

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

In the Matter of Application of)
)
)
AFRISPACE, INC.)
)
For Authority to Construct, Launch)
and Operate a Subregional Africa)
and Middle Eastern Satellite Sound)
Broadcasting Transmission System)

File No. CSS-90-017

AMENDMENT

Tara K. Giunta
Coudert Brothers
1627 I Street, N.W.
Washington, D.C. 20006
(202) 736-1809

Its Attorneys

January 22, 1999

AFRISPACE, INC.

Benno A. Ammann
President
AfriSpace, Inc.
2400 N Street, N.W.
Ground Floor
Washington, D.C. 20037
(202) 861-8899

Table of Contents

Executive Summary	iii
I. Overview	2
II. Background	3
A. AfriSpace Application	3
B. The AfriSpace Experimental License	9
1. Issuance of the Experimental License	9
2. Progress Under the Experimental License	11
C. ITU Coordination and Standardization	17
III. Review of Amendment to AfriSpace Application	18
A. Updated Description of AfriSpace Service and System	19
B. Need for Expedited Grant of a Full License	22
C. Regulatory Aspects of Application and Amendment	23
1. Private International Satellite System	23
2. Rationale for Changing Orbital Position	23
3. Numerous FCC Authorizations to Satellite Providers with Control Facilities Outside of the United States	25
4. Control of AfriSpace/Satellite and Facilities Remains in the United States	26
D. Orbital Location	27
E. Technical Considerations	27
F. Corporate Organization of AfriSpace	28
G. Financial Considerations	29
H. Public Interest	31
IV. Compliance with 47 C.F.R. §25.114	32
V. Anti-drug Abuse Act	36
VI. Certification	36
VII. Further Information	37
VIII. Conclusion	37

List of Attachments

Attachment 1 - FCC Form 312 and Related Exhibits

Exhibit A - Ownership of AfriSpace and WorldSpace, Inc.

Exhibit B - Board of Directors and Officers of AfriSpace and
WorldSpace, Inc.

Attachment 2 - Technical Description

Attachment 3 - Technical Certification

Attachment 4 - Financial Information

Attachment 5 - Estimated Operating Expenses

Attachment 6 - Financial Certification

Attachment 7 - Balance Sheet Current For The Fiscal Year -- 1997

Attachment 8 - Financial Commitments Reflected in the Balance Sheet

Attachment 9 - AfriStar Schedule and Milestones

Attachment 10 - Diagram of AfriStar System

Attachment 11 - Organizational Structure of WorldSpace, Inc. And AfriSpace

Attachment 12 - Background and Ownership Information Regarding WorldSpace
International Network Inc.

Attachment 13 - Organizational Structure of WorldSpace, Inc. International Network Inc.

Attachment 14 - Diagram of AfriSpace Business

Executive Summary

On July 23, 1990, AfriSpace, Inc. ("AfriSpace") filed an application for a private international satellite system to provide Broadcasting-Satellite Service (Sound) ("BSS(Sound)") on a non-common carrier basis to Africa and the Middle East in the 1467-1492 MHz frequency band. AfriSpace hereby submits this amendment to update the information contained in its pending application, and bring its orbital location into conformance with the FCC experimental license granted to AfriSpace in 1991. AfriSpace also seeks to modify its application to include the use of the lower BSS(Sound) L-Band frequencies, specifically 1452-1467 MHz, subject to the results of a competent ITU conference to be convened for the planning of BSS(Sound) services in this lower band.

AfriSpace's mission has not changed since the day it was conceived -- to bring badly needed additional sources of information, entertainment and news to the vastly underserved people and communities of Africa and the Middle East. Africa has an average of 0.8 radios per household. In the United States, by contrast, there is an average of 5.4 radios per household; in Europe, typically, there are 3.0 radios per household.¹ The average American has access to a multitude of media outlets, including print media, over-the-air television, cable television, satellite services and many other information and entertainment sources, exemplified best by the exploding access to the Internet. In sharp contrast, most people in the regions to be served by the AfriStar satellite rely on radio as a primary means of accessing local and national information. A lucky few have access to unreliable shortwave radio providing limited access to international

¹ United Nations Educational, Scientific and Cultural Organization ("UNESCO") Statistical Yearbook 1996.

news and information resources. AfriStar will advance pluralism and the free flow of information by providing access to these sources of information to all citizens in Africa and the Middle East.

AfriSpace will be the first international private satellite system to offer BSS(Sound) technology to the developing nations of Africa and the Middle East. As Vice President Albert Gore stated at the International Telecommunication Union (“ITU”) Plenipotentiary Conference in Minneapolis last year, “. . . today, on the eve of a new century and a new millennium, we have an unprecedented opportunity to use these powerful new forces of technology to advance our oldest and most cherished values.”² Those values, as described by the Vice President, are “rising standards of living and literacy, an ever-widening circle of democracy, freedom, and individual empowerment.”³ Satellite technology can break the economic equation that hinders the extension of communications services to remote and rural areas, and open new markets for U.S. products and services.

AfriStar will provide the platform for customers to deliver a mix of commercial and non-commercial programming, including public service information supplied by international, regional and national health and social welfare agencies. A strong component in this mix is expected to be programming produced by U.S. organizations. AfriStar will offer such U.S. programmers, and other U.S. international media organizations, the infrastructure necessary to

² Vice President Albert Gore, Remarks before the 15th International ITU Plenipotentiary Conference, Minneapolis, Minnesota, U.S.A. (Oct. 12, 1998).

³ *Id.*

reach the over one billion people in Africa and the Middle East which to date have been largely out of their reach.

On June 21, 1991, AfriSpace was granted an experimental license for the AfriStar system. This experimental license allowed AfriSpace, with the Commission's assistance, to build its business, develop and test its technology, and conduct different studies. In addition, the experimental license allowed AfriSpace to enter its last phase of development, the launch of the AfriStar satellite which successfully took place on October 28, 1998. In the second quarter of 1999, AfriSpace intends to initiate commercial trials of the AfriStar system. In addition, AfriSpace, has made great strides regarding the ITU coordination and standardization process. The ITU coordination process is in its final stages, in large measure due to the efforts and support of the FCC.

In summary, AfriSpace requests that the Commission grant this application and issue a private international satellite license on an expedited basis so that the public benefits of the AfriStar system will be realized as rapidly as possible.

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AMENDMENT

AfriSpace, Inc. ("AfriSpace"), pursuant to Section 25.116 of the Federal Communications Commission's ("FCC" or "Commission") Rules, 47 C.F.R. §25.116 (1997), hereby submits this amendment to its pending application for a private international satellite system in the 1467-1492 MHz frequency band (hereinafter referred to as "Amendment"). Through this Amendment, AfriSpace respectfully requests permission to: (i) update the information contained in its application for a full license for the AfriStar private international satellite system to provide facilities on a non-common carrier basis for customers wishing to provide international Broadcasting-Satellite Service (Sound) ("BSS(Sound)") to Africa and the Middle East in the 1467-1492 MHz frequency band; (ii) bring its orbital location into conformance with the FCC experimental license granted to AfriSpace in 1991, as amended; and (iii) modify its application to include the use of the lower BSS(Sound) L-Band frequencies, specifically 1452-1467 MHz,

subject to the results of a competent International Telecommunication Union ("ITU") conference to be convened for the planning of BSS(Sound) services in this lower band.

I. Overview

Despite the fact that one in every eight people on Earth live in Africa, it remains the last economic and political frontier on the planet. In the 1990's, many nations in Asia and Latin America, as well as Eastern Europe, instituted economic and political reforms long encouraged by the United States. A new era dawned as the Cold War died. Unfortunately, the African people were largely left behind in this rush to reformation, though the start of political and economic reform has lately commenced in several countries in the region. President Clinton's visit to Africa last year highlighted the progress that has been made and the commitment of the United States to provide greater assistance to, and investment in, the nations and people of Africa. As President Clinton said before that trip, "the United States stands ready to be a partner in Africa's prosperity."⁴ Many obstacles, however, remain subject to or dependant upon full realization of economic development and political reform in Africa and the Middle East.

Information and communication scarcity is one such obstacle to sustainable development in these regions. AfriSpace intends to assist in remedying that situation by providing the facility by which the people of Africa and the Middle East will have access to a true cornucopia of digital audio and ancillary services. For the first time, the average listener in Africa and the

⁴ President William Jefferson Clinton, Statement on House of Representative Action on the "African Growth and Opportunity Act," 34 Weekly Comp. Pres. Doc. 416 (Mar. 11, 1998).

Middle East will be able to choose from and compare a diversity of sources of news, opinion, music and entertainment - a true realization of the free flow of information encouraged by U.S. policies and embodied in the United Nations Charter. AfriSpace will be the latest manifestation of long-established U.S. policy to use space technology -- ranging from fixed satellite services and remote sensing to low earth orbiting satellite systems -- to promote economic growth in developing regions.

For AfriSpace, the vision remains the same, though it has matured with the support of the FCC under its experimental license program and through its coordination of AfriStar before the ITU. AfriSpace was thus able to move into the next stage, with the launch of its AfriStar satellite on October 28, 1998, and testing of the satellite on an experimental basis, before initiating commercial trials planned in the second quarter of 1999.

The sections which follow describe the progress made by AfriSpace, and its parent company, WorldSpace, Inc.,⁵ in bringing forward the vision that has driven this venture since 1990, including the refinements made to the technology, the business structure and the service delivery mechanism.

II. Background

A. AfriSpace Application

AfriSpace submitted an application on July 23, 1990 to construct, launch and operate a private international satellite system to provide BSS(Sound) to Africa and the Middle East

⁵ See Attachment 11 for an organizational chart relating to WorldSpace, Inc. and AfriSpace, Inc.

(hereinafter referred to as "Application").⁶ In a subsequent letter to the Commission dated August 6, 1990, AfriSpace clarified that it was only requesting that the Commission issue a construction permit to commence construction of its first satellite, AfriStar, which was FCC policy in 1990.⁷ The Application was placed on Public Notice on October 12, 1990, and comments were requested from interested parties.⁸ The Public Notice stated that the Application had not yet been accepted for filing by the Commission. In particular, the FCC specifically invited comments from the Executive Branch in view of the national interest and foreign policy issues raised by the application.

Supportive comments were received by more than 30 parties, encompassing U.S. Government agencies,⁹ representatives from educational institutions, industry members, foreign

⁶ AfriSpace, Inc., Application to the Federal Communications Commission "For Authority to Construct, Launch and Operate a Subregional Africa and Middle Eastern Satellite Sound Broadcasting Transmission System," FCC File No. CSS-90-017 (July 23, 1990).

⁷ Letter from Barbara L. (Pixie) Waite to Donna R. Searcy, Secretary, Federal Communications Commission (Aug. 6, 1990). Before 1996, the FCC's licensing policy for satellites contemplated issuance of a construction permit prior to issuing a launch and operating license.

⁸ Public Notice, Report No. I-9501, (Oct. 12, 1990).

⁹ Comments were filed by the Department of State, the National Telecommunications and Information Administration within the Department of Commerce ("NTIA"), and the National Aeronautics and Space Administration ("NASA"). The Department of State stated that it had "weighed the foreign policy issues involved and has no objection to the Commission proceeding with consideration of this application." However, given that an international frequency allocation had not been made yet for BSS(Sound), and that the United States had not reached a position as to what domestic spectrum allocation should be used for such a service, the Department of State did not take a position on the frequency band issue. Comments of Department of State, at 1. NTIA stated that it

governments, regional, and multilateral and international organizations, including African and Middle Eastern organizations and private citizens.¹⁰ No party filed a petition to deny the

“supported the implementation of such services as an important opportunity for United States industry, from a commercial perspective.” Although NASA was not able to endorse specific commercial entities or undertaking, it did state in its letter that “. . . NASA supports the commercial utilization of space and space communications technologies in a manner consistent with the benefit of citizens of the United States and the world. It is NASA’s view that the concept of an international satellite sound broadcasting system represents such a potentially beneficial utilization of space and space communications technology.” Comments of NASA, at 1.

¹⁰ In addition to the U.S. Government agencies mentioned in the preceding footnote, the following parties also filed supportive comments: Access Network; ADVANCE, Incorporated; AfriSpace (submitting letters of support from Union of National Radio and Television Organizations of Africa (URTNA); PanAfrican News Agency; U.S. Embassy, Botswana; Office de Radiodiffusion Television du Senegal; B.S. Rao, ITU Project Coordinator; Satellite Broadcasting Saudi Arabia; Radio & Television Union of the Government of Egypt; Radio Canada International; Council of Europe; International Institute of Communications; the Ministry of Information of the People’s Democratic Republic of Ethiopia; Government of Benin; African, Caribbean and Pacific Group of States; Embassy of the Republic of Zimbabwe; Zimbabwe Broadcasting Corporation; Minister of Information and the Press of the Republic of Zaire; Ministry of Communication of the Republic of Niger; Ministry of Culture & Communication of the Republic of Senegal; and Government of Guinea); American Association of Community and Junior Colleges; American Association of University Women; Black College Satellite Network; California Center for International Private Enterprise; California State University; The Christian Science Publishing Society; Colorado Video, Inc.; Defense Systems, Inc.; Engineering Technologies, Inc.; Frank B. Hall & Company, Inc.; Department of Radio, TV and Film, School of Communications, George Washington University; Hispanic Information & Telecommunications Network, Inc.; Wegard D. Holby, Esq.; Abiyi R. Ford, Howard University; Sulayman S. Nyang, Ph.D., College of Liberal Arts, African Studies & Research Program, Howard University; International Technologies, Inc.; International Telecommunication Union; Molajo Group, Inc.; Morgan Graphics; Multi-Technology Analysis & Research Corporation; National Association of Arab Americans; Donald R. Norland; Philip Olivetti; The Right-Roc Group; Société Internationale Financière Pour Les Investissements Et Le Développement En Afrique; Soundprint (John Hopkins University); Stanford

Application. The only issue of potential debate expressed by certain parties involved the allocation of frequencies to BSS(Sound),¹¹ which was resolved at WARC-92, as discussed below.

On November 9, 1990, AfriSpace filed a letter with the Commission explaining that the company was willing to accept a "license at any frequency within the range identified by ITU Resolution 520 (0.5-3.0 GHz) or WARC-92, notwithstanding its specification of 1470-1530 MHz."¹² Subsequently, AfriSpace's counsel filed a letter on January 25, 1991, after a meeting with Commission staff members, restating that it was not asking for a frequency allocation or a full license, but was asking only for a construction permit at that time.¹³

Telecom; Gary J. Strauch; TeleSystems International Corporation; Transcomm, Inc.; UNESCO; Peter Watkins; The World Bank; and World Christian Broadcasting Corporation. The following parties filed reply comments: National Association of Black Owned Broadcasters, Inc. and Voice of America Inc.

¹¹ See Comments filed by American Mobile Satellite Corporation, Communications Satellite Corporation and Motorola, Inc.

¹² Letter from Noah Samara to Donna R. Searcy, Secretary, Federal Communications Commission, regarding the Application of AfriSpace, Inc., FCC File No. CSS-90-017 (Nov. 9, 1990). NTIA supported acceptance of AfriSpace's application for filing, based on AfriSpace's amendment, which stated that AfriSpace would accept a grant and subsequent license at any frequency within the range identified by ITU Resolution 520 (0.5-3.0 GHz) or WARC-92. Moreover, NTIA noted "that other nations are contemplating similar activities and, therefore, encourage[d] all reasonable expediency in this matter." Comments of NTIA, at 1-2.

¹³ Letter from Tara Kalagher Giunta, Attorney for AfriSpace, to Donna R. Searcy, Secretary, Federal Communications Commission, regarding the Application of AfriSpace, Inc., FCC File No. CSS-90-017 (Jan. 25, 1991).

On January 30, 1991, AfriSpace filed a minor amendment to its pending Application, notifying the Commission that: (i) AfriSpace had become a wholly-owned subsidiary of WorldSpace, Inc.; (ii) AfriSpace had been reconstituted as a Maryland corporation; and (iii) no substantive changes had been made to the ownership and control of AfriSpace as a result of the corporate reorganization.¹⁴

Through its counsel, AfriSpace submitted a letter to the FCC clarifying various questions raised by Commission staff in a meeting held on April 9, 1991.¹⁵ AfriSpace reiterated that, at that time, it was seeking only a construction permit and not specific frequencies. It also emphasized that it would operate as an private international satellite system and would not be providing any services to or within the United States. On July 30, 1991, AfriSpace submitted a separate application for a pioneer's preference,¹⁶ restating a request that had been made in its pending application.¹⁷

¹⁴ Amendment to Application of AfriSpace, Inc., FCC File No. CSS-90-017 (Jan. 30, 1991).

¹⁵ Letter from Tedson J. Meyers, Attorney for AfriSpace, to Gerald P. Vaughan, Deputy Chief, Common Carrier Bureau, Federal Communications Commission, regarding Application of AfriSpace, Inc., FCC File No. CSS-90-017 (Apr. 23, 1990).

¹⁶ Letter from Tedson J. Meyers, Attorney for AfriSpace, to Donna R. Searcy, Secretary, Federal Communications Commission, regarding Establishment of Procedures to Provide a Preference to Applicants Proposing an Allocation for New Services, General Docket No. 90-217; FCC File No. CSS-90-017; Supplemental Notice of Inquiry, Gen. Docket No. 89-554 (July 30, 1991).

¹⁷ Application, *supra* n. 5, at 77.

On March 3, 1992, WARC-92 allocated the band 1452-1492 MHz for facilities downlinking BSS(Sound), with immediate use permissible in the upper 25 MHz of that band (*i.e.*, 1467-1492 MHz).¹⁸ On May 6, 1992, AfriSpace filed an amendment to its pending Application.¹⁹ The amendment was filed to bring AfriSpace's Application up-to-date with the results of WARC-92 and to amend the technical specifications in the AfriSpace application.

On June 21, 1996, AfriSpace filed an amendment to its pioneer's preference request²⁰ in order to comply with the new requirements established by the Commission in ET Docket No. 93-266.²¹ On September 11, 1997, the Commission terminated the pioneer's preference program

¹⁸ In footnote S5.344 to Resolution 528 (WARC-92), the United States reserved an alternative allocation in the L- Band (1452-1525 MHz) to fixed and mobile services on a primary basis. In footnote S5.393 the United States reserved an additional allocation (2310-2360 MHz) for BSS(Sound) downlinks within the United States. These footnotes to ITU Resolution 528 (WARC-92) are not applicable to AfriSpace because AfriSpace's facilities will downlink outside of the United States exclusively (*i.e.*, into Africa and the Middle East).

¹⁹ Amendment to AfriSpace's Application and Amended Application for a Construction Permit, FCC File No. CSS-90-017 (May 6, 1992).

²⁰ Letter from Tara Kalagher Giunta, Attorney for AfriSpace, to William F. Caton, Acting Secretary, Federal Communication Commission, regarding AfriSpace Amendment to Pioneer's Preference Application in CSS-90-017 (Jun. 21, 1996).

²¹ The Commission issued a Public Notice on May 14, 1996 stating that parties with outstanding pioneer's preference requests that had not reached the Tentative Decision Stage or complied with the new requirements set forth in the Second Report and Order and Third Report and Order in Docket 93-266 had to amend their applications by June 21, 1996. Filing Deadline Announced for Submission of Amendments to Pending Pioneer's Preference Requests, *Public Notice*, 11 F.C.C.R.13829 (1996).

and dismissed all pending pioneer's preference requests, including AfriSpace's request.²² That dismissal was appealed by Qualcomm, but the appeal was denied by the Commission in April 1998.²³ A court challenge to this dismissal is pending.²⁴

B. The AfriSpace Experimental License

1. Issuance of the Experimental License

In 1991, after discussions with FCC staff, AfriSpace filed an application for an experimental license in order to permit AfriSpace to proceed with its business venture while the ITU and the Commission resolved frequency allocation issues related to BSS(Sound).²⁵ On June 20, 1991, the FCC granted AfriSpace an experimental license for its space station to be located at 12 degrees W.L., and to use the 2310-2360 MHz band. The Commission also granted a separate experimental license for an uplink earth station to operate from the United States between 7015-7075 MHz.²⁶ The Commission's experimental license policies allowed AfriSpace to organize its

²² See Dismissal of All Pending Pioneer's Preference Requests; Review of the Pioneer's Preference Rules. *Order*, 12 F.C.C.R. 14006, 14009 (1997).

²³ See Dismissal of All Pending Pioneer's Preference Requests; Review of the Pioneer's Preference Rules. *Memorandum Opinion and Order*, 13 F.C.C.R. 11485 (1998).

²⁴ See *Qualcomm Incorporated v. FCC*, No. 98-1246 (D.C. Cir., May 21, 1998).

²⁵ Application of AfriSpace, Inc. For Experimental License, FCC File No. 2075-EX-PL-91, (June 10, 1991).

²⁶ See Experimental Licenses, FCC File Nos. 2075-EX-PL-91 and 2083-EX-PL-91 (issued June 21, 1991 and October 31, 1991, respectively). AfriSpace received an experimental radio station construction permit and license authorizing it to construct, launch and operate a satellite system on a non-commercial basis. In

business, develop and test its technology, conduct market studies, test the satellite, and launch and operate the AfriStar satellite on an experimental basis.²⁷

Since 1991, the experimental license has been renewed every two years, with the most recent renewal set to expire in December 1999.²⁸ Various modifications and amendments have been made by AfriSpace during the past seven years to the experimental license. The most significant involved an amendment in 1992 to bring the frequency allocations into compliance with the outcome of WARC-92.²⁹ In 1994, pursuant to an agreement reached with NTIA and the

1998, the Commission eliminated the rules requiring that a construction permit be obtained in conjunction with an experimental license. *See* Amendment of Part 5 of the Commission's Rules to Revise the Experimental Radio Service Regulations, FCC 98-283 *Report and Order*, (1998), ET Docket No. 96-256.

²⁷ Through its counsel, AfriSpace submitted a letter to the Commission clarifying that AfriSpace would not be withdrawing its application for a full license merely because it had received an experimental license. Letter from Tara Kalagher Giunta, Attorney for AfriSpace, to Donna R. Searcy, Secretary, Federal Communications Commission, regarding the Application of AfriSpace, Inc., FCC File No. CSS-90-017 (July 31, 1991).

²⁸ *See* Experimental License, FCC File No. 2075-EX-PL-91 (authorization effective from June 21, 1991 to Dec. 1, 1993); 2083-EX-PL-91 (authorization effective from Oct. 31, 1991 to Dec. 1, 1993); 3046-EX-ML-92 (authorization effective from July 20, 1992 to Dec. 1, 1993); 3046-EX-R-93 (authorization effective from Dec. 1, 1993 to Dec. 1, 1995); 4593-EX-ML-95 (authorization effective from Apr. 4, 1995 to Dec. 1, 1995); 4593-EX-R-95 (authorization effective from Dec. 1, 1995 to Dec. 1, 1997); and 4593-EX-R-97 (authorization effective from Dec. 1, 1997 to Dec. 1, 1999).

²⁹ On March 27, 1992, AfriSpace modified its space station experimental license to conform to the frequencies allocated by WARC-92, on a non-interference basis. The Commission granted a modified experimental license in the 1467-1492 MHz frequency band. Experimental License, FCC File No. 3046-EX-ML-92 (authorization effective July 20, 1992 to Dec. 1, 1993).

Department of Defense, AfriSpace requested permission to change the orbital location for the AfriStar satellite from 12 degrees W.L. to 21 degrees E.L., in order to eliminate possible coordination difficulties with Mobile Aeronautical Telemetry Service ("MATS") operations in the United States.³⁰ The modified experimental license was issued in April 1995.³¹ At the time of the modification, AfriSpace returned its experimental license for an associated earth station in the United States because, as a result of the satellite's repositioning, the earth station would no longer be in view of the satellite.³²

2. Progress Under the Experimental License

AfriSpace has made outstanding progress in developing its technology and business case under the Commission's experimental license program. In 1993, the Commission instituted a requirement that experimental licensees file status reports every six months. AfriSpace has filed such status reports for each subsequent six-month period, demonstrating the progress under the experimental license.

During 1992-1994, AfriSpace's parent, WorldSpace, Inc., negotiated with several major satellite manufacturers for the design, development and construction of its satellite system.

³⁰ See Letter from Richard D. Parlow, National Telecommunication and Information Administration, to Richard M. Smith, Federal Communications Commission, (Sept. 9, 1994).

³¹ Application of AfriSpace for New or Modified Radio Station Authorization, FCC File No. 4593-EX-ML-95 (Dec. 30, 1994), FCC Experimental File No. 4593-EX-ML-95 (authorization effective from Apr. 4, 1995 to Dec. 1, 1995).

³² See Letter from Noah A. Samara to H. Franklin Wright, Office of Engineering and Technology, Federal Communications Commission (Mar. 20, 1995).

Consultations with technical experts enhanced the efficiency with which AfriSpace will use the frequency spectrum. As a result, a plan was developed to utilize time division multiplexing in addition to the already planned use of digital modulation techniques, thus allowing for a wider variety of audio service channel quality.³³ Additionally, moving the AfriStar satellite to 21 degrees E.L. reduced the possibility of harmful interference to fixed service transmitters.

WorldSpace, Inc. conducted users' conferences, involving representatives of international and national broadcasting organizations, global industrial electronics and consumer products manufacturers, governments, public telephone operators, United Nations agency and non-governmental organization representatives, as well as interested parties from telecommunications, banking and investment entities. As a result of information learned from these users' conferences, MPEG³⁴ 2.5 Layer 3 was selected as the audio compression coding standard for the system, enabling more efficient use of the radio frequency spectrum and greater access to the system by smaller programmers.

In January 1995, Alcatel Espace ("Alcatel") was chosen as the prime contractor to build and deliver in-orbit the AfriStar satellite, based on specifications for the end-to-end system design and integration of the various segments (*i.e.*, transmission, space, mission, radio, infrastructure and business) designed by Motorola, Inc. By the end of 1995, Matra Marconi

³³ The service quality will range between AM monaural voice (16 kbps) to compact disk (CD) stereo voice/music (128 kbps) quality.

³⁴ MPEG is commonly known as a series of hardware and software standards designed to reduce the storage requirements of digital bit streams. The word MPEG is actually the acronym for the Motion Pictures Experts Group, a joint committee of the International Standards Organization ("ISO") and the Electrotechnical Commission ("EC").

Space ("Matra") was selected as the major subcontractor to Alcatel. Matra's EuroStar 2000+ design was selected for the satellite platform. Spectrum efficiency was greatly increased when a decision was made to reuse the downlink frequency band through polarization diversity.

In September 1995, an experiment was conducted by the Motorola Government Systems and Technology Group to test, in real-time, the AfriStar satellite network's Time Division Multiplexed ("TDM"), Quaternary Phase Shift Keying ("QPSK") modulated, digital waveform. The demonstration was conducted using an L-Band transponder on the Mexican Solidaridad II satellite and a transportable uplink located in Mexico. The signal reception and processing equipment were located at a site in Tempe, Arizona. The test results confirmed the robustness of the waveform and effectiveness of the audio source coding and error correction coding. The Fraunhofer Institute Integrierte Schaltungen ("FhGIIS") continued to progress the development of receiver technology.

Also during this period, the Gallup Research Organization conducted a market survey to ascertain and quantify the effects of various factors affecting market penetration of the AfriSpace BSS(Sound) service. Data was collected on such parameters as price sensitivity, programming choices, and consumer product availability. Overall, the results provided empirical evidence of strong interest and enthusiasm for the proposed service, and projections reflected that millions of receivers would be in use within five years of service initiation.

Steady progress continued on the design and development phase to the product development, testing and procurement stage. Specifically, in July 1996, AfriSpace completed BSS(Sound) system simulation activities and validation tests. These tests verified the compatibility of the digital format at the broadcast, space and radio segment levels for both

uplink and downlink signals. During this period, SGS Thompson (new ST Microelectronics) (Italy) and ITT Intermetall (Germany) (now Micronas Intermetall) were selected as the two initial radio chipset manufacturers for production of the micro-integrated circuits for the radio receivers. McKinsey & Company also was contracted to conduct further market research and strategy studies following the Gallup market survey.

In September 1996, FhGIIS conducted experiments to validate the quality of signal reception in stationary, portable and mobile environments.³⁵ Several operational modes were confirmed and a full report with quantitative results was produced. The qualitative results validated the complete end-to-end transmission chain. These results established a benchmark for further developmental tests and technical investigations.

By the end of 1996, the satellite manufacturing program progressed to the Critical Design Review (“CDR”) stage, and other aspects of the end-to-end system design continued to develop (e.g., receiver chipset development), along with ground network and feeder link station implementation.

Between 1996 and 1997, the company focused on finalizing the long-term financing of the system, as more fully described below. Achievements during this period were mostly accomplished through strategic alliances and interim debt financing. Industrial partners largely conducted design and development work for their respective aspects of the system, in

³⁵ Key tests used a helicopter as a platform to simulate satellite operations and a personal computer-based prototype receiver. The test setup consisted of replaying a pre-recorded TDM bitstream, representative of various audio qualities, from a personal computer that was on board the helicopter. The helicopter hovered at altitudes between 3,000-10,000 feet and transmitted the amplified signal at various power levels and elevation angles.

anticipation of obtaining the funding necessary to move the program into full deployment and operation.

On December 15, 1997, Alcatel delivered the AfriStar payload to the Integration and Test facilities at Matra, which then commenced assembly of the payload with the spacecraft bus. Additionally, the ground network equipment for the operation and control of the AfriStar satellite completed final test stages.

From January through August 1998, the AfriStar payload underwent systems tests and final payload assembly procedures at the Matra Marconi Space and Interspace test facilities. Test results demonstrated that the communications payload functioned normally.

During these tests, the communications payload performance disclosed a potential difficulty if the satellite were to transmit at the higher end of the 1467-1492 MHz frequency band, due to phase noise that could be introduced into the signal by the interaction of payload signal generating components. This phase noise could cause receivers to suffer from intermittent loss of signal. However, the frequency plan for AfriStar (*see* Attachment 2 for a further description of the AfriStar frequency plan) calls for the satellite to transmit in frequencies well away from the higher end of its allocated range. Consequently, there is little likelihood that AfriStar will operationally experience phase noise.

In late August, the fully completed AfriStar satellite was shipped to the Alcatel launch facility in Kourou, French Guyana for launch vehicle integration. The AfriStar satellite shared a payload with a GE Americom communications satellite aboard an Arianespace Ariane 4 launcher.

The AfriStar launch took place on October 28, 1998 from Kourou. It resulted in successful insertion of the spacecraft into transfer orbit, from which ground controllers moved it to its present geostationary position at 21 degrees E.L. The launch and transfer orbit maneuvers were followed by the handover of ground control operations from CNES (the French space agency) to the AfriSpace Regional Operations Center ("ROC") and associated earth stations on November 9, 1998. However, the spacecraft will remain the responsibility of Alcatel until its formal acceptance at the In-Orbit Acceptance Review ("IOAR").

In-orbit payload testing commenced once the AfriSpace ROC assumed operational control of the AfriStar satellite. While, for the most part, the payload functioned normally. After conducting various tests, however, an anomaly was observed in the Payload Interface Unit ("PIU"), which controls the switching of the traveling wave tube amplifiers ("TWTAs") for two of the three beams. This anomaly limits the ability of AfriSpace to reconfigure the payload and, in the event that a TWTA fails, could reduce the capacity to back-up a failed TWTA with one of the back-up units. Inability to restore the operation of a failed TWTA may result in substantial loss of capacity, which may in turn, reduce the useful life of the satellite.

Shortly after the completion of In-Orbit Testing on January 7, 1999, the AfriStar satellite successfully completed end-to-end system tests, using production radios and other test equipment. AfriSpace will commence normal on-station operations of AfriStar following completion of the IOAR. This review is planned for the end of January 1999; however, the risks associated with the PIU anomaly will remain with Alcatel until all associated procedures regarding qualification and training are completed. This process is expected to be completed by

early March 1999, after which the AfriStar satellite will become available for commercial trials and eventual revenue service.

C. ITU Coordination and Standardization

After granting AfriSpace its experimental license in June 1992, the Commission commenced the ITU coordination process on behalf of AfriSpace by submitting advance publication information to the ITU for both the uplink and downlink frequency bands of AfriStar's wideband communications carriers. This information was published by the ITU in December 1992. Subsequently, the FCC sent the Request for Coordination information for AfriStar to the ITU in September 1994. The ITU published the Request for Coordination for AfriStar in July 1996. This publication provided all countries with notice of AfriSpace's intention to operate AfriStar at 21 degrees E.L., in the BSS(Sound) L-Band frequencies.³⁶ AfriStar was the first satellite for which a Request for Coordination was published by the ITU for BSS(Sound) in the L-Band to the African and Middle East region. On August 26, 1997, the ITU published the modification to the Request for Coordination for AfriStar, to add the uplink narrowband carriers and other information on the telemetry carrier.

The Commission, on behalf of AfriSpace, has conducted exchanges of information with commenting Administrations and reached coordination agreements with Ethiopia and Senegal.

³⁶ Advance publication information for AfriStar initially identified the orbital location for the satellite as 12 degrees W.L. The orbital location was later changed to 21 degrees E.L. for reasons as stated above.

As of January 1999, the ITU had received 17 Letters of Association (“LOAs”) regarding AfriStar from various African and Middle Eastern countries, indicating their intention to authorize the use of AfriStar. These countries include: Angola, Botswana, Central African Republic, Democratic Republic of the Congo, Egypt, Gabon, Gambia, Ghana, Kenya, Lesotho, Liberia, Mauritius, Senegal, Sierra Leone, South Africa, Togo and Uganda.

In October 1998, Joint Working Group 10-11S of the ITU's Radiocommunication Bureau approved Recommendation BO.1130-1 on systems for digital sound broadcasting. The Recommendation states that the three digital audio broadcast systems developed to date, including the transmission system to be used by the AfriStar satellite network (referred to as Digital System D), are equally acceptable. Given the comparability between the systems, the Recommendation allows each individual government to decide which of the three digital audio broadcast systems to adopt. The Recommendation will be submitted for approval at the next full Study Group 10 meeting in June 1999, and for adoption at the ITU Radiocommunication Assembly in 2000.

III. Review of Amendment to AfriSpace Application

This Amendment provides the Commission with updated information regarding AfriSpace's pending Application. Since AfriSpace's Application was originally filed in 1990, certain changes have taken place which AfriSpace brings to the Commission's attention below.

A. Updated Description of AfriSpace Service and System

AfriSpace proposes to operate an private international satellite system, called AfriStar, in the BSS(Sound) portion of the L-Band. Since 1990, when the Application was filed, AfriSpace's service objectives have remained the same.³⁷ AfriSpace will offer point-to-multipoint transmission capacity to customers exclusively on a non-common carrier basis. Initially, nearly all of the capacity will be leased to one customer, WorldSpace International Network Inc. ("WIN").³⁸ Win will resell capacity to programmers in need of BSS(Sound) transmission capacity in the African and Middle Eastern region.

AfriStar will serve close to sixty countries in the African and Middle East region, with a combined population of more than 1 billion people. By and large, radio is the leading form of information dissemination in those countries. As noted by many of the parties that submitted comments in support of AfriSpace's pending Application, however, radio programming options in these countries are few. There is limited access to local, regional or international news, entertainment and educational programming.³⁹ AfriStar will offer a reliable and vitally needed alternative to unreliable shortwave radio for international, regional and national audiences. It will allow programmers the ability to provide the people of Africa and the Middle East with a

³⁷ See Application, *supra* n. 5, at 16.

³⁸ WIN is an off-shore company located in the British Virgin Islands in which WorldSpace, Inc. holds a 17 percent ownership interest. See also, Part III. F of the Amendment.

³⁹ See, e.g., Letter from Tara Kalagher Giunta, Attorney for AfriSpace, to Donna R. Searcy, Secretary, Federal Communications Commission, FCC File No. CSS-90-017 (Jan. 25, 1991).

broad range of programming and information in many languages, and consistent with audience interests and needs.

Since AfriSpace's Application was filed, the company has proceeded to develop its proposed system and certain changes have been introduced regarding the operational and technical aspects of the system. Attachment 2 and this Section of the Amendment update the system and technical descriptions set forth in Parts I and VIII of the Application.⁴⁰ These operational and technical aspects have been submitted to the FCC previously in reviewing the experimental license.

The AfriStar system consists of a geostationary satellite, associated ground control systems, associated network management systems and feeder link stations. The satellite is equipped with three downlink beams, each focused on a different geographical region within the satellite's overall coverage area.

AfriSpace will exercise complete technical and operational control over AfriStar through dedicated facilities and staff. Operation of the satellite is monitored and controlled by the ground control system consisting of a ROC located in Washington, D.C., and two Telemetry, Control and Range ("TCR") stations and one In-Orbit Testing/Communications Systems Monitoring ("IOT/CSM") facility, located off-shore, in line-of-sight of the satellite.

The TCR stations are located in Bangalore, India and Port Luis, Mauritius. The TCR station in India constitutes the primary technical control facility for AfriSpace's private satellite

⁴⁰ Application, *supra* n. 5 at 14-22 (System and Service Description) and 80-97 (Technical Description).

system, while the station in Mauritius provides the technical back-up control facility for the system. The IOT/CSM facility is located in Libreville, Gabon.

The ROC in Washington, D.C. manages the performance and operation of all AfriStar systems, including the on-board communications payload. In addition, the ROC, through its mission control center, controls and facilitates the delivery and quality of the signals from the individual feeder link stations to the satellite by assigning the signals to the appropriate uplink frequencies and routing them through the onboard communications payload to their appropriate downlink carriers. The ROC controls the satellite from Washington, D.C. via dedicated telephone lines to the remote TCR stations.

See Attachment 2 to this Amendment for a more detailed technical and operational description of the AfriStar private international satellite system.

To finance the space segment, AfriSpace has entered into a 12-year lease agreement whereby it will lease AfriStar from an offshore company, WorldSpace Satellite Company, Ltd.⁴¹ AfriSpace will offer capacity on AfriStar to its customers. Initially, nearly all of the capacity on AfriStar will be leased to WTN pursuant to a channel service agreement. *See Attachment 8 to this Amendment for a summary and a copy of the lease and channel service agreements.* WTN already has signed agreements with numerous global and regional audio broadcasters, including CNN International, Bloomberg, Kenya Broadcasting Corporation, Ghana Broadcasting

⁴¹ WorldSpace Satellite Company, Ltd. is a British Virgin Islands corporation and a wholly-owned subsidiary of WTN, also a British Virgin Islands corporation.

Corporation, Radio One Lebanon, Egyptian Radio and Television Union, Radio Sanyu Uganda, South Africa's Kaya FM, Benin's Golfe FM and Mali's Radio Kledu.

B. Need for Expedited Grant of a Full License

The AfriSpace Application has been pending before the Commission since 1990. As stated previously, over 30 parties filed comments in support of the proposed AfriStar private international satellite system, expressing their agreement that such a service was critically needed in the African and Middle Eastern regions.

AfriStar will operate on a non-exclusive basis. Because the AfriStar satellite is located at the 21 degrees E.L. orbital position and is not visible from U.S. territory, it will not cause interference to the U.S. systems operating in the same or adjacent frequency bands.⁴²

AfriSpace has made substantial progress with its project, thanks to the Commission's encouragement through grant and renewal of the experimental license, and the FCC's assistance with the ITU coordination process. AfriSpace now requires a full license to operate the AfriStar satellite on a commercial basis at 21 degrees E.L.⁴³ In addition, AfriSpace, Inc. seeks to modify its application to include the use of the lower L-Band frequencies, specifically 1452-1467 MHz, subject to the results of a competent ITU conference to be convened for the planning of BSS(Sound) services in this lower band.

⁴² See Letter from Tara K. Giunta, Attorney for AfriSpace to Francis K. Williams, Chief, Treaty Branch, Office of Engineering and Technology, Federal Communications Commission, FCC File No. 1300AS-S-FKN (Mar. 31, 1994).

