Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
PanAmSat Licensee Corporation	)	
	)	File Nos. SAT-LOA-20011221-00134
For Authority to Launch and Operate	)	SAT-WAV-20020322-00031
A Replacement Ku-band	)	
Fixed Satellite Service Space Station	)	
	)	
	)	

ORDER AND AUTHORIZATION

Adopted: May 7, 2002 **Released: May 8, 2002**

By the Chief, Satellite Division:

I. INTRODUCTION

1. By this Order, we grant PanAmSat Licensee Corporation (PanAmSat) authority to launch and operate a satellite in the Fixed-Satellite Service (FSS) in the Ku-band[1] to replace its Galaxy VIII(I) satellite, experiencing subsystem failures, located at the 95° W.L. orbit location. We also grant PanAmSat's request for a waiver of Section 25.210(e) of the Commission's rules and allow PanAmSat to use circularly polarized transponders on its replacement satellite. By this action, we enable PanAmSat to ensure continuation of service to the public and increased service reliability.

II. BACKGROUND

2. PanAmSat is authorized to operate a global network of over 20 communications satellites. With this system, PanAmSat provides the means for commercial television and radio distribution, teleconferencing, video backhaul, high speed image transmission and private data networks, among other services. In 1997, the International Bureau, Satellite and Radiocommunication Division, authorized the launch and operation of PanAmSat's Galaxy VIII(I) satellite to provide affordable international communications in the 11.45-11.7 and 13.75-14.0 GHz bands between and among the United States and Mexico, the Caribbean, Central America and South America to a wide range of

[1] The "conventional" Ku-band frequencies refer to 11.7-12.2 GHz (space-to Earth) and 14.0-14.5 GHz bands (Earth-to-Space). The conventional band is allocated to the Fixed Satellite Service on a primary basis. 47 C.F.R. § 2.106. The "extended" Ku-band herein refers to the 11.45-11.7 GHz and 13.75-14.0 GHz. The 13.75-14.0 GHz band is shared between the fixed-satellite service and the government radiolocation service on a co-primary basis. Galaxy VIII(I) is authorized to operate in the conventional and extended Ku-bands. PanAmSat proposes to operate Galaxy VIII(I)-R in these bands as well.

commercial and residential users.[2] PanAmSat was also authorized to use the 11.7-11.95 GHz band on Galaxy VIII(I) for service to Latin America.[3]

3. PanAmSat requests authority to launch and operate a Ku-band satellite, Galaxy VIII(I)-R, to replace the Galaxy VIII(I) satellite. PanAmSat proposes to locate Galaxy VIII(I)-R at the 95° W.L. orbit location, which is the orbit location assigned to Galaxy VIII(I).[4] Galaxy VIII(I)-R will receive communications in the 13.75-14.0 GHz band and transmit in the 11.45-11.7 GHz and 11.7-11.95 GHz bands.[5] PanAmSat states that Galaxy VIII(I)-R will be a general purpose communications satellite, designed to support the variety of services offered within PanAmSat's satellite system. Depending on user needs, the transponders on Galaxy VIII(I)-R can accommodate television, radio, voice or data communications. PanAmSat requests that this application be processed outside of the context of a processing round.[6] PanAmSat states that the spacecraft will be launched in the third quarter of 2002.[7] We placed this application on public notice on January 11, 2002.[8] No comments or oppositions were filed in response to the notice.

III. DISCUSSION

4. Given the enormous costs of building and operating satellite space stations, the Commission has stated that there should be some assurance that operators will be able to continue to serve their customers.[9] The Commission has therefore stated that, when the orbit location remains available for a U.S. satellite with the technical characteristics similar to the proposed replacement satellite, it will generally authorize the replacement satellite at the same location.[10] The Commission also acts on applications for replacement satellites as they are filed, without consolidating them into a processing group.[11]

5. All applicants must demonstrate technical, legal and financial qualifications to hold a space station license.[12] PanAmSat's legal and technical qualifications are evidenced by its well

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[2] PanAmSat Corporation, for Authority to Launch and Operate the Galaxy VIII(I) Fixed Communications Satellite, *Order and Authorization*, 12 FCC Rcd 20345 (Int'l Bur., SRD 1997) (*PanAmSat Order*).

