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

In the Matter of Application by	)	
	)	
SES AMERICOM, INC.	)	Call Signs S2807, E920698, E7169,
	)	E090060, KA288, KB27, E040303
For Special Temporary Authority to	)	
Test SES-1 at 142.5º W.L.	)	

REQUEST FOR SPECIAL TEMPORARY AUTHORITY

By this application, SES Americom, Inc. (doing business as "SES WORLD SKIES"),[1] respectfully requests space station and earth station special temporary authority ("STA") for a period of up to 30 days, commencing on or about April 24, 2010, to permit SES WORLD SKIES to perform in-orbit testing ("IOT") of its SES-1 spacecraft at 142.5º W.L. Specifically, SES WORLD SKIES requests: (1) authority to perform Tracking, Telemetry, Command, and Monitoring ("TTC&M") in order to position SES-1 at 142.5º W.L.; (2) authority to operate the TTC&M and communications payloads of SES-1 at 142.5º W.L. during IOT; and (3) authority to perform TTC&M in order to drift SES-1 to 101º W.L. following the completion of IOT. The call signs of the space station and earth stations for which STA is requested are listed in the caption above.[2]

SES WORLD SKIES has a pending application for a Commission license to operate SES-1 at 101º W.L. in the conventional C- and Ku-bands to replace SES WORLD

---

[1] On September 7, 2009, SES S.A. announced that the newly integrated operations of its two indirect subsidiaries, New Skies Satellites B.V. and SES Americom would be conducted under a single brand name, SES WORLD SKIES. The new brand name does not affect the underlying legal entities that hold Commission authorizations or U.S. market access rights.

[2] The TTC&M frequencies for the SES-1 satellite are at the edges of the conventional C- and Ku-band. *See* SES Americom, Inc., File Nos. SAT-RPL-20100120-00014 (Call Sign S2807) ("SES-1 Application"), Technical Narrative at 6.

SKIES' AMC-4 spacecraft[3] and recently amended the application to provide technical information concerning the satellite's 17/24 GHz Broadcasting Satellite Service ("BSS") payload.[4] SES WORLD SKIES requests authority to test the C-band, Ku-band, and 17/24 GHz BSS band payloads of SES-1 at 142.5º W.L. As discussed below, temporary operation of SES-1 at 142.5º W.L. rather than 101° W.L. will permit testing to occur without disruption to existing customers at 101º W.L. and will not adversely affect the operation of any adjacent satellites. SES WORLD SKIES seeks expedited action on this request because SES-1 is scheduled for launch on or about April 24, 2010.

Grant of STAs Will Serve the Public Interest. Grant of SES WORLD SKIES' request to test SES-1 at the 142.5º W.L. orbital position is in the public interest. By testing SES-1 at this location, SES WORLD SKIES will minimize the risk of interference and be able to ensure that SES-1 is fully operational at the time it arrives at its final orbital location, thereby avoiding any interruption in service that otherwise might be associated with spacecraft testing.

No Harmful Interference to Other Spacecraft. The testing of SES-1 at 142.5º W.L. will not cause harmful interference to the operations of any other spacecraft. No spacecraft with Ku-band operations currently operates within six degrees on either side of the 142.5º W.L. position. The closest satellite operating in a portion of the C-band frequencies is Inmarsat 2 F1 at 142° W.L. The in-orbit testing of SES-1 at 142.5° W.L. has been coordinated

---

[3] *See* SES-1 Application. The "conventional C-band" refers to the 3700-4200 MHz and 5925-6425 MHz frequencies. The "conventional Ku-band" refers to the 11.7-12.2 GHz and 14.0-14.5 GHz frequencies.

[4] *See* SES Americom, Inc., File No. SAT-AMD-20100309-00040 ("SES-1 Amendment"). The "17/24 GHz BSS" refers to the 17.3-17.8 GHz and 24.75-25.25 GHz frequencies. SES WORLD SKIES is not requesting authority to operate the 17/24 GHz BSS payload of SES-1 at 101º W.L. (*see* SES-1 Application, Narrative at 1 n.2), but requests authority herein to perform in-orbit testing of the payload at 142.5° W.L. to verify its performance characteristics.

with Inmarsat. The next closest C-band spacecraft are SES WORLD SKIES' AMC-7 and AMC-8 satellites, at 137º W.L. and 139º W.L., respectively. SES WORLD SKIES will manage the operations of its spacecraft to ensure that no harmful interference occurs. With respect to other 17/24 GHz BSS spacecraft, the only currently in-orbit spacecraft with a payload in the 17.3-17.7 GHz frequencies – DIRECTV RB-2A – will be located nearly forty degrees away from the requested IOT location at 102.765º W.L.[5] As a result, there should be no impact on that spacecraft. Moreover, in-orbit testing of the 17/24 GHz payload will not result in a power flux density at the earth's surface in the 17.3-17.7 GHz band that exceeds the applicable limits in Section 25.208(w) of the Commission's rules (*see* Attachment 1).

There is no material risk of space-path interference to Direct Broadcast Satellite ("DBS") spacecraft using the 17.3-17.8 GHz band for feeder links. Although the Commission has not yet finalized rules regarding the appropriate spacing between DBS and 17/24 GHz BSS satellites, there is consensus among the commenting parties that an orbital separation of no more than a few tenths of a degree will suffice to prevent interference.[6] The U.S. DBS orbital location that is closest to the proposed IOT location is more than five degrees away at 148º W.L., and that location is not currently occupied by an operational DBS spacecraft. In fact, the nearest operational DBS spacecraft is the Canadian-licensed Ciel 2 satellite at 129° W.L. – over thirteen degrees away.

---

[5] *See DIRECTV Enterprises, LLC*, Stamp Grant, File No. SAT-LOA-20090807-00085, Call Sign S2796 (granted Jan. 8, 2010).

[6] *See Establishment of Policies and Service Rules for the Broadcasting-Satellite Service at the 17.3-17.7 GHz Frequency Band and at the 17.7-17.8 GHz Frequency Band Internationally, and at the 24.75-25.25 GHz Frequency Band for Fixed Satellite Services Providing Feeder Links to the Broadcasting-Satellite Service and for the Satellite Services Operating Bi-directionally in the 17.3-17.8 GHz Frequency Band*, Report and Order and Further Notice of Proposed Rulemaking, FCC 07-76, 22 FCC Rcd 8842 at ¶ 186 (2007) ("*Reverse Band Order*") (commenters support minimum separation of 0.2-0.3 degrees between DBS and 17/24 GHz BSS satellites).