C. Regulatory Aspects of Application and Amendment

1. Private International Satellite System

AfriSpace will only provide facilities for its customers to provide programming to the African and Middle Eastern region on a private carriage basis. As such, AfriSpace is similar to PanAmSat, Orion and other international private satellite providers. Additionally, AfriSpace's customers will offer their programming outside of the United States; and therefore, they will not interfere with U.S. terrestrial radio broadcasters or S-DARS licensees providing service in the United States. AfriSpace is not subject to the rules established for Satellite Digital Audio Radio Service ("S-DARS") in the United States because it is not a domestic S-DARS system.⁴⁴

2. Rationale for Changing Orbital Position

When AfriSpace filed its original experimental application in 1991, it requested the same orbital location (12 degrees W.L.) that it had specified in its July 1990 application to construct, launch and operate a private international satellite. The satellite's orbital position was within the U.S. line-of-sight. This location was chosen in order to "achieve AfriStar's primary coverage of the African-Arabian region, and still be controlled from U.S. territory . . ."⁴⁵ On December 30, 1994, pursuant to the above-mentioned coordination agreement with NTIA and DOD, AfriSpace filed a letter with its FCC Form 442 requesting a modification in its experimental license for a

⁴⁴ See Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band, *Report and Order Memorandum Opinion and Order and Further Notice of Proposed Rulemaking*, 12 F.C.C.R. 5754 (1997).

⁴⁵ Application of AfriSpace, Inc. For Experimental License, *supra* n. 24, Exhibit 1 (June 10, 1991).

BSS(Sound) space station to relocate the satellite to 21 degrees E.L. from 12 degrees W.L. This change was made to eliminate concerns expressed to the Commission by other U.S. government agencies regarding potential interference to U.S. MATS sites.⁴⁶ Consequently, AfriSpace returned the related experimental earth station license which became unusable for a satellite at 21 degrees E.L.⁴⁷ As a result, the Commission issued AfriSpace a new experimental license at the 21 degrees E.L. location.⁴⁸ As part of the decision to move the satellite, AfriSpace and the Commission agreed to find an alternative means of controlling the satellite at the new 21 degrees E.L. location. It was acknowledged by both AfriSpace and the Commission that AfriSpace would maintain control of the satellite indirectly from the United States. Subsequently, AfriSpace constructed a spacecraft control network that included dedicated telephone lines to its TCR stations in Mauritius and India from the ROC located in Washington, D.C.

⁴⁶ “. . . [F]rom the new location any chance of interference by the satellite into the Mobile Aeronautical Telemetry Service (“MATS”) in the United States will be virtually eliminated. Concerns about such potential interference have been expressed by the National Telecommunications and Information Administration (“NTIA”) and the Department of Defense (“DOD”). While an understanding has been achieved with NTIA and DOD on these issues, AfriSpace’s proposal contained herein to modify the location of the satellite should put to rest any remaining concerns concerning potential interference into U.S. MATS sites.” Letter from Timothy J. Logue, Space & Telecommunications Analyst, to Federal Communications Commission, Experimental Radio Service (Dec. 30, 1994).

⁴⁷ See Letter from Noah A. Samara to Franklin Wright, Office of Engineering and Technology, Federal Communications Commission (Mar. 20, 1995).

⁴⁸ Experimental License, FCC File No. 4593-EX-ML-95 (authorization effective from Apr. 4, 1995 to Dec. 1, 1995).

3. Numerous FCC Authorizations to Satellite Providers with Control Facilities Outside of the United States

Consistent with FCC precedent, while AfriSpace will offer its facilities to provide service outside of the United States, it will control the satellite from Washington, D.C. The Commission has previously authorized other private international satellite systems whose control facilities are out of line-of-sight of the United States, but who assure remote or indirect control through various facilities.

In 1992, for example, the FCC authorized PanAmSat Corporation (“PanAmSat”) to construct, launch and operate a new hybrid satellite in the Indian Ocean region (PAS-6).⁴⁹ As set forth in PanAmSat’s application, the Telemetry, Tracking and Control (“TT&C”) for the satellite would be accomplished from a new facility to be constructed abroad.⁵⁰ The facility performing the TT&C for the PAS-6 satellite is located in Perth, Australia. PanAmSat also has authority to construct, launch and operate a second satellite in the Indian Ocean Region (PAS-7). PanAmSat’s TT&C facilities in Australia also are used to control the PAS-7 satellite. In addition, the Commission has granted PanAmSat special temporary authority to launch and

⁴⁹ Alpha Lyracom, d/b/a Pan American Satellite, Application for Authority to Construct, Launch and Operate a Hybrid International Communications Satellite System (PAS-6), *Memorandum Opinion, Order and Authorization*, 7 F.C.C.R. 2974 (1992).

⁵⁰ See In the Matter of Application of Alpha Lyracom, d/b/a Pan American Satellite For Authority to Construct, Launch and Operate a Hybrid Separate System International Communications Satellite, File No. CSS-91-005 (Nov. 29, 1990), in Exhibit No. 1, at 2. See also, Application of PanAmSat Licensee Corp. For Authority to Construct, Launch and Operate a Hybrid C-/Ku Band Satellite in its Separate International Communications Satellite System, Application (Feb. 2, 1996), Exhibit 1.

operate the PAS-21 satellite, a C/Ku-band hybrid satellite, to be co-located with PAS-6. This satellite also is controlled through the TT&C facilities in Australia.

Similarly, the Commission has authorized numerous satellite service providers seeking authorizations for global satellite systems. Many of these systems have TT&C facilities located in overseas locations. In 1997, for example, the FCC authorized several global Ka-band systems whose systems proposed to use satellite control stations and facilities outside of the United States to control their satellites.⁵¹

4. Control of AfriSpace/Satellite and Facilities Remains in the United States

AfriSpace's TCR stations, located in Mauritius and India, will operate via dedicated telephone lines which directly link back to the ROC in Washington, D.C. Thus, AfriSpace will be able to control the satellite at all times from its operations base in the United States. While the Commission rules allow operating of control facilities under contract to the licensee,⁵² AfriSpace has chosen to operate the IOT/CSM facility in Gabon with AfriSpace employees, and to directly connect it to the ROC in Washington, D.C.

⁵¹ See, e.g., Morning Star Satellite Company, L.L.C. Application for Authority to Construct, Launch, and Operate a Ka-Band Satellite System in the Fixed-Satellite Service, *Order and Authorization*, 12 F.C.C.R. 6039 (1997); GE American Communications, Inc. Application for Authority to Construct, Launch and Operate a Ka-Band Satellite System in the Fixed-Satellite Service, *Order and Authorization*, 12 F.C.C.R. 6475 (1997).

⁵² For example, not only is PAS-6's TT&C facility located in Perth, Australia, but the facility is operated under contract with Optus. The same is true for the PAS-7 and PAS-21 satellites.

D. Orbital Location

Through this Amendment, AfriSpace seeks to bring the orbital location in its Application in conformance with its experimental license, and requests that the location be changed from 12 degrees W.L. to 21 degrees E.L.⁵³ In April 1995, the FCC approved AfriSpace's request to move its orbital location to 21 degrees E.L. for its experimental license. The 21 degrees E.L. orbital slot is preferable because it eliminates possible coordination difficulties with MATS operations in the United States and reduces the possibility of harmful interference to fixed service transmitters. Further, as noted, with the assistance of the FCC, the ITU coordination process of AfriStar at 21 degrees E.L. is far advanced. Given these reasons, AfriSpace requests that the Commission accept its proposed change in orbital location for AfriStar.

E. Technical Considerations

Since the Application was filed in 1990, various technical modifications and improvements have been made to the system, as reported in the semi-annual reports associated with AfriSpace's experimental license. An updated Technical Description is contained in Attachment 2 to this Amendment, which replaces the Technical Description contained in Part VIII of the Application.

⁵³ See Application, *supra* n. 5, at 91.

F. Corporate Organization of AfriSpace

As set forth in its Application and earlier amendments, AfriSpace is a U.S. company. It is 100 percent owned by WorldSpace, Inc., a Maryland corporation.⁵⁴ WorldSpace, Inc., is owned 97.5 percent by U.S. shareholders and 2.5 percent by foreign shareholders. See Exhibit A to FCC Form 312 (Attachment 1) to this Amendment. Since AfriSpace filed its 1991 amendment notifying the Commission of AfriSpace's reconstitution as a subsidiary of WorldSpace, Inc., certain corporate decisions have taken place.⁵⁵ Additionally, certain members of the Board of Directors and officers of WorldSpace, Inc., and AfriSpace have changed, as noted in Exhibit B to FCC Form 312 (Attachment 1) to this Amendment.

In December 1996, WorldSpace, Inc. sold all of its non-AfriSpace assets⁵⁶ to an offshore entity, WIN, in exchange for capital and a 16 percent equity stake in WIN.⁵⁷ The cash proceeds of the sale to WIN were, and are being, used to finance AfriSpace's financial needs through the commencement of commercial trials in the second quarter of 1999. Section III. G. below and Attachments 4-8 to this Amendment provide information relating to AfriSpace's financial

⁵⁴ See Attachment 11 to this Amendment for the organizational structure of WorldSpace, Inc. and AfriSpace.

⁵⁵ See Amendment to Application of AfriSpace, Inc., FCC File No. CSS-90-017 (filed Jan. 30, 1991).

⁵⁶ Assets include the development, manufacturing and launch agreements, technology agreements and non-AfriSpace employees.

⁵⁷ See Attachment 14 of this Amendment for a diagram of the AfriSpace business. See Attachment 13 of this Amendment for the organizational structure of WorldSpace International Network Inc.

qualifications. Simultaneously, the shareholders and holders of options of WorldSpace, Inc. were granted rights to exchange their WorldSpace, Inc. shares for WIN shares, subject to FCC approval. None of these rights have been exercised (and permission is not being sought here for such exercise). If and when such exercise is anticipated, AfriSpace will seek prior FCC approval. If all of these rights were to be exercised following FCC approval, WorldSpace, Inc. would become a wholly-owned subsidiary of WIN.⁵⁸

In the interest of fullest disclosure, we have attached the following information on WIN as Attachment 12.

G. Financial Considerations

Section 25.114(c)(11), requires applicants providing certain specified satellite services to demonstrate that they are financially qualified.⁵⁹ AfriSpace, however, does not fall into any of the specific categories under indicated in Section 25.114(c)(11). In the event that the Commission determines that AfriSpace is required to demonstrate its financial qualifications, and to the extent such a showing may not have been met, the company hereby requests a waiver of the financial requirements showing of Section 25.140(b)-(e), pursuant to Section 1.3 of the

⁵⁸ If all the aforementioned rights to acquire WIN shares were to be exercised, the shareholders of WorldSpace, Inc. would have, on a fully diluted basis, a 10% interest in WIN.

⁵⁹ Under Section 25.114(c)(11), applicants must include detailed information demonstrating their financial qualifications to construct and launch the proposed satellites relating to fixed satellite services; non-voice, non-geostationary mobile satellite services; or 1.6/2.4 GHz mobile satellite service.

Commission's Rules.⁶⁰ Grant of a waiver would be consistent with Commission precedent and the public interest in encouraging new entrants using innovative technology which benefit consumers and provide services to developing regions. While AfriSpace does not fall into any of these categories under Section 25.114(c)(11), in the interests of fullest disclosure, it submits the financial information required for providers of fixed satellite services, as per 47 C.F.R. §25.114 (1997), in Attachments 4-8. Attachment 7 includes the consolidated balance sheets of its parent, WorldSpace, Inc., for 1997 and for the eleven months ending November 30, 1998. These balance sheets reflect the financial status of WorldSpace and its subsidiaries.

AfriSpace will be leasing the AfriStar satellite and related ground facilities through a lease agreement with WorldSpace Satellite Company, Ltd., a subsidiary of WIN. Attachment 8 to this Amendment includes a summary and copy of the satellite lease agreement. AfriSpace estimates that the cost of the lease is \$10.9 million during the first year of operation. Operating expenses for the first year of operation are estimated to be \$4 million. These expenses include employees, office lease, operations expenses relating to the ROC facilities and system maintenance, computers, supplies and other miscellaneous items. Upon launch of its commercial

⁶⁰ Applicants, subject to the financial showing requirements of Section 25.114(c)(11), generally must demonstrate their financial ability to fund the estimated costs of construction, launch and first-year operation of its proposed satellite system. This showing may be demonstrated by either submitting evidence of internal financing or irrevocable external financing. See Section 25.140(b), (c); Mobile Communications Holdings, Inc. Application to Construct, Launch, and Operate an Elliptical Low Earth Orbit Mobile Satellite, Order and Authorization 12 F.C.C.R. 9663 (1997) (*citing* Ultravision Broadcasting Application for Construction Permit for New Television Broadcast Services, Memorandum Opinion and Order 1 F.C.C. 2d 544 (1985)).

service, AfriSpace will fund its business by leasing substantially all of its transmission capacity to WIN through a channel service agreement, as described in Attachment 8.

H. Public Interest

AfriSpace is precisely the kind of new competitive, entrepreneurial venture that the Commission has sought to encourage -- indeed, the Commission's support over the past 8 years through the issuance and multiple renewals of the experimental license, has been integral to placing AfriSpace where it is today: the successful launch of the AfriStar satellite on an experimental basis on October 28, 1998 and months away from initiating commercial trials.

At AFCOM '98 held on September 9, 1998, FCC Chairman William Kennard pledged to work with Africa to advance the African Information Infrastructure. He stated that "the prime goal must be to attain universal access -- to bring the benefits of telecommunications in order to improve the lives of the people. This objective must drive our efforts as policymakers."⁶¹

The AfriStar satellite will, for the first time, enable one of the largest regions of the world to have access to information, communications and entertainment never before enjoyed by its over one billion people. By providing the AfriStar satellite facility, AfriSpace will allow consumers in Africa and the Middle East to receive a diverse range of new services from U.S.,

⁶¹ William E. Kennard, African Telecommunications: A Partnership for Progress, Keynote Address Before AFCOM '98: The Seventh All-Africa Telecommunications, Information Technology, Trade & Investment Conference (Sept. 9, 1998).

international, regional and local programmers. Largely overlooked until very recently, Africa and the Middle East represent the economic and political frontier of the new millennium.

To use the term coined by South Africa's Deputy President, Thabo Mbeki, the region is undergoing an African Renaissance. With the growing liberalization, privatization and law reforms underway in the region, Africa and the Middle East are beginning to realize the benefits associated with competition, the free flow of information and open exchange of views -- precepts long established and protected in the United States. The United States has been the champion of these principles and the defender of the belief that each individual holds the right to be heard, and to seek and receive information and ideas through any media regardless of parameters.⁶² Those voices can only be heard if facilities necessary to distribute those voices are available. AfriSpace will provide one such facility over which a diversity of voices and views will be disseminated. We urge the Commission to approve this amendment and issue the license expeditiously. It is in the public interest to establish this facility for U.S. programmers and content providers to distribute their services, and for the citizens of Africa and the Middle East to have access to a multiplicity of views and entertainment sources.

IV. Compliance with 47 C.F.R. §25.114

The AfriSpace service is not specifically addressed under the Commission's Rules. Therefore, we have followed the general requirements for space station authorizations. In accordance with the general requirements set forth for space station authorizations in Section

⁶² U.N. Universal Declaration of Human Rights, art. 19.

25.114 of the Commission's Rules, AfriSpace submits the following information to update its Application.⁶³

- (a) AfriSpace submitted a comprehensive proposal for its proposed space station on July 23, 1990 and seeks herein to amend its Application as described in this Amendment and attachments.
- (b) This Amendment, including FCC Form 312 and all attachments and exhibits, as well as the AfriSpace Application and its related amendments, together constitute a concrete proposal for Commission evaluation. For the formal waiver required by Section 304 of the Communication Act (1996), 47 U.S.C. §304, *see* signature on Certification at the end of Attachment 1 to this Amendment, FCC Form 312. For the Technical Description and Certification, *see* Attachments 2 and 3 respectively, to this Amendment.
- (c) (1) and (2)

Correspondence regarding this application should be addressed to Applicant:

Mr. Benno A. Ammann
President
AfriSpace, Inc.
2400 N Street, N.W., Ground Floor
Washington, D.C. 20037
(202)861-8899

⁶³ Under section 25.114(c)(11), applicants must include detailed information demonstrating the financial qualifications of the applicant to construct and launch the proposed satellites relating to fixed satellite services; non-voice, non-geostationary mobile satellite services; or 1.6/2.4 GHz mobile satellite service, as appropriate. As described in Part III. G. Of this Amendment, AfriSpace, however, does not fall into any of these categories. However, in the interests of fullest disclosure, AfriSpace submits the financial information required for providers of fixed satellite services, as per 47 C.F.R. §25.114 (1997). To the extent that the Commission determines that AfriSpace is required to demonstrate its financial qualifications, and to the extent such a showing may not have been met, the Company is requesting a waiver of the financial requirements.

with a copy to legal counsel:

Ms. Tara K. Giunta
Coudert Brothers
1627 I Street, N.W.
Washington, D.C. 20006
(202) 736-1809

- (3) The Applicant is amending its pending Application as discussed under Section III of this Amendment and requesting issuance of a full license for a geostationary private international satellite system to serve Africa and the Middle East on a non-common carrier basis, in the 1467-1492 MHz band. Secondly, AfriSpace seeks to bring its orbital position into conformance with its experimental authorization, as amended. AfriSpace also seeks to modify its application to include the use of the lower BSS(Sound) L-Band frequency, specifically 1452-1467 MHz spectrum, contingent upon the results from a competent ITU conference to be convened for the planning of BSS(Sound) service in this lower band.
- (4) AfriSpace is establishing a geostationary private international satellite system to provide space segment capacity in the 1467-1492 MHz band, and conditionally the 1452-1467 MHz band, to serve Africa and the Middle East, as described in its Application and Section III of this Amendment. *See also*, Technical Description and Certification under Attachments 2 and 3 respectively, to this Amendment.
- (5) For a full description of the information required by Section 25.114(c)(5) of the Commission's Rules, 47 C.F.R. §25.114(c)(5), *see* Attachments 2 and 3 to this Amendment.

- (6) (i) The proposed system is geostationary. AfriSpace requests through this Amendment that its orbital location be changed from 12 degrees W.L. to 21 degrees E.L. This change in orbital location will bring the orbital location of AfriStar in conformance with the orbital location in AfriSpace's experimental license, thereby eliminating possible coordination difficulties and any interference concerns. *See also*, Section III of this Amendment and Attachment 2.
- (ii) Not applicable. The proposed system is geostationary.
- (iii) Not applicable.
- (7) *See* Attachment 2 to this Amendment.
- (8) *See* Section III of this Amendment for description of services and Attachment 2 to this Amendment.
- (9) *See* Attachment 2 to this Amendment.
- (10) *See* Attachment 2 to this Amendment.
- (11) *See* Attachment 2 to this Amendment.
- (12) *See* Attachment 2 to this Amendment.
- (13) For financial information, *see* Attachments 4-8 to this Amendment.
- (14) As specified in AfriSpace's Application, the AfriStar private international satellite system will only operate on a non-common carrier basis, by leasing channel capacity through long-term, individually-negotiated contracts.
- (15) *See* Attachment 9 to this Amendment for construction and launch dates for AfriSpace's leased satellite, AfriStar.

(16) As set forth in AfriSpace's Application and elaborated upon in Section III of this Amendment, the AfriStar private international satellite system will allow programmers to access capacity and disseminate information in such key areas as commerce, disaster preparedness, cultural diversity, education, environmental preservation, and health and safety. This is particularly important because it will provide access to the African continent, a region that is extensively underserved by communications infrastructure.

(17) Not applicable.

(18) Not applicable.

(19) Not applicable.

(20) Not applicable.

(21) Not applicable.

(d) Not applicable.

V. **Anti-drug Abuse Act**

The undersigned certifies that neither AfriSpace, nor any 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. §853a.

VI. **Certification**

On behalf of AfriSpace, the undersigned, hereby certifies that all statements made in this Amendment are true, correct, and complete to the best of his knowledge and belief.

VII. Further Information

AfriSpace has attempted to comply fully with all of the space station application requirements set out in Part 25 of the Commission's rules. AfriSpace believes it has complied fully with all pertinent Commission rules and policies, and has supplied all relevant information required to license a BSS(Sound) system. To the extent the Commission views the proposal as not fully in accord with current regulatory requirements,⁶⁴ AfriSpace hereby requests that the Commission grant any waivers that may be necessary or appropriate in the context of this proposal. Further, to the extent the Commission requires additional information in connection with this application, AfriSpace will respond promptly to any Commission request for such further information.

VIII. Conclusion

In 1990, when AfriSpace filed its application, and throughout the ensuing years, many people thought the task of launching such an advanced communications system for such an underdeveloped region was impossible. Today, the impossible has been achieved and it has been achieved largely because of the support and inspiration of organizations like the FCC -- organizations that believed in and were committed to the objective of establishing a system by which information can be disseminated in a region largely ignored. AfriSpace urges the Commission to accept this Amendment, confirm the change of orbital location in conformance with the action already taken on its experimental license, and issue AfriSpace a full license for

⁶⁴ See also, Part III. G. of the Amendment.

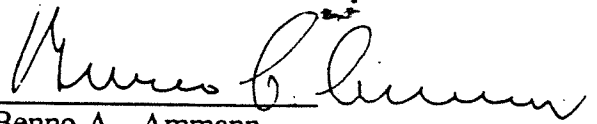
the AfriStar private international satellite system in the BSS(Sound) L-Band to serve Africa and the Middle East. Interested parties have had ample time to address any issues relating to AfriSpace's Application. Additionally, during the seven and one-half years that AfriSpace's Application has been pending, no other party has filed an application seeking to provide a similar service. We urge the FCC to approve this request expeditiously in order for AfriSpace to begin providing vitally needed capacity to this developing region.

In his speech before the Parliament of South Africa in March 1998, President Clinton stated that "[i]t used to be when American policymakers thought of Africa at all, they would ask, what can we do for Africa, or whatever can we do about Africa? Those were the wrong questions. The right question today is, what can we do with Africa?"⁶⁵ AfriSpace embodies what we can do with Africa. With AfriSpace, one billion people in Africa and the Middle East, largely untouched by the global information revolution, will be able to access all types of information about their country, their neighbors and the world.

Consistent with the invaluable support to and encouragement of AfriSpace that the Commission has demonstrated since 1991, we respectfully request that the Commission reaffirm that support and issue a license for AfriStar -- a facility that will further the long-stated policies of the U.S. Government to promote the free flow of information and support the economic, political and cultural development of Africa and the Middle East along democratic lines.

⁶⁵ President William Jefferson Clinton, Remarks to House of Parliament, National Parliament, Cape Town, South Africa (Mar. 26, 1998) (transcript available through Fed. News Svc.).

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Benno A. Ammann". The signature is written in a cursive style with a prominent initial "B".

Benno A. Ammann
President
AfriSpace, Inc.

Its Attorneys:

Tara K. Giunta
Coudert Brothers
1627 I Street, N.W.
Washington, D.C. 20006
(202) 736-1809

January 22, 1999

CERTIFICATE OF SERVICE

I, Jovana M. Cooke, hereby certify that on this 2nd day of January, 1999, a true and correct copy of the foregoing "Amendment" was sent by first class U.S. mail, postage prepaid, to the following parties:

Chairman William E. Kennard*
Federal Communications Commission
445 12th Street, S.W. Room 8C302
Washington, D.C. 20024

Commissioner Harold Furchtgott-Roth*
Federal Communications Commission
445 12th Street, S.W. Room 8C302
Washington, D.C. 20024

Commissioner Susan Ness*
Federal Communications Commission
445 12th Street, S.W. Room 8C302
Washington, D.C. 20024

Commissioner Michael Powell*
Federal Communications Commission
445 12th Street, S.W. Room 8C302
Washington, D.C. 20024

Commissioner Gloria Tristani*
Federal Communications Commission
445 12th Street, S.W. Room 8C302
Washington, D.C. 20024

Regina Keeney*
Chief, International Bureau
Federal Communications Commission
2000 M Street, N.W.
Washington, D.C. 20554

Thomas S. Tycz*
Chief, Satellite and Radiocommunications
Division, International Bureau
Federal Communications Commission
2000 M Street, N.W.
Washington, D.C. 20554

Fern Jarmulnek*
Chief, Satellite Policy Branch
International Bureau
Federal Communications Commission
2000 M Street, N.W.
Washington, D.C. 20554

Rosalee Chiara*
International Bureau
Federal Communications Commission
2000 M Street, N.W.
Washington, D.C. 20554

Cassandra Thomas*
International Bureau
Federal Communications Commission
2000 M Street, N.W.
Washington, D.C. 20554

Dale N. Hatfield*
Chief, Office of Engineering and Technology
2000 M Street, N.W., Suite 408
Washington, D.C. 20554

Staff Newman*
Chief, New Technology Development Division
2000 M Street, N.W., Suite 408
Washington, D.C. 20554

Paul Marrangoni*
Chief, Experimental License Branch
2000 M Street, N.W., Suite 408
Washington, D.C. 20554

Ambassador Vonya McAnn
United States Department of State, EB/CIP
Bureau of International Communications and
Information Policy
2201 C Street, N.W., Room 4826
Washington, D.C. 20520

Larry Irving
Assistant Secretary for Communications and
Information
United States Department of Commerce
Herbert C. Hoover Building
14th & Constitution Avenue, N.W.
Room 4898
Washington, D.C. 20230

Joe Rothenburg
Associate Administrator
Office of Space Flight, Code M
National Aeronautics and Space Administration
300 E Street, S.W.
Washington, D.C. 20546

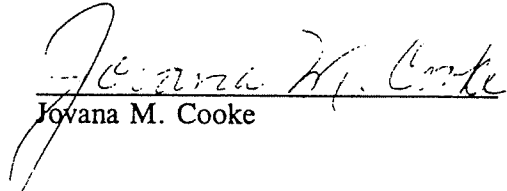
Lon C. Levin
Vice President & Regulatory Counsel
American Mobile Satellite Corporation
10802 Park Ridge Boulevard
Reston, VA 20191

Bruce D. Jacobs
Fisher Wayland Cooper
Leader & Zaragoza L.L.P.
2001 Pennsylvania Avenue, N.W. Suite 400
Washington, D.C. 20006

Counsel to American Mobile Satellite
Corporation

Neal T. Kilminster
Associate General
Legal Affairs
Communications Satellite Corporation
6560 Rock Spring Drive
Bethesda, MD 20817

Michael D. Kennedy
Corporate Vice President and Director
Global Spectrum and Telecommunications
Policy
Barry Lambergman
Manager, Satellite Regulatory Affairs
Motorola, Inc.
1350 I Street, N.W.
Washington, D.C. 20005


Jovana M. Cooke

LIST OF EXHIBITS AND ATTACHMENTS

- Attachment 1 - FCC Form 312 and Related Exhibits
- Exhibit A - Ownership of AfriSpace and WorldSpace, Inc.
- Exhibit B - Board of Directors and Officers of AfriSpace and WorldSpace, Inc.
- Attachment 2 - Technical Description
- Attachment 3 - Technical Certification
- Attachment 4 - Financial Information
- Attachment 5 - Estimated Operating Expenses
- Attachment 6 - Financial Certification
- Attachment 7 - Balance Sheet Current For The Latest Fiscal Year -- 1997
- Attachment 8 - Financial Commitments Reflected in the Balance Sheet
- Attachment 9 - AfriStar Schedule and Milestones
- Attachment 10 - Diagram of AfriStar System
- Attachment 11 - Organizational Structure of WorldSpace, Inc. and AfriSpace
- Attachment 12 - Background and Ownership Information Regarding WorldSpace International Network Inc.
- Attachment 13 - Organizational Structure of WorldSpace, Inc. International Network Inc.
- Attachment 14 - Diagram of AfriSpace Business

ATTACHMENT 1
FCC Form 312 And Related Exhibits

FCC 312
Main Form

FEDERAL COMMUNICATIONS COMMISSION

APPLICATION FOR SATELLITE SPACE AND EARTH STATION AUTHORIZATIONS

Approved by OMB
3004-1078
Est. Avg. Burden Hours
Per Response: 11 hrs

FCC Use Only
File Number:
Call Sign:
Fee Number:

APPLICANT INFORMATION

1. Legal Name of Applicant Afrispac, Inc.		2. Voice Telephone Number 202-861-8899	
3. Other Name Used for Doing Business (if any)		4. Fax Telephone Number 202-861-1197	
5. Mailing Street Address or P.O. Box 2400 N Street, N.W., Ground Floor ATTENTION Benno A. Ammann		6. City Washington	8. Zip Code 20037
9. Name of Contact Representative (if other than applicant) Tara K. Giunta 11. Firm or Company Name Coudert Brothers		10. Voice Telephone Number 202-736-1809	
13. Mailing Street Address or P.O. Box 1627 I Street, N.W. ATTENTION:		12. Fax Telephone Number 202-775-1168	16. Zip Code 20006
		14. City Washington	15. State / Country (if not U.S.A.) D.C.

CLASSIFICATION OF FILING

17. Place an "X" in the box next to the classification that applies to this filing for both questions a. and b. Mark only one box for 17a and only one box for 17b.

<input type="checkbox"/> a1. Earth Station	<input type="checkbox"/> b1. Application for License of New Station	<input type="checkbox"/> b6. Transfer of Control of License or Registration
<input checked="" type="checkbox"/> a2. Space Station	<input type="checkbox"/> b2. Application for Registration of New Domestic Receive-Only Station	<input type="checkbox"/> b7. Notification of Minor Modification
	<input checked="" type="checkbox"/> b3. Amendment to a Pending Application	<input type="checkbox"/> b8. Application for License of New Receive-Only Station Using Non-U.S. Licensed Satellite
	<input type="checkbox"/> b4. Modification of License or Registration	<input type="checkbox"/> b9. Letter of Intent to Use Non-U.S. Licensed Satellite to Provide Service in the United States
	<input type="checkbox"/> b5. Assignment of License or Registration	<input type="checkbox"/> b10. Other (Please Specify):

18. If this filing is in reference to an existing station, enter:
Call sign of station: N/A

19. If this filing is an amendment to a pending application enter:
(a) Date pending application was filed: 7/23/90
(b) File number of pending application: CSS-90-017

TYPE OF SERVICE

20. NATURE OF SERVICE: This filing is for an authorization to provide or use the following type(s) of service(s). Place an "X" in the box(es) next to all that apply.

- a. Fixed Satellite c. Radiodetermination Satellite e. Direct to Home Fixed Satellite g. Other (please specify) **Broadcasting Satellite Service**
 b. Mobile Satellite d. Earth Exploration Satellite f. Digital Audio Radio Service h. BSS (Sound) i. BSS (Sound)

21. STATUS: Place an "X" in the box next to the applicable status. Mark only one box. 22. If earth station applicant, place an "X" in the box(es) next to all that apply.

- a. Common Carrier b. Non-Common Carrier a. Using U.S. licensed satellites b. Using Non-U.S. licensed satellites N/A

23. If applicant is providing INTERNATIONAL COMMON CARRIER service, see instructions regarding Sec. 214 filings. Mark only one box. Are these facilities:

- a. Connected to the Public Switched Network b. Not connected to the Public Switched Network N/A

24. FREQUENCY BAND(S): Place an "X" in the box(es) next to all applicable frequency band(s).

- a. C-Band (4/6 GHz) b. Ku-Band (12/14 GHz) c. Other (Please specify) **1467-1492 MHz**

TYPE OF STATION

25. CLASS OF STATION: Place an "X" in the box next to the class of station that applies. Mark only one box.

- a. Fixed Earth Station b. Temporary Fixed Earth Station c. 12/14 GHz VSAT Network d. Mobile Earth Station e. Space Station f. Other (Specify)

If space station applicant, go to Question 27

26. TYPE OF EARTH STATION FACILITY: Mark only one box

- a. Transmit/Receive b. Transmit Only c. Receive Only N/A

PURPOSE OF MODIFICATION OR AMENDMENT

27. The purpose of this proposed modification or amendment is to: Place an "X" in the box(es) next to all that apply.

- a -- authorization to add new emission designator and related service
 b -- authorization to change emission designator and related service
 c -- authorization to increase EIRP and EIRP density
 d -- authorization to replace antenna
 e -- authorization to add antenna
 f -- authorization to relocate fixed station
 g -- authorization to change assigned frequency(ies)
 h -- authorization to add Points of Communication (satellites & countries)
 i -- authorization to change Points of Communication (satellites & countries)
 j -- authorization for facilities for which environmental assessment and radiation hazard reporting is required
 k -- Other (Please Specify) **To update information in pending application**

ENVIRONMENTAL POLICY

28. Would a Commission grant of any proposal in this application or amendment have a significant environmental impact as defined by 47 CFR 1.1307? If YES, submit the statement as required by Sections 1.1308 and 1.1311 of the Commission's rules, 47 C.F.R. §§ 1.1308 and 1.1311, as an exhibit to this application. YES NO

A Radiation Hazard Study must accompany all applications as an exhibit for new transmitting facilities, major modifications, or major amendments. Refer to OET Bulletin 65.

ALIEN OWNERSHIP

29. Is the applicant a foreign government or the representative of any foreign government?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
30. Is the applicant an alien or the representative of an alien?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
31. Is the applicant a corporation organized under the laws of any foreign government?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
32. Is the applicant a corporation of which more than one-fifth of the capital stock is owned of record or voted by aliens or their representatives or by a foreign government or representative thereof or by any corporation organized under the laws of a foreign country?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
33. Is the applicant a corporation directly or indirectly controlled by any other corporation of which more than one-fourth of the capital stock is owned of record or voted by aliens, their representatives, or by a foreign government or representative thereof or by any corporation organized under the laws of a foreign country?	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
34. If any answer to questions 29, 30, 31, 32 and/or 33 is Yes, attach as an exhibit, the identification of the aliens or foreign entities, their nationality, their relationship to the applicant, and the percentage of stock they own or vote.	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO

BASIC QUALIFICATIONS

35. Does the applicant request any waivers or exemptions from any of the Commission's Rules? If Yes, attach as an exhibit, copies of the requests for waivers or exemptions with supporting documents.	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
36. Has the applicant or any party to this application had any FCC station authorization or license revoked or had any application for an initial, modification or renewal of FCC station authorization, license, or construction permit denied by the Commission? If Yes, attach as an exhibit, an explanation of the circumstances.	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
37. Has the applicant, or any party to this application, or any party directly or indirectly controlling the applicant ever been convicted of a felony by any state or federal court? If Yes, attach as an exhibit, an explanation of the circumstances.	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
38. Has any court finally adjudged the applicant, or any person directly or indirectly controlling the applicant, guilty of unlawfully monopolizing or attempting unlawfully to monopolize radio communication, directly or indirectly, through control of manufacture or sale of radio apparatus, exclusive traffic arrangement or any other means or unfair methods of competition? If Yes, attach as an exhibit, an explanation of the circumstances.	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
39. Is the applicant, or any person directly or indirectly controlling the applicant, currently a party in any pending matter referred to in the preceding two items? If Yes, attach as an exhibit, an explanation of the circumstances.	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
40. If the applicant is a corporation and is applying for a space station license, attach as an exhibit the names, addresses, and citizenship of those stockholders owning of record and/or voting 10 percent or more of the Filer's voting stock and the percentages so held. In the case of fiduciary control, indicate the beneficiary(ies) or class of beneficiaries. Also list the names and addresses of the officers and directors of the Filer.	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
41. By checking Yes, the undersigned certifies, that neither the 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="checkbox"/> YES	<input type="checkbox"/> NO
42a. Does the applicant intend to use a non-U.S. licensed satellite to provide service in the United States? If yes, answer 42b and attach an exhibit providing the information specified in 47 C.F.R. § 25.137, as appropriate. If no, proceed to question 43.	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
42b. What administration has licensed or is in the process of licensing the space station? If no license will be issued, what administration has coordinated or is in the process of coordinating the space station?		N/A

43. Description. (Summarize the nature of the application and the services to be provided).

Amendment to pending application for a private international BSS(Sound) satellite system to serve Africa and the Middle East on a non-common carrier basis. See attached Amendment to Afrispace Application.

Exhibit No. Identify all exhibits that are attached to this application.

A List of Shareholders

B List of Officers and Directors

CERTIFICATION

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, and requests an authorization in accordance with this application. The applicant certifies that grant of this application would not cause the applicant to be in violation of the spectrum aggregation limit in 47 CFR Part 20. All statements made in exhibits are a material part hereof and are incorporated herein as if set out in full in this application. The undersigned, individually and for the applicant, hereby certifies that all statements made in this application and in all attached exhibits are true, complete and correct to the best of his or her knowledge and belief, and are made in good faith.

44. Applicant is a (an): (Place an "X" in the box next to applicable response.)

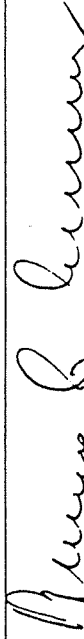
- a. Individual b. Unincorporated Association c. Partnership d. Corporation e. Governmental Entity f. Other (Please specify)

45. Typed Name of Person Signing

Benno A. Ammann

President

47. Signature



48. Date

January 22, 1999

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).

EXHIBIT A
Ownership of AfriSpace and WorldSpace, Inc.

AfriSpace is 100% owned by WorldSpace, Inc., a Maryland corporation. The list of WorldSpace, Inc. shareholders and their percentage of ownership, including a brief description of corporate entities, is as follows:

Shareholders of WorldSpace, Inc.			
Name	Address	Percentage of Ownership	Citizenship
Shareholders Holding More than 10%			
TelUS ¹	15 Lee Ave. Tacoma Park, MD 20910	39.98%	U.S.
Bina Aspen	1101 Woodside Pkwy. Silver Spring, MD 20910	20.20%	U.S.
Syndicated Communications Venture Partners ²	8401 Colesville Rd., Suite 300 Silver Spring, MD 20910	11.27%	U.S.
Shareholders Holding Less than 10%			
Techno-V USA Ltd. Partnership ³	c/o Techno Venture USA, Inc. 75 Junction Sq. Dr. Concord, MA 01742	8.00%	U.S.
Eyob Samara	c/o TelUS 15 Lee Ave. Tacoma Park, MD 20910	6.66%	U.S.

¹ TelUS is a U.S. holding company which is owned by Mr. Noah A. Samara, Mr. Eyob Samara and Ms. Rahel Samara.

² Syndicated Communications Venture Partners is a U.S. minority-owned venture capital firm with substantial investments in telecommunications and media projects.

³ Techno-V USA Ltd. Partnership is a venture capital company specializing in technology companies.

Shareholders of WorldSpace, Inc.			
Name	Address	Percentage of Ownership	Citizenship
PPH Foundation ⁴	c/o Martine Rothblatt 1826 R St., N.W. Washington, D.C. 20009	2.67%	U.S.
Napier Pillai	c/o CaribSpace Suite 5, 1-A Dere St. Port-of-Spain Republic of Trinidad & Tobago	1.33%	Trinidad & Tobago
Public Service Satellite Consortium ⁵	c/o Esatel 4900 Seminary Rd., #430 Alexandria, VA 22311	1.00%	U.S.
Dr. Saad El Fishaway	c/o G. Miller & Co. 1215 19th St., N.W. Washington, D.C. 20036	0.80%	U.S.
Wilbur L. Pritchard	c/o W.L. Pritchard & Co. 7315 Wisonsin Ave. Bethesda, MD 20814	0.80%	U.S.
Noah A. Samara	8903 Ellsworth Ct. Silver Spring, MD 20910	0.80%	U.S.
Patricia Ammann	c/o Benno A. Ammann Box 855 Middleburg, VA 22117	0.60%	U.S.
Regula Lorenz	3000 Bluebird Ln. Box 364 Middleburg, VA 20118	0.60%	Swiss
Phillip Olivetti	107 Waverly Pl. New York, NY 10011	0.47%	U.S.

⁴ PPH Foundation is a U.S. non-profit foundation which distributes information and promotes research on lung disease.

