EXHIBIT A

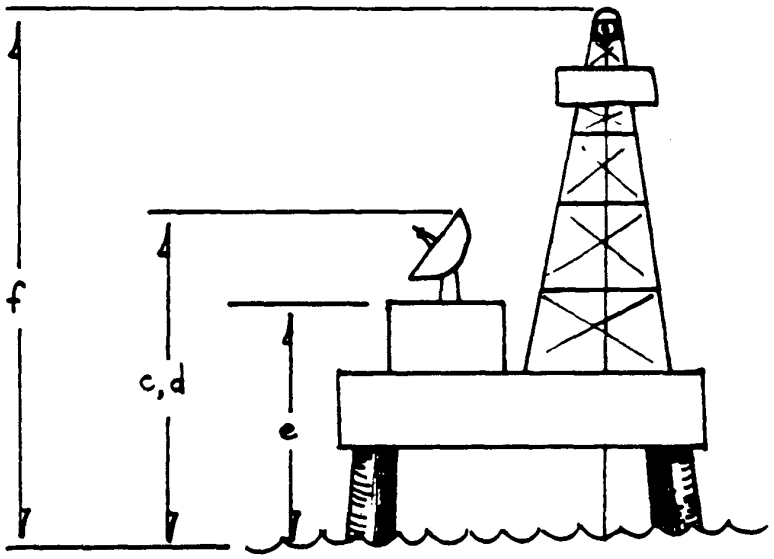


Exhibit B

Radiation Hazard Analysis

Overview -

This showing demonstrates that, as installed, on the drilling vessel, the IWL Communications Shipboard Antenna presents acceptable levels of microwave radiation exposure to persons on the vessel.

Applicable Standards -

The standard used for acceptable levels of microwave radiation are tabulated in the FCC document Office of Engineering and Technology (OET) Bulletin 65. The calculation techniques are also tabulated in this document.

Referring to Figure 1 Page 85, of Bulletin 65, it can be seen that the MPE (Maximum Permissible Level) of radiation in the frequency range of the earth station antenna is

5 mw/cm^2 Occupational Level
1 mw/cm^2 General Public

Conclusion -

This showing will demonstrate that in the worst case in the antenna spillover region, the radiation energy will be less than the standard for exposure by the general public. Furthermore it will demonstrate that the areas of higher radiation are neither accessible by the general population on the rig, nor are they accessible by service personnel unless the transmitter is totally disabled.

Technical Showing -

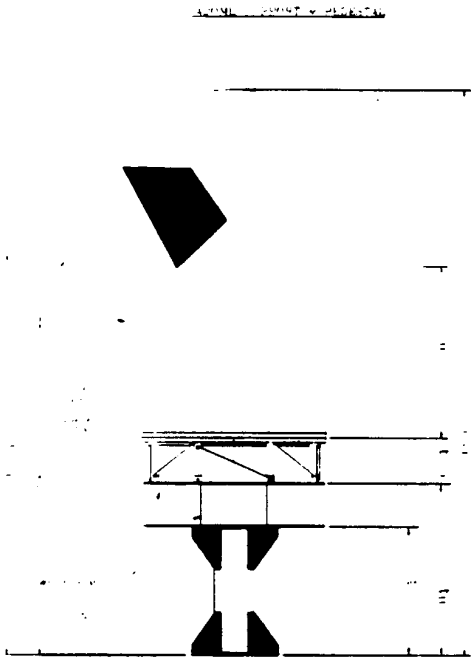
As can be seen in the attached drawing, the entire radiating structure of the system is enclosed in a radome. This structure prevents access to the antenna by any personnel. The only time that anyone would work inside the radome would be to service the system, and under these conditions there are two levels of protection to prevent transmitter activation. First, the outbound carrier interlock prevents the transmitter from activation unless the system is receiving the outbound carrier from the hub station. For service personnel to enter the radome, the inertial stabilization of the antenna must be turned off, and the

antenna must be pointed to zenith. Therefore it cannot receive an outbound signal from the hub.

The second protection is the warning labels and high level of training of service personnel who work on the system. Access to the inside of the radome is protected by lock and key, and only trained IWL service personnel will have access to these keys.

Therefore the only area where there will be any radiation will be on the outside of the radome. The following diagram shows where the calculation is performed as per OET Bulletin 65, and demonstrates that access to this area by rig personnel is difficult, and that radiation levels will be significantly lower in the areas of routine access.

Figure 1 Antenna Radiation Diagram



As can be seen in Figure 1, the spillover region is inside the radome, and is over 11 feet above the deck of the vessel. Due to absorptive losses in the radome, and $1/R^2$ losses over the distances from the antenna to the deck of the vessel, the level presented to personnel on deck will be less than those calculated in the spillover region.

Following is the calculation of the microwave energy due to the Shipboard Earth Station Transmitter in the spillover region as described above.

Exhibit B

Antenna Diameter	2.4	M
Antenna Diameter (cm)	240	cm
Reflector Area (cm^2)	45239	cm^2
Transmitter Power	20	Watts
Transmitter Power (mw)	20000	mw
Losses between Transmitter and feed	0.25	dB
Transmitter power from Feed	18881	mw
Radiation Cylinder energy Density	0.42	mw/cm^2
OET Bulletin 65 Standard for the General Public	1	mw/cm^2

Conclusion -

From this calculation it can be seen that in the spillover region, the energy density from the earth station transmitter is less than half the FCC standard. As described above personnel on deck will be exposed to levels lower than those calculated above. Therefore it can be concluded that the Shipboard Earth Station presents an acceptable level of microwave radiation hazard to the population on the rig.

EXHIBIT D

Request for Waiver

In the instant FCC Form 312 application, IWL Communications, Inc. ("IWL"), proposes to use an antenna with a 2.4 meter diameter. However, due to the small aperture of this antenna, the radiation pattern will exceed certain performance standards in Section 25.209(a) of the Commission's rules. 47 C.F.R. § 25.209(a) (1998). Specifically, the 1.64° beamwidth of the main lobe of the antenna exceeds the FCC's 1° limit. In addition, at certain points, the gain of the antenna at the side lobes exceeds the emission envelopes defined in Section 25.209(a). In order to utilize the proposed antenna, pursuant to Section 25.209(f), 47 C.F.R. § 25.209(f) (1998), IWL respectfully requests a waiver of Section 25.209(a) of the Commission's rules.

As further demonstrated in Exhibit H of this application, IWL will implement network design strategies which will result in significant spectral cooling of the emissions from the antenna. Therefore, the antenna will not cause harmful interference to adjacent satellites, and it will materially comply with the requirements in Sections 25.251 and 25.209(f) of the Commission's rules. Accordingly, a waiver of Section 25.209(a) of the Commission's rules is appropriate pursuant to Section 25.209(f) because unacceptable levels of interference will not be caused under conditions of uniform 2° orbital spacings.

Exhibit H

Overview -

IWL Communication provides this report to demonstrate the compliance of the Seatel 9667 6 GHz shipboard earth station with the provisions of 47 CFR 25.209, the FCC's rules supporting 2 degree satellite spacing.

Applicable Standards -

In IWL's extensive history of operation of satellite communications equipment in the offshore energy industry, we have noted that it is necessary to provide very small earth stations on board offshore drilling vessels, due both to the physical space constraints associated with shipboard installation, and due to naval architecture considerations impacting the seaworthiness on the vessel. As a result, we have selected an antenna with a diameter of 2.4 M for this project. Due to the small aperture of this antenna, the radiation pattern will exceed the stipulated performance standards at azimuths near the main pointing axis as set forth in section 25.209 (a) of the Commission's rules.

IWL intends to demonstrate in this analysis that the intended antenna will not cause harmful interference due to network design strategies that IWL has implemented for this type of antenna which result in significant spectral cooling of the emission from this antenna. With these spectral cooling strategies, the antenna will materially comply with the requirements of sections 25.251 and 25.209(f) of the FCC rules. Therefore, the proposed antenna should be authorized by the Commission.

FCC regulations do not clearly specify the non-interference criteria to be applied in a technical showing. The current FCC rules do, however, refer to related International Telecommunications Union (ITU) standards and recommendations for technical analysis related to control of potential interference. Therefore in the analysis we have relied upon ITU guidelines and techniques for determination of potential harmful interference.

Conclusions -

Due to the time critical nature of the application process, IWL's research in the matter of adjacent satellite interference was limited to the known co frequency interference cases with the two satellites stationed 2 degrees on either side of the intended spacecraft GE 2.

The services analyzed with regard to the IWL station's interference are both stable long term services, and are anticipated to remain in place for at least the next year. This period will be longer than the operating period requested in the main application.

Exhibit H

From the analysis presented below, it is clear that the spectral cooling strategies used in the IWL Shipboard Earth Station allow for significantly better performance than the ITU carrier to Interference (C/I) standards as put forth in Table 5 of ITU-R S.740. In the worst case, the interference presented by the IWL Shipboard Earth Station is 5.5 dB less than that allowed in the ITU recommendations.

Technical Analysis -

The following section will describe the strategy used to spectrally cool the transmission from the shipboard earth station, the parameters received from GE Americom of the co-frequency carriers on the adjacent spacecraft, the topocentric discrimination angles between and an ASI analysis based on the worst case sidelobe radiation from the Shipboard Antenna.

Spectral Cooling Strategy -

Two techniques are used to minimize the energy density of the transmission from the shipboard station. The first is to use a large aperture hub station (G/T >29.5 dB/K) to minimize the noise contribution and interference contribution of the downlink (satellite to Ground Station) segment of the link. The second is to use a Vitterbi forward error correction with concatenated Reed Solomon coding, at a rate ½ (Vitterbi) and Rate 239/256 Reed Solomon. These two factors limit the uplink EIRP of the Shipboard Earth Station to 37.2 dBW for a carrier having a symbol rate of 411 ksps. Please refer to GE link budget attached as Annex 1.

