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BEFORE THE

Federal Communications Commission

WASHINGTON, D.C. 20554

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SEP 28 2001

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of	)	
	)	
Amendment of Parts 2 and 25 of the	)	
Commission's Rules to Allocate Spectrum For	)	RM- _____
Government and Non-Government Use in the	)	
Radionavigation-Satellite Service	)	

To: The Commission

PETITION FOR RULE MAKING

Lockheed Martin Corporation ("Lockheed Martin"), pursuant to Section 1.401 of the Commission's rules (47 C.F.R. § 1.401), hereby petitions the Commission to initiate a rulemaking to amend Section 2.106 of its rules to include the allocation of additional spectrum for the Radionavigation-Satellite Service ("RNSS"). In particular, Lockheed Martin seeks allocation to RNSS, both government and non-government, of the frequency band at 1164-1215 MHz that was made available worldwide by WRC-2000 in both the space-to-Earth and space-to-space directions, and the modification of the allocation at 1559-1610 MHz that is currently available for both government and non-government RNSS systems to permit use in the space-to-space direction.

I. BACKGROUND

A. The Current Status of the Air Traffic Control System

Earlier this year, the *Washington Post* carried an editorial expressing the view that it is "exhaustingly clear" to air travelers that the air traffic control system in the United States has been unable to keep up with the recent growth in the commercial aviation

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marketplace.[1] Since the U.S. airline industry was deregulated in 1978, daily departures have doubled, and the number of passengers has grown by 250 percent.[2] In 1999, U.S. airlines carried 694 million passengers.[3] Total airline passenger traffic in the Americas (domestic and international, scheduled and charter) increased by an average of 3.7% per year during the late 1980s, and 1990s.[4] It is not yet clear what impact the September 11, 2001 terrorist attacks on the United States using commercial aircraft will have on long-term future air traffic growth. While there is likely to be an extended period of reduced reliance on commercial air carriers, this impact is not likely to change the fundamental need for upgrade of existing air traffic systems.

Even if recent trends were to level off or decline in the coming years,[5] the need for modernization would still be acute. The traffic increases that have occurred during the past decade have already placed a significant strain on the aging air traffic management infrastructure, which has approached the point of saturation and gridlock. Demand has escalated faster than the general rate of economic growth.[6] As a result, delays have soared. In 1999, about twenty percent of all flights arrived late, with each delay averaging about 50 minutes.[7] In 2000,

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[1] Editorial, *Washington Post,* at A22 (February 2, 2001).

[2] Don Phillips, "International Traveler Update," *International Herald Tribune*, at 2 (January 31, 2001).

[3] *Id.*

[4] "The Americas' Air Passenger Traffic - 1985-2011," Air Transport Action Group, at 8 (1998).

[5] Prior to this year, air traffic was forecast to increase at an average annual rate of 3.8% over the next decade, reaching 1.4 billion passengers in 2011; nearly 4 million passengers were expected to travel by air every day to, from and within the Americas by 2011. Similar growth was anticipated in the Euro/Africa and Asia/Pacific regions. *Id.*

[6] FAA 1999 Terminal Area Forecast Report.

[7] Don Phillips, "International Traveler Update," *International Herald Tribune*, at 2 (January 31, 2001).

the length of the average delay increased to 55 minutes.[8] Airline passenger frustration has increased substantially along with these numbers.[9]

One element of this problem is the fact that the existing ground-based navigation system has inherent limitations in its geographic coverage. These constraints require pilots to fly structured routes, referred to as "highways-in-the-sky" that are not necessarily the most direct or fuel-efficient means of air travel from one point to another.[10] The routes assigned by the air traffic control ("ATC") system promote safe travel under the limitations of the present infrastructure, but travel times do not reflect the actual distance between the departure point and the destination or the speed capability of the aircraft.[11] Accordingly, there is an urgent need to update the system, safely reducing the separation between aircraft, and making the best use of available information to optimize traffic flow and improve controller productivity.

The Federal Aviation Administration ("FAA") has embarked on an extensive program to modernize the national airspace system. There is strong international support for this modernization effort, including movement from ground-based navigation systems to space-based systems. Several efforts are currently under way to augment the positioning information provided by the Global Positioning System ("GPS") and raise its level of performance to meet safety of life requirements. Among these efforts is the Wide Area Augmentation System

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[8] *Id.*

[9] Aviation Week & Space Technology, October 25, 1999.

