

FCC 95-47
Feb 20 11 30 AM '95

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

In the Matter of)
)
Allocation of Spectrum Below) ET Docket No. 94-32
5 GHz Transferred from)
Federal Government Use)

**FIRST REPORT AND ORDER AND
SECOND NOTICE OF PROPOSED RULE MAKING**

Adopted: February 7, 1995

Released: February 17, 1995

Comment Date: March 20, 1995

Reply Comment Date: April 4, 1995

By the Commission:

TABLE OF CONTENTS

	Paragraphs
I. INTRODUCTION	1
II. BACKGROUND	2-5
III. DISCUSSION	6-129
 REPORT AND ORDER	
2390-2400 MHz	7-24
2402-2417 MHz	25-35
4660-4685 MHz	36-54
 SECOND NOTICE OF PROPOSED RULE MAKING	
2390-2400 MHz	55-57
2402-2417 MHz	58-59

4660-4685 MHz	60-129
A. Service Rules	60-63
B. Use of Spectrum	64-67
C. Assignment Methods	68-76
D. Channelization; Aggregation	77-78
E. License Area	79-82
F. Eligibility	83
G. Competitive Bidding Issues	84-120
H. Technical Rules	121-122
I. License Term	123
J. Construction Requirements	124
K. Regulatory Status	125-127
L. Licensing Issues	128-129
IV. ORDERING CLAUSE	130
V. PROCEDURAL MATTERS	131-134

I. INTRODUCTION

1. By this action, we adopt allocations for and propose rules governing the use of 50 megahertz of spectrum, at 2390-2400 MHz, 2402-2417 MHz, and 4660-4685 MHz, that has been transferred from Federal Government to private sector use. In particular, we are providing 25 megahertz for use by unlicensed devices and the Amateur service and 25 megahertz for Fixed and Mobile operations. Specifically, we are allocating the 2390-2400 MHz band for use by unlicensed Personal Communications Services (PCS) devices, providing for continued use of the 2402-2417 MHz band by devices operating in accordance with Part 15 of our Rules, allocating both of these bands for use by the Amateur service on a primary basis, and allocating the band 4660-4685 MHz for use by Fixed and Mobile services. The 2390-2400 MHz and 2402-2417 MHz bands will be governed by existing applicable rules. We are proposing rules for use of the 4660-4685 MHz band. The allocations adopted herein will benefit the public by providing for the introduction of new services and devices and the enhancement of existing services and devices. These new and enhanced services and uses will create new jobs, foster economic growth, and improve access to communications by industry and the American public.

II. BACKGROUND

2. On August 10, 1993, the Omnibus Budget Reconciliation Act of 1993¹ (Reconciliation Act) was signed into law. The Reconciliation Act required that the Secretary of Commerce identify 200 megahertz of spectrum currently allocated for use by Federal Government agencies that could be transferred to private sector use. All of the 200 megahertz of spectrum recommended for reallocation must be located below 5 gigahertz, with at least 100 megahertz of this being below 3 gigahertz. The Reconciliation Act also required the Secretary of Commerce to issue within six months of its enactment a report making a preliminary identification of reallocable bands of frequencies and to issue within 18 months a final report recommending the spectrum for reallocation.² In its report making a preliminary identification of spectrum, the Department of Commerce was required to identify at least 50 megahertz of spectrum for immediate reallocation.³ The remaining spectrum is to be made available over a ten-year period.⁴

3. In accordance with the requirements of the Reconciliation Act, on February 10, 1994, the Department of Commerce released its report making a preliminary identification of spectrum for reallocation (Preliminary Report).⁵ The frequency bands identified for reallocation in the Preliminary Report are listed in Appendix A. Three of these frequency bands, 2390-2400 MHz, 2402-2417 MHz, and 4660-4685 MHz, were identified for immediate reallocation and are now available for private sector use.⁶ The Reconciliation Act also requires that the Commission allocate, and propose regulations to assign, the 50 megahertz of spectrum that is immediately available no later than 18 months after its enactment (*i.e.*, by February 10, 1995).⁷

¹ Omnibus Budget Reconciliation Act of 1993, Pub. L. No. 103-66, 107 Stat. 312 (approved August 10, 1993).

² See Reconciliation Act, § 6001(a)(3), as codified at 47 U.S.C. § 923.

³ At least one-half of the 50 megahertz identified for immediate reallocation must be below 3 gigahertz and all of it must be identified for exclusive non-Federal use.

⁴ Reconciliation Act, § 6001(a)(3), as codified at 47 U.S.C. § 923(e)(2)(A).

⁵ Preliminary Spectrum Reallocation Report, U.S. Department of Commerce, NTIA Special Publication 94-27, February, 1994.

⁶ By letter dated October 27, 1994, the President of the United States notified the Chairman of the Commission that Federal Government frequency assignments in these bands have been withdrawn and that the National Table of Frequency Allocations has been modified to reflect the reallocation of these bands.

⁷ Reconciliation Act, § 6001(a)(3), as codified at 47 U.S.C. § 925(a).

4. On May 4, 1994, we released a Notice of Inquiry (NOI) in this proceeding seeking information on potential applications for the 50 megahertz of spectrum that has been transferred from Federal Government use.⁸ Following this, we released a Notice of Proposed Rule Making (NPRM) on November 8, 1994, proposing that all 50 megahertz of the transferred spectrum be allocated to Fixed and Mobile services.⁹ We stated in the NPRM our belief that such a broad allocation would provide the greatest degree of flexibility, thereby allowing licensees to offer a wide range of services employing varying technologies.¹⁰ We also indicated our belief that most services provided in this spectrum would meet the statutory criteria for auctions and proposed that licenses be offered through competitive bidding.¹¹ In addition to our basic proposal, however, we also discussed alternatives wherein these bands would be allocated to specific services.¹²

5. In response to our NPRM, we received 90 comments and 52 reply comments.¹³ Several parties interested in providing commercial services supported our proposal for a Fixed and Mobile allocation scheme with licenses issued pursuant to competitive bidding.¹⁴ However, most of the commenting parties oppose our proposal, based on a number of legal, technical, economic, and public interest arguments.¹⁵ Most of the parties who oppose a general allocation also provide information regarding specific services that they believe should be accommodated in particular bands.¹⁶

⁸ Notice of Inquiry, 9 FCC Rcd 2175 (1994).

⁹ Notice of Proposed Rule Making, ET Docket No. 94-32, 9 FCC Rcd 6779 (1994).

¹⁰ Id. at 6780, para. 8.

¹¹ Id. at 6780-81, para. 9.

¹² Id. at 6781-83, paras. 12-22.

¹³ See Appendices B and C.

¹⁴ Comments of American Telecasting 4, Wireless Cable Association at 3-4, Wireless Holdings at 4-5, Leaco at 5, Pacific Bell Mobile at 1-2.

¹⁵ See generally Comments of Alcatel Network Systems, American Petroleum Institute, APCO, AAR, County of LA, Forest Industries Telecommunication, ITA, LA County Sheriff, MRFAC, TIA, UTC, ARRL, WINForum, Apple, AT&T, Cincinnati Microwave, Compaq, EIA, Cylink, FSC, FLI, Metricom, Norand, Part 15 Coalition, Standard Microsystems, Symbol, Tetherless, Western Multiplex, Windata, Xircom, Loral/Qualcomm, Continental Airlines, In-Flight, MSTV, Motorola, and Bell Atlantic.

¹⁶ A description of services proposed by commenters is contained in the discussion of comments for each band.

