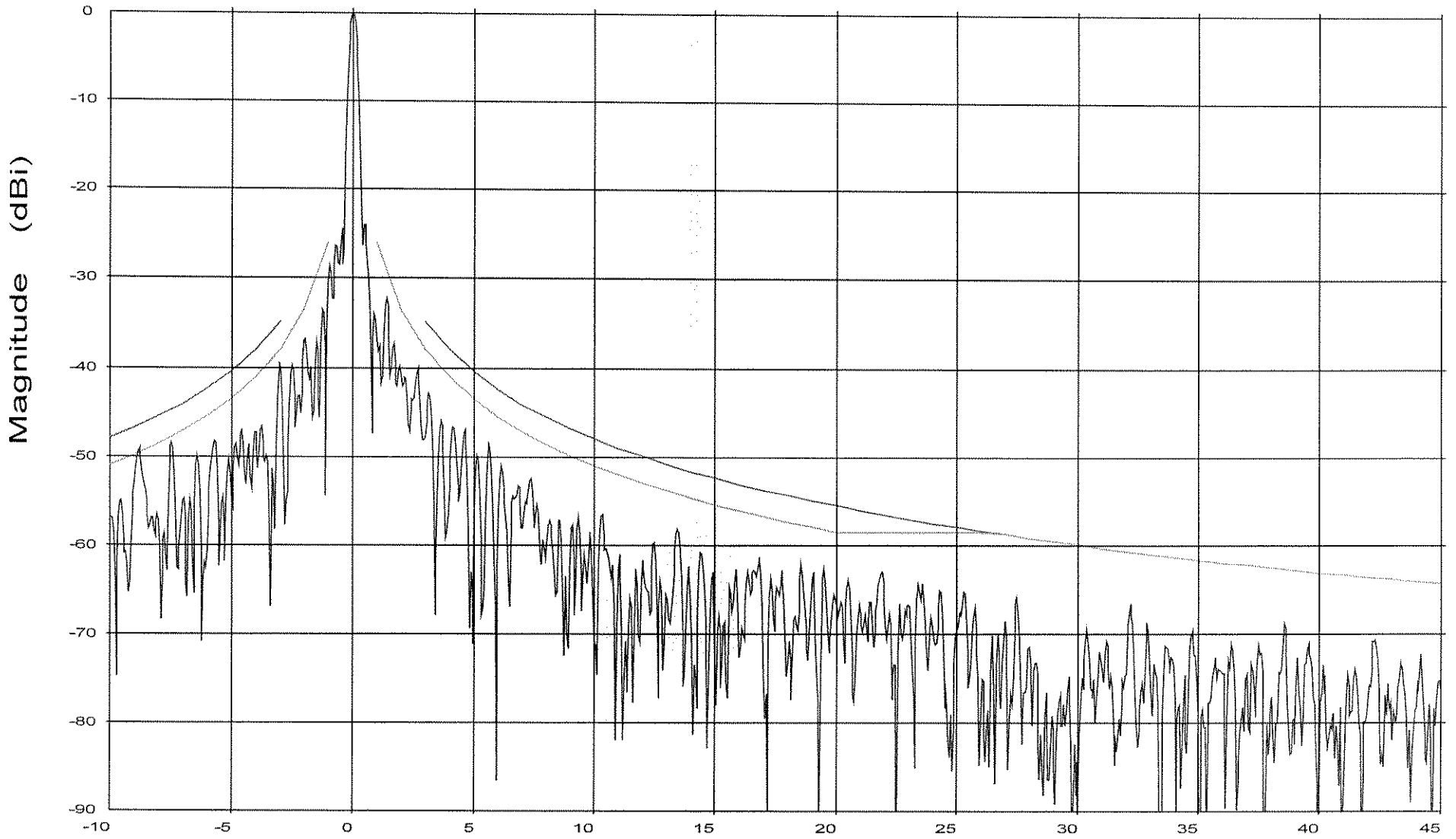
File: 2288 46.dat

2.4M Ka-Band Antenna System
O3b Terminal

Frequency : 27.600 GHz

Operator: J Hartness

Channel: AUT Tx pol: LHCP Rx pol: LHCP



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General Dynamics SATCOM Technologies
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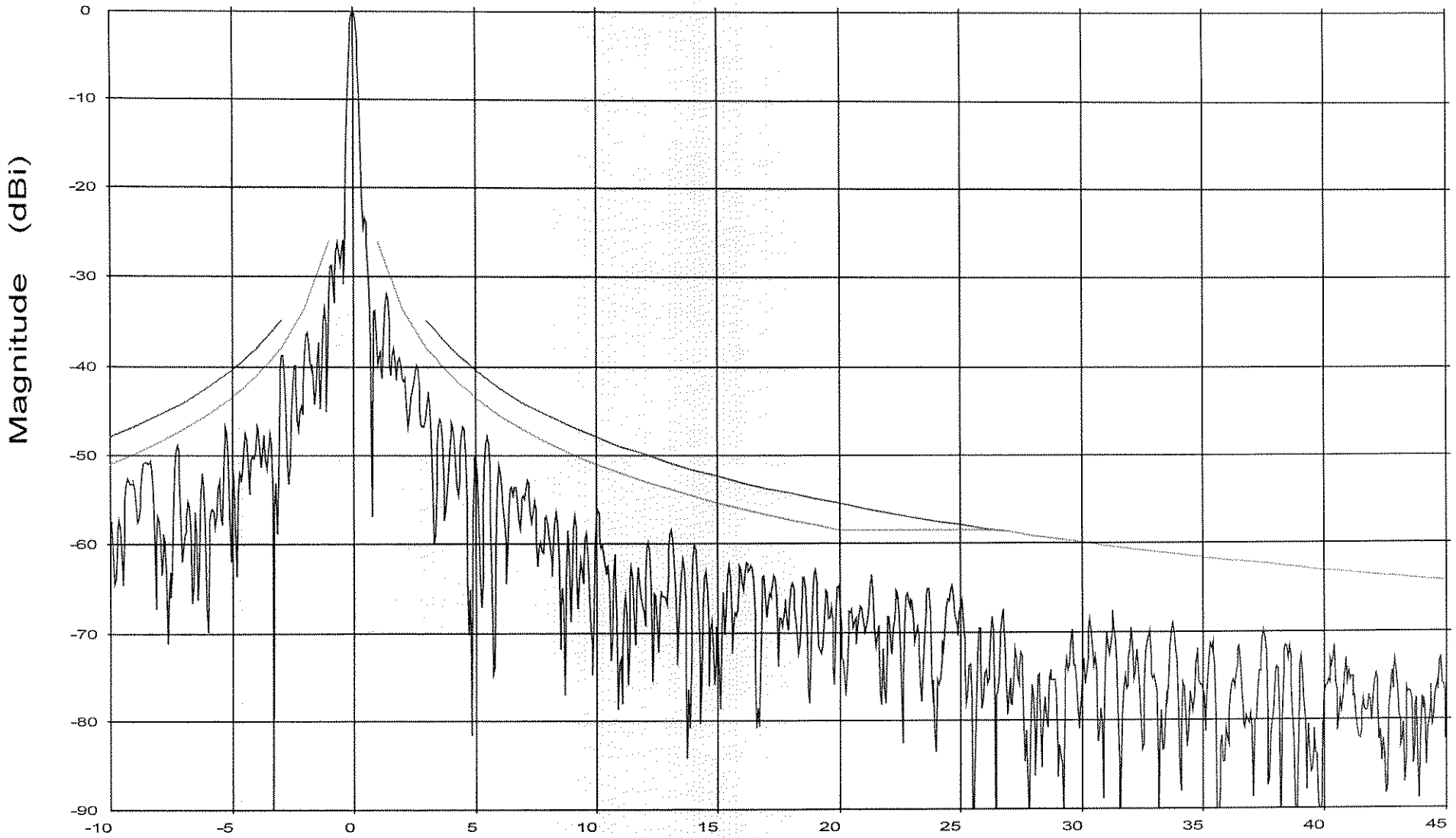
File: 2288 46.dat