⁵ Public Service Satellite Consortium is a U.S. trust fund whose goal is to execute and facilitate appropriate and timely application of satellite and other telecommunications technologies for public service.

Shareholders of WorldSpace, Inc.			
Name	Address	Percentage of Ownership	Citizenship
W.L. Pritchard & Co. ⁶	7315 Wisconsin Ave. Bethesda, MD 20814	0.41%	U.S.
Robert Johnstone	c/o Fleet Clearing Corp. 71 Western Ave., Box 100 W. Boothbay Harbor, ME 04575	0.40%	U.S.
MARCOR ⁷	1101 Woodside Pkwy. Silver Spring, MD 20910	0.40%	U.S.
Richard Allen	905 16th St., N.W. Suite 400 Washington, D.C. 20006	0.40%	U.S.
James Laramie	10612 Good Spring Ave. Great Falls, VA 22066	0.40%	U.S.
Martine Rothblatt	1101 Woodside Pkwy. Silver Spring, MD 20910	0.40%	U.S.
Gabriel GZ Rothblatt	1101 Woodside Pkwy. Silver Spring, MD 20910	0.32%	U.S.
Sunee LeClaire Rothblatt	1101 Woodside Pkwy. Silver Spring, MD 20910	0.32%	U.S.
Jenesis Alia Rothblatt	1101 Woodside Pkwy. Silver Spring, MD 20910	0.29%	U.S.
Charles Kase	c/o M E Craig 1627 Greenbrier Ct. Reston, VA 22090	0.27%	U.S.
Filipe Noguera	#33 Scotland Terrace Andalussia Maraval Republic of Trinidad & Tobago	0.27%	Trinidad & Tobago
Jason O'Neill	1109 Beverly Dr. Alexandria, VA 22302	0.20%	U.S.

⁶ W.L. Pritchard & Co. is a U.S. satellite engineering and consulting company.

⁷ MARCOR is a U.S. technology and development company.

Shareholders of WorldSpace, Inc.			
Name	Address	Percentage of Ownership	Citizenship
Shirley Kay O'Neill	9913 Shrewsbury Ct. Gaithersburg, MD 20879	0.20%	U.S.
Eli Rothblatt	1101 Woodside Pkwy. Silver Spring, MD 20910	0.16%	U.S.
Richard Butler Nominee Pty. Ltd.	40 Barrington Ave. Kew, Victoria 3101 Australia	0.11%	Australia
Salha Hassan Elkurdi	#2 Chemin Oche Combe 1297 Founex Switzerland	0.07%	Swiss
Tedson J. Meyers	5410 Macomb St., N.W. Washington, D.C. 20016	0.07%	U.S.
Dr. Abdi Sharif	16454 Refugio Rd. Encino, CA 91436	0.05%	U.S.
Tierno Bah	12121 Turnstone Ct. Silver Spring, MD 20904	0.05%	Guinean
Teresa Bongartz	2032 Belmont Rd., N.W. #225 Washington, D.C. 20009	0.03%	U.S.

EXHIBIT B
Board of Directors and Officers of AfriSpace and WorldSpace, Inc.

AfriSpace

Board of Directors

1. Noah A. Samara, U.S. citizen
2. Benno A. Ammann, U.S. citizen
3. Tedson J. Meyers, U.S. citizen
4. Terry Jones, U.S. citizen

Officers

1. Benno A. Ammann, President
2. Jack Piontek, Vice President
3. Tara K. Giunta, Secretary and Treasurer

WorldSpace, Inc.

Board of Directors

1. Noah A. Samara, U.S. citizen
2. Benno A. Ammann, U.S. citizen
3. Tedson J. Meyers, U.S. citizen
4. Terry Jones, U.S. citizen

Officers

1. Noah A. Samara, President
2. Benno A. Ammann, Treasurer
3. Tara K. Giunta, Secretary

EXHIBIT B
Board of Directors and Officers of AfriSpace and WorldSpace, Inc.

AfriSpace

Board of Directors

1. Noah A. Samara, U.S. citizen
2. Benno A. Ammann, U.S. citizen
3. Tedson J. Meyers, U.S. citizen
4. Terry Jones, U.S. citizen

Officers

1. Benno A. Ammann, President
2. Jack Piontek, Vice President
3. Tara K. Giunta, Secretary and Treasurer

WorldSpace, Inc.

Board of Directors

1. Noah A. Samara, U.S. citizen
2. Benno A. Ammann, U.S. citizen
3. Tedson J. Meyers, U.S. citizen
4. Terry Jones, U.S. citizen

Officers

1. Noah A. Samara, President
2. Benno A. Ammann, Treasurer
3. Tara K. Giunta, Secretary

ATTACHMENT 2
Technical Description

ATTACHMENT 2 SYSTEM TECHNICAL DESCRIPTION
--

I. System Overview

AfriSpace, Inc. is leasing the AfriStar satellite from WorldSpace Satellite Company, Ltd. The AfriStar satellite is in the final phase of development. On October 28, 1998, the satellite was launched, on an experimental basis, using an Arianespace launch vehicle Ariane 4 from Kourou, French Guiana. AfriStar will deliver hundreds of digital, high-quality audio and multimedia broadcasting channels to the Africa and Middle East region. The system is operating in the 1467-1492 MHz frequency band (Space-to-Earth), allocated at WARC-92, and the 7025-7075 MHz band (Earth-to-Space) to provide digital Broadcasting-Satellite Service (Sound) ("BSS(Sound)") to Africa and the Middle East. High availability is achieved by providing a combination of adequate signal margin and high elevation angles throughout the service area.

AfriStar is employing technologies that have been developed to provide highly efficient usage of space segment resources for digital BSS(Sound). Some of the world's largest industrial organizations are participating in the development, manufacture and distribution of a whole array of products, ranging from Telemetry, Command and Ranging ("TCR") earth stations, Feeder Link Stations ("FLS"), and ground control and data networks.

The AfriStar system is utilizing a basic module of 1.536 Mbps information rate in approximately 2.5 MHz of radio frequency ("RF") spectrum. Three L-Band spot beams cover Africa and the Middle East. Each of these spot beams is broadcasting two carriers: one operating in Left Hand Circular Polarization ("LHCP"), the other in Right Hand Circular Polarization ("RHCP"). The information rate is composed of a Time Division Multiplex ("TDM") of Primary Rate Channels ("PRCs"). Each PRC has a bit rate of 16 kbps and can be increased in 8 kbps increments. A Broadcast Channel is composed of the desired number of PRCs that will include the audio programs and the associated data services of the audio channels. The Broadcast Channel format is selected at the discretion of the programmer to provide CD or FM stereo/mono quality. Thus, for example, as many as 24 FM stereo quality (64 kbps) music channels can be provided within the allocated bandwidth of each TDM carrier. If still higher bit rates are intended for use, then the number of channels would be correspondingly reduced.

The audio input is digitally encoded using MPEG 2.5 Layer 3 audio compression techniques. The use of this very efficient audio compression technique allows high quality audio to be provided with bit rates ranging from 16 to 128 kbps. Each PRC is FEC encoded and QPSK modulated for direct broadcasting to the radio receivers. The transmission bit rate of a basic module (TDM carrier) will be 3.68 Mbps. It is generated either on the ground, when accessing the transparent payload, or on board the satellite when accessing the baseband processor.

Using the processing payload, program audio feeds can be transmitted from any site within the uplink coverage area. Fixed "Processed FLS" transmit individual PRCs in an SCPC format to access the satellite processor, which multiplex the SCPC transmissions into an aggregate carrier for transmission on the L-Band downlink. For the transparent payload, "Transparent Hub FLS" earth stations combine audio feeds from a number of sources into a 3.68 Mbps TDM carrier and uplink to the satellite's frequency translating transponder.

In October 1998, the Joint Working 10-11S of the ITU's Radiocommunication Bureau approved Recommendation BO.1130-1 on systems for digital sound broadcasting. The Recommendation states that the three digital audio broadcast systems developed to date, including the transmission system to be used with the AfriStar satellite network (referred to as Digital System D), are equally acceptable. The Recommendation will be submitted for approval at the next full Study Group 10 meeting in June 1999, and for adoption at the ITU Radiocommunication Assembly in 2000. The relevant portions of ITU-R Recommendation BO. 1130-1 are attached as Annex C-1.

II. Technical Information

A. Satellite Description

1. Number and Location of Satellite

The AfriStar satellite was launched into geostationary orbit and positioned at 21° E.L.. The location of the satellite provides high elevation angles over the African and Middle East service area. High elevation angles are a key factor in providing a high availability satellite digital BSS(Sound) service in territories which have a wide variety of terrain, climate and areas of thick foliage.

2. Satellite Characteristics

The characteristics of the AfriStar satellite are listed in Table A-1. The satellite is based on Matra Marconi Space's very successful Eurostar 2000+ platform, which is also used by the HOTBIRD European DBS satellite system. Data on the spacecraft mass budget, launch mass breakdown and power budget are contained in Tables A-2 through A-4.

B. Communications Payload Description

The communications payload of the AfriStar satellite has two components:

- a bent-pipe payload, referred to as the “transparent payload”, consisting of three transponders, that provide frequency translation, amplification and retransmission; and
- a processing payload, referred to as “the processed payload”, consisting of a baseband processor and three transponders, that provide demodulation, amplification, re-routing and retransmission.

The satellite's communications parameters are summarized in Table A-5. All communication uplinks are received through the global beam. Each of the communication transponders is capable of being connected to any of the three downlink beams.

During transfer orbit and emergency operations, TCR functions are transmitted and received at S-Band through dedicated antennas. During normal operations, telecommand signals are received through a global X-Band antenna and telemetry signals are transmitted at L-Band through a dedicated global antenna.

1. Frequency Plan and Polarization

Uplink

FLS transmits uplink signals in the 7025-7075 MHz band using RHCP. These uplink signals are used for audio feeds as well as for the command and ranging uplink carriers. The command and ranging carriers are located at center frequencies of 7073 and 7074 MHz and occupy a bandwidth of approximately 800 kHz and will use LHCP. The characteristics of the command carriers are listed in Table A-6.

The frequency plan for the feeder links provides access for two types of uplink carriers: 3.68 Mbps TDM carriers and 38 kbps PRCs. Hub earth stations will multiplex individual feeds into aggregate TDM carriers for transmission to the transponders of the transparent payload. In the second form of access, the satellite will process up to 288 individual SCPC/FDM carriers from smaller fixed earth stations. These uplink channels are grouped in 6 blocks of 48 PRCs. A processor on board the satellite will multiplex individual feeds into three 3.68 Mbps TDM carriers for transmission to the three processed downlink beams. One of the advantages of using a TDM signal format is that it reduces the complexity of the receiver design.

The 3.68 Mbps TDM carrier is tunable across the “feeder link” band in steps of 608 kHz beginning at 7026.796 MHz. The 38 kbps carriers are organized in blocks of 48 carriers. The carrier separation within each block is 38 kHz and each block is tunable in steps of 608 kHz across the feeder link band beginning from 7026.675 MHz.

Downlink

The AfriStar system employs a multiple-feed L-Band reflector configuration to produce three dual-polarized spot beams to cover the service area. This feed/reflector combination efficiently distributes downlink power over the service areas with minimal radiation into adjacent geographic areas. The half-power beamwidth is approximately 5.8 degrees. The satellite is capable of transmitting six TDM carriers, two in each of the L-Band spot beams. These carriers can be set anywhere within the downlink frequency band in steps of 920 kHz. Each 3.68 Mbps TDM carrier is QPSK modulated and can support a minimum of 12 audio channels digitized at 128 kbps and a maximum of 96 audio channels digitized at 16 kbps. The six TDM carriers operate in circular polarization. Each beam carries one LHCP TDM and one RHCP TDM.

These carriers can be placed anywhere across the 1452-1492 MHz L-Band spectrum in steps of 920 kHz. The frequency plan of the transparent and the processed missions are offset by 460 kHz to optimize the use of the frequency band. The carrier frequencies for the transparent mission are settable from 1453.844 MHz to 1490.644 MHz in steps of 920 kHz. The carrier frequencies for the processed mission are settable from 1453.384 MHz to 1490.184 MHz in steps of 920 kHz. Any of these center frequencies can be selected for the transmission of a 3.68 Mbps TDM in any one of the downlink spotbeams. However, AfriSpace is complying with current ITU regulations (Res. 528) that limit the transmission of the TDM carriers to the 1467-1492 MHz portion of the band. AfriSpace is also seeking to modify its application to include the use of the lower L-Band frequencies, specifically 1452-1467 MHz, subject to the results of any ITU conferences to be convened for the planning of BSS(Sound) services in this lower band. The L-Band downlink frequency plan is as follows.

Beam Name	Type of Carrier	Polarization	Center Frequency (MHz)
North East (BD)	Transparent	Right	1,468.564
	Processed	Left	1,470.864
South (CD)	Transparent	Left	1,473.164
	Processed	Right	1,475.464
North - West (AD)	Processed	Right	1,478.224
	Transparent	Left	1,480.524

The characteristics of the TCR carriers are listed in Table A-6. The primary on-station telemetry carrier is located at the center frequency of 1491.7 MHz. For TCR during launch and transfer orbit, the satellite is equipped with an S-band transmitter and receiver that is connected to an omni-directional antenna.

2. Emission designator

Emission designator and the allocated bandwidth for the different carriers are listed in Table A-5.

3. Final amplifier output power

The spacecraft is delivering 300 watts of power to the L-Band antenna feed.

4. Antenna Subsystem

For the L-Band downlink transmissions, there are two deployable reflectors and four antenna feeds mounted on the satellite that is used to generate three pairs of dual-polarized spot beams. The coverage is generated by means of two feeds illuminating the East antenna and one feed illuminating the West antenna. Each feed has two ports, one for LHCP, the other for RHCP. Each antenna port is fed directly from parallel 150-watt TWTA's that supply 300 watts of total RF power. The transmit antenna gain contours are shown in Figure A-3. A third antenna is a horn that provides global uplink coverage for the reception of feeder link signals. The coverage pattern for this antenna is shown in Figure A-4. This horn also is used for the reception of the on-orbit command uplink. A fourth antenna is an omni-directional S-band antenna that is used for transfer orbit and emergency TCR.

TABLE A-1: Characteristics of the AfriStar Satellite

Spacecraft Bus	Matra Marconi Eurostar 2000+
Operational Life	12 Years
Orbital Maneuver Life	15 Years
Stabilization	3-Axis, Earth Sensor, Momentum Wheels and Thrusters
Available DC Power	2.8 kW
Eclipse Capability	100%
Deployed Length	Approximately 124 Feet
Approximate Weight	2750 Kg with Propellant
L-Band Antennas	2 Reflectors with Multiple Feeds
X-band Antenna	1 Global Receive Horn
Number of L-B and TDM Carriers	6
Number of Antenna Coverage Areas	4 (1 uplink, 3 downlink)

TABLE A-2: AfriStar Mass Budget

Item	Mass (Kg)
Repeater	213.90
Antenna	78.30
Total Payload	292.20
Structure	194.80
Thermal Control	59.20
Propulsion	112.90
ADCS	46.50
TCR	46.60
EPS	54.40
Batteries	208.10
Solar Array	133.50
CM DC Harness	13.00
SM DC Harness	31.60
Total Service Module	900.60
Spacecraft Dry Mass	1192.80
Specification	1237.80
Margin	45.00

TABLE A-3: AfriStar Launch Mass Breakdown

	Ariane 4	Ariane 5**
Dry Mass	1237.6	1237.6
Helium	4.2	4.2
Propellant*	1527.0	1496.8
Launch Mass	2768.8	2738.6

* 15 years maneuver lifetime at 3 sigma probability

** Spacecraft design compatible with launch by Ariane 4 and 5

TABLE A-4: AfriStar Power Budget

Repeater	1948 W
Platform	224 W
Total Bus (42.5V)	2172 W
Battery Charge	274 W
Solar Array/ASR loss	86 W
Total at SA connector (44V)	2532 W
Total Available	2798 W
Solar Array Margin	10.5%
Solar Array Margin Required	3%

SA: Solar Array

ASR: Array Switching Regulator

TABLE A-5: Satellite System Communications Parameters

Frequency	
Receive (MHz)	7025.0-7075.0
Transmit (MHz)	1467.0-1492.0
Polarization	
Receive	RHCP
Transmit	RHCP and LHCP
Peak G/T	-8.3 dB/K
System Noise Temperature	455° K
Emission Limitations:	(% occupied bandwidth)
50 to 100%	> 25 dBc attenuation in any 4 kHz
100 to 250%	> 35 dBc attenuation in any 4 kHz
> 250%	> 66.4 dBc attenuation in any 4 kHz
Saturation Power Flux Density ("SPFD")	-120 dBW/m ²
Transponder Gain at Max. SPFD	136.6 dB
Transponder Gain at Min. SPFD	145.0 dB
Carrier Bandwidth	2.6 MHz
Maximum Transmit EIRP Carrier	53 dBW
Total EIRP	60.8 dBW
Transmitter Redundancy	8 for 6
Maximum (Peak) PFD	-136 dBW/m ² /4 kHz
Power into Each Antenna Port	300 watts/23.2 dBW
Emission Designator	2M6OG7EDW 27KOG1EDW
Command Emission Designator	1MOOFXD
Telemetry Emission Designator	500KG7D
Maintenance of Satellite Position	East/West ±.1° North/South ±.1°

**TABLE A-5: Satellite System Communications Parameters
(Continued)**

Relationship between satellite receive antenna gain pattern and gain temperature ratio:

City	G/T(dB/K)
Natal	-10.3
La Reunion	-9.5
Bombay	-10.3
London	-10.3
Athens	-9.4
Dakar	-9.6
Douala	-8.3
Riyadh	-9.3

Predicted receiver channel filter response characteristics: not applicable

Predicted transmitter channel filter response characteristics: noise reduction filters are used at the input of the TWTAs to reduce spurious emissions into the radio-astronomy band, 1400-1427 MHz, to levels complying with Recommendation ITU-R RA 769.

**TABLE A-6: TCR Parameters
 X/L-Band**

<u>Command Parameters</u>	
Frequency (MHz)	7073 and 7074
Earth Station Antenna Diameter (meters)	6.2
Gain (dBW)	51.4
Total Power at Antenna Input (dBW)	16.6
Max. Flux Den. (dBW/m ²)	-94.2
Max EIRP (dBW)	68
Polarization	LHCP
Modulation	PCM/BPSK/PM
Peak Deviation (kHz)	300
Occupied Bandwidth (kHz)	800
Receiver Bandwidth (kHz)	1000
<u>Telemetry Parameters</u>	
Frequency (MHz)	1452.3 and 1491.7
EIRP (dBW)	9.5
Polarization	RHCP
Modulation	PCM/BPSK/PM
Occupied Bandwidth (kHz)	500

C. Ground Segment

The ground segment for the AfriStar system consists of two major components: (1) Feeder Link Stations and (2) Satellite Operations and Control facilities. The following sections present additional details on the major ground segment components.

1. Feeder Link Stations

FLS is used to uplink the various audio programs to the satellite. Two types of FLS are used to access the satellites. The first FLS type is a large hub capable of uplinking one to three TDM carriers. These TDM carriers access the satellite's transparent payload for frequency translation, amplification and retransmission. This FLS is referred to as a "Transparent Hub FLS" since it only accesses the satellite's transparent payload.

The second type of FLS is a smaller VSAT-like terminal capable of uplinking individual 16 kbps PRCs in SCPC mode. The smaller VSAT FLS is referred to as a "Processed FLS" since it only accesses the satellite's processed payload. The carriers access the processed payload which demodulates, amplifies and retransmits the audio programming on a single TDM carrier equal in power and capacity to the transparent TDM carrier.

The uplink band for both the TDM Hub and FDM FLS is in the 7 GHz band. The uplink signal is FEC encoded and includes some overhead for network management and encryption.

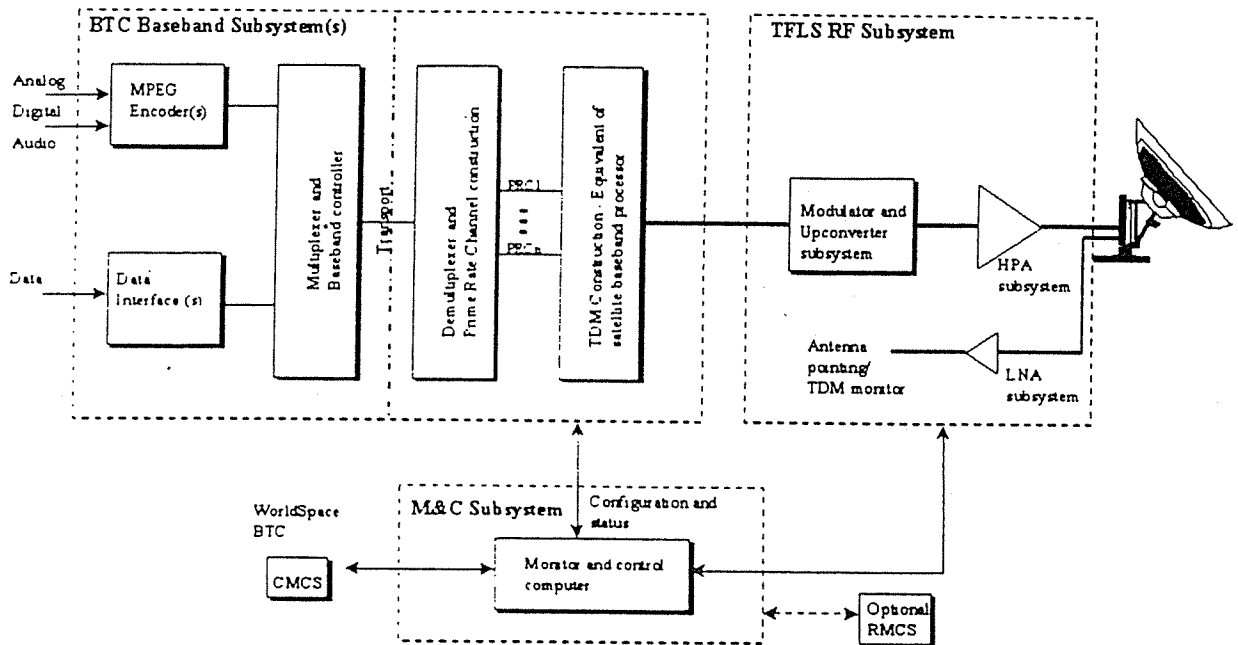
The characteristics of the Transparent Hub FLS are listed in Table A- 7.

TABLE A-7: Transparent Hub FLS

Parameter	Characteristics
Antenna	4.8 meters, Cassegrain
Antenna Feed Transmit	X-Band (7.025-7.075 GHz)
Antenna 3 dB Beamwidth	.57 degrees
TX Sidelobe Mask Compliance	ITU-R S.580-5 (1994)
Uplink EIRP (Single TDM Carrier)	68 dBW Max.
TX Cross Polarization Isolation	> 25 dB
TDM Rate	3.680 Mbps
TDM Carrier Frequency Step Size	608 kHz
Modulation	QPSK
TDM Carrier Occupied Bandwidth	2.6 MHz

The following Figure A-1 shows the signal flow for the Transparent Hub FLS. In the transparent mission case, up to 96 audio sources are time division multiplexed together and fed to the TDM formatter and QPSK IF modulator. The TDM carrier is up-converted from IF to 7 GHz and amplified by a high power amplifier and fed to the antenna feed. The antenna/HPA is in a redundant configuration with automatic switchover capability. The HPA is capable of 300 watts output but is backed off from saturation to operate in a linear mode.

FIGURE A-1: Transparent Hub FLS Functional Block Diagram



BTC: Beam Technical Center
 CMCS: Central Monitoring Control System
 RMCS: Remote Monitoring Control System

The characteristics of the Processed FLS are listed in Table A-8.

TABLE A-8: Processed FLS

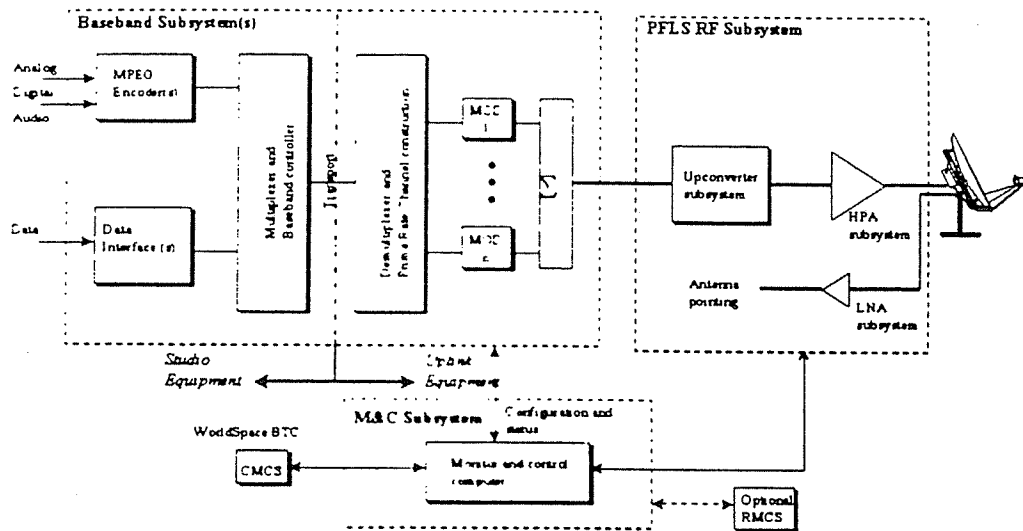
Parameter	Characteristics
Antenna	2.4 to 4.8 meters
Antenna Feed Transmit	X-Band (7.025-7.075 GHz)
Antenna 3 dB Beamwidth	.57 degrees to 1.13 degrees
TX Sidelobe Mask Compliance	ITU-R S.580-5 (1994)
Off-axis EIRP Emission Compliance	ITU-R S.524-4
Uplink EIRP (per Prime Rate Carrier)	53 dBW Max.
TX Cross Polarization Isolation	> 25 dB
SCPC Carrier Frequency Step Size	38 kHz
Modulation Type	QPSK with Differential Encoding
Modulation Rate	38 kbps
Carrier Occupied Bandwidth	27 kHz

The smaller Processed FLS is used to uplink individual contributions of audio programming to the satellites. These stations are located within regions with elevation angles greater than 10 degrees in the uplink coverage. The program material originating from a single source is digitized, encoded and uplinked to the satellite from Processed FLS with antenna diameters ranging from 2.4 to 4.8 meters.

Figure A-2 shows the signal flow for the Processed FLS. In the processed mission case, a broadcast channel is encoded and multiplexed with a service control header. The encoded compression ratio depends on the desired program quality. The channel is then demultiplexed into elemental PRCs which carry program information at a rate of 16 kbps for FDMA uplink to the satellite. Up to eight PRCs per broadcast channel is individually modulated using QPSK with differential encoding on an IF carrier. The individual carriers is combined and up-converted to the 7 GHz band. The PRCs are amplified by a redundant HPA configuration. The HPAs are capable of 25 to 125 watts depending on the number of PRCs and antenna size. The HPA output is backed off from saturation to operate in a linear mode to minimize intermodulation products. The composite bit rate for each SCPC carrier is approximately 38 kbps and occupies a bandwidth of about 27 kHz. The frequency spacing between carriers on the satellites is 38 kHz.

The individual SCPC carriers are demodulated on-board the spacecraft by multi-carrier demodulators then time-division multiplexed through the satellite baseband processor to form a 3.68 Mbps TDM signal identical in format to the TDM carrier transmitted by the Transparent Hub FLS.

FIGURE A-2: Processed FLS Functional Block Diagram



BTC: Beam Technical Center
 CMCS: Central Monitoring Control System
 RMCS: Remote Monitoring Control System

2. Satellite Operations and Control

The TCR functions for the AfriStar satellite are performed via two stations operated by AfriSpace contractors. The main station for TCR is located in Bangalore, India and a back-up station is in Port Luis, Mauritius. The stations are controlled by a Regional Operation Center ("ROC") located in Washington, D.C., and operated by AfriSpace personnel. The two stations are connected with the ROC through dedicated telephone lines. Each station will have redundant antennas and electronics, to provide availability of greater than 99.5 percent, for telemetry reception and telecommand transmission.

The TCR stations' antennas have circular dual-band feeds with a 7 GHz LHCP port for the command and ranging carrier and a 1.5 GHz RHCP port for the telemetry carrier. The antennas are capable of steptrack, manual and programmed tracking of the spacecraft. Antenna parameters are given in Table A-8. The Transmitters, Receivers, Inter-Facility Links ("IFLs"), Baseband Equipment, Data Processing Equipment and Communication links to the ROC employ equipment redundancy to provide the required reliability.

In addition to the TCR stations, there is an In-Orbit Test and Communications Systems Monitoring ("IOT/CSM") facility in Libreville, Gabon, operated by AfriSpace contractors and connected to the ROC in Washington, D.C., by dedicated telephone lines. The IOT/CSM consists of specialized receivers to monitor the quality of individual program channels and spectrum analyzers, synthesizers and other RF equipment to determine the quality of the communications signals.

D. Description of Services, Transmission Characteristics and Performance Objectives

1. Services

The digital compression techniques used is Audio MPEG 2.5 Layer 3 with bit rate multiples of 8 kbps, ranging from 16 kbps to 128 kbps. MPEG audio coding permits data rate reduction by a factor of 12 without the loss of sound quality. These large reductions of the data rate are realized by the use of perceptual coding techniques. Layer 3 is the most efficient layer of the MPEG audio coding family. For low bit rates, it achieves the highest sound quality.

Some typical performance data of Layer 3 are:

Sound Quality	Bandwidth	Mode	Bit Rate	Compression Method	Reduction Ratio
AM Monaural Voice	4.5 kHz	Mono	16 kbps	MPEG 2.5	48:1
Better than FM Mono	7.5 kHz	Mono	32 kbps	MPEG 2	24:1
Similar to FM Stereo	11 kHz	Stereo	64 kbps	MPEG 2	24:1
Near-CD	15 kHz	Stereo	96 kbps	MPEG 1	16:1
CD	> 15 kHz	Stereo	128 kbps	MPEG 1	12:1

The AfriStar satellite is capable of transmitting 2 TDM carriers in each of its three spot beams. Each TDM carrier consists of 96 PRCs each operating at 16 kbps. The PRCs are combined to carry programming channels ranging from 16 kbps to 128 kbps, and may be dynamically allocated to meet the demands of the desired service mode. For instance, 8 PRCs may be combined for an hour to relay a classical music concert, followed by an hour of 4 separate news channels (32 kbps). Since the content of the TDM channels may be dynamically reconfigured at any time, the content of AfriStar's transmissions may be altered to meet market demands.

2. Link Calculations

The system is designed to provide BSS(Sound) with sufficient margin to overcome propagation impairments. Table A-9 contains a link calculation for the system. The link calculation shows that there is approximately 9.7 dB of margin available at edge of coverage (4.5 dB from maximum gain peak) to overcome propagation impairments assuming a receiver G/T of -13.4 dB/K. As previously reported, propagation experiments were conducted to validate the quality of signal reception in stationary, portable and mobile environments. Key test elements included a helicopter that was used as a platform to simulate satellite operations and a PC-based prototype receiver. The test setup consisted of replaying a pre-recorded TDM bit stream, representative of various audio qualities, from a PC on board the helicopter. The helicopter hovered at altitudes between 3,000 and 10,000 feet and re-transmitted the amplified signal to the fixed and mobile receivers. A full report with quantitative results was produced. The qualitative results have validated the complete transmission chain, in particular the following:

- indoor reception using a simple helix and patch antenna under line-of-sight conditions;
- at elevation angles higher than 70 degrees mobile reception under line-of-sight conditions using a helix antenna mounted on a vehicle rooftop with a 4 dB gain;

- at elevation angles between 30 degrees and 70 degrees, mobile reception under line-of-sight conditions using a steerable antenna with a gain of 8 to 11 dB; and
- planned system power margins.

TABLE A-9: Link Budget

SATELLITE	UNITS	AfriStar
Uplink Beam	--	Global
Downlink Beam	--	Spot
Uplink Frequency	GHz	7.063
Downlink Frequency	GHz	1.467
Transponder Bandwidth	MHz	2.5
Carrier		
Carrier Information Rate	Mbps	1.536
Modulation Scheme	--	QPSK
Required Eb/No	dB	2.7
Implementation Margin	dB	2.5
UPLINK		
Ground Segment		
Antenna Diameter	meters	4.6
Transmit EIRP	dBW	65.6
Space Segment		
Uplink Path loss	dB	201.8
Spacecraft G/T	dB/K	-10.8
G/T Degradations	dB	2.3
Spacecraft G/T	dB/K	-13.1
Input Back-off (Total)	dB	0.0
Operating Flux Density	dBW/m ²	-97.8
C/No Thermal Up	dB/Hz	79.2
DOWNLINK		Transparent
Space Segment		
Output Back-off (per Carrier)	dB	0.0
Saturated EIRP EOC	dBW	48.8
Downlink Path Loss	dB	187.4
Receiver		
Receiver G/T	dB/K	-13.4
C/No Received	dB/Hz	76.7
C/(No) Required	dB/Hz	67.0
Available Downlink Margins	dB	9.7

FIGURE A-3: AfriStar Downlink Antenna Gain

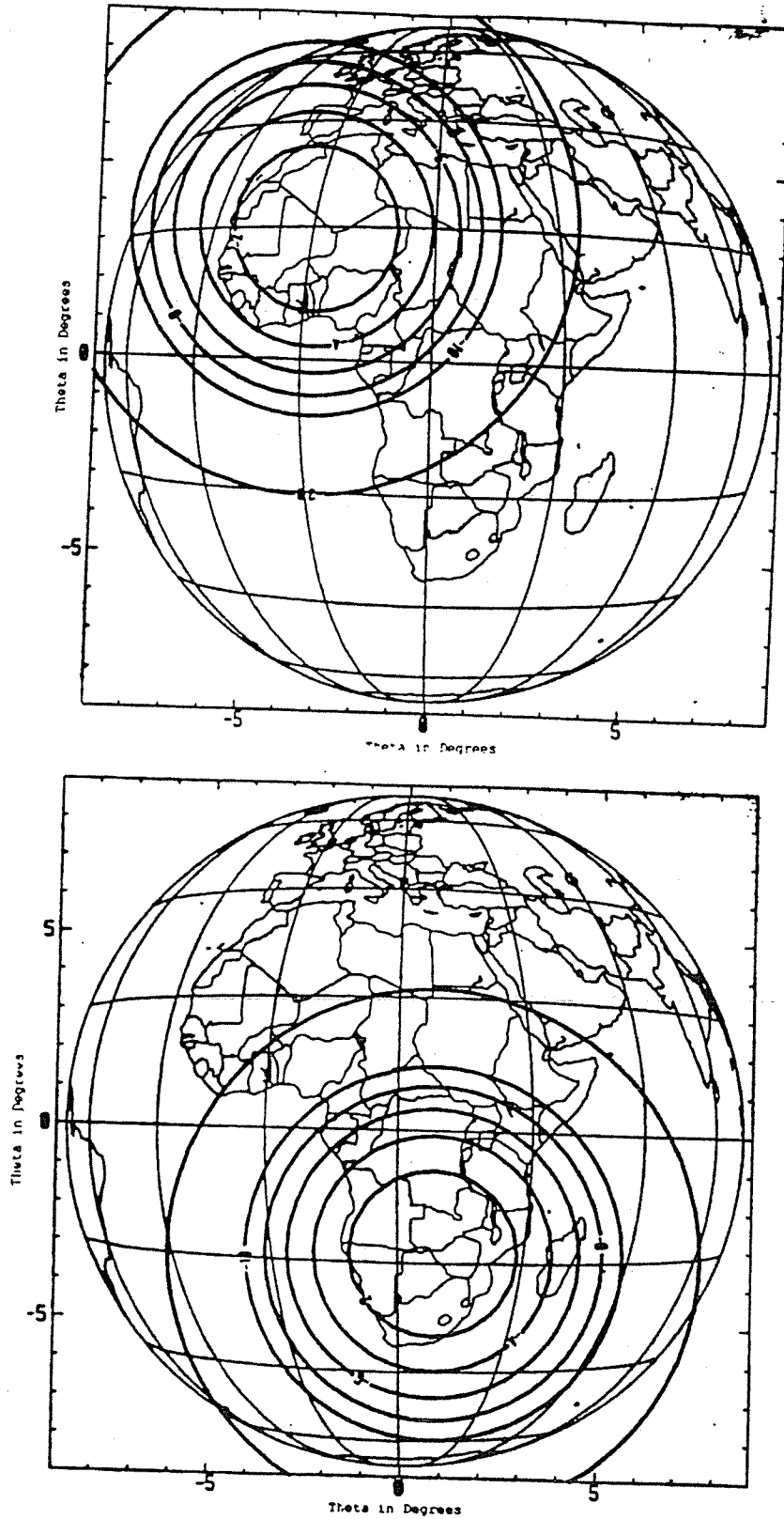
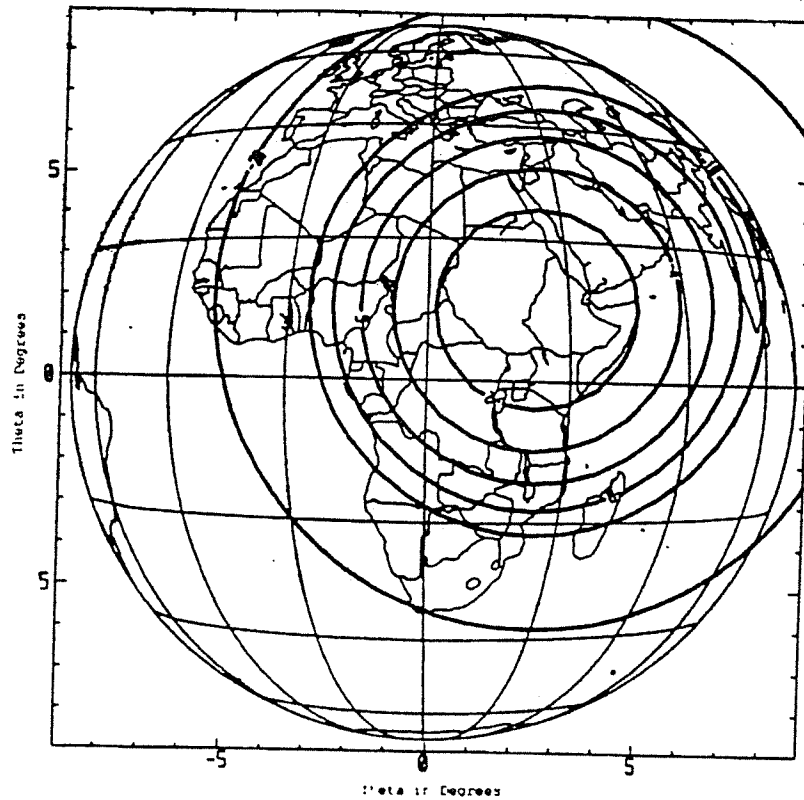


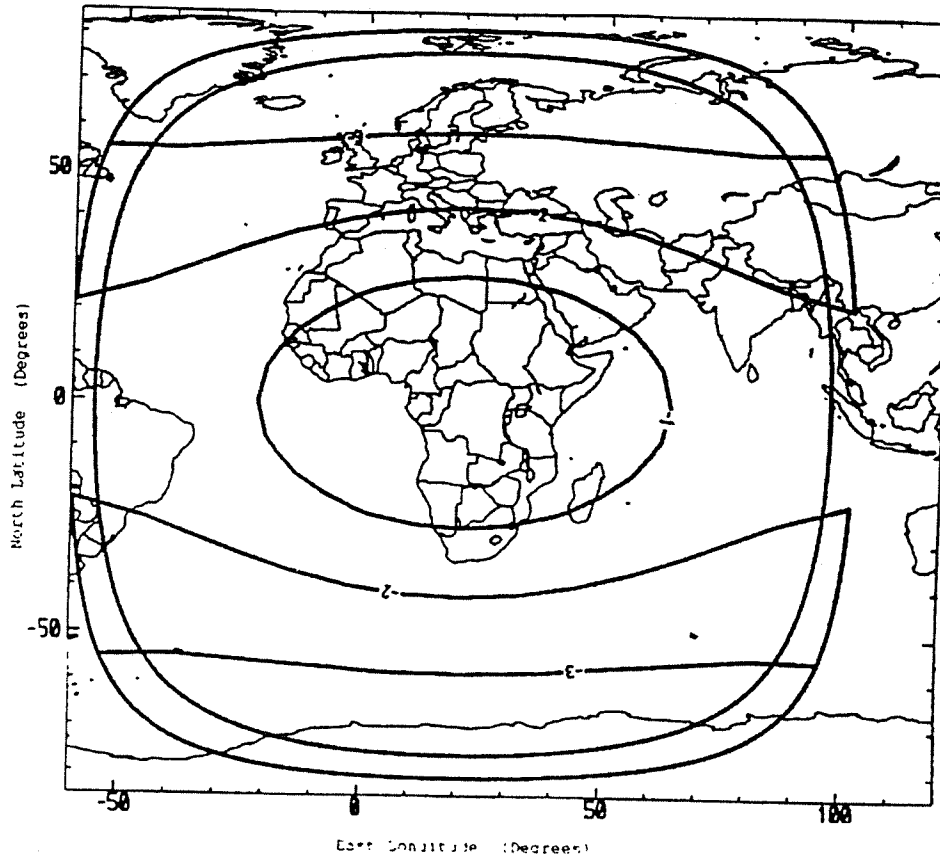
FIGURE A-3: AfriStar Downlink Antenna Gain (Continued)



Notes:

1. View of the earth is from 21°E Longitude. Latitude and Longitude lines are at 20° intervals.
2. Contours shown are -2, -4, -6, -8, -10 and -20 dB relative to maximum gain (30 dBi)

FIGURE A-4: AfriStar Global Uplink Antenna Gain



Notes:

1. Antenna gain contours shown are -1, -2 and -3 dB relative to maximum gain (20 dBi). Gain contours below -3dB do not fall on the earth.
2. Also shown are the 5° elevation and 0° elevation contours.