No Harmful Interference to Terrestrial Services. The SES-1 TT&C operations during the proposed drift and station-keeping maneuvers will not cause harmful interference to any co-primary terrestrial services. The C-band earth stations to be used in connection with the drift and in-orbit testing of the satellite (call signs E7169, E090060, KA288 and KB27) have been coordinated to communicate with satellites in the 101° to 142.5° W.L. orbital arc using the C-band frequencies. These earth stations will not exceed the maximum output EIRP density specified in their respective licenses. The TT&C operations will not result in a power flux density at the earth's surface that exceeds the applicable limits in Section 25.208(a) of the Commission's rules (*see* Attachment 1).

The proposed SES-1 IOT operations in the C-band are also not expected to cause harmful interference to co-primary terrestrial services. Some IOT procedures will require the satellite transponders to intermittently transmit a CW carrier for a short duration of time (less than five minutes) over a period of a couple of days. During such transmissions, the maximum satellite downlink PFD density is expected to exceed the PFD limits specified in Section 25.208(a), but only for the minimal amounts of time during IOT (*see* Attachment 1).

Testing of SES-1 will not cause harmful interference to terrestrial services in the 17.7-17.8 GHz and 24 GHz bands.[7] With respect to terrestrial licensees in the 17.7-17.8 GHz band, the power flux density at the earth's surface generated by the in-orbit testing of SES-1 will not exceed the limit of -115 dBW/m^2/MHz in Section 25.208(c) of the Commission's rules.[8]

---

[7] Earth station E040303 is located well outside of the exclusion zones listed in footnote US402 of the U.S. Table of Allocations for operations in the 17.6-17.7 GHz and 17.375-17.475 GHz frequencies. *See* 47 C.F.R. § 2.106.

[8] SES WORLD SKIES recognizes that the 17.7-17.8 GHz band is allocated to BSS internationally but not within the United States. *See* 47 C.F.R. § 2.106; *Reverse Band Order* at ¶ 55. SES WORLD SKIES respectfully requests a temporary waiver of the U.S. Table of Allocations for purposes of the in-orbit testing of the SES-1 spacecraft. The Commission has in

With respect to terrestrial services in the 24 GHz band, SES WORLD SKIES notes that the earth station it proposes to use for testing, E040303, is located in the Los Angeles-Riverside-Orange County Economic Area (BEA160). A search of the FCC ULS database indicates that there is no 24 GHz licensee for the entire BEA160 Economic Area. However, there are a number of DEMS licenses held by Fibertower Spectrum Holdings LLC authorized to operate in Standard Metropolitan Statistical Areas (SMSA) located within BEA160, and earth station E040303 lies within the SMSA for the WPNH293 DEMS license (*see* Attachment 2).[9] SES WORLD SKIES is in the process of coordinating the use of the E040303 earth station for IOT within the WPNH293 DEMS license and to the neighboring DEMS licenses (WPNH 292, WMT 306, WMT 314, WMT 337)**,** and will notify the Commission of the outcome of that coordination shortly. SES WORLD SKIES's assessment, subject to coordination confirmation, is that harmful interference to DEMS operations within WPNH293 or its neighboring call signs is not likely given the specific azimuth, high elevation angle, proximity and narrow beamwidth of the proposed IOT operations (*see* Attachment 3). The operation of E040303 for IOT is expected to have no impact on DEMS operations in adjacent SMSAs, as the predicted power flux

---

the past granted waivers of the U.S. Table of Allocations where such waiver would not result in harmful interference to lawful users of the band. *See, e.g., Northrop Grumman Space & Mission Systems Corporation*, 24 FCC Rcd 2330 (IB 2009) at ¶ 90. In this case, SES WORLD SKIES's IOT operations will not exceed the power flux density limits established by the Commission to protect terrestrial licensees in the 17.7-17.8 GHz band. As a result, terrestrial operations in this band will be fully protected.

[9] To the extent that the Commission concludes that 47 C.F.R. § 25.203(l) applies in these circumstances, SES WORLD SKIES respectfully requests a temporary waiver of the rule for purposes of the in-orbit testing of the SES-1 spacecraft. A waiver of the Commission's rules is warranted when a waiver would not undermine the purpose of the rule. *See, e.g., PanAmSat Licensee Corp.*, 17 FCC Rcd 10483, 10492 (Sat. Div. 2002). The purpose of the rule in question is to protect 24 GHz licensees that are authorized to operate within an entire Economic Area from interference from earth stations transmitting in the 24.25-24.75 GHz band. *See Reverse Band Order* at ¶ 127. In this case, there is no such EA-wide licensee and harmful interference is unlikely to result for the reasons stated herein.

density at the nearest SMSA boundaries is calculated well below the -114 dBW/m^2/MHz coordination trigger designed to protect 24 GHz Economic Area licensees (*see* Attachment 2).[10] To ensure Fibertower's DEMS operations are protected, SES WORLD SKIES will provide Fibertower with advance notice of its proposed IOT and provide a 24/7 point of contact during IOT.

In addition, and in any event, SES WORLD SKIES will conduct all IOT and drift operations on a non-harmful interference basis, and will cease transmissions promptly in the event any harmful interference is caused by such operations.

Radiolocation and Radionavigation. SES WORLD SKIES notes that there are Federal Government radiolocation systems allocated on a primary basis in the 15.7-17.3 GHz band and on a secondary basis in the 17.3-17.7 GHz band.[11] For the short duration of the proposed IOT of the 17/24 GHz BSS payload on SES-1, SES WORLD SKIES will accept the potential for interference caused to its communications links from such radiolocation systems, and will cease transmissions in the event its operations causes any harmful interference into such radiolocation systems.

SES WORLD SKIES also notes that a portion of the 24.75-25.25 GHz band is allocated on a co-primary basis to Federal government and non-Federal government radionavigation systems. In its 2007 *Reverse Band Order*, the Commission indicated that it was not aware of any radionavigation system operating in this band.[12] SES WORLD SKIES is also not aware of any such radionavigation systems. Accordingly, SES WORLD SKIES does not

---

[10] *See* 47 C.F.R. § 25.203(l).

[11] *See Reverse Band Order* at ¶¶ 129 *et seq.*

[12] *Id.* at ¶ 116 n.361.

anticipate that its proposed IOT operations could cause any harmful interference to such systems, but will of course cease transmissions in the event that any harmful interference is caused.

In addition, to facilitate coordination with Federal Government users, SES WORLD SKIES will accept conditions similar to the one imposed on grant of a recent DIRECTV request for an STA to conduct in-orbit testing in the same frequency band – namely, to provide a 24/7 point-of-contact during IOT and to provide appropriate notification 24 hours in advance of testing and after testing is completed.[13]

Protective Conditions. SES WORLD SKIES seeks authority to position and test SES-1 at 142.5° W.L., and to relocate the satellite to 101° W.L. once testing is completed, subject to the following (or similar) conditions:

(a) SES WORLD SKIES will coordinate its drift and test operations with all potentially affected operating satellite networks.

