

APPLICATION FOR EARTH STATION SPECIAL TEMPORARY AUTHORITY

APPLICANT INFORMATION Enter a description of this application to identify it on the main menu:  
STA to communicate (receive-only) with India's ResourceSat-1 satellite.

1. Applicant

<b>Name:</b>	Space Imaging LLC	<b>Phone Number:</b>	303-254-2151
<b>DBA Name:</b>		<b>Fax Number:</b>	303-254-2214
<b>Street:</b>	12076 Grant Street	<b>E-Mail:</b>	ssmith@spaceimaging.com
<b>City:</b>	Thornton	<b>State:</b>	CO
<b>Country:</b>	USA	<b>Zipcode:</b>	80241 -3102
<b>Attention:</b>	Mr Scott Smith		

**Granted**

date: 12/9/04 to 2/9/05

authorized by: See attachment  
for conditions.

Signature 12/9/04  
signature

**2. Contact**

<b>Name:</b>	Raymond G. Bender, Jr.	<b>Phone Number:</b>	202-776-2758
<b>Company:</b>	Dow, Lohnes & Albertson, pllc	<b>Fax Number:</b>	202-776-2222
<b>Street:</b>	1200 New Hampshire Ave, N.W. Suite 800	<b>E-Mail:</b>	RBender@DowLohnes.com
<b>City:</b>	Washington	<b>State:</b>	DC
<b>Country:</b>	USA	<b>Zipcode:</b>	20036 -6802
<b>Contact Title:</b>	Attorney	<b>Relationship:</b>	Legal Counsel

3. Reference File Number SESMOD2004060700809

4a. Is a fee submitted with this application?

- If Yes, complete and attach FCC Form 159. If No, indicate reason for fee exemption (see 47 C.F.R.Section 1.1114).  
 Governmental Entity     Noncommercial educational licensee  
 Other(please explain):

4b. Fee Classification CGX – Fixed Satellite Transmit/Receive Earth Station

5. Type Request

- Use Prior to Grant                       Change Station Location                       Other

6. Requested Use Prior Date  
12/10/2004

7. CityNorman

8. Latitude  
(dd mm ss.s h) 35 10 47.2 N

9. State OK	10. Longitude (dd mm ss.s h) 97 33 59.3 W
11. Please supply any need attachments. Attachment 1: STA Exhibit                      Attachment 2:                      Attachment 3:	
12. Description. (If the complete description does not appear in this box, please go to the end of the form to view it in its entirety.) <div style="border: 1px solid black; padding: 5px; margin: 10px 0;">This STA Request seeks FCC authority for an existing Space Imaging earth station at Norman, OK, to communicate (on a receive-only basis) with India's ResourceSat-1 remote-sensing satellite during the pendency of an FCC Form 312 license modification applicaton.</div>	
13. By checking Yes, the undersigned certifies that neither applicant nor any other party to the application is subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Act of 1988, 21 U.S.C. Section 862, because of a conviction for possession or distribution of a controlled substance. See 47 CFR 1.2002(b) for the meaning of "party to the application"; for these purposes. <input checked="" type="radio"/> Yes <input type="radio"/> No	
14. Name of Person Signing Scott Smith	15. Title of Person Signing Executive Vice President, Satellite Access Systems
WILLFUL FALSE STATEMENTS MADE ON THIS FORM ARE PUNISHABLE BY FINE AND / OR IMPRISONMENT (U.S. Code, Title 18, Section 1001), AND/OR REVOCATION OF ANY STATION AUTHORIZATION (U.S. Code, Title 47, Section 312(a)(1)), AND/OR FORFEITURE (U.S. Code, Title 47, Section 503).	

**FCC NOTICE REQUIRED BY THE PAPERWORK REDUCTION ACT**

The public reporting for this collection of information is estimated to average 2 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the required data, and completing and reviewing the collection of information. If you have any comments on this burden estimate, or how we can improve the collection and reduce the burden it causes you, please write to the Federal Communications Commission, AMD–PERM, Paperwork Reduction Project (3060–0678), Washington, DC 20554. We will also accept your comments regarding the Paperwork Reduction Act aspects of this collection via the Internet if you send them to [jboley@fcc.gov](mailto:jboley@fcc.gov). PLEASE DO NOT SEND COMPLETED FORMS TO THIS ADDRESS.

Remember – You are not required to respond to a collection of information sponsored by the Federal government, and the government may not conduct or sponsor this collection, unless it displays a currently valid OMB control number or if we fail to provide you with this notice. This collection has been assigned an OMB control number of 3060–0678.