Adjacent Satellite Traffic -

The IWL Shipboard Service is intended to be put into service on GE 2 Located at 85 Degrees West, and the service area is intended to be restricted to the Gulf of Mexico. From conversations with technical personnel at GE, the carriers on the co frequency transponders are understood to have the following parameters:

Satellite - GE 3

Location	87	Degrees West Longitude
Transponder Number	16	
Transponder Receive Center Frequency	6245	MHz
Transponder Bandwidth	36	MHz
Service Type	Analog Video	
Video Signal Flux Density	-85	dBw/M^2

Video Signal Bandwidth	24000	kHz
Video Signal Flux Density/4 kHz	-122.782	dBW/4kHz

Satellite - Spacenet 3

Location	83	Degrees West Longitude
Transponder Number	16U	
Transponder Receive Center Frequency	6245	MHz
Transponder Bandwidth	72	MHz
Service Type	Digital Video	
Video Signal Flux Density	-95	dBw/M^2
Video Signal Bandwidth	24000	kHz
Video Signal Flux Density/4 kHz	-132.782	dBW/4kHz

Satellite Discrimination Look Angles -

For the ASI analysis, a topocentric model was used for the analysis. In the anticipated region of operation, this model yielded a worst case discrimination angle of 3.8 degrees between the desired and adjacent satellites. Note that this assumption is conservative since both economic and terrestrial interference considerations will cause the station to be operated in the deep water region of the Gulf where the discrimination angle is greater.

Antenna characteristics -

Although the antenna meets 32 - 25 Log (theta) requirements with the sidelobe averaging techniques permitted by ITU-R S.524-5, the analysis uses the worst case sidelobe performance of the antenna, which is 2 dB above the 32 - 25 Log (theta) screen. Antenna Characteristics are attached as Annex 2.

ASI Analysis Calculations

The Calculation Strategy is to determine the flux density per unit bandwidth illuminating the interfered with satellite due to the sidelobe characteristics of the shipboard station, and then to determine the comparable flux density per unit bandwidth illuminating the same satellite due to the desired signal. From these two densities, the C/I ratio was calculated.

The following tables show the calculations in detail:

Exhibit H

Case 1 Analog Video Carrier on GE 3		
Interferring Carrier Parameters		
Uplink EIRP	37.2	dBW
Carrier Info Rate	384	kbps
Bits per Symbol	2	
FEC	0.50	
Reed Solomon	0.93	
Carrier Symbol Rate	411	ksps
Carrier Noise Bandwidth	411	kHz
Shipboard Station Main Beam Emission		
Carrier Main Beam Energy Density	17.1	dBW/4kHz
Tx Gain On Axis	41.4	dBi
Energy Density into Feed flange	-24.3	dBW/4kHz
Shipboard Station Side Lobe Emission		
Discrimination Angle to other sat	3.8	degrees
Antenna Gain at envelope	19.5	dBi
Sidelobe energy density	-4.8	dBW/4kHz
Spreading Losses to other satellite	162.3	dB
Flux arriving at interferred with satellite	-167.1	dBW/m^2/4kHz
Desired (Interferred with) Carrier Parameters		
SCPC Signal Flux Density	-85	dBw/M^2
SCPC Signal Bandwidth	24000	kHz
SCPC Signal Flux Density/4 kHz	-122.8	dBW/4kHz
C/I Calculations		
Interfering Signal C/I Ratio	44.3	dB
ITU-R S.740 Table 5 C/I Criteria	27.1	dB
Margin	17.2	dB

Exhibit H

Case 2 Digital Video Carrier on Spacenet 3		
Interferring Carrier Parameters		
Uplink EIRP	37.2	dBW
Carrier Info Rate	384	kbps
Bits per Symbol	2	
FEC	0.50	
Reed Solomon	0.93	
Carrier Symbol Rate	411	ksps
Carrier Noise Bandwidth	411	kHz
Shipboard Station Main Beam Emission		
Carrier Main Beam Energy Density	17.1	dBW/4kHz
Tx Gain On Axis	41.4	dBi
Energy Density into Feed flange	-24.3	dBW/4kHz
Shipboard Station Side Lobe Emission		
Discrimination Angle to other sat	3.8	degrees
Antenna Gain at envelope	19.5	dBi
Sidelobe energy density	-4.8	dBW/4kHz
Spreading Losses to other satellite	162.3	dB
Flux arriving at interferred with satellite	-167.1	dBW/m^2/4kHz
Desired (Interferred with) Carrier Parameters		
SCPC Signal Flux Density	-95	dBw/M^2
SCPC Signal Bandwidth	24000	kHz
SCPC Signal Flux Density/4 kHz	-132.8	dBW/m^2/4kHz
C/I Calculations		
Interfering Signal C/I Ratio	34.3	dB
ITU-R S.740 Table 5 C/I Criteria	28.8	dB
Margin	5.5	dB

Exhibit H

Annex 1 - GE Link Budget

ZBI 492-0621

LinkbudTrack

Linkbud	Customer Name	Requester	Date requested
Lb98269	IWL	VERNER	11-04-1998

C.S. File	Assigned Engineer	Date Completed
	LUCATORTO	11-04-1998

Service Description

RECEIVED 11/3/98 at 5:34PM

Larry,

The request is for C-band capacity on GE-2.
eGE American Communications, Inc

Kent Verner
phone: 609-987-4017 DC *777-4017
fax: 609-987-4517 DC *777-4517
e-mail: kent.verner@gecapital.com

From: Lucatorto, Larry S (CAP, AMR)
Sent: Wednesday, October 28, 1998 2:06 PM
To: Verner, Kent (CAP, AMR)
Cc: Brad Keller; Bud Warner; Mark Rathert
Subject: FW: Link Budget request IWL

Kent

Please clarify the requirement for the space segment (C or Ku band), there is no GE3 C band SCPC (as Greg eluded to in his message below). GE3-05K is a Ku band SCPC transponder

Thanx
Larry

From: Myers, Greg
Sent: Tuesday, October 27, 1998 2:50 PM
To: 'Larry Lucatorto (GE American)'
Subject: Link Budget request

Larry,

As we discussed, IWL is looking for C-Band SCPC space segment between for the Deepwater Pathfinder Drillship in the Gulf of Mexico. The

remote antenna will be a 2.4M Seatel 9697 stabilized antenna and the hub antenna a 8.1Mub Vertex in Houston, TX. Kent Verner has mentioned GE-3 Transponder 5 capacity as one option. Please run link budget at 99.95% availability utilizing the following parameters:

Data Rate:
408.1Kbps (384kbps user +24.1Kbps Reed Solomon OH)

Modulation:
QPSK R1/2
With Reed Solomon Coding

Antenna Houston, TX
Vertex 8.1M
Tx Gain (@ Midband) 53.0dBi
Rx Gain (@ Midband) 49.2dBi
Antenna Noise Temp @ 40° elevation = 33°
System G/T 29.5 (@ 10° elevation)

Houston RF:
EF DATA CDT5000 40W
LNA/Tranceiver Noise Temp 35K

Antenna GOM
Seatel 2.4M antenna
Tx Gain (@ Midband) 41.4 dBi
Rx Gain (@ Midband) 38.1dBi
System G/T 16.2 dB/K

Tranceiver:
SSE C-STAR (20W)
LNA/Tranceiver Noise Temp 45K

Modem (both Locations):
Comstream CM701

Modem Performance:
Viterbi Rate < = 3.6 dB Eb/No for 1X10E7 BER with Reed Solomon Coding

Antenna Locations:

Houston, TX
Latitude 29 Degrees 35 Minutes North
Longitude 95 Degrees 30 Minutes West

Initial Rig Location:
Latitude 26 Degrees 00 Minutes North
Longitude 95 Degrees 00 Minutes West

Please call or Email if you have any further questions.

Greg Myers
Tel: (281) 482-0289
Fax: (281) 482-0621
Email: gmyers@cprk.com

Link Budget ID#: LB98082166
Description: INS.
Last Updated: 11/6/1998

LINK BUDGET PARAMETERS

Date: November 6, 1998
Time: 2:25 PM

CARRIER PARAMETERS

BUDGET TYPE:	Digital
DATA RATE:	384.0 KBPS
NUMBER OF MODULATION PHASES:	4
FEC CODING RATE:	1/2
REED-SOLOMON CODING RATE:	239/256
SPREADING FACTOR:	1.00
IF BANDWIDTH:	0.411 MHz
REQUIRED (faded) Eb/No:	3.6 dB
REQUIRED (faded) C/N:	3.3 dB

SYSTEM PARAMETERS

SATELLITE:	GE1
TRANSPONDER:	18C
SATELLITE LONGITUDE:	-85.0 deg
TRANSPONDER UPLINK POLARIZATION:	VERTICAL
TRANSPONDER DOWNLINK POLARIZATION:	HORIZONTAL
TRANSPONDER INPUT BACKOFF:	9.0 dB
TRANSPONDER OUTPUT BACKOFF:	4.0 dB
ATTENUATOR SETTING:	10.0 dB
CARRIER TO INTERFERENCE RATIO:	19.0 dB
TRANSPONDER USABLE BANDWIDTH:	36.0 MHz
TRANSPONDER CENTER FREQUENCY:	6265.0 MHz
GUARD SPECTRUM MARGIN:	1.0 dB

UPLINK PARAMETERS

TRANSMIT SITE	INITIAL SIG
SATURATED SATELLITE FLUX DENSITY:	-97.0 dBW/m2
EFFECTIVE SATELLITE FLUX DENSITY:	-87.0 dBW/m2
SATELLITE G/T:	-0.8 dB/K
FREE SPACE LOSS:	199.7 dB
ANTENNA DIAMETER:	2.40 m
BAND ICAO:	K
AVAILABILITY:	99.950 %
UPLINK RAIN MARGIN:	1.9 dB
UPLINK RADOME LOSS:	0.0 dB
TRANSMIT EIRP:	37.2 dBW
CALCULATED C/N0 UP:	9.2 dB
AZIMUTH:	158.1 deg
ELEVATION:	57.6 deg
POLARIZATION ANGLE:	-18.6 deg

