APPENDIX A: COMMENTING PARTIES

Comments on the SIA Petition:
ACTUA – The Association for Telecommunications Professionals in Higher Education
Alliance for Higher Education, *et al.*
Archdiocese of New York
Arizona Board of Regents, *et al.*
Bladen Community College
California State University, Stanislaus
Catholic Television Network *et al*
Cellular Telecommunications Industry Association
Central Piedmont Community College
Digital Broadcast Corporation
Edgecombe Community College
Friends of WRLN, Inc.
Globalstar L.P.
Hispanic Information and Telecommunications Network, Inc.
ICO Services Limited
Instructional Telecommunications Foundation
IP Wireless, Inc.
James Sprunt Community College
Johnston Community College
Martin Community College
Miami-Dade County Public Schools
Mississippi Authority for Educational Television
Mississippi Department of Education
Mississippi EdNet Institute, Inc.
Mississippi Institutions of Higher Learning
Mississippi Sate Board for Community and Junior Colleges
National ITFS Association
Nash Community College
Network for Instructional TV, Inc.
Nokia Inc.
Nucentrix Broadband Networks, Inc.
Pikes Peak Community College
Randolph Community College
San Bernardino Community College
Sandhills Community College
South Carolina Educational Television Commission
South Piedmont Community College
University of Minnesota
Wireless Communications Association International, Inc.
Wireless One of North Carolina, L.L.C.
Worldcom, Inc.

Reply Comments on the SIA Petition:
Association of America's Public Television Stations and The Public Broadcasting Service
Worldcom, Inc.

Comments on the CTIA Petition:
AT&T Wireless Services
Archdiocese of New York
Arizona Board of Regents, *et al.*
CDMA Development Group
Cisco Systems, Inc.
Digital Broadcast Corporation
Globalstar L.P.
Hispanic Information and Telecommunications Network, Inc.
Instructional Telecommunications Foundation
IP Wireless, Inc.
LCC International, Inc.
Lucent Technologies, Inc.
Motorola, Inc.
National ITFS Association
Network for Instructional TV, Inc.
Nokia Inc.
Nucentrix Broadband Networks, Inc.
Qualcomm Incorporated
Sprint Corporation
Universal Wireless Communications Corporation
Verizon Wireless
Wireless Communications Association International, Inc.
Wireless One of North Carolina, L.L.C.
Worldcom, Inc.

Reply Comments on the CTIA Petition:
Association of America's Public Television Stations and The Public Broadcasting Service
BellSouth Corporation
Cellular Telecommunications Industry Association
Telecommunications Industry Association
Telephone and Data Systems, Inc.
Worldcom, Inc.

APPENDIX B: INITIAL REGULATORY FLEXIBILITY ANALYSIS

As required by the Regulatory Flexibility Act ("RFA"),[131] the Commission has prepared this Initial Regulatory Flexibility Analysis ("IRFA") of the possible significant economic impact on small entities by the policies and rules proposed in this *NPRM*. Comment is requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments on the *NPRM* as provided above in paragraph 78. The Commission will send a copy of the *NPRM*, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration. *See* 5 U.S.C. § 603(a). In addition, the *NPRM* and IRFA (or summaries thereof) will be published in the Federal Register.

Need for, and Objectives of, the Proposed Rules

The *NPRM* proposes the possible use of several frequency bands that could be used for advanced wireless communications systems, and solicits comments on various pairing options for those bands. The objective of these proposed actions is to allocate spectrum that could be used to provide a wide range of voice, data, and broadband services over a variety of mobile and fixed networks.

Legal Basis

The proposed action is authorized under Sections 4(i), 7(a), 303(c), 303(f), 303(g), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 157(a), 303(c), 303(f), 303(g), and 303(r).

Description and Estimate of the Number of Small Entities To Which the Proposed Rules May Apply

The RFA directs agencies to provide a description of, and, where feasible, an estimate of the number of small entities that may be affected by the proposed rules, if adopted.[132] The Regulatory Flexibility Act defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small business concern" under section 3 of the Small Business Act.[133] A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.[134]

A small organization is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field."[135] Nationwide, as of 1992, there were approximately 275,801 small organizations.[136] The definition of "small governmental jurisdiction" is one with

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[131] *See* 5 U.S.C. § 603. The RFA, *see*, 5 U.S.C. § 601 *et seq.*, has been amended by the Contract With America Advancement Act of 1996, Pub. L. No. 104-121, 110 Stat. 847 (1996) (CWAAA). Title II of the CWAAA is the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA).

