

# Technical Brief for ThinKom VMES System

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## 2 INTRODUCTION

Thinkom is seeking a permanent FCC license for the operation of its ground mobile satcom-on-the-move system. Thinkom is seeking a license with the following attributes:

- Single Earth Station License (vs VSAT/blanket)
- ALSAT license
- CONUS operation
- Vehicle Mounted Earth Station (VMES)

The Thinkom system is filed as compliant with **47CFR25.226** paragraph **(a)(1)** as follows:

- **(a)(1)(i)** the VMES that uses transmitters with off-axis EIRP spectral-densities lower than or equal to the levels in paragraph (a)(1)(i)
- **(a)(1)(ii)(A)** Each VMES transmitter shall maintain a pointing error of less than or equal to **0.2°** between the orbital location of the target satellite and the axis of the main lobe of the VMES antenna
- **(a)(1)(iii)(A)** all emissions from the VMES shall automatically cease within 100 milliseconds if the angle between the orbital location of the target satellite and the axis of the main lobe of the VMES antenna exceeds 0.5°, and transmission shall not resume until such angle is less than or equal to 0.2°

In addition this filing is compliant and provides the information set forth in paragraphs

- (a)(4) through (a)(9) and
- (b), (c), (d), and (e)

### **47CFR §25.209**

The ThinSAT®300 terminal does not comply with 47 CFR §25.209.

### **47CFR §25.226**

The ThinSAT®300 terminal is compliant with 47CFR§25.226 in the plane of the geostationary arc.

The ThinSAT®300 terminal exceeds the off-axis EIRP spectral density values set forth in the Commission's rules in directions away from the geostationary arc. See 47 CFR §25.226(a)(1)(i)(B). This separate off-axis EIRP spectral density mask is intended to protect Ku-band NGSO FSS systems. However, no systems of this type are presently planned or are operating. Thinkom will enter into a coordination arrangement with any future Ku-band NGSO FSS system to develop adequate operating parameters to facilitate co-frequency sharing.



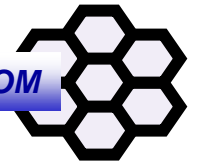
Accordingly, ThinKom respectfully requests a waiver of the off-axis EIRP limits set forth in Section 25.226(a)(1)(i)(B). Such a waiver is warranted given the important VMES applications that will be enabled through a grant of ThinKom's application and the absence of existing or planned Ku-band NGSO FSS operations.

### **Coordination**

VMES terminals will not operate within 125 km of a NASA/TDRSS or NSF/Radio Observatory site. Coordination with will be performed if closer operation is needed. ThinKom respectfully requests a waiver to not coordinate at this time.

Intellicom Technologies, Inc. is representing Thinkom in this matter. Please contact the following for additional information, comments, or clarifications:

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[www.ITCcom.net](http://www.ITCcom.net)



### 3 SYSTEM DESCRIPTION

This section provides a description of the satcom system. Key components are identified.

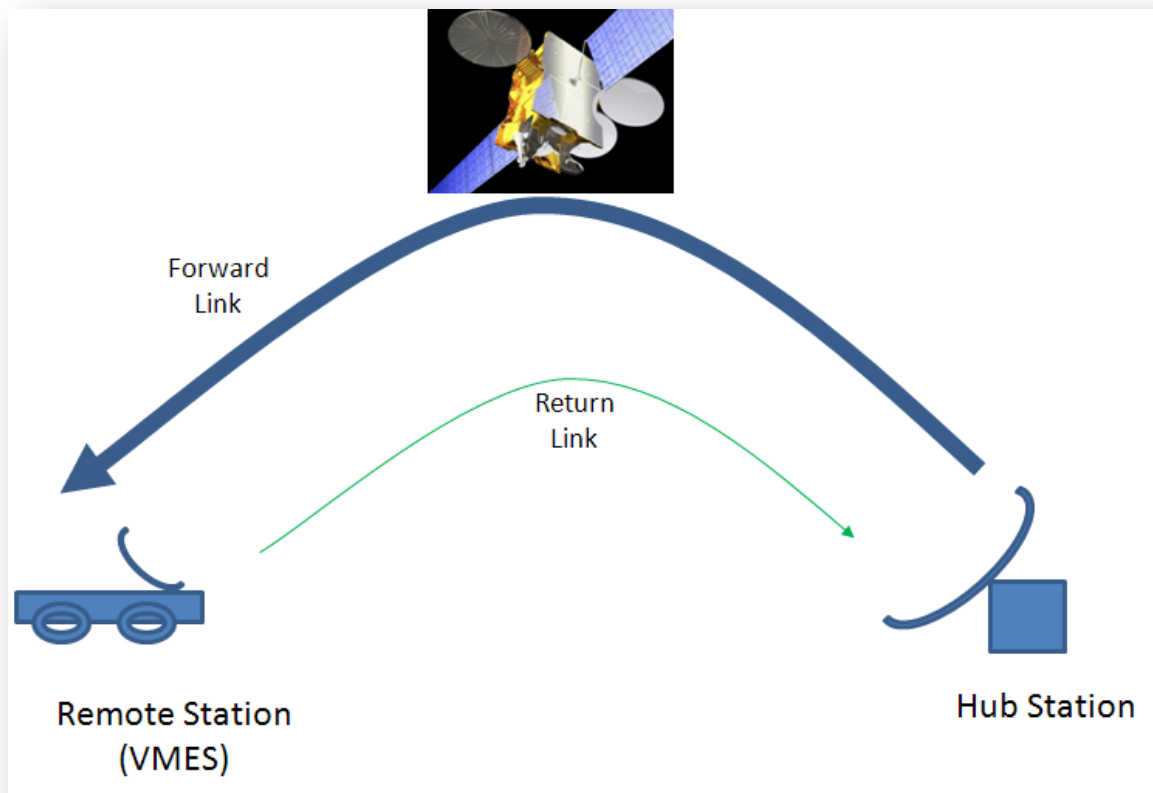
#### 3.1 Network Configuration

Thin-kom is seeking a single earth station license. The single earth station will operate in a duplex mode with a hub earth station.

The maximum remote to hub (return) link will be 4 Mbps. Connection to private or public data services occur at the hub.

#### 3.2 RF Transmission System

The RF transmission system includes one Hub earth station, one satellite, and one VMES remote earth station.





### 3.2.1 Satellites (Points of Communication)

Thinkom is requesting an ALSAT license for its U.S.-licensed earth stations to access any space station on the Permitted Space Station list (<http://transition.fcc.gov/ib/sd/se/permitted.html>). The earth station complies with the Commission's technical requirements (25.226), and will operate under the conditions on its license.

A link budget example is included in this document for operation using the Horizons-1 satellite with parameters as follows:

Satellite Input Parameters	Value	Units
Satellite longitude	127.00W	degrees
Transponder type	TWTA	
Receive G/T	5	dB/K
Saturation flux density	-93.5	dBW/m <sup>2</sup>
Satellite attenuator pad	5	dB
Satellite ALC	0	dB
EIRP (saturation)	50.6	dBW
Transponder bandwidth	36	MHz
Input back off total	6	dB
Output back off total	3.5	dB
Intermodulation interference	14.8	dB
Number of transponder carriers	AUTO	

### 3.2.2 Master/Hub Earth Station

The hub earth station has the following attributes:

Location	Ellenwood, Georgia
Coordinates	33.7N, Long 84.4W
Antenna	11m diameter
Rx Gain	60.4 dBi
G/T	38.6 dB/K

The hub earth station is licensed under a separate FCC license as follows:

- Call sign E050169
- Antenna designator ATL K11
- Expires 7/27/2020



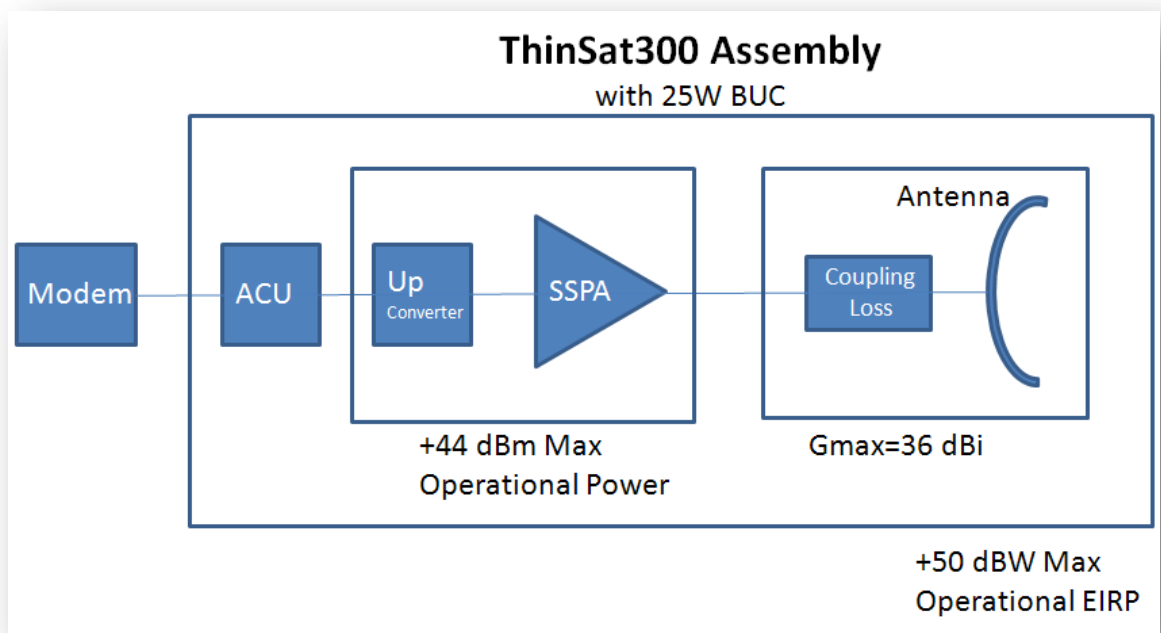
### 3.2.3 Vehicle Mounted Earth Station (VMES)

The Thinsat300 subsystem consists of:

- Receive Antenna
- Transmit Antenna
- Block Upconverter and SSPA (BUC)
- LNB
- Antenna Control System
  - o Antenna Control Unit (ACU)
  - o Graphical User Interface (GUI)
  - o GPS
  - o Inertial Navigation system
  - o Signal Tracking Assistance

A product brochure is included in the appendix.

Following is a block diagram of the transmit portion of the Thinsat300.



#### Thinsat300 – Key Attributes

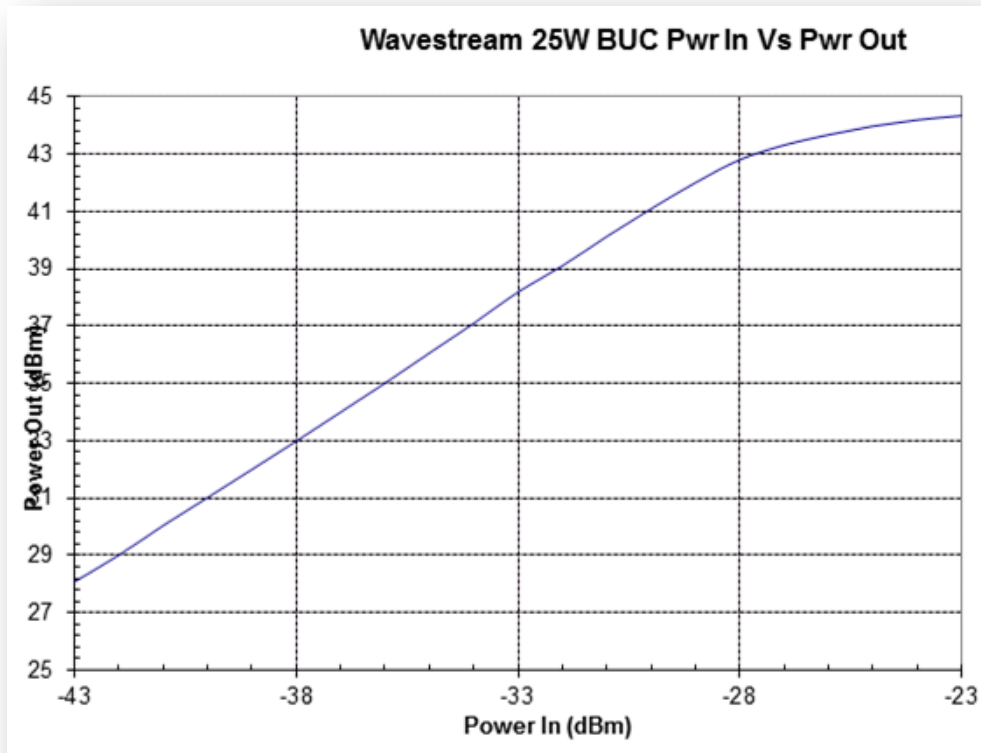
- Wavestream 25W BUC, MTB-KUE025-CS07
- (Optional 50W BUC)
- Comtech CDM-570L Modem
- EIRP 50 dBW max
- Gtx=36 peak
- Grx=33 peak
- G/T = 13 dB/K peak

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### 3.2.4 BUC Performance

The input output curve of the BUC is shown in the following figure. The 25 Watt SSPA saturates at 44 dBm. A 40 Watt SSPA is also available. Typical operation will include an output back off necessary for meeting adjacent channel objectives or spectral regrowth characteristics defined by the satellite operator.



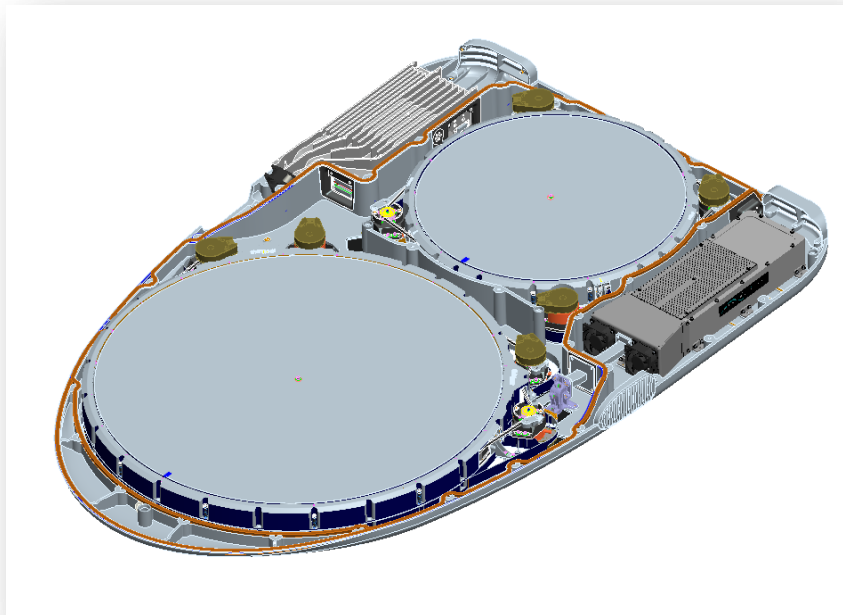
### 3.2.4.1 Thinsat300 Antenna

The ThinSat300 system consists of two separate VICTS antennas (one for Rx and one for Tx) controlled by an advanced antenna controller unit (ACU). Each antenna on ThinSat consists of platters which are rotated in such a fashion to phase the antenna mainbeam towards the target satellite without the use of any electronic phaseshifters. In this fashion, the Rx and Tx antennas comprised within ThinSat can be thought of as phased arrays whose mainbeam scan is set by the mechanically controlled configuration of its constituent platters.

The antenna control system utilizes GPS, an advanced inertial navigation system (INS), and knowledge of the satellite ephemeris (knowledge box) to compute the pointing for the antenna.

The ThinKom ThinSAT300 Antenna Assembly (Part Number 1004800-100) is a mechanically-actuated, electronically-scanned antenna system. The polarizers are mechanically-actuated. The system includes an integrated antenna controller, BUC, interface unit, and installation kit.

The transmit antenna, shown below in the front of the system, is approximately 31.5" (0.80m) in diameter with an effective aperture diameter of 29.0" (0.74m). The Receive antenna, shown in the back of the system, is approximately 21.5" (0.55m) in diameter with an effective aperture diameter of 19.0" (0.48m).



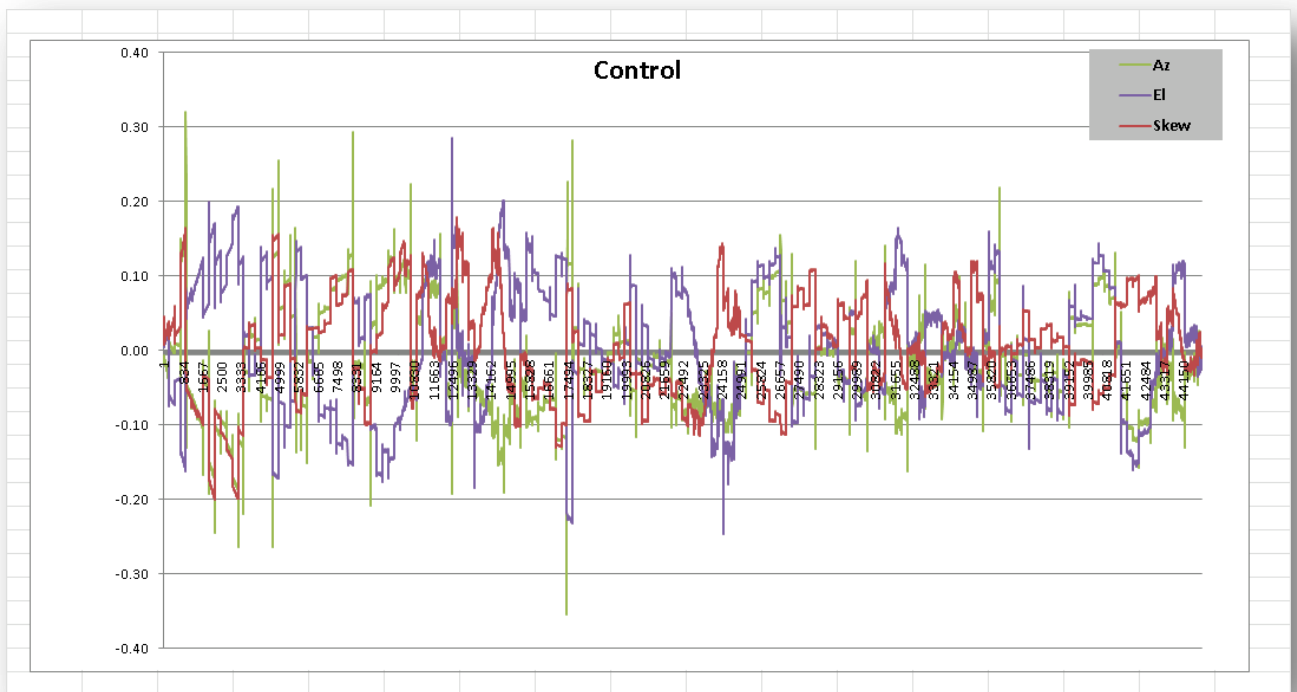


### 3.2.4.2 Pointing Performance

The pointing performance of the Thinsat300 has been analyzed. The following chart shows the pointing error (azimuth, elevation, skew) over time while the terminal is subjected to motion typical of a ground vehicle driven on a paved road at up to 75 mph.

Note that pointing errors are typically less than 0.2 degrees. Per FCC25.226 the transmitter will be muted within 100mS if pointing error exceeds 0.5 degrees and will remain muted until the pointing error is 0.2 degrees or less.

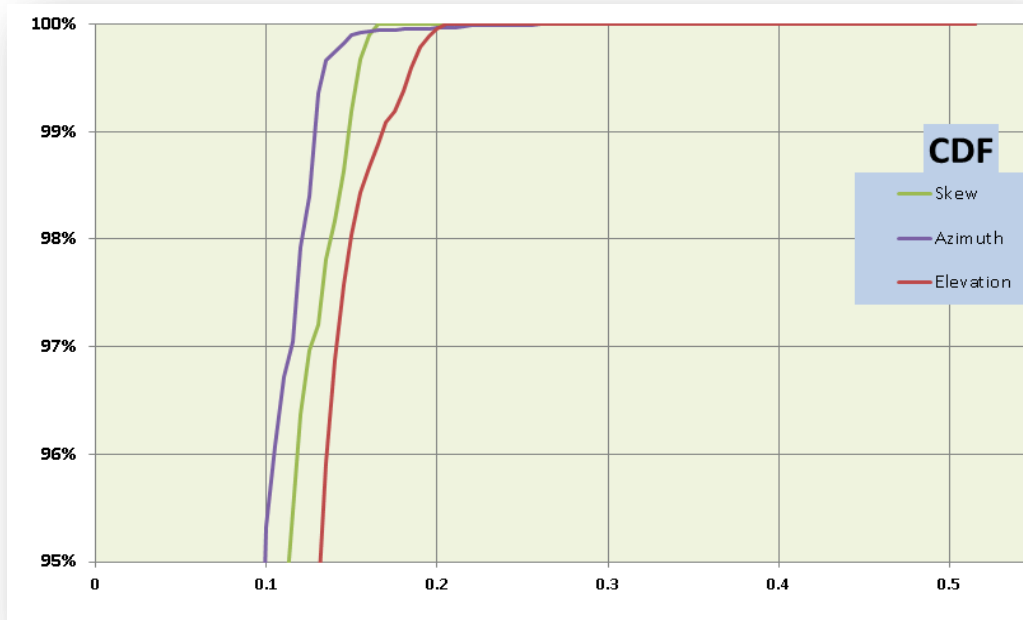
The Thinsat300 is compliant with 47CFR25.226 paragraph **(a)(1)**.



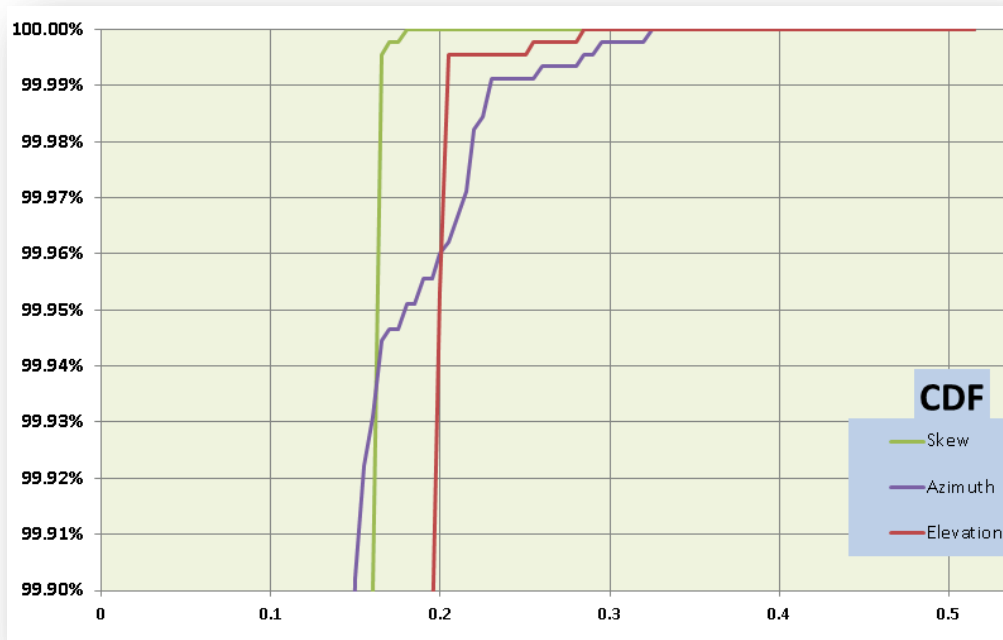
A cumulative distribution function was produced from this pointing error data. The CDF demonstrates that pointing errors are 0.2 degree or less 99.95% of the time. Transmit muting may occur 0.05% of the time.



### CDF 95% to 100%



### CDF 99.9% to 100% - Close In





### 3.3 Modulation

Comtech CDM-570L modems will be used for this system (see product brochure in the appendix).

Following is the Eb/No performance of the modem.

Turbo Product Codec (Q/OQPSK)		
	<u>1/2</u>	<u>3/4</u>
$10^{-6}$	2.9 (2.6)	3.8 (3.4)
$10^{-8}$	3.3 (2.8)	4.4 (4.0)

### 3.4 Transmit Carrier

#### 3.4.1 VMES Transmit

The VMES will transmit one and only one BPSK or QPSK carrier with a data rate from 56 kbps up to 4 Mbps. The actual transmission rate will depend on the customer needs, terminal maximum EIRP, link needs, and compliance with FCC25.226.

The carrier attributes will be assigned and configured locally and manually. The spectrum will be used by only one transmitter at a time (N=1). No TDMA or CDMA will be used. No contention based protocols will be used.

Occupied bandwidth is 1.2 times the symbol rate.

#### 3.4.2 Hub Transmit

The VMES will transmit one or more BPSK or QPSK carriers with a data rate from 56 kbps up to 4 Mbps. The actual transmission rate will depend on the customer needs, terminal maximum EIRP, and link needs.

The carrier attributes will be assigned and configured locally and manually. The spectrum will be used by only one transmitter at a time (N=1). No TDMA or CDMA will be used. No contention based protocols will be used.

Occupied bandwidth is 1.2 times the symbol rate.

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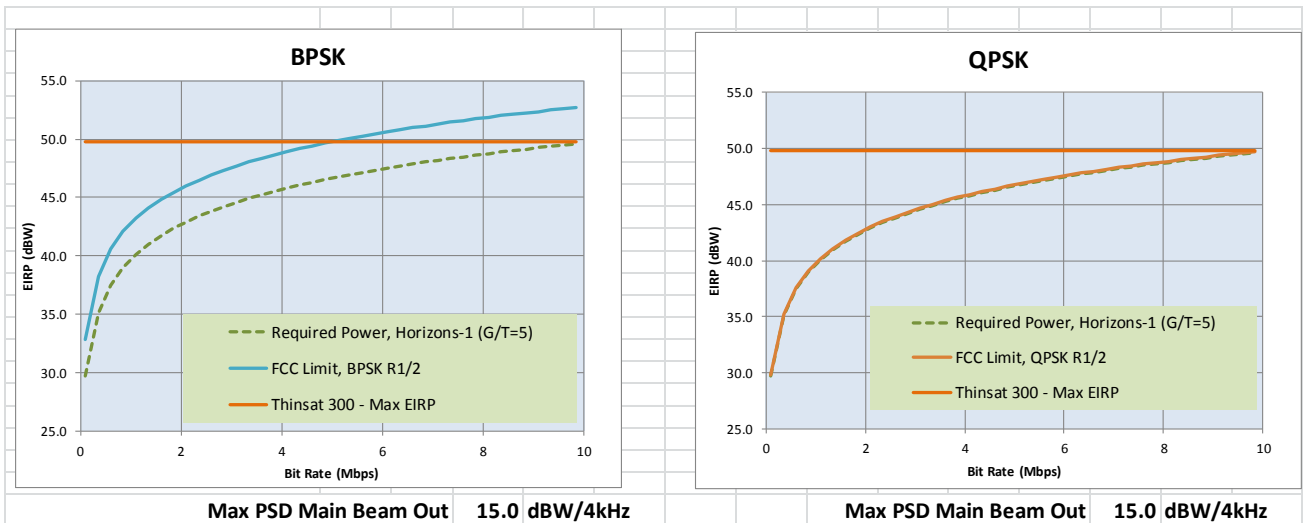
### 3.5 Link Budget Summary

A sample link budget is provided in the appendix.

The link budget was used to determine the EIRP necessary to support a link from the remote to the hub for various bit rates. While the transmitter is capable of providing up to 50 dBW EIRP, the EIRP density will comply with FCC25.226. The following charts show the EIRP needed to support a link vs. bit rate (dashed lines). Solid lines show the maximum EIRP density that can be transmitted while meeting FCC25.226.

#### 3.5.1 Typical – Uplink from LA

- Horizons 1 satellite
- Elevation = 50 degrees (Scan 40)
- Skew angle 13 degrees
- Frequencies 14.05, 14.25, 14.45 GHz
- FCC 25.226 permitted PSD = 15 dBW/4kHz
- No spreading is required for BPSK or QPSK.

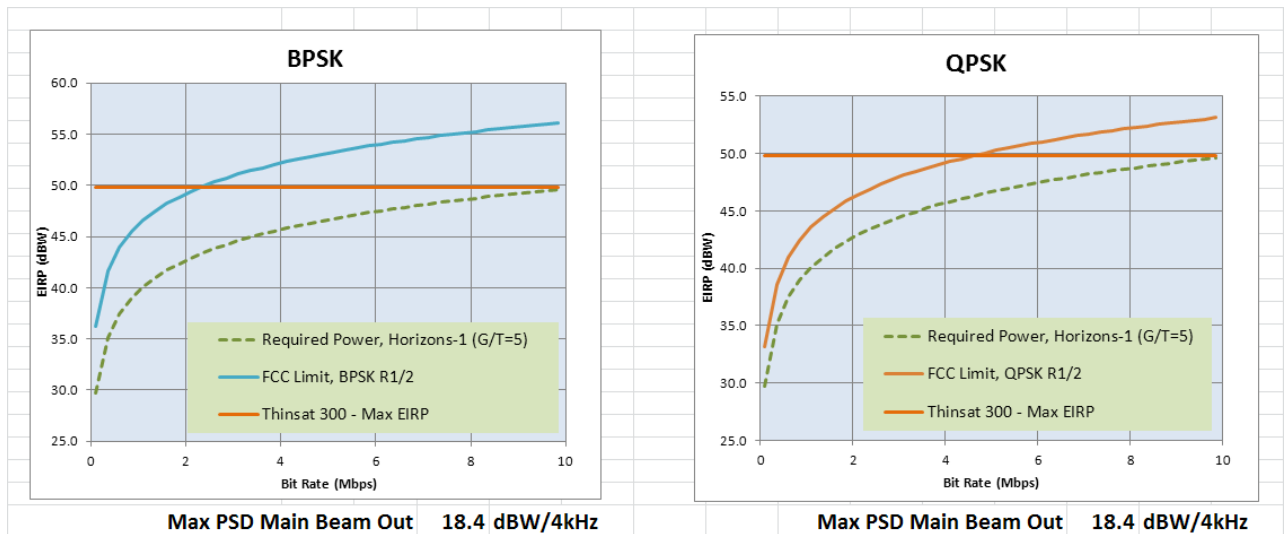




### 3.5.2 EIRP PSD

The maximum EIRP PSD that is 25.226 compliant occurs at:

- Elevation angle 30 degrees (scan 60)
- Skew angle 10 degrees
- Frequencies 14.05, 14.25, 14.45 GHz
- FCC 25.226 permitted PSD = 18.4 dBW/4kHz
- No spreading is required for BPSK or QPSK.



### 3.6 EIRP Spectral Density Management

Thinkom has thoroughly characterized the Tx antenna performance over a wide range of elevation angles using its on-site NF range facilities. These patterns were used to generate projected GeoPlane cuts to determine the max PSD levels contained in the Appendix.

The ThinSat ACU continually monitors the effective elevation and skew angles to the target satellite through its INS and constant monitoring of satellite ephemeris. With this knowledge, the ACU is able to dynamically keep the emitted PSD below the levels specified in FCC25.226 by continually adjusting the input BUC power based on the instantaneous elevation and effective skew angle to the target satellite.

While the data in this filing represents only a small subset of all possible elevation and skew angles, Thinkom maintains a much larger database drawn from actual measurements of the Tx antenna that will be incorporated into the ACU logic.





### 3.7 Point(s) of Communications

Thinkom is requesting an ALSAT license for its U.S.-licensed earth stations to access any space station on the Permitted Space Station list (<http://transition.fcc.gov/ib/sd/se/permitted.html>). The earth station complies with the Commission's technical requirements, and will operate under the conditions on its license.

A sample link budget is included for operation on Horizons-1.

In FCC 09-63, Para 11 it is stated that:

"ESV operators seeking to operate at higher off-axis power-density levels may not access satellites pursuant to ALSAT authority"

The ThinSAT300 complies with the off-axis power-density levels per FCC25.226 in the geostationary plane. Since the VMES is not exceeding the off-axis power-density levels we request to access satellites pursuant to ALSAT authority.



## 4 FCC25.226 Form 312 and Schedule B

### 4.1 Tables

**(b)(1)(A)(i)** Any VMES applicant filing an application pursuant to paragraph (a)(1) of this section shall file **three tables** showing

1. the **off-axis EIRP level** of the proposed earth station antenna in the direction of the **plane of the GSO**;
2. the **co-polarized EIRP in the elevation plane**, that is, the plane perpendicular to the plane of the GSO; and
3. **cross polarized EIRP**.

Each table shall provide the EIRP level

- at increments of **0.1°** for angles between 0° and 10° off-axis, and
- at increments of **5°** for angles between 10° and 180° off-axis.

(A) For purposes of the **off-axis EIRP table in the plane of the GSO**, the off axis angle is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite, and the plane of the GSO is determined by the focal point of the antenna and the line tangent to the arc of the GSO at the orbital position of the target satellite.

(B) For purposes of the **off-axis co-polarized EIRP table in the elevation plane**, the off-axis angle is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite, and the elevation plane is defined as the plane perpendicular to the plane of the GSO defined in paragraph (b)(1)(i)(A) of this section.

(C) For purposes of the **cross-polarized EIRP table**, the off-axis angle is the angle in degrees from the line connecting the focal point of the antenna to the orbital location of the target satellite and the plane of the GSO as defined in paragraph (b)(1)(i)(A) of this section will be used.

Tables are included in the appendix.



## 4.2 Gain and PSD Pattern

- (b)(1)(A)(ii)** A VMES applicant shall include a **certification**, in Schedule B, that
- the VMES antenna conforms to the gain pattern criteria of § 25.209(a) and
  - (b), that, combined with the maximum input power density calculated from the EIRP density less the antenna gain, which is entered in Schedule B, demonstrates that the off-axis EIRP spectral density envelope set forth in paragraphs (a)(1)(i)(A) through (a)(1)(i)(C) of this section will be met under the assumption that the antenna is pointed at the target satellite.

### **47 CFR §25.209**

The ThinSAT®300 terminal does not comply with 47 CFR §25.209.

### **47 CFR §25.226**

The ThinSAT®300 terminal is compliant with 47CFR§25.226 in the plane of the geostationary arc.

The ThinSAT®300 terminal exceeds the off-axis EIRP spectral density values set forth in the Commission's rules in directions away from the geostationary arc. See 47 CFR §25.226(a)(1)(i)(B). This separate off-axis EIRP spectral density mask is intended to protect Ku-band NGSO FSS systems. However, no systems of this type are presently planned or are operating. ThinKom will enter into a coordination arrangement with any future Ku-band NGSO FSS system to develop adequate operating parameters to facilitate co-frequency sharing.

### **NGSO FSS Systems and Waiver Request**

Accordingly, ThinKom respectfully requests a waiver of the off-axis EIRP limits set forth in Section 25.226(a)(1)(i)(B). Such a waiver is warranted given the important VMES applications that will be enabled through grant of ThinKom's application and the absence of existing or planned Ku-band NGSO FSS operations.

### 4.3 Value of N

**(b)(1)(A)**

The VMES applicant also shall provide the value N described in paragraph (a)(1)(i)(A) of this section.

N=1 for our system.

There will be no simultaneous use of frequency and no CDMA.

### 4.4 Pointing Error and Mute Provisions

**(b)(1)(A)(iii)** A VMES applicant proposing to implement a transmitter under paragraph **(a)(1)(ii)(A)** of this section shall provide a **certification from the equipment manufacturer** stating that

- the antenna tracking system will maintain a **pointing error of less than or equal to 0.2°** between the orbital location of the target satellite and the axis of the main lobe of the VMES antenna and that
- the antenna tracking system is capable of ceasing emissions within **100 milliseconds** if the angle between the orbital location of the target satellite and the axis of the main lobe of the VMES antenna **exceeds 0.5°**.

Pointing error data has been provided in a previous section.

Thinkom certifies that:

- the antenna tracking system will maintain a **pointing error of less than or equal to 0.2°** between the orbital location of the target satellite and the axis of the main lobe of the VMES antenna and that
- the antenna tracking system is capable of ceasing emissions within **100 milliseconds** if the angle between the orbital location of the target satellite and the axis of the main lobe of the VMES antenna **exceeds 0.5°**.

The ThinSat 300 antenna autonomously prevents the VMES operator from transmitting in prohibited NASA and NSF geographical locations mandated by the FCC coordination sites listed in 25.226. The ThinSat 300 software is flexible to accommodate additional/future transmit mute zones mandated by the FCC.

The Thinsat BUC is autonomously turned off when:

- (1) ThinSat 300 GPS indicates that the remote is within the NASA or NSF sites, and
- (2) VMES transmit frequency is within the prohibited transmit frequency range.



## 4.5 Geographic Areas

(b)(4) There shall be an exhibit included with the application describing the **geographic area(s)** in which the VMESs will operate.

VMES terminals will operate throughout CONUS.

## 4.6 Contention Protocol

(b)(5) Any VMES applicant filing for a VMES terminal or system and planning to use a **contention protocol** shall include in its application a certification that will comply with the requirements of paragraph (a)(4) of this section.

(a)(4) An applicant filing to operate a VMES terminal or system and planning to use a **contention protocol** shall certify that its contention protocol use will be reasonable.

No contention protocol will be used.

## 4.7 Point of Contact

(b)(6) The **point of contact** referred to in paragraph (a)(5) of this section shall be included in the application.

(a)(5) There shall be a **point of contact** in the United States, with phone number and address, available 24 hours a day, seven days a week, with authority and ability to cease all emissions from the VMESs.

TK300 Operations (VMES)	Hub Operations
Jorge Raphael Sr. Systems Engineer ThinkKom Solutions, Inc. 20000 Mariner Ave., Suite 500 Torrance, CA 90503 Office: 310.896.3903 Fax: 310.214.1066 JorgeR@thin-kom.com <a href="http://www.thinkom.com">www.thinkom.com</a>	Oncall NOC (Network Operations Center) 949-707-4729 x0



## 4.8 Data Logging

**(b)(7)** Any VMES applicant filing for a VMES terminal or system shall include in its application a certification that will comply with the requirements of paragraph **(a)(6)** of this section.

**(a)(6)** For each VMES transmitter, a **record** of the vehicle location (i.e., latitude/longitude), transmit frequency, channel bandwidth and satellite used shall be time annotated and maintained for a period of not less than one (1) year. **Records shall be recorded** at time intervals no greater than every five (5) minutes while the VMES is transmitting. The VMES operator shall make this data available upon request to a coordinator, fixed system operator, fixed-satellite system operator, NTIA, or the Commission within 24 hours of the request.

The ThinSat300 antenna uses a data logger for logging remote's transmit frequency, transmit polarization, time stamp in UTC (Coordinated Universal Time), duration of transmit time, geographical location (latitude and longitude), , and satellite information (Norad identification number).

The logs are stored in a non-volatile memory and are readily available for download by selecting the Download TX Log Data button from the ThinSat300 GUI. The TX data logger is a circular buffer that can store the aforementioned information for at least one year.

## 4.9 Radio Frequency Hazard Analysis

**(b)(8)** All VMES applicants shall submit a **radio frequency hazard analysis** determining via calculation, simulation, or field measurement whether VMES terminals, or classes of terminals, will produce power densities that will exceed the Commission's radio frequency exposure criteria.

VMES applicants with VMES terminals that will exceed the guidelines in § 1.1310 of this chapter for radio frequency radiation exposure shall provide, with their environmental assessment, a plan for mitigation of radiation exposure to the extent required to meet those guidelines.

All VMES licensees shall ensure installation of VMES terminals on vehicles by qualified installers who have an understanding of the antenna's radiation environment and the measures best suited to maximize protection of the general public and persons operating the vehicle and equipment.

A VMES terminal exhibiting radiation exposure levels exceeding 1.0 mW/cm<sup>2</sup> in accessible areas, such as at the exterior surface of the radome, shall have a **label** attached to the surface of the terminal warning about the radiation hazard and shall include thereon a diagram showing the regions around the terminal where the radiation levels could exceed 1.0 mW/cm<sup>2</sup>.

All VMES licensees shall ensure that a VMES terminal **ceases transmission upon encountering an obstruction** that degrades the VMES downlink signal.

Please see radio frequency hazard analysis report.



## 4.10 NASA Coordination

(c)

(1) Operations of VMESs in the 14.0–14.2 GHz (Earth-to-space) frequency band within **125 km** of the **NASA** TDRSS facilities on

- Guam (latitude 13°36'55" N, longitude 144°51'22" E) or
- White Sands, New Mexico (latitude 32°20'59" N, longitude 106°36'31" W and latitude 32°32'40" N, longitude 106°36'48" W)

are subject to coordination with the National Aeronautics and Space Administration (NASA) through the National Telecommunications and Information Administration (NTIA) Interdepartment Radio Advisory Committee (IRAC). Licensees shall notify the International Bureau once they have completed coordination. Upon receipt of such notification from a licensee, the International Bureau will issue a public notice stating that the licensee may commence operations within the coordination zone in 30 days if no party has opposed the operations.

(2) When NTIA seeks to provide similar protection to **future TDRSS** sites that have been coordinated through the IRAC Frequency Assignment Subcommittee process, NTIA will notify the Commission's International Bureau that the site is nearing operational status. Upon public notice from the International Bureau, all Ku-band VMES licensees shall cease operations in the 14.0–14.2 GHz band within **125 km** of the new TDRSS site until the licensees complete coordination with NTIA/IRAC for the new TDRSS facility. Licensees shall notify the International Bureau once they have completed coordination for the new TDRSS site. Upon receipt of such notification from a licensee, the International Bureau will issue a public notice stating that the licensee may commence operations within the coordination zone in 30 days if no party has opposed the operations. The VMES licensee then will be permitted to commence operations in the 14.0–14.2 GHz band within 125 km of the new TDRSS site, subject to any operational constraints developed in the coordination process.

VMES terminals will not operate within 125km of a TDRSS site. Coordination with will be performed if operation closer than 125km is needed.

The Thinsat BUC is autonomously turned off when:

- (1) ThinSat 300 GPS indicates that the remote is within the NASA or NSF sites, and
- (2) VMES transmit frequency is within the prohibited transmit frequency range.

A waiver is requested to not perform coordination unless operation is planned within the specified coordination zone and on the shared frequencies.



**4.11 NSF Coordination**

(d)

(1) Operations of VMESs in the 14.47–14.5 GHz (Earth-to-space) frequency band in the vicinity of radio astronomy service (RAS) observatories observing in the 14.47–14.5 GHz band are subject to coordination with the **National Science Foundation (NSF)**. The appropriate NSF contact point to initiate coordination is Electromagnetic Spectrum Manager, NSF, 4201 Wilson Blvd., Suite 1045, Arlington VA 22203, fax 703–292–9034, e-mail *esm@nsf.gov*. Licensees shall notify the International Bureau once they have completed coordination. Upon receipt of the coordination agreement from a licensee, the International Bureau will issue a public notice stating that the licensee may commence operations within the coordination zone in 30 days if no party has opposed the operations.

(2) Table 1 provides a list of each applicable RAS site, its location, and the applicable coordination zone.

TABLE 1—APPLICABLE RADIO ASTRONOMY SERVICE (RAS) FACILITIES AND ASSOCIATED COORDINATION DISTANCES

Observatory	Latitude (north)	Longitude (west)	Radius (km) of coordination zone
Arecibo, Observatory, Arecibo, PR .....	18°20'37"	66°45'11"	Island of Puerto Rico.
Green Bank, WV .....	38°25'59"	79°50'23"	160.
Very Large Array, near Socorro, NM .....	34°04'44"	107°37'06"	160.
Pisgah Astronomical Research Institute, Rosman, NC	35°11'59"	82°52'19"	160.
U of Michigan Radio Astronomy Observatory, Stinchfield Woods, MI.	42°23'56"	83°56'11"	160.
Very Long Baseline Array (VLBA) stations:			
Owens Valley, CA .....	37°13'54"	118°16'37"	160*.
Mauna Kea, HI .....	19°48'05"	155°27'20"	50.
Brewster, WA .....	48°07'52"	119°41'00"	
Kitt Peak, AZ .....	31°57'23"	111°36'45"	
Pie Town, NM .....	34°18'04"	108°07'09"	
Los Alamos, NM .....	35°46'30"	106°14'44"	
Fort Davis, TX .....	30°38'06"	103°56'41"	
North Liberty, IA .....	41°46'17"	91°34'27"	
Hancock, NH .....	42°56'01"	71°59'12"	
St. Croix, VI .....	17°45'24"	64°35'01"	

\* Owens Valley, CA operates both a VLBA station and single-dish telescopes.

(3) When NTIA seeks to provide similar protection to **future RAS sites** that have been coordinated through the IRAC Frequency Assignment Subcommittee process, NTIA will notify the Commission's International Bureau that the site is nearing operational status. Upon public notice from the International Bureau, all Ku-band VMES licensees shall cease operations in the 14.47–14.5 GHz band within the relevant geographic zone (160 kms for single dish radio observatories and Very Large Array antenna systems and 50 kms for Very Long Baseline Array antenna systems) of the new RAS site until the licensees complete coordination for the new RAS facility. Licensees shall notify the International Bureau once they have completed coordination for the new RAS site and shall submit the coordination agreement to the Commission. Upon receipt of such notification from a licensee, the International Bureau will issue a public notice stating that the licensee may commence operations within the coordination zone in 30 days if no party opposed the operations. The VMES licensee then will be permitted to commence operations in the 14.47–14.5 GHz band within the relevant coordination distance around the new RAS site, subject to any operational constraints developed in the coordination process.

VMES terminals will not operate within the distances specified in 25.226 (d)(2). Coordination will be performed if closer operation needed.





The Thinsat BUC is autonomously turned off when:

- (1) ThinSat 300 GPS indicates that the remote is within the NASA or NSF sites,  
and
- (2) VMES transmit frequency is within the prohibited transmit frequency range.

A waiver is requested to not perform coordination unless operation is planned within the specified coordination zone and on the shared frequencies.



## 4.12 Position Location Technology

(e) VMES licensees shall use **Global Positioning Satellite-related** or other similar position location technology to ensure compliance with paragraphs (c) and (d) of this section.

The Thinsat300 utilizes GPS for position location.

## 4.13 Protection

(a)(8) A VMES terminal receiving in the 10.95–11.2 GHz (space-to-Earth), 11.45–11.7 GHz (space-to-Earth) and 11.7–12.2 GHz (space-to-Earth) bands shall receive protection from interference caused by space stations other than the target space station only to the degree to which harmful interference would not be expected to be caused to an earth station employing an antenna conforming to the referenced patterns defined in § 25.209(a) and (b) and stationary at the location at which any interference occurred.

Thinkom understands and accepts (a)(8) of FCC25.226.



## 5 APPENDIX

### 5.1 Link budget

#### Digital Link Budget

Intellicom Technologies ([www.ITCcom.net](http://www.ITCcom.net))

Sunday, July 22, 2012

Service Name	Thinsat 300 Uplink w/CDM600
Coverage	LA Uplink
Uplink earth station	Thinsat300, Los Angeles
Downlink earth station	Ellenwood Station, GA
Satellite name	Horizons-1

Link Input Parameters	Up	Down	Units
Site latitude	34N	33.7N	degrees
Site longitude	118.3W	84.4W	degrees
Site altitude	0	0	km
Frequency	14.25	11.95	GHz
Polarization	Vertical	Horizontal	
Rain model	Crane (F)	Crane (D3)	(mm/h or zone)
Availability (average year)	99.75	99.75	%
Antenna aperture	1	11	metres
Antenna efficiency / gain	+36	+60.4	% (+ prefix dBi)
Coupling loss	0	0	dB
Antenna tracking / mispoint error	0.5	0.5	dB
LNB noise figure / temp		+110	dB (+ prefix K)
Antenna noise		50	K
Adjacent carrier interference	20	20	dB
Adjacent satellite interference	20	20	dB
Cross polarization interference	35	35	dB
Uplink station HPA output back-off	0		dB
Number of carriers / HPA	1		
HPA C/IM (up)	50		dB
Uplink power control	0		dB
Uplink filter truncation loss	0		dB
Required HPA power capability	MIN		W



Satellite Input Parameters	Value	Units
Satellite longitude	127.00W	degrees
Transponder type	TWTA	
Receive G/T	5	dB/K
Saturation flux density	-93.5	dBW/m2
Satellite attenuator pad	5	dB
Satellite ALC	0	dB
EIRP (saturation)	50.6	dBW
Transponder bandwidth	36	MHz
Input back off total	6	dB
Output back off total	3.5	dB
Intermodulation interference	14.8	dB
Number of transponder carriers	AUTO	

Carrier/Link Input Parameters	Value	Units
Modulation	4-PSK	
Required bit error rate performance	10 <sup>-6</sup>	
Required Eb/No without FEC coding	10.53	dB
Required Eb/No with FEC coding	2.9	dB
Information rate	10	Mbps
Overhead	0	%
FEC code rate	0.5	
Spreading gain	0	dB
Reed Solomon code (1 + Roll off factor)	1.2	
Carrier spacing factor	1.4	
Bandwidth allocation step size	.01	MHz
System margin	1.	dB

Calculations at Saturation	Value	Units
Gain 1m <sup>2</sup>	44.53	dB/m2
Uplink C/No	100.57	dB.Hz
Downlink C/No	111.02	dB.Hz
Total C/No	100.19	dB.Hz
Uplink EIRP for saturation	74.66	dBW

General Calculations	Up	Down	Units
Elevation	49.39	30.27	degrees
True azimuth	195.30	238.89	degrees
Compass bearing	182.14	243.89	degrees
Path distance to satellite	37115.69	38587.04	km
Propagation time delay	0.123804	0.128712	seconds
Antenna efficiency	17.85	57.79	%
Antenna gain	36.00	60.40	dBi
Availability (average year)	99.75	99.75	%
Link downtime (average year)	21.915	21.915	hours
Availability (worst month)	99.147	99.147	%
Link downtime (worst month)	6.234	6.234	hours
Spectral power density	-57.12	-42.68	dBW/Hz



<b>Uplink Calculation</b>	<b>Clear</b>	<b>Rain Up</b>	<b>Rain Dn</b>	<b>Units</b>
Uplink transmit EIRP	49.67	49.67	49.67	dBW
Transponder input back-off (total)	6.00	6.00	6.00	dB
Input back-off per carrier	24.99	25.62	24.99	dB
Mispoint loss	0.50	0.50	0.50	dB
Free space loss	206.92	206.92	206.92	dB
Atmospheric absorption	0.09	0.09	0.09	dB
Tropospheric scintillation fading	0.19	0.19	0.19	dB
Atmospheric losses total	0.28	0.28	0.28	dB
Total path loss (excluding rain)	207.20	207.20	207.20	dB
Rain attenuation	0.00	0.63	0.00	dB
Uplink power control	0.00	0.00	0.00	dB
Uncompensated rain fade	0.00	0.63	0.00	dB
C/No (thermal)	75.58	74.95	75.58	dB.Hz
C/N (thermal)	4.79	4.16	4.79	dB
C/ACI	20.00	19.37	20.00	dB
C/ASI	20.00	19.37	20.00	dB
C/XPI	35.00	34.37	35.00	dB
C/IM	50.00	50.00	50.00	dB
Eb/(No+Io)	5.32	4.69	5.32	dB
<b>Downlink Calculation</b>	<b>Clear</b>	<b>Rain Up</b>	<b>Rain Dn</b>	<b>Units</b>
Satellite EIRP total	50.60	50.60	50.60	dBW
Transponder output back-off (total)	3.50	3.50	3.50	dB
Output back-off per carrier	22.49	23.12	22.49	dB
Satellite EIRP per carrier	28.11	27.48	28.11	dBW
Mispoint loss	0.50	0.50	0.50	dB
Free space loss	205.72	205.72	205.72	dB
Atmospheric absorption	0.13	0.13	0.13	dB
Tropospheric scintillation fading	0.19	0.19	0.19	dB
Atmospheric losses total	0.31	0.31	0.31	dB
Total path loss (excluding rain)	206.04	206.04	206.04	dB
Rain attenuation	0.00	0.00	3.82	dB
Noise increase due to precipitation	0.00	0.00	3.01	dB
Downlink degradation (DND)	0.00	0.00	6.83	dB
Total system noise	160.00	160.00	319.93	K
Figure of merit (G/T)	37.86	37.86	34.85	dB/K
C/No (thermal)	88.53	87.90	81.70	dB.Hz
C/N (thermal)	17.74	17.11	10.91	dB
C/ACI	20.00	19.37	20.00	dB
C/ASI	20.00	19.37	20.00	dB
C/XPI	35.00	34.37	35.00	dB
C/IM	14.80	14.17	14.80	dB
Eb/(No+Io)	12.32	11.69	9.50	dB



<b>Totals per Carrier (End-to-End)</b>	<b>Clear</b>	<b>Rain Up</b>	<b>Rain Dn</b>	<b>Units</b>
C/No (thermal)	75.36	74.73	74.63	dB.Hz
C/N (thermal)	4.57	3.94	3.84	dB
C/ACI	16.99	16.36	16.99	dB
C/ASI	16.99	16.36	16.99	dB
C/XPI	31.99	31.36	31.99	dB
C/IM	14.80	14.17	14.80	dB
C/(No+Io)	74.53	73.90	73.91	dB.Hz
C/(N+I)	3.74	3.11	3.12	dB
Eb/(No+Io)	4.53	3.90	3.91	dB
System margin	1.00	1.00	1.00	dB
Net Eb/(No+Io)	3.53	2.90	2.91	dB
Required Eb/(No+Io)	2.90	2.90	2.90	dB
Excess margin	0.63	0.00	0.01	dB
<b>Earth Station Power Requirements</b>	<b>Value</b>			<b>Units</b>
EIRP per carrier	49.67			dBW
Antenna gain	36.00			dBi
Antenna feed flange power per carrier	13.67			dBW
Uplink power control	0.00			dB
HPA output back off	0.00			dB
Waveguide loss	0			dB
Filter truncation loss	0			dB
Number of HPA carriers	1			
Total HPA power required	13.6739			dBW
Required HPA power capability	23.3020			W
Spectral power density	-57.12			dBW/Hz
<b>Space Segment Utilization</b>	<b>Value</b>			<b>Units</b>
Overall link availability	99.501			%
Information rate (inc overhead)	10.0000			Mbps
Transmit rate	20.0000			Mbps
Symbol rate	10.0000			Mbaud
Occupied bandwidth	12.0000			MHz
Noise bandwidth	70.79			dB.Hz
Minimum allocated bandwidth required	14.0000			MHz
Allocated transponder bandwidth	14.0000			MHz
Percentage transponder bandwidth used	38.89			%
Used transponder power	28.11			dBW
Percentage transponder power used	1.26			%
Max carriers by transponder bandwidth	2.57			
Max carriers by transponder power	79.26			
Max transponder carriers limited by:-	Bandwidth			[2.57]



## 5.2 Antenna EIRP PSD Patterns

EIRP Power Spectral Density (PSD) is shown for:

- Frequencies 14.05, 14.25, 14.45 GHz
- Elevation angles 20, 30, 45, 60, 70 degrees (Scan 70 60 45 30 20)
- Skew angles 10, 30, 50

Vertical and Horizontal polarization results are identical.

The following table shows the maximum PSD for each scenario.

				Skew>>>		
				10	30	50
				Max TX PSD dBW/4kHz	Max TX PSD dBW/4kHz	Max TX PSD dBW/4kHz
				Out of Antenna	Out of Antenna	Out of Antenna
File Name	Freq	Elevation	Scan			
FCC.table.scan20.f14.05	14.05	70	20	15.7	16.6	14.2
FCC.table.scan30.f14.05	14.05	60	30	14.4	16.1	15.0
FCC.table.scan45.f14.05	14.05	45	45	16.5	15.8	13.2
FCC.table.scan60.f14.05	14.05	30	60	18.3	17.1	14.7
FCC.table.scan70.f14.05	14.05	20	70	17.5	16.0	13.7
FCC.table.scan20.f14.25	14.25	70	20	15.5	16.7	14.5
FCC.table.scan30.f14.25	14.25	60	30	16.3	14.7	15.0
FCC.table.scan45.f14.25	14.25	45	45	15.4	15.0	12.6
FCC.table.scan60.f14.25	14.25	30	60	18.3	16.6	15.2
FCC.table.scan70.f14.25	14.25	20	70	17.6	16.6	14.2
FCC.table.scan20.f14.45	14.45	70	20	15.4	14.9	15.1
FCC.table.scan30.f14.45	14.45	60	30	15.8	13.5	13.0
FCC.table.scan45.f14.45	14.45	45	45	15.8	15.2	14.7
FCC.table.scan60.f14.45	14.45	30	60	18.4	17.0	15.0
FCC.table.scan70.f14.45	14.45	20	70	17.8	16.4	14.5

Both the Rx and Tx antennas in ThinSat generate unique radiation patterns compared to traditional on-axis antennas. In the latter, the antenna mechanically points at its intended target and radiates symmetric radiation patterns; these class of antennas can be characterized succinctly in a far-field range by just two E/H-plane pattern cuts.

In the case of ThinSat, the antenna's mechanical normal generally does not point towards the target satellite but instead relies on mechanical rotation of its platters to electronically phase its mainbeam towards the target satellite. Also, ThinSat's radiated patterns do not exhibit symmetry of any kind; this means traditional far-field E/H-plane pattern cuts cannot sufficiently characterize its antenna patterns and instead, only full hemispherical pattern data from a NF range can provide



sufficient data to generate projected GeoPlane pattern cuts. For all these reasons, the pattern data and GeoPlane cuts supplied in this filing will differ markedly from those of previous VMES filings. That is, for ThinSat, actual GeoPlane co-pol/cross-pol cuts calculated from full hemispherical NF pattern data are supplied in lieu of far-field E/H-plane cuts. This methodology ultimately provides much more accurate GeoPlane cuts than traditional methods used for on-axis type antennas.

The ThinSat Tx antenna utilizes an adjustable gridline polarizer to align the antenna's natural polarization with that of the target satellite's projected H/V-polarized fields (as projected onto the face of the Tx aperture). The amount of twisting or adjusting required depends on the elevation scan, skew angle, and transponder polarization. Because there exists an infinite combination of these parameters, it is impossible to supply all possible projected H/V-pol responses available from ThinSat and we have instead supplied the representative subset contained in this filing as co-pol and cross-pol responses. These reported co-pol numbers are analogous to the co-polarized H/H or V/V response taken in a traditional far-field range (while cross-pol is akin to H/V or V/H), but adjusted to account for variable skew angles.





### 5.2.1 14.25 GHz

Sample graphical plots are shown for 14.25 GHz.

Tabular data is included in a later appendix for 14.05, 14.25, 14.45 GHz.