DOWNLINK PARAMETERS

COMPUTED RESULTS

Receive Site	Sat EIRP (dBW)	Free Space Loss (dB)	NS	Avail (%)	D/L Rain Margin (dB)	D/L Radome Loss (dB)	Dia (m)	TSYS (K)	S.S. G/T (dB/K)	C/N EIRP (dBW)	C/N DOWN (dB)	Clear Sky C/N (dB)	AZ (deg)	EL (deg)	POL (deg)	Trans (%)
HUGHES TX	40.0	195.9	S	99.950	1.1	0.0	0.00	100.0	20.5	5.3	11.5	6.5	159.8	51.5	-37.5	0.00

TRANSPONDER UTILIZATION

IF BW (MHz)	Req'd Spacing Factor	Req'd BW (MHz)	Alloc BW (MHz)	Alloc BW (%)	Alloc Power (%)	C/N OBO (dB)	C/N IBO (dB)
0.411	1.35	0.555	0.600	1.67	0.08	25.1	30.1

MONITOR SITE INFORMATION

	VVES	SMAS	OSFC	WMA	ODJ	UTAH
SATURATED EIRP (dB):	41.0	40.4	41.4	41.3	41.3	41.0
CARRIER EIRP (dBW):	5.8	5.3	6.3	6.2	6.2	5.8
CARRIER EIRP (Hotlo):	3.8	3.4	4.3	4.2	4.2	3.8

CARRIER DOWNLINK SIGO DENSITY: -13.57 dBW / 4 kHz

Link Budget ID#: LB980908146
Description: hrl
Last Updated: 10/6/1998

LINK BUDGET PARAMETERS

Date: November 6, 1998
Time: 2:25 PM

CARRIER PARAMETERS

BUDGET TYPE:	Digital
DATA RATE:	384.0 KBPS
NUMBER OF MODULATION PHASES:	4
FEC CODING RATE:	8/2
REED-SOLOMON CODING RATE:	239/256
SPREADING FACTOR:	1.00
IF BANDWIDTH:	0.611 MHz
REQUIRED (Eb/No) Eb/No:	3.6 dB
REQUIRED (Es/No) C/N:	3.3 dB

SYSTEM PARAMETERS

SATELLITE:	C81
TRANSPONDER:	16C
SATELLITE LONGITUDE:	-85.0 deg
TRANSPONDER UPLINK POLARIZATION:	VERTICAL
TRANSPONDER DOWNLINK POLARIZATION:	HORIZONTAL
TRANSPONDER INPUT BACKOFF:	7.0 dB
TRANSPONDER OUTPUT BACKOFF:	4.0 dB
ATTENUATOR SETTING:	10.0 dB
CARRIER TO INTERFERENCE RATIO:	15.0 dB
TRANSPONDER USABLE BANDWIDTH:	36.0 MHz
TRANSPONDER CENTER FREQUENCY:	6265.0 MHz
RADIO SYSTEM MARGIN:	1.0 dB

UPLINK PARAMETERS

TRANSMIT SITE:	HOUSTON TR
SATURATED SATELLITE FLUX DENSITY:	-99.0 dBW/m2
EFFECTIVE SATELLITE FLUX DENSITY:	-89.0 dBW/m2
SATELLITE G/T:	2.0 dB/K
FREE SPACE LOSS:	199.7 dB
ANTENNA DIAMETER:	9.10 m
RAIN ZONE:	E
AVAILABILITY:	99.950 %
UPLINK RAIN MARGIN:	1.0 dB
UPLINK RADOME LOSS:	0.0 dB
TRANSMIT EIRP:	45.1 dBW
CALCULATED C/N UP:	19.0 dB
AZIMUTH:	159.8 deg
ELEVATION:	51.5 deg
POLARIZATION ANGLE:	-17.5 deg

DOWNLINK PARAMETERS

COMPUTED RESULTS

Receive Site	Sat EIRP (dBW)	Free Space Loss (dB)	BE	Avail (%)	D/L Rain Margin (dB)	D/L Radome Loss (dB)	Dia (m)	Tsys (K)	S.C. G/T (dB/K)	C/N EIRP (dBW)	C/N DOWN (dB)	Clear Sky C/N (dB)	AZ (deg)	EL (deg)	POL (deg)	Trace (%)
INITIAL BAD	39.7	195.8	B	99.950	1.3	0.0	3.40	180.0	16.2	15.2	8.2	7.1	158.1	57.6	-19.6	0.90

TRANSPONDER UTILIZATION

BP (MHz)	Spacing (MHz)	Req'd BW (MHz)	Alloc BW (MHz)	Alloc BW (%)	Alloc Power (%)	C/N (dB)	C/N (dB)
0.611	0.35	0.385	0.000	1.07	0.90	24.5	27.5

