

Before the
Federal Communications Commission
Washington, D.C. 20554
FCC MAIL SECTION
JUL 6 12 PM '00

In the Matter of)
)
Amendment of Section 2.106 of the)
Commission's Rules to Allocate) ET Docket No. 95-18
Spectrum at 2 GHz for Use)
by the Mobile-Satellite Service)
)
)
)

**SECOND REPORT AND ORDER AND
SECOND MEMORANDUM OPINION AND ORDER**

Adopted: June 27, 2000

Released: July 3, 2000

By the Commission: Commissioner Furchtgott-Roth approving in part, dissenting in part, and issuing a statement.

INTRODUCTION

1. In this *Order*, we take a number of actions to allow new Mobile-Satellite Service (MSS) licensees to clear spectrum for their operations. The new MSS operations that will occur in these bands will provide mobile communications for American consumers, thus increasing competition in the mobile communications market, and serving areas that are not currently served or are underserved, such as rural areas. Specifically, we finalize the reallocation of 2 GHz spectrum for the Broadcast Auxiliary Service (BAS) at 2025-2110 MHz, and make Government satellite operations co-primary in the 2025-2110 MHz band. We also establish the rules under which we will provide for relocation of incumbent BAS and Fixed Service (FS) microwave licensees from 2 GHz spectrum. The advent of new MSS service in the 2 GHz band will be a significant step toward providing global mobile communications. Finally, we deny three petitions for reconsideration of previous actions in this proceeding.

BACKGROUND

2. The 1992 World Administrative Radio Conference (WARC-92) made international allocations of the 1930-1980 MHz (Earth-to-space or uplink) and 2120-2170 MHz (space-to-Earth or downlink) bands in Region 2 and the 1980-2010 MHz (uplink) and 2170-2200 MHz (downlink) bands worldwide to MSS.¹ Thus, as it affects the bands addressed in this proceeding, WARC-92 allocated the 1990-2010 MHz and 2170-2200 MHz bands to MSS worldwide, and the 2165-2170 MHz band to MSS in Region 2. WARC-92 also adopted primary allocations for the space operation, space research and Earth exploration-satellite services for Earth-to-space and space-to-space transmissions in the 2025-2110 MHz band on a worldwide basis.

¹ See Final Acts of the 1992 World Administrative Radio Conference, Malaga-Torremolinos (1992).

3. In the *Emerging Technologies* proceeding, concluded in 1994,² the Commission reserved 220 megahertz of spectrum in the 2 GHz band, at 1850-1990 MHz, 2110-2150 MHz, and 2160-2200 MHz, for reallocation to services using new and innovative technologies.³ The Commission also provided that new technology licensees in these bands would be allowed to clear their spectrum by relocating incumbent FS microwave licensees to bands above 4 GHz.⁴

4. The Commission then allocated the 1850-1990 MHz band to terrestrial broadband Personal Communications Services (PCS) in June of 1994.⁵ The Commission anticipated that PCS would use spectrum intensively, thereby bringing into question the feasibility of MSS in this band. The Commission concluded that it could not make a domestic allocation of 2 GHz spectrum for MSS that would be consistent with the international allocations without jeopardizing the availability of spectrum for PCS. The Commission acknowledged the potential value of MSS in areas that may not be readily or economically served by PCS, such as sparsely-populated rural areas,⁶ stating that it would investigate possibilities for allocating additional frequencies for MSS at 2 GHz.⁷ Further, the Commission stated that it would attempt to accommodate MSS within the internationally allocated bands remaining outside the PCS allocation and would pursue additional international allocations for MSS at the 1995 World Radiocommunication Conference (WRC-95).⁸ This proceeding was initiated in 1995 in response to that commitment.

5. WRC-95 adopted additional international allocations for MSS. As a result of the actions taken at WRC-95, effective January 1, 2000, the 1990-2010 MHz (uplink) and 2170-2200 MHz (downlink) bands remain allocated to MSS worldwide, and the 2165-2170 MHz (downlink) band remains allocated to MSS in Region 2. Also effective January 1, 2000, the 2010-2025 MHz (uplink) band is allocated to MSS in the United States and Canada. Effective January 1, 2005, the 2010-2025 MHz (uplink) band will be allocated to MSS in all of Region 2.⁹

² See *Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies (Emerging Technologies)*, ET Docket No. 92-9, *First Report and Order and Third Notice of Proposed Rule Making*, 7 FCC Rcd 6886 (1992); *Second Report and Order*, 8 FCC Rcd 6495 (1993); *Third Report and Order and Memorandum Opinion and Order*, 8 FCC Rcd 6589 (1993); *Memorandum Opinion and Order*, 9 FCC Rcd 1943 (1994); *Second Memorandum Opinion and Order*, 9 FCC Rcd 7797 (1994), *aff'd*, *Association of Public Safety Communications Officials-International, Inc. v. FCC*, (APCO v. FCC), 76 F.3d 395 (D.C. Cir. 1996).

³ See *Emerging Technologies First Report and Order and Third Notice*, 7 FCC Rcd 6886, at ¶ 21.

⁴ See *id.* at ¶¶ 23-24.

⁵ See *Amendment of the Commission's Rules to Establish New Personal Communications Services (PCS Proceeding)*, GEN Docket No. 90-314, *Memorandum Opinion and Order*, 9 FCC Rcd 5947 (1994).

⁶ *Id.* at ¶ 94.

⁷ At that time, MSS had been domestically allocated 16.5 megahertz in the 2.4 GHz band, paired with 16.5 megahertz in the 1.6 GHz band. See *Amendment of the Commission's Rules to Establish Rules and Policies Pertaining to a Mobile Satellite Service in the 1610-1626.5/2483.5-2500 MHz Frequency Bands (Big LEOs)*, CC Docket No. 92-166, *Report and Order*, 9 FCC Rcd 5936 (1994).

⁸ See *PCS Memorandum Opinion and Order*, 9 FCC Rcd 5947, at ¶ 97.

⁹ Generally, WARC-92 allocated the 1930-1980 MHz band to MSS in Region 2, and the 1980-2010 MHz band to MSS worldwide. The 2010-2025 MHz band was not then allocated to MSS. In the upper band, WARC-92 allocated the 2120-2170 MHz band to MSS in Region 2, and the 2170-2200 MHz band to MSS worldwide. WRC-95 retained the allocation of the 1930-1970 MHz band to MSS in Region 2, deleted the allocation of the (continued....)

6. In the *First Report and Order and Further Notice of Proposed Rule Making (First R&O/Further Notice)* in this proceeding, the Commission reallocated the 1990-2025 MHz and 2165-2200 MHz bands to MSS, effective January 1, 2000.¹⁰ Because this reallocation removed 35 megahertz from the total of 120 megahertz allocated to BAS, the Commission reallocated to BAS the 2110-2130 MHz band, currently allocated to FS microwave uses. This left BAS with 105 megahertz of spectrum at 2025-2130 MHz. In making this reallocation, the Commission determined that it is technically feasible for BAS to use channels of 15 megahertz width, as opposed to the current 17 or 18 megahertz width.¹¹ The Commission also stated that new MSS licensees in the band are required to bear the costs of relocation of BAS and FS licensees in the affected spectrum, in accordance with the policies established in the *Emerging Technologies* proceeding.¹² Finally, the Commission requested comment on relocation procedures to account for the unique characteristics of BAS, and proposed to apply the negotiation periods and good faith standards of our *Microwave Cost-Sharing* proceeding to the relocation of FS microwave licensees by MSS. The Commission also proposed to require subsequently entering MSS licensees to reimburse earlier MSS licensees for a portion of the expenses incurred in relocation of incumbent licensees.¹³

7. The Balanced Budget Act of 1997 (BBA-97) directed the Commission to reallocate 55 megahertz of spectrum in the 2 GHz range for reassignment by auction.¹⁴ The Commission is specifically directed to reallocate the 40 megahertz at 2110-2150 MHz for reassignment by auction by September 30, 2002.¹⁵ Only if we determine that auction of other spectrum would better serve the public interest and could reasonably be expected to produce greater receipts, may we reallocate an alternate 40 megahertz. We were also directed to allocate an additional 15 megahertz from spectrum at 1990-2110 MHz for reassignment by auction by September 30, 2002, unless the President determined that such spectrum cannot be reallocated due to the need to protect Federal Government systems and that reallocation of an alternate 15 megahertz better serves the public interest and can be reasonably expected to produce comparable receipts.¹⁶ On November 17, 1998, the National Telecommunications and Information Administration (NTIA), on behalf of the President, submitted a letter to the Commission, exercising the Presidential option to identify an alternate 15 megahertz of spectrum to satisfy the

(Continued from previous page)

1970-1980 MHz band to MSS in Region 2, retained the allocation of the 1980-2010 MHz band to MSS worldwide, and retained the allocation of the 2120-2170 MHz band to MSS in Region 2 and the allocation of the 2170-2200 MHz band worldwide, all changes effective January 1, 2000. Additionally, WRC-95 allocated the 2010-2025 MHz band to MSS in Region 2 effective January 1, 2005. The United States and Canada entered a footnote to this allocation providing that the 2010-2025 MHz band will be usable by MSS in the United States and Canada effective January 1, 2000. See the band plan chart at Appendix A.