2.4M Ka-Band Antenna System
O3b Terminal

Frequency : 28.350 GHz

Operator: J Hartness

Channel: AUT Tx pol: LHCP Rx pol: LHCP



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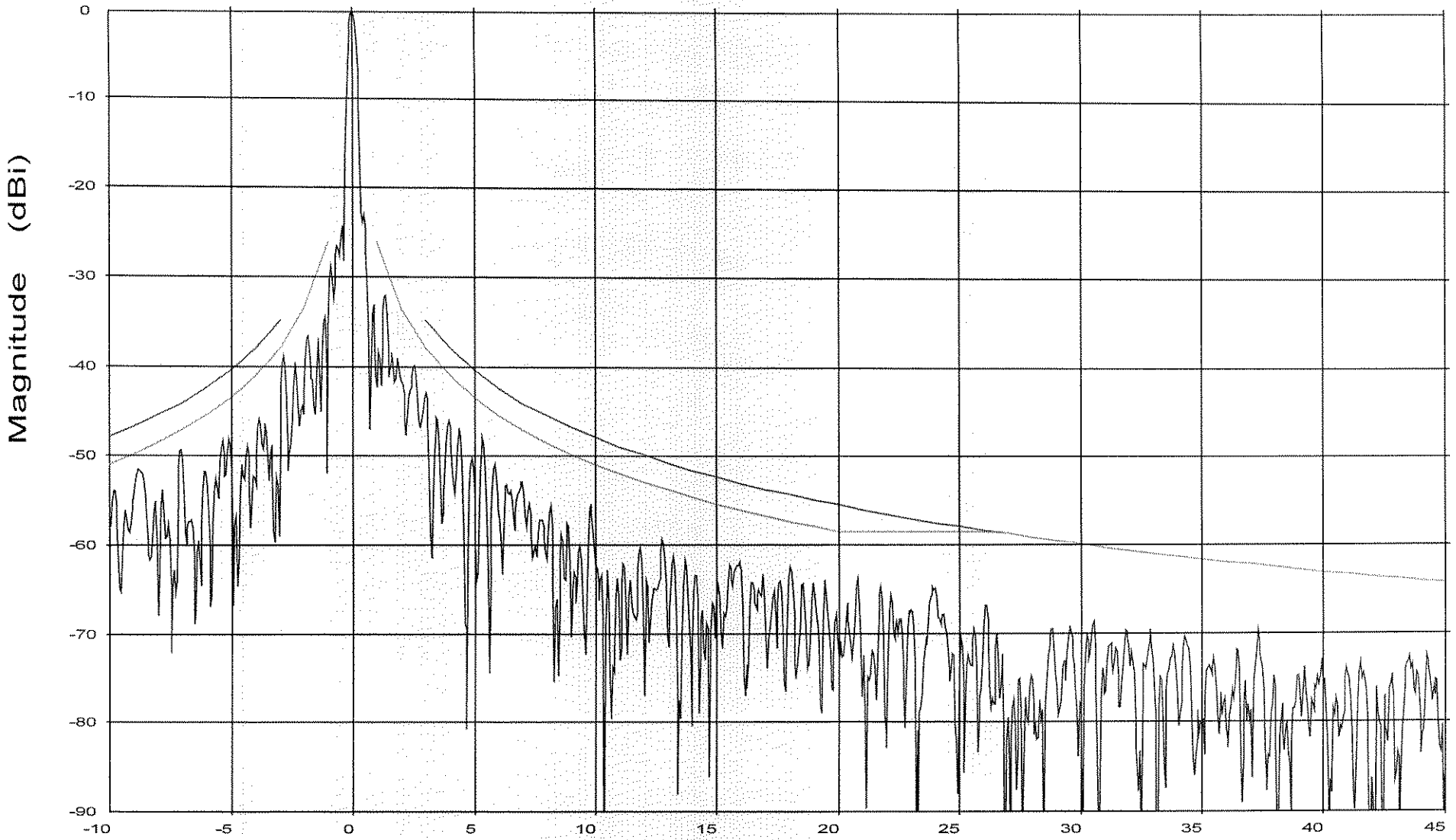

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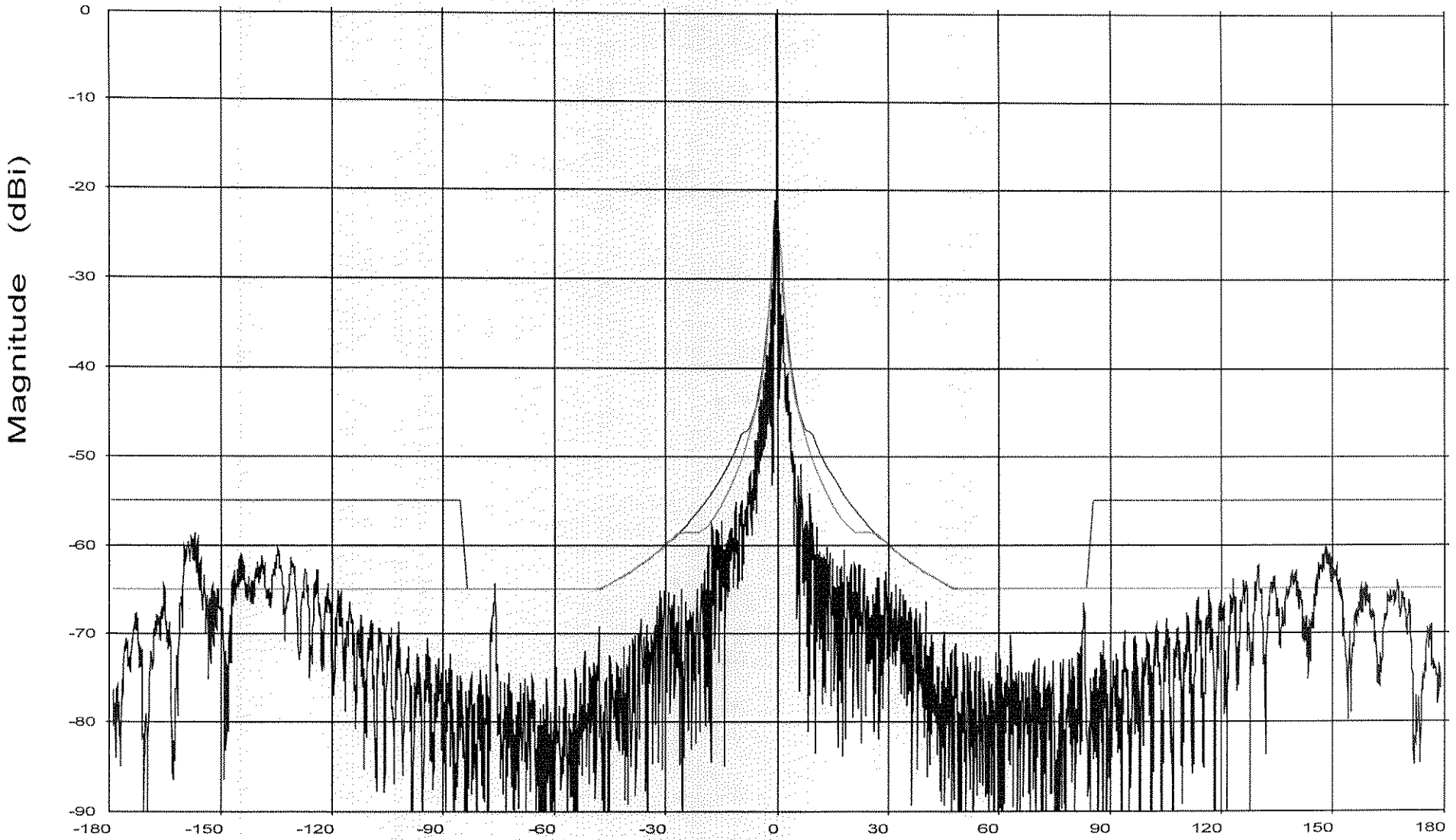
Operator: J Hartness

Channel: AUT Tx pol: LHCP Rx pol: LHCP



RPE: FCC Part 25.209 Ka-Band Co-Pol Azimuth
RPE: ITU-R-580-6

General Dynamics SATCOM Technologies
East Maiden Test Facility
4488 Lawing Chapel Church Road
Maiden, North Carolina 28650

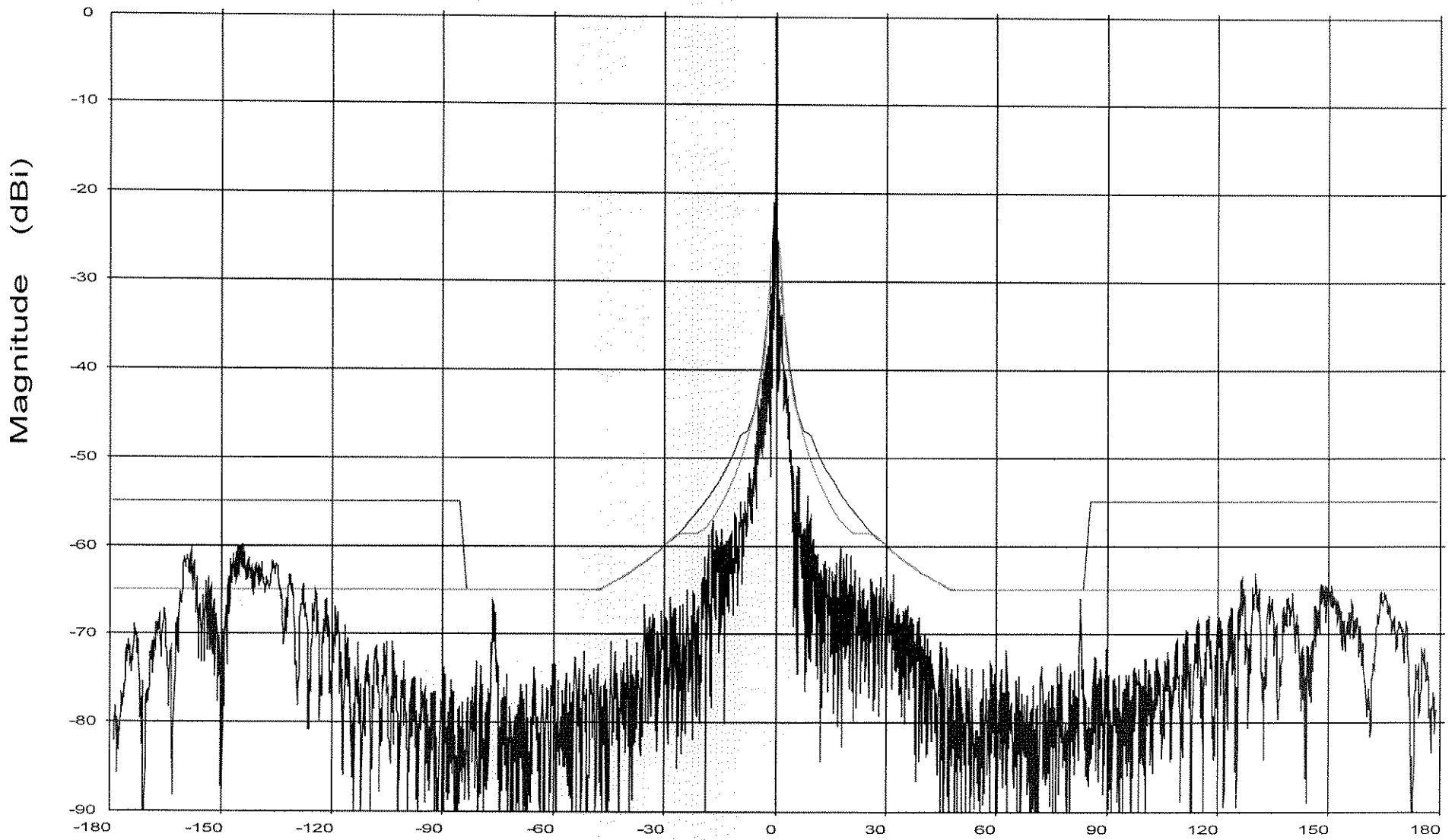
File: 2288 45.dat

2.4M Ka-Band Antenna System
O3b Terminal

Frequency : 28.350 GHz

Operator: J Hartness

Channel: AUT Tx pol: LHCP Rx pol: LHCP



RPE: FCC Part 25.209 Ka-Band Co-Pol Azimuth
RPE: ITU-R-580-6

General Dynamics SATCOM Technologies
East Malden Test Facility
4485 Lawing Chapel Church Road
Malden, North Carolina 28650