**THE FOREGOING NOTICE IS REQUIRED BY THE PAPERWORK REDUCTION ACT OF 1995, PUBLIC LAW 104–13, OCTOBER 1, 1995, 44 U.S.C. SECTION 3507.**

**Request of Space Imaging LLC for Special Temporary Authorization  
To Receive Remotely-Sensed Data from the Indian ResourceSat-1 Satellite**

Space Imaging LLC (“Space Imaging”) hereby requests a Special Temporary Authorization (“STA”), pursuant to Section 25.120 of the Commission’s rules, to receive remotely-sensed imagery data from India’s ResourceSat-1 satellite at Space Imaging’s existing earth station facility in Norman, Oklahoma. On June 7, 2004, Space Imaging filed a license modification application on FCC Form 312 to add the ResourceSat-1 satellite as a new point of communication (on a receive-only basis) at the Norman earth station. That application has been pending for six months and remains pending at this time.<sup>1</sup>

**Space Imaging hereby seeks an STA to initiate receive-only communications from the ResourceSat-1 satellite beginning on December 10, 2004**, and lasting until the Commission is able to grant a permanent authorization pursuant to Space Imaging’s pending FCC Form 312 modification application. The proposed X-band operations have now been fully coordinated with the National Telecommunication and Information Administration (“NTIA”), and grant of an STA therefore would pose no risk to U.S. Government operations. Moreover, no objections were filed with respect to Space Imaging’s underlying FCC Form 312 modification application, and the Commission apparently is satisfied with the technical and other showings set forth in that application. For reasons set forth below, Space Imaging requests an STA to cover the intervening period until the Commission can take final action on Space Imaging’s pending FCC Form 312 license modification application.

In support of this STA Request, the following is respectfully shown:

**I. Preliminary Statement**

Space Imaging is the licensee of the IKONOS remote-sensing satellite system, a non-geostationary satellite orbit (“NGSO”) Earth Exploration-Satellite Service (“EESS”) system using spectrum in the 8025-8400 MHz frequency band to downlink remotely-sensed data to various earth stations in the United States and around the world. Space Imaging operates FCC-licensed earth stations at four locations in the United States to receive remotely-sensed data from the IKONOS satellite and other authorized space stations. The company provides a variety of imagery and data products and value-added services for commercial and government applications.

---

<sup>1</sup> Space Imaging also filed, on June 7, 2004, a separate FCC Form 312 modification application to receive remotely-sensed imagery data from the ResourceSat-1 satellite at another existing Space Imaging earth station in Fairbanks, Alaska, and that application also remains pending. Space Imaging is not seeking an STA at this time with respect to the Fairbanks station, but only seeks an STA to receive ResourceSat-1 data at the Norman station.

Space Imaging's remote-sensing system provides products and services to various business sectors, including the agriculture, environmental, forestry, oil and gas, mining, real estate, telecommunications, transportation and other industry sectors. Space Imaging also serves Federal, state and local governments in connection with defense and intelligence programs, planning and tax assessment, mapping and other projects. Indeed, as the Commission is aware, the *U.S. Commercial Remote Sensing Policy*, which was adopted by the White House in April 2003, reflects the growing reliance by the U.S. Government upon the commercial remote-sensing industry.

Space Imaging offers remotely-sensed data and products derived from its own IKONOS satellite operations. In addition, for years Space Imaging has distributed data and products from certain Indian satellites owned and operated by the Indian Space Research Organization ("ISRO"), a government entity of the Republic of India. Indeed, the Commission previously has authorized the reception of data from three other ISRO satellites, IRS-1B, IRS-1C and IRS-1D, at Space Imaging's Norman, OK earth station which is the subject of this STA Request.<sup>2</sup> As noted in Space Imaging's pending FCC Form 312 license modification application, ISRO's new ResourceSat-1 satellite, which was launched into orbit on October 17, 2003, is intended to continue and replace the remote-sensing data services provided by the Indian satellites IRS-1C and IRS-1D, both of which have far outlived their design mission lives. In addition, ResourceSat-1 will afford vastly enhanced data quality over the existing IRS-1C and IRS-1D operations.

Space Imaging submits that an STA is justified under Section 25.120 of the rules based on the following circumstances:

First, Space Imaging needs immediately to commence communications with ResourceSat-1 as the designated replacement satellite for Indian satellites IRS-1C and IRS-1D. The IRS-1C satellite is no longer able to provide service in North America, and the IRS-1D satellite is beginning to evidence deterioration that has adversely affected the quality of service provided to Space Imaging by that satellite.