(b) During the drift of SES-1 to 142.5° W.L., and during the drift from 142.5° W.L. and 101° W.L., only the TT&C payload of the SES-1 spacecraft will be operated.

(c) No harmful interference will be caused to any lawfully operating satellite network or radio communication system and SES WORLD SKIES operations will cease immediately upon notification of harmful interference. Further, SES WORLD SKIES shall notify the Commission in writing that it has received such a notification within 14 days of receipt.

(d) SES WORLD SKIES will accept interference from any lawfully operating satellite network or radio communication system.

(e) Testing authority is limited to the conventional C- and Ku-band frequencies and the 17/24 GHz BSS frequencies (including the 17.7-17.8 GHz frequencies) at the 142.5° W.L. orbital location.

(f) During in-orbit testing, SES WORLD SKIES shall maintain the SES-1 space station within an east/west longitudinal station-keeping tolerance of +/-0.05 degrees of the 142.5° W.L. orbital location.

(g) Operations of the SES-1 space station at 142.5° W.L. are limited to in-orbit testing, and shall not include any provision of commercial services.

---

[13] *See* DIRECTV Enterprises, LLC, Stamp Grant, File No. SAT-STA-20091202-01525 (granted Feb. 21, 2010).

(h) The authorization is subject to change in any of its terms or cancellation in its entirety at any time upon reasonable notice, but without hearing, if in the opinion of the Commission, circumstances require.

(i) The temporary authority will commence on the date SES WORLD SKIES launches SES-1, currently scheduled for April 24, 2010, and terminate 30 days from that date.

(j) The 24/7 point of contact for SES WORLD SKIES during IOT and drift maneuvers is Dave Westlund, (805) 217-4415, dave.westlund@ses.com.

(k) SES WORLD SKIES will notify Fibertower (Joe Sandri, jsandri@fibertower.com, and Angela Parsons, aparsons@fibertower.com) 24 hours prior to the beginning of IOT in the 17/24 GHz BSS and after IOT has been completed.

(l) SES WORLD SKIES will notify the Air Force Frequency Management Agency (robert.lando@pentagon.af.mil, 703-428-1513) 24 hours prior to the beginning of IOT operations and after IOT operations have been completed.

(m) SES WORLD SKIES shall notify the Commission in writing no later than seven days after it has completed testing of SES-1 and commenced the move of SES-1 to its assigned orbital location.

SES WORLD SKIES hereby certifies that no party to this application is subject to a denial of federal benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. § 862.

For the foregoing reasons, SES WORLD SKIES respectfully requests special temporary authority to position and test SES-1 at 142.5º W.L. for a period of up to 30 days, commencing upon the launch of SES-1, and to relocate the spacecraft to 101° W.L. following the completion of in-orbit testing. Grant of the requested authority will permit testing of the spacecraft to occur without affecting services to customers and will permit a seamless transition of services. As noted above, SES WORLD SKIES is preparing to launch SES-1 on or about April 24, 2010, and requests expedited action on this application to accommodate that schedule.

Respectfully submitted,

SES AMERICOM, INC.

By: */s/ Daniel C.H. Mah*

Daniel C. H. Mah
Regulatory Counsel
SES Americom, Inc.
Four Research Way
Princeton, NJ 08540

Of Counsel
Karis A. Hastings
Hogan & Hartson L.L.P.
555 13th Street, N.W.
Washington, D.C. 20004-1109
Tel: (202) 637-5600

Dated: April 7, 2010

ATTACHMENT 1

This attachment provides information in support of applications of SES Americom, Inc. (doing business as "SES WORLD SKIES") for space station and earth station special temporary authority in connection with: (1) the proposed in-orbit testing ("IOT") of the SES-1 spacecraft, call sign S2807 at 142.5° W.L.; and (2) Tracking, Telemetry, Command, and Monitoring ("TTC&M") to position SES-1 at 142.5° W.L. and drift the spacecraft to its assigned orbital location of 101° W.L. following completion of IOT. The following SES WORLD SKIES earth stations will be used for IOT and TTC&M functions:

Call Sign	Location	Function	Frequencies
E7169	Woodbine, MD	Primary TTC&M to drift and maintain SES-1 at 142.5º W.L.	C-band TTC&M --Command: 6423.5 MHz --Beacons/Telemetry: 3700.5 MHz 4199.5 MHz
E090060	Sunset Beach, HI	Secondary TTC&M to drift and maintain SES-1 at 142.5º W.L.	C-band TTC&M --Command: 6423.5 MHz --Beacons/Telemetry: 3700.5 MHz 4199.5 MHz
E040303	Somis, CA	17/24 GHz BSS IOT at 142.5° W.L.	17/24 GHz BSS IOT -- 17.3-17.8 GHz; 24.75-24.25 GHz
KB27	Somis, CA	C-band IOT at 142.5° W.L.	C-band IOT -- 3700-4200 MHz; 5925-6425 MHz
KA288	Somis, CA	Ku-band IOT at 142.5º W.L. Secondary TTC&M during drift from 142.5º W.L. to 101° W.L.	Ku-band IOT -- 11.7-12.2 GHz; 14.0-14.5 GHz Ku-band TTC&M --Command: 14499.0 MHz --Beacons/Telemetry: 11701.0 MHz 12199.0 MHz
E920698	Woodbine, MD	Primary TTC&M to drift SES-1 from 142.5º W.L. to 101° W.L. after IOT	Ku-band TTC&M --Command: 14499.0 MHz --Beacons/Telemetry: 11701.0 MHz 12199.0 MHz

IOT of SES-1 will involve verifying the performance characteristics of the transponders and antenna patterns and will utilize in some cases saturating CW carriers in the

conventional C-band, Ku-band and 17/24 GHz BSS frequencies. The IOT will include the following tests: satellite power amplifier transfer characteristics; satellite transponder characteristics; antenna mapping; and EIRP and SFD, amplitude linearity, group delay amplitude response, polarization isolation, and attenuator checks. The earth stations utilized for the performance of the IOT will not exceed the maximum output EIRP density specified in their respective licenses.

The maximum satellite transmit power during IOT will be consistent with the values in the SES-1 Application, as amended, except for those tests that require the transmission of CW carriers for short periods of time (less than 5 minutes). These test procedures are required to verify the performance of the satellite in the linear and non-linear region and to precisely establish the operational point of the transponder amplifiers.