III. Status of ITU Coordination

Since 1992, AfriSpace has been assiduously pursuing full coordination of the AfriStar satellite network submitted to the ITU by the FCC as AFRIBSS.

A. Status of ITU Filings

WIC	Receipt	Published	ITU Publication	Band	Long
2058	June 19, 1992	Dec. 22, 1992	AR11/A/879	7025-7075	12W
2058	June 19, 1992	Dec. 22, 1992	RES33/A/24	1467-1492	12W
2069	Sept. 29, 1992	Mar. 23, 1993	AR11/A/879A ADD-1	5925-6425	12W
2235	Sept. 20, 1994	July 9, 1996	AR11/C/2525	7050-7075	21E
2235	Sept. 20, 1994	July 9, 1996	RES33/C/24	1467-1492	21E
2292	Mar. 19, 1996	Aug. 26, 1997	AR11/C/2525 Mod-1	7025-7075	21E
2292	Mar. 19, 1996	Aug. 26, 1997	RES33/C/24 Mod-1	1467-1492	21E
2292	Mar. 19, 1996	Aug. 26, 1997	RES33/G/25 Mod-1	1467-1492	21E
2292	Mar. 19, 1996	Aug. 26, 1997	RES46/C/238	7025-7075	21E

B. Status of Bilateral Coordinations

Country	Appendix 3 Comment	Appendix 3 MOD-1 Comment	Coordination Agreement
Brazil	Nov. 8, '96	None	Not required
Ethiopia	Oct. 4, '96	None	May 11, '98
Finland	None	Sept. 11, '97	
France	None	Dec. 16, '97 Dec. 19, '97 Dec. 23, '97	
Germany	None	Dec. 19, '97	
India	Nov. 8, '96	Dec. 23, '97	
Iran	Nov. 7, '96	None	
Russia	Nov. 9, '96	Dec. 26, '97	
Saudi Arabia	Aug. 24, '96 May 3, '97 July 14, '97	Sept. 20, '97	
Senegal	Aug. 29, '96	None	Feb. 9, '98
Syria	None	Oct. 11, '97	
Ukraine*	Nov. 26, '96	None	
United Arab Emirates	None	Sept. 10, '97	
United Kingdom	Nov. 8, '96	Dec. 22, '97	

* The Ukraine objection will not be listed in the report to the Radiocommunication Bureau filed by the FCC under Radio Regulation 1056.

C. Letters of Association

The following administrations have notified the ITU Radiocommunication Bureau that, in response to the Appendix 3 filings, they intend to authorize the utilization of the AFRIBSS satellite system within their territories:

Angola, Botswana, Central African Republic, Democratic Republic of the Congo, Egypt, Gabon, Gambia, Ghana, Kenya, Lesotho, Liberia, Mauritius, Senegal, Sierra Leone, South Africa, Togo and Uganda.

ANNEX D-1

RECOMMENDATION ITU-R BO. 1130-1 (Excerpt)

SYSTEMS FOR DIGITAL SOUND BROADCASTING TO VEHICULAR, PORTABLE
AND FIXED RECEIVERS FOR BROADCASTING-SATELLITE SERVICE (SOUND)
BANDS IN THE FREQUENCY RANGE 1400-2700 MHZ



INTERNATIONAL TELECOMMUNICATION UNION

RADIOCOMMUNICATION
STUDY GROUPS

Document 10/38-E
29 October 1998
Original: English only

Subject: Question ITU-R 93/10

Source: Documents 10/6 (Rev. 1) and 10-11S/TEMP/56 + Corr.1

Joint Working Group 10-11S

**DRAFT REVISION OF RECOMMENDATION ITU-R BO.1130-1 ON SYSTEMS
FOR DIGITAL SOUND BROADCASTING**

The Director, Radiocommunication Bureau, resubmitted, in the three languages, to the October 1998 JWP 10-11S the draft revision of Recommendation ITU-R BO.1130-1, which had been submitted by JWP 10-11S to SG 10 after its January meeting in Honolulu, Hawaii.

JWP 10-11S formed a drafting group that included representation from each of the systems cited in Recommendation ITU-R BO.1130-1, from the BR, from Cuba and Mexico, from Japan which may have a fourth system submitted in the near future to be included in the Recommendation, and also the SG 10 Chairman attended the drafting group meeting.

After receiving the facts on each of the three systems considering the comments from the Cuban, Mexican, BR and SG 10 representatives, in a very harmonious manner, the drafting group proposed the modification accompanying this cover page to JWP 10-11S. It was approved by JWP 10-11S and is submitted to SG 10 and the Radiocommunication Assembly for approval.

JWP 10-11S consider that this proposed revision represents the facts, fairly on the three systems, takes into account the ITU-R instructions given in Resolution 1 concerning a multiple system Recommendation for the same radio service application, and provides a structure suitable for additions, if warranted.

DRAFT REVISION OF RECOMMENDATION ITU-R BO.1130-1

**SYSTEMS SELECTION FOR DIGITAL SOUND BROADCASTING TO VEHICULAR,
PORTABLE AND FIXED RECEIVERS FOR BROADCASTING SATELLITE SERVICE
(SOUND) IN THE BANDS IN THE FREQUENCY RANGE 1 400 - 2 700 MHZ**

(Question ITU-R 93/10)

The ITU Radiocommunication Assembly,

considering

- a) that there is an increasing interest worldwide for digital sound broadcasting to vehicular, portable and fixed receivers in the broadcasting-satellite service (BSS) (sound) bands allocated at the World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum (Malaga-Torremolinos, 1992) (WARC-92), and several satellite-based digital sound broadcasting services for national and supra-national coverage are being considered;
- b) that the ITU-R has already adopted Recommendations ITU-R BS.774 and ITU-R BO.789 to indicate the necessary technical and operating characteristics for digital sound broadcasting systems to vehicular, portable and fixed receivers for terrestrial and satellite delivery, respectively;
- c) that according to Resolution ITU-R 1, with respect to multi-systems Recommendations, an evaluation of the recommended systems has been performed and its results are included in the "recommends";
- d) that all three recommended systems (Digital Systems A, B and D) are sufficiently documented in the ITU-R;
- e) that these three systems have been field-tested sufficiently, and that the results of these tests have been documented in the ITU-R;
- f) that Digital System A described in Annex 1, is the recommended standard for terrestrial digital sound broadcasting to vehicular, portable and fixed receivers in the frequency bands allocated to sound broadcasting above 30 MHz as specified in Recommendation ITU-R BS.1114;
- g) that a standardization process in Europe has resulted in the adoption of Digital System A (EUREKA 147 as an ETSI standard ETS 300 401) for BSS/BS (sound) to vehicular, portable and fixed receivers;
- h) that Resolution 1, Digital Audio Broadcasting, of the 8th World Conference of Broadcasting Unions (Barbados, 24-25 April 1995) stated that continuing efforts should be made to see if a unique worldwide standard for Digital Audio Broadcasting is achievable, and if not achievable, that maximum commonality of source coding, transport structure, channel coding and frequency band should be encouraged;

noting

- a) a summary of Digital Systems A, B and D is presented in Annex 1;
- b) the full systems descriptions for Digital Systems A, B and D are given in Annexes 2, 3 and 4 respectively,

recommends

that administrations that wish to implement BSS (sound) services meeting some or all of the requirements as stated in Recommendation ITU-R BO.789, should use the following Table to evaluate the respective merits of Digital Systems A, B and D when selecting their system:

TABLE 1: Performance of Digital Systems A, B and D evaluated on the basis of the recommended technical and operating characteristics listed in ITU-R BO.789(1)(2)

Characteristics from BO.789 (condensed wording)	Digital System A	Digital System B	Digital System D
1. Range of audio quality and types of reception	Range is from 8 kbit/s to 384 kbit/s per audio channel in increments of 8 kbit/s. MPEG-2 Layer-2 audio decoder typically operating at 192 kbit/s is implemented in receivers. The system is intended for vehicular, portable and fixed reception. ⁽¹⁾	Range is from 16 kbit/s to 320 kbit/s per audio channel in increments of 16 kbit/s. PAC source encoder at 160 kbit/s was used for most field tests. The system is intended for vehicular, portable and fixed reception. ⁽¹⁾⁽²⁾	Range is from 16 kbit/s to 128 kbit/s per audio channel in increments of 16 kbit/s. MPEG-2 and MPEG-2.5 Layer 3 audio coding is used. The system is intended for portable and fixed reception. ⁽³⁾
2. Spectrum efficiency better than FM	FM stereo quality achievable in less than 200 kHz bandwidth, co-channel and adjacent channel protection requirements much less than that for FM. Efficiency is especially high in the case of repeaters using the same frequency (Orthogonal multi-carrier modulation with convolution error correcting coding, COFDM).	FM stereo quality achievable in less than 200 kHz bandwidth, co-channel and adjacent channel protection requirements much less than that for FM (QPSK modulation with concatenated block and convolutional error correcting coding.)	FM stereo quality achievable in less than 200 kHz bandwidth, co-channel and adjacent channel protection requirements much less than that for FM (QPSK modulation with concatenated block and convolutional error correcting coding.)
3. Performance in multipath and shadowing environments	System is especially designed for multipath operation. It works on the basis of a power summation of echoes falling within a given time interval. This feature allows use of on-channel repeaters to cover shadowed areas.	System is designed for maximizing link margin via satellite ⁽⁴⁾ and for mitigation of multipath and doppler spread effects in the complementary terrestrial mode. ⁽⁴⁾ Shadowing is covered by use of on-channel repeaters. ⁽⁴⁾	The system in its basic configuration is designed primarily for direct reception via satellite and in this mode multipath reception difficulties do not arise. The satellite link margin is maximized to enhance the performance under direct satellite reception with some degree of shadowing. ⁽⁴⁾
4. Common receiver signal processing for satellite and terrestrial broadcasting	Allows the use of the same receiver, from the RF front end to the audio and data output. Integrated or separate receive antennas can be used for satellite (circular polarization) and terrestrial (vertical polarization) signal reception.	Allows for the use of the same basic receiver for both satellite and terrestrial transmission, with an added equalization component required for terrestrial delivery. ⁽⁴⁾	For fixed and portable applications in rural environments, the same basic receiver can be used provided the terrestrial augmentation (for indoor reception) is limited to micro-power gap fillers. Second-generation receivers are being developed for reception in urban environments, including mobile applications. ⁽¹⁾
5. Reconfiguration and quality vs. number of programmes tradeoff	Service multiplex is based on 64 sub-channels of capacity varying from 8 kbit/s to about 1 Mbit/s, depending on the error protection level, and is totally reconfigurable in a dynamic fashion. Each sub-channel can also contain an unlimited number of variable capacity data packet channels.	Designed in 16 kbit/s building blocks to accommodate this feature.	A flexible 16 kbit/sec building block multiplex is employed in order to trade off programme audio quality against number of services.
6. Extent of coverage vs. number of programmes tradeoff	5 levels of protection for audio and 8 levels of protection for data services are available through using punctured convolutional coding for each of the 64 sub-channels (FEC ranges from 1/4 to 7/8).	Allowance for this tradeoff is based on an information bit rate contained in steps of 32 kbit/s and a variable FEC rate. ⁽¹⁾	The system is optimized for direct reception from satellite. Implementation of this requirement is beneficial only for terrestrial transmission. (2)

<p>7. Common receiver for different means of programme delivery</p> <ul style="list-style-type: none"> - satellite coverage area - mixed/hybrid - terrestrial services - cable distribution 	<ul style="list-style-type: none"> - Allows satellite services for different coverage area sizes (limitations are due to satellite power (6) and transmit antenna size). - Allows the use of the same band as terrestrial sound broadcasting (mixed) as well as the use of terrestrial on-channel repeaters to re-transmit the satellite coverage (hybrid) resulting in all these channels being received transparently by a common receiver - Allows local, subnational and national terrestrial services with the same modulation with single transmitter or multiple transmitters operating in a Single Frequency Network to take advantage of a common receiver - Signal can be carried transparently by cable 	<ul style="list-style-type: none"> - Allows satellite services for different coverage area sizes (limitations are due to satellite power (6) and transmit antenna size). - Mixed and hybrid use of satellite and complementary terrestrial services in the bands allocated for BSS (sound) by WARC-97 (4) - With terrestrial transmitters in the appropriate frequency bands (4) - Signal can be carried transparently by cable. 	<p>Allows satellite services for different coverage area sizes (limitations are due to satellite power (6) and transmit antenna size).</p> <p>Will be possible with second generation receiver. (5)</p> <p>Will be possible with second generation receiver. (5)</p> <p>Signal can be carried transparently by cable</p> <p>Programme-associated data comprising text (dynamic labels) and graphics with conditional access control can be delivered.</p>
<p>8. Programme-related data capability</p>	<p>Programme associated data (PAD) channel from 0.66 kbit/s to 64 kbit/s capacity is available through a reduction of any audio channel by the corresponding amount. Dynamic label for programme and service identification showing on the receiver alphanumeric display is available to all receivers. Basic ITML decoding and JPEG picture decoding is available on receivers with graphic displays (1/4 VGA), etc.</p> <p>Any sub-channel (out of 64) not used for audio can be used for programme-independent data services. Data packet channels for high priority services available to all receivers used to any service of the multiplex can be carried in the Fast Information Channel (FIC). Total capacity is up to 16 kbit/s. Receivers are equipped with a Radio Data Interface (RDI) for data transfer to computer.</p> <p>The multiplex can be dynamically reconfigured in a fashion transparent to the user.</p> <p>The system multiplex structure is compliant with the OSI layered model, especially for the data channels, except for the unequal error protection features of the MPEG-2 Layer-2 audio channel.</p>	<p>To be determined (4)</p> <p>Any 32 kbit/s block can be used for value added services; not tested. (4)</p> <p>To be determined (4)</p> <p>Capable, though not tested. (4)</p>	<p>Capacity in increments of 8 kbit/sec up to the full 1.536 Mbit/sec capacity of the TDMA can be assigned to independent data for the delivery of business data, paging, still pictures graphics etc. under conditional access control if desired. A data connector is provided on the receivers for interfacing to information technology networks and communications networks.</p> <p>The multiplex can be dynamically reconfigured in a fashion transparent to the user.</p> <p>The system multiplex structure was developed to be in line with the OSI layered model.</p>
<p>9. Value-added data capability</p>	<p>Any sub-channel (out of 64) not used for audio can be used for programme-independent data services. Data packet channels for high priority services available to all receivers used to any service of the multiplex can be carried in the Fast Information Channel (FIC). Total capacity is up to 16 kbit/s. Receivers are equipped with a Radio Data Interface (RDI) for data transfer to computer.</p> <p>The multiplex can be dynamically reconfigured in a fashion transparent to the user.</p> <p>The system multiplex structure is compliant with the OSI layered model, especially for the data channels, except for the unequal error protection features of the MPEG-2 Layer-2 audio channel.</p>	<p>To be determined (4)</p> <p>Any 32 kbit/s block can be used for value added services; not tested. (4)</p> <p>To be determined (4)</p> <p>Capable, though not tested. (4)</p>	<p>Capacity in increments of 8 kbit/sec up to the full 1.536 Mbit/sec capacity of the TDMA can be assigned to independent data for the delivery of business data, paging, still pictures graphics etc. under conditional access control if desired. A data connector is provided on the receivers for interfacing to information technology networks and communications networks.</p> <p>The multiplex can be dynamically reconfigured in a fashion transparent to the user.</p> <p>The system multiplex structure was developed to be in line with the OSI layered model.</p>
<p>10. Flexible assignment of services</p>	<p>The multiplex can be dynamically reconfigured in a fashion transparent to the user.</p> <p>The system multiplex structure is compliant with the OSI layered model, especially for the data channels, except for the unequal error protection features of the MPEG-2 Layer-2 audio channel.</p>	<p>To be determined (4)</p> <p>Capable, though not tested. (4)</p>	<p>Capacity in increments of 8 kbit/sec up to the full 1.536 Mbit/sec capacity of the TDMA can be assigned to independent data for the delivery of business data, paging, still pictures graphics etc. under conditional access control if desired. A data connector is provided on the receivers for interfacing to information technology networks and communications networks.</p> <p>The multiplex can be dynamically reconfigured in a fashion transparent to the user.</p> <p>The system multiplex structure was developed to be in line with the OSI layered model.</p>
<p>11. Compatibility of multiplex structure with OSI</p>	<p>The multiplex can be dynamically reconfigured in a fashion transparent to the user.</p> <p>The system multiplex structure is compliant with the OSI layered model, especially for the data channels, except for the unequal error protection features of the MPEG-2 Layer-2 audio channel.</p>	<p>To be determined (4)</p> <p>Capable, though not tested. (4)</p>	<p>Capacity in increments of 8 kbit/sec up to the full 1.536 Mbit/sec capacity of the TDMA can be assigned to independent data for the delivery of business data, paging, still pictures graphics etc. under conditional access control if desired. A data connector is provided on the receivers for interfacing to information technology networks and communications networks.</p> <p>The multiplex can be dynamically reconfigured in a fashion transparent to the user.</p> <p>The system multiplex structure was developed to be in line with the OSI layered model.</p>

<p>12. Receiver low-cost manufacturing</p>	<p>Allows for mass-production manufacturing and low-cost consumer receivers. Typical receivers have been integrated in two chips. One chip manufacturer has integrated the full receiver circuitry into one chip.</p>	<p>With relatively simple design (low complexity) it is anticipated that relatively low-cost consumer receivers can be developed.</p>	<p>The system was specifically optimized to enable an initial low complexity portable receiver deployment. Several models of low cost receivers based on LSI mass production techniques are being manufactured.</p>
<p>(1) Beyond the Annexes attached to this Recommendation, additional, detailed information on these systems appears in the ITU-R Special Publication on digital sound broadcasting in the broadcasting bands above 30 MHz (Geneva, 1995) and its updates. Also, as noted in considering B) there is an ETSI standard for Digital System A</p> <p>(2) It is understood that some administrations may wish to develop BSS(S) and BS systems that do not provide the entire range of characteristics listed in Recommendation ITU-R BO 789. For example an administration may wish to have a service that provides the equivalent of monophonic FM audio intended primarily for reception by very low-cost fixed or portable receivers, rather than vehicle-mounted receivers. Nevertheless, it is understood that such administrations would endeavour to develop digital sound broadcasting systems that conform to the extent practicable, with the characteristics cited in Recommendation ITU-R BO 789. Technology in this area of digital BSS(sound) is developing rapidly. Accordingly, if additional systems intending to meet the requirements given in Recommendation ITU-R BO 789 are developed, they may also be considered for recommendation.</p> <p>(3) Digital System A's terrestrial broadcasting implementation, including on-channel gap-fillers and coverage extenders, is in operation in several countries and it has been field-tested over two satellites at 1.5 GHz coverage areas and in the laboratory by the developer and also by an independent testing organization. However, the tested receiver prototype did not include any channel equalization which would permit operation in a multipath environment created by terrestrial on-channel repeaters which would allow mobile and portable reception in urban areas. Nevertheless, results of laboratory tests performed on a channel equalizer operating at 300 ksymbol/s with simulated L- and S-band propagation conditions (including realistic multipath and Doppler spreads) were reported.</p> <p>(4) The current status of Digital System B is that it is a hardware prototype engineering model. Digital System B has been field-tested in mobile operations over many hours via satellite on different satellites with varying multipath environments created by terrestrial on-channel repeaters which would allow mobile and portable reception in urban areas. Nevertheless, results of laboratory tests performed on a channel equalizer operating at 300 ksymbol/s with simulated L- and S-band propagation conditions (including realistic multipath and Doppler spreads) were reported.</p> <p>(5) Digital System D has been demonstrated over satellite and field-tested through helicopter tests and results of end-to-end laboratory transmission tests have been reported. Additional configurations of Digital System D designed to enhance system performance when terrestrial augmentation is employed and multipath reception difficulties are expected under mobile reception conditions are currently under development and test. Both adaptive equalization and multi-carrier COFDM techniques are being evaluated.</p> <p>(6) In the case of single carrier transmission systems, there is a 7 dB advantage (Digital System D) in satellite link margin for a given transmitter power compared to that of a multi-carrier transmission system (Digital System A). This advantage becomes 3.5 dB when a channel equalizer is included in the receiver to allow for satellite/terrestrial hybrid reception (Digital Systems B).</p>			

ANNEX DESCRIPTION OF BSS SOUND SYSTEMS

SUMMARY OF DIGITAL SYSTEM A

Digital System A, also known as the Eureka 147 DAB system, has been developed for both satellite and terrestrial broadcasting applications in order to allow a common low-cost receiver to be used. The system has been designed to provide vehicular, portable and fixed reception with low gain omni-directional receive antennas located at 1.5 m above ground. Digital System A allows for complementary use of satellite and terrestrial broadcast transmitters resulting in better spectrum efficiency and higher service availability in all receiving situations. It especially offers improved performance in multipath and shadowing environments which are typical of urban reception conditions, and the required satellite transponder power can be reduced by the use of on-channel terrestrial repeaters to serve as "gap-fillers". Digital System A is capable of offering various levels of sound quality up to high quality sound comparable to that obtained from consumer digital recorded media. It can also offer various data services and different levels of conditional access and the capability of dynamically re-arranging the various services contained in the multiplex.

SUMMARY OF DIGITAL SYSTEM B

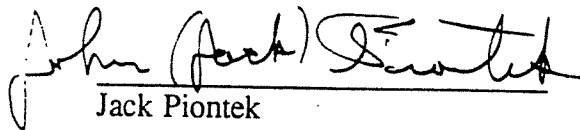
Since available transponder power is at a premium on communications satellites, Digital System B, originally proposed by VOA/JPL, was designed to provide maximum efficiency on board a communications satellite. Use is made of QPSK coherent demodulation. Appropriate levels of error correction are included. Since complementary terrestrial use requires significant multipath rejection, an adaptive equaliser technique was designed to permit Digital System B to be a complete satellite/terrestrial broadcast delivery mechanism. Receiver cost is expected to be relatively low because the modulation methods and other aspects of the overall design are relatively simple. The system's current status is that it is a hardware prototype engineering model.

SUMMARY OF DIGITAL SYSTEM D

Digital System D, also known as the WorldSpace system, is primarily designed to provide satellite digital audio and data broadcasting for fixed and portable reception. It has been designed to optimize performance for satellite service delivery in the L-band (1 452 - 1 492 MHz). This is achieved through the use of coherent QPSK demodulation with concatenated block and convolutional error correcting coding, and linear amplification. The choice of TDM/QPSK modulation allows for enhanced coverage for a given satellite transponder power. Digital System D provides for a flexible multiplex of digitized audio sources to be modulated onto a downlink TDM carrier. The Digital System D receiver uses state-of-the-art microwave and digital large-scale integrated circuit technology with the primary objective of achieving low-cost production and high-quality performance. Work is also proceeding on the development of techniques to allow hybrid satellite/terrestrial broadcasting systems using Digital System D.

ATTACHMENT 3
Technical Certification

I, Jack Piontek, hereby certify, under penalty of perjury, that I am ~~the~~ technically qualified person responsible for the preparation of the technical information in the foregoing Amendment to AfriSpace's Application, dated July 23, 1990 for an authorization to construct, launch, and operate an international private satellite sound broadcasting system on a non-common carrier basis, that I am familiar with Part 25 of the Commission's Rules, and that I have reviewed the technical information in the foregoing Amendment and found it to be complete and accurate to the best of my knowledge and belief.

A handwritten signature in black ink, appearing to read "John (Jack) Piontek", written over a horizontal line.

Jack Piontek
Vice President
AfriSpace, Inc.

Dated: January 22, 1999

ATTACHMENT 4
Financial Information

Pursuant to Sections 25.140(b)-(e) of the Commission's Rules, 47 C.F.R. §25.140(b)-(e) (1997), AfriSpace submits the following information.

- (b) (1) AfriSpace has provided the information required under Section 25.114 of the Commission's Rules, 47 C.F.R. §25.114, (1997), under Section III of this Amendment.
 - (2) Not applicable because the proposed system is not a fixed-satellite space station.
 - (3) See Attachment 5 to this Amendment for the estimated costs of the lease and any other initial expenses for the space station.
 - (4) See Attachment 5 to this Amendment for AfriSpace's estimated operating expenses for one year after commencement of operations of the proposed space station.
- (c) AfriSpace demonstrates its financial ability to meet the costs specified in paragraphs (b)(3) and (b)(4) of this section by submitting the following information verified by affidavit (*see*, Attachment 6 to this Amendment):
- (1) A balance sheet current for the latest fiscal year is provided under Attachment 7 to this Amendment. Documentation of the financial commitments reflected in the balance sheet (such as, for example, loan agreements and service contracts) is provided under Attachment 8 to this Amendment.

ATTACHMENT 5
Estimated Operating Expenses

Requirement	Estimated Costs
First Year Lease Cost	\$10.9 million
First Year Operating Expenses	\$4 million
<hr/>	
Total	\$14.9 million

Lease Costs for AfriStar Satellite	
Amount (U.S.)	Year
\$10.9 million	1
\$16.4 million	2
\$21.9 million	3
\$27.3 million	from year 4 to the end of the term of the agreement

Break-down of First Year Operating Expenses		
Item	Expenses (U.S.)	Comment
AfriSpace Staff	\$904,957	1998 Staff costs plus 3% increase for 1999
ROC Operations Contract	\$907,227	Geologics Incorporated Engineering Consulting (Shift Operator)
ROC System and Facilities Maintenance	\$306,856	22,767 per month negotiated with Boston Properties; Maintenance Contracts for ROC data processing systems
ROC Rent and Utilities	\$370,000	Rent and utilities
Ground Control Network	\$322,000	Communication Circuits to Mauritius and India
Telephone	\$60,000	Long Distance Voice, Cellular Phones, Pagers
ISDN for Home Computers	\$7,200	8 engineers
TCR/ (U.S.) CSM Site Services	\$1,004,000	Site Services in Mauritius and India
TCR Station Repairs	\$45,000	3 stations, 5 repairs/station at \$3,000 per repair
Supplies	\$3,600	Computer paper, printer cart., etc. - \$300/mo.
Training	\$8,000	2 staff, 2 courses (VMS-UNIX) @ \$2000 per course
Travel	\$60,000	TCR site visits, training, meetings, etc.
Misc.	\$1,200	
Total Operating Expenses	\$4 million	

ATTACHMENT 6
Financial Certification

I, Benno A. Ammann, hereby certify, under penalty of perjury, that I have reviewed the financial information contained in the foregoing Amendment to AfriSpace's Application dated July 23, 1990 for an authorization to construct, launch, and operate an international private satellite sound broadcasting system on a non-common carrier basis, and found it to be complete and accurate to the best of my knowledge and belief.



Benno A. Ammann
President
AfriSpace, Inc.

Dated: January 22, 1999

ATTACHMENT 7
Balance Sheet

Consolidated Balance Sheet for WorldSpace, Inc. For 1997

WORLDSPACE, INC. AND SUBSIDIARIES
(A Development Stage Enterprise)
CONSOLIDATED BALANCE SHEETS

	December 31,	
	1997	1996
ASSETS		
Current assets:		
Cash and cash equivalents	\$ 11,951,792	\$ 1,000,000
Due from WIN	3,611,960	2,934,023
Due from AMRC	390,659	-
Other receivables	277,220	250,000
Total current assets	16,231,631	4,184,023
Notes receivable from AMRC	80,731,298	-
Investment in WIN	301,268	301,268
Investment in AMRC	7,500,000	-
Total assets	\$ 104,764,197	\$ 4,485,291
 LIABILITIES AND STOCKHOLDERS' DEFICIT		
Current liabilities:		
Accounts payable and accrued expenses	\$ 4,393,220	\$ -
Notes payable	1,000,000	1,000,000
Income taxes payable	-	690,000
Dividend payable	2,476,415	2,476,415
Accrued interest	100,000	-
Total current liabilities	7,969,635	4,166,415
Notes and advances payable	98,425,000	7,000,000
Accrued interest	5,446,146	1,231,323
Total liabilities	111,840,781	12,397,738
Commitments and contingencies		
Stockholders' deficit:		
Common stock: \$0.01 par value; 20,000,000 shares authorized; 7,504,289 shares issued and outstanding as of December 31, 1996 and 1997	75,043	75,043
Additional Paid-in-Capital	5,000,000	-
Deficit accumulated during the development stage	(12,151,627)	(7,987,490)
Total stockholders' deficit	(7,076,584)	(7,912,447)
Total liabilities and stockholders' deficit	\$ 104,764,197	\$ 4,485,291

The accompanying notes are an integral part of these consolidated financial statements.

ATTACHMENT 8

Financial Commitments Reflected in the Balance Sheet

As reflected in the Balance Sheet, AfriSpace must make lease payments to the WorldSpace Satellite Company, Ltd. for the AfriStar satellite. Set forth below is a summary of the lease agreement. In addition, we have included a copy of the agreement. The balance sheet also reflects that WorldSpace International Network will be leasing capacity from AfriSpace in order to resell that capacity to broadcasters and content providers in Africa and the Middle East. A summary and copy of the channel service agreement is attached. See also Attachments 12, 14 and 15 for chart showing organizations mentioned here.

Summary of Lease Agreement

AfriSpace entered into a Lease Agreement with WorldSpace Satellite Company, Ltd., ("WSC"), a British Virgin Islands corporation, on January 19, 1999. In December 1996, certain agreements entered into by WorldSpace, Inc., AfriSpace's parent company, with Alcatel Espace ("Alcatel") were assigned to WSC, including an In-Orbit Delivery Contract, End-to-End Contract, and System Agreement. The In-Orbit Delivery Contract is the agreement through which Alcatel agreed to develop, construct, launch and place into geostationary orbit the AfriStar satellite. Through the End-to-End Agreement, Alcatel agreed to provide certain services for the satellite, including tracking, telemetry and command facilities, earth stations, a network control center and other equipment. Through the System Agreement, Alcatel agreed to provide operation services and certain ground infrastructure.

Assignment of the three Alcatel agreements was part of a sale of assets that was undertaken to provide working capital for WorldSpace, Inc. and its subsidiary company, AfriSpace.

As a result of the assignment, the AfriStar satellite and related infrastructure are owned by WSC and leased by AfriSpace under a 12-year agreement. The Lease Agreement will commence upon final in-orbit acceptance of the AfriStar satellite by WSC. The related infrastructure include the equipment, parts and components (including buildings, real estate, equipment and facilities used for the regional operations center, and tracking, telemetry and command of the AfriStar satellite).

Under the terms of the lease, AfriSpace pays WSC a yearly base rent to lease the AfriStar satellite and related infrastructure, the amount of which is based on a percentage of WSC's costs for the AfriStar satellite and related infrastructure. The lease will commence on the In-Service Date, *i.e.*, the date of Final Acceptance of the AfriStar satellite. The lease is renewable for an additional two-year term during the first renewal period and for a one-year period during the second renewal term. The base rent during any renewal term shall be equal to the fair market value of the AfriStar satellite and related infrastructure.

Under the Lease Agreement, AfriSpace maintains ultimate control over the AfriStar

satellite and related infrastructure, as well as control and unfettered use over all other matters relating to the AfriStar satellite, including all policy, personnel, financial and day-to-day operational matters (and matters relating to the FCC space station authorization awarded to AfriSpace) to the full extent required by the Commission and any applicable federal, state or local law. AfriSpace may enter into subcontractual arrangements with third parties for operational matters consistent with FCC requirements.

AfriSpace is responsible for maintaining, managing and monitoring (including the provision of tracking, telemetry and control functions) the AfriStar satellite and related infrastructure. AfriSpace is fully and exclusively responsible for the AfriStar satellite and related infrastructure and the regulatory licenses required to operate such facilities.

AfriStar is placed in geostationary orbit at 21 degrees E.L. and may only be moved by AfriSpace if necessary to comply with a requirement of the FCC. AfriSpace shall be responsible for obtaining satellite in-orbit life insurance by the In-Service Date and shall maintain the insurance during the term of the lease, but shall not be responsible for obtaining general liability insurance for the AfriStar satellite and related infrastructure.

WSC may terminate the lease on six months' notice if it determines in its sole discretion that, for commercial, political, regulatory or tax reasons, the AfriStar satellite and related infrastructure are required for use by an affiliate of WSC or in a different orbital location than that permitted under the Commission's license. If AfriSpace's experimental license is not renewed prior to its expiration date or the FCC does not grant AfriSpace a permanent license within 12 months after the In-Service Date, WSC may also terminate the lease. AfriSpace may terminate the lease in the event of loss of the AfriStar satellite, subject to payment of a stipulated loss value to WSC.

Not more than 365 days nor less than 270 days prior to the end of the term or any renewal term of the Agreement, AfriSpace may give notice to WSC tentatively electing to purchase the AfriStar satellite and related infrastructure. The purchase price shall be equal to the fair market value of the AfriStar satellite and related infrastructure. At least 180 days before the end of the term or any renewal term, AfriSpace shall notify WSC of its irrevocable decision of whether or not to sell the acquire the AfriStar satellite and related infrastructure. The Lease Agreement is governed by the laws of the State of New York.

Summary of Channel Service Agreement

AfriSpace entered into a Channel Service Agreement with WorldSpace International Network Inc. ("WIN"), a British Virgin Islands corporation, on January 19, 1999. Under the Channel Service Agreement, AfriSpace leases capacity to WIN from the AfriStar satellite. WIN, in turn, resells the capacity to broadcasters and content providers for transmission by AfriSpace in the geographic areas covered by the AfriStar satellite. AfriSpace also provides technical services to WIN, whereby AfriSpace personnel operates and controls the AfriStar satellite.

The term of the Channel Service Agreement begins on the Service Start-Up Date, *i.e.*, the In-Service Date of the AfriStar satellite, and terminates on the 10-year anniversary of that date.

WIN must pay AfriSpace a monthly service fee beginning on the Service Start-Up date. Additionally, WIN must provide a security deposit equivalent to the service fee for two months. WIN is solely responsible for any taxes, charges, levies, duties, usage, spectrum or license fees that may be asserted by any governmental entity as a result of the service provided by WIN. WIN may not assign any of its rights under the Channel Service Agreement other than to a WIN subsidiary that has the requisite licenses, permits, franchises, rights or privileges of WIN without the prior written consent of AfriSpace. WIN is responsible for obtaining and maintaining any necessary governmental permits, licenses, and approvals related to its business, while AfriSpace is responsible for the licensing of the satellite.

Any transmission by WIN to the AfriStar satellite must conform to a digital transmission plan, which plan must be submitted to AfriSpace, and can only be modified with approval from AfriSpace. WIN is responsible for the provision, installation, operation and maintenance of all earth station facilities and equipment used for transmitting signals to the service channels, as well as any authorizations necessary for the installations and operation of such facilities.

Either party may terminate the Channel Service Agreement if the Service Start-Up Date does not occur before December 31, 1999.

AfriSpace may terminate the Channel Service Agreement if it believes in good faith that WIN's failure to comply with any necessary permits, approvals or licenses related to its business will have a material adverse effect on AfriSpace's ability to operate the AfriStar satellite and that such an effect cannot be remedied by WIN's immediately taking action to comply with such requirements.

The Channel Service Agreement terminates upon removal by AfriSpace of the AfriStar facilities due to the fact that: (i) the remaining fuel on board is not sufficient to maintain the satellite in geosynchronous orbit, after allowing sufficient fuel for de-orbiting the AfriStar satellite; or (ii) the AfriStar satellite suffers failure of a certain number of channels. In such event, WIN will not have any further obligations under the Channel Service Agreement and AfriSpace will be required to return to WIN any unused portion of the deposit and any outage credits.

AfriStar is in geostationary orbit at 21 degrees E.L. In the event that AfriSpace is required by the Commission to change the AfriStar orbital location, the change will not affect the validity of the Channel Service Agreement, except to the extent that the change prevents AfriSpace from providing service that meets the service specifications set forth in the Channel Service Agreement. In such case, the termination provisions under the Channel Service Agreement will apply. The Channel Service Agreement is governed by the laws of the State of New York.

LEASE AGREEMENT

THIS LEASE AGREEMENT (this "Lease") is entered into as of January 19, 1999, by and between WORLDSpace SATELLITE COMPANY LTD., a British Virgin Islands corporation ("Lessor"), and AFRISPACE, INC., a Maryland corporation ("Lessee").

WITNESSETH

WHEREAS, pursuant to the Alcatel Assignment Agreement, dated as of December 18, 1996, by and between WorldSpace, Inc., a Maryland corporation, and the Lessor, the Lessor has become a party to: (i) the Amended and Restated IOD Contract, dated October 8, 1995, as from time to time amended, between WorldSpace and Alcatel Espace, a French corporation ("Alcatel"), pursuant to which Alcatel has agreed to develop, construct, launch and place into geostationary orbit three satellites for the benefit of WorldSpace, Inc. (the "In-Orbit Delivery Contract"); (ii) the WorldStar DAB End-to-End System Contract, dated November 9, 1995, as from time to time amended, between WorldSpace, Inc. and Alcatel, pursuant to which Alcatel has agreed to provide certain services with respect to the three satellites, including tracking, telemetry and command facilities, earth stations, a network control center and other equipment (the "End-to-End Contract"); and (iii) the WorldStar On-Station Operation Services Contract, dated June 26, 1996, between WorldSpace, Inc. and Alcatel, pursuant to which Alcatel has agreed to provide operation services certain ground infrastructure (the "System Agreement" and, together with the In-Orbit Delivery Contract and the End-to-End Agreement, the "Alcatel Agreements");

WHEREAS, the AfriStar Satellite is one of the satellites to which the Alcatel Agreements pertain;

WHEREAS, the Lessee has previously agreed to lease from the Lessor and the Lessor has previously agreed to lease to the Lessee the AfriStar Facilities described herein, upon substantially the terms and subject to substantially the conditions set forth in this Lease;

NOW, THEREFORE, in consideration of the premises and of the representations, warranties, covenants, agreements and conditions set forth herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereby agree as follows:

ARTICLE 1 DEFINITIONS

When used in this Lease, the following terms shall have the meanings specified below:

"Affiliate" as to any Person shall mean any other Person directly or indirectly controlling, controlled by or under common control with such Person. For purposes of this definition, "control" (including, with correlative meanings, the terms "controlling," "controlled by" and "under common control with"), as applied to any Person, means the

possession, directly or indirectly, of the power to direct or cause the direction of the management and policies of such Person, whether through the ownership of voting securities, by contract or otherwise.