[10] *See* U.S. Government Accounting Office, "National Airspace System: Persistent Problems in FAA's New Navigation System Highlight Need for Periodic Reevaluation, Report No. GAO/RCED/AIMD-00-130, at 6 (June 2000) ("GAO Report").

[11] Testimony of Deborah C. McElroy, President, Regional Airline Ass'n, Before the Subcommittee on Aviation, Committee on Transportation and Infrastructure, United States House of Representatives (June 29, 2000).

("WAAS"), which monitors the health and performance of the GPS system through a network of many ground stations and improves the accuracy by performing differential correction. The monitoring data collected on the ground is then embedded in a new GPS signal and broadcast to users over geostationary satellites. This service will provide precision approach with vertical guidance capability to virtually all runways in the U.S. It will also provide a common navigation base for all phases of flight and for all types of users.

In August 2000, the FAA approved the WAAS signal for applications not requiring the level of integrity necessary for critical flight safety operations, such as increasing situational awareness during flight under visual flight rules and on the ground.[12] The FAA has reaffirmed the WAAS architecture and technical viability through an independent review board comprised of the country's most knowledgeable specialists on satellite navigation. The panel concluded that WAAS will work better than the FAA had previously anticipated, and the system is a necessary cornerstone to make satellite navigation the primary means for guiding aircraft in the United States, allowing a cutback in the expensive system of ground-based navigation aids now used.[13] Ultimately, the system is expected to support navigation through all phases of flight, en route as well as non-precision and Category I precision landing approaches.

The goal of providing the enhanced signal accuracy, integrity, and availability, necessary to replace the current ground-based ATC system, is also being facilitated by changes in the accuracy and integrity of transmissions available from the GPS satellite network. In May 2000, the Department of Defense (DoD) ended the practice of intentionally degrading the GPS

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[12] *See* FAA Press Release, "Wide Area Augmentation System Signal Now Available," released August 24, 2000 (available at http://www.faa.gov/apa/pr/2000press/aug00.cfm).

[13] *See* "FAA Plans to Let Satellites Guide Small-Plane Landings," *Washington Post*, April 11, 2001.

signal available to non-military users.[14] This action improved the accuracy of the signal available for civilian use from about 100 meters from true position to 20 meters from true position.[15]

In addition, the 2000 World Radiocommunication Conference ("WRC-2000") produced several decisions expanding the spectrum available for RNSS and enhancing the utility of existing spectrum available for this service. First, the 1164-1215 MHz band ("L5 band"), which is part of a larger band available for the aeronautical radionavigation service ("ARNS"), was allocated to RNSS on a co-primary basis for both space-to-Earth and space-to-space transmissions.[16] The use of this new allocation is subject to the limitation that it may neither cause harmful interference to, nor claim protection from, ARNS.[17] However, as the ARNS is the only other service in this band, the additional allocation for RNSS should result in a higher level of integrity due to the reduced possibility of interference.

Second, WRC-2000 modified the RNSS allocation in the existing 1559-1610 MHz band ("L1 band") to permit space-to-space transmissions, and to phase out, effective January 1, 2005, a co-primary allocation in certain countries for the terrestrial Fixed Service (FS)

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[14] *See* GAO Report at 11.

[15] *Id.*

[16] *See* Final Acts of the World Radiocommunication Conference (Istanbul, 2000) at 18 ("WRC-2000 Final Acts").

[17] *See* WRC-2000 Final Acts, ITU Radio Regulation S5.328A. RNSS is also subject to the limitation that "aggregate power flux-density produced by all the space stations of all radionavigation-satellite systems at the Earth's surface shall not exceed the provisional value of –115 dB(W/m^2) in any 1 MHz band for all angles of arrival." *Id.* A resolution adopted by WRC-2000, Resolution 605 (WRC-2000), called for ITU study of the need for such an aggregate power limit and, if the need is found, for the appropriate value within a range of –115 dB (W/m^2) to –119 dB (W/m^2) in any 1 MHz band.