III. DISCUSSION

6. Based on the record in this proceeding, we believe that an approach that provides spectrum for both unlicensed devices and Fixed and Mobile services would best serve the public interest. Taking into account the unique nature of some of the bands under consideration, the current communications environment, and the suggestions of the commenting parties, we find it is desirable to allocate 25 megahertz for specific services and devices and 25 megahertz for Fixed and Mobile operations. Specifically, we are allocating the 2390-2400 MHz band for use by unlicensed PCS devices, providing for continued use of the 2402-2417 MHz band by other unlicensed devices operating in accordance with Part 15 of our Rules, allocating both of these bands for use by the Amateur service on a primary basis, and allocating the band 4660-4685 MHz for Fixed and Mobile services. Comments and issues relating to each of the specific bands are discussed below.

REPORT AND ORDER

2390-2400 MHz

7. **Background.** Internationally, 2390-2400 MHz is allocated in Region 2¹⁷ on a primary basis to the fixed, mobile, and radiolocation services, and on a secondary basis to the Amateur service.¹⁸ Domestically, this band is currently allocated on a secondary basis to the Amateur service. In its Preliminary Report, the Department of Commerce expresses concern over the effect of future non-Government use on the National Astronomy and Ionospheric Center, which operates a planetary research radar at Arecibo, Puerto Rico at 2380 MHz. To protect radio astronomy operations, the Department of Commerce states that the 2390-2400 MHz band should not be used for airborne or space-to-Earth links, and that restrictions on terrestrial operations in the vicinity of the Puerto Rico planetary research radar facility may be necessary.¹⁹

8. **Comments.** As with the NOI in this proceeding, we received a number of comments from Amateur radio licensees and organizations.²⁰ The 2390-2400 MHz band lies

¹⁷ See 47 C.F.R. § 2.104(b)(2) for a description of Region 2.

¹⁸ See Table of Frequency Allocations, 47 C.F.R. § 2.106.

¹⁹ Preliminary Report, section 4 at 14-17.

²⁰ See generally Comments of A. Frank Adamson, Ph.D., American Radio Relay League (ARRL), L. Stephen Bell, Northern California Packet Association, Northern Amateur Relay Council of California (NARCC), Palomar Amateur Radio Club, Inc., Robert S. Bennett,

within the 2300-2450 MHz frequency range, which is referred to as the 13 cm band by the Amateur service community. The Department of Commerce has proposed reallocating 35 megahertz of spectrum, at 2300-2310 MHz, 2390-2400 MHz, and 2402-2417 MHz, out of the total 70 megahertz of spectrum currently available for use by the Amateur service on a secondary basis in the 13 cm band.²¹ Amateur service commenters contend that sharing between commercial licensees and the Amateur service is generally not possible because of the density and location of commercial users. These commenters describe the important contributions that the Amateur service makes by providing emergency communications, educational opportunities, and radio communications research. They contend that continued access to all or most of the 13 cm band is important to the Amateur service, because the band provides an opportunity for growth as lower bands become increasingly congested or are allocated for services other than the Amateur service. Accordingly, the Amateur service commenters request that all or most of the portions of the 13 cm band reallocated from Federal Government use be made available for the primary or co-primary use of the Amateur radio service or that any displaced Amateur services be accommodated in alternative bands.²²

9. Comments were also received from a wide variety of users of private radio spectrum, including public safety, industrial, and land transportation radio service user organizations. These commenters dispute our position that private users can obtain service through commercial radio providers or that they can compete for spectrum on the same basis as commercial providers.²³ Private users argue that commercial systems are designed to

Ph.D., San Bernardino Microwave Society (SBMS), Southern California Repeater and Remote Base Association (SCRRBA), Western States VHF-Microwave Society, and William A. Burns, and Reply Comments of Amateur Radio Council of Arizona, ARRL, James S. Kaplan, NARCC, Radio Amateur Satellite Corporation, SBMS, SCRRBA, and Amateur Television Network.

²¹ Preliminary Report at Section 5.

²² A number of commenters representing Amateur interests have suggested that the Department of Commerce make available portions of the 2310-2390 MHz band for use by the Amateur Radio Service to accommodate displaced Amateur users, or that the portions of 2300-2310 MHz band not be transferred in exchange for transferring spectrum above and adjacent to 2417 MHz. Reallocation of additional or alternative spectrum must be addressed by the Department of Commerce and is outside the scope of this proceeding. We note, however, that in our August 9th report to the Secretary of Commerce, FCC 94-213, we provided an analysis of comments received in response to the Preliminary Report along with our own comments and recommendations for consideration by the Department of Commerce for incorporation in its final report.

²³ NPRM, 9 FCC Rcd at 6782, para. 16. See generally Comments of American Petroleum Institute (API), Association of Public Safety Communications Officials (APCO), Association of American Railroads (AAR), County of Los Angeles (County of LA), Forest

provide mainstream communications and generally cannot provide the specialized communications or data transmission requirements of many private users.²⁴ A number of the advanced specialized needs of private users are described in a Petition for Rule Making filed by the Coalition of Private Users of Emerging Multimedia Technologies (COPE).²⁵ Further, commenters state that commercial providers naturally concentrate their coverage in densely populated areas where demand is highest and do not provide sufficient coverage for private users that often require complete coverage throughout rural areas or areas that do not conform to normal commercial licensing areas that are based on economic trading considerations. Private users, in particular public safety organizations, also contend that the service provided by commercial providers is not reliable enough to meet critical safety needs nor do commercial systems have sufficient capacity to meet demand during peak use periods, particularly during emergencies or disasters when wired communications may be affected. Public safety organizations point out that they cannot afford to wait for an open channel when loss of life or property is at stake. Private users also contend that they must be able to dynamically control their communications systems in order to meet changing demands. Finally, private users maintain that it is unreasonable to expect private entities to compete against commercial service providers in bidding for spectrum because private entities do not have the fiscal resources that commercial entities have and, particularly in the case of public safety and local governments, have a longer planning cycle than commercial providers.

10. In-Flight Phone Corp., Inc. (In-Flight) asserts that the 2390-2400 MHz band should be allocated for use by a ground-to-air, aeronautical audio/visual service (AAVS) to

Industries Telecommunication (FIT), Industrial Telecommunication Association, Inc. (ITA), Los Angeles County Sheriff's Department (LA Sheriff), Manufacturer Radio Frequency Advisory Committee (MRFAC), Motorola, Inc. (Motorola), Personal Communications Industry Association (PCIA), Telecommunications Industry Association (TIA), UTC, Alcatel Network Systems, Inc., and Reply Comments of API, AAR, ITA, Motorola, and Alarm Industry Communications Committee (AICC).

²⁴ PCIA in particular provides several examples of communications requirements, such as the needs of railroads, overnight delivery companies, airlines, and other very large users, that PCIA contends cannot be meet by commercial providers.

