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September 30, 2004

BY HAND DELIVERY

Ms. Marlene H. Dortch, Secretary
Federal Communications Commission
Office of the Secretary
c/o Natek, Inc., Inc.
236 Massachusetts Avenue, N.E.
Suite 110
Washington, DC 20002

Re: Written *Ex Parte* Presentation
ARINC Inc. SKYLink Application, File No. SES-LIC-20030910-01261

Dear Ms. Dortch:

By its counsel, ARINC Inc. ("ARINC") hereby provides supplemental information regarding its SKYLink Application. Specifically, ARINC submits:

(1) a copy of a signed coordination agreement between the National Aeronautics and Space Administration ("NASA") and ARINC;

(2) a copy of a signed coordination agreement between the National Science Foundation ("NSF") and ARINC; and

(3) a revised page 18 of the Technical Description that accompanied the SKYLink Application at Exhibit 3. The revised page 18 is marked as a revised page and is formatted to be a page-for-page replacement to the original page 18 of the Technical Description.

This submission completes the SKYLink Application file.

Kindly direct any questions regarding this material to the undersigned.

Sincerely,

Carl R. Frank

Enclosures

cc(w/encl.): Thomas Tycz, FCC
Steven Spaeth, FCC
Robert Nelson, FCC
Ed Davidson, NTIA
Robert Spearing, NASA
Tomas Gerely, NSF
Joseph A. Godles, Goldberg, Godles, Wiener & Wright (first class mail)
Philip L. Malet, Steptoe & Johnson LLP (first class mail)
Carlos M. Nalda, Steptoe & Johnson LLP (first class mail)

A Coordination Agreement
Between the National Aeronautics and Space Administration (hereinafter "NASA")
and ARINC, Incorporated (hereinafter "ARINC")
for Operation of the ARINC SKYLink[SM] AMSS
in the 14.0 – 14.5 GHz-Band

ARINC seeks to license and operate aeronautical mobile-satellite stations (AMSS) over the Continental United States (CONUS) on a secondary basis in the 14.0 to 14.5 GHz FSS band. The AMSS terminals are part of the SKYLink[SM] satellite communications system aboard general aviation and commercial aircraft using transponders in the Geostationary Satellite Orbit (GSO) arc. This Coordination Agreement has been prepared in compliance with the rules of the Federal Communications Commission (FCC) and the recommendations of the International Telecommunication Union (ITU) following the World Radiocommunication Conference WRC-03.

1. Overview

1.1 The 14.0 – 14.5 GHz-band has been allocated to mobile-satellite service, now including aeronautical mobile-satellite service, on a secondary basis, provided that airborne earth stations (AES) include specific protection to the Space Research Services (SRS) earth stations and to the Tracking and Data Relay Satellite System (TDRSS) within the 13.40 – 14.4 GHz-band

1.2 ARINC has filed an application for license authorization with the FCC on September 2, 2003, File Number SES-LIC-20030910-01261, to operate up to 1000 technically identical AES units in the 11.7 – 12.2 and 14.0 – 14.5 GHz-bands.

1.3 The ARINC AES receives from, and transmits to, the same GSO satellite transponder under control of a Ground Earth Station (GES) and Network Operations Center (NOC). They, and the terrestrial network to which they are connected, comprise the ARINC SKYLink[SM] system.

1.4 This Coordination Agreement has been prepared to ensure that operation of the SKYLink[SM] AESs conform to FCC requirements for protection of the SRS Network.

1.5 ARINC has the authority to negotiate and sign this Coordination Agreement for the SKYLink[SM] system and NASA has the authority to negotiate and sign this agreement for the TDRSS and SRS Network sites listed in Section 2.1.

2. Space Research Services Earth Stations

2.1 TDRSS Earth Station Sites

Table 1 provides a list of TDRSS Earth Stations sites currently requiring interference protection. Also provided are the TDRSS satellite orbital locations currently supported by each Earth Station site.

Earth Station Site	Latitude (D,M,S)	Longitude (D,M,S)	TDRSS Satellite Degrees East Long.*
Continental United States			
White Sands, New Mexico	N32 30' 18.686"	W106 36' 37.153"	-174
Antenna Size – 18.3 meter			-171
Antenna Gain – 66.4 dBi			-150
Elevation – 1456 m			-79
			-62
			-49
			-47
			-41
United States Territory[1]			
Guam	N13 36' 0"	E144 54' 0"	85
Antenna Size – 11 meter			-171
Antenna Gain – 61.9 dBi			-174

Table 1. Existing TDRSS Earth Station Sites

* Ephemeris data on existing TDRS spacecraft indicated in Table 1 may be found at the following Web sites:
http://oigl.gsfc.nasa.gov/scripts/foxweb.exe/homepage@app01?tdac=NKOB4PDFG9IULCBJ99TI (2 line element sets)
http://mmfd.gsfc.nasa.gov/FDD_prodicts.html (Other datasets)

2.2 Additional TDRSS Earth Station Sites

NASA may unilaterally add additional TDRSS earth station sites to the list in 2.1 above. . NASA is currently planning to add a new earth station on the east coast of the U.S. to communicate to a new geostationary TDRS orbit position, and another earth station outside

[1] Should ARINC extend operations outside of CONUS, it shall provide the same protection to NASA's TDRSS Earth Stations sites around the world (such as Guam) as will be provided to the other Station sites covered by this Agreement.

CONUS to communicate with an additional new geostationary TDRS orbit position, not yet defined. NASA will advise more details on these additional sites and TDRS positions once they have been finalized. NASA shall provide ARINC at least two months written notice of these and/or additional sites which may be using the 13.40 – 14.4 GHz-band for satellite to earth data relay or of changes in status to the existing sites. It is understood, however, that in emergency situations, such notice may be significantly shorter or waived altogether.

2.3 Earth Site Protection Limits

The TDRSS protection limits are listed in the Table 2 below.

Frequency Band	Interference Threshold Limit Measured at Antenna Output	Reference Percentage of Time
13.40 – 14.00 GHz	-176 dBW/ kHz	Never to be Exceeded
14.00 – 14.05 GHz	-146 dBW/ MHz	Never to be Exceeded
14.05 – 14.40 GHz	-100 dBW	Never to be Exceeded

Table 2. TDRSS Protection Limits

For interference calculations, the TDRS spacecraft can have an inclination angle up to 15 degrees. In calculating the interference threshold levels in Table 2, the antenna patterns in Figure 1 below should be used.