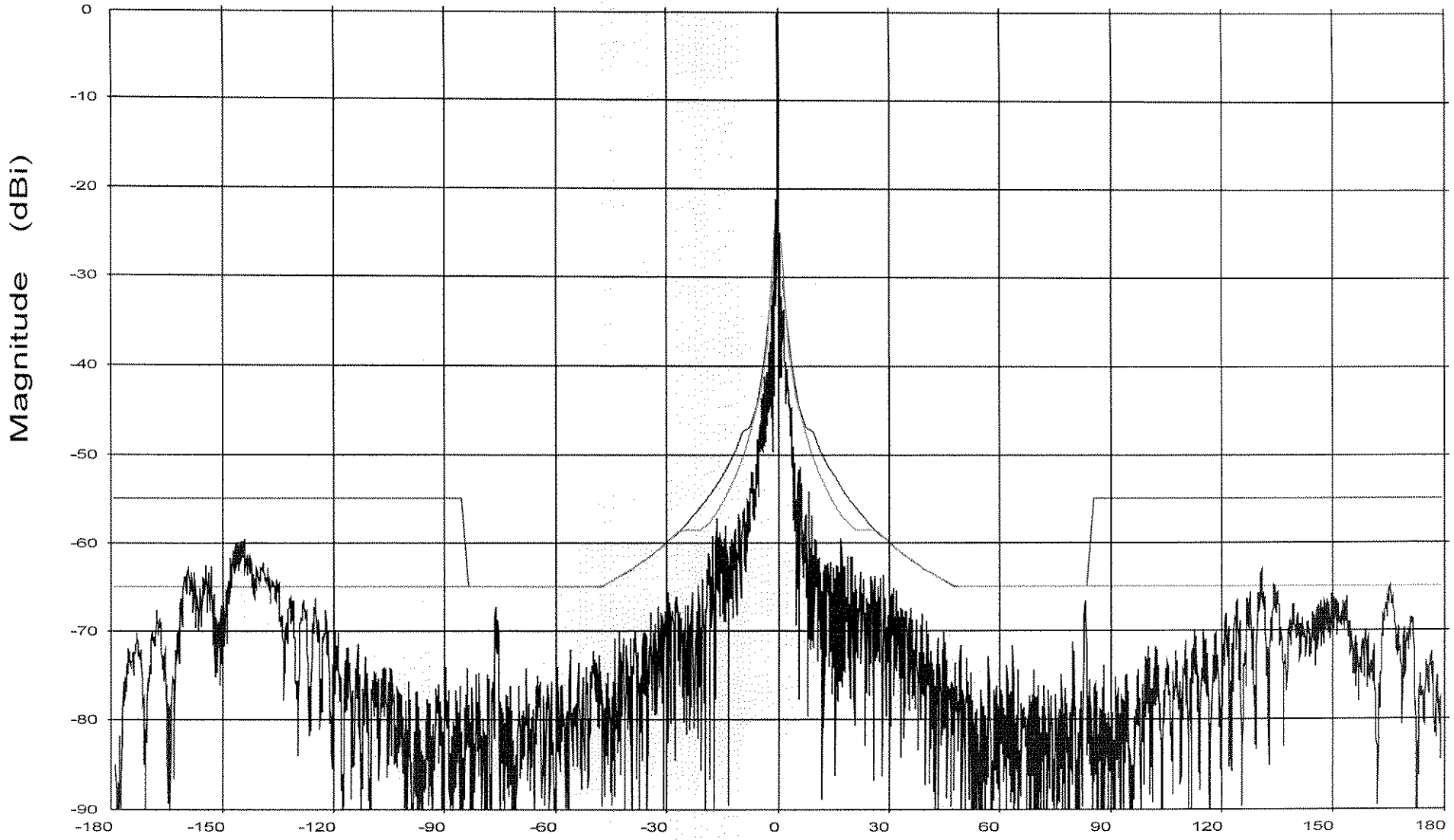
File: 2288 45.dat

2.4M Ka-Band Antenna System
O3b Terminal

Frequency : 29.100 GHz

Operator: J Hartness

Channel: AUT Tx pol: LHCP Rx pol: LHCP



RPE: FCC Part 25.209 Ka-Band Co-Pol Azimuth
RPE: ITU-R-580-6

General Dynamics SATCOM Technologies
East Malden Test Facility
4486 Lansing Chapel Church Road
Malden, North Carolina 28650

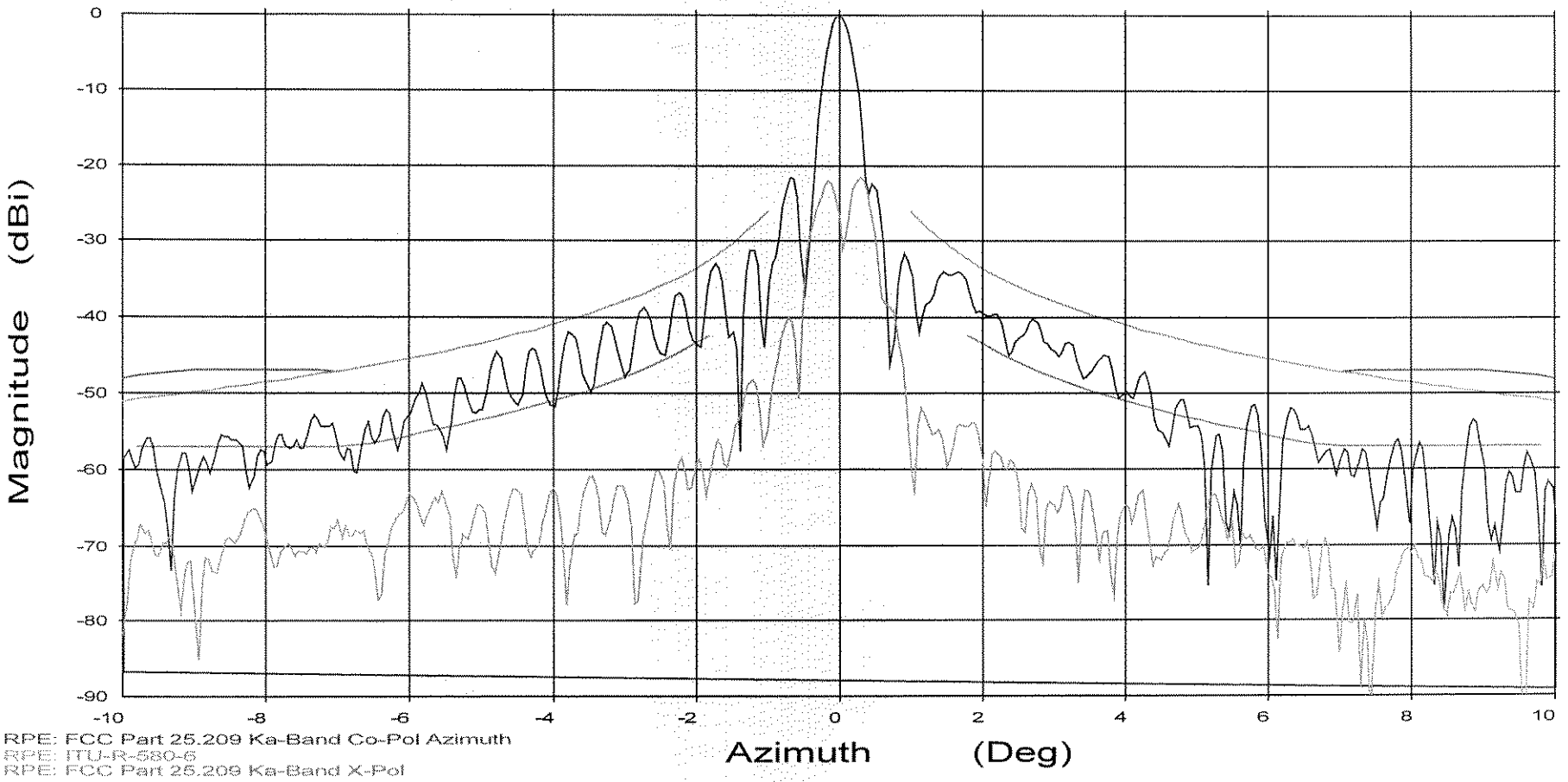
RHCP Transmit Radiation Patterns

2.4M Ka-Band Antenna System
O3b Terminal

Frequency : 27.600 GHz

Operator: J Hartness

Channel: AUT Tx pol: RHCP Rx pol: RHCP



RPE: FCC Part 25.209 Ka-Band Co-Pol Azimuth
RPE: ITU-R-580-6
RPE: FCC Part 25.209 Ka-Band X-Pol

