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June 10, 2004

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Policy Division
International Bureau

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

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Re: **Written Ex Parte Presentation**
ARINC Inc., SKYLinkSM Application, File Nos. SES-LIC-20030910-
01261 & SES-AMD-20031223-01860

Dear Ms. Dortch:

On June 10, 2004, representatives from ARINC Inc. ("ARINC") and its counsel met with Thomas Tycz, Chief, Satellite Division, International Bureau; Robert Nelson, Chief, Engineering Branch, Satellite Division, International Bureau; Kathryn Medley, Engineering Branch, Satellite Division, International Bureau; Shabnam Javid, Engineering Branch, Satellite Division; and Arthur Lechtman, Policy Branch, Satellite Division, International Bureau. Representing ARINC were Edward H. Montgomery, Vice President, Aviation & Air Traffic Services and Global Maintenance Services; Kris E. Hutchison, Senior Director, Frequency Management; William M. Kolb, Program Manager, SKYLink; and Bruce F. Miller, Project Engineer, SKYLink. Carl R. Frank and Heather O. Dixon of Wiley Rein & Fielding LLP, counsel to ARINC, also attended the meeting. ARINC made the attached presentation regarding its SKYLinkSM application to the attendees.

Kindly direct any questions regarding this matter to the undersigned.

Sincerely,

No. of Copies rec'd 012
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Heather O. Dixon