[132] 5 U.S.C. § 603(b)(3).

[133] *Id.* § 601(3).

[134] *Id.* § 632.

[135] *Id.* § 601(4).

[136] Department of Commerce, U.S. Bureau of the Census, 1992 Economic Census, Table 6 (special tabulation of data under contract to Office of Advocacy of the U.S. Small Business Administration).

populations of fewer than 50,000.[137] There are 85,006 governmental jurisdictions in the nation.[138] This number includes such entities as states, counties, cities, utility districts and school districts. There are no figures available on what portion of this number has populations of fewer than 50,000. However, this number includes 38,978 counties, cities and towns, and of those, 37,556, or 96 percent, have populations of fewer than 50,000.[139] The Census Bureau estimates that this ratio is approximately accurate for all government entities. Thus, of the 85,006 governmental entities, we estimate that 96 percent, or about 81,600, are small entities that may be affected by our rules. Nationwide, there are 4.44 million small business firms, according to SBA reporting data.[140] The applicable definition of small entity is the definition under the SBA rules applicable to radiotelephone (wireless) companies. This provides that a small entity is a radiotelephone company employing no more than 1,500 persons.[141] According to the Bureau of the Census, only 12 radiotelephone firms from a total of 1,178 such firms that operated during 1992 had 1,000 or more employees;[142] therefore, at least 1,166 radiotelephone firms in 1992 had 1,500 or fewer employees. We are unable at this time to quantify the specific impact of our proposals on these firms, but invite comment on this issue.

Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements

This item deals only with the possible use of frequency bands below 3 GHz to support the introduction of new advanced wireless services, and does not propose service rule. Thus, the item proposes no new reporting, recordkeeping, or other compliance requirements.

Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered

The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives: (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities. We considered proposing spectrum for the mobile-satellite service in the 2500-2520/2670-2690 MHz bands, as requested by the Satellite Industry Association, but rejected that alternative for technical reasons and because the MSS already has access to a significant amount of spectrum below 3 GHz. We believe that our proposal to explore the possible use of several frequency bands that could be used to provide a wide range of voice, data, and broadband services over a variety of mobile and fixed networks may provide new opportunities for small entities. We request comment on alternatives that could minimize the impact of this proposed action on small entities.

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[137] 5 U.S.C. § 601(5).

[138] 1992 Census of Governments, U.S. Bureau of the Census, U.S. Department of Commerce.

[139] *Id.*

[140] *See* 1992 Economic Census, U.S. Bureau of the Census, Table 6 (special tabulation of data under contract to Office of Advocacy of the U.S. Small Business Administration).

[141] 13 CFR 121.201, SIC code 4812.

[142] 1992 Census, Series UC92-S-1, at Table 5, SIC code 4812.

Federal Rules that May Duplicate, Overlap, or Conflict With the Proposed Rules

None.

APPENDIX C: IMT-2000/3G RADIO INTERFACES

[Information gathered from Recommendation ITU-R M.1457]

(1) CDMA Direct Spread Spectrum - This interface is called the Universal Terrestrial Radio Access (UTRA) Frequency Division Duplex (FDD) or Wideband CDMA (WCDMA). The radio access scheme is direct-sequence CDMA with information spread over a bandwidth of about 5 MHz with a chip rate of3.84 Mchip/s. The radio interface is defined to carry a range of services to support both circuit switched as well as packet switched services.

(2) CDMA Multi-Carrier - This radio interface is called cdma2000. The radio interface is a wideband spread spectrum system that uses CDMA technology and provides a 3G evolution for systems using the current TIA/EIA-95-B family of standards. This radio interface permits any combination of voice, packet data, and high-speed circuit data services to be operated concurrently. RF channel bandwidths of 1.25 MHz (1X component) and 3.75 MHz (3X component) are supported at this time but the specification can be extended to bandwidths up to 15 MHz.

(3) CDMA TDD – This interface is called UTRA TDD. It employs a direct-sequence CDMA radio access scheme. There are two versions UTRA Time Division Duplex (TDD) that uses a 5 MHz bandwidth and a chip rate of 3.84 Mchip/s and TD-SCDMA that uses 1.6 MHz bandwidth with a chip rate of 1.28 Mchip/s. The UTRA TDD specifications were developed to provide commonality with UTRA FDD. This radio interface has been designed for flexibility where different services such as speech, data, and multimedia can simultaneously by used by a user and multiplexed on a single carrier.