"AfriStar Facilities" shall mean, collectively, the AfriStar Satellite and the Major System Components.

"AfriStar Satellite" shall mean the communications satellite named AfriStar constructed under the In-Orbit Delivery Contract.

"Alcatel" is defined in the Preambles hereto.

"Alcatel Agreements" shall mean the In-Orbit Delivery Contract, the End-to-End Contract and the System Agreement, as any of the same shall hereafter be amended or supplemented.

"Appraisal Procedure" shall mean an agreement between the Lessor and the Lessee with respect to an amount or value or, failing such agreement, the procedure for determining an amount or value. If the Lessor and the Lessee shall have been unable to agree on such amount or value, either the Lessor or the Lessee shall give written notice to the other party requesting determination of such amount or value, and the parties shall consult for the purpose of appointing a mutually acceptable qualified independent appraiser. If the Lessor and the Lessee shall be unable to agree on an appraiser within twenty (20) days after the giving of such notice, such amount or value shall be determined by a panel of three independent appraisers. One of the appraisers shall be selected by the Lessee and another shall be selected by the Lessor; *provided, however*, that if either party shall fail to select an appraiser within thirty (30) days after the giving of such notice, such appraiser shall be selected by the other party. The two appraisers shall select a third appraiser or, if they shall be unable to agree on a third appraiser within ten (10) days after each of such two appraisers shall have been selected, such third appraiser shall be selected by the American Arbitration Association. The three appraisers shall determine such amount or value within forty-five (45) days after such appointment, and their determination shall be final and binding on the parties. The determination of the appraiser that differs most from the second highest determination of all three appraisers shall be excluded, the remaining two determinations shall be averaged, and such average shall constitute the determination of the appraisers. The fees and expenses of the appraiser appointed by or on behalf of the Lessee shall be paid by the Lessee, the fees and expenses of the appraiser appointed by or on behalf of the Lessor shall be paid by the Lessor, and the fees and expenses of the third appraiser shall be divided equally between the Lessee and the Lessor.

"Approved Insurer" shall mean any reputable insurer or reinsurer, or insurance broker, or reinsurance broker, of internationally recognized responsibility and standing in satellite insurance, acceptable to the Lessor.

"Base Rent" shall have the meaning set forth in Section 3.1 hereof.

"Base Rent Payment Date" shall mean the last day of each quarterly period ending after the In-Service Date. If a Base Rent Payment Date shall fall on a day that is not a Business Day, any payment due on such Base Rent Payment Date shall be made on the next succeeding Business Day.

"Business Day" shall mean any day other than a Saturday, Sunday or other day on which banking institutions in New York, New York, are authorized or required by Law to be closed.

"Casualty Payment Date" shall mean each Base Rent Payment Date during the Term. If a Casualty Payment Date shall fall on a day that is not a Business Day, any payment due on such Casualty Payment Date shall be made on the next succeeding Business Day.

"Channel Service Agreement" shall mean the Channel Service Agreement of even date herewith between the Lessee and WorldSpace International Network Inc.

"Claims" shall mean any and all claims, damages, losses, liabilities, demands, suits, judgments, causes of action, legal proceedings, whether civil or criminal, penalties, fines and other sanctions, and any attorneys' fees and other reasonable costs and expenses in connection herewith or therewith, including any of the foregoing arising or imposed with or without the Lessor's fault or negligence (whether passive or active) or under the doctrine of absolute or strict liability.

"Code" shall mean the Internal Revenue Code of 1986, as amended.

"Default" shall mean any event which, with the giving of notice or the passage of time or both, would constitute an Event of Default hereunder.

"Dollars" and "\$" shall mean lawful currency of the United States of America.

"End-to-End Contract" is defined in the Preambles hereto.

"Event of Default" shall have the meaning specified in Article 16 hereof.

"Event of Loss" shall mean any of the following events with respect to the AfriStar Satellite or any Major System Component:

(a) the loss of the AfriStar Satellite or a Major System Component or the loss of the use of the AfriStar Satellite or such Major System Component for a period exceeding sixty (60) days (or for any period that includes the last day of the Term) due, for any reason whatsoever, to the destruction of or damage to the AfriStar Satellite or such Major System Component that renders the AfriStar Satellite or such Major System Component

uneconomic to repair or permanently unfit for normal use by the Lessee for any reason whatsoever;

(b) any damage to the AfriStar Satellite or such Major System Component that results in an insurance settlement with respect to the AfriStar Satellite or such Major System Component on the basis of a total loss or on the basis of a compromised or constructive total loss;

(c) the loss or disappearance of the AfriStar Satellite or such Major System Component for a period in excess of ninety (90) consecutive days (or for any period that shall include the last day of the Term);

(d) the condemnation, confiscation, appropriation or seizure of, or requisition of title to the AfriStar Satellite or such Major System Component, or the use of the AfriStar Satellite or such Major System Component by or on the authority of any Governmental Entity or purported Governmental Entity, which in any such case shall have resulted in the loss of possession thereof by the Lessee for a period in excess of ninety (90) consecutive days (or for any period that shall include the last day of the Term);

(e) for any reason whatsoever (including, without limitation, any change in the orbital position of the AfriStar Satellite required by the Lessor) the remaining amount of propellant available on board the AfriStar Satellite to duly operate the AfriStar Satellite shall be less than the amount required to de-orbit the AfriStar Satellite; or

(f) any other event after the In-Service Date resulting in the AfriStar Satellite or such Major System Component being rendered, for any reason whatsoever, commercially unusable by the Lessee for a period of ninety (90) consecutive days, unless the Lessee shall at that time be diligently endeavoring to remedy the consequences of such event, in which case for a period of one hundred eighty (180) consecutive days.

The date of such Event of Loss shall be (i) in the case of an Event of Loss arising under clause (a), (b) or (e), the date of the event or occurrence giving rise thereto or, in the event the date of such event or occurrence is uncertain, the date on which the Lessee first became aware of, or reasonably should have first become aware of, such event or occurrence, and (ii) in the case of an Event of Loss arising under clause (c), (d) or (f), the last day of the periods specified therein.

"Fair Market Rental Value" shall mean an amount (determined pursuant to the Appraisal Procedure) equal to the annual rental for the AfriStar Facilities that would be obtained in an arm's-length transaction between an informed and willing lessee (other than a lessee currently in possession and other than a lessee that is an Affiliate of the Lessee or the Lessor) under no compulsion to lease and an informed and willing lessor under no compulsion to lease. Fair Market Rental Value shall be determined on the basis that (i) the rent during any Renewal Term will be paid annually in arrears and (ii) the AfriStar Facilities

have been maintained in all respects in accordance with the provisions of this Lease (whether or not all or any part thereof is in fact in such condition), but shall otherwise be determined on an as-is where-is basis.

"Fair Market Sales Value" shall mean an amount (determined pursuant to the Appraisal Procedure) equal to the value of the AfriStar Facilities that would be obtained in an arm's-length transaction between an informed and willing buyer (other than a buyer currently in possession and other than a buyer that is an Affiliate of the Lessee or the Lessor) under no compulsion to buy and an informed and willing seller under no compulsion to sell. Fair Market Sales Value shall be determined on the basis that (i) the amount of propellant on board the AfriStar Satellite is at least equal to the Residual Propellant Level and (ii) the AfriStar Facilities have been maintained in all respects in accordance with the provisions of this Lease (whether or not all or any part thereof is in fact in such condition), but shall otherwise be determined on an as-is where-is basis.

"FCC" shall mean the Federal Communications Commission, or any successor thereto.

"Final Acceptance" has the meaning ascribed thereto in the In-Orbit Delivery Contract.

"Governmental Entity" shall mean and include (a) the FCC; (b) any national government, or political subdivision thereof or local jurisdiction therein; (c) any board, commission, department, division, organ, instrumentality, court, or agency of any entity described in clause (b) above, however constituted; and (d) any association, organization, or institution of which any entity described in (b) or (c) above is a member or to whose jurisdiction any such entity is subject or in whose activities any such entity is a participant but only to the extent that any of the preceding have jurisdiction over the AfriStar Facilities or the Lessee.

"Indemnitee" shall mean the Lessor and its officers, directors, agents, employees, successors and assigns.

"In-Orbit Delivery Contract" is defined in the Preambles hereto.

"In-Service Date" shall mean the date of Final Acceptance of the AfriStar Satellite under the In-Orbit Delivery Contract.

"Interest Rate" shall mean the rate announced from time to time by Citibank N.A. as its base rate.

"IRS" shall mean the Internal Revenue Service or any successor thereto.

"Law" shall mean any applicable federal, state, local or other law or governmental requirement of any kind, domestic or foreign, and the rules, regulations and orders promulgated thereunder.

"Lease" shall mean this Lease and any and all amendments, revisions, supplements and modifications thereto.

"Lease Supplement" shall mean the lease supplement in substantially the form of Annex 1 hereto to be executed and delivered by the Lessor and the Lessee as of the In-Service Date or as of any date on which a replacement Major System Component becomes subject to this Agreement pursuant to Section 10.2 hereof.

"Lessee" shall mean AfriSpace, Inc., a Maryland corporation, and its successors and permitted assigns.

"Lessor" shall mean WorldSpace Satellite Company Ltd., a corporation formed under the laws of the British Virgin Islands, and its successors and permitted assigns.

"Lessor's Cost" shall mean, in relation to the AfriStar Satellite and each Major System Component, the amounts specified in the Lease Supplement that is executed and delivered on the In-Service Date or in a Lease Supplement relating to a replacement system component.

"Lessor's Liens" shall mean Liens arising as a result of (a) claims made against, by or through the Lessor or any Affiliate of the Lessor not related to the transactions contemplated by this Lease; (b) acts or omissions of the Lessor in contravention of this Lease; (c) Taxes imposed against the Lessor that are not required to be indemnified against by the Lessee pursuant to Article 9; or (d) claims against the Lessor arising out of the voluntary transfer by the Lessor of all or any part of its interests in the AfriStar Facilities or this Lease, other than a transfer pursuant to Article 10 or Article 17 hereof.

"Lien" shall mean any mortgage, pledge, lien, charge, encumbrance, hypothecation, lease, exercise of rights, security interest or claim or other type of preferential arrangement.

"Major System Component" shall mean each of the following:

- (a) the Telemetry Command and Ranging Station located in Bangalore, India;
- (b) the Telemetry Command and Ranging Station located in Mauritius;
- (c) the Communication System Monitoring Station located in Libreville, Gabon; and
- (d) the Regional Operations Center, located in Washington, D.C., U.S.A;

together with all equipment, parts and components (including buildings, real estate, equipment and facilities used for the regional operations center, tracking, telemetry and command of the AfriStar Satellite) relating to the AfriStar Satellite or the use, operation or control thereof, and all substitutes, replacements and renewals of any and all such items, in each case associated with the use and operation of each Major System Component. ~~Such~~ term shall also mean and include any system component that is replaced pursuant to Section 10.2 hereof following an Event of Loss with respect to any Major System Component.

"Person" shall mean any individual person, corporation, partnership, limited liability company, firm, joint stock company, joint venture, trust, estate, unincorporated organization, association, Governmental Entity or other entity.

"Proprietary Information" shall have the meaning set forth in Section 19.1.

"Renewal Term" shall mean each period for which the Lessee has renewed this Lease pursuant to Section 20.1 hereof.

"Rent" shall mean, collectively, Base Rent and Supplemental Rent.

"Residual Propellant Level" shall mean the amount of propellant on board the AfriStar Satellite on the In-Service Date (as set forth in the Lease Supplement executed and delivered on such date), as reduced by the number of kilograms of propellant used to accomplish maneuvers of the AfriStar Satellite (including routine station-keeping) during the Term that are required by the Lessor and not voluntarily sought by the Lessee.

"Special Termination Event" shall have the meaning ascribed thereto in Article 13.

"Stipulated Loss Value" as of any date during the Term shall mean, in relation to the AfriStar Satellite and each Major System Component, an amount equal to the product of the Lessor's Cost thereof multiplied by the percentage set forth in Exhibit A attached hereto opposite the applicable Casualty Payment Date specified therein.

"Supplemental Rent" shall mean any and all amounts, liabilities and obligations (other than Base Rent) that the Lessee assumes or agrees to pay hereunder, or under any document delivered pursuant hereto, to the Lessor, including without limitation (a) any payment of Stipulated Loss Value; (b) any payment of indemnity required by Article 9 and Article 12 hereof; (c) to the extent permitted by applicable Law, interest at the Interest Rate (all computations of interest under this Lease to be made on the basis of a three hundred sixty (360) day year for the actual number of days elapsed) calculated (i) on any installment of Base Rent (or any part thereof) not paid on the due date thereof for the period the same remains unpaid and (ii) on any Supplemental Rent not paid when due hereunder until the same is paid; or (d) adjustments made pursuant to Section 7.2 relating to decrease in propellant.

"System Agreement" is defined in the Preambles hereto.

"Taxes" shall mean any and all fees (including, without limitation, license, documentation and registration fees), taxes (including, without limitation, income, gross receipts, sales, rental, use, turnover, value added, property (tangible and intangible), excise and stamp taxes), licenses, levies, imposts, duties, recording charges or fees, charges, assessments or withholdings of any nature whatsoever, together with any and all assessments, penalties, fines, additions to tax and interest thereon.

"Term" shall have the meaning specified in Section 2.3 hereof.

"Termination Date" shall mean the date of expiration or termination of this Lease during or at the end of the Term or any Renewal Term.

"Uniform Commercial Code" shall mean the Uniform Commercial Code as from time to time in effect under the laws of the State of New York.

ARTICLE 2 LEASE

2.1. Lease. The Lessor hereby agrees to lease the AfriStar Facilities to the Lessee, and the Lessee hereby agrees to lease the AfriStar Facilities from the Lessor, upon the terms and subject to the conditions of this Lease. As of the In-Service Date and upon execution and delivery of the Lease Supplement relating to the AfriStar Facilities, the AfriStar Facilities shall be deemed for all purposes to have been delivered and leased by the Lessor to the Lessee hereunder, and examined and accepted by the Lessee hereunder for all purposes.

2.2. In-Service Date. The Lessor shall give the Lessee thirty days' written notice of the anticipated In-Service Date and shall promptly notify the Lessee in writing of any delay or postponement of such In-Service Date (such notice to specify the new anticipated In-Service Date). If the In-Service Date does not occur prior to December 31, 1999, the Lessee shall have the right to terminate this Lease by giving written notice to the Lessor.

2.3. Term of Lease. The term of this Lease shall commence on the In-Service Date and shall terminate on the twelfth anniversary of the In-Service Date or, if the Lease is renewed pursuant to Section 20.1 hereof, at the end of any Renewal Term; *provided, however,* that this Lease may be earlier terminated pursuant to the provisions hereof.

ARTICLE 3
RENT

3.1. Rent.

(a) Base Rent. The Lessee covenants and agrees to pay to the Lessor on each Base Rent Payment Date, the rent (the "Base Rent") for the quarterly period then ended an amount stated as a percentage of Lessor's Cost determined in accordance with the schedule contained in Exhibit B.

(b) Supplemental Rent. The Lessee covenants and agrees to pay to the Lessor any and all Supplemental Rent as the same becomes due.

3.2. Place and Method of Payment. All Rent and other amounts payable by the Lessee to the Lessor under this Lease shall be paid in immediately available funds in Dollars, at such account as is set forth in the Lease Supplement, or at such other location as the Lessor shall designate from time to time in writing.

3.3. Net Lease; No Setoff, Counterclaims, Etc.

(a) This Lease is a net lease and, notwithstanding any provision of this Lease to the contrary, the Lessee's obligation to pay all Rent as and when the same shall become due and payable in accordance with the terms of this Lease shall be absolute and unconditional and shall not be affected or reduced by any circumstances, including without limitation (i) any setoff, counterclaim, recoupment, defense or other right that the Lessee may have against the Lessor or any other Person, for any reason whatsoever; (ii) any defect in the title, condition, design, operation or fitness for use of, or any damage to or loss or destruction of, the AfriStar Facilities, or any interruption or cessation in the use or possession thereof by the Lessee for any reason whatsoever; (iii) any Liens with respect to the AfriStar Facilities; (iv) the invalidity or unenforceability or lack of due authorization or other infirmity of this Lease or any absence of right, power or authority of the Lessor or the Lessee to enter into this Lease; (v) any insolvency, bankruptcy, reorganization or similar proceedings by or against the Lessor or the Lessee; (vi) any other circumstance or happening of any nature whatsoever, whether similar or dissimilar to any of the foregoing; or (vii) any Taxes. It is the express intention of the Lessor and the Lessee that all Rent payable hereunder shall be payable in all events and under any circumstances of whatsoever nature, unless the obligation to pay the same shall be terminated pursuant to the express provisions of this Lease.

(b) Until such time as all Rent required to be paid under this Lease shall have been paid, the Lessee shall not have any right to terminate this Lease or to be released, relieved or discharged from its obligation to make, and shall not suspend or discontinue, any payment of Rent for any reason whatsoever. The Lessee hereby waives, to the extent permitted by Law, any and all rights that it may now have or that at any time hereafter may be conferred upon it, by Law or otherwise, to terminate this Lease or any obligation imposed

upon the Lessee hereunder, except to the extent this Lease or any such obligation shall be terminated pursuant to the express provisions of this Lease.

(c) If for any reason whatsoever this Lease shall be terminated other than in accordance with the express provisions hereof, in whole or in part by operation of Law or otherwise, the Lessee nonetheless agrees, to the extent permitted by Law, to pay to the Lessor an amount equal to each Rent payment at the time and in the manner such payment would have become due and payable in accordance with the terms hereof had this Lease not been terminated in whole or in part. Each payment of Rent shall be final, and the Lessee agrees not to seek to recover all or any part of any such payment from the Lessor for any reason under or any circumstance whatsoever; *provided, however*, that nothing contained in this Section 3.4 (c) shall prevent the Lessee from bringing an action for damages suffered by the Lessee as a result of the breach of any Person of any obligation of such Person expressly stated in this Lease or for equitable relief to obtain compliance with any such obligation.

ARTICLE 4 REPRESENTATIONS AND WARRANTIES

4.1. Disclaimer of Warranties.

(a) SUBJECT TO SECTION 4.2, AS BETWEEN THE LESSOR AND THE LESSEE, DELIVERY OF THE AFRISTAR FACILITIES PURSUANT TO ARTICLE 2 HEREOF SHALL BE CONCLUSIVE PROOF OF ACCEPTANCE BY THE LESSEE OF SUCH AFRISTAR FACILITIES AS BEING IN COMPLIANCE WITH ALL REQUIREMENTS OF THIS LEASE, AND THE LESSOR LEASES AND THE LESSEE TAKES THE AFRISTAR FACILITIES AND EACH PART THEREOF "AS IS," AND THE LESSEE ACKNOWLEDGES THAT NEITHER THE LESSOR NOR ANY OTHER PERSON HAS MADE NOR SHALL BE DEEMED TO HAVE MADE, AND THE LESSOR HEREBY SPECIFICALLY DISCLAIMS, ANY REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, AS TO THE TITLE, VALUE, COMPLIANCE WITH SPECIFICATIONS, CONDITION, MERCHANTABILITY, DESIGN, QUALITY, DURABILITY, OPERATION, OR FITNESS FOR USE FOR A PARTICULAR PURPOSE OF THE AFRISTAR FACILITIES OR ANY PART THEREOF, OR ANY OTHER REPRESENTATION OR WARRANTY WHATSOEVER, EXPRESS OR IMPLIED, WITH RESPECT TO THE AFRISTAR FACILITIES OR ANY PART THEREOF, IT BEING AGREED THAT ALL RISKS INCIDENT THERETO ARE TO BE BORNE BY THE LESSEE IN THE EVENT OF ANY DEFECT OR DEFICIENCY IN THE AFRISTAR FACILITIES OR ANY PART THEREOF, OF ANY NATURE, WHETHER PATENT OR LATENT, AND THAT THE LESSOR SHALL HAVE NO RESPONSIBILITY OR LIABILITY WITH RESPECT THERETO, except that the Lessor hereby represents, warrants and covenants that on delivery of the AfriStar Facilities pursuant to Article 2, the AfriStar Facilities shall be free of Lessor Liens.

(b) EXCEPT AS EXPRESSLY PROVIDED HEREIN, THE LESSOR SHALL NOT HAVE ANY RESPONSIBILITY OR LIABILITY TO THE LESSEE OR ANY OTHER PERSON, WHETHER ARISING IN CONTRACT OR TORT OR OUT OF ANY NEGLIGENCE OR STRICT LIABILITY OF THE LESSOR OR OTHERWISE, FOR (i) ANY LIABILITY, LOSS OR DAMAGE CAUSED OR ALLEGED TO BE CAUSED DIRECTLY OR INDIRECTLY BY THE AFRISTAR FACILITIES OR BY ANY INADEQUACY THEREOF OR DEFICIENCY OR DEFECT THEREIN OR BY ANY OTHER CIRCUMSTANCES IN CONNECTION THEREWITH; (ii) THE USE, OPERATION OR PERFORMANCE OF THE AFRISTAR FACILITIES OR ANY RISKS RELATING THERETO; (iii) ANY INTERRUPTION OF SERVICE, LOSS OF BUSINESS OR ANTICIPATED PROFITS OR CONSEQUENTIAL DAMAGES; OR (iv) THE DELIVERY, OPERATION, SERVICING, MAINTENANCE, REPAIR, IMPROVEMENT OR REPLACEMENT OF THE AFRISTAR FACILITIES.

(c) Notwithstanding anything to the contrary which may be contained here, in the event that there exist on the In-Service date any operational defects in the AfriStar Satellite that may affect its useful life or serviceability, the terms and conditions of this Lease shall be amended in a manner mutually agreeable to the parties and such amended terms and conditions (which may include adjustments to Base Rent and the Term) shall be included in the Lease Supplement that is executed and delivered on the In-Service Date. In the event the parties cannot reach agreement on such amended terms and conditions, this Lease shall terminate and be of no further force and effect.

(d) The provisions of this Article 4 have been negotiated and the foregoing provisions are intended to be a complete exclusion and negation of any other warranties by the Lessor, express or implied, with respect to the AfriStar Facilities or any part thereof, whether arising pursuant to the Uniform Commercial Code or any other Law now or hereafter in effect. The Lessor shall not at any time be required to inspect the AfriStar Facilities or any component part thereof after delivery, nor shall any inspection by the Lessor or any Person be deemed to affect or modify the provisions of this Article 4.

4.2. Lessor to Exercise Certain Rights. So long as no Event of Default has occurred and is continuing, the Lessor agrees to exercise, at the Lessee's expense, for the exclusive benefit of the Lessee such rights as the Lessor may have under (a) any warranty, express or implied, with respect to the AfriStar Facilities or (b) the Alcatel Agreements or any other agreement to which the Lessor is a party to the extent that the same relate to the use, maintenance, control and operation of any of the AfriStar Facilities; *provided, however*, that upon an Event of Default and termination of this Lease all such rights shall be exercisable by the Lessor to the exclusion of the Lessee. So long as no Event of Default has occurred and is continuing, the Lessor agrees that it will not enter into any amendment, waiver, modification or supplement to the Alcatel Agreements or any other agreement relating to the use, maintenance, control and operation of any of the AfriStar Facilities (x) unless the Lessor has given the Lessee written notice at least five Business Days prior thereto of any such amendment, waiver, modification or supplement and (y) if such amendment, waiver,

modification or supplement could reasonably in the sole opinion of the Lessee materially adversely affect the rights of the Lessee hereunder, the Lessee has given its prior written consent thereto in writing. None of the provisions of this Article 4 or any other provision of this Lease shall be deemed to amend, modify or otherwise affect the representations, warranties or other obligations (express or implied), if any, of Alcatel or any other Person with respect to the AfriStar Facilities or any parts, components or accessories thereof, or to release Alcatel or any other Person from any such representation, warranty or obligation.

ARTICLE 5 LIENS; QUIET ENJOYMENT

5.1. Prohibition of Liens. The Lessee shall not directly or indirectly create, incur, assume or suffer to exist any Lien on or with respect to this Lease, the AfriStar Facilities, or title thereto or any interest therein, except (a) the respective rights of the Lessor and the Lessee as herein provided; (b) Lessor's Liens; (c) the Channel Service Agreement; (d) Liens for Taxes either not yet due or being contested in accordance with Article 9 hereof and so long as adequate reserves are maintained with respect to such Lien; (e) Liens of materialmen, mechanics, workmen, repairmen, employees, suppliers or other like Liens arising in the ordinary course of business, which either are not delinquent or are being contested in good faith by the Lessee, so long as the AfriStar Facilities are not in danger of being lost, sold, confiscated, forfeited or seized as a result of such Lien; (f) the rights of others under agreements or arrangements to the extent expressly permitted hereunder; (g) Liens (other than Liens for Taxes) arising out of judgments or awards against the Lessee with respect to which at the time an appeal or proceeding for review is being prosecuted in good faith and with respect to which there shall have been secured a stay of execution pending such appeal or proceeding for review; and (h) any other Lien with respect to which a bond or other security, in an amount and under terms satisfactory to the Lessor, shall have been provided. The Lessee shall promptly, at its own expense, take such action as may be necessary to duly discharge any Lien (except for the Liens referred to in Clauses (a), (b) and (c) of this Section 5.1) if the same shall arise at any time with respect to the AfriStar Facilities. The Lessee's obligations under this Article 5 with respect to any Lien on the AfriStar Facilities resulting from a claim arising prior to the termination of this Lease (except for the Liens referred to in clauses (a), (b) or (c) of this Section 5.1) shall survive such termination. The Lessee shall not assign or convey any of its rights, title and interest in and to the AfriStar Facilities to any Person and shall not directly or indirectly create, incur, assume or suffer to exist any Lien on or with respect to the AfriStar Facilities, or title thereto, or any interest therein, other than the Liens referred to in this Section 5.1.

5.2. Quiet Enjoyment. So long as no Event of Default shall have occurred and be continuing, as between the Lessor and the Lessee, the Lessee shall have the exclusive rights to possession and control of the AfriStar Facilities and the Lessor shall not take any action that interferes with the peaceful and quiet enjoyment of the use or nonuse (subject at all times to compliance with Section 6.1 hereof) of the AfriStar Facilities by the Lessee; *provided, however*, that nothing contained in this Section 5.2 shall prevent the Lessor from bringing an

6.5. Compliance With Law. Consistent with its regulatory obligations, the Lessee shall have and maintain all permits, licenses and approvals required by the FCC and Law to operate the AfriStar Facilities and shall satisfy the applicable requirements of the FCC and other Law with respect to the AfriStar Facilities and the Lessee. The Lessor and the Lessee hereby acknowledge and agree that the Lessee shall have full control over the AfriStar Facilities under this Lease, including all day-to-day operational control and management of the AfriStar Facilities and shall be fully and exclusively responsible for the AfriStar Facilities, the business and the regulatory licenses required to operate the AfriStar Facilities. To the extent permissible, the Lessee shall prepare and file in timely fashion, or, where the Lessor shall be required to file, prepare and deliver to the Lessor, within a reasonable time prior to the date for filing, any reports with respect to the AfriStar Facilities during any period included in the Term that are required to be filed with any Governmental Entity. The Lessor shall notify the Lessee promptly after the Lessor shall have actual knowledge of any reports or filings required of the Lessor by Law in connection with its ownership of the AfriStar Facilities; *provided, however*, that the Lessor shall not incur any liability to the Lessee for failure to so notify the Lessee. The Lessor hereby appoints the Lessee its attorney-in-fact to execute such reports and the Lessor shall cooperate in furnishing the Lessee such information as is available to it that must be included in such reports. Upon demand, the Lessee shall reimburse the Lessor for any reasonable out-of-pocket costs incurred by the Lessor in connection with the preparation and filing of reports. Promptly after filing, the Lessee shall furnish the Lessor a copy of all reports filed by the Lessee on behalf of the Lessor pursuant to this Section 6.5.

ARTICLE 7 LOCATION, PROPELLANT ADJUSTMENT AND PROCEDURES

7.1. Location of AfriStar Satellite. The AfriStar Satellite is to be placed at the 21 degrees East longitude geostationary orbital location. The Lessee shall not during the Term move the AfriStar Satellite to a new assigned orbital position, except that the Lessee may move the AfriStar Satellite to a new assigned position if necessary to comply with an order of the FCC.

7.2. Propellant Adjustment. If at the Termination Date the amount of propellant aboard the AfriStar Satellite is less than the Residual Propellant Level, then the Lessee shall compensate the Lessor for the decrease, if any, in the Fair Sales Market Value of the AfriStar Satellite as of the Termination Date attributable solely to such deficiency.

7.3. Procedures. Any determination pursuant to Section 7.2 above shall be made as promptly as possible in accordance with the Appraisal Procedure after the end of the Term. Any amount payable by the Lessee as the result of such determination shall bear interest at the Interest Rate from the last day of the Term until the date of actual payment and shall be paid by the Lessee within five (5) Business Days of the receipt of the determination pursuant to the Appraisal Procedure, and the obligation to make such payment shall continue notwithstanding the earlier termination of this Lease.

**ARTICLE 8
INFORMATION; INSPECTION**

8.1. Certain Events. During the Term, the Lessee agrees to furnish the Lessor notice in writing of any proceeding by or against the Lessee the adverse determination of which would materially and adversely affect the Lessee's ability to perform under this Lease and any other matter that materially and adversely affects the Lessee's ability to perform under this Lease.

8.2. Operational Reports. From time to time, the Lessee shall provide the Lessor with written reports setting forth such information concerning the AfriStar Facilities as the Lessor may reasonably request, including without limitation information concerning the location, condition, use and operation of the AfriStar Facilities.

8.3. Inspection. The Lessor shall have the right, at its own expense upon reasonable prior notice to the Lessee during normal business hours accompanied by an employee or agent of the Lessee, to examine (a) the AfriStar Facilities; (b) all test results and data relating to the AfriStar Facilities; and (c) the books and records of the Lessee relating to the maintenance and operation of the AfriStar Facilities, and to make copies and extracts therefrom, and to discuss such matters with Lessee's officers. The Lessor shall also have the right to obtain information regarding the condition and state of repair of the AfriStar Facilities, compliance by the Lessee with Article 11 hereof, and the absence of any Event of Default. The Lessor shall not have a duty to make any inspection or inquiry and shall not incur any liability or obligation by reason of making, or not making, any such inquiry.

**ARTICLE 9
GENERAL TAX INDEMNITY**

9.1. Tax Indemnity. The Lessee agrees that all payments by the Lessee in connection with the transactions contemplated by this Lease shall be free of all withholdings or deductions of any nature whatsoever (including without limitation withholding taxes, monetary transfer fees and similar taxes and charges), and in the event any withholding or deduction is required, the Lessee shall (i) within the time prescribed therefor by applicable Law, file such returns and reports with, and pay such amounts to, the appropriate Governmental Entity as may be required with respect to such payments (including any additional amounts payable under clause (ii) hereof) and (ii) pay to the relevant Indemnitee such additional amount as may be required in order that the net amount received by such Indemnitee is the same as the amount that would have been received, absent such deduction or withholding. In addition, the Lessee agrees for the benefit of each Indemnitee to pay and, on written demand, to indemnify and hold each Indemnitee harmless from, all license and registration fees, duties, imposts, deductions, charges and, without limiting the generality of the foregoing, all Taxes, howsoever levied or imposed, whether levied or imposed upon or asserted against any Indemnitee, the Lessee, this Lease, the AfriStar Facilities, or any part thereof or interest therein, or otherwise by any federal, state or local government, or

instrumentality thereof, or by any foreign government or any taxing authority or governmental subdivision or instrumentality of any other country or of a territory or possession of the United States of America or by any international taxing authority, upon or with respect to, based upon or measured by:

- (a) the AfriStar Facilities, or any part thereof, or interest therein:
- (b) the exportation, importation, ownership, delivery, nondelivery, warehousing, removal, leasing, exchange, acceptance, assigning, possession, repossession, condition, recording, use, operation, settlement of any insurance claim, sale, mortgaging, pledging, financing, subleasing, rental, retirement, chartering, imposition of any Lien, abandonment, registration, preparation, installation, modification, repair, maintenance, replacement, transportation, warehousing, storage, transfer of title, return or other disposition of the AfriStar Facilities or any part thereof or interest therein;
- (c) the rentals, receipts or earnings arising from any one or more of the items or acts described in clause (a) or (b) above (including without limitation the Rent);
- (d) upon or with respect to this Lease or any rentals or other payments required to be made hereunder; or
- (e) otherwise with respect to or in connection with the transactions contemplated by this Lease.

9.2. Exclusions. Notwithstanding the foregoing, there shall be excluded from the indemnity provided in Section 9.1 hereof the following:

- (a) Taxes that are United States withholding taxes and Taxes upon or with respect to the net income of any Indemnitee and any franchise, capital, "doing business" or similar Taxes imposed on such Indemnitee (other than any such Taxes that are or are in the nature of sales, rental, use, value-added, license or property taxes) that are imposed by any Governmental Entity or taxing authority thereof in any jurisdiction in which such Indemnitee (or any Affiliate of such Indemnitee) is subject to tax as a result of transactions or activities other than the transactions or activities contemplated by this Lease;
- (b) Taxes imposed as a result of (i) a sale, transfer, assignment, or other disposition by an Indemnitee of the AfriStar Facilities or part thereof or interest therein or any interest in the Rent or part thereof or any interest in this Lease or any part thereof, unless such sale, transfer, assignment or other disposition occurs by reason of the exercise of such Indemnitee's remedies under this Lease upon an Event of Default, or (ii) to the extent such Taxes exceed the Taxes that would have been payable had there not been such a sale, transfer, assignment, or other disposition; and

(c) Taxes relating to the AfriStar Facilities or any part thereof, or interest therein, for any taxable period or portion thereof, relating to events occurring prior to the In-Service Date or after the expiration of the Term of this Lease and the redelivery of the AfriStar Facilities in accordance with this Lease, except to the extent that any such Taxes are imposed in connection with remedies exercised by Lessor following an Event of Default.

9.3. After Tax Basis of Payments. The Lessee further agrees that, with respect to any payment or indemnity under this Article 9 and under Article 12 hereof, such payment or indemnity shall include the amount necessary to hold the recipient of the payment or indemnity harmless on an after-Tax basis from all Taxes required to be paid or credited by such recipient with respect to such payment or indemnity under the laws of any Federal, state or local government or taxing authority in the United States of America, or under the laws of any foreign government or any taxing authority or governmental subdivision of a foreign country or possession or territory of the United States, after taking into account any savings or reduction in Taxes available by any credit, deduction or otherwise in the taxable period of the relevant Indemnitee in which such payment or indemnity is made or in the succeeding taxable period of such Indemnitee.

In the event that an Indemnitee actually realizes a Tax benefit (whether by way of a credit, deduction or otherwise) in respect of any Taxes or other amounts for which the Lessee has made any payments to or on behalf of such Indemnitee hereunder or under Article 12 hereof, such Indemnitee shall, promptly upon the realization of such Tax benefit, pay to the Lessee the amount of such Tax benefit (after giving credit to the Lessee for any further Tax savings realized by such Indemnitee by reason of deductions, credits, allocations or allowances in respect of the payment of any such Tax benefit). All determinations as to the amount and timing of the receipt or realization of any Tax benefit shall be made by the relevant Indemnitee in its sole good faith discretion, it being understood and agreed that (x) the Lessee shall have no right to inspect or examine any Tax returns of such Indemnitee or any records or documents relating thereto and (y) such Indemnitee shall have no obligation to disclose to the Lessee or any other person the basis of calculation of any such Tax benefit. Any Taxes that are imposed on a Indemnitee as a result of a disallowance or reduction (including through the expiration of any Tax credit carryovers of such Indemnitee that would not otherwise have expired) of any benefit as to which such Indemnitee has made a payment to the Lessee hereunder shall be treated as a Tax for which the Lessee is obligated to indemnify such Indemnitee on demand without any exclusions or defenses. Notwithstanding the foregoing, no payment shall be required to be made to the Lessee at any time while an Event of Default shall have occurred and be continuing unremedied or prior to the time when the Lessee shall have made all payments and indemnities theretofore required and then due and payable to such Indemnitee under this Lease.

9.4. Payments; Tax Contests

(a) The Lessee shall pay all Taxes for which it assumes liability hereunder within ten (10) days after receipt of a written demand therefor from such Indemnitee;

provided, however, that, except as provided herein, such amounts shall not be payable in the case of Taxes that are being contested prior to the final determination of such contest.

(b) In the event an Indemnitee makes a payment with respect to any such Taxes, the Lessee shall pay to the Indemnitee interest on the amount of such payment at the Interest Rate from the date of such Indemnitee's payment to the relevant taxing authority to the date of such payment by the Lessee to the Indemnitee hereunder.

(c) If a written claim is made against any Indemnitee for any Taxes for which the Lessee may have an indemnity obligation hereunder, such Indemnitee shall notify the Lessee thereof as promptly as practicable after receipt of such claim; *provided, however*, that the failure to provide such notice shall not affect the Lessee's obligations hereunder to any Indemnitee except to the extent that the Lessee's ability to contest such claim or cause it to be contested as provided herein is adversely affected. So long as (i) a contest of such Taxes does not involve any danger of the sale, forfeiture or loss of the AfriStar Facilities or any part thereof or interest therein, (ii) Lessee has provided the relevant Indemnitee with an opinion of independent tax counsel acceptable to such Indemnitee that a reasonable basis exists for contesting such claim and (iii) Lessee has made adequate reserves for such Taxes or, if required by the relevant Indemnitee, an adequate bond has been posted by Lessee, then the Indemnitee at Lessee's written request will in good faith, with due diligence and at Lessee's sole cost and expense, contest (or, if permitted by law, permit Lessee to contest in the Lessee's name or in the name of the Indemnitee) the validity, applicability or amount of such Taxes. If such contest is to be initiated by the payment of, and the claiming of a refund for, any Taxes, Lessee shall advance to the relevant Indemnitee sufficient funds (on an interest-free basis) to make such payments and shall have agreed to indemnify such Indemnitee for any tax consequences resulting from such advance of funds. Although the relevant Indemnitee may consult in good faith with Lessee concerning the conduct of any contest, such Indemnitee shall control the conduct of all proceedings relating to any such contest which is brought by or on behalf of such Indemnitee. Any contest initiated hereunder may be settled or discontinued at any time provided that the relevant Indemnitee shall have waived any right to indemnification for the Taxes being contested. If an Indemnitee shall obtain a refund of any Taxes for which the Lessee shall have made an advance hereunder, such Indemnitee shall promptly pay to the Lessee the amount of such refund, together with any interest received on such refund; *provided, however*, that no payment shall be required to be made to the Lessee at any time while an Event of Default shall have occurred and be continuing unremedied or prior to the time when the Lessee shall have made all payments and indemnities theretofore required and then due and payable to such Indemnitee under this Lease.

9.5. Reports. In case any report or return is required to be made with respect to any Taxes that are an obligation of the Lessee under this Article 9, Lessee will either make such report or return in such manner as will show the ownership of the AfriStar Facilities in the Lessor and send a copy of such report or return to the Lessor or will notify the Lessor of such requirement and if lawfully able to do so, will make such report or return in such

manner as shall be reasonably satisfactory to the Lessor. As soon as practicable after the beginning of each calendar year (but in no event later than February 28 of such year), the Lessee shall provide the Lessor with any information that the Lessor shall reasonably request in writing (by January 31 of such year) and the Lessee can reasonably compile, to enable the Lessor to allocate accurately for foreign, state and local tax purposes its rental income for the preceding calendar year.