[3] *PanAmSat Order,* 12 FCC Rcd at 20348.

[4] PanAmSat Licensee Corp., Application for Authority to Launch and Operate a Replacement Ku-band Fixed-Satellite Service Space Station, File No. SAT-LOA-20011221-00134 (Filed Dec. 21, 2001) (*PanAmSat Application*).

[5] PanAmSat intends to reuse both the uplink and downlink band assignments. By employing frequency reuse with its service uplink spectrum, the North American and South American beams will each have a capacity equivalent of 500 megahertz or a total bandwidth of 1000 megahertz. Similarly, PanAmSat intends to reuse the downlink band assignment for a total bandwidth of 1000 megahertz *PanAmSat Application*, Exhibit 1a at 3.

[6] *PanAmSat Application* at 1.

[7] *PanAmSat Application*, Exhibit 1.

[8] Satellite Policy Branch, Report No. SAT-00098 (Jan. 11, 2002).

[9] GE Americom Commuications, Inc., For Authority to Construct and Launch its GE-2 Replacement Satellite and to operate it at 85° W.L., 10 FCC Rcd 13775 (Int'l Bur. 1995) (citations omited).

[10] Columbia Communications Corporation, Authorization to Launch and Operate a Geostationary C-Band Replacement Satellite in the Fixed-Satellite Service at 37.5° W.L., *Memorandum Opinion and Order*, 16 FCC Rcd 20176 (Int'l Bur. 2001).

[11] GE Americom, 10 FCC Rcd at 13776.

[12] 47 C.F.R. §§ 25.114, 25.140.

documented experience and that of its predecessors-in-interest in establishing and operating a satellite system. Applicants must also show current assets and operating income sufficient to meet the estimated costs of proposed construction, launch and operating expenses for one year.[13] This requirement is intended to ensure that the orbit and spectrum resources are not tied up by entities unable to ultimately finance their proposals. In support of the application, PanAmSat submitted a financial statement of PanAmSat Corporation as well as its parent company, Hughes Electronics Corporation, demonstrating that it has sufficient current assets to finance the construction, launch and operation of the Galaxy VIII(I)-R satellite.[14] We find that PanAmSat has demonstrated its current ability to meet our financial requirements.[15]

6. *Request to Operate in the 11.45-11.7 GHz Band.* We note that PanAmSat requests use of the 11.45-11.7 GHz band. Under Section 25.208(b) of the Commissions rules, the downlink power flux density (pfd) levels of carriers at the earth's surface may not exceed the levels specified in the 11.45-11.7 GHz band for various elevation angle ranges. For the proposed Galaxy VIII(I)-R spacecraft, PanAmSat has calculated the pfd levels for beams operating in the 11.45-11.7 GHz frequency band at 5°, 25° and 90° elevation angles for both analog (TV/FM) and digital carrier types. The application shows that the pfd levels could be exceeded at the 90° elevation angle by 1.5 dB. Nonetheless, PanAmSat states in its application that it will take all necessary steps such as employing continuous video modulation with its TV/FM carriers, to ensure that all transmissions emanating from the proposed spacecraft will meet the pfd limits contained in Section 25.208 of the Commissions rules.[16] Subsequently, PanAmSat supplemented its application to demonstrate several operational options available to PanAmSat to satisfy the pfd requirement. In the supplement, PanAmSat states that the scenario set forth in its application presents the "worst case" and offered operational options available to maintain the pfd levels of the spacecraft transmission within acceptable limits.[17] These include limiting the transmissions on its West South America beam to only those transmissions that would comply with the requisite pfd limits, *e.g.*, digital transmissions. Alternatively, PanAmSat also proposes to employ video modulation with the "possible addition of an energy spreading signal."[18] PanAmSat states that if this method or any other non-e.i.r.p. (equivalent isotropically radiated power) reduction methods that might become available in the future do not result in compliance with the pfd limits of Section 25.208, then PanAmSat would reduce the downlink e.i.r.p. to the appropriate level to achieve compliance.[19]

7. Section 25.211 of our rules requires that all transmissions operating in the frequency bands described in Section 25.208(b) and (c) (*i.e.*, 11.45-11.7GHz) shall also contain an energy dispersal signal at all times with a minimum peak-to-peak bandwidth set at the value necessary to meet to the power flux density limits specified in Section 25. 208(b) and (c). Accordingly, we remind PanAmSat that it is required to employ such an energy dispersal signal at all times when transmitting downlink analog video signals in the 11.45-11.7 GHz frequency bands.