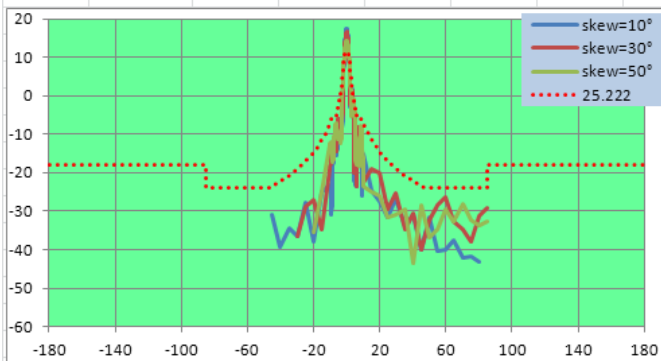


# 14.25 GHz, Elevation= 20, Scan= 70 degrees

Skew	10°	30°	50°
Max PSD Main Beam Out	17.6	16.6	14.2

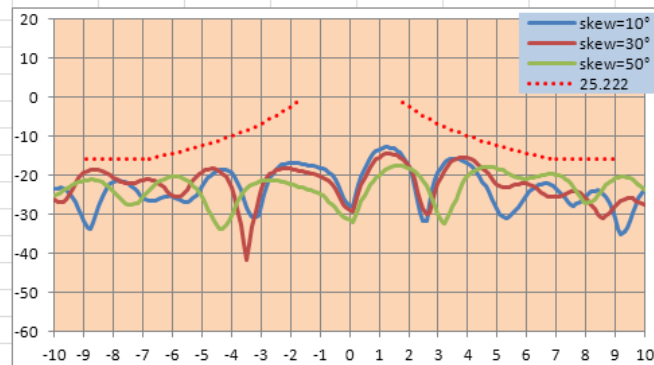
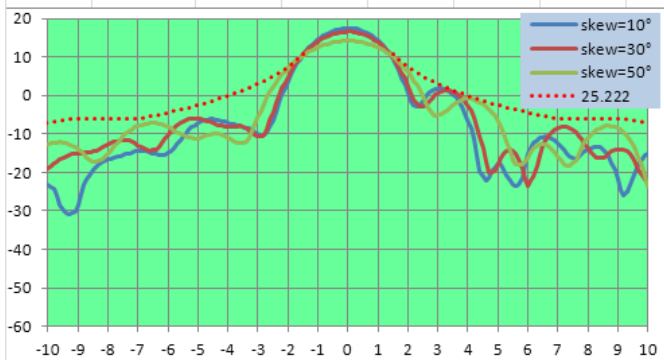
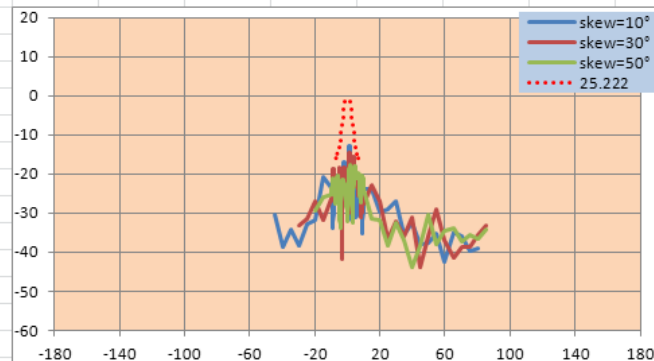
**GSO (Azimuth)**

EPRP PSD (dBW/4kHz) vs Angle (degrees)



**Cross Polarization (GSO)**

EPRP PSD (dBW/4kHz) vs Angle (degrees)



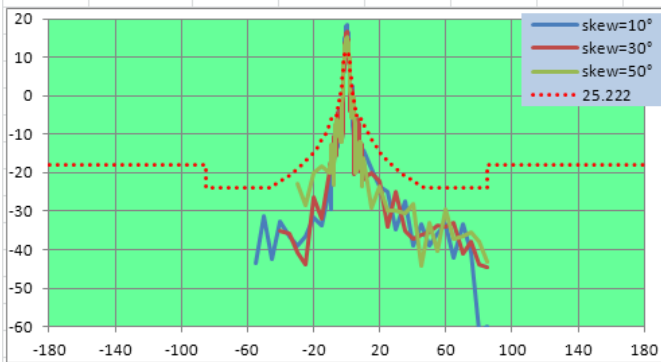


# 14.25 GHz, Elevation= 30, Scan= 60 degrees

Skew	10°	30°	50°	
Max PSD Main Beam Out	18.3	16.6	15.2	dBW/4kHz

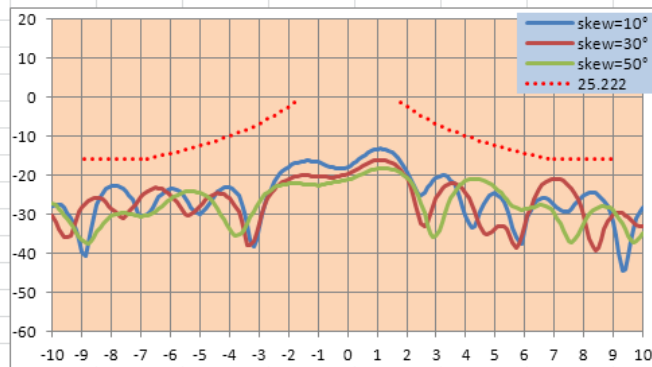
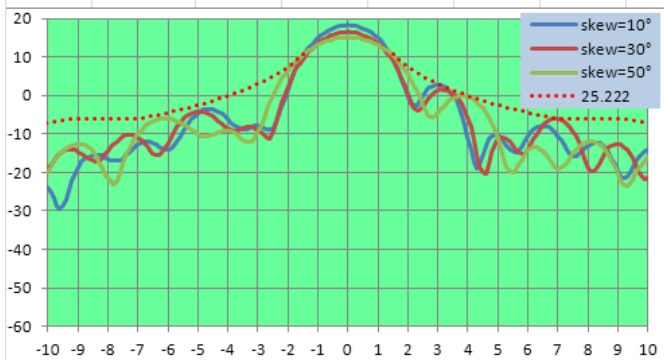
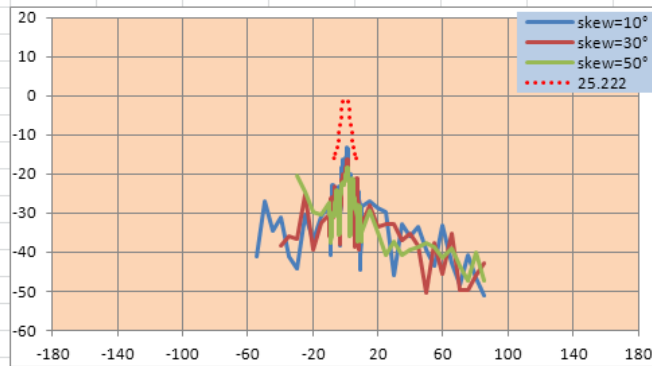
**GSO (Azimuth)**

EPRP PSD (dBW/4kHz) vs Angle (degrees)



**Cross Polarization (GSO)**

EPRP PSD (dBW/4kHz) vs Angle (degrees)



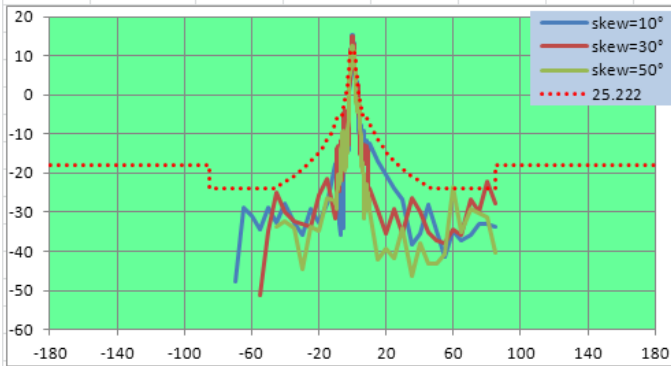


# 14.25 GHz, Elevation= 45, Scan= 45 degrees

Skew	10°	30°	50°
Max PSD Main Beam Out	15.4	15.0	12.6 dBW/4kHz

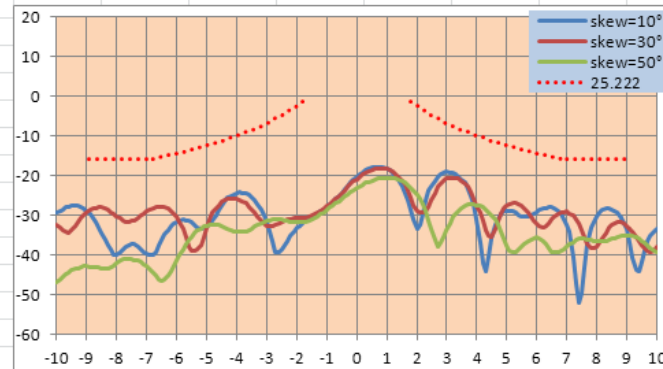
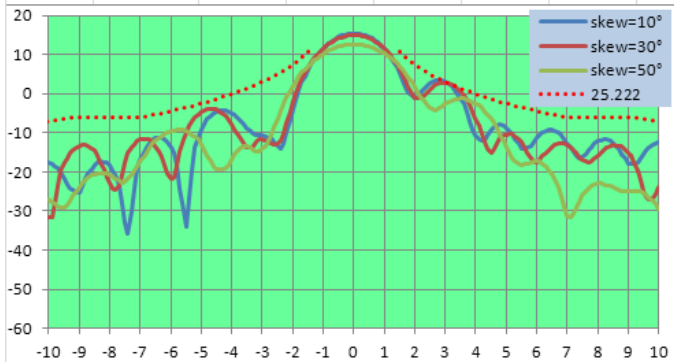
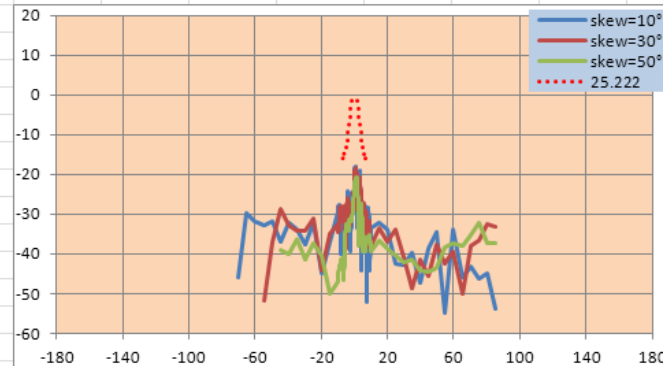
**GSO (Azimuth)**

EPRP PSD (dBW/4kHz) vs Angle (degrees)



**Cross Polarization (GSO)**

EPRP PSD (dBW/4kHz) vs Angle (degrees)



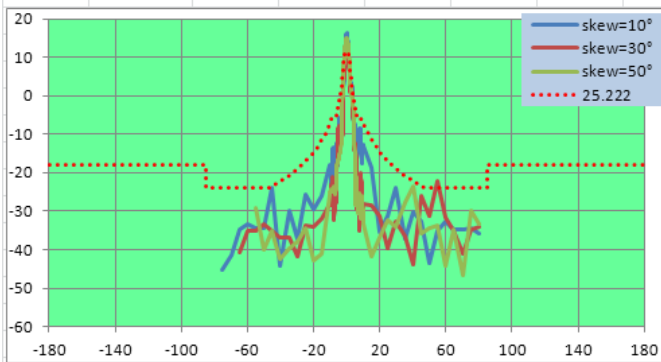


# 14.25 GHz, Elevation= 60, Scan= 30 degrees

Skew	10°	30°	50°	
Max PSD Main Beam Out	16.3	14.7	15.0	dBW/4kHz

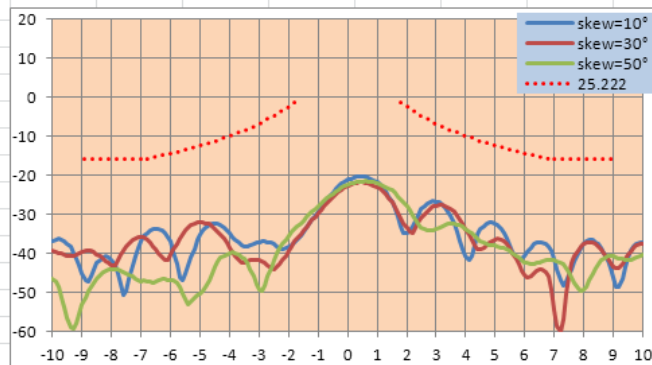
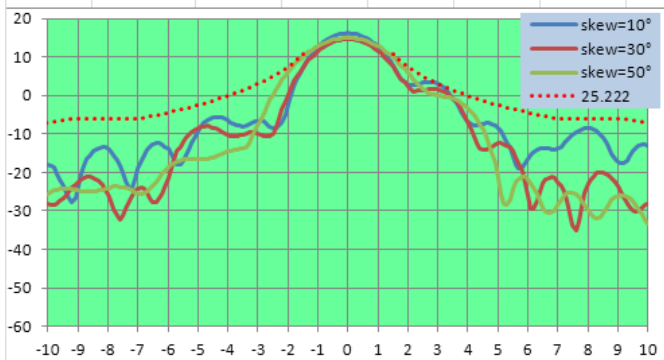
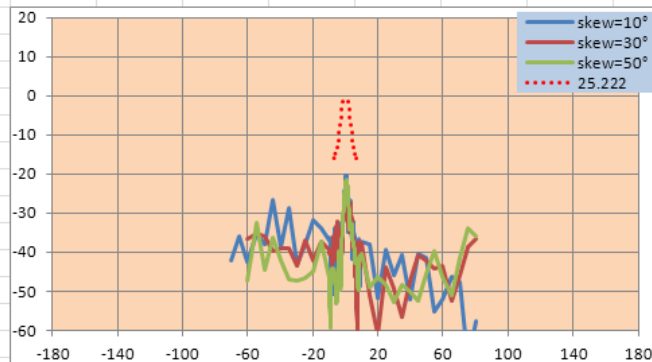
**GSO (Azimuth)**

EPRP PSD (dBW/4kHz) vs Angle (degrees)



**Cross Polarization (GSO)**

EPRP PSD (dBW/4kHz) vs Angle (degrees)



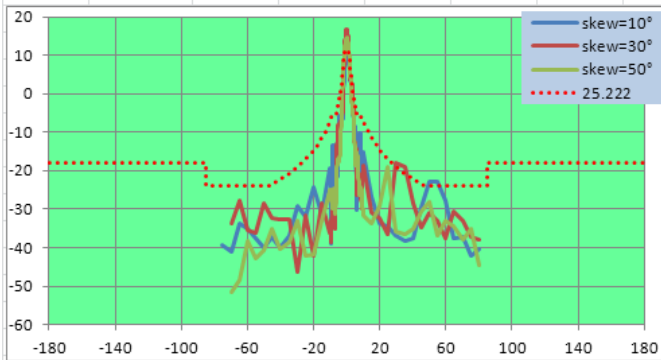


# 14.25 GHz, Elevation= 70, Scan= 20 degrees

Skew	10°	30°	50°	
Max PSD Main Beam Out	15.5	16.7	14.5	dBW/4kHz

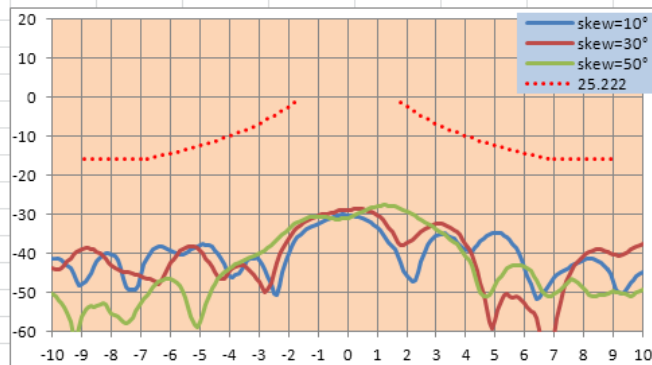
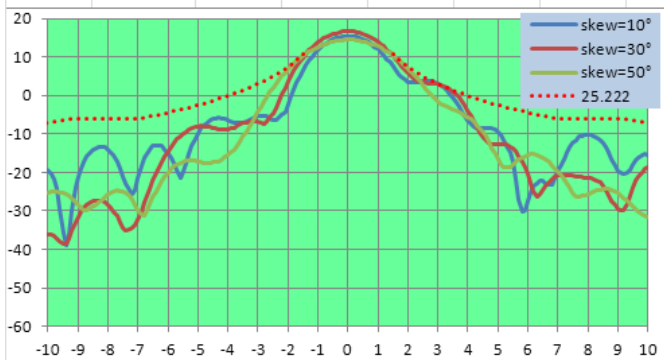
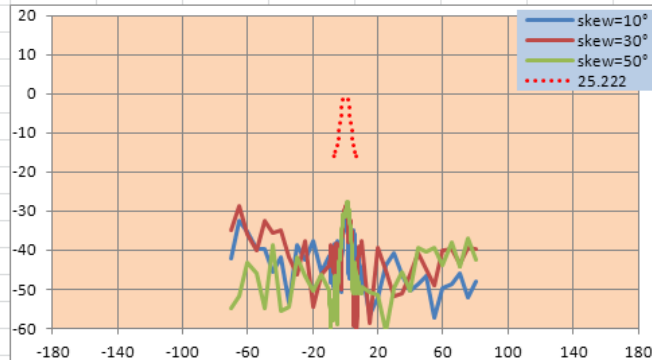
**GSO (Azimuth)**

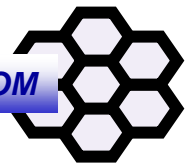
EPRP PSD (dBW/4kHz) vs Angle (degrees)



**Cross Polarization (GSO)**

EPRP PSD (dBW/4kHz) vs Angle (degrees)





## 5.3 TS300 Brochure

# thinSat® 300

*Conformal VSAT Connectivity... Instant and on the Move!*

**General Information**

**Total Weight:** 93 lbs. (42 Kg, Including BUC/SSPA)  
**Size:** 58" x 39" x 4.3"  
 (150 cm x 100 cm x 11 cm)  
**Polarization:** Dual Tracking Linear  
**Transmit Band:** (13.75) 14.0-14.5 GHz  
**Receive Band:** (10.95-11.70) 11.70-12.75 GHz  
**G/T (mid-band):** 10-13 dB/K (8 dB/K at 20° Elev)  
**EIRP:** 47-50 dBW (45 dBW at 20° Elev, 25 W BUC)  
**Interoperability:** Equiv. to 88 cm x 36 cm Parabolic

**Acquisition and Track**

**Initial Acquisition:** 60 seconds (Cold-Start with GPS)  
**Re-acquisition after 3 minute blockage:** 1 second  
**Track Speed/Agility:** 100"/sec, 300"/sec<sup>2</sup>

**Environmental**

**Operational Temperature:** -30°C to +55°C  
**Storage Temperature:** -30°C to +70°C

**Mounting Specifications**

**Rack-Mount compatible:** 36" to 44" (90 cm to 110 cm)

**Voltage / Power**

12 VDC (220 W Avg., 295 W Peak w/ 25 W BUC/SSPA)

**Cabling**

**IF Interface:** 75 Ohm N-type (Transmit & Receive)  
**Data Interface:** Ethernet (RJ45)

**Controller**

Fully Integrated

**BUC/SSPA (Internal)**

8 W standard; also available 16, 25 and 40 W

**Features and Benefits**

**Lowest Profile**

- 40% to 65% Lower Profile than Competing OTM Products
- Lowest Cost...Lowest Drag...Lowest Visibility Installation

**Lowest Operating Costs**

- 3x to 10x Higher Spectral (MB/\$) Efficiency than Competing OTM Products
- Return Link Equivalent to 88 cm x 36 cm (35" x 14") "Pop-Up" Parabolic
- NO SPREADING REQUIRED!

**Highest Data Rates**

- 4x to 10x Higher Return Link Data Rates than Competing OTM Products
- 49 to 52 dBW EIRP with Internal 40 W BUC (56 to 59 dBW External)
- HD Back-Haul Capable!

**Broadest World-wide Coverage and Availability**

- 40% to 60% Larger Scan Volume than Competing OTM Products
- Full International (Ku-Band) Frequency Coverage
- All-Latitude Availability with Full Equatorial, High-Skew, and Near-Zenith Ops

**Always-on...On-the-Move!**

- Agile Proprietary Closed-Loop Tracker
- Instant-on...No Setup...No Takedown

**Users and Applications**

**Government**

- Disaster Recovery, ICE, FEMA, DHS Mobile Field Ops
- First Responders
- Instant-On...No Setup...No Takedown

**First Responders**

- In-Pursuit, In-Route, and On-Scene

**Transportation**

- Safety/Surveillance/Security, Trains, Public Transit

**Enterprise/Commercial**

- SNG, Oil & Gas, Insurance, Security, Utilities

**Mobile Broadband Communication ...Anywhere**

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A Revolution in Antennas™

Receive Antenna      Integrated 8 to 40 W BUC (Internal)  
(200 W External)

Antenna Control Unit      Transmit Antenna

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## 5.4 Comtech Modem Brochure

### CDM-570/L & CDM-570/L-IP Satellite Modems Modems



#### Overview

The CDM-570 and the CDM-570L are Comtech EF Data's entry-level satellite modems that provide industry leading performance and flexibility in a 1 RU package at a very competitive price. Designed to address the market for low-cost terminals, the modems are available with 70/140 MHz or L-Band IF and EIA-530/-422, V.35, EIA-232 and G.703 data interfaces. An optional Internet Protocol (IP) Module with 10/100Base-T Ethernet port is available for IP-centric applications.

#### Features

- Data rate range from 2.4 kbps to 9.98 Mbps
- CDM-570 & CDM-570-IP: 50 to 90 or 100 to 180 MHz IF range
- CDM-570L & CDM-570L-IP: 950 to 2000 MHz IF range
- Modulation types: BPSK, QPSK, OQPSK, 8PSK, Patented 8-QAM, 16-QAM
- Forward Error Correction (FEC) choices include Turbo Product Code (TPC), Viterbi, Reed-Solomon, and Trellis Coded Modulation (TCM)
- Data Interfaces: EIA-422/530, V.35, G.703 T1/E1 (option), 10/100Base-T Ethernet (option)
- Standards based management via SNMP, Web, or Telnet
- Symmetric as well as asymmetric operation for maximum bandwidth efficiency
- Support for mesh, star and hybrid network topologies
- G.703 clock extension for IP backhaul (option)
- Fast acquisition demodulator ( $\pm 32$  kHz acquisition range, 64 kbps, Rate 1/2 QPSK: 150 ms average)
- Automatic Uplink Power Control (AUPC)
- Embedded Distant-end Monitor and Control (EDMAC/EDMAC2)
- Redundancy options
- CDM-570 & CDM-570-IP: FSK communications to CSAT-5060 or KST-2000A
- CDM-570L & CDM-570L-IP: 10 MHz reference for BUC, FSK communications and optional BUC power supply
- CDM-570L & CDM-570L-IP: 10 MHz reference and power supply for LNB
- Optional, integrated IP Module with 10/100Base-T Ethernet port (CDM-570-IP and CDM-570L-IP)
  - Static IP routing for unicast and multicast
  - Header and payload compression for maximum efficiency
  - IGMP v1 and v2
  - VLAN capability with 802.1Q compliant QoS
  - Vipersat Management System (VMS) integration

#### Typical Users

- Enterprise
- Internet Service Providers
- Satellite Service Providers
- Offshore & Maritime
- Mobile Operators

#### Common Applications

- Mobile Backhaul
- Communications on-the-Move
- Disaster Recovery & Emergency Communications
- Enterprise
- Offshore & Maritime Communications
- Satellite News Gathering

#### Turbo Product Coding

The optional Turbo Product Codec delivers significant performance improvement when compared to Viterbi with concatenated Reed-Solomon. It offers increased coding gain, lower decoding delay, and significant bandwidth savings compared to traditional FEC.

#### EDMAC & AUPC Operation

The CDM-570/L-IP has the ability to monitor and control the distant end of a point-to-point satellite link using EDMAC or EDMAC2. User data is framed and bits are added to pass control, status, and AUPC information. This is transparent to the user.

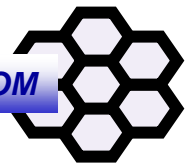
#### Management

The modems support SNMP, web-based and command line interfaces for management. The modems can also be configured and monitored from the front panel, or through the remote M&C port (for non-IP mode of operation). Ten complete RF configurations may be stored in the modem. An event log stores alarm and status information in non-volatile RAM, while the link statistics log stores link performance (Eb/No and AUPC performance) for monitoring and reporting purposes.



[www.comtecheffdata.com](http://www.comtecheffdata.com)





### G.703 Clock Extension

Mobile networks require precise synchronization of base stations, which is a challenge when using IP backhaul. Most operators are forced to use GPS-based external equipment for site synchronization. CDM-570/L-IP offers a G.703 clock extension option that propagates a high stability reference from hub to the remote. This process does not require additional bandwidth.

### FAST Feature Enhancements

The FAST codes make it easy to upgrade the modem capability in the field. New features can be added on site, using FAST access codes purchased from Comtech EF Data that can be entered via the front panel.

### IP Module

With its innovative architecture and support for advanced capabilities, IP Module-equipped versions of the CDM-570/L allow for efficient IP networking and transport over satellite. The CDM-570/L-IP supports a wide range of applications and network topologies.

### Header Compression Option

Configurable on a per route basis, header compression reduces the bandwidth required for VoIP by as much as 60%. Example: A G.729 voice codec, operating at 8 kbps, requires 32 kbps bandwidth once encapsulated into an IP/UDP/RTP frame. With compression, the same voice call needs only 10.8 kbps total WAN satellite bandwidth. Typical Web/HTTP traffic can also be reduced by 10% via IP/TCP header compression.

### Payload Compression Option

Configurable on a per route basis, payload compression can reduce the required satellite bandwidth by up to 40%.

### Quality of Service (QoS) Option

The modems support multi-level QoS to reduce jitter and latency for real time traffic, provides priority treatment to mission critical applications and allows non-critical traffic to use the remaining bandwidth. Supported modes are:

- DiffServ – Industry-standard method of providing QoS enabling seamless co-existence in networks that implement DiffServ.
- Max/Priority – Provides eight levels of traffic prioritization with the ability to limit maximum traffic per priority class
- Min/Max – Provides a Committed Information Rate (CIR) to each user defined class of traffic with the ability to allow a higher burstable rate depending on availability

### Vipersat Management System

- Dynamic SCPC carrier allocation & true bandwidth-on-demand
- User-defined policies for upstream carrier switching
- Star and full mesh capabilities using single hop on-demand
- Advanced switching takes advantage of using other modulation/forward error correction combinations
- Guaranteed bandwidth capability

### VMS Network & Bandwidth Management

A Vipersat-powered network integrates these advanced modems with a powerful network management tool, the Vipersat Management System (VMS). In addition to the traditional monitoring and control of the CDM-570/L-IP modems and the CDD-564/L and CDD-562L demodulators, the VMS allows these devices to share bandwidth, and when needed, switch automatically to a dedicated SCPC channel. In a Vipersat-powered network, the CDM-570/L-IP modem takes advantage of its fast acquisition demodulation to allow it to operate in a shared mode. Inbound transmissions (from remote to hub) can be switched from a shared Selective Time Division Multiple Access (STDMA) mode to a dedicated Single Carrier Per Channel (SCPC) connection via a variety of user defined policies or triggers. This enables the network to more effectively handle real-time connection-oriented applications and reduces both latency and network congestion. Through VMS, dynamic point-to-point mesh connections can also be established between remotes.

### Upstream Switching

Through protocol classification in the remote terminals, the modem initiates automatic switching. VMS establishes dSCPC bandwidth based on policies that can be individually enabled on a per-remote basis, or globally enabled. Policies can be configured for a variety of applications such as VoIP, video (VTC), or based on a load, or via a schedule, Type of Service (ToS), or QoS rules such as IP port or IP address and protocol type. Operators are able to set minimum and maximum data rates for each remote as well as excess data rates for an initial upstream switch.

### Vipersat Operation Mode

Vipersat operation is enabled via a FAST feature code. Networks can easily start off in point-to-point or point-to-multipoint configurations. As the network grows and users wish to take advantage of the bandwidth on-demand savings by implementing a Vipersat network, modems can easily be upgraded to Vipersat mode. Vipersat mode provides for the ability to operate in the following modulation/FEC rates:

STDMA	QPSK, Rate 3/4 Turbo FEC – all STDMA modes Data Rate Range: 64 kbps – 4.5 Mbps BPSK, Rate 5/16 Turbo FEC – Entry Channel Mode only Data Rate Range: 32 kbps to 937 kbps
SCPC	All Turbo Product Code FEC rates as detailed in the following specifications



**Specifications**

Frequency Range	CDM-570 & CDM-570-IP: 50 to 90 or 100 to 180 MHz, 100 Hz resolution CDM-570L & CDM-570L-IP: 950 to 2000 MHz, 100 Hz resolution	
Data Interfaces	EIA-422/-530 DCE, V.35 DCE, Sync EIA-232, 10/100Base-T Ethernet (option), G.703 T1 balanced (option), G.703 E1 balanced or unbalanced (option)	
Data Rate Range (See user manual for details)	2.4 kbps to 9.98 Mbps (depending on modulation, FEC and framing), 1 bps step with fully independent TX and RX rates	
<b>Modulation &amp; FEC</b>	<b>Data Rate Range</b>	
5/16 BPSK TPC	2.4 kbps to 0.937 Mbps	
21/44 BPSK TPC	2.4 kbps to 1.430 Mbps	
1/2 BPSK	2.4 kbps to 1.500 Mbps	
1/2 QPSK/OQPSK	4.8 kbps to 3.000 Mbps	
3/4 QPSK/OQPSK	7.2 kbps to 4.500 Mbps	
7/8 QPSK/OQPSK	8.4 kbps to 5.250 Mbps	
2/3 8PSK TCM	8.7 kbps to 4.400 Mbps	
21/44 QPSK/OQPSK TPC	4.8 kbps to 2.980 Mbps	
3/4 QPSK/OQPSK TPC	7.2 kbps to 4.500 Mbps	
7/8 QPSK/OQPSK TPC	8.4 kbps to 5.250 Mbps	
0.95 QPSK/OQPSK TPC	9.1 kbps to 5.666 Mbps	
3/4 8PSK/8-QAM TPC	10.8 kbps to 6.750 Mbps	
7/8 8PSK/8-QAM TPC	13.6 kbps to 7.875 Mbps	
0.95 8PSK/8-QAM TPC	15.3 kbps to 8.500 Mbps	
3/4 16-QAM TPC	14.4 kbps to 9.000 Mbps	
7/8 16-QAM TPC	16.8 kbps to 9.980 Mbps	
Uncoded BPSK	4.8 kbps to 3.000 Mbps	
Uncoded QPSK/OQPSK	9.6 kbps to 5.000 Mbps	
<b>Note:</b> Data rate specifications reflect CDM-570/L or CDM-570/L-IP modem operating in non-Vipersat mode		
Scrambling	Mode dependent – ITU V.35, or proprietary externally synchronized	
FEC Options		
Viterbi	Rate 1/2 BPSK, QPSK/OQPSK Rate 3/4 and 7/8 QPSK/OQPSK and 16-QAM w/RS	
TCM	8PSK 2/3 (Closed network – not IESS-310)	
Turbo Product Coding	Rate 21/44 BPSK, 5/16 BPSK, Rate 21/44 QPSK/OQPSK Rate 3/4 and Rate 7/8 QPSK/OQPSK, 8PSK/8-QAM and 16-QAM Rate 0.95 QPSK/OQPSK and 8PSK/8-QAM	
Reed-Solomon	Proprietary 220/200 and 200/180 modes available	
Uncoded	BPSK, QPSK/OQPSK	
M&C Interface	EIA-232, EIA-485 (2- or 4-wire), Ethernet 10/100Base-T (dependent on operational mode)	
Input/Output Impedance	CDM-570 & CDM-570-IP: matched for 50/75 Ω, BNC connector CDM-570L & CDM-570L-IP: transmit and receive 50 Ω, female Type N connector	
External Reference Input	1, 2, 5, 10 or 20 MHz, BNC connector	
Form C Relays	TX, RX traffic alarms and unit faults	

**Modulator**

	CDM-570 & CDM-570-IP	CDM-570L & CDM-570L-IP
Frequency Stability	±1 ppm, 0° to 50°C (32° to 122°F)	±0.06 ppm, 0° to 50°C (32° to 122°F)
Output Power	0 to -25 dBm, 0.1 dB steps	0 to -40 dBm, 0.1 dB steps
Accuracy	± 0.5 dB over frequency and temperature	± 1.0 dB over frequency and temperature
Phase Noise	< 0.75 degrees RMS double-sided, 100 Hz to 1 MHz	< 1.2 degrees RMS double-sided, 100 Hz to 1 MHz
Output Spectrum/Filtering	Meets IESS-308/-309 power spectral mask	
Harmonics and Spurious	< -55 dBc/4 kHz (typically < -60 dBc/4 kHz)	
Transmit On/Off Ratio	55 dB minimum	
External TX Carrier Off	By TTL LOW signal, or RTS	
TX Clock Options	Internal (SCT), external (TT), loop timing with symmetric or asymmetric operation (data interface dependent)	

**Demodulator**

	CDM-570 & CDM-570-IP	CDM-570L & CDM-570L-IP
Input Power Range	-30 to -60 dBm	-130 + 10 log symbol rate, dBm (minimum) -90 + 10 log symbol rate, dBm (maximum)
Max Composite Level	+35 dBc, up to -5 dBm absolute max.	+40 dBc, up to -10 dBm absolute max.
Acquisition Range	± 1 to ± 32 kHz, 1 kHz step	± 1 to ± 32 kHz, 1 kHz step, symbol rate <= 625 kbps ± 1 to ± 200 kHz, 1 kHz step, symbol rate > 625 kbps
Acquisition Time	Highly dependent on data rate, FEC rate, and demodulator acquisition range. Example: 120 ms average at 64 kbps, Rate 1/2 QPSK, ± 10 kHz acquisition sweep range, 6dB Eb/No	
Receive Buffer	512, 1024, 2048, 4096, 8192, or 16384 bits	
Receive Clock Options	Buffer disabled (RX satellite), buffer enabled (symmetric or asymmetric operation) (data interface dependent)	
Clock Tracking	± 100 ppm minimum	
Monitor Functions	E <sub>u</sub> /N <sub>u</sub> , frequency offset, BER, buffer fill status, RX signal level	

**Example BER Performance**

For symbol rates up to 2.5 Msps (See user's manual for higher symbol rates). Guaranteed E<sub>u</sub>/N<sub>u</sub>, in dB (typical values in parentheses) with two adjacent carriers 7 dB higher. (See the user's manual for a complete listing of the performance of all FEC types, code rates, and modulation types.)

<b>Viterbi</b>	1/2	3/4	7/8
<b>BPSK, QPSK/OQPSK</b>			
10 <sup>-5</sup>	5.4 (4.9)	6.8 (6.3)	7.7 (7.2)
10 <sup>-7</sup>	6.7 (6.2)	8.2 (7.7)	9.0 (8.6)
<b>Viterbi &amp; Concatenated Reed-Solomon 220/200 or 200/180</b>			
<b>BPSK, QPSK/OQPSK</b>	1/2	3/4	7/8
10 <sup>-5</sup>	4.3 (4.0)	5.6 (4.7)	6.5 (6.0)
10 <sup>-7</sup>	4.5 (4.2)	6.0 (5.2)	6.9 (6.5)
<b>Turbo Product Codec</b>			
<b>BPSK</b>	5/16	21/44	
10 <sup>-4</sup>	2.4 (2.1)	2.8 (2.5)	
10 <sup>-7</sup>	2.6 (2.3)	3.1 (2.8)	
10 <sup>-9</sup>	2.7 (2.4)	3.3 (2.9)	
<b>QPSK/OQPSK</b>	21/44	3/4	7/8
10 <sup>-4</sup>	2.9 (2.6)	3.8 (3.4)	4.3 (4.0)
10 <sup>-7</sup>	3.3 (2.8)	4.4 (4.0)	4.5 (4.2)
<b>8PSK</b>	3/4	7/8	0.95
10 <sup>-4</sup>	6.2 (5.8)	7.0 (6.6)	9.3 (8.9)
10 <sup>-7</sup>	6.8 (6.3)	7.2 (6.8)	10.3 (9.9)
<b>8-QAM</b>	3/4	7/8	0.95
10 <sup>-4</sup>	6.5 (6.1)	6.6 (6.2)	9.6 (9.2)
10 <sup>-7</sup>	7.2 (6.8)	6.8 (6.4)	10.6 (10.2)
<b>16-QAM</b>	3/4	7/8	
10 <sup>-4</sup>	7.4 (7.0)	8.1 (7.7)	
10 <sup>-7</sup>	7.8 (7.3)	8.2 (7.8)	
10 <sup>-9</sup>	8.2 (7.7)	8.3 (7.9)	

**Low-Noise Block Converter (LNB) Support**

<b>(CDM-570L &amp; CDM-570L-IP Only)</b>	
LNB Voltage	+13, +18, and +24 VDC @ 500 mA maximum
LNB Reference	10 MHz via RX center conductor, -3 dBm ± 3 dB

**Block Up Converter (BUC) Support**

<b>(CDM-570L &amp; CDM-570L-IP Only)</b>	
BUC Voltage	24 VDC, 90 W @ 50°C, 100 W @ 30°C (internally fitted option) 48 VDC, 150 W @ 50°C, 180 W @ 30°C (internally fitted option, not available with -24 VDC input)
BUC Reference	10 MHz via TX center conductor, 0 dBm ± 3 dB
FSK Support	Via TX center conductor with FSK BUCs



**Environmental & Physical**

Temperature	Operating: 0 to 50°C (32 to 122°F) Storage: -25 to 85°C (-13 to 185°F)
Power Supply	100 to 240 VAC, 50/60 Hz -24 VDC (HW option) -48 VDC (HW option)
Power Consumption (See Manual)	CDM-570: 29 W typical (32 W max.) CDM-570-IP: 37 W typical CDM-570L: 29 W typical (32 W max.) w/o BUC CDM-570L-IP: 37 W typical w/o BUC
Dimensions (height x width x depth)	CDM-570-IP: 1.75" x 19" x 12" (4.4 x 48.3 x 30.5 cm) CDM-570L-IP: 1.75" x 19" x 16" (4.4 x 48.3 x 40.6 cm)
Weight	CDM-570 & CDM-570-IP: 6 lbs (2.7 kg) CDM-570L: 7 lbs (3.2 kg) (without BUC P/S) CDM-570L & CDM-570L-IP: 16 lbs (7.2 kg) including 150 W BUC power supply

**Operations & Maintenance**

Configuration and Management	Front panel Remote port – EIA-232 or EIA-485 (2- or 4-wire) SNMP with MIB II and private, modem-specific MIB Telnet Web browser (HTTP) Console interface (EIA-232, RJ-12 connector)
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Software/firmware upgrade via FTP	
IP traffic statistics	
Faults and alarms	
Configuration backup and restore	

**Security**

Password protection	
Access list	

**Accessories**

CRS-170A	CDM-570L & CDM-570L-IP: 1:1 Modem Redundancy IF Switch
CRS-180	CDM-570 & CDM-570-IP: 1:1 Modem Redundancy IF Switch
CRS-280	CDM-570: 1:N Modem Redundancy IF Switch Module
CRS-280L	CDM-570L: 1:N Modem Redundancy IF Switch Module
CRS-300	CDM-570 & CDM-570L: 1:10 Modem Redundancy Switch

**Regulatory**

CE Mark	EN 301 480-1 (ERM) EN55022 (Emissions) EN55024 (Immunity) EN 61000-3-2 EN 61000-3-3 EN80950 (Safety)
FCC	FCC Part 15, Subpart B

**Available Options**

How Enabled	Option
FAST	Variable rate to 2.048 Mbps
FAST	Variable rate to 5 Mbps
FAST	Variable rate to 9.98 Mbps
FAST	8PSK, 8-QAM modulation (8-QAM with TPC only)
FAST	16-QAM modulation
FAST	G.703 clock extension (requires G.703 E1/T1 interface option)
Hardware	G.703 E1/T1 interface
Hardware	Reed-Solomon Codec board
Hardware	Turbo Codec board
Hardware	Power supply, AC input
Hardware	Power supply, -24 VDC input
Hardware	Power supply, -48 VDC input
Hardware	24 VDC, 90 W @ 50°C (100 W @ 30°C) BUC power supply, AC input, -24 or -48 VDC input
Hardware	48 VDC, 150 W @ 50°C (180 W @ 30°C) BUC power supply, AC input or -48 VDC input
Hardware	IP Module
	<b>IP Module Options:</b>
FAST	Header compression
FAST	Payload compression
FAST	Quality of Service (QoS) – 3 modes
FAST	Vipersat Management System Integration

**Networking Protocols**

RFC 768 – UDP	RFC 2045 – MIME
RFC 791 – IP	RFC 2236 – IGMP v2
RFC 792 – ICMP	RFC 2474 – Diffserv
RFC 793 – TCP	RFC 2475 – Diffserv
RFC 826 – ARP	RFC 2578 – SMI
RFC 856 – Telnet	RFC 2597 – AF PHB
RFC 882 – Ping	RFC 2598 – Expedite Forwarding
RFC 894 – IP	RFC 2616 – HTTP
RFC 959 – FTP	RFC 2821 – SMTP
RFC 1112 – IP Multicast	RFC 3412 – SNMP
RFC 1213 – SNMP MIB II	RFC 3416 – SNMPv2
RFC 1812 – IPv4 Routers	RFC 3418 – SNMP MIB



CDM-570/L-IP Satellite Modem back panel



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## 5.5 EIRP PSD (dBW/4kHz) Tabular Data

### 5.5.1 14.05 GHz



5.5.1.1 Elevation=70°, Scan=20°, f=14.05 GHz

angle	GSO (co) skew=10°	GSO (co) skew=30°	GSO (co) skew=50°	elev (co) skew=10°	elev (co) skew=30°	elev (co) skew=50°	GSO (x) skew=10°	GSO (x) skew=30°	GSO (x) skew=50°
-180									
-175									
-170									
-165									
-160									
-155									
-150									
-145									
-140									
-135									
-130									
-125									
-120									
-115									
-110									
-105			-75.26						-75.75
-100			-45.16						-48.85
-95			-40.48						-45.4
-90			-45.05						-47.18
-85	-100.15		-37.85				-99.84		-48.91
-80	-48.76		-43.23				-48.51		-40.15
-75	-37.85	-78.55	-45.77			-64.01	-40.09	-79.06	-53.1
-70	-37.28	-30.54	-37.36		-64.36	-44.36	-39.2	-31.19	-49.09
-65	-35.36	-30.72	-42.48	-46.54	-49.91	-45.52	-36.4	-32.68	-54.86
-60	-37.28	-27.26	-21.52	-31.91	-43.13	-33.41	-36.31	-29.69	-38.25
-55	-32.12	-28.51	-33.66	-29.12	-43.87	-49.33	-41.42	-31.88	-45.8
-50	-34.35	-28.72	-37.48	-27.54	-53.98	-34.79	-37.37	-29.93	-48.25
-45	-32.5	-33.51	-35.4	-32.11	-36.28	-34.45	-44.93	-38.58	-55.35
-40	-28.37	-37.11	-33.05	-24.61	-45.58	-33.52	-37.88	-42.72	-47.42
-35	-30.76	-33.83	-41.5	-27.94	-38.64	-38.13	-39.6	-44.94	-45.14
-30	-32.66	-36.35	-19.52	-26.01	-33.36	-35.45	-42.15	-54.82	-50.58
-25	-28.35	-38.64	-26.49	-19.05	-31.94	-35.01	-43.55	-43.3	-47.71
-20	-26.04	-34.68	-26.75	-22.85	-25.96	-30.7	-36.82	-43.81	-53.18
-15	-33.39	-30.99	-23.73	-18.91	-25.87	-40.7	-49.48	-45.46	-65.19
-10	-24.26	-36.62	-30.36	-19.57	-21.85	-26.74	-41.86	-41.47	-50.35
-9.9	-26.25	-35.5	-29.76	-19.81	-21.32	-26.03	-42.37	-41.7	-50.38
-9.8	-28.26	-34.26	-29.09	-20.11	-20.81	-25.39	-42.86	-42.3	-50.33
-9.7	-29.26	-32.83	-28.29	-20.49	-20.33	-24.79	-43.69	-43.12	-50.22
-9.6	-29.38	-31.24	-27.45	-20.95	-19.91	-24.29	-44.83	-44.02	-49.79
-9.5	-29.21	-29.71	-26.54	-21.1	-19.65	-23.98	-46.04	-44.97	-49.34
-9.4	-28.45	-28.47	-25.77	-21.36	-19.36	-23.68	-47.51	-46	-48.93
-9.3	-26.42	-27.38	-25.13	-21.74	-19.05	-23.42	-49.52	-47.11	-48.57
-9.2	-23.86	-26.28	-24.58	-22.01	-18.7	-23.22	-51.8	-48.3	-48.29
-9.1	-21.22	-25.35	-24.07	-21.59	-18.26	-23.32	-54.13	-49.33	-48.05
-9	-19.83	-24.67	-23.57	-21.01	-17.89	-23.43	-54.12	-50	-47.72
-8.9	-18.7	-24.11	-23.36	-20.51	-17.69	-23.54	-53.85	-50.64	-47.49
-8.8	-17.64	-23.58	-23.3	-19.97	-17.47	-23.67	-53.74	-51.42	-47.21
-8.7	-16.88	-23.17	-23.35	-19.37	-17.19	-23.97	-53.11	-52.05	-46.74
-8.6	-16.54	-23.06	-23.45	-18.82	-16.9	-24.34	-51.43	-51.81	-46.13
-8.5	-16.22	-22.98	-23.73	-18.31	-16.61	-24.67	-49.64	-51.2	-45.58
-8.4	-16.08	-22.99	-24.35	-17.81	-16.6	-24.98	-48.01	-51.11	-45.23
-8.3	-16.4	-23.24	-25.17	-17.33	-16.7	-25.23	-47.14	-51.84	-44.84
-8.2	-16.78	-23.63	-26.18	-16.84	-16.84	-25.28	-46.46	-52.58	-44.33
-8.1	-17.48	-24.11	-27.31	-16.37	-16.99	-25.27	-45.74	-52.89	-43.84
-8	-18.63	-24.64	-29.33	-15.92	-17.16	-25.19	-44.87	-52.79	-43.54
-7.9	-20.1	-25.22	-31.65	-15.48	-17.36	-25.05	-43.83	-52.42	-43.42
-7.8	-21.66	-25.87	-33.61	-14.97	-18.09	-24.71	-42.71	-51.92	-43.39
-7.7	-24.2	-26.66	-34.93	-14.32	-18.86	-24.36	-41.68	-51.61	-43.36
-7.6	-27.11	-27.32	-35.28	-13.7	-19.67	-24.05	-40.66	-51.34	-43.29
-7.5	-29.99	-27.43	-33.59	-13.07	-20.51	-23.74	-39.58	-51.06	-43.26
-7.4	-29.46	-27.13	-31.57	-12.42	-21.54	-23.54	-38.78	-50.65	-43.32
-7.3	-26.24	-26.68	-29.68	-11.81	-22.33	-23.52	-38.22	-49.98	-43.35
-7.2	-22.65	-26.08	-28.09	-11.21	-22.05	-23.58	-37.69	-49.52	-43.34



-7.1	-19.42	-25.4	-26.89	-10.59	-21.63	-23.69	-37.22	-51.52	-43.34
-7	-18.11	-24.62	-26.07	-9.96	-21.12	-23.83	-37.28	-54.79	-43.42
-6.9	-16.81	-23.73	-25.58	-9.4	-20.7	-24.42	-37.33	-58.38	-43.53
-6.8	-15.78	-22.88	-25.27	-8.81	-20.01	-25.04	-37.54	-61.44	-43.66
-6.7	-15.28	-22.08	-25.26	-8.22	-19.14	-25.53	-38.16	-63.33	-44.03
-6.6	-15.08	-21.25	-25.52	-7.65	-18.24	-25.72	-39.03	-63.49	-44.68
-6.5	-15.03	-20.34	-26	-7.13	-17.51	-25.76	-40.08	-61.43	-45.52
-6.4	-15.44	-19.38	-26.63	-6.74	-16.77	-25.53	-41.63	-56.62	-46.47
-6.3	-16.31	-18.49	-27.38	-6.35	-15.98	-25.03	-43.72	-52.72	-47.58
-6.2	-17.16	-17.52	-28.27	-6.04	-15.14	-24.25	-45.87	-49.44	-49.51
-6.1	-19.35	-16.49	-28.74	-5.77	-15.18	-23.3	-46.85	-46.78	-51.57
-6	-22.23	-15.54	-28.61	-5.48	-15.36	-22.16	-46.99	-44.79	-53.27
-5.9	-25.21	-14.7	-28.09	-5.21	-15.5	-21.12	-46.73	-43.49	-54.61
-5.8	-26.31	-13.87	-27.05	-5.08	-15.63	-20.18	-46	-42.72	-54.48
-5.7	-23.06	-13.05	-25.5	-4.94	-15.86	-19.37	-44.4	-42.2	-52.52
-5.6	-19.56	-12.44	-24	-4.8	-16.62	-18.77	-42.7	-41.88	-50.5
-5.5	-16.54	-11.9	-22.65	-4.76	-17.39	-18.28	-41.18	-41.68	-48.65
-5.4	-14.43	-11.37	-21.43	-4.82	-17.92	-17.9	-40.46	-41.57	-46.85
-5.3	-12.54	-10.95	-20.28	-4.88	-18.21	-17.61	-39.96	-41.61	-45.66
-5.2	-10.81	-10.69	-19.26	-4.94	-17.29	-17.46	-39.58	-41.87	-44.84
-5.1	-9.48	-10.55	-18.37	-5.45	-16.07	-17.41	-39.5	-42.26	-44.19
-5	-8.6	-10.42	-17.57	-5.98	-14.99	-17.41	-39.77	-42.57	-43.63
-4.9	-7.71	-10.36	-16.81	-6.49	-13.97	-17.45	-40.04	-42.75	-43.21
-4.8	-7.13	-10.48	-16.06	-7.24	-12.61	-17.55	-40.56	-42.66	-43.27
-4.7	-6.77	-10.61	-15.36	-8.5	-11.15	-17.54	-41.26	-42.4	-43.49
-4.6	-6.45	-10.77	-14.66	-9.72	-9.76	-17.38	-42.01	-41.96	-43.74
-4.5	-6.3	-10.89	-13.99	-10.91	-8.44	-17.17	-42.59	-41.46	-44.03
-4.4	-6.35	-10.93	-13.38	-13.22	-7.5	-16.91	-42.96	-41	-44.38
-4.3	-6.46	-10.94	-12.82	-15.72	-6.68	-16.53	-43.28	-40.49	-44.58
-4.2	-6.57	-10.92	-12.27	-17.9	-5.88	-16.08	-43.59	-39.93	-44.07
-4.1	-6.83	-10.61	-11.72	-19.1	-5.11	-15.59	-43.29	-39.53	-43.24
-4	-7.1	-10.19	-11.33	-15.27	-4.38	-15.07	-42.97	-39.26	-42.19
-3.9	-7.31	-9.72	-11.08	-11.84	-3.83	-14.6	-42.72	-39.09	-41.04
-3.8	-7.35	-9.27	-10.93	-8.81	-3.36	-14.27	-42.7	-39	-39.92
-3.7	-7.25	-8.87	-10.81	-6.52	-2.87	-14	-42.86	-38.97	-38.88
-3.6	-7.14	-8.52	-10.73	-4.68	-2.38	-13.82	-43.08	-38.97	-37.91
-3.5	-6.9	-8.17	-10.73	-2.87	-1.96	-13.66	-43.73	-38.97	-37.15
-3.4	-6.47	-7.92	-10.82	-1.1	-1.54	-12.86	-45	-38.97	-36.6
-3.3	-6.04	-7.97	-10.93	0.11	-0.96	-12.02	-46.18	-38.87	-36.32
-3.2	-5.75	-8.1	-11.06	1.32	-0.31	-11.21	-47.51	-38.65	-36.15
-3.1	-5.56	-8.24	-10.58	2.52	0.3	-10.45	-49.11	-38.31	-36.25
-3	-5.42	-8.16	-9.42	3.59	0.93	-9.24	-51	-37.87	-36.67
-2.9	-5.36	-7.52	-8.04	4.53	1.58	-7.55	-52.37	-37.36	-37.31
-2.8	-5.74	-6.86	-6.61	5.47	2.3	-5.84	-50.01	-36.75	-38.24
-2.7	-6.16	-6.24	-5.11	6.4	3.19	-4.13	-47.23	-36.07	-39.28
-2.6	-6.5	-4.97	-3.57	7.15	4.07	-2.51	-44.58	-35.4	-40.21
-2.5	-6.36	-3.26	-2.03	7.85	4.97	-1.15	-42.55	-34.74	-40.83
-2.4	-5.99	-1.39	-0.5	8.54	5.87	0.22	-40.78	-34.06	-41.02
-2.3	-5.45	0.42	0.98	9.18	6.76	1.59	-39.05	-33.35	-40.62
-2.2	-4.36	2.08	2.35	9.75	7.57	2.94	-37.55	-32.66	-39.41
-2.1	-2.31	3.52	3.46	10.32	8.37	4.01	-36.44	-32.08	-37.22
-2	-0.27	4.96	4.55	10.89	9.16	5	-35.24	-31.46	-35.13
-1.9	1.56	6.35	5.61	11.36	9.93	6	-34.14	-30.81	-33.23
-1.8	3.24	7.51	6.6	11.83	10.66	7	-33.12	-30.14	-31.55
-1.7	4.86	8.57	7.48	12.29	11.38	7.86	-32.09	-29.46	-30.18
-1.6	6.35	9.61	8.26	12.73	11.98	8.57	-31.08	-28.77	-29.07
-1.5	7.58	10.6	9.02	13.11	12.55	9.28	-30.16	-28.08	-28.06
-1.4	8.72	11.36	9.76	13.49	13.07	10	-29.25	-27.37	-27.16
-1.3	9.87	12.11	10.38	13.86	13.58	10.7	-28.31	-26.66	-26.46
-1.2	10.74	12.86	10.92	14.11	14.09	11.17	-27.5	-25.94	-25.91
-1.1	11.56	13.49	11.43	14.35	14.55	11.63	-26.72	-25.26	-25.42
-1	12.35	14.03	11.92	14.59	14.86	12.1	-25.95	-24.61	-24.98
-0.9	13.02	14.52	12.37	14.8	15.17	12.57	-25.26	-23.99	-24.62
-0.8	13.54	14.98	12.73	14.96	15.48	12.92	-24.65	-23.39	-24.37
-0.7	14.07	15.37	13.04	15.12	15.78	13.18	-24.06	-22.83	-24.16
-0.6	14.49	15.66	13.34	15.29	16.03	13.44	-23.52	-22.35	-23.95
-0.5	14.81	15.95	13.61	15.39	16.19	13.7	-23.06	-21.9	-23.75
-0.4	15.11	16.21	13.8	15.48	16.31	13.92	-22.62	-21.48	-23.59
-0.3	15.34	16.37	13.94	15.57	16.43	14.02	-22.23	-21.13	-23.43





-0.2	15.48	16.45	14.05	15.63	16.5	14.09	-21.9	-20.85	-23.25
-0.1	15.57	16.53	14.15	15.66	16.57	14.15	-21.6	-20.6	-23.03
0	15.67	16.61	14.23	15.67	16.61	14.23	-21.33	-20.39	-22.77
0.1	15.58	16.53	14.16	15.64	16.55	14.16	-21.15	-20.28	-22.52
0.2	15.47	16.43	14.09	15.56	16.45	14.06	-20.99	-20.22	-22.25
0.3	15.34	16.32	14	15.47	16.34	13.94	-20.87	-20.21	-21.94
0.4	15.11	16.13	13.89	15.39	16.23	13.82	-20.82	-20.28	-21.65
0.5	14.79	15.87	13.7	15.27	16.12	13.62	-20.83	-20.42	-21.4
0.6	14.45	15.57	13.42	15.13	15.91	13.35	-20.88	-20.62	-21.22
0.7	14.03	15.27	13.14	14.99	15.63	13.05	-20.99	-20.85	-21.04
0.8	13.48	14.88	12.85	14.85	15.35	12.74	-21.21	-21.2	-20.86
0.9	12.93	14.38	12.49	14.65	15.07	12.41	-21.44	-21.66	-20.8
1	12.29	13.86	12.03	14.45	14.76	11.94	-21.76	-22.18	-20.86
1.1	11.54	13.32	11.53	14.26	14.43	11.46	-22.17	-22.78	-20.99
1.2	10.76	12.72	11.02	14.03	13.99	10.95	-22.63	-23.46	-21.13
1.3	9.94	11.99	10.49	13.75	13.52	10.44	-23.14	-24.27	-21.32
1.4	8.98	11.26	9.88	13.44	13.03	9.8	-23.85	-25.18	-21.68
1.5	7.98	10.51	9.14	13.12	12.51	9.11	-24.62	-26.29	-22.22
1.6	7	9.63	8.41	12.75	11.99	8.41	-25.42	-27.69	-22.78
1.7	6.11	8.71	7.67	12.38	11.43	7.68	-26.47	-29.23	-23.37
1.8	5.27	7.79	6.89	12.01	10.71	6.91	-27.7	-30.89	-24.08
1.9	4.49	6.91	6.03	11.59	9.96	6.04	-28.99	-32.95	-24.95
2	3.92	6.08	5.14	11.16	9.22	5.18	-30.32	-35.7	-25.91
2.1	3.72	5.28	4.25	10.72	8.47	4.28	-31.69	-38.46	-26.87
2.2	3.53	4.48	3.38	10.25	7.69	3.38	-33.15	-40.36	-27.85
2.3	3.46	3.89	2.61	9.73	6.72	2.61	-33.91	-41.39	-28.7
2.4	3.52	3.52	1.93	9.2	5.69	1.86	-33.9	-41.12	-29.41
2.5	3.63	3.24	1.29	8.68	4.66	1.11	-33.48	-39.65	-30.02
2.6	3.68	2.95	0.68	8.04	3.6	0.31	-32.96	-37.59	-30.54
2.7	3.62	2.72	0.14	7.37	2.51	-0.22	-32.33	-35.81	-30.95
2.8	3.53	2.63	-0.2	6.7	1.38	-0.58	-31.62	-34.59	-31.16
2.9	3.44	2.54	-0.45	5.98	0.01	-0.92	-30.84	-33.6	-31.31
3	3.06	2.43	-0.69	5.21	-1.36	-1.29	-30.6	-32.81	-31.44
3.1	2.62	2.2	-0.93	4.44	-2.7	-1.66	-30.46	-32.46	-31.56
3.2	2.13	1.88	-1.17	3.66	-4	-1.92	-30.37	-32.41	-31.8
3.3	1.51	1.55	-1.45	2.79	-5.27	-2.18	-30.51	-32.47	-32.22
3.4	0.67	1.17	-1.76	1.92	-6.34	-2.43	-30.99	-32.65	-32.74
3.5	-0.16	0.59	-2.07	1.06	-7.22	-2.74	-31.46	-33.09	-33.25
3.6	-1.17	-0.08	-2.4	0.1	-8.03	-3.22	-32.25	-33.75	-33.74
3.7	-2.38	-0.8	-2.93	-0.88	-8.77	-3.73	-33.44	-34.59	-34.46
3.8	-3.63	-1.66	-3.54	-1.86	-9.41	-4.24	-34.72	-35.73	-35.34
3.9	-4.88	-2.72	-4.2	-2.89	-9.96	-4.78	-36.34	-37.23	-36.21
4	-6.11	-3.91	-4.88	-3.97	-10.06	-5.51	-38.44	-39.06	-37.01
4.1	-7.33	-5.14	-5.64	-5.03	-10.22	-6.43	-40.81	-41.12	-37.8
4.2	-8.54	-6.49	-6.57	-6.06	-10.39	-7.36	-43.28	-43.66	-38.71
4.3	-8.92	-8.3	-7.65	-7.11	-10.59	-8.3	-42.98	-47.31	-39.57
4.4	-9.15	-10.26	-8.77	-8.13	-10.83	-9.27	-42.04	-50.08	-40.35
4.5	-9.34	-12.34	-9.93	-9.12	-11.12	-10.71	-40.8	-51.89	-41.09
4.6	-9.4	-14	-11.13	-10.04	-11.38	-12.12	-39.54	-51.56	-42.07
4.7	-9.36	-15.08	-12.45	-10.94	-11.68	-13.5	-38.35	-49.31	-43.21
4.8	-9.34	-16.19	-13.92	-11.83	-12.02	-14.84	-37.19	-47.33	-44.39
4.9	-9.44	-17.54	-15.43	-12.71	-12.4	-16.3	-36.26	-45.82	-45.64
5	-9.93	-17.85	-16.83	-13.57	-12.77	-17.68	-36.07	-45.64	-47.13
5.1	-10.44	-17.59	-17.58	-14.48	-13.23	-18.61	-35.89	-46.12	-49.79
5.2	-11.23	-17.02	-18.35	-15.1	-13.78	-19.1	-35.95	-46.99	-52.21
5.3	-12.37	-16.51	-18.99	-15.62	-14.39	-19.34	-36.32	-48.87	-53.84
5.4	-13.72	-16.43	-19.36	-16.09	-15.01	-19.66	-36.88	-51.95	-54.59
5.5	-15.27	-16.88	-19.55	-16.5	-15.68	-19.85	-37.54	-55.1	-54.56
5.6	-17.88	-17.29	-19.8	-16.87	-16.42	-19.91	-38.53	-56.08	-53.99
5.7	-21.01	-17.76	-19.97	-17.21	-17.49	-19.84	-39.62	-54.34	-53.39
5.8	-24.2	-18.64	-20.17	-17.51	-18.6	-20.75	-40.68	-50.52	-52.24
5.9	-25.24	-19.59	-20.45	-17.79	-19.79	-21.77	-41.4	-46.96	-51.12
6	-24.87	-20.4	-20.87	-18.1	-21.05	-22.74	-41.88	-44.32	-50.03
6.1	-24.21	-20.99	-21.28	-18.41	-22.37	-23.65	-42.25	-42.51	-48.86
6.2	-23.34	-21.31	-21.57	-18.72	-23.6	-25.08	-42.4	-41.58	-47.81
6.3	-22.07	-21.32	-21.72	-19.1	-24.65	-27.11	-41.97	-40.84	-47.08
6.4	-20.85	-21	-21.73	-19.54	-25.55	-28.67	-41.52	-40.24	-46.23
6.5	-20.05	-20.52	-21.72	-19.95	-26.32	-29.77	-41.21	-40.21	-45.2
6.6	-19.91	-20.05	-21.51	-20.39	-27.12	-30.4	-41.12	-40.53	-44.2