¹⁰ See *In re Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum at 2 GHz for Use by the Mobile-Satellite Service*, ET Docket 95-18, *First R&O/Further Notice*, 12 FCC Rcd 7388 at ¶ 14 (1997).

¹¹ See *id.* at ¶ 32.

¹² See *id.* at ¶¶ 33, 42.

¹³ See *id.* at ¶¶ 64-80.

¹⁴ See Balanced Budget Act of 1997, Pub. L.No 105-33, 111 Stat. 251, § 3002(c)(1) (1997).

¹⁵ See *id.*, § 3002(c)(3).

¹⁶ See *id.*, § 3002(c)(4).

requirements of BBA-97.¹⁷ The BBA-97 requirement that we allocate the 2110-2150 MHz band for assignment by auction necessitated a change in our decision to reallocate the 1990-2130 MHz band to BAS.

8. On March 19, 1998, the Commission released a public notice identifying applications and letters of intent for satellite service in the 2 GHz band.¹⁸ Upon initial review, the Commission found nine applications and letters of intent from potential 2 GHz MSS licensees acceptable for filing.¹⁹

9. On November 24, 1998, the Commission released the *Third Notice of Proposed Rule Making and Memorandum Opinion and Order and Order (Third Notice)* in this proceeding. In the *Memorandum Opinion and Order and Order* portions of that document, the Commission affirmed its allocation of the 1990-2025 MHz and 2165-2200 MHz bands to the Mobile-Satellite Service (MSS).²⁰ The Commission also reaffirmed its decision that new MSS licensees in the 1990-2025 MHz and 2165-2200 MHz bands would be required to relocate any incumbent, co-primary licensees with which they were incapable of sharing spectrum.²¹ Finally, the Commission dismissed as premature a request from the ICO Service Group to require the submission by BAS licensees of detailed equipment and operational information.²²

10. In the *Third Notice*, in order to comply with the mandate of BBA-97, the Commission proposed to reallocate 40 megahertz of spectrum, at 2110-2150 MHz, to the Fixed and Mobile Services,

¹⁷ Letter from L. Irving, NTIA, to William Kennard, Chairman, Federal Communications Commission, Nov. 17, 1998.

¹⁸ Public Notice, Report No. SPB-119 (rel. March 19, 1998). In this document, the term "application" refers to submissions by parties seeking to operate U.S.-licensed systems; the term "letter of intent" refers to submissions by those non-U.S. licensed systems seeking to serve the U.S. market using 2 GHz MSS spectrum; and the term "MSS licensee" includes MSS systems licensed by the Commission to serve the United States, as well as non-U.S.-licensed satellite systems for which the Commission reserved spectrum to serve the United States. See *The Establishment of Policies and Service Rules for the Mobile Satellite Service in the 2 GHz Band*, IB Docket No. 99-81, *Notice of Proposed Rulemaking*, 14 FCC Rcd 4843, at ¶ 72 (1999).

¹⁹ The nine applications and letters of intent found acceptable for filing were submitted by The Boeing Company (File Nos. 179-SAT-P/LA-97(16) and 90-SAT-AMEND-98(20); IBFS File Nos. SAT-LOA-19970926-00149 and SAT-AMD-19980318-00021); Celsat America, Inc. (File Nos. 26/27/28-DSS-P-94, 36-SAT-AMEND-95, 65/66/67-SAT-AMEND-96, 192-SAT-AMEND-97, and 88-SAT-AMEND-98; IBFS Nos. SAT-A/O-19940408-00016/17/18, SAT-AMD-19941125-00089, SAT-AMD-19960124-00007/8/9, SAT-AMD-19970925-00124 and SAT-AMD-19980113-00009); Constellation Communications, Inc. (File No. 181-SAT-P/LA-97(46); IBFS File Nos. SAT-LAO-19970926-00148 and SAT-AMD-19991230-00134); Globalstar, L.P. (File Nos. 183 through 186-SAT-P/LA-97 and 182-SAT-P/LA-97(64); IBFS File Nos. SAT-LOA-19970926-00151 through SAT-LOA-19970926-00156); Iridium LLC (File No. 187-SAT-P/LA-97(96); IBFS File No. SAT-LOA-19970926-00147); Mobile Communications Holdings, Inc. (File No. 180-SAT-P/LA-97(26); IBFS File No. SAT-LOA-19970926-00150); ICO Services Limited (File No. 188-SAT-LOI-97; IBFS File No. SAT-LOI-19970926-00163); Inmarsat Horizons (File No. 190-SAT-LOI-97; IBFS File No. SAT-LOI-19970924-00098); and TMI Communications and Company, Limited Partnership (File No. 189-SAT-LOI-97; IBFS File No. SAT-LOI-19970926-00161).

²⁰ See *In re Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum at 2 GHz for Use by the Mobile-Satellite Service*, ET Docket No. 95-18, *Memorandum Opinion and Order and Third Notice of Proposed Rule Making and Order*, 13 FCC Rcd 23,949, at ¶ 11 (1998).

²¹ See *id.* at ¶ 13.

²² See *id.* at ¶¶ 55-56.

for eventual assignment of licenses by auction.²³ In order to meet these requirements, we proposed to change the BAS allocations made earlier from the 2025-2130 MHz band to the 2025-2110 MHz band.²⁴ We also proposed to add a co-primary allocation for Government space operations (Earth-to-space and space-to-space), Earth-exploration satellite (Earth-to-space and space-to-space) and space Research (Earth-to-space and space-to-space) to the 2025-2110 MHz band. We further proposed policies to govern the relocation of BAS and FS microwave licensees that are affected by these reallocations.

SECOND REPORT AND ORDER

A. Spectrum Allocation for the Broadcast Auxiliary Service.

11. In the *Third Notice*, we proposed to allocate the 2025-2110 MHz band to BAS. This would effectively remove the 20 megahertz we added to the BAS allocation in the *First Report and Order*, leaving BAS with a total of 85 megahertz. We noted that an allocation of 85 megahertz for BAS could provide six channels of 12 megahertz, and one of 13 megahertz, for BAS operations.

12. This allocation would appear to satisfy most of BAS licensees' needs for channel capacity. We agree with the National Association of Broadcasters (NAB) and the Association for Maximum Service Television (MSTV) that BAS licensees share and may fully occupy all seven channels in a TV market.²⁵ In many markets, all seven BAS channels in the 1990-2110 MHz band are not fully used, but in larger television markets seven BAS channels are insufficient to meet the needs of BAS licensees, and engineering techniques are used to maximize the capacity of BAS.²⁶ We find that seven is, on average, an appropriate number of channels for BAS service in the 2 GHz band. As explained by Cosmos Broadcasting Corporation, Cox Broadcasting, Inc., Media General Inc., and the Radio-Television News Directors Association (Cosmos Coalition), the use of seven BAS channels is coordinated so four to seven television stations can each use two channels for back-to-back live shots and simultaneous live shots from two locations.²⁷ We find that seven BAS channels will generally allow television broadcasters to cover breaking news events, sports, weather, and other on-location broadcasting events.

13. Given the requirements of BBA-97 to allocate the 2110-2150 MHz band for assignment by auction, along with our reallocation of the 1990-2025 MHz band to MSS, we are left with 85 megahertz of contiguous spectrum for BAS at 2025-2110 MHz. The record supports our finding that a BAS band of 85 megahertz will allow a robust BAS system to continue operating for the benefit of the American public. It is worth noting that the Association for Maximum Service Television (MSTV), the National Association of Broadcasters (NAB), and the Society of Broadcast Engineers (SBE), three of the

²³ See BBA-97, § 3002(c).

²⁴ BAS spectrum in the 2 GHz band is also authorized for use by the Cable Television Relay Service (CARS) and the Local Television Transmission Service (LTTS). See 47 C.F.R. §§ 74.602, 78.18(a)(7), 21.901(b). As in previous actions in this proceeding, we will refer to these services collectively as BAS, and all proposals and decisions apply to CARS and LTTS in the band, as well as to BAS.

²⁵ See MSTV/NAB Joint Comments at 8.

²⁶ See SBE Comments at 2.