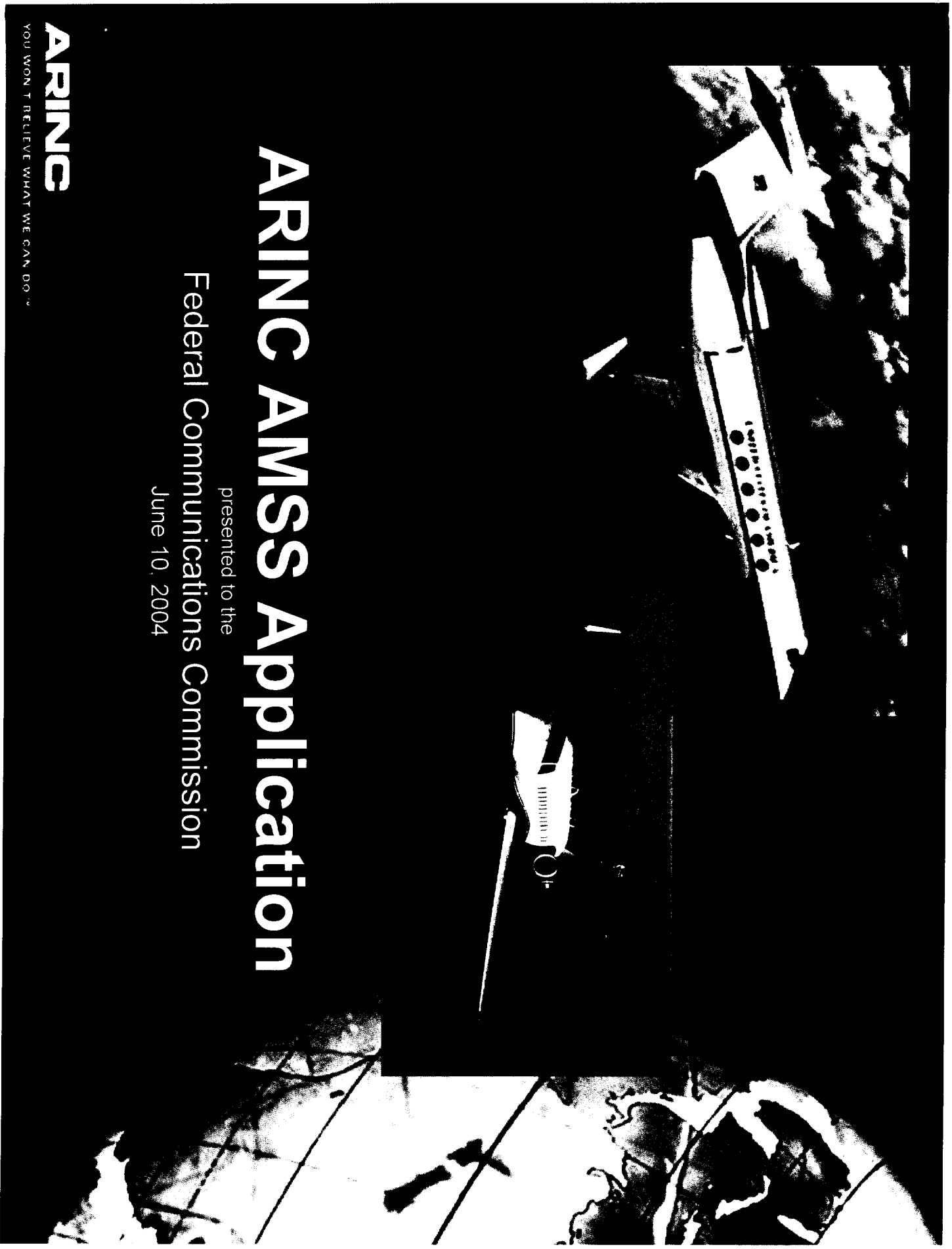
Enclosure

cc(w/encl.): Thomas Tycz
Robert Nelson

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Kathryn Medley
Shabnam Javid
Arthur Lechtman



ARINC AMSS Application

presented to the
Federal Communications Commission
June 10, 2004

ARINC

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Agenda

- ARINC Corporate Overview
- SKYLinkSM
- Protection of Other Users of 14.0-14.5 GHz Band



ARINC