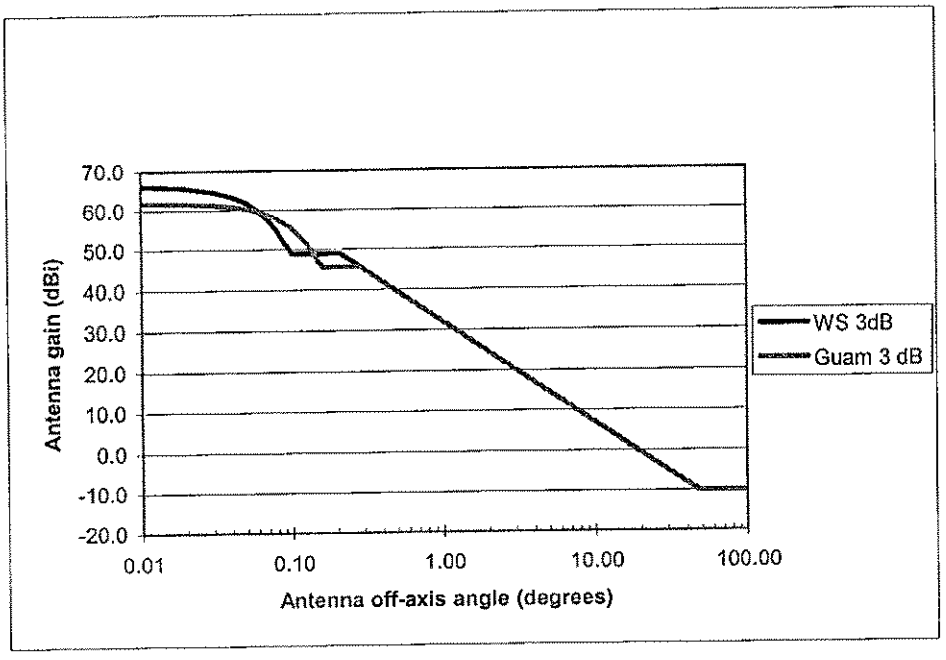


Figure 1. TDRS Earth Station Antenna Gain Patterns

Note that the antenna pattern in Figure 1 is calculated using Annex III of Appendix 8 of the ITU Radio Regulations, with the following modifications:

$G_1 = 5 + 15\log(D/\lambda)$
$\varphi_r = 12.02\ (D/\lambda)^{-0.6}$

Where Gmax and D are given in Table 1.

3. Operational Coordination Agreement

NASA and ARINC agree to the following:

The purpose of this Coordination Agreement is to provide protection to the TDRSS Earth Station sites listed in Table 1 and any future TDRSS Earth Station sites.

The level of protection afforded to the sites in Table 1, and any future TDRS earth station sites which NASA adds to Table 1 pursuant to Section 2.2 of this Agreement, shall be equal to or greater than the Interference Threshold Limits shown in Table 2.

3.1 This Coordination Agreement may be reviewed periodically by the signatories to the agreement beginning within a year following commencement of service by ARINC under an operational license from the FCC. The purpose of the review is to assess the effectiveness of this agreement and update this, or successor operational agreements, as appropriate.

3.2 Each party shall inform the other party in a timely manner of changes in the points of contact as defined in Section 5.

3.3 FINANCIAL OBLIGATIONS: Each party shall be responsible for funding its own responsibilities under this Agreement. No provision of this Agreement shall be interpreted to require obligation of funds in violation of the Anti Deficiency Act 31 U.S.C § 1341.

ARINC agrees to:

3.4 Monitor, control and cease transmissions from any AES that would exceed the thresholds given in Table 2 within line-of-sight of the sites listed in Table 1.

3.5 Monitor, control and cease transmissions from any AES that would exceed the thresholds given in the Table 2 within line-of-sight of such additional sites as NASA may require.

3.6 Respond expeditiously to a NASA request for protection of the sites listed in Section 2.1, or additions thereto as provided for in Section 2.2, in accordance with the threshold limits of Section 2.3.

3.7 Respond expeditiously to a NASA request to isolate a source of interference to a TDRSS Earth Station suspected to be from an AES.

NASA agrees to:

3.8 Maintain an open dialog with ARINC concerning any perceived breach of interference thresholds that may be attributable to an AES that is not in compliance with this Coordination Agreement.

3.9 Provide timely notification to ARINC of changes or additions to TDRSS earth station sites, TDRS spacecraft orbital positions or interference thresholds listed in this Coordination Agreement.

4. Assignment and Termination

4.1 This Coordination Agreement shall be binding upon the parties hereto and their respective successors and assigns.

4.2 This Coordination Agreement may be terminated by either party upon 6 months written notice to the other.

4.3 CONTINUING OBLIGATIONS: The obligation of ARINC to protect the NASA TDRSS Earth Stations from interference as described in this Agreement will survive termination or expiration of this Agreement.

5. Points of Contact

5.1 Points of contact concerning this Coordination Agreement:

Name: David P. Struba
Title: Director NASA Spectrum Policy
Organization: NASA
Address: NASA Headquarters
Washington D.C. 20546-0001

Telephone: (202) 358-4808
Facsimile: (202) 358-2865
e-mail: David.Struba@nasa.gov

Name: Timothy Leiss
Title: Contracts Administrator
Organization: ARINC, Inc.
Address: ARINC, Inc.
2551 Riva Road
Annapolis, MD 21401
Telephone: (410)-266-2991
Facsimile: (410)-266-2110
e-mail: tleiss@arinc.com

5.2 Points of contact for technical concerns related to this Coordination Agreement:

Name: Roger D. Porter
Title: Goddard Spectrum Manager
Organization: NASA
Address: Goddard Space Flight Center
Mission Services Program Office
Greenbelt, MD 20771
Telephone: (301) 286-5089
Facsimile: (301) 286-1724
e-mail: Roger.Porter@gsfc.nasa.gov

Name: William Kolb
Title: Sr. Director
Organization: ARINC, Inc.
Address: ARINC Inc.
2551 Riva Road
Annapolis, MD 21401
Telephone: (410)-266-4017
Facsimile: (410)-573-3026
e-mail: wkolb@arinc.com

6. Signatures

This Coordination Agreement is being made in good faith by both parties and is effective on the date of final signature.

For: The National Aeronautics and Space Administration:

By: Robert E. Spearing

Name: Robert E. Spearing

Title: Associate Assistant Administrator
For Space Communications

Date: 3 Sept. 2004

For: ARINC Incorporated:

By: Timothy J. Leiss

Name: Timothy J. Leiss

Title: Senior Subcontracts Specialist

Date: SEPT. 2, 2004

A Coordination Agreement Between the National Science Foundation (hereinafter "NSF") and ARINC, Incorporated (hereinafter "ARINC") for Operation of the ARINC SKYLink AMSS and Radio Astronomy Sites Jointly Sharing the 14.0 – 14.5 GHz-Band

ARINC seeks to license and operate aeronautical mobile-satellite stations (AMSS) over the Continental United States (CONUS) on a secondary basis in the 14.0 to 14.5 GHz FSS band. The AMSS terminals are part of the SKYLink[SM] satellite communications system aboard general aviation and commercial aircraft using transponders in the Geostationary Satellite Orbit (GSO) arc. This Coordination Agreement has been prepared in compliance with the rules of the Federal Communications Commission (FCC) and the recommendations of the International Telecommunication Union (ITU) in effect following the World Radiocommunication Conference WRC-03.

1. Overview

1.1 The 14.0 – 14.5 GHz-band has been allocated to mobile-satellite service, now including aeronautical mobile-satellite service, on a secondary basis, provided that airborne earth stations (AES) include specific protection to the radio astronomy service within the 14.47 – 14.50 GHz-band

1.2 The 14.47 – 14.50 GHz-band is allocated to radio astronomy service on a secondary basis.

1.3 ARINC. has filed an application for license authorization with the FCC on September 2, 2003, File Number SES-LIC-20030910-01261, to operate up to 1000 technically identical AES units in the 11.7 – 12.2 and 14.0 – 14.5 GHz-bands.

1.4 These AESs receive from, and transmit to, the same transponder under control of a Ground Earth Station (GES) and Network Operations Center (NOC). They, and the terrestrial network to which they are connected, comprise the ARINC SKYLink[SM] system.