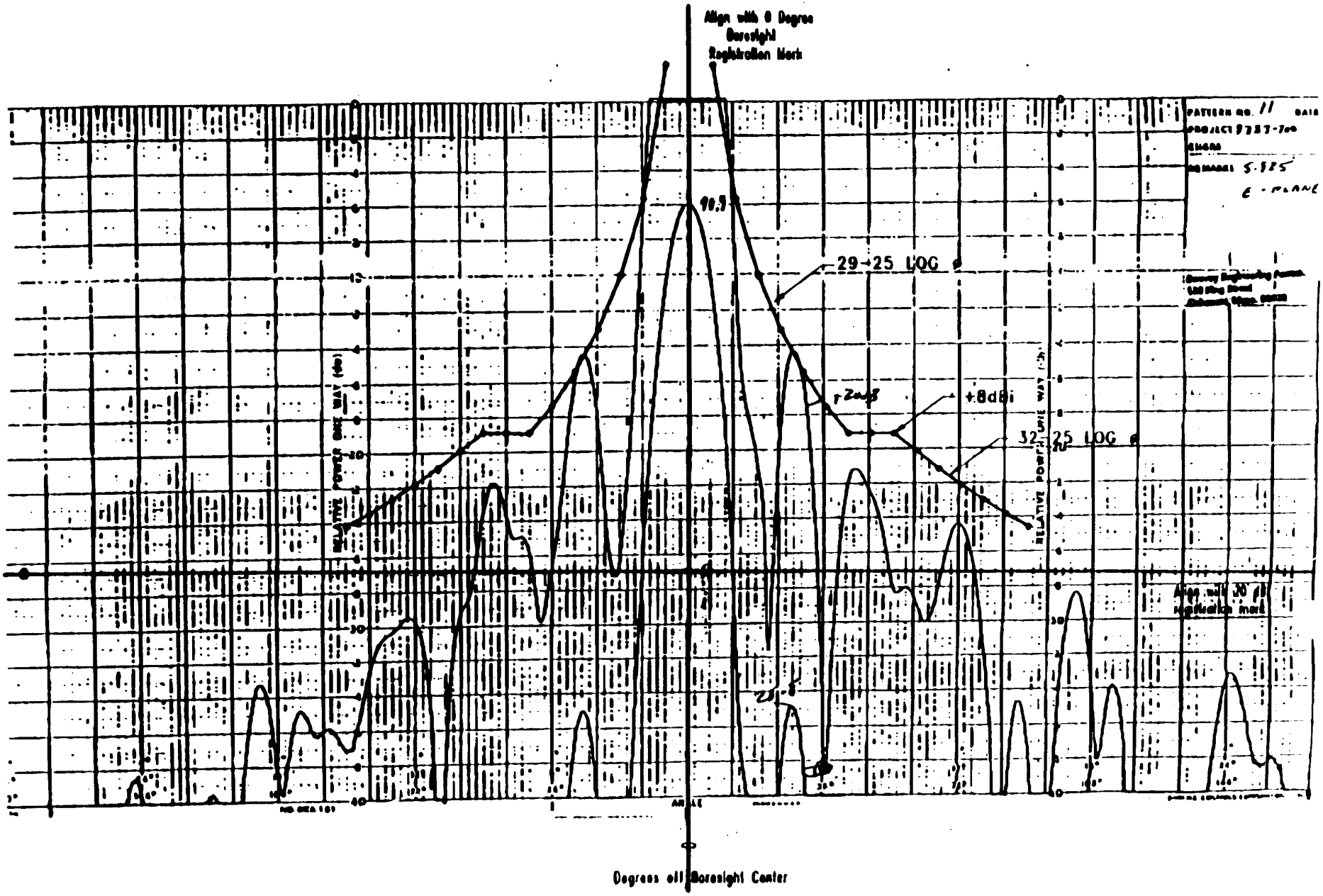
MONITOR SITE INFORMATION

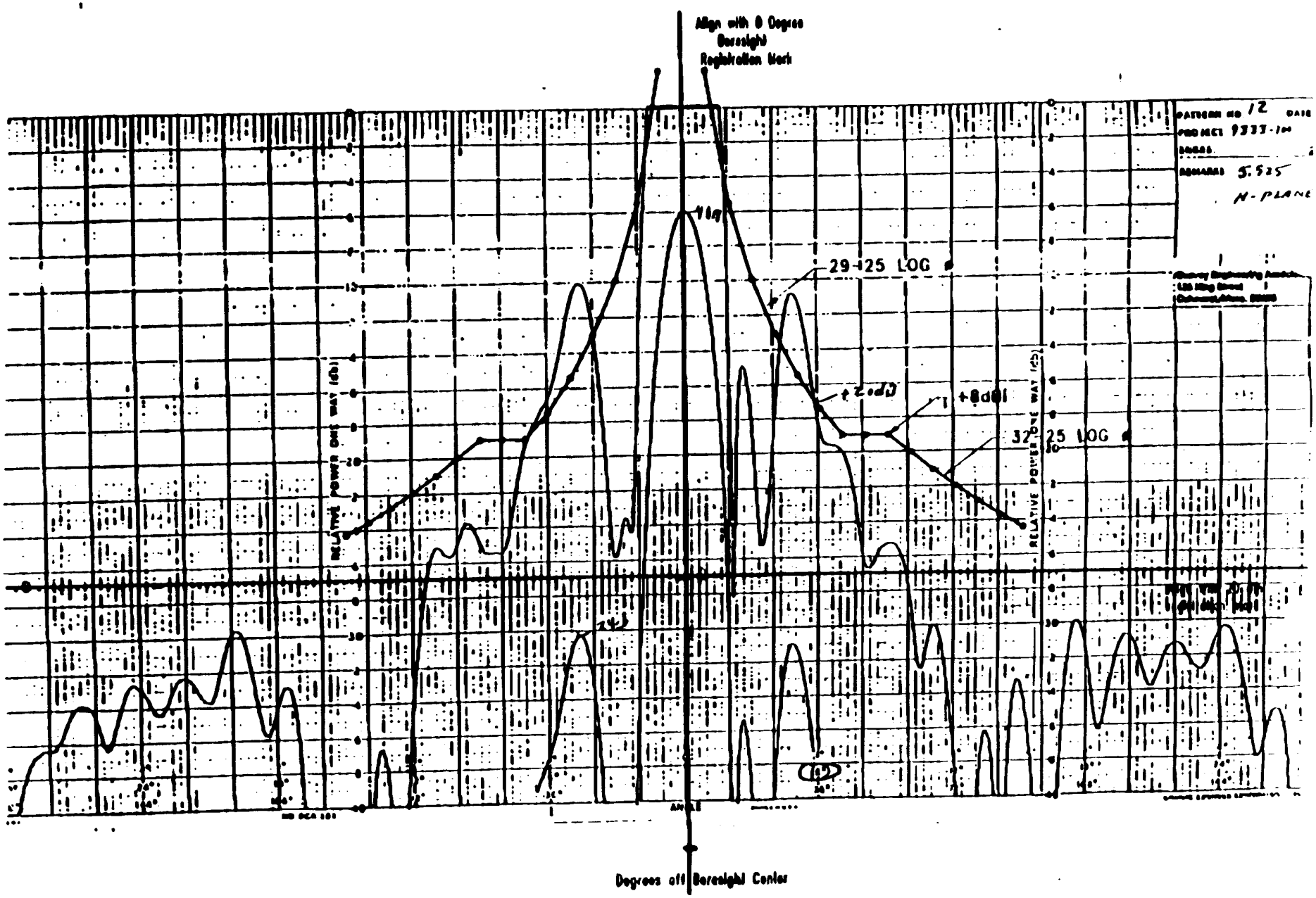
	VVDS	EMCS	GSAC	GUAM	GDJ	USAR
SATURATED EIRP (dB):	41.0	40.4	41.4	41.3	41.3	41.0
CARRIER EIRP (dBW):	16.5	15.9	16.9	16.8	16.8	16.5
CARRIER EIRP (Watts):	44.6	38.8	49.2	48.3	48.3	44.6

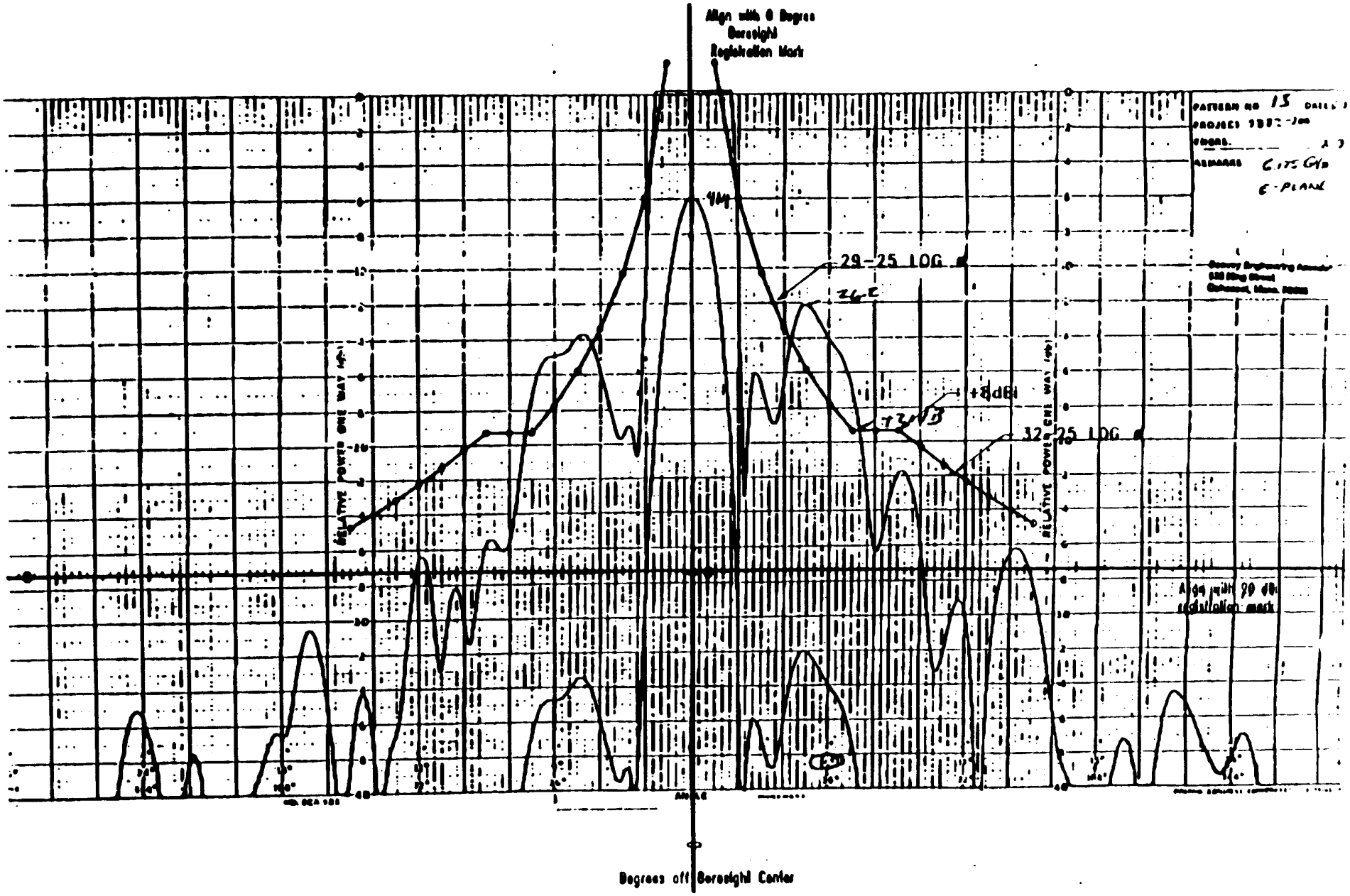
CARRIER DOWNLINK EIRP DENSITY: -8.92 dBW / 4 kHz