6.7	-20.13	-19.63	-21.05	-20.84	-27.84	-28.34	-41.12	-41.01	-43.52
6.8	-20.36	-19.28	-20.52	-21.24	-27.28	-26.34	-41.24	-41.58	-43.12
6.9	-20.51	-19.08	-20.09	-21.61	-26.76	-24.55	-41.67	-42.27	-42.87
7	-20.6	-19.13	-19.78	-21.99	-26.45	-22.99	-42.35	-43.03	-42.67
7.1	-20.78	-19.3	-19.46	-22.33	-26.1	-22.02	-42.98	-43.89	-42.58
7.2	-20.14	-19.56	-19.12	-22.64	-25.72	-21.41	-43.72	-44.58	-42.66
7.3	-19	-19.92	-19.06	-22.86	-25.62	-20.83	-44.57	-44.46	-43.37
7.4	-17.65	-20.38	-19.17	-23.11	-26.09	-20.27	-45.51	-43.75	-44.26
7.5	-16.39	-20.9	-19.34	-23.38	-26.6	-19.79	-46.16	-42.95	-45.3
7.6	-15.48	-21.46	-19.54	-23.61	-27.16	-19.94	-46.09	-42.21	-46.48
7.7	-14.56	-21.66	-19.85	-23.98	-27.91	-20.09	-46.17	-41.9	-48.27
7.8	-13.72	-21.79	-20.41	-24.57	-28.85	-20.25	-46.22	-41.6	-51.24
7.9	-13.34	-21.9	-21.13	-25.16	-30.87	-20.4	-45.78	-41.32	-54.61
8	-13.05	-21.92	-21.91	-25.61	-33.73	-20.93	-45.27	-41.2	-57.89
8.1	-12.85	-21.84	-22.73	-26.19	-36.99	-21.68	-44.88	-41.43	-61.09
8.2	-12.87	-21.69	-23.56	-26.88	-40.28	-22.43	-44.66	-42.08	-61.95
8.3	-13.16	-21.52	-24.4	-27.65	-43.54	-23.17	-44.62	-42.88	-59.85
8.4	-13.46	-21.47	-25.24	-28.59	-46.07	-23.96	-44.55	-43.7	-56.4
8.5	-14.12	-21.74	-26.07	-29.71	-41.74	-25.15	-44.6	-44.62	-53.59
8.6	-15.09	-22.03	-26.84	-31.24	-37.24	-26.32	-44.69	-45.45	-51.43
8.7	-16.14	-22.34	-27.05	-33.23	-33.58	-27.45	-44.73	-45.77	-50.18
8.8	-17.75	-22.91	-26.83	-35.46	-30.76	-28.55	-44.62	-45.67	-50.02
8.9	-20.13	-23.89	-26.54	-38.85	-29.02	-29.06	-44.34	-45.49	-50.14
9	-22.87	-24.76	-26.22	-43.77	-27.85	-29.41	-43.96	-45.11	-50.39
9.1	-25.67	-25.5	-25.99	-47.32	-27.1	-29.74	-43.53	-44.5	-50.9
9.2	-26.72	-25.66	-25.92	-49.87	-26.47	-30.04	-43.16	-43.89	-51.78
9.3	-27.36	-25.55	-25.95	-44.42	-25.93	-30.19	-42.8	-43.32	-52.88
9.4	-27.6	-25.3	-26.04	-39.13	-25.5	-30.07	-42.47	-42.8	-53.74
9.5	-26.41	-24.79	-26.19	-34.55	-25.2	-29.99	-42.35	-42.35	-54.06
9.6	-23.86	-23.86	-26.82	-31.84	-25.08	-29.95	-42.46	-42.01	-54.31
9.7	-21.44	-22.59	-27.76	-30.16	-24.97	-29.93	-42.63	-41.77	-53.92
9.8	-19.45	-21.55	-28.89	-28.71	-24.94	-30.23	-42.97	-41.81	-52.95
9.9	-18.78	-20.66	-30.16	-27.66	-25	-30.64	-43.94	-42.04	-51.66
10	-18.17	-19.97	-31.47	-27.09	-25.09	-31.06	-45.02	-42.51	-50.29
15	-22.7	-33.12	-29.61	-24.45	-29.24	-42.82	-50.34	-46.29	-45.87
20	-35.94	-31.52	-33.49	-12.29	-14.48	-36.12	-46.11	-48.93	-51.37
25	-33.85	-31.64	-42.71	-15.67	-16.01	-20.86	-47.42	-52.1	-42.75
30	-27.3	-18.21	-37.27	-19.89	-29.77	-44.58	-42.26	-52.36	-46.82
35	-35.77	-30.86	-47.52	-36.97	-24.69	-36.48	-42.22	-47.79	-45.3
40	-32.26	-27.69	-42.73	-25.36	-28.08	-43.14	-54.93	-48.17	-42.08
45	-24.56	-35.95	-37.28	-28.2	-42.02	-36.58	-52.09	-49.24	-42.95
50	-22.63	-46.12	-40.23	-31.85	-19.68	-28.86	-51.57	-41.4	-47.5
55	-27.52	-44.09	-41.24	-37.64	-36	-42.56	-50.78	-50.09	-42.16
60	-36.26	-29.22	-47.58	-35.77	-33.86	-34.52	-48.29	-38.8	-45.47
65	-40.57	-34.91	-47.1	-29.92	-37.18	-28.56	-45.24	-36.41	-46.01
70	-42.27	-42.01	-77.91	-41.93	-42.7	-41.97	-62.92	-48.28	-70.08
75	-43.19	-36.77		-32.12	-34.95	-35.99	-52.93	-40.57	
80	-43.87	-37.86		-46.91	-38.82	-33.61	-45.64	-42.86	
85	-43.33	-35.07		-34.68	-35.71	-39.98	-47.31	-33.75	
90				-38.08	-40.61	-34.55			
95				-31.55	-41.84	-35.4			
100				-34.59	-49.86	-50.57			
105				-38.82	-87.08				
110				-74.86					
115									
120									
125									
130									
135									
140									
145									
150									
155									
160									
165									
170									
175									
180									





5.5.1.2 Elevation=60°, Scan=30°, f=14.05 GHz:

angle	GSO (co) skew=10°	GSO (co) skew=30°	GSO (co) skew=50°	elev (co) skew=10°	elev (co) skew=30°	elev (co) skew=50°	GSO (x) skew=10°	GSO (x) skew=30°	GSO (x) skew=50°
-180									
-175									
-170									
-165									
-160									
-155									
-150									
-145									
-140									
-135									
-130									
-125									
-120									
-115									
-110									
-105									
-100									
-95									
-90									
-85									
-80	-69.73						-69.28		
-75	-42.49						-43.22		
-70	-46.14	-81.35					-46.11	-82.18	
-65	-40.21	-32.6				-68.58	-41.35	-34.09	
-60	-30.97	-30.66	-48.84		-61.19	-48.75	-34.64	-31.98	-51.55
-55	-32.28	-31.15	-30.72	-38.33	-46.82	-49.49	-33.14	-34.54	-34.84
-50	-23.4	-30.41	-35.6	-32.2	-38.56	-37.92	-26.9	-32.7	-39.99
-45	-27.97	-41.26	-32.38	-43.77	-37.38	-50.41	-30.45	-49.54	-33.6
-40	-31.39	-36.23	-39.58	-23.1	-41.13	-38.63	-34.81	-41.73	-40.88
-35	-37.52	-54.67	-46.94	-16.92	-41.03	-33.9	-41.69	-49.45	-46.85
-30	-40.38	-33.13	-36.78	-18.49	-35.74	-49.04	-41.75	-40.39	-45.51
-25	-31.96	-30.73	-35.06	-12.58	-35.53	-32.94	-43.96	-37.57	-44.31
-20	-37.13	-34.23	-32.44	-13.74	-32.95	-31.56	-37.88	-38.78	-56.38
-15	-41.39	-41.95	-37.19	-22.02	-30.8	-34.3	-44.3	-44.25	-44.24
-10	-18.09	-24	-30.24	-7.56	-22.86	-30.06	-38.05	-37.02	-48.79
-9.9	-19.08	-23.26	-29.47	-7.46	-23.3	-26.11	-38.86	-36.12	-50.24
-9.8	-20.06	-22.45	-28.78	-7.34	-23.4	-24.76	-39.7	-35.37	-51.15
-9.7	-22.37	-21.58	-28.14	-7.21	-23.7	-23.61	-41.14	-34.85	-51.84
-9.6	-25.69	-20.68	-27.56	-7.06	-24.09	-22.48	-43.07	-34.51	-52.1
-9.5	-29.36	-19.8	-27.06	-6.9	-24.53	-21.37	-45.24	-34.21	-51.91
-9.4	-31.28	-18.97	-26.62	-6.68	-25.02	-20.89	-46.59	-33.98	-52.03
-9.3	-29.61	-18.43	-26.23	-6.45	-25.49	-20.5	-46.19	-34.05	-51.88
-9.2	-27.08	-17.98	-25.83	-6.2	-25.21	-20.18	-45.27	-34.14	-51.57
-9.1	-24.55	-17.58	-25.37	-5.94	-24.76	-19.87	-44.2	-34.21	-50.81
-9	-22.47	-17.39	-24.84	-5.66	-23.98	-19.95	-42.58	-34.35	-49.71
-8.9	-20.46	-17.38	-24.28	-5.36	-22.87	-20.1	-40.92	-34.53	-48.83
-8.8	-18.57	-17.46	-23.84	-5.06	-21.42	-20.26	-39.35	-34.69	-48.44
-8.7	-17.29	-17.62	-23.39	-4.74	-19.85	-20.41	-38.26	-34.82	-48.14
-8.6	-16.64	-18	-22.91	-4.43	-19.14	-20.85	-37.66	-34.93	-47.87
-8.5	-16.03	-18.67	-22.42	-4.12	-18.38	-21.36	-37.12	-35.03	-47.59
-8.4	-15.62	-19.5	-21.94	-3.85	-17.6	-21.9	-36.73	-35.21	-47.36
-8.3	-15.78	-20.53	-21.59	-3.59	-16.77	-22.43	-36.77	-35.42	-47.23
-8.2	-15.93	-22.16	-21.32	-3.34	-15.93	-22.66	-36.84	-35.67	-47.1
-8.1	-16.4	-24.24	-21.08	-3.13	-15.2	-22.84	-37.06	-35.96	-46.85
-8	-17.22	-26.58	-20.89	-2.91	-14.83	-23.06	-37.45	-36.29	-46.55
-7.9	-18.22	-28.69	-20.74	-2.69	-14.45	-23.31	-37.95	-36.69	-46.19
-7.8	-19.21	-29.18	-20.73	-2.47	-14.06	-22.78	-38.47	-37.22	-46.12
-7.7	-20.15	-29	-20.82	-2.3	-13.73	-22.07	-39	-37.81	-46.13
-7.6	-21.04	-28.07	-20.94	-2.14	-13.42	-21.38	-39.55	-38.41	-46.06
-7.5	-21.89	-26.68	-21.08	-1.97	-13.19	-20.69	-40.14	-39.16	-46.01
-7.4	-21.02	-25.3	-21.23	-1.8	-13.17	-19.96	-40.43	-40.04	-45.97
-7.3	-19.5	-24.05	-21.4	-1.69	-13.14	-19.18	-40.61	-40.96	-46.01
-7.2	-17.85	-23.02	-21.62	-1.59	-13.24	-18.36	-40.75	-41.88	-46.28
-7.1	-16.4	-22.51	-21.78	-1.48	-13.34	-17.52	-40.86	-42.86	-46.24



-7	-15.28	-22.81	-21.72	-1.36	-13.44	-16.96	-40.94	-43.86	-46.28
-6.9	-14.19	-23.22	-21.5	-1.36	-13.63	-16.42	-41	-44.65	-46.35
-6.8	-13.29	-23.71	-21.17	-1.38	-14.03	-15.84	-41.1	-45.3	-46.36
-6.7	-12.96	-24.72	-20.73	-1.39	-14.63	-15.2	-41.49	-44.75	-46.28
-6.6	-12.69	-25.97	-20.22	-1.4	-15.2	-14.83	-41.89	-43.83	-46.14
-6.5	-12.63	-27.35	-19.65	-1.48	-15.73	-14.5	-42.48	-42.92	-46.12
-6.4	-12.93	-27.68	-19.06	-1.59	-16.22	-14.14	-43.44	-41.99	-46.31
-6.3	-13.48	-25.53	-18.47	-1.69	-16.85	-13.75	-44.66	-41.01	-46.38
-6.2	-14.19	-22.46	-17.96	-1.78	-17.46	-13.64	-45.8	-40.07	-46.25
-6.1	-15.67	-19.25	-17.51	-1.96	-17.78	-13.58	-46.53	-39.36	-45.94
-6	-17.76	-16.73	-17.18	-2.19	-17.81	-13.5	-46.94	-38.96	-45.74
-5.9	-19.84	-14.96	-16.92	-2.41	-17.54	-13.4	-47.36	-38.83	-45.41
-5.8	-20.67	-13.41	-16.73	-2.62	-16.82	-13.55	-46.34	-38.79	-44.89
-5.7	-20.68	-11.95	-16.66	-2.96	-15.82	-13.72	-44.42	-38.84	-44.27
-5.6	-20.39	-10.76	-16.74	-3.39	-14.84	-13.86	-42.22	-39.17	-43.64
-5.5	-19.39	-9.97	-16.93	-3.84	-13.8	-13.97	-40.26	-39.93	-42.95
-5.4	-16.71	-9.21	-17.23	-4.32	-12.71	-13.82	-38.98	-40.74	-42.25
-5.3	-14.08	-8.47	-17.6	-5.01	-11.68	-13.55	-37.7	-41.67	-41.52
-5.2	-11.77	-8.18	-18.09	-5.82	-10.72	-13.19	-36.53	-43.62	-41.02
-5.1	-10.45	-7.96	-18.63	-6.63	-9.95	-12.75	-35.83	-45.75	-40.7
-5	-9.35	-7.77	-19.15	-7.44	-9.29	-11.74	-35.22	-47.9	-40.52
-4.9	-8.38	-7.71	-19.6	-8.39	-8.66	-10.68	-34.71	-49.75	-40.45
-4.8	-7.71	-7.89	-20	-9.37	-8.19	-9.6	-34.44	-51.24	-40.44
-4.7	-7.32	-8.16	-20.25	-10.26	-7.72	-8.5	-34.41	-52.58	-40.6
-4.6	-6.96	-8.47	-20.15	-11.06	-7.27	-7.46	-34.4	-52.76	-41.15
-4.5	-6.9	-8.91	-19.67	-10.7	-7.03	-6.44	-34.67	-51.81	-41.86
-4.4	-7.04	-9.47	-19.1	-9.55	-6.89	-5.43	-35.11	-50.3	-42.6
-4.3	-7.2	-10.04	-18.47	-8.35	-6.77	-4.47	-35.57	-49.36	-43.35
-4.2	-7.56	-10.53	-17.91	-7.1	-6.62	-3.82	-36.29	-49.16	-43.98
-4.1	-8.07	-10.74	-17.52	-5.64	-6.44	-3.21	-37.21	-49.11	-44.25
-4	-8.62	-10.59	-17.3	-4.23	-6.23	-2.6	-38.18	-48.67	-44
-3.9	-9.13	-10.4	-17.12	-2.86	-5.8	-2	-39.23	-48.09	-43.48
-3.8	-9.44	-10.15	-17	-1.5	-5.29	-1.69	-40.71	-47.69	-42.69
-3.7	-9.72	-9.55	-16.69	-0.39	-4.7	-1.41	-42.16	-47	-41.57
-3.6	-9.88	-8.93	-15.67	0.63	-4.03	-1.17	-43.55	-46.15	-40.31
-3.5	-9.54	-8.3	-14.42	1.63	-3.27	-0.94	-44.79	-45.16	-39.14
-3.4	-9.02	-7.89	-13.15	2.63	-2.58	-0.98	-45.93	-44.28	-38.1
-3.3	-8.53	-7.75	-11.86	3.46	-1.46	-1.04	-46.8	-43.63	-37.11
-3.2	-8.11	-7.76	-10.49	4.24	-0.33	-1.1	-47.16	-43.11	-36.19
-3.1	-7.77	-7.84	-8.76	5.01	0.8	-1.17	-47.03	-42.58	-35.44
-3	-7.44	-8.18	-6.94	5.78	1.88	-1.22	-47	-42.05	-34.79
-2.9	-7.6	-8.83	-5.13	6.43	2.9	-1.27	-46.72	-41.53	-34.13
-2.8	-8.05	-9.5	-3.33	7.06	3.9	-1.33	-46.33	-41	-33.46
-2.7	-8.58	-9.87	-1.62	7.69	4.84	-1.35	-45.96	-40.42	-32.8
-2.6	-9.13	-9.09	-0.14	8.31	5.77	-0.59	-45.44	-39.7	-32.19
-2.5	-9.69	-7.17	1.11	8.77	6.61	0.18	-44.73	-38.83	-31.62
-2.4	-10.24	-5.2	2.34	9.23	7.45	0.96	-43.98	-37.95	-31.03
-2.3	-10.6	-3.17	3.56	9.69	8.28	1.73	-43.24	-37.06	-30.43
-2.2	-8.03	-1.21	4.76	10.13	9.05	2.83	-42.03	-36.09	-29.82
-2.1	-5.42	0.74	5.75	10.51	9.69	3.93	-40.79	-35.13	-29.28
-2	-2.91	2.67	6.64	10.88	10.29	5.04	-39.52	-34.18	-28.77
-1.9	-0.75	4.33	7.51	11.26	10.88	6.14	-38.17	-33.22	-28.26
-1.8	1.2	5.72	8.36	11.61	11.48	7.07	-36.77	-32.22	-27.74
-1.7	3.06	6.99	9.17	11.91	12.07	7.98	-35.36	-31.18	-27.21
-1.6	4.67	8.23	9.9	12.21	12.55	8.88	-33.97	-30.13	-26.69
-1.5	5.97	9.32	10.48	12.51	12.95	9.74	-32.61	-29.11	-26.25
-1.4	7.27	10.23	11.06	12.79	13.36	10.38	-31.24	-28.12	-25.8
-1.3	8.37	11.12	11.63	13.03	13.76	11.03	-29.96	-27.13	-25.31
-1.2	9.32	11.95	12.16	13.27	14.15	11.68	-28.74	-26.13	-24.75
-1.1	10.23	12.64	12.62	13.48	14.5	12.29	-27.53	-25.18	-24.2
-1	11.03	13.22	13	13.64	14.77	12.7	-26.4	-24.26	-23.7
-0.9	11.65	13.8	13.36	13.77	15.01	13.11	-25.42	-23.35	-23.22
-0.8	12.25	14.35	13.7	13.9	15.24	13.53	-24.47	-22.47	-22.71
-0.7	12.83	14.71	14.01	14.04	15.43	13.91	-23.53	-21.76	-22.12
-0.6	13.21	15.08	14.27	14.13	15.62	14.15	-22.8	-21.07	-21.57
-0.5	13.57	15.42	14.46	14.2	15.82	14.4	-22.09	-20.36	-21.1
-0.4	13.89	15.66	14.62	14.28	15.93	14.61	-21.42	-19.75	-20.66
-0.3	14.12	15.82	14.75	14.36	15.99	14.79	-20.86	-19.22	-20.22
-0.2	14.26	15.96	14.86	14.39	16.02	14.84	-20.38	-18.73	-19.78



-0.1	14.39	16.08	14.95	14.41	16.07	14.89	-19.93	-18.27	-19.37
0	14.44	16.11	14.95	14.44	16.11	14.95	-19.57	-17.9	-19.06
0.1	14.38	16.06	14.91	14.45	16.15	14.96	-19.33	-17.64	-18.81
0.2	14.32	15.99	14.84	14.43	16.04	14.83	-19.1	-17.41	-18.61
0.3	14.15	15.86	14.75	14.38	15.94	14.7	-18.99	-17.26	-18.44
0.4	13.9	15.64	14.64	14.31	15.84	14.58	-18.97	-17.21	-18.3
0.5	13.61	15.37	14.47	14.21	15.74	14.39	-19	-17.23	-18.25
0.6	13.27	15.09	14.22	14.09	15.61	14.11	-19.09	-17.28	-18.3
0.7	12.78	14.77	13.94	13.97	15.45	13.83	-19.35	-17.37	-18.41
0.8	12.26	14.29	13.66	13.85	15.2	13.52	-19.65	-17.66	-18.53
0.9	11.71	13.77	13.37	13.69	14.96	13.15	-19.98	-18.01	-18.68
1	10.99	13.25	12.97	13.52	14.7	12.66	-20.51	-18.38	-18.96
1.1	10.21	12.6	12.51	13.34	14.42	12.19	-21.1	-18.89	-19.36
1.2	9.39	11.87	12.01	13.17	14.14	11.71	-21.76	-19.51	-19.8
1.3	8.45	11.11	11.51	12.94	13.83	11.15	-22.54	-20.17	-20.25
1.4	7.37	10.33	10.99	12.71	13.44	10.44	-23.49	-20.87	-20.73
1.5	6.29	9.41	10.4	12.48	13	9.73	-24.44	-21.76	-21.34
1.6	5.17	8.38	9.67	12.24	12.57	9.02	-25.45	-22.79	-22.14
1.7	4.03	7.37	8.94	11.94	12.14	8.18	-26.49	-23.83	-22.96
1.8	2.9	6.39	8.2	11.62	11.72	7.23	-27.54	-24.83	-23.81
1.9	2.05	5.46	7.45	11.29	11.2	6.29	-28.23	-25.75	-24.72
2	1.5	4.58	6.63	10.93	10.59	5.33	-28.54	-26.58	-25.77
2.1	1.07	3.77	5.75	10.54	10	4.15	-28.7	-27.34	-26.95
2.2	0.72	3.12	4.88	10.15	9.41	2.8	-28.77	-27.89	-28.14
2.3	0.9	2.94	4.03	9.77	8.79	1.47	-28.3	-27.74	-29.33
2.4	1.12	2.79	3.17	9.31	8.16	0.16	-27.8	-27.52	-30.63
2.5	1.31	2.68	2.41	8.86	7.43	-1.57	-27.34	-27.25	-31.66
2.6	1.41	2.7	1.81	8.4	6.65	-3.61	-27.03	-26.93	-32.2
2.7	1.46	2.8	1.32	7.93	5.87	-5.61	-26.8	-26.61	-32.41
2.8	1.45	2.87	0.87	7.38	5.06	-7.58	-26.63	-26.31	-32.39
2.9	1.3	2.9	0.44	6.84	4.26	-9.46	-26.62	-26.09	-32.14
3	0.96	2.78	0.07	6.3	3.48	-11.42	-26.83	-26.14	-31.69
3.1	0.61	2.58	-0.05	5.7	2.52	-13.5	-27.05	-26.31	-31.26
3.2	0.04	2.37	-0.16	5.03	1.48	-15.63	-27.5	-26.51	-30.83
3.3	-0.7	2.03	-0.31	4.35	0.47	-15.67	-28.15	-26.93	-30.4
3.4	-1.51	1.51	-0.46	3.68	-0.51	-14.92	-28.89	-27.58	-30
3.5	-2.48	0.89	-0.63	2.9	-1.47	-14.25	-29.83	-28.36	-29.67
3.6	-3.71	0.22	-0.86	2.11	-2.45	-13.65	-31.11	-29.24	-29.5
3.7	-5.05	-0.57	-1.18	1.34	-3.68	-13.47	-32.53	-30.41	-29.51
3.8	-6.39	-1.66	-1.57	0.52	-4.84	-13.44	-34.02	-32.21	-29.56
3.9	-7.84	-2.78	-1.96	-0.39	-5.95	-13.39	-36.29	-34.13	-29.61
4	-9.3	-3.96	-2.38	-1.29	-7.02	-13.31	-38.71	-36.13	-29.67
4.1	-10.59	-5.61	-2.98	-2.18	-8.03	-13.7	-41.05	-39.72	-29.96
4.2	-11.26	-7.56	-3.71	-3.08	-9.02	-14.22	-42.7	-44.03	-30.4
4.3	-11.35	-9.59	-4.48	-3.98	-10	-14.74	-43.61	-47.95	-30.86
4.4	-11.41	-11.74	-5.27	-4.9	-10.88	-15.32	-44.21	-50.5	-31.33
4.5	-11.35	-14.24	-6.08	-5.77	-11.67	-16.06	-44.25	-47.37	-31.8
4.6	-11.12	-16.96	-7.14	-6.4	-12.33	-16.81	-43.45	-43.44	-32.63
4.7	-10.9	-19.9	-8.33	-7.08	-12.87	-17.55	-42.52	-39.92	-33.65
4.8	-10.95	-21.33	-9.56	-7.8	-13.3	-18.29	-42.17	-37.74	-34.73
4.9	-11.28	-21.13	-10.8	-8.23	-13.67	-18.75	-42.39	-36.65	-35.87
5	-11.75	-19.99	-12.01	-8.39	-13.96	-19.19	-42.87	-36.02	-37.26
5.1	-12.39	-18.74	-13.24	-8.61	-14.16	-19.61	-43.63	-35.46	-39.09
5.2	-13.54	-17.87	-14.73	-8.89	-14.29	-19.99	-45.22	-35.18	-41.45
5.3	-14.84	-18.04	-16.12	-8.82	-14.41	-20.06	-47.13	-35.33	-44.17
5.4	-16.16	-18.29	-17.28	-8.72	-14.55	-20.06	-49.17	-35.5	-46.67
5.5	-17.2	-18.73	-18.14	-8.64	-14.71	-20.06	-48.72	-35.74	-48.34
5.6	-18.13	-20.04	-18.97	-8.55	-14.84	-20.01	-47.78	-36.29	-48.97
5.7	-18.83	-21.95	-19.86	-8.44	-15.02	-20.08	-46.95	-37.04	-48.85
5.8	-18.74	-23.91	-20.78	-8.33	-15.17	-20.13	-45.88	-37.72	-48.16
5.9	-17.53	-25.59	-21.68	-8.2	-15.3	-20.16	-44.3	-38.28	-46.69
6	-16.29	-25.71	-22.64	-8.26	-15.51	-20.15	-42.68	-38.93	-44.95
6.1	-15.23	-25.35	-23.71	-8.42	-15.83	-20.38	-41.41	-39.45	-43.57
6.2	-14.49	-24.68	-25.35	-8.56	-16.17	-20.64	-40.85	-39.85	-42.89
6.3	-13.81	-23.54	-28.12	-8.71	-16.52	-20.93	-40.38	-40.13	-42.64
6.4	-13.35	-22.2	-32.12	-8.93	-16.87	-21.26	-40.14	-40.36	-42.48
6.5	-13.16	-20.92	-37.29	-9.13	-17.29	-21.83	-40.21	-40.62	-42.22
6.6	-13.13	-19.88	-42.23	-9.3	-17.49	-22.37	-40.47	-40.96	-41.99
6.7	-13.13	-19.27	-41.47	-9.54	-17.7	-23	-40.75	-41.44	-42.34



6.8	-13.31	-19.22	-35.46	-9.8	-17.95	-23.73	-41.26	-42.21	-43.05
6.9	-13.55	-19.26	-30.58	-10.04	-18.31	-24.55	-41.82	-43.06	-43.46
7	-13.79	-19.47	-26.82	-10.29	-18.77	-25.35	-42.37	-44.04	-43.58
7.1	-13.88	-20.17	-24.26	-10.61	-19.25	-26.17	-42.51	-45.08	-43.79
7.2	-13.86	-21.24	-22.84	-10.92	-19.11	-27.04	-42.36	-46.02	-44.14
7.3	-13.79	-22.42	-22.19	-11.21	-19.05	-27.41	-42.09	-46.69	-44.47
7.4	-13.62	-23.76	-21.63	-11.62	-19.05	-27.51	-41.66	-46.92	-44.82
7.5	-13.25	-25.89	-21.16	-12.29	-19.07	-27.34	-40.92	-45.36	-45.26
7.6	-12.85	-28.44	-20.85	-12.9	-19.12	-26.97	-40.2	-43.78	-46.17
7.7	-12.5	-31.86	-20.82	-13.48	-19.28	-26.8	-39.58	-42.39	-46.81
7.8	-12.24	-33.35	-20.98	-14.1	-19.48	-26.52	-39.14	-41.33	-47.26
7.9	-12.01	-32.4	-21.25	-14.67	-19.65	-26.12	-38.8	-40.53	-47.77
8	-11.86	-29.94	-21.57	-15.19	-19.81	-25.78	-38.58	-39.89	-48.49
8.1	-11.9	-27.01	-21.95	-15.75	-20.1	-26.14	-38.59	-39.34	-49.36
8.2	-12.09	-24.59	-22.4	-16.3	-20.48	-26.45	-38.8	-39.04	-50.27
8.3	-12.29	-23.86	-22.93	-16.82	-20.97	-26.79	-39.07	-39.17	-51.57
8.4	-12.85	-23	-23.34	-17.31	-21.72	-27.37	-39.67	-39.32	-52.48
8.5	-13.58	-22.19	-23.66	-17.86	-22.78	-29.07	-40.49	-39.51	-53.34
8.6	-14.36	-21.79	-23.94	-18.39	-24.12	-30.53	-41.45	-39.73	-54.3
8.7	-15.38	-21.72	-24.11	-18.88	-25.49	-31.76	-42.98	-39.95	-55.88
8.8	-16.66	-21.66	-24.1	-19.42	-26.89	-32.34	-45.26	-40.1	-58.75
8.9	-18	-21.71	-23.95	-20.09	-29.23	-31.39	-47.96	-40.08	-61.9
9	-19.3	-22.21	-23.79	-20.67	-31.94	-30.69	-50.85	-39.88	-65.35
9.1	-19.6	-22.6	-23.63	-21.17	-34.08	-30.26	-50.91	-39.59	-69.06
9.2	-19.87	-22.88	-23.51	-21.69	-35.66	-29.71	-50.58	-39.24	-70.38
9.3	-19.94	-23.24	-23.48	-22.17	-34.65	-28.22	-49.78	-38.95	-67.48
9.4	-19.39	-23.56	-23.55	-22.61	-32.03	-26.83	-48.37	-38.78	-61.8
9.5	-18.42	-23.67	-23.66	-23.08	-29.13	-25.56	-46.37	-38.65	-56.76
9.6	-17.49	-23.69	-23.83	-23.59	-26.45	-24.58	-44.22	-38.56	-52.51
9.7	-16.74	-23.76	-24.11	-24.11	-24.8	-24.07	-42.6	-38.69	-49.45
9.8	-16.36	-23.96	-24.63	-24.67	-23.75	-23.59	-41.73	-39.14	-47.39
9.9	-15.99	-24.1	-25.32	-25.37	-22.8	-23.22	-40.94	-39.61	-45.8
10	-15.93	-24.29	-26.12	-26.14	-21.97	-22.99	-40.43	-40.27	-44.54
15	-26.93	-30.28	-33.72	-32.34	-33.83	-37.17	-48.02	-42.02	-47.3
20	-30.29	-37.03	-32.9	-30.45	-37.29	-34.06	-53.57	-65.93	-46.65
25	-32.04	-31.16	-35.52	-30.86	-27.06	-19.62	-45.83	-55.22	-40.54
30	-29.04	-29.45	-36.28	-15.41	-24.49	-39.68	-42.21	-46.33	-41.53
35	-33.52	-51.92	-35.45	-15.63	-16.25	-41.9	-49.21	-53.72	-48.09
40	-39.46	-37.38	-23.56	-34.24	-29.72	-22.85	-54.36	-43.46	-52.99
45	-39.45	-30.24	-44.14	-35.44	-32.21	-20.8	-45.09	-37.49	-42.06
50	-36.41	-28.37	-45.49	-27.85	-47.33	-28.18	-47.62	-45.18	-46.03
55	-36	-23.67	-51.73	-31.11	-33.29	-43.08	-48.33	-35.62	-52.38
60	-44.45	-34.75	-37.69	-23.88	-41.72	-31.29	-45.62	-50.74	-37.31
65	-45.01	-49.38	-31.35	-27.57	-24.05	-35.35	-51.35	-50.49	-35.65
70	-32.47	-44.4	-36.65	-35.72	-24.73	-35.33	-46.86	-39.71	-47.46
75	-44.49	-44.34	-29.21	-42.27	-35.35	-38.54	-46.42	-44.13	-35.89
80	-47.84	-36.59	-26.61	-48.22	-51.22	-31.76	-56.81	-37.3	-30.2
85	-51.7	-31.73	-39.59	-41.15	-40.18	-23.71	-51.44	-32.49	-41.6
90				-31.05	-40.1	-44.42			
95				-49.3	-36.65	-41.05			
100				-29.67	-41.8	-45.16			
105				-23.03	-49.58	-50.15			
110				-27.03	-52.62	-101.31			
115				-34.26	-73.6				
120				-109.43					
125									
130									
135									
140									
145									
150									
155									
160									
165									
170									
175									
180									



**5.5.1.3 Elevation=45 ° , Scan=45 ° , f=14.05 GHz:**

angle	GSO (co) skew=10°	GSO (co) skew=30°	GSO (co) skew=50°	elev (co) skew=10°	elev (co) skew=30°	elev (co) skew=50°	GSO (x) skew=10°	GSO (x) skew=30°	GSO (x) skew=50°
-180									
-175									
-170									
-165									
-160									
-155									
-150									
-145									
-140									
-135									
-130									
-125			-72.21						-77.43
-120			-62.07						-68.63
-115			-43.63						-65.32
-110			-46.81						-44.75
-105			-41.7						-52.39
-100			-27.14						-37.71
-95			-31.29						-45.25
-90			-34.95						-41.29
-85			-37.61						-45.46
-80			-38.93						-38.1
-75	-74.71		-36.39				-75.67		-37.41
-70	-56.87		-36.72				-55.97		-51.07
-65	-28.13		-37.51				-28.49		-47.46
-60	-23.17	-69.82	-37.81				-23.88	-71.46	-41.6
-55	-31.47	-50.95	-29.16			-78.02	-32.11	-52.94	-41.29
-50	-27.87	-36.15	-24.08			-32.49	-31.18	-37.87	-41.81
-45	-27.26	-33.4	-30.27		-70.07	-34.36	-30.07	-35.31	-41.27
-40	-29.46	-38.39	-25.4	-36.45	-35.34	-28.89	-33.68	-44.42	-49.76
-35	-34.46	-30.79	-27.05	-21.06	-31.32	-31.01	-40.45	-37.27	-60.78
-30	-46.17	-32.85	-29.63	-14.84	-38.34	-30.6	-38.88	-51.08	-44.79
-25	-29.54	-24.94	-37.15	-12.29	-29.62	-25.6	-33.99	-36.74	-39.9
-20	-46.63	-24.92	-35.65	-15.26	-26.02	-33.12	-37.57	-42.74	-36.09
-15	-27.3	-24.44	-32.43	-9.08	-34.01	-21.65	-37.96	-36.77	-43.4
-10	-16.26	-21.57	-26.09	-0.06	-25.14	-15.37	-33.46	-33.86	-42
-9.9	-16.99	-19.99	-26.74	0.06	-24.61	-15.56	-33.54	-34.82	-42.13
-9.8	-18.84	-18.51	-27.43	0.19	-24	-15.85	-34.02	-35.28	-42.35
-9.7	-21.61	-17.36	-28.21	0.32	-23.33	-16.16	-34.82	-34.57	-42.93
-9.6	-24.71	-16.21	-29.13	0.45	-22.6	-16.49	-35.75	-33.79	-43.88
-9.5	-26.47	-15.07	-31	0.57	-21.81	-17.15	-37.13	-32.94	-44.61
-9.4	-25.68	-14.47	-33.23	0.64	-20.99	-18.16	-39.34	-32.02	-45.18
-9.3	-24.16	-14.07	-35.81	0.71	-20.44	-19.3	-41.79	-31.08	-45.58
-9.2	-22.56	-13.72	-39.24	0.78	-20.04	-20.51	-44.21	-30.15	-46.7
-9.1	-20.12	-13.52	-41.24	0.85	-19.61	-21.98	-43.54	-29.36	-48.32
-9	-17.59	-13.63	-40.13	0.93	-19.14	-23.87	-42.45	-28.83	-49.59
-8.9	-15.07	-13.97	-38.05	0.95	-18.64	-25.76	-41.24	-28.49	-50.29
-8.8	-13.55	-14.34	-35.27	0.95	-18.1	-27.64	-39.41	-28.17	-50.43
-8.7	-12.56	-14.9	-31.66	0.95	-17.86	-29.36	-37.27	-27.94	-49.45
-8.6	-11.61	-16.33	-29.77	0.95	-17.89	-27.61	-35.19	-28.06	-48.21
-8.5	-10.89	-17.85	-28.55	0.92	-17.89	-25.42	-33.5	-28.2	-47.39
-8.4	-10.66	-19.47	-27.49	0.88	-17.85	-23.13	-32.55	-28.37	-47.02
-8.3	-10.44	-21.9	-26.45	0.75	-17.78	-20.87	-31.63	-28.69	-47.07
-8.2	-10.36	-24.75	-25.62	0.62	-17.67	-19.63	-30.85	-29.12	-47.06
-8.1	-10.79	-27.32	-25.22	0.49	-17.78	-18.71	-30.55	-29.61	-46.42
-8	-11.25	-28.46	-24.98	0.35	-18.45	-17.83	-30.29	-30.11	-45.7
-7.9	-11.98	-26.89	-24.77	0.22	-19.06	-17.01	-30.16	-30.55	-45.31
-7.8	-13.25	-22.97	-24.57	0.02	-19.6	-16.59	-30.32	-30.93	-45.23
-7.7	-14.85	-19.31	-24.52	-0.23	-20.07	-16.55	-30.65	-31.27	-45.24
-7.6	-17.15	-15.98	-24.63	-0.5	-20.47	-16.57	-31.09	-31.57	-45.26
-7.5	-21.38	-14.81	-24.81	-0.76	-20.9	-16.64	-31.83	-31.54	-45.15
-7.4	-27.6	-13.77	-25.01	-1.03	-21.71	-17.01	-32.89	-31.48	-44.85
-7.3	-33.69	-12.78	-25.21	-1.3	-22.43	-17.98	-33.96	-31.38	-44.46
-7.2	-32.79	-12.18	-25.38	-1.75	-22.92	-19.02	-35.03	-31.3	-44.23
-7.1	-26.82	-11.93	-25.51	-2.2	-23.19	-20.14	-36.1	-31.26	-44.1



-7	-20.12	-11.86	-25.65	-2.66	-23.24	-21.3	-37.18	-31.26	-43.61
-6.9	-15.8	-11.91	-25.81	-3.16	-22.99	-22.02	-37.22	-31.32	-42.9
-6.8	-13.69	-12.31	-25.91	-3.67	-21.56	-22.56	-36.25	-31.51	-42.24
-6.7	-12.35	-13.24	-25.92	-4.25	-20.35	-22.81	-34.87	-31.93	-41.71
-6.6	-11.25	-14.24	-25.85	-4.84	-19.26	-22.78	-33.55	-32.37	-41.2
-6.5	-10.83	-15.3	-25.72	-5.4	-18.29	-20.91	-32.5	-32.84	-40.63
-6.4	-10.59	-17.79	-25.6	-5.95	-17.44	-18.73	-31.52	-33.51	-40.05
-6.3	-10.35	-20.48	-25.52	-6.48	-16.7	-16.59	-30.54	-34.21	-39.47
-6.2	-10.92	-23.19	-25.45	-6.72	-16.23	-14.5	-30.18	-34.92	-38.98
-6.1	-11.63	-23.8	-25.42	-6.46	-15.77	-13.12	-29.93	-35.32	-38.5
-6	-12.46	-21.65	-25.21	-6.13	-15.36	-12.14	-29.72	-35.29	-38.23
-5.9	-14.59	-18.14	-24.93	-5.73	-15.08	-11.21	-29.77	-35.01	-38.09
-5.8	-17.86	-14.81	-24.69	-5.26	-14.92	-10.31	-30.06	-34.68	-38
-5.7	-20.79	-12.1	-24.52	-4.69	-14.88	-9.65	-30.35	-34.17	-37.97
-5.6	-22.22	-10.62	-24.41	-3.72	-15.5	-9.31	-30.68	-33.35	-38
-5.5	-20.2	-9.18	-24.3	-2.74	-16.33	-9	-31.07	-32.56	-38.15
-5.4	-18.15	-7.81	-23.87	-1.75	-17.31	-8.73	-31.46	-31.8	-38.57
-5.3	-15.96	-7.02	-23.42	-0.78	-18.59	-8.56	-31.73	-31.26	-39.1
-5.2	-13.59	-6.45	-23.1	0.17	-20.17	-8.81	-31.79	-30.81	-39.74
-5.1	-11.19	-5.9	-22.89	0.94	-22.05	-9.09	-31.81	-30.4	-40.49
-5	-9.16	-5.52	-22.8	1.7	-21.83	-9.4	-31.84	-30.13	-41.34
-4.9	-7.76	-5.45	-22.37	2.46	-20.46	-9.76	-31.89	-30.09	-42.33
-4.8	-6.79	-5.49	-21.64	3.22	-18.4	-10.76	-31.97	-30.16	-43.43
-4.7	-5.92	-5.57	-21.05	3.97	-16.4	-11.89	-32.14	-30.27	-44.58
-4.6	-5.44	-5.88	-20.66	4.6	-14.46	-13.11	-32.71	-30.5	-45.74
-4.5	-5.22	-6.56	-20.45	5.2	-12.57	-14.43	-33.53	-30.87	-46.91
-4.4	-4.99	-7.29	-19.3	5.8	-10.7	-17.32	-34.39	-31.29	-46.96
-4.3	-5.18	-8.1	-17.85	6.4	-8.86	-20.61	-35.27	-31.74	-46.53
-4.2	-5.55	-9.63	-16.44	7	-7.16	-23.76	-36.14	-32.17	-45.48
-4.1	-5.98	-11.69	-15.12	7.52	-5.44	-26.76	-37.01	-32.53	-43.76
-4	-6.74	-13.81	-13.79	8.01	-3.73	-26.82	-36.77	-32.76	-42
-3.9	-7.94	-15.76	-12.38	8.5	-2.01	-23.94	-35.09	-32.77	-40.65
-3.8	-9.2	-16.91	-10.9	8.99	-0.76	-20.77	-33.16	-32.59	-39.53
-3.7	-10.54	-17.59	-9.4	9.44	0.27	-17.79	-31.25	-32.28	-38.36
-3.6	-12.48	-17.95	-7.87	9.83	1.24	-15.62	-29.93	-31.85	-37.12
-3.5	-14.37	-17.21	-6.5	10.2	2.23	-15.22	-28.63	-31.45	-36.1
-3.4	-15.7	-15.61	-5.26	10.57	3.23	-14.93	-27.48	-31.13	-35.26
-3.3	-15.34	-13.88	-4.02	10.95	4.24	-14.75	-26.8	-30.79	-34.44
-3.2	-14.35	-12.49	-2.77	11.33	5.08	-14.73	-26.3	-30.42	-33.62
-3.1	-13.52	-12.07	-1.58	11.64	5.78	-16.92	-25.88	-30.19	-32.86
-3	-13.03	-12.8	-0.53	11.95	6.45	-18.82	-25.68	-30.14	-32.21
-2.9	-12.91	-13.7	0.41	12.26	7.14	-20.35	-25.71	-30.09	-31.66
-2.8	-12.93	-14.73	1.36	12.57	7.83	-21.51	-25.74	-30.03	-31.1
-2.7	-13.75	-14.91	2.34	12.88	8.54	-18.32	-25.88	-29.79	-30.54
-2.6	-15.35	-14.4	3.25	13.15	9.15	-14.46	-26.13	-29.52	-29.99
-2.5	-16.83	-13.32	4	13.4	9.64	-10.65	-26.37	-29.26	-29.46
-2.4	-15.69	-10.97	4.73	13.67	10.13	-6.91	-26.44	-28.69	-28.93
-2.3	-12.26	-7.79	5.47	13.93	10.63	-4.33	-26.33	-27.87	-28.4
-2.2	-7.99	-4.51	6.21	14.19	11.14	-2.45	-26.15	-27.02	-27.85
-2.1	-4.25	-1.58	6.9	14.37	11.65	-0.63	-25.8	-26.2	-27.28
-2	-1.53	0.84	7.47	14.54	12.08	1.13	-25.15	-25.34	-26.65
-1.9	0.87	2.57	8.03	14.72	12.41	2.66	-24.4	-24.4	-26.02
-1.8	3.24	4.27	8.6	14.9	12.74	3.85	-23.65	-23.48	-25.39
-1.7	4.84	5.9	9.17	15.08	13.08	4.99	-22.86	-22.6	-24.77
-1.6	6.37	7.14	9.61	15.22	13.43	6.08	-22.06	-21.81	-24.12
-1.5	7.86	8.28	10.03	15.36	13.79	7.09	-21.28	-21.06	-23.49
-1.4	9.1	9.4	10.44	15.51	14.07	7.86	-20.57	-20.33	-22.88
-1.3	10.17	10.37	10.84	15.65	14.27	8.61	-19.9	-19.69	-22.29
-1.2	11.2	11.16	11.21	15.78	14.47	9.34	-19.25	-19.14	-21.72
-1.1	12.11	11.9	11.49	15.89	14.69	10.06	-18.65	-18.61	-21.17
-1	12.84	12.62	11.77	15.99	14.91	10.54	-18.1	-18.08	-20.64
-0.9	13.56	13.23	12.05	16.1	15.13	11.01	-17.55	-17.6	-20.12
-0.8	14.19	13.72	12.33	16.22	15.28	11.47	-17.02	-17.15	-19.64
-0.7	14.68	14.2	12.52	16.3	15.36	11.91	-16.52	-16.7	-19.2
-0.6	15.15	14.64	12.67	16.36	15.46	12.23	-16.02	-16.26	-18.8
-0.5	15.55	14.97	12.81	16.39	15.56	12.5	-15.54	-15.87	-18.4
-0.4	15.86	15.22	12.97	16.43	15.66	12.75	-15.09	-15.51	-18.02
-0.3	16.11	15.46	13.1	16.47	15.76	12.97	-14.65	-15.14	-17.65
-0.2	16.32	15.65	13.18	16.47	15.79	13.1	-14.22	-14.79	-17.32



-0.1	16.43	15.71	13.19	16.47	15.77	13.16	-13.84	-14.5	-17.04
0	16.47	15.76	13.2	16.47	15.76	13.2	-13.49	-14.21	-16.77
0.1	16.51	15.8	13.22	16.48	15.75	13.24	-13.14	-13.91	-16.49
0.2	16.4	15.72	13.21	16.47	15.75	13.21	-12.91	-13.71	-16.25
0.3	16.24	15.57	13.13	16.44	15.72	13.05	-12.71	-13.55	-16.06
0.4	16.06	15.39	13.03	16.41	15.65	12.88	-12.52	-13.41	-15.89
0.5	15.77	15.15	12.92	16.38	15.52	12.69	-12.43	-13.33	-15.73
0.6	15.37	14.82	12.8	16.36	15.41	12.48	-12.44	-13.33	-15.59
0.7	14.94	14.4	12.64	16.3	15.3	12.1	-12.48	-13.41	-15.48
0.8	14.45	13.98	12.39	16.24	15.17	11.71	-12.58	-13.5	-15.44
0.9	13.75	13.51	12.16	16.18	15.03	11.29	-12.89	-13.63	-15.4
1	13.04	12.82	11.93	16.08	14.86	10.84	-13.22	-14.01	-15.36
1.1	12.23	12.11	11.68	15.98	14.63	10.19	-13.65	-14.41	-15.34
1.2	11.19	11.36	11.32	15.83	14.41	9.49	-14.32	-14.84	-15.44
1.3	10.08	10.41	10.92	15.69	14.18	8.78	-15.07	-15.51	-15.57
1.4	8.84	9.3	10.52	15.56	13.93	8.04	-15.99	-16.36	-15.7
1.5	7.38	8.14	10.13	15.42	13.69	7.11	-17.21	-17.28	-15.83
1.6	5.75	6.91	9.7	15.25	13.41	5.98	-18.67	-18.36	-15.99
1.7	4.13	5.47	9.17	15.06	13.07	4.83	-20.28	-19.83	-16.25
1.8	2.56	3.91	8.56	14.87	12.72	3.66	-22.74	-21.61	-16.59
1.9	1.08	2.35	7.96	14.69	12.34	2.39	-25.9	-23.45	-16.93
2	-0.33	1.08	7.38	14.49	11.97	1.02	-29.13	-25.26	-17.27
2.1	-0.55	0.41	6.68	14.25	11.6	-0.32	-30.04	-26.78	-17.7
2.2	-0.02	0	5.89	14.02	11.2	-1.59	-29.27	-27.96	-18.22
2.3	0.74	-0.25	5.08	13.78	10.72	-2.62	-27.74	-28.73	-18.75
2.4	1.47	-0.07	4.27	13.55	10.19	-2.62	-26.02	-28.31	-19.31
2.5	2.1	0.65	3.39	13.26	9.68	-2.51	-24.35	-26.43	-19.94
2.6	2.69	1.36	2.38	12.92	9.17	-2.31	-22.81	-24.67	-20.67
2.7	3.22	2.03	1.16	12.58	8.67	-2.01	-21.4	-23.06	-21.56
2.8	3.22	2.31	-0.04	12.24	8.13	-1.55	-21.01	-22.28	-22.45
2.9	3.19	2.49	-1.21	11.88	7.45	-1.13	-20.64	-21.67	-23.33
3	3.07	2.64	-2.39	11.46	6.79	-0.74	-20.39	-21.11	-24.23
3.1	2.66	2.61	-4.23	11.04	6.14	-0.39	-20.5	-20.77	-25.64
3.2	2.09	2.37	-6.22	10.63	5.5	-0.32	-20.81	-20.66	-27.2
3.3	1.42	2.01	-8.21	10.22	4.87	-0.39	-21.22	-20.7	-28.79
3.4	0.5	1.59	-10.2	9.71	4.13	-0.52	-21.87	-20.79	-30.43
3.5	-0.74	0.98	-11.68	9.18	3.3	-0.72	-22.84	-21.07	-32.07
3.6	-2	0.04	-12.21	8.66	2.48	-1.1	-23.82	-21.64	-33.67
3.7	-3.83	-0.94	-12.74	8.15	1.68	-1.7	-25.27	-22.24	-35.32
3.8	-6.13	-1.96	-13.49	7.57	0.9	-2.34	-27.09	-22.86	-37.22
3.9	-8.53	-3.57	-14.48	6.93	0.07	-3.02	-28.95	-23.84	-39.23
4	-10.73	-5.45	-14.64	6.3	-0.82	-3.87	-31.6	-24.98	-39.71
4.1	-12.62	-7.41	-14.05	5.66	-1.82	-5.17	-35.06	-26.15	-38.94
4.2	-14.27	-9.65	-13.2	4.96	-2.79	-6.55	-38.79	-27.49	-37.72
4.3	-15.14	-12.26	-12.25	4.14	-3.72	-8	-41.34	-29.09	-36.31
4.4	-13.82	-14.68	-11.38	3.33	-4.69	-9.51	-40.14	-30.63	-34.94
4.5	-11.91	-16.75	-10.91	2.52	-5.63	-12.06	-37.97	-32.02	-34.1
4.6	-10.05	-16.82	-10.93	1.72	-6.61	-14.88	-35.99	-32.87	-34
4.7	-9.39	-15.27	-10.94	0.84	-7.63	-17.76	-34.82	-33.12	-33.94
4.8	-9.04	-13.46	-10.93	-0.05	-8.6	-20.65	-33.83	-33.01	-33.94
4.9	-8.8	-11.87	-10.92	-0.92	-9.58	-21.11	-32.91	-32.69	-34.01
5	-8.99	-10.95	-11.4	-1.79	-10.49	-20.21	-32.42	-32.31	-34.76
5.1	-9.61	-10.66	-11.95	-2.34	-11.34	-18.88	-32.35	-32.01	-35.7
5.2	-10.27	-10.45	-12.52	-2.74	-12.13	-17.13	-32.27	-31.78	-36.82
5.3	-11.01	-10.38	-13.1	-3.14	-12.85	-15.89	-32.21	-31.65	-38.1
5.4	-11.92	-11.07	-13.88	-3.55	-13.54	-15.35	-32.22	-32.13	-39.55
5.5	-12.83	-11.9	-14.95	-3.67	-14.13	-14.92	-32.14	-32.79	-41.05
5.6	-13.26	-12.82	-16.1	-3.35	-14.61	-14.59	-31.89	-33.56	-42.29
5.7	-12.88	-14	-17.27	-3.1	-14.98	-14.51	-31.44	-34.12	-43.21
5.8	-12.18	-15.31	-18.46	-2.86	-15.24	-15.2	-30.9	-34.49	-43.83
5.9	-11.41	-16.62	-20.2	-2.62	-15.39	-15.98	-30.3	-34.83	-42.85
6	-10.55	-17.6	-22.32	-2.26	-15.46	-16.86	-29.68	-35	-41.07
6.1	-9.64	-17.67	-24.35	-1.91	-15.43	-17.83	-29.06	-34.51	-39.3
6.2	-8.78	-16.59	-26.22	-1.56	-15.31	-19.66	-28.45	-33.17	-37.66
6.3	-8.29	-15.37	-27.79	-1.21	-15.16	-21.78	-28.03	-31.8	-36.21
6.4	-8.01	-14.12	-28.56	-0.99	-15.02	-23.99	-27.74	-30.5	-35.14
6.5	-7.76	-13.24	-28.47	-0.78	-14.91	-26.2	-27.47	-29.59	-34.45
6.6	-7.83	-12.5	-28.15	-0.56	-14.76	-26.5	-27.45	-28.81	-33.87
6.7	-8.13	-11.81	-27.57	-0.33	-14.56	-25.49	-27.61	-28.05	-33.45





6.8	-8.49	-11.37	-27.04	-0.25	-14.41	-24.12	-27.84	-27.49	-33.07
6.9	-9.08	-11.33	-26.18	-0.18	-14.27	-22.27	-28.29	-27.26	-33.05
7	-10.1	-11.43	-25.44	-0.12	-14.14	-20.81	-29.14	-27.11	-33.13
7.1	-11.18	-11.64	-24.93	-0.04	-14.12	-20.06	-30.08	-27.04	-33.24
7.2	-12.31	-12.23	-24.63	-0.11	-14.07	-19.42	-31.09	-27.32	-33.39
7.3	-13.69	-13.05	-24.46	-0.23	-14.14	-18.91	-32.77	-27.8	-33.7
7.4	-15.05	-13.95	-24.34	-0.34	-14.19	-18.58	-34.48	-28.33	-34.25
7.5	-16.15	-14.91	-24.24	-0.45	-14.2	-19	-35.97	-29.05	-34.93
7.6	-16.24	-15.87	-24.24	-0.63	-14.23	-19.55	-36.46	-30.14	-35.64
7.7	-15.65	-16.74	-24.33	-0.87	-14.38	-20.23	-36.17	-31.55	-36.4
7.8	-14.98	-17.42	-24.42	-1.1	-14.6	-21.03	-35.61	-33.03	-37.29
7.9	-14.24	-17.76	-24.24	-1.33	-14.79	-22.56	-34.61	-34.55	-38.58
8	-13.43	-17.01	-24.01	-1.62	-14.95	-24.77	-33.09	-36.34	-39.86
8.1	-12.65	-16.14	-23.75	-1.98	-15.08	-27.36	-31.61	-37.39	-41.12
8.2	-12.16	-15.17	-23.48	-2.34	-15.29	-30.32	-30.54	-37.74	-42.38
8.3	-12.05	-14.37	-23.23	-2.69	-15.55	-31.65	-29.9	-36.69	-42.8
8.4	-12.05	-13.75	-22.97	-3.11	-15.77	-30.7	-29.35	-35.11	-42.52
8.5	-12.29	-13.24	-22.67	-3.6	-15.97	-28.78	-29	-33.66	-42
8.6	-12.87	-12.86	-22.33	-4.09	-16.14	-26.31	-28.91	-32.45	-41.36
8.7	-13.65	-12.74	-21.98	-4.59	-16.43	-24.01	-28.98	-31.62	-40.58
8.8	-14.55	-12.88	-21.74	-5.17	-16.68	-22.92	-29.1	-31.13	-39.63
8.9	-15.87	-13.08	-21.65	-5.83	-16.96	-21.93	-29.5	-30.81	-38.6
9	-17.44	-13.48	-21.58	-6.49	-17.22	-21.06	-30.05	-30.77	-37.81
9.1	-19.06	-14.34	-21.49	-7.13	-17.54	-20.41	-30.61	-31.19	-37.01
9.2	-19.61	-15.39	-21.41	-7.79	-17.93	-20.34	-31.33	-31.85	-36.25
9.3	-19.58	-16.52	-21.51	-8.46	-18.31	-20.37	-32.18	-32.65	-35.79
9.4	-19.3	-18.19	-21.68	-9.13	-18.69	-20.45	-33.15	-33.92	-35.45
9.5	-18.62	-20.77	-21.83	-9.78	-19.17	-20.56	-34.05	-35.98	-35.1
9.6	-17.46	-23.69	-21.96	-10.32	-19.83	-21.04	-34.81	-38.4	-34.76
9.7	-16.24	-27.29	-22.11	-10.65	-20.49	-21.66	-35.68	-41.24	-34.53
9.8	-15.07	-28.61	-22.37	-10.97	-21.14	-22.25	-36.64	-42.04	-34.57
9.9	-14.69	-27.96	-22.67	-11.27	-21.78	-22.8	-37.06	-41.33	-34.75
10	-14.34	-26.15	-22.93	-11.37	-22.57	-23.42	-37.54	-39.8	-34.92
15	-17.37	-24.61	-34.4	-15.59	-28.07	-26.72	-38.41	-36.48	-51.39
20	-19.7	-25.8	-35.74	-22.93	-25.93	-32.84	-36.17	-34.36	-37.75
25	-29.51	-29.35	-31.93	-28.9	-41.25	-36.94	-38.82	-35.29	-36.41
30	-35.63	-28.48	-55.66	-29.23	-24.84	-37.74	-48.96	-34.5	-39.09
35	-33.66	-36.43	-39.78	-25.98	-24.26	-30.87	-35.42	-36.17	-43.06
40	-34.48	-40.77	-45.21	-36.39	-23.98	-42.74	-46.23	-41.12	-40.41
45	-26.31	-34.03	-52.13	-12.88	-19.89	-34.38	-45.09	-39.57	-47.43
50	-33.91	-34.16	-88.29	-11.94	-30.72	-45.12	-38.49	-40.96	-88.71
55	-33.53	-28.08		-23.31	-31.96	-40.86	-41	-50.92	
60	-33.63	-33.71		-30.95	-47.4	-38.55	-58.43	-39.88	
65	-39.43	-29.84		-38.33	-39.7	-25.3	-50.62	-41.23	
70	-36.94	-29.71		-31.08	-27.91	-42.53	-36.16	-37.09	
75	-39.56	-30.15		-35.87	-28.76	-32.02	-47.76	-40.51	
80	-43.59	-26.96		-42.97	-29.47	-31.57	-45.83	-32.77	
85	-43.34	-33.82		-32.25	-43.25	-28.42	-43.34	-38.02	
90				-21.62	-27.14	-39.81			
95				-31.48	-24.04	-35.36			
100				-27.47	-33.23	-37.45			
105				-26.72	-33.23	-36.73			
110				-28.79	-40.37	-28.95			
115				-40.35	-41.89	-35.38			
120				-29.44	-39.02	-89.6			
125				-31.3	-46.7				
130				-42.65	-79.46				
135				-65.51					
140									
145									
150									
155									
160									
165									
170									
175									
180									





**5.5.1.4 Elevation=30°, Scan=60°, f=14.05 GHz:**

angle	GSO (co) skew=10°	GSO (co) skew=30°	GSO (co) skew=50°	elev (co) skew=10°	elev (co) skew=30°	elev (co) skew=50°	GSO (x) skew=10°	GSO (x) skew=30°	GSO (x) skew=50°
-180									
-175									
-170									
-165									
-160									
-155									
-150									
-145									
-140									
-135									
-130									
-125									
-120									
-115									
-110									
-105									
-100									
-95									
-90									
-85									
-80									
-75									
-70									
-65									
-60									
-55	-42.11						-34.31		
-50	-30.22						-28.58		
-45	-34.08						-33.74		
-40	-34.13						-35.79		
-35	-26.89	-33.45					-37.53	-27.26	-32.01
-30	-28.74	-30.57	-31.11				-40.29	-38.52	-38.79
-25	-27.04	-32.02	-25.93	-16.84	-30.96	-33.13	-23.39	-28.38	-25.1
-20	-35.99	-40.78	-25.02	-6.82	-37.64	-30.58	-31.89	-28.76	-33.32
-15	-28.41	-27.3	-16.88	-0.29	-23.32	-31.57	-47.37	-27.01	-33.26
-10	-26.39	-15.79	-16.08	-7.09	-32.24	-26.88	-27.73	-29.47	-27.29
-9.9	-27.05	-15.11	-15.33	-7.53	-32.36	-27.22	-27.35	-30.54	-27.63
-9.8	-27.67	-14.51	-14.62	-7.95	-32.48	-27.42	-27.23	-31.4	-28.01
-9.7	-27.58	-14.11	-14.07	-8.35	-32.59	-27.39	-27.36	-31.75	-28.44
-9.6	-25.98	-13.81	-13.7	-8.71	-32.56	-27.34	-28.02	-31.8	-28.96
-9.5	-24.05	-13.62	-13.39	-9.04	-31.28	-27.19	-28.94	-31.49	-29.52
-9.4	-22.45	-13.68	-13.14	-9.34	-29.85	-26.87	-30.3	-30.25	-30.1
-9.3	-21.07	-13.76	-13.05	-9.33	-28.29	-26.54	-31.94	-28.97	-30.67
-9.2	-19.81	-14.22	-13.12	-9.07	-26.58	-26.13	-33.46	-28.03	-31.24
-9.1	-18.7	-14.82	-13.21	-8.71	-25.08	-25.56	-34.83	-27.22	-31.82
-9	-17.71	-15.42	-13.44	-8.27	-23.73	-25	-35.68	-26.51	-32.34
-8.9	-17.09	-15.97	-13.97	-7.74	-22.39	-24.49	-34.94	-26.06	-32.67
-8.8	-16.52	-16.48	-14.6	-7.14	-21.07	-24.01	-34.06	-25.68	-32.91
-8.7	-16.3	-16.84	-15.37	-6.45	-19.79	-23.51	-32.48	-25.5	-32.99
-8.6	-16.15	-17.05	-16.59	-5.64	-18.83	-23.06	-30.73	-25.47	-32.91
-8.5	-16.17	-17.03	-18.29	-4.82	-17.89	-22.66	-29.09	-25.57	-32.69
-8.4	-16.28	-16.5	-19.95	-3.99	-16.96	-22.26	-27.49	-25.9	-32.48
-8.3	-16.51	-15.54	-21.45	-3.15	-15.97	-21.9	-26.22	-26.45	-32.28
-8.2	-16.85	-14.59	-21.9	-2.31	-15.14	-21.58	-25.28	-27.22	-32.16
-8.1	-17.18	-13.7	-22.09	-1.46	-14.44	-21.27	-24.65	-28.63	-32.07
-8	-17.42	-12.83	-22.22	-0.67	-13.74	-21	-24.37	-30.22	-32.02
-7.9	-17.52	-12.05	-21.17	-0.05	-13.07	-20.75	-24.34	-32.07	-31.98
-7.8	-17.39	-11.4	-19.16	0.56	-12.44	-20.5	-24.47	-33.98	-32.01
-7.7	-17	-10.77	-16.95	1.17	-12.06	-20.32	-24.77	-35.66	-32.09
-7.6	-16.5	-10.4	-14.93	1.77	-11.69	-20.16	-25.15	-37.27	-32.32
-7.5	-15.76	-10.1	-13.39	2.37	-11.26	-20	-25.7	-38.48	-32.81
-7.4	-15.01	-10.02	-12.24	2.96	-10.84	-19.96	-26.28	-37.9	-33.54
-7.3	-14.23	-10.21	-11.14	3.45	-10.61	-19.96	-27.03	-35.62	-34.32
-7.2	-13.45	-10.53	-10.14	3.94	-10.49	-19.95	-27.76	-32.91	-35.06
-7.1	-12.96	-11.1	-9.43	4.43	-10.39	-20.1	-27.68	-30.65	-35.45