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[13] 47 C.F.R. § 25.114.

[14] PanAmSat's application shows it has current assets of $373 million and net operating income of $122 million, and that Hughes Electronics Corp. has current assets of $4.1 billion to finance the estimated cost of $205 million for the Galaxy VIII(I)-R satellite. *PanAmSat Application*, Exhibit 2 and supplemental electronic filing of March 8, 2002.

[15] 47 C.F.R. § 25.140(c).

[16] *PanAmSat Application*, Item B (d).

[17] Letter to William F. Caton, Acting Secretary, FCC from Joseph A. Godles, Counsel for PanAmSat Licensee Corp. (February 6, 2002) at p. 2.

[18] *Id.*

[19] *Id.*

8. In addition, PanAmSat has provided no technical analysis demonstrating the efficacy of its proposal to use continuous video modulation to ensure compliance with the pfd limits of Section 25.208. We are not convinced that continuous video modulation, even in the presence of a typical energy dispersal signal, will be entirely effective in ensuring compliance with the required pfd limits. Accordingly, we require PanAmSat to operate by whatever means necessary within the downlink power flux density limits specified in Section 25.208(b) of the Commission's rules, including, when necessary, a reduction in its transmitted downlink e.i.r.p.

9. The 11.45 –11.7 GHz frequency band in which PanAmSat proposes to operate is allocated to terrestrial and fixed-satellite service (FSS) on a co-primary basis.[20] FSS operations in this band, however, are limited in the United States to international service.[21] Although the International Telecommunication Union (ITU) has allocated the 10.7-11.7 GHz "extended" Ku-band frequencies to the fixed-satellite service, the Commission limits the use of these bands to international satellite service and prohibits purely domestic use. In the United States, the terrestrial wireless service is also allocated to use these frequencies, and the fixed-satellite service was prohibited from using these frequencies domestically in order to limit the number of FSS earth stations with which the terrestrial fixed-service would be required to coordinate.[22] PanAmSat, therefore, may only use this band for downlink operations in the United States if its uplink operations originate outside of the United States. PanAmSat's application shows its intent to use uplinks from its "North American/Mexico" beam with corresponding downlinks using the "Puerto Rico" beam in the 11.45-11.7 GHz band.[23] If PanAmSat's intent includes using uplinks from the United States then it cannot use corresponding downlinks in the United States and its possessions. Thus, no earth stations may be licensed for U.S. domestic service in the 11.45-11.7 GHz band if the uplink originates from a location in the United States or its possessions. We condition PanAmSat's authorization accordingly.

10. *Request to Use the 13.75-14.0 GHz Band*. We also condition PanAmSat's use of the 13.75-14.0 GHz band. The 13.75-14.0 GHz band has been allocated domestically and internationally to FSS, subject to restrictions embodied in footnotes to the domestic and international tables of frequency allocations. Because the 13.75-14.0 GHz band is shared on a primary basis with Government radiolocation and with the forward space-to-space and space-to-Earth links of the NASA Tracking and Data Relay Satellite (TDRS) System in the space research service, earth stations in the United States and its possessions operating with the Galaxy VIII(I)-R satellite will require coordination through the National Telecommunications and Information Administration (NTIA) Interdepartment Radio Advisory Committee's (IRAC) Frequency Assignment Subcommittee (FAS).[24] In this regard, we have received a letter from the NTIA requesting that we identify these requirements in any grant of authority to operate a satellite in the 13.75-14.0 GHz band.[25]

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[20] 47 C.F.R. § 25.208. Allocation on a given frequency band for a particular service on a primary basis entitles operators to protection against harmful interference from stations of "secondary" services. Further, secondary services cannot claim protection from harmful interference caused by stations of a primary service. 47 C.F.R. §§ 2.104(d) and 2.105(c).

[21] 47 C.F.R. § 2.106 footnote NG104.

[22] Assignment of Orbital Locations to Space Stations in the Domestic Fixed Satellite Service and the Applications of GE American Communications, Inc., *Order and Authorization*, 15 FCC Rcd 3385 (Int'l Bur. 1999).