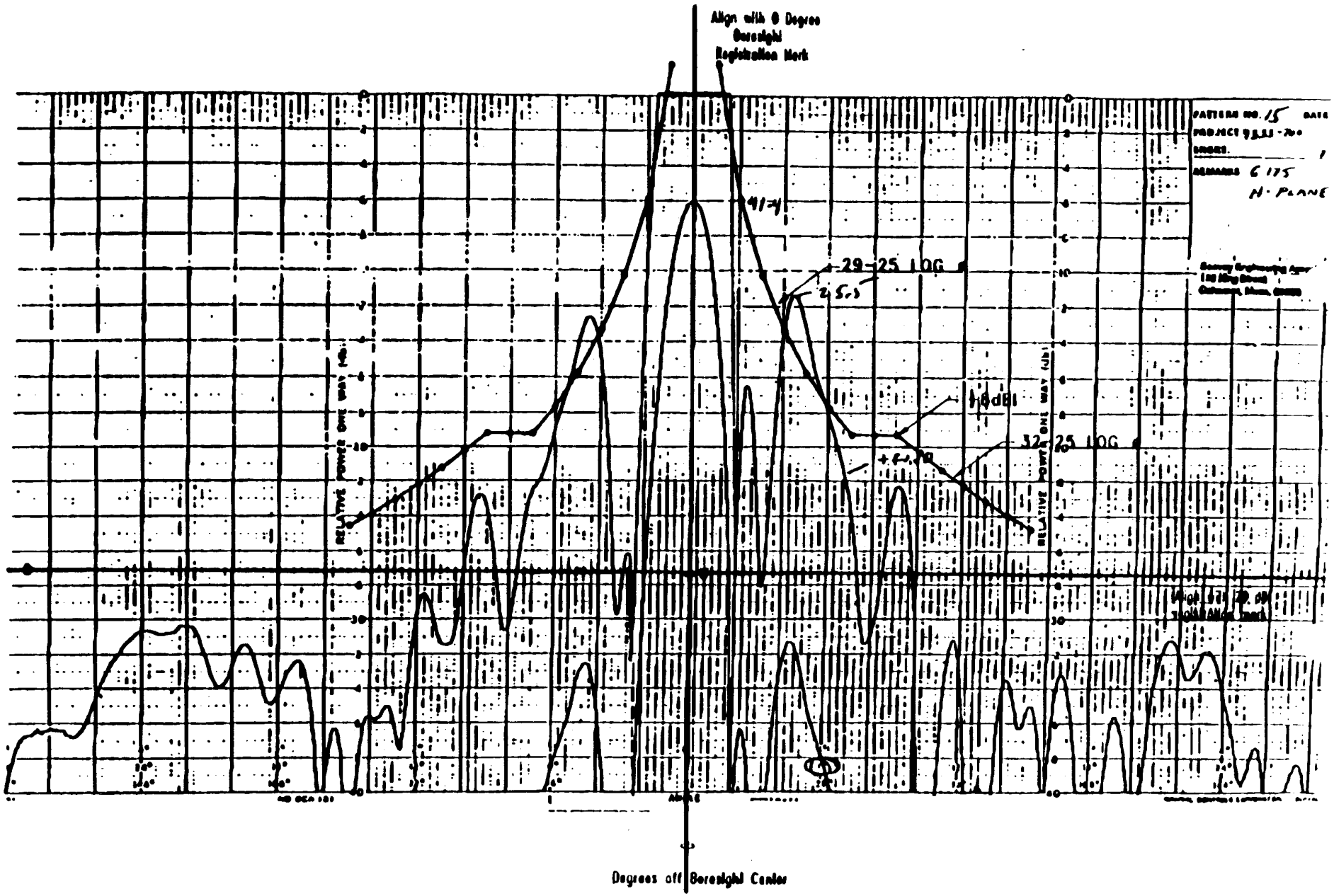
Exhibit H

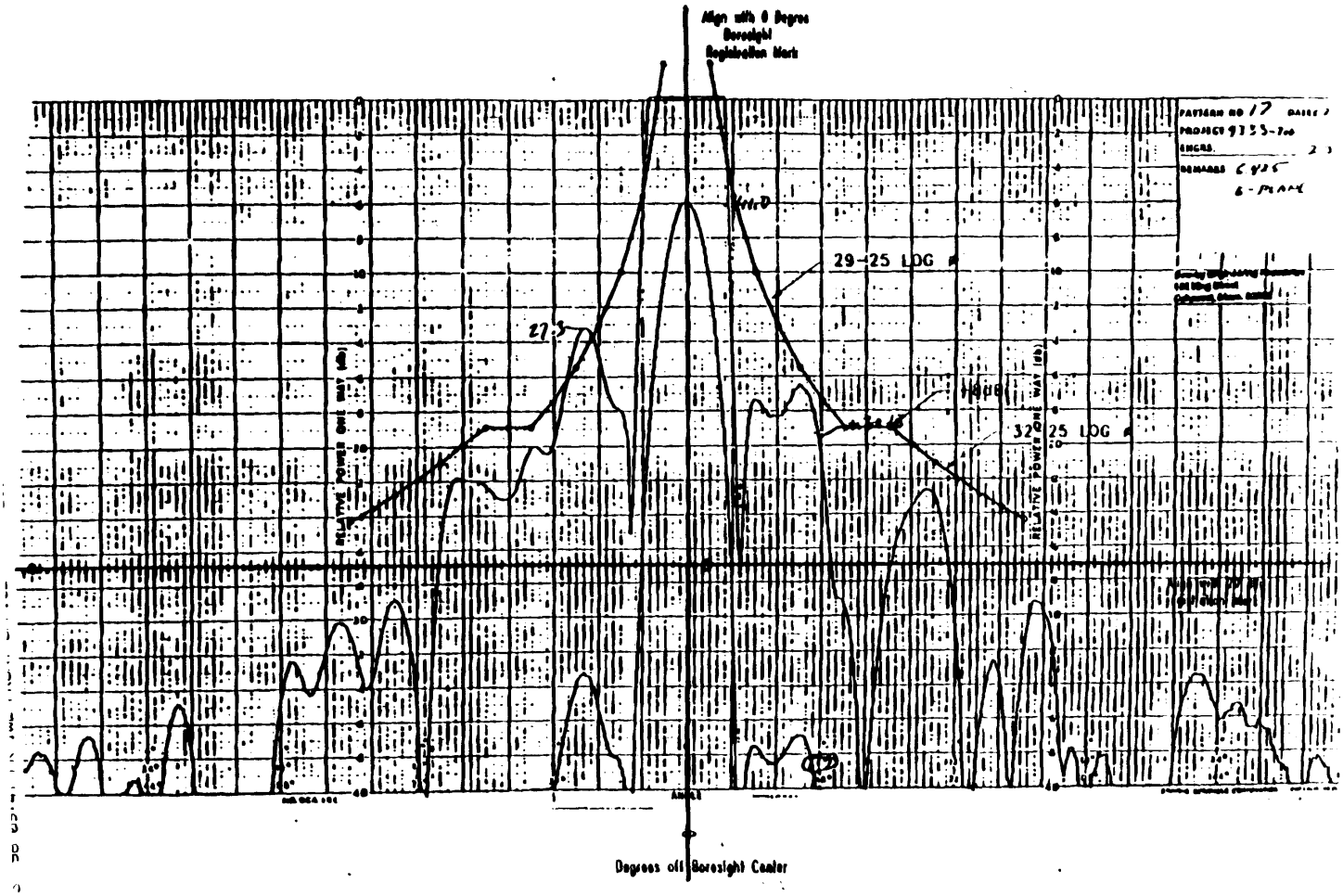
Annex 2 - Seatel Antenna Patterns

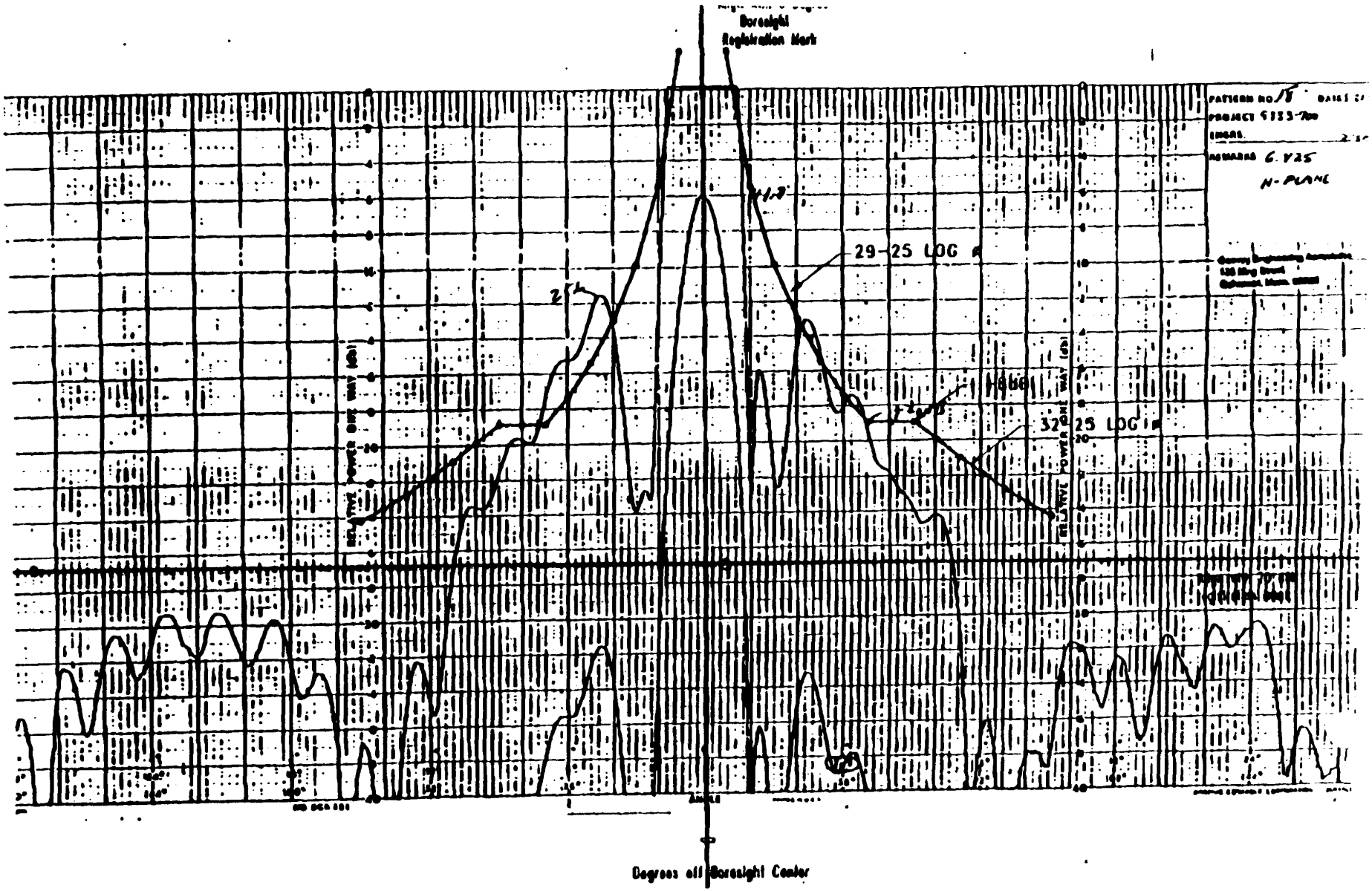

Align with 0 Degree
Boresight
Registration Mark
29-25 LOG θ
+8dBi
32-25 LOG θ
Degrees off Boresight Center


Align with 0 Degree
Boresight
Registration Mark
29-125 LOG
+2dBi
+8dBi
32-25 LOG
RELATIVE POWER ONE WAY (dB)
RELATIVE POWER ONE WAY (dB)
Degrees off Boresight Center


Align with 0 Degree Boresight Registration Mark
29-25 LOG
26 E
+8dBi
73 VB
32-25 LOG
Degrees off Boresight Center


Align with 0 Degree
Boresight
Registration Mark
PATTERN NO. 15
H-PLANE
29-25 LOG θ
25 LOG θ
Degrees off Boresight Center


Align with 0 Degree
Boresight
Registration Mark
29-25 LOG
27.5
32
25 LOG
RELATIVE POWER ONE WAY (dB)
Degrees off Boresight Center


Boresight
Registration Mark
29-25 LOG θ
32-25 LOG θ
Degrees off Boresight Center

MICRONET COMMUNICATIONS, INC.