-7	-12.55	-11.91	-8.75	4.92	-10.29	-20.31	-27.39	-28.81	-35.55
-6.9	-12.31	-12.8	-8.1	5.41	-10.23	-20.5	-26.85	-27.27	-35.5
-6.8	-12.21	-13.84	-7.66	5.89	-10.52	-20.72	-26.14	-26.27	-35.04
-6.7	-12.25	-14.93	-7.3	6.3	-10.74	-20.93	-25.29	-25.54	-34.39
-6.6	-12.45	-15.92	-6.96	6.7	-10.94	-21.11	-24.29	-24.98	-33.63
-6.5	-12.8	-16.6	-6.71	7.09	-11.12	-20.86	-23.33	-24.81	-32.61
-6.4	-13.41	-17.14	-6.62	7.49	-11.49	-20.54	-22.63	-24.66	-31.44
-6.3	-14.13	-16.05	-6.61	7.89	-11.97	-20.2	-22.11	-24.82	-30.39
-6.2	-14.52	-14.51	-6.62	8.28	-12.41	-19.28	-21.74	-25.09	-29.48
-6.1	-14.58	-12.87	-6.77	8.63	-12.79	-18.3	-21.52	-25.43	-28.71
-6	-14.43	-11.17	-7.05	8.97	-13.03	-17.31	-21.44	-25.85	-28.06
-5.9	-14	-9.46	-7.35	9.31	-12.61	-16.04	-21.54	-26.31	-27.47
-5.8	-13.26	-8.03	-7.68	9.66	-12.22	-14.74	-21.78	-26.83	-26.95
-5.7	-11.93	-6.89	-8.11	10.01	-11.84	-13.44	-22.29	-27.42	-26.58
-5.6	-10.42	-5.9	-8.57	10.35	-11.49	-12.38	-22.97	-27.88	-26.31
-5.5	-9.12	-5.2	-9.04	10.64	-10.61	-11.3	-23.89	-27.96	-26.12
-5.4	-8	-4.72	-9.57	10.92	-9.51	-10.24	-25	-27.73	-26.01
-5.3	-6.97	-4.3	-10.12	11.21	-8.51	-9.38	-25.98	-27.43	-26
-5.2	-6.09	-4.09	-10.66	11.49	-7.55	-8.5	-26.73	-26.93	-26.03
-5.1	-5.26	-3.9	-11.13	11.78	-6.53	-7.69	-27.39	-26.43	-26.12
-5	-4.7	-3.89	-11.21	12.05	-5.2	-7.11	-27.59	-25.87	-26.46
-4.9	-4.15	-3.95	-11.13	12.3	-3.9	-6.52	-27.77	-25.28	-26.94
-4.8	-4.01	-4.1	-11	12.56	-2.63	-6.02	-26.68	-24.76	-27.47
-4.7	-3.92	-4.43	-10.8	12.82	-1.4	-5.72	-25.45	-24.4	-28.18
-4.6	-3.98	-4.83	-10.54	13.07	-0.41	-5.41	-24.5	-24.11	-29.1
-4.5	-4.12	-5.31	-10.29	13.33	0.55	-5.17	-23.66	-24.02	-30.13
-4.4	-4.36	-5.87	-10.07	13.56	1.51	-5.09	-23.02	-24.11	-31.21
-4.3	-4.7	-6.4	-9.89	13.77	2.48	-5.01	-22.52	-24.32	-32.26
-4.2	-5.14	-6.87	-9.78	13.97	3.38	-5.01	-22.22	-24.68	-33.28
-4.1	-5.69	-7.26	-9.74	14.16	4.12	-5.17	-22.19	-25.2	-34.29
-4	-6.26	-7.58	-9.9	14.36	4.85	-5.32	-22.4	-25.83	-34.93
-3.9	-6.73	-7.65	-10.51	14.55	5.57	-5.62	-22.93	-26.75	-34.27
-3.8	-7.09	-7.69	-11.21	14.73	6.31	-6.11	-23.77	-27.74	-33.35
-3.7	-7.34	-7.54	-12	14.9	6.92	-6.59	-25.01	-29.07	-32.19
-3.6	-7.44	-7.29	-12.92	15.08	7.53	-6.68	-26.84	-30.59	-30.86
-3.5	-7.44	-7.09	-13.65	15.26	8.15	-6.54	-29.06	-31.87	-29.45
-3.4	-7.23	-7.18	-13.99	15.45	8.77	-6.47	-32.02	-32.08	-28.03
-3.3	-7.03	-7.4	-13.63	15.6	9.32	-5.95	-34.51	-31.82	-26.72
-3.2	-7.04	-7.83	-12.61	15.76	9.81	-5.21	-34.24	-31.07	-25.55
-3.1	-7.18	-8.44	-11.25	15.92	10.32	-4.54	-32.64	-29.82	-24.46
-3	-7.63	-9.2	-9.56	16.05	10.83	-3.29	-30.79	-28.35	-23.43
-2.9	-8.37	-10.22	-7.32	16.19	11.34	-1.81	-28.75	-26.83	-22.55
-2.8	-9.08	-11.42	-4.85	16.31	11.72	-0.34	-26.66	-25.37	-21.89
-2.7	-9.69	-12.03	-2.51	16.43	12.09	0.89	-24.47	-24.03	-21.26
-2.6	-10.02	-9.99	-0.42	16.55	12.46	2.08	-22.43	-23.05	-20.67
-2.5	-8.63	-7.76	0.98	16.67	12.84	3.29	-21.24	-22.13	-20.24
-2.4	-6.93	-5.21	2.31	16.8	13.18	4.31	-20.14	-21.29	-19.81
-2.3	-4.65	-2.53	3.6	16.91	13.49	5.34	-19.35	-20.55	-19.38
-2.2	-2.24	0.03	4.7	17.02	13.81	6.36	-18.63	-19.87	-19.08
-2.1	0.16	2.16	5.71	17.13	14.12	7.17	-18.05	-19.31	-18.83
-2	2.53	4.1	6.69	17.24	14.41	7.99	-17.55	-18.83	-18.59
-1.9	4.65	5.74	7.6	17.35	14.66	8.8	-17.12	-18.42	-18.37
-1.8	6.48	7.09	8.42	17.43	14.91	9.41	-16.77	-18.09	-18.16
-1.7	8.08	8.32	9.18	17.51	15.17	10.03	-16.47	-17.81	-17.98
-1.6	9.43	9.44	9.9	17.59	15.43	10.64	-16.24	-17.56	-17.84
-1.5	10.6	10.46	10.53	17.67	15.61	11.14	-16.05	-17.28	-17.76
-1.4	11.68	11.43	11.07	17.75	15.78	11.63	-15.87	-17.02	-17.69
-1.3	12.65	12.24	11.6	17.82	15.96	12.09	-15.72	-16.81	-17.62
-1.2	13.56	13.03	12.11	17.88	16.15	12.47	-15.6	-16.65	-17.55
-1.1	14.35	13.7	12.52	17.94	16.31	12.87	-15.52	-16.51	-17.48
-1	15.08	14.29	12.88	18	16.43	13.22	-15.44	-16.4	-17.43
-0.9	15.69	14.84	13.24	18.07	16.52	13.5	-15.38	-16.3	-17.4
-0.8	16.24	15.3	13.54	18.12	16.63	13.79	-15.32	-16.17	-17.38
-0.7	16.7	15.7	13.8	18.16	16.74	14.02	-15.2	-16.01	-17.38
-0.6	17.1	16.05	14.05	18.18	16.81	14.18	-15.07	-15.84	-17.38
-0.5	17.44	16.33	14.26	18.21	16.88	14.35	-14.94	-15.7	-17.37
-0.4	17.72	16.58	14.42	18.24	16.93	14.47	-14.79	-15.59	-17.34
-0.3	17.96	16.78	14.55	18.24	16.99	14.56	-14.62	-15.46	-17.32
-0.2	18.12	16.93	14.66	18.24	17.02	14.66	-14.38	-15.33	-17.33



-0.1	18.26	17.05	14.72	18.25	17.02	14.69	-14.14	-15.21	-17.36
0	18.25	17.04	14.71	18.25	17.04	14.71	-13.8	-15.02	-17.34
0.1	18.23	17.01	14.69	18.26	17.05	14.74	-13.44	-14.81	-17.3
0.2	18.12	16.92	14.64	18.25	17.05	14.66	-13.11	-14.6	-17.24
0.3	17.97	16.77	14.53	18.24	16.98	14.55	-12.79	-14.43	-17.22
0.4	17.76	16.59	14.39	18.23	16.91	14.45	-12.5	-14.29	-17.24
0.5	17.49	16.35	14.24	18.23	16.84	14.28	-12.23	-14.16	-17.29
0.6	17.15	16.06	14.05	18.19	16.78	14.1	-12.02	-14.03	-17.32
0.7	16.73	15.72	13.8	18.14	16.68	13.94	-11.86	-13.93	-17.31
0.8	16.23	15.28	13.53	18.09	16.56	13.69	-11.77	-13.86	-17.3
0.9	15.65	14.8	13.22	18.04	16.45	13.45	-11.77	-13.8	-17.35
1	14.97	14.23	12.85	18	16.35	13.2	-11.84	-13.82	-17.43
1.1	14.21	13.55	12.43	17.93	16.24	12.84	-11.96	-13.92	-17.52
1.2	13.35	12.85	12	17.87	16.08	12.5	-12.17	-14.04	-17.61
1.3	12.4	11.97	11.48	17.82	15.92	12.14	-12.42	-14.28	-17.69
1.4	11.3	11.06	10.86	17.76	15.76	11.68	-12.79	-14.5	-17.85
1.5	10.09	10.01	10.22	17.69	15.62	11.24	-13.23	-14.82	-18.05
1.6	8.59	8.87	9.54	17.61	15.42	10.77	-13.88	-15.17	-18.29
1.7	6.95	7.58	8.76	17.54	15.2	10.2	-14.61	-15.61	-18.58
1.8	5.16	6.03	7.89	17.45	14.97	9.65	-15.42	-16.25	-18.91
1.9	3.28	4.3	6.99	17.35	14.75	9.08	-16.3	-17	-19.29
2	1.49	2.6	5.97	17.23	14.49	8.45	-17.22	-17.83	-19.75
2.1	-0.12	0.97	4.82	17.11	14.2	7.83	-18.2	-18.78	-20.3
2.2	-1.32	-0.51	3.63	16.99	13.91	7.13	-19.13	-19.77	-20.89
2.3	-0.92	-1.51	2.37	16.88	13.6	6.31	-19.88	-20.86	-21.58
2.4	-0.44	-2.04	0.88	16.73	13.28	5.48	-20.61	-22.04	-22.52
2.5	0.34	-2.15	-0.65	16.58	12.91	4.56	-20.65	-23.34	-23.59
2.6	1.13	-1.23	-2.16	16.42	12.55	3.58	-20.61	-24.61	-24.74
2.7	1.76	-0.25	-3.22	16.27	12.19	2.62	-20.42	-25.95	-26.22
2.8	2.3	0.47	-3.77	16.11	11.8	1.56	-20.16	-26.58	-28.26
2.9	2.62	1.04	-4.08	15.91	11.37	0.46	-19.87	-26.76	-30.85
3	2.76	1.47	-4.15	15.7	10.93	-0.63	-19.58	-26.66	-33.69
3.1	2.69	1.72	-3.85	15.49	10.5	-1.92	-19.4	-26.27	-36.12
3.2	2.36	1.82	-3.28	15.28	10.07	-3.24	-19.44	-25.64	-37.91
3.3	1.84	1.76	-2.66	15.02	9.58	-4.51	-19.64	-25.02	-38.53
3.4	1.15	1.47	-2.07	14.77	9.01	-6.04	-19.98	-24.63	-37.13
3.5	0.29	1.11	-1.62	14.52	8.45	-7.6	-20.48	-24.28	-34.38
3.6	-0.78	0.45	-1.22	14.27	7.91	-9.11	-21.12	-24.39	-31.85
3.7	-2.11	-0.39	-0.88	13.98	7.36	-10.61	-21.97	-24.75	-29.54
3.8	-3.7	-1.4	-0.83	13.68	6.74	-12.15	-22.95	-25.26	-28.03
3.9	-5.82	-2.73	-0.89	13.38	6.13	-13.75	-24.25	-26.09	-27.02
4	-8.47	-4.2	-0.99	13.09	5.52	-15.72	-25.62	-27.07	-26.13
4.1	-12.5	-6.32	-1.23	12.77	4.94	-17.73	-26.91	-28.65	-25.44
4.2	-17.11	-8.95	-1.59	12.4	4.32	-19.79	-28.11	-30.69	-24.92
4.3	-20.42	-12.7	-2.02	12.04	3.68	-22.12	-29.03	-33.53	-24.51
4.4	-22.08	-18.57	-2.57	11.68	3.05	-24.85	-29.63	-37.79	-24.25
4.5	-21.97	-25.71	-3.27	11.3	2.44	-27.56	-29.86	-42.83	-24.13
4.6	-18.13	-29.94	-4.09	10.88	1.84	-28.03	-29.2	-45.73	-24.1
4.7	-14.37	-25.99	-4.99	10.47	1.16	-28.47	-28.47	-42.61	-24.08
4.8	-13.56	-22.26	-6.11	10.06	0.49	-28.48	-28.12	-39.63	-24.19
4.9	-13.04	-18.36	-7.78	9.63	-0.16	-27.12	-27.78	-36.3	-24.7
5	-13.45	-15.01	-9.56	9.17	-0.79	-25.76	-27.71	-33.17	-25.19
5.1	-14.13	-12.93	-11.52	8.7	-1.45	-24.66	-27.73	-30.92	-25.7
5.2	-15.16	-12.19	-14.27	8.24	-2.17	-23.27	-27.97	-29.81	-26.47
5.3	-16.39	-11.96	-17.09	7.76	-2.87	-21.92	-28.36	-29.17	-27.34
5.4	-17.34	-12.37	-19.66	7.18	-3.54	-20.91	-28.92	-29.03	-28.22
5.5	-17.78	-13.36	-21.27	6.61	-4.2	-20.25	-29.66	-29.29	-29.27
5.6	-17.52	-14.32	-21.62	6.03	-4.9	-19.59	-30.37	-29.62	-30.45
5.7	-16.27	-15.05	-21.24	5.42	-5.6	-19.13	-30.7	-30.07	-31.49
5.8	-14.43	-15.51	-20.34	4.7	-6.27	-18.8	-30.78	-30.53	-32.43
5.9	-12.64	-15.68	-18.9	3.98	-6.92	-18.51	-30.73	-30.95	-33.41
6	-10.96	-15.15	-17.34	3.26	-7.56	-18.39	-30.6	-31.23	-34.2
6.1	-9.57	-14.39	-16.05	2.51	-8.26	-18.35	-30.2	-31.2	-34.54
6.2	-8.57	-12.93	-15.3	1.68	-8.92	-18.32	-29.2	-30.55	-34.32
6.3	-7.79	-11.31	-15.21	0.85	-9.55	-18.48	-28.17	-29.6	-33.96
6.4	-7.4	-9.89	-15.34	0.04	-10.14	-18.71	-27.56	-28.5	-33.58
6.5	-7.2	-8.78	-15.62	-0.72	-10.71	-18.98	-27.13	-27.48	-33.23
6.6	-7.19	-7.88	-16.23	-1.38	-11.26	-19.32	-26.88	-26.56	-32.95
6.7	-7.33	-7.16	-17.11	-2.03	-11.76	-19.69	-26.77	-25.74	-32.85



6.8	-7.6	-6.68	-18.04	-2.65	-12.21	-20.12	-26.81	-25.01	-32.92
6.9	-8.08	-6.28	-18.93	-3.01	-12.52	-20.59	-27.12	-24.33	-33.09
7	-8.66	-6.13	-19.71	-3.02	-12.84	-21.08	-27.52	-23.82	-33.51
7.1	-9.68	-6.08	-20.26	-3.01	-13.11	-21.58	-28.45	-23.39	-33.99
7.2	-10.72	-6.28	-20.37	-2.98	-13.32	-21.97	-29.43	-23.16	-34.69
7.3	-11.96	-6.77	-19.3	-2.66	-13.44	-22.25	-31.21	-23.14	-35.69
7.4	-13.23	-7.33	-17.91	-2.13	-13.53	-22.5	-33.04	-23.16	-36.91
7.5	-14.23	-8.18	-16.49	-1.61	-13.56	-22.65	-34.6	-23.33	-38.31
7.6	-15.07	-9.21	-15.21	-1.09	-13.52	-22.78	-35.86	-23.59	-39.31
7.7	-15.46	-10.45	-14.15	-0.58	-13.44	-22.9	-36.17	-23.97	-39.66
7.8	-15.37	-11.97	-13.24	-0.09	-13.43	-22.91	-35.4	-24.53	-39.65
7.9	-14.97	-13.7	-12.45	0.39	-13.39	-22.75	-33.89	-25.23	-39.4
8	-14.36	-15.65	-11.87	0.87	-13.31	-22.64	-32.03	-26.13	-38.48
8.1	-13.65	-17.84	-11.52	1.25	-13.18	-22.61	-30.27	-27.36	-36.68
8.2	-13.09	-19.88	-11.27	1.62	-13.16	-22.63	-28.88	-28.67	-34.73
8.3	-12.74	-19.52	-11.14	1.99	-13.2	-22.72	-27.9	-31.06	-32.91
8.4	-12.52	-18.49	-11.28	2.34	-13.2	-22.78	-27.1	-34.52	-32.08
8.5	-12.64	-17.16	-11.54	2.61	-13.17	-22.87	-26.65	-38.29	-31.35
8.6	-12.91	-15.65	-11.89	2.89	-13.16	-23	-26.34	-41.67	-30.67
8.7	-13.61	-14.16	-12.49	3.16	-13.26	-23.18	-26.32	-44.77	-30.3
8.8	-14.53	-13.07	-13.29	3.4	-13.34	-23.42	-26.44	-44.36	-30.14
8.9	-16.04	-12.35	-14.23	3.57	-13.4	-23.65	-26.78	-40.11	-30.08
9	-17.94	-11.86	-15.5	3.73	-13.43	-23.89	-27.31	-35.67	-30.17
9.1	-19.58	-11.76	-17.29	3.89	-13.62	-24.2	-27.94	-33.24	-30.46
9.2	-20.82	-11.89	-19.47	3.99	-13.81	-24.41	-28.66	-31.8	-30.87
9.3	-21.65	-12.18	-21.96	4.07	-13.98	-24.58	-29.4	-30.71	-31.35
9.4	-21.26	-12.77	-25.33	4.16	-14.13	-24.81	-30.12	-30.11	-32.09
9.5	-20.46	-13.48	-28.58	4.24	-14.4	-24.9	-30.77	-29.66	-32.96
9.6	-18.86	-14.56	-31.35	4.25	-14.77	-24.91	-30.75	-29.61	-33.9
9.7	-17.14	-15.78	-32.2	4.26	-15.12	-24.95	-30.44	-29.72	-34.83
9.8	-15.76	-17.14	-29.53	4.28	-15.47	-24.93	-29.96	-30.02	-35.53
9.9	-14.66	-18.63	-25.42	4.26	-15.86	-24.88	-29.34	-30.54	-35.99
10	-13.87	-20.03	-22.03	4.21	-16.3	-24.83	-28.65	-31.18	-36.21
15	-20.14	-18.74	-25.19	-3.23	-21.91	-27.88	-34.04	-25.62	-30.31
20	-22.98	-23.34	-26.23	-5.32	-30.23	-30.08	-33.96	-39.25	-39.73
25	-28.51	-30.88	-38.62	-19.26	-37.5	-33.36	-33.94	-36.14	-36.21
30	-29.93	-28.38	-31.09	-28.73	-30.25	-38	-34.1	-58.15	-46.95
35	-39.88	-32.2	-33.4	-24	-40.22	-36.29	-39.87	-37.88	-38.27
40	-35.65	-31.97	-30.85	-37.77	-23.03	-27.74	-38.55	-53.83	-44.17
45	-55.89	-35.01	-39.4	-34.67	-30.7	-31.06	-40.88	-38.93	-45.16
50	-34.53	-32.35	-43.26	-31.72	-20.58	-28.72	-32.8	-45.46	-39.52
55	-35.45	-32.93	-31.89	-29.63	-22.45	-29.51	-42.05	-32.81	-40.82
60	-34.42	-40.61	-35.38	-14.3	-22.13	-22.72	-34	-41.88	-40.96
65	-43.61	-32.51	-33.44	-17.58	-35.52	-33.88	-37.11	-42.8	-41.7
70	-34.99	-38.41	-40.02	-35.6	-38.14	-51.23	-37.59	-50.03	-46.38
75	-48.42	-34.68	-32.19	-29.59	-45.08	-44.35	-58.63	-38.49	-37.71
80	-49.32	-40.1	-34.82	-31.27	-40.67	-46.82	-56.34	-41.52	-36.45
85	-56.44	-46.32	-42.8	-38.38	-48.59	-46.21	-51.88	-43.58	-44.63
90				-37.99	-44.53	-51.72			
95				-38.93	-52.57	-48.03			
100				-40.91	-59.7				
105									
110									
115									
120									
125									
130									
135									
140									
145									
150									
155									
160									
165									
170									
175									
180									



**5.5.1.5 Elevation=20°, Scan=70°, f=14.05 GHz:**

angle	GSO (co) skew=10°	GSO (co) skew=30°	GSO (co) skew=50°	elev (co) skew=10°	elev (co) skew=30°	elev (co) skew=50°	GSO (x) skew=10°	GSO (x) skew=30°	GSO (x) skew=50°
-180									
-175									
-170									
-165									
-160									
-155									
-150									
-145									
-140									
-135									
-130									
-125									
-120									
-115									
-110									
-105									
-100									
-95									
-90									
-85									
-80									
-75									
-70									
-65									
-60									
-55									
-50									
-45	-34.11							-31.07	
-40	-31.87							-29.58	
-35	-35.86							-23.13	
-30	-37.13							-28.95	
-25	-27.44	-26.74						-24.2	-28.59
-20	-32.01	-30.94						-25.69	-32.33
-15	-22.03	-23.48	-27.57	-9.01	-25.25	-30.42	-20.84	-24	-22.61
-10	-25.26	-15.78	-13.79	5.17	-24.65	-21.01	-24.25	-25.26	-26.32
-9.9	-25.53	-15.79	-13.84	5.41	-23.99	-20.59	-25.02	-25.14	-25.87
-9.8	-25.77	-15.83	-13.9	5.64	-23.35	-20.22	-25.91	-24.92	-25.4
-9.7	-25.94	-15.97	-14.06	5.86	-22.71	-19.96	-27.17	-24.21	-24.94
-9.6	-26.07	-16.11	-14.4	6.08	-21.8	-19.69	-28.55	-23.51	-24.49
-9.5	-25.87	-16.23	-14.87	6.3	-20.83	-19.51	-31.39	-22.82	-24.07
-9.4	-25.44	-16.33	-15.34	6.5	-19.83	-19.48	-35.19	-22.16	-23.67
-9.3	-25	-16.43	-15.86	6.69	-18.8	-19.45	-36.94	-21.49	-23.36
-9.2	-24.56	-16.44	-16.44	6.89	-17.79	-19.52	-36.14	-21.03	-23.2
-9.1	-24.1	-16.44	-17.01	7.09	-16.97	-19.74	-34.32	-20.58	-23.06
-9	-23.59	-16.27	-17.54	7.29	-16.16	-19.96	-31.46	-20.29	-22.96
-8.9	-23.1	-15.88	-17.92	7.49	-15.33	-20.24	-28.3	-20.16	-23.01
-8.8	-22.66	-15.44	-18.19	7.7	-14.49	-20.61	-25.92	-20.08	-23.15
-8.7	-22.29	-14.97	-18.41	7.91	-13.81	-20.97	-24.36	-20.1	-23.31
-8.6	-21.91	-14.48	-18.35	8.12	-13.19	-21.39	-22.97	-20.18	-23.58
-8.5	-21.44	-14.01	-17.52	8.32	-12.56	-21.88	-22.16	-20.29	-24.09
-8.4	-20.99	-13.56	-16.66	8.5	-11.93	-22.37	-21.35	-20.46	-24.63
-8.3	-20.44	-13.12	-15.79	8.69	-11.31	-22.65	-20.88	-20.66	-25.2
-8.2	-19.89	-12.76	-14.94	8.89	-10.92	-22.71	-20.43	-20.89	-26.04
-8.1	-19.21	-12.51	-14.09	9.06	-10.52	-22.8	-20.23	-21.16	-26.94
-8	-18.49	-12.32	-13.24	9.23	-10.11	-22.71	-20.11	-21.42	-27.82
-7.9	-17.79	-12.3	-12.44	9.41	-9.7	-22.45	-20.22	-21.66	-28.56
-7.8	-17.1	-12.39	-11.72	9.59	-9.4	-22.2	-20.5	-21.89	-29.04
-7.7	-16.48	-12.54	-11.03	9.77	-9.25	-21.87	-20.9	-22.1	-29.42
-7.6	-15.95	-12.92	-10.35	9.95	-9.09	-21.47	-21.4	-22.28	-29.75
-7.5	-15.5	-13.32	-9.83	10.13	-8.92	-21.07	-21.96	-22.46	-29.56
-7.4	-15.14	-13.89	-9.39	10.32	-8.74	-20.75	-22.54	-22.63	-29.05
-7.3	-14.88	-14.61	-8.96	10.5	-8.7	-20.5	-23.13	-22.79	-28.48
-7.2	-14.73	-15.35	-8.64	10.68	-8.66	-20.25	-23.7	-22.97	-27.79
-7.1	-14.79	-16.2	-8.46	10.86	-8.61	-20.24	-24.22	-23.26	-26.98



-7	-14.93	-17.07	-8.34	11.05	-8.55	-20.41	-24.63	-23.58	-26.15
-6.9	-15.46	-17.36	-8.25	11.24	-8.54	-20.56	-24.55	-23.99	-25.37
-6.8	-16	-17.11	-8.22	11.42	-8.61	-20.78	-24.47	-24.49	-24.71
-6.7	-16.78	-16.67	-8.26	11.59	-8.67	-21.05	-24.26	-25.02	-24.18
-6.6	-17.58	-15.78	-8.31	11.76	-8.72	-21.3	-24.04	-25.59	-23.66
-6.5	-18.58	-14.64	-8.38	11.94	-8.78	-21.51	-23.82	-26.19	-23.23
-6.4	-19.66	-13.46	-8.56	12.11	-8.65	-21.7	-23.6	-26.74	-22.99
-6.3	-19.83	-12.24	-8.75	12.26	-8.48	-21.87	-23.61	-27.22	-22.78
-6.2	-19.12	-11.03	-8.95	12.41	-8.35	-21.08	-23.84	-27.6	-22.6
-6.1	-18.1	-10	-9.22	12.57	-8.24	-19.72	-24.26	-27.63	-22.59
-6	-16.91	-9.22	-9.55	12.72	-8.04	-18.4	-24.91	-27.18	-22.71
-5.9	-15.61	-8.48	-9.87	12.88	-7.48	-17.11	-25.7	-26.67	-22.85
-5.8	-14.21	-7.9	-10.16	13.04	-6.93	-15.85	-26.56	-25.99	-23.08
-5.7	-12.74	-7.4	-10.32	13.2	-6.39	-14.6	-27.46	-25.21	-23.58
-5.6	-11.47	-6.96	-10.46	13.36	-5.86	-13.43	-28.21	-24.43	-24.14
-5.5	-10.47	-6.7	-10.59	13.51	-5.15	-12.28	-28.74	-23.66	-24.72
-5.4	-9.58	-6.45	-10.61	13.64	-4.33	-11.15	-28.88	-22.89	-25.61
-5.3	-9	-6.45	-10.57	13.76	-3.55	-10.28	-27.7	-22.38	-26.66
-5.2	-8.45	-6.55	-10.52	13.89	-2.8	-9.49	-26.46	-21.98	-27.82
-5.1	-8.07	-6.7	-10.41	14.01	-2.05	-8.71	-25.12	-21.64	-29.32
-5	-7.74	-6.93	-10.21	14.14	-1.25	-8.2	-23.73	-21.49	-31.24
-4.9	-7.56	-7.19	-9.99	14.27	-0.45	-7.76	-22.54	-21.37	-33.43
-4.8	-7.46	-7.49	-9.79	14.4	0.37	-7.32	-21.47	-21.42	-35.5
-4.7	-7.48	-7.82	-9.69	14.53	1.2	-7.07	-20.68	-21.57	-36.49
-4.6	-7.63	-8.14	-9.68	14.66	1.94	-6.86	-20.23	-21.84	-36.13
-4.5	-7.82	-8.41	-9.7	14.78	2.61	-6.63	-19.94	-22.36	-35.33
-4.4	-8.02	-8.65	-9.86	14.9	3.3	-6.62	-19.85	-23.03	-34.14
-4.3	-8.22	-8.76	-10.38	15.01	3.99	-6.63	-19.89	-24.11	-32.71
-4.2	-8.4	-8.7	-10.96	15.12	4.66	-6.63	-20.14	-25.78	-31.17
-4.1	-8.55	-8.6	-11.6	15.21	5.23	-7	-20.55	-27.54	-29.56
-4	-8.6	-8.49	-12.31	15.3	5.8	-7.4	-21.26	-29.19	-28.11
-3.9	-8.52	-8.37	-13.05	15.4	6.38	-7.79	-22.34	-30.67	-26.87
-3.8	-8.41	-8.26	-13.8	15.5	6.98	-7.89	-23.85	-32.06	-25.69
-3.7	-8.27	-8.17	-14.34	15.6	7.52	-8.04	-26.39	-33.3	-24.73
-3.6	-8.15	-8.1	-14.33	15.68	8.01	-8.22	-28.84	-34.15	-24.12
-3.5	-8.17	-8.44	-14.02	15.76	8.5	-7.8	-30.17	-32.71	-23.55
-3.4	-8.25	-9.14	-13.36	15.85	9	-7.42	-31.03	-29.63	-23.02
-3.3	-8.46	-9.91	-11.69	15.93	9.5	-7.01	-30.25	-26.77	-22.7
-3.2	-8.76	-10.81	-9.74	16.02	9.89	-5.64	-28.38	-24.78	-22.44
-3.1	-9.55	-11.67	-7.81	16.11	10.25	-4.3	-26.4	-23.04	-22.2
-3	-10.88	-12.25	-5.87	16.2	10.62	-3	-24.32	-21.73	-22.03
-2.9	-11.72	-12.56	-3.97	16.29	10.99	-1.76	-22.4	-20.75	-21.94
-2.8	-11.35	-12.25	-2.14	16.35	11.36	-0.5	-20.88	-19.92	-21.87
-2.7	-10.46	-10.27	-0.5	16.41	11.67	0.73	-19.56	-19.34	-21.84
-2.6	-9.02	-7.27	0.88	16.47	11.99	1.83	-18.56	-18.92	-21.87
-2.5	-7.24	-4.6	2.09	16.53	12.31	2.95	-17.75	-18.6	-21.93
-2.4	-5	-2.38	3.26	16.59	12.63	4.02	-17.15	-18.4	-22
-2.3	-2.31	-0.33	4.32	16.66	12.9	4.92	-16.74	-18.26	-22.1
-2.2	0.12	1.54	5.16	16.72	13.15	5.83	-16.42	-18.17	-22.28
-2.1	2.07	3.22	5.98	16.79	13.41	6.68	-16.24	-18.14	-22.44
-2	3.92	4.81	6.78	16.84	13.68	7.33	-16.09	-18.13	-22.58
-1.9	5.52	6.08	7.48	16.89	13.94	7.99	-16.03	-18.2	-22.75
-1.8	7.04	7.31	8.14	16.94	14.13	8.62	-15.99	-18.26	-22.89
-1.7	8.35	8.39	8.78	17	14.32	9.16	-16.01	-18.36	-23
-1.6	9.54	9.29	9.36	17.05	14.52	9.71	-16.06	-18.49	-23.12
-1.5	10.6	10.17	9.88	17.09	14.72	10.23	-16.15	-18.61	-23.23
-1.4	11.49	10.92	10.39	17.14	14.87	10.68	-16.28	-18.78	-23.32
-1.3	12.33	11.65	10.87	17.17	15	11.14	-16.44	-18.97	-23.39
-1.2	13.09	12.31	11.27	17.2	15.14	11.55	-16.65	-19.18	-23.47
-1.1	13.81	12.91	11.64	17.23	15.27	11.88	-16.89	-19.4	-23.53
-1	14.45	13.47	12.01	17.26	15.42	12.21	-17.17	-19.64	-23.58
-0.9	15.04	13.95	12.31	17.29	15.51	12.48	-17.48	-19.9	-23.48
-0.8	15.55	14.37	12.56	17.33	15.6	12.7	-17.83	-20.19	-23.3
-0.7	15.98	14.74	12.8	17.37	15.7	12.93	-18.23	-20.36	-23.16
-0.6	16.36	15.05	13.01	17.39	15.79	13.11	-18.49	-20.35	-22.94
-0.5	16.66	15.32	13.18	17.42	15.85	13.26	-18.53	-20.25	-22.55
-0.4	16.93	15.55	13.32	17.44	15.9	13.41	-18.46	-20	-22.13
-0.3	17.13	15.73	13.46	17.47	15.95	13.52	-18.1	-19.54	-21.7
-0.2	17.3	15.89	13.56	17.47	16	13.59	-17.62	-19.05	-21.1



-0.1	17.4	15.97	13.62	17.47	16.06	13.68	-16.83	-18.19	-20.37
0	17.48	16.04	13.68	17.48	16.04	13.68	-15.88	-17.31	-19.67
0.1	17.45	16.02	13.68	17.46	16	13.63	-14.91	-16.45	-19.02
0.2	17.35	15.92	13.61	17.44	15.97	13.58	-13.93	-15.59	-18.37
0.3	17.19	15.81	13.52	17.42	15.94	13.48	-13.03	-14.75	-17.73
0.4	16.98	15.61	13.42	17.41	15.89	13.36	-12.24	-14.05	-17.12
0.5	16.73	15.4	13.26	17.4	15.81	13.24	-11.5	-13.39	-16.6
0.6	16.41	15.13	13.08	17.39	15.74	13.07	-10.89	-12.81	-16.13
0.7	16.04	14.81	12.9	17.37	15.68	12.88	-10.35	-12.31	-15.66
0.8	15.59	14.45	12.67	17.34	15.61	12.7	-9.96	-11.87	-15.26
0.9	15.07	14.01	12.38	17.31	15.48	12.44	-9.68	-11.55	-14.94
1	14.46	13.51	12.08	17.28	15.36	12.17	-9.52	-11.34	-14.65
1.1	13.73	12.94	11.74	17.24	15.24	11.89	-9.5	-11.19	-14.42
1.2	12.95	12.26	11.34	17.19	15.12	11.52	-9.54	-11.19	-14.27
1.3	12.04	11.53	10.89	17.15	14.99	11.13	-9.72	-11.23	-14.17
1.4	11.09	10.71	10.43	17.09	14.82	10.76	-9.93	-11.37	-14.09
1.5	9.98	9.79	9.9	17.03	14.65	10.3	-10.3	-11.6	-14.07
1.6	8.8	8.84	9.28	16.96	14.47	9.85	-10.72	-11.85	-14.15
1.7	7.32	7.67	8.65	16.9	14.29	9.42	-11.4	-12.29	-14.24
1.8	5.67	6.48	7.96	16.84	14.06	8.9	-12.22	-12.73	-14.39
1.9	3.94	5.04	7.14	16.79	13.83	8.4	-13.21	-13.41	-14.67
2	2.14	3.42	6.29	16.71	13.59	7.88	-14.4	-14.25	-14.97
2.1	0.47	1.79	5.43	16.63	13.37	7.19	-15.81	-15.19	-15.28
2.2	-0.87	0.34	4.42	16.56	13.13	6.52	-17.58	-16.45	-15.73
2.3	-1.82	-0.99	3.34	16.48	12.84	5.86	-19.74	-17.86	-16.24
2.4	-1.82	-1.9	2.25	16.4	12.56	5.08	-22.88	-19.96	-16.76
2.5	-1.17	-2.34	1.03	16.31	12.28	4.31	-26.6	-22.73	-17.57
2.6	-0.44	-2.42	-0.28	16.2	12.01	3.56	-29.07	-26	-18.67
2.7	0.34	-1.97	-1.57	16.09	11.71	2.71	-29.93	-29.99	-19.92
2.8	1.03	-1.08	-2.69	15.98	11.41	1.87	-29.86	-34.18	-21.34
2.9	1.5	-0.29	-3.44	15.87	11.08	1.02	-27.7	-35.84	-23.07
3	1.89	0.26	-3.81	15.76	10.76	-0.02	-25.31	-32.17	-25.07
3.1	2.02	0.75	-4.08	15.65	10.42	-1.02	-23.25	-28.51	-27.1
3.2	2.08	1.08	-4.1	15.52	10.02	-2.03	-21.36	-25.38	-28.98
3.3	1.81	1.26	-3.67	15.38	9.63	-3.25	-20.42	-22.76	-30
3.4	1.41	1.39	-3.2	15.24	9.25	-4.41	-19.88	-20.62	-30.31
3.5	0.83	1.27	-2.69	15.1	8.87	-5.6	-19.56	-19.53	-29.88
3.6	0.13	1.09	-2.18	14.97	8.43	-6.99	-19.42	-18.63	-27.78
3.7	-0.71	0.66	-1.69	14.83	7.97	-8.37	-19.41	-18.15	-25.71
3.8	-1.71	0.08	-1.24	14.65	7.53	-9.74	-19.57	-17.92	-23.79
3.9	-2.88	-0.62	-0.97	14.46	7.09	-11.23	-19.86	-17.83	-22.32
4	-4.34	-1.47	-0.83	14.28	6.66	-12.61	-20.33	-17.88	-21.23
4.1	-6.08	-2.43	-0.75	14.09	6.2	-14.07	-20.91	-18.03	-20.3
4.2	-8.24	-3.57	-0.76	13.91	5.72	-16	-21.54	-18.31	-19.53
4.3	-10.9	-4.96	-0.89	13.72	5.26	-18.05	-22.23	-18.75	-18.94
4.4	-14.02	-6.53	-1.09	13.5	4.8	-19.85	-22.91	-19.29	-18.45
4.5	-18.03	-8.51	-1.34	13.29	4.32	-21.01	-23.59	-20.01	-18.04
4.6	-22.06	-10.87	-1.7	13.07	3.82	-22.41	-24.31	-20.88	-17.75
4.7	-25.81	-13.36	-2.18	12.86	3.33	-24.14	-25.08	-21.81	-17.6
4.8	-29	-15.97	-2.71	12.64	2.82	-26.11	-25.91	-22.96	-17.49
4.9	-26.95	-18.24	-3.34	12.39	2.32	-28.16	-26.66	-24.06	-17.46
5	-24.04	-19.15	-4.25	12.13	1.77	-28.97	-27.46	-25.13	-17.63
5.1	-22.91	-19.52	-5.21	11.85	1.23	-28.51	-28.41	-26.11	-17.82
5.2	-22.75	-19.26	-6.21	11.58	0.71	-27.97	-29.4	-26.91	-18.04
5.3	-22.93	-18.16	-7.54	11.3	0.2	-27.05	-30.17	-27.42	-18.39
5.4	-23.3	-16.93	-9	11.01	-0.34	-25.85	-30.69	-27.69	-18.79
5.5	-23.18	-16.83	-10.53	10.69	-0.91	-24.79	-30.77	-27.44	-19.21
5.6	-21.89	-17.49	-12.19	10.37	-1.45	-23.85	-30.16	-26.88	-19.65
5.7	-20	-18.6	-13.89	10.05	-1.97	-23.02	-29.04	-26.24	-20.1
5.8	-18.17	-20.36	-15.56	9.73	-2.46	-22.31	-27.68	-25.53	-20.54
5.9	-16.39	-22.5	-16.88	9.42	-2.97	-21.72	-26.17	-24.82	-20.94
6	-14.76	-24.46	-17.5	9.02	-3.58	-21.13	-24.73	-24.16	-21.28
6.1	-13.38	-25.93	-17.55	8.61	-4.16	-20.58	-23.45	-23.54	-21.55
6.2	-12.1	-26.73	-17.3	8.21	-4.72	-20.2	-22.26	-22.97	-21.74
6.3	-11.35	-23.97	-16.74	7.8	-5.27	-19.91	-21.43	-22.42	-21.78
6.4	-10.63	-19.55	-16.09	7.39	-5.87	-19.62	-20.67	-22.01	-21.68
6.5	-10.45	-16.1	-15.48	6.91	-6.46	-19.39	-20.37	-21.66	-21.56
6.6	-10.39	-14.09	-15.08	6.41	-7.1	-19.19	-20.17	-21.36	-21.42
6.7	-10.61	-12.3	-15.12	5.92	-7.72	-19.01	-20.23	-21.09	-21.29



6.8	-10.97	-11.12	-15.27	5.43	-8.33	-18.9	-20.42	-20.9	-21.17
6.9	-11.55	-10.2	-15.53	4.93	-8.93	-18.82	-20.82	-20.76	-21.06
7	-12.34	-9.49	-16.2	4.35	-9.51	-18.74	-21.4	-20.69	-21.03
7.1	-13.42	-9.03	-17.06	3.72	-10.12	-18.71	-22.27	-20.71	-21.04
7.2	-14.88	-8.72	-18.01	3.09	-10.75	-18.68	-23.53	-20.82	-21.08
7.3	-16.52	-8.66	-18.87	2.46	-11.34	-18.66	-25.29	-21.09	-21.28
7.4	-18.03	-8.86	-19.47	1.84	-11.92	-18.7	-27.89	-21.53	-21.66
7.5	-19.21	-9.16	-19.79	1.16	-12.47	-18.77	-31.04	-22.05	-22.1
7.6	-19.67	-9.67	-19.65	0.45	-13	-18.84	-33.28	-22.77	-22.63
7.7	-19.19	-10.27	-18.7	-0.24	-13.48	-18.95	-34.03	-23.57	-23.38
7.8	-18.5	-11	-17.4	-0.92	-13.87	-19.07	-33.96	-24.5	-24.28
7.9	-16.64	-11.93	-16.09	-1.6	-14.23	-19.19	-30.52	-25.64	-25.25
8	-14.86	-12.94	-14.76	-2.1	-14.54	-19.29	-27.24	-26.83	-26.54
8.1	-13.93	-14.27	-13.47	-2.54	-14.81	-19.4	-25.61	-28.18	-28.15
8.2	-13.11	-15.68	-12.26	-2.95	-15	-19.51	-24.18	-29.48	-29.86
8.3	-12.62	-16.63	-11.22	-3.33	-15.14	-19.68	-23.2	-30.07	-31.68
8.4	-12.28	-17.07	-10.52	-3.68	-15.25	-19.85	-22.44	-29.92	-32.96
8.5	-12.19	-17.28	-9.98	-3.47	-15.32	-20.02	-21.98	-29.4	-33.46
8.6	-12.31	-17.17	-9.51	-3.23	-15.36	-20.17	-21.77	-28.56	-33.3
8.7	-12.69	-16.79	-9.2	-2.98	-15.38	-20.33	-21.83	-27.56	-32.07
8.8	-13.39	-16.26	-9.06	-2.73	-15.39	-20.49	-22.2	-26.65	-30.18
8.9	-14.45	-15.52	-8.96	-2.43	-15.38	-20.69	-22.89	-25.84	-28.58
9	-16.04	-14.81	-8.97	-1.95	-15.35	-20.9	-24.01	-25.13	-27.37
9.1	-18.17	-14.39	-9.19	-1.51	-15.35	-21.12	-25.56	-24.67	-26.55
9.2	-20.53	-14.36	-9.44	-1.08	-15.4	-21.36	-27.32	-24.54	-25.82
9.3	-23.09	-14.38	-9.74	-0.65	-15.46	-21.63	-29.38	-24.44	-25.17
9.4	-25.31	-14.88	-10.23	-0.25	-15.52	-21.92	-31.41	-24.71	-24.75
9.5	-25.93	-15.4	-10.84	0.12	-15.57	-22.15	-33.09	-25.11	-24.5
9.6	-25.91	-16.26	-11.55	0.48	-15.68	-22.36	-34.57	-25.74	-24.46
9.7	-23.16	-17.4	-12.58	0.84	-15.78	-22.56	-32.34	-26.55	-24.65
9.8	-20.24	-18.78	-13.95	1.2	-15.86	-22.7	-29.46	-27.52	-25.06
9.9	-18	-20.74	-15.51	1.46	-15.94	-22.85	-27.06	-28.86	-25.58
10	-16.24	-22.96	-17.5	1.71	-15.99	-22.96	-24.94	-30.39	-26.27
15	-31.65	-15.51	-31.08	-5.24	-22.97	-31.96	-29.16	-23.37	-40.72
20	-26.14	-22.17	-27.53	-3.61	-27.82	-26.71	-30.67	-27.98	-32.46
25	-32.36	-31.33	-29.19	-4.35	-25.87	-28.77	-25.16	-32.77	-40.02
30	-26.88	-28.59	-38.17	-14.94	-31.14	-27.66	-28.86	-36.4	-31.13
35	-39.35	-33.04	-29.67	-14.67	-31.36	-31.49	-28.7	-36.97	-32.55
40	-37.12	-27.79	-27.63	-17.81	-23.56	-27.17	-34.76	-32.16	-37.84
45	-30.82	-33.93	-33.32	-22.05	-27.69	-26.58	-31.03	-36.42	-38.68
50	-34.63	-29.16	-27.92	-28.57	-20.01	-28.45	-34.13	-31.37	-35.63
55	-29.61	-39.72	-33.26	-20.79	-19.98	-26.69	-39.57	-34.49	-36.13
60	-43.27	-33.93	-39.53	-26.83	-25.86	-27.05	-44.21	-30.36	-33.63
65	-39.75	-27.29	-33.75	-15.26	-34.52	-28.75	-37.38	-46.54	-38.93
70	-35.58	-35.15	-33.95	-14.21	-26.64	-36.48	-35.1	-45.61	-33.69
75	-38.93	-34.6	-32.79	-11.43	-41.73	-33.38	-38.07	-33.6	-37.21
80	-42.37	-26.48	-35.04	-25.25	-34.33	-30.98	-54.65	-28.98	-34.79
85	-48.11	-25.66	-35.73	-27.56	-32.14	-33.79	-43.72	-27.68	-32.73
90				-27.3	-26.97	-26.95			
95				-27.87	-36.7	-34.52			
100				-28.64	-34.82	-56.52			
105				-28.67	-43.8				
110				-35.01					
115									
120									
125									
130									
135									
140									
145									
150									
155									
160									
165									
170									
175									
180									





**5.5.2 14.25 GHz**



**5.5.2.1 Elevation=70°, Scan=20°, f=14.25 GHz:**

angle	GSO (co) skew=10°	GSO (co) skew=30°	GSO (co) skew=50°	elev (co) skew=10°	elev (co) skew=30°	elev (co) skew=50°	GSO (x) skew=10°	GSO (x) skew=30°	GSO (x) skew=50°
-180									
-175									
-170									
-165									
-160									
-155									
-150									
-145									
-140									
-135									
-130									
-125									
-120									
-115									
-110									
-105									
-100									
-95									
-90									
-85	-90.73						-90.07		
-80	-51.33						-57.33		
-75	-33.28	-47.23					-94.11	-35.76	-47.43
-70	-32.8	-31.14	-58.4	-74.9	-65.56	-48.61	-35.63	-32.24	-61.71
-65	-34.72	-44.74	-42.77	-54.3	-48.88	-49.62	-36.53	-45.49	-49.53
-60	-38.22	-30.49	-35.9	-41.71	-49.23	-37.49	-37.85	-33.32	-38.59
-55	-32.41	-30.63	-35.95	-39.59	-41.02	-41.47	-37.61	-32.97	-42.13
-50	-37.86	-36.01	-33.27	-38.27	-40.88	-36.15	-47.15	-40.33	-38.78
-45	-39.17	-39.1	-40.26	-37.04	-50.96	-30.65	-47.74	-43.98	-44.11
-40	-34.04	-37.61	-42.94	-39.12	-38.6	-34.38	-41.91	-39.48	-44.95
-35	-28.6	-30.11	-33.14	-27.18	-33.11	-33.15	-35.64	-41.84	-42.02
-30	-32.13	-36.9	-32.95	-20.61	-40.14	-42.31	-46.79	-41.01	-41.82
-25	-25.53	-32.79	-30.08	-12.58	-36.31	-36.99	-43.11	-40.01	-40.52
-20	-21.69	-39.94	-37.21	-9.81	-31.06	-31.63	-34.16	-46.61	-49.6
-15	-35.27	-30.27	-39.84	-17.83	-27.44	-31.19	-43.35	-45.1	-50.08
-10	-17.23	-33.76	-25.5	-9.88	-20.9	-24.82	-39.26	-52.84	-46.54
-9.9	-17.37	-33.89	-24.97	-10.03	-21.17	-26.27	-38.85	-54.63	-46.06
-9.8	-17.51	-33.7	-24.47	-10.22	-21.63	-27.94	-38.42	-56.84	-45.57
-9.7	-18.31	-33.35	-23.99	-10.4	-22.07	-29.76	-38.46	-59.23	-45.13
-9.6	-19.41	-32.75	-23.56	-10.58	-22.4	-31.91	-38.71	-60.27	-44.89
-9.5	-20.59	-31.91	-23.25	-10.79	-22.69	-34.79	-39.01	-59.35	-44.95
-9.4	-22.73	-30.94	-23.09	-11.01	-22.94	-36.57	-39.68	-57.13	-45.19
-9.3	-26.16	-29.98	-22.97	-11.22	-23.16	-37.32	-40.84	-54.87	-45.49
-9.2	-29.37	-29.02	-22.87	-11.42	-23.83	-37.33	-42.04	-52.31	-45.85
-9.1	-30.54	-28.13	-22.82	-11.62	-24.46	-34.16	-43.59	-49.77	-46.69
-9	-27.39	-27.33	-22.91	-11.82	-25.03	-31.43	-45.92	-47.64	-48
-8.9	-23.97	-26.67	-23.09	-12	-25.56	-29.13	-48.34	-46.06	-49.66
-8.8	-21.16	-26.2	-23.29	-11.98	-26.07	-27.31	-49.47	-45.05	-51.53
-8.7	-19.03	-25.89	-23.5	-11.89	-26.55	-26.41	-49.14	-44.45	-53.45
-8.6	-17.26	-25.69	-23.72	-11.79	-27.64	-25.62	-48.02	-44	-54.68
-8.5	-15.6	-25.66	-24.05	-11.58	-28.58	-24.87	-46.83	-43.77	-54.65
-8.4	-14.84	-25.93	-24.38	-11.13	-29.39	-24.15	-45.2	-43.86	-54.01
-8.3	-14.17	-26.32	-24.67	-10.66	-30.08	-23.63	-43.5	-44.02	-52.7
-8.2	-13.65	-26.95	-24.93	-10.19	-30.54	-23.21	-41.99	-44.32	-50.83
-8.1	-13.51	-27.98	-25.16	-9.6	-30.76	-22.76	-41.04	-44.88	-48.82
-8	-13.57	-29.48	-25.34	-8.98	-31.27	-22.28	-40.37	-45.7	-47.05
-7.9	-13.79	-31.4	-25.47	-8.36	-29.96	-21.89	-39.82	-46.71	-45.43
-7.8	-14.41	-33.64	-25.54	-7.74	-28.61	-21.55	-39.59	-47.76	-43.85
-7.7	-15.35	-35.57	-25.59	-7.16	-27.23	-21.23	-39.6	-48.62	-42.62
-7.6	-16.29	-37.18	-25.66	-6.58	-26.17	-20.92	-39.62	-49.37	-41.93
-7.5	-18.94	-38.14	-25.74	-5.99	-24.96	-20.72	-40.17	-49.83	-41.49
-7.4	-22.12	-37.82	-25.82	-5.49	-23.58	-20.65	-40.89	-49.69	-41.1
-7.3	-24.92	-36.19	-25.86	-5	-22.58	-20.62	-41.75	-49.03	-40.76
-7.2	-26.03	-34	-25.84	-4.51	-22	-20.68	-43.08	-48.18	-40.62
-7.1	-24.54	-32.44	-25.82	-4.11	-21.36	-20.83	-45.11	-47.32	-40.91



-7	-23.05	-32.85	-25.72	-3.79	-20.66	-20.97	-47.14	-46.82	-41.33
-6.9	-21.05	-32.98	-25.46	-3.48	-19.92	-21.16	-48.82	-46.31	-41.77
-6.8	-18.66	-32.78	-25.03	-3.16	-19.25	-21.39	-50.31	-45.93	-42.25
-6.7	-16.2	-32.77	-24.39	-2.96	-18.65	-21.42	-51.82	-45.91	-42.89
-6.6	-14.44	-33.65	-23.57	-2.78	-18.4	-21.04	-51.72	-46.2	-43.71
-6.5	-13.49	-35.42	-22.63	-2.59	-18.12	-20.46	-49.73	-46.59	-44.58
-6.4	-12.71	-36.52	-21.67	-2.47	-17.92	-19.66	-47.45	-47.16	-45.33
-6.3	-12.09	-32.17	-20.76	-2.42	-17.65	-18.77	-45.51	-48.43	-45.71
-6.2	-12.17	-27.56	-19.89	-2.36	-17.3	-17.99	-45.21	-49.87	-45.8
-6.1	-12.26	-23.12	-19.06	-2.32	-16.9	-17.05	-44.92	-51.3	-45.75
-6	-12.72	-20.22	-18.28	-2.42	-16.88	-16.05	-45.31	-52.33	-45.56
-5.9	-13.61	-18.31	-17.6	-2.51	-16.8	-15.16	-46.47	-53.18	-45.3
-5.8	-14.71	-16.36	-17.04	-2.6	-16.63	-14.69	-48.02	-53.77	-45.12
-5.7	-15.9	-14.57	-16.57	-2.81	-16.34	-14.21	-49.31	-52.93	-45.12
-5.6	-17.57	-13.5	-16.19	-3.1	-15.93	-13.73	-49.41	-49.98	-45.22
-5.5	-19.36	-12.4	-15.91	-3.39	-15.42	-13.36	-49.19	-47.33	-45.39
-5.4	-20.38	-11.36	-15.7	-3.73	-15	-13.34	-48.46	-45.05	-45.75
-5.3	-18.91	-10.61	-15.57	-4.3	-14.54	-13.29	-46.27	-43.43	-46.4
-5.2	-16.32	-10.04	-15.52	-4.86	-13.96	-13.23	-43.47	-42.17	-47.3
-5.1	-13.93	-9.47	-15.54	-5.45	-13.33	-13.16	-41.01	-41.04	-48.39
-5	-12.01	-8.99	-15.64	-6.42	-12.67	-12.93	-39.26	-40.19	-49.52
-4.9	-10.46	-8.84	-15.77	-7.46	-11.9	-12.58	-38.05	-39.81	-50.68
-4.8	-8.9	-8.69	-15.89	-8.48	-11.15	-12.13	-36.85	-39.45	-51.71
-4.7	-8.02	-8.57	-16.02	-9.4	-10.64	-11.56	-36.27	-39.13	-52.16
-4.6	-7.32	-8.65	-16.18	-10.14	-10.12	-10.36	-35.85	-39.02	-51.87
-4.5	-6.71	-8.84	-16.31	-10.82	-9.6	-9.19	-35.52	-39.03	-51.03
-4.4	-6.3	-9.03	-16.33	-11.33	-9.08	-7.99	-35.41	-39.11	-49.91
-4.3	-6.19	-9.26	-16.25	-9.7	-8.58	-6.77	-35.63	-39.38	-48.5
-4.2	-6.08	-9.57	-16.15	-8.11	-8.08	-5.67	-35.84	-40.05	-46.91
-4.1	-6.21	-9.87	-16.12	-6.54	-7.74	-4.61	-36.39	-40.83	-45.42
-4	-6.49	-10.11	-15.99	-4.98	-7.4	-3.62	-37.15	-41.75	-44.37
-3.9	-6.79	-10.13	-15.64	-3.43	-7	-2.65	-37.94	-43	-43.55
-3.8	-7.1	-10.01	-15.06	-1.9	-6.59	-1.97	-38.8	-44.52	-42.85
-3.7	-7.41	-9.85	-14.37	-0.49	-6.19	-1.33	-39.75	-46.43	-42.24
-3.6	-7.69	-9.64	-13.78	0.65	-5.76	-0.72	-40.59	-48.98	-41.73
-3.5	-7.82	-9.3	-13.22	1.78	-5.12	-0.17	-41.06	-52.08	-41.63
-3.4	-7.54	-8.95	-12.22	2.9	-4.23	0.12	-40.55	-53.14	-41.6
-3.3	-7.25	-8.63	-10.78	3.8	-3.35	0.34	-40.05	-52.75	-41.63
-3.2	-6.9	-8.54	-9.21	4.68	-2.43	0.56	-39.39	-52.23	-41.76
-3.1	-6.5	-8.56	-7.63	5.53	-1.48	0.76	-38.6	-51.07	-42.14
-3	-6.06	-8.58	-6.08	6.26	-0.56	0.77	-37.76	-48.82	-42.77
-2.9	-5.72	-8.63	-4.6	6.91	0.36	0.71	-37.03	-46.24	-43.41
-2.8	-5.75	-8.82	-3.15	7.56	1.38	0.66	-36.69	-45.34	-44.07
-2.7	-5.8	-9.02	-1.69	8.19	2.4	0.6	-36.4	-44.46	-45.21
-2.6	-5.94	-8.94	-0.23	8.74	3.33	0.76	-36.24	-43.67	-46.92
-2.5	-6.24	-7.81	1.09	9.28	4.26	1.02	-36.34	-43.09	-48.95
-2.4	-6.6	-6.21	2.26	9.82	5.18	1.3	-36.53	-42.59	-51.28
-2.3	-6.54	-4.62	3.36	10.28	6.08	1.59	-36.76	-42.07	-53.16
-2.2	-5.58	-2.97	4.44	10.72	6.85	2.3	-37.04	-41.55	-53.33
-2.1	-4.16	-1.15	5.51	11.17	7.57	3.27	-37.34	-41.18	-52.06
-2	-2.73	0.68	6.45	11.57	8.28	4.22	-37.58	-40.74	-49.87
-1.9	-0.83	2.4	7.3	11.94	8.96	5.17	-37.03	-40.08	-47.3
-1.8	1.15	3.83	8.11	12.3	9.6	6.12	-36.3	-38.97	-44.68
-1.7	3.02	5.14	8.91	12.65	10.24	7.08	-35.43	-37.62	-42.13
-1.6	4.66	6.43	9.66	12.95	10.84	8.03	-34.29	-36.21	-39.7
-1.5	6.09	7.61	10.32	13.26	11.29	8.95	-32.92	-34.8	-37.41
-1.4	7.52	8.55	10.91	13.56	11.73	9.77	-31.54	-33.49	-35.32
-1.3	8.66	9.49	11.48	13.8	12.17	10.48	-30.29	-32.16	-33.82
-1.2	9.71	10.38	12.04	14.04	12.6	11.19	-29.09	-30.87	-32.33
-1.1	10.73	11.11	12.53	14.27	12.99	11.89	-27.92	-29.72	-30.93
-1	11.58	11.78	12.95	14.44	13.38	12.47	-26.91	-28.62	-29.67
-0.9	12.3	12.42	13.32	14.6	13.65	12.92	-26.04	-27.55	-28.56
-0.8	12.99	12.98	13.69	14.76	13.9	13.37	-25.19	-26.61	-27.58
-0.7	13.58	13.39	14.05	14.9	14.12	13.82	-24.46	-25.91	-26.6
-0.6	14.04	13.81	14.3	15	14.33	14.2	-23.89	-25.2	-25.75
-0.5	14.49	14.17	14.5	15.11	14.54	14.42	-23.33	-24.56	-25.06
-0.4	14.81	14.42	14.67	15.21	14.72	14.63	-22.94	-24.04	-24.44
-0.3	15.04	14.63	14.85	15.26	14.82	14.85	-22.66	-23.58	-23.85
-0.2	15.24	14.82	14.99	15.32	14.88	15.01	-22.41	-23.14	-23.29