(with the FS remaining secondary until January 1, 2015).[18] Throughout this period, administrations are urged to protect the RNSS and ARNS in this band and not to authorize new frequency assignments for the fixed service. These steps should have the effect of enhancing the integrity of RNSS in this band, while offering added functionality as well.

Third, WRC-2000 made a pair of changes in the frequency range of the existing RNSS allocation at 1215-1260 MHz ("L2 band"). [19] WRC-2000 added the space-to-space direction to the RNSS allocation. WRC-2000 also extended the L2 range by adding new RNSS allocations (space-to-Earth and space-to-space) to the 1260-1300 MHz range. It also adopted a resolution calling for study as to whether power flux-density limits are needed across the 85 MHz range from 1215-1300 MHz. In the United States, the current allocation at L2 is limited to government systems, in the portion of the band used by GPS, and to Amateur services on a secondary basis in the 1240-1300 MHz band.[20]

Finally, WRC-2000 made a new allocation to RNSS in the 5 GHz range. This allocation, based on a European proposal to the Conference, is subject to a series of power limitations to protect services in the same and adjacent bands.

B. Lockheed Martin's Interest in the Development of RNSS

Lockheed Martin Corporation is one of the world's largest diversified defense, aerospace and advanced technology companies, and is a leader in the design, development, engineering, and production of spacecraft, launch vehicles, and both terrestrial and space

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[18] *See* WRC-2000 Final Acts, ITU Radio Regulations S5.355A and S5.359A. There is also a co-primary allocation to the ARNS in the 1559-1610 MHz band.

[19] In the original L2 frequency band, 1215-1260 MHz (of which 1215-1240 MHz is used for GPS and 1240-1260 MHz is used by the Russian Federation's Global Navigation Satellite System ("GLONASS")),

[20] *See* 47 C.F.R. § 2.106

communications systems. The company has been involved in GPS from the earliest stages of the system concept. Lockheed Martin has manufactured twenty-one GPS IIR satellites, six of which are now in orbit and on station. Fourteen GPS IIR spacecraft are scheduled for launch over the next several years, and will provide upgraded navigational capability for government, commercial and private users. The company is also responsible for launch and flight operations support of the GPS IIR, including development of constellation management software and other mission critical elements of the system.[21]

Lockheed Martin currently provides the geostationary component of the WAAS broadcast services under contract to the FAA (DTAF01-97-C-00008). The contract services provided include operating and maintaining four ground earth stations and leasing services from two INMARSAT satellites (Atlantic Ocean Region-West and Pacific Ocean Region) that carry GPS L1 frequency transponders. These facilities have been broadcasting the WAAS signal since September 1998. The service currently in operation has been used to demonstrate the capabilities of WAAS. These facilities will need to be replenished and expanded to support the WAAS full operational capability requirement. The FAA will also need mission primacy, guaranteed replenishment, and multi-frequency processed payloads to meet the safety-of-life, availability, and continuity-of-service requirements. This requires the deployment of dedicated, well-placed satellites to provide sufficient coverage over the entire FAA flight information region.

At the request of the U.S. Congress, the FAA prepared a Satellite Navigation investment analysis report, which was completed in September 1999. The analysis concluded

[21] Other recent Lockheed Martin satellite communications programs include NASA's Advanced Communications Technology Satellite ("ACTS"), as well as spacecraft missions for INTELSAT, Inmarsat, EchoStar Communications Corporation, the U.S. Department of Defense, and others.

that WAAS was cost effective and that the FAA should lease the services under a performance-based service contract, as they are currently doing, rather than buying and operating satellites of its own. Consequently, to support the FAA's preferred acquisition approach, it will be necessary for a commercial operator to obtain a license to build and deploy GPS augmentation broadcast satellites.

In April 1999, Lockheed Martin sought authority from the FCC to launch and operate such a global augmentation system, which will be fully compatible with GPS and its other augmentations, including WAAS in North America.[22] Filed under the working name Regional Positioning System ("RPS"), Lockheed Martin's system will provide RNSS from six orbital locations, co-locating up to two spacecraft at each orbital slot, and operating in both the L-band and C-band. RPS will provide accurate navigation with high integrity, accuracy and availability to aviation and other users both domestically and globally.