(4) TDMA Single-Carrier - This radio interface is called Universal Wireless Communication-136 (UWC-136). It was developed with the objective of maximum commonality between TIA/EIA-136 and GSM General Packet Radio Service (GPRS). The radio interface is intended for evolving TIA/EIA-136 technology to 3G. This is done by enhancing the voice and data capabilities of the 30 kHz channels, adding a 200 kHz carrier for high speed data (384 kbits/s) for high mobility applications and adding a 1.6 MHz carrier for very high speed data (2 Mbits/s) for low mobility applications.

(5) FDMA/TDMA – This radio interface is called Digital Enhanced Cordless Telecommunications (DECT) and is defined by a set of ETSI standards. The standard specifies a TDMA radio interface with time division duplex (TDD) and supports symmetric and asymmetric connections, connection oriented and connectionless data transport as well as variable bit rates up to 2.88 Mbits/s per carrier. The carrier spacing is 1.728 MHz.

The IMT-2000 radio interface development process is ongoing with a view toward seeking a single terrestrial standard encompassing high level groupings of CDMA, TDMA, or a combination thereof. Additionally, consistent with ITU-T Recommendations, IMT-2000 air interfaces should include the capability of operating with both of the major third generation core networks, evolved ANSI-41 and GSM-MAP.

APPENDIX D: SPECTRUM USAGE IN OTHER COUNTRIES[143]

[Charts reproduced from Report ITU-R M.2024][144]

Current and planned utilization	
Terrestrial component	
470-862 MHz	
CEPT(1)	This band is currently used in Europe for analogue broadcasting. With the replacement of analogue television by DVB-T, it is possible that parts of this band may be made available for other services. At present parts of the band are also used for other services (e.g. tactical radio relay links) and demand for these services are likely to continue. CEPT is investigating whether this band may be considered as a candidate band for IMT-2000 expansion
United States of America	**470-806 MHz** – TV broadcast band and land mobile use. With transition from analogue to digital TV, 24 MHz (764-776/794-806 MHz) has been re-allocated for FS and MS for public safety use. This spectrum would not be suitable for IMT-2000. 36 MHz (746-764/776-794 MHz) has been re-allocated for FS, MS and broadcast service (BS) for commercial use. Transition to digital TV scheduled to be substantially complete by December 31, 2006, an additional 48 MHz of spectrum (698-746 MHz) will be recovered in the long term. Specific usage of the additional spectrum blocks of 36 MHz and 48 MHz is not yet defined, some portions might be suitable for IMT-2000. **608-614 MHz** – allocated to radio astronomy in the United States of America. (and many other places worldwide), and heavily used. This band is shared in the United States of America with low power biomedical telemetry devices (data transmission from cardiac monitors to IC units in hospitals)
Malaysia	**470-806 MHz** – UHF TV BS

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[144] "Summary of Spectrum Usage Survey Results," Report ITU-R M.2024 (2000), International Telecommunications Union.

Current and planned utilization	
Terrestrial component (*cont.*)	
470-862 MHz	
Korea	**762-780 MHz** – possible candidate band 470-752 MHz: UHF-TV 752-762 MHz: FS 762-780 MHz: possible candidate band for IMT-2000 additional 780-806 MHz: FS 752-806 MHz: digital TV transition purpose 806-824 MHz: TRS(T) 824-849 MHz: cellular (T) 849-851 MHz: FS 851-869 MHz: TRS(R)
China	470-566 MHz/606-798 MHz: TV BS 566-606 MHz: FS
Japan	470-770 MHz: TV BS 810-828 MHz, 838-840 MHz and 843-846 MHz: second generation (2G) cellular system
Canada	This band is used in Canada for television broadcasting. The introduction of digital TV in the band and the ultimate phase-out of analogue (NTSC) TV should allow future consideration of other services in spectrum not required for digital TV
Australia	**470-520 MHz** – heavily used for FS and MS. **520-820 MHz** – not available for mobile due to broadcasting use. Transition from analogue broadcasting will make full use of this allocation until 2012 due to the simulcasting requirements. Other services including wireless microphones, biomedical telemetry services and similar low power uses also use the available localised holes in the spectrum used for broadcasting. Requirements for future broadcasting and datacasting requirements will be subject to further reviews
South Africa	**470- 854 MHz** – reserved for digital TV. **790- 854 MHz** – sharing broadcasting with fixed in wireless access (FWA) and FS
Brazil	**470-608 MHz/614-806 MHz** – these bands are used in Brazil for television broadcasting. Although the introduction of digital television in these bands is not already scheduled, the ultimate phase-out of analogue TV should allow future consideration of other services in parts of the spectrum not required for digital television. **608-614 MHz** – this band is allocated to radio astronomy in Brazil
New Zealand	**470-494 MHz** – MS. Potentially available and suitable for IMT-2000 extension. **494-518 MHz** – under review. Potentially unavailable and unsuitable for IMT-2000 extension: – potential interference from existing BS TV in adjacent band. – possible future national allocation for BS TV. **518-806 MHz** – BS TV; much of this spectrum is privately owned. Unavailable and unsuitable for IMT-2000 extension