[23] *PanAmSat Application,* Exhibit 1b.

[24] *See Amendment of Parts 2, 25, and 90 of the Commission's Rules to Allocate the 13.75-14.0 GHz Band to the Fixed-Satellite Service,* ET Docket No. 96-20, *Report and Order*, 11 FCC Rcd 11951, 11960-61 ¶ 20 (1996).

[25] *See* Letter from William Hatch, Acting Associate Administrator, Office of Spectrum Management, NTIA, to Roderick Porter, Acting Chief, International Bureau, FCC (May 11, 1999).

11. Domestically, footnotes US337, US356, and US357 are applicable. Footnote US337 to U.S. Table of Frequency Allocations was specifically adopted because TDRS operations in this band support manned spaceflight.[26] Footnotes US356 and US357 place certain restrictions on FSS operations.[27] Internationally, footnotes S5.502 and S5.503 to the ITU Radio Regulations also place certain restrictions on FSS operations.[28] As US356 and US357 have been adopted domestically the parallel footnotes in the ITU Radio Regulations (*i.e.*, footnotes S5.502 and S5.503) have been removed from the U.S. Table of Frequency Allocations. The fundamental difference between the U.S. and international footnotes is that international footnote S5.503 places e.i.r.p density restrictions for protection of data relay services in six megahertz of bandwidth (13.772 - 13.778 MHz) whereas, U.S. footnote US357 extends to ten megahertz (13.77 - 13.78 MHz) the bandwidth where these restrictions apply. We require that earth stations in the United States and its possessions (U.S. & P) operate in accordance with U.S. footnotes US356 and US357. For earth stations not in the U.S. & P accessing the Galaxy VIII(I)-R satellite, we require operation to be consistent with international footnotes S5.502 and S5.503. We further require that non-U.S. & P operation with the Galaxy VIII(I)-R satellite in the four additional megahertz with e.i.r.p. density restrictions under the U.S. footnote to be coordinated with the NASA TDRS system. In the absence of a mutually acceptable coordination agreement with the NASA TDRS system forward space-to-space link within the additional four megahertz highlighted above, the operation of Galaxy VIII(I)-R outside the U.S. & P in the entire 13.77 - 13.78 MHz band will be subject to U.S. footnote US357.

12. While the dates in ITU Radio Regulation footnote S5.503A have passed,[29] NTIA notes that NASA's Tropical Rainfall Measuring Mission (TRMM) satellite system radar in the band 13.793-13.805 GHz is still operating.[30] Since TRMM is a highly valuable and visible U.S. asset, with a broad range of international users, NTIA has requested cooperation from the FCC and non-Federal Government entities in providing assistance in reducing interference with the TRMM radar.[31] NTIA notes that it desires that FSS earth stations in the 13.793 - 13.805 GHz frequency band located south of 39° North

[26] Footnote US337 requires that earth stations operating in the 13.75-13.8 GHz band be coordinated through the National Telecommunications and Information Administration (NTIA) Interdepartment Radio Advisory Committee's Frequency Assignment Subcommittee to minimize interference to the forward space-to-space link of the National Aeronautics and Space Administration Tracking and Data Relay Satellite System. 47 C.F.R. § 2.106 US337.

[27] Footnote US356 places a restriction minimum antenna size of 4.5 meters for earth stations operating in the 13.75-14.0 GHz band and indicates a minimum equivalent isotropically radiated power ("e.i.r.p.") that should be used. Footnote US357 limits FSS earth station e.i.r.p. spectral density in the 13.77-13.78 GHz band until those geostationary space stations in the space research service for which advance publication information was received by the ITU prior to 31 January 1992 cease to operate in this band.

[28] Footnote S5.502 to the ITU Radio Regulations places certain restrictions on the minimum equivalent isotropically radiated power ("e.i.r.p.") and minimum antenna size for earth stations operating in the 13.75-14.0 GHz band. Footnote S5.503 limits FSS earth station e.i.r.p. spectral density in the 13.772-13.778 GHz band until those geostationary space stations in the space research service for which advance publication information was received by the ITU prior to 31 January 1992 cease to operate in this band.