Overlays	Cal. file
2288 54.dat-ant_under_test	2288 54.dat
2288 56.dat-ant_under_test	2288 56.dat

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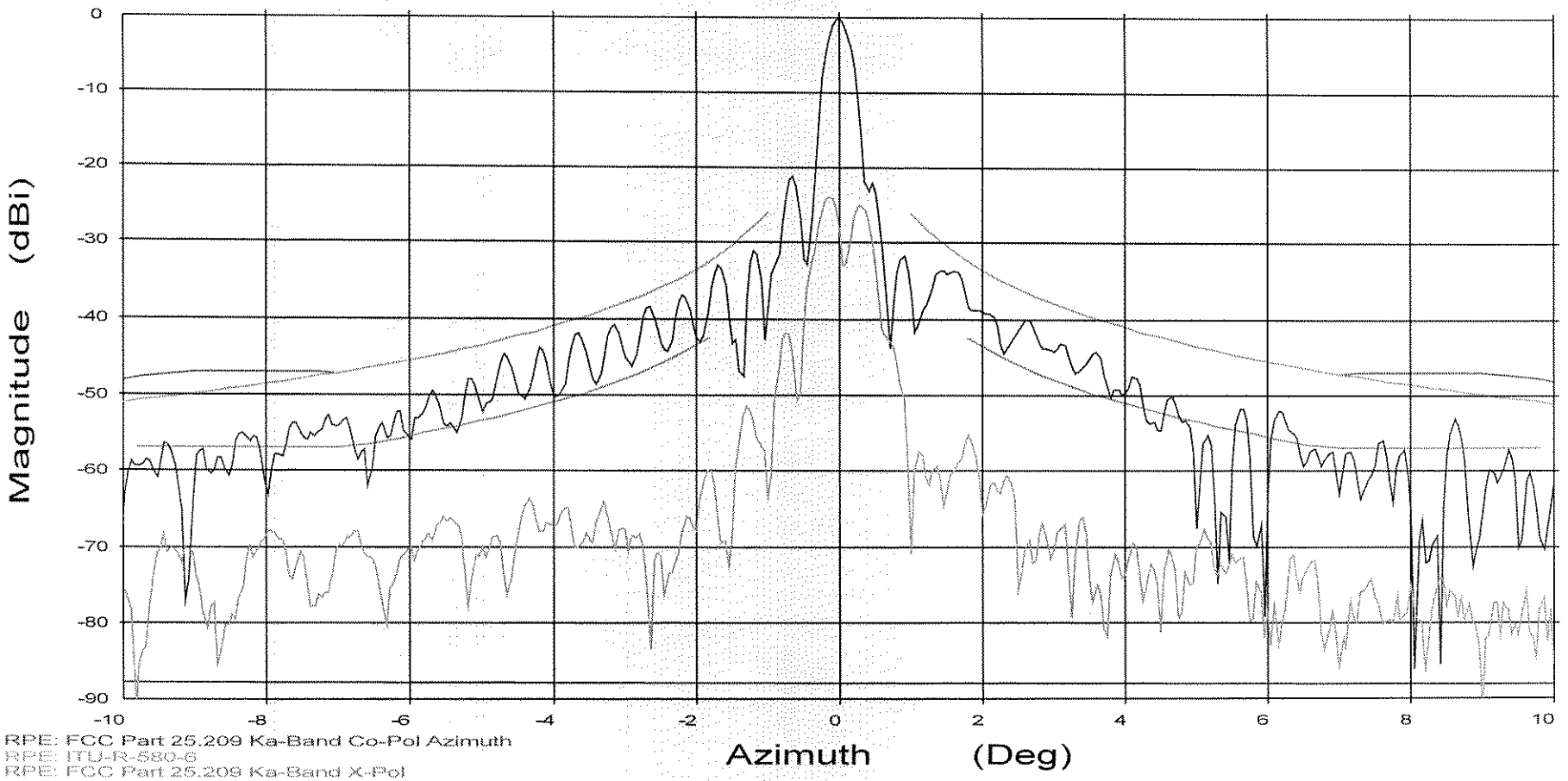
East Malden Test Facility
4480 Lawing Chapel Church Road
Malden, North Carolina 28650

2.4M Ka-Band Antenna System
O3b Terminal

Frequency : 28.350 GHz

Operator: J Hartness

Channel: AUT Tx pol: RHCP Rx pol: RHCP



RPE: FCC Part 25.209 Ka-Band Co-Pol Azimuth
RPE: ITU-R-580-6
RPE: FCC Part 25.209 Ka-Band X-Pol

Overlays	Cal. file
2288 54.dat-ant_under_test——	2288 54.dat
2288 56.dat-ant_under_test----	2288 56.dat

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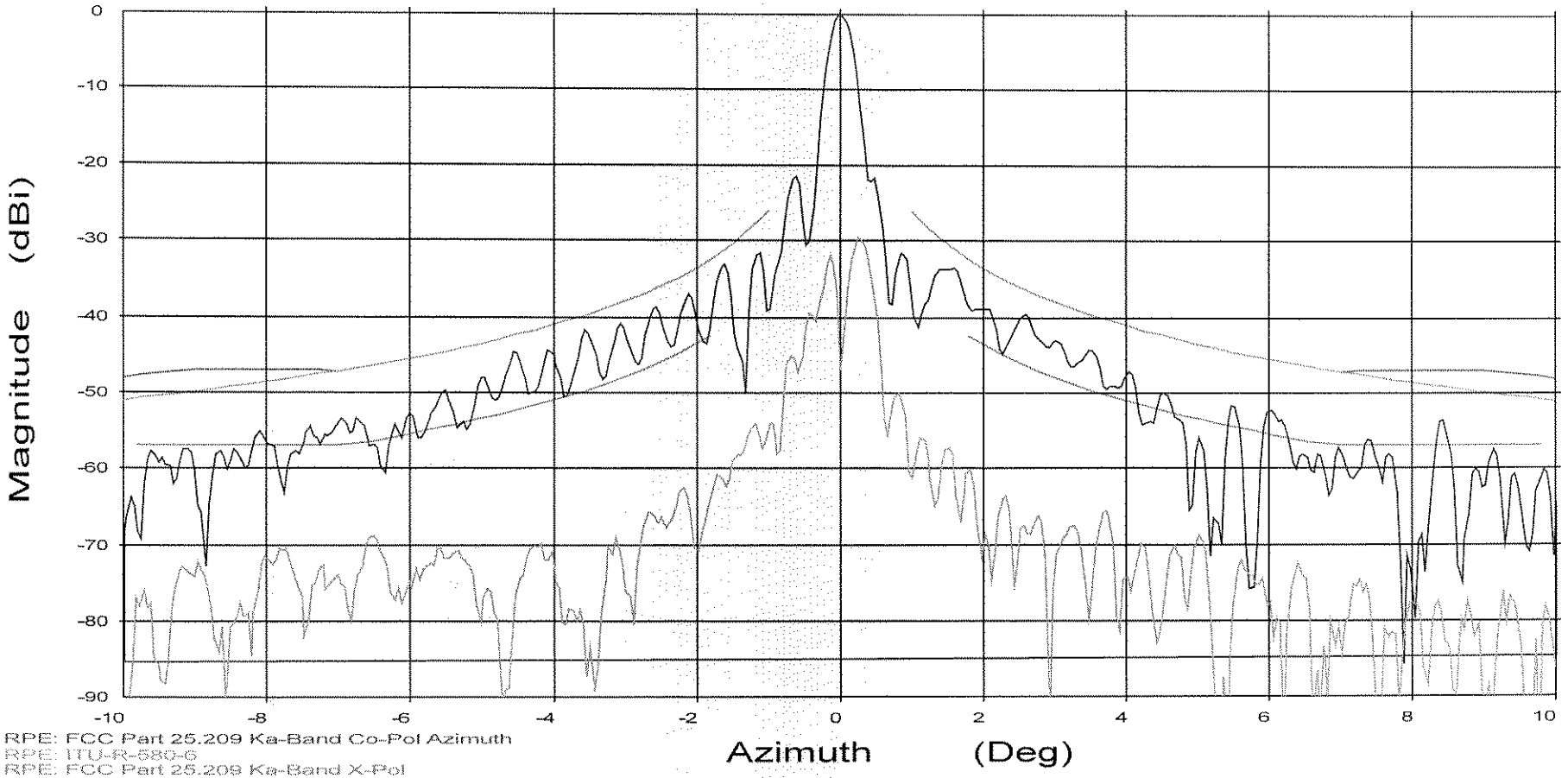
East Maiden Test Facility
4436 Lawing Chapel Church Road
Maiden, North Carolina 28650

2.4M Ka-Band Antenna System
O3b Terminal

Frequency : 29.100 GHz

Operator: J Hartness

Channel: AUT Tx pol: RHCP Rx pol: RHCP



RPE: FCC Part 25.209 Ka-Band Co-Pol Azimuth
RPE: ITU-R-580-6
RPE: FCC Part 25.209 Ka-Band X-Pol

Overlays	Cal. file
2288 54.dat-ant_under_test——	2288 54.dat
2288 56.dat-ant_under_test----	2288 56.dat