²⁷ See Cosmos Coalition Comments at 3.

premier groups representing broadcasting interests, agree that it is possible to continue providing seven channels of 2 GHz BAS in an 85-megahertz band by using channels of approximately 12 megahertz bandwidth.²⁸ Commenters representing the satellite industry agree that the 2025-2110 MHz band is an appropriate allocation for BAS.²⁹ Experimental results confirm that it is possible to carry a contribution-quality television signal in a channel of 12 megahertz bandwidth with the use of digital equipment,³⁰ and that it may be possible to carry such a signal in a channel of 12 megahertz with analog equipment.³¹ Only one commenter believes that the proposed allocation is not sufficient for a seven-channel 2 GHz BAS system. BST, Inc. (BST), a video production company specializing in providing coverage of sporting events such as automobile and sailboat races, states that because it uses all seven BAS channels at many sporting events, without being able to use directional antennas, it receives cross-channel interference even with BAS channels of 17 megahertz. BST flatly states that it cannot use 12- or 13-megahertz channels,³² even though it also reveals that it is currently experimenting with techniques that will allow some compression of the signal.³³ BST also states that it uses frequencies outside the BAS band, coordinating with other users. We conclude that while reducing the BAS band to channels of 12 or 13 megahertz may work hardship on BST and other specialized users, improved equipment and techniques for transmitting video signals will allow a BAS band of seven channels in 85 megahertz, which is sufficient for the large majority of BAS users. We therefore reallocate BAS at 2025-2110 MHz.

B. Government Operations in the 2025-2110 MHz Band.

14. On February 11, 1998, the National Telecommunications and Information Administration (NTIA) requested that we amend the U.S. Table of Frequency Allocations to reflect a primary allocation for Government space operations, earth exploration satellites, and space research in the 2025-2110 MHz band.³⁴ NTIA pointed out that this band is internationally allocated for these services, and that the 1997 World Radiocommunication Conference modified international footnote S5.391 to protect these space services in the 2025-2110 MHz band.³⁵ NTIA stated that this is an

²⁸ See MSTV/NAB Joint Comments at 3; SBE Comments at 1.

²⁹ See Iridium LLC Comments at 2; Inmarsat Comments at 4; ICO Services Limited (ICO) Comments at 17; ICO USA Service Group (IUSG) Comments at 11.

³⁰ See, e.g., Letter from Dr. J. Payne, Nucomm, Inc. to M. Salas, Federal Communications Commission, Feb. 11, 1998; Letter from B. Henoch, COMSAT Corp. to M. Salas, Federal Communications Commission, Mar. 18, 1998.

³¹ See ICO Reply, Appx. A at 12-13; Letter from D. Davidson, Walt Disney Co. to M. Salas, Federal Communications Commission, Apr. 9, 1999.

³² See BST Comments at 8.

³³ See *id.* at 9.

³⁴ See Letter from William T. Hatch, Acting Deputy Associate Administrator, Office of Spectrum Management, NTIA to Richard Smith, Chief, Office of Engineering and Technology, Federal Communications Commission, Feb. 11, 1998.

³⁵ The modified international footnote S5.391 reads

In making assignments to the mobile service in the bands 2025-2110 MHz and 2200-2290 MHz, administrations shall not introduce high-density mobile systems, as described in Recommendation ITU-R SA.1154, and shall take this Recommendation into account for the introduction of any other type of mobile system.

opportune time to modify the U.S. Table of Frequency Allocations in the 2025-2110 MHz band, and to require terrestrial systems in the band to conform with relevant ITU Radio Regulations and ITU-R Recommendations that protect Government space systems. Accordingly, in the *Third Notice*, we proposed to grant co-primary status to the Government space operation (Earth-to-space and space-to-space), Earth-exploration satellite (Earth-to-space and space-to-space), and space research (Earth-to-space and space-to-space) services in the 2025-2110 MHz band, noting that such operations are currently permitted by footnotes to the Table of Frequency Allocations.³⁶ Because of the previous exclusive non-Government allocation of this band, we proposed to limit Government use of the band by requiring that Government satellite operations do not constrain future deployment of BAS licensees operating in conformance with our rules in the 2025-2110 MHz band. We also proposed to adopt domestically international footnote S5.391, in order to minimize the likelihood of interference to Government satellite communications from non-Government terrestrial operations, and to follow the guidelines of Recommendation ITU-R SA.1154, which recommends technical limitations on terrestrial mobile systems to protect satellite systems in the 2025-2110 MHz band from interference, and ITU-R F.1247, which recommends technical limitations on fixed systems in the band to protect satellite systems, in dealing with future BAS systems in the band.³⁷

15. The National Aeronautics and Space Administration (NASA) states that it uses this spectrum for satellites which support such major programs as the Space Shuttle, the Hubble Space Telescope, the Tracking and Data Relay Satellite System and will use this spectrum to support the International Space Station. NASA has used this band for almost thirty years.³⁸ Permitted to use the 2025-2110 MHz band by footnotes to the Table of Frequency Allocations, these Government systems have successfully shared spectrum with BAS during this period. There is no indication that the elevation of Government systems to co-primary status will change this sharing in the future, so long as appropriate protections are provided to BAS operations. MSTV/NAB and SBE support co-primary status for Government systems, so long as BAS operations are protected.³⁹ IUSG agrees, citing the sharing as an example of the benefits of terrestrial/satellite coordination.⁴⁰ Space experts also support co-primary status.⁴¹

16. Because of the successful sharing between BAS and Government satellite operations in the past, we conclude that the formalization of these operations by the elevation of Government satellite operations to co-primary status will provide increased certainty and clarity to the U.S. Table of Frequency Allocations. At the same time, we remain concerned about the impact of this co-primary allocation on BAS, especially on future deployment of BAS. In order to assure that Government satellite

³⁶ See *Third Notice*, 13 FCC Rcd 13,949, at ¶¶ 33-34. Under footnote US90 to the U.S. Table of Frequency Allocations, 47 U.S.C. § 2.016, operations of these Government systems may not cause interference to non-Government operations.

³⁷ See *Third Notice*, 13 FCC Rcd 13,949, at ¶ 34. See also Rec. ITU-R SA.1154; Rec. ITU-R F.1247.

³⁸ See Letter from D. Harris, NASA to R. Parlow, NTIA, Aug. 11, 1997.

³⁹ See MSTV/NAB Joint Comments at 21-22; SBE Comments at 7.

⁴⁰ See IUSG Comments at 13.

⁴¹ Both NASA and the Deputy Director of the Australian Government's Canberra Deep Space Communication Complex (CDSCC), Dr. Richard Jacobsen, filed comments in support. See NASA Comments at 3; Dr. Richard Jacobsen, CDSCC Comments.

operations do not interfere with or hamper the growth of BAS, we will adopt proposed footnote US346,⁴² amending it to read:

Except as provided by footnote US222, the use of the band 2025-2110 MHz by the Government space operation service (Earth-to-space), Earth-exploration-satellite service (Earth-to-space), and space research service (Earth-to-space) shall not constrain the deployment of the Television Broadcast Auxiliary Service, the Cable Television Relay Service, or the Local Television Transmission Service. To facilitate compatible operations between non-Government terrestrial receiving stations at fixed sites and Government earth station transmitters, coordination is required. To facilitate compatible operations between non-Government terrestrial transmitting stations and Government spacecraft receivers, the terrestrial transmitters shall not be high-density systems (see Recommendations ITU-R SA.1154 and ITU-R F.1247).

We conclude that these measures will allow the continuation of Government satellite operations, while at the same time protecting the current operation and future growth of BAS systems as currently defined in our rules. Accordingly, we are granting co-primary status in the 2025-2110 MHz band to Government space research (Earth-to-space), space operations (Earth-to-space), and Earth-exploration-satellite services, as proposed. Future rule changes affecting the technical characteristics of BAS systems will be coordinated with the NTIA prior to implementation to assure continued compatible operations between Government satellite operations and non-Government uses of the 2025-2110 MHz band.

C. Allocation of the 2110-2150 MHz Band.

17. In the *Third Notice*, we proposed reallocation of the 2110-2150 MHz band to the Fixed and Mobile Services for assignment of licenses by auction. We took this action to conform to the requirements of BBA-97. We initially chose to address this issue in this proceeding because of our prior reallocation of a part of that band, the 2110-2130 MHz segment, to BAS. We recently stated that we will initiate a separate proceeding to address the reallocation of the 2110-2150 MHz band.⁴³ Therefore, we will not consider this band further in this proceeding.

D. Relocation of BAS in the 1990-2110 MHz Band.

18. *The Original BAS Band.* At the beginning of this proceeding, the BAS band at 2 GHz comprised 120 megahertz of spectrum, divided into one channel of 18 megahertz bandwidth and six channels of 17 megahertz bandwidth.⁴⁴ The band is used for mobile and temporary-fixed electronic newsgathering (ENG) applications and fixed studio-to-transmitter links (STLs) and television relay links.

19. BAS licensees are television stations and networks,⁴⁵ Cable Television Relay Service

⁴² See *Third Notice*, Appx. B.

⁴³ See *Principles for Reallocation of Spectrum to Encourage the Development of Telecommunications Technologies for the New Millennium (Policy Statement)*, 14 FCC Rcd 19,868, at ¶ 23 (1999).