In its application, Lockheed Martin proposed to operate RPS in the L-band spectrum currently allocated to RNSS. Specifically, it requested authorization for downlinks in the L1 band and the L2 band (1215-1240 MHz). Recognizing that the L2 band is restricted to government use, Lockheed Martin requested a waiver of the government-only limitation on this spectrum contained in Part 2 of the Commission's rules. It also sought authority to use the L5 band that were then under discussion, pending finalization of the signal structure.[23]

In June 2000, the United States filed Advance Publication information covering the orbital locations and frequency assignments for the spacecraft of the RPS system with the

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[22] *See* Applications of Lockheed Martin Corporation, FCC File Nos. SAT-LOA-19990427-00045 thru – 00050 (filed April 27, 1999) ("RPS Application").

[23] *See* RPS Application at 35-36.

ITU – thereby establishing a deadline under ITU regulations of June 2005 for bringing the frequency assignments into use.[24]

Unless a decision is made to include a new civil signal in the L2 band on a timetable consistent with the authorization and implementation of RPS, Lockheed Martin does not anticipate that the L2 band would be included on RPS.[25] With regard, however, to the international agreement on use of the L5 band that was reached at WRC-2000, there is now spectrum available on a global basis at L5 for the regional GPS augmentation system that Lockheed Martin has proposed.

Lockheed Martin intends that RPS will be the geostationary component of the global navigation satellite system ("GNSS"), and will satisfy all of the requirements for GNSS that are currently under development through the International Civil Aviation Organization ("ICAO").[26] Consistent with the requirements of the ITU Radio Regulations, RPS will be fully compatible with GPS, its augmentations, and all other elements of the GNSS, causing no harmful interference to the vital operations of these systems. Moreover, in anticipation of the ongoing improvements in global navigation standards, RPS will provide various capabilities extending beyond those needed for WAAS. With the inclusion of RPS, the GNSS system will thus be able

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[24] Under ITU regulations, this deadline can be extended to June 2007 if a "due diligence" filing is made before 2005 and an acceptable reason for an additional two-year implementation period is proffered.

[25] If, however, a decision is made to include a second civil signal on L2 in the modernization program for GPS as early as this Fall, which is a possibility, Lockheed Martin would indeed seek to modify its ITU filings to add the newly allocated spectrum and continue to pursue authority to operate in that band as specified in its application.

[26] The GNSS is comprised of GPS, the Russian Federation's GLONASS, and various ground-based augmentation systems, such as the FAA's WAAS in North America, the European Geostationary Navigation Overlay System ("EGNOS"), and the Japanese MTSAT Satellite Augmentation System ("MSAS").

to provide the navigation accuracy, availability, and integrity capabilities needed for civil en route navigation through, and including, Category I precision approach landings.

The RPS navigation signal will be similar to the GPS signal, but will include an augmentation message instead of the navigation message contained in the GPS signal.[27] Advanced avionics installed in civil and commercial aircraft will receive transmissions from both RPS and GPS satellites and compute accurate position, velocity and time parameters for use in aircraft navigation. Specifically, by using the information from the RPS augmentation message (ionospheric data, differential correction, and integrity information), including data from regional augmentation systems such as WAAS, the user will be able to ensure that in-tolerance navigation data is being received. The augmentation data from the RPS satellites will thus allow airborne users to compute positional accuracy to within 7.6 meters (horizontal and vertical), which the FAA has determined is the required standard to provide sufficient accuracy, availability and integrity to support flight navigation, en route through precision approach.

Terrestrial users will also be able to use RPS transmissions for new applications such as automated farming and mining operations, automobile navigation, automated traffic management, and enhanced maritime navigation, etc. Additional services could be offered by integrating a user's positional information with a user generated communications message for remote tracking, theft prevention/recovery, and search & rescue.

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[27] *See* RPS Application at 45-47.

II. REQUESTED ACTION

A. The Commission Should Promptly Allocate the 1164-1215 MHz Spectrum (L5 Band) Made Available At WRC-2000 For Both Government and Non-Government RNSS Operations (Space-to-Earth) on a Co-Primary Basis.

As detailed above, the aging of the current air traffic control system and the long-term growth of airline passenger traffic have together produced an urgent need for an upgrade in the air navigation infrastructure. The additional allocations made at WRC-2000 for RNSS provide a significant first step toward facilitating this upgrade. And Lockheed Martin has already filed an application with the Commission that promises to implement a new service that is made possible by these allocation changes.