SUPPLEMENTAL SHOWING PART 21.100(D)

CAPROCK COMMUNICATIONS INC
January 18, 2000 M0001801
AT 24 #1, ESV, GM 6.175 / 3.95 GHz PAGE 1

PURSUANT TO PARTS 25.203, 21.100 (d) AND 21.706 (c)(d) OF THE FCC RULES AND REGULATIONS, A FREQUENCY COORDINATION STUDY OF THE FACILITIES PROPOSED IN THIS APPLICATION WAS CONDUCTED BY MICRONET COMMUNICATIONS, INC. THE RESULTS OF THE STUDY INDICATE THAT NO UNACCEPTABLE INTERFERENCE WILL RESULT WITH EXISTING OR PROPOSED AND PRIOR COORDINATED COMMON CARRIER FACILITIES.

FREQUENCY COORDINATION DATA WAS FORWARDED TO THE FOLLOWING PARTIES OR THEIR AUTHORIZED COORDINATION AGENTS ON JANUARY 19, 2000.

AT&T COMMUNICATIONS
AT&T COMMUNICATIONS OF THE SOUTH CENTRAL STATES INC
BELLSOUTH TELECOMMUNICATIONS INC
CENTRAL TELEPHONE COMPANY (NC)
GTE MOBILNET OF NASHVILLE INCORPORATED
MCI WORLDCOM NETWORK SERVICES INC
RIG TELEPHONE INC D/B/A DATACOM - 6 GHz
RIG TELEPHONE INC DBA DATACOM
SHELL OFFSHORE SERVICES COMPANY

RESPECTFULLY SUBMITTED,

JOE FOOLE
SYSTEMS ENGINEER

****
* MICRONET COMMUNICATIONS, INC. *
****

File: M0001801 01-19-2000 page 1

TECHNICAL CHARACTERISTICS OF TRANSMIT RECEIVE EARTH STATION

Company:		CAPROCK COMMUNICATIONS INC	
Site Name, State:		AT 24 #1 ESV, GM	
Call Sign:			
Latitude	(NAD83)	27 56 57.2 N	
Longitude	(NAD83)	88 44 44.1 W	
Elevation AMSL	(ft/m)	66.00	20.12
Receive Frequency Range	(MHz)	3700.00	4200.00
Transmit Frequency Range	(MHz)	5925.00	6425.00
Range of Satellite Orbital Long.	(deg W)	63	139
Range of Azimuths from North	(deg)	134.18	248.71
Antenna Centerline	(ft/m)	23.00	7.01
Antenna Elevation Angles	(deg)	46.79	26.63

Equipment Parameters		3.95 GHz	6.17 GHz
Antenna Gain, Main Beam	(dbI)	38.10	41.40
15 DB Half Beamwidth	(deg)	2.45	1.45
Antennas	Receive: SEATEL 9697 Transmit: SEATEL 9697		
Max Transmitter Power	(dbW/4KHz)		-16.70
Max EIRP Main Beam	(dbW/4KHz)		24.70
Modulation / Emission Designator	Digital		1M00G1W

Coordination Parameters		3.95 GHz	6.17 GHz
Max Greater Circle Distances	(km)	359.57	140.59
Max Rain Scatter Distances	(km)	557.58	100.00
Max Interference Power Long Term	(dbW)	-140.60	-151.80
Max Interference Power Short Term	(dbW)	-118.40	-130.80
Rain Zone / Radio Zone		1	C

MICRONET COMMUNICATIONS, INC.
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Horizon Angle Horizon Gain Final Contour - 6.17 GHz TRANSMIT

Company: CAPROCK COMMUNICATIONS INC

Site Name, State: AT 24 #1 ESV, GM

Call Sign:

Latitude (NAD83) 27 56 57.2 N Longitude (NAD83) 88 44 44.1 W

North Azimuth (deg)	Horizon Angle (deg)	Horizon Gain (db)	Final Contour (km)	North Azimuth (deg)	Horizon Angle (deg)	Horizon Gain (db)	Final Contour (km)
0	0.0000	-14.02	123.3	180	0.0000	-13.00	123.3
5	0.0000	-17.58	123.3	185	0.0000	-13.00	123.3
10	0.0000	-17.01	123.3	190	0.0000	-13.00	123.3
15	0.0000	-14.47	123.3	195	0.0000	-12.49	123.3
20	0.0000	-11.86	123.3	200	0.0000	-11.28	123.3
25	0.0000	-10.00	123.3	205	0.0000	-10.00	123.3
30	0.0000	-10.00	123.3	210	0.0000	-10.00	123.3
35	0.0000	-10.00	123.3	215	0.0000	-10.00	123.8
40	0.0000	-10.00	123.3	220	0.0000	-10.00	123.9
45	0.0000	-10.00	123.3	225	0.0000	-10.00	123.9
50	0.0000	-10.00	123.3	230	0.0000	-7.14	123.5
55	0.0000	-11.45	123.3	235	0.0000	-4.92	123.3
60	0.0000	-12.90	123.3	240	0.0000	-4.44	123.3
65	0.0000	-13.00	123.3	245	0.0000	-4.16	123.3
70	0.0000	-13.00	125.8	250	0.0000	-4.11	123.3
75	0.0000	-13.00	128.4	255	0.0000	-4.28	123.3
80	0.0000	-13.00	131.1	260	0.0000	-4.67	123.3
85	0.0000	-13.00	133.7	265	0.0000	-5.90	123.3
90	0.0000	-13.00	136.2	270	0.0000	-8.60	123.3
95	0.0000	-13.00	138.3	275	0.0000	-10.00	123.3
100	0.0000	-13.00	139.9	280	0.0000	-10.00	123.3
105	0.0000	-12.14	140.6	285	0.0000	-10.00	123.3
110	0.0000	-11.17	140.4	290	0.0000	-10.00	123.3
115	0.0000	-10.35	139.2	295	0.0000	-11.43	123.3
120	0.0000	-10.00	137.4	300	0.0000	-13.00	123.3
125	0.0000	-10.00	135.0	305	0.0000	-13.00	123.3
130	0.0000	-10.00	132.5	310	0.0000	-13.00	123.3
135	0.0000	-10.00	129.8	315	0.0000	-13.00	123.3
140	0.0000	-10.00	127.2	320	0.0000	-13.00	123.3
145	0.0000	-10.00	124.8	325	0.0000	-13.00	123.3
150	0.0000	-10.00	123.3	330	0.0000	-11.62	123.3
155	0.0000	-10.60	123.3	335	0.0000	-10.00	123.3
160	0.0000	-11.47	123.3	340	0.0000	-10.00	123.3
165	0.0000	-12.49	123.3	345	0.0000	-10.00	123.3
170	0.0000	-13.00	123.3	350	0.0000	-10.00	123.3
175	0.0000	-13.00	123.3	355	0.0000	-10.43	123.3

MICRONET COMMUNICATIONS, INC.
01-19-2000

File: M0001801

Horizon Angle Horizon Gain Final Contour - 3.95 GHz RECEIVE

Company: CAPROCK COMMUNICATIONS INC

Site Name, State: AT 24 #1 ESV, GM

Call Sign:

Latitude (NAD83) 27 56 57.2 N Longitude (NAD83) 88 44 44.1 W

North Azimuth (deg)	Horizon Angle (deg)	Horizon Gain (db)	Final Contour (km)	North Azimuth (deg)	Horizon Angle (deg)	Horizon Gain (db)	Final Contour (km)
0	0.0000	-9.30	312.8	180	0.0000	-10.00	312.8
5	0.0000	-11.66	312.8	185	0.0000	-10.00	312.8
10	0.0000	-11.31	312.8	190	0.0000	-10.00	312.8
15	0.0000	-9.67	312.8	195	0.0000	-10.00	312.8
20	0.0000	-7.53	312.8	200	0.0000	-10.00	312.8
25	0.0000	-6.00	312.8	205	0.0000	-10.00	312.8
30	0.0000	-6.00	312.8	210	0.0000	-9.59	313.0
35	0.0000	-6.00	312.8	215	0.0000	-8.66	314.1
40	0.0000	-7.71	312.8	220	0.0000	-7.71	314.5
45	0.0000	-10.00	312.8	225	0.0000	-6.84	314.3
50	0.0000	-10.00	312.8	230	0.0000	-6.07	313.4
55	0.0000	-10.00	312.8	235	0.0000	-5.40	312.8
60	0.0000	-10.00	312.8	240	0.0000	-4.74	312.8
65	0.0000	-10.00	312.9	245	0.0000	-4.35	312.8
70	0.0000	-10.00	319.4	250	0.0000	-4.27	312.8
75	0.0000	-10.00	326.1	255	0.0000	-4.51	312.8
80	0.0000	-10.00	332.9	260	0.0000	-5.05	312.8
85	0.0000	-10.00	339.7	265	0.0000	-5.74	312.8
90	0.0000	-10.00	346.2	270	0.0000	-6.45	312.8
95	0.0000	-10.00	352.7	275	0.0000	-7.28	312.8
100	0.0000	-10.00	357.4	280	0.0000	-8.20	312.8
105	0.0000	-10.00	359.6	285	0.0000	-9.18	312.8
110	0.0000	-10.00	358.9	290	0.0000	-10.00	312.8
115	0.0000	-10.00	355.4	295	0.0000	-10.00	312.8
120	0.0000	-10.00	349.8	300	0.0000	-10.00	312.8
125	0.0000	-10.00	343.1	305	0.0000	-10.00	312.8
130	0.0000	-9.98	336.5	310	0.0000	-10.00	312.8
135	0.0000	-9.94	329.6	315	0.0000	-10.00	312.8
140	0.0000	-10.00	322.8	320	0.0000	-10.00	312.8
145	0.0000	-10.00	316.7	325	0.0000	-10.00	312.8
150	0.0000	-10.00	312.8	330	0.0000	-10.00	312.8
155	0.0000	-10.00	312.8	335	0.0000	-10.00	312.8
160	0.0000	-10.00	312.8	340	0.0000	-9.08	312.8
165	0.0000	-10.00	312.8	345	0.0000	-6.00	312.8
170	0.0000	-10.00	312.8	350	0.0000	-6.00	312.8
175	0.0000	-10.00	312.8	355	0.0000	-6.35	312.8