⁴⁴ See 47 C.F.R. § 74.602.

⁴⁵ See 47 C.F.R. § 74.600.

licensees,⁴⁶ and licensees in the Local Television Transmission Service.⁴⁷ Except for certain fixed applications, BAS license areas are the Nielsen Designated Market Areas (DMAs) of television stations.⁴⁸ According to the Society of Broadcast Engineers, use of BAS channels can be divided into four categories:

Category I. "Los Angeles" or "LA." Extremely heavy use, mostly split channel. There is lots of itinerant use and channel borrowing and sharing; even so, seven channels aren't enough.

Category II. "Metro." Spectrum is heavily used, especially during the news hours. There is some split channel use, not a lot, and some itinerant use. There is regular channel borrowing and sharing.

Category III. "Light." There is some electronic news gathering ("ENG"), some fixed link, maybe even some channels mostly vacant most of the time. Typically, a small-market, low-competition situation.

Category IV. "Rural." ENG is unheard of, the use is for fixed, long-haul relays to small-market TV stations, to TV translator stations, and to cable television headends. In some areas not all channels are even used.⁴⁹

BAS licensees are typically licensed to use all seven BAS channels, and channel usage is coordinated on a dynamic basis by frequency coordinators in a TV market. The BAS system is highly integrated, and ENG applications often operate both within markets and across market boundaries.⁵⁰

20. *The Future BAS Band.* Because of the allocations made in this proceeding, the BAS band will be reduced from 120 megahertz to a total of 85 megahertz at 2025-2110 MHz. In order to divide this band into nearly identical channels, we will adopt a final channelization of one channel of 12.4 megahertz and six channels of 12.1 megahertz each. As we stated above, we conclude that seven channels is appropriate for the 2 GHz BAS band to accommodate most needs of BAS licensees in the various markets.

21. We believe that BAS licensees in the future will primarily use digital equipment, though we will permit the continued use of FM analog equipment. We see no reason to believe that the patterns of use in the various categories of markets will change drastically, though we expect use in all markets to increase gradually as advances in technology produce better, more reliable, less expensive BAS equipment.

22. *The Transition from the Current BAS band to the Future BAS band.* As noted above, the 1990-2025 MHz band is the MSS uplink band. Satellites would be subject to receiving interference from

⁴⁶ See 47 C.F.R. § 74.602(f).

⁴⁷ See 47 C.F.R. § 74.602(e).

⁴⁸ These markets can be found in the Television and Cable Fact Book, Stations Vol. #67, 1999 Ed. at A-5 (Warren Publishing, Inc.).

⁴⁹ SBE Comments at 2.

⁵⁰ See MSTV/NAB Comments at 7-8.

BAS transmitters operating in that band on Earth. BAS receivers would also be subject to interference from nearby MSS handsets. In the *Third Notice*, we tentatively concluded that we should require simultaneous retuning or replacement of all BAS equipment nationwide on a date certain, though we questioned whether a sufficient supply of equipment would be available to satisfy the simultaneous conversion of all BAS operations.⁵¹ We generally proposed to require replacement or retuning of BAS equipment to be conducted in accordance with our *Emerging Technologies* policies, as modified by the decisions in our *Microwave Cost-Sharing* proceeding, as delineated in 47 C.F.R. Part 101.⁵² We asked parties to also comment on geographic issues, including, for example, whether equipment replacement could be done on a market-by-market basis or with a staged deployment within local markets. We invited comment on a broad range of alternative approaches.⁵³

23. Commenters representing BAS generally favored a simultaneous national cut-over from the current BAS band to the future BAS band. MSTV/NAB points out that a gradual transition would be expensive and lead to operation of different equipment in varying channel widths, which would be operationally cumbersome and could impair the quality of ENG services.⁵⁴ SBE adds that a gradual transition would lead to great difficulties in an integrated, closely coordinated service, especially given the mobility of ENG trucks and the unpredictability of where and when newsworthy events will occur.⁵⁵ Iridium, LLC, a MSS applicant, supports the simultaneous cut-over, pointing out that such a transition would provide MSS operators with assurance that their spectrum will be clear for entry when needed, and that the simultaneous cut-over would provide an incentive to MSS licensees to bring their systems on-line as rapidly as possible.⁵⁶

24. The majority of MSS commenters favored conducting the transition of BAS in phases. IUSG submitted a plan under which the first entrant to the MSS market at 2 GHz would narrow BAS channel 1 from its current 18 megahertz to 12 megahertz, freeing six megahertz for MSS operation. Later, a second MSS entrant would change BAS channel 2 to a digital channel of 10 megahertz, freeing another seven megahertz for MSS. Finally, other entrants would narrow BAS channels 3-5, and move channels 1-2 into the spectrum cleared by this narrowing, fully clearing the 1990-2025 MHz band for MSS, and leaving a BAS band with five digital channels of 10 megahertz each and two 17-megahertz channels for digital or analog BAS operations.⁵⁷ ICO presents its own suggested phased plan, whereby we would require BAS to discontinue use of current BAS Channel 1 (1990-2008 MHz) prior to the start of MSS operations, and would require BAS to discontinue use of current BAS Channel 2 (2008-2025 MHz) when MSS operations reached the point of needing the Channel 2 spectrum.⁵⁸ Several other MSS

⁵¹ See *Third Notice* at ¶ 39.

⁵² See *In re Amendment to the Commission's Rules Regarding a Plan for Sharing the Costs of Microwave Relocation (Microwave Cost-Sharing)*, WT Docket No. 95-157, *First Report and Order and Further Notice of Proposed Rule Making*, 11 FCC Rcd 8825 (1996); *Second Report and Order*, 12 FCC Rcd 2705 (1997).

⁵³ See *Third Notice*, 13 FCC Rcd 13,949, at ¶ 40.

⁵⁴ See MSTV/NAB Reply at 9.

⁵⁵ See SBE Comments at 3-4.

⁵⁶ See Iridium Comments at 3-4.

⁵⁷ See IUSG Comments at 23-36, Exhibit 1.

⁵⁸ See ICO Comments at 6-8.

licensees support the idea of a phased transition, as does one BAS commenter, the Cosmos Coalition.⁵⁹ These commenters point out the difficulties of a simultaneous nationwide transition: the sheer size of the problem, the significant likelihood that new equipment tuned to the new channel plan may not be manufactured in time for a national cut-over,⁶⁰ and the insufficiency of skilled labor, already busy on the transition to digital television.⁶¹

25. On the issue of whether the transition should be nationwide, those who favored a single-step transition also favored a simultaneous nationwide cut-over to the new BAS band. These parties generally believe that even a short period when different BAS markets were on different channel plans would render coordination in the highly integrated BAS environment so complex and difficult as to be untenable.⁶² MSTV/NAB also points out that a market-by-market transition "would be extremely expensive and operationally cumbersome for broadcasters and would impair the quality of ENG services."⁶³

26. Other parties state that a nationwide cut-over is likely to be impossible. The Cosmos Coalition asserts that a period of several years is necessary to ensure the availability of new equipment, especially digital ENG equipment, necessary to BAS operation in the new band.⁶⁴ IUSG notes that BAS licensees rarely use all seven BAS channels outside the largest markets, and believes that smaller-market BAS licensees will be able to forgo the use of one or more channels for a time.⁶⁵

27. The transition plan we adopt for BAS must provide for early entry to the 1990-2025 MHz band for new MSS licensees. The relocation policy we adopted in our *Emerging Technologies* proceeding was designed for this very purpose: to allow early entry for new technology providers by allowing providers of new services to negotiate financial arrangements for reaccommodation of incumbent licensees. We concluded in the *First R&O/Further Notice* that we would apply our relocation policy to the reallocations in this proceeding.⁶⁶ In order to be realistic, however, the transition plan we adopt must minimize the costs of new MSS providers. Our relocation policy was designed to allow gradual relocation of incumbents on a link-by-link basis during a geographical build-out period. A gradual build-out is not possible in the case of MSS, because the MSS signal will reach a large geographical area simultaneously. The integrated nature of BAS also makes isolated, link-by-link relocation infeasible. Because of the need for nationwide relocation by relatively few licensees, we believe it is necessary to minimize costs to the extent possible for MSS licensees, and to defer costs where possible so that they can be paid on an ongoing basis, rather than in a lump sum.

⁵⁹ See The Boeing Company (Boeing) Comments at 5-6; Constellation Communications, Inc. (Constellation) Comments at 6; Cosmos Coalition Comments at 7-9.

⁶⁰ See IUSG Comments at 19.

⁶¹ See Cosmos Coalition Joint Comments at 8.

⁶² See, e.g., MSTV/NAB Comments at 7-8; SBE Reply at 8, Iridium Reply at 4-6; Motorola Reply at 10.

⁶³ See MSTV/NAB Reply at 9.

⁶⁴ See Cosmos Coalition Reply at 4-5.