²⁵ COPE is a group consisting of a broad range of private land mobile users and user associations. In its petition, COPE argues that a need exists for an allocation of 75 megahertz of spectrum below 3 GHz for the development of an "Advanced Private Land Mobile Communications Service", which would accommodate the needs of private land mobile radio user communities for new operations such as advanced wireless imaging and decision processing/remote file access systems. COPE specifically suggests that spectrum be reallocated from the Federal Government, and it states that the most likely source of spectrum to accommodate private emerging technology needs lies in the spectrum to be reallocated under the requirements of the Reconciliation Act.

provide live multi-channel audio and video programming for airline passengers.²⁶ In-Flight had proposed this service in response to our NOI and we discussed AAVS as a possible use for this band in the NPRM.²⁷ Use of this band for AAVS is supported by American West Airlines, Capital Cities/ABC, and Continental Airlines.²⁸ Claircom Communications Group, L.P. (Claircom) generally supports a live audio/video service but urges that the Commission ensure that sufficient spectrum is made available to support several providers in a competitive environment and that the service be a two-way, interactive service.²⁹ A number of Amateur service commenters note that In-Flight was one of the few commenters that addressed the issue of sharing with the Amateur service and that AAVS might be an acceptable service provided that an AAVS/Amateur sharing arrangement could be developed.³⁰ Several commenters oppose allocating this band for AAVS, however, arguing that service would be limited to airline passengers rather than providing benefits to the broader population.³¹

11. Another option for this spectrum discussed in the NPRM was a proposal by Southwestern Bell (SWB) that the 2300-2310 and 2390-2400 MHz bands be paired and allocated for use in providing wireless local loop service, allowing local exchange carriers to provide wireless telephone service.³² SWB filed additional comments bolstering its support for a wireless local loop service, claiming that allocation of this spectrum for such service would reduce overall installation costs for local telephone service, allow for faster introduction of new services, and allow faster recovery of operations in the event of a disaster.³³ Use of these bands for wireless local loop service is supported by Bell Atlantic,

²⁶ In-Flight comments at 13-21.

²⁷ NPRM, 9 FCC Rcd. at 6781, para. 12. We also note that, in an Ex Parte filing dated January 24, 1995, In-Flight states that AAVS could be provided at 4660-4685 MHz. In-Flight offers this as a possible alternative to providing AAVS at 2390-2400 MHz.

²⁸ American West comments at 1-2; ABC comments at 1-2; Continental Airlines comments at 2-4.

²⁹ See generally Comments of Claircom.

³⁰ See Reply Comments of the Amateur Radio Council of Arizona at 2, and ARRL at 13-16 and 29. ARRL has since, however, filed an Ex Parte presentation stating that sharing partners other than unlicensed PCS in the 2390-2400 MHz band, "are not promising." ARRL Ex Parte presentation dated January 26, 1995, at 2.

³¹ Southwestern Bell (SWB) comments at 10; TDS Telecommunications Corp. (TDS) comments at 5; United States Telephone Association comments at 2.

³² NPRM, 9 FCC Rcd. at 6781, para. 13.

³³ SWB comments at 1-6.

NYNEX, OPASTCO, Rochester Telephone, SR Telecom, TDS Telecommunications, the United States Telephone Association, and Tadiran Telecommunications.³⁴ These commenters claim that the 2300-2310 MHz and 2390-2400 MHz bands present an ideal and unique opportunity to implement wireless local loops because they can be paired to provide frequency division duplex operation, which is advantageous for wireless local loops because it would allow a system to serve twice the number of users per port transceiver compared to a system using time division duplex.³⁵ These commenters also state that these bands offer preferable propagation characteristics compared to spectrum above 3 GHz. These commenters also contend that it is not possible to provide wireless local loop service using spectrum allocated for Personal Communications Services (PCS) or the Basic Exchange Telecommunications Radio Service (BETRS) because of restrictions on use of those services. Avant-Garde claims that it currently provides a wireless local loop type service in the 38 GHz band, and that the benefits espoused by SWB as to the cost and reliability benefits of wireless local loops are indeed realistic.³⁶ Several commenters oppose allocating this spectrum for the use of wireless local loops because, they claim, it would not be a new service.³⁷

12. Leaco Rural Telephone Cooperative (Leaco) states that the spectrum from the Federal Government should be used to provide interactive video, voice and data service in rural areas.³⁸ Pacific Bell Mobile supports a Fixed and Mobile allocation for the 2390-2400 MHz band and requests that we clarify that this band could be used as a source of additional PCS spectrum.³⁹

13. The Loral/Qualcomm Partnership, L.P. (Loral Qualcomm) requests that the 2390-2400 MHz band be allocated for use by non-Geostationary (non-GSO) Mobile Satellite

³⁴ Comments of Bell Atlantic at 2-3; NYNEX at 1-3; OPASTC at 2-3; Rochester Telephone at 1-2; SR Telecom at 2-5; TDS Telecommunications at 1-6; United States Telephone Association at 1-2 and; Tadiran Telecommunications at 2. Tadiran would also allocate the 2402-2417 MHz band for wireless local loops and would require that spread spectrum equipment be used. See also Reply Comments of Frontier Corporation, GTE, Interdigital Corporation, and the National Telephone Cooperative Association.

³⁵ See Comments of SWB at Appendix A.

³⁶ Avant-Garde comments at 2.

³⁷ In-Flight comments at 20-21, Apple comments at 8. Apple states that our Rules already adequately provide for this type of service. In-Flight claims that Section 7 of the Communications Act requires the Commission to prefer a new service over other types of service.

³⁸ Comments of Leaco at 1.

³⁹ Comments of Pacific Bell Mobile at 1-3.

Service (MSS) Earth-to-space service links. Loral/Qualcomm states that the spectrum currently allocated for MSS is insufficient to support the likely demand for MSS and that additional spectrum will soon be needed.⁴⁰ COMSAT Corporation (COMSAT) supports use of this band for MSS service uplinks.⁴¹ We note, however, that in comments filed in response to the NOI in this proceeding, the American Mobile Satellite Corporation (AMSC) claimed that neither the 2390-2400 MHz nor the 2402-2417 MHz band was a viable candidate for providing MSS uplinks because of interference from ISM devices and Part 15 equipment operating in the 2400-2500 MHz band.⁴² In reply comments to the NPRM, AMSC supports instead use of both the 2390-2400 MHz and the 2402-2417 MHz bands for MSS service downlinks.⁴³

14. In our NPRM we raised the possibility of using either or both of the 2300-2310 MHz and 2390-2400 MHz bands to provide unlicensed PCS or to accommodate the Multipoint Distribution Service (MDS) that is currently provided in the 2150-2160 MHz band so that 2150-2160 MHz could be used for unlicensed PCS.⁴⁴ Apple Computer, Compaq Computer, Standard Microsystems, Software Publishers Association (SPA), and Symbol Technologies, Inc., support allocating the 2390-2400 MHz band for unlicensed Data-PCS (asynchronous PCS), citing the need for clear spectrum nationwide for implementation of nomadic devices that can be used anywhere at anytime.⁴⁵ Microsoft and IEEE support allocating 2390-2400 MHz for unlicensed use, but do not specify unlicensed Data-PCS.⁴⁶ Several wireless cable service providers have filed comments opposing relocating MDS from the 2150-2160 MHz band, stating that this service is still in its infancy and faces strong competition from cable companies, satellite broadcast services, and even telephone companies

⁴⁰ Loral/Qualcomm comments at 2-4.

⁴¹ COMSAT reply comments at 5.

⁴² AMSC comments filed in response to NOI at 1-2.

⁴³ AMSC comments at 1-2. Such an allocation would conflict with the Preliminary Report's recommendation, which is supported by commenters in this proceeding, that the 2390-2400 MHz band not be used for space-to-Earth links. Preliminary Report, Section 4 at 14-17, comments of the National Research Council (NRC) at 5-7, comments of Cornell University and The National Astronomy and Ionosphere Center (Cornell) at 2-3, and comments filed in response to the NOI by Cornell University and NRC. AMSC argues, however, that these parties have not provided sufficient technical support for their position.

⁴⁴ NPRM, 9 FCC Rcd. at 6781, para. 14.

⁴⁵ Comments of Apple at 3-5; Compaq at 2-8; Standard Microsystems at 3 and; SPA at 6-8, reply comments of Symbol at 6-8.