In order to facilitate U.S. licensing of an RNSS system to operate in this band however, Lockheed Martin urges the Commission to implement domestically the frequency allocations adopted at WRC-2000. Such Commission action is the appropriate culmination of the efforts by the U.S. at WRC-2000 to secure this spectrum for RNSS. As discussed more fully below, domestic implementation of these new and revised allocations will promote improvement of the air traffic control system and thereby promote air safety.

As the Commission is aware, the National Telecommunications and Information Administration ("NTIA") sent a letter, in July 2001, to the Commission urging that several actions from WRC-2000, including actions regarding RNSS, be incorporated into the Commission's Table of Frequency Allocations.[28] In this letter, NTIA, noting that the U.S. intends only to use the 1164-1188 MHz portion of the L5 band for RNSS at this time, asks the Commission to adopt a footnote in the U.S. Table of Frequency Allocations that includes only

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[28] *See* Letter dated July 18, 2001, from William T. Hatch, Associate Administrator, NTIA, to Bruce Franca, Acting Chief, Office of Engineering and Technology, FCC, at 1 and Attachment 1 ("NTIA Letter").

the lower 24 MHz of the L5 band that was allocated at WRC-2000.[29] It seeks to defer consideration of RNSS in the remainder of the L5 band (1188-1215 MHz). Moreover, where the Radio Regulation No. S5.328A added by WRC-2000 included a provisional aggregate power flux-density (pfd) limit on RNSS space-to-Earth systems to protect co-frequency ARNS systems, NTIA concludes that "if a pfd limit needs to be imposed domestically, it would be preferable to add it in Chapter 8 of the NTIA Manual and in the FCC Service Rules, rather than in an allocation footnote. Therefore, we have determined that the RNSS allocation without a pfd is the appropriate approach."[30]

Lockheed Martin wishes to make clear that its expectation is that, as an augmentation of GPS in its present and future incarnations, RPS will use only the frequency bands that GPS will use. Thus, it would expect that operationally, it too would be limited to use of the 1164-1188 MHz band. Nevertheless, Lockheed Martin is of the view that it may be more expedient for the Commission to proceed today with a modification of its Table of Frequency Allocations to specify the entire 1164-1215 MHz band allocation by WRC-2000. The technical definition of RNSS at L5 are concluding, and GPS modernization plans are complicated by potential impacts of the proposal of a European-backed RNSS initiative called Galileo to use spectrum in the same frequency range. If the Commission were to allocate the entire band, and address authorization questions in individual licensing proceedings, it would retain the maximum flexibility to adapt rapidly and fully to potential changes in the GPS modernization plans. Thus, while Lockheed Martin recognizes the intent of the NTIA Letter, and is in agreement that the suggestion is fully in accord with current GPS planning, it believes that it would be preferable

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[29] *Id.* at Attachment 1, p. 1.

[30] *Id.*

for the Commission to conform its allocation table to reflect the full L5 international allocation made by WRC-2000.

Lockheed Martin concurs in full with NTIA's proposal not to include a pfd limit in the Table of Frequency Allocations at this time. The limit adopted by WRC-2000 is a provisional aggregate limit, and studies in the ITU since WRC-2000 have shown that there are significant technical and regulatory questions about the ability of an aggregate power flux-density limit to adequately protect ARNS receivers from interference. To be sure, Lockheed Martin's concurrence with NTIA's proposal is in no way a retreat from the needs of RNSS. Quite to the contrary, Lockheed Martin believes that protection of ARNS receivers from RNSS space-to-Earth transmissions in this band is imperative, and Lockheed Martin is actively involved in the ongoing ITU-R studies that are seeking the appropriate means of ensuring that such protection is provided. [31]

Accordingly, the Commission should promptly incorporate the changes adopted at WRC-2000 in Parts 2 and 25 of its rules. Specifically, Section 2.106 of the Commission's rules should be modified to include the additional allocation for RNSS at 1164-1215 MHz provided by RR Footnote S5.328A (as modified by proposed U.S. footnote USL5), and should be made available for both government and non-government users. Complete details of the changes requested by Lockheed Martin are attached hereto as Attachment 1.