With respect to the PFD limits on the earth's surface, the nominal operation of the SES-1 TTC&M and the IOT procedures will result in the following:

- Satellite TTC&M operations in the C-band frequency bands will not exceed the PFD limit of -152 dBW/m^2/4 kHz (at the 5 degree elevation angle) specified in Section 25.208(a) of the Commission's rules. The PFD levels for the nominal TTC&M operations will be -166 dBW/m2/4 kHz, at all elevation angles, which is less than the operational PFD values of the SES-1 C-band transponders as presented in the SES-1 Application.
- The use of a CW carrier during C-band IOT will result in satellite emissions in the 3700 - 4200 MHz frequency band that exceed the Commission's PFD limits on the earth's surface in Section 25.208(a). However, the test duration is very short (in the order of 2 to

3 minutes, and certainly less than 5 minutes). SES WORLD SKIES will cease transmissions in the event of harmful interference.

- The use of a CW carrier during 17/24 GHz BSS IOT will result in satellite emissions in the 17.3-17.7 GHz frequency band that will not exceed the Commission's PFD limits on the earth's surface in Section 25.208(w). The resulting PFD values are shown in the SES-1 Amendment Technical Appendix at 8, section 7, table 4. In any event, the test duration will be very short (in the order of 2 to 3 minutes, and certainly less than 5 minutes). There should be no impact on other operational 17/24 GHz BSS systems since the closest operational system is DIRECTV RB-2A located forty degrees away at 102.765° W.L.
- The use of a CW carrier during 17/24 GHz BSS IOT will result in satellite emissions in the 17.7 -17.8 GHz frequency band that will not exceed the PFD limit of -115dBW/m^2/MHz at the earth's surface specified in Section 25.208(c) of the Commission's rules. In any event, the test duration will be very short (in the order of 2 to 3 minutes, and certainly less than 5 minutes). The resulting PFD values are shown in the SES-1 Amendment Technical Appendix at 8, section 7, table 4.

SES WORLD SKIES will terminate transmissions immediately upon notification of harmful interference resulting from the IOT operations.

19700 Janelia Farm Boulevard
Ashburn, VA 20147
(703) 726-5500
Fax (703) 726-5600
http://www.comsearch.com

COMSEARCH®

ATTACHMENT 2

March 11, 2010

****
*** CLIENT COPY ***
*** PLEASE MAIL ***
*** TO CUSTOMER ***

Re: SES Americom, Inc.
Moorpark, California
Temporary Transmit/Receive Earth Station
Operation Dates: 04/30/2010 - 06/30/2010
Job Number: 100311COMSJC09

********** REVISED TEMPORARY COORDINATION NOTICE **********

Dear Frequency Coordinator:

On behalf of SES Americom, Inc., we are forwarding the attached revised coordination data for a temporary transmit/receive earth station located at the site referenced above.

This earth station will transmit only on the satellite(s) and frequency or frequencies as described in the attached data. Please do not report cases involving 17 GHz facilities or problems involving non-active paths or frequencies outside the specified range. If your analysis identifies any unresolved 17 GHz potential interference cases, our client will accept these cases. This notice makes a minimal revision to the satellite arc.

If there are any questions concerning this coordination notice, please contact Comsearch.

Sincerely,

COMSEARCH

Jeffrey E. Cowles
Principal Frequency Planner

Enclosure(s)

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5660 http://www.comsearch.com

Date:	03/11/2010
Job Number:	100311COMSJC09

Administrative Information

Status	TEMPORARY (Operation from 04/30/2010 to 06/30/2010)
Call Sign	TEMP06
Licensee Code	P3210
Licensee Name	SES Americom, Inc.

Site Information — MOORPARK, CALIFORNIA

Venue Name	
Latitude (NAD 83)	34° 19' 32.0" N
Longitude (NAD 83)	118° 59' 44.0" W
Climate Zone	A
Rain Zone	4
Ground Elevation (AMSL)	310.0 m / 1017.1 ft

Link Information

Satellite Type	Geostationary
Mode	TR - Transmit-Receive
Modulation	No Modulation
Satellite Arc	142° W to 143° West Longitude
Azimuth Range	217.0° to 218.3°
Corresponding Elevation Angles	43.1° / 42.6°
Antenna Centerline (AGL)	3.66 m / 12.0 ft

Antenna Information		Receive		Transmit	
Manufacturer		Andrew Corporation		Andrew Corporation	
Model		5.6 Meter		5.6 Meter	
Gain / Diameter		59.0 dBi / 5.6 m		61.5 dBi / 5.6 m	
3-dB / 15-dB Beamwidth		0.19° / 0.36°		0.14° / 0.27°	
Max Available RF Power	(dBW/4 kHz)			15.5	
	(dBW/MHz)			15.5	
Maximum EIRP	(dBW/4 kHz)			77.0	
	(dBW/MHz)			77.0	
	(dBW)			77.0	
Interference Objectives:	Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
	Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%

Frequency Information	Receive 18.0 GHz	Transmit 25.0 GHz
Emission / Frequency Range (MHz)	N0N / 17300.0 - 17800.0	N0N / 24750.0 - 25250.0
Max Great Circle Coordination Distance	136.2 km / 84.6 mi	176.7 km / 109.8 mi
Precipitation Scatter Contour Radius	100.0 km / 62.1 mi	100.0 km / 62.1 mi

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5660 http://www.comsearch.com

Coordination Values	**MOORPARK, CA**			
Licensee Name	SES Americom, Inc.			
Latitude (NAD 83)	34° 19' 32.0" N			
Longitude (NAD 83)	118° 59' 44.0" W			
Ground Elevation (AMSL)	310.0 m / 1017.1 ft			
Antenna Centerline (AGL)	3.66 m / 12.0 ft			
Antenna Model	Andrew Corporation 5.6 Meter			
Antenna Mode	Receive 18.0 GHz		Transmit 25.0 GHz	
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%
Max Available RF Power			15.5 (dBW/4 kHz)	