[29] Footnote S5.503A states that: "Until 1 January 2000, stations in the fixed-satellite service shall not cause harmful interference to non-geostationary space stations in the space research and Earth exploration-satellite services. Additionally, when planning earth stations in the fixed-satellite service to be brought into service between 1 January 2000 and 1 January 2001, in order to accommodate the needs of spaceborne precipitation radars operating in the band 13.793-13.805 GHz, advantage should be taken of the consultation process and the information given in Recommendation ITU-R SA.1071."

[30] *See* Letter from Fredrick R. Wentland, Acting Associate Administrator, Office of Spectrum Management, NTIA, to Donald Abelson, Chief, International Bureau, FCC (February 28, 2002).

[31] *Id.*

Latitude and east of 110° West Longitude operate with emission levels below -150 dBW/600 kHz at the TRMM space station receiver. As this is a request and not a requirement, considering the secondary nature of the TRMM operation, we urge, but do not require, operators of earth stations accessing the Galaxy VIII(I)-R satellite in the 13.75 - 14.0 GHz band to cooperate voluntarily with NASA in order to facilitate continued operation of the TRMM satellite. NTIA also notes that none of the other space-based radar operations covered by S5.503A will seek continued cooperation in this respect.[32]

13. *Waiver Request.* PanAmSat also requests a waiver of Section 25.210(e) of the Commission's rules so that it may use circular polarization for certain Ku-band transponders on Galaxy VIII(I)-R.[33] Part 25 of our rules sets out technical requirements for earth and space stations in the Fixed-Satellite Service. Section 25.210(e) requires that space stations be designed to derive the maximum capacity from the assigned orbit location by employing state-of-the-art full frequency reuse using both horizontal and vertical polarization.[34] PanAmSat's waiver request was placed on Public Notice. No comments were received in response to the Notice.[35]

14. PanAmSat asserts that its existing and proposed operations are consistent with the goals underlying Section 25.210(e). Although the transponders at issue in the request do not employ linear polarization, PanAmSat claims they nevertheless achieve full frequency reuse. PanAmSat will employ right hand and left hand circular polarization and states that these transponders will replace transponders on Galaxy VIII(I) that PanAmSat's customer, DIRECTV Latin America, uses to provide direct to home services. DIRECTV Latin America has over one million circularly polarized customer-premise earth stations that receive service from these transponders. PanAmSat states that to convert the existing services to linear polarization would be prohibitively expensive. If not converted, PanAmSat claims the earth station antenna feeds, supporting structures and possibly each earth station antenna would have to be replaced or over one million customers will lose service. PanAmSat asserts that mandating replacement when it can achieve full frequency reuse with its existing and replacement system would be wasteful, inefficient and contrary to the public interest.[36]

15. The Commission may waive a rule for good cause shown.[37] Waiver is appropriate if special circumstances warrant a deviation from the general rule and such deviation would better serve the public interest than would strict adherence to the general rule.[38] Generally, the Commission may grant a waiver of its rules in a particular case if the relief requested would not undermine the policy objective of the rule in question and would otherwise serve the public interest.[39] We find that granting PanAmSat's waiver request would not undermine our policy. PanAmSat represents that its transponders will achieve full frequency reuse. We also find that grant of the waiver furthers the public interest by ensuring an efficient means of continuation of service to existing customers. In granting this waiver request we remind PanAmSat that, consistent with our rules, given the non-conforming design of its satellite, PanAmSat must protect the routinely licensed services of other satellite networks. In addition, PanAmSat

[32] *Id.*

[33] PanAmSat Licensee Corporation, Request for Waiver, filed March 22, 2002 (*PanAmSat Waiver*).

[34] 47 C.F.R. § 25.210(e).

[35] Public Notice, Satellite Policy Branch Information, Report No. SAT-00107, April 5, 2002.

[36] *PanAmSat Waiver* at 2.

[37] 47 C.F.R. § 1.3.

[38] *Northeast Cellular Telephone Co. v. FCC*, 897 F.2d 1166 (D.C. Cir. 1990).

[39] *Wait Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969); Dominion Video Satellite, Inc., *Order and Authorization*, 14 FCC Rcd 8182 (Int'l Bur. 1999).

must coordinate its non-compliant services with the non-compliant services of other satellite networks on an equal basis.