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ARINC Incorporated

- Established in 1929 at the urging of the Federal Radio Commission to coordinate, manage, and conserve the limited radio spectrum for Aviation.
- World leader in transportation communications and systems engineering
- Headquartered in Annapolis, Maryland
- More than 3,000 Employees Located in 100 Offices Worldwide



ARINC

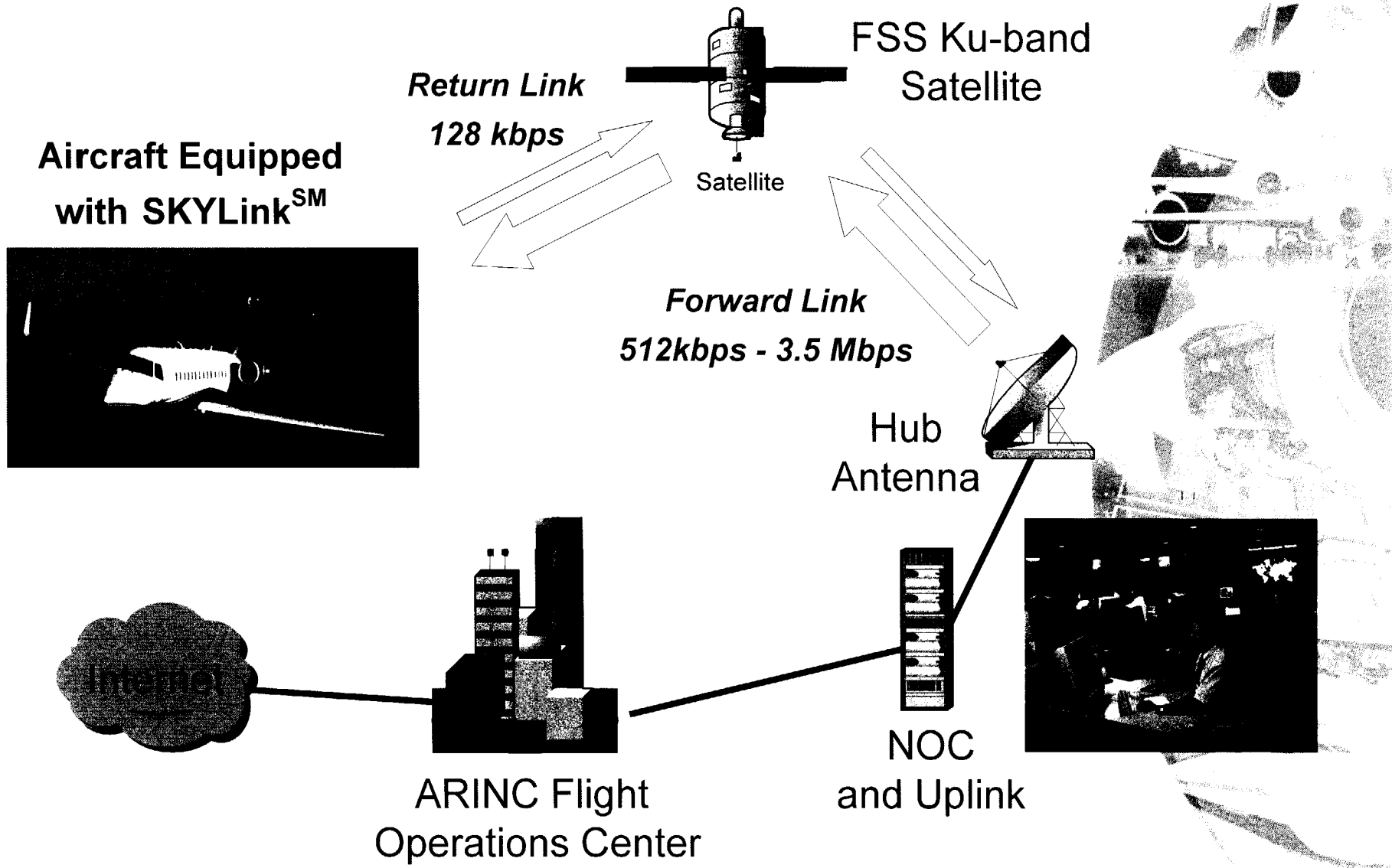
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SKYLinkSM