1.5 This Coordination Agreement has been prepared to ensure that operation of the SKYLink AESs conform to the requirements of the FCC and the recommendations of the ITU for radioastronomy protection.

1.6 ARINC has the authority to negotiate and sign this Coordination Agreement for the SKYLink system and the Electromagnetic Spectrum Unit of the NSF has the authority to negotiate and sign this agreement for the Radio Astronomy sites listed in Section 2.1.

2. National Science Foundation Radio Astronomy Observatories

2.1 Site Table

Following is a list of NSF supported Radio Astronomy sites within the United States and its territories which may make observations in the 14.47 – 14.50 GHz-band. Two different levels of protection are provided for these sites during periods when they are performing observations, as detailed in Section 3.

Observatory	Latitude (D,M,S)	Longitude (D,M,S)
National Radio Astronomy Observatory (NRAO) sites:		
Green Bank, WV (National Radio Quiet Zone)	38 25 59	79 50 24
Socorro, NM	34 04 43	107 37 04
National Astronomy and Ionosphere Center (NAIC) site:		
Arecibo, PR (tentative addition to site list)	18 20 46	66 45 11
Very Long Base Array sites, CONUS:		
Kitt Peak, AZ	31 57 22	111 36 42
Owens Valley, CA	37 13 54	118 16 34
N. Liberty, IA	41 46 17	91 34 26
Hancock, NH	42 56 01	71 59 12
Los Alamos, NM	35 46 30	106 14 42
Pie Town, NM	34 18 04	108 07 07
Ft. Davis, TX	30 38 06	103 56 39
Brewster, WA	48 07 53	119 40 55
Very Long Base Array sites, off shore		
Mauna Kea, HI	19 48 16	155 27 29
St. Croix, VI	17 45 31	64 35 03

2.2 Additional Radio Astronomy Sites

Additional Radio Astronomy sites may be added to the list in 2.1 above. NSF shall give ARINC. at least two months notice of additional sites which may be using the 14.47 – 14.50 GHz-band for observations or of changes in status to the existing sites.

3. Operational Coordination Agreement

NSF and ARINC agree to the following:

3.1 The purpose of this Coordination Agreement is to provide protection to the Radio Astronomy sites listed in the site Table of 2.1 during periods of observations in the 14.47 – 14.50 GHz-band to the following aggregate power flux density (pfd) levels within that band:

a. -221 dBW/m^2/Hz, for the Green Bank, Socorro and Arecibo sites
b. -189 dBW/m^2/Hz, for the VBLA sites

3.2 This Coordination Agreement should be reviewed periodically by all signatories to the agreement beginning within a year following commencement of service by ARINC under an operational license from the FCC. The purpose of the review is to assess the effectiveness of this agreement as well as to update this, or successor operational agreements, as applicable.

3.3 Each party shall inform the other party in a timely manner of changes in the points of contact as defined in Section 5.

ARINC agrees to:

3.4 Cease transmissions from AESs in the 14.47 – 14.50 GHz-band, within line-of-sight of Radio Astronomy sites listed in the site Table of 2.1, during periods of notified radio astronomy observations.

3.5 Control the AES transmitters so that the pfd levels in the 14.47 – 14.50 GHz-band, produced by individual AES, measured at the radio astronomy sites during periods of notified observation, do not exceed the following levels:

pfd (dBW/m^2/MHz) = -182 + 0.5 * θ for $\theta \leq 10°$
pfd (dBW/m^2/MHz) = -177 for $10° < \theta \leq 90°$
where θ is the angle of arrival at the receiving site

This will be accomplished by operating on transponders that are sufficiently removed from the RA frequencies and by reducing or ceasing AES transmissions in the vicinity of Radio Astronomy sites during periods of notified radio astronomy observations.

3.6 Respond expeditiously to an NSF request for protection in accordance with Sections 3.4 and 3.5 of any site listed in site Table 2.1, for observations of special transient celestial objects (comets, supernovae and other celestial objects of heretofore unknown type) that are not anticipated by the observation schedule in Section 3.7, and that may need to be

accommodated on shorter notice. Requests for such observations are not expected to exceed 40 hours per calendar year.

NSF agrees to:

3.7 Maintain an observation schedule in the 14.47 – 14.50 GHz-band for the sites listed in the site Table 2.1 and provide this schedule via both e-mail and fax to the designated points of contact listed in Section 5.2 below at least 7 days prior to the scheduled observations.

3.8 Provide through NAIC and NRAO full access to ARINC. representatives to data relating to interference in the 14.47 – 14.50 GHz-band that may be collected during observations that fall within the scope of this Coordination Agreement.

4. Assignment and Termination

4.1 This Coordination Agreement shall be binding upon the parties hereto and their respective successors and assigns.

4.2 This Coordination Agreement may be terminated by either party upon 6 months of notice.

5. Points of Contact

5.1 Points of contact concerning this Coordination Agreement:

Contact: Dr. Tomas E. Gergely
Title: Electromagnetic Spectrum Manager
Organization: National Science Foundation
Address: 4201 Wilson Boulevard, Room 1030
Arlington VA 22230 USA
Telephone: (703)-292-4896
Facsimile: (703)-292-9034
e-mail: tgergely@nsf.gov

Name: Timothy Leiss
Title: Contracts Administrator
Organization: ARINC
Address: 2551 Riva Road
Annapolis MD 21401 USA
Telephone: (410)-266-2991
Facsimile: (410)-266-2110
e-mail: tleiss@arinc.com

5.2 Points of contact for Radio Astronomy observation schedules:

Contact: Dr. Harvey Liszt
Title: Director, Spectrum Management
Organization: NRAO
Address: 520 Edgemont Rd.
Charlottesville, Va. 22903
Telephone: (434)-296-0344
Facsimile: (434)-296-0278
e-mail: hliszt@nrao.edu

Name: William Kolb
Title: Sr. Director
Organization: ARINC, Inc.
Address: 2551 Riva Road
Annapolis MD 21401 USA
Telephone: (410)-266-4017
Facsimile: (410)-573-3026
e-mail: wkolb@arinc.com

6. Signatures

This Coordination Agreement is being made in good faith by both parties and is effective on the date on which the later party signs it. It may be executed in one or more counterparts, each of which will be deemed an original, and all of which together will constitute one and the same instrument.

For National Science Foundation:

By: _____

Name: Dr. Tomas Gergely
Title: Electromagnetics Spectrum Manager

Date: Sept. 24, 2004

For ARINC Incorporated.

By: _____

Name: Timothy Leiss
Title: Senior Subcontracts Specialist

Date: SEPT. 2, 2004

Attachment A

The ARINC SKYLink℠ Plan To Protect Radio Astronomy

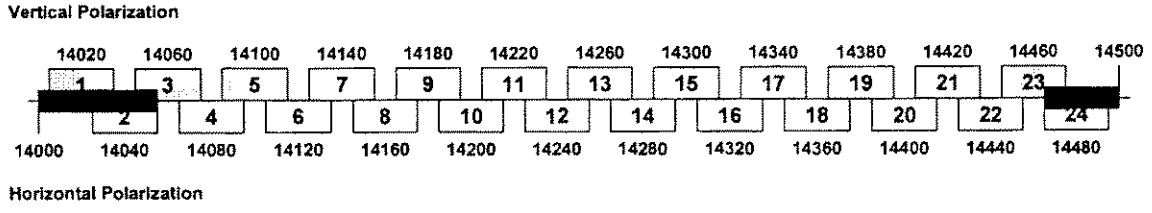
Overview

There are three methods that will be employed to provide protection from interference to the NSF radioastronomy sites. Those methods are transponder frequency selection, AES transmission power control and geographical avoidance of the sites.