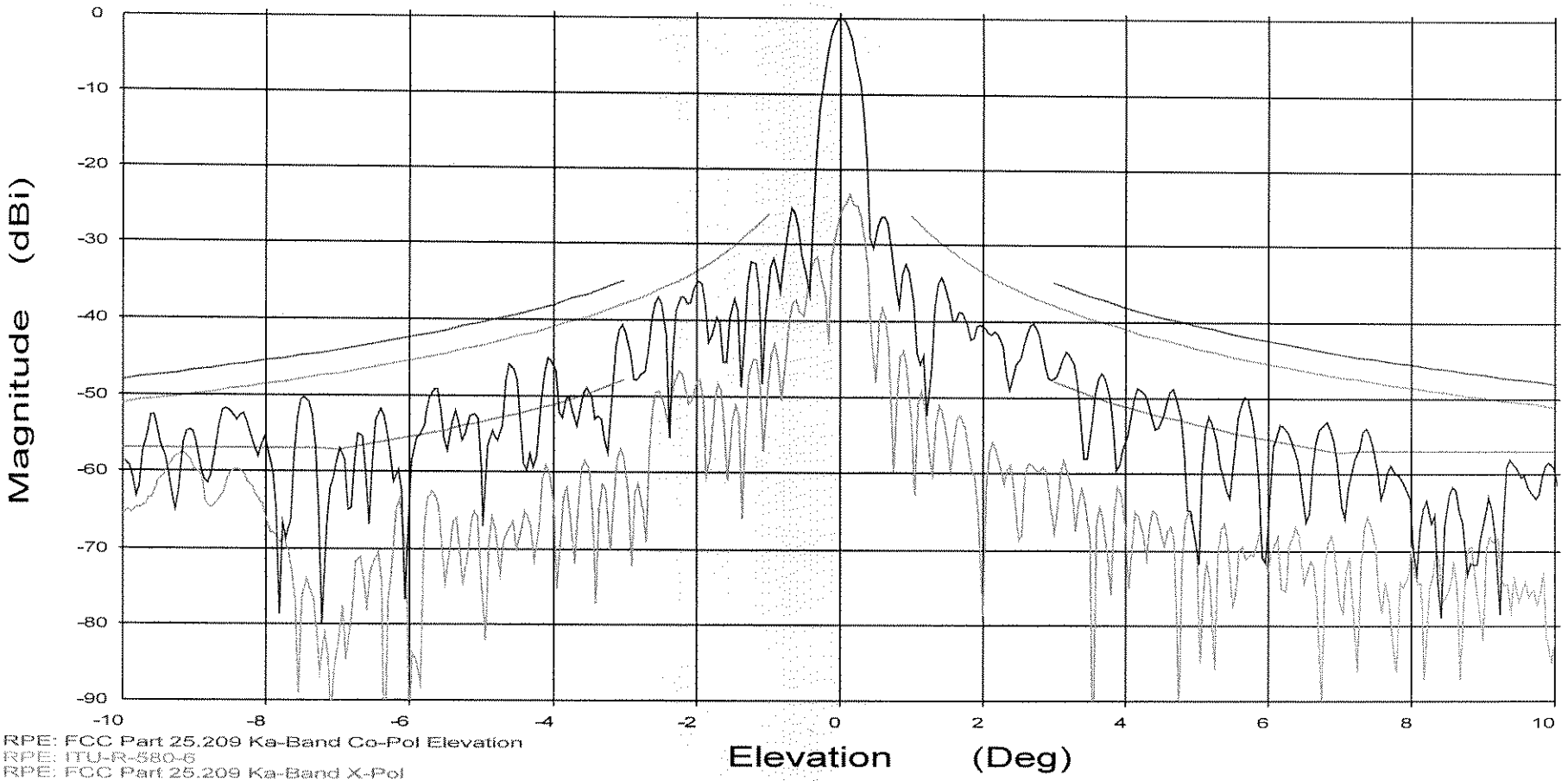
General Dynamics SATCOM Technologies
East Malden Test Facility
4488 Lawing Chapel Church Road
Malden, North Carolina 28650

2.4M Ka-Band Antenna System
O3b Terminal

Frequency : 27.600 GHz

Operator: J Hartness

Channel: AUT Tx pol: RHCP Rx pol: RHCP



RPE: FCC Part 25.209 Ka-Band Co-Pol Elevation
RPE: ITU-R-580-6
RPE: FCC Part 25.209 Ka-Band X-Pol

Overlays	Cal. file
2288 58.dat-ant_under_test	2288 58.dat
2288 59.dat-ant_under_test	2288 59.dat

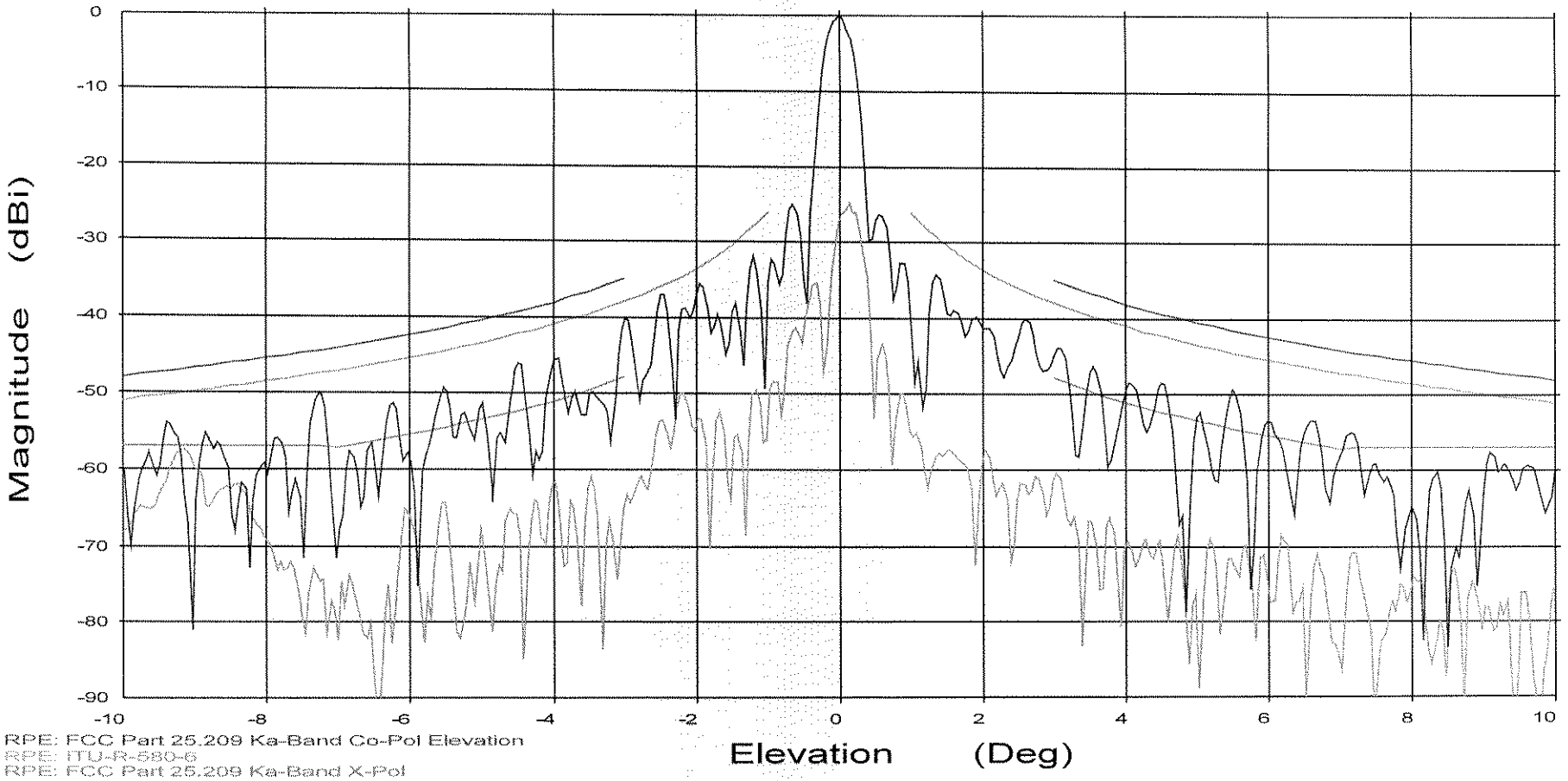
General Dynamics SATCOM Technologies
Pax Maiden Test Facility
4488 Lawing Chapel Church Road
Maiden, North Carolina 28650

2.4M Ka-Band Antenna System
O3b Terminal

Frequency : 28.350 GHz

Operator: J Hartness

Channel: AUT Tx pol: RHCP Rx pol: RHCP



RPE: FCC Part 25.209 Ka-Band Co-Pol Elevation
RPE: ITU-R-580-6
RPE: FCC Part 25.209 Ka-Band X-Pol

Overlays	Cal. file
2288 58.dat-ant_under_test	2288 58.dat
2288 59.dat-ant_under_test	2288 59.dat