The Commission should also make a corresponding change to Section 25.202(a) of its rules, to add a subsection identifying the spectrum available for RNSS. This provision can

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[31] Lockheed Martin observes, in this regard, that the language of RR S5.328A that RNSS systems shall not cause harmful interference to, or claim protection from, ARNS stations remains in the footnote proposed by NTIA. *See id.* at Attachment 1, p.4.

be added as subsection (7). A specific proposal for language to be added to Section 25.202(a) is attached hereto as Attachment 2.

B. The Commission Should Permit Both The L5 Band at 1164-1215 MHz and the Existing RNSS Allocation at 1559-1610 MHz (L1 Band) To Be Used For Space-to-Space Transmissions.

In addition to making the new L5 band spectrum available for space-to-Earth transmissions, WRC-2000 made both the L5 spectrum and the L1 band at 1559-1610 MHz available for transmissions in the space-to-space direction.[32] This allocation came largely as a result of the efforts of the U.S. Government, spurred by the National Aeronautics and Space Administration ("NASA"), to secure interference protection for space-to-space transmissions in the spectrum used by GPS.

Although GPS was initially used only for terrestrial and aviation purposes, beginning in the early 1990s, GPS receivers were flown onboard spacecraft for such applications as spacecraft navigation, attitude control, time synchronization, orbit determination, and atmospheric profiling. GPS has also been used, or is planned to be used, onboard the U.S. space shuttles, the International Space Station, the International Space Station Emergency Crew Return Vehicle, and many commercial satellite systems. Without a specific allocation for space-to-space transmissions in the ITU's Radio Regulations, however, there has been no interference protection for the space-based uses.

Lockheed Martin urges the Commission to incorporate this primary allocation for space-to-space transmissions in the domestic tables in addition to the space-to-Earth

[32] *See* Final Acts of WRC-2000 (Istanbul) at 18 (RR No. S5.328A) and 20 (Art. S5).

designations.[33] Just as space-based users have been able to make use of GPS transmissions, they would also be able to utilize the signals of GPS augmentations that will provide even greater accuracy and integrity for GNSS. Because of the many applications that can be offered using this spectrum, the Commission should explicitly adopt the interference protections that inclusion in the Table of Frequency Allocations affords.

C. Public Interest Considerations Support Allocation Of The L1 And L5 Spectrum For RNSS On An Expedited Basis.

Adoption of each of the new and modified spectrum allocations discussed above will foster improved aviation flight safety and promote continued U.S. leadership in the satellite-based radionavigation and positioning equipment markets. Non-government use will necessarily be fully compatible with, and complementary to, the current GPS service and its augmentations, such as the FAA's WAAS. Most importantly, it will enable the private sector to assume a greater role in the ongoing modernization of the U.S. air traffic management system, which is critical to maintaining safe operations.

The market for private service providers using RNSS spectrum is expected to be substantial, including two broad classes of users – (1) the commercial and general aviation communities, and (2) terrestrial end-users. Within these broad groups, Lockheed Martin expects

[33] These proposed changes are included in Attachment 1. Lockheed Martin concurs with NTIA's suggestion not to include the unnecessary provisions of Radio Regulation S5.329A in the domestic table of frequency allocation. *See NTIA Letter* at Attachment 1, p.2. In addition, and despite the fact that the ability of Lockheed Martin ultimately to include spectrum in L2 remains uncertain for reasons discussed above, Lockheed Martin supports NTIA's suggestion that the space-to-space allocation for RNSS at 1215-1240 MHz agreed at WRC-2000 be included in the Table of Frequency Allocations. *See id.* For now, and unless GPS modernization plans change, the allocation should be for Federal Government use only. Unlike the case with the L5 allocation discussion in Section II.A above, however, Lockheed Martin believes it to be acceptable to limit the allocation to the GPS portion of the L2 band for the reason that L2 is already in use by RNSS systems and with 400 MHz of new RNSS spectrum added by WRC-2000 in the 1260-1300 MHz band, there is much less uncertainty as to where systems (including the proposed Galileo system) will operate in the L2 range.

that users will include both those that have already adopted GPS technology, and those that will do so when improved accuracy and/or signal availability are provided. Many administrations currently have plans to include adoption of GPS augmentation systems as part of their long-range airspace navigation modernization. Private RNSS systems, such as Lockheed Martin's proposed RPS, will help meet these requirements.