There are two different protection criteria identified by the NSF. Interference thresholds for the Arecibo, PR, the Green Bank WV and the Socorro, NM sites are -221 dBW/m^2/Hz and for the Very Long Base Array sites, -189 dBW/m^2/Hz, aggregate power flux density.

Transponder Frequency Selection

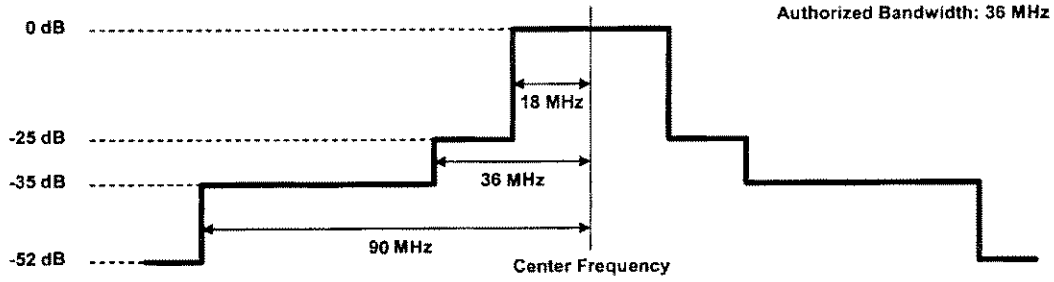
Figure 1 depicts a Fixed Satellite Service (FSS) satellite in a geostationary arc to service the continental United States (CONUS) with frequency allocations of individual transponders.



Uplink Band, 14000-14500 MHz, Divided Among 24 Transponders

Figure 1 CONUS FSS Satellite

By inspection of Figure 1, we accept that it is not practical to allow SKYLink to use transponders 23 or 24 (and, by extension, transponders 1,2, and 3). The question then becomes one of how much attenuation can be achieved by frequency separation. Section 25.202(f) of the FCC rules imposes the spectral mask shown in Figure 2, below.



Individual Transponder Spectral Mask per 25.202(f)

Figure 2 36MHz Transponder Spectral Mask

In fact, the spectral output of the SKYLink AES is considerably better than this mask. From the output spectrum shown below in Figure 3 we see that beginning at 36 MHz away from the center frequency, the Power Spectral Density (PSD) is down 55 dB and beyond 40 MHz is generally 65 dB below the specified PSD. That also precludes use of transponder 22 during active radioastronomy use and transponder 4 at the Government Services end of the spectrum.

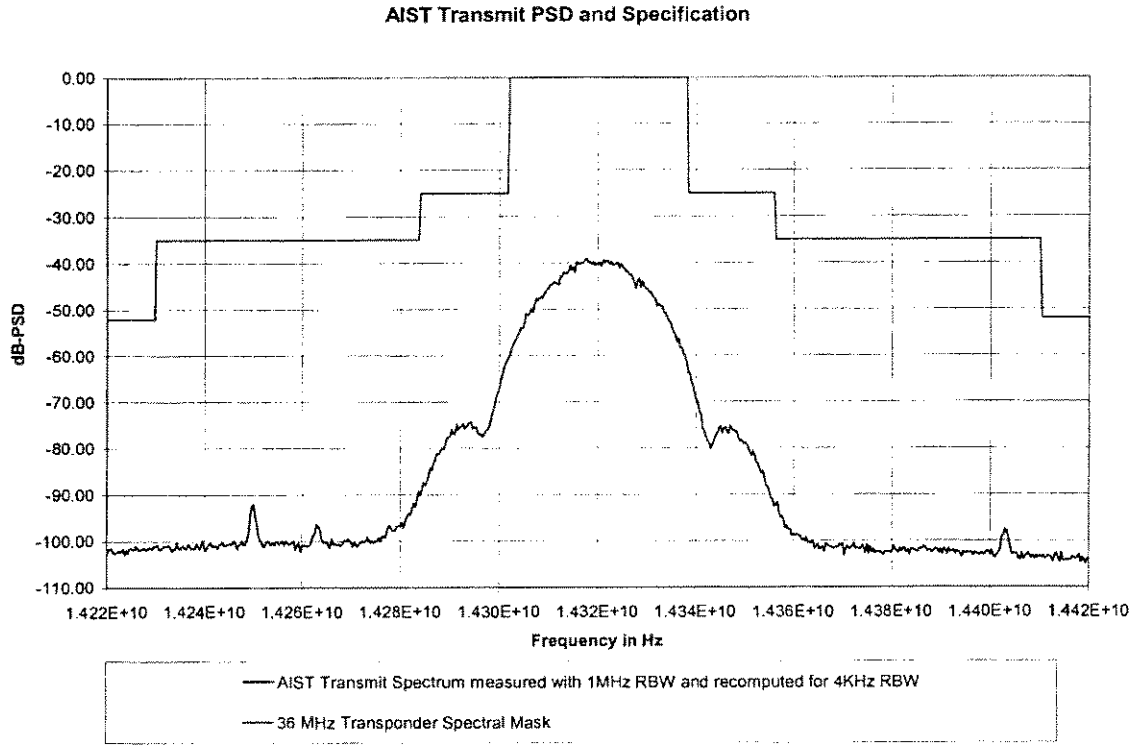


Figure 3 SKYLink AES Power Spectral Density

NSF Coordination Agreement

The key finding is that only transponders 5-21, corresponding to frequencies in the 14.08 – 14.44 GHz range, are practical for the SKYLink service, with some additional attenuation necessary. The SKYLink service will be launched using transponder 16, which affords significant frequency separation from radioastronomy observation frequencies. As the SKYLink service expands to other transponders in the future, the transponders selected will be limited to those between 5 and 21, to preserve the frequency separation from radioastronomy and from US Government Services.

AES Transmission Power Control

The SKYLink system has been designed to be compliant with the Recommendation ITU-R M.1643, Annex 1, Part C, which has been accepted and implemented by the Federal Communications Commission subsequent to the World Radiocommunication Conference WRC-03. Figure 4 shows the limitations imposed on a single AES by that Recommendation for both radioastronomy and for the National Radio Quiet Zone surrounding Green Bank, WV.