⁴⁶ Comments of Microsoft at 5-6, and IEEE at 4.

that will provide video dial tone service. They argue that any disruption of service could be devastating to the industry and will be very expensive to implement.⁴⁷

15. **Decision.** In the Second Report and Order in Gen Docket 90-314, concerning establishment of PCS, we determined that successful implementation of unlicensed PCS devices requires 40 megahertz of spectrum. Accordingly, we dedicated the band 1890-1930 MHz for use by unlicensed PCS devices, with 20 megahertz of spectrum each for asynchronous and isochronous operation.⁴⁸ Subsequently, in response to a number of petitions for reconsideration, we adopted a Memorandum Opinion and Order that modified the overall 2 GHz PCS allocation to better achieve our goals in developing the service. In doing so, however, we reduced the amount of spectrum dedicated for use by unlicensed PCS devices from 40 megahertz to 20 megahertz. We recognized that this would likely leave unlicensed PCS devices with insufficient spectrum to accommodate expected demand and indicated a commitment to pursue additional spectrum for such use.⁴⁹

16. Considering the important contribution that we believe PCS will make in providing affordable, accessible communications for the public, we are committed to ensuring the successful implementation of such services. An important part of PCS will be the use of unlicensed devices to provide a wide variety of voice and data communications, particularly to interact with a larger information network. These devices have the potential to offer a portable "on-ramp" to the information highway that will be accessible to everyone. The potential for open access to the information infrastructure offered by unlicensed PCS devices will provide benefits, not only to commercial users, but also to individuals and private users. Accordingly, we believe that it is appropriate to fulfill our commitment to provide sufficient spectrum for unlicensed PCS data devices by allocating 2390-2400 MHz for use by unlicensed asynchronous PCS devices.⁵⁰ This band provides a unique opportunity to provide for these devices. As pointed out by several commenters, equipment manufacturers will need

⁴⁷ Comments of Wireless Cable Association at 5; Wireless Holdings at 1-5 and; Home Box Office at 2-5.

⁴⁸ Amendment of the Commission's Rules to Establish New Personal Communications Services, Second Report and Order, Gen Docket No. 90-314, 8 FCC Rcd 7700, 7777, para. 185 (1993).

⁴⁹ Amendment of the Commission's Rules to Establish New Personal Communications Services, Memorandum Opinion and Order, Gen Docket No. 90-314, 9 FCC Rcd 4957, 4991, para. 87 (1994).

⁵⁰ Comments filed in support of allocating this spectrum for unlicensed PCS have all expressed the need for additional spectrum for asynchronous (data) use. We have received no comments requesting that 2390-2400 MHz be used for isochronous (voice and limited data) unlicensed PCS. We are not, however, making a determination at this time that there is not a need for additional spectrum for isochronous use.

to relocate existing fixed microwave users out of the 1910-1930 MHz band, which we previously dedicated for unlicensed PCS use, before that band can be widely used by unlicensed PCS devices, particularly nomadic devices. Our action today will provide spectrum for immediate implementation of unlicensed nomadic PCS data operations.

17. We will regulate these unlicensed PCS devices in accordance with Part 15 of our Rules. Devices operating under Part 15 have generally proven to be effective in operating in shared environments with other services, including in frequency bands shared with the Amateur service. We recognize the value of maintaining adequate spectrum for the Amateur service and we believe that the generally robust nature of PCS devices will make it feasible for unlicensed PCS devices and Amateur operations to operate on a shared basis in this band. In addition, both Apple and the ARRL believe that shared use of this band is possible.⁵¹ Accordingly, we are providing for the continued availability of the 2390-2400 MHz band for Amateur operations, and are increasing the status of the Amateur service in this band to primary.⁵² Considering past experience of Part 15 devices and Amateur service users operating in a shared environment, we do not believe that it is necessary to adopt specific provisions for protecting either of these operations.

18. While we have considered allocating this band for Fixed and Mobile services or for a number of specific services proposed by commenters in this proceeding such as, AAVS, wireless local loops, and MSS, we believe that use by new unlicensed PCS and continued use

⁵¹ Apple comments at 4-5 and 10, ARRL Ex Parte presentation dated January 26, 1995. Compaq argues that 2390-2400 MHz should be allocated for exclusive use by unlicensed PCS and that doing so will not excessively disrupt Amateur service operations. Compaq comments at 4. Compaq does not, however, provide details as to the potential for the Amateur service to adversely impact unlicensed PCS operations. Absent compelling information to the contrary, we believe that it is appropriate to provide continued access to the band by the Amateur service.

⁵² While our decision today upgrades availability of the 2390-2400 MHz and 2402-2417 MHz bands for the Amateur service from secondary to primary, we are not making a determination at this time as to the continued availability of the 2300-2310 MHz band for the Amateur service. We intend to carefully consider the benefits of continued Amateur service access to 2300-2310 MHz in future decisions. In its January 26, 1995, Ex Parte presentation, ARRL requests that the Amateur service be given primary status in the entire 2390-2450 MHz band. The 2400-2402 MHz and 2417-2450 MHz portions of this band remain allocated for primary use by Federal Government stations and have not been identified for transfer to non-Government use. ARRL's request is, therefore, outside of the scope of this proceeding. We note, however, that the justification provided in the Department of Commerce Preliminary Report for not reallocating the 2400-2402 MHz portion was due to its current use by the Amateur service and we expect that such use will continue to be accommodated. See Department of Commerce Preliminary Report at 4-17.

by the Amateur service represents the greatest opportunity for using this band to benefit the public. We believe that allocation of this band for unlicensed PCS will lead to the development of new and unique devices and applications that can be provided in a cost effective manner and will be available to virtually every person in the nation.⁵³ Such devices will increase American productivity by allowing business to operate more efficiently and will allow more people to access information in a variety of ways from almost any location. Amateur service use of this band will allow these users to continue to develop radio communication technologies through experimentation, provide communications during emergencies and natural disasters, and provide education in the area of radio communication.

19. There are a number of additional reasons for using 2390-2400 MHz for unlicensed PCS as opposed to other proposed services. Concerning our proposal to allocate this band for Fixed and Mobile services, we believe that the recent allocation of 120 megahertz of spectrum at 2 GHz for general mobile services in the form of broadband PCS is sufficient to satisfy the needs of general mobile service providers in this frequency range at this time. Moreover, an allocation for Fixed and Mobile use would be incompatible with continued use of this band by the Amateur service.

20. The wireless local loop service proposed by Southwestern Bell is also incompatible with continued use of this band by the Amateur service. Although Southwestern Bell has addressed this concern, the solutions proposed would either result in a significant decrease in the amount of spectrum available to the Amateur service or would require allocation of alternate spectrum for the Amateur service. Further, we believe that wireless local loop service could be provided in spectrum allocated for broadband PCS in the 1850-1990 MHz band. Although our rules specify that Fixed services provided under PCS must be ancillary to mobile operations,⁵⁴ we have attempted to provide licensees with flexibility to determine how this spectrum is used and we would entertain waiver requests to provide primary Fixed service in this spectrum for certain applications if a licensee demonstrates that a Fixed service best meets the demands of an area.⁵⁵ We also note that a number of

⁵³ Our decision should not be interpreted as a general policy statement regarding the relative merits of these various uses. It merely reflects our belief that, for reasons limited to this band and the communications environment at this time, the public will receive the greatest benefit from use of this band for unlicensed PCS. We also note that we have initiated a proceeding to pursue additional spectrum for MSS. See Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum at 2 GHz for Use by the Mobile-Satellite Service, Notice of Proposed Rule Making ET Docket No. 95-18, FCC 95-39, released January 31, 1995.

⁵⁴ 47 C.F.R. § 24.3.