-0.1	15.38	14.94	15.05	15.37	14.93	15.05	-22.23	-22.82	-22.85
0	15.38	14.93	15.05	15.38	14.93	15.05	-22.24	-22.69	-22.57
0.1	15.38	14.93	15.05	15.38	14.93	15.05	-22.25	-22.55	-22.31
0.2	15.27	14.87	15.05	15.38	14.93	15.01	-22.39	-22.47	-22.03
0.3	15.08	14.72	14.96	15.35	14.9	14.85	-22.64	-22.51	-21.85
0.4	14.86	14.52	14.81	15.29	14.74	14.67	-22.93	-22.59	-21.81
0.5	14.56	14.29	14.62	15.23	14.58	14.47	-23.32	-22.72	-21.84
0.6	14.12	13.98	14.43	15.16	14.42	14.24	-23.91	-22.97	-21.85
0.7	13.66	13.55	14.25	15.05	14.24	13.85	-24.52	-23.39	-21.85
0.8	13.13	13.12	13.91	14.93	14.03	13.47	-25.23	-23.79	-22.05
0.9	12.43	12.62	13.53	14.8	13.81	13.06	-26.18	-24.27	-22.33
1	11.71	12.01	13.15	14.59	13.51	12.62	-27.18	-24.88	-22.6
1.1	10.91	11.35	12.76	14.37	13.13	12	-28.29	-25.51	-22.85
1.2	10	10.66	12.31	14.16	12.75	11.37	-29.59	-26.19	-23.18
1.3	9.03	9.87	11.73	13.89	12.36	10.74	-30.97	-27.01	-23.7
1.4	8.06	8.97	11.12	13.61	11.97	10.08	-32.32	-27.96	-24.25
1.5	7.01	8.08	10.51	13.33	11.53	9.17	-33.56	-28.87	-24.77
1.6	5.96	7.15	9.9	13.01	11.03	8.25	-34.76	-29.76	-25.28
1.7	5.02	6.18	9.14	12.66	10.46	7.34	-35.7	-30.64	-26.01
1.8	4.34	5.18	8.3	12.31	9.86	6.43	-36.02	-31.52	-26.83
1.9	3.87	4.25	7.46	11.95	9.24	5.21	-35.86	-32.3	-27.64
2	3.47	3.47	6.62	11.52	8.62	3.97	-35.69	-32.84	-28.43
2.1	3.44	2.9	5.74	11.08	7.99	2.73	-35.39	-33.04	-29.29
2.2	3.6	2.32	4.76	10.65	7.31	1.5	-35.02	-33.26	-30.26
2.3	3.76	1.99	3.77	10.14	6.47	0.01	-34.68	-33.26	-31.19
2.4	3.87	1.89	2.79	9.63	5.64	-1.55	-34.6	-33.06	-32.08
2.5	3.96	1.88	1.79	9.12	4.79	-3.1	-34.66	-32.78	-32.99
2.6	4.01	1.86	0.87	8.54	3.91	-4.64	-34.78	-32.56	-33.83
2.7	3.94	1.82	0.21	7.94	3.03	-5.73	-35.05	-32.47	-34.36
2.8	3.69	1.76	-0.42	7.35	2.15	-6.7	-35.56	-32.44	-34.8
2.9	3.44	1.7	-1.02	6.7	1.13	-7.7	-36.09	-32.4	-35.2
3	2.95	1.51	-1.58	5.99	0.05	-8.69	-36.91	-32.53	-35.64
3.1	2.34	1.2	-1.93	5.26	-1.02	-9.06	-37.89	-32.79	-36.01
3.2	1.67	0.83	-2.13	4.51	-2.07	-9.21	-38.98	-33.16	-36.33
3.3	0.87	0.38	-2.31	3.69	-3.14	-9.39	-40.36	-33.67	-36.65
3.4	-0.19	-0.25	-2.5	2.88	-4.19	-9.62	-42.25	-34.41	-37.05
3.5	-1.24	-1.02	-2.71	2.06	-5.25	-9.96	-44.18	-35.33	-37.56
3.6	-2.4	-1.81	-3.06	1.13	-6.37	-10.36	-47.05	-36.25	-38.34
3.7	-3.67	-2.78	-3.42	0.21	-7.44	-10.76	-50.68	-37.47	-39.15
3.8	-4.96	-3.91	-3.81	-0.71	-8.46	-11.19	-54.49	-38.94	-40.18
3.9	-5.98	-5.14	-4.27	-1.71	-9.44	-11.76	-55.47	-40.59	-41.44
4	-6.64	-6.44	-4.84	-2.71	-10.32	-12.41	-52.84	-42.56	-43.02
4.1	-7.21	-7.81	-5.62	-3.72	-11.12	-13.04	-49.61	-45.04	-45.19
4.2	-7.69	-9.22	-6.43	-4.73	-11.77	-13.65	-46.74	-47.64	-47.81
4.3	-7.59	-10.64	-7.29	-5.75	-12.34	-14.22	-44.97	-50.01	-50.97
4.4	-7.48	-11.54	-8.24	-6.78	-12.8	-14.73	-43.25	-51.51	-53.79
4.5	-7.46	-12.11	-9.41	-7.75	-13.19	-15.23	-41.83	-51.95	-54.91
4.6	-7.56	-12.51	-10.66	-8.68	-13.53	-15.74	-40.78	-51.62	-53.76
4.7	-7.74	-12.8	-11.85	-9.66	-13.76	-16.2	-39.97	-50.97	-51
4.8	-7.98	-12.89	-12.92	-10.56	-13.9	-16.63	-39.21	-50.21	-48.37
4.9	-8.71	-12.87	-14	-11.27	-14	-17.12	-38.87	-49.4	-46.53
5	-9.51	-12.81	-14.94	-12.01	-14.08	-17.68	-38.57	-48.49	-45.32
5.1	-10.49	-13.08	-15.48	-12.73	-14.17	-18.37	-38.36	-47.95	-44.78
5.2	-11.91	-13.56	-15.69	-13.14	-14.23	-19.3	-38.36	-47.88	-44.66
5.3	-13.58	-14.12	-15.66	-13.66	-14.28	-20.41	-38.49	-47.99	-44.8
5.4	-15.54	-14.85	-15.5	-14.27	-14.38	-21.67	-38.66	-48.06	-45.25
5.5	-18.28	-16.12	-15.4	-14.75	-14.59	-23.13	-39.01	-48.27	-46.28
5.6	-21.56	-17.59	-15.35	-15.29	-14.81	-24.84	-39.48	-48.47	-47.78
5.7	-24.82	-19.06	-15.27	-15.91	-15.04	-26.71	-39.9	-48.56	-49.36
5.8	-26.24	-21.5	-15.33	-16.4	-15.38	-28.55	-40.45	-49.18	-50.66
5.9	-26.93	-24.21	-15.68	-16.81	-15.74	-29.92	-41.03	-50.12	-50.67
6	-27.42	-26.67	-16.23	-17.24	-16.11	-29.24	-41.59	-51.11	-49.7
6.1	-27.82	-28.06	-16.8	-17.6	-16.67	-28.07	-42.15	-52.01	-48.78
6.2	-28.23	-26.77	-17.4	-17.88	-17.35	-26.46	-42.71	-52.83	-47.91
6.3	-28.77	-25.12	-18.66	-18.13	-18.05	-24.88	-43.26	-53.54	-47.07
6.4	-28.22	-23.72	-20.4	-18.39	-18.78	-24.21	-43.95	-54.31	-46.27
6.5	-27.11	-22.64	-22.2	-18.7	-19.58	-23.64	-44.7	-54.75	-45.51
6.6	-25.88	-21.77	-23.99	-18.97	-20.41	-23.23	-45.46	-54.77	-44.78
6.7	-23.9	-20.99	-25.39	-19.26	-21.33	-22.97	-46.56	-54.5	-44.29



6.8	-20.84	-20.41	-25.96	-19.7	-22.5	-23.27	-48.08	-54.14	-44.23
6.9	-17.76	-20.35	-25.8	-20.12	-23.64	-23.66	-49.37	-53.93	-44.18
7	-15.11	-20.38	-25.35	-20.53	-24.75	-24.14	-50.04	-54.1	-44.09
7.1	-13.53	-20.43	-24.77	-21.36	-25.84	-24.79	-49.79	-53.76	-44.19
7.2	-12.04	-20.8	-23.81	-22.12	-26.78	-25.66	-49.58	-53.69	-44.46
7.3	-10.86	-21.31	-22.59	-22.76	-27.63	-26.47	-48.85	-53.77	-44.76
7.4	-10	-21.8	-21.35	-23.51	-28.59	-27.21	-47.57	-53.81	-45
7.5	-9.3	-22.3	-20.25	-24.16	-29.46	-27.7	-46.08	-53.95	-45.25
7.6	-8.65	-22.99	-19.38	-24.68	-30.16	-27.5	-44.76	-55	-45.79
7.7	-8.5	-23.74	-18.99	-25.2	-30.76	-27.09	-44.12	-57.46	-46.43
7.8	-8.34	-24.47	-18.76	-25.62	-31.26	-26.52	-43.55	-58.94	-47.02
7.9	-8.33	-25.32	-18.62	-25.89	-31.72	-25.79	-43.28	-58.04	-47.56
8	-8.54	-26.35	-18.54	-25.95	-32.18	-25.17	-43.44	-56.92	-47.96
8.1	-8.89	-27.62	-18.62	-25.84	-32.51	-24.7	-43.85	-57.34	-48.28
8.2	-9.33	-29.02	-18.95	-25.6	-32.63	-24.28	-44.55	-59.15	-48.77
8.3	-10.07	-30.19	-19.36	-25.1	-32.81	-23.91	-46.04	-60.68	-49.01
8.4	-10.95	-31.9	-19.86	-24.37	-32.83	-23.81	-47.94	-59.79	-49.25
8.5	-11.84	-34.36	-20.37	-23.64	-32.69	-24.03	-49.9	-58.8	-49.19
8.6	-13.1	-34.25	-21.09	-22.92	-32.71	-24.3	-51.99	-57.35	-49.16
8.7	-14.49	-32.09	-21.99	-22.28	-31.92	-24.62	-54.06	-55.47	-49.25
8.8	-15.72	-28.98	-22.94	-21.68	-31.07	-25.12	-55.2	-53.28	-49.42
8.9	-16.55	-25.52	-23.88	-21.16	-30.21	-25.89	-54.21	-50.87	-49.57
9	-16.84	-23.93	-24.77	-20.85	-29.52	-26.67	-50.5	-48.76	-49.56
9.1	-17.13	-22.41	-25.96	-20.62	-28.73	-27.43	-46.95	-47.03	-49.76
9.2	-16.67	-20.89	-27.09	-20.52	-27.84	-28.15	-44.97	-45.38	-49.79
9.3	-15.87	-19.88	-28.09	-20.63	-27.14	-28.76	-43.63	-44.03	-49.73
9.4	-14.98	-19.16	-28.93	-20.77	-26.61	-29.22	-42.44	-42.89	-49.66
9.5	-14.32	-18.46	-29.62	-20.94	-26.07	-29.58	-41.58	-41.88	-49.58
9.6	-13.96	-17.85	-30.12	-21.32	-25.52	-29.79	-41.16	-41.13	-49.41
9.7	-13.63	-17.72	-30.63	-21.77	-24.93	-29.79	-40.73	-40.89	-48.98
9.8	-13.53	-17.61	-31.12	-22.24	-24.34	-29.94	-40.44	-40.69	-48.53
9.9	-13.83	-17.5	-31.58	-22.95	-23.75	-30.27	-40.44	-40.51	-48.05
10	-14.17	-17.69	-32.01	-23.77	-23.44	-30.75	-40.43	-40.58	-47.78
15	-23.32	-39.09	-29.29	-38.45	-13.34	-20.92	-54.41	-43.14	-47.9
20	-27.15	-43.96	-24.96	-19.31	-17.88	-30.38	-42.15	-40.93	-44.69
25	-37.96	-29.48	-17.39	-30.23	-21.13	-28.75	-49.54	-55.75	-47.73
30	-27.11	-23.12	-30.03	-27.15	-30.63	-15.43	-49.31	-41.87	-42.17
35	-32.78	-18.75	-30.4	-39.91	-28.68	-24.48	-44	-52.71	-46.36
40	-36.2	-37.89	-36.36	-18.36	-38.93	-27.72	-49.2	-52.02	-50.48
45	-32.59	-34.41	-34.79	-30.95	-19.04	-32.39	-49.94	-49.42	-57.97
50	-44.68	-44.72	-32.98	-31.19	-31.42	-47.1	-42.65	-44.21	-37.17
55	-25.11	-34.74	-37.97	-31.21	-31.39	-30.61	-43.99	-42.42	-44.25
60	-23.83	-37.38	-38.33	-34.65	-43.39	-18.33	-40.68	-48.73	-44.26
65	-27.28	-36.83	-33.88	-30.92	-39.21	-24.12	-42.18	-45.02	-46.39
70	-36.37	-37.46	-29.96	-30.6	-32.99	-35.68	-51.65	-42.86	-35.51
75	-44.98	-38.16	-39.37	-27.34	-30.71	-49.57	-52.42	-44.18	-45.95
80	-44.17	-34.25	-34.67	-17.88	-49	-34.87	-51.55	-37.18	-34.38
85	-44.99	-41.63	-31.68	-17.12	-51.22	-40.05	-53.33	-41.2	-31.7
90				-21.4	-44.26	-40			
95				-31.06	-54.73	-46.09			
100				-34.25	-57.05	-69.99			
105				-66.59	-83.21				
110									
115									
120									
125									
130									
135									
140									
145									
150									
155									
160									
165									
170									
175									
180									



**5.5.2.2 Elevation=60°, Scan=30°, f=14.25 GHz:**

angle	GSO (co) skew=10°	GSO (co) skew=30°	GSO (co) skew=50°	elev (co) skew=10°	elev (co) skew=30°	elev (co) skew=50°	GSO (x) skew=10°	GSO (x) skew=30°	GSO (x) skew=50°
-180									
-175									
-170									
-165									
-160									
-155									
-150									
-145									
-140									
-135									
-130									
-125									
-120									
-115									
-110									
-105									
-100									
-95									
-90									
-85									
-80	-90.67						-90.76		
-75	-45.31						-48.8		
-70	-41.52	-56.62					-41.97	-57.65	
-65	-34.73	-40.71	-85.75				-36.08	-42.3	-87.32
-60	-33.24	-35.18	-42.82			-67.77	-51.44	-42.42	-36.63
-55	-34.26	-35	-29.29	-65.22	-46.98	-47.6	-35.2	-35.34	-32.61
-50	-34.5	-33.42	-39.81	-41.83	-49.46	-44.7	-37.84	-35.91	-44.42
-45	-24.02	-34.95	-35.19	-31.37	-47.26	-42.35	-26.65	-39.87	-36.38
-40	-44.17	-36.92	-42.27	-26.27	-43.29	-39.8	-38.64	-39.11	-42.08
-35	-29.75	-36.73	-39.54	-22.94	-41.43	-41.78	-28.68	-38.89	-46.84
-30	-37.17	-41.7	-37.9	-19.81	-40.79	-39.25	-43.03	-43.52	-47.3
-25	-25.66	-33.82	-34.37	-11.35	-38.43	-42.69	-37.94	-37.12	-46.64
-20	-29.6	-33.96	-42.67	-11.69	-40.12	-33.34	-31.68	-42.28	-44.73
-15	-25.99	-31.86	-40.89	-16.54	-36.22	-27.36	-33.82	-37.26	-37.41
-10	-17.92	-28.09	-25.53	-3.99	-25.6	-30.02	-37.05	-39.23	-46.45
-9.9	-18.27	-28.27	-25.08	-3.95	-26.38	-28.48	-36.6	-39.56	-47.32
-9.8	-18.74	-28.37	-24.72	-3.92	-27.18	-26.97	-36.24	-39.91	-48.82
-9.7	-20.21	-28.07	-24.49	-3.88	-27.57	-25.58	-36.51	-40.21	-51.28
-9.6	-21.88	-27.43	-24.34	-3.84	-27.54	-24.66	-36.91	-40.47	-53.9
-9.5	-23.53	-26.67	-24.27	-3.77	-27.4	-24.19	-37.49	-40.69	-56.45
-9.4	-25.11	-25.81	-24.23	-3.69	-27.1	-23.72	-38.49	-40.81	-59.04
-9.3	-26.6	-24.88	-24.27	-3.59	-26.64	-23.26	-39.93	-40.65	-59.34
-9.2	-27.76	-23.95	-24.34	-3.49	-26.03	-23.05	-41.41	-40.36	-57.98
-9.1	-26.73	-23.04	-24.49	-3.37	-25.32	-23.14	-43.17	-39.98	-55.68
-9	-23.59	-22.35	-24.67	-3.22	-24.3	-23.31	-45.13	-39.71	-53.27
-8.9	-20.41	-21.83	-24.83	-3.07	-23.22	-23.48	-47.07	-39.52	-51.29
-8.8	-18.17	-21.43	-24.97	-2.9	-22.07	-23.7	-47.18	-39.37	-49.78
-8.7	-16.67	-21.15	-25.07	-2.73	-20.88	-24.02	-45.85	-39.35	-48.57
-8.6	-15.43	-21.13	-25.1	-2.53	-19.69	-24.39	-44.03	-39.66	-47.47
-8.5	-14.36	-21.37	-25.02	-2.32	-18.55	-24.81	-42.42	-40.26	-46.53
-8.4	-13.95	-21.68	-24.84	-2.11	-17.95	-24.91	-41.67	-40.87	-45.63
-8.3	-13.57	-22.22	-24.66	-1.89	-17.33	-24.41	-41	-41.47	-45.01
-8.2	-13.32	-23.19	-24.5	-1.72	-16.76	-23.94	-40.59	-42.03	-44.6
-8.1	-13.54	-24.41	-24.3	-1.55	-16.22	-23.52	-41.05	-42.58	-44.34
-8	-13.89	-25.8	-24.06	-1.37	-15.66	-22.97	-41.79	-43.07	-44.29
-7.9	-14.44	-27.48	-23.79	-1.18	-15.09	-22.05	-42.99	-43.02	-44.25
-7.8	-15.4	-29.46	-23.65	-1.03	-14.87	-21.12	-45.1	-41.77	-44.31
-7.7	-16.76	-31.1	-23.67	-0.87	-14.74	-20.18	-48.02	-40.53	-44.53
-7.6	-18.14	-32.38	-23.72	-0.7	-14.62	-19.33	-50.76	-39.29	-44.78
-7.5	-20.02	-31.36	-23.83	-0.54	-14.48	-18.69	-49.56	-38.35	-45.24
-7.4	-22.13	-29.57	-24.01	-0.42	-14.34	-18.03	-46.53	-37.52	-45.64
-7.3	-24.26	-27.54	-24.3	-0.3	-14.22	-17.34	-43.26	-36.72	-46.01
-7.2	-24	-25.83	-24.75	-0.18	-14.52	-16.71	-40.71	-36.15	-46.6
-7.1	-21.69	-24.88	-25.17	-0.05	-14.83	-16.32	-38.81	-35.98	-47.04



-7	-19.1	-24.34	-25.43	0	-15.15	-15.94	-37.07	-36.01	-47.16
-6.9	-16.78	-23.88	-25.5	0.05	-15.46	-15.54	-35.56	-36.07	-47.01
-6.8	-15.5	-24.29	-25.29	0.11	-15.91	-15.17	-34.88	-36.54	-47.14
-6.7	-14.22	-25.36	-24.86	0.16	-16.45	-15.02	-34.23	-37.33	-47.38
-6.6	-13.24	-26.68	-24.23	0.1	-17.41	-14.84	-33.79	-38.21	-47.54
-6.5	-12.74	-27.64	-23.38	0	-18.47	-14.63	-33.73	-39.14	-47.39
-6.4	-12.46	-27.64	-22.38	-0.09	-19.53	-14.46	-33.82	-40.08	-46.95
-6.3	-12.37	-26.64	-21.37	-0.19	-20.43	-14.54	-34.12	-40.95	-46.7
-6.2	-12.69	-25.52	-20.43	-0.43	-21.12	-14.6	-34.83	-41.66	-46.77
-6.1	-13.28	-24.02	-19.55	-0.67	-21.59	-14.62	-35.81	-41.85	-46.96
-6	-13.87	-21.53	-18.77	-0.91	-21.87	-14.67	-36.82	-40.52	-47.03
-5.9	-15.2	-18.98	-18.09	-1.19	-21.19	-14.93	-39.65	-39.04	-47.09
-5.8	-16.67	-16.47	-17.55	-1.68	-20	-15.13	-42.97	-37.54	-47.63
-5.7	-17.97	-14.56	-17.15	-2.16	-18.7	-15.32	-46.11	-36.25	-48.79
-5.6	-18.01	-13.26	-16.82	-2.66	-17.27	-15.44	-46.89	-35.22	-50.3
-5.5	-16.73	-11.99	-16.57	-3.27	-15.72	-15.3	-45.09	-34.25	-51.9
-5.4	-15.46	-10.79	-16.39	-4.25	-14.63	-15.06	-43.19	-33.38	-53.13
-5.3	-14.03	-10.08	-16.36	-5.25	-13.67	-14.72	-41.15	-32.98	-52.37
-5.2	-12.25	-9.44	-16.38	-6.25	-12.75	-14.18	-38.92	-32.64	-51.45
-5.1	-10.5	-8.81	-16.45	-7.7	-11.87	-13.1	-36.73	-32.29	-50.72
-5	-9.11	-8.4	-16.54	-10	-11.1	-12.03	-35.13	-32.17	-50.26
-4.9	-8.06	-8.18	-16.6	-12.26	-10.45	-10.92	-34.11	-32.24	-49.72
-4.8	-7.17	-8.02	-16.57	-14.42	-9.97	-9.8	-33.34	-32.38	-48.62
-4.7	-6.41	-7.94	-16.46	-14.68	-9.54	-8.74	-32.73	-32.6	-46.91
-4.6	-6.03	-8.07	-16.31	-12.65	-9.1	-7.68	-32.57	-33.09	-45.16
-4.5	-5.73	-8.35	-16.11	-10.58	-8.75	-6.65	-32.52	-33.76	-43.43
-4.4	-5.51	-8.64	-15.86	-8.48	-8.38	-5.7	-32.55	-34.42	-42.01
-4.3	-5.62	-8.99	-15.53	-6.49	-8	-5.01	-32.96	-35.26	-41.24
-4.2	-5.81	-9.41	-15.18	-4.62	-7.52	-4.32	-33.47	-36.31	-40.79
-4.1	-6.07	-9.85	-14.85	-2.78	-6.98	-3.63	-34.08	-37.46	-40.34
-4	-6.45	-10.26	-14.55	-0.98	-6.45	-3.01	-34.86	-38.61	-39.94
-3.9	-6.95	-10.54	-14.28	0.34	-5.85	-2.66	-35.8	-39.75	-39.65
-3.8	-7.44	-10.54	-14.08	1.49	-5.19	-2.34	-36.73	-40.76	-40.03
-3.7	-7.72	-10.49	-13.91	2.63	-4.47	-2.02	-37.42	-41.67	-40.48
-3.6	-7.89	-10.38	-13.79	3.76	-3.67	-1.76	-37.96	-42.36	-40.98
-3.5	-8.03	-10.13	-13.7	4.63	-2.72	-1.72	-38.46	-42.37	-41.57
-3.4	-7.88	-9.82	-13.24	5.47	-1.75	-1.69	-38.47	-42.11	-42.57
-3.3	-7.48	-9.52	-12.16	6.27	-0.75	-1.67	-38.11	-41.85	-44.12
-3.2	-7.07	-9.37	-10.7	7.05	0.2	-1.67	-37.7	-41.66	-46.02
-3.1	-6.74	-9.65	-9.19	7.67	1.12	-1.65	-37.34	-41.73	-47.95
-3	-6.63	-9.95	-7.64	8.29	2.02	-1.64	-37.16	-41.84	-49.47
-2.9	-6.52	-10.29	-6.06	8.9	2.91	-1.64	-36.96	-42	-49.72
-2.8	-6.75	-10.45	-4.46	9.49	3.78	-1.51	-36.95	-42.57	-48.15
-2.7	-7.38	-10.51	-2.87	9.99	4.59	-0.79	-37.16	-43.24	-46.02
-2.6	-8.18	-10.53	-1.3	10.49	5.4	-0.1	-37.46	-43.85	-43.88
-2.5	-8.64	-9.97	0.23	10.99	6.22	0.6	-37.79	-44.06	-41.74
-2.4	-8.4	-8.2	1.68	11.45	6.97	1.37	-38.17	-43.51	-39.9
-2.3	-7.81	-5.92	2.82	11.86	7.59	2.46	-38.58	-42.7	-38.69
-2.2	-7.19	-3.61	3.95	12.27	8.2	3.55	-39	-41.87	-37.57
-2.1	-4.81	-1.59	5.05	12.68	8.82	4.66	-38.73	-40.75	-36.5
-2	-2.21	0.23	6.12	13.04	9.44	5.69	-38.39	-39.48	-35.47
-1.9	0.29	1.98	7.07	13.38	10.02	6.6	-37.99	-38.22	-34.59
-1.8	2.42	3.6	7.9	13.72	10.52	7.51	-37.34	-37.1	-33.84
-1.7	4.19	4.99	8.69	14.04	10.96	8.43	-36.46	-36.13	-33.12
-1.6	5.92	6.18	9.45	14.27	11.39	9.31	-35.58	-35.22	-32.39
-1.5	7.41	7.36	10.19	14.51	11.82	10	-34.64	-34.31	-31.64
-1.4	8.63	8.42	10.83	14.74	12.2	10.65	-33.61	-33.4	-30.91
-1.3	9.84	9.3	11.38	14.96	12.59	11.31	-32.57	-32.5	-30.19
-1.2	10.86	10.13	11.91	15.13	12.93	11.94	-31.5	-31.59	-29.46
-1.1	11.74	10.92	12.41	15.31	13.21	12.4	-30.41	-30.69	-28.73
-1	12.57	11.59	12.88	15.49	13.43	12.86	-29.31	-29.81	-28
-0.9	13.34	12.14	13.3	15.63	13.66	13.32	-28.22	-28.95	-27.28
-0.8	13.9	12.67	13.62	15.75	13.9	13.71	-27.22	-28.07	-26.61
-0.7	14.45	13.2	13.92	15.87	14.14	13.97	-26.21	-27.18	-25.97
-0.6	14.94	13.54	14.19	15.99	14.29	14.23	-25.25	-26.42	-25.35
-0.5	15.3	13.86	14.46	16.06	14.37	14.49	-24.42	-25.67	-24.73
-0.4	15.62	14.17	14.64	16.13	14.46	14.72	-23.63	-24.94	-24.19
-0.3	15.88	14.39	14.76	16.2	14.55	14.81	-22.91	-24.32	-23.74
-0.2	16.05	14.49	14.85	16.26	14.62	14.88	-22.31	-23.82	-23.32



-0.1	16.16	14.59	14.93	16.28	14.67	14.96	-21.78	-23.33	-22.92
0	16.26	14.68	15	16.26	14.68	15	-21.26	-22.84	-22.53
0.1	16.19	14.62	14.96	16.24	14.63	14.92	-20.97	-22.55	-22.26
0.2	16.09	14.53	14.88	16.2	14.57	14.84	-20.71	-22.3	-22.07
0.3	15.96	14.41	14.76	16.13	14.48	14.75	-20.49	-22.08	-21.91
0.4	15.73	14.21	14.63	16.06	14.39	14.61	-20.4	-21.97	-21.76
0.5	15.4	13.92	14.48	15.99	14.31	14.35	-20.44	-21.97	-21.65
0.6	15.05	13.59	14.25	15.88	14.19	14.1	-20.5	-22.03	-21.62
0.7	14.61	13.24	13.94	15.77	13.96	13.85	-20.67	-22.11	-21.7
0.8	14.03	12.77	13.61	15.65	13.74	13.56	-21.02	-22.34	-21.81
0.9	13.44	12.22	13.27	15.53	13.52	13.11	-21.38	-22.7	-21.92
1	12.7	11.63	12.89	15.36	13.31	12.66	-21.93	-23.09	-22.06
1.1	11.87	10.96	12.41	15.2	13.06	12.23	-22.62	-23.59	-22.35
1.2	10.99	10.18	11.86	15.04	12.77	11.74	-23.37	-24.27	-22.73
1.3	10.02	9.31	11.29	14.85	12.41	11.11	-24.3	-25.07	-23.13
1.4	8.86	8.43	10.71	14.63	12.06	10.47	-25.61	-25.92	-23.53
1.5	7.68	7.48	10.11	14.41	11.66	9.82	-26.99	-26.94	-23.94
1.6	6.5	6.39	9.32	14.17	11.27	9.11	-28.56	-28.4	-24.68
1.7	5.34	5.27	8.49	13.86	10.88	8.22	-30.76	-29.85	-25.46
1.8	4.2	4.2	7.66	13.56	10.46	7.34	-33.09	-31.27	-26.25
1.9	3.3	3.26	6.82	13.25	9.92	6.48	-34.72	-32.53	-27.05
2	2.81	2.46	5.95	12.92	9.37	5.48	-35.03	-33.58	-27.98
2.1	2.67	1.72	5.03	12.56	8.83	4.25	-34.18	-34.42	-29.12
2.2	2.56	1.11	4.11	12.19	8.3	3.03	-33.16	-34.83	-30.33
2.3	2.77	1.19	3.22	11.83	7.74	1.82	-31.75	-33.43	-31.5
2.4	3.09	1.27	2.36	11.41	7.14	0.45	-30.27	-32.18	-32.64
2.5	3.42	1.36	1.66	10.98	6.42	-1.31	-28.82	-30.98	-33.53
2.6	3.56	1.48	1.15	10.55	5.72	-3.06	-27.94	-30.05	-33.99
2.7	3.59	1.62	0.76	10.1	5	-4.77	-27.41	-29.31	-34.17
2.8	3.58	1.75	0.42	9.59	4.26	-6.61	-26.96	-28.62	-34.2
2.9	3.44	1.82	0.13	9.08	3.54	-8.84	-26.71	-28.03	-34.1
3	3.03	1.65	-0.12	8.57	2.78	-11.11	-26.87	-27.84	-33.89
3.1	2.62	1.39	-0.21	7.98	1.86	-13.39	-27.05	-27.81	-33.5
3.2	2	1.1	-0.3	7.35	0.94	-14.8	-27.53	-27.79	-33.12
3.3	1.19	0.63	-0.4	6.71	0.03	-14.46	-28.32	-28	-32.75
3.4	0.29	-0.01	-0.56	6.04	-0.86	-14.3	-29.23	-28.39	-32.45
3.5	-0.74	-0.72	-0.82	5.25	-1.75	-14.31	-30.52	-28.85	-32.35
3.6	-2	-1.53	-1.2	4.46	-2.7	-14.36	-32.5	-29.41	-32.51
3.7	-3.32	-2.61	-1.6	3.69	-3.82	-14.15	-34.65	-30.28	-32.69
3.8	-4.63	-3.94	-2.04	2.77	-4.89	-13.91	-36.82	-31.42	-32.93
3.9	-5.71	-5.32	-2.6	1.78	-5.94	-13.62	-38.94	-32.59	-33.26
4	-6.77	-6.9	-3.34	0.8	-6.98	-13.54	-40.9	-33.89	-33.8
4.1	-7.57	-8.7	-4.2	-0.22	-7.97	-13.93	-41.77	-35.29	-34.42
4.2	-7.83	-10.63	-5.14	-1.58	-8.96	-14.44	-40.6	-36.71	-35.05
4.3	-7.64	-12.44	-6.2	-2.91	-10.12	-14.92	-37.84	-38.03	-35.65
4.4	-7.44	-13.7	-7.39	-4.23	-11.23	-15.53	-35.34	-38.98	-36.2
4.5	-7.27	-13.94	-8.85	-6.16	-12.24	-16.44	-33.87	-38.93	-36.79
4.6	-7.14	-13.97	-10.59	-8.42	-13.16	-17.38	-33.11	-38.57	-37.34
4.7	-7.01	-13.76	-12.64	-10.58	-14	-18.5	-32.37	-38	-37.72
4.8	-7.27	-13.33	-14.95	-12.78	-14.79	-19.73	-32.18	-37.45	-37.93
4.9	-7.75	-12.83	-17.72	-16.07	-15.75	-20.99	-32.3	-36.94	-38.05
5	-8.33	-12.39	-21.44	-19.3	-16.58	-22.34	-32.52	-36.52	-38.15
5.1	-9.14	-12.2	-25.78	-22.46	-17.29	-23.79	-32.96	-36.34	-38.31
5.2	-10.54	-12.56	-28.16	-21.57	-17.9	-25.26	-33.94	-36.7	-38.56
5.3	-11.96	-12.98	-28.51	-18.29	-18.39	-26.27	-34.94	-37.09	-38.8
5.4	-13.65	-13.47	-26.95	-15.35	-18.78	-26.56	-36.21	-37.52	-39.05
5.5	-15.69	-14.57	-24.31	-12.9	-19.31	-26.13	-37.87	-38.56	-39.49
5.6	-17.88	-16.05	-22.47	-11.85	-19.75	-25.34	-39.8	-39.93	-40.05
5.7	-19.12	-17.68	-21.69	-10.75	-20.08	-24.87	-41.22	-41.4	-40.65
5.8	-18.8	-19.74	-21.23	-9.61	-20.29	-24.1	-41.61	-42.89	-41.23
5.9	-17.61	-22.87	-21.13	-8.91	-20.46	-23.35	-41.3	-44.4	-41.8
6	-16.36	-26.15	-21.81	-8.46	-20.64	-22.84	-40.82	-45.54	-42.36
6.1	-15.48	-29.47	-22.79	-7.99	-20.66	-22.63	-39.84	-46.26	-42.62
6.2	-14.65	-29.31	-24.02	-7.56	-20.71	-22.35	-38.78	-45.96	-42.73
6.3	-13.93	-27.31	-25.48	-7.41	-20.87	-22.1	-37.78	-45.23	-42.68
6.4	-13.64	-24.9	-27.23	-7.26	-21.1	-22.02	-37.27	-44.49	-42.53
6.5	-13.7	-22.97	-29.02	-7.21	-21.37	-22.05	-37.17	-44.05	-42.31
6.6	-13.77	-21.91	-30.24	-7.3	-21.68	-21.98	-37.16	-44.23	-42.09
6.7	-13.87	-21.4	-30.69	-7.45	-21.74	-21.83	-37.51	-44.92	-41.86





6.8	-13.99	-21.09	-30.29	-7.59	-21.94	-21.8	-38.43	-45.84	-41.62
6.9	-14.09	-21.4	-29.69	-7.76	-22.31	-21.91	-39.37	-49.38	-41.66
7	-13.8	-22.31	-28.48	-8.03	-22.84	-21.86	-41.38	-54.35	-41.82
7.1	-13.21	-23.51	-27.12	-8.29	-23.51	-21.67	-44.06	-58.72	-42.05
7.2	-12.48	-25.05	-26.05	-8.53	-24.32	-21.49	-46.86	-60.15	-42.41
7.3	-11.72	-27.3	-25.36	-8.85	-24.7	-21.51	-48.42	-57.07	-42.96
7.4	-10.94	-30.59	-25.13	-9.18	-25.18	-21.44	-47.21	-50.22	-43.81
7.5	-10.15	-33.65	-25.39	-9.49	-25.89	-21.26	-45.68	-45.84	-44.88
7.6	-9.43	-34.95	-25.75	-9.82	-26.95	-21.15	-44.04	-42.35	-46.15
7.7	-9.01	-32.5	-26.4	-10.16	-28.38	-21.26	-42.07	-40.58	-47.53
7.8	-8.67	-28.84	-27.35	-10.49	-30.17	-21.32	-40.14	-39.41	-48.91
7.9	-8.43	-25.44	-28.5	-10.82	-31.23	-21.37	-38.59	-38.29	-49.72
8	-8.4	-22.86	-29.74	-11.12	-32.22	-21.53	-37.61	-37.48	-49.51
8.1	-8.57	-21.87	-30.93	-11.52	-33.35	-21.99	-37.11	-37.33	-48.78
8.2	-8.77	-20.96	-31.72	-11.94	-34.56	-22.4	-36.68	-37.32	-46.9
8.3	-9.33	-20.18	-31.95	-12.31	-35.69	-22.77	-36.78	-37.35	-45.16
8.4	-10.09	-20.03	-31.57	-12.64	-37.51	-23.45	-37.15	-37.77	-43.74
8.5	-10.89	-20.09	-30.7	-12.95	-38.68	-24.59	-37.56	-38.34	-42.65
8.6	-12.07	-20.22	-29.53	-13.22	-38.51	-25.71	-38.61	-39.03	-41.87
8.7	-13.54	-20.6	-28.26	-13.47	-35.98	-26.81	-40.14	-40.04	-41.33
8.8	-15.06	-21.42	-27.18	-13.69	-33.89	-28.27	-41.8	-41.4	-40.89
8.9	-16.41	-22.37	-26.47	-13.89	-32.23	-30.8	-43.7	-42.53	-40.67
9	-17.06	-23.41	-26.19	-14.11	-30.98	-33.2	-46.38	-43.38	-40.82
9.1	-17.65	-24.82	-26.06	-14.31	-29.93	-35.48	-48.56	-43.79	-41.05
9.2	-17.68	-26.4	-26.05	-14.51	-28.93	-36.6	-48.79	-43.7	-41.29
9.3	-16.83	-27.92	-26.19	-14.72	-27.94	-34.63	-46.49	-42.86	-41.53
9.4	-15.59	-29.13	-26.59	-14.97	-27.15	-32.71	-43.39	-41.58	-41.74
9.5	-14.49	-29.84	-27.38	-15.21	-26.49	-30.78	-40.94	-40.5	-41.83
9.6	-13.72	-30.03	-28.33	-15.45	-25.83	-29.05	-39.43	-39.58	-41.78
9.7	-13.19	-29.72	-29.45	-15.78	-25.2	-28.01	-38.49	-38.72	-41.56
9.8	-12.68	-29.03	-30.83	-16.16	-24.73	-27.03	-37.6	-38.05	-41.21
9.9	-12.73	-28.46	-32.17	-16.55	-24.3	-26.23	-37.42	-37.73	-40.88
10	-12.96	-28.07	-33.43	-16.98	-23.88	-25.61	-37.46	-37.59	-40.56
15	-18.72	-28.37	-41.67	-28.35	-32.55	-37.77	-38.15	-51.1	-48.97
20	-35.35	-31.21	-36.87	-29.96	-32.77	-41.57	-51.77	-61.18	-46.1
25	-31.22	-39.56	-32.15	-33.94	-15.85	-34.57	-39.53	-43.84	-48.24
30	-23.71	-32.8	-34.09	-9.29	-25.86	-37.8	-45.97	-49.34	-52.86
35	-37.32	-36.54	-27.81	-28.62	-23.57	-38.28	-40.76	-56.53	-48.48
40	-30.13	-43.79	-23.48	-36.37	-34.46	-17.36	-51.99	-47.18	-50
45	-32.61	-26.15	-35.79	-26.29	-37.35	-31.86	-40.38	-40.86	-52.51
50	-43.62	-31.22	-34.31	-26.83	-40.86	-31.41	-41.43	-41.96	-45.42
55	-35.1	-22.19	-33.52	-25.79	-37.32	-38.55	-55.32	-44.11	-39.61
60	-32.69	-31.5	-44.35	-21.31	-33.9	-36.76	-52.16	-43.45	-46.34
65	-34.85	-35.24	-34.66	-35.83	-23.16	-40.17	-46.2	-52.34	-51.02
70	-34.74	-41.19	-46.79	-32.58	-30.99	-52.8	-47.63	-45.83	-41.32
75	-34.32	-34.89	-29.71	-32.3	-34.76	-27.9	-67.83	-38.83	-33.83
80	-35.77	-34.11	-33.45	-26.33	-40.17	-21.68	-57.48	-36.54	-36.06
85	-47.36	-38.53	-28.31	-31.84	-36.6	-36.92	-51.2	-44.23	-29.76
90				-32.59	-47.46	-39.88			
95				-47.33	-38.69	-50.06			
100				-20.54	-45.58	-41.34			
105				-26.02	-45.29	-44.66			
110				-36.66	-62.39	-100.28			
115				-44.37	-90.37				
120				-91.48					
125									
130									
135									
140									
145									
150									
155									
160									
165									
170									
175									
180									



**5.5.2.3 Elevation=45 ° , Scan=45 ° , f=14.25 GHz:**

angle	GSO (co) skew=10°	GSO (co) skew=30°	GSO (co) skew=50°	elev (co) skew=10°	elev (co) skew=30°	elev (co) skew=50°	GSO (x) skew=10°	GSO (x) skew=30°	GSO (x) skew=50°
-180									
-175									
-170									
-165									
-160									
-155									
-150									
-145									
-140									
-135									
-130									
-125									
-120									
-115									
-110									
-105									
-100									
-95									
-90									
-85									
-80									
-75	-76.47						-77.19		
-70	-47.77						-45.77		
-65	-28.79						-29.82		
-60	-30.74	-60.77					-31.87	-62.67	
-55	-34.44	-51.15				-87.89	-32.81	-51.83	
-50	-28.88	-34.56	-66.54			-52.06	-31.77	-37.03	-69.01
-45	-32.57	-24.81	-33.58		-57.18	-43.84	-36.99	-28.57	-39.07
-40	-27.61	-29.85	-32.12	-37.97	-40.52	-38.78	-32.25	-32.77	-40.19
-35	-32.47	-32.23	-34.15	-20.84	-34.25	-38.78	-33.7	-34.13	-36.12
-30	-35.64	-32.96	-44.59	-16.03	-35.43	-42.11	-37.68	-34.21	-41.29
-25	-29.09	-33.56	-33.81	-13.81	-27.99	-35.99	-32.11	-31.11	-37.47
-20	-32.65	-25.69	-34.66	-21.48	-40.65	-35.03	-44.72	-44.06	-40.26
-15	-27.82	-21.6	-26.28	-6.97	-30.26	-32.93	-36.82	-34.87	-50
-10	-17.56	-31.45	-26.9	0.71	-17.24	-21.4	-29.54	-32.54	-46.96
-9.9	-17.96	-31.41	-27.61	0.81	-16.87	-21.36	-29	-33.33	-46.29
-9.8	-18.53	-27.61	-28.23	0.92	-16.46	-21.7	-28.55	-33.86	-45.64
-9.7	-19.14	-23.56	-28.77	0.98	-16.03	-22.05	-28.12	-34.31	-45.01
-9.6	-20.19	-19.84	-29.22	1.03	-15.56	-22.38	-27.87	-34.57	-44.41
-9.5	-21.62	-17.71	-29	1.08	-15.15	-22.76	-27.78	-33.99	-43.94
-9.4	-23.09	-16.46	-28.26	1.14	-15.04	-23.35	-27.71	-32.93	-43.6
-9.3	-24.31	-15.24	-27.24	1.19	-14.9	-23.96	-27.74	-31.86	-43.34
-9.2	-24.72	-14.29	-26.04	1.2	-14.75	-24.57	-28.09	-30.9	-43.12
-9.1	-25.12	-13.78	-24.8	1.16	-14.57	-25.16	-28.44	-30.14	-42.92
-9	-25.12	-13.45	-23.72	1.12	-14.37	-25.37	-28.88	-29.47	-42.87
-8.9	-23.62	-13.16	-22.97	1.08	-14.18	-25.47	-29.71	-28.82	-43.06
-8.8	-21.87	-13.14	-22.25	1.04	-14.4	-25.59	-30.59	-28.38	-43.19
-8.7	-20.31	-13.53	-21.55	1	-14.62	-25.72	-31.63	-28.26	-43.26
-8.6	-19.19	-13.95	-20.89	0.9	-14.81	-25.45	-33.01	-28.15	-43.26
-8.5	-18.38	-14.45	-20.58	0.79	-14.98	-24.97	-34.63	-28.1	-43.37
-8.4	-17.69	-15.88	-20.47	0.67	-15.13	-24.48	-36.2	-28.41	-43.44
-8.3	-17.37	-17.62	-20.44	0.55	-15.28	-23.99	-37.6	-28.8	-43.38
-8.2	-17.44	-19.47	-20.46	0.44	-16.07	-23.56	-38.84	-29.21	-43.14
-8.1	-17.53	-21.33	-20.55	0.27	-17	-23.16	-40.09	-29.68	-42.71
-8	-18.31	-22.94	-20.75	0.05	-17.89	-22.74	-40.1	-30.24	-42.08
-7.9	-19.52	-24.16	-21.12	-0.18	-18.73	-22.3	-39.4	-30.84	-41.44
-7.8	-20.84	-24.67	-21.61	-0.41	-19.52	-21.97	-38.53	-31.39	-41.26
-7.7	-23.69	-23.66	-22.2	-0.65	-20.27	-21.7	-37.95	-31.71	-41.25
-7.6	-28.12	-20.59	-22.85	-0.9	-21.44	-21.41	-37.68	-31.62	-41.26
-7.5	-32.82	-17.69	-22.53	-1.35	-22.62	-21.09	-37.47	-31.51	-41.23
-7.4	-35.75	-15.02	-21.76	-1.82	-23.6	-20.81	-37.42	-31.38	-41.28
-7.3	-30.07	-13.88	-20.83	-2.29	-24.38	-20.58	-38.12	-30.84	-41.48
-7.2	-24.27	-12.99	-19.77	-2.77	-24.94	-20.33	-38.83	-30.21	-41.87
-7.1	-19.1	-12.14	-18.59	-3.25	-25.29	-20.07	-39.48	-29.57	-42.41



-7	-16.73	-11.63	-17.38	-4.02	-24.36	-19.87	-39.84	-29.03	-42.98
-6.9	-15.06	-11.52	-16.21	-4.86	-22.17	-19.78	-40.12	-28.63	-43.6
-6.8	-13.59	-11.56	-15.05	-5.73	-20.2	-19.69	-40.06	-28.28	-44.37
-6.7	-12.57	-11.72	-13.9	-6.61	-18.46	-19.61	-39.23	-27.96	-45.31
-6.6	-11.95	-12.35	-12.78	-7.52	-16.95	-19.7	-37.73	-27.84	-46.36
-6.5	-11.41	-13.51	-12.06	-8.55	-15.67	-20.06	-36.28	-27.94	-46.5
-6.4	-11.22	-14.74	-11.45	-9.62	-14.53	-20.44	-35.02	-28.04	-46.14
-6.3	-11.39	-16.27	-10.86	-10.64	-13.79	-20.82	-33.97	-28.28	-45.39
-6.2	-11.58	-18.27	-10.29	-11.62	-13.14	-21.55	-32.93	-28.88	-44.24
-6.1	-12.4	-20.23	-9.83	-12.57	-12.58	-22.82	-32.24	-29.63	-42.84
-6	-13.65	-21.88	-9.57	-12.31	-12.11	-23.98	-31.79	-30.39	-41.44
-5.9	-15.02	-21.52	-9.43	-10.94	-11.73	-24.99	-31.4	-31.63	-40.11
-5.8	-18.33	-18.17	-9.32	-9.42	-11.36	-25.02	-31.24	-33.64	-38.76
-5.7	-24.09	-14.83	-9.25	-7.89	-11.37	-23.21	-31.38	-35.74	-37.45
-5.6	-29.98	-11.62	-9.27	-6.34	-11.44	-21.41	-31.59	-37.88	-36.28
-5.5	-34.18	-9.73	-9.6	-4.97	-11.58	-19.62	-31.84	-38.93	-35.42
-5.4	-26.78	-8.3	-10	-3.8	-11.78	-17.81	-32.46	-39.12	-34.66
-5.3	-19.7	-6.96	-10.44	-2.64	-12.05	-15.95	-33.06	-38.8	-33.95
-5.2	-13.79	-5.94	-10.93	-1.5	-12.18	-14.14	-33.5	-37.55	-33.35
-5.1	-10.94	-5.24	-11.7	-0.37	-12.74	-12.39	-33.33	-35.48	-32.94
-5	-9.21	-4.7	-12.93	0.6	-13.11	-10.9	-32.93	-33.14	-32.74
-4.9	-7.66	-4.23	-14.34	1.39	-13.26	-9.87	-32.32	-31.04	-32.62
-4.8	-6.51	-3.95	-15.82	2.18	-13.22	-8.84	-31.31	-29.44	-32.56
-4.7	-5.72	-3.94	-17.38	2.96	-13.05	-7.81	-29.94	-28.49	-32.54
-4.6	-4.97	-3.95	-18.66	3.74	-13.01	-6.88	-28.61	-27.57	-32.62
-4.5	-4.57	-4.02	-19.25	4.43	-11.48	-6.28	-27.54	-26.73	-32.87
-4.4	-4.38	-4.5	-19.49	5.04	-9.82	-5.69	-26.63	-26.35	-33.19
-4.3	-4.2	-5.06	-19.44	5.65	-8.2	-5.1	-25.73	-26.07	-33.54
-4.2	-4.32	-5.66	-19.13	6.25	-6.61	-4.6	-25.16	-25.81	-33.93
-4.1	-4.6	-6.57	-18.29	6.81	-5.15	-4.44	-24.76	-25.78	-34.2
-4	-4.92	-7.82	-16.87	7.28	-3.81	-4.28	-24.41	-25.98	-34.23
-3.9	-5.42	-9.13	-15.64	7.71	-2.65	-4.1	-24.24	-26.23	-34.23
-3.8	-6.21	-10.43	-14.59	8.15	-1.53	-4.02	-24.39	-26.53	-34.19
-3.7	-7	-11.63	-13.66	8.58	-0.41	-4.32	-24.57	-27.1	-34.12
-3.6	-7.81	-12.67	-13.37	9.02	0.72	-4.6	-24.84	-27.84	-33.83
-3.5	-8.7	-13.57	-13.51	9.39	1.75	-4.86	-25.56	-28.6	-33.4
-3.4	-9.57	-13.8	-13.82	9.75	2.79	-5.2	-26.29	-29.41	-32.93
-3.3	-10.21	-13.23	-14.27	10.1	3.64	-5.86	-27.24	-30.31	-32.48
-3.2	-10.48	-12.4	-14.76	10.46	4.39	-6.52	-28.57	-31.29	-32.06
-3.1	-10.57	-11.73	-14.85	10.82	5.14	-7.2	-30.08	-32.23	-31.73
-3	-10.68	-11.47	-14.22	11.12	5.88	-7.61	-31.83	-32.8	-31.52
-2.9	-10.86	-11.81	-13.28	11.42	6.59	-6.66	-34.07	-32.74	-31.32
-2.8	-11.11	-12.26	-12.03	11.72	7.31	-5.82	-36.69	-32.69	-31.12
-2.7	-11.38	-12.83	-10.42	12.02	7.92	-5.09	-39.38	-32.63	-30.99
-2.6	-12.24	-12.87	-8.41	12.31	8.45	-4.38	-39.32	-32.22	-31.08
-2.5	-13.21	-12.63	-6.36	12.55	8.98	-2.88	-38.51	-31.77	-31.22
-2.4	-14.18	-12.11	-4.37	12.75	9.48	-1.37	-37.53	-31.31	-31.37
-2.3	-12.72	-10.35	-2.44	12.97	9.97	0.15	-36.45	-31.04	-31.5
-2.2	-9.74	-7.56	-0.69	13.18	10.48	1.62	-35.31	-30.94	-31.63
-2.1	-6.71	-4.6	0.77	13.37	10.94	2.69	-34.18	-30.86	-31.74
-2	-3.87	-1.83	1.99	13.54	11.3	3.77	-33.24	-30.77	-31.85
-1.9	-1.46	0.38	3.17	13.71	11.65	4.86	-32.67	-30.72	-31.9
-1.8	0.92	2.17	4.31	13.89	11.99	5.92	-32.09	-30.69	-31.89
-1.7	2.98	3.92	5.39	14.07	12.34	6.63	-31.54	-30.59	-31.79
-1.6	4.6	5.47	6.26	14.21	12.69	7.36	-31.04	-30.41	-31.49
-1.5	6.14	6.74	7.04	14.34	13.02	8.11	-30.54	-30.12	-31.1
-1.4	7.51	7.9	7.79	14.48	13.25	8.86	-30.05	-29.76	-30.7
-1.3	8.68	8.99	8.52	14.63	13.45	9.35	-29.56	-29.35	-30.27
-1.2	9.75	9.95	9.18	14.76	13.67	9.86	-29.08	-28.88	-29.8
-1.1	10.75	10.73	9.72	14.87	13.89	10.35	-28.58	-28.33	-29.24
-1	11.56	11.5	10.22	14.97	14.12	10.84	-28.02	-27.79	-28.67
-0.9	12.3	12.26	10.68	15.08	14.33	11.14	-27.43	-27.24	-28.12
-0.8	13.04	12.77	11.11	15.18	14.43	11.44	-26.85	-26.55	-27.58
-0.7	13.55	13.27	11.47	15.23	14.53	11.76	-26.08	-25.85	-27.04
-0.6	14.02	13.76	11.76	15.26	14.63	12.08	-25.28	-25.16	-26.48
-0.5	14.47	14.12	12.01	15.3	14.74	12.22	-24.47	-24.45	-25.91
-0.4	14.8	14.39	12.24	15.34	14.86	12.36	-23.64	-23.72	-25.33
-0.3	15.04	14.62	12.43	15.39	14.96	12.5	-22.79	-22.98	-24.77
-0.2	15.26	14.82	12.57	15.39	14.95	12.64	-21.95	-22.24	-24.23



-0.1	15.39	14.92	12.6	15.39	14.94	12.63	-21.18	-21.58	-23.76
0	15.41	14.94	12.62	15.41	14.94	12.62	-20.5	-20.96	-23.28
0.1	15.42	14.95	12.64	15.42	14.95	12.63	-19.82	-20.35	-22.8
0.2	15.31	14.89	12.62	15.41	14.96	12.64	-19.28	-19.81	-22.32
0.3	15.12	14.71	12.5	15.38	14.95	12.48	-18.84	-19.4	-21.95
0.4	14.9	14.48	12.31	15.36	14.83	12.32	-18.44	-19.03	-21.65
0.5	14.58	14.22	12.1	15.34	14.73	12.17	-18.15	-18.69	-21.36
0.6	14.13	13.85	11.88	15.32	14.63	12.02	-18.02	-18.47	-21.08
0.7	13.65	13.37	11.62	15.25	14.54	11.72	-17.93	-18.39	-20.83
0.8	13.12	12.88	11.27	15.19	14.41	11.44	-17.88	-18.31	-20.68
0.9	12.32	12.37	10.81	15.11	14.3	11.16	-18.15	-18.25	-20.64
1	11.51	11.58	10.34	15.01	14.09	10.87	-18.43	-18.51	-20.62
1.1	10.62	10.76	9.86	14.89	13.89	10.4	-18.8	-18.79	-20.61
1.2	9.45	9.91	9.33	14.75	13.68	9.94	-19.48	-19.1	-20.64
1.3	8.19	8.84	8.65	14.61	13.45	9.5	-20.28	-19.67	-20.84
1.4	6.81	7.58	7.87	14.47	13.22	9.07	-21.27	-20.45	-21.16
1.5	5.18	6.27	7.05	14.32	13	8.45	-22.67	-21.29	-21.52
1.6	3.32	4.88	6.22	14.13	12.7	7.84	-24.46	-22.3	-21.89
1.7	1.54	3.29	5.33	13.95	12.38	7.21	-26.33	-23.82	-22.33
1.8	0.3	1.59	4.19	13.76	12.02	6.59	-28.65	-25.68	-23.1
1.9	-0.47	-0.09	2.95	13.58	11.66	5.76	-31.13	-27.58	-24.01
2	-1.17	-1.04	1.68	13.35	11.32	4.93	-33.4	-28.93	-25.01
2.1	-0.8	-1.11	0.39	13.11	10.99	4.12	-32.37	-29.42	-26.06
2.2	0.15	-0.83	-0.81	12.87	10.57	3.33	-29.57	-29.49	-27.44
2.3	1.24	-0.42	-1.86	12.63	10.07	2.24	-26.45	-29.14	-29.2
2.4	2.12	0.21	-2.74	12.36	9.58	1.13	-24.01	-28.03	-31.29
2.5	2.65	1	-3.48	12.05	9.1	0.04	-22.68	-26.17	-33.65
2.6	3.15	1.76	-4.05	11.7	8.64	-1.02	-21.4	-24.39	-36.1
2.7	3.52	2.46	-4.28	11.36	8.16	-2.5	-20.31	-22.75	-37.95
2.8	3.44	2.63	-3.71	11	7.56	-3.96	-19.86	-22.09	-37
2.9	3.34	2.76	-3.14	10.57	6.91	-5.37	-19.44	-21.48	-35.7
3	3.07	2.87	-2.59	10.15	6.27	-6.8	-19.2	-20.9	-34.02
3.1	2.56	2.72	-2.07	9.72	5.65	-8.76	-19.23	-20.65	-32.02
3.2	1.91	2.36	-1.69	9.3	5.01	-10.74	-19.41	-20.66	-30.53
3.3	1.11	1.96	-1.48	8.77	4.32	-12.71	-19.72	-20.72	-29.69
3.4	0	1.46	-1.31	8.23	3.57	-14.65	-20.34	-20.9	-28.97
3.5	-1.29	0.66	-1.2	7.69	2.75	-15.66	-21.13	-21.42	-28.28
3.6	-2.6	-0.34	-1.16	7.15	1.94	-16.85	-21.93	-22.17	-27.63
3.7	-4.72	-1.37	-1.35	6.5	1.1	-18.39	-23.49	-22.98	-27.4
3.8	-7	-2.77	-1.66	5.79	0.22	-20.24	-25.21	-24.2	-27.39
3.9	-9.27	-4.5	-2.01	5.08	-0.65	-20.42	-27.16	-25.77	-27.45
4	-10.72	-6.35	-2.42	4.37	-1.56	-20.36	-31.25	-27.51	-27.52
4.1	-11.53	-8.3	-2.95	3.52	-2.56	-20.31	-36.98	-29.44	-27.69
4.2	-12.06	-10.35	-3.64	2.49	-3.63	-20.27	-42.15	-31.58	-28.07
4.3	-11.87	-12.42	-4.5	1.43	-4.7	-21.06	-44.26	-33.69	-28.69
4.4	-10.52	-14.24	-5.39	0.37	-5.74	-21.85	-40.33	-35.22	-29.38
4.5	-9.19	-15.23	-6.32	-0.9	-6.74	-22.53	-35.75	-35.56	-30.13
4.6	-8.37	-14.02	-7.41	-2.78	-7.73	-23.09	-32.65	-33.59	-30.97
4.7	-8.08	-12.69	-8.88	-4.66	-8.95	-24.21	-31.06	-31.58	-32.4
4.8	-7.92	-11.42	-10.46	-6.54	-10.07	-25.43	-29.83	-29.73	-34.03
4.9	-8.09	-10.69	-12.07	-8.49	-11.09	-27.13	-29.09	-28.5	-35.78
5	-8.66	-10.42	-13.71	-11.1	-12.02	-28.82	-28.88	-27.8	-37.62
5.1	-9.4	-10.24	-15.26	-13.68	-12.91	-29.86	-28.9	-27.27	-39.08
5.2	-10.24	-10.23	-16.45	-16.25	-13.84	-30.47	-29.01	-26.91	-39.44
5.3	-11.5	-10.86	-17.32	-18.79	-14.6	-30.69	-29.43	-27.06	-39.28
5.4	-12.83	-11.65	-17.9	-15.89	-15.2	-30.54	-29.9	-27.36	-38.81
5.5	-14.07	-12.5	-18.18	-12.68	-15.65	-30.04	-30.35	-27.71	-38.03
5.6	-14.09	-13.65	-18.08	-9.49	-16.11	-29.38	-30.37	-28.37	-37.2
5.7	-13.75	-14.99	-17.8	-6.32	-16.48	-28.93	-30.29	-29.3	-36.56
5.8	-13.25	-16.37	-17.52	-4.93	-16.63	-28.7	-30.13	-30.38	-36.11
5.9	-12.47	-17.35	-17.31	-3.93	-16.74	-28.88	-29.78	-31.46	-35.8
6	-11.45	-17.46	-17.22	-2.94	-16.73	-29.25	-29.23	-32.3	-35.67
6.1	-10.5	-16.79	-17.39	-1.95	-16.8	-29.6	-28.74	-32.79	-35.85
6.2	-9.83	-15.99	-17.99	-1.33	-16.72	-29.86	-28.38	-33.05	-36.56
6.3	-9.53	-15.11	-18.7	-0.84	-16.49	-30.06	-28.19	-32.85	-37.37
6.4	-9.25	-14.3	-19.51	-0.35	-16.11	-30.22	-28	-32.11	-38.27
6.5	-9.31	-13.57	-20.42	0.15	-16.01	-30.35	-28.12	-31.21	-39.22
6.6	-9.62	-12.95	-21.95	0.48	-15.96	-30.45	-28.47	-30.34	-39.53
6.7	-10.03	-12.66	-23.99	0.73	-15.85	-30.14	-28.9	-29.75	-39.33



6.8	-10.67	-12.71	-26.22	0.98	-15.68	-29.51	-29.67	-29.44	-39.02
6.9	-11.67	-12.81	-28.65	1.23	-15.45	-28.94	-30.99	-29.22	-38.61
7	-12.77	-12.99	-31.1	1.39	-15.23	-28.42	-32.47	-29.12	-38.1
7.1	-13.88	-13.66	-31.46	1.49	-15.25	-28.08	-34.13	-29.58	-37.46
7.2	-14.92	-14.42	-30.53	1.6	-15.31	-27.89	-40.61	-30.21	-36.88
7.3	-15.92	-15.24	-29.25	1.7	-15.34	-27.81	-47.34	-30.95	-36.42
7.4	-16.6	-16.03	-27.7	1.73	-15.36	-27.83	-52.19	-32.18	-36.07
7.5	-16.23	-16.73	-26.13	1.71	-15.4	-28.01	-49.58	-33.78	-35.89
7.6	-15.32	-17.3	-24.94	1.66	-15.41	-28.34	-43.04	-35.55	-35.93
7.7	-14.42	-17.6	-24.23	1.61	-15.55	-28.82	-37.2	-37.2	-36.12
7.8	-13.59	-17.35	-23.64	1.49	-15.76	-29.44	-33.33	-38.25	-36.32
7.9	-12.85	-16.63	-23.16	1.34	-15.99	-29.89	-31.77	-38.38	-36.53
8	-12.14	-15.84	-22.85	1.19	-16.21	-30.25	-30.24	-38.04	-36.74
8.1	-11.82	-15.09	-22.99	1.05	-16.39	-30.61	-29.34	-37.11	-36.73
8.2	-11.75	-14.46	-23.2	0.84	-16.55	-30.98	-28.86	-35.75	-36.63
8.3	-11.74	-13.9	-23.42	0.61	-16.8	-30.87	-28.45	-34.38	-36.5
8.4	-12.05	-13.43	-23.65	0.38	-17.14	-30.34	-28.39	-33.24	-36.31
8.5	-12.64	-13.18	-23.95	0.15	-17.46	-29.51	-28.63	-32.49	-36.06
8.6	-13.32	-13.24	-24.39	-0.13	-17.76	-28.5	-28.98	-32.17	-35.75
8.7	-14.15	-13.36	-24.73	-0.44	-18.03	-27.68	-29.54	-31.96	-35.48
8.8	-15.4	-13.54	-24.91	-0.74	-18.35	-27.07	-30.75	-31.83	-35.28
8.9	-16.7	-14.28	-24.93	-1.03	-18.71	-26.43	-32.09	-32.26	-35.15
9	-17.86	-15.11	-24.94	-1.38	-19.14	-25.77	-33.66	-32.78	-35.12
9.1	-17.95	-16	-24.99	-1.73	-19.56	-25.29	-36.92	-33.36	-35.2
9.2	-17.8	-17.47	-25.04	-2.08	-20.03	-25.03	-40.75	-34.27	-35.37
9.3	-17.41	-19.62	-25.06	-2.46	-20.55	-24.79	-43.9	-35.44	-35.64
9.4	-16.6	-22.16	-25.1	-2.87	-21.07	-24.54	-44.2	-36.58	-36.03
9.5	-15.46	-24.76	-25.28	-3.27	-21.65	-24.48	-41.73	-37.61	-36.54
9.6	-14.38	-26.45	-25.87	-3.66	-22.38	-24.63	-39	-38.37	-37.05
9.7	-13.56	-26.88	-26.54	-4.06	-23.26	-24.82	-36.7	-38.88	-37.6
9.8	-13.07	-26.72	-27.3	-4.43	-24.18	-25.01	-35.36	-39.24	-38.19
9.9	-12.61	-25.6	-28.13	-4.79	-25.14	-25.33	-34.05	-38.96	-38.87
10	-12.47	-23.82	-29.43	-5.16	-26.16	-25.86	-33.4	-38.07	-39.43
15	-16.99	-29.31	-41.98	-23.44	-29.77	-33.86	-32.24	-33.44	-36.73
20	-20.5	-35.38	-39.43	-28.22	-26.4	-41.44	-33.82	-36.79	-38.78
25	-23.95	-29.19	-41.68	-25.57	-32.12	-30.38	-42.52	-33.7	-40.26
30	-26.65	-35.51	-34.1	-25.58	-27.33	-27.13	-42.96	-40.85	-42.15
35	-38.11	-26.41	-46.16	-27.33	-39.51	-33.15	-39.85	-48.69	-41.46
40	-35.26	-29.96	-37.82	-25.94	-20.4	-35.18	-47.35	-41.28	-44.3
45	-28.19	-35.22	-43.2	-9.13	-17.6	-32.71	-38.68	-45.42	-44.43
50	-34.58	-37.31	-43.11	-24.71	-31.64	-19.68	-34.53	-37.74	-43.4
55	-41.55	-37.85	-40.59	-26.35	-32.8	-29.53	-54.74	-42.33	-38.28
60	-34.81	-34.22	-23.54	-29.74	-32.2	-34.16	-33.9	-39.36	-37.23
65	-37.34	-35.71	-35.03	-33.28	-37.98	-36.77	-45.94	-49.9	-38.14
70	-35.61	-26.7	-29.07	-35.99	-35.55	-44.9	-43.01	-37.9	-35.1
75	-33	-29.75	-30.18	-32.31	-38.72	-41.15	-46.15	-36.58	-32.24
80	-32.92	-22	-31.4	-27.9	-38.35	-49.43	-44.95	-32.5	-37.26
85	-33.7	-27.6	-40.33	-24.69	-33.84	-34.61	-54	-33.02	-37.18
90				-24.95	-24.69	-39.22			
95				-37.67	-35.03	-29.28			
100				-33.44	-35.21	-26.29			
105				-34.4	-40.64	-36.98			
110				-34.55	-35.53	-42.77			
115				-30.49	-47.77	-51.82			
120				-30.7	-40.76	-86.06			
125				-32.04	-42				
130				-38.6	-88.49				
135				-78.47					
140									
145									
150									
155									
160									
165									
170									
175									
180									