- SKYLinkSM is an airborne mobile communications service jointly developed by ARINC and the following technology partners:
 - **SES AMERICOM**
An SES GLOBAL Company
 - **ViaSat**
 - **RANTEC**
Microwave Systems
- SKYLinkSM provides premium broadband Internet communication services and the infrastructure to deliver those services to the aviation market.
- Together, these provide the executive traveler with a true office experience in the cabin and the crew with valuable services on the flight deck.
- SKYLinkSM brings competition to the U.S. AMSS industry.



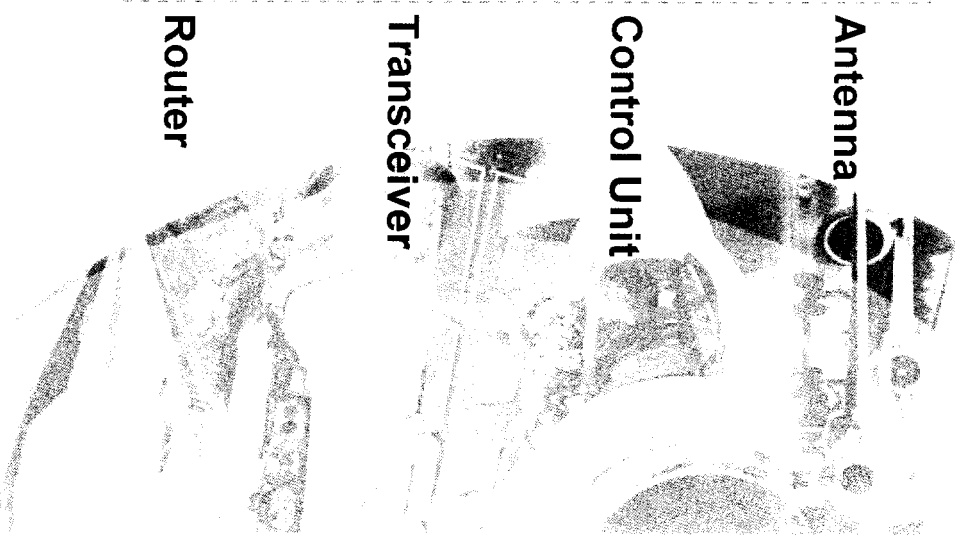
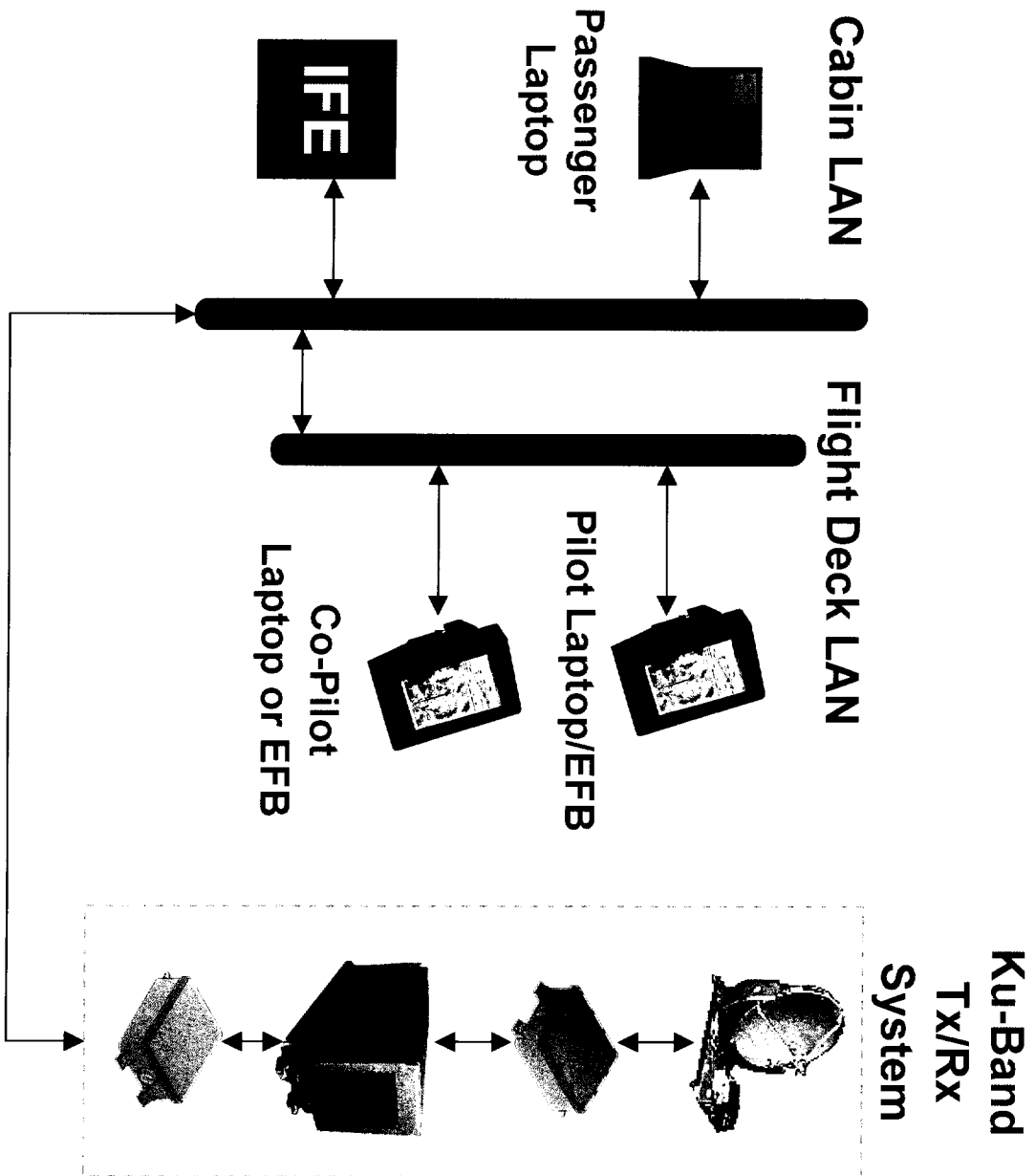
SKYLinkSM Network