In non-aviation areas of radionavigation, non-government operators will be able to increase the reliability of GPS for other safety uses. GPS is currently relied upon directly by millions of users worldwide in a wide variety of civil safety-related applications, and is indirectly relied upon by hundreds of millions of people around the world. Free access to the GPS satellite navigation data has led to the creation of new industries that produce and deploy small, mobile GPS receivers for numerous terrestrial applications. Non-government access to new RNSS spectrum will promote future growth in this industry by permitting private companies to offer services that make available more accurate navigation data, and thereby enable numerous new and improved terrestrial applications.

The Commission, however, must not delay in taking action so that these promised benefits may be achieved. Time is already growing short to realize timely implementation of the GPS augmentation system that Lockheed Martin has proposed. As noted above, the United States submitted Advance Publication Information (API) for RPS to the ITU last June. As a result, the clock is already ticking on compliance with the ITU's strengthened due diligence requirements.

III. CONCLUSION

For all of the foregoing reasons, Lockheed Martin urges the Commission to proceed quickly to allocate spectrum at 1164-1215 MHz for the RNSS, and to modify the current allocations at 1559-1610 MHz and 1215-1240 MHz to add the space-to-space direction.

Respectfully submitted,

LOCKHEED MARTIN CORPORATION

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September 28, 2001

960 – 1350 MHz					
International Table			United States Table		FCC Rule Part(s)
Region 1	Region 2	Region 3	Federal Government	Non-Federal Government	
960-1215 AERONAUTICAL RADIONAVIGATION S5.328 **S5.328A**			960-1215 AERONAUTICAL RADIO-NAVIGATION S5.328 **USL5** US224	960-1215 AERONAUTICAL RADIO-NAVIGATION S5.328 **USL5** US224	AVIATION (87)
1 215-1 240 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) **(space-to-space)** S5.329 **S5.329A** SPACE RESEARCH (active) S5.330 S5.331 S5.332			1215-1240 RADIOLOCATION S5.333 G56 RADIONAVIGATION-SATELLITE (space-to-Earth) **(space-to-space)**	1215-1240 S5.333	
1 240-1 260 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) **(space-to-space)** S5.329 **S5.329A** SPACE RESEARCH (active) Amateur S5.330 S5.331 S5.332 S5.334 S5.335 **S5.335A**			1240-1300 RADIOLOCATION S5.333 G56	1240-1300 Amateur	Amateur (97)
1 260-1 300 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION RADIONAVIGATION-SATELLITE (space-to-Earth) **(space-to-space)** S5.329 **S5.329A** SPACE RESEARCH (active) Amateur S5.282 S5.330 S5.331 S5.333 S5.334 S5.335 **S5.335A**			S5.334	S5.282 S5.333 S5.334	
1300-1350 AERONAUTICAL RADIONAVIGATION S5.337 RADIOLOCATION **RADIONAVIGATION-SATELLITE (Earth-to-space)** S5.149 **S5.337A**			1300-1350 AERONAUTICAL RADIONAVIGATION S5.337 Radiolocation G2 S5.149	1300-1350 AERONAUTICAL RADIONAVIGATION S5.337 S5.149	Aviation (87)

Attachment 1
Proposed Changes to Part 2 of the Commission's Rules

The changes set forth below are proposed for Part 2 of the Commission's Rules. In the Tables, modifications from the current rules are indicated by **bold text with double underlining**. The proposals below do not include the text of modifications and additions to the International Footnotes adopted at the 2000 World Radiocommunication Conference (Istanbul, 2000) that do not impact the specific bands that are covered by the foregoing rulemaking proposal, although all new international footnote numbers are indicated in the Tables.

PART 2 -- FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

4. Section 2.106, the Table of Frequency Allocations, is amended as follows:

a. In the list of International Footnotes, footnotes S5.328 and S5.329 are revised, and new footnotes S5.328A, S5.329A, S5.355A, and S5.359A are added to conform to changes adopted at the World Radiocommunication Conference (Istanbul, 2000) ("WRC-2000").