			Receive 18.0 GHz		Transmit 25.0 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
0	14.34	133.74	-10.00	100.00	-10.00	100.00
5	14.44	137.48	-10.00	100.00	-10.00	100.00
10	14.21	140.78	-10.00	100.00	-10.00	100.00
15	14.29	143.97	-10.00	100.00	-10.00	100.00
20	14.30	146.73	-10.00	100.00	-10.00	100.00
25	16.81	151.21	-10.00	100.00	-10.00	100.00
30	11.89	148.05	-10.00	100.00	-10.00	100.00
35	12.58	149.38	-10.00	100.00	-10.00	100.00
40	12.54	149.26	-10.00	100.00	-10.00	100.00
45	12.57	148.48	-10.00	100.00	-10.00	100.00
50	9.15	143.88	-10.00	100.00	-10.00	100.00
55	9.14	142.03	-10.00	100.00	-10.00	100.00
60	9.15	139.73	-10.00	100.00	-10.00	100.00
65	10.84	138.25	-10.00	100.00	-10.00	100.00
70	10.82	135.11	-10.00	100.00	-10.00	100.00
75	14.56	133.77	-10.00	100.00	-10.00	100.00
80	13.85	129.61	-10.00	100.00	-10.00	100.00
85	13.64	125.60	-10.00	100.00	-10.00	100.00
90	12.17	121.04	-10.00	100.00	-10.00	100.00
95	12.16	117.00	-10.00	100.00	-10.00	100.00
100	9.60	112.21	-10.00	100.00	-10.00	100.00
105	9.96	108.25	-10.00	100.00	-10.00	100.00
110	9.87	104.13	-10.00	100.00	-10.00	100.00
115	9.85	99.99	-10.00	100.00	-10.00	100.00
120	8.19	95.71	-10.00	100.00	-10.00	100.00
125	6.89	91.59	-10.00	100.00	-10.00	100.00
130	8.15	87.52	-10.00	100.00	-10.00	100.00
135	9.36	83.34	-10.00	100.00	-10.00	100.00
140	9.05	79.24	-10.00	100.00	-10.00	100.00
145	9.83	75.01	-10.00	100.00	-10.00	100.00
150	8.14	71.31	-10.00	100.00	-10.00	100.00
155	8.88	67.15	-10.00	100.00	-10.00	100.00
160	6.94	63.91	-10.00	100.00	-10.00	100.00
165	4.97	61.04	-10.00	100.00	-10.00	100.00
170	4.95	57.57	-10.00	100.00	-10.00	100.00
175	2.38	55.73	-10.00	100.00	-10.00	100.40
180	2.38	52.76	-10.00	100.00	-10.00	100.40
185	0.69	51.25	-10.00	106.00	-10.00	142.70

COMSEARCH

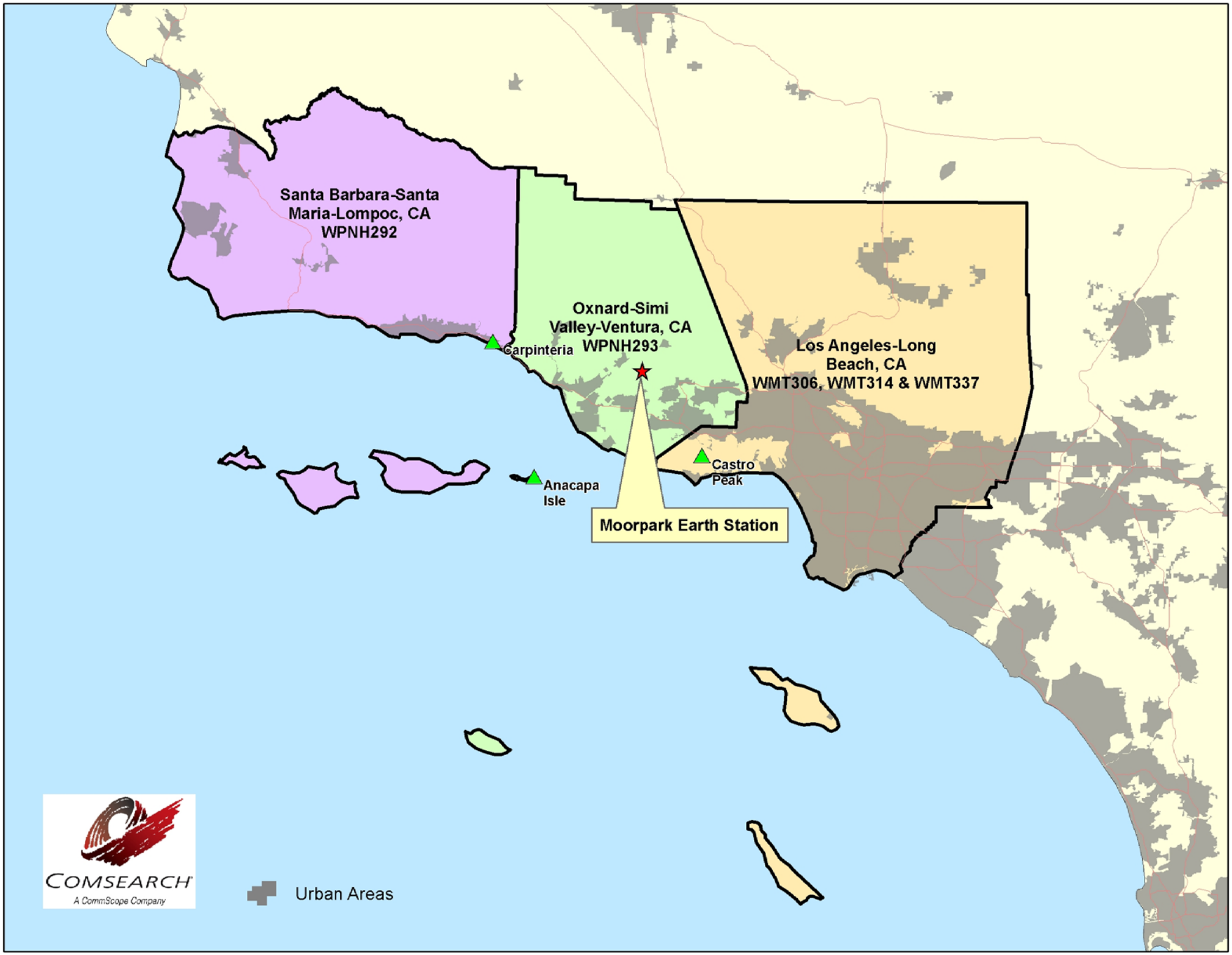
Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5660 http://www.comsearch.com

Coordination Values	**MOORPARK, CA**			
Licensee Name	SES Americom, Inc.			
Latitude (NAD 83)	34° 19' 32.0" N			
Longitude (NAD 83)	118° 59' 44.0" W			
Ground Elevation (AMSL)	310.0 m / 1017.1 ft			
Antenna Centerline (AGL)	3.66 m / 12.0 ft			
Antenna Model	Andrew Corporation 5.6 Meter			
Antenna Mode	Receive 18.0 GHz		Transmit 25.0 GHz	
Interference Objectives: Long Term	-156.0 dBW/MHz	20%	-151.0 dBW/4 kHz	20%
Short Term	-146.0 dBW/MHz	0.01%	-128.0 dBW/4 kHz	0.0025%
Max Available RF Power			15.5 (dBW/4 kHz)	