Second, the ResourceSat-1 satellite has vastly improved data quality over the previously-authorized Indian satellites IRS-1C and IRS-1D, and the commencement of communications with this new satellite will afford new and improved remote-sensing applications for commercial and government users alike.

Third, commencement of communications with the ResourceSat-1 satellite will foster ongoing cooperation and harmonious relations between U.S. and Indian interests (both commercial and government) in the field of remote-sensing.

---

<sup>2</sup> See Space Imaging's FCC Radio Station Authorization for the Norman, OK earth station, Call Sign E960463. The Commission also has authorized the reception of data from ISRO satellites at Space Imaging's earth station in Fairbanks, AK. See Space Imaging's FCC Radio Station Authorization for the Fairbanks, AK earth station, Call Sign E970270.

Finally, the proposed operations have been fully coordinated with NTIA and no technical issues prevent the grant of this relatively straightforward receive-only proposal. Immediate approval of this STA Request will address Space Imaging's need to communicate with ResourceSat-1, and at the same time permit the FCC to address associated processing issues in the normal course.

Each of these considerations is discussed more fully below.

## **II. Grant of this STA Request Would Serve the Public Interest**

This STA Request complies with Section 25.120 of the rules, and a grant would serve the public interest for the following reasons:

### **1. Space Imaging Seeks to Communicate with ResourceSat-1 as the Replacement Satellite for Deteriorating Indian Satellite's IRS-1C and IRS-1D**

As indicated in the pending FCC Form 312 license modification application, ResourceSat-1 was launched in October 2003 to be the replacement satellite for two other Indian remote-sensing satellites operated by ISRO, specifically IRS-1C and IRS-1D, both of which have far outlived their design mission lives. While Space Imaging holds FCC authorizations to receive remotely-sensed data from IRS-1C and IRS-1D at its Norman, OK earth station, IRS-1C has ceased service in North America and IRS-1D service is now deteriorating. Thus, it is critical for Space Imaging immediately to commence communicating with ResourceSat-1 as the intended replacement satellite for IRS-1C and IRS-1D.

The current health and status of these satellites is as follows:

#### **IRS-1C**

The current duty cycle for the IRS-1C satellite is limited to 8 minutes, suggesting that fuel resources and/or battery power is nearing its limit. For this reason, IRS-1C is no longer in service in North America and Space Imaging now is unable to access the satellite from its Norman, OK, or Fairbanks, AK ground stations. Given IRS-1C's serious power constraints, ISTRAC, the Indian government's coordinating agency responsible for scheduling access to the satellite, has limited IRS-1C service only to ground stations that fall within the 0000-0900 GMT time constraints (*i.e.*, on the other side of the world). Thus, Space Imaging has had to discontinue communications between its U.S. ground stations and the IRS-1C satellite. Considering Space Imaging's reliance on the two Indian satellites (IRS-1C and IRS-1D), the loss of IRS-1C service represents a 50 percent reduction in earth coverage capacity.

ISTRAC has also reported that a thruster underperformance is preventing controllers from maintaining the IRS-1C spacecraft at the correct altitude which has changed the equatorial crossing time from 10:30 AM (MLT) to 09:25 AM (MLT). This decrease in altitude makes imagery incompatible with current archive imagery.

Even where IRS-1C is currently able to provide service in other regions of the world, it can only operate in limited service modes due to serious power constraints. Specifically, the satellite's current mode of operation (downlink) is limited to Panchromatic ("PAN") service only. Thus, other modes of operation (Linear Imaging Self Scanner ("LISS-3"), Wide Field Sensor ("WiFS") and PAN+WiFS) are not being used. As noted, however, Space Imaging is not even able to receive service in PAN mode because the satellite is no longer in service over North America.

### **IRS-1D**

IRS-1D's life expectancy currently is estimated at about one year, until December 2005. Its current duty cycle is limited to 16-minutes and 23-seconds, which indicates current constraints on fuel resources and/or battery power. Further evidence of this condition is the recent operational prerogative initiated by India to cancel passes or parts of passes that forecast excessive cloud cover.