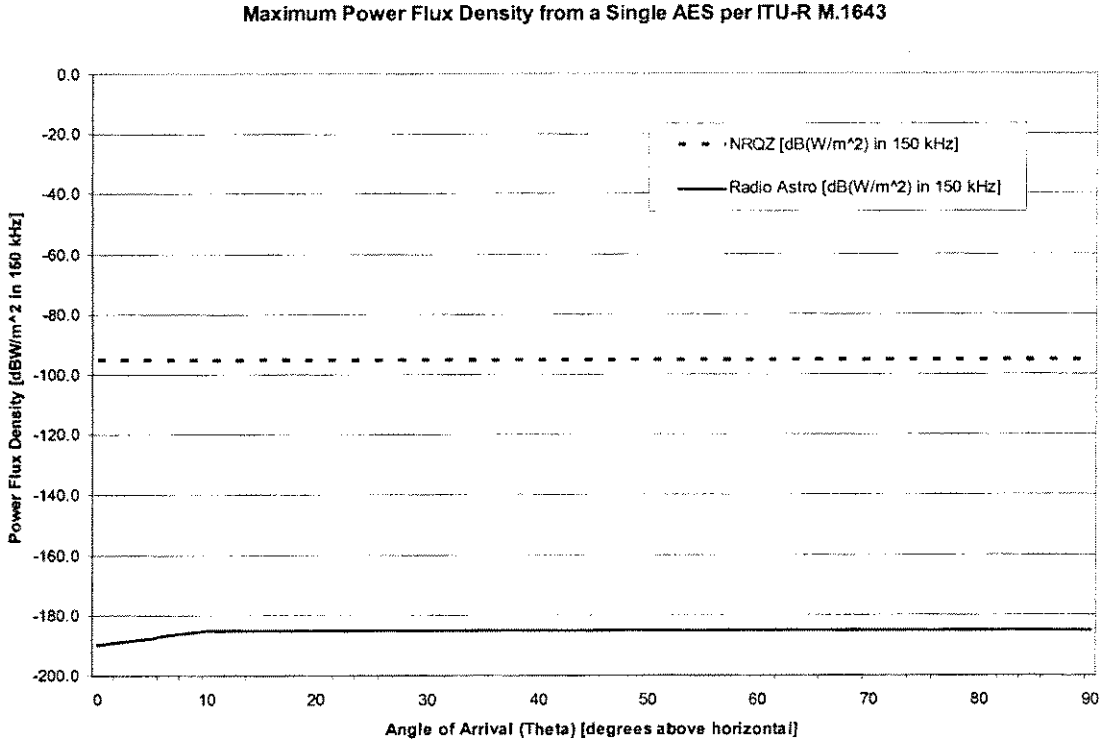


Figure 4 Maximum Permitted PFD from a Single AES for Radioastronomy Protection

Annex 2 to that same Recommendation ITU-R M.1643 establishes the derivation of a "lower hemisphere" EIRP mask, for aircraft at a given altitude, that yields power flux densities on the ground that comply with the limits established in Annex 1. There is a different mask for each altitude, with the allowable EIRP directly proportional to the aircraft altitude and the corresponding emission angle below the local horizontal. Figure 5 shows those relationships with respect to the radioastronomy limits.

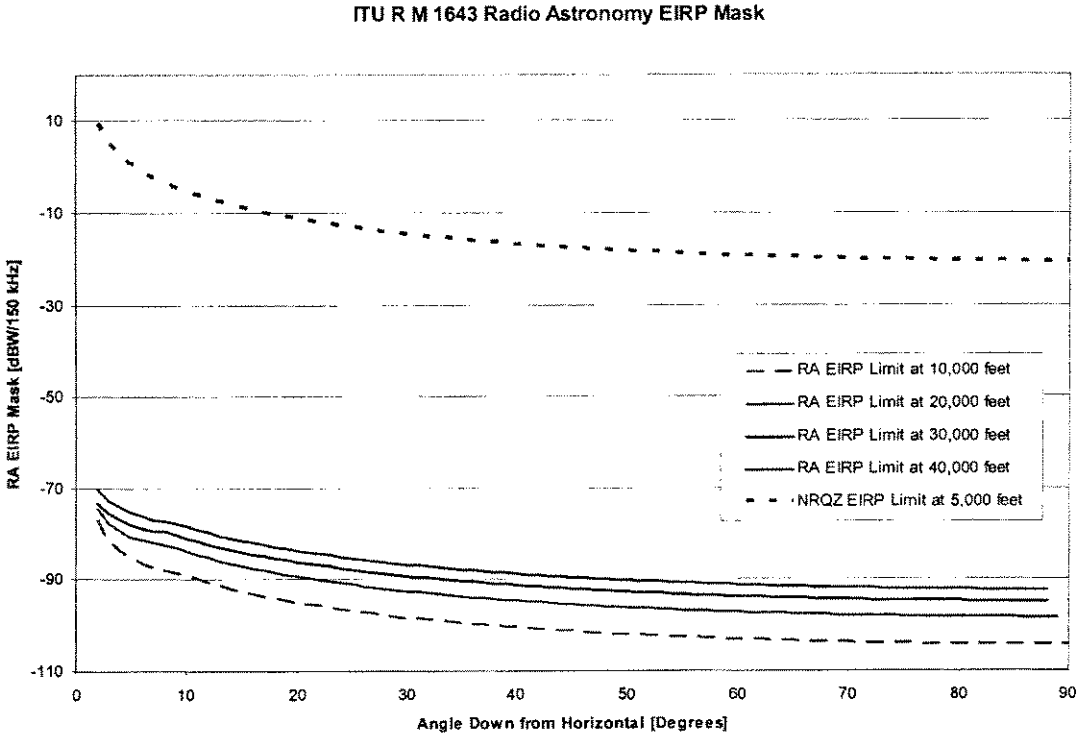


Figure 5 Radioastronomy EIRP Mask

With the emission limits established, the next steps are to derive and plot the SKYLink AES EIRP. That plot will then be compared to the limits for the NSF site protection requirements. The first step in that process is to compute the "main lobe" SKYLink EIRP in a 150 kHz bandwidth. Using data from the CONUS worst case link budget study (Bangor, Maine vicinity) at the maximum permitted data rate of 128 kbps, spread over 28.8 MHz, the EIRP is 10.26 dBW in 150 kHz.

Having determined that the "main lobe" SKYLink EIRP is +10.26 dBW in a 150 kHz bandwidth, the next step is to apply the antenna gain, as a function of elevation relative to both the main lobe and to the airframe, to determine the "lower hemisphere" SKYLink EIRP. A key parameter is the antenna pointing elevation, which, at 28.29 degrees above the horizon in Bangor, ME, is also the worst cast for CONUS operation. The antenna pointing angle remains constant as the aircraft maneuvers, so the only effect of banking is to increase or reduce any signal masking by the airframe.

Figure 6 depicts the SKYLink antenna relative gain and the FCC specified gain mask per Section 25.209(a)(1) of the Commission's Rules .