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SKYLinkSM on a Typical Aircraft



SKYYLinkSM

**Protection of Other Users of
14.0-14.5 GHz Band**



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SKYLinkSM Protects Other Users of 14.0-14.5 GHz Band

- SKYLinkSM manages AMSS traffic to ensure that the aggregate EIRP of all AES assigned to a single transponder does not exceed the VSAT emission mask more than 0.001 percent of the time.
- SKYLinkSM employs power control at log-in.
- SKYLinkSM ensures that AES cannot transmit before receiving and decoding NOC authorization command.
- SKYLinkSM has been fully coordinated with adjacent satellite operators.
- The SKYLinkSM GES meets FCC and ITU requirements.

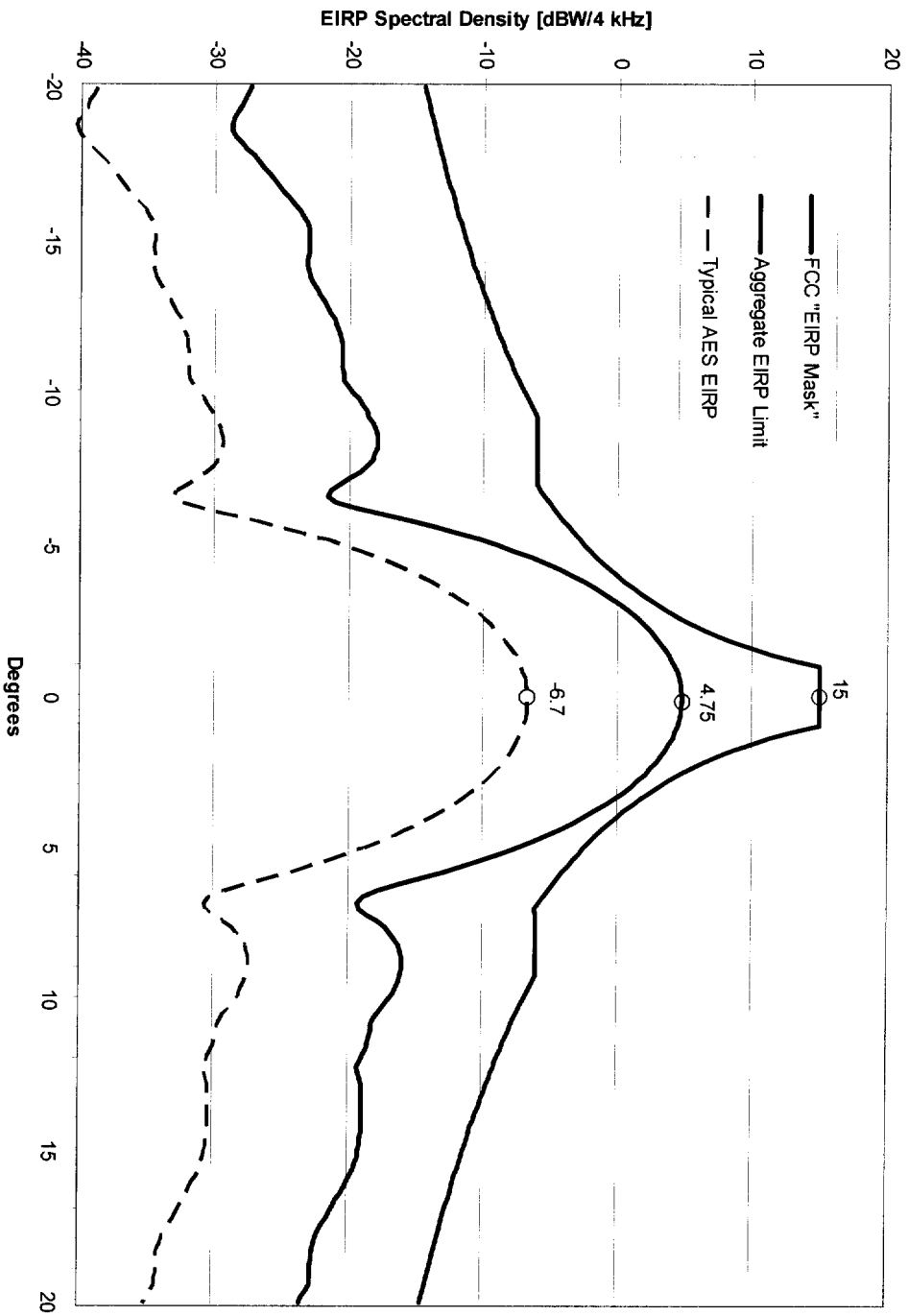


SKYLinkSM Meets Requirements for Routine Processing

- WRC-03 adopted the U.S. position for secondary AMSS allocation in Ku-band FSS.
- Part 25 provides for routine licensing of VSAT networks that comply with EIRP densities specified in Section 25.134(a)(1) and an emission mask set forth in Section 25.209(a)(1).
- Boeing and ARINC agree that compliant AMSS earth stations/AES should be *routinely* licensed.



SKYLinkSM Operates Below the Mask



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SKYLinkSM Verification of Mask Compliance

- ARINC calculated the total probability of exceeding the VSAT emission mask using Monte Carlo simulations.
 - ARINC evaluated four sources of EIRP variation and derived the cumulative probability that a given number of simultaneously transmitting AES would exceed the mask.
 - ARINC then calculated the probability of simultaneous transmissions with varying numbers of active AES.
- The results show that, under expected worst case conditions, SKYLinkSM complies 99.999% of the time with applicable AMSS off-axis ERIP limits.
- The adjacent satellite operators concur and coordination is now complete.