The following International Footnotes are also incorporated into the United States Table to implement domestically the allocations made at WRC-2000: S5.328A and S5.329A

The revisions and additions read as follows:

§ 2.106 Table of Frequency Allocations

[See next page.]

MOD

1559 – 1610 MHz					
International Table			United States Table		FCC Rule Part(s)
Region 1	Region 2	Region 3	Federal Government	Non-Federal Government	
1 559-1 610 AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) **(space-to-space) S5.329A** S5.341 **S5.355A** **S5.359A** S5.363			1559-1610 AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) **(space-to-space)** S5.341 US208 US260	1559-1610 AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) **(space-to-space)** S5.341 US208 US260	AVIATION (87)

MOD

S5.328 The use of the band 960-1 215 MHz by the aeronautical radionavigation service is reserved on a worldwide basis for the operation and development of airborne electronic aids to air navigation and any directly associated ground-based facilities.

ADD

S5.328A *Additional allocation:* the band 1 164-1 215 MHz is also allocated to the radionavigation-satellite service (space-to-Earth) (space-to-space) on a primary basis. The aggregate power flux-density produced by all the space stations of all radionavigation-satellite systems at the Earth's surface shall not exceed the provisional value of -115 dB(W/m^2) in any 1 MHz band for all angles of arrival. Stations in the radionavigation-satellite service shall not cause harmful interference to, nor claim protection from, stations of the aeronautical-radionavigation service. The provisions of Resolution **[COM5/19] (WRC-2000)** apply.

ADD

S5.329A Use of systems in the radionavigation-satellite service (space-to-space) operating in the bands 1 215-1 300 MHz and 1 559-1 610 MHz is not intended to provide safety service applications, and shall not impose any additional constraints on other systems or services operating in accordance with the Table of Frequency Allocations.

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ADD

S5.355A *Additional allocation:* in Bahrain, Bangladesh, Congo, Egypt, Eritrea, Iraq, Israel, Jordan, Kuwait, Lebanon, Malta, Morocco, Qatar, Syria, Somalia, Sudan, Chad, Togo and Yemen, the band 1 559-1 610 MHz is also allocated to the fixed service on a secondary basis until 1 January 2015, at which time this allocation shall no longer be valid. Administrations are urged to take all practicable steps to protect the radionavigation-satellite service and not authorize new frequency assignments to fixed-service systems in this band.

ADD

S5.359A *Additional allocation:* The band 1 559-1 610 MHz is also allocated to the fixed service on a primary basis until 1 January 2005 in Germany, Armenia, Azerbaijan, Belarus, Benin, Bosnia and Herzegovina, Bulgaria, Spain, France, Gabon, Georgia, Greece, Guinea, Guinea-Bissau, Hungary, Kazakstan, Latvia, Lithuania, Moldova, Mongolia, Nigeria, Uganda, Uzbekistan, Pakistan, Poland, Kyrgyzstan, the Dem. People's Rep. of Korea, Romania, the Russian Federation, Senegal, Swaziland, Tajikistan, Tanzania, Turkmenistan and Ukraine, and until 1 January 2010 in Saudi Arabia, Cameroon, Jordan, Kuwait, Lebanon, Libya, Mali, Morocco, Mauritania, Syria and Tunisia. After these dates, the fixed service may continue to operate on a secondary basis until 1 January 2015, at which time this allocation shall no longer be valid. Administrations are urged to take all practicable steps to protect the radionavigation-satellite service and the aeronautical radionavigation service and not authorize new frequency assignments to fixed-service systems in this band.

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ADD

USL5 *Additional allocation:* the band 1 164-1 215 MHz is also allocated to the radionavigation-satellite service (space-to-Earth) (space-to-space) on a primary basis. Stations in the radionavigation-satellite service shall not cause harmful interference to, nor claim protection from, stations of the aeronautical-radionavigation service.

Attachment 2
Proposed Changes to Part 25 of the Commission's Rules

The changes set forth below are proposed for Part 25 of the Commission's Rules.

PART 25 – SATELLITE COMMUNICATIONS

Section 25.202(a) is amended by adding the following subsection (7):

The following spectrum is available for use by the radionavigation-satellite service:

1164-1215 MHz (space-to-Earth) (space-to-space)
1559-1610 MHz (space-to-Earth) (space-to-space)