Current and planned utilization	
Terrestrial component (*cont.*)	
470-862 MHz	
Morocco	**470-838 MHz** – UHF TV broadcast band **806-866 MHz** – MS and FS. Trunk radio systems
806-821/851-866 MHz	
CEPT(1)	See the band 470-862 MHz
United States of America	Currently used for specialized mobile radio (SMR) service, private and public safety systems that substantially limit use for IMT-2000. Some pre-IMT-2000 SMR licensees may choose to evolve to IMT-2000 technologies and services
Malaysia	806-862 MHz: trunk radio service
China	806-821/851-866 MHz: trunk radio systems
Japan	860-885 MHz: 2G cellular system
Canada	These bands are used for mobile radio services, including public safety applications
Australia	806-820 MHz: BS. See comments on the 470-862 MHz band
South Africa	**856-900 MHz** – FS **864.1-868.1 MHz** – CT-2/short-range FWA
Brazil	**806-824/851-869 MHz** – these bands are used for SMR services, including public safety applications
New Zealand	**806-819/851-870 MHz** – FS, trunked mobile. Potentially available and suitable for IMT-2000 extension, currently not available
824-849/869-894 MHz	
CEPT(1)	See the bands 470-862 MHz and 880-960 MHz
United States of America	Current United States of America's cellular telephone paired bands. Pre-IMT-2000 cellular system operators may choose to evolve to next generation technologies and services such as IMT-2000
Korea	These bands were assigned for land mobile service (using CDMA system). AMPS will be replaced by 2002
China	825-880 MHz: cellular systems 821-825/866-870 MHz: wireless data transmission system
Japan	860-885 MHz and 893-895 MHz: 2G cellular system
Canada	These bands are used for cellular radiotelephone services
Australia	825-845 MHz and 870-890 MHz: licences have been issued until year 2013 which do allow use of IMT-2000 technology. 850-915 MHz: not available in off-shore areas due to radiolocation use.

Current and planned utilization	
Terrestrial component (*cont.*)	
824-849/869-894 MHz	
South Africa	**824-849/869-894 MHz** – FWA systems. **872-905/917-950 MHz** – shared band; FWA with other services such as CDMA. TACS. etc. **876-880/921-925 MHz** – GSM
Brazil	**824-849/869-894 MHz** – these bands are used for cellular radiotelephone services. Suitable for IMT-2000 when the use of first generation (1G) and 2G decreases
New Zealand	**825-845 MHz** – MS. spectrum privately owned. Potentially available and suitable for IMT-2000 extension. **870-915 MHz** – MS. spectrum privately owned. Potentially available and suitable for IMT-2000 extension
Morocco	**866-880 MHz** – MS and FS. Trunk radio systems
880-915/925-960 MHz	
CEPT(1)	This band is currently used extensively in Europe for 2G mobile (GSM 900). Availability of this band for IMT-2000 can only be made progressively in the longer term as GSM use decreases. Times-cales for availability of this band for IMT-2000 may differ on a national basis. On this basis, this band as a whole is considered by CEPT to be a candidate for IMT-2000 expansion
United States of America	902-928 MHz: heavily congested by radiolocation. government fixed and mobile, radio amateur, vehicle location monitoring and low power unlicensed devices. Some defense systems operate on a worldwide basis. Not suitable and not available for IMT-2000. 894-902 MHz and 928-960 MHz: various fixed and mobile applications, parts of this band are not suitable for IMT-2000, 894-896 MHz is used for aeronautical mobile communications and 932-935/941-944 MHz is used for fixed point-to-point microwave systems for federal government agencies. 896-901/935-940 MHz is used for private and SMR systems. Some pre-IMT-2000 SMR operators may choose to evolve to technologies and services such as IMT-2000
Malaysia	**880-890 MHz** – current AMPS/ETACS use. **925-935 MHz** – possible use of two-way paging as well
Korea	These bands were assigned for CT. CT-2. mobile data. broadcasting relay service: 869-894 MHz: cellular (R) 894-898 MHz: FS 898-900 MHz: MS (data communications) (T) 900-910 MHz: FS, MS 910-914 MHz: CT-2 914-915 MHz: CT-1 915-924.55 MHz: FS, MS 924.55-925.45 MHz: paging (T) 925.45-928 MHz: FS, MS 928-930 MHz: FS, MS (wireless microphone) 930-938 MHz: FS, MS 938-940 MHz: MS (data communications) (R) 940-942 MHz: FS, MS 942-959 MHz: FS, MS (auxiliary BS) 959-960 MHz: CT-1