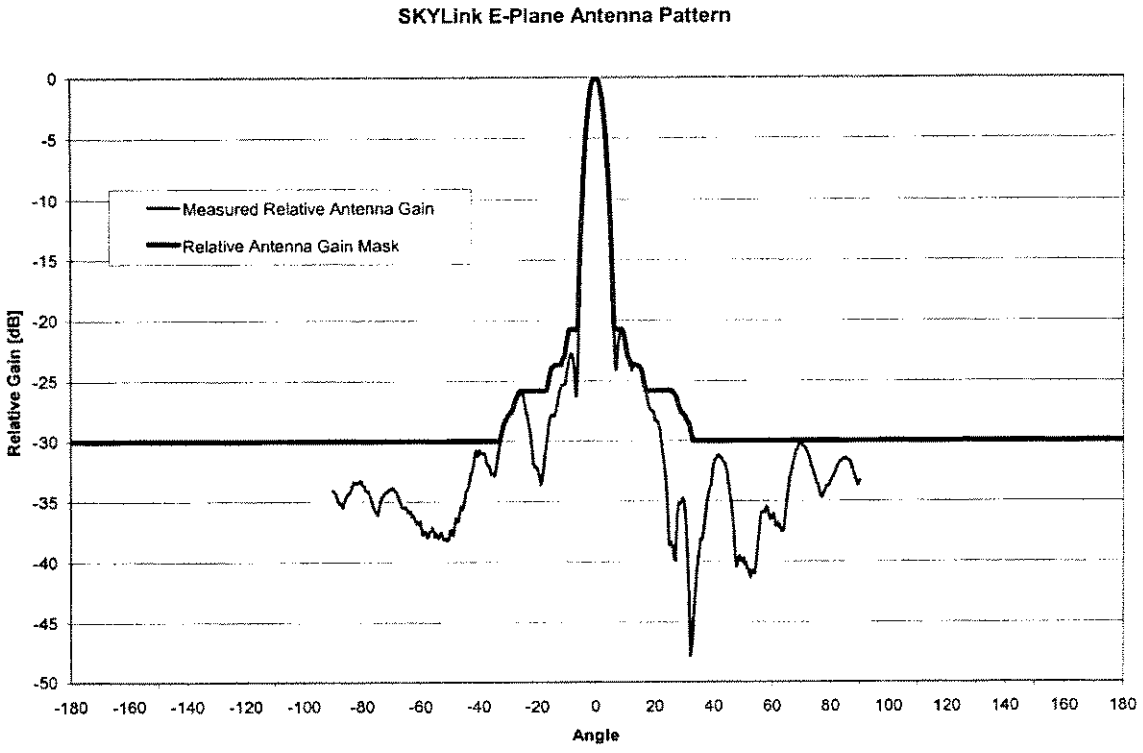


Figure 6 Relative Antenna Gain and Mask

When this relative antenna gain is added to the +10.26 dBW EIRP (in 150 kHz) and overlaid on the RA EIRP mask in Figure 7 below, we see that with this antenna pattern the National Radio Quiet Zone is protected even for the minimum antenna elevation of 10 degrees for all aircraft altitudes of 10,000 feet or better. However, when this is overlaid on the RA EIRP mask below, we see that this antenna pattern does not, by itself, protect the radioastronomy sites.

Assuming a 65 dB "out-of-band" attenuation, a lower hemisphere elevation antenna pattern mask as good as, or better than, the one shown below would be required to support unrestricted operation (on transponders 5 – 21) down to 20,000 feet at the minimum elevation of 10 degrees. While the minimum mechanical elevation of the SKYLink AES is 6°, the worst case elevation required in CONUS is 28.29° in Maine.

This is consistent with Recommendation ITU-R M.1643, which suggests that AMSS stations not transmit in the 14.47-14.50 GHz frequency range when in line of sight of radioastronomy stations.

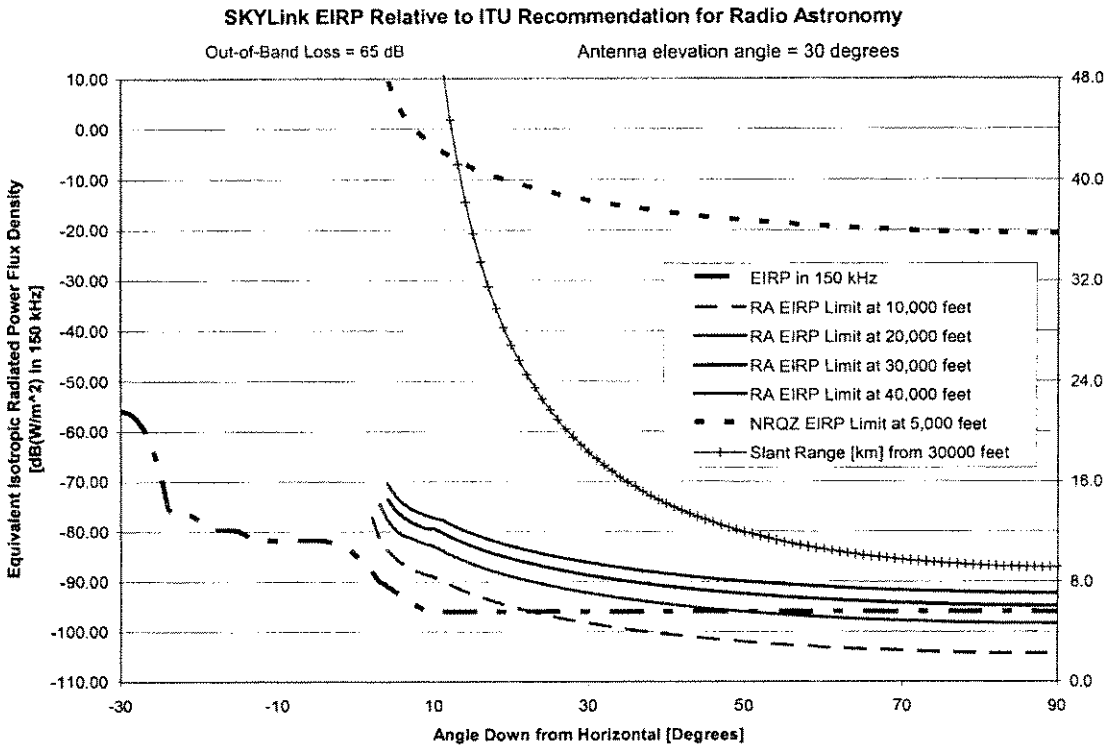


Figure 7 EIRP Relative to ITU-R M. 1643 Limits

Data analysis up to this point has been limited to a single AES operating in a worst case location at maximum EIRP for the desired 128 kbps data rate at the edge of CONUS. Each SKYLink provisioned aircraft is equipped with a technically identical AES, under control of a Network Operating Center co-located with the Ground Earth Station. An analysis now follows for multiple AESs built on a worst case location and pointing angle.

Figure 8 is a plot of the maximum EIRP/Hz from a single AES, operating at a maximum data rate of 128 kbps, at just 5° elevation above the horizon. There is a mechanical stop to prevent the antenna from pointing any lower. The Bangor, Maine location requires a 28° elevation minimum, so the plot is for the worst case.