IV. CONCLUSION AND ORDERING CLAUSES

16. Based on the foregoing, we find that granting authority to PanAmSat to operate Galaxy VIII(I)-R from the 95° W.L. orbit location furthers the public interest, convenience and necessity.

17. Accordingly, IT IS ORDERED, that PanAmSat Licensee Corporation's application, File No. SAT-LOA-2001221-00134 is GRANTED and PanAmSat Licensee Corporation is authorized to launch and operate its Galaxy VIII(I)-R satellite at 95° W.L. in accordance with the terms, conditions and technical specifications, including the launch of Galaxy VIII(I)-R in 2002, set forth in its application and this Order.

18. IT IS FURTHER ORDERED that PanAmSat Licensee Corporation shall conduct its operations pursuant to this authorization in a manner that is consistent at all times with the power flux density requirements of 47 C.F.R. § 25.208(b).

19. IT IS FURTHER ORDERED that, PanAmSat Licensee Corporation shall prepare the necessary information, as may be required, for submission to the ITU to initiate and complete the advance publication, international coordination, and notification process of this space station in accordance with ITU Radio Regulations. We also remind PanAmSat that no protection from interference caused by radio stations authorized by other administrations is guaranteed unless coordination procedures are timely completed or, with respect to individual administrations, by successfully completing coordination agreements. Any radio station authorization for which coordination has not been completed may be subject to additional terms and conditions as required to effect coordination of the frequency assignments of other administrations. *See* 47 C.F.R. § 25.111(b).

20. IT IS FURTHER ORDERED that PanAmSat Licensee Corporation's use of the 11.45-11.7 GHz frequency band shall comply with the terms of footnote NG104 to 47 C.F.R. § 2.106 which permits use of this downlink frequency for international service only, i.e. where the corresponding uplink does not originate in the United States.

21. IT IS FURTHER ORDERED that in the 13.75-14.0 GHz band, all earth stations in the United States and its possessions are required to coordinate through National Telecommunications Information Administration's Interdepartment Radio Advisory Committee's Frequency Assignment Subcommittee.

22. IT IS FURTHER ORDERED that the operation of the satellite in the 13.75-14.0 GHz band shall be in accordance with footnotes US356 and US357 to 47 C.F.R. § 2.106 in the United States and its possessions and footnotes S5.502 and, subject to coordination with the Interdepartment Radio Advisory Committee, S5.503 to the ITU Radio Regulations outside of the United States and its possessions. In addition, in the absence of a separate coordination agreement with the forward space-to-space link of the NASA TDRS system operating in the 13.75-14.0 GHz frequency band, U.S. footnote US357 will apply to non-United States operation of the satellite in the 13.77 - 13.78 GHz band.

23. IT IS FURTHER ORDERED that PanAmSat Licensee Corporation is obligated to comply with the applicable laws, regulations, rules, and licensing procedures in those countries it proposes to serve.

24. IT IS FURTHER ORDERED that the license term for the Galaxy VIII(I)-R satellite is fifteen years and will begin to run on the date PanAmSat Licensee Corporation certifies to the Commission that the satellite has been successfully placed into orbit and its operation fully conforms to the terms and conditions of this authorization.

25. IT IS FURTHER ORDERED, pursuant to Section 1.3 of the Commission's rules, 47 C.F.R. § 1.3, that PanAmSat Licensee Corporation is GRANTED a waiver of 47 C.F.R. § 25.210(e), File No. SAT-WAV-20020322-00031, and Galaxy VIII(I)-R is authorized to use circular polarization on its Ku-band transponders. We remind PanAmSat of its obligation to protect the routinely licensed services of other satellite networks and to coordinate its non-compliant services with the non-compliant services of other satellite networks on an equal basis.

26 PanAmSat Licensee Corporation is afforded thirty days from the date of release of this order and authorization to decline this authorization as conditioned. Failure to respond within this period will constitute a formal acceptance of the authorization as conditioned.

27. This Order is issued pursuant to Section 0.261 of the Commission's rules on delegated authority, 47 C.F.R. § 0.261, and is effective upon release.

FEDERAL COMMUNICATIONS COMMISSON

Thomas S. Tycz
Chief
Satellite Division