⁵⁵ As we stated in determining what services could be provided under PCS, fixed services can generally be accommodated in other bands. Second Report and Order, Gen Docket 90-314, 8 FCC Rcd 7700, 7712, para. 23 (1993). A recent staff letter clarifying

proponents of the wireless local loop service have stressed the need for such service in rural areas. It seems likely that, in these rural areas, broadband PCS systems will have sufficient capacity to accommodate wireless local loops. This service could be provided either directly by the broadband PCS licensee or through a secondary provider operating under the licensee's authority.⁵⁶

21. Regarding proposed use of 2390-2400 MHz for provision of an aeronautical audio/visual service (AAVS), we note that this service would be limited to airline passengers, rather than the general public. We believe that other spectrum or other alternative possibilities should be considered for such a service. For example, In-Flight has stated that AAVS could be accommodated in the 4660-4685 MHz band,⁵⁷ and, if an AAVS provider is able to obtain a nationwide license, AAVS can be provided as a Mobile service in that band. Finally, concerning possible use of this band for MSS, the Commission is currently considering allocation of an additional 70 megahertz of spectrum in the 2 GHz band and we believe this may be sufficient to satisfy MSS needs in this frequency range at this time.⁵⁸

22. As discussed above, we received comments from a number of entities seeking use of this spectrum to satisfy the needs of private spectrum users, particularly as described in the Petition for Rule Making filed by COPE. Although we have not allocated this spectrum for private use, we believe that the types of uses provided by unlicensed PCS devices, as well as unlicensed devices operating under Part 15 of our Rules in the 2400-2483.5 MHz band, will meet some of the requirements described by COPE as they relate to data and information transfer.⁵⁹ In addition, we have released a report evaluating the needs of the public safety

permissible uses of PCS spectrum, notes that the Commission intended the definition of PCS to be sufficiently inclusive to accommodate a wide range of services and technologies, including new and creative applications. Letter to A. Carroccio from R. Keeney, Chief, Wireless Telecommunications Task Force, Nov. 15, 1994, at 1.

⁵⁶ In addition, our Rules allow a PCS licensee to assign portions of its licensed PCS spectrum after January 1, 2000, provided it has met the five-year construction requirements. 47 C.F.R. § 24.229(d). Geographic partitioning to rural telephone companies is also permitted under Section 24.714 of the Commission's Rules.

⁵⁷ See In-Flight Ex Parte filing dated January 24, 1995.

⁵⁸ See Notice of Proposed Rule Making, ET Docket No. 95-18, FCC 95-39, released January 31, 1995.

⁵⁹ In addition, additional capacity for private systems may be gained through implementation of spectrum efficient technologies. See Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Services and Modify the Policies Governing Them, Notice of Proposed Rule Making, PR Docket No. 92-235, 7 FCC Rcd 8105 (1992).

community through the year 2010 and we will consider the recommendations in this report as additional spectrum becomes available.⁶⁰

23. We will regulate unlicensed PCS devices in accordance with the technical standards currently embodied in Part 15, Subpart D of the Rules. Because we already have existing rules for unlicensed PCS in place, we believe that it is appropriate to apply them to devices that will use the 2390-2400 MHz band. Accordingly, the power levels, emission limits, and the spectrum etiquette for unlicensed PCS devices operating at 2390-2400 MHz shall be consistent with requirements for asynchronous devices operating at 1910-1920 MHz. Also consistent with use of the 1910-1920 MHz band, asynchronous devices operating in the 2390-2400 MHz band must have a bandwidth of 500 kHz or greater. Unlike the 1910-1930 MHz band, there are no incumbent users in the 2390-2400 MHz band that must be relocated prior to wide-spread use of the band for unlicensed PCS. Therefore, we will not require that unlicensed PCS devices operating at 2390-2400 MHz be coordinated through UTAM.⁶¹

24. We note that the Notice did not contain a specific discussion of technical rules for unlicensed PCS devices. However, we have concluded that an additional notice and comment period regarding rules for unlicensed PCS devices is unnecessary and would be contrary to the public interest. First, it is unnecessary because we already have rules in place governing the operation of unlicensed asynchronous PCS devices. Our action here merely provides additional spectrum for such use. Second, providing a notice and comment period would be contrary to the public interest because it would unnecessarily delay the availability of unlicensed PCS devices and the benefits that these devices will provide to the public. Accordingly, pursuant to Section 553 of the Administrative Procedures Act we find good cause for adopting these slight modifications to Part 15 of the Rules without notice and comment, 5 U.S.C. § 553(b)(3)(B).

2402-2417 MHz

25. The 2402-2417 MHz band is allocated internationally in Region 2 on a primary basis to the fixed, mobile, and radiolocation services, and on a secondary basis to the amateur service.⁶² Domestically, the band is currently allocated on a secondary basis to the amateur service. The 2402-2417 MHz band lies within the 2400-2500 MHz band that is available for

⁶⁰ See Federal Communications Commission, REPORT AND PLAN: MEETING STATE AND LOCAL GOVERNMENT PUBLIC SAFETY NEEDS THROUGH THE YEAR 2010, FCC 95-55, released Feb. 9, 1995.

⁶¹ Prior to operation, unlicensed PCS devices at 1910-1930 MHz must be coordinated by the Unlicensed PCS Ad Hoc Committee for 2 GHz Microwave Transition Management (UTAM). See 47 C.F.R. § 15.307.

⁶² See Table of Frequency Allocations, 47 C.F.R. § 2.106.

use by industrial, scientific, and medical (ISM) applications.⁶³ Radio services operating within this band must accept harmful interference that may be caused by ISM devices, which include a large number of microwave ovens commonly used in households. In addition, the 2400-2483.5 MHz band is available domestically for use by equipment authorized under Part 15 of the Rules.⁶⁴

26. As described previously, the 2402-2417 MHz band lies within the Amateur service 13 cm band. Amateur comments regarding reallocation of portions of the 13 cm band have already been discussed in the preceding paragraphs,⁶⁵ and the points made with regard to reallocation of 2390-2400 MHz apply to this band as well.

27. We received very few comments recommending uses for the 2402-2417 MHz band other than for the Amateur service or continued Part 15 use. In general, commenters argue that use of the band for ISM equipment severely limits the band's utility for provision of commercial services. Several ISM equipment manufacturers express concern that allocating 2402-2417 MHz for a licensed commercial service, especially if licenses are issued via competitive bidding, could adversely affect ISM use of the band in the future.⁶⁶

28. Only a few commenters support commercial use of 2402-2417 MHz. Tadiran urges that Part 15 use of the band be phased out and that the band be made available for implementation of wireless local loop service using spread spectrum technology.⁶⁷ Pegasus Communications, Inc. argues that the band should be used for a low power mobile service for video production use.⁶⁸

29. Loral/Qualcomm, supported by AMSC and COMSAT, seeks use of the band for non-GSO MSS service links in the space-to-Earth direction, stating its belief that Part 15 and ISM use of the band will have minimal impact on MSS operations.⁶⁹ AMSC believes that

⁶³ See Table of Frequency Allocations, 47 C.F.R. § 2.106. See also 47 C.F.R. Part 18.

⁶⁴ Part 15 provides for operation of unlicensed low-power devices.

⁶⁵ Para. 8, *supra*.

⁶⁶ Comments of Fusion Systems Corporation (FSC) at 4, Fusion Lighting, Inc. (FLI) at 1-2. Reply comments of SUNSAT Energy Council, International Space Power Program, American Institute of Aeronautics and Astronautics, and ETM Solar Works.

⁶⁷ Tadiran comments at 2-3.

⁶⁸ Pegasus comments.