			Receive 18.0 GHz		Transmit 25.0 GHz	
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	49.44	-10.00	136.20	-10.00	176.70
195	1.28	46.32	-9.64	100.00	-9.64	125.10
200	2.54	43.37	-8.93	100.00	-8.93	101.10
205	2.29	42.07	-8.60	100.00	-8.60	106.90
210	2.56	40.73	-8.25	100.00	-8.25	103.20
215	3.48	39.22	-7.84	100.00	-7.84	100.00
220	3.08	39.54	-7.92	100.00	-7.92	100.00
225	0.97	42.05	-8.59	100.00	-8.59	135.20
230	2.27	41.69	-8.50	100.00	-8.50	107.60
235	3.66	41.83	-8.54	100.00	-8.54	100.00
240	4.74	42.80	-8.79	100.00	-8.79	100.00
245	6.11	44.08	-9.11	100.00	-9.11	100.00
250	6.34	46.67	-9.73	100.00	-9.73	100.00
255	7.57	48.96	-10.00	100.00	-10.00	100.00
260	7.42	52.38	-10.00	100.00	-10.00	100.00
265	8.32	55.48	-10.00	100.00	-10.00	100.00
270	8.32	59.19	-10.00	100.00	-10.00	100.00
275	11.13	62.08	-10.00	100.00	-10.00	100.00
280	11.91	65.94	-10.00	100.00	-10.00	100.00
285	11.58	70.18	-10.00	100.00	-10.00	100.00
290	9.87	74.68	-10.00	100.00	-10.00	100.00
295	10.52	78.76	-10.00	100.00	-10.00	100.00
300	11.05	82.94	-10.00	100.00	-10.00	100.00
305	11.87	87.17	-10.00	100.00	-10.00	100.00
310	13.14	91.48	-10.00	100.00	-10.00	100.00
315	13.24	95.84	-10.00	100.00	-10.00	100.00
320	13.82	100.24	-10.00	100.00	-10.00	100.00
325	14.04	104.62	-10.00	100.00	-10.00	100.00
330	14.82	109.10	-10.00	100.00	-10.00	100.00
335	13.83	113.20	-10.00	100.00	-10.00	100.00
340	14.63	117.66	-10.00	100.00	-10.00	100.00
345	15.87	122.27	-10.00	100.00	-10.00	100.00
350	16.95	126.85	-10.00	100.00	-10.00	100.00
355	17.37	131.18	-10.00	100.00	-10.00	100.00

ATTACHMENT 3



Moorpark PFD Calculations

Earth Station Name	Moorpark	Moorpark	Moorpark
Earth Station Transmitter Power (dBW)	15.5	15.5	15.5
Earth Station Modulation	N0N	N0N	N0N
Earth Station Transmit Power Density (dBW/MHz)	15.5	15.5	15.5
Receive Station Name	Carpinteria	Anacapa Isle	Castro Peak
Receive Station Latitude (DD-MM-SS N)	34-24-03.0	34-00-52.0	34-05-06.0
Receive Station Longitude (DDD-MM-SS W)	119-30-53.4	119-21-42.4	118-46-57.3
Receive Station Ground Elevation AMSL (m)	11.8	54.9	835.6
Receive Station Antenna Centerline Height (m)	30.0	30.0	30.0
ES to RS Distance (km)	48.5	48.3	33.1
ES to RS Azimuth (deg)	280.1	224.5	143.6
ES to RS Horizon Gain (dBi)	-10.0	-8.5	-10.0
ES to RS EIRP (dBW/MHz)	5.5	7.0	5.5
ES to RS EIRP (W/MHz)	3.5	5.0	3.5
Free Space PFD at RS (W/m^2/MHz)	1.2E-10	1.7E-10	2.6E-10
Free Space PFD at RS (dBW/m^2/MHz)	-99.2	-97.7	-95.9
20% OH Loss (dB)	98.8	50.9	43.6
20% PFD at RS (dBW/m^2/MHz)	-198.0	-148.6	-139.5
0.0025% OH Loss (dB)	47.7	40.2	36.5
0.0025% PFD at RS (dBW/m^2/MHz)	-146.9	-137.9	-132.4

Pathloss Calculations (NSMA Tropo)

Path data for case # 3	**MOORPARK**		**CARPINTERIA**	
Latitude	34 19 32.0		34 24 3.0	
Longitude	118 59 44.0		119 30 53.4	
Antenna Center Agl	12.01 ft.	3.66 m.	98.43 ft.	30.00 m.
Site Elevation Amsl	1017.11 ft.	310.00 m.	38.72 ft.	11.80 m.
Antenna Center Amsl	1029.12 ft.	313.66 m.	137.15 ft.	41.80 m.
Effective Antenna Ht ...	12.01 ft.	3.66 m.	98.43 ft.	30.00 m.
Horizon Distance	0.27 mi.	0.43 km.	5.67 mi.	9.13 km.
Horizon Elevation Amsl .	1323.23 ft.	403.30 m.	1059.76 ft.	323.00 m.
Ray Crossover Angle	245.46 mr.			
Terrain Delta Ht	548.76 ft.	167.25 m.		
Effective Distance	85.65 mi.	137.81 km.		
Pathlength	30.14 mi.	48.49 km.		
Azimuth	280.06 deg.		99.77 deg.	
Frequency	25000 MHz			
K Factor	1.33 (K)			

Radio Climate Phrase ... Continental Temperate Climate
Type of Path ..... Irregular Terrain
Free Space Path Loss ... 154.1 dB Atmospheric Loss ... 7.170 dB
Diff. Loss .... 1053.6 dB (1207.7 dB) Tropo. Loss ...108.5 dB (262.6 dB)
Terrain data type ..... 1.0 ARC Second

Losses	L-Fspl	Sigma	Controlling Propagation Mode	
252.9 dB	98.8 dB	4.4 dB	20. %	Tropospheric Scatter
233.0 dB	78.9 dB	8.2 dB	1. %	Tropospheric Scatter
219.9 dB	65.9 dB	10.9 dB	0.1 %	Tropospheric Scatter
210.7 dB	56.6 dB	12.9 dB	0.01 %	Tropospheric Scatter
201.8 dB	47.7 dB	14.8 dB	0.0025%	Tropospheric Scatter

The OH loss calculations considered a terrain profile of 341 points.
The list below shows the highest point in each fiftieth of the path length.