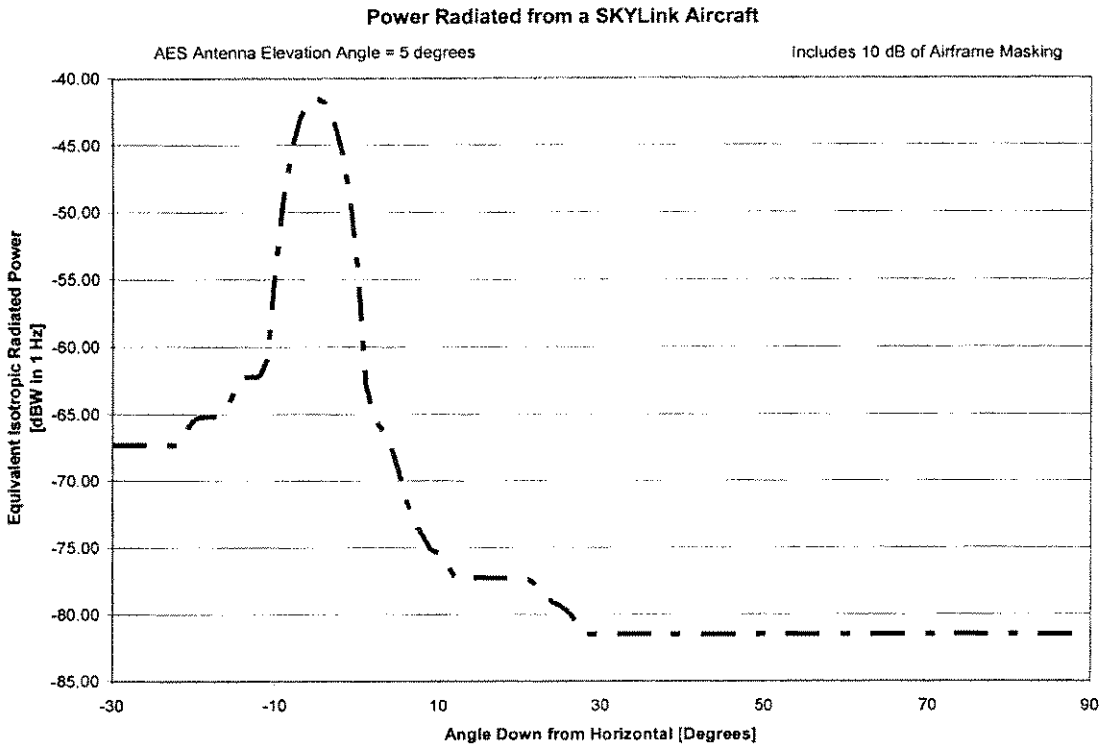


Figure 8 SKYLink AES Power vs. Elevation Angle at 128 kbps data rate

Under those extreme conditions, Figure 9 shows the maximum power flux density from AES equipped aircraft at 10,000ft., 25,000 ft., 30,000 ft., 40,000 ft. and 50,000 ft. (the ceiling of some executive jets) with the NSF aggregate PFD limits for non-VLBA and VLBA antenna sites. It is clear that individual AESs do exceed the NSF limits if no power reduction is applied to them.

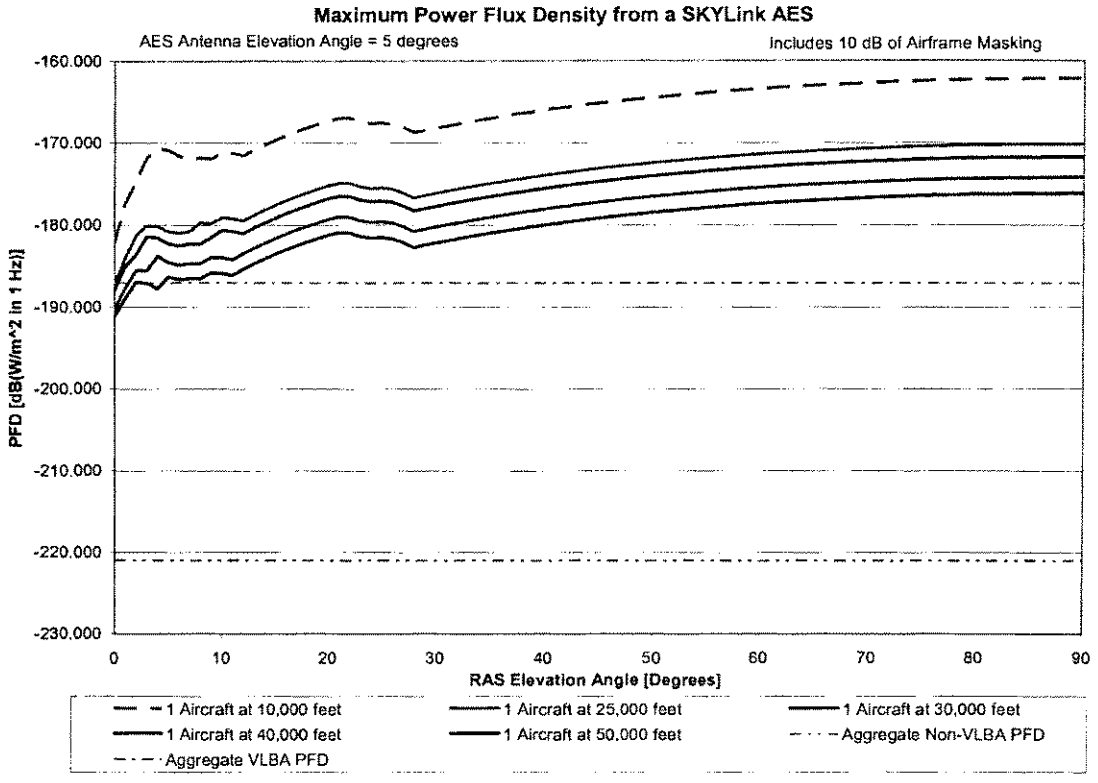


Figure 9 Maximum AES PFD at Selected Altitudes vs. RadioastronomyElev. Angles

The model is then calculated for ten (10) AES equipped aircraft flying at 30,000 ft. in the same worst case location all transmitting at exactly the same instant in time. Data taken from data dependent business firms indicates that if 300 users were logged on to the system, there is a less than one per cent (1%) chance that any 10 would transmit (request data) at exactly the same time. The plot in Figure 10 indicates that 60dB of attenuation of the AES transmitted signal will be required to remain below the NSF threshold for radiotelescope sites within sight of the aircraft and 30dB of attenuation to remain below the VLBA site threshold.

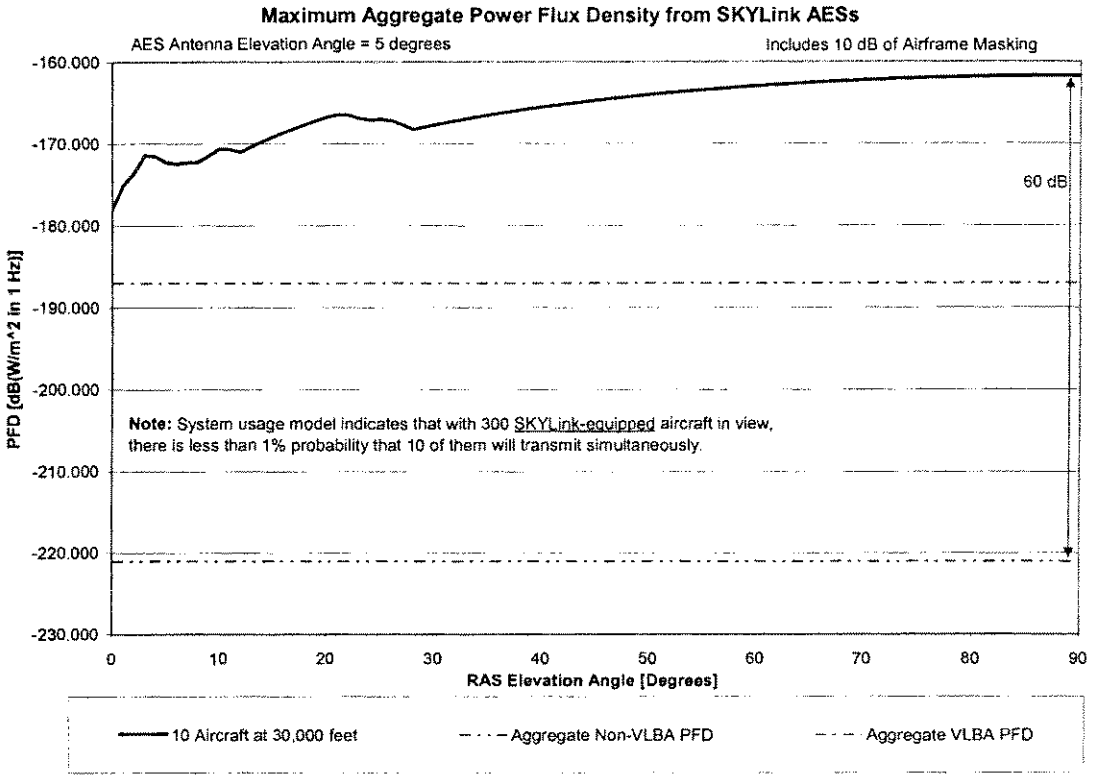


Figure 10 Maximum Aggregate AES PFD Attenuation Requirements

As recommended in ITU-R M 1643, the SKYLink Network Operations Center will prevent those AESs from transmitting within line of sight of any NSF site designated as active for the duration of the active time period, regardless of flight altitude.