⁶⁹ Loral/Qualcomm comments at 3, 4-5 AMSC reply comments at 2-3, and COMSAT reply comments at 5.

interference between MSS providers and other users of the band can be handled on a case-by-case basis.⁷⁰

30. More than one-third of the comments received in response to the NPRM were filed by manufacturers of Part 15 devices, particularly manufacturers of wireless local area networks (LANs) and devices that interact with wireless LANs.⁷¹ These commenters note that, since the Commission encouraged development of unlicensed spread spectrum systems in the 902-928 MHz, 2400-2483.5 MHz, and 5700-5825 MHz bands, the industry has responded with a wide variety of products, including digital cordless telephones, electronic article surveillance equipment, utility metering devices, fire and security alarm devices, wireless bar code readers, collision avoidance systems, and wireless LANs. They contend that these Part 15 devices provide the kind of spectrum efficient uses, new technologies, and open competitive markets that the Commission is trying to promote. The LAN MAN Standards Committee of the IEEE, IEEE 802, and other parties filed comments discussing the work that has gone into developing standards for wireless LANs based on current Part 15 Rules for this band. These commenters note that 2400-2483.5 MHz is increasingly available internationally for Part 15 type use and it is likely that the IEEE 802 standard will be used internationally. They argue, therefore, that it would undermine the nation's international competitiveness if the Commission adversely affects Part 15 use of the band. The commenters urge that the 2402-2417 MHz portion of the band be retained for Part 15 use without disruption by high power licensed systems. Some commenters argue that the status of Part 15 use should be raised to primary.

31. Several parties seeking spectrum for private uses urge that 2402-2417 MHz be allocated for licensed use by private radio services, particularly for advanced private systems as described by COPE.⁷² On the other hand, API, TIA, UTC, and Motorola, all entities that are generally strong proponents of allocating spectrum for private radio services, oppose

⁷⁰ AMSC reply comments at 3.

⁷¹ See generally Comments of 3Com Corporation (3Com), Advanced Micro Devices, Inc. (AMD), Andrew Corporation (Andrew), Apple Computer, Inc. (Apple), AT&T, Brian Robinson, Cincinnati Microwave, Compaq Computer Corporation (Compaq), Consumer Electronics Group of the Electronics Industries Association (EIA), Cylink Corporation (Cylink), IEEE 802, International Business Machines Corporation (IBM), Metricom, Inc., Microsoft Corporation (Microsoft), Norand Corporation (Norand), Part 15 Coalition, Rockwell International Corp. (Rockwell), Standard Microsystems Corporation (SMC), Symbol Technologies, Inc. (Symbol), Tetherless Access LTD. (TAL), Western Multiplex Corporation (WMC), Windata, Inc., Wireless Information Networks Forum, Inc. (Winforum), Xircom, Inc. and Reply Comments of AMD, Apple, AT&T, Claircom Communications Group, L.P., Compaq, Cylink, Interdigital Communication Corporation, IBM, Micron Communications, Inc., Part 15 Coalition, Metricom, Symbol, Andrew, Proxim, Inc.

⁷² Comments of County of LA at 3, FIT at 6, ITA at 11-12, and MRFAC at 8.

licensed use of 2402-2417 MHz, arguing instead that the band should remain available for use by Part 15 devices because of the broad utility of Part 15 equipment, including for private users.⁷³ UTC urges the Commission to place spread spectrum Part 15 devices into a new Part 16 and accord these devices primary status in the band.⁷⁴

32. **Decision.** Commenters expressed only limited interest in use of the 2402-2417 MHz band for licensed commercial services. In contrast, there was significant concern expressed about maintaining use of the band by Part 15 devices. As described above, this band lies within 2400-2483.5 MHz, which is available for use by spread spectrum devices under Part 15 of our Rules. Eliminating Part 15 use of 2402-2417 MHz would severely reduce the amount of spectrum available to Part 15 devices, and could significantly impair the ability of Part 15 devices to operate in the 2400-2483.5 MHz band by forcing them to operate entirely in portions of the band most affected by ISM devices and by limiting their information capacity. These Part 15 devices provide a variety of consumer and business oriented services that benefit individuals, commercial services, and private spectrum users, and they also have applications for public safety and medical needs. Benefits include lower costs of energy through automatic meter reading and optimized power generation, low-cost broadband access to Internet services and other information networks for schools, libraries, telecommuters and home offices, mobility of telephonic and computer communications within offices and homes without extensive reconstruction and wiring, immediately installable video conferencing among and between buildings for educational instruction, health care monitoring and judicial procedures without construction of special studio facilities, safe transport of chemicals and petroleum products through low-cost and easily deployable pipeline monitoring services, and control for potentially tens of thousands of traffic lights, at less than one-third the cost of wireline solutions, to ease road congestion, and significantly reduce pollution and new street construction.⁷⁵ These and other applications of technologies implemented through Part 15 devices have the potential to benefit virtually every person and business in the nation, as well as to promote American competitiveness abroad. Considering the universal benefits provided by part 15 equipment, the potential growth for new technologies in this area, and the difficulty of implementing commercial services in this band, we find that the public is best served by providing for the continued availability of this band for Part 15 equipment.

33. One of the principal Part 15 uses being implemented in the 2400-2483.5 MHz band is wireless LANs. Commenters have provided sales figures demonstrating a rapidly expanding market for wireless LAN equipment with sales of \$200 million for 1994 and expected sales as high as \$2.5 billion dollars by 1998.⁷⁶ Disrupting Part 15 use of 2402-

⁷³ Comments of API at 7-8; TIA at 2 and 10; UTC at 14; and Motorola at 10-14.

⁷⁴ UTC comments at 14.

⁷⁵ See, e.g., Cylink comments at 4.

⁷⁶ Comments of IBM at 11; Symbol at 5; and Norand at 6.

2417 MHz could affect the market as well as the ability of U.S. firms to compete in the worldwide market for wireless LANs. In addition, manufacturers would have to modify equipment designed to operate throughout the 2400-2483.5 MHz band at a time when considerable resources have been expended on equipment development but when manufacturers have not yet recouped their investment because the equipment is just now becoming widely available.

34. In addition to maintaining availability of 2402-2417 MHz for use by Part 15 equipment, we are also providing for continued use of this band by the Amateur service and upgrading the band from secondary to primary use by the Amateur service. Both Part 15 manufacturers and Amateur service licensees are familiar with operating in a shared radio environment, and we are unaware of any conflicts that have occurred between Part 15 devices and Amateur operations in this band. This action will essentially preserve the status quo regarding use of this band.⁷⁷

35. We decline to allocate the band for other uses proposed by commenters. None of the parties that support use of this band for MSS support their belief that MSS is compatible with Part 15 or ISM use of the band. MSS is also not compatible with Amateur use of the band. In addition, we are currently considering allocation of an additional 70 megahertz of spectrum in the 2 GHz band that may be sufficient to satisfy MSS needs in this frequency range at this time.⁷⁸ Tadiran's proposal to use this band for wireless local loops is part of a larger proposal by Tadiran to allocate the 2300-2310 MHz, 2390-2400 MHz, and 2402-2417 MHz bands for spread spectrum wireless local loops that Tadiran states would meet the technical requirements for spread spectrum systems under Part 15 of our Rules.⁷⁹ However, we have made the 2390-2400 MHz band available for unlicensed PCS devices, and without that band Tadiran's plan would be incomplete. We believe that the public is benefitted more by allowing the greatest number of possible uses of this band under Part 15 of the Rules rather than by restricting use to one type of application. We note that Tadiran would be able to use this band for spread spectrum wireless local loops under Part 15 of our rules, although not on an exclusive basis. The proposal by Pegasus to use this band for video production use would result in relatively limited benefits to the public when compared to the amount and types use provided by Part 15 devices operating in this band. In addition, as we noted in our decision regarding the 2390-2400 MHz band, while we have not allocated this band for the

⁷⁷ Our action today does not affect use of this band by ISM equipment. ISM use of this frequency band will continue in accordance with Part 18 of our Rules, 47 C.F.R. Part 18. Other radio services operating in this band must accept harmful interference which may be caused by ISM applications. See footnote 752 to the Table of Frequency Allocations, 47 C.F.R. § 2.106.