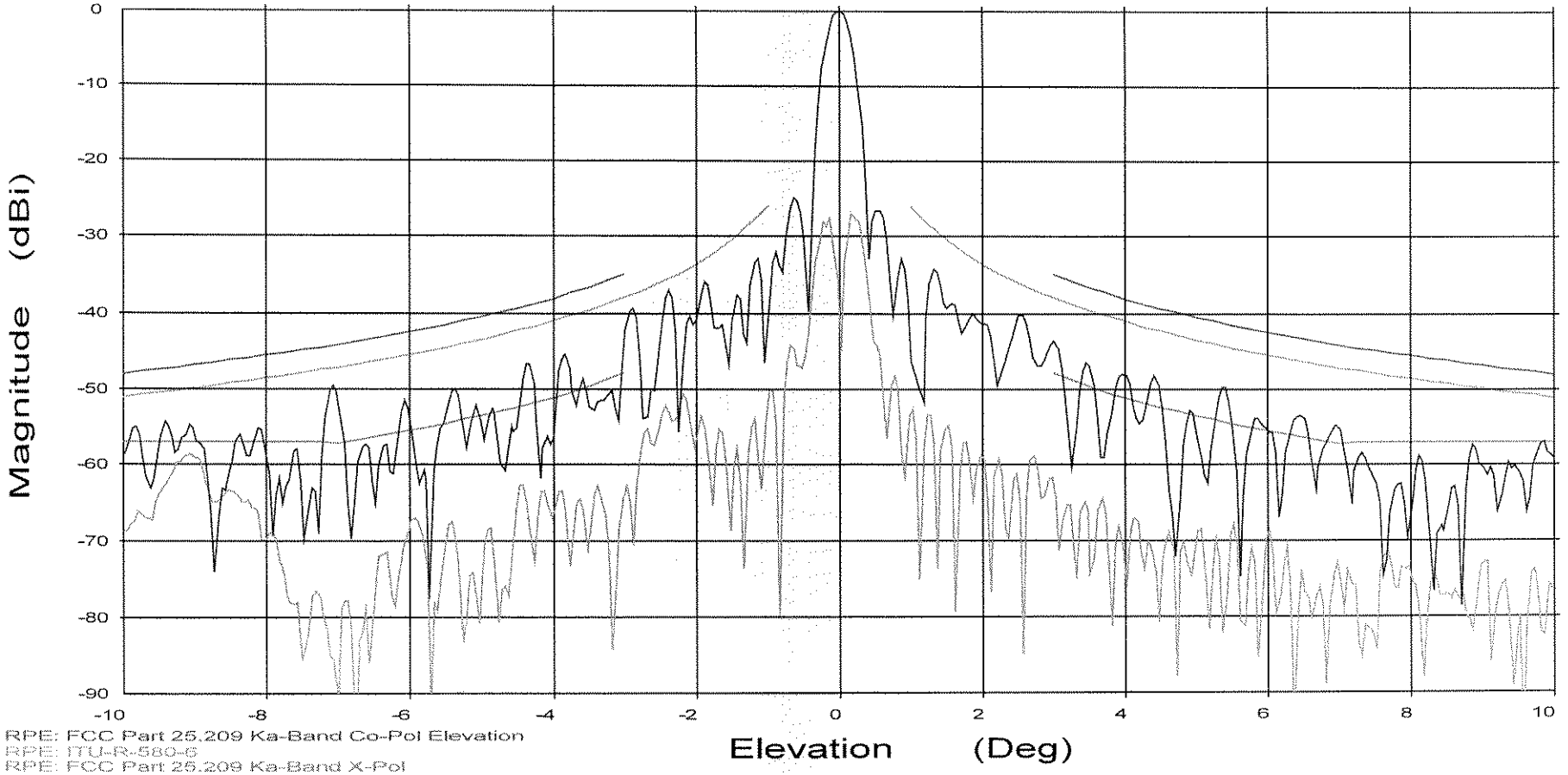
General Dynamics SATCOM Technologies
East Marion Test Facility
4488 Lawing Chapel Church Road
Maiden, North Carolina 28650

2.4M Ka-Band Antenna System
O3b Terminal

Frequency : 29.100 GHz

Operator: J Hartness

Channel: AUT Tx pol: RHCP Rx pol: RHCP



RPE: FCC Part 25.209 Ka-Band Co-Pol Elevation
RPE: ITU-R-580-6
RPE: FCC Part 25.209 Ka-Band X-Pol

Overlays	Cal. file
2288 58.dat-ant_under_test	2288 58.dat
2288 59.dat-ant_under_test	2288 59.dat

General Dynamics SATCOM Technologies
Fast Maiden Test Facility
4488 Lawing Chapel Church Road
Maiden, North Carolina 28650

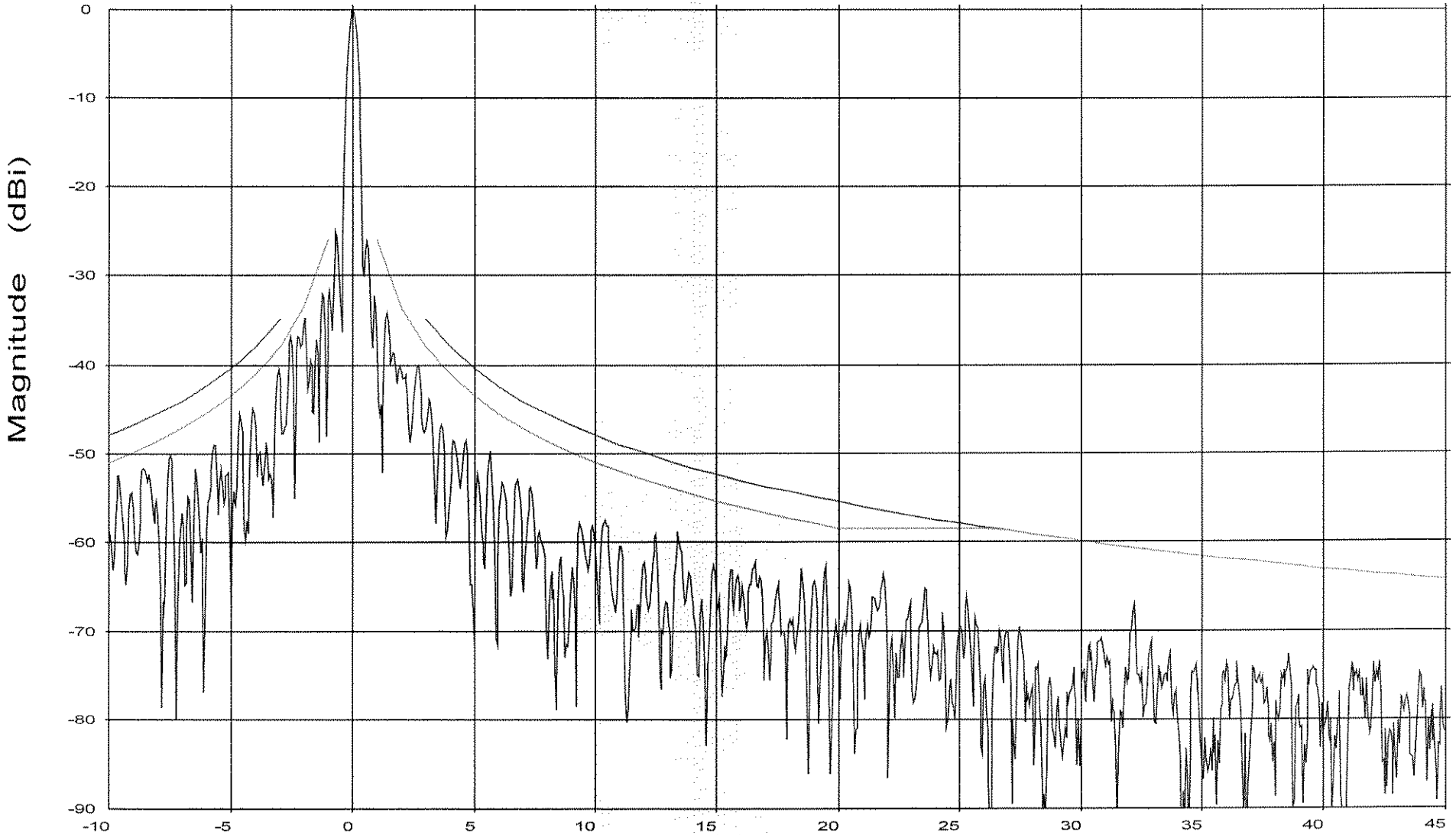
File: 2288 59.dat

2.4M Ka-Band Antenna System
O3b Terminal

Frequency : 27.600 GHz

Operator: J Hartness

Channel: AUT Tx pol: RHCP Rx pol: RHCP



RPE: FCC Part 25.209 Ka-Band Co-Pol Elevation
RPE: ITU-R-580-6

General Dynamics SATCOM Technologies
East Malden Test Facility
4488 Lawing Chapel Church Road
Malden, North Carolina 28650