Dist. (km.)	Elev. (m.)	Obstr. (m.)	K=Inf. Clrnce. (m.)	K= 1.33 Clrnce. (m.)	Dist. (km.)	Elev. (m.)	Obstr. (m.)	K=Inf. Clrnce. (m.)	K= 1.33 Clrnce. (m.)
0.00	310.0	3.7	0.0	0.0	24.82	306.4	0.0	-131.9	-166.5
0.43	403.3	0.0	-92.0	-93.3	25.96	342.4	0.0	-174.3	-208.8
1.43	470.4	0.0	-164.7	-168.7	26.67	296.4	0.0	-132.3	-166.6
2.71	688.0	0.0	-389.5	-396.8	27.67	271.2	0.0	-112.7	-146.6
3.00	592.5	0.0	-295.6	-303.7	28.38	285.6	0.0	-131.1	-164.7
3.99	369.5	0.0	-78.2	-88.7	29.95	191.4	0.0	-45.7	-78.4
4.85	231.4	0.0	55.1	42.6	30.38	266.0	0.0	-122.7	-155.1
5.85	116.5	0.0	164.4	149.7	31.24	204.5	0.0	-65.9	-97.7
7.70	71.5	0.0	199.0	180.5	32.66	164.3	0.0	-33.7	-64.2
8.70	76.3	0.0	188.6	168.2	33.80	236.4	0.0	-112.2	-141.5
9.56	86.3	0.0	173.8	151.8	34.52	320.2	0.0	-200.0	-228.5
10.55	97.6	0.0	156.9	133.3	35.80	348.7	0.0	-235.7	-262.5
11.27	154.3	0.0	96.2	71.5	35.94	361.3	0.0	-249.1	-275.7
12.27	231.2	0.0	13.7	-12.5	37.80	266.5	0.0	-164.7	-188.6
12.84	257.5	0.0	-15.8	-42.8	38.08	306.4	0.0	-206.2	-229.6
13.83	168.2	0.0	67.9	39.6	39.37	323.0	0.0	-230.0	-251.2
15.12	261.7	0.0	-32.8	-62.6	39.79	275.9	0.0	-185.3	-205.7
15.55	227.0	0.0	-0.5	-30.7	40.79	217.1	0.0	-132.1	-150.6
16.97	237.6	0.0	-19.1	-50.6	42.22	203.2	0.0	-126.2	-141.8
18.40	401.7	0.0	-191.2	-223.8	42.79	166.8	0.0	-93.0	-107.4
19.40	465.4	0.0	-260.5	-293.8	43.79	134.5	0.0	-66.3	-78.5
19.68	421.8	0.0	-218.5	-251.9	44.64	58.1	0.0	5.3	-4.8
20.40	414.7	0.0	-215.4	-249.2	45.64	45.5	0.0	12.3	4.6
21.39	407.9	0.0	-214.2	-248.4	46.64	36.5	0.0	15.7	10.6
22.68	264.0	0.0	-77.5	-112.0	47.64	18.1	0.0	28.5	26.1
24.25	228.7	0.0	-51.0	-85.6	48.49	11.8	30.0	0.0	0.0

Pathloss Calculation (NSMA Tropo)

Path data for case # 4	**MOORPARK**		**ANACAPA ISLE**	
Latitude	34 19 32.0		34 0 52.0	
Longitude	118 59 44.0		119 21 42.4	
Antenna Center Agl	12.01 ft.	3.66 m.	98.43 ft.	30.00 m.
Site Elevation Amsl	1017.11 ft.	310.00 m.	180.00 ft.	54.86 m.
Antenna Center Amsl	1029.12 ft.	313.66 m.	278.43 ft.	84.86 m.
Effective Antenna Ht ...	12.01 ft.	3.66 m.	185.74 ft.	56.61 m.
Horizon Distance	0.62 mi.	1.00 km.	28.85 mi.	46.42 km.
Horizon Elevation Amsl .	1083.06 ft.	330.10 m.	1094.54 ft.	333.60 m.
Ray Crossover Angle	24.70 mr.			
Terrain Delta Ht	238.05 ft.	72.55 m.		
Effective Distance	79.43 mi.	127.81 km.		
Pathlength	30.01 mi.	48.28 km.		
Azimuth	224.48 deg.		44.27 deg.	
Frequency	25000 MHz			
K Factor	1.33 (K)			

Radio Climate Phrase ... Continental Temperate Climate
Type of Path ..... Two Single Knife Edges
Free Space Path Loss ... 154.0 dB Atmospheric Loss ... 7.138 dB
Diff. Loss .... 49.9 dB (204.0 dB) Tropo. Loss ... 74.8 dB (228.8 dB)
Terrain data type ..... 1.0 ARC Second

Losses	L-Fspl	Sigma	Controlling Propagation Mode
204.9 dB	50.9 dB	3.6 dB	20. % Diffraction
198.7 dB	44.6 dB	3.9 dB	1. % Diffraction
196.8 dB	42.8 dB	4.1 dB	0.1 % Diffraction
195.6 dB	41.6 dB	4.3 dB	0.01 % Diffraction
194.2 dB	40.2 dB	4.5 dB	0.0025% Diffraction

The OH loss calculations considered a terrain profile of 339 points.
The list below shows the highest point in each fiftieth of the path length.