9.6. Survival. All of the obligations of the Lessee under this Article 9 with respect to the AfriStar Facilities or any part thereof shall survive the assignment, expiration or other termination of this Lease. Such obligations are expressly undertaken by the Lessee for the benefit of, and shall be enforceable by the Lessor and each other Indemnitee. The Lessee's obligations under this Article 9 shall not be affected by any circumstances, including without limitation any setoff, counterclaim, recoupment, defense or other right that the Lessee may have against the Lessor or any other person for any reason whatsoever. The Lessee will pay to an Indemnitee, on demand, to the extent permitted by applicable law, interest at the Interest Rate hereto on any amount not paid when due pursuant to this Article 9 until the same shall be paid. All indemnities, obligations, adjustments and payments provided for in this Article 9 shall survive, and remain in full force and effect, notwithstanding the expiration or other termination of this Lease. The obligations of the Lessee in respect of all such indemnities, obligations, adjustments and payments are expressly made for the benefit of, and shall be enforceable by, an Indemnitee, without declaring this Lease to be in default or taking other action thereunder, and notwithstanding any provision to the contrary contained herein.

ARTICLE 10 LOSS, DESTRUCTION, CONDEMNATION OR DAMAGE

10.1. Event of Loss with Respect to the AfriStar Satellite. Upon the occurrence of an Event of Loss with respect to the AfriStar Satellite during the Term hereof, the Lessee shall forthwith (and, in any event, within five (5) Business Days of such occurrence) give the Lessor notice of such Event of Loss and shall pay to the Lessor not less than sixty (60) days following such Event of Loss an amount equal to the sum of (a) the Stipulated Loss Value for the AfriStar Satellite calculated as of the Casualty Payment Date next following the date of such Event of Loss and (b) an amount equal to the Base Rent Payment due on such date multiplied by a fraction the numerator of which is the number of days that have elapsed since the last Casualty Payment Date and the denominator of which is the number of days from (and including) such last Casualty Payment Date to (but not including) the Casualty Payment Date next following the Event of Loss.

Upon the payment of such Stipulated Loss Value and Basic Rent, (a) the obligation of the Lessee to pay Basic Rent hereunder on any Basic Rent Payment Date occurring on or subsequent to the date of such payment shall terminate, (b) the Term shall end, and (c) the Lessor shall without recourse or warranty (except as to Lessor's Liens) be deemed to have transferred to the Lessee all of the Lessor's right, title and interest in and to the AfriStar Satellite, all in as-is where-is condition, and shall, at the Lessee's expense, execute and

deliver such bills of sale and other documents and instruments as Lessee shall reasonably request to evidence (on the public record or otherwise) such transfer and the vesting of all right, title and interest in and to the AfriStar Satellite in the Lessee, all in as-is where-is condition free and clear of all right, title and interest of the Lessor, or any Affiliate thereof, and Lessor's Liens.

10.2. Event of Loss with Respect to Major System Components. Upon the occurrence of an Event of Loss with respect to any Major System Component during the Term hereof, the Lessee shall forthwith (and, in any event, within five (5) Business Days of such occurrence) give the Lessor notice of such Event of Loss. As promptly as practicable but not more than ninety (90) days following the occurrence of such Event of Loss, the Lessor shall acquire and lease to the Lessee hereunder, a replacement system component (which need not be a new system component), such replacement system component to be free and clear of all Lessor's Liens and to have an operational capability at least equal to, and to be in as good operating condition as, the Major System Component so replaced (assuming such Major System Component was in the condition and repair required by the terms of this Lease) and the parties shall execute and deliver a Lease Supplement relating to such replacement system component at the time it is delivered to the Lessee hereunder, which Lease Supplement shall set forth, among other things, the Lessor's Cost of such replacement system component. During the period between the occurrence of the Event of Loss and the date of the replacement of the Major System Component pursuant to this Section 10.2, the obligation of Lessee to pay Base Rent pursuant to Article 3 shall continue unchanged, except that upon such replacement, it shall become an obligation to pay such Rent in respect of such replacement system component. For all purposes hereof, upon delivery of such replacement system component to the Lessee and the execution and delivery of a Lease Supplement relating thereto, such replacement system component shall be leased hereunder, the replacement system component shall be a "Major System Component" as defined herein with respect to the AfriStar Facilities to the same extent as the Major System Component replaced thereby.

10.3. Application of Proceeds and Payments Following an Event of Loss. Subject to the provisions of Section 10.5, any payments received at any time by the Lessor or by the Lessee with respect to the AfriStar Facilities (including insurance proceeds from insurance carried by the Lessee and payments received from any Governmental Entity or other Person as a result of the occurrence of an Event of Loss) shall be applied as follows:

(a) so much of such payments as shall not exceed all amounts, if any, required to be paid by the Lessee pursuant to Section 10.1 shall be applied in reduction of the Lessee's obligation to pay such amounts if not already paid by the Lessee, or, if already paid by the Lessee, shall be applied to reimburse the Lessee for its payment of such amounts; and

(b) the balance, if any, of such payments remaining thereafter, if they are from insurance carried by the Lessee, shall be paid to the Lessee or, if they are from any

other Person or source, shall be divided between the Lessor and the Lessee as their interests may appear.

10.4. Application of Proceeds Not Relating to an Event of Loss. In the event of the requisition for use by a Governmental Entity of any portion of the AfriStar Facilities that does not result in an Event of Loss, the Lessee shall promptly notify the Lessor thereof and all obligations of the Lessee under this Lease shall continue to the same extent as if such requisition had not occurred and, subject to Section 10.5, shall be paid to the Lessee. Subject to Section 10.5 and for so long as no Event of Default shall have occurred and be continuing, payments received at any time by the Lessor or the Lessee from any insurer under insurance carried by the Lessee or paid by any Governmental Entity or other Person with respect to any loss, condemnation, confiscation, theft or seizure of, or use of, or damage to, the AfriStar Facilities or any part thereof that does not constitute an Event of Loss shall be applied in reduction of the Lessee's obligation to repair any damage to the AfriStar Facilities resulting from such event or circumstance if not already paid by the Lessee or, if already paid by the Lessee, shall be paid to the Lessee, and any excess remaining shall be paid to or retained by the Lessor or the Lessee, as their interests may appear.

10.5. Application During Default. Any amount that shall be payable to the Lessee pursuant to this Lease arising out of any insurance, warranty, award by a Governmental Entity or otherwise, shall not be paid to the Lessee or, if it shall have been previously paid to the Lessee, shall not be retained by the Lessee but shall be paid to the Lessor, if at the time of such payment any Default or Event of Default shall have occurred and be continuing. In such event, all such amounts shall be paid to and held by the Lessor and shall be paid over to the Lessee when such Default or Event of Default shall cease to be continuing, except that if the Lessor shall have theretofore declared this Lease to be in default pursuant to Article 16 hereof, such amounts shall be retained by the Lessor and disposed of in accordance with the provisions thereof.

ARTICLE 11 INSURANCE

11.1. Satellite Life Insurance. The Lessee shall obtain as soon as available, but in no event later than the In-Service Date, and shall thereafter maintain for the Term of this Lease, satellite life insurance on terms consistent with good industry practice reasonably satisfactory to the Lessor, and through Approved Insurers, covering the AfriStar Satellite in an amount not less than the Stipulated Loss Value thereof as of the next succeeding Casualty Payment Date.

11.2. Public Liability and Property Damage Insurance. The Lessee shall not be required to maintain general liability insurance with respect to the AfriStar Facilities; *provided, however,* that if during the Term of this lease liability insurance becomes available and (a) is customarily maintained by owners of satellites and (b) is obtainable at rates that are reasonably acceptable to the Lessee, the Lessee will at its own cost and expense maintain or

cause to be maintained such liability insurance with respect to the AfriStar Facilities in an amount customarily maintained by owners of satellites.

11.3. Additional Insureds. All insurance policies carried in accordance with this Article 11 and all policies taken out in substitution or replacement for any such policies shall:

(a) name the Lessor as an additional insured (but without imposing upon the Lessor any obligation imposed upon the insured, including, without limitation, the liability to pay the premium for such policies);

(b) provide that any loss shall be payable to the Lessor;

(c) provide that the insurance shall not be invalidated by any action, inaction or neglect by the Lessee or any other Person (other than any action, inaction or neglect by the Lessor), and shall insure the Lessor regardless of (i) any breach or violation of any warranty, declaration or condition by the Lessee that is contained in such policy, (ii) any foreclosure or other proceeding or notice of sale relating to the AfriStar Facilities, or (iii) any change in title to or ownership of the AfriStar Facilities;

(d) provide that, as against the Lessor, the insurers shall waive any rights or subrogation (except for claims arising out of willful misconduct or gross negligence of the Lessor);

(e) provide that, if such insurance is allowed to lapse for non-payment of premium or any other reason, or such insurance is cancelled, terminated or changed, such cancellation, termination or change shall not be effective as to Lessor unless and until at least thirty (30) days' written notice shall have been given to the Lessor;

(f) provide that such insurance shall be primary without right of contribution from any excess insurance carried by the Lessor; and

(g) permit the Lessor to make payments to effect the continuation of such insurance coverage upon notice of cancellation due to non-payment of premium.

11.4. Other Insurance. The Lessee, at its own expense and for its exclusive benefit, may obtain and maintain insurance covering the AfriStar Facilities in excess of the amounts required hereunder ("Additional Insurance") and no such Additional Insurance or the proceeds thereof shall be deemed for any reason or purpose to be subject to this Lease; *provided, however,* that any such Additional Insurance shall provide excess coverage to the insurance being maintained by the Lessor in accordance with Section 11.1 and Section 11.2. Prior to obtaining any Additional Insurance, the Lessee shall provide the Lessor with reasonable notice of the Additional Insurance (including the proposed terms thereof) proposed to be obtained by it. Similarly, the Lessor shall have the right to carry Additional Insurance for its own benefit at its own expense, without, however, thereby limiting the Lessee's obligations

under this Article 11. The insurance payments for any loss covered by the Additional Insurance carried by the Lessee shall be paid to the Lessee, and the insurance payments for any loss covered by the Additional Insurance carried by the Lessor shall be paid to the Lessor. The Lessor agrees that any Additional Insurance maintained by the Lessor shall not contain any restrictions or prohibitions relating to operation or use of the AfriStar Facilities that are more burdensome than those restrictions or prohibitions, if any, contained in the insurance required to be maintained by the Lessee pursuant to this Article 11.

11.5. Certificates of Insurance. On or before the In-Service Date, and thereafter on each renewal by the lessee of the insurance required hereby, but not less often than annually, the Lessee will furnish to the Lessor one or more certificates each executed and delivered by one or more Approved Insurers, appointed by the Lessee, which together shall describe in reasonable detail the insurance carried on the AfriStar Facilities and shall certify that the insurance then maintained on the AfriStar Facilities complies with the terms of this Lease. The Lessee will cause each such Approved Insurer to agree to advise the Lessor in writing (a) promptly of any default in the payment of any premium and of any other act or omission on the part of the Lessee that might invalidate or render unenforceable, in whole or in part, any insurance required hereby, and (b) at least thirty (30) days prior to the non-renewal, termination or cancellation of any insurance required hereby of any such non-renewal, termination or cancellation of any such insurance by the underwriters for any reason. If the Lessee shall fail to maintain insurance as herein provided, the Lessor may, at its option (but without any obligation to do so) obtain such insurance and, in such event, the Lessee shall upon demand reimburse the Lessor, as Supplemental Rent, for the cost thereof without waiver of any other rights the Lessor may have.

ARTICLE 12 INDEMNIFICATION

12.1. Indemnification. The Lessee agrees to indemnify, reimburse, hold harmless and to defend each Indemnitee from and against any and all Claims that in any way may result from, pertain to or arise in any manner out of, or are in any manner related to (a) the AfriStar Facilities or this Lease, or the breach of any representation, warranty or covenant made by the Lessee hereunder; (b) the condition, ownership, manufacture, purchase, delivery, nondelivery, lease, acceptance, rejection, possession, return, disposition or use, or operation of the AfriStar Facilities either in the air or on the ground; (c) any defect in the AfriStar Facilities (whether or not discovered or discoverable by the Lessee or the Lessor) arising from the material or any articles used therein or from the design, testing, or use thereof or from any maintenance, service, repair, overhaul, or testing of the AfriStar Facilities, whether or not the AfriStar Facilities are in the possession of the Lessee, and regardless of where the AfriStar Facilities may then be located; or (d) any transaction, approval, or document contemplated by this Lease or given or entered into in connection herewith; *provided, however*, that the Lessee shall be subrogated to all rights and remedies that the Lessor may have against Alcatel or any other Person as to any such Claims, but only

to the extent that the Lessee satisfies its indemnification obligation to the Lessor hereunder with respect to such Claims.

12.2. Waiver of Claims. The Lessee hereby waives, and releases each Indemnitee from, any Claims (whether existing now or hereafter arising) for or on account of or arising or in any way connected with injury to or death of personnel of the Lessee or loss or damage to property of the Lessee or the loss of use of any property that may result from or arise in any manner out of or in relation to the ownership, leasing, condition, use or operation of the AfriStar Facilities, either in the air or on the ground, of which may be caused by any defect in the AfriStar Facilities from the material or any article used therein or from the design or testing thereof, or use thereof, or from any maintenance, service, repair, overhaul or testing of the AfriStar Facilities regardless of when such defect may be discovered, whether or not the AfriStar Facilities are at the time in the possession of the Lessee, and regardless of the location of the AfriStar Facilities at any such time.

12.3. Survival. All of the obligations of the Lessee under this Article 12 with respect to the AfriStar Facilities or any part thereof shall survive the assignment, expiration or other termination of this Lease. Such obligations are expressly undertaken by the Lessee for the benefit of, and shall be enforceable by the Lessor and each other Indemnitee. The Lessee's obligations under this Article 12 shall not be affected by any circumstances, including without limitation any setoff, counterclaim, recoupment, defense or other right that the Lessee may have against the Lessor or any other person for any reason whatsoever. The Lessee will pay to an Indemnitee, on demand, to the extent permitted by applicable law, interest at the Interest Rate hereto on any amount not paid when due pursuant to this Article 9 until the same shall be paid. All indemnities, obligations, adjustments and payments provided for in this Article 12 shall survive, and remain in full force and effect, notwithstanding the expiration or other termination of this Lease. The obligations of the Lessee in respect of all such indemnities, obligations, adjustments and payments are expressly made for the benefit of, and shall be enforceable by, an Indemnitee, without declaring this Lease to be in default or taking other action thereunder, and notwithstanding any provision to the contrary contained herein.

12.4. Exclusions. Notwithstanding the foregoing provisions of this Article 12, the Lessee shall not be obligated to make any payment by way of indemnity in respect of any Claims against an Indemnitee:

(a) that result from or arise out of the gross negligence or willful misconduct of such Indemnitee (other than gross negligence or willful misconduct of the Lessee or any Affiliate of the Lessee that is imputed to the Lessor);

(b) in respect to the AfriStar Facilities to the extent that the same are attributable to acts or events that occur after the AfriStar Facilities has been redelivered to the Lessor in accordance with Article 15 hereof and is no longer subject to this Lease unless any such act or event shall itself directly result from an act or omission of the Lessee that

occurred during the Term and except to the extent that any such Claims are imposed in connection with remedies exercised by Lessor following an Event of Default;

(c) any Claim that is a Tax whether or not such Tax is indemnified against pursuant to Article 9, the Lessee's responsibility for Taxes being dealt with exclusively in Article 9;

(d) any Claim to the extent such Claim relates to a cost, fee or expense that this Lease expressly states to be payable by a Person other than the Lessee; or

(e) any Claim that constitutes a Lien of the type the Lessee is not required to discharge pursuant to Article 5 hereof.

12.5. General.

(a) In the case of any Claim indemnified by the Lessee hereunder that is covered by a policy of insurance maintained by the Lessee, each Indemnitee agrees to cooperate, at the Lessee's expense, with the insurers in the exercise of their rights to investigate, defend or compromise such Claim as may be required to retain the benefits of such insurance with respect to such Claim.

(b) If any Indemnitee has actual knowledge of any Claim or other liability, hereby indemnified against with respect to it, it shall give prompt written notice thereof to the Lessee; *provided, however*, that (i) the failure of any Indemnitee to so notify the Lessee shall not release the Lessee from any of its obligations under this Article 12 (except to the extent that the Lessee is materially prejudiced in the exercise of its rights to contest such Claim as a result of such failure) and (ii) payment by the Lessee to an Indemnitee pursuant to this Article 12 shall not be deemed to constitute a waiver or release of any right or remedy (including any remedy of damages) the Lessee may have against such Indemnitee.

(c) Subject to the rights of insurers under policies of insurance maintained by the Lessee, the Lessee shall have the right to investigate, and the right in its sole discretion to defend or compromise, any Claim for which indemnification is sought under this Article 12 and Indemnitee shall cooperate, at the Lessee's expense, with all reasonable requests of the Lessee in connection therewith. Where the Lessee or the insurers under a policy of insurance maintained by the Lessee undertake the defense of an Indemnitee with respect to a Claim, no additional legal fees or expenses of such Indemnitee in connection with the defense of such Claim shall be indemnified hereunder unless such fees or expenses were incurred at the request of the Lessee or such insurers; *provided, however*, that if (i) in the written opinion of counsel to such Indemnitee an actual or potential material conflict of interest exists where it is advisable for such Indemnitee to be represented by separate counsel, or (ii) such Indemnitee has been indicted or otherwise charged in a criminal complaint in connection with a Claim not excluded by this Article 12 and such Indemnitee informs the Lessee that such Indemnitee desires to be represented by separate counsel, the reasonable fees

and expenses of such separate counsel shall be borne by the Lessee. Subject to the requirements of any policy of insurance, the Lessee will (upon reasonable request) consult in good faith with an Indemnitee, and an Indemnitee may participate or be present (but not participate) at its own expense in any judicial proceeding controlled by the Lessee pursuant to the preceding provision; *provided, however*, that such party participation (as opposed to presence) does not, in the opinion of the independent counsel appointed by the Lessee or its insurers to conduct such proceedings, interfere with such control and such participation or presence shall not constitute a waiver of the indemnification provided in this Article 12. Nothing shall require an Indemnitee to contest by itself or assume control of any proceeding.

(d) To the extent that a Claim indemnified by the Lessee under this Article 12 is in fact paid in full by the Lessee and/or an insurer under a policy of insurance maintained by the Lessee, the Lessee and/or such insurer, as the case may be, shall be subrogated to the rights and remedies of the Indemnitee on whose behalf such Claim was paid (other than rights of such Indemnitee under insurance policies maintained at its own expense) with respect to the transaction or event giving rise to such Claim.

ARTICLE 13 SPECIAL TERMINATION EVENTS

13.1. Status of FCC Proceedings. The Lessee applied in 1990 for an FCC license to construct, own and operate a private international satellite system and it currently holds an experimental FCC license that was issued in 1991 to organize its business, develop and test its technology, conduct market studies and tests of its satellites, and to launch and operate the AfriStar Satellite on an experimental basis. The experimental license, as amended and modified from time to time, currently is scheduled to expire on December 31, 1999 and the Lessee intends to file an application for a permanent FCC license that will allow the Lessee to operate a private international satellite system. This Lease is being entered into by the Lessor and the Lessee with the expectation that the Lessee's experimental license will not be revoked by the FCC and that such permanent license will be issued by the FCC to the Lessee and such non-revocation and issuance are of the essence of this Lease. The Lessee agrees to use reasonable best efforts to diligently process the foregoing license applications and the Lessor agrees to cooperate in good faith with the Lessee and to supply all information as may be in the possession of the Lessor and required in connection therewith.

13.2 Special Termination Events. In the event that (a) the Lessee's experimental license is not renewed by the FCC on or prior to its currently scheduled expiration date or (b) the FCC does not issue a permanent license to the Lessee allowing the Lessee to operate a private international satellite system on or before the expiration of a twelve (12) month period commencing on the In-Service Date (each, a "Special Termination Event"), this Lease shall terminate and be of no further force and effect from and after the date of expiration of the Lessee's experimental license or the first anniversary date of the In-Service Date, as the case may be. In the event of a termination of this Lease by reason of a Special Termination Event, the Lessee shall pay to the Lessor an amount equal to (x) the Base Rent Payment due

on the next Base Payment Date multiplied by a fraction the numerator of which is the number of days that have elapsed since the last Base Rent Payment Date and the denominator of which is the number of days from (and including) such last Base Rent Payment Date to (but not including) the Base Rent Payment Date next following the Special Termination Event, plus (y) all other amounts then due and payable hereunder, plus (z) as liquidated damages for loss of a bargain and not as a penalty, an amount equal to ten percent (10%) of the Stipulated Loss Value on the Base Rent Payment Date next following the Special Termination Event.

ARTICLE 14 PERFECTION OF TITLE AND FURTHER ASSURANCES

14.1. Perfection of Title. If at any time any filing or recording is reasonably necessary to protect the interest of the Lessor, the Lessee, at its own cost and expense and upon request by the Lessor, shall cause this Lease, any financing statements with respect hereto, and any and all additional instruments that shall be executed pursuant to the terms hereof, to be kept, filed and recorded and to be re-executed, related and re-recorded in the appropriate office or offices pursuant to Law, to perfect, protect and preserve the rights and interests of the Lessor hereunder and in the AfriStar Facilities. At the reasonable request of the Lessor, the Lessee shall furnish to the Lessor an opinion of counsel or other evidence satisfactory to the Lessor of each such filing or refiling and recordation or re-recordation.

14.2. Further Action by Lessee. The Lessee shall promptly and duly execute and deliver to the Lessor such documents and assurances and take such further action as the Lessor may from time to time reasonably request in order to carry out more effectively the intent and purpose of this Lease and to establish and protect the rights and remedies created or intended to be created in favor of the Lessor hereunder.

ARTICLE 15 REDELIVERY OF AFRISTAR FACILITIES

15.1. Redelivery. On the last day of the Term, whether at the Termination Date or at such other time as required under this Lease, the Lessee shall at the Lessee's cost and expense, redeliver the AfriStar Facilities then required to be redelivered to the Lessor, with the AfriStar Satellite then being in an orbital position then authorized by the FCC, such redelivery to be accomplished by executing and delivering to the Lessor an instrument in form and substance reasonably satisfactory to the Lessor evidencing surrender by the Lessee of all of the Lessee's rights to the AfriStar Facilities under this Lease. At the time of such redelivery (a) the AfriStar Facilities shall be free and clear of all Liens other than Lessor Liens and, except as may have otherwise been expressly agreed to in writing by Lessor, free and clear of any right of any person to use or have access to the AfriStar Facilities other than the Lessor, and (b) the AfriStar Facilities shall be in compliance with the terms of Article 6 and Article 7 hereof. If for any reason, the Lessee shall not have redelivered the AfriStar Facilities as required pursuant to the provisions of this Article 15 on the required day, the Lessee shall pay to the Lessor on demand additional Base Rent on a per diem basis for each

day after such day until Lessee is in full compliance with this Article 15, which Base Rent shall be in an amount per day equal to the daily rate of Base Rent applicable immediately prior to such day (computed on the basis of a 360-day year of twelve 30-day months), such compensation to be in addition to and not a substitute for such liability as the Lessee may have as a result of such failure to redeliver the AfriStar Facilities. Without limiting the generality of any of the other terms of this Lease, the Lessee shall be liable for any costs and expenses incurred by the Lessor as a result of the failure of the Lessee duly to perform and comply with any of the terms of this Article 15.

15.2. Assignment of Rights. The Lessor may assign its rights under this Article 15 in respect of the AfriStar Facilities and any rights it may have for the failure of the Lessee to maintain the AfriStar Facilities in accordance with the terms hereof to any Person who leases or purchases or agrees to lease or purchase the AfriStar Facilities from the Lessor. The Lessee agrees that during the last one hundred eighty (180) days of the Term, it will cooperate in all reasonable respects with efforts of the Lessor to lease or sell the AfriStar Facilities, including aiding potential lessees or purchasers by providing the records relating to the maintenance and performance of the AfriStar Facilities, as described in Article 8 hereof; *provided, however*, that the Lessee shall not be required for such purpose materially to interfere with the use of the AfriStar Facilities or to disclose confidential information unrelated to the AfriStar Facilities or their use or maintenance; and, *provided further*, that nothing contained herein shall require the Lessee to disclose any financial or competitive information relating to it.

ARTICLE 16 EVENTS OF DEFAULT

Any one or more of the following occurrences or events shall constitute an Event of Default (whether any such event shall be voluntary or involuntary or come about or be effected by operation of Law or pursuant to or in compliance with any judgment, decree or order of any court):

(a) The Lessee shall fail to make any payment of Rent (including Supplemental Rent or Stipulated Loss Value) to the Lessor when due and such failure shall continue for a period of five (5) Business Days;

(b) The Lessee shall fail to obtain and maintain any insurance required under the provisions of Article 11 hereof and such failure shall continue for a period of thirty (30) days after notice thereof has been given to the Lessee or the Lessee shall operate the AfriStar Satellite outside of the scope of the insurance coverage maintained with respect to the AfriStar Satellite or shall operate the AfriStar Facilities at any time when required insurance coverages are not in full force and effect;

day after such day until Lessee is in full compliance with this Article 15, which Base Rent shall be in an amount per day equal to the daily rate of Base Rent applicable immediately prior to such day (computed on the basis of a 360-day year of twelve 30-day months), such compensation to be in addition to and not a substitute for such liability as the Lessee may have as a result of such failure to redeliver the AfriStar Facilities. Without limiting the generality of any of the other terms of this Lease, the Lessee shall be liable for any costs and expenses incurred by the Lessor as a result of the failure of the Lessee duly to perform and comply with any of the terms of this Article 15.

15.2. Assignment of Rights. The Lessor may assign its rights under this Article 15 in respect of the AfriStar Facilities and any rights it may have for the failure of the Lessee to maintain the AfriStar Facilities in accordance with the terms hereof to any Person who leases or purchases or agrees to lease or purchase the AfriStar Facilities from the Lessor. The Lessee agrees that during the last one hundred eighty (180) days of the Term, it will cooperate in all reasonable respects with efforts of the Lessor to lease or sell the AfriStar Facilities, including aiding potential lessees or purchasers by providing the records relating to the maintenance and performance of the AfriStar Facilities, as described in Article 8 hereof; *provided, however*, that the Lessee shall not be required for such purpose materially to interfere with the use of the AfriStar Facilities or to disclose confidential information unrelated to the AfriStar Facilities or their use or maintenance; and, *provided further*, that nothing contained herein shall require the Lessee to disclose any financial or competitive information relating to it.

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(b) The Lessee shall fail to obtain and maintain any insurance required under the provisions of Article 11 hereof and such failure shall continue for a period of thirty (30) days after notice thereof has been given to the Lessee or the Lessee shall operate the AfriStar Satellite outside of the scope of the insurance coverage maintained with respect to the AfriStar Satellite or shall operate the AfriStar Facilities at any time when required insurance coverages are not in full force and effect;

(c) The Lessee shall fail to return the AfriStar Facilities to the Lessor on or prior to the Termination Date as herein provided in compliance with the provisions of Article 15;

(d) Any licenses, permits, franchises, rights or privileges required for the conduct of the business and operations of the Lessee's business or the use and operation of the AfriStar Facilities shall be revoked or otherwise terminated or the free and continued use and exercise thereof curtailed or prevented and as a result thereof the Lessee's ability to use the AfriStar Facilities in the manner contemplated herein is materially adversely affected;

(e) The Lessee shall fail to perform or observe, in any material respect, any other covenant, condition or agreement to be performed or observed by it hereunder and such failure shall continue unremedied for a period of thirty (30) days after the earlier of the actual knowledge thereof by an officer of the Lessee from any creditable source or receipt by the Lessee of written notice given by the Lessor to the Lessee;

(f) Any representation or warranty made by the Lessee herein or in any document or certificate furnished the Lessor in connection herewith or in any statement, report, schedule, notice or other writing furnished by the Lessee pursuant hereto is incorrect at the time given in any material respect and such incorrectness shall be material at the time in question;

(g) The Lessee consents to the appointment of a receiver, trustee or liquidator of itself or of a substantial part of its property, or the Lessee admits in writing its inability to pay its debts generally as they come due, or makes a general assignment for the benefit of creditors, or the Lessee files a voluntary petition in bankruptcy or a voluntary petition seeking reorganization in a proceeding under any bankruptcy laws (as now or hereafter in effect), or an answer admitting the material allegations of a petition filed against the Lessee in any such proceeding, or the Lessee by voluntary petition, answer or consent seeks relief under the provisions of any bankruptcy or other similar law providing for the reorganization or winding-up of corporations, or provides for an agreement, composition, extension or adjustment with its creditors;

(h) An order, judgment or decree is entered by any court, with or without the consent of the Lessee, appointing a receiver, trustee or liquidator for the Lessee or of all or any substantial part of its property, or all or any substantial part of the property of the Lessee is sequestered, and any such order, judgment or decree of appointment or sequestration remains in effect, undismissed, unstayed or unvacated for a period of sixty (60) consecutive days after the date of entry thereof;

(i) A petition against the Lessee in a proceeding under the bankruptcy, insolvency or similar Law (as now or hereafter in effect) of any Governmental Entity is filed and is not withdrawn or dismissed within sixty (60) consecutive days thereafter, or if, under the provisions of any Law providing for reorganization or winding-up of corporations that

may apply to the Lessee, any court of competent jurisdiction assumes jurisdiction over, or custody or control of, the Lessee or of all or any substantial part of its property and such jurisdiction, custody or control remains in effect, unrelinquished, unstayed or unterminated for a period of sixty (60) consecutive days;

(j) A final judgment for the payment of money not covered by insurance in excess of two hundred fifty thousand Dollars (\$250,000), or final judgments for the payment of money not covered by insurance in excess of five hundred thousand Dollars (\$500,000) in the aggregate, shall be rendered against the Lessee and the same shall remain undischarged for a period of forty-five (45) consecutive days during which execution thereof shall not be effectively stayed by agreement of the parties involved, stayed by court order or adequately bonded; or

(k) The Lessee shall default in the payment of any obligation for the payment of borrowed money, for the deferred purchase price of property or for the payment of rent or hire under any lease or agreement which has a principal amount of five hundred thousand Dollars (\$500,000) or more (determined in the case of borrowed money by the amount outstanding under the agreement pursuant to which such borrowed money was borrowed, in the case of a deferred purchase price by the remaining balance and in the case of a lease by the present discounted value of the remaining rent or hire payable thereunder) when the same becomes due if such nonpayment results in the right of such holder to accelerate such indebtedness or any lessor shall have become entitled to require the payment of any termination, stipulated loss, liquidated damages or similar amount or to demand repossession of such property; or the Lessee shall default in the performance of any other term, agreement or condition contained in any material agreement or instrument under or by which any such obligation is created, evidenced or secured, if the effect of such default is to cause or allow such obligation to become due prior to its stated maturity.

ARTICLE 17 REMEDIES

Upon the occurrence of any Event of Default and any time thereafter so long as the same shall be continuing, the Lessor may, at its option and without notice to the Lessee, declare this Lease to be in default and exercise one or more of the following remedies as the Lessor in its sole discretion shall elect, to the extent available and permitted by, and subject to compliance with any mandatory requirements of all Laws then in effect:

(a) The Lessor or its agent may sell the AfriStar Facilities at private or public sale, as the Lessor may determine, or otherwise dispose of, hold, use, operate or lease to others or keep idle the AfriStar Facilities, all on such terms and conditions as the Lessor in its sole discretion may determine, and all free and clear of any rights of the Lessee or any claim of the Lessee, in equity or at Law, and without any duty to account to the Lessee, and the Lessee shall use its best efforts to obtain, or to assist the Lessor in obtaining, any necessary regulatory approvals for the Lessor to take any action pursuant to this clause (a);

provided, however, that (i) if the Lessor or its agent shall sell the AfriStar Facilities, the obligation of the Lessee to pay Base Rent with respect thereto for any period after the date of the sale shall terminate and this Lease shall terminate from and after the date of such sale, and (ii) the Lessee's obligation to pay Base Rent for any period after the Lessee shall have been deprived of control of the AfriStar Facilities pursuant to this clause (a) shall be reduced by the net proceeds, if any, received by the Lessor from leasing the AfriStar Facilities to, or otherwise permitting its use by, any Person other than the Lessee for all or any portion of such period. If the Lessor shall have sold the AfriStar Facilities pursuant to this clause (a), the Lessor may demand that the Lessee pay the Lessor, and the Lessee shall pay the Lessor, as liquidated damages for the loss of a bargain and not as a penalty, in lieu of all Base Rent due after the date on which such sale shall occur, an amount equal to the excess of the Stipulated Loss Value of the Equipment over the net sales proceeds realized by the Lessor on such sale.

(b) The Lessor may proceed by appropriate court action or actions, either at Law or in equity, to enforce performance by the Lessee of the applicable covenants of this Lease and to recover damages for the breach thereof and to rescind this Lease.

(c) The Lessor may terminate this Lease by written notice (which notice shall be effective upon dispatch) and repossess the AfriStar Facilities.

In addition to the foregoing, the Lessee shall be liable for any and all unpaid Rent during or after the exercise of any of the aforementioned remedies, together with interest on such unpaid amounts at the Interest Rate, and until satisfaction of all of the Lessee's obligations to the Lessor hereunder and for all reasonable legal fees and other reasonable costs and expenses incurred by the Lessor by reason of the occurrence of any Event of Default or the exercise of the Lessor's remedies with respect thereto, including all costs and expenses incurred in connection with the return of the AfriStar Facilities in accordance with the terms of Article 15 hereof.

In effecting any repossession, the Lessor and its representatives and agents, to the extent permitted by Law, shall (v) have the right to enter upon any premises where it reasonably believes the AfriStar Facilities to be located; (w) not be liable, in conversion or otherwise, for the taking of any personal property of the Lessee that is in or attached to the AfriStar Facilities which is repossessed; (x) not be liable or responsible, in any manner, for any inadvertent damage or injury to any of the Lessee's property in repossessing and holding the AfriStar Facilities, except for that caused by or in connection with Lessor's gross negligence or willful acts; (y) have the right to maintain possession of and dispose of the AfriStar Facilities on any premises owned by the Lessee or under the Lessee's control; and (z) have the right to obtain a key to any premises at which the AfriStar Facilities may be located from the landlord or owner thereof.

If reasonably required by the Lessor, the Lessee, at its sole expense, shall assemble and make the AfriStar Facilities available at a place designated by the Lessor in accordance

with Article 15 hereof. The Lessee hereby agrees that, in the event of the return to or repossession by the Lessor of the AfriStar Facilities, any rights in any warranty (express or implied) heretofore assigned to the Lessee or otherwise held by the Lessee shall without further act, notice or writing be assigned or reassigned to the Lessor, if assignable. The Lessee shall be liable to the Lessor for all reasonable expenses, disbursements, costs and fees incurred in (A) repossessing, storing, preserving, shipping, maintaining, repairing and refurbishing the AfriStar Facilities to the condition required by Article 15 hereof and (B) preparing the AfriStar Facilities for sale or lease, advertising the sale or lease of the AfriStar Facilities and selling or releasing the AfriStar Facilities. The Lessor is hereby authorized and instructed, at its option, to make reasonable expenditures which the Lessor considers advisable to repair and restore the AfriStar Facilities to the condition required by Article 15 hereof, all at the Lessee's sole expense.

No remedy referred to in this Article 17 is intended to be exclusive, but, to the extent permissible hereunder or under applicable Law, each shall be cumulative and in addition to any other remedy referred to above or otherwise available to the Lessor at Law or in equity; and the exercise or beginning of exercise by the Lessor of any one or more of such remedies shall not preclude the simultaneous or later exercise by the Lessor of any or all of such other remedies. No express or implied waiver by the Lessor of any Event of Default shall in any way be, or be construed to be, a waiver of any future or subsequent Event of Default.

ARTICLE 18 ALIENATION

The Lessor shall have the right at its sole cost and expense to assign, sell or encumber any interest of the Lessor in the AfriStar Facilities or this Lease and/or the proceeds hereof, subject to the rights of the Lessee under the provisions of this Lease. To effect or facilitate any such assignment, sale or encumbrance, the Lessee agrees to provide, at the Lessor's sole cost and expense, such agreements, consents, conveyances or documents as may be reasonably requested by the Lessor. The agreements, covenants, obligations, and liabilities contained herein including, but not limited to, all obligations to pay rent and indemnify each Indemnitee are made for the benefit of each Indemnitee and their respective successors and assigns.

ARTICLE 19 CONFIDENTIALITY

19.1. Proprietary Information. During performance of this Lease, the Lessor and the Lessee shall have access to and shall receive confidential information from each other, and all such information, whether disclosed orally or in writing, shall be considered "Proprietary Information." Proprietary Information shall not include any information that the receiving party can establish to have (a) become publicly known without breach of this Lease; (b) been lawfully given to the receiving party by a third party who is not obligated to maintain confidentiality; (c) been independently developed by the receiving party without reference to

the Proprietary Information of the other party, as established by documentary evidence; or (d) been developed by the receiving party prior to the date of receipt from the other party, as established by documentary evidence.

19.2. Nondisclosure. The Lessor and the Lessee agree not to disclose Proprietary Information of the other party without such other party's prior written consent and further agree that Proprietary Information of the other party shall only be disclosed to employees with a demonstrable need to know and with whom there is a binding confidentiality agreement. For a period of three (3) years after the Termination Date of this Lease, the Lessor and the Lessee agree to protect and preserve the confidentiality of the Proprietary Information of the other party hereto. Notwithstanding the foregoing, (a) the Lessor or the Lessee shall be entitled to disclose Proprietary Information of the other party when compelled by court order; *provided, however*, that such party shall give the other party written notice of such obligation within ten (10) days of receipt of the court order and (b) the Lessee may disclose any such Proprietary Information to the FCC or any other Governmental Entity in connection with any proceedings relating to the application for or issuance of licenses or permits.

ARTICLE 20 FAIR MARKET VALUE OPTIONS

20.1. Renewal Options. Not more than 365 days or less than 270 days prior to the end of the Term or the first Renewal Term entered into pursuant to this first paragraph of this Section 20.1, the Lessee may give to the Lessor a written notice tentatively electing to extend the term of this Lease for a Renewal Term as hereinafter provided. The first Renewal Term shall be an additional two-year period commencing at the end of the Term and the second Renewal Term shall be an additional one-year period commencing at the end of the then-expiring Renewal Term. The basic rent payable for the AfriStar Facilities during any such Renewal Term shall be payable annually in arrears on each rent payment date during such Renewal Term and shall be equal to the Fair Market Rental Value of the AfriStar Facilities, which shall be determined separately for each such Renewal Term of this Lease.

At least 180 days before the end of the Term or the current Renewal Term, Lessee shall notify Lessor in writing of its final determination, which shall be irrevocable, whether or not to extend or extend further the term of this Lease pursuant to this Section 20.1; *provided, however*, that any final election so to extend such term shall be effective only if (a) the Lease has not been terminated as permitted by the terms hereof prior to the date on which the Renewal Term is to commence and (b) no Event of Default shall have occurred and be continuing on the date of such final election or on the date on which the Renewal Term is to commence and all Rent owed by Lessee on or before such dates shall have been duly paid on or before such dates. If Lessee fails to give final notice meeting such conditions within the time specified above, Lessee shall be deemed to have waived any right to extend the term for the AfriStar Facilities pursuant to this Section 20.1. Except as otherwise expressly provided herein, all of the terms of this Lease shall apply during the entire period of each Renewal

Term except that (x) basic rent for the AfriStar Facilities shall be determined as aforesaid and (y) the stipulated loss values for the AfriStar Facilities shall be equal to the Fair Market Sales Value thereof at the beginning of each year during the Renewal Term involved (determined in each case, as indicated below, in a single determination made before the beginning of the Renewal Term involved).