Discrimination Angle Transmission Loss - 6.17 GHz TRANSMIT

Company: CAPROCK COMMUNICATIONS INC

Site Name, State: AT 24 #1 ESV, GM

Call Sign:

Latitude (NAD83) 27 56 57.2 N Longitude (NAD83) 88 44 44.1 W

North Azimuth (deg)	Minimum Discrimination Angle (deg)	Trans Loss (db)	North Azimuth (deg)	Minimum Discrimination Angle (deg)	Trans Loss (db)
0	108.943	151.38	180	57.380	151.38
5	113.327	151.38	185	56.983	151.38
10	112.628	151.38	190	55.821	151.38
15	109.506	151.38	195	53.978	151.38
20	106.291	151.38	200	51.566	151.38
25	103.004	151.38	205	48.693	151.38
30	99.659	151.38	210	45.461	151.94
35	96.274	151.38	215	41.949	152.81
40	92.863	151.38	220	38.366	153.78
45	89.441	151.38	225	35.065	154.76
50	86.020	151.38	230	32.144	155.70
55	82.616	151.38	235	29.718	156.55
60	79.243	151.38	240	27.916	157.23
65	75.915	151.38	245	26.866	157.65
70	72.649	151.38	250	26.657	157.73
75	69.463	151.38	255	27.309	157.47
80	66.376	151.38	260	28.762	156.91
85	63.410	151.38	265	30.903	156.13
90	60.589	151.38	270	33.601	155.22
95	57.941	151.38	275	36.731	154.25
100	55.495	151.38	280	40.192	153.28
105	53.283	151.38	285	43.903	152.32
110	51.341	151.38	290	47.805	151.39
115	49.702	151.38	295	51.853	151.38
120	48.401	151.38	300	56.013	151.38
125	47.468	151.47	305	60.259	151.38
130	46.925	151.59	310	64.572	151.38
135	46.787	151.63	315	68.936	151.38
140	47.058	151.56	320	73.339	151.38
145	47.731	151.41	325	77.771	151.38
150	48.787	151.38	330	82.223	151.38
155	50.202	151.38	335	86.687	151.38
160	51.944	151.38	340	91.156	151.38
165	53.978	151.38	345	95.623	151.38
170	55.820	151.38	350	100.082	151.38
175	56.983	151.38	355	104.524	151.38

Discrimination Angle Transmission Loss - 3.95 GHz RECEIVE

Company: CAPROCK COMMUNICATIONS INC

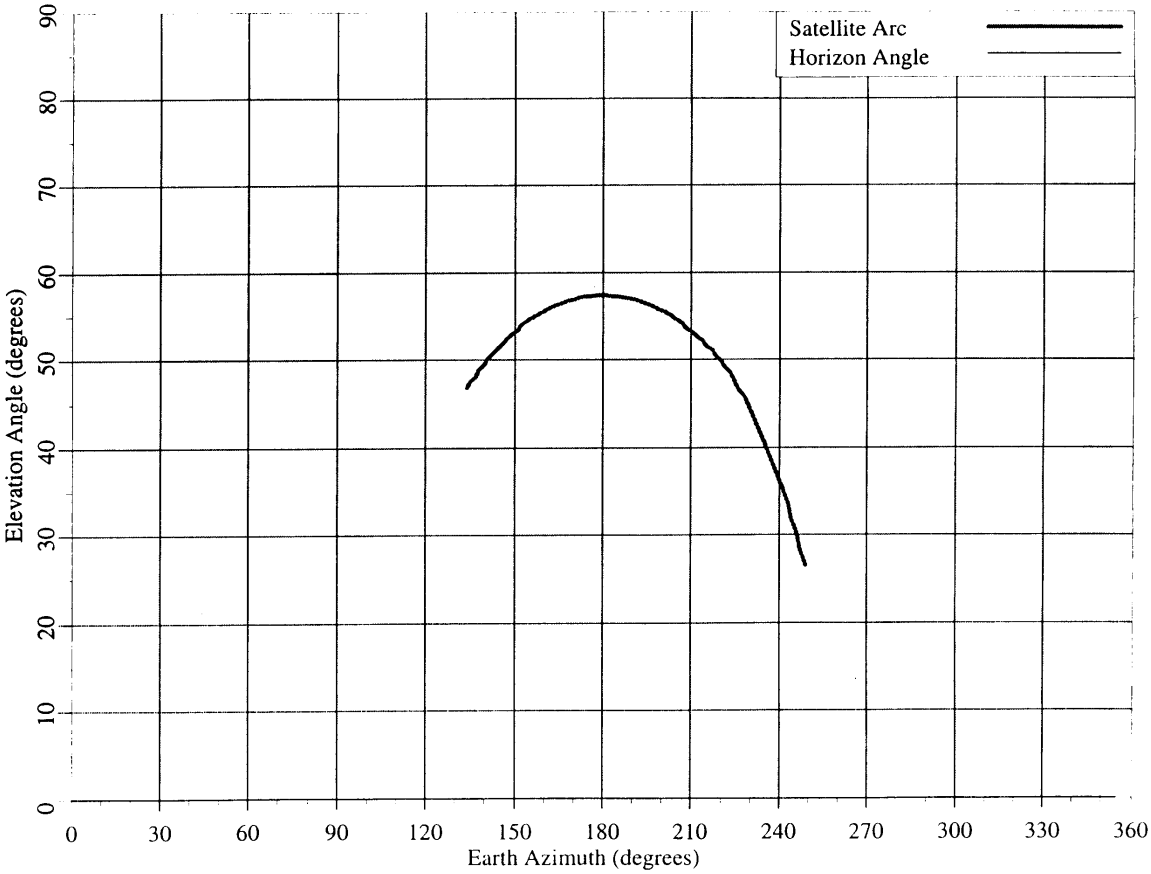
Site Name, State: AT 24 #1 ESV, GM

Call Sign:

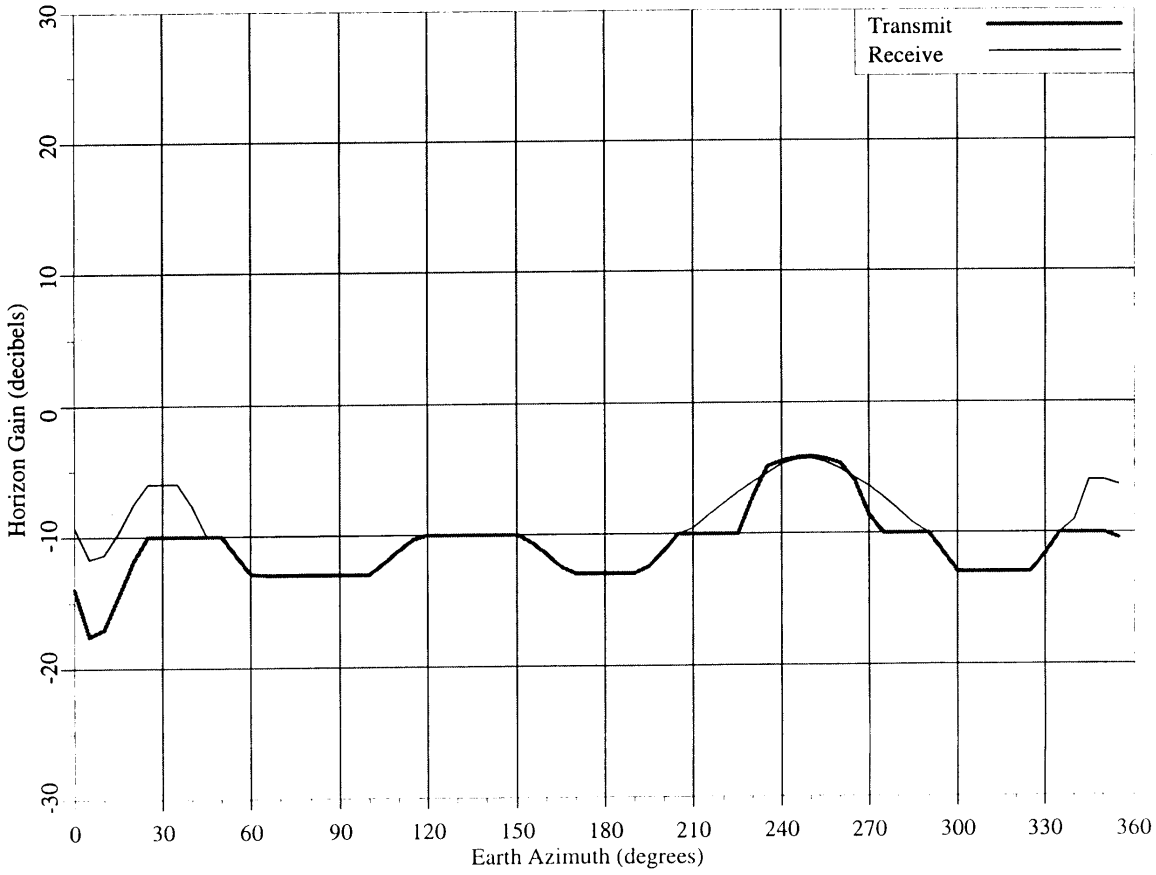
Latitude (NAD83) 27 56 57.2 N Longitude (NAD83) 88 44 44.1 W