Geographical Avoidance of Active RA Sites

As previously noted, ITU-R M.1643 and subsequently the FCC, requires that the SFD masks for both types of radioastronomy sites are met, but that AESs shut down completely when within line-of-sight of any active RA site. To insure that the requirement is met, two procedures must be followed. First, ARINC as the AMSS system operator must be notified of which sites will be active and at what times. Second, ARINC must insure that all aircraft approaching line-of-sight with those active sites will cease transmission for the duration of their proximity to the sites. A Table of those sites is reproduced below.

Observatory	Latitude (D,M,S)	Longitude (D,M,S)
National Radio Astronomy Observatory (NRAO) sites:		
Green Bank, WV (National Radio Quiet Zone)	38 25 59	79 50 24
Socorro, NM	34 04 43	107 37 04
National Astronomy and Ionosphere Center (NAIC) site:		
Arecibo, PR (tentative addition to site list)	18 20 46	66 45 11
Very Long Base Array sites, CONUS:		
Kitt Peak, AZ	31 57 22	111 36 42
Owens Valley, CA	37 13 54	118 16 34
N. Liberty, IA	41 46 17	91 34 26
Hancock, NH	42 56 01	71 59 12
Los Alamos, NM	35 46 30	106 14 42
Pie Town, NM	34 18 04	108 07 07
Ft. Davis, TX	30 38 06	103 56 39
Brewster, WA	48 07 53	119 40 55
Very Long Base Array sites, off shore		
Mauna Kea, HI	19 48 16	155 27 29
St. Croix, VI	17 45 31	64 35 03

The SKYLink system is designed so that the Network Operating Center (NOC) that controls the AESs is always dynamically aware of the location of the AESs. That NOC will load each AES with transmission prohibitions each time it logs into the SKYLink network, according to the foregoing Section 3 Operational Coordination Agreement.

[REVISED PAGE]

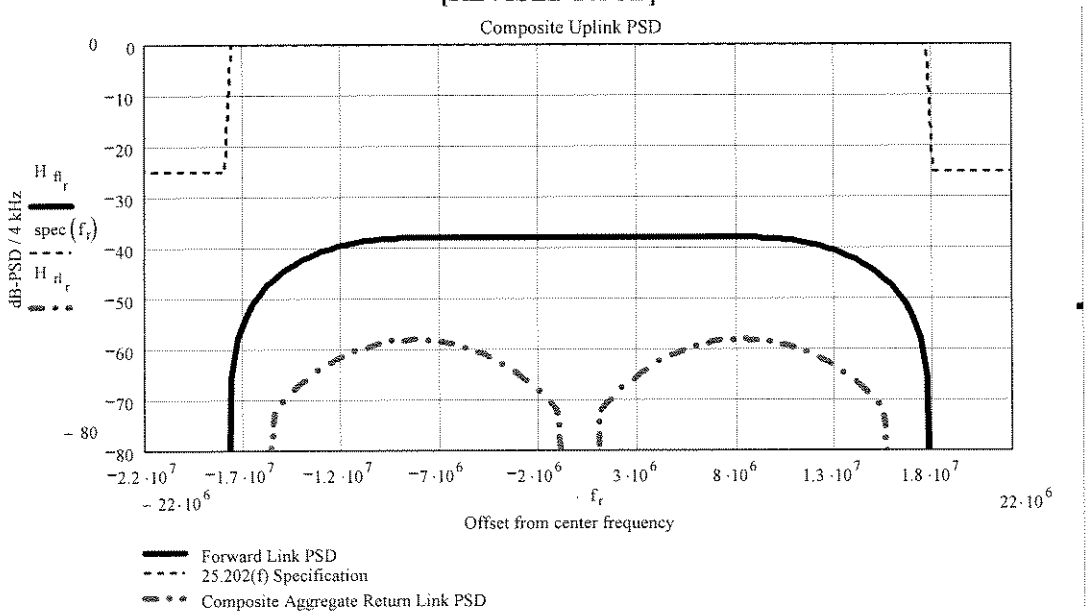


Figure 3-3 Forward and Return Links in the Authorized Bandwidth

(Figure corrected to show the 25.202(f) specification as the average carrier power, not the average power spectral density of the carrier, as originally shown.)

In Figure 3-3, the Forward link spectral mask is used to determine the symbol rate limits per 25.202(f).

The composite Forward and Return link spectrum (single-sided) outside the authorized bandwidth will be similar to that shown in Figure 3-4.

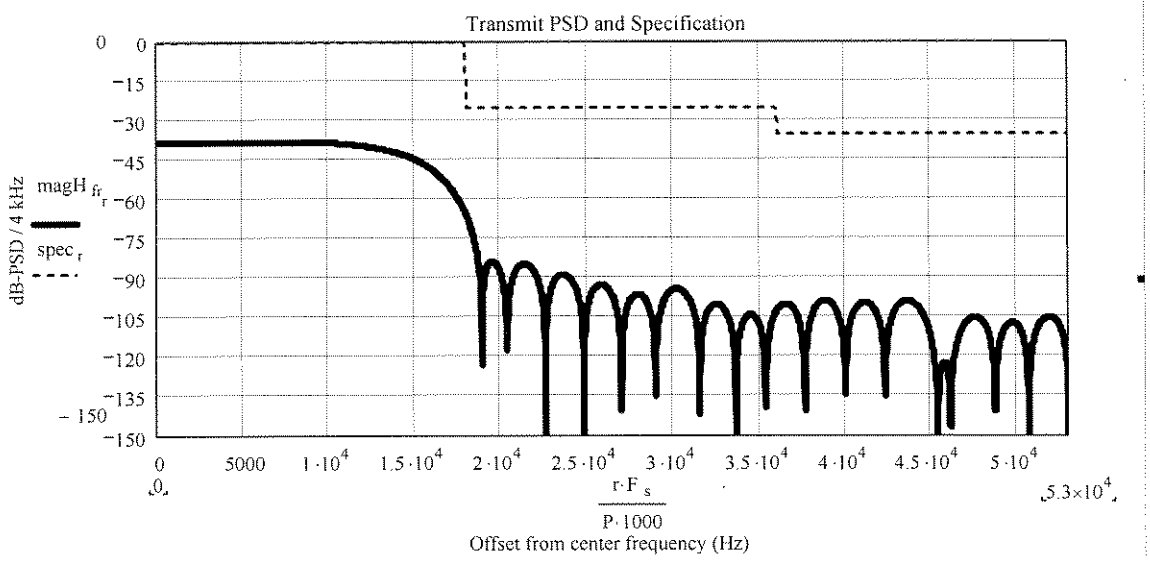


Figure 3-4 Theoretical and Implemented Forward Link Spectrum

(Figure corrected to show the 25.202(f) specification as the average carrier power, not the average power spectral density of the carrier, as originally shown.)