20.2. Purchase Option. Not more than 365 days nor less than 270 days before the end of the Term or any Renewal Term, Lessee may give written notice to lessor tentatively electing to purchase the AfriStar Facilities as provided in this Section 20.2. The purchase price for any such purchase shall be equal to the Fair Market Sales Value of the AfriStar Facilities. At least 180 days before the end of the Term or any Renewal Term, Lessee shall notify Lessor in writing of its final determination, which shall be irrevocable, whether or not to purchase the AfriStar Facilities; *provided, however*, that any final election so to purchase shall be effective only if (a) the Lease has not been terminated as permitted by the terms hereof prior to lease-end and (b) no Event of Default shall have occurred and be continuing on the date of such final election or at the time scheduled for the purchase of the AfriStar Facilities and all Rent owed by Lessee on or before such dates shall have been duly paid on or before such dates. If Lessee fails to give final notice meeting such conditions within the time specified above, Lessee shall be deemed to have waived any right to purchase the AfriStar Facilities pursuant to this Section 20.2.

If Lessee's election to purchase the AfriStar Facilities is effective as above provided, then at the end of the Term or the Renewal Term, as the case may be, the Lessor shall transfer to the Lessee or to any Person designated by the Lessee, free and clear of any Lessor's lien and otherwise without recourse, representation or warranty, all right, title and interest originally conveyed to Lessor in and to the AfriStar Facilities at the time the AfriStar Facilities were first subjected to this Lease.

ARTICLE 21 MISCELLANEOUS

21.1. Severability. Any provision of this Lease that is prohibited or unenforceable in any jurisdiction shall, as to such jurisdiction, be ineffective to the extent of such prohibition or unenforceability without invalidating the remaining provisions hereof. Any such prohibition or unenforceability in any jurisdiction shall not invalidate or render unenforceable such provision in any other jurisdiction. To the extent permitted by Law, the Lessee hereby waives any provision of Law that renders any provisions hereof prohibited or unenforceable in any respect.

21.2. Governing Law; Jurisdiction. This Lease shall be governed by and construed in accordance with the laws of the State of New York, applicable to contracts made and to be performed entirely within the State of New York. The Lessor and the Lessee hereby (a) accept and consent, generally and unconditionally, to the nonexclusive jurisdiction of the U.S. District Court for the Southern District of New York, or, if federal jurisdiction is unavailable

for any reason, to the jurisdiction of the state courts of the State of New York sitting in the Borough of Manhattan, City of New York, for all claims, actions, disputes, controversies and similar matters arising hereunder or related hereto; (b) irrevocably waive any objection they may have as to the venue of such proceeding brought in any such court or that such court is an inconvenient forum; and (c) waive personal service of process and agree to service of process by certified or registered mail, return receipt requested, addressed to the parties at the addresses set forth in this Lease. Nothing herein shall limit or otherwise affect the right of either party hereto to serve process in any other manner permitted by Law.

21.3. Construction. This Lease shall constitute an agreement of lease, and nothing herein shall be construed as conveying to the Lessee any right, title or interest in the AfriStar Facilities except as a lessee only. The headings in this Lease are for convenience of reference only and shall not define or limit any of the terms of provisions hereof. Whenever required by the context hereof, the singular shall include the plural and vice versa. Reference to this Lease shall mean this Lease as amended or supplemented from time to time.

21.4. Notices. All notices, demands, requests, or other communications given hereunder shall be in writing and shall be hand delivered, dispatched by overnight courier or mailed by first-class, registered or certified mail, return receipt requested, postage prepaid, or transmitted by confirmed telecopy, addressed as follows:

(a) If to the Lessor:

WorldSpace Satellite Company Ltd.
c/o HWR Services, Ltd.
Skelton Building
Road Town, Tortola
British Virgin Islands
Attention: Sheila George
Telephone No.: (284) 494-4354
Telecopier No.: (284) 494-3547

(b) If to the Lessee:

AfriSpace, Inc.
2400 N Street, N.W.
Ground Floor
Washington, D.C. 20037
Attention: Benno A. Ammann
Telephone No.: (202) 861-8899
Telecopier No.: (202) 861-1197

or such other address as the addressee may indicate by written notice to the other party in accordance with this Section 21.4.

21.6. Transaction Costs. The Lessor and the Lessee shall each be responsible for its own costs and expenses incurred in connection with the preparation, negotiation and delivery of this Lease and any other documents or instruments delivered in connection herewith and the transactions contemplated hereby.

21.7. Sale-Leaseback Financing. The Lessee agrees that, if necessary in connection with any third party financing arranged by the Lessor for the Lessor's Cost of the AfriStar Facilities or any part thereof (including any sale-leaseback financing or a financing utilizing a tax-advantaged structure), it will negotiate in good faith with the Lessor with respect to such amendments and modifications to the Lease as may be required by such third party financing source; *provided, however*, that the Lessee shall not be required to agree to any such amendments or modifications if they would materially increase its obligations or materially reduce its rights under this Lease; and, *provided, further, however*, that any financial savings achieved by the Lessor through such financing (including any that are attributable to the availability of tax benefits to the Lessor or the third party financing source) shall be equitably shared with the Lessee.

21.8. Entire Agreement; Amendment. This Lease constitutes the entire agreement between the Lessor and the Lessee with respect to the subject matter hereof and supersedes all prior agreements, commitments or understandings, both written and oral, with respect to such matters. No amendment, modification or discharge of this Lease shall be valid or binding unless set forth in writing and duly executed by the party against whom enforcement of such amendment, modification, or discharge is sought.

21.9. Counterparts; Uniform Commercial Code. This Lease and each amendment or supplement hereto may be executed by the Lessor and the Lessee in separate counterparts, none of which need contain the signatures of all parties, each of which when so executed and delivered shall be deemed to be an original, and all of which shall together constitute one and the same instrument. Only the counterpart of this Lease and each amendment or supplement hereto executed by the Lessee shall evidence the monetary obligations of the Lessee hereunder, and to the extent, if any, that this Lease constitutes chattel paper (as such term is defined in the Uniform Commercial Code as in effect in any applicable jurisdiction), no security interest in this Lease may be created by the transfer or possession of any counterpart hereof other than such counterpart.

IN WITNESS WHEREOF, the Lessor and the Lessee have cause this Lease to be duly executed on their behalf by their officers thereunto duly authorized, all as of the date first written above.

WORLDSPACE SATELLITE COMPANY LTD.

By: James R. Laramie

Name: JAMES R. LARAMIE

Title: DIRECTOR + SECRETARY

AFRISPACE, INC.

By: Benno A. Ammann

Name: BENNO A. AMMANN

Title: President

Exhibit A

Schedule of Stipulated Loss Values

<u>Casualty Payment Date</u>	<u>Stipulated Loss Value*</u>
1	98.5625000%
2	97.1034376%
3	95.6224892%
4	94.1193266%
5	92.5936165%
6	91.0450208%
7	89.4731961%
8	87.8777941%
9	86.2584611%
10	84.6148380%
11	82.9465606%
12	81.2532591%
13	79.5345580%
14	77.7900764%
15	76.0194276%
16	74.2222191%
17	72.3980524%
18	70.5465232%
19	68.6672211%
20	66.7597294%
21	64.8236254%
22	62.8584798%
23	60.8638571%
24	58.8393150%
25	56.7844047%
26	54.6986709%

Casualty Payment Date

Stipulated Loss Value*

27	52.5816510%
28	50.4328758%
29	48.2518689%
30	46.0381470%
31	43.7912193%
32	41.5105876%
33	39.1957464%
34	36.8461827%
35	34.4613754%
36	32.0407961%
37	29.5839081%
38	27.0901668%
39	24.5590193%
40	21.9899046%
41	19.3822532%
42	16.7354871%
43	14.0490194%
44	11.3222548%
45	8.5545886%
46	5.7454075%
47	2.8940886%
48	0.0000000%

* Expressed as a percentage of the Lessor's Cost. In the event that a Stipulated Loss Value payment falls due on a date that is between two Casualty Payment Dates, the amount payable shall be determined as of the next succeeding Casualty Payment Date.

Exhibit B

Schedule of Base Rent

<u>Base Rent Payment Date</u>	<u>Base Rent*</u>
1	1.1749996 %
2	1.1749996 %
3	1.1749996 %
4	1.1749996 %
5	1.7624994 %
6	1.7624994 %
7	1.7624994 %
8	1.7624994 %
9	2.3499992 %
10	2.3499992 %
11	2.3499992 %
12	2.3499992 %
13	2.937499 %
14	2.937499 %
15	2.937499 %
16	2.937499 %
17	2.937499 %
18	2.937499 %
19	2.937499 %
20	2.937499 %
21	2.937499 %
22	2.937499 %
23	2.937499 %
24	2.937499 %
25	2.937499 %
26	2.937499 %

Base Rent Payment Date

Base Rent*

27	2.937499%
28	2.937499%
29	2.937499%
30	2.937499%
31	2.937499%
32	2.937499%
33	2.937499%
34	2.937499%
35	2.937499%
36	2.937499%
37	2.937499%
28	2.937499%
39	2.937499%
40	2.937499%
41	2.937499%
42	2.937499%
43	2.937499%
44	2.937499%
45	2.937499%
46	2.937499%
47	2.937499%
48	2.937499%

* Expressed as a percentage of Lessor's Cost.

Annex 1

To

Lease Agreement Dated as of January 19, 1999

Annex 1

To

Lease Agreement Dated as of January 19, 1999

**Form of Lease Supplement
To Be Executed and Delivered on the In-Service Date of the AfriStar Facilities**

LEASE SUPPLEMENT NO. 1

THIS LEASE SUPPLEMENT NO. 1, dated as of _____, 1999, is entered into by and between WORLDSPACE SATELLITE COMPANY LTD., a British Virgin Islands corporation ("Lessor"), and AFRISPACE, INC., a Maryland corporation ("Lessee").

W I T N E S S E T H

WHEREAS, Lessor and Lessee have heretofore entered into that certain Lease Agreement, dated as of January 19, 1999 (the "Lease Agreement", defined terms therein being used herein as therein defined), which provides in Section 2.01 for the execution of a Lease Supplement substantially in the form hereof for the purpose of leasing the AfriStar Facilities under the Lease Agreement as and when delivered by Lessor to Lessee in accordance with the terms thereof; and

WHEREAS, the Lease Agreement relates to the satellite and Major System Components described below, and a counterpart of the Lease Agreement is attached to and made a part of this Lease Supplement;

NOW, THEREFORE, in consideration of the premises and other good and sufficient consideration, and pursuant to Section 2.01 of the Lease Agreement, Lessor and Lessee hereby agree as follows:

1. Lessor hereby delivers and leases to Lessee, and Lessee hereby accepts and leases from Lessor, under the Lease Agreement as hereby supplemented, the AfriStar Facilities which consist of the following components (which may or may not be attached to each other at the moment of acceptance hereunder):

- (i) AfriStar Satellite; and
- (ii) Major System Components.

2. The Lessor's Cost for the AfriStar Facilities is as follows:

- (i) AfriStar Satellite: [\$212,607,542];*
- (ii) Major System Components: [\$16,467,658].*

3. The Base Rent for the AfriStar Facilities shall be the percentages of Lessor's Cost as set forth in Exhibit B to the Lease Agreement.

* Subject to adjustment on the In-Service Date to reflect final cost figures.

4. The Stipulated Loss Values for the AfriStar Facilities shall be the percentages of Lessor's Cost set forth in Exhibit A to the Lease Agreement.

5. The Interest Rate shall be the rate announced from time to time by Citibank N.A. as its base rate.

6. The In-Service Date is the date of this Lease Supplement set forth in the opening paragraph hereof.

7. Lessee hereby confirms to Lessor that the Lessee has accepted the AfriStar Facilities for all purposes hereof and for the Lease Agreement in good working order and repair and without defect or inherent vice in title or fitness for use, whether or not discoverable by Lessee as of the date hereof, or, to the extent known to Lessee, in condition, design, or operation, and free and clear of all liens, encumbrances and rights of others; *provided* that nothing contained herein or in the Lease Agreement shall in any way diminish or otherwise affect any right Lessee or Lessor may have with respect to the AfriStar Facilities against the manufacturer or any suppliers under the Alcatel Agreements or otherwise.

8. Payment Account Details:

[insert]

9. All of the terms and provisions of the Lease Agreement are hereby incorporated by reference in this Lease Supplement to the same extent as if fully set forth herein.

10. This Lease Supplement is being delivered in the state of New York and shall in all respects be governed by, and construed in accordance with, the laws of the state of New York, including all matters of construction, validity and performance.

IN WITNESS WHEREOF, Lessor and Lessee have caused this Lease Supplement to be duly executed as of the day and year first above written.

WORLDSPACE SATELLITE COMPANY LTD.

By:

Name:

Title:

AFRISPACE, INC.

By:

Name:

Title:

**Form of Lease Supplement
To Be Executed and Delivered in Connection with Major System Component
Replacements**

LEASE SUPPLEMENT NO. 2

THIS LEASE SUPPLEMENT NO. 2, dated as of _____, _____, is entered into by and between WORLDSPACE SATELLITE COMPANY LTD., a British Virgin Islands corporation ("Lessor"), and AFRISPACE, INC., a Maryland corporation ("Lessee").

W I T N E S S E T H

WHEREAS, Lessor and Lessee have heretofore entered into that certain Lease Agreement, dated as of January 19, 1999 (the "Lease Agreement", defined terms therein being used herein as therein defined), which provides in Section 2.01 for the execution of a Lease Supplement substantially in the form hereof for the purpose of leasing the AfriStar Facilities under the Lease Agreement as and when delivered by Lessor to Lessee in accordance with the terms thereof; and

WHEREAS, the Lease Agreement provides that if an Event of Loss occurs with respect to a Major System Component, the Lessor shall acquire a replacement system component and lease it to the Lessee;

NOW, THEREFORE, in consideration of the premises and other good and sufficient consideration, and pursuant to Section 2.01 of the Lease Agreement, Lessor and Lessee hereby agree as follows:

1. Lessor hereby delivers and leases to Lessee, and Lessee hereby accepts and leases from Lessor, under the Lease Agreement as hereby supplemented, the replacement system component described below:

[insert component description]

2. The Lessor's Cost for the replacement system components is as follows:

[insert cost]

3. The Base Rent for the replacement system component shall be as follows:

[insert]

4. The Stipulated Loss Values for the replacement system component shall be as follows:

[insert]

5. The delivery date of the replacement system component is the date of this Lease Supplement set forth in the opening paragraph hereof.

6. Lessee hereby confirms to Lessor that the Lessee has accepted the replacement system component for all purposes hereof and for the Lease Agreement in good working order and repair and without defect or inherent vice in title or fitness for use, whether or not discoverable by Lessee as of the date hereof, or, to the extent known to Lessee, in condition, design, or operation, and free and clear of all liens, encumbrances and rights of others; *provided* that nothing contained herein or in the Lease Agreement shall in any way diminish or otherwise affect any right Lessee or Lessor may have with respect to the replacement system component against the manufacturer or any suppliers thereof.

7. All of the terms and provisions of the Lease Agreement are hereby incorporated by reference in this Lease Supplement to the same extent as if fully set forth herein.

8. This Lease Supplement is being delivered in the state of New York and shall in all respects be governed by, and construed in accordance with, the laws of the state of New York, including all matters of construction, validity and performance.

IN WITNESS WHEREOF, Lessor and Lessee have caused this Lease Supplement to be duly executed as of the day and year first above written.

WORLDSPACE SATELLITE COMPANY LTD.

By:

Name:

Title:

AFRISPACE, INC.

By:

Name:

Title:

CHANNEL SERVICE AGREEMENT

THIS CHANNEL SERVICE AGREEMENT (the "Agreement") is entered into as of January 19, 1999 by and between AFRISPACE, INC., a Maryland corporation ("AfriSpace" or the "Service Company") and WORLDSPACE INTERNATIONAL NETWORK INC., a British Virgin Islands corporation ("Customer").

WITNESSETH

WHEREAS, AfriSpace is the lessee of a communications satellite located at 21 degrees East Longitude (the "AfriStar Satellite") and related facilities and equipment pursuant to a Lease Agreement of even date hereof between WorldSpace Satellite Company Ltd. (the "Satellite Lessor") and AfriSpace (the "Satellite Lease"); and

WHEREAS, AfriSpace has offered to provide service on 547 Prime Data Rate Channels (defined herein) in the L-band frequencies (the "Service"), which shall be supplied by AfriSpace in three (3) Beams (defined herein) from the AfriStar Satellite as described in Appendix B hereto; and

WHEREAS, the Service Company and Customer have agreed that the Service Company shall provide to the Customer and the Customer has agreed to take and pay for the Service upon the terms and subject to the conditions specified in this Agreement;

NOW, THEREFORE, in consideration of the premises and of the representations, warranties, covenants, agreements and conditions set forth herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereby agree as follows:

ARTICLE I DEFINITIONS

When used in this Agreement, the following terms shall have the meanings specified below:

"Affiliate" as to any Person shall mean any other Person directly or indirectly controlling, controlled by or under common control with such Person. For purposes of this definition, "control" (including, with correlative meanings, the terms "controlling," "controlled by" and "under common control with"), as applied to any Person, means the possession, directly or indirectly, of the power to direct or cause the direction of the management and policies of such Person, whether through the ownership of voting securities, by contract or otherwise.

"AfriStar Satellite" shall have the meaning set forth in the Preamble.

"AfriSpace" is defined in the first paragraph of this Agreement.

"Agreement" shall mean this channel service agreement and any and all amendments, revisions, supplements and modifications thereto.

"Beams" shall mean each of the three (3) downlink spot beams on the AfriStar Satellite, each of which has a maximum capacity of 192 Prime Data Rate Channels.

"Business Day" shall mean any day other than a Saturday, Sunday or other day on which banking institutions in New York, New York, are authorized or required by Law to be closed.

"Claims" shall mean any and all claims, damages, losses, liabilities, demands, suits, judgments, causes of action, legal proceedings, whether civil or criminal, penalties, fines and other sanctions, and any attorneys' fees and other reasonable costs and expenses in connection herewith or therewith, including any of the foregoing arising or imposed with or without the Service Company's fault or negligence (whether passive or active) or under the doctrine of absolute or strict liability.

"Code" shall mean the United States Internal Revenue Code, as amended.

"Confirmed Outage" shall have the meaning set forth in Section 6.1 hereof.

"Confirmed Service Failure" shall have the meaning set forth in Section 6.3 hereof.

"Customer" shall mean WorldSpace International Network Inc, a British Virgin Islands corporation, and any Permitted Assignee.

"Customer-Provided Facilities" shall have the meaning set forth in Section 5.4 hereof.

"Deposit" shall have the meaning set forth in Section 3.4 hereof.

"FCC" shall mean the Federal Communications Commission, or any successor thereto.

"Force Majeure" shall have the meaning set forth in Section 7.1 hereof.

"Governmental Entity" shall mean and include (a) the FCC; (b) any national government, or political subdivision thereof or local jurisdiction therein; (c) any board, commission, department, division, organ, instrumentality, court, or agency of any entity described in clause (b) above, however constituted; and (d) any association, organization, or institution of which any entity described in (b) or (c) above is a member or to whose jurisdiction any such entity is subject or in whose activities any such entity is a participant but only to the extent that any of the preceding have jurisdiction over the Service Company, the Customer, the AfriStar Satellite, the Major System Components or the Customer-Provided Facilities.

"Indemnitee" shall mean the Service Company and its officers, directors, agents, employees, successors and permitted assigns.

"Interest Rate" shall mean (i) the rate announced from time to time by Citibank N.A. as its base rate plus (ii) one half of one percent (0.05%).

"Law" shall mean any applicable federal, state, local or other law or governmental requirement of any kind, domestic or foreign, and the rules, regulations and orders promulgated thereunder.

"Major System Components" shall have the meaning set forth in the Satellite Lease.

"Operational Requirements" shall have the meaning set forth in Appendix C hereto.

"Outage Credit" shall have the meaning set forth in Section 6.2 hereof.

"Permitted Assignee" of Customer shall mean any corporation that is a wholly-owned subsidiary of Customer and that has all licenses, permits, franchises, rights or privileges required for the commercial use of the Service.

"Person" shall mean any individual person, corporation, partnership, limited liability company, firm, joint stock company, joint venture, trust, estate, unincorporated organization, association, Governmental Entity or other entity.

"Prime Data Rate Channel" shall mean a data bit stream operating at sixteen (16) kilobits per second, which is the smallest usable quantity of band-width capable of transmitting an AM mono-quality audio signal.

"Proprietary Information" shall have the meaning set forth in Section 10.1.

"Satellite Lease" shall have the meaning set forth in the Preambles to this Agreement.

"Satellite Lessor" shall have the meaning set forth in the Preambles to this Agreement

"Service" shall have the meaning set forth in the Preambles to this Agreement.

"Service Channels" shall have the meaning set forth in Section 2.2.

"Service Fee" shall mean the fee payable pursuant to Article 3 hereof.

"Service Interruption" shall be deemed to have occurred if the Service fails to meet the Service Specifications for any reason other than:

(a) The failure or non-performance of any Customer-Provided Facilities, including earth station conditions inconsistent with the Operational Requirements set forth in, or the representations of Customer in, Appendix C hereto;

- (b) The fault, negligence or failure to act of Customer, its employees, agents or contractors;
- (c) Suspensions or terminations of Service made in accordance with this Agreement;
- (d) An event of Force Majeure;
- (e) The unavailability of Service during emergency conditions such as major natural or man-made disasters and emergencies involving United States national defense and security;
- (f) The unavailability of the Service due to weather conditions or radio interference caused by parties other than the Service Company; or
- (g) The unavailability of the Service due to periodic testing (done with at least 48 hours' notice to Customer) or emergency testing (done with the greatest notice possible under the circumstances).

"Service Preemption" shall have the meaning set forth in Section 6.4 hereof.

"Service Specifications" shall have the meaning set forth in Appendix B hereto.

"Service Start-up Date" shall mean the In-Service Date of the AfriStar Satellite as defined in the Satellite Lease.

"Service Term" shall mean the full term of the Agreement.

"Supplemental Fee" shall mean any and all amounts, liabilities and obligations (other than any Service Fee) that Customer assumes or agrees to pay hereunder, or under any document delivered pursuant hereto, to the Service Company, including without limitation (a) any payment of indemnity required by Section 9.2 hereof; or (b) to the extent permitted by Law, interest calculated at the Interest Rate (all computations of interest under this Agreement to be made on the basis of a three hundred sixty (360) day year for the actual number of days elapsed) calculated (i) on any Service Fee (or any part thereof) not paid on the due date thereof for the period the same remains unpaid and (ii) on any Supplemental Fee not paid when due hereunder until the same is paid.

"Transmission Plan" shall have the meaning set forth in Section 5.3 hereof.

ARTICLE 2 PROVISION OF SERVICE

2.1 Service. the Service Company agrees to provide, and Customer agrees to accept, Service that meets the Service Specifications set forth in Appendix B hereto. The Service Company shall not voluntarily preempt or interrupt the provision of Service to Customer, except as may be required under Section 6.4 hereto.

2.2 Channels. The Prime Data Rate Channels upon which the Service Company shall provide Service to Customer (the "Service Channels") are identified in Appendix B hereto.

2.3 Digital Audio Service. The Service is designed for, and may be used by, Customer solely to provide international transmission of digital audio transmission service and associated ancillary data transmissions to countries in the geographic area covered by the Beams of the AfriStar Satellite. The parties hereto agree that such transmission service shall not be (a) provided to any Person in any country against which the United States has imposed an embargo of such transmission service or (b) provided to any organization, public or private, that engages in the research or production of military devices, armaments or any instruments of warfare, including biological, chemical and nuclear warfare. The Service Company will provide Customer with a list of such countries, and will notify Customer of any changes thereto.

ARTICLE 3 TERM AND PAYMENT

3.1 Term. The term of this Agreement shall commence on the Service Start-up Date and shall terminate nine (9) years and six (6) months later, unless prior thereto this Agreement shall have been terminated in accordance with the provisions of Article 8.

3.2 Service Start-up Date. The Service Company shall give Customer thirty (30) days' written notice of the anticipated Service Start-up Date and shall promptly notify Customer in writing of any delay or postponement of such Service Start-up Date (such notice to specify the new anticipated Service Start-up Date).

3.3 Fees. Customer covenants and agrees to pay to the Service Company for each month of the Term beginning on the Service Start-up Date the monthly Service Fee set forth in Appendix A hereto. Customer shall make each payment of the Service Fee, in advance, no later than the first Business Day of each month of the Term. Customer also covenants and agrees to pay to the Service Company any and all Supplemental Fees as the same become due. Failure of Customer to pay any Service Fee or Supplemental Fee in full when due shall constitute a material breach of this Agreement.

3.4 Security Deposit. On the Service Start-up Date, Customer shall deposit with the Service Company an amount equal to the Service Fee for two months (the "Deposit"). The Deposit shall be held as security for, and applied towards the payment of, any amount payable

by the Customer hereunder if the same is not paid when due. Any balance of the Deposit remaining at the end of the Term shall be returned to the Customer.

3.5 Manner of Payment. At least ten (10) Business Days prior to the next succeeding due date of a Service Fee, the Service Company shall forward to Customer an advice reflecting any Outage Credit due Customer and Customer may deduct such Outage Credit from the Service Fee next due. All payments by Customer under this Agreement shall be paid in immediately available funds in U.S. dollars, at such account or location as the Service Company shall designate on the Service Start-up Date or thereafter from time to time in writing.

3.6 Taxes. Customer is solely responsible for any taxes, charges, levies, duties, usage, spectrum or license fees that may be asserted by any Governmental Entity as a result of the service provided by the Customer and/or Customer's use of, and payments for, the Service; *provided, however,* that, except as provided herein, the Customer shall not be liable for any United States income taxes on the Service Company. In the event the United States taxable income of the Service Company is increased as a result of an adjustment by the United States Internal Revenue Service to the Service Fees and other amounts payable hereunder by Customer to the Service Company under Section 482 of the Code, the Customer shall indemnify the Service Company and pay to the Service Company on demand (and on an after-tax basis) for all taxes (and interest thereon and penalties and additional taxes associated therewith) that may be payable as a result of such adjustment. The Service Company and Customer shall cooperate in good faith to minimize any indemnity payable under this Section 3.6 including by means of the procedures described in Revenue Procedure 65-17, if applicable.

ARTICLE 4 ASSIGNMENT

4.1 Assignment by the Service Company. The Service Company shall have the right to assign, sell or encumber any of its rights and interests to the AfriStar Satellite and under this Agreement to any Person, subject to the rights of Customer under this Agreement. Customer agrees that upon receipt of notice from the Service Company of such assignment, sale or encumbrance, Customer shall perform all of its obligations under to this Agreement directly for the benefit of such Person and shall pay all sums due or to become due directly to such Person, if so directed by the Service Company. To effect or facilitate such assignment, sale or encumbrance, Customer agrees to provide, at the Service Company's sole cost and expense, such documentation as the Service Company may reasonably request.

4.2 Assignment by Customer. Customer shall not assign any of its rights under this Agreement to any other party other than to a Permitted Assignee without the prior written consent of the Service Company, which consent may be withheld or conditioned in the Service Company's sole discretion. Customer shall have and retain throughout the Service Term the right to maintain and to enter into arrangements in compliance with Law and this Agreement for the use of the Service Channels by its customers. Any such arrangements or agreement shall not require the consent of the Service Company; *provided, however,* that in all such cases, Customer

shall remain primarily liable to the Service Company for the performance of all terms of this Agreement.

ARTICLE 5 CUSTOMER'S OBLIGATIONS

5.1 Compliance With Law. Customer shall have and maintain all permits, licenses and approvals required by any Governmental Entity and applicable Law to use the Service and shall comply with all requirements of any Governmental Entity and applicable Law that are applicable to its use of the Service (including, without limitation, any restrictions that limit or prevent Customer's use of the Service in, between, or among any countries). Customer's failure to so comply or to obtain necessary authorization or approval from any Governmental Entity as may be necessary for Customer to use the Service shall not relieve Customer of its obligations pursuant to this Agreement to pay for Service made available hereunder. Failure of Customer to comply with the requirements of this Section 5.1 shall constitute a material breach of this Agreement.

5.2 Non-interference and Use Restrictions. Customer's transmissions to and from the AfriStar Satellite and its use of the Service shall comply with all applicable Laws, including the International Telecommunication Union's Radio Regulations. Customer will follow established practices and procedures for frequency coordination and will not use the Service Channels, or any portion thereof, in a manner that would or could be expected to, under standard engineering practice, interfere with the use of or cause physical harm to any other Prime Data Rate Channel, the AfriStar Satellite, any other satellite, or any Prime Data Rate Channel on such other satellite. Customer shall also comply with the operational requirements (the "Operational Requirements") set forth in Appendix C hereto, as the same may be modified from time to time by the Service Company in its reasonable discretion. If the Service Company determines that Customer is not in compliance with the Operational Requirements, the Service Company shall send notice to Customer pursuant to Section 6.6 hereof, and, if necessary, may terminate this Agreement pursuant to Section 8.1(b) hereof.

5.3 Transmission Plan. Transmissions by Customer to the AfriStar Satellite shall conform to a digital transmission plan (the "Transmission Plan"), which Transmission Plan shall be submitted by Customer to the Service Company within twenty (20) days of Customer's receipt of notice of the Service Start-up Date. Customer may modify the Transmission Plan from time to time. The Transmission Plan and any modification thereto are subject to the Service Company's written approval, which approval the Service Company shall not unreasonably withhold or delay. Customer will provide to the Service Company, at no cost to the Service Company, equipment necessary to decode its signals.

5.4 Customer-Provided Facilities. Customer shall be responsible for the provision, installation, operation and maintenance of all earth station facilities and equipment used for transmitting signals to the Service Channels (the "Customer-Provided Facilities") in accordance with the requirements set forth in this Agreement. Customer shall also be responsible for

acquiring all authorizations necessary for installation and operation of Customer-Provided Facilities. Any provision by the Service Company to Customer of earth station or other terrestrial facilities or services shall be subject to a separate agreement. Customer will configure, equip and operate its Customer-Provided Facilities so that the interface of the Customer-Provided Facilities with the AfriStar Satellite shall conform to the characteristics and technical parameters of the AfriStar Satellite. Customer will follow the Service Company's procedures for initiating or terminating any transmission to the Satellite. Customer will operate all Customer-Provided Facilities in a manner that allows for cessation of transmission, and Customer will cease such transmission, immediately upon receiving notice from the Service Company pursuant to the procedure set forth in Section 6.6. Customer will furnish information on a continuing basis as required by the Service Company to prepare for, initiate, provide, maintain and immediately discontinue the use of the Service upon notice by the Service Company.

5.5 Inspection. The Service Company shall have the right, at its own expense upon reasonable prior notice to Customer during normal business hours accompanied by an employee or agent of Customer, to inspect any Customer-Provided Facility. The Service Company shall not have a duty to make any inspection or inquiry and shall not incur any liability or obligation by reason of making, or not making, any such inquiry. Customer shall, upon the Service Company's request, provide measured proof that any Customer-Provided Facility meets or exceeds the Operational Requirements set forth in Appendix C hereto.

5.6 Reports. Customer shall prepare and file in timely fashion any reports with respect to the Service during the Service Term that are required to be filed with any Governmental Entity. Promptly after filing, Customer shall furnish the Service Company a copy of all reports filed by Customer pursuant to this Section 5.6.

ARTICLE 6 SERVICE INTERRUPTION, SERVICE FAILURE AND SERVICE PREEMPTION

6.1 Confirmed Outage. A "Confirmed Outage" of Service shall be deemed to have occurred if (a) a Service Interruption occurs for a continuing and uninterrupted period of thirty (30) minutes and (b) the Service Company (i) confirms such Service Interruption and (ii) is not able to provide Service to Customer by comparable means.

6.2 Outage Credits. The Service Company shall give Customer a credit (an "Outage Credit") toward Customer's payment obligation of Service Fees due subsequent to the month(s) during which a Confirmed Outage has occurred. Each Outage Credit shall be determined by the following formula:

Outage Credit equals:

N multiplied by S;

M

Where,

N = the number of hours (or portion thereof) during which there is a Confirmed Outage on a particular Service Channel during a particular month,

M = the number of hours in such month, and

S = the Service Fee applicable to the affected Service Channel for such month.

For purposes of determining Outage Credits, each Service Interruption (a) commences when the Service Company is notified by Customer of the Service Interruption or the Service Company otherwise becomes aware of the Service Interruption and notifies Customer of the same, and Customer ceases using the Service, whichever is later, and (b) continues until the earliest of (i) the date on which the Service Company notifies Customer that Service has been restored to the Service Specifications, (ii) the date on which Customer resumes using the Service, or (iii) if this Agreement is terminated pursuant to Section 8.1(a), the date of such termination.

6.3 Confirmed Service Failure.

(a) A "Confirmed Service Failure" shall be deemed to have occurred if (i) a Service Interruption continues for (x) a period of six (6) consecutive hours or (y) a cumulative period of twelve (12) hours during any consecutive 30-day period, and (ii) the Service Company (x) confirms such Service Interruption and (y) is not able to provide comparable service that meets Service Specifications within 108 hours of such Service Interruption.

(b) In the case of any Confirmed Service Failure, (i) either party may terminate this Agreement as provided in Section 8.1(a) hereof or (ii) Customer may elect not to terminate this Agreement, in which event Customer shall be entitled to Outage Credits pursuant to Section 6.2 hereof until the earliest of (x) the date on which the Service Company is able to provide such comparable service, (y) the date on which the Service Company restores the Service, and (z) if the Customer thereafter elects to terminate this Agreement pursuant to Section 8.1(a) hereof, the date of such termination.

6.4 Service Preemption. Customer agrees that, in unusual or abnormal technical situations or other unforeseen conditions beyond the reasonable control of the Service Company, the Service Company shall have the right to deliberately preempt Service to Customer (a "Service Preemption") in order to protect the overall safety and performance of the AfriStar Satellite. Such decisions to cause a Service Preemption shall be made by the Service Company in its sole discretion. To the extent possible, the Service Company shall give Customer at least 24 hours' notice of such Service Preemption and will use its reasonable best efforts to schedule, coordinate with Customer, and conduct its activities during such Service Preemption to minimize the

disruption of the Service. Immediately upon receiving notice of a Service Preemption, Customer shall cease all transmissions to the AfriStar Satellite. To the extent that such Service Preemption results in a Confirmed Outage or a Confirmed Service Failure, Customer shall have the rights set forth in this Article 6.

6.5 Customer Cooperation. In the event of a Service Interruption or Service Preemption, Customer shall use all reasonable efforts to cooperate with the Service Company in curing such situation. The efforts of Customer shall include, but are limited to (a) increasing the power of its transmission to the AfriStar Satellite at the request of the Service Company, to the extent that Customer can do so with existing Customer-Provided Facilities and (b) permitting the Service Company, at the Service Company's option and expense, to upgrade the Customer-Provided Facilities.

6.6 Telephone Notices. For the purpose of receiving notices from the Service Company in connection with any Service Interruption, Service Preemption, restoration of Service, or compliance with Operational Requirements, Customer shall maintain at one designated Customer-Provided Facility (a) a telephone that is staffed at all times and (b) an automatic facsimile machine in operation and capable of receiving messages from the Service Company at all times. **FOR THE PURPOSES OF IMPLEMENTING ANY SUCH NOTICE FROM THE SERVICE COMPANY, ANY PERSON STAFFING A CUSTOMER-PROVIDED FACILITY MUST HAVE THE TECHNICAL CAPABILITY AND ABSOLUTE AUTHORITY IMMEDIATELY TO TERMINATE OR MODIFY THE TRANSMISSION IF SO NOTIFIED BY THE SERVICE COMPANY.** The Service Company shall maintain a telephone that is continuously staffed for the purposes of giving such notice. All such notices shall be made in English and shall be effective upon the placement of a telephone call from one party to the other. Each party shall promptly confirm in writing any telephone notice given pursuant to this Section 6.6.

6.7 Testing. Notwithstanding the foregoing, the Service Company reserves the right periodically to transmit, or to cause the Satellite Lessor to transmit, station-keeping signals or engineering service commands to selected Service Channels on the AfriStar Satellite.

ARTICLE 7 FORCE MAJEURE

7.1 Events of Force Majeure. The Service Company shall not be liable for any failure of performance or unavailability of Service due to causes beyond its commercially reasonable control (each, an event of "Force Majeure"), including, but not limited to any (a) order, regulation or written directive of a Governmental Entity that has jurisdiction over the activities of the Service Company; (b) sun outage, externally caused electromagnetic interference, or meteorological or astronomical disturbance; (c) earthquake, hurricane, snowstorm, fire, flood or other Acts of God; (d) strike, labor dispute, war, civil disorder, epidemic, quarantine or embargo; or (e) acts or omissions of Customer, its employees, agents, or contractors.

7.2 Remedies. If, within sixty (60) days of an event of Force Majeure, the Service Company is able to restore Service meeting the Service Specifications or to offer comparable Service to the Customer on the AfriStar Satellite or another satellite, this Agreement shall be extended by the period of time that the Service was not available to Customer, but only to the extent that the Service Company is permitted to offer such extension under the Satellite Lease. In the event that the Service Company does not restore Service or offer comparable Service to Customer during such sixty (60) day period, either party hereto may terminate this Agreement as provided in Article 8; *provided, however*, that Customer shall not be permitted to terminate this Agreement if the event of Force Majeure is attributable to Section 7.1(e) above. The remedies provided in this Article 7 shall be the only remedies available to Customer for the unavailability of Service caused by an event of Force Majeure.

ARTICLE 8 TERMINATION

8.1 Termination For Cause.

(a) Either party may terminate this Agreement on five (5) days' written notice to the other party in the event of a Confirmed Service Failure or an event of Force Majeure for which comparable Service is not timely offered pursuant to Section 6.3 or Section 7.2, as the case may be.

(b) The Service Company may terminate this Agreement if Customer fails (i) to pay any Service Fee or Supplemental Fee due pursuant to Section 3.3 hereof and such fee remains unpaid ten (10) days after the payment due date; or (ii) immediately to cease activity in violation of Section 5.2 or Section 6.4 hereof upon receiving telephone or facsimile notice from the Service Company; or (iii) to take immediate action to comply with all requirements of Section 5.1 hereof after receiving notice from any Governmental Entity or the Service Company of any failure to comply with such requirements; or (iv) to cease any other activity in violation of Customer's obligations under this Agreement within thirty (30) days after receiving from the Service Company a notice of such violation. Notwithstanding subsection (iii) of the foregoing sentence, the Service Company shall have the right to terminate this Agreement immediately if it believes in good faith that Customer's failure to comply with the requirements of Section 5.1 hereof will have a material adverse affect on the Service Company's ability to operate the AfriStar Satellite and that such material adverse affect cannot be remedied by Customer's immediate taking of action to comply with such requirements. Upon receiving notice of such termination, Customer shall immediately cease using the Service and shall pay to the Service Company, as liquidated damages for loss of a bargain and not as a penalty, an amount equal to (x) the present value (determined by application of a discount rate equal to the Interest Rate) of the Service Fees due for the remaining Service Term plus (y) any Supplemental Fees due to the Service Company less (z) any unused portion of the Deposit and any Outage Credits. In addition to its other remedies at law or in equity, the Service Company shall be entitled to use the Service Channels or to provide Service to any other entity or entities as the Service Company may, in its sole discretion, determine, and Customer shall not be entitled to any offset or equitable relief

with respect to such use of Service or fees paid to the Service Company. Customer acknowledges that the foregoing rights of the Service Company are reasonable under the circumstances.