⁷⁸ See note 53, *supra*.

⁷⁹ Tadiran comments at 2-4.

exclusive use of private users, we believe that unlicensed devices operating under Part 15 of our Rules will meet some of the needs of private users.⁸⁰

4660-4685 MHz

36. Internationally, 4660-4685 MHz is allocated in Region 2 on a primary basis for fixed, fixed-satellite, and mobile services.⁸¹ This band is allocated domestically on a primary basis for non-government fixed-satellite service space-to-Earth links, with use limited to international inter-continental systems.⁸² However, there is currently no non-Government use of this band.⁸³

37. The Association for Maximum Service Television, Inc. (MSTV) in a joint filing with a number of television broadcast entities reasserts its request, discussed in the NPRM, that 4660-4685 MHz be allocated for use by the broadcast auxiliary service to support digital advanced television and possibly to relieve congestion in the 1990-2110 MHz band. MSTV claims that no other service has made a compelling argument for requiring use of the 4660-4685 MHz band and that implementation of advanced television will provide the greatest benefit to the public.⁸⁴ This is also supported by the Society of Broadcast Engineers, Inc.⁸⁵

⁸⁰ See para. 22, supra.

⁸¹ See Table of Frequency Allocations, 47 C.F.R. § 2.106. Use of the fixed-satellite service (space-to-earth) at 4500-4800 MHz is subject to an allotment plan contained at Appendix 30B of the international Radio Regulations.

⁸² See Table of Frequency Allocations, 47 C.F.R. § 2.106. The fixed-satellite service in this band is also subject to case-by-case electromagnetic compatibility analyses. See U.S. allocation footnote 245.

⁸³ An agreement with Canada requires that certain United States Government terrestrial line of sight and troposcatter systems be coordinated with Canada. This agreement also permits use of this band by airborne or other mobile stations but requires that such stations protect Canadian systems. See Sharing Arrangement Between the Department of Communications of Canada and the National Telecommunications and Information Administration of the United States Concerning the Use of the Band 4400-5000 MHz, signed August 29, 1986. Because this agreement was between the NTIA and the Canadian Department of Communications it will be necessary, in the future, to evaluate and renegotiate an agreement between the FCC and the Canadian Government for non-Government use of this band.

⁸⁴ MSTV comments at 2-10.

⁸⁵ Reply comments of the Society of Broadcast Engineers.

38. Other parties request that the band be allocated for private fixed microwave to accommodate systems being displaced from the 2 GHz PCS bands. They dispute our belief that adequate provision has been made to reaccommodate fixed microwave systems displaced by PCS.⁸⁶ These parties argue that additional spectrum for reaccommodation of displaced fixed microwave operations is needed. Alcatel claims that discrepancies between protection criteria for fixed microwave systems and fixed-satellite systems operating in the 3700-4200 MHz band limit the usefulness of that band for reaccommodation of fixed users displaced from the 2 GHz PCS band.⁸⁷ As noted by Alcatel, however, accommodation of displaced fixed point-to-point systems requires use of paired spectrum with sufficient frequency separation between pairs. Alcatel argues that at least 100 megahertz of spectrum is required to accommodate the necessary frequency pairs and urges the Department of Commerce to identify an additional 50 megahertz of spectrum in this frequency band for reallocation to private sector use.⁸⁸

39. Loral/Qualcomm advocates using this band for Earth-to-space feeder links to support non-GSO MSS. Although this band is already allocated for Fixed Satellite Service (FSS) space-to-Earth links and is part of the FSS allotment plan in Appendix 30B of the international Radio Regulations, Loral/Qualcomm states that their proposal to implement reverse band working of this spectrum, without interfering with FSS operations, is supported by papers submitted to ITU-R Working Party 4A and Task Group 4/5.⁸⁹

40. Several commenters suggest that this band be used to provide a variety of wireless interactive services. Proposals as to how this would be implemented vary. American Telecasting favors our proposal for a general allocation, with licenses awarded by auction, but it would have the Commission restrict eligibility to those entities already providing service to paying subscribers within a market.⁹⁰ Leaco Rural Telephone Cooperative, Inc. also favors a general allocation but wants rural telephone exchange carriers to have a preference for obtaining spectrum in certain areas.⁹¹ Wireless Holding, Inc. and the Wireless Cable Association International both support our proposal for a very flexible

⁸⁶ API comments at 8-9, Alcatel comments at 8-9.

⁸⁷ Alcatel comments at 8-9.

⁸⁸ Alcatel comments at 9. An additional 50 megahertz of spectrum, combined with the 4635-4660 MHz band that was also identified for reallocation in the Preliminary Report, would result in a total of 100 MHz.

⁸⁹ Loral/Qualcomm comments at 5-6.

⁹⁰ American Telecasting comments at 4-6.

⁹¹ Leaco comments at 5-9.

allocation and urge us to not adopt overly restrictive eligibility or technical rules.⁹² Finally, Tadiran proposes that 4660-4685 MHz be used for in-building communications.⁹³

41. **Decision.** We are adopting a Fixed and Mobile allocation in the 4660-4685 MHz band. We have weighed the benefits of allocating this band for the services proposed by commenters, but remain convinced that the public will receive the greatest benefit by allocating the 4660-4685 MHz band to the Fixed and Mobile services, regardless of whether the ultimate use of this spectrum is for private services, non-subscriber services, or subscriber-based services .

42. A number of commenters argue that if we adopt such an allocation we would not fulfill our responsibility under Section 303 of the Communications Act which requires that we classify radio stations and prescribe the nature of the service to be rendered by each radio station.⁹⁴ As explained below, we believe that an allocation to Fixed and Mobile services is permissible under the Communications Act and, for the 4660-4685 MHz band, we find that a Fixed and Mobile allocation is in the public interest. Therefore, we reject the arguments advanced by commenters.

43. The Commission is required by the National Telecommunications and Information Administration Organization Act (NTIAO Act) to issue regulations to allocate the 50 megahertz of spectrum that the Secretary of Commerce identified and recommended for immediate reallocation from Government use no later than 18 months from enactment of the Reconciliation Act.⁹⁵ For purposes of this portion of the NTIAO Act, the term "allocation" is defined as "an entry in the National Table of Frequency Allocations of a given frequency band for the purpose of its use by one or more radiocommunication services" (emphasis added).⁹⁶ The Table of Frequency Allocations often contains allocations to more than one type of service⁹⁷ and such allocations are specifically authorized in this instance by the

⁹² Comments of Wireless Holdings, Inc. at 4-5, and the Wireless Cable Association International at 1-7.

⁹³ Tadiran comments at 2.

⁹⁴ See Comments of Continental Airlines at 2, FIT at 3, In-Flight at 3-6, MRFAC at 4, Metricom at 10-13, Motorola at 15-17, TIA at 4, UTC at 3 and Winforum at 8. 47 U.S.C. §§ 303(a), 303(b).

⁹⁵ Section 115(a) of the National Telecommunications and Information Administration Organization Act, 47 U.S.C. § 925(a).

⁹⁶ Section 111(1) of the National Telecommunications and Information Administration Organization Act, 47 U.S.C. § 921(1) (emphasis added).