⁶⁵ See IUSG Comments at 22-23.

⁶⁶ See *First R&O/Further Notice*, 12 FCC Rcd 7388, at ¶¶ 33, 42.

28. At the same time, it is essential that we ensure the continuity of BAS during the transition. BAS is a critical part of the broadcasting system by which information and entertainment is provided to the American public. We must minimize the disruption and down time BAS licensees will undergo in the transition, in order to continue day-to-day high quality BAS service.

29. In order to serve the goals of our relocation policy and account for the special circumstances involved in the transition of the highly integrated BAS, we adopt a two-phase plan for the transition of BAS from its current 120 megahertz of spectrum at 1990-2110 MHz to a band of 85 megahertz at 2025-2110, comprising seven BAS channels. We have decided that a two-phase transition will minimize costs and burdens on all parties. In Phase I of the transition, the first MSS entrant (or entrants if more than one MSS licensee is ready to begin service within a short period) will be responsible for clearing 18 megahertz of spectrum at 1990-2008 MHz. This corresponds with current BAS Channel 1. The Phase I BAS band will consist of one channel of 15 megahertz, and six channels of 14.5 megahertz each, centered at the following frequencies:

Channel 1	--	2015.5 MHz
Channel 2	--	2030 MHz
Channel 3	--	2044.5 MHz
Channel 4	--	2059 MHz
Channel 5	--	2073.5 MHz
Channel 6	--	2088 MHz
Channel 7	--	2102.5 MHz

Phase I will persist as long as 18 megahertz of spectrum is sufficient for MSS operations.

30. In Phase II of the transition, the BAS band will again be narrowed, to its final configuration of seven channels in the 2025-2110 MHz band, centered at the following frequencies:

Channel 1	--	2031.20 MHz
Channel 2	--	2043.45 MHz
Channel 3	--	2055.55 MHz
Channel 4	--	2067.65 MHz
Channel 5	--	2079.75 MHz
Channel 6	--	2091.85 MHz
Channel 7	--	2103.95 MHz

Phase II will be triggered when the 18 megahertz of Phase I spectrum is no longer sufficient to meet MSS requirements.

31. We will require the first MSS licensee(s) to complete Phase I of our relocation plan only in the 30 largest (LA and Metro) television markets before they begin operations. After the new MSS licensee(s) begin operations, we will forbid the use of the current BAS channel 1 (1990-2008 MHz), in the Light and Rural markets, where BAS has not yet been relocated. The new MSS licensee(s) will be required to complete subsequent Phase I relocation in the next 70 largest (Light) television markets within three years of the date upon which they begin operations.

32. As in Phase I, BAS licensees in the LA and Metro television markets must be relocated to the Phase II channel plan before the new MSS entrant(s) may begin operations in Phase II spectrum. We will forbid use of Phase I BAS channel 1 (2008-2023 MHz) in the remaining television markets as of the date Phase II MSS operations begin in Phase II spectrum. From that date, MSS providers will

have three years to complete relocation of BAS licensees in the Light markets, and an additional two years, for a total of five years, to complete relocation in the remaining (Rural) television markets.

33. Although all Phase II relocation may be completed before all MSS licensees are ready to begin service, it is possible that the final MSS licensee will be ready to begin service before the completion of Phase II relocation. We conclude that an MSS licensee needing the 2023-2025 MHz portion of the MSS band may not begin service until all BAS licensees have been relocated to the final BAS band. This is because the Phase I BAS channel 2 (2023-2037.5 MHz) overlaps the MSS band by two megahertz (2023-2025 MHz). We conclude that it would be excessively onerous to forbid the use of this channel, as well as Phase I channel 1, during the Phase II transition. If this situation should arise, the MSS licensee needing the 2023-2025 MHz segment to begin operations may accelerate the relocation process at its own expense, and have this expense deducted from the *pro rata* share of costs it owes previous licensees. We think that this eventuality is unlikely to arise for two reasons. First, this portion of the MSS band may be occupied by a licensee capable of sharing with BAS (see ¶¶ 62-63 *infra*), which would obviate the need for accelerated relocation of the remaining markets in Phase II. Second, if this portion of the spectrum is the last to be assigned to an MSS licensee, it is possible that the relocation will be finished before that MSS licensee is ready to begin service.

34. We find that this two-phase plan is an appropriate compromise between a simultaneous national cut-over and a multi-phase, licensee-by-licensee transition. This phased approach to BAS relocation will allow an orderly transition with minimum disruption to BAS service, while at the same time assuring efficient use of the spectrum. A transition of more phases, as recommended by IUSG, would burden BAS incumbents with frequent equipment changes and the attendant confusion and equipment down time. A simultaneous cut-over is impracticable for the reasons presented by commenters in opposition. We also note that some MSS licensees will begin service later than others. This argues strongly against a simultaneous national cut-over which could leave substantial amounts of valuable 2 GHz spectrum unused for a long period of time.

35. Requiring relocation of BAS licensees in the LA and Metro markets before MSS begins operations ensures the continuity of a seven-channel BAS system where seven channels are most needed, while allowing several years for the relocation of BAS in the Light and Rural markets, where the need for seven channels is less pressing. This approach will allow new MSS licensees to spread out the cost of BAS relocation over several years, and pay much of the cost out of operating revenues, rather than start-up capital. Further, the burden on manufacturers of BAS equipment and the trained personnel needed to retune or replace BAS equipment will be lessened by the phased nature of the transition, and by the varying time limits for relocating the different categories of markets. We also believe that digital BAS equipment will benefit from more time for design development, becoming higher capacity, smaller, less expensive, and less power-intensive. Finally, our transition plan minimizes the amount of valuable 2 GHz spectrum that could lie fallow, unused by relocated BAS licensees and not yet occupied by MSS licensees, during the early phase of MSS growth.

36. Finally, NAB has suggested a plan whereby, in addition to relocation of the LA and Metro markets, MSS will be required to relocate one ENG mobile vehicle in each market to allow it to operate on the Phase I channel plan. NAB points out that if ENG vehicles in a Metro market and ENG vehicles in an adjacent Light market were assigned to cover the same event, near the border of the markets or within the borders of one of the markets, coordination would prove difficult, because the two ENG systems would be operating on different channel widths.⁶⁷ Because NAB filed its suggestion in an *ex parte* letter, no other party has commented.

⁶⁷ See Letter from J. Goodman, NAB to M. Salas, Federal Communications Commission, Feb. 23, 2000.

37. While we are aware of the coordination difficulties presented by NAB's scenario, we decline to adopt its suggestion. First, we note that operation in the BAS outside of the licensee's city of license of the associated broadcast station is on a secondary, non-interference basis to home-city licensees.⁶⁸ Our relocation policy has never provided for secondary licensees or secondary uses, and we hesitate to do so here. Second, we note that in the scenario described by NAB, coordinators would be able to assign the secondary, out-of-area licensees to BAS Channels 8 and 9 (2450-2483.5 MHz), which are unaffected by this relocation. In the alternative, the out-of-area licensees could use satellite newsgathering equipment, which would also avoid any problem with incompatible channel widths. Finally, the relocation suggested by NAB would be very difficult and expensive, because it would be necessary to relocate BAS receive sites as well as ENG vehicles. We find that, in view of the alternatives available to BAS licensees, NAB's suggestion would be unnecessarily burdensome upon MSS licensees.

38. *Negotiations.* In the *Third Notice*, we invited comment as to whether it is feasible to allow MSS and BAS operators to negotiate an appropriate transition plan, or whether the nature and needs of BAS and MSS would require us to mandate a transition plan.⁶⁹ We proposed to require that negotiations be conducted in accordance with our *Emerging Technologies* policies, as modified by the decisions in our *Microwave Cost-Sharing* proceeding, as applied in Section E *infra* and as delineated in 47 C.F.R. Part 101.⁷⁰ These proceedings defined relocation negotiations as voluntary and mandatory. Voluntary negotiations "are strictly voluntary and are not defined by any parameters."⁷¹ During mandatory negotiations, on the other hand, "an [incumbent] licensee may not refuse to negotiate and all parties are required to negotiate in good faith. Good faith requires each party to provide information to the other that is reasonably necessary to facilitate the relocation process."⁷² If no agreement is reached during negotiations, the new technology licensee may proceed to involuntary relocation of the incumbent. In such a case, the new technology licensee must guarantee payment of all relocation expenses, and must construct, test, and deliver to the incumbent comparable replacement facilities.⁷³ In the *Microwave Relocation Cost-Sharing* proceeding, the Commission reduced the voluntary negotiation period from two years to one year for non-public safety FS incumbents. Thus, the negotiation period for relocation of non-public safety FS incumbents is now one year for voluntary negotiations and one year for mandatory negotiations, for a total of two years. We proposed to adjust the negotiation periods for the 1990-2025 MHz band in the same manner. We also proposed to apply the good faith requirements of 47 C.F.R. § 101.73 to negotiations for the relocation of BAS.