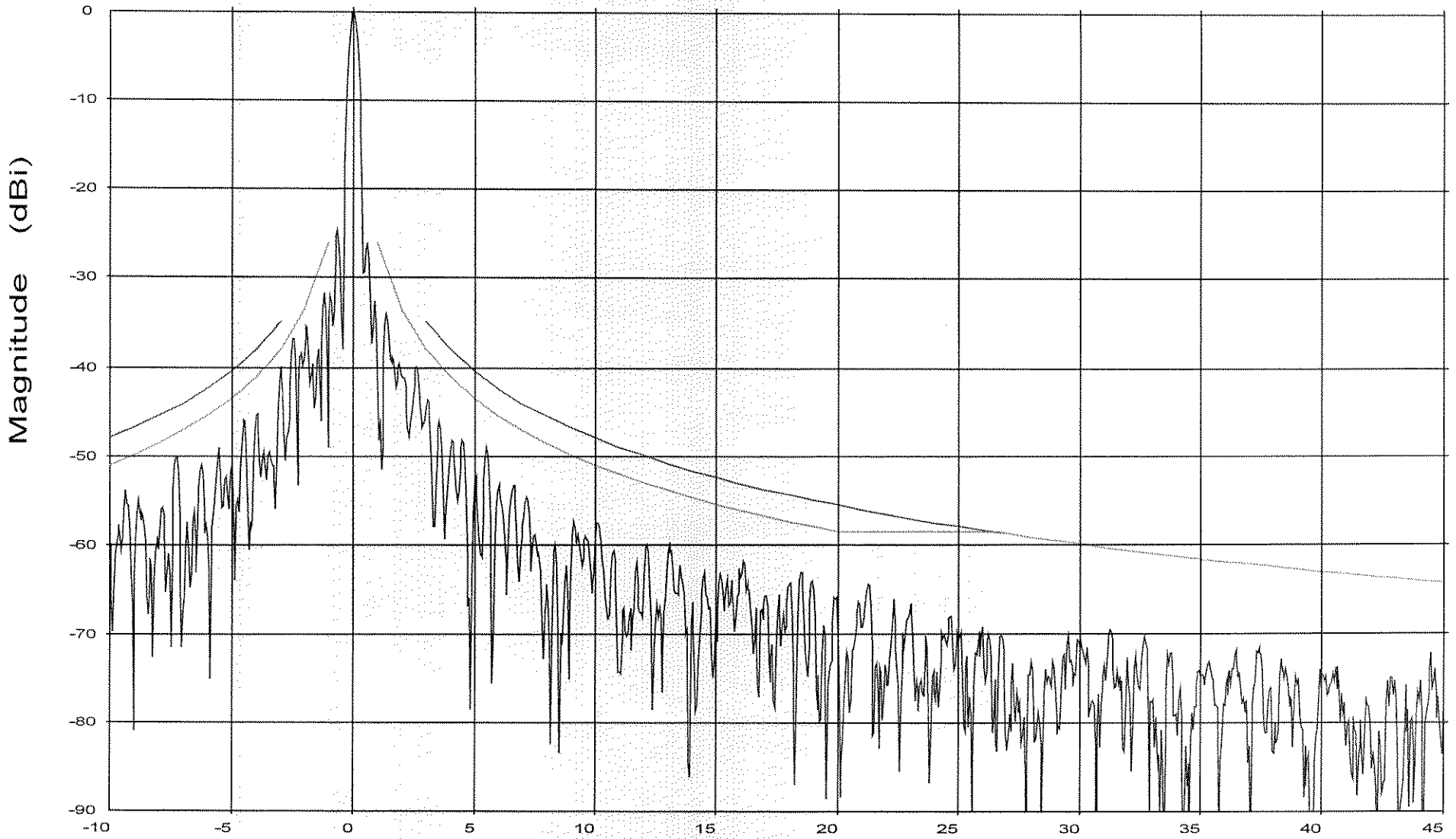
File: 2288 59.dat

2.4M Ka-Band Antenna System
O3b Terminal

Frequency : 28.350 GHz

Operator: J Hartness

Channel: AUT Tx pol: RHCP Rx pol: RHCP



RPE: FCC Part 25.209 Ka-Band Co-Pol Elevation
RPE: ITU-R-580-6

General Dynamics SATCOM Technologies
East Malden Test Facility
4486 Lawing Chapel Church Road
Malden, North Carolina 28650

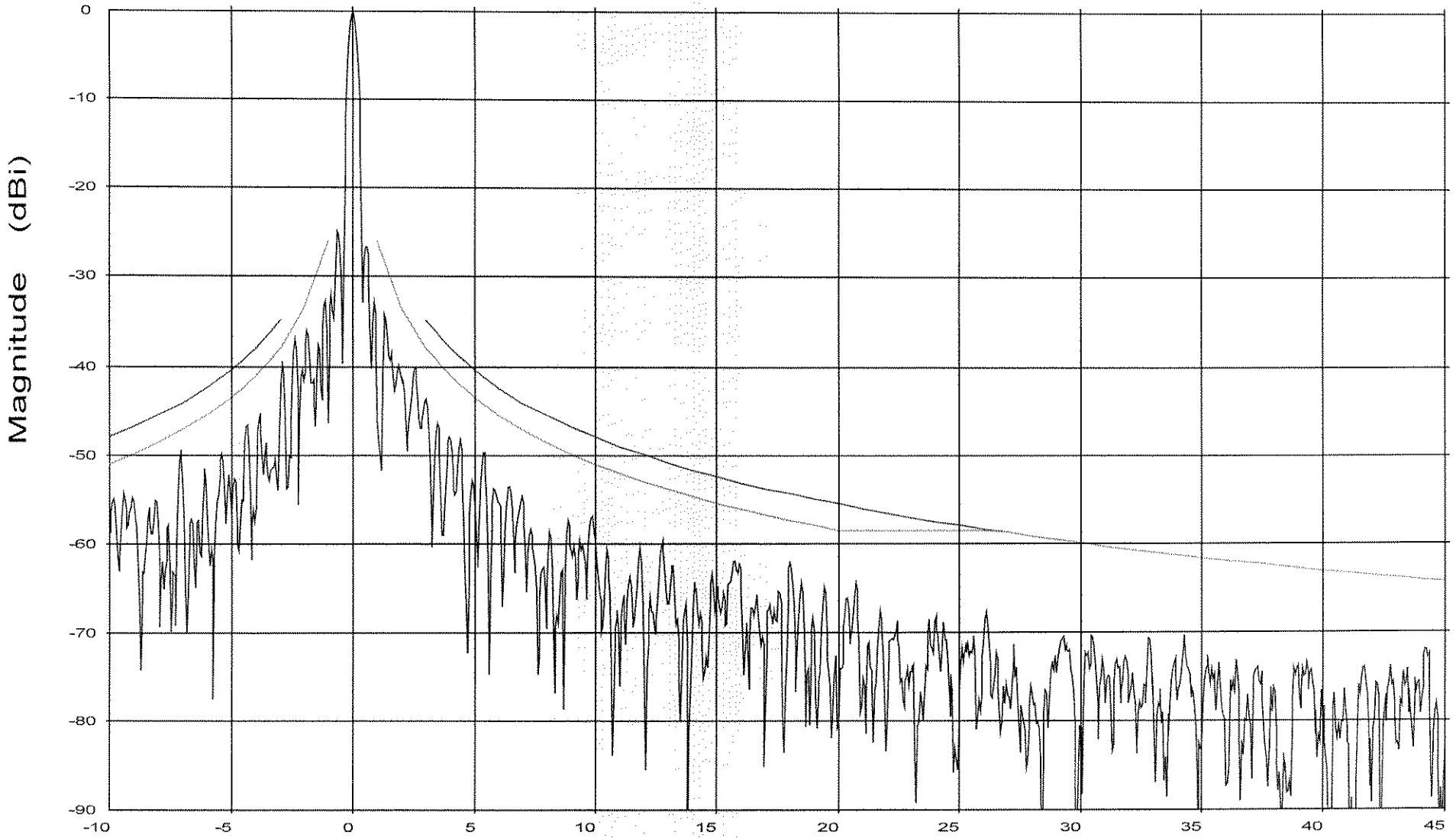
File: 2288 59.dat

2.4M Ka-Band Antenna System
O3b Terminal

Frequency : 29.100 GHz

Operator: J Hartness

Channel: AUT Tx pol: RHCP Rx pol: RHCP



RPE: FCC Part 25.209 Ka-Band Co-Pol Elevation
RPE: ITU-R-580-6

General Dynamics SATCOM Technologies
East Malden Test Facility
4488 Lawing Chapel Church Road
Malden, North Carolina 28650

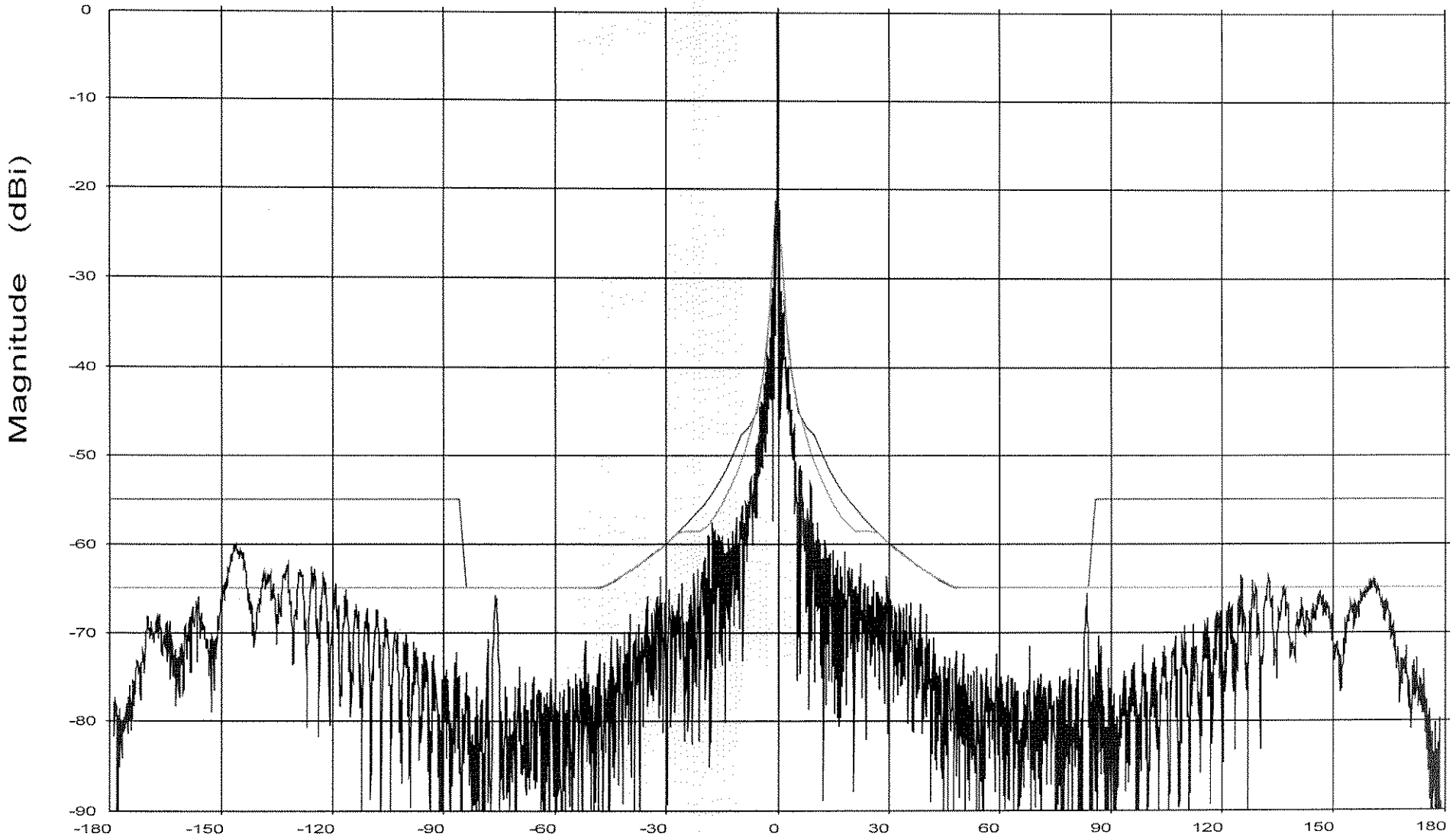
File: 2288 54.dat

2.4M Ka-Band Antenna System
O3b Terminal

Frequency : 27.600 GHz

Operator: J Hartness

Channel: AUT Tx pol: RHCP Rx pol: RHCP



RPE: FCC Part 25.209 Ka-Band Co-Pol Azimuth
RPE: ITU-R-580-6

General Dynamics SATCOM Technologies
East Malden Test Facility
4488 Lawing Chapel Church Road
Malden, North Carolina 28650