**5.5.2.4 Elevation=30°, Scan=60°, f=14.25 GHz:**

angle	GSO (co) skew=10°	GSO (co) skew=30°	GSO (co) skew=50°	elev (co) skew=10°	elev (co) skew=30°	elev (co) skew=50°	GSO (x) skew=10°	GSO (x) skew=30°	GSO (x) skew=50°
-180									
-175									
-170									
-165									
-160									
-155									
-150									
-145									
-140									
-135									
-130									
-125									
-120									
-115									
-110									
-105									
-100									
-95									
-90									
-85									
-80									
-75									
-70									
-65									
-60									
-55	-43.5						-40.92		
-50	-31.32						-27.03		
-45	-42.46						-34.45		
-40	-32.49	-34.95					-30.93	-38.5	
-35	-36.42	-35.62				-38.34	-40.98	-35.94	
-30	-38.89	-40.72	-22.91		-33.99	-41.88	-44.02	-36.6	-20.51
-25	-36.43	-43.95	-28.6	-14.29	-28.61	-33.44	-30.57	-25.38	-24.62
-20	-31.44	-26.49	-19.95	-6.17	-31.76	-28.78	-36.87	-39.29	-29.6
-15	-33.56	-31.88	-18.15	-0.48	-21.83	-31.22	-30.82	-32.4	-30.44
-10	-23.81	-19.3	-20.07	-6.88	-33.45	-24.17	-28.12	-30.54	-27.39
-9.9	-25.12	-17.95	-18.27	-7.37	-35.07	-24.35	-27.62	-32.26	-27.81
-9.8	-26.72	-16.81	-17.05	-7.83	-34.02	-24.56	-27.5	-33.77	-28.52
-9.7	-28.67	-15.8	-16.04	-8.24	-32.76	-24.75	-27.79	-35.02	-29.36
-9.6	-29.64	-15.02	-15.09	-8.62	-31.63	-24.69	-28.39	-35.78	-30.25
-9.5	-28.57	-14.5	-14.3	-8.96	-30.63	-24.57	-29.62	-35.96	-31.25
-9.4	-26.98	-14.09	-13.77	-9.26	-29.51	-24.41	-30.99	-35.57	-32.41
-9.3	-24.7	-14.01	-13.33	-9.17	-28.17	-24.17	-32.57	-33.68	-33.6
-9.2	-22.16	-14.04	-12.92	-8.84	-26.89	-23.9	-34.29	-31.42	-34.76
-9.1	-20.14	-14.22	-12.69	-8.43	-25.66	-23.61	-36.65	-29.53	-35.79
-9	-18.62	-14.67	-12.62	-7.96	-24.47	-23.23	-39.63	-28.44	-36.64
-8.9	-17.36	-15.14	-12.59	-7.42	-23.16	-22.86	-40.61	-27.38	-37.32
-8.8	-16.66	-15.63	-12.71	-6.8	-21.79	-22.49	-37.4	-26.78	-37.55
-8.7	-16.03	-16.12	-13.12	-6.1	-20.39	-22.17	-33.99	-26.34	-36.95
-8.6	-15.67	-16.59	-13.71	-5.34	-18.98	-21.87	-30.77	-26.06	-35.86
-8.5	-15.37	-17.01	-14.41	-4.58	-17.69	-21.59	-27.57	-26	-34.56
-8.4	-15.32	-17.4	-15.47	-3.81	-16.92	-21.31	-25.75	-26.05	-33.42
-8.3	-15.37	-17.14	-17.18	-3.04	-16.16	-21.05	-24.46	-26.41	-32.58
-8.2	-15.63	-16.19	-18.9	-2.26	-15.26	-20.82	-23.6	-27.13	-31.78
-8.1	-16.05	-15.23	-20.63	-1.49	-14.38	-20.62	-23.06	-27.88	-31.02
-8	-16.45	-14.31	-21.54	-0.86	-13.69	-20.45	-22.76	-28.67	-30.57
-7.9	-16.77	-13.43	-22.3	-0.24	-13.11	-20.29	-22.69	-29.46	-30.21
-7.8	-16.98	-12.58	-23.02	0.38	-12.55	-20.15	-22.82	-30.17	-29.9
-7.7	-16.99	-11.84	-22.2	1	-12.01	-20.04	-23.14	-30.6	-29.77
-7.6	-16.78	-11.13	-20.12	1.61	-11.53	-19.96	-23.67	-30.97	-29.78
-7.5	-16.36	-10.67	-17.71	2.22	-11.21	-19.98	-24.32	-30.47	-29.82
-7.4	-15.58	-10.35	-15.51	2.71	-10.89	-20.01	-25.22	-29.54	-29.91
-7.3	-14.8	-10.16	-13.74	3.2	-10.58	-20.11	-26.29	-28.51	-30.11
-7.2	-14.01	-10.26	-12.37	3.69	-10.3	-20.35	-28.15	-27.5	-30.36
-7.1	-13.25	-10.49	-11.06	4.18	-10.17	-20.58	-29.94	-26.51	-30.56



-7	-12.73	-10.91	-9.88	4.67	-10.15	-20.82	-30.37	-25.65	-30.65
-6.9	-12.26	-11.53	-9.07	5.15	-10.15	-21.07	-30.57	-24.94	-30.53
-6.8	-12	-12.24	-8.3	5.58	-10.14	-21.31	-30.18	-24.33	-30.38
-6.7	-11.86	-13.1	-7.57	6.02	-10.18	-21.49	-29.49	-23.87	-30.19
-6.6	-11.92	-14.12	-7.07	6.45	-10.81	-21.53	-28.44	-23.57	-29.76
-6.5	-12.2	-15.04	-6.66	6.88	-11.46	-21.54	-27.03	-23.34	-29.24
-6.4	-12.62	-15.33	-6.27	7.32	-12.12	-21.13	-25.73	-23.49	-28.69
-6.3	-13.22	-15.46	-6.01	7.74	-12.81	-20.05	-24.88	-23.69	-28.03
-6.2	-13.84	-14.85	-5.89	8.11	-13.5	-19.06	-24.23	-24.08	-27.33
-6.1	-14.09	-13.72	-5.86	8.47	-14.05	-17.95	-23.85	-24.65	-26.69
-6	-14.11	-12.47	-5.88	8.83	-14.55	-16.75	-23.62	-25.3	-26.14
-5.9	-13.78	-10.99	-6.04	9.19	-15.03	-15.51	-23.6	-26.1	-25.66
-5.8	-13.08	-9.44	-6.32	9.56	-15.45	-14.26	-23.78	-26.97	-25.27
-5.7	-12.11	-8.1	-6.63	9.89	-15.3	-13	-24.2	-27.95	-24.89
-5.6	-10.75	-6.99	-6.99	10.22	-15.14	-11.72	-24.95	-29.04	-24.56
-5.5	-9.33	-6.06	-7.46	10.54	-14.99	-10.61	-25.9	-29.99	-24.36
-5.4	-8.09	-5.34	-7.95	10.87	-14.88	-9.68	-27.03	-30.37	-24.24
-5.3	-7	-4.87	-8.45	11.2	-13.53	-8.75	-28.24	-30.01	-24.2
-5.2	-6.02	-4.46	-9	11.52	-11.34	-7.98	-29.22	-29.55	-24.29
-5.1	-5.2	-4.28	-9.56	11.8	-9.19	-7.32	-29.85	-28.85	-24.43
-5	-4.46	-4.14	-10.1	12.08	-7.1	-6.65	-30.16	-28.1	-24.59
-4.9	-3.98	-4.14	-10.46	12.34	-5.12	-6.12	-29.43	-27.29	-24.87
-4.8	-3.5	-4.27	-10.53	12.59	-3.87	-5.68	-28.67	-26.45	-25.33
-4.7	-3.46	-4.46	-10.45	12.85	-2.65	-5.22	-27.41	-25.66	-25.91
-4.6	-3.43	-4.88	-10.29	13.07	-1.42	-4.94	-26.14	-25.18	-26.61
-4.5	-3.6	-5.4	-10.06	13.29	-0.2	-4.74	-25.18	-24.82	-27.57
-4.4	-3.85	-6.02	-9.78	13.51	0.84	-4.52	-24.32	-24.67	-28.79
-4.3	-4.24	-6.74	-9.5	13.74	1.77	-4.67	-23.72	-24.77	-30.07
-4.2	-4.74	-7.47	-9.26	13.96	2.7	-4.93	-23.3	-25.01	-31.39
-4.1	-5.38	-8.09	-9.15	14.18	3.6	-5.17	-23.12	-25.43	-32.69
-4	-6.19	-8.58	-9.11	14.37	4.49	-5.81	-23.21	-26.09	-33.92
-3.9	-7.01	-9	-9.15	14.57	5.19	-6.52	-23.54	-26.88	-35.04
-3.8	-7.69	-9.1	-9.57	14.77	5.9	-7.18	-24.27	-28.1	-35.46
-3.7	-8.27	-9.12	-10.18	14.97	6.62	-7.84	-25.31	-29.48	-35.34
-3.6	-8.62	-8.9	-10.87	15.15	7.34	-8.52	-27.17	-31.75	-34.86
-3.5	-8.77	-8.51	-11.56	15.3	7.92	-9.22	-29.81	-34.91	-33.84
-3.4	-8.69	-8.16	-12.01	15.46	8.43	-8.63	-32.95	-37.95	-32.34
-3.3	-8.35	-8.15	-12.12	15.63	8.94	-8.17	-36.64	-38	-30.75
-3.2	-8.05	-8.3	-11.84	15.79	9.47	-7.92	-38.48	-36.79	-29.3
-3.1	-7.91	-8.62	-10.93	15.95	9.99	-6.24	-36.62	-34.97	-28.02
-3	-7.93	-9.09	-9.44	16.1	10.42	-4.57	-33.21	-32.46	-26.93
-2.9	-8.19	-9.64	-7.82	16.25	10.84	-2.93	-30.21	-29.84	-25.92
-2.8	-8.6	-10.32	-5.99	16.4	11.26	-1.28	-27.65	-27.67	-25.04
-2.7	-8.87	-11.07	-3.75	16.55	11.7	0.4	-25.33	-26.1	-24.39
-2.6	-8.86	-11.34	-1.69	16.71	12.09	2.02	-23.46	-24.67	-23.81
-2.5	-8.52	-9.12	0.29	16.84	12.45	3.27	-21.75	-23.79	-23.32
-2.4	-6.85	-6.64	1.82	16.97	12.81	4.55	-20.72	-23	-22.98
-2.3	-5.09	-4.18	3.15	17.09	13.16	5.76	-19.7	-22.36	-22.73
-2.2	-2.75	-1.79	4.42	17.2	13.51	6.64	-19.04	-21.83	-22.54
-2.1	-0.35	0.5	5.57	17.32	13.79	7.54	-18.42	-21.34	-22.39
-2	1.84	2.48	6.56	17.42	14.07	8.4	-17.93	-20.96	-22.26
-1.9	3.94	4.29	7.48	17.51	14.36	9.13	-17.49	-20.64	-22.18
-1.8	5.82	5.88	8.36	17.62	14.62	9.85	-17.14	-20.41	-22.18
-1.7	7.49	7.21	9.16	17.72	14.85	10.51	-16.87	-20.27	-22.22
-1.6	8.99	8.43	9.89	17.81	15.04	11.08	-16.66	-20.19	-22.3
-1.5	10.25	9.53	10.6	17.89	15.24	11.66	-16.52	-20.16	-22.41
-1.4	11.39	10.49	11.26	17.97	15.44	12.18	-16.44	-20.21	-22.4
-1.3	12.39	11.42	11.8	18.05	15.64	12.61	-16.43	-20.23	-22.36
-1.2	13.3	12.17	12.33	18.13	15.76	13.06	-16.47	-20.29	-22.44
-1.1	14.12	12.92	12.84	18.18	15.88	13.43	-16.61	-20.34	-22.63
-1	14.87	13.57	13.25	18.2	16.02	13.72	-16.8	-20.39	-22.68
-0.9	15.55	14.17	13.6	18.23	16.16	14.01	-17.03	-20.46	-22.66
-0.8	16.16	14.71	13.92	18.26	16.27	14.26	-17.3	-20.52	-22.49
-0.7	16.68	15.13	14.2	18.29	16.33	14.46	-17.59	-20.56	-22.27
-0.6	17.1	15.5	14.43	18.3	16.4	14.68	-17.88	-20.67	-22.08
-0.5	17.44	15.81	14.64	18.3	16.47	14.84	-18.13	-20.71	-21.93
-0.4	17.73	16.05	14.83	18.31	16.54	14.96	-18.25	-20.53	-21.86
-0.3	17.96	16.26	14.97	18.32	16.55	15.08	-18.25	-20.31	-21.78
-0.2	18.14	16.4	15.05	18.33	16.55	15.13	-18.25	-20.13	-21.58



-0.1	18.24	16.49	15.12	18.32	16.55	15.14	-18.2	-20	-21.42
0	18.32	16.56	15.16	18.32	16.56	15.16	-18.12	-19.87	-21.27
0.1	18.27	16.51	15.12	18.32	16.53	15.11	-17.61	-19.46	-20.98
0.2	18.21	16.46	15.07	18.29	16.48	15.03	-17.14	-19.16	-20.82
0.3	18.03	16.3	15	18.26	16.43	14.97	-16.55	-18.79	-20.59
0.4	17.81	16.09	14.84	18.22	16.38	14.83	-15.94	-18.33	-20.14
0.5	17.5	15.83	14.64	18.19	16.34	14.69	-15.37	-17.8	-19.66
0.6	17.15	15.49	14.43	18.16	16.25	14.55	-14.83	-17.32	-19.28
0.7	16.73	15.12	14.18	18.13	16.17	14.34	-14.33	-16.92	-18.99
0.8	16.23	14.68	13.86	18.09	16.09	14.13	-13.9	-16.61	-18.79
0.9	15.67	14.16	13.51	18.05	16	13.93	-13.53	-16.38	-18.6
1	14.95	13.59	13.13	18.02	15.88	13.58	-13.38	-16.21	-18.41
1.1	14.18	12.89	12.67	17.99	15.75	13.23	-13.28	-16.16	-18.29
1.2	13.22	12.13	12.18	17.93	15.63	12.89	-13.37	-16.16	-18.25
1.3	12.17	11.25	11.66	17.87	15.51	12.46	-13.55	-16.24	-18.31
1.4	10.94	10.17	11.04	17.81	15.36	12.04	-13.89	-16.51	-18.43
1.5	9.58	9.04	10.32	17.74	15.14	11.61	-14.32	-16.83	-18.57
1.6	8	7.65	9.55	17.66	14.92	11.11	-14.9	-17.35	-18.78
1.7	6.19	6.13	8.73	17.56	14.72	10.61	-15.63	-17.96	-19.09
1.8	4.12	4.41	7.74	17.46	14.5	10.07	-16.57	-18.73	-19.56
1.9	1.74	2.41	6.63	17.37	14.22	9.43	-17.81	-19.67	-20.14
2	-0.58	0.28	5.47	17.27	13.93	8.81	-19.24	-20.83	-20.76
2.1	-2.08	-1.64	4.16	17.13	13.65	8.13	-20.73	-22.46	-21.52
2.2	-2.56	-3.06	2.63	17	13.37	7.34	-22.24	-24.9	-22.55
2.3	-2.44	-4.08	1.06	16.87	13.06	6.56	-23.63	-27.67	-23.75
2.4	-1.18	-3.66	-0.55	16.74	12.7	5.71	-24.75	-30.11	-25.12
2.5	0.06	-2.96	-2.36	16.58	12.34	4.76	-25.34	-32.34	-27.18
2.6	1.11	-1.98	-4.02	16.42	11.99	3.84	-24.42	-33.16	-29.71
2.7	2.01	-0.8	-5.5	16.24	11.65	2.85	-23.28	-32.21	-32.69
2.8	2.5	0.29	-5.8	16.06	11.22	1.81	-22.33	-30.22	-34.93
2.9	2.77	0.95	-5.3	15.84	10.78	0.8	-21.46	-28.01	-35.77
3	2.82	1.33	-4.48	15.62	10.34	-0.37	-20.81	-25.97	-35.43
3.1	2.67	1.53	-3.59	15.4	9.92	-1.65	-20.37	-24.4	-34.13
3.2	2.37	1.47	-2.73	15.17	9.47	-2.88	-20.1	-23.43	-32.15
3.3	1.79	1.29	-1.92	14.94	8.93	-4.24	-20.22	-22.74	-29.89
3.4	1.12	0.93	-1.19	14.69	8.39	-5.69	-20.43	-22.32	-27.68
3.5	-0.03	0.39	-0.62	14.44	7.87	-7.09	-21.29	-22.18	-25.82
3.6	-1.25	-0.25	-0.34	14.19	7.36	-8.49	-22.23	-22.09	-24.68
3.7	-3.11	-1.26	-0.1	13.94	6.8	-9.9	-23.99	-22.4	-23.58
3.8	-5.16	-2.33	0.03	13.67	6.23	-11.29	-25.99	-22.76	-22.63
3.9	-7.83	-3.89	-0.09	13.39	5.67	-12.77	-28.22	-23.53	-22.06
4	-10.84	-5.81	-0.31	13.1	5.12	-14.29	-30.56	-24.56	-21.62
4.1	-14.06	-8.29	-0.59	12.79	4.56	-15.78	-32.33	-25.85	-21.27
4.2	-17.31	-11.69	-1.08	12.45	3.95	-17.29	-33.34	-27.5	-21.12
4.3	-19.06	-15.57	-1.74	12.11	3.34	-18.78	-33.24	-29.44	-21.11
4.4	-17.8	-18.55	-2.44	11.78	2.75	-20.31	-31.59	-31.35	-21.11
4.5	-15.09	-19.87	-3.28	11.42	2.16	-22.31	-29.29	-33.05	-21.18
4.6	-12.96	-20.36	-4.46	11.03	1.51	-25.11	-27.48	-34.78	-21.49
4.7	-11.38	-17.99	-5.76	10.63	0.81	-28.71	-26.12	-35.22	-21.82
4.8	-10.41	-14.65	-7.14	10.24	0.12	-32.2	-25.2	-34.95	-22.15
4.9	-10.21	-12.3	-9.05	9.82	-0.55	-33.82	-24.82	-34.59	-22.66
5	-10.34	-11.45	-11.29	9.33	-1.22	-34.93	-24.72	-33.92	-23.25
5.1	-11.03	-11	-13.83	8.85	-1.99	-31.02	-25.11	-33.2	-23.84
5.2	-11.95	-11.05	-16.45	8.35	-2.76	-28.25	-25.81	-33.02	-24.59
5.3	-12.96	-11.45	-18.55	7.79	-3.51	-26.6	-27	-33.29	-25.47
5.4	-13.96	-12.05	-19.78	7.15	-4.24	-25.5	-28.65	-34.01	-26.37
5.5	-14.6	-12.92	-20.07	6.5	-4.97	-24.44	-30.83	-35.49	-27.17
5.6	-14.69	-13.96	-19.38	5.86	-5.75	-23.53	-33.67	-37.43	-27.85
5.7	-14.42	-14.89	-17.89	5.11	-6.48	-22.89	-35.94	-38.63	-28.36
5.8	-13	-15.24	-16.36	4.23	-7.19	-22.46	-36.98	-37.48	-28.72
5.9	-11.56	-15.3	-14.97	3.35	-7.84	-22.25	-37.64	-35.55	-28.87
6	-10.51	-14.2	-14.24	2.46	-8.55	-21.98	-34.12	-33.08	-28.77
6.1	-9.5	-12.8	-13.68	1.32	-9.2	-21.84	-30.77	-30.54	-28.65
6.2	-8.83	-11.37	-13.32	0.01	-9.81	-21.9	-28.9	-28.27	-28.48
6.3	-8.3	-10.01	-13.48	-1.31	-10.36	-22.18	-27.62	-26.42	-28.2
6.4	-8	-8.75	-13.92	-2.66	-10.92	-22.5	-26.77	-24.84	-27.92
6.5	-7.9	-7.75	-14.48	-4.76	-11.45	-22.81	-26.25	-23.57	-27.7
6.6	-7.98	-7.01	-15.3	-7.15	-11.92	-23.09	-26	-22.63	-27.68
6.7	-8.3	-6.41	-16.42	-9.62	-12.33	-23.41	-26.09	-21.83	-27.95





6.8	-8.79	-6.16	-17.54	-12.17	-12.73	-23.73	-26.38	-21.39	-28.27
6.9	-9.57	-6.04	-18.58	-12.62	-13.14	-24.03	-26.98	-21.09	-28.73
7	-10.54	-6.13	-18.81	-12.88	-13.46	-24.34	-27.77	-20.99	-29.83
7.1	-11.61	-6.42	-18.71	-13.03	-13.7	-24.43	-28.39	-21.07	-31.16
7.2	-12.77	-6.77	-18.45	-12.66	-13.87	-24.4	-28.91	-21.19	-32.57
7.3	-13.91	-7.4	-17.67	-10.53	-14.09	-24.39	-29.26	-21.55	-34.17
7.4	-15.02	-8.15	-16.51	-8.35	-14.22	-24.29	-29.43	-22.01	-35.64
7.5	-15.76	-9.15	-15.25	-6.14	-14.26	-24.11	-29.29	-22.67	-36.89
7.6	-15.69	-10.45	-14.13	-4.47	-14.21	-23.86	-28.58	-23.56	-37.4
7.7	-15.12	-12.05	-13.27	-3.5	-14.17	-23.62	-27.55	-24.68	-36.73
7.8	-14.49	-14.07	-12.67	-2.53	-14.18	-23.41	-26.65	-26.18	-35.22
7.9	-13.82	-16.52	-12.23	-1.56	-14.13	-23.21	-25.92	-28.12	-33.7
8	-13.19	-18.85	-11.96	-0.9	-14.01	-23.07	-25.34	-30.25	-32.33
8.1	-12.71	-19.55	-11.97	-0.33	-13.89	-22.93	-24.97	-33.47	-31.08
8.2	-12.28	-19.85	-12.03	0.24	-13.88	-22.78	-24.61	-36.36	-29.99
8.3	-12.31	-18.91	-12.3	0.79	-13.86	-22.76	-24.64	-38.38	-29.15
8.4	-12.36	-17.29	-12.85	1.17	-13.79	-22.83	-24.67	-39.37	-28.61
8.5	-12.97	-15.66	-13.52	1.54	-13.77	-22.94	-25.15	-38.83	-28.24
8.6	-13.76	-14.42	-14.28	1.92	-13.77	-23.11	-25.79	-36.54	-27.99
8.7	-14.94	-13.49	-15.37	2.24	-13.83	-23.3	-26.76	-33.72	-27.97
8.8	-16.42	-12.86	-16.84	2.47	-13.87	-23.53	-28	-31.82	-28.18
8.9	-18.01	-12.67	-18.47	2.71	-13.96	-23.77	-29.75	-30.94	-28.49
9	-19.66	-12.6	-20.22	2.92	-14.04	-24.03	-32.26	-30.21	-28.97
9.1	-20.98	-12.83	-21.99	3.05	-14.24	-24.32	-35.42	-29.86	-29.93
9.2	-21.32	-13.29	-23.09	3.15	-14.44	-24.54	-39.92	-29.78	-31.12
9.3	-21.02	-13.94	-23.53	3.26	-14.67	-24.74	-44.46	-29.87	-32.49
9.4	-20	-14.99	-22.87	3.35	-14.9	-24.94	-44.21	-30.31	-33.99
9.5	-18.52	-16.19	-21.62	3.35	-15.19	-24.87	-40.63	-30.83	-35.43
9.6	-17.18	-17.77	-20.19	3.36	-15.59	-24.75	-37.02	-31.49	-36.66
9.7	-16.02	-19.58	-18.86	3.36	-16.02	-24.65	-33.74	-32.24	-37.22
9.8	-15.09	-21.04	-17.77	3.31	-16.44	-24.5	-31.14	-32.84	-36.91
9.9	-14.47	-21.62	-16.9	3.22	-16.85	-24.3	-29.46	-33.11	-35.99
10	-14.13	-21.34	-16.26	3.14	-17.33	-24.07	-28.41	-33.17	-34.78
15	-19.09	-20.02	-29.02	-2.31	-28.65	-44.05	-26.98	-27.88	-29.22
20	-23.6	-22.01	-23.59	-4.96	-23.7	-31.15	-28.66	-33.48	-35.03
25	-24.87	-34.18	-29.87	-19.98	-31.71	-30.66	-29.85	-32.94	-40.7
30	-34.85	-24.81	-29.97	-15.9	-34.92	-28.98	-45.85	-32.77	-37.31
35	-27.28	-35.09	-30.53	-25.92	-26.03	-41.71	-32.68	-36.91	-40.86
40	-38.83	-37.15	-28.04	-19.24	-28.38	-39.37	-36	-35.26	-39.35
45	-33.16	-36.24	-44.24	-24.63	-25.62	-33.38	-33.63	-38.19	-38.6
50	-39.1	-35.39	-32.95	-20.3	-27.69	-23.56	-39.36	-50.31	-37.58
55	-35.73	-33.78	-40.25	-19.14	-21.95	-28.38	-43.55	-37.77	-38.8
60	-33.19	-34.15	-29.65	-16.93	-33.74	-26.67	-33.24	-45.69	-41.47
65	-42.07	-33.04	-37.16	-22.73	-35.84	-36.98	-42.8	-35.36	-38.86
70	-33.16	-40.96	-36.56	-24.48	-38.39	-40.58	-48.44	-49.56	-43.39
75	-40.56	-37.85	-35.27	-36.14	-33.59	-40.33	-40.71	-49.63	-47.43
80	-61.24	-43.74	-37.74	-37.28	-39.82	-53.09	-46.54	-46.03	-39.91
85	-59.93	-44.51	-43.08	-44.5	-39.73	-47.85	-51.2	-42.95	-47.14
90				-40.23	-41.73	-43.65			
95				-42.21	-60.17	-48.73			
100				-49.09	-62.06				
105									
110									
115									
120									
125									
130									
135									
140									
145									
150									
155									
160									
165									
170									
175									
180									



**5.5.2.5 Elevation=20°, Scan=70°, f=14.25 GHz:**

angle	GSO (co) skew=10°	GSO (co) skew=30°	GSO (co) skew=50°	elev (co) skew=10°	elev (co) skew=30°	elev (co) skew=50°	GSO (x) skew=10°	GSO (x) skew=30°	GSO (x) skew=50°
-180									
-175									
-170									
-165									
-160									
-155									
-150									
-145									
-140									
-135									
-130									
-125									
-120									
-115									
-110									
-105									
-100									
-95									
-90									
-85									
-80									
-75									
-70									
-65									
-60									
-55									
-50									
-45	-30.82						-30.48		
-40	-39.42						-38.52		
-35	-34.22						-34.3		
-30	-36.48	-36.34					-38.17	-33.17	
-25	-27.74	-28.92					-32.67	-31.6	
-20	-37.94	-27.07	-35.42		-39.32	-44.29	-31.77	-27.04	-29.49
-15	-24.79	-34.88	-24.9	-14.52	-28.53	-31.76	-20.93	-31.96	-26.01
-10	-23.31	-19	-12.68	4.06	-26.08	-27.19	-23.6	-26.45	-25.37
-9.9	-23.8	-18.34	-12.43	4.31	-24.57	-26.63	-23.37	-26.91	-25.01
-9.8	-24.31	-17.68	-12.28	4.55	-23.15	-25.94	-23.18	-27.12	-24.49
-9.7	-26.01	-17.08	-12.16	4.79	-22.02	-25.24	-23.45	-26.86	-23.94
-9.6	-28.28	-16.53	-12.11	5.04	-20.85	-24.55	-23.93	-26.15	-23.44
-9.5	-29.76	-16.03	-12.23	5.28	-19.66	-23.96	-24.72	-25.23	-23.01
-9.4	-30.42	-15.67	-12.42	5.5	-18.44	-23.36	-25.81	-23.67	-22.61
-9.3	-30.74	-15.36	-12.63	5.73	-17.47	-22.78	-27.07	-22.06	-22.21
-9.2	-30.62	-15.15	-13	5.96	-16.66	-22.31	-28.57	-20.81	-21.9
-9.1	-30.16	-15.09	-13.5	6.2	-15.84	-21.85	-30.19	-20.12	-21.67
-9	-28.42	-15.04	-14.02	6.43	-15.02	-21.4	-31.83	-19.44	-21.47
-8.9	-25.58	-14.99	-14.6	6.67	-14.18	-21.12	-33.6	-19.07	-21.31
-8.8	-23.28	-14.93	-15.3	6.91	-13.63	-20.84	-33.99	-18.78	-21.25
-8.7	-21.82	-14.85	-16.08	7.15	-13.05	-20.58	-32.11	-18.59	-21.26
-8.6	-20.48	-14.7	-16.81	7.39	-12.46	-20.48	-30.06	-18.62	-21.29
-8.5	-19.48	-14.54	-17.24	7.61	-11.86	-20.38	-27.84	-18.69	-21.47
-8.4	-18.59	-14.26	-17.09	7.83	-11.35	-20.36	-25.63	-18.95	-21.92
-8.3	-17.92	-13.91	-16.89	8.04	-10.97	-20.37	-24.08	-19.31	-22.37
-8.2	-17.37	-13.54	-16.6	8.25	-10.58	-20.39	-22.95	-19.73	-22.86
-8.1	-16.96	-13.15	-15.92	8.46	-10.19	-20.4	-22.18	-20.23	-23.57
-8	-16.69	-12.74	-15.14	8.68	-9.79	-20.4	-21.82	-20.8	-24.34
-7.9	-16.43	-12.38	-14.35	8.9	-9.51	-20.39	-21.56	-21.27	-25.1
-7.8	-16.19	-12.08	-13.47	9.11	-9.27	-20.39	-21.57	-21.64	-25.82
-7.7	-15.96	-11.83	-12.5	9.33	-9.02	-20.32	-21.64	-21.96	-26.5
-7.6	-15.72	-11.66	-11.53	9.55	-8.76	-20.24	-21.92	-22.15	-27.16
-7.5	-15.47	-11.57	-10.6	9.78	-8.55	-20.16	-22.28	-22.23	-27.74
-7.4	-15.22	-11.55	-9.91	10	-8.49	-20.07	-22.83	-22.25	-27.69
-7.3	-14.96	-11.77	-9.3	10.2	-8.43	-19.96	-23.53	-21.99	-27.45
-7.2	-14.75	-12.04	-8.69	10.39	-8.35	-19.84	-24.27	-21.7	-27.16
-7.1	-14.59	-12.41	-8.24	10.58	-8.27	-19.69	-25.09	-21.47	-26.54



-7	-14.49	-12.92	-7.93	10.76	-8.35	-19.51	-25.84	-21.34	-25.69
-6.9	-14.47	-13.43	-7.65	10.95	-8.57	-19.31	-26.34	-21.2	-24.8
-6.8	-14.5	-13.79	-7.43	11.14	-8.78	-19.08	-26.66	-21.28	-23.96
-6.7	-14.6	-14.13	-7.31	11.33	-8.98	-18.82	-26.76	-21.38	-23.21
-6.6	-14.76	-14.27	-7.25	11.52	-9.17	-18.44	-26.64	-21.62	-22.54
-6.5	-14.96	-14.18	-7.21	11.72	-9.23	-17.86	-26.42	-22.01	-21.89
-6.4	-15.25	-14	-7.23	11.9	-9.3	-17.27	-25.94	-22.45	-21.34
-6.3	-15.49	-13.24	-7.39	12.07	-9.39	-16.62	-25.54	-23.23	-20.98
-6.2	-15.42	-12.16	-7.56	12.24	-9.51	-15.81	-25.43	-24.18	-20.64
-6.1	-15.33	-11.14	-7.77	12.41	-9.52	-14.99	-25.37	-24.93	-20.37
-6	-14.91	-10.2	-8.15	12.59	-9.29	-14.14	-25.54	-25.36	-20.32
-5.9	-14.39	-9.3	-8.61	12.77	-9.11	-13.2	-25.79	-25.58	-20.38
-5.8	-13.61	-8.48	-9.08	12.92	-8.98	-12.26	-26.19	-25.58	-20.45
-5.7	-12.63	-7.77	-9.54	13.07	-8.91	-11.34	-26.71	-25.23	-20.64
-5.6	-11.64	-7.11	-9.96	13.22	-8.19	-10.47	-26.99	-24.72	-21.04
-5.5	-10.68	-6.64	-10.36	13.36	-7.25	-9.6	-26.93	-23.72	-21.45
-5.4	-9.78	-6.28	-10.73	13.49	-6.34	-8.81	-26.63	-22.5	-21.9
-5.3	-8.99	-6	-10.92	13.62	-5.46	-8.15	-26.01	-21.38	-22.68
-5.2	-8.28	-5.94	-11.07	13.76	-4.64	-7.49	-25.16	-20.58	-23.55
-5.1	-7.65	-5.89	-11.2	13.89	-3.72	-6.9	-24.15	-19.8	-24.44
-5	-7.13	-5.98	-11.12	14.03	-2.79	-6.42	-22.96	-19.29	-25.65
-4.9	-6.68	-6.12	-10.89	14.17	-1.83	-5.95	-21.84	-18.87	-27.12
-4.8	-6.43	-6.31	-10.61	14.32	-0.86	-5.55	-20.9	-18.54	-28.68
-4.7	-6.21	-6.59	-10.34	14.46	0.05	-5.28	-20.01	-18.42	-30.25
-4.6	-6.19	-6.89	-10.12	14.58	0.89	-5	-19.5	-18.35	-31.71
-4.5	-6.19	-7.21	-9.94	14.7	1.74	-4.87	-19.02	-18.57	-32.93
-4.4	-6.3	-7.53	-9.81	14.8	2.58	-4.94	-18.83	-18.99	-33.78
-4.3	-6.44	-7.8	-9.85	14.91	3.43	-4.99	-18.73	-19.59	-33.79
-4.2	-6.63	-7.95	-10.11	15.02	4.13	-5.22	-18.81	-20.5	-32.81
-4.1	-6.87	-8.03	-10.41	15.13	4.8	-5.63	-19.03	-21.64	-31.74
-4	-7.11	-8.07	-10.79	15.25	5.49	-6.02	-19.52	-23.27	-30.49
-3.9	-7.34	-8.04	-11.3	15.36	6.2	-6.5	-20.34	-25.74	-28.68
-3.8	-7.57	-8.01	-11.81	15.46	6.87	-7.08	-21.63	-28.61	-26.91
-3.7	-7.76	-7.97	-12.3	15.55	7.41	-7.68	-23.7	-32.68	-25.25
-3.6	-7.94	-7.93	-12.44	15.65	7.95	-8.25	-26.19	-37.78	-24.21
-3.5	-8.13	-7.97	-12.24	15.75	8.48	-8.84	-28.26	-41.81	-23.52
-3.4	-8.34	-8.48	-11.82	15.86	9.02	-9.5	-29.77	-37.52	-22.87
-3.3	-8.59	-9.02	-10.85	15.96	9.47	-9.02	-30.83	-33.05	-22.35
-3.2	-8.96	-9.59	-9.17	16.07	9.89	-7.57	-30.67	-29.42	-22.03
-3.1	-9.36	-10.14	-7.34	16.15	10.32	-6.2	-30.24	-26.31	-21.78
-3	-9.97	-10.54	-5.52	16.23	10.76	-4.75	-27.66	-23.53	-21.55
-2.9	-10.61	-10.48	-3.77	16.3	11.2	-3.22	-24.92	-21.94	-21.43
-2.8	-10.19	-10.24	-2.08	16.37	11.56	-1.69	-22.84	-20.72	-21.38
-2.7	-9.51	-8.86	-0.44	16.45	11.93	-0.25	-20.92	-19.86	-21.34
-2.6	-8.14	-6.55	1.04	16.53	12.29	1.17	-19.59	-19.27	-21.37
-2.5	-6.34	-4.11	2.31	16.61	12.65	2.59	-18.63	-18.83	-21.47
-2.4	-4.28	-1.93	3.52	16.69	12.98	3.73	-17.93	-18.57	-21.58
-2.3	-2	0.03	4.62	16.75	13.28	4.74	-17.48	-18.43	-21.72
-2.2	0.22	1.86	5.55	16.82	13.58	5.76	-17.18	-18.36	-21.92
-2.1	2.15	3.46	6.37	16.89	13.89	6.6	-17.02	-18.4	-22.15
-2	3.87	4.99	7.18	16.95	14.21	7.38	-16.96	-18.45	-22.37
-1.9	5.46	6.37	7.93	17.03	14.42	8.17	-16.96	-18.58	-22.59
-1.8	6.9	7.61	8.59	17.09	14.62	8.84	-17.01	-18.75	-22.83
-1.7	8.26	8.8	9.24	17.14	14.82	9.48	-17.1	-18.93	-23.04
-1.6	9.46	9.7	9.87	17.18	15.02	10.13	-17.26	-19.12	-23.24
-1.5	10.6	10.6	10.41	17.21	15.22	10.66	-17.41	-19.3	-23.51
-1.4	11.5	11.39	10.92	17.25	15.37	11.17	-17.53	-19.48	-23.74
-1.3	12.39	12.12	11.41	17.29	15.53	11.68	-17.66	-19.65	-23.93
-1.2	13.14	12.81	11.83	17.33	15.7	12.04	-17.81	-19.82	-24.2
-1.1	13.87	13.43	12.2	17.38	15.86	12.38	-17.96	-20.05	-24.49
-1	14.51	14.01	12.56	17.42	15.97	12.72	-18.19	-20.29	-24.76
-0.9	15.11	14.52	12.89	17.44	16.07	12.98	-18.47	-20.61	-25.23
-0.8	15.63	14.95	13.15	17.47	16.18	13.24	-18.85	-21.01	-26.01
-0.7	16.08	15.33	13.38	17.5	16.29	13.5	-19.34	-21.56	-26.85
-0.6	16.47	15.65	13.6	17.54	16.4	13.69	-20.07	-22.47	-27.63
-0.5	16.78	15.9	13.78	17.57	16.45	13.86	-21.21	-23.63	-28.44
-0.4	17.03	16.13	13.91	17.59	16.5	14.03	-22.58	-24.83	-29.36
-0.3	17.23	16.28	14.03	17.58	16.54	14.1	-24.13	-26.21	-30.2
-0.2	17.39	16.43	14.13	17.57	16.58	14.17	-25.77	-27.51	-30.87



-0.1	17.5	16.51	14.17	17.56	16.58	14.24	-27.13	-28.41	-31.12
0	17.54	16.56	14.2	17.54	16.56	14.2	-28.15	-29.14	-31.49
0.1	17.55	16.57	14.23	17.54	16.53	14.17	-28.05	-29.3	-32
0.2	17.44	16.47	14.16	17.53	16.52	14.13	-25.29	-26.9	-30.37
0.3	17.31	16.36	14.08	17.51	16.5	14.03	-22.51	-24.45	-28.57
0.4	17.07	16.16	13.97	17.49	16.42	13.92	-20.4	-22.52	-26.75
0.5	16.8	15.92	13.8	17.46	16.34	13.81	-18.47	-20.81	-25.18
0.6	16.45	15.63	13.59	17.43	16.27	13.62	-16.99	-19.27	-23.84
0.7	16.05	15.27	13.35	17.41	16.2	13.44	-15.74	-18.02	-22.65
0.8	15.59	14.87	13.09	17.39	16.12	13.26	-14.73	-16.93	-21.64
0.9	15.06	14.41	12.78	17.37	16.01	12.97	-13.96	-16.07	-20.82
1	14.43	13.89	12.44	17.31	15.9	12.69	-13.37	-15.45	-20.1
1.1	13.66	13.3	12.08	17.26	15.79	12.41	-13.09	-14.94	-19.43
1.2	12.8	12.58	11.67	17.21	15.68	12.03	-12.92	-14.68	-18.87
1.3	11.8	11.76	11.2	17.16	15.51	11.66	-12.92	-14.58	-18.41
1.4	10.72	10.87	10.71	17.12	15.33	11.28	-13.02	-14.56	-17.99
1.5	9.47	9.82	10.17	17.07	15.16	10.83	-13.29	-14.75	-17.67
1.6	8.09	8.74	9.46	17	15	10.38	-13.71	-14.95	-17.65
1.7	6.48	7.4	8.73	16.94	14.82	9.93	-14.33	-15.43	-17.66
1.8	4.6	5.99	7.99	16.87	14.58	9.4	-15.21	-15.99	-17.7
1.9	2.61	4.37	7.06	16.81	14.34	8.88	-16.37	-16.77	-17.97
2	0.48	2.49	6.07	16.75	14.11	8.34	-18.05	-17.84	-18.29
2.1	-1.45	0.54	5.04	16.68	13.88	7.66	-20.16	-19.05	-18.62
2.2	-2.47	-1.01	3.86	16.6	13.64	6.99	-23.25	-21.26	-19.14
2.3	-2.92	-2.28	2.57	16.51	13.36	6.3	-26.72	-24.12	-19.81
2.4	-2.54	-2.99	1.25	16.42	13.07	5.53	-29.59	-26.73	-20.57
2.5	-1.4	-3	-0.16	16.32	12.79	4.77	-31.84	-28.72	-21.55
2.6	-0.37	-2.64	-1.69	16.23	12.51	4.01	-31.66	-29.95	-22.88
2.7	0.47	-1.93	-3.25	16.12	12.19	3.18	-27.46	-29.57	-24.43
2.8	1.19	-0.83	-4.57	16.01	11.86	2.38	-23.62	-27.02	-26.12
2.9	1.57	0.16	-5.19	15.9	11.55	1.52	-21.22	-24.19	-28.07
3	1.84	0.69	-5.05	15.79	11.2	0.55	-19.3	-22.09	-30.1
3.1	1.86	1.09	-4.82	15.68	10.85	-0.39	-18.03	-20.34	-31.67
3.2	1.75	1.31	-4.45	15.57	10.43	-1.37	-17.1	-18.93	-32.38
3.3	1.44	1.31	-3.78	15.44	10.02	-2.42	-16.45	-17.94	-31.11
3.4	0.99	1.27	-3.09	15.3	9.62	-3.42	-16.02	-17.01	-29.63
3.5	0.33	0.97	-2.39	15.16	9.23	-4.41	-15.8	-16.44	-28.13
3.6	-0.58	0.61	-1.88	15.03	8.76	-5.44	-15.81	-15.98	-26.15
3.7	-1.67	0.07	-1.44	14.88	8.29	-6.51	-15.94	-15.68	-24.2
3.8	-3.01	-0.64	-1.04	14.7	7.81	-7.59	-16.22	-15.55	-22.38
3.9	-4.55	-1.49	-0.85	14.5	7.35	-8.68	-16.59	-15.53	-21.13
4	-6.38	-2.64	-0.82	14.3	6.89	-9.71	-17.09	-15.69	-20.28
4.1	-8.55	-4.04	-0.85	14.09	6.4	-10.74	-17.7	-16	-19.53
4.2	-11.41	-5.77	-0.99	13.89	5.87	-11.81	-18.44	-16.4	-18.92
4.3	-15.6	-8.1	-1.32	13.69	5.36	-12.84	-19.42	-16.95	-18.53
4.4	-19.53	-10.73	-1.75	13.45	4.85	-14.01	-20.46	-17.55	-18.24
4.5	-21.14	-13.78	-2.24	13.22	4.33	-15.29	-21.69	-18.26	-18
4.6	-22.25	-17.1	-2.85	12.99	3.79	-16.52	-22.96	-19.05	-17.86
4.7	-21.32	-20.1	-3.61	12.75	3.23	-17.88	-24.34	-19.87	-17.84
4.8	-19.71	-20.1	-4.41	12.52	2.65	-19.53	-25.78	-20.83	-17.84
4.9	-18.55	-19.35	-5.4	12.24	2.08	-21.35	-27.29	-21.77	-17.95
5	-17.74	-17.85	-6.74	11.95	1.49	-24.12	-28.84	-22.42	-18.23
5.1	-18.07	-16.28	-8.17	11.65	0.91	-27.32	-29.96	-22.84	-18.53
5.2	-19.35	-15.04	-9.75	11.34	0.34	-29.96	-30.68	-23.08	-18.86
5.3	-20.8	-14.36	-11.93	11.03	-0.25	-29.95	-30.96	-23.14	-19.26
5.4	-22.12	-14.01	-14.38	10.69	-0.87	-28.4	-30.74	-23.08	-19.69
5.5	-23.15	-14.27	-16.77	10.32	-1.49	-27.45	-30.17	-22.9	-20.1
5.6	-23.53	-15.15	-18	9.95	-2.08	-26.89	-29.35	-22.62	-20.44
5.7	-23.07	-16.52	-18.01	9.59	-2.66	-26.62	-28.34	-22.36	-20.68
5.8	-21.4	-18.93	-17.83	9.22	-3.22	-26.6	-27.27	-22.21	-20.87
5.9	-18.05	-21.73	-17.32	8.81	-3.86	-25.88	-26.14	-22.17	-20.98
6	-15.15	-23.38	-16.16	8.36	-4.48	-24.45	-25.09	-22.27	-20.96
6.1	-13.76	-22.27	-14.86	7.91	-5.09	-23.07	-24.31	-22.55	-20.87
6.2	-12.39	-21	-13.64	7.46	-5.68	-22.23	-23.52	-22.89	-20.75
6.3	-11.72	-18.35	-13.07	7.01	-6.25	-21.78	-23.06	-23.34	-20.57
6.4	-11.07	-15.47	-12.84	6.5	-6.88	-21.25	-22.59	-23.86	-20.36
6.5	-10.78	-13.14	-12.68	5.93	-7.52	-20.82	-22.34	-24.39	-20.14
6.6	-10.63	-11.54	-12.83	5.35	-8.15	-20.61	-22.15	-24.94	-19.97
6.7	-10.79	-10.23	-13.32	4.77	-8.76	-20.43	-22.22	-25.52	-19.88



6.8	-11.15	-9.39	-13.99	4.18	-9.36	-20.37	-22.46	-25.74	-19.83
6.9	-11.72	-8.84	-14.83	3.48	-10.01	-20.39	-22.91	-25.73	-19.86
7	-12.49	-8.44	-15.84	2.72	-10.72	-20.42	-23.54	-25.67	-20.01
7.1	-13.34	-8.25	-16.9	1.95	-11.41	-20.47	-24.29	-25.47	-20.25
7.2	-14.18	-8.19	-17.84	1.17	-12.08	-20.58	-25.09	-25.14	-20.53
7.3	-14.99	-8.28	-18.4	0.39	-12.74	-20.72	-25.94	-24.78	-20.95
7.4	-15.68	-8.57	-18.24	-0.69	-13.36	-20.91	-26.8	-24.44	-21.56
7.5	-16.19	-8.92	-17.64	-1.84	-14	-21.13	-27.62	-24.1	-22.27
7.6	-16.37	-9.64	-16.72	-3.01	-14.59	-21.36	-28.06	-24.23	-23.06
7.7	-15.71	-10.45	-15.08	-4.21	-15.14	-21.53	-27.41	-24.33	-24.25
7.8	-15.08	-11.42	-13.54	-5.47	-15.6	-21.65	-26.81	-24.68	-25.45
7.9	-14.52	-12.53	-12.11	-7.04	-16	-21.76	-26.16	-25.25	-26.65
8	-13.99	-13.66	-11.08	-8.59	-16.39	-21.85	-25.53	-25.93	-27.16
8.1	-13.64	-14.64	-10.25	-10.13	-16.68	-21.91	-24.94	-26.79	-27.13
8.2	-13.35	-15.57	-9.5	-11.64	-16.88	-21.96	-24.36	-27.76	-26.85
8.3	-13.33	-16.13	-8.92	-12.07	-17.04	-21.98	-24.08	-28.8	-26.25
8.4	-13.49	-16.28	-8.49	-11.15	-17.13	-22	-23.99	-29.93	-25.38
8.5	-13.96	-16.19	-8.15	-10.15	-17.15	-22.02	-24.22	-30.85	-24.39
8.6	-14.76	-15.79	-7.94	-9.07	-17.13	-22.06	-24.8	-31.03	-23.43
8.7	-15.9	-15.14	-7.93	-7.92	-17.12	-22.12	-25.73	-30.38	-22.64
8.8	-17.49	-14.55	-8.02	-6.81	-17.12	-22.18	-27.16	-29.61	-21.93
8.9	-19.48	-14.25	-8.16	-5.73	-17.11	-22.31	-29	-28.83	-21.29
9	-21.86	-13.95	-8.49	-4.64	-17.05	-22.47	-31.2	-27.98	-20.86
9.1	-24.53	-13.96	-9	-3.56	-16.99	-22.66	-33.71	-27.3	-20.6
9.2	-26.01	-14.13	-9.62	-2.62	-17.04	-22.81	-35.21	-26.66	-20.47
9.3	-24.8	-14.48	-10.42	-2.01	-17.1	-22.91	-34.59	-26.13	-20.48
9.4	-23.31	-15.2	-11.5	-1.42	-17.15	-22.99	-33.66	-25.95	-20.66
9.5	-21.52	-16.03	-12.73	-0.82	-17.12	-23.11	-31.82	-25.87	-20.9
9.6	-19.67	-17.46	-14.14	-0.24	-17.11	-23.1	-29.85	-26.08	-21.22
9.7	-18.08	-19.26	-16.04	0.15	-17.19	-23.02	-27.91	-26.49	-21.73
9.8	-16.6	-20.83	-18.41	0.5	-17.28	-22.87	-25.98	-26.91	-22.39
9.9	-15.64	-21.91	-21.05	0.85	-17.34	-22.62	-24.71	-27.35	-23.1
10	-15.07	-22.47	-23.46	1.2	-17.37	-22.31	-23.92	-27.81	-24.01
15	-24.53	-19.1	-24.92	-2.18	-29.5	-25.19	-23.81	-22.91	-31.39
20	-27.32	-19.97	-26.08	-9.8	-32.76	-44.07	-29.75	-26.82	-31.79
25	-31.58	-29.42	-31.52	-5.36	-23.33	-25.45	-29.07	-36.53	-38.44
30	-26.57	-25.17	-30.78	-9.31	-38.45	-31.34	-27.04	-32.24	-32.46
35	-34.07	-34.75	-29.31	-18.91	-24.13	-33.32	-35.45	-36.07	-37.01
40	-30.97	-30.58	-43.47	-16.44	-30.34	-45.31	-32.38	-31.11	-43.96
45	-39.87	-39.99	-28.5	-25.64	-40.24	-34.84	-37.93	-43.99	-38.29
50	-31.44	-32.44	-36.66	-21.85	-38.57	-34.73	-37.78	-35.76	-30.37
55	-40.47	-28.46	-34.9	-25.51	-26.99	-38.98	-35.08	-29.03	-37.96
60	-39.84	-26.41	-29.45	-25.89	-22.84	-31.41	-42.35	-36.91	-34.55
65	-37.54	-32.55	-32.6	-24.11	-29.62	-29.81	-34.87	-41.31	-33.94
70	-41.99	-34.69	-28.16	-18.2	-26.78	-30.43	-35.91	-38.51	-37.3
75	-41.6	-38.01	-32.3	-24.77	-30.65	-39.49	-39.63	-38.52	-35.74
80	-43.08	-31.08	-33.75	-28.86	-27.34	-27.94	-39.07	-35.49	-36.62
85		-29.15	-32.65	-27.93	-40.24	-27.69		-33.04	-34.23
90				-37.43	-27.98	-30.45			
95				-26.96	-34.46	-41.89			
100				-33.08	-37.57	-49.24			
105				-34.87	-38.85				
110				-45.99					
115									
120									
125									
130									
135									
140									
145									
150									
155									
160									
165									
170									
175									
180									



**5.5.3 14.45 GHz**



**5.5.3.1 Elevation=70°, Scan=20°, f=14.45 GHz:**

angle	GSO (co) skew=10°	GSO (co) skew=30°	GSO (co) skew=50°	elev (co) skew=10°	elev (co) skew=30°	elev (co) skew=50°	GSO (x) skew=10°	GSO (x) skew=30°	GSO (x) skew=50°
-180									
-175									
-170									
-165									
-160									
-155									
-150									
-145									
-140									
-135									
-130									
-125									
-120									
-115									
-110									
-105									
-100									
-95									
-90									
-85	-90.73						-90.07		
-80	-51.33						-57.33		
-75	-33.28	-47.23					-94.11	-35.76	-47.43
-70	-32.8	-31.14	-58.4	-74.9	-65.56	-48.61	-35.63	-32.24	-61.71
-65	-34.72	-44.74	-42.77	-54.3	-48.88	-49.62	-36.53	-45.49	-49.53
-60	-38.22	-30.49	-35.9	-41.71	-49.23	-37.49	-37.85	-33.32	-38.59
-55	-32.41	-30.63	-35.95	-39.59	-41.02	-41.47	-37.61	-32.97	-42.13
-50	-37.86	-36.01	-33.27	-38.27	-40.88	-36.15	-47.15	-40.33	-38.78
-45	-39.17	-39.1	-40.26	-37.04	-50.96	-30.65	-47.74	-43.98	-44.11
-40	-34.04	-37.61	-42.94	-39.12	-38.6	-34.38	-41.91	-39.48	-44.95
-35	-28.6	-30.11	-33.14	-27.18	-33.11	-33.15	-35.64	-41.84	-42.02
-30	-32.13	-36.9	-32.95	-20.61	-40.14	-42.31	-46.79	-41.01	-41.82
-25	-25.53	-32.79	-30.08	-12.58	-36.31	-36.99	-43.11	-40.01	-40.52
-20	-21.69	-39.94	-37.21	-9.81	-31.06	-31.63	-34.16	-46.61	-49.6
-15	-35.27	-30.27	-39.84	-17.83	-27.44	-31.19	-43.35	-45.1	-50.08
-10	-17.23	-33.76	-25.5	-9.88	-20.9	-24.82	-39.26	-52.84	-46.54
-9.9	-17.37	-33.89	-24.97	-10.03	-21.17	-26.27	-38.85	-54.63	-46.06
-9.8	-17.51	-33.7	-24.47	-10.22	-21.63	-27.94	-38.42	-56.84	-45.57
-9.7	-18.31	-33.35	-23.99	-10.4	-22.07	-29.76	-38.46	-59.23	-45.13
-9.6	-19.41	-32.75	-23.56	-10.58	-22.4	-31.91	-38.71	-60.27	-44.89
-9.5	-20.59	-31.91	-23.25	-10.79	-22.69	-34.79	-39.01	-59.35	-44.95
-9.4	-22.73	-30.94	-23.09	-11.01	-22.94	-36.57	-39.68	-57.13	-45.19
-9.3	-26.16	-29.98	-22.97	-11.22	-23.16	-37.32	-40.84	-54.87	-45.49
-9.2	-29.37	-29.02	-22.87	-11.42	-23.83	-37.33	-42.04	-52.31	-45.85
-9.1	-30.54	-28.13	-22.82	-11.62	-24.46	-34.16	-43.59	-49.77	-46.69
-9	-27.39	-27.33	-22.91	-11.82	-25.03	-31.43	-45.92	-47.64	-48
-8.9	-23.97	-26.67	-23.09	-12	-25.56	-29.13	-48.34	-46.06	-49.66
-8.8	-21.16	-26.2	-23.29	-11.98	-26.07	-27.31	-49.47	-45.05	-51.53
-8.7	-19.03	-25.89	-23.5	-11.89	-26.55	-26.41	-49.14	-44.45	-53.45
-8.6	-17.26	-25.69	-23.72	-11.79	-27.64	-25.62	-48.02	-44	-54.68
-8.5	-15.6	-25.66	-24.05	-11.58	-28.58	-24.87	-46.83	-43.77	-54.65
-8.4	-14.84	-25.93	-24.38	-11.13	-29.39	-24.15	-45.2	-43.86	-54.01
-8.3	-14.17	-26.32	-24.67	-10.66	-30.08	-23.63	-43.5	-44.02	-52.7
-8.2	-13.65	-26.95	-24.93	-10.19	-30.54	-23.21	-41.99	-44.32	-50.83
-8.1	-13.51	-27.98	-25.16	-9.6	-30.76	-22.76	-41.04	-44.88	-48.82
-8	-13.57	-29.48	-25.34	-8.98	-31.27	-22.28	-40.37	-45.7	-47.05
-7.9	-13.79	-31.4	-25.47	-8.36	-29.96	-21.89	-39.82	-46.71	-45.43
-7.8	-14.41	-33.64	-25.54	-7.74	-28.61	-21.55	-39.59	-47.76	-43.85
-7.7	-15.35	-35.57	-25.59	-7.16	-27.23	-21.23	-39.6	-48.62	-42.62
-7.6	-16.29	-37.18	-25.66	-6.58	-26.17	-20.92	-39.62	-49.37	-41.93
-7.5	-18.94	-38.14	-25.74	-5.99	-24.96	-20.72	-40.17	-49.83	-41.49
-7.4	-22.12	-37.82	-25.82	-5.49	-23.58	-20.65	-40.89	-49.69	-41.1
-7.3	-24.92	-36.19	-25.86	-5	-22.58	-20.62	-41.75	-49.03	-40.76
-7.2	-26.03	-34	-25.84	-4.51	-22	-20.68	-43.08	-48.18	-40.62
-7.1	-24.54	-32.44	-25.82	-4.11	-21.36	-20.83	-45.11	-47.32	-40.91