The IRS-1D satellite is now beginning to evidence the same deteriorating pattern as IRS-1C experienced, and a number of anomalies are developing given that the satellite has exceeded its original design life. For example, the satellite formerly provided 2-3 passes a day to Space Imaging's U.S. earth stations, whereas it currently provides only 1-2 passes a day. This equates to an additional 30 percent reduction in earth coverage due to the limited amount of passes IRS-1D is now capable of supporting. Moreover, with respect to PAN mode, the western half of the western array's odd detectors are no longer functioning. While certain compensating measures have been implemented to address this failure, they are not able to provide optimal service (and operational efficiency is compromised as well). Also, the LISS-3 Band 2 is no longer functioning, and detectors and associated electronics show very poor response with cross-track striping. In short, the anomalies that IRS-1D is now experiencing are beginning to add up and additional problems doubtless will occur during the satellite's remaining life.

Given this serious degradation of service—which is total in the case of IRS-1C because it no longer is capable of serving North America--Space Imaging immediately needs to begin accessing imagery data provided by India's replacement ResourceSat-1 satellite.

## **2. Grant of this STA Request Will Permit Space Imaging to Offer New and Improved Remote-Sensing Services to Government and Commercial Users**

As noted above, the ResourceSat-1 satellite has vastly improved data qualities over the previously-authorized IRS-1C and IRS-1D satellite operations, and it therefore affords new and improved applications for Government and commercial users alike, particularly with regard to urban planning, national security, mapping, agriculture and crop monitoring, forestry, and disaster management. Space Imaging seeks to make such services available to commercial and Government customers without further delay, especially considering the time that has elapsed since Space Imaging first sought authority to communicate with ResourceSat-1.



Space Imaging anticipates, for example, that the United States Geological Survey (“USGS”) will be a large customer for ResourceSat-1 data in view of the enhanced capabilities of the new ResourceSat-1 satellite. Moreover, the U.S. Department of Agriculture (“USDA”) has been a large customer for IRS-C and IRS-1D data and has inquired about the availability of ResourceSat-1 data. In addition, the White House has committed to using foreign sources as a Landsat-1 “gapfiller,” and the ResourceSat-1 satellite is a prime foreign source for state-of-the-art remotely-sensed imagery and data. Thus, grant of this STA Request will permit Space Imaging to begin offering innovative new and improved data capabilities immediately, not only to commercial users but also to the USGS, USDA and other Government agencies. Further delay during the pendency of Space Imaging’s underlying FCC Form 312 license modification application will only frustrate Space Imaging’s legitimate business objectives and prevent the offering of new and innovative remote-sensing services to the public.

**3. Grant of this STA Request Will Foster Harmonious Relations Between U.S. and Indian Remote Sensing Interests**

As the Commission is aware, India has a highly-developed remote-sensing satellite industry and there has been a long history of cooperation on remote-sensing activities between the U.S. and Indian Governments and their respective commercial interests. Grant of this STA Request would permit Space Imaging to satisfy ongoing obligations to its Indian colleagues by the commencement of ResourceSat-1 services in the United States.<sup>3</sup> Space Imaging’s application for authority to communicate with this new Indian remote-sensing satellite has been pending for six months, and favorable action on this STA request would avoid further delay in meeting these commercial obligations.

The pending FCC Form 312 license modification application sets forth certain background information concerning U.S.-Indian relations in the field of remote sensing, including the following:

- ? The FCC routinely has permitted remote-sensing satellites licensed by the Republic of India (a WTO member nation) to downlink data to U.S. earth stations. For example, in 1996 the FCC authorized a predecessor of Space Imaging, Lockheed Martin Earth Observation Satellite Company, Inc. (dba “EOSAT”), to receive data at its Norman, OK earth station from Indian remote-sensing satellites IRS-1B and IRS-1C, based on a showing that India permitted EESS services to be provided in its market via the transmission of remotely-sensed data from U.S. satellites to earth stations located in India.<sup>4</sup> At that time, EOSAT, as the operator of the U.S. Landsat system, transmitted remotely-sensed data to a ground station operated by the Indian Government’s National Remote Sensing Agency (“NRSA”) at Hyderabad, India, in accordance with a Memorandum of

---

<sup>3</sup> Space Imaging has entered into a long-term contract with Antrix Corporation, ISRO’s commercial arm, to market and sell data and ground station access to India’s IRS constellation of satellites, including ResourceSat-1.

<sup>4</sup> See File No. 1538-DSE-L-96. EOSAT’s Norman, OK earth station later was assigned to Space Imaging pursuant to FCC File No. 713-DSE-AL-98(2).