8.2 Retirement of AfriStar Satellite. This Agreement shall terminate upon the removal from service by the Service Company of the AfriStar Satellite if (a) in the Service Company's judgment, the remaining fuel on board the AfriStar Satellite is no longer sufficient to maintain geosynchronous orbit within plus or minus 0.05 degrees, after allowing sufficient fuel for de-orbiting the AfriStar Satellite, or (b) the Satellite suffers failure of fifty percent (50%) or more Prime Data Rate Channels. In such event, the Service Company shall give prompt written notice to Customer of its determination to remove the AfriStar Satellite from service and the date of such removal. In the event of a termination under this Section 8.2, Customer shall have no further obligations hereunder and the Service Company shall forthwith return to Customer any unused portion of the Deposit and any Outage Credits.

8.3 Failure to Commence Service. If the Service Start-up Date does not occur prior to December 31, 1999, either party shall have the right to terminate this Agreement without further obligation or liability to the other party. If Customer terminates pursuant to this Section 8.3, the Service Company shall promptly refund the Deposit to Customer.

8.4 Termination for Convenience. If the Satellite Lease is otherwise terminated under Section 13.3 thereof or by reason of a default by the Service Company under the Satellite Lease, the Service Company may terminate this Agreement six (6) months (or such shorter period during which the Satellite Lease remains in effect) after giving advance written notice to Customer while continuing to provide the Service during such notification period. Upon completion of the notification period, Customer shall immediately cease using the Service. If Customer has not been able to purchase service on another satellite that is comparable to the Service provided hereunder and on terms and conditions no less favorable than those provided herein within thirty (30) days prior to the end of the notification period, the Service Company shall pay to Customer, as liquidated damages for loss of a bargain and not as a penalty, an amount equal to (a) the aggregate Service Fees applicable to the twelve-month period commencing on the date of termination of the Service, less (b) any unpaid portion of any Service Fees and any Supplemental Fees that are due, plus (c) any unused portion of the Deposit and any Outage Credits.

8.5 Bankruptcy or Insolvency. In the event that Customer ceases conducting business in the normal course, becomes insolvent, makes a general assignment for the benefit of creditors, suffers or permits the appointment of a receiver for its business or assets, or seeks protection under any Law relating to insolvency or the protection of the rights of creditors generally, then at the option of the Service Company, on five (5) days' notice to Customer, the Service Company may terminate this Agreement; *provided, however*, that Customer shall continue to be obligated to pay to the Service Company, as liquidated damages for loss of a bargain and not as a penalty, an amount equal to (a) the present value (determined by application of a discount rate equal to the Interest Rate) of the Service Fees due for the remaining Service Term, plus (b) any

Supplemental Fees due to the Service Company, less (c) any unused portion of the Deposit and any Outage Credits, which amount shall become immediately due and payable. Upon receipt of notice of termination, Customer shall immediately cease using the Service.

8.6 Rights and Obligations Upon Termination. Upon termination of this Agreement pursuant to Section 8.1(a) or Section 8.2 hereof, the Service Company shall promptly refund to Customer any portion of the Service Fee (including any unused portion of the Deposit and Outage Credits) applicable to any period of the Service Term during which Customer has not received Service. The termination of this Agreement for any reason shall extinguish all of the Service Company's obligations to provide, and Customer's obligations to accept, Service but shall not affect Customer's obligations under Section 9.2 hereof or the parties' obligations under Article 10 hereof, which shall survive the termination of this Agreement.

8.7 Injunctive Relief. If Customer fails or refuses to cease using the Service after receipt of notice of termination, the Service Company may bring injunctive action to require Customer to cease such use. The Service Company shall be entitled to recover reasonable attorneys' fees, expenses and costs incurred in seeking to collect all sums due hereunder and to prevent continued use of the Service by Customer.

ARTICLE 9 LIMITATION OF LIABILITY AND INDEMNIFICATION

9.1 Limitation of Liability.

(a) ANY AND ALL EXPRESS AND IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PURPOSE OR USE, ARE EXPRESSLY EXCLUDED AND DISCLAIMED. IT IS EXPRESSLY AGREED THAT THE SERVICE COMPANY'S SOLE OBLIGATION UNDER THIS AGREEMENT IS TO PROVIDE SERVICE TO CUSTOMER, AND CUSTOMER'S EXCLUSIVE REMEDIES FOR ANY CAUSE WHATSOEVER ARISING OUT OF OR RELATING TO THIS AGREEMENT ARE LIMITED TO THOSE SET FORTH IN SECTION 6.2 AND ARTICLE 8 AND ALL OTHER REMEDIES OF ANY KIND ARE EXPRESSLY EXCLUDED. In no event shall the Service Company be liable for any direct or indirect, incidental, consequential, special or any other types of damages or loss of revenues, whether foreseeable or not, occasioned by any defect in the AfriStar Satellite or the provision of Service herein, any delay in the provision of Service to Customer, any failure of the Service Company to provide Service, or any other cause whatsoever. The Service Company makes no warranty, express or implied, to any person or entity other than Customer concerning the Service or the AfriStar Satellite.

(b) Without limiting the generality of the foregoing, Customer acknowledges and agrees that it shall have no right of recovery for the satisfaction of any cause whatsoever, arising out of or relating to this Agreement, against any officer, director, employee, agent or shareholder of the Service Company or Satellite Lessor, or any supplier of services or equipment

to the Service Company or Satellite Lessor in connection with the construction, launch, operation, maintenance, tracking, telemetry and control of the AfriStar Satellite or the Service Channels, or the provision of Service to Customer in any circumstances in which the Service Company would be obligated to indemnify such supplier.

9.2 Indemnification. Customer agrees to indemnify, reimburse, hold harmless and to defend each Indemnitee from and against all Claims that in any way may result from, pertain to or arise in any manner out of Customer's use of the Service that (a) are caused by any act, omission, fault or negligence of Customer, (b) arise under a warranty, representation, or statement by Customer to the Service Company or any third party in connection with the Service or any transmissions over the Service, (c) arise out of the content of Customer's programming, including any libel, slander, obscenity, indecency, infringement of copyright, infringement of patents, or breach in the privacy or security of transmissions, (d) arise out of any change in facilities, operations or procedures, or in connection with the Customer-Provided Facilities, or (e) arise out of disputes between or among Customer and its program recipients.

9.3 Survival. All obligations of Customer under Section 9.2 hereof shall survive the assignment, expiration or other termination of this Agreement. Such obligations are expressly undertaken by Customer for the benefit of, and shall be enforceable by the Service Company and each other Indemnitee. The limitation of liability set forth in Section 9.1 hereof shall apply to, and the indemnifications set forth in Section 9.2 hereof shall run in favor of, the Service Company.

ARTICLE 10 CONFIDENTIALITY

10.1 Proprietary Information. During performance of this Agreement, the Service Company and Customer shall have access to and shall receive confidential information from each other, and all such information, whether disclosed orally or in writing, shall be considered "Proprietary Information." Proprietary Information shall not include any information that the receiving party can establish to have (a) become publicly known without breach of this Agreement; (b) been lawfully given to the receiving party by a third party who is not obligated to maintain confidentiality; (c) been independently developed by the receiving party without reference to the Proprietary Information of the other party, as established by documentary evidence; or (d) been developed by the receiving party prior to the date of receipt from the other party, as established by documentary evidence.

10.2 Nondisclosure. The Service Company and Customer agree not to disclose Proprietary Information of the other party without such other party's prior written consent and further agree that Proprietary Information of the other party shall only be disclosed to employees with a demonstrable need to know and with whom there is a binding confidentiality agreement. For a period of three (3) years after the last day of the Service Term the Service Company and Customer agree to protect and preserve the confidentiality of the Proprietary Information of the other party hereto. Notwithstanding the foregoing, the Service Company or Customer shall be

entitled to disclose Proprietary Information of the other party (a) when compelled by court order; *provided, however*, that such party shall give the other party written notice of such obligation within ten (10) days of receipt of the court order and (b) to any Governmental Entity in connection with any proceedings relating to the application for or issuances of licenses or permits.

ARTICLE 11 REPRESENTATIONS, WARRANTIES AND COVENANTS

The Service Company has or will use all reasonable efforts to obtain and maintain all consents and authorizations from any Governmental Entity that may be necessary for providing the Service as contemplated in this Agreement. Subject to the understanding that certain consents and authorizations have not yet been obtained and that certain applications may be pending or subsequently filed with certain Governmental Entities, each of the Service Company and Customer represents, warrants and covenants with the other that:

11.1 Authority. It has the right, power and authority to enter into and perform its obligations under this Agreement.

11.2 Corporate Approvals. It has taken all requisite corporate action, as applicable, to approve execution, delivery and performance of this Agreement, and this Agreement constitutes its legal, valid and binding obligation.

11.3 Consents. The fulfillment of its obligations will not constitute a material violation of any existing applicable Law. All material governmental, public or private consents, permissions, agreements, licenses or authorizations necessary for the performance of its obligations under this Agreement to which it is subject have been obtained or shall be obtained prior to the Service Start-up Date.

11.4 Litigation. There are no pending, or to the best of its knowledge, threatened actions or proceedings before any court or administrative agency that would materially adversely affect the ability of it to perform its obligations hereunder.

11.5 No Broker. It does not know of any broker, finder or intermediary involved in the negotiations and discussions incident to the execution of this Agreement, or of any broker, finder or intermediary who might be entitled to a fee or commission upon the execution of this Agreement.

11.6 Further Assurances. It shall promptly and duly execute and deliver to the other party hereto such documents and assurances and take such further action as such other party may from time to time reasonable request in order to carry out more effectively the intent and purpose of this Agreement.

ARTICLE 12

ADDITIONAL REPRESENTATIONS, WARRANTIES AND COVENANTS OF THE SERVICE COMPANY

12.1 Orbital Location. The AfriStar Satellite is to be placed in geostationary orbit at 21 degrees East Longitude. In the event that the Service Company is required by the FCC to change the Satellite's orbital location, such change shall not affect the continuing validity of this Agreement, except to the extent such change prevents the Service Company from providing Service that meets the Service Specifications, in which event the termination provision set forth in Article 8 shall apply.

12.2 Government Authorizations. The Service Company shall use all reasonable efforts to obtain and maintain all necessary authorizations or permissions of any Governmental Entity to operate the AfriStar Satellite and to comply in all material respects with all regulations of all Governmental Entities regarding the operation of the AfriStar Satellite.

ARTICLE 13 GOVERNING LAW; JURISDICTION; ARBITRATION

13.1 Governing Law. This Agreement shall be governed by and construed in accordance with the laws of the State of New York applicable to contracts made and to be performed entirely within the State of New York.

13.2 Jurisdiction. AfriSpace and Customer hereby (a) accept and consent, generally and unconditionally, to the nonexclusive jurisdiction of the U.S. District Court for the Southern District of New York, or, if federal jurisdiction is unavailable for any reason, to the jurisdiction of the state courts of the State of New York sitting in the Borough of Manhattan, City of New York, for all claims, actions, disputes, controversies and similar matters arising hereunder or related hereto; (b) irrevocably waive any objection they may have as to the venue of such proceeding brought in any such court or that such court is an inconvenient forum; and (c) waive personal service of process and agree to service of process by certified or registered mail, return receipt requested, addressed to the parties at the addresses set forth in this Agreement. Nothing herein shall limit or otherwise affect the right of either party hereto to serve process in any other manner permitted by Law except as to a dispute regarding a Service Interruption as provided in Section 13.3 hereof.

13.3 Arbitration. Any dispute as to whether a Service Interruption constitutes a Confirmed Outage or a Confirmed Service Failure shall be finally settled by arbitration administered by the American Arbitration Association under its Commercial Arbitration Rules. The place of arbitration shall be the District of Columbia, and the language of the arbitration shall be English. Nothing in this Section 13.3 shall constitute a waiver of (a) the right of the Service Provider to seek injunctive relief pursuant to Section 8.6 hereof or (b) the right of either party to avail itself of the U.S. District Court for the Southern District of New York, or the state courts of the State of New York sitting in the Borough of Manhattan, City of New York, pursuant to Section 13.2 hereof in respect of any other matters in dispute hereunder.

ARTICLE 14 MISCELLANEOUS

14.1 Actions by the Service Company. Nothing in this Agreement shall be construed to prevent the Service Company from taking any action necessary to (a) protect its contractual arrangements with the Satellite Lessor or (b) require Customer or any other customer to act in accordance with their covenants and agreements pursuant to this Agreement or any other agreement, as the case may be, and with the Operational Requirements.

14.2 No Property Interest Created. This Agreement is a service contract and does not grant, and Customer shall not assert, any right, interest (including, without limitation, any leasehold or similar possessory right), or lien upon the property or assets of the Service Company, including the AfriStar Satellite, the AfriStar Related Equipment or any other satellite or related equipment that it may own.

14.3 Severability. Any provision of this Agreement that is prohibited or unenforceable in any jurisdiction shall, as to such jurisdiction, be ineffective to the extent of such prohibition or unenforceability without invalidating the remaining provisions hereof. Any such prohibition or unenforceability in any jurisdiction shall not invalidate or render unenforceable such provision in any other jurisdiction. To the extent permitted by Law, Customer hereby waives any provision of Law that renders any provisions hereof prohibited or unenforceable in any respect.

14.4 No Third Party Beneficiary. The provisions of this Agreement are for the benefit only of Customer and the Service Company, and no third party may seek to enforce or benefit from these provisions, except that both parties acknowledge and agree that (a) the non-interference requirements of Section 5.2 hereof are intended for the benefit of the Service Company, the Satellite Lessor, any customers of the Service Company or any Affiliate of the Service Company and (b) the indemnification provisions of Section 9.2 are intended for the benefit of any Indemnitee. The Service Company and Customer agree that any other customer of the Service Company or any Affiliate of the Service Company shall have the right, as a third-party beneficiary, to enforce the non-interference requirements against Customer directly in an action brought solely by such other customer, or may join with Satellite Lessor, the Service Company or any such Affiliate in bringing an action against Customer for violation of such non-interference requirements. The Service Company and Customer agree that any Indemnitee shall have the right, as a third-party beneficiary, to enforce the indemnification provisions of Section 9.2 against Customer directly in an action brought solely by such Indemnitee, or may join with Satellite Lessor, the Service Company or any other Indemnitee in bringing an action against Customer for violation of Section 9.2.

14.5 Non-Waiver Of Breach. Either party may specifically waive any breach of this Agreement by the other party, provided that no such waiver shall be binding or effective unless in writing and no such waiver shall constitute a continuing waiver of similar or other breaches. A waiving party may at any time, upon notice given in writing to the breaching party, direct

future compliance with the waived term or terms of this Agreement, in which event the breaching party shall comply as directed from such time forward.

14.6 Notices. All notices, demands, requests, or other communications given hereunder shall be in writing and shall be hand delivered, dispatched by overnight courier or mailed by first-class, registered or certified mail, return receipt requested, postage prepaid, or transmitted by confirmed telecopy, addressed as follows:

(a) If to the Service Company:

AfriSpace, Inc.
2400 N Street, N.W.
Ground Floor
Washington, D.C. 20037
Attention: Benno A. Ammann
Telephone No.: (202) 861-8899
Telecopier No.: (202) 861-1197

(b) If to Customer:

WorldSpace International Network Inc.
c/o HWR Services, Ltd.
J.R. O'Neal Building
Road Town, Tortola
British Virgin Islands
Attention: Adell Klein
Telephone No.: (284) 494-2233
Telecopier No.: (284) 494-4885

or such other address as the addressee may indicate by written notice to the other party in accordance with this Section 14.6.

Each such notice, demand, request, or communication shall be deemed given for all purposes at such time as it is delivered to the addressee (with the return receipt, the delivery receipt, or (with respect to a telecopy) the answerback being deemed conclusive, but not exclusive, evidence of such delivery) or at such time as delivery is refused by the addressee upon presentation.

14.7 Entire Agreement; Amendment. This Agreement constitutes the entire agreement between the parties with respect to the subject matter hereof and supersedes all prior agreements, commitments or understandings, both written and oral, with respect to such matters. No amendment, modification or discharge of this Agreement shall be valid or binding unless set forth in writing and duly executed by the party against whom enforcement of such amendment, modification, or discharge is sought.


14.8 Relationship of Parties. This Agreement is not intended to constitute or create a joint venture, pooling arrangement, partnership, agency or business organization of any kind. The Service Company and Customer are independent contractors for all purposes and neither party shall act as or hold itself out as agent for the other or create or attempt to create liabilities for the other party.

14.9 Headings. The headings in this Agreement are for convenience of reference only and shall not define or limit any of the terms of provisions hereof.

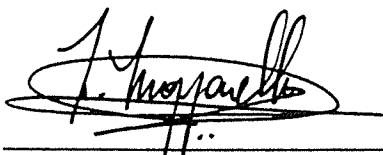
14.10 Counterparts. This Agreement and any amendment or supplement hereto may be executed by the parties in separate counterparts, none of which need contain the signatures of all parties, each of which when so executed and delivered shall be deemed to be an original, and all of which shall together constitute one and the same instrument.

IN WITNESS WHEREOF, the Service Company and Customer have cause this Agreement to be duly executed on their behalf by their officers thereunto duly authorized, all as of the date first written above.

AFRISPACE, INC.

By: 
Name: BENN C. AMMANN
Title: President

WORLDSPACE INTERNATIONAL NETWORK INC.

By: 
Name: Julio N. Mazzarella
Title: Treasurer and CFO

List of Appendices

- A. Payment Schedule**
- B. Service Specifications**
- C. Operational Requirements**

APPENDIX A

Payment Schedule

<u>Payment Due Dates</u>	<u>Fee Amount Payable*</u>
First Twelve Months	\$1,102,690
Next Twelve Months	\$1,654,034
Next Twelve Months	\$2,205,379
Months 37-114	\$2,756,724

* Subject to adjustment if the Satellite Lease rentals are adjusted on the In-Service Date (as defined therein).

APPENDIX B
Service Specifications

APPENDIX C

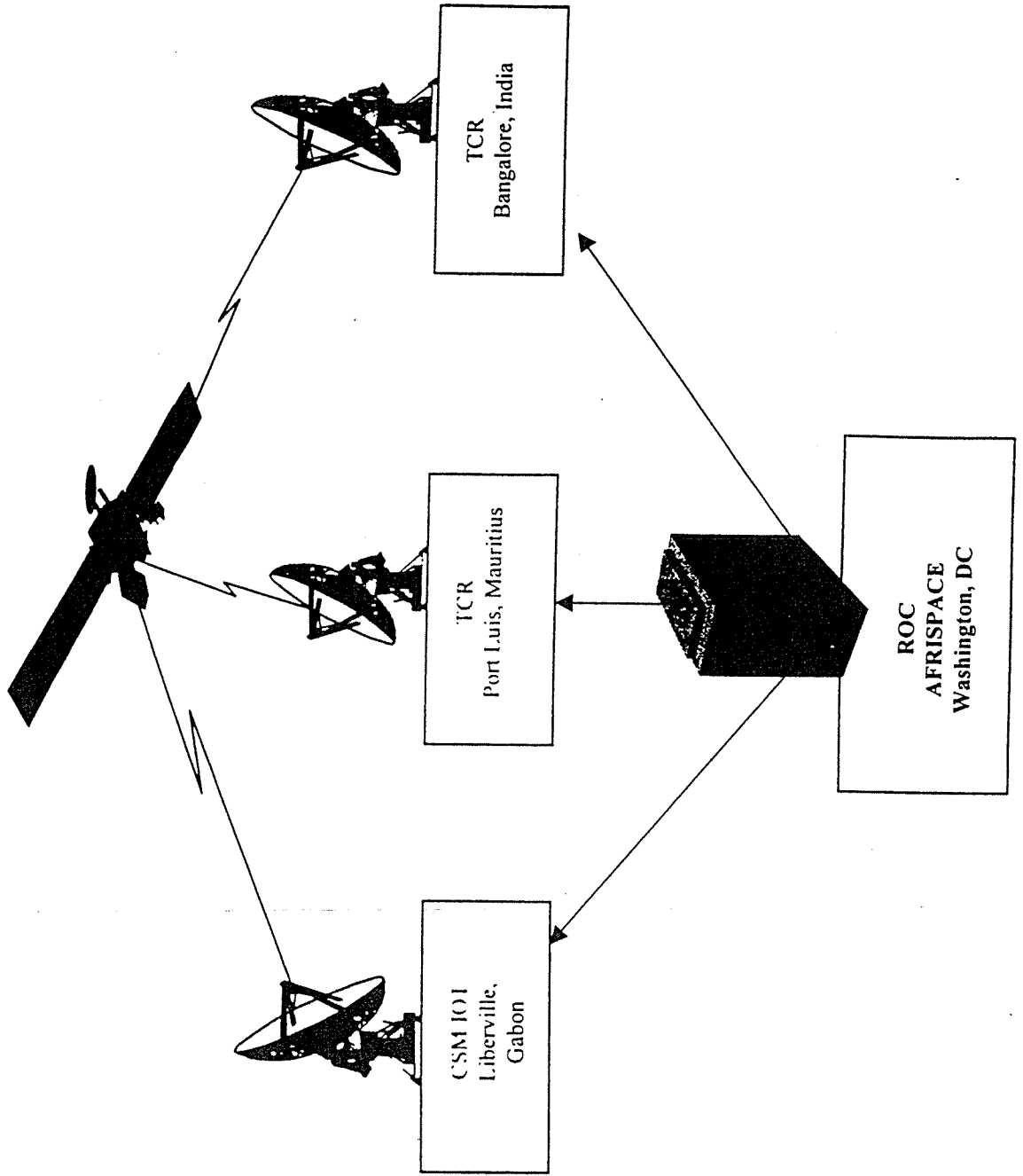
Operational Requirements

ATTACHMENT 9
AfriStar Schedule and Milestones

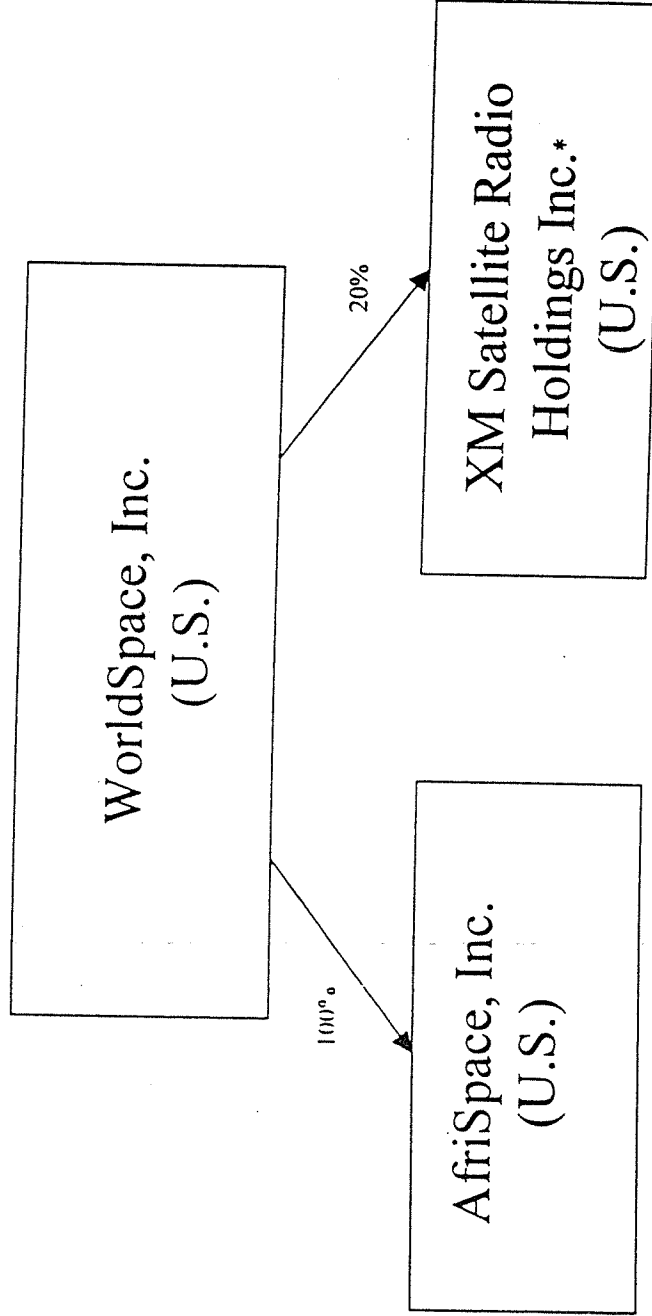
<u>Event</u>	<u>Completion Date</u>
Spacecraft RFP Issued	July 1994
Spacecraft Contractor Selected	December 1994
Spacecraft Contract Executed	January 1995
Spacecraft Construction Go-Ahead	October 1995
Launch Services Contractor Selected	March 1996
Spacecraft Construction Completed	July 1998
Spacecraft Delivery to Launch Site	September 1998
Spacecraft Launch	October 1998
Spacecraft on Station	November 1998
Commencement of Commercial Trials	Second quarter of 1999

Note: AfriSpace, a U.S. corporation, will lease the AfriStar satellite from WorldSpace Satellite Company, Ltd., a British Virgin Islands company. Prior to 1996, the milestones were achieved by WorldSpace, Inc.. After WorldSpace, Inc.'s 1996 sale, described in Part III. F. of this Amendment, which resulted in the transfer of most of WorldSpace, Inc. (excluding AfriSpace) to WIN, the milestones set forth above were, or will be, achieved by WIN's subsidiary, WorldSpace Satellite Company, Ltd.

Attachment 10
Diagram of AFRISat System



Attachment 11
Organizational Structure of WorldSpace, Inc. and AfriSpace, Inc.



*AMSC and WorldSpace, Inc. filed an application with the Commission on October 30, 1998 to transfer control of XM Satellite Radio Holdings Inc. (the parent company of XM Satellite Radio Inc.) to WorldSpace, Inc. At the time the transfer of control application was filed, it was anticipated that, if approved, WorldSpace, Inc.'s equity interest in XM Satellite Radio Holdings Inc. would increase to 81.7%. Recently, AMSC invested an additional \$21.4 million in XM Satellite Radio Holdings Inc. As a result of this investment, and after exercise of the options, WorldSpace, Inc.'s interest in XM Radio Satellite Holdings Inc. would amount to 72 percent.

ATTACHMENT 12
Background and Ownership Information Regarding
WorldSpace International Network Inc.

With regard to the financing of WIN, WorldSpace, Inc. understands that:

- The financing for WIN was provided by Mr. Mohammed Hussein Al Amoudi and Mr. Khalid bin Mahfouz, with funding from the National Commercial Bank of Saudi Arabia ("NCB").⁶⁶
- Messrs. Al Amoudi and bin Mahfouz are citizens of Saudi Arabia.⁶⁷
- The 1996 WorldSpace, Inc. sale to WIN and financing transactions resulted in 78% of WIN's equity being held by Grenadier Holdings Corp., a British Virgin Islands company formed for this purpose.
- Grenadier Holdings Corp. is owned of record by Mr. Al Amoudi.
- Mr. bin Mahfouz, or NCB, provided much of the capital which was invested in WIN and credited to Grenadier Holdings.
- WIN issued debt interests to Credit Suisse S.A., acting as fiduciary for Crystal Capital Ventures, Ltd. , a British Virgin Islands company formed for this purpose.

⁶⁶ NCB is Saudi Arabia's oldest and largest bank and handles over one quarter of Saudi Arabia's letter of credit (investment) business. NCB has invested in major infrastructure development and hundreds of other projects in Saudi Arabia, a country that is one of the United States' oldest and most reliable allies. The bank also has 245 branches in Saudi Arabia and relationships with 600 out-of-country banks in over 70 nations.

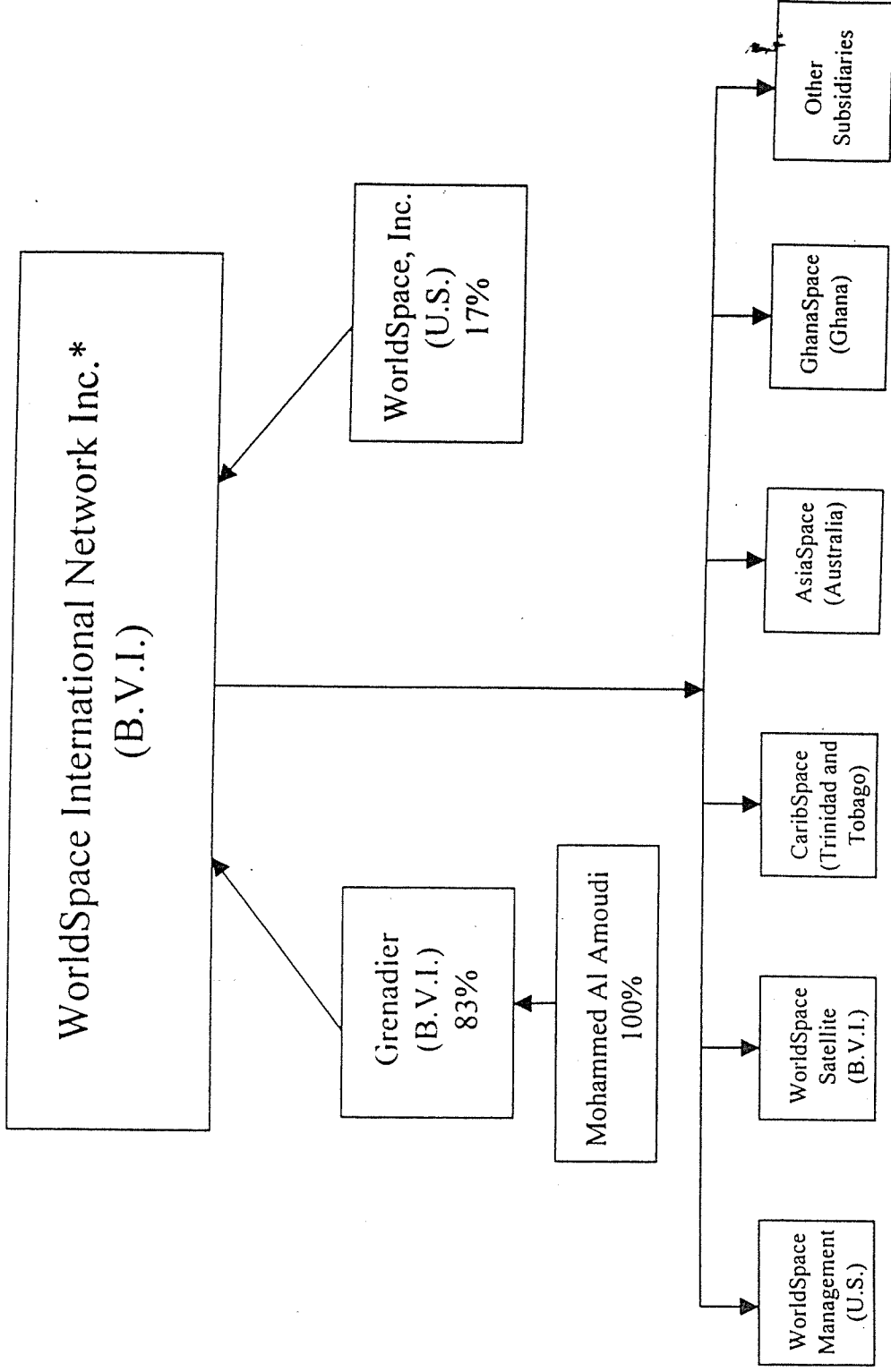
⁶⁷ From December 1996 to November 1998, Mr. Salah Idris, also a citizen of Saudi Arabia, was the owner of 6% of WIN through Industrial Development, Inc., a single-purpose investment vehicle organized under British Virgin Islands law. See, for example, article written by *Wall Street Journal* of October 28, 1998, referring to Mr. Idris. On November 20, 1998, Mr. Idris, at WIN's request, entered into an Exchange Agreement with WIN, whereby Mr. Idris relinquished his 6% share in WIN in return for a convertible promissory note. Such note is convertible, at the election of Mr. Idris or WIN, into the same number of WIN shares as Mr. Idris held prior to the Exchange Agreement, only upon a determination by the WIN Board of Directors that such conversion will not adversely affect the business, operations or prospects of WIN.

- The stock of Crystal Capital originally was owned of record by Mr. bin Mahfouz, but an October 1997 agreement provided for transfer of that stock to Mr. Al Amoudi.
- Mr. bin Mahfouz, or NCB, provided all of the funds which Credit Suisse S.A., on behalf of Crystal Capital, loaned to WIN.
- Since 1997, discussions have occurred from time to time on behalf of Messrs. Al Amoudi and bin Mahfouz to determine their respective allocation of interests and risks regarding their financial contributions to WIN. To WorldSpace, Inc.'s knowledge, these discussions have not been reduced to an agreement.

The following provides information on the investors.

- Mr. Al Amoudi, a Saudi Arabian business man, was born in Ethiopia. As head of the Al Amoudi Group, Mr. Al Amoudi's business interests range from construction and real estate investments to hotel and hospital administration. He has investments of approximately \$4 billion around the world, including substantial holdings in Ethiopia and Europe. A major investment is Midroc Industries, a hotel and construction firm that recently built the new Sheraton Hotel in Ethiopia. In less than five years, Mr. Al Amoudi has invested over \$500 million in Ethiopia alone. Mr. Al Amoudi also owns a controlling interest in Corral Petroleum Holdings ("Corral"), an oil refinery company with a global presence. Corral is the biggest Saudi private sector downstream operator overseas. It owns oil refining companies in Morocco and Lebanon, as well as Prem Petroleum AB ("Prem") in Sweden -- formerly the state-owned OK Petroleum AB -- the largest refiner and marketer of petroleum products in Scandinavia. Prem has exploration concessions in Europe and Africa. On October 1, 1997, Al Amoudi was honored at a luncheon jointly sponsored by the World Bank and the U.S. State Department for his private sector initiatives in Africa. In 1998, he was decorated by Swedish King Carl Gustav with an award for his involvement in various projects in Sweden.
- Mr. bin Mahfouz, a Saudi Arabian banking executive, was born in Yemen. Mr. bin Mahfouz's many investments include construction projects throughout the Middle East and Europe, and Nimir Petroleum, which operates in Yemen, Colombia, Azerbaijan, and Sakhalin Island. He is Chairman of Al-Murjan, a Saudi Arabian holding company, which will distribute Globalstar's mobile satellite services throughout eight Middle Eastern countries (*i.e.*, Bahrain, Jordan, Kuwait, Oman, Qatar, Syria, United Arab Emirates and Yemen). Mr. bin Mahfouz also is the Chairman and controlling shareholder of NCB.

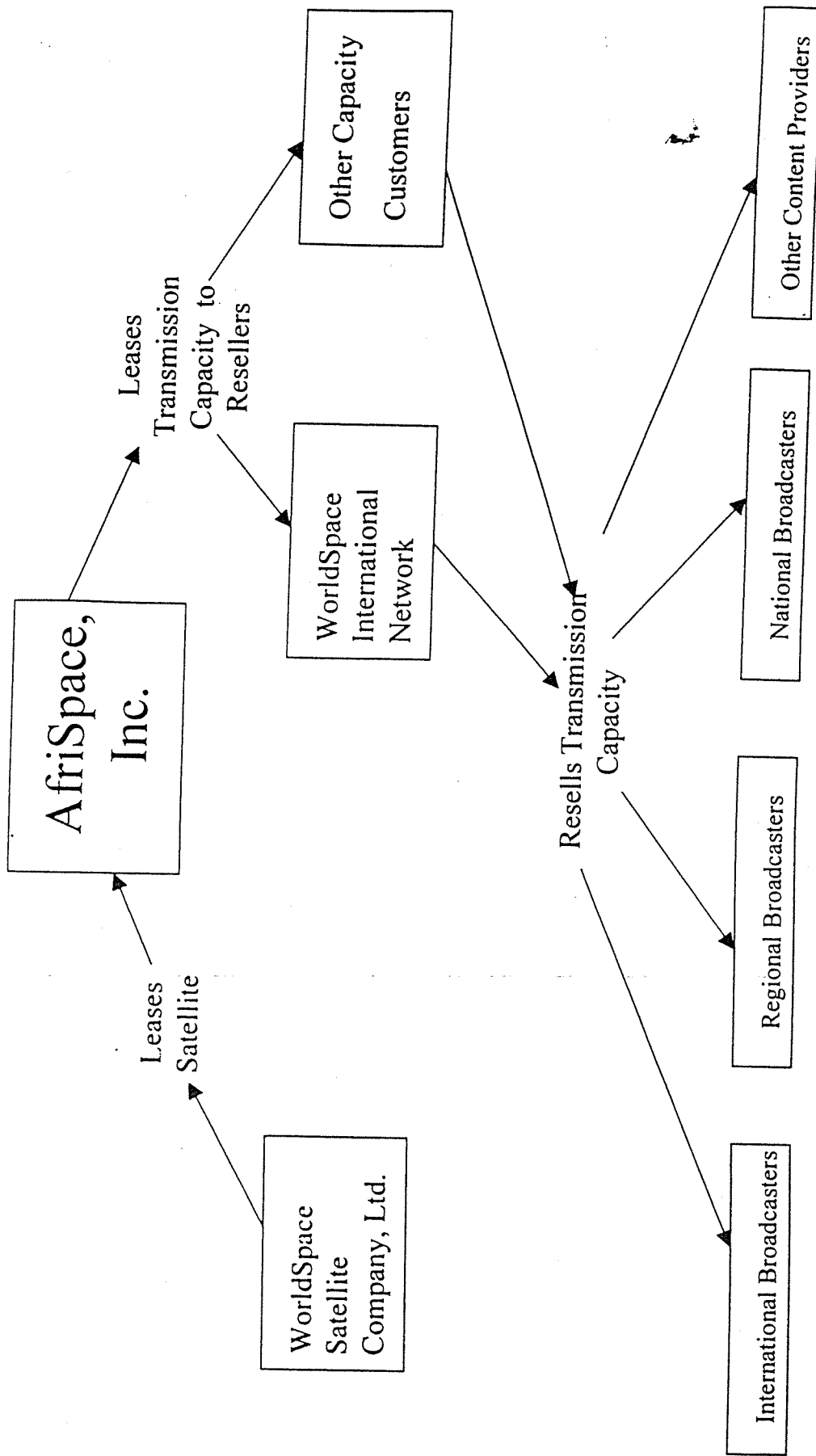
Attachment 13
Organizational Structure of WorldSpace International Network Inc.



* This only represents outstanding equity interests. Therefore, any other interests, which are held in the form of debt, options or convertible notes, are not reflected in the chart.

Attachment 14

Diagram of AfriSpace, Inc. Business



ARTICLES OF INCORPORATION

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'90 NOV 5 PM 3 21

WORLDSPACE, INC.

STATE DEPT. OF ASSESSMENTS & TAXATION

11/05/90

B:21Y

FIRST: The undersigned, Newton B. Fowler, III, whose post office address is 1800 Mercantile Bank and Trust Building, 2 Hopkins Plaza, Baltimore, Maryland 21201, being over eighteen years of age and acting as incorporator, hereby forms a Corporation under the Maryland General Corporation Law.

SECOND: The name of the corporation (which is hereinafter called the "Corporation") is:

WORLDSPACE, INC.

THIRD: The purposes for which the Corporation is formed is to carry on any and all business, transactions and activities permitted by the Maryland General Corporation Law which may be deemed desirable by the Board of Directors of the Corporation as well as all activities and things necessary and incidental thereto, to the full extent empowered by such laws.

FOURTH: The post office address of the principal office of the Corporation in this State is 100 Light Street, 6th Floor, Baltimore, Maryland 21202. The resident agent of the Corporation in this State is Joseph M. Roulhac, whose post office address is 100 Light Street, 6th Floor, Baltimore, Maryland 21202. Said resident agent is a citizen of the State of Maryland, and actually resides therein.

I.D. NO# D3112059
ACKN. NO. - 091C3040548
WORLDSPACE, INC.

091C3040548

NO. OF CERTIFIED COPIES - 1

STATE OF MARYLAND

I hereby certify that this is a true and complete copy of the page document on file in this office. DATED: 11-20-90

STATE DEPARTMENT OF ASSESSMENTS AND TAXATION

BY: Gerald C. Selby

This stamp replaces our previous certification system. Effective 10/84