North Azimuth (deg)	Minimum Discrimination Angle (deg)	Trans Loss (db)	North Azimuth (deg)	Minimum Discrimination Angle (deg)	Trans Loss (db)
0	108.943	195.39	180	57.380	195.39
5	113.327	195.39	185	56.983	195.39
10	112.628	195.39	190	55.821	195.39
15	109.506	195.39	195	53.978	195.39
20	106.291	195.39	200	51.566	195.39
25	103.004	195.39	205	48.693	195.39
30	99.659	195.39	210	45.461	195.94
35	96.274	195.39	215	41.949	196.82
40	92.863	195.39	220	38.366	197.79
45	89.441	195.39	225	35.065	198.76
50	86.020	195.39	230	32.144	199.71
55	82.616	195.39	235	29.718	200.56
60	79.243	195.39	240	27.916	201.24
65	75.915	195.39	245	26.866	201.66
70	72.649	195.39	250	26.657	201.74
75	69.463	195.39	255	27.309	201.48
80	66.376	195.39	260	28.762	200.91
85	63.410	195.39	265	30.903	200.14
90	60.589	195.39	270	33.601	199.23
95	57.941	195.39	275	36.731	198.26
100	55.495	195.39	280	40.192	197.28
105	53.283	195.39	285	43.903	196.32
110	51.341	195.39	290	47.805	195.40
115	49.702	195.39	295	51.853	195.39
120	48.401	195.39	300	56.013	195.39
125	47.468	195.48	305	60.259	195.39
130	46.925	195.60	310	64.572	195.39
135	46.787	195.63	315	68.936	195.39
140	47.058	195.57	320	73.339	195.39
145	47.731	195.42	325	77.771	195.39
150	48.787	195.39	330	82.223	195.39
155	50.202	195.39	335	86.687	195.39
160	51.944	195.39	340	91.156	195.39
165	53.978	195.39	345	95.623	195.39
170	55.820	195.39	350	100.082	195.39
175	56.983	195.39	355	104.524	195.39

Horizon Angle & Satellite Arc for AT 24 #1 ESV, GM
Micronet Communications, Inc.

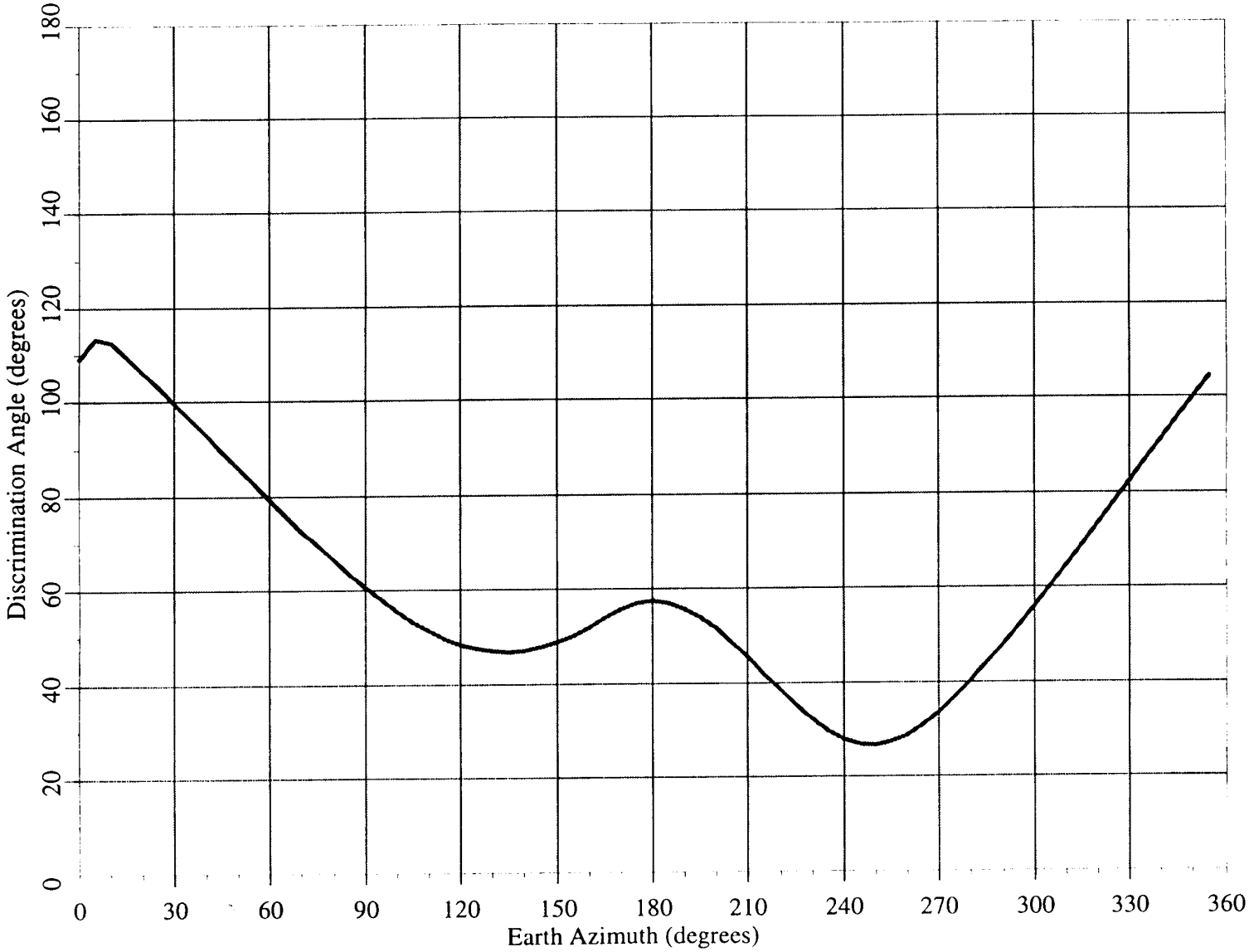


Horizon Gain for AT 24 #1 ESV, GM
Micronet Communications, Inc.

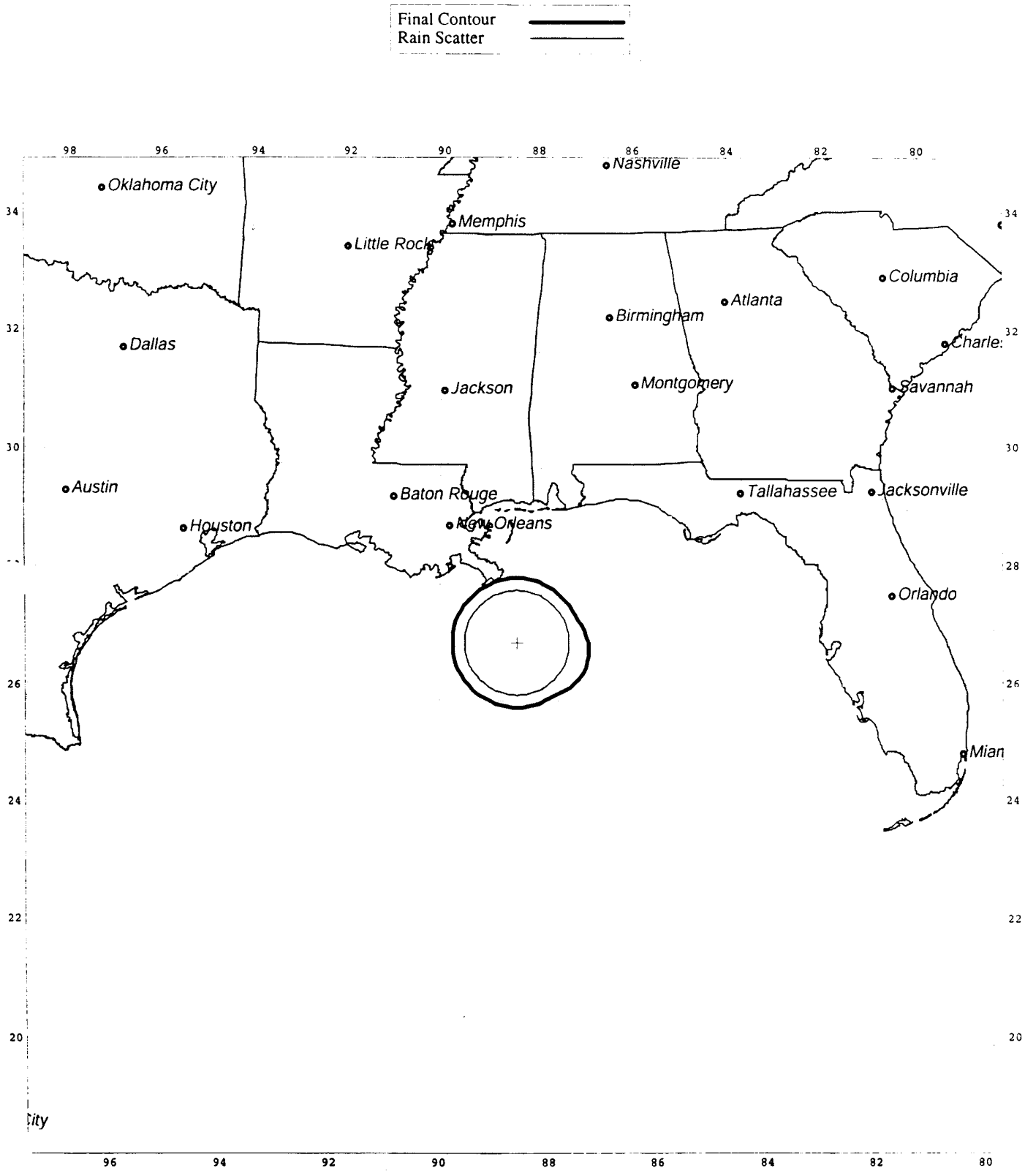


Minimum Discrimination Angles for AT 24 #1 ESV, GM

Micronet Communications, Inc.



Final Contour & Rain Scatter
for AT 24 #1 ESV, GM - Transmit



SCALE - 1:10000000 1 inch = 157.8 miles

Final Contour & Rain Scatter
for AT 24 #1 ESV, GM - Receive

SCALE - 1:10000000 1 inch = 157.8 miles

Final Contour
Rain Scatter