39. Comments on the freedom of negotiations varied widely. IUSG, for example, suggests that we establish negotiation periods and a sunset date, and otherwise leave negotiations to the parties.⁷⁴

⁶⁸ See 47 C.F.R. § 74.632(d).

⁶⁹ See *Third Notice*, 13 FCC Rcd 13,949, at ¶ 40.

⁷⁰ See *Microwave Cost-Sharing First Report and Order/Further Notice of Proposed Rule Making*, 11 FCC Rcd 8825.

⁷¹ 47 C.F.R. § 101.71.

⁷² 47 C.F.R. § 101.73.

⁷³ See 47 C.F.R. § 101.75 for details on costs and the definition of comparable facilities.

⁷⁴ See IUSG Comments at 34-40.

MSTV/NAB request that we mandate that each industry in the negotiations be represented by a national negotiator, and that we mandate full compensation for BAS incumbents, leaving only information-gathering and technical issues for negotiation.⁷⁵ Other commenters, like the Cosmos Coalition, recommend that we establish almost all of the details of relocation, including the formula for calculating costs.⁷⁶

40. On the question of negotiation structure and periods, most parties recommended a simplified structure. A majority of commenters also stated that the negotiation period should be shortened from the period established in our *Emerging Technologies* and *Microwave Cost-Sharing* proceedings. MSTV/NAB, noting that several factors have significantly delayed this proceeding, requests that we abandon voluntary negotiations and adopt a two-year mandatory negotiation period, starting 60 days after the effective date of this *Second Report and Order*.⁷⁷ Several parties advocate a one-year negotiation period, to allow expeditious entry for MSS licensees.⁷⁸

41. Finally, as regards the application of the good-faith requirement of 47 C.F.R. § 101.73, all parties who addressed this proposal in comments supported our proposal to require good faith in negotiation.⁷⁹ IUSG recommends strengthening our good-faith guidelines by clarifying what procedure we would use to evaluate an alleged violation of our good faith requirements, how much time would be required to resolve allegations of good faith violations, and what punishments would be imposed on violators. IUSG claims that, without these specifics, our good-faith guidelines inspire little faith in the negotiating parties.⁸⁰

42. We remain convinced that the best way to achieve an equitable solution is to define the parameters of the relocation, and within those parameters to allow maximum flexibility to negotiators. The parties involved are better informed than the Commission as to their needs and the nature of the markets for their services and the equipment and facilities they need for their systems. At the same time, the nature of BAS as an integrated, coordinated system, and the nationwide nature of MSS necessitate a much more structured relocation framework than that contemplated in our *Emerging Technologies* proceeding. There are substantial differences between BAS and FS microwave. BAS is an integrated service whose licensees undergo a dynamic coordination process on a daily basis in covering news events. FS microwave is far less integrated, consisting essentially of a large number of individual links, with coordination required only upon first activation of any link, to ensure that the new link is sufficiently removed from existing links in frequency, geography, and orientation to avoid harmful interference. Further, FS microwave relocation has thus far consisted of removing links from the 2 GHz spectrum and relocating them to spectrum above 5 GHz. By contrast, BAS "relocation" will consist of reducing the seven BAS channels into a smaller portion of the same band they currently occupy. Finally, the integrated nature of BAS, along with the nationwide, and indeed global, scope of MSS, makes a licensee-by-licensee relocation of BAS impossible. For these reasons, we must consider additional factors in crafting a relocation scheme for BAS. It remains a primary goal to ensure that the BAS

⁷⁵ See MSTV/NAB Comments at 17-20.

⁷⁶ See Cosmos Coalition Comments at 11; Reply at 6-7.

⁷⁷ See MSTV/NAB Joint Comments at 16.

⁷⁸ See IUSG Reply at 43; Cosmos Coalition Joint Comments at 11; Inmarsat Reply at 6.

⁷⁹ See NAB/MSTV Comments at 17; Iridium Comments at 7; IUSG Comments at 38.

⁸⁰ See IUSG Comments at 38-39.

transition causes the minimum possible disruption to BAS operations.

43. At the same time, MSS is entitled to reasonable terms for initiating service. Several factors complicate the transition of BAS. First, the 2 GHz MSS system proponents are at widely differing points in the process of preparing to begin service. ICO plans to begin service in the year 2002.⁸¹ Other applicants may take as much as several more years to offer service.⁸² Along with the impossibility of relocation of BAS in accordance with a geographic “buildout” schedule, this means that the early licensees of MSS could face a relocation burden that would be a barrier to entry. We find that it is necessary to ensure a BAS relocation plan that is not unreasonably burdensome upon MSS, while also fair to the incumbents.

44. We are persuaded that a shorter negotiation period than that which we have used before is justified in this case. In the first place, the BAS and MSS industries have been aware of this proceeding, and closely following its progress, since 1995. Also, as commenters have noted, intervening Congressional action and other factors have caused unusual delays in this proceeding.⁸³ Further, we note that the spectrum became available for MSS on January 1, 2000, and ICO expects to be ready to provide MSS service in 2002.⁸⁴ While negotiations must be given enough time to be effective, they should not unreasonably delay MSS access to the 1990-2025 MHz and 2165-2200 MHz bands. We believe that the considerable proscriptions we have been obligated to place upon the relocation of BAS, compared to previous relocations of FS microwave licensees, narrows the scope of negotiations considerably.

45. We established our two-phase transition plan to respond to the needs of BAS and MSS for an orderly and expeditious transition. We endeavor to minimize restrictions on relocation negotiations, merely providing an incentive to negotiate to both parties, and the minimum set of rules to ensure continuity of BAS service. Outside of these requirements, we will leave all arrangements to the negotiations of the parties involved. We emphasize that negotiations may produce any solution that is acceptable to both parties, as long as the solutions do not contradict our transition plan. For example, in many of the Metro markets, the BAS licensees in a particular market may opt for simply accepting a prohibition on the use of BAS channel 1, rather than retuning to 14.5 megahertz channels. This is because licensees in some of the larger markets satisfy demands for BAS channels by splitting channels, sending two overlapping BAS signals in a single channel. While this practice degrades the quality of the BAS signal, it doubles the channel capacity of BAS. Channel splitting is much more feasible with BAS channels of 17 megahertz than with BAS channels of 14.5 megahertz. Such a solution would be acceptable to us, as it meets our goals of freeing 18 megahertz of spectrum for MSS operations in Phase I. BAS licensees and MSS licensees may also choose whether to negotiate individually or collectively for relocation. To facilitate an orderly frequency coordination process and prevent interference, however, we will require that all BAS licensees in the same market use the same channel plan. For this reason, we will require all BAS licensees within a Nielsen DMA to coordinate and choose whether they

⁸¹ See Debtor’s Amended Disclosure Statement Pursuant to 11 U.S.C. § 1125, *In re* ICO Global Communications Services, Inc., Case Nos. 99-2933 through 99-2936 (MFW) (Bankr. D. Del.) (dated March 20, 2000), at p. 87.

⁸² See, e.g., IUSG Comments at 56; Constellation Comments at 4; Boeing Reply at 6.

⁸³ See, e.g., MSTV/NAB Joint Comments at 16.

⁸⁴ See Debtor’s Amended Disclosure Statement Pursuant to 11 U.S.C. § 1125, *In re* ICO Global Communications Services, Inc., Case Nos. 99-2933 through 99-2936 (MFW) (Bankr. D. Del.) (dated March 20, 2000), at p. 87.

prefer to surrender BAS channel 1 during Phase I, or whether they wish to be relocated to seven channels of 14.5 or 15 megahertz. After this decision is reached, licensees may negotiate individually or collectively with MSS providers, but must negotiate for relocation in accordance with the coordinated decision of all BAS licensees in the market.

46. We will forego the voluntary negotiation period in the case of MSS/BAS negotiations, and impose a two-year mandatory negotiation period, after which BAS licensees may be involuntarily relocated in accordance with our relocation scheme. This period for the 30 largest television markets will begin to run 30 days after the publication of this *Second Report and Order* in the Federal Register. After the first MSS entrant in Phase I spectrum begins operations, another two-year mandatory negotiation period begins in the next 70 largest markets whenever the MSS licensee informs a BAS licensee, in writing, of its desire to negotiate. Similar negotiation periods will begin for Phase II, on the date that any MSS licensee informs BAS licensees, in writing, of its desire to negotiate for relocation of BAS incumbents in the 2008-2025 MHz band for Phase II. To ensure that all parties are aware of the start of Phase II, we will require the first MSS licensee in Phase II spectrum to provide the Commission and all other MSS licensees in the 1990-2025 MHz band with copies of its letter to BAS licensees informing them of its desire to negotiate for relocation of BAS.