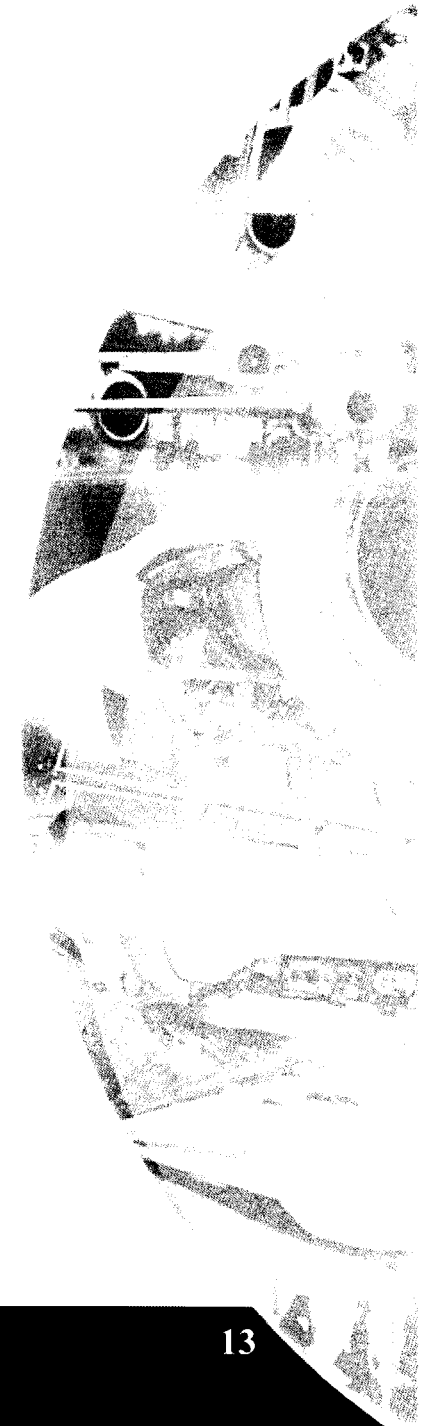
Boeing's Analysis of Mask Compliance

- The ARINC simulation was developed specifically for SKYLinkSM and uses conservative estimates to account for all errors and to ensure it complies with FCC Rules.
- Boeing assumes the congestion control algorithm, which is currently set to trigger only when the probability of exceeding the mask nears 1%, governs SKYLinkSM compliance and ignores more important factors.
- Boeing concludes from its simulation that SKYLinkSM would adversely affect adjacent FSS satellites.
 - *This conclusion is unsupported.* Boeing uses assumptions that do not correspond to the license application, the SKYLinkSM system design, or reality.
 - *This conclusion is forced.* Boeing chose assumptions that support its unfounded contention SKYLinkSM will exceed authorized off-axis levels.



Boeing Makes Unfounded Assumptions

Issue	Boeing Assumption	Reality
AES Duty Cycle	0.1225. Boeing assumes nearly 50% more traffic than ARINC's already inflated busy hour traffic, significantly increasing the odds of exceeding off-axis EIRP.	0.083.
Probability of Exceeding FCC EIRP Mask, P(EM)	1%. Boeing forces its result by assuming a P(EM) 1000 times higher than ARINC's to determine the input to its simulation.	0.001%.
GES Antenna Output Power	76.4 dBW. Boeing assumes 4 times more GES antenna output power than the actual value, which is shown in the link budget.	70 dBW.
Number of Error Terms	1 Error Term. Boeing lumps pointing errors into a single term, compounding their effects by making them dependent rather than independent	3 Statistically Independent Error Terms.
2-Dimensional Distribution of Pointing Errors	Orthogonal pointing errors ignored. Boeing unrealistically assumes all pointing errors line up in the direction of the GSO arc, effectively doubling the off-axis EIRP contribution of active AES.	Orthogonal pointing errors accounted for.



SKYLinkSM Has Positive Control

- Neither the FCC Rules nor ITU-R M.1643 require positive control.
- Nevertheless, the SKYLinkSM Network Management System (NMS) provides real-time, positive control of all AES and ensures correct pointing of antennas.
- Boeing only offers their transmit-on-command system as an example of positive control.
 - No SKYLinkSM AES can transmit, however, until it receives and successfully implements a series of NMS commands.
 - Furthermore, the SKYLinkSM NMS can command any AES to commence or cease transmission.
- By any meaningful interpretation, SKYLinkSM has positive control.



SKYLinkSM Controls Log-in Power

- Boeing claims the SKYLinkSM protocol allows an AES to transmit log-in bursts at any time with increasing power levels without authorization from the NMS.
- *This is incorrect.* Before an AES can transmit it must receive and implement the following configuration commands from the NMS:
 - authorized transmission power
 - amplitude step size
 - amplitude limit
 - authorized data rate
- Log-ins are statistically independent and typically occur once during a flight.
- Power is continuously controlled to the minimum necessary to close the link.



SKYLinkSM Uplink Meets FCC/ITU Requirements

- Boeing asserts the uplink operates at an input power resulting in an off-axis EIRP of as little as 3.4 dB below the FCC/ITU limit, before factoring in AES transmissions.
 - *This is incorrect.* The SKYLinkSM uplink operates at an EIRP 6.4 dB below the FCC authorized limit, as shown on all forward link budgets.
 - Further, the antenna flange power density is 9 dB below the FCC/ITU limit and the off-axis EIRP power density is 7.5 dBW/40 kHz below the FCC/ITU limit.
 - The SKYLinkSM uplink does not have a significant impact on aggregate off-axis EIRP.



Summary

- SKYLinkSM complies with FCC Rules and Regulations for Ku-band AMSS operation.
- SKYLinkSM has been coordinated with other FSS system operators.
- SKYLinkSM has conducted extensive testing via its experimental license since August 2003 – with no interference complaints.
- Public and Government interest in SKYLink is high.
- ARINC has responded fully to all Boeing comments.
- The FCC should expeditiously license the SKYLinkSM AMSS system.