Dist. (km.)	Elev. (m.)	Obstr. (m.)	K=Inf. Clrnce. (m.)	K= 1.33 Clrnce. (m.)	Dist. (km.)	Elev. (m.)	Obstr. (m.)	K=Inf. Clrnce. (m.)	K= 1.33 Clrnce. (m.)
0.00	310.0	3.7	0.0	0.0	24.28	8.8	0.0	189.8	155.4
0.71	324.8	0.0	-14.5	-16.5	25.28	6.8	0.0	187.0	152.8
1.00	330.1	-0.1	-21.1	-23.9	26.43	5.2	0.0	183.2	149.2
1.86	333.6	0.0	-28.7	-33.8	28.00	4.3	0.0	176.7	143.2
2.00	329.7	0.0	-25.5	-31.0	28.14	0.0	0.0	180.3	146.9
3.00	275.3	0.0	24.1	16.1	29.00	0.0	0.0	176.2	143.3
4.00	267.3	0.0	27.4	17.0	30.00	0.0	0.0	171.5	139.2
4.86	200.5	0.0	90.1	77.7	31.28	0.4	0.0	165.0	133.7
5.86	165.9	0.0	120.0	105.4	32.00	0.0	0.0	162.0	131.3
6.86	147.9	0.0	133.3	116.5	32.85	0.0	0.0	158.0	128.1
8.14	117.8	0.0	157.3	138.0	33.85	0.0	0.0	153.2	124.4
8.71	109.5	0.0	162.9	142.5	34.85	0.0	0.0	148.5	120.9
9.71	94.4	0.0	173.2	151.1	35.85	0.0	0.0	143.8	117.5
11.57	93.7	0.0	165.1	140.1	36.71	0.0	0.0	139.7	114.6
11.71	91.1	0.0	167.1	141.8	37.71	0.0	0.0	135.0	111.4
12.57	63.3	0.0	190.8	164.3	38.71	0.0	0.0	130.2	108.4
13.57	36.8	0.0	212.6	184.8	39.71	0.0	0.0	125.5	105.4
14.57	26.5	0.0	218.1	189.1	40.57	0.0	0.0	121.4	103.0
15.71	22.0	0.0	217.2	187.0	41.57	0.0	0.0	116.7	100.2
16.43	20.6	0.0	215.2	184.4	42.57	0.0	0.0	111.9	97.6
18.14	19.2	0.0	208.5	176.2	43.57	0.0	0.0	107.2	95.1
18.43	19.1	0.0	207.2	174.8	44.42	0.0	0.0	103.1	93.0
19.43	18.0	0.0	203.6	170.5	45.42	0.0	0.0	98.4	90.7
20.28	17.2	0.0	200.3	166.8	46.42	0.0	0.0	93.7	88.6
21.28	16.1	0.0	196.7	162.8	48.14	53.3	0.0	32.2	31.8
22.28	13.8	0.0	194.3	160.1	48.28	54.9	30.0	0.0	0.0
23.28	11.2	0.0	192.1	157.8					

Pathloss Calculation (NSMA Tropo)

Path data for case # 5	**MOORPARK**		**CASTRO PEAK**	
Latitude	34 19 32.0		34 5 6.0	
Longitude	118 59 44.0		118 46 57.3	
Antenna Center Agl	12.01 ft.	3.66 m.	98.43 ft.	30.00 m.
Site Elevation Amsl	1017.11 ft.	310.00 m.	2741.60 ft.	835.60 m.
Antenna Center Amsl	1029.12 ft.	313.66 m.	2840.03 ft.	865.60 m.
Effective Antenna Ht ...	12.01 ft.	3.66 m.	2113.26 ft.	644.09 m.
Horizon Distance	0.18 mi.	0.29 km.	20.41 mi.	32.84 km.
Horizon Elevation Amsl .	1189.36 ft.	362.50 m.	1189.36 ft.	362.50 m.
Ray Crossover Angle	157.67 mr.			
Terrain Delta Ht	468.35 ft.	142.74 m.		
Effective Distance	21.83 mi.	35.12 km.		
Pathlength	20.59 mi.	33.12 km.		
Azimuth	143.60 deg.		323.72 deg.	
Frequency	25000 MHz			
K Factor	1.33 (K)			

Radio Climate Phrase ... Continental Temperate Climate
Type of Path ..... Single Knife Edge
Free Space Path Loss ... 150.8 dB Atmospheric Loss ... 4.898 dB
Diff. Loss .... 43.6 dB (194.3 dB) Tropo. Loss ...101.9 dB (252.6 dB)
Terrain data type ..... 1.0 ARC Second

Losses	L-Fspl	Sigma	Controlling Propagation Mode
194.3 dB	43.6 dB	3.6 dB	20. % Diffraction
190.1 dB	39.4 dB	3.7 dB	1. % Diffraction
189.0 dB	38.2 dB	3.8 dB	0.1 % Diffraction
188.2 dB	37.4 dB	3.9 dB	0.01 % Diffraction
187.3 dB	36.5 dB	4.0 dB	0.0025% Diffraction

The OH loss calculations considered a terrain profile of 233 points.
The list below shows the highest point in each fiftieth of the path length.

Dist. (km.)	Elev. (m.)	Obstr. (m.)	K=Inf. Clrnce. (m.)	K= 1.33 Clrnce. (m.)	Dist. (km.)	Elev. (m.)	Obstr. (m.)	K=Inf. Clrnce. (m.)	K= 1.33 Clrnce. (m.)
0.00	310.0	3.7	0.0	0.0	17.13	257.1	0.0	342.0	325.9
0.29	362.5	0.0	-44.1	-44.6	17.28	267.6	0.0	333.9	317.8
1.29	297.5	0.0	37.6	35.2	18.42	247.5	0.0	373.1	357.1
1.43	301.5	0.0	36.0	33.3	18.56	263.6	0.0	359.3	343.4
2.00	246.5	0.0	100.5	96.8	19.70	233.9	0.0	408.1	392.5
3.14	295.4	0.0	70.6	65.0	20.27	246.2	0.0	405.3	389.9
3.86	239.6	0.0	138.3	131.6	21.13	275.2	0.0	390.6	375.6
4.00	219.0	0.0	161.3	154.4	21.42	346.1	0.0	324.4	309.6
4.71	171.7	0.0	220.5	212.6	22.27	394.1	0.0	290.7	276.4
5.43	157.0	0.0	247.1	238.2	22.56	376.6	0.0	313.0	298.9
6.57	166.0	0.0	257.1	246.8	23.27	294.1	0.0	407.3	393.8
6.71	134.5	0.0	291.0	280.5	23.99	281.4	0.0	431.9	419.0
7.42	117.4	0.0	320.0	308.7	24.99	274.2	0.0	455.8	443.8
8.57	147.7	0.0	308.7	296.3	25.70	274.4	0.0	467.5	456.2
8.85	220.6	0.0	240.6	227.9	26.13	322.1	0.0	426.9	416.1
9.85	246.0	0.0	231.8	218.3	26.70	307.0	0.0	451.5	441.4
10.57	235.1	0.0	254.6	240.6	27.70	408.1	0.0	367.1	358.2
10.71	215.8	0.0	276.3	262.1	27.84	411.4	0.0	366.2	357.5
11.28	130.6	0.0	371.0	356.5	29.13	332.1	0.0	466.9	460.0
11.99	84.3	0.0	429.2	414.3	29.70	433.9	0.0	374.6	368.6
13.14	83.0	0.0	449.5	434.0	29.84	427.5	0.0	383.4	377.6
13.85	290.7	0.0	253.7	238.0	31.13	403.5	0.0	428.8	425.1
13.99	278.7	0.0	268.1	252.3	31.70	544.8	0.0	297.0	294.3
15.13	200.4	0.0	365.4	349.4	32.41	745.5	0.0	108.2	106.8
15.71	195.7	0.0	379.7	363.5	32.98	824.3	0.0	38.9	38.6
16.42	236.0	0.0	351.3	335.1	33.12	835.6	30.0	0.0	0.0