-7	-23.05	-32.85	-25.72	-3.79	-20.66	-20.97	-47.14	-46.82	-41.33
-6.9	-21.05	-32.98	-25.46	-3.48	-19.92	-21.16	-48.82	-46.31	-41.77
-6.8	-18.66	-32.78	-25.03	-3.16	-19.25	-21.39	-50.31	-45.93	-42.25
-6.7	-16.2	-32.77	-24.39	-2.96	-18.65	-21.42	-51.82	-45.91	-42.89
-6.6	-14.44	-33.65	-23.57	-2.78	-18.4	-21.04	-51.72	-46.2	-43.71
-6.5	-13.49	-35.42	-22.63	-2.59	-18.12	-20.46	-49.73	-46.59	-44.58
-6.4	-12.71	-36.52	-21.67	-2.47	-17.92	-19.66	-47.45	-47.16	-45.33
-6.3	-12.09	-32.17	-20.76	-2.42	-17.65	-18.77	-45.51	-48.43	-45.71
-6.2	-12.17	-27.56	-19.89	-2.36	-17.3	-17.99	-45.21	-49.87	-45.8
-6.1	-12.26	-23.12	-19.06	-2.32	-16.9	-17.05	-44.92	-51.3	-45.75
-6	-12.72	-20.22	-18.28	-2.42	-16.88	-16.05	-45.31	-52.33	-45.56
-5.9	-13.61	-18.31	-17.6	-2.51	-16.8	-15.16	-46.47	-53.18	-45.3
-5.8	-14.71	-16.36	-17.04	-2.6	-16.63	-14.69	-48.02	-53.77	-45.12
-5.7	-15.9	-14.57	-16.57	-2.81	-16.34	-14.21	-49.31	-52.93	-45.12
-5.6	-17.57	-13.5	-16.19	-3.1	-15.93	-13.73	-49.41	-49.98	-45.22
-5.5	-19.36	-12.4	-15.91	-3.39	-15.42	-13.36	-49.19	-47.33	-45.39
-5.4	-20.38	-11.36	-15.7	-3.73	-15	-13.34	-48.46	-45.05	-45.75
-5.3	-18.91	-10.61	-15.57	-4.3	-14.54	-13.29	-46.27	-43.43	-46.4
-5.2	-16.32	-10.04	-15.52	-4.86	-13.96	-13.23	-43.47	-42.17	-47.3
-5.1	-13.93	-9.47	-15.54	-5.45	-13.33	-13.16	-41.01	-41.04	-48.39
-5	-12.01	-8.99	-15.64	-6.42	-12.67	-12.93	-39.26	-40.19	-49.52
-4.9	-10.46	-8.84	-15.77	-7.46	-11.9	-12.58	-38.05	-39.81	-50.68
-4.8	-8.9	-8.69	-15.89	-8.48	-11.15	-12.13	-36.85	-39.45	-51.71
-4.7	-8.02	-8.57	-16.02	-9.4	-10.64	-11.56	-36.27	-39.13	-52.16
-4.6	-7.32	-8.65	-16.18	-10.14	-10.12	-10.36	-35.85	-39.02	-51.87
-4.5	-6.71	-8.84	-16.31	-10.82	-9.6	-9.19	-35.52	-39.03	-51.03
-4.4	-6.3	-9.03	-16.33	-11.33	-9.08	-7.99	-35.41	-39.11	-49.91
-4.3	-6.19	-9.26	-16.25	-9.7	-8.58	-6.77	-35.63	-39.38	-48.5
-4.2	-6.08	-9.57	-16.15	-8.11	-8.08	-5.67	-35.84	-40.05	-46.91
-4.1	-6.21	-9.87	-16.12	-6.54	-7.74	-4.61	-36.39	-40.83	-45.42
-4	-6.49	-10.11	-15.99	-4.98	-7.4	-3.62	-37.15	-41.75	-44.37
-3.9	-6.79	-10.13	-15.64	-3.43	-7	-2.65	-37.94	-43	-43.55
-3.8	-7.1	-10.01	-15.06	-1.9	-6.59	-1.97	-38.8	-44.52	-42.85
-3.7	-7.41	-9.85	-14.37	-0.49	-6.19	-1.33	-39.75	-46.43	-42.24
-3.6	-7.69	-9.64	-13.78	0.65	-5.76	-0.72	-40.59	-48.98	-41.73
-3.5	-7.82	-9.3	-13.22	1.78	-5.12	-0.17	-41.06	-52.08	-41.63
-3.4	-7.54	-8.95	-12.22	2.9	-4.23	0.12	-40.55	-53.14	-41.6
-3.3	-7.25	-8.63	-10.78	3.8	-3.35	0.34	-40.05	-52.75	-41.63
-3.2	-6.9	-8.54	-9.21	4.68	-2.43	0.56	-39.39	-52.23	-41.76
-3.1	-6.5	-8.56	-7.63	5.53	-1.48	0.76	-38.6	-51.07	-42.14
-3	-6.06	-8.58	-6.08	6.26	-0.56	0.77	-37.76	-48.82	-42.77
-2.9	-5.72	-8.63	-4.6	6.91	0.36	0.71	-37.03	-46.24	-43.41
-2.8	-5.75	-8.82	-3.15	7.56	1.38	0.66	-36.69	-45.34	-44.07
-2.7	-5.8	-9.02	-1.69	8.19	2.4	0.6	-36.4	-44.46	-45.21
-2.6	-5.94	-8.94	-0.23	8.74	3.33	0.76	-36.24	-43.67	-46.92
-2.5	-6.24	-7.81	1.09	9.28	4.26	1.02	-36.34	-43.09	-48.95
-2.4	-6.6	-6.21	2.26	9.82	5.18	1.3	-36.53	-42.59	-51.28
-2.3	-6.54	-4.62	3.36	10.28	6.08	1.59	-36.76	-42.07	-53.16
-2.2	-5.58	-2.97	4.44	10.72	6.85	2.3	-37.04	-41.55	-53.33
-2.1	-4.16	-1.15	5.51	11.17	7.57	3.27	-37.34	-41.18	-52.06
-2	-2.73	0.68	6.45	11.57	8.28	4.22	-37.58	-40.74	-49.87
-1.9	-0.83	2.4	7.3	11.94	8.96	5.17	-37.03	-40.08	-47.3
-1.8	1.15	3.83	8.11	12.3	9.6	6.12	-36.3	-38.97	-44.68
-1.7	3.02	5.14	8.91	12.65	10.24	7.08	-35.43	-37.62	-42.13
-1.6	4.66	6.43	9.66	12.95	10.84	8.03	-34.29	-36.21	-39.7
-1.5	6.09	7.61	10.32	13.26	11.29	8.95	-32.92	-34.8	-37.41
-1.4	7.52	8.55	10.91	13.56	11.73	9.77	-31.54	-33.49	-35.32
-1.3	8.66	9.49	11.48	13.8	12.17	10.48	-30.29	-32.16	-33.82
-1.2	9.71	10.38	12.04	14.04	12.6	11.19	-29.09	-30.87	-32.33
-1.1	10.73	11.11	12.53	14.27	12.99	11.89	-27.92	-29.72	-30.93
-1	11.58	11.78	12.95	14.44	13.38	12.47	-26.91	-28.62	-29.67
-0.9	12.3	12.42	13.32	14.6	13.65	12.92	-26.04	-27.55	-28.56
-0.8	12.99	12.98	13.69	14.76	13.9	13.37	-25.19	-26.61	-27.58
-0.7	13.58	13.39	14.05	14.9	14.12	13.82	-24.46	-25.91	-26.6
-0.6	14.04	13.81	14.3	15	14.33	14.2	-23.89	-25.2	-25.75
-0.5	14.49	14.17	14.5	15.11	14.54	14.42	-23.33	-24.56	-25.06
-0.4	14.81	14.42	14.67	15.21	14.72	14.63	-22.94	-24.04	-24.44
-0.3	15.04	14.63	14.85	15.26	14.82	14.85	-22.66	-23.58	-23.85
-0.2	15.24	14.82	14.99	15.32	14.88	15.01	-22.41	-23.14	-23.29





-0.1	15.38	14.94	15.05	15.37	14.93	15.05	-22.23	-22.82	-22.85
0	15.38	14.93	15.05	15.38	14.93	15.05	-22.24	-22.69	-22.57
0.1	15.38	14.93	15.05	15.38	14.93	15.05	-22.25	-22.55	-22.31
0.2	15.27	14.87	15.05	15.38	14.93	15.01	-22.39	-22.47	-22.03
0.3	15.08	14.72	14.96	15.35	14.9	14.85	-22.64	-22.51	-21.85
0.4	14.86	14.52	14.81	15.29	14.74	14.67	-22.93	-22.59	-21.81
0.5	14.56	14.29	14.62	15.23	14.58	14.47	-23.32	-22.72	-21.84
0.6	14.12	13.98	14.43	15.16	14.42	14.24	-23.91	-22.97	-21.85
0.7	13.66	13.55	14.25	15.05	14.24	13.85	-24.52	-23.39	-21.85
0.8	13.13	13.12	13.91	14.93	14.03	13.47	-25.23	-23.79	-22.05
0.9	12.43	12.62	13.53	14.8	13.81	13.06	-26.18	-24.27	-22.33
1	11.71	12.01	13.15	14.59	13.51	12.62	-27.18	-24.88	-22.6
1.1	10.91	11.35	12.76	14.37	13.13	12	-28.29	-25.51	-22.85
1.2	10	10.66	12.31	14.16	12.75	11.37	-29.59	-26.19	-23.18
1.3	9.03	9.87	11.73	13.89	12.36	10.74	-30.97	-27.01	-23.7
1.4	8.06	8.97	11.12	13.61	11.97	10.08	-32.32	-27.96	-24.25
1.5	7.01	8.08	10.51	13.33	11.53	9.17	-33.56	-28.87	-24.77
1.6	5.96	7.15	9.9	13.01	11.03	8.25	-34.76	-29.76	-25.28
1.7	5.02	6.18	9.14	12.66	10.46	7.34	-35.7	-30.64	-26.01
1.8	4.34	5.18	8.3	12.31	9.86	6.43	-36.02	-31.52	-26.83
1.9	3.87	4.25	7.46	11.95	9.24	5.21	-35.86	-32.3	-27.64
2	3.47	3.47	6.62	11.52	8.62	3.97	-35.69	-32.84	-28.43
2.1	3.44	2.9	5.74	11.08	7.99	2.73	-35.39	-33.04	-29.29
2.2	3.6	2.32	4.76	10.65	7.31	1.5	-35.02	-33.26	-30.26
2.3	3.76	1.99	3.77	10.14	6.47	0.01	-34.68	-33.26	-31.19
2.4	3.87	1.89	2.79	9.63	5.64	-1.55	-34.6	-33.06	-32.08
2.5	3.96	1.88	1.79	9.12	4.79	-3.1	-34.66	-32.78	-32.99
2.6	4.01	1.86	0.87	8.54	3.91	-4.64	-34.78	-32.56	-33.83
2.7	3.94	1.82	0.21	7.94	3.03	-5.73	-35.05	-32.47	-34.36
2.8	3.69	1.76	-0.42	7.35	2.15	-6.7	-35.56	-32.44	-34.8
2.9	3.44	1.7	-1.02	6.7	1.13	-7.7	-36.09	-32.4	-35.2
3	2.95	1.51	-1.58	5.99	0.05	-8.69	-36.91	-32.53	-35.64
3.1	2.34	1.2	-1.93	5.26	-1.02	-9.06	-37.89	-32.79	-36.01
3.2	1.67	0.83	-2.13	4.51	-2.07	-9.21	-38.98	-33.16	-36.33
3.3	0.87	0.38	-2.31	3.69	-3.14	-9.39	-40.36	-33.67	-36.65
3.4	-0.19	-0.25	-2.5	2.88	-4.19	-9.62	-42.25	-34.41	-37.05
3.5	-1.24	-1.02	-2.71	2.06	-5.25	-9.96	-44.18	-35.33	-37.56
3.6	-2.4	-1.81	-3.06	1.13	-6.37	-10.36	-47.05	-36.25	-38.34
3.7	-3.67	-2.78	-3.42	0.21	-7.44	-10.76	-50.68	-37.47	-39.15
3.8	-4.96	-3.91	-3.81	-0.71	-8.46	-11.19	-54.49	-38.94	-40.18
3.9	-5.98	-5.14	-4.27	-1.71	-9.44	-11.76	-55.47	-40.59	-41.44
4	-6.64	-6.44	-4.84	-2.71	-10.32	-12.41	-52.84	-42.56	-43.02
4.1	-7.21	-7.81	-5.62	-3.72	-11.12	-13.04	-49.61	-45.04	-45.19
4.2	-7.69	-9.22	-6.43	-4.73	-11.77	-13.65	-46.74	-47.64	-47.81
4.3	-7.59	-10.64	-7.29	-5.75	-12.34	-14.22	-44.97	-50.01	-50.97
4.4	-7.48	-11.54	-8.24	-6.78	-12.8	-14.73	-43.25	-51.51	-53.79
4.5	-7.46	-12.11	-9.41	-7.75	-13.19	-15.23	-41.83	-51.95	-54.91
4.6	-7.56	-12.51	-10.66	-8.68	-13.53	-15.74	-40.78	-51.62	-53.76
4.7	-7.74	-12.8	-11.85	-9.66	-13.76	-16.2	-39.97	-50.97	-51
4.8	-7.98	-12.89	-12.92	-10.56	-13.9	-16.63	-39.21	-50.21	-48.37
4.9	-8.71	-12.87	-14	-11.27	-14	-17.12	-38.87	-49.4	-46.53
5	-9.51	-12.81	-14.94	-12.01	-14.08	-17.68	-38.57	-48.49	-45.32
5.1	-10.49	-13.08	-15.48	-12.73	-14.17	-18.37	-38.36	-47.95	-44.78
5.2	-11.91	-13.56	-15.69	-13.14	-14.23	-19.3	-38.36	-47.88	-44.66
5.3	-13.58	-14.12	-15.66	-13.66	-14.28	-20.41	-38.49	-47.99	-44.8
5.4	-15.54	-14.85	-15.5	-14.27	-14.38	-21.67	-38.66	-48.06	-45.25
5.5	-18.28	-16.12	-15.4	-14.75	-14.59	-23.13	-39.01	-48.27	-46.28
5.6	-21.56	-17.59	-15.35	-15.29	-14.81	-24.84	-39.48	-48.47	-47.78
5.7	-24.82	-19.06	-15.27	-15.91	-15.04	-26.71	-39.9	-48.56	-49.36
5.8	-26.24	-21.5	-15.33	-16.4	-15.38	-28.55	-40.45	-49.18	-50.66
5.9	-26.93	-24.21	-15.68	-16.81	-15.74	-29.92	-41.03	-50.12	-50.67
6	-27.42	-26.67	-16.23	-17.24	-16.11	-29.24	-41.59	-51.11	-49.7
6.1	-27.82	-28.06	-16.8	-17.6	-16.67	-28.07	-42.15	-52.01	-48.78
6.2	-28.23	-26.77	-17.4	-17.88	-17.35	-26.46	-42.71	-52.83	-47.91
6.3	-28.77	-25.12	-18.66	-18.13	-18.05	-24.88	-43.26	-53.54	-47.07
6.4	-28.22	-23.72	-20.4	-18.39	-18.78	-24.21	-43.95	-54.31	-46.27
6.5	-27.11	-22.64	-22.2	-18.7	-19.58	-23.64	-44.7	-54.75	-45.51
6.6	-25.88	-21.77	-23.99	-18.97	-20.41	-23.23	-45.46	-54.77	-44.78
6.7	-23.9	-20.99	-25.39	-19.26	-21.33	-22.97	-46.56	-54.5	-44.29



6.8	-20.84	-20.41	-25.96	-19.7	-22.5	-23.27	-48.08	-54.14	-44.23
6.9	-17.76	-20.35	-25.8	-20.12	-23.64	-23.66	-49.37	-53.93	-44.18
7	-15.11	-20.38	-25.35	-20.53	-24.75	-24.14	-50.04	-54.1	-44.09
7.1	-13.53	-20.43	-24.77	-21.36	-25.84	-24.79	-49.79	-53.76	-44.19
7.2	-12.04	-20.8	-23.81	-22.12	-26.78	-25.66	-49.58	-53.69	-44.46
7.3	-10.86	-21.31	-22.59	-22.76	-27.63	-26.47	-48.85	-53.77	-44.76
7.4	-10	-21.8	-21.35	-23.51	-28.59	-27.21	-47.57	-53.81	-45
7.5	-9.3	-22.3	-20.25	-24.16	-29.46	-27.7	-46.08	-53.95	-45.25
7.6	-8.65	-22.99	-19.38	-24.68	-30.16	-27.5	-44.76	-55	-45.79
7.7	-8.5	-23.74	-18.99	-25.2	-30.76	-27.09	-44.12	-57.46	-46.43
7.8	-8.34	-24.47	-18.76	-25.62	-31.26	-26.52	-43.55	-58.94	-47.02
7.9	-8.33	-25.32	-18.62	-25.89	-31.72	-25.79	-43.28	-58.04	-47.56
8	-8.54	-26.35	-18.54	-25.95	-32.18	-25.17	-43.44	-56.92	-47.96
8.1	-8.89	-27.62	-18.62	-25.84	-32.51	-24.7	-43.85	-57.34	-48.28
8.2	-9.33	-29.02	-18.95	-25.6	-32.63	-24.28	-44.55	-59.15	-48.77
8.3	-10.07	-30.19	-19.36	-25.1	-32.81	-23.91	-46.04	-60.68	-49.01
8.4	-10.95	-31.9	-19.86	-24.37	-32.83	-23.81	-47.94	-59.79	-49.25
8.5	-11.84	-34.36	-20.37	-23.64	-32.69	-24.03	-49.9	-58.8	-49.19
8.6	-13.1	-34.25	-21.09	-22.92	-32.71	-24.3	-51.99	-57.35	-49.16
8.7	-14.49	-32.09	-21.99	-22.28	-31.92	-24.62	-54.06	-55.47	-49.25
8.8	-15.72	-28.98	-22.94	-21.68	-31.07	-25.12	-55.2	-53.28	-49.42
8.9	-16.55	-25.52	-23.88	-21.16	-30.21	-25.89	-54.21	-50.87	-49.57
9	-16.84	-23.93	-24.77	-20.85	-29.52	-26.67	-50.5	-48.76	-49.56
9.1	-17.13	-22.41	-25.96	-20.62	-28.73	-27.43	-46.95	-47.03	-49.76
9.2	-16.67	-20.89	-27.09	-20.52	-27.84	-28.15	-44.97	-45.38	-49.79
9.3	-15.87	-19.88	-28.09	-20.63	-27.14	-28.76	-43.63	-44.03	-49.73
9.4	-14.98	-19.16	-28.93	-20.77	-26.61	-29.22	-42.44	-42.89	-49.66
9.5	-14.32	-18.46	-29.62	-20.94	-26.07	-29.58	-41.58	-41.88	-49.58
9.6	-13.96	-17.85	-30.12	-21.32	-25.52	-29.79	-41.16	-41.13	-49.41
9.7	-13.63	-17.72	-30.63	-21.77	-24.93	-29.79	-40.73	-40.89	-48.98
9.8	-13.53	-17.61	-31.12	-22.24	-24.34	-29.94	-40.44	-40.69	-48.53
9.9	-13.83	-17.5	-31.58	-22.95	-23.75	-30.27	-40.44	-40.51	-48.05
10	-14.17	-17.69	-32.01	-23.77	-23.44	-30.75	-40.43	-40.58	-47.78
15	-23.32	-39.09	-29.29	-38.45	-13.34	-20.92	-54.41	-43.14	-47.9
20	-27.15	-43.96	-24.96	-19.31	-17.88	-30.38	-42.15	-40.93	-44.69
25	-37.96	-29.48	-17.39	-30.23	-21.13	-28.75	-49.54	-55.75	-47.73
30	-27.11	-23.12	-30.03	-27.15	-30.63	-15.43	-49.31	-41.87	-42.17
35	-32.78	-18.75	-30.4	-39.91	-28.68	-24.48	-44	-52.71	-46.36
40	-36.2	-37.89	-36.36	-18.36	-38.93	-27.72	-49.2	-52.02	-50.48
45	-32.59	-34.41	-34.79	-30.95	-19.04	-32.39	-49.94	-49.42	-57.97
50	-44.68	-44.72	-32.98	-31.19	-31.42	-47.1	-42.65	-44.21	-37.17
55	-25.11	-34.74	-37.97	-31.21	-31.39	-30.61	-43.99	-42.42	-44.25
60	-23.83	-37.38	-38.33	-34.65	-43.39	-18.33	-40.68	-48.73	-44.26
65	-27.28	-36.83	-33.88	-30.92	-39.21	-24.12	-42.18	-45.02	-46.39
70	-36.37	-37.46	-29.96	-30.6	-32.99	-35.68	-51.65	-42.86	-35.51
75	-44.98	-38.16	-39.37	-27.34	-30.71	-49.57	-52.42	-44.18	-45.95
80	-44.17	-34.25	-34.67	-17.88	-49	-34.87	-51.55	-37.18	-34.38
85	-44.99	-41.63	-31.68	-17.12	-51.22	-40.05	-53.33	-41.2	-31.7
90				-21.4	-44.26	-40			
95				-31.06	-54.73	-46.09			
100				-34.25	-57.05	-69.99			
105				-66.59	-83.21				
110									
115									
120									
125									
130									
135									
140									
145									
150									
155									
160									
165									
170									
175									
180									



**5.5.3.2 Elevation=60°, Scan=30°, f=14.45 GHz:**

angle	GSO (co) skew=10°	GSO (co) skew=30°	GSO (co) skew=50°	elev (co) skew=10°	elev (co) skew=30°	elev (co) skew=50°	GSO (x) skew=10°	GSO (x) skew=30°	GSO (x) skew=50°
-180									
-175									
-170									
-165									
-160									
-155									
-150									
-145									
-140									
-135									
-130									
-125									
-120									
-115									
-110									
-105									
-100									
-95									
-90									
-85									
-80	-75.42						-75.5		
-75	-40.48						-42.08		
-70	-50.73	-93.78					-51.98	-93.78	
-65	-45.95	-43.33	-89.32			-66.08	-48.56	-42.86	-90.75
-60	-37.11	-30.07	-36.54		-76.3	-50.02	-37.66	-31	-40.94
-55	-42.81	-31.87	-44.46	-42.35	-42.05	-50.1	-44.56	-34.26	-47.12
-50	-35.06	-42.87	-31.88	-37.47	-38.2	-42.81	-42.05	-43.97	-35.49
-45	-31.02	-29.44	-33.95	-30.66	-45.71	-39.08	-32.2	-31.6	-39.62
-40	-23.44	-43.66	-36.98	-26.65	-41.9	-48.92	-31.22	-47.95	-43.45
-35	-30.24	-36.24	-36.97	-39.07	-36.95	-40.62	-33.81	-46.94	-50.63
-30	-34.11	-44.62	-34.66	-27.49	-44.17	-44.59	-40.61	-46.31	-43.61
-25	-36.22	-43.57	-52.6	-19.41	-33.89	-50.08	-38.73	-45.56	-43.44
-20	-36.58	-35.24	-39.77	-15.65	-35.5	-36.44	-34.17	-47.51	-45.78
-15	-25.55	-30.34	-49.3	-16.22	-36.25	-31.51	-39.2	-46.19	-40.49
-10	-16.36	-31.56	-30.53	-6.54	-33.81	-39.53	-37.67	-53.25	-37.95
-9.9	-16.12	-31.47	-29.97	-6.47	-33.26	-37.28	-36.07	-53.67	-38.45
-9.8	-16.4	-31.23	-29.46	-6.39	-32.51	-34.97	-35.33	-53.7	-39.04
-9.7	-16.85	-30.32	-29.06	-6.3	-31.56	-33.38	-34.89	-51.62	-39.79
-9.6	-17.33	-28.91	-28.77	-6.2	-30.41	-31.84	-34.49	-48.3	-40.73
-9.5	-18.41	-27.4	-28.53	-6.08	-29.31	-30.36	-34.71	-45.18	-41.71
-9.4	-19.88	-25.9	-28.35	-5.91	-28.38	-28.99	-35.35	-42.47	-42.62
-9.3	-21.31	-24.89	-28.26	-5.73	-27.41	-28.31	-36.13	-40.98	-43.47
-9.2	-22.51	-23.87	-28.33	-5.54	-26.4	-27.63	-37.41	-39.45	-44.14
-9.1	-23.26	-22.85	-28.51	-5.33	-25.37	-26.96	-39.7	-37.89	-44.47
-9	-24	-22.2	-28.78	-5.09	-24.51	-26.29	-41.97	-36.89	-44.47
-8.9	-23.52	-21.76	-29.14	-4.85	-23.74	-25.86	-42.69	-36.15	-44.24
-8.8	-21.85	-21.37	-29.53	-4.59	-23.19	-25.45	-41.89	-35.47	-43.85
-8.7	-19.78	-21.13	-29.8	-4.32	-22.62	-25.05	-40.57	-34.92	-43.22
-8.6	-18.04	-21.21	-30.14	-4.05	-22.06	-24.63	-38.99	-34.71	-42.62
-8.5	-16.86	-21.43	-30.52	-3.76	-21.55	-24.2	-37.02	-34.6	-42.15
-8.4	-15.86	-21.71	-30.93	-3.47	-21.01	-23.76	-34.95	-34.51	-41.75
-8.3	-14.91	-22.43	-30.89	-3.18	-20.46	-23.31	-32.99	-34.69	-41.43
-8.2	-14.71	-23.49	-30.48	-2.91	-20.19	-22.85	-32.13	-35.07	-41.18
-8.1	-14.54	-24.8	-29.91	-2.63	-19.96	-22.4	-31.33	-35.55	-41
-8	-14.58	-26.42	-29.25	-2.36	-19.74	-21.95	-30.71	-36.18	-40.88
-7.9	-14.99	-28.3	-28.5	-2.14	-19.49	-21.49	-30.43	-37.02	-40.78
-7.8	-15.66	-30.16	-27.81	-1.95	-19.23	-21.03	-30.38	-38.02	-40.71
-7.7	-16.49	-31.8	-27.16	-1.76	-18.99	-20.58	-30.42	-39.09	-40.67
-7.6	-17.93	-31.66	-26.5	-1.55	-19.02	-20.12	-30.81	-39.96	-40.65
-7.5	-19.73	-29.72	-25.81	-1.4	-19.15	-19.76	-31.41	-40.52	-40.58
-7.4	-21.54	-27.25	-25.17	-1.28	-19.26	-19.4	-32.02	-40.98	-40.49
-7.3	-21.68	-24.91	-24.65	-1.15	-19.37	-19.09	-33.15	-41.19	-40.42
-7.2	-21.12	-23.24	-24.19	-1.02	-19.66	-18.78	-34.48	-40.95	-40.38
-7.1	-20.36	-22.26	-23.69	-0.95	-19.99	-18.46	-35.85	-40.3	-40.36



-7	-19.16	-21.38	-23.16	-0.92	-20.47	-18.14	-37.25	-39.57	-40.35
-6.9	-17.29	-20.84	-22.54	-0.88	-21.18	-17.95	-38.68	-38.89	-40.43
-6.8	-15.42	-21.04	-21.99	-0.84	-22.16	-17.77	-40.06	-38.54	-40.7
-6.7	-14.12	-21.29	-21.4	-0.89	-23.5	-17.58	-40.34	-38.18	-41.06
-6.6	-13.3	-21.87	-20.77	-0.98	-24.99	-17.37	-39.76	-37.88	-41.48
-6.5	-12.56	-23.66	-20.11	-1.06	-26.62	-17.22	-39.04	-37.91	-42
-6.4	-12.22	-26.47	-19.46	-1.14	-28.14	-17.12	-38.53	-38.2	-42.82
-6.3	-12.26	-29.43	-18.91	-1.37	-27.94	-17.06	-38.2	-38.53	-44.19
-6.2	-12.43	-31.51	-18.35	-1.61	-27.38	-16.98	-37.98	-38.99	-45.87
-6.1	-12.78	-28.85	-17.78	-1.86	-26.45	-17	-37.97	-40.05	-47.89
-6	-14.01	-25.79	-17.22	-2.17	-25.16	-17.1	-38.91	-41.14	-50.05
-5.9	-15.22	-22.42	-16.85	-2.71	-22.85	-17.17	-39.83	-42.3	-50.4
-5.8	-16.37	-19.75	-16.58	-3.25	-20.45	-17.22	-41.73	-44.03	-49.95
-5.7	-17.4	-17.47	-16.33	-3.79	-18.79	-17.3	-45.19	-46.33	-49.51
-5.6	-18.37	-15.22	-16.09	-4.48	-17.37	-17.34	-49.27	-49.37	-49.08
-5.5	-18.51	-13.27	-15.9	-5.55	-16.13	-17.31	-51.37	-52.01	-48.48
-5.4	-16.84	-12.2	-16	-6.64	-15.01	-17.21	-49.39	-50.65	-46.52
-5.3	-14.26	-11.15	-16.17	-7.73	-13.98	-16.81	-45.46	-48.24	-44.64
-5.2	-11.72	-10.13	-16.35	-9.77	-13.02	-16.07	-41.75	-44.77	-43.02
-5.1	-10.15	-9.49	-16.55	-13.19	-12.28	-15.26	-39.7	-42.81	-41.66
-5	-8.73	-9	-16.9	-16.69	-11.7	-14.38	-37.91	-41.47	-40.74
-4.9	-7.45	-8.55	-17.38	-20.26	-11.13	-13.38	-36.33	-40.2	-40.23
-4.8	-6.51	-8.25	-17.87	-19.74	-10.57	-12.29	-35.23	-39.16	-39.88
-4.7	-5.88	-8.23	-18.34	-16.74	-10.03	-11.17	-34.57	-38.67	-39.61
-4.6	-5.29	-8.3	-18.78	-13.55	-9.55	-10.04	-33.96	-38.33	-39.44
-4.5	-4.98	-8.39	-19.01	-10.18	-9.1	-9.03	-33.67	-38.03	-39.57
-4.4	-4.91	-8.78	-19.08	-7.9	-8.65	-8.2	-33.65	-38.19	-39.98
-4.3	-4.85	-9.29	-19.04	-5.81	-8.15	-7.37	-33.64	-38.53	-40.56
-4.2	-5.11	-9.84	-18.91	-3.77	-7.67	-6.55	-34	-38.95	-41.23
-4.1	-5.56	-10.45	-18.76	-1.89	-7.2	-5.82	-34.58	-39.64	-41.99
-4	-6.07	-11.13	-18.68	-0.7	-6.69	-5.31	-35.26	-40.7	-42.78
-3.9	-6.71	-11.83	-18.71	0.49	-6.13	-4.83	-36.24	-42	-43.47
-3.8	-7.63	-12.52	-18.8	1.68	-5.33	-4.35	-37.81	-43.41	-43.85
-3.7	-8.54	-12.65	-18.91	2.72	-4.57	-3.97	-39.39	-44.9	-43.89
-3.6	-9.15	-12.53	-19.43	3.56	-3.78	-3.78	-42.98	-46.28	-43.41
-3.5	-9.5	-12.32	-20.27	4.41	-2.95	-3.61	-48.38	-47.52	-42.47
-3.4	-9.75	-12.06	-21.18	5.25	-2.07	-3.47	-54.42	-47.89	-41.27
-3.3	-9.67	-11.77	-22	5.99	-1.28	-3.37	-56.34	-47.18	-40.02
-3.2	-9.13	-11.48	-22.3	6.66	-0.43	-3.36	-52.52	-45.82	-38.84
-3.1	-8.5	-11.28	-20.85	7.34	0.44	-3.38	-47.35	-44.42	-37.84
-3	-7.94	-11.73	-17.35	8.02	1.32	-3.41	-42.35	-43.34	-37.06
-2.9	-7.94	-12.73	-14.01	8.58	2.14	-3.37	-40.61	-42.62	-36.57
-2.8	-7.96	-13.81	-10.75	9.13	2.97	-2.93	-38.93	-42.02	-36.15
-2.7	-8.58	-14.58	-7.89	9.69	3.8	-2.5	-37.58	-41.69	-35.83
-2.6	-10.1	-14.89	-5.67	10.21	4.57	-2.09	-36.71	-41.66	-35.66
-2.5	-12.15	-14.86	-3.95	10.67	5.24	-1.57	-36.12	-41.89	-35.67
-2.4	-13.56	-14.38	-2.28	11.13	5.89	-0.53	-35.61	-42.19	-35.88
-2.3	-12.6	-12.43	-0.64	11.58	6.54	0.52	-35.39	-42.25	-36.2
-2.2	-10.76	-8.97	0.86	11.95	7.2	1.56	-35.25	-42.44	-36.6
-2.1	-8.72	-5.56	2.05	12.29	7.84	2.59	-35.13	-42.76	-37.17
-2	-5.75	-2.73	3.17	12.63	8.42	3.57	-35.09	-43.09	-37.91
-1.9	-2.52	-0.6	4.25	12.97	8.91	4.57	-35.08	-43.38	-38.77
-1.8	0.41	1.18	5.3	13.26	9.4	5.58	-35.03	-43.68	-39.61
-1.7	2.75	2.89	6.24	13.54	9.87	6.52	-34.91	-43.81	-40.27
-1.6	4.52	4.37	7.02	13.82	10.31	7.24	-34.73	-43.22	-40.56
-1.5	6.28	5.54	7.78	14.08	10.75	7.96	-34.55	-41.7	-40.28
-1.4	7.64	6.71	8.5	14.3	11.19	8.69	-34.1	-40.3	-39.31
-1.3	8.86	7.76	9.18	14.51	11.51	9.41	-33.58	-38.87	-38.1
-1.2	10.04	8.64	9.75	14.73	11.78	9.93	-33.04	-37.3	-36.71
-1.1	11.03	9.44	10.26	14.91	12.06	10.42	-32.27	-35.75	-35.26
-1	11.85	10.21	10.74	15.07	12.33	10.91	-31.32	-34.3	-33.83
-0.9	12.64	10.87	11.19	15.23	12.61	11.4	-30.37	-32.95	-32.49
-0.8	13.34	11.39	11.61	15.38	12.84	11.71	-29.37	-31.72	-31.24
-0.7	13.88	11.89	11.9	15.48	12.99	12.02	-28.28	-30.53	-30.19
-0.6	14.41	12.33	12.17	15.59	13.11	12.31	-27.19	-29.43	-29.2
-0.5	14.81	12.65	12.41	15.69	13.24	12.59	-26.22	-28.45	-28.33
-0.4	15.12	12.93	12.64	15.74	13.32	12.7	-25.31	-27.52	-27.51
-0.3	15.4	13.18	12.8	15.75	13.41	12.82	-24.42	-26.62	-26.79
-0.2	15.62	13.36	12.88	15.77	13.5	12.94	-23.61	-25.83	-26.18



-0.1	15.69	13.42	12.95	15.78	13.53	13.05	-22.97	-25.21	-25.59
0	15.75	13.47	12.98	15.75	13.47	12.98	-22.33	-24.61	-25.11
0.1	15.75	13.48	13	15.72	13.42	12.91	-21.8	-24.08	-24.63
0.2	15.62	13.35	12.91	15.69	13.37	12.85	-21.43	-23.73	-24.31
0.3	15.47	13.2	12.78	15.64	13.33	12.79	-21.1	-23.4	-24.03
0.4	15.23	13.02	12.63	15.56	13.24	12.58	-20.88	-23.1	-23.81
0.5	14.9	12.76	12.45	15.47	13.12	12.34	-20.8	-22.93	-23.64
0.6	14.51	12.38	12.24	15.39	12.93	12.1	-20.79	-22.91	-23.52
0.7	14.11	11.98	11.91	15.28	12.76	11.86	-20.81	-22.94	-23.55
0.8	13.47	11.54	11.56	15.15	12.54	11.47	-21.14	-23.02	-23.58
0.9	12.82	10.92	11.18	15.02	12.32	11.07	-21.48	-23.33	-23.72
1	12.11	10.29	10.78	14.88	12.11	10.65	-21.91	-23.65	-23.87
1.1	11.26	9.63	10.29	14.71	11.9	10.22	-22.53	-24.01	-24.14
1.2	10.33	8.85	9.72	14.53	11.54	9.62	-23.26	-24.53	-24.5
1.3	9.35	7.97	9.14	14.36	11.19	9.02	-24.08	-25.22	-24.92
1.4	8.23	7.06	8.52	14.15	10.84	8.41	-25.12	-25.97	-25.42
1.5	7.02	6.14	7.89	13.9	10.5	7.81	-26.31	-26.76	-25.92
1.6	5.81	5.08	7.13	13.65	10.12	6.97	-27.51	-27.92	-26.66
1.7	4.78	4.03	6.36	13.39	9.74	6.12	-28.56	-29.08	-27.43
1.8	3.81	3.04	5.57	13.09	9.28	5.29	-29.59	-30.23	-28.33
1.9	3.01	2.28	4.78	12.78	8.79	4.46	-30.38	-31.32	-29.29
2	2.62	1.71	4	12.48	8.27	3.37	-30.54	-32.4	-30.39
2.1	2.68	1.19	3.25	12.13	7.75	2.25	-29.99	-33.52	-31.71
2.2	2.77	0.8	2.53	11.77	7.24	1.14	-29.44	-34.42	-33.16
2.3	2.98	0.93	1.82	11.41	6.73	0.06	-28.81	-34.01	-35.05
2.4	3.28	1.06	1.15	11.04	6.12	-1.42	-28.14	-33.56	-37.09
2.5	3.57	1.19	0.74	10.62	5.45	-2.95	-27.45	-33.06	-38.9
2.6	3.69	1.29	0.48	10.19	4.8	-4.47	-27.03	-32.5	-40.54
2.7	3.68	1.37	0.25	9.77	4.15	-5.94	-26.8	-31.92	-42.15
2.8	3.61	1.4	0.03	9.31	3.47	-8.03	-26.62	-31.35	-43.35
2.9	3.44	1.37	-0.15	8.82	2.8	-10.18	-26.58	-30.83	-43.37
3	3	1.09	-0.24	8.34	2.1	-12.18	-26.85	-30.71	-42.42
3.1	2.55	0.79	-0.32	7.85	1.31	-14.09	-27.11	-30.58	-41.26
3.2	1.91	0.47	-0.46	7.28	0.5	-15.36	-27.61	-30.46	-39.72
3.3	1.11	-0.1	-0.62	6.71	-0.29	-16.59	-28.3	-30.64	-38.41
3.4	0.25	-0.82	-0.84	6.11	-1.05	-17.97	-29.05	-31.01	-37.58
3.5	-0.73	-1.57	-1.15	5.44	-1.82	-19.53	-29.99	-31.41	-37.15
3.6	-1.91	-2.44	-1.53	4.74	-2.61	-19.53	-31.27	-31.94	-36.89
3.7	-3.13	-3.65	-1.96	4.05	-3.52	-19.08	-32.61	-32.92	-36.71
3.8	-4.29	-4.89	-2.41	3.33	-4.41	-18.87	-33.98	-33.94	-36.7
3.9	-5.25	-6.17	-3.03	2.52	-5.28	-18.89	-35.47	-34.99	-36.96
4	-6.19	-7.68	-3.77	1.72	-6.13	-19.06	-37	-36.71	-37.39
4.1	-6.86	-9.32	-4.61	0.92	-6.94	-19.24	-38.03	-38.85	-37.97
4.2	-7.17	-11	-5.5	0.03	-7.71	-19.5	-38.35	-41.18	-38.67
4.3	-7.23	-12.38	-6.48	-0.87	-8.54	-19.84	-38.19	-43.1	-39.57
4.4	-7.29	-12.87	-7.68	-1.77	-9.34	-20.33	-38	-43.5	-40.77
4.5	-7.37	-13.26	-9.11	-2.66	-10.07	-20.89	-37.57	-43.37	-42.24
4.6	-7.45	-13.55	-10.66	-3.53	-10.73	-21.59	-37.07	-42.71	-43.92
4.7	-7.63	-13.43	-12.28	-4.42	-11.34	-22.48	-36.67	-41.37	-45.74
4.8	-8.16	-13.18	-14.28	-5.32	-11.87	-23.24	-36.73	-39.91	-47.79
4.9	-8.86	-12.92	-16.88	-5.85	-12.39	-23.82	-37.02	-38.5	-49.56
5	-9.76	-12.86	-20.08	-6.4	-12.9	-24.4	-37.5	-37.45	-50.61
5.1	-11.09	-13.23	-23.76	-7	-13.37	-25.06	-38.4	-37.09	-51.04
5.2	-12.85	-13.68	-27.81	-7.23	-13.78	-25.51	-39.74	-36.83	-50.99
5.3	-14.63	-14.17	-29.64	-7.19	-14.13	-25.64	-41.16	-36.62	-49.86
5.4	-17.95	-15.39	-29.75	-7.21	-14.43	-25.62	-42.9	-37.07	-48.86
5.5	-21.74	-16.89	-28.9	-7.24	-14.75	-25.47	-45.2	-37.77	-48.1
5.6	-25.22	-18.5	-27.26	-7.01	-15.22	-25.14	-47.77	-38.55	-47.58
5.7	-25.83	-21.39	-25.51	-6.78	-15.65	-24.77	-48.4	-39.74	-47.23
5.8	-22.94	-26.51	-24.54	-6.55	-16.05	-24.48	-46.15	-41.61	-46.93
5.9	-20.08	-32.54	-24.34	-6.36	-16.43	-24.28	-43.4	-43.66	-46.63
6	-17.94	-39.32	-24.26	-6.17	-16.77	-24.28	-41.05	-45.83	-46.32
6.1	-16.95	-36.95	-24.3	-5.96	-17.06	-24.23	-39.96	-50.11	-46
6.2	-16.01	-32.61	-24.71	-5.8	-17.69	-24.08	-38.87	-53.92	-45.7
6.3	-15.58	-28.13	-25.35	-5.74	-18.3	-24.06	-38.28	-56.72	-45.4
6.4	-15.52	-25.08	-26.02	-5.67	-18.85	-24.21	-38.09	-56.95	-45.09
6.5	-15.57	-23.91	-26.55	-5.58	-19.34	-24.54	-38.03	-54.48	-44.76
6.6	-15.54	-23.3	-26.94	-5.65	-19.81	-24.82	-38.17	-51.89	-44.45
6.7	-15.27	-22.86	-27.12	-5.71	-20.23	-25.12	-39.01	-49.8	-44.32



6.8	-14.97	-23.57	-27.11	-5.76	-20.85	-25.52	-39.81	-50.68	-44.42
6.9	-14.42	-24.68	-26.95	-5.9	-21.64	-25.97	-41.16	-51.99	-44.66
7	-13.48	-26.02	-26.65	-6.09	-22.42	-26.47	-43.56	-53.17	-45.01
7.1	-12.42	-27.03	-26.36	-6.27	-23.12	-26.99	-46.43	-53.08	-45.47
7.2	-11.41	-27.57	-26.22	-6.55	-23.72	-27.44	-48.62	-51.9	-46.11
7.3	-10.52	-28.05	-26.21	-6.93	-24.25	-27.6	-49.53	-51.15	-47.16
7.4	-9.7	-28.68	-26.3	-7.29	-24.92	-27.67	-49.72	-51.14	-48.71
7.5	-8.89	-27.39	-26.51	-7.64	-25.94	-27.67	-49.81	-49.09	-50.84
7.6	-8.53	-25.37	-26.98	-8.06	-27	-27.6	-47.54	-46.55	-52.32
7.7	-8.2	-23	-27.6	-8.47	-27.99	-27.36	-45.17	-43.98	-52.75
7.8	-7.98	-21.13	-28.37	-8.86	-28.69	-27.04	-43.26	-42.05	-52.56
7.9	-7.97	-19.96	-29.37	-9.25	-29.16	-26.63	-42.29	-40.79	-51.89
8	-8.14	-19.09	-30.62	-9.64	-29.39	-26.17	-42.08	-39.75	-50.48
8.1	-8.37	-18.29	-31.84	-10.01	-30.1	-26.1	-42.05	-38.72	-48.71
8.2	-8.87	-17.98	-32.5	-10.35	-30.34	-25.99	-42.88	-38.26	-47.17
8.3	-9.56	-17.88	-32.99	-10.59	-30.01	-25.84	-44.3	-38.04	-45.76
8.4	-10.26	-17.8	-33.37	-10.83	-29.16	-25.64	-45.75	-37.85	-44.49
8.5	-11.28	-17.95	-33.4	-11.06	-28.87	-25.83	-48.39	-37.95	-43.52
8.6	-12.49	-18.37	-33.19	-11.12	-28.36	-26.11	-51.42	-38.35	-42.91
8.7	-13.7	-18.93	-33.03	-11.17	-27.54	-26.38	-53.75	-38.92	-42.56
8.8	-14.74	-19.54	-32.79	-11.21	-26.7	-26.62	-53.69	-39.57	-42.28
8.9	-15.41	-20.58	-32.39	-11.18	-26.11	-27.1	-49.28	-40.74	-42.29
9	-16.03	-21.81	-32.43	-11.1	-25.48	-27.7	-45.16	-42.16	-42.49
9.1	-15.98	-23.03	-32.77	-11.06	-24.79	-28.42	-42.47	-43.58	-42.88
9.2	-15.34	-24.8	-33.2	-11.03	-24.21	-29.16	-40.81	-44.7	-43.4
9.3	-14.54	-26.9	-33.6	-10.99	-23.75	-29.93	-39.38	-45.23	-43.99
9.4	-13.86	-28.92	-33.87	-10.95	-23.35	-30.82	-38.34	-45.18	-44.66
9.5	-13.34	-30.49	-33.79	-10.92	-22.96	-32.01	-37.8	-44.71	-45.35
9.6	-12.89	-31.04	-32.98	-10.93	-22.71	-33.48	-37.4	-43.47	-45.98
9.7	-12.52	-31.19	-31.66	-10.94	-22.47	-34.67	-37.07	-41.9	-46.18
9.8	-12.69	-31.66	-30.16	-10.95	-22.24	-35.93	-37.38	-40.51	-46.22
9.9	-12.88	-31.59	-28.7	-11.02	-22.03	-37.36	-37.69	-39.59	-46.1
10	-13.24	-31.01	-27.43	-11.12	-22.07	-40.05	-38.22	-39.09	-45.82
15	-16.27	-27.19	-31.97	-32.32	-32.6	-29.77	-39.26	-58.07	-42.43
20	-21.66	-33.45	-40.87	-23.85	-26.11	-33.02	-45.84	-41.49	-46.48
25	-34.31	-33.33	-38.7	-32.66	-26.23	-30.64	-46.39	-54.33	-52.7
30	-39.42	-33.34	-37.38	-7.65	-18.82	-40.46	-38.11	-48.58	-53.44
35	-29.81	-37.61	-31.55	-20.79	-23.35	-24.66	-40.29	-44.69	-51.72
40	-30.82	-41.69	-19.12	-28.55	-35.48	-18.26	-40.7	-43.7	-45.37
45	-28.34	-46.02	-39.07	-33.32	-33.78	-30.36	-42.29	-42.3	-42.96
50	-38.28	-39.03	-50.37	-29.54	-53.78	-33.52	-45.27	-43.45	-46.88
55	-38.03	-21.08	-36.99	-33.28	-37.34	-32.41	-43.25	-43.81	-41.99
60	-45.1	-26.99	-39.15	-20.64	-29.31	-38.17	-50.23	-46.41	-45.67
65	-39.25	-39.58	-48.66	-36.05	-23.56	-36.55	-48.99	-47	-57.83
70	-41.43	-41.84	-49.66	-37.87	-39.04	-39.85	-46.46	-43.18	-42.33
75	-45.93	-46.57	-38.16	-48.45	-49.11	-23.16	-55.92	-51.02	-36.3
80	-50.14	-38.11	-30.46	-33.33	-43.31	-24.59	-51.99	-46.81	-35.14
85	-43.9	-36.35	-29.63	-39.15	-35.07	-38.14	-55.17	-38.38	-29.86
90				-36.67	-42.95	-42.08			
95				-23.98	-45.54	-47.64			
100				-22.41	-53.83	-44.77			
105				-24.08	-52.79	-51.16			
110				-30.41	-52.27	-99.26			
115				-61.4	-87.57				
120									
125									
130									
135									
140									
145									
150									
155									
160									
165									
170									
175									
180									



**5.5.3.3 Elevation=45 ° , Scan=45 ° , f=14.45 GHz:**

angle	GSO (co) skew=10°	GSO (co) skew=30°	GSO (co) skew=50°	elev (co) skew=10°	elev (co) skew=30°	elev (co) skew=50°	GSO (x) skew=10°	GSO (x) skew=30°	GSO (x) skew=50°
-180									
-175									
-170									
-165									
-160									
-155									
-150									
-145									
-140									
-135									
-130									
-125									
-120									
-115									
-110									
-105									
-100									
-95									
-90									
-85									
-80									
-75	-83.01						-82.04		
-70	-45.05						-44.72		
-65	-34.8						-35.29		
-60	-27.12	-73.93					-28.09	-74.9	
-55	-32.05	-37.27				-77.6	-32.51	-38.88	
-50	-32.33	-27.71	-66.59			-54.34	-37.74	-30.29	-68.72
-45	-26.35	-26.24	-45.76	-89.85	-41.2	-57.91	-30.45	-29.19	-55.87
-40	-30.62	-36.97	-39.38	-34.85	-42.74	-40.39	-33.35	-36.25	-38.67
-35	-39.66	-37.19	-32.11	-23.67	-36.64	-44.58	-48.63	-39.97	-40.44
-30	-36.18	-33.76	-39.21	-17.94	-44.93	-38.87	-45.57	-32.84	-33.78
-25	-38.39	-31.11	-35.21	-13.94	-38.63	-40.68	-34.93	-44.57	-43.37
-20	-39.49	-31.5	-30.24	-27.54	-31.09	-31.91	-38.43	-34.98	-41.19
-15	-27.08	-21.21	-24.02	-7.16	-29.64	-30.85	-31.08	-39.36	-37.47
-10	-19.76	-22.36	-20.88	-4.21	-22.83	-27.71	-30.61	-30.09	-32.82
-9.9	-20.28	-23.77	-21.92	-4.04	-23.11	-27.79	-30.48	-30.63	-33.57
-9.8	-20.81	-24.96	-23.06	-3.87	-23.42	-27.94	-30.35	-31.37	-34.36
-9.7	-21.75	-25.99	-24.38	-3.7	-23.8	-28.14	-30.46	-32.11	-35.16
-9.6	-23.34	-26.11	-25.85	-3.58	-24.04	-28.41	-30.96	-32.72	-35.97
-9.5	-25.19	-23.91	-26.83	-3.47	-24.15	-28.24	-31.6	-32.92	-37.04
-9.4	-26.5	-21.39	-27.37	-3.35	-24.17	-28.12	-32.49	-32.98	-38.11
-9.3	-26.85	-18.91	-27.5	-3.23	-24.11	-28.1	-33.82	-32.95	-39.1
-9.2	-26.64	-17.37	-27.22	-3.1	-23.97	-28.09	-35.41	-32.31	-40.01
-9.1	-26.29	-16.31	-26.38	-3.05	-24.21	-27.4	-36.96	-31.38	-40.58
-9	-24.51	-15.38	-24.99	-3.01	-24.32	-26.64	-37.96	-30.38	-40.51
-8.9	-22.25	-14.67	-23.43	-2.96	-24.29	-25.9	-38.76	-29.48	-39.97
-8.8	-19.97	-14.32	-21.95	-2.92	-24.17	-25.18	-39.54	-28.74	-39.4
-8.7	-18.56	-14.19	-20.54	-2.89	-24.09	-24.46	-38.55	-28.12	-38.82
-8.6	-17.52	-14.13	-19.37	-2.92	-23.93	-23.74	-36.8	-27.54	-38.25
-8.5	-16.56	-14.27	-18.68	-3	-24.4	-23.02	-35.1	-27.11	-37.78
-8.4	-15.91	-14.96	-18.11	-3.08	-24.91	-22.29	-33.77	-27.04	-37.36
-8.3	-15.67	-15.69	-17.63	-3.16	-25.33	-21.72	-32.95	-27	-36.93
-8.2	-15.47	-16.49	-17.25	-3.24	-25.68	-21.21	-32.17	-26.98	-36.48
-8.1	-15.53	-18.55	-17.11	-3.37	-26.01	-20.71	-31.68	-27.32	-36.22
-8	-16.01	-21.02	-17.25	-3.56	-26.21	-20.21	-31.68	-27.77	-36.23
-7.9	-16.5	-23.58	-17.45	-3.76	-25.85	-19.9	-31.7	-28.23	-36.21
-7.8	-17.3	-25.12	-17.69	-3.97	-25.4	-19.64	-32.08	-28.86	-36.15
-7.7	-18.37	-25.03	-17.98	-4.18	-25.24	-19.37	-32.78	-29.71	-36.04
-7.6	-19.53	-24.3	-18.37	-4.42	-25.26	-19.07	-33.61	-30.62	-35.94
-7.5	-20.29	-23.16	-18.81	-4.75	-25.23	-18.97	-34.91	-31.52	-35.93
-7.4	-20.29	-21.18	-19.21	-5.08	-25.24	-18.95	-37.06	-32.23	-35.95
-7.3	-20.05	-19.02	-19.56	-5.42	-24.92	-18.9	-39.5	-32.83	-36
-7.2	-19.78	-17.04	-19.68	-5.76	-23.69	-18.81	-41.98	-33.46	-35.97
-7.1	-18.27	-15.64	-19.19	-6.1	-22.64	-18.96	-44.21	-33.69	-35.69





-7	-16.77	-14.87	-18.14	-6.41	-21.67	-19.21	-46.31	-33.4	-35.25
-6.9	-15.4	-14.39	-16.98	-6.73	-20.78	-19.41	-47.42	-32.89	-34.96
-6.8	-14.43	-14.06	-15.72	-7.06	-20.11	-19.56	-45.94	-32.38	-34.86
-6.7	-13.66	-14.12	-14.41	-7.37	-19.67	-20.06	-43.19	-31.91	-34.83
-6.6	-13.05	-14.72	-13.42	-7.56	-19.14	-20.87	-40.85	-31.51	-34.42
-6.5	-12.77	-15.4	-12.46	-7.33	-18.69	-21.6	-39.43	-31.12	-34.01
-6.4	-12.79	-16.44	-11.52	-7.06	-18.14	-22.24	-38.82	-30.8	-33.62
-6.3	-12.84	-20.1	-10.61	-6.76	-17.72	-22.85	-38.26	-30.91	-33.26
-6.2	-13.63	-24.27	-9.91	-6.42	-17.52	-23.37	-38.75	-31.08	-32.95
-6.1	-14.7	-28.5	-9.44	-5.97	-17.54	-23.76	-39.65	-31.33	-32.67
-6	-15.82	-28.34	-9.06	-5.21	-17.51	-24.04	-40.62	-31.96	-32.36
-5.9	-19.75	-24.6	-8.7	-4.43	-17.46	-23.01	-41.35	-32.9	-32.02
-5.8	-25.5	-20.37	-8.39	-3.64	-17.37	-21.01	-41.88	-33.92	-31.66
-5.7	-30.9	-16.35	-8.26	-2.82	-17.55	-19.07	-42.12	-35.02	-31.39
-5.6	-32.35	-13.84	-8.38	-2.01	-18	-17.18	-41.36	-36.24	-31.23
-5.5	-25.89	-11.87	-8.56	-1.24	-18.71	-15.53	-38.74	-37.41	-31.02
-5.4	-19.38	-9.99	-8.78	-0.46	-18.75	-14.07	-36.16	-38.5	-30.78
-5.3	-14.46	-8.64	-9.11	0.32	-18.45	-12.6	-34.01	-38.65	-30.55
-5.2	-12.15	-7.67	-9.79	1.1	-18	-11.13	-32.48	-37.99	-30.44
-5.1	-10.13	-6.82	-10.72	1.83	-17.02	-9.94	-31.04	-36.95	-30.41
-5	-8.57	-6.15	-11.73	2.45	-15.51	-9.06	-29.91	-35.77	-30.36
-4.9	-7.46	-5.74	-12.82	3.07	-13.46	-8.17	-29.08	-34.62	-30.31
-4.8	-6.55	-5.53	-14.18	3.69	-11.57	-7.26	-28.4	-33.62	-30.31
-4.7	-5.79	-5.37	-16.89	4.32	-10.34	-6.5	-27.82	-32.71	-30.47
-4.6	-5.39	-5.37	-19.55	4.86	-9.03	-5.98	-27.52	-32	-30.64
-4.5	-5.1	-5.73	-21.98	5.36	-7.65	-5.44	-27.3	-31.66	-30.82
-4.4	-4.84	-6.12	-24.19	5.87	-6.2	-4.88	-27.1	-31.39	-30.99
-4.3	-5.06	-6.63	-24	6.39	-4.67	-4.51	-27.22	-31.22	-31.25
-4.2	-5.33	-7.6	-21.78	6.9	-3.2	-4.43	-27.38	-31.29	-31.58
-4.1	-5.74	-8.8	-18.98	7.34	-2.25	-4.3	-27.61	-31.51	-31.92
-4	-6.47	-10.06	-16.42	7.78	-1.29	-4.15	-28.02	-31.78	-32.24
-3.9	-7.42	-11.74	-14.23	8.22	-0.29	-4.19	-28.55	-32.16	-32.5
-3.8	-8.52	-14.21	-12.9	8.66	0.72	-4.56	-29.14	-32.74	-32.63
-3.7	-10.03	-16.58	-12.54	9.08	1.74	-4.85	-29.93	-33.38	-32.55
-3.6	-11.85	-18.85	-12.42	9.45	2.73	-5.11	-30.87	-34.09	-32.39
-3.5	-13.68	-18.15	-12.42	9.83	3.44	-5.47	-31.81	-34.64	-32.14
-3.4	-14.39	-16.77	-13.02	10.2	4.15	-5.97	-33.12	-35.17	-31.78
-3.3	-14.76	-15.25	-15.41	10.58	4.87	-6.46	-34.54	-35.71	-31.31
-3.2	-15.03	-14.1	-19.24	10.9	5.61	-6.94	-35.98	-35.85	-30.77
-3.1	-14.72	-13.42	-23.08	11.18	6.31	-6.71	-37.45	-35.54	-30.25
-3	-13.92	-13.02	-25.65	11.46	7.01	-5.35	-38.94	-35.06	-29.82
-2.9	-13.34	-13.2	-25.56	11.74	7.57	-4.16	-40.36	-34.59	-29.49
-2.8	-13.56	-15.18	-19.49	12.03	8.1	-3.15	-41.38	-34.17	-29.37
-2.7	-15.38	-18.52	-14.15	12.27	8.64	-2.11	-41.62	-33.8	-29.3
-2.6	-17.28	-22.08	-9.5	12.51	9.15	-0.64	-41.95	-33.47	-29.29
-2.5	-17.4	-22.42	-5.53	12.75	9.65	0.82	-43.04	-33.41	-29.34
-2.4	-15.81	-18.73	-2.83	13	10.17	2.27	-44.88	-33.69	-29.84
-2.3	-13.63	-13.37	-0.93	13.22	10.6	3.6	-47.07	-34.15	-30.66
-2.2	-10.75	-8.15	0.76	13.42	10.97	4.65	-47.95	-34.85	-31.64
-2.1	-7.23	-4.16	2.38	13.62	11.34	5.68	-47.09	-36.04	-32.74
-2	-3.61	-1.7	3.9	13.82	11.69	6.72	-45.35	-37.67	-33.98
-1.9	-0.34	0.6	5.16	14.02	12.04	7.68	-43.08	-39.06	-35.35
-1.8	1.61	2.72	6.2	14.19	12.41	8.41	-40.27	-39.66	-36.55
-1.7	3.53	4.21	7.19	14.36	12.74	9.15	-37.45	-39.14	-37.08
-1.6	5.31	5.67	8.16	14.53	13	9.9	-34.83	-38.06	-36.97
-1.5	6.74	7.08	9.04	14.71	13.22	10.59	-32.76	-36.44	-36.31
-1.4	8.05	8.23	9.8	14.85	13.46	11.07	-30.9	-34.54	-35.38
-1.3	9.26	9.23	10.47	14.94	13.7	11.56	-29.36	-32.66	-34.3
-1.2	10.3	10.21	11.11	15.05	13.96	12.07	-28.26	-30.92	-33.14
-1.1	11.22	11.1	11.71	15.15	14.2	12.55	-27.45	-29.57	-32.06
-1	12.11	11.77	12.26	15.26	14.32	12.88	-26.75	-29.08	-31.28
-0.9	12.8	12.41	12.67	15.33	14.44	13.22	-26.55	-28.67	-31.08
-0.8	13.43	13.05	13.07	15.4	14.58	13.57	-26.52	-28.33	-30.99
-0.7	14.05	13.51	13.45	15.48	14.72	13.86	-26.55	-28.68	-31.05
-0.6	14.48	13.91	13.8	15.56	14.87	14.03	-27.31	-29.25	-31.32
-0.5	14.85	14.3	14.04	15.62	14.99	14.21	-28.29	-29.9	-32.85
-0.4	15.19	14.61	14.23	15.65	15.02	14.39	-29.78	-31.63	-35.31
-0.3	15.45	14.83	14.4	15.7	15.06	14.56	-32.78	-34.8	-38.03
-0.2	15.61	15.01	14.56	15.74	15.1	14.6	-37.5	-38.77	-41.01