⁹⁷ See 47 C.F.R. § 2.106.

NTIAO Act. Therefore, our allocation of the 4660-4685 MHz band to Fixed and Mobile Services is permissible and consistent with established practice.

44. We believe that such an allocation is consistent with the Commission's obligations under the Communications Act. The Commission has very broad authority under the Communications Act to allocate spectrum. Our authority derives from Section 303 of the Communications Act, which provides:

Except as otherwise provided in this Act, the Commission from time to time, as public convenience, interest, or necessity requires shall --

- (a) Classify radio stations;
- (b) Prescribe the nature of the service to be rendered by each class of licensed stations and each station within any class;
- (c) Assign bands of frequencies to the various classes of stations, and assign frequencies for each individual station⁹⁸

Nothing in the language of Section 303 establishes or suggests any limitation or restriction on the Commission's discretion to prescribe the nature of the service to be rendered over radio frequencies or its authority to assign (or allocate) frequencies to the various classes of stations. Moreover, nothing in the language of Section 303 or its legislative history suggests that the Commission is prohibited from assigning spectrum to stations for more than one permissible use, or otherwise limits the Commission's discretion in making spectrum allocations that it deems to serve the public interest.⁹⁹ With respect to allocation decisions, courts have accorded "substantial deference" to Commission determinations.¹⁰⁰

⁹⁸ 47 U.S.C. § 303(a)-(c)

⁹⁹ Other sections of the Communications Act support the view that Congress expected the Commission to utilize some amount of spectrum for particular types of services. See, e.g., 47 U.S.C. § 309(b) (referring to fixed point-to-point microwave stations, industrial radio positioning stations, and aeronautical stations); 47 U.S.C. § 319 (distinguishing between amateur stations, mobile stations, public coast stations, privately owned fixed microwave stations, common carrier stations, and broadcast stations). Nevertheless, these sections cannot be read to limit the Commission's discretion to permit the use of some spectrum for more broadly defined services.

¹⁰⁰ See National Ass'n of Regulatory Utility Commissioners v. FCC, 525 F.2d 630, 636 (D.C. Cir.), cert. denied, 425 U.S. 992 (1976); see also Telocator Network of America v. FCC, 691 F.2d 525, 549 (D.C.Cir. 1982).

45. Commission precedent also supports the permissibility of allocating spectrum in a manner that allows for its use by a broadly defined service. In 1986, the Commission allocated 2 MHz of spectrum for a new General Purpose Mobile Service (GPMS) accessible to all land mobile, maritime mobile, and aeronautical mobile uses.¹⁰¹ In that instance, the Commission found that its GPMS allocation served the public interest.¹⁰² The Commission rejected claims that such an allocation was unlawful, noting that "[n]othing in Sections 303(a)-(c) suggests the Commission is not permitted to take into account marketplace forces when exercising its spectrum allocation responsibilities under the public interest standard."¹⁰³ Our current approach is also similar to that taken in our Emerging Technologies proceeding, ET Docket No. 92-9. In that proceeding, the Commission allocated 220 megahertz of spectrum to the Fixed and Mobile services and identified it for use by emerging technologies. Later, we permitted PCS providers to use 140 megahertz of this spectrum.¹⁰⁴ We disagree with the contention made by some commenters that the current approach differs from that applied in allocating spectrum for PCS.¹⁰⁵ While we envision service rules designed to accommodate a variety of uses, as with PCS, we have no intention of abdicating our responsibility to provide a regulatory structure that is sufficient to provide for use of the spectrum that is in the public interest. The necessary extent of such a structure is explored in the Notice of Proposed Rule Making section of this item.

46. Our allocation is also not so broad as to permit use of the 4660-4685 MHz band for any purpose. Allocation to the Fixed and Mobile services will allow licensees to use the spectrum to provide any Fixed service, including Aeronautical Fixed, fixed point-to-point, and fixed point-to-multipoint systems, and any Mobile service, including Aeronautical mobile, Land mobile, or Maritime mobile service. The allocation would not, however, allow licensees

¹⁰¹ Amendment of Parts 2 and 22 of the Commission's Rules Relative to Cellular Communications System, Report and Order, GEN Docket Nos. 84-1231, 84-1233, 84-1234, 2 FCC Rcd 1825, 1841 (1986), recon. denied, 2 FCC Rcd 6830 (1987).

¹⁰² Id. at 1840.

¹⁰³ Id. at 1839. We note that this flexible use spectrum was never licensed. We ultimately reallocated this spectrum for narrowband personal communications services (PCS).

¹⁰⁴ See generally Amendment of the Commission's Rules to Establish New Personal Communications Services, GEN Docket No. 90-314, Memorandum Opinion and Order, 9 FCC Rcd 5031 (1994).

¹⁰⁵ A broad variety of services are permitted under PCS. See Section 24.3 of the Rules which permit PCS licensees to, "provide any mobile communications service on their assigned spectrum. Fixed services may be provided only if ancillary to mobile operations. Broadcasting as defined by the Communications Act is prohibited." 47 C.F.R. § 24.3.

to use the spectrum for Broadcast services, Radiolocation services, or any Satellite services, including the Broadcast or Mobile Satellite Service.¹⁰⁶

47. Although the majority of commenters oppose our proposal, we note that we did receive support for a Fixed and Mobile allocation. Wireless Holdings, Leaco Rural Telephone Cooperative (Leaco), American Telecasting, Pacific Bell Mobile Systems, and the Wireless Cable Association (WCA) support a fixed and mobile allocation for some or all of the spectrum under consideration and have expressed an interest in providing commercial services.¹⁰⁷ Several of these commenters would restrict licensee eligibility to some degree.¹⁰⁸ Additionally, UTC believes that a Fixed and Mobile allocation for commercial services is appropriate, provided that the needs of private users are satisfied in bands specifically set aside for private users.¹⁰⁹

48. In this instance, we find that an allocation for Fixed and Mobile services is not only permissible under the Communications Act, but will also serve the public interest, regardless of whether the ultimate use of the spectrum is for private or commercial services. We believe that such an allocation will ensure that the spectrum is used for services that are most highly valued by the licensees and/or their customers. While we expressed our belief in the Notice that services provided under such an approach would most likely meet the statutory criteria for auctions and that such an allocation would be economically beneficial to users and provide operators with incentives to develop and introduce innovative service features and technologies,¹¹⁰ the benefits of this type of allocation extend beyond those services offered by commercial, subscriber based providers. If potential licensees indicate that the principal use of this spectrum will not involve receipt by the licensee of compensation from subscribers, thus making this spectrum not subject to auction, we maintain

¹⁰⁶ We note that Broadcast Auxiliary services are not considered a Broadcasting service as defined in Section 2.1 of our Rules, 47 C.F.R. § 2.1. See also para. 53, infra.

¹⁰⁷ Comments of American Telecasting 4, Wireless Cable Association at 3-4, Wireless Holdings at 4-5, Leaco at 5, Pacific Bell Mobile at 1-2.

¹⁰⁸ American Telecasting states that eligibility should be limited to "those who already offer service to paying subscribers in the particular area." American Telecasting comments at 6. Leaco would permit rural telephone companies to obtain licenses in some instances without participating in a auction, subject to the rural telephone company paying an amount based on the average price paid for auctioned spectrum. Leaco comments at 5-9. Pacific Bell Mobile Systems merely requests that the Commission not prohibit use of this band for accommodation of fixed microwave systems that are displaced from the 1850-1990 MHz band by broadband PCS. Pacific Bell Mobile System comments at 2.

¹⁰⁹ UTC comments at 9-11.

¹¹⁰ NPRM, 9 FCC Rcd. at 6780, para. 9.