47. Because all commenters support the application of our good faith requirements on any negotiations stemming from this proceeding, we will apply the provisions of 47 C.F.R. § 101.73 to such negotiations. Our goal is to ensure good faith negotiations by imposing sanctions which will outweigh any benefit a party may try to achieve through bad faith. We decline to delineate specific remedies for violation of the good faith requirement, as requested by IUSG. Rather, we believe that it is necessary for us to retain sufficient flexibility to be able to craft an appropriate remedy for a given violation in light of the particular circumstances at hand. For example, in cases where we determine that the BAS incumbent has violated good faith, we would seriously consider permitting the MSS licensee to move immediately to involuntary relocation of the BAS incumbent, thus allowing the MSS licensee to determine comparable facilities. In cases where we determine that the MSS licensee has violated good faith, we may apply one or more of several remedies that take into account the most recent offer of the BAS incumbent, and relocation-related premiums, such as system-wide relocations or analog-to-digital conversions. We believe it is effective to retain a wide range of potential responses to violations, and simply assure all parties that any party who violates our good faith requirements, either by acting in bad faith or by filing frivolous or harassing claims of violations, will suffer sufficient penalties to outweigh any advantage it hoped to gain by its violation.

48. In the event that agreement is not reached in any negotiation period, the MSS licensee(s) will have the option of involuntary relocation. In such a case, the MSS licensee may, at its own expense, make necessary modifications to or replacement of the incumbent licensee's BAS equipment in a fashion consistent with the modifications or replacement performed in negotiated agreements. It would not be in the public interest to allow a right of return to relocated incumbents, as was provided in our *Emerging Technologies Proceeding*. The disruption to region-wide or world-wide satellite systems for the benefit of relatively few BAS incumbents is infeasible. We will therefore allow involuntarily relocated BAS incumbents to petition the Commission for additional modification to or replacement of their equipment in any case where the incumbent believes it has not received comparable performance from its returned or replaced equipment. Upon proof shown, we will order the MSS licensee in question to further modify or replace the incumbent BAS licensee's equipment.

49. This negotiation structure serves our twin goals of providing early access to the spectrum for MSS providers, while maintaining the integrity of the BAS system. We believe that the two year period for negotiations is sufficient to encourage all parties to engage in rapid, effective negotiations, without excessively delaying the initiation of MSS service.

50. *Sunset Date for BAS Relocation.* In the *Third Notice*, we inquired whether we should impose a "sunset" date, after which MSS licensees would no longer be required to relocate incumbents. 47 C.F.R. § 101.79 states that new licensees are no longer required to pay relocation expenses after ten years following the start of the voluntary negotiation period for relocation. We asked whether the sunset date should commence after the beginning of the voluntary negotiation period, as in 47 C.F.R. § 101.79, or some other date.

51. Commenting parties have been in wide disagreement on this issue. MSS parties typically favor short sunset dates, on the order of two to five years from the date of this *Second Report and Order*.⁸⁵ In support of short sunset dates, MSS parties cite the ample notice of the impending BAS relocation,⁸⁶ incentive to incumbents to relocate quickly,⁸⁷ and other proceedings in which we have established relatively short sunset periods.⁸⁸ These commenters supporting a shorter sunset period point out that BAS incumbents have been aware of the impending relocation for some time, being on notice since 1992,⁸⁹ 1995,⁹⁰ or 1998.⁹¹ Broadcasting interests generally have supported a fixed transition plan that moots the idea of a sunset date. The Association of America's Public Television Stations (APTS), however, recommends no sunset date at all, arguing that a sunset date would merely encourage MSS providers to refrain from entering rural and smaller markets until after the sunset date had passed.⁹²

52. In our *Microwave Cost-Sharing Proceeding*, we explained our reasons for adopting a sunset date for relocation.

... an emerging technology licensee's obligation to relocate 2 GHz microwave incumbents should not continue indefinitely; however, we are also persuaded by incumbents that immediate conversion to secondary status in the year 2005 may not be necessary, especially with respect to ... links that would not interfere with any [new technology] systems. To strike a fair balance between these competing interests, we conclude that 2 GHz microwave incumbents will retain primary status unless and until an emerging technology licensee requires use of the spectrum, but that the emerging technology licensee will not be obligated to pay relocation costs after the relocation rules sunset, i.e., ten years after the voluntary

⁸⁵ See IUSG Comments at 39; Iridium Comments at 2-3; Constellation Comments at 5; Inmarsat Comments at 7; Boeing Comments at 13.

⁸⁶ See Inmarsat Comments at 7.

⁸⁷ See Boeing Comments at 13.

⁸⁸ See IUSG Comments at 39-40 (citing *Establishment of a Spectrum Utilization Policy for the Fixed and Mobile Services' Use of Certain Bands Between 947 MHz and 40 GHz*, GEN Docket No. 82-334, 54 RR 2d 1001 (1983)).

⁸⁹ See Inmarsat Reply at 7.

⁹⁰ See Constellation Comments at 5.

⁹¹ See Boeing Reply at 13.

⁹² See APTS Comments at 7-8.

period begins for the first emerging technology licensees in the service.⁹³

We believe that the same considerations apply here. A sunset date provides a measure of certainty for new technology licensees, while at the same time giving incumbents ample time to prepare for the eventuality of moving to another frequency band. We believe that an appropriate sunset date is ten years after the beginning of the negotiation period. This is the period we currently use for relocation of FS microwave licensees.⁹⁴ We have been presented with no persuasive reason to adopt a different sunset date in the case of BAS incumbents. While we agree with commenters who state that BAS incumbents have been aware that a change in their allocated band was forthcoming for quite some time,⁹⁵ we note that the final form of the post-transition BAS band and the rules for the transition have not been promulgated until this *Second Report and Order*. We note that in the *Notice of Proposed Rule Making* in this proceeding, we proposed a final BAS band of 2025-2145 MHz, divided into seven channels of 17 or 18 megahertz each.⁹⁶ Had the BAS community begun ordering, and BAS manufacturers begun designing, equipment on the basis of the *Notice of Proposed Rule Making*, that equipment would now be useless, as the center frequencies and channel widths would be incompatible with the final BAS band we have adopted in this proceeding. Because it would have been impossible to plan for the BAS transition until the final form of the BAS band was known, we do not believe that BAS licensees had adequate notice of the change in their spectrum sufficient to allow planning for the transition. We think it reasonable to begin the sunset period only when the parties involved are informed of the rules under which the transition will be carried out. At the same time, arguments that there needs to be some certainty of an end date for the transition, as well as an incentive to BAS incumbents to negotiate, are well taken.

53. As noted above, we will begin the negotiation period 30 days after this *Second Report and Order* is published in the Federal Register. The obligation to relocate BAS incumbents will sunset ten years after that date. At that point, incumbent BAS licensees will shift to secondary status in the 1990-2025 MHz band, and all relocation obligations to BAS licensees will cease, including any which may be under negotiation when the sunset date arrives.⁹⁷ Consistent with our FS microwave sunset rules,⁹⁸ after that date any BAS licensee continuing to operate in the band will be required to vacate the band within six months of receipt of a written demand from a new licensee in the band.

54. This definition of the start date for relocations answers the need for basic fairness in relocation. Until this *Second Report and Order*, BAS licensees did not know what the final BAS band would be. We find that the combination of a negotiation period as established above and a specific sunset will both encourage BAS incumbents to move forward with relocation, and also provide BAS with assurances that the relocation will not be cut short by a premature sunset date. Our sunset date also

⁹³ *Microwave Cost-Sharing First Report and Order/Further Notice of Proposed Rule Making*, 11 FCC Rcd 8825, at ¶ 65.

⁹⁴ See 47 C.F.R. § 101.79.

⁹⁵ See *supra* nn. 89-91.

⁹⁶ See *In re Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum at 2 GHz for Use by the Mobile-Satellite Service*, ET Docket No. 95-18, *Notice of Proposed Rule Making*, 10 FCC Rec 3230, ¶ 9 (1995).

⁹⁷ Cost-sharing obligations among relocating parties, explained below, continue beyond the sunset date.

⁹⁸ See 47 C.F.R. § 101.79.

provides a definite end to the transition, a time at which BAS licensees, if not finally relocated to the future BAS band of 2025-2110 MHz, will shift to secondary status.