-0.1	15.75	15.14	14.68	15.79	15.15	14.64	-41.74	-42.58	-43.8
0	15.8	15.17	14.68	15.8	15.17	14.68	-41.91	-42.54	-43.03
0.1	15.74	15.12	14.63	15.81	15.2	14.69	-37.74	-38.99	-40.63
0.2	15.68	15.05	14.58	15.82	15.16	14.59	-33.4	-35	-37.71
0.3	15.49	14.91	14.52	15.84	15.1	14.49	-30.31	-31.57	-34.27
0.4	15.22	14.67	14.38	15.81	15.05	14.41	-27.95	-29.12	-31.43
0.5	14.92	14.39	14.16	15.75	14.97	14.31	-25.83	-27.17	-29.49
0.6	14.53	14.06	13.88	15.69	14.9	14.06	-24.2	-25.43	-28.06
0.7	13.99	13.63	13.59	15.64	14.83	13.82	-23.34	-24.17	-26.66
0.8	13.44	13.07	13.27	15.57	14.72	13.59	-22.51	-23.44	-25.35
0.9	12.79	12.49	12.87	15.47	14.55	13.35	-21.9	-22.73	-24.42
1	11.96	11.82	12.36	15.37	14.37	12.96	-21.76	-22.23	-23.89
1.1	11.11	10.98	11.8	15.28	14.19	12.59	-21.63	-22.11	-23.44
1.2	10.09	10.09	11.22	15.19	14.03	12.21	-21.76	-22.06	-23.03
1.3	8.9	9.15	10.58	15.05	13.87	11.8	-22.18	-22.09	-22.74
1.4	7.63	8.02	9.82	14.91	13.65	11.24	-22.72	-22.42	-22.68
1.5	6.27	6.71	8.98	14.77	13.34	10.69	-23.52	-23.04	-22.8
1.6	4.74	5.37	8.09	14.64	13.05	10.15	-24.86	-23.73	-22.99
1.7	3.18	4.02	7.15	14.46	12.76	9.59	-26.35	-24.63	-23.29
1.8	1.71	2.74	6.16	14.28	12.48	8.84	-27.92	-26.35	-23.69
1.9	1.3	1.55	4.95	14.1	12.17	8.08	-30.22	-28.15	-24.61
2	0.98	0.42	3.73	13.92	11.83	7.34	-32.49	-30.02	-25.61
2.1	0.94	0.3	2.5	13.71	11.41	6.56	-33.59	-31.12	-26.76
2.2	1.37	0.64	1.28	13.46	11	5.59	-32.55	-31.72	-28.12
2.3	2.06	1.05	0.43	13.18	10.59	4.63	-30.32	-32.03	-30.04
2.4	2.67	1.52	-0.01	12.91	10.14	3.7	-28.25	-31.54	-32.42
2.5	3.1	2	-0.34	12.62	9.69	2.71	-26.64	-29.74	-34.81
2.6	3.39	2.46	-0.55	12.28	9.25	1.35	-25.35	-27.86	-37.13
2.7	3.67	2.89	-0.64	11.94	8.69	0.03	-24.09	-26.06	-38.83
2.8	3.56	3.01	-0.28	11.6	8.13	-1.25	-23.53	-25.01	-36.56
2.9	3.35	3	0.13	11.26	7.53	-2.55	-23.13	-24.26	-34
3	3.07	2.95	0.53	10.84	6.94	-4.41	-22.82	-23.6	-31.56
3.1	2.53	2.72	0.92	10.43	6.37	-6.25	-22.85	-23.22	-29.28
3.2	1.78	2.26	1.17	10.02	5.8	-8.03	-23.13	-23.16	-27.63
3.3	0.96	1.69	1.22	9.61	5.1	-9.83	-23.5	-23.29	-26.72
3.4	-0.1	1.04	1.2	9.11	4.36	-12.89	-24.13	-23.52	-26.09
3.5	-1.48	0.13	1.15	8.62	3.64	-15.74	-25.12	-24.11	-25.52
3.6	-2.88	-1.02	1.07	8.13	2.93	-18.38	-26.13	-25.02	-25.01
3.7	-4.6	-2.2	0.79	7.64	2.23	-20.79	-27.77	-25.99	-24.81
3.8	-6.5	-3.66	0.33	7.07	1.48	-21.96	-29.79	-27.56	-24.89
3.9	-8.45	-5.44	-0.2	6.49	0.66	-23.88	-31.95	-29.87	-25.04
4	-9.51	-7.39	-0.75	5.92	-0.23	-26.55	-33.86	-32.71	-25.23
4.1	-9.66	-9.18	-1.41	5.33	-1.08	-29.77	-35.37	-35.42	-25.54
4.2	-9.57	-10.44	-2.26	4.63	-1.96	-29.51	-36.48	-37.03	-26.11
4.3	-9.28	-11.02	-3.32	3.92	-2.84	-28.5	-36.7	-36.89	-26.91
4.4	-8.46	-11.42	-4.46	3.22	-3.71	-27.81	-34.64	-35.93	-27.75
4.5	-7.66	-11.35	-5.66	2.51	-4.59	-27.68	-32.6	-33.97	-28.63
4.6	-7.16	-10.58	-7.1	1.78	-5.55	-27.43	-31.05	-31.69	-29.84
4.7	-7.06	-9.73	-8.99	1.04	-6.55	-27	-30.21	-29.6	-31.68
4.8	-7.1	-9.02	-11.19	0.3	-7.52	-26.4	-29.58	-27.94	-33.45
4.9	-7.4	-8.72	-13.59	-0.44	-8.44	-25.24	-29.25	-26.97	-34.97
5	-8.07	-8.79	-16.02	-1.06	-9.32	-23.96	-29.28	-26.51	-36.17
5.1	-8.91	-8.93	-17.98	-1.64	-10.2	-22.78	-29.49	-26.11	-36.67
5.2	-9.84	-9.24	-18.78	-2.22	-11.1	-21.7	-29.73	-25.87	-36.09
5.3	-11.28	-10.2	-19.26	-2.8	-11.91	-20.73	-30.23	-26.15	-35.47
5.4	-12.78	-11.24	-19.25	-3.08	-12.62	-20.14	-30.74	-26.49	-34.89
5.5	-14.11	-12.37	-18.67	-3.25	-13.22	-19.48	-31.15	-26.95	-34.35
5.6	-14.43	-14.02	-17.92	-3.42	-13.82	-18.92	-31.08	-27.84	-33.69
5.7	-14.34	-15.87	-17.22	-3.6	-14.31	-18.45	-30.87	-28.93	-33.11
5.8	-14.03	-17.68	-16.63	-3.55	-14.55	-18.35	-30.6	-30.05	-32.7
5.9	-13.32	-18.72	-16.18	-3.43	-14.67	-18.33	-30.13	-31.04	-32.44
6	-12.28	-18.02	-15.99	-3.34	-14.72	-18.35	-29.48	-31.62	-32.36
6.1	-11.31	-16.97	-16.47	-3.26	-14.7	-18.39	-28.87	-32	-32.65
6.2	-10.78	-15.7	-17.12	-3.13	-14.58	-18.75	-28.47	-32.19	-33.04
6.3	-10.52	-14.68	-17.87	-2.99	-14.35	-19.2	-28.19	-31.6	-33.42
6.4	-10.29	-13.8	-18.71	-2.85	-14.16	-19.69	-27.93	-30.83	-33.7
6.5	-10.51	-13	-20.07	-2.7	-14.07	-20.25	-28.01	-30.04	-34.06
6.6	-10.98	-12.53	-21.8	-2.62	-13.96	-21.09	-28.25	-29.47	-34.44
6.7	-11.51	-12.45	-23.64	-2.55	-13.82	-22.06	-28.56	-29.17	-34.78



6.8	-12.22	-12.55	-25.32	-2.47	-13.67	-23.1	-29.01	-29.04	-35.01
6.9	-13.21	-12.74	-26.34	-2.4	-13.56	-24.2	-29.7	-29.02	-35.06
7	-14.19	-13.28	-26.13	-2.42	-13.55	-25.62	-30.41	-29.51	-34.81
7.1	-14.8	-14.06	-25.32	-2.46	-13.67	-27.16	-30.94	-30.42	-34.5
7.2	-14.76	-14.86	-24.45	-2.49	-13.8	-28.88	-31.15	-31.45	-34.28
7.3	-14.65	-15.48	-23.6	-2.51	-13.96	-30.66	-31.34	-32.89	-34.14
7.4	-14.16	-15.84	-22.84	-2.65	-14.2	-32.41	-31.22	-34.74	-33.98
7.5	-13.34	-15.98	-22.19	-2.78	-14.45	-33.86	-30.74	-36.83	-33.75
7.6	-12.39	-15.88	-21.64	-2.91	-14.73	-34.99	-30.04	-38.5	-33.5
7.7	-11.58	-15.4	-21.18	-3.05	-15.14	-35.67	-29.37	-38.67	-33.29
7.8	-11.12	-14.52	-20.83	-3.29	-15.65	-35.81	-28.85	-36.58	-33.12
7.9	-10.72	-13.62	-20.75	-3.53	-16.16	-35.69	-28.35	-34.35	-32.99
8	-10.42	-12.82	-20.87	-3.76	-16.66	-35.28	-27.91	-32.3	-32.91
8.1	-10.61	-12.26	-21	-3.98	-17.16	-34.58	-27.91	-30.8	-32.83
8.2	-10.87	-11.78	-21.12	-4.23	-17.67	-34.15	-27.95	-29.52	-32.74
8.3	-11.29	-11.4	-21.25	-4.47	-18.22	-34.33	-28.14	-28.4	-32.63
8.4	-12.03	-11.29	-21.48	-4.69	-18.74	-34.44	-28.63	-27.67	-32.56
8.5	-12.99	-11.49	-21.84	-4.9	-19.21	-34.49	-29.32	-27.38	-32.58
8.6	-14	-11.74	-22.11	-5.07	-19.62	-34.59	-30.17	-27.16	-32.57
8.7	-15.16	-12.11	-22.27	-5.23	-19.93	-35.12	-31.5	-27.08	-32.53
8.8	-16.39	-13.05	-22.46	-5.38	-20.2	-36.09	-33.18	-27.53	-32.49
8.9	-17.58	-14.05	-22.87	-5.48	-20.5	-37.35	-34.97	-28.06	-32.52
9	-17.4	-15.18	-23.31	-5.54	-20.81	-37.79	-37.79	-28.67	-32.61
9.1	-16.79	-17.25	-23.72	-5.59	-21.07	-37.48	-40.65	-29.91	-32.77
9.2	-16.08	-20.16	-24.16	-5.63	-21.31	-37.56	-43.01	-31.66	-33.01
9.3	-15.25	-23.44	-24.79	-5.62	-21.55	-37.95	-42.83	-33.57	-33.4
9.4	-14.35	-26.45	-25.79	-5.59	-21.79	-37.35	-40.34	-35.81	-33.97
9.5	-13.52	-26.84	-27.05	-5.56	-22.15	-35.56	-37.97	-38.94	-34.74
9.6	-12.92	-26.13	-28.58	-5.55	-22.69	-33.62	-36.04	-41.17	-35.75
9.7	-12.74	-24.61	-30.5	-5.53	-23.19	-31.54	-34.97	-42.39	-37.08
9.8	-12.58	-22.66	-31.82	-5.51	-23.65	-29.91	-33.97	-40.6	-38.38
9.9	-12.74	-20.73	-32.64	-5.5	-24.04	-28.9	-33.47	-37.82	-39.51
10	-13.19	-18.96	-33.13	-5.48	-24.35	-27.91	-33.42	-35.22	-40.45
15	-15.3	-29.72	-31.07	-13.02	-37.2	-32.1	-29.51	-33.6	-41.81
20	-20.97	-25.3	-29.77	-20.02	-29.91	-31.43	-32.49	-37.12	-42.98
25	-19.81	-31.36	-30.73	-24.03	-35.07	-30.99	-36.91	-40.52	-44.38
30	-23.61	-27.34	-30.93	-29.12	-30.48	-44.49	-39.07	-45.71	-39.82
35	-32.59	-31.23	-35.01	-28.13	-18	-33.78	-34.74	-45.1	-46.3
40	-31.08	-34.55	-33.16	-27.08	-36.04	-25.84	-44.58	-42.94	-46.17
45	-34.61	-38.27	-35.31	-12.36	-21.78	-32.54	-42.06	-41.39	-44.47
50	-42.3	-36.03	-39.44	-30.52	-40.6	-24.08	-39.58	-40.85	-38.05
55	-41.95	-34.87	-35.84	-41.94	-28.86	-26.78	-47.33	-47.65	-53.34
60	-31.33	-30.97	-23.48	-32.29	-37.97	-47.59	-38.89	-49.83	-34.36
65	-31.86	-33.5	-33.7	-43.57	-30.53	-33.93	-47.01	-49.37	-35.52
70	-35.6	-32.38	-32.67	-39.57	-34.29	-38.39	-38.7	-49.45	-36.47
75	-30.53	-24.92	-34.21	-36.71	-35.06	-31.78	-40.04	-40.34	-36.11
80	-38.66	-25.37	-38.4	-34.9	-34.42	-39.76	-40.2	-36.19	-34.13
85	-40.19	-26.5	-25.71	-23.73	-27.46	-34.58	-46.8	-30.08	-29
90				-27.23	-24.7	-44.19			
95				-28.28	-52.14	-23.45			
100				-32.69	-34.67	-27.09			
105				-36.78	-41.26	-46.77			
110				-42.99	-37.12	-49.14			
115				-28.22	-36.41	-44.02			
120				-34.83	-40.33	-69.2			
125				-30.53	-49.49				
130				-34.9	-82.16				
135									
140									
145									
150									
155									
160									
165									
170									
175									
180									



**5.5.3.4 Elevation=20°, Scan=60°, f=14.45 GHz:**

angle	GSO (co) skew=10°	GSO (co) skew=30°	GSO (co) skew=50°	elev (co) skew=10°	elev (co) skew=30°	elev (co) skew=50°	GSO (x) skew=10°	GSO (x) skew=30°	GSO (x) skew=50°
-180									
-175									
-170									
-165									
-160									
-155									
-150									
-145									
-140									
-135									
-130									
-125									
-120									
-115									
-110									
-105									
-100									
-95									
-90									
-85									
-80									
-75									
-70									
-65									
-60									
-55	-30.48						-30.68		
-50	-32.92						-29.86		
-45	-40.59						-44.17		
-40	-27.09	-34.65					-26.4	-28.21	
-35	-34.87	-31.08					-36.74	-40.72	-27.79
-30	-31.59	-35.5	-27.38		-31.8	-44.69	-34.23	-30.96	-24.23
-25	-36.16	-43.43	-29.61	-13.38	-40.3	-40.97	-36.23	-28.88	-25.47
-20	-41.89	-29.13	-20.63	-6.67	-45.11	-30.28	-30.54	-39.25	-33.88
-15	-27.11	-23.13	-29.35	-1.43	-27.84	-36.1	-27.11	-28.63	-31.66
-10	-22.89	-20.28	-23.1	-5.62	-31.3	-26.32	-25.08	-28.81	-27.22
-9.9	-23.49	-19.25	-22.15	-6.06	-31.71	-26.34	-24.7	-30.46	-27.71
-9.8	-24.42	-18.13	-20.39	-6.52	-31.66	-26.25	-24.59	-32.28	-28.5
-9.7	-25.11	-16.98	-18.72	-6.98	-30.9	-26.13	-24.59	-34.17	-29.34
-9.6	-25.19	-15.85	-17.2	-7.43	-30.07	-25.99	-24.86	-36.11	-30.26
-9.5	-25.24	-14.84	-16.24	-7.73	-29.17	-25.68	-25.17	-37.34	-32.05
-9.4	-24.5	-14.14	-15.34	-7.96	-28.2	-25.38	-25.98	-36.82	-34.07
-9.3	-23.74	-13.66	-14.49	-8.16	-26.8	-25.05	-26.79	-34.86	-36.25
-9.2	-22.3	-13.32	-13.84	-8.33	-25.11	-24.51	-28.13	-32.91	-38.35
-9.1	-20.63	-13.32	-13.38	-8.46	-23.49	-24.01	-29.65	-31.29	-40.4
-9	-19.23	-13.36	-12.98	-8.56	-21.95	-23.53	-31.29	-29.68	-42.51
-8.9	-18.07	-13.59	-12.68	-8.33	-20.49	-23.1	-33.03	-28.28	-43.97
-8.8	-17.09	-13.98	-12.58	-7.89	-19.34	-22.7	-34.18	-27.14	-43.23
-8.7	-16.33	-14.41	-12.65	-7.41	-18.28	-22.34	-34.32	-26.07	-40.49
-8.6	-15.7	-15.1	-12.75	-6.89	-17.28	-22.05	-33.74	-25.5	-37.3
-8.5	-15.25	-15.83	-13.08	-6.3	-16.34	-21.81	-32.06	-25.02	-34.77
-8.4	-14.96	-16.41	-13.82	-5.66	-15.44	-21.61	-29.51	-24.83	-33.28
-8.3	-14.86	-16.86	-14.6	-4.95	-14.67	-21.49	-27.49	-24.88	-31.87
-8.2	-15.04	-17.1	-15.49	-4.21	-13.94	-21.39	-26.21	-25.08	-30.57
-8.1	-15.36	-16.85	-16.88	-3.46	-13.25	-21.33	-25.16	-25.48	-29.66
-8	-15.94	-16.21	-18.42	-2.71	-12.61	-21.38	-24.54	-26.05	-28.91
-7.9	-16.58	-15.45	-19.92	-1.95	-12.11	-21.44	-24.11	-26.69	-28.21
-7.8	-17.21	-14.45	-21.05	-1.18	-11.68	-21.53	-23.99	-27.47	-27.76
-7.7	-17.82	-13.42	-21.79	-0.5	-11.26	-21.7	-24.05	-28.3	-27.5
-7.6	-18.36	-12.46	-22.28	0.16	-10.85	-21.91	-24.33	-29.17	-27.3
-7.5	-18.82	-11.65	-22.34	0.82	-10.5	-22.2	-24.85	-30.09	-27.13
-7.4	-18.87	-10.85	-20.67	1.48	-10.39	-22.53	-25.68	-30.99	-27.15
-7.3	-17.84	-10.58	-18.11	2.15	-10.32	-22.87	-27.39	-30.3	-27.29
-7.2	-16.81	-10.39	-15.69	2.77	-10.27	-23.2	-29.12	-29.42	-27.43
-7.1	-15.85	-10.4	-13.66	3.29	-10.24	-23.59	-31.12	-28.51	-27.68



-7	-14.9	-10.6	-12.17	3.81	-10.36	-23.97	-33.18	-27.61	-28.12
-6.9	-14.1	-10.94	-10.85	4.33	-10.65	-24.2	-34.57	-26.72	-28.68
-6.8	-13.36	-11.54	-9.63	4.85	-10.97	-24.02	-35.73	-25.9	-29.25
-6.7	-12.84	-12.37	-8.7	5.37	-11.32	-23.83	-34.5	-25.16	-29.78
-6.6	-12.48	-13.44	-7.95	5.84	-11.7	-23.54	-31.45	-24.56	-30.25
-6.5	-12.38	-15.02	-7.24	6.28	-12.55	-22.87	-28.61	-24.23	-30.7
-6.4	-12.55	-16.62	-6.65	6.72	-13.4	-22.18	-26.83	-24.03	-31.04
-6.3	-12.89	-17.43	-6.25	7.16	-14.2	-21.29	-25.69	-24.05	-31.2
-6.2	-13.28	-16.86	-5.93	7.6	-15.01	-19.98	-24.85	-24.4	-31.34
-6.1	-13.69	-16.11	-5.66	8.02	-16.1	-18.57	-24.29	-24.77	-31.37
-6	-14.02	-14.73	-5.61	8.39	-17.7	-17.18	-23.96	-25.65	-31
-5.9	-14.21	-13.25	-5.68	8.75	-19.32	-15.91	-23.97	-26.59	-30.43
-5.8	-14.07	-11.62	-5.78	9.08	-20.95	-14.59	-24.16	-27.65	-29.82
-5.7	-13.19	-9.91	-5.99	9.42	-22.53	-13.39	-24.75	-28.83	-29.27
-5.6	-12.18	-8.27	-6.37	9.77	-20.82	-12.38	-25.56	-30.04	-28.84
-5.5	-10.91	-7.02	-6.82	10.07	-18.26	-11.32	-27.02	-31.08	-28.42
-5.4	-9.58	-6.12	-7.32	10.37	-15.72	-10.35	-28.64	-31.9	-28.03
-5.3	-8.35	-5.35	-7.96	10.67	-13.19	-9.54	-29.77	-32.11	-27.78
-5.2	-7.2	-4.81	-8.69	10.97	-10.81	-8.69	-30.51	-31.25	-27.65
-5.1	-6.19	-4.4	-9.44	11.27	-8.89	-7.97	-30.95	-29.99	-27.56
-5	-5.38	-4.11	-10.28	11.55	-6.98	-7.37	-30.87	-28.68	-27.6
-4.9	-4.65	-4.01	-11.22	11.81	-5.07	-6.75	-30.47	-27.33	-27.79
-4.8	-4.22	-3.94	-12.14	12.08	-3.17	-6.33	-28.71	-26.02	-28.09
-4.7	-3.83	-4.13	-12.88	12.35	-1.81	-6.08	-26.74	-25.19	-28.55
-4.6	-3.74	-4.37	-12.98	12.62	-0.73	-5.81	-25.41	-24.45	-29.34
-4.5	-3.71	-4.83	-12.7	12.86	0.33	-5.74	-24.23	-23.99	-30.37
-4.4	-3.87	-5.51	-12.34	13.07	1.41	-5.79	-23.35	-23.82	-31.56
-4.3	-4.14	-6.3	-11.92	13.29	2.47	-5.8	-22.66	-23.8	-32.7
-4.2	-4.56	-7.21	-11.47	13.51	3.21	-6.11	-22.2	-24.03	-33.59
-4.1	-5.12	-8.22	-11.04	13.74	3.97	-6.54	-21.94	-24.47	-34.42
-4	-5.85	-9.14	-10.68	13.96	4.71	-6.94	-21.92	-25.1	-35.04
-3.9	-6.78	-9.87	-10.51	14.17	5.45	-7.94	-22.18	-26.15	-35.09
-3.8	-7.79	-10.48	-10.44	14.38	6.13	-9.12	-22.71	-27.39	-34.71
-3.7	-8.62	-10.76	-10.43	14.59	6.72	-10.18	-23.55	-29.04	-33.95
-3.6	-9.24	-10.55	-10.82	14.81	7.32	-10.72	-24.75	-31.26	-32.82
-3.5	-9.69	-10.27	-11.52	15.02	7.94	-11.37	-26.39	-33.51	-31.52
-3.4	-9.84	-9.76	-12.35	15.22	8.55	-12.37	-28.81	-34.36	-30.09
-3.3	-9.79	-9.25	-12.86	15.41	9.05	-11.73	-31.99	-34.76	-28.78
-3.2	-9.33	-9.08	-12.55	15.6	9.55	-10.6	-36.92	-34.06	-27.79
-3.1	-8.87	-9.18	-11.65	15.79	10.06	-9.64	-40.85	-32.57	-26.99
-3	-8.77	-9.41	-10.47	15.95	10.58	-7.36	-39.36	-30.73	-26.24
-2.9	-8.87	-9.71	-8.96	16.1	11.07	-4.74	-34.93	-28.54	-25.63
-2.8	-8.98	-10.04	-7.19	16.26	11.47	-2.06	-31.11	-26.1	-25.18
-2.7	-9.06	-10.2	-5.36	16.41	11.87	-0.45	-28.02	-24	-24.75
-2.6	-9.04	-9.88	-3.49	16.57	12.29	1.05	-25.28	-22.81	-24.33
-2.5	-8.74	-9.19	-1.66	16.71	12.73	2.6	-23.52	-21.7	-24.11
-2.4	-8.29	-7.36	0.12	16.84	13.07	3.74	-21.82	-20.93	-23.89
-2.3	-5.7	-4.85	1.84	16.98	13.36	4.84	-20.84	-20.36	-23.69
-2.2	-3	-2.39	3.19	17.11	13.66	5.97	-19.9	-19.85	-23.68
-2.1	-0.65	-0.13	4.38	17.25	13.96	6.85	-19.27	-19.49	-23.71
-2	1.61	2.04	5.5	17.36	14.26	7.72	-18.74	-19.16	-23.69
-1.9	3.64	3.91	6.54	17.46	14.51	8.62	-18.32	-18.92	-23.72
-1.8	5.53	5.57	7.46	17.54	14.74	9.32	-17.96	-18.75	-23.84
-1.7	7.24	7.07	8.32	17.62	14.97	10	-17.68	-18.61	-23.99
-1.6	8.76	8.36	9.15	17.69	15.2	10.7	-17.46	-18.56	-24.13
-1.5	10.13	9.51	9.89	17.75	15.4	11.18	-17.3	-18.59	-24.37
-1.4	11.3	10.57	10.54	17.81	15.58	11.67	-17.2	-18.7	-24.67
-1.3	12.35	11.45	11.18	17.88	15.76	12.17	-17.13	-18.91	-24.79
-1.2	13.29	12.32	11.77	17.94	15.94	12.55	-17.09	-19.06	-24.79
-1.1	14.13	13.06	12.27	17.99	16.12	12.94	-17.06	-19.27	-24.83
-1	14.9	13.76	12.75	18.04	16.24	13.32	-17.08	-19.44	-24.78
-0.9	15.58	14.39	13.21	18.09	16.37	13.6	-17.13	-19.62	-24.81
-0.8	16.2	14.95	13.56	18.14	16.5	13.89	-17.2	-19.82	-24.85
-0.7	16.75	15.46	13.86	18.19	16.63	14.17	-17.3	-19.92	-24.75
-0.6	17.22	15.87	14.15	18.24	16.71	14.37	-17.4	-19.91	-24.43
-0.5	17.59	16.18	14.39	18.27	16.76	14.59	-17.49	-19.91	-23.89
-0.4	17.88	16.45	14.57	18.3	16.82	14.77	-17.58	-19.93	-23.28
-0.3	18.11	16.65	14.73	18.34	16.88	14.84	-17.67	-19.92	-22.81
-0.2	18.26	16.81	14.86	18.37	16.94	14.91	-17.78	-19.83	-22.43



-0.1	18.39	16.92	14.93	18.39	16.95	14.97	-17.84	-19.62	-21.89
0	18.41	16.96	14.97	18.41	16.96	14.97	-17.84	-19.29	-21.28
0.1	18.42	16.99	15	18.44	16.98	14.98	-17.8	-18.92	-20.61
0.2	18.33	16.91	14.98	18.47	17.01	14.97	-17.64	-18.49	-19.92
0.3	18.22	16.81	14.9	18.47	16.99	14.9	-17.5	-18.14	-19.5
0.4	17.96	16.61	14.8	18.47	16.94	14.82	-17.34	-17.9	-19.1
0.5	17.64	16.32	14.64	18.48	16.9	14.7	-17.21	-17.7	-18.69
0.6	17.23	15.98	14.41	18.49	16.87	14.53	-17.14	-17.52	-18.3
0.7	16.75	15.56	14.14	18.47	16.84	14.37	-17.12	-17.36	-17.93
0.8	16.2	15.07	13.84	18.44	16.73	14.15	-17.15	-17.23	-17.62
0.9	15.55	14.53	13.46	18.4	16.61	13.85	-17.24	-17.17	-17.44
1	14.85	13.87	13.01	18.37	16.5	13.54	-17.34	-17.21	-17.3
1.1	13.99	13.17	12.55	18.29	16.4	13.18	-17.41	-17.33	-17.16
1.2	13.1	12.34	12.04	18.21	16.25	12.77	-17.52	-17.59	-17.03
1.3	11.89	11.4	11.42	18.12	16.01	12.37	-17.83	-17.92	-16.99
1.4	10.56	10.33	10.75	18.04	15.79	11.92	-18.23	-18.33	-17.07
1.5	8.91	8.97	10.04	17.94	15.57	11.43	-18.83	-18.92	-17.19
1.6	7.05	7.5	9.19	17.81	15.35	10.92	-19.6	-19.62	-17.43
1.7	4.9	5.63	8.26	17.69	15.07	10.34	-20.63	-20.66	-17.7
1.8	2.47	3.46	7.31	17.57	14.76	9.72	-21.95	-21.99	-17.97
1.9	-0.09	1.13	6.13	17.44	14.46	9.1	-23.73	-23.76	-18.45
2	-2.62	-1.35	4.63	17.28	14.17	8.39	-26.24	-26.19	-19.22
2.1	-4.7	-3.7	3.06	17.12	13.87	7.63	-29.24	-28.92	-20.02
2.2	-5.09	-5.14	1.38	16.95	13.51	6.85	-31.88	-31.37	-20.91
2.3	-3.38	-4.56	-0.57	16.77	13.15	5.98	-33.81	-33.42	-22.2
2.4	-1.69	-3.69	-2.55	16.57	12.8	5.08	-34.18	-34.82	-23.58
2.5	-0.09	-2.36	-4.38	16.36	12.46	4.2	-31.87	-32.47	-25.06
2.6	1.28	-0.98	-5.37	16.16	12.08	3.22	-29.07	-29.51	-26.61
2.7	2.15	0.19	-5.77	15.97	11.67	2.23	-26.39	-26.8	-28.15
2.8	2.75	1.08	-5.81	15.75	11.26	1.24	-24.03	-24.5	-29.68
2.9	2.99	1.77	-5.21	15.53	10.87	0.06	-22.43	-22.63	-30.42
3	2.95	2.18	-4.07	15.32	10.49	-1.16	-21.42	-21.3	-30.22
3.1	2.72	2.34	-2.8	15.1	10.01	-2.34	-20.67	-20.39	-29.51
3.2	2.2	2.35	-1.68	14.88	9.53	-3.69	-20.29	-19.63	-28.63
3.3	1.6	2.04	-0.85	14.66	9.07	-5.05	-20.01	-19.23	-27.56
3.4	0.65	1.62	-0.34	14.43	8.61	-6.39	-20.06	-18.95	-26.37
3.5	-0.31	0.99	0.09	14.2	8.14	-7.79	-20.12	-18.83	-25.2
3.6	-1.75	0.12	0.34	13.92	7.61	-9.19	-20.53	-18.92	-24.19
3.7	-3.23	-0.9	0.37	13.64	7.1	-10.55	-20.97	-19.11	-23.43
3.8	-5.7	-2.31	0.33	13.37	6.61	-12.01	-21.76	-19.52	-22.69
3.9	-8.58	-3.87	0.22	13.1	6.12	-13.47	-22.68	-20.02	-21.99
4	-11.43	-5.87	-0.09	12.78	5.56	-14.89	-23.61	-20.69	-21.59
4.1	-14.14	-8.29	-0.54	12.45	4.99	-16.51	-24.54	-21.54	-21.37
4.2	-16	-11.06	-1.04	12.12	4.44	-18.2	-25.4	-22.57	-21.19
4.3	-16.43	-14.2	-1.72	11.79	3.9	-19.94	-26.11	-23.93	-21.14
4.4	-15.98	-17.1	-2.65	11.39	3.31	-22.73	-26.7	-25.61	-21.35
4.5	-13.92	-18.47	-3.66	11	2.65	-25.84	-26.78	-27.59	-21.58
4.6	-11.39	-16.64	-4.83	10.6	2.01	-28.75	-26.68	-30.31	-21.92
4.7	-10.29	-14.82	-6.59	10.2	1.39	-30.4	-26.51	-33.01	-22.52
4.8	-9.85	-12.96	-8.56	9.7	0.77	-31.94	-26.32	-34.86	-23.15
4.9	-9.82	-11.27	-10.68	9.19	0.06	-33.17	-26.25	-36.04	-23.77
5	-10.08	-10.19	-13.39	8.68	-0.64	-30.01	-26.27	-36.05	-24.59
5.1	-10.56	-9.8	-16.24	8.14	-1.32	-27.16	-26.41	-34.92	-25.48
5.2	-11.2	-9.79	-18.9	7.51	-1.96	-25.36	-26.65	-33.48	-26.34
5.3	-11.88	-10.17	-20.35	6.88	-2.66	-24.28	-26.94	-32.57	-27.17
5.4	-12.45	-10.98	-19.96	6.26	-3.35	-23.23	-27.23	-32.22	-27.96
5.5	-12.81	-11.83	-18.36	5.56	-4.01	-22.27	-27.46	-31.97	-28.63
5.6	-12.69	-12.64	-16.35	4.77	-4.63	-21.61	-27.4	-32.15	-29.05
5.7	-11.9	-13.41	-14.7	3.98	-5.27	-21.02	-26.94	-32.36	-29.08
5.8	-11.05	-13.67	-13.6	3.2	-5.91	-20.61	-26.33	-32.71	-28.82
5.9	-10.1	-13.45	-12.7	2.28	-6.53	-20.42	-25.5	-33.09	-28.45
6	-9.17	-12.95	-12.27	1.31	-7.1	-20.29	-24.62	-33.2	-28.02
6.1	-8.4	-11.84	-12.2	0.35	-7.69	-20.16	-23.76	-32.19	-27.6
6.2	-7.72	-10.51	-12.29	-0.63	-8.29	-20.13	-22.96	-30.87	-27.18
6.3	-7.35	-9.39	-12.58	-1.69	-8.85	-20.16	-22.37	-29.58	-26.82
6.4	-7.2	-8.52	-13.17	-2.75	-9.37	-20.25	-21.93	-28.26	-26.59
6.5	-7.21	-7.79	-14.01	-3.78	-9.89	-20.43	-21.61	-27.01	-26.49
6.6	-7.5	-7.27	-14.98	-4.69	-10.42	-20.58	-21.48	-25.87	-26.46
6.7	-7.87	-6.92	-16.1	-5.08	-10.89	-20.63	-21.39	-24.81	-26.58



6.8	-8.54	-6.67	-17.38	-5.45	-11.29	-20.71	-21.5	-23.81	-26.92
6.9	-9.25	-6.76	-18.57	-5.81	-11.68	-20.79	-21.63	-23.27	-27.3
7	-10.35	-6.88	-19.21	-5.68	-12.09	-20.88	-21.98	-22.72	-27.81
7.1	-11.51	-7.38	-18.68	-5.07	-12.42	-20.88	-22.36	-22.57	-28.56
7.2	-12.98	-8.07	-17.83	-4.47	-12.66	-20.78	-22.89	-22.6	-29.25
7.3	-14.61	-9	-16.86	-3.88	-12.87	-20.67	-23.49	-22.82	-29.77
7.4	-15.75	-10.22	-15.85	-3.16	-13.09	-20.54	-24.11	-23.29	-29.84
7.5	-16.33	-11.66	-14.89	-2.43	-13.22	-20.39	-24.75	-23.95	-29.53
7.6	-16.43	-13.25	-13.99	-1.74	-13.26	-20.26	-25.4	-24.87	-29.1
7.7	-16	-14.97	-13.23	-1.09	-13.34	-20.2	-26.05	-26.23	-28.51
7.8	-15.26	-16.54	-12.81	-0.6	-13.42	-20.13	-26.65	-27.88	-27.65
7.9	-14.4	-17.42	-12.51	-0.11	-13.43	-20.1	-27.11	-30.55	-26.96
8	-13.48	-17.87	-12.26	0.37	-13.36	-20.16	-27.44	-33.62	-26.29
8.1	-12.92	-17.27	-12.37	0.77	-13.39	-20.22	-27.77	-35.74	-25.71
8.2	-12.72	-15.86	-12.57	1.09	-13.55	-20.39	-28.08	-36.1	-25.22
8.3	-12.72	-14.35	-12.88	1.41	-13.66	-20.66	-28.45	-35.27	-24.88
8.4	-12.97	-13.2	-13.41	1.74	-13.74	-20.93	-28.94	-33.58	-24.77
8.5	-13.42	-12.32	-14.13	1.93	-13.81	-21.28	-29.49	-31.41	-24.83
8.6	-14.11	-11.69	-14.93	2.11	-14.03	-21.82	-30.05	-29.34	-24.96
8.7	-15.06	-11.4	-15.81	2.3	-14.23	-22.39	-30.61	-27.68	-25.24
8.8	-16.25	-11.26	-16.83	2.44	-14.4	-22.95	-31.2	-26.3	-25.82
8.9	-17.73	-11.41	-17.81	2.5	-14.58	-23.47	-31.81	-25.42	-26.56
9	-18.96	-11.85	-18.7	2.55	-14.8	-23.98	-32.1	-25.04	-27.38
9.1	-19.42	-12.5	-19.35	2.61	-15.1	-24.47	-31.64	-24.87	-28.61
9.2	-19.79	-13.75	-19.67	2.58	-15.37	-24.85	-31.17	-25.21	-30.2
9.3	-19.28	-15.19	-19.76	2.55	-15.64	-25.23	-30.47	-25.67	-31.99
9.4	-18.7	-17.05	-19.49	2.53	-15.89	-25.43	-29.81	-26.5	-34.74
9.5	-17.71	-19.15	-18.9	2.47	-16.26	-25.33	-29.09	-27.63	-38.49
9.6	-16.57	-20.97	-18.2	2.37	-16.65	-25.33	-28.39	-29.05	-41.89
9.7	-15.73	-22.2	-17.59	2.28	-17.02	-25.25	-27.92	-30.84	-43.32
9.8	-15.18	-22.79	-17.12	2.18	-17.37	-24.96	-27.65	-32.83	-42.26
9.9	-14.85	-22.39	-16.83	2.03	-17.71	-24.63	-27.54	-34.72	-39.37
10	-14.86	-19.94	-16.64	1.87	-18.2	-24.33	-27.66	-36.09	-37.05
15	-18.48	-19.72	-28.79	-4.17	-25.57	-33.88	-27.07	-28.33	-30.51
20	-23.6	-21.97	-24.78	-4.71	-23.93	-35.27	-27.19	-28.36	-30.27
25	-23.98	-46.8	-32.34	-7.34	-29.65	-35.07	-29.01	-35.79	-37.94
30	-34.9	-28.14	-32.52	-13.22	-42.85	-36.38	-37.94	-30.22	-39.44
35	-28.26	-27.17	-30.79	-14.99	-26.08	-35.15	-33.49	-39.04	-38.27
40	-33.86	-33.91	-34.06	-25.74	-36.06	-24.63	-39.38	-37.56	-38.67
45	-32.04	-34.47	-37	-20.74	-22.35	-25.13	-33.33	-45.71	-41.13
50	-30.8	-38.21	-35.96	-24.91	-24.77	-34.14	-30.14	-39.75	-45.29
55	-34.69	-43.53	-34.85	-18.34	-22.67	-23.34	-37.68	-42.35	-40.62
60	-32.12	-42.16	-42.66	-15.52	-29.19	-35.28	-46.71	-46.56	-49.31
65	-31.61	-34.63	-34.94	-35.57	-31.9	-36.28	-31.3	-38.54	-44.64
70	-40.87	-34.27	-37.06	-28.64	-34.33	-40.97	-37.79	-39.94	-50.86
75	-43.58	-32.61	-35.97	-37.84	-33.59	-49.81	-45.06	-49.59	-39.45
80	-54.7	-44.23	-41.66	-38.05	-49.79	-42.24	-48.4	-48.83	-44.83
85		-43.25	-38	-42.36	-41.24	-41.51		-51.89	-38.24
90				-34.47	-51.42	-53.92			
95				-38.73	-57.54	-57.4			
100				-49.21					
105									
110									
115									
120									
125									
130									
135									
140									
145									
150									
155									
160									
165									
170									
175									
180									



**5.5.3.5 Elevation=20°, Scan=70°, f=14.45 GHz:**

angle	GSO (co) skew=10°	GSO (co) skew=30°	GSO (co) skew=50°	elev (co) skew=10°	elev (co) skew=30°	elev (co) skew=50°	GSO (x) skew=10°	GSO (x) skew=30°	GSO (x) skew=50°
-180									
-175									
-170									
-165									
-160									
-155									
-150									
-145									
-140									
-135									
-130									
-125									
-120									
-115									
-110									
-105									
-100									
-95									
-90									
-85									
-80									
-75									
-70									
-65									
-60									
-55									
-50									
-45	-29.25							-31.48	
-40	-38.42							-38.32	
-35	-28.76							-27.51	
-30	-38.28							-30.67	
-25	-22.5	-32.35					-37.82	-22.78	-34.77
-20	-31.96	-27.95	-26.42			-32.58	-32.94	-35.77	-27.05
-15	-28.56	-33.37	-18.26	-11.55		-30.67	-29.5	-19.97	-26.53
-10	-33.19	-18.54	-12.77	3.78		-18.34	-24.31	-36.33	-30.24
-9.9	-34.37	-17.74	-12.39	4.07		-17.78	-23.78	-36.2	-32.94
-9.8	-34.55	-17.05	-12.01	4.35		-17.22	-23.25	-35.79	-34.41
-9.7	-33.87	-16.39	-11.66	4.61		-16.66	-22.81	-35.18	-35.47
-9.6	-32.95	-15.85	-11.61	4.86		-16.19	-22.36	-34.52	-34.87
-9.5	-31.5	-15.49	-11.56	5.1		-15.7	-21.92	-33.81	-32.01
-9.4	-29.94	-15.2	-11.52	5.34		-15.21	-21.64	-33.18	-28.24
-9.3	-26.94	-15.14	-11.64	5.59		-14.7	-21.36	-32.67	-25.63
-9.2	-23.97	-15.31	-11.87	5.83		-14.26	-21.09	-32.21	-24.28
-9.1	-22.31	-15.51	-12.11	6.08		-13.91	-21.03	-31.32	-23.04
-9	-20.85	-15.76	-12.43	6.34		-13.51	-20.96	-30.37	-22.1
-8.9	-19.72	-16.04	-12.92	6.59		-13.09	-20.94	-29.37	-21.36
-8.8	-18.76	-16.3	-13.46	6.84		-12.67	-21.11	-28.33	-20.73
-8.7	-18	-16.47	-14.02	7.08		-12.37	-21.28	-27.3	-20.49
-8.6	-17.42	-16.61	-14.78	7.33		-12.1	-21.47	-26.29	-20.26
-8.5	-17	-16.45	-15.69	7.57		-11.82	-21.81	-25.33	-20.27
-8.4	-16.76	-16.08	-16.58	7.82		-11.53	-22.16	-24.5	-20.44
-8.3	-16.68	-15.67	-17.16	8.07		-11.26	-22.53	-23.8	-20.67
-8.2	-16.78	-14.99	-17.17	8.31		-11.13	-22.98	-23.3	-21.28
-8.1	-17.1	-14.28	-16.89	8.54		-10.99	-23.46	-23.05	-21.92
-8	-17.44	-13.64	-16.52	8.77		-10.85	-23.93	-22.88	-22.64
-7.9	-17.83	-13.04	-15.91	9		-10.67	-24.12	-22.97	-23.42
-7.8	-18.21	-12.47	-14.95	9.2		-10.61	-24.34	-23.07	-24.21
-7.7	-18.47	-12.05	-13.98	9.4		-10.68	-24.54	-23.62	-25.01
-7.6	-18.72	-11.72	-13	9.6		-10.74	-24.42	-24.18	-25.82
-7.5	-18.55	-11.52	-11.98	9.8		-10.77	-24.3	-25.2	-26.31
-7.4	-18.24	-11.52	-10.98	10.01		-10.79	-24.15	-26.38	-26.32
-7.3	-17.76	-11.64	-10	10.22		-11.3	-23.74	-29.15	-26.12
-7.2	-17.17	-11.93	-9.31	10.43		-11.96	-23.41	-33.12	-25.78
-7.1	-16.6	-12.49	-8.8	10.64		-12.55	-23.01	-36.05	-25.28



-7	-16.11	-13.07	-8.32	10.86	-13.07	-22.37	-37.06	-24.8	-26.82
-6.9	-15.69	-13.76	-7.91	11.05	-13.52	-21.71	-36.79	-24.42	-25.97
-6.8	-15.4	-14.49	-7.64	11.23	-13.75	-21	-35.09	-24.09	-25.14
-6.7	-15.23	-15.19	-7.42	11.4	-14.05	-20.15	-32.23	-23.85	-24.32
-6.6	-15.22	-15.83	-7.22	11.57	-14.43	-19.28	-29.82	-23.87	-23.51
-6.5	-15.49	-16.43	-7.16	11.74	-14.89	-18.36	-27.88	-23.91	-22.83
-6.4	-15.74	-15.7	-7.2	11.92	-15.26	-17.35	-26.1	-24.41	-22.23
-6.3	-15.91	-14.55	-7.25	12.1	-15.54	-16.31	-25.27	-25.06	-21.65
-6.2	-16.08	-13.36	-7.37	12.28	-16.01	-15.26	-24.46	-25.69	-21.19
-6.1	-15.86	-12.17	-7.63	12.44	-16.66	-14.24	-24.16	-26.23	-20.91
-6	-15.58	-10.98	-7.92	12.59	-17.38	-13.2	-23.96	-26.74	-20.69
-5.9	-14.79	-9.88	-8.25	12.74	-15.84	-12.21	-24.08	-26.96	-20.54
-5.8	-13.75	-8.84	-8.65	12.9	-13.75	-11.37	-24.37	-26.97	-20.57
-5.7	-12.58	-7.9	-9.12	13.05	-11.8	-10.5	-24.91	-26.69	-20.77
-5.6	-11.29	-7.14	-9.57	13.21	-9.97	-9.65	-25.69	-25.89	-21.01
-5.5	-10.05	-6.5	-9.98	13.37	-8.32	-8.96	-26.32	-24.78	-21.33
-5.4	-8.98	-6.01	-10.23	13.52	-7.05	-8.23	-26.54	-23.71	-21.92
-5.3	-8.03	-5.8	-10.47	13.65	-5.77	-7.55	-26.45	-22.77	-22.55
-5.2	-7.2	-5.62	-10.69	13.78	-4.49	-7.02	-26.03	-21.88	-23.21
-5.1	-6.5	-5.59	-10.66	13.9	-3.22	-6.47	-25.29	-21.2	-24.57
-5	-5.91	-5.64	-10.58	14.03	-2.14	-5.98	-24.34	-20.66	-26.12
-4.9	-5.5	-5.74	-10.49	14.16	-1.22	-5.67	-23.02	-20.18	-27.66
-4.8	-5.16	-6.02	-10.28	14.29	-0.28	-5.35	-21.78	-19.98	-29.93
-4.7	-5.17	-6.3	-9.94	14.42	0.7	-5.09	-20.98	-19.8	-32.89
-4.6	-5.19	-6.75	-9.58	14.56	1.72	-5.07	-20.2	-19.89	-35.89
-4.5	-5.44	-7.28	-9.28	14.67	2.49	-5.03	-19.76	-20.12	-37.84
-4.4	-5.72	-7.81	-9.13	14.79	3.23	-5.06	-19.36	-20.55	-37.25
-4.3	-6.18	-8.32	-9.1	14.91	3.99	-5.37	-19.23	-21.38	-35.13
-4.2	-6.72	-8.82	-9.09	15.03	4.72	-5.64	-19.23	-22.38	-33.08
-4.1	-7.4	-9.16	-9.23	15.16	5.44	-5.97	-19.47	-24.09	-30.96
-4	-8.2	-9.36	-9.6	15.27	5.95	-6.56	-19.92	-26.42	-28.65
-3.9	-8.99	-9.47	-10	15.38	6.47	-7.1	-20.72	-28.88	-26.28
-3.8	-9.7	-9.45	-10.44	15.48	7.01	-7.69	-21.99	-31.42	-24.13
-3.7	-10.29	-9.33	-11.02	15.57	7.57	-8.57	-23.61	-34.03	-22.95
-3.6	-10.64	-9.21	-11.6	15.66	8.07	-9.48	-25.5	-35.23	-22.04
-3.5	-10.75	-9.06	-12.1	15.76	8.53	-9.78	-27.63	-32.25	-21.17
-3.4	-10.73	-8.95	-11.72	15.86	8.99	-8.84	-29.63	-29.18	-20.62
-3.3	-10.45	-9.03	-10.54	15.97	9.46	-8.04	-31.37	-26.69	-20.31
-3.2	-10.17	-9.23	-9.22	16.07	9.94	-7.06	-32.47	-24.66	-20.03
-3.1	-9.83	-9.35	-7.74	16.16	10.33	-5.52	-28.97	-22.76	-19.82
-3	-9.49	-9.14	-6.14	16.26	10.73	-4.06	-25.47	-21.46	-19.74
-2.9	-8.93	-8.88	-4.5	16.35	11.13	-2.61	-23.36	-20.22	-19.7
-2.8	-8.35	-8.29	-2.87	16.45	11.54	-1	-21.44	-19.35	-19.68
-2.7	-7.39	-7.49	-1.33	16.55	11.93	0.64	-20.1	-18.7	-19.76
-2.6	-6.26	-6.33	0.14	16.64	12.24	2.06	-19.02	-18.21	-19.89
-2.5	-4.82	-4.56	1.57	16.71	12.55	3.11	-18.22	-17.98	-20.01
-2.4	-3.13	-2.53	2.86	16.78	12.88	4.18	-17.64	-17.87	-20.14
-2.3	-1.34	-0.64	3.96	16.84	13.21	5.19	-17.28	-17.87	-20.28
-2.2	0.46	1.08	5.03	16.91	13.49	6.07	-17.14	-17.97	-20.42
-2.1	2.22	2.72	6.03	16.98	13.73	6.97	-17.14	-18.09	-20.5
-2	3.86	4.23	6.89	17.05	13.97	7.8	-17.23	-18.24	-20.45
-1.9	5.37	5.64	7.68	17.13	14.21	8.52	-17.39	-18.41	-20.33
-1.8	6.8	6.97	8.44	17.19	14.45	9.26	-17.55	-18.57	-20.2
-1.7	8.11	8.08	9.12	17.25	14.63	9.92	-17.72	-18.7	-20.1
-1.6	9.37	9.18	9.73	17.3	14.82	10.46	-17.88	-18.83	-19.96
-1.5	10.44	10.08	10.32	17.36	15.01	11.01	-17.97	-18.76	-19.83
-1.4	11.51	10.9	10.89	17.42	15.21	11.49	-18.05	-18.62	-19.71
-1.3	12.34	11.67	11.37	17.48	15.4	11.89	-17.84	-18.47	-19.61
-1.2	13.15	12.36	11.84	17.54	15.52	12.29	-17.61	-18.32	-19.51
-1.1	13.87	13.03	12.3	17.56	15.66	12.65	-17.4	-18.16	-19.44
-1	14.56	13.6	12.68	17.58	15.8	12.96	-17.19	-18.05	-19.46
-0.9	15.16	14.13	13.02	17.6	15.94	13.28	-17.05	-17.98	-19.56
-0.8	15.71	14.61	13.34	17.63	16.04	13.55	-16.95	-17.98	-19.71
-0.7	16.2	15.02	13.6	17.65	16.11	13.77	-16.96	-18.11	-20.03
-0.6	16.61	15.38	13.8	17.68	16.18	13.99	-17.11	-18.34	-20.56
-0.5	16.96	15.68	13.98	17.69	16.25	14.15	-17.44	-18.78	-21.16
-0.4	17.23	15.9	14.15	17.7	16.32	14.25	-18.09	-19.54	-21.9
-0.3	17.44	16.1	14.26	17.71	16.33	14.37	-19.02	-20.45	-23
-0.2	17.6	16.22	14.35	17.72	16.34	14.43	-20.37	-21.91	-24.31





-0.1	17.69	16.31	14.43	17.74	16.35	14.45	-22.17	-23.6	-25.74
0	17.75	16.37	14.47	17.75	16.37	14.47	-24.04	-25.42	-27.32
0.1	17.73	16.35	14.45	17.75	16.36	14.43	-26.08	-27.67	-29.48
0.2	17.68	16.32	14.42	17.74	16.31	14.36	-27.66	-30.04	-31.82
0.3	17.53	16.17	14.35	17.72	16.26	14.29	-27.62	-29.86	-33.43
0.4	17.35	16	14.22	17.7	16.22	14.19	-27.11	-28.71	-32.91
0.5	17.05	15.76	14.07	17.68	16.19	14.05	-25.39	-26.92	-31.22
0.6	16.7	15.45	13.91	17.66	16.12	13.92	-23.21	-24.88	-28.79
0.7	16.27	15.09	13.67	17.62	16.03	13.72	-21.17	-22.86	-26.67
0.8	15.77	14.67	13.39	17.58	15.94	13.48	-19.26	-21.05	-24.93
0.9	15.21	14.18	13.08	17.54	15.85	13.23	-17.69	-19.47	-23.25
1	14.57	13.64	12.72	17.51	15.77	12.92	-16.62	-18.14	-21.8
1.1	13.85	13.01	12.28	17.47	15.62	12.57	-15.78	-17.25	-20.65
1.2	12.97	12.32	11.84	17.43	15.47	12.24	-15.34	-16.54	-19.59
1.3	12	11.52	11.36	17.38	15.31	11.86	-15.08	-16.08	-18.64
1.4	10.83	10.57	10.79	17.33	15.15	11.45	-15.06	-15.91	-18
1.5	9.52	9.57	10.19	17.28	14.97	11.06	-15.19	-15.79	-17.49
1.6	7.99	8.22	9.58	17.23	14.76	10.61	-15.54	-16.03	-17.01
1.7	6.25	6.85	8.8	17.18	14.55	10.11	-16.1	-16.3	-16.84
1.8	4.32	5.21	7.92	17.1	14.35	9.62	-16.84	-16.86	-16.85
1.9	2.13	3.42	7	17.01	14.14	9.06	-17.81	-17.6	-16.88
2	0.07	1.47	5.95	16.93	13.89	8.45	-19.16	-18.51	-17.04
2.1	-1.42	-0.74	4.7	16.85	13.62	7.85	-21.27	-19.74	-17.36
2.2	-2.41	-3.08	3.36	16.77	13.36	7.19	-23.61	-21.14	-17.76
2.3	-2.49	-4.14	1.98	16.68	13.1	6.5	-25.22	-23.18	-18.26
2.4	-1.81	-3.85	0.56	16.57	12.85	5.8	-26.09	-25.84	-18.99
2.5	-0.91	-3.23	-0.86	16.47	12.55	5.04	-26.23	-27.89	-19.89
2.6	0.31	-2.31	-2.26	16.36	12.24	4.27	-25.21	-28.36	-20.84
2.7	1.41	-1.24	-3.57	16.26	11.93	3.51	-23.9	-27.64	-22
2.8	2.02	-0.24	-4.72	16.17	11.63	2.69	-21.66	-26.38	-23.47
2.9	2.57	0.58	-5.67	16.04	11.32	1.85	-19.49	-24.01	-24.99
3	2.64	1.35	-6.24	15.92	10.96	1.03	-18.29	-21.65	-26.5
3.1	2.63	1.67	-5.12	15.8	10.58	0.12	-17.26	-20.21	-27.69
3.2	2.37	1.89	-4.01	15.66	10.2	-0.83	-16.58	-18.99	-28.73
3.3	2.01	1.9	-2.94	15.52	9.83	-1.76	-16.04	-18.07	-29.57
3.4	1.45	1.7	-2.19	15.36	9.43	-2.7	-15.72	-17.48	-28.89
3.5	0.76	1.4	-1.55	15.18	9.02	-3.65	-15.56	-17.02	-27.81
3.6	-0.15	0.88	-0.95	15.01	8.61	-4.58	-15.59	-16.79	-26.67
3.7	-1.28	0.21	-0.55	14.84	8.18	-5.53	-15.8	-16.69	-25.33
3.8	-2.68	-0.64	-0.31	14.67	7.76	-6.51	-16.18	-16.73	-23.89
3.9	-4.49	-1.71	-0.17	14.48	7.3	-7.48	-16.73	-16.93	-22.51
4	-6.84	-2.96	-0.16	14.28	6.84	-8.47	-17.48	-17.22	-21.42
4.1	-10.02	-4.51	-0.33	14.08	6.39	-9.47	-18.36	-17.65	-20.72
4.2	-14.43	-6.41	-0.58	13.89	5.93	-10.46	-19.43	-18.23	-20.21
4.3	-19.17	-8.71	-0.9	13.69	5.45	-11.59	-20.6	-18.86	-19.77
4.4	-25.01	-13.4	-1.4	13.48	4.93	-12.78	-22.04	-19.7	-19.56
4.5	-29.79	-18.61	-2.06	13.25	4.42	-13.98	-23.51	-20.56	-19.55
4.6	-24.44	-22.18	-2.81	13.01	3.92	-15.49	-25.27	-21.4	-19.59
4.7	-18.92	-24.35	-3.78	12.76	3.42	-17.19	-27.01	-22.2	-19.78
4.8	-16.2	-23.95	-5.05	12.52	2.87	-18.86	-28.38	-22.93	-20.13
4.9	-14.32	-19.9	-6.4	12.24	2.29	-20.65	-29.58	-23.44	-20.51
5	-13.65	-15.2	-8.02	11.94	1.73	-22.54	-30.26	-23.8	-20.95
5.1	-13.71	-12.7	-10.22	11.64	1.17	-24.43	-30.6	-23.86	-21.51
5.2	-14.25	-11.81	-12.73	11.35	0.63	-26.22	-30.77	-23.69	-22.14
5.3	-15.21	-11.37	-15.29	11.05	0.02	-28.46	-30.82	-23.5	-22.77
5.4	-16.25	-11.38	-17.73	10.72	-0.59	-31.36	-30.86	-23.36	-23.4
5.5	-17.18	-11.7	-19.72	10.36	-1.19	-32.26	-30.99	-23.28	-24.01
5.6	-17.76	-12.21	-20.99	10	-1.78	-31.47	-31.13	-23.3	-24.59
5.7	-17.42	-13.01	-21.03	9.65	-2.37	-29.82	-31.03	-23.61	-25.02
5.8	-16.34	-13.83	-18.71	9.29	-3.03	-27.53	-30.72	-24.01	-24.98
5.9	-15	-14.57	-16.67	8.88	-3.69	-25.38	-30.22	-24.82	-24.87
6	-13.31	-15.2	-14.97	8.45	-4.35	-23.62	-29.43	-25.77	-24.7
6.1	-11.82	-15.03	-13.95	8.01	-4.99	-22.53	-28.6	-27.44	-24.31
6.2	-10.75	-13.97	-13.11	7.57	-5.64	-21.75	-27.57	-29.96	-23.88
6.3	-9.87	-12.73	-12.38	7.12	-6.4	-20.93	-26.55	-32.49	-23.43
6.4	-9.39	-11.56	-12.09	6.59	-7.18	-20.33	-25.82	-33.38	-23.01
6.5	-9.09	-10.43	-12.14	6.05	-7.95	-19.93	-25.22	-33.41	-22.63
6.6	-9.02	-9.45	-12.35	5.51	-8.7	-19.52	-24.79	-32.57	-22.3
6.7	-9.11	-8.67	-12.8	4.98	-9.49	-19.22	-24.49	-30.78	-22.11



6.8	-9.36	-8.03	-13.52	4.38	-10.33	-18.99	-24.32	-28.78	-22.13
6.9	-9.84	-7.6	-14.36	3.71	-11.15	-18.73	-24.35	-26.91	-22.25
7	-10.44	-7.37	-15.13	3.03	-11.93	-18.53	-24.49	-25.21	-22.46
7.1	-11.3	-7.24	-15.59	2.36	-12.67	-18.39	-24.91	-23.74	-22.88
7.2	-12.23	-7.53	-15.65	1.69	-13.36	-18.24	-25.4	-23.06	-23.47
7.3	-13.32	-7.85	-15.55	0.84	-13.99	-18.16	-26.14	-22.44	-24.06
7.4	-14.45	-8.44	-15.05	-0.04	-14.55	-18.14	-26.97	-22.13	-24.71
7.5	-15.32	-9.19	-14.18	-0.92	-15.03	-18.09	-27.75	-21.99	-25.37
7.6	-16.01	-10.1	-13.2	-1.79	-15.42	-18.15	-28.52	-22.03	-25.98
7.7	-16.41	-11.28	-12.18	-2.66	-15.59	-18.32	-29.18	-22.33	-26.37
7.8	-16.48	-12.6	-11.23	-3.53	-15.71	-18.5	-29.73	-22.76	-26.39
7.9	-16.32	-14.32	-10.34	-4.37	-15.75	-18.77	-29.99	-23.54	-26.21
8	-15.93	-16.34	-9.55	-5.2	-15.72	-19.11	-29.76	-24.6	-25.83
8.1	-15.48	-17.94	-8.97	-6.01	-15.6	-19.41	-29.32	-25.91	-25.14
8.2	-15.24	-18.59	-8.6	-6.17	-15.4	-19.82	-28.95	-27.65	-24.25
8.3	-15.21	-18.6	-8.3	-6.18	-15.19	-20.35	-28.65	-29.61	-23.4
8.4	-15.38	-18.17	-8.14	-6.19	-14.95	-20.91	-28.43	-31.33	-22.64
8.5	-15.86	-17.07	-8.17	-6.19	-14.69	-21.59	-28.36	-32.26	-22.02
8.6	-16.47	-15.84	-8.23	-5.94	-14.45	-22.35	-28.38	-32.97	-21.42
8.7	-17.6	-14.8	-8.35	-5.36	-14.25	-23.06	-28.78	-31.89	-20.88
8.8	-18.78	-13.82	-8.77	-4.8	-14.07	-23.84	-29.18	-30.16	-20.56
8.9	-22.34	-13.22	-9.3	-4.25	-13.88	-24.74	-30.68	-28.45	-20.32
9	-26.12	-13	-9.89	-3.71	-13.66	-25.71	-32.25	-27.08	-20.12
9.1	-27.32	-12.97	-10.82	-3.22	-13.49	-26.57	-34.04	-25.98	-20.15
9.2	-27.52	-13.31	-11.94	-2.74	-13.38	-27.02	-35.98	-25.35	-20.29
9.3	-26.41	-13.87	-13.15	-2.27	-13.28	-27.49	-37.38	-25.01	-20.48
9.4	-24.36	-14.71	-15.31	-1.8	-13.16	-27.89	-38.32	-24.89	-20.93
9.5	-22.08	-15.91	-18.84	-1.44	-13.04	-27.98	-37.81	-25.07	-21.69
9.6	-19.91	-17.31	-23.13	-1.1	-13	-28.16	-35.48	-25.41	-22.56
9.7	-18.11	-19.07	-27.33	-0.76	-12.99	-28.04	-32.7	-26.02	-23.53
9.8	-16.97	-21.14	-29.12	-0.43	-12.98	-27.12	-30.8	-26.93	-24.71
9.9	-16.39	-22.93	-29.59	-0.16	-12.96	-26.25	-29.64	-28.05	-25.9
10	-16.03	-22.65	-27.81	0.06	-12.95	-25.43	-28.74	-29.82	-27.06
15	-20.19	-18.53	-18.26	-2.62	-27.12	-23.05	-25.6	-25.14	-29.03
20	-26.92	-17.14	-23.62	-12.51	-25.95	-37.46	-28.68	-27.23	-31.35
25	-32.75	-27.8	-27.12	-7.67	-29.06	-23.46	-31.63	-29.24	-38.03
30	-27.27	-27.75	-24.56	-11.85	-33.39	-30.91	-22.03	-44.25	-35.51
35	-30.42	-28.27	-31.52	-23.68	-27.16	-33.82	-26.61	-34.34	-36.54
40	-35.46	-31.68	-24.31	-26.03	-22.57	-24.43	-33.76	-40.2	-41.01
45	-31.47	-27.2	-29.81	-26.82	-25.92	-32.87	-40	-34.4	-32.38
50	-34.02	-32.87	-31.13	-21.19	-22.77	-28.64	-29.36	-38.84	-38.76
55	-36.43	-30.93	-32.93	-23.63	-22.91	-28.31	-42.57	-33.9	-38.77
60	-40.1	-40.21	-35	-22.61	-23.72	-24.53	-32.18	-43.33	-38.26
65	-40.8	-32.82	-27.74	-18.05	-27.87	-37.26	-32.87	-29.89	-33.21
70	-43.98	-37.4	-51.94	-20.82	-34.67	-46.98	-35.51	-32.67	-35.69
75	-48.01	-30.07	-38.9	-30.14	-32.64	-39.6	-35.61	-31.02	-43.9
80	-43.2	-36.31	-41.82	-22.95	-36.71	-45.09	-38.45	-37.57	-48.95
85	-59.34	-34.52	-35.55	-29.07	-43.31	-45.99	-48.37	-42.35	-35.37
90				-43.87	-35.22	-36.44			
95				-26.24	-36.53	-43.26			
100				-32.19	-45.38				
105				-39.56	-57.15				
110				-43.72					
115									
120									
125									
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