Understanding between NRSA and the U.S. Department of Commerce's National Oceanic and Atmospheric Administration ("NOAA"). In 1998 the Commission authorized the reception of remotely-sensed data from Indian satellite IRS-1D at Space Imaging's Norman, OK earth station; and in 2001 the Commission authorized the reception of remotely-sensed data from Indian satellites IRS-1C and IRS-1D at Space Imaging's Fairbanks, AK earth station.<sup>5</sup>

- ? There currently is in effect a Memorandum of Understanding between the Department of Space and the Department of Science and Technology of the Government of the Republic of India and the National Aeronautics and Space Administration ("NASA") and NOAA for scientific cooperation in the areas of earth and atmospheric sciences (the "MOU"), which was signed on December 16, 1997, for an initial period of 5 years and subsequently extended for another 5 years by an amendment in December 2002. Under this MOU, a copy of which was attached to Space Imaging's pending FCC Form 312 license modification application, the United States and India make available to each other Earth and atmospheric observation data produced by their respective satellite systems, as well as retrospective data from such systems contained in their archives. Pursuant to the MOU, the United States and India have an established communications line between New Delhi and Suitland, Maryland, devoted to the exchange of data from their respective environmental satellites. According to NOAA, the U.S. also is in the process of developing ground stations throughout the world for its future polar-orbit satellite system, NPOESS, and plans to install a NOAA ground station in India for receipt of data from the NPOESS satellites.

The above-described relationships demonstrate a high-level and longstanding cooperation on remote-sensing activities between the United States and India Governments and commercial interests. As noted, on the commercial side, Space Imaging (or its predecessor) has been authorized since 1996 to receive remotely-sensed data downlinked by several Indian satellites to Space Imaging ground stations in Norman, OK, and Fairbanks, AK. Space Imaging desires to continue to foster its business relationship with ISRO and Antrix Corporation, especially given the long and harmonious dealings between the U.S. and Indian interests in the field of remote sensing. For this reason, Space Imaging urges the Commission to grant this STA Request so it can begin receiving communications from ResourceSat-1 as soon as possible and thereby meet its obligations to its Indian partners.

#### **4. There is No Technical or Other Bar to Favorable FCC Action**

The proposed STA operations are straightforward and involve receive-only communications at a currently-authorized Space Imaging earth station. Moreover, the proposed operations have been fully coordinated with NTIA and therefore pose no risk of interference to government systems. Immediate approval of this STA Request will address Space Imaging's need to commence communications with the ResourceSat-1 satellite, while at the same time

---

<sup>5</sup> See File No. SES-MOD-20001020-02053.

permitting the Commission to address any remaining licensing issues surrounding the pending FCC Form 312 license modification application in the ordinary course.

In accordance with Section 25.120(a) of the rules, a copy of this STA Request is being forwarded to the Commission's Columbia Operations Center in Columbia, Maryland.

The applicant waives any claim to the use of any particular frequency or of the electromagnetic spectrum as against the regulatory power of the United States because of the previous use of the same, whether by license or otherwise.

Considering the foregoing, Space Imaging respectfully submits that grant of this STA Request would serve the public interest. **Space Imaging respectfully requests FCC authorization to begin receiving ResourceSat-1 data at its Norman, OK earth station on or before Friday, December 10, 2004.**

**FEDERAL COMMUNICATIONS COMMISSION  
WASHINGTON, D.C. 20554**

December 9, 2004

STA No: SES-STA-20041206-01789  
Call Sign: E960463

- 1) Space Imaging LLC (Space Imaging) is authorized to receive remotely-sensed data and imagery from Indian-licensed ResourceSat-1 in the 8072.5-8177.5 MHz and 8247.5-8352.5 MHz bands with bandwidths of 105 MHz, in accordance with the terms, conditions, and technical specifications set forth in its application, this attachment and the Commission's Rules.
- 2) All expenses for operation shall be at Space Imaging's own risk.
- 3) Harmful radio interference shall not be caused to any other lawfully operated radio station and satellite, and operation shall cease immediately upon notification of interference. Complaints of all radio interference shall be forwarded immediately to the Commission, in writing.
- 4) Space Imaging's receive-only operation is subject to a Special note S144 in Annex a of Chapter 9 of NTIA Manual, which states that this assignment is not in complete conformity with the National Table of Frequency Allocations. Those operations that are conducted under the non-conforming portions of this assignment are on a secondary basis to operations conducted under assignments that are in conformity with the National Table of Frequency Allocations.