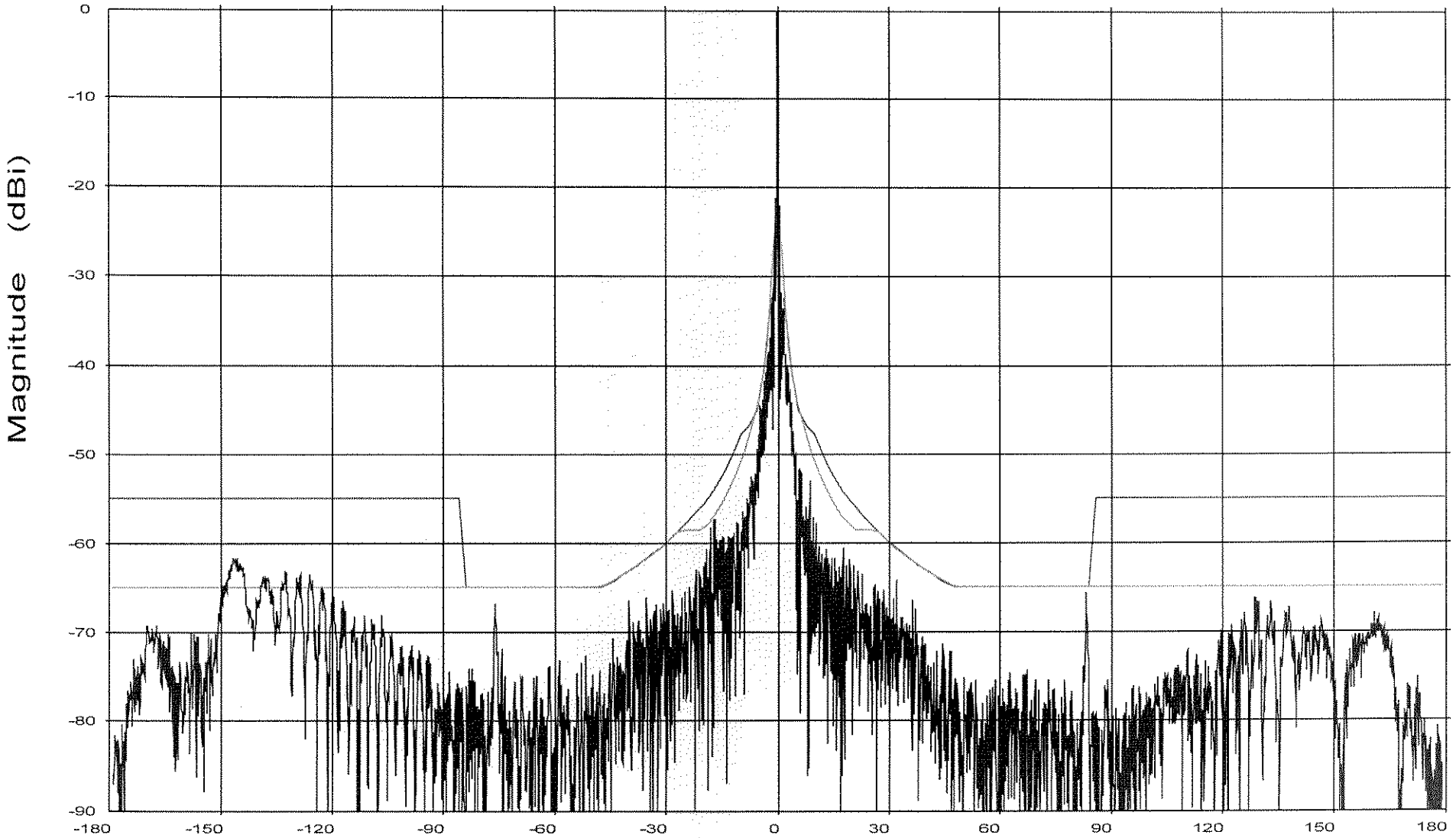
File: 2288 54.dat

2.4M Ka-Band Antenna System
O3b Terminal

Frequency : 28.350 GHz

Operator: J Hartness

Channel: AUT Tx pol: RHCP Rx pol: RHCP



RPE: FCC Part 25.209 Ka-Band Co-Pol Azimuth
RPE: ITU-R-580-6

General Dynamics SATCOM Technologies
East Malden Test Facility
4486 Leaving Chapel Church Road
Malden, North Carolina 28650

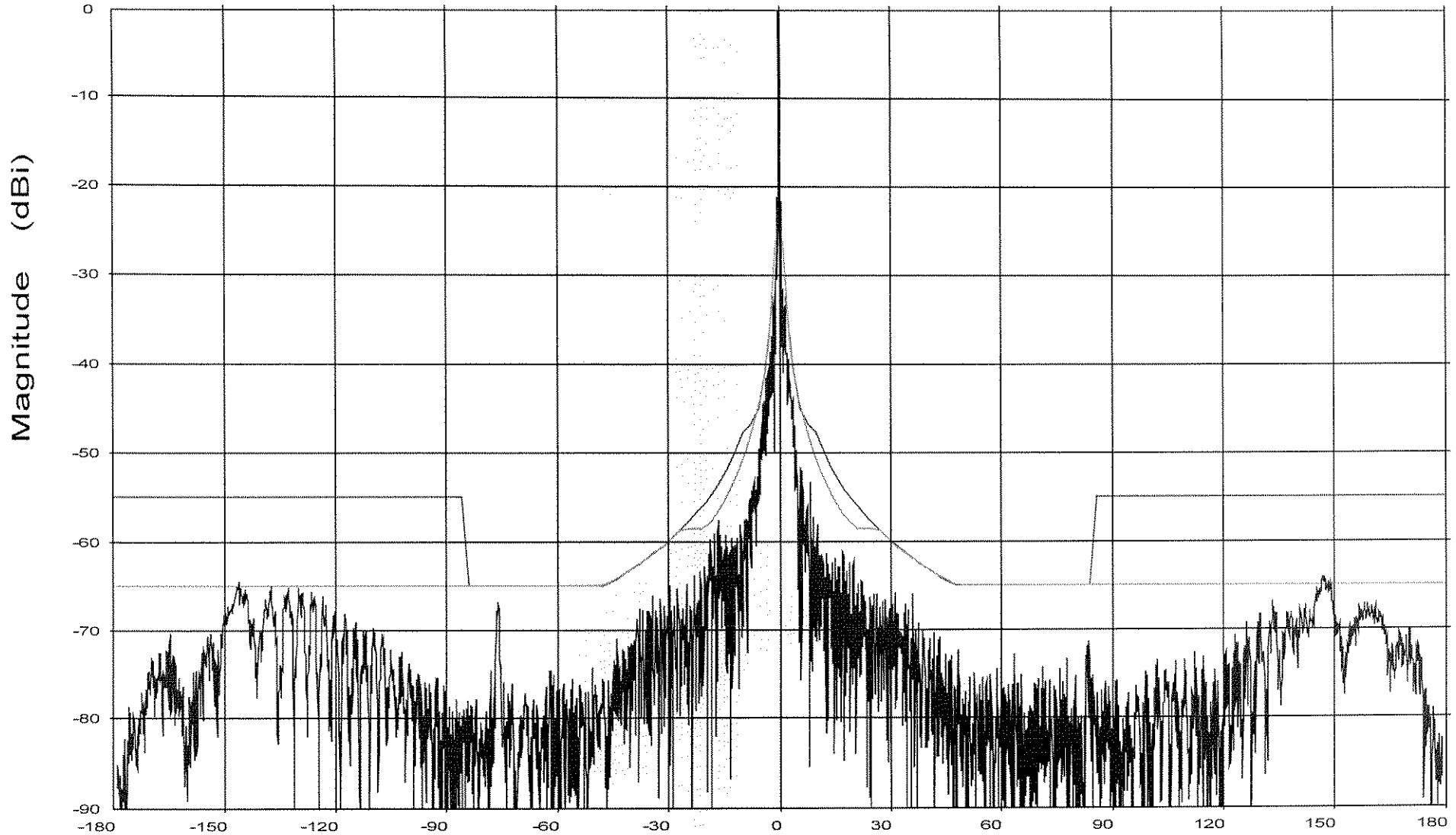
File: 2288 54.dat

2.4M Ka-Band Antenna System
O3b Terminal

Frequency : 29.100 GHz

Operator: J Hartness

Channel: AUT Tx pol: RHCP Rx pol: RHCP



RPE: FCC Part 25.209 Ka-Band Co-Pol Azimuth
RPE: ITU-R-580-6

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Maiden, North Carolina 28650

End of Report

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East Malden Test Facility
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