55. *Participation in BAS Relocation.* In the *First R&O/Further Notice*, we sought comment on whether we should freeze new BAS license applications during the negotiation period. If we did not freeze new applications, we asked if we should subject new BAS licenses issued after the release of that document to a condition requiring relocation to be at their licensees' own expense, given that new BAS license applicants would be on notice of the pending relocation of BAS.⁹⁹

56. Several MSS parties strongly advocate freezing BAS licensing. IUSG requested that we condition new BAS licenses issued after March 14, 1997 (the date of the *First R&O/Further Notice of Proposed Rule Making*) on a requirement that the licensee must pay for its own relocation,¹⁰⁰ and that we similarly condition BAS license renewals after November 25, 1998 (the date of the *Third Notice*).¹⁰¹ ICO and Inmarsat agree with conditioning new and renewal licenses issued after March 14, 1997.¹⁰² These parties state that freezing or conditioning new and renewed BAS licenses will provide stability and certainty to the relocation process by establishing the upper limit of the number of BAS licensees to be relocated. Further, MSS commenters claim that BAS has been on notice that such a freeze or conditioning of licenses could occur at any time after July 22, 1997, the date we began accepting applications for MSS licenses.¹⁰³ Broadcasting interests oppose any such licensing freeze or conditioning licenses. NAB/MSTV claim that a freeze on new BAS licenses would paralyze the expansion of BAS,¹⁰⁴ and that conditioning new licenses as of any point earlier than the release of this *Second Report and Order* would be unfair, because BAS licensees have not known before this point what the final shape of their spectrum would be.¹⁰⁵ SBE agrees, and suggests that the release date of this *Second Report and Order* is the appropriate date for cutting off relocation for new BAS licensees.¹⁰⁶

57. We have not previously considered whether to freeze or condition BAS license grants or renewals at any particular point, despite requests from some parties that we do so. The *Second Memorandum Opinion and Order* portion of this document deals with one such request. This is because, before our consideration of the comments filed in response to the *Third Notice*, we had made no decision on what form the allocation of the BAS band or the rules regarding BAS relocation would take, *i.e.*, the size of the future BAS band or whether the transition would be simultaneous or phased, nationwide or market-by-market. Until adoption of this *Second Report and Order*, the eventual allocation for BAS was not finalized, and BAS licensees therefore could not have known whether the future BAS band would be of 105 megahertz divided into seven 15-megahertz channels, 85 megahertz divided into seven 12- and

⁹⁹ See *First R&O/Further Notice* at ¶ 71.

¹⁰⁰ See IUSG Comments at 27.

¹⁰¹ See *id.* at 29.

¹⁰² See ICO Comments at 7; Inmarsat Reply at 3.

¹⁰³ See, *e.g.*, IUSG Comments at 28-29.

¹⁰⁴ See NAB/MSTV Reply at 19.

¹⁰⁵ See *id.* at 19-20.

¹⁰⁶ See SBE Reply at 6.

13-megahertz channels, or 70 megahertz divided into seven 10-megahertz channels. The exact nature of the future BAS band was critical to knowing what sort of equipment licensees should purchase. We therefore found that it would be unfair to require BAS licensees to acquire equipment that would meet undefined new standards, which would have been the effect of conditioning new licenses or renewals on secondary status before this document established the future BAS band and the rules for relocation of BAS licensees. Conditioning licenses prior to this *Second Report and Order* would have raised so much uncertainty in equipment purchases for new licensees that we believe it would have effectively prevented stations from seeking to provide BAS service during the freeze period.

58. Now that the relocation rules for BAS have been established, however, we believe that it would be unfair to MSS licensees to require them to relocate licensees who knew of the relocation before they received their licenses. BAS licensees who receive their licenses after this point will be aware of the size and channel bandwidth of the future BAS band, and of the interim Phase I BAS band. A television station wishing to begin BAS service can use this information in ordering its equipment. There is therefore no reason to continue to allow new BAS licensees to acquire equipment designed to operate only in the current BAS band, with the expectation of being relocated by MSS.

59. Accordingly, we will require that upon publication in the Federal Register of this *Second Report and Order* all initial grants of BAS licenses will be conditioned so that the licensees may operate only in the 2008-2110 MHz portion of the spectrum. This will align new BAS licenses with our Phase I BAS band, which we expect to be effective for several years. Furthermore, if new BAS operators whose licenses were issued later than 30 days after publication of this *Second Report and Order* in the Federal Register choose to operate in the full 2008-2110 MHz band, they must be aware that during Phase II or at the end of the sunset period, they will be required to adhere to the new BAS channel plan of seven channels in the 2025-2110 MHz band. These new licensees will not be relocated by MSS, but must prepare for relocation as needed at their own expense.

60. We believe that conditioning new BAS licenses to require new licensees to relocate themselves serves the need of MSS applicants for a defined list of the BAS licensees with whom they would have to negotiate. At the same time, we conclude that making the license condition retroactive would be unfair to BAS licensees, who made their equipment purchases without knowing or being able to know the eventual shape of the BAS band, but who decided to begin using BAS in their operations.

61. *MSS/BAS Spectrum Sharing.* In the *Third Notice*, we noted that some systems may employ technologies that would allow them to share spectrum with BAS in the 1990-2025 MHz band. We sought comment on whether such systems should be exempted from participation in the relocation of BAS.¹⁰⁷ One MSS license applicant, Celsat, Inc. (Celsat), presented a plan by which it, and possibly other geostationary MSS systems, could share spectrum with BAS.¹⁰⁸ Celsat claims that its advanced technology allows sharing with both BAS and FS microwave systems, and states that allowing such sharing, and exempting MSS licensees who can share spectrum with BAS incumbents from participating in relocation, is a more spectrally efficient and fair alternative than a wholesale imposition of relocation on all MSS licensees.¹⁰⁹ SBE reviewed Celsat's sharing proposal, and agrees that if a MSS provider can demonstrate that it will not cause harmful interference to, nor receive harmful interference from, BAS

¹⁰⁷ See *Third Notice*, 13 FCC Rcd 13,949, at ¶ 42.

¹⁰⁸ See Celsat *ex parte* letter, Dec. 17, 1998; Celsat Comments at 3-4.

¹⁰⁹ See Celsat Reply at 4-5.

operations, that provider should not have to share in the costs of relocating BAS.¹¹⁰ IUSG also states that it would be punitive and spectrum-inefficient to require a MSS licensee that is capable of sharing spectrum to pay the costs of relocation.¹¹¹ On the other hand, MSTV/NAB disagree with Celsat, stating that relocation should be triggered whenever incumbents will receive interference from, or cause interference to, new MSS licensees. According to MSTV/NAB, "there is no evidence that a significant number of MSS systems will be able to avoid BAS interference...."¹¹² Boeing asserts that exempting some MSS licensees from sharing in the costs of relocation would merely shift the burden unfairly to other MSS operators.¹¹³

62. This proceeding was initiated for the purpose of allocating spectrum for MSS, a task that entails establishment of a definite plan for the relocation of incumbent operators. The relocation of BAS is particularly difficult compared to prior relocations of FS microwave licensees. As we have noted, BAS is a highly integrated, nationwide service in which simple, link-by-link relocation is not possible. This is why we have designed the BAS transition plan above. We also conclude that it is necessary for there to be a defined form of the future BAS band. It is not feasible to allow the size and channelization of that future BAS band to depend on possible sharing with one or more MSS systems. Moreover, we are requiring the first MSS licensee(s) to clear much more spectrum than they will actually be assigned. As such, we could not apply a simple requirement that each MSS licensee clear the spectrum it will use; rather, we were obligated to design a complex transition, and will require MSS licensees to abide by the transition plan described above.

63. On the other hand, we recognize that the relocation plan we adopt in this *Second Report and Order* may enable certain MSS systems to share spectrum with BAS operations in the 2 GHz band. In this regard, we intend to adhere to the relocation policy in our *Emerging Technologies* proceeding, which states that "we will encourage spectrum sharing between emerging technologies services and incumbent 2 GHz fixed microwave users whenever technically feasible. . . . We are hopeful, however, that spectrum sharing techniques for some services . . . may prove workable. The success of those techniques could allow co-primary operation of some emerging technologies with existing fixed microwave services on a non-interference basis without the need for any relocation agreements."¹¹⁴ We have consistently allowed new licensees that were able to share spectrum with incumbents to do so, and have exempted those licensees from relocation obligations. Therefore, in accordance with our policy, we will require each MSS operator to either conclusively demonstrate that its proposed system is capable of sharing spectrum with all types of BAS operations in the 2 GHz band or participate in the relocation of BAS. We will consider the specific plans that Celsat, and possibly other MSS applicants, present for MSS/BAS sharing in our ongoing proceeding for 2 GHz MSS licensing and service rules.¹¹⁵

64. *Cost Sharing.* In the *Third Notice*, we proposed to require subsequently entering MSS licensees in the 1990-2025 MHz band to compensate earlier MSS operators for the reasonable costs

¹¹⁰ See SBE Reply at 4.

¹¹¹ See IUSG Comments at 62.

¹¹² See MSTV/NAB Reply at 6-7.

¹¹³ See Boeing Reply at 3.

¹¹⁴ *Emerging Technologies First Report and Order and Third Notice of Proposed Rule Making* at ¶ 29.

¹¹⁵ See *the Establishment of Policies and Service Rules for the Mobile Satellite Service in the 2 GHz Band*, IB Docket No. 99-81, *Notice of Proposed Rulemaking*, 14 FCC Rcd 4843 (1999).