Current and planned utilization	
Terrestrial component (*cont.*)	
880-915/925-960 MHz	
China	880-915/925-960 MHz: cellular systems. 915-917 MHz: non-central controller personal system. 917-925 MHz: stereo broadcast transmission system
Japan	**895-901 MHz** – 2G cellular system
Australia	**915-928 MHz** – not available for mobile due to radiolocation usage. **928-942 MHz** – not available for MSS due to radiolocation. **890-915 MHz** and **935-960 MHz** – extensively used for 2G (GSM) mobile systems. Their refarming for terrestrial use could only be made progressively over the long term when 2G mobile system use decreases and is replaced by IMT-2000
South Africa	**880-890/925-935 MHz** – extended GSM (urban) shared with FWA (rural). **914-915/959-960 MHz** – CT-1
Brazil	**896-901/935-940 MHz** – these bands are used for SMR services, including public safety applications. **902-942 MHz** – in Brazil there are various fixed and mobile applications, including low-power unlicensed devices in this band. It appears not suitable for IMT-2000. **942-960 MHz** – heavily used by auxiliary BS. It appears not suitable for IMT-2000
New Zealand	**915-921/929-935 MHz** – FS, suitable but unavailable for IMT-2000 extension. **921-929 MHz** – Industrial, scientific and medical (ISM), unsuitable and unavailable for IMT-2000 extension. **935-960 MHz** – MS, spectrum privately owned. Suitable and potentially available for IMT-2000 extension
Morocco	**880-890 MHz** – MS and FS. Extended GSM band. **890-915/935-960 MHz** – MS (GSM). **915-935 MHz** – MS and FS
1 350-1 400 MHz	
CEPT(1)	Channel plan for the FS (1 350-1 375 MHz paired with 1 492-1 517 MHz and 1 375-1 400 MHz paired with 1 427-1 452 MHz). Radiolocation
United States of America	**1 350-1 385 MHz** – exclusive Government allocation to FS, MS radiolocation service, aeronautical radionavigation service (ARNS) (see RR No. S5.334). The ARNS is used by ATC radars. Not suitable or available for IMT-2000. **1 385-1 400 MHz** – will be made available for commercial use in January 1999 with suitable standards to protect ATC radars
Korea	These bands were assigned for radiolocation service
China	Radiolocation and radionavigation
Japan	This band was assigned for radiolocation service
Australia	Not available for mobile or MSS due to radiodetermination usage
Brazil	Not available for IMT-2000 due to radiolocation usage. ATC radars are used in ARNS systems
Morocco	MS and FS

Current and planned utilization	
Terrestrial component (*cont.*)	
1 427-1 525 MHz	
CEPT[1]	Channel plan for the FS (1 350-1 375 MHz paired with 1 492-1 517 MHz and 1 375-1 400 MHz paired with 1 427-1 452 MHz). 1 517-1 525 MHz: unidirectional fixed links. 1 452-1 492 MHz: digital audio broadcasting (DAB)
United Stated of America	1 427-1 435 MHz: available for commercial use in January 1999, suitability and availability for IMT-2000 has not been determined. 1 435-1 527 MHz: telemetering, telecommand, aeronautical telemetry. Vital and extensive use for aeronautical telemetry supporting U.S. test flight and equipment. Not suitable or available for IMT-2000
Malaysia	1 427-1 452 MHz: available. 1 452-1 469 MHz: terrestrial DAB (T-DAB). 1 467-1 492 MHz: satellite DAB (S-DAB)
Korea	1 427-1 525 MHz: FS
China	Point-to-multipoint microwave communication system
Japan	1 429-1 453 MHz and 1 477-1 501 MHz: 2G cellular system
Canada	In Canada, the sub-bands 1 427-1 452/1 492-1 517 MHz are used for subscriber radio systems and possibly for wireless meter reading systems. Canada is implementing digital radio broadcasting in the band 1 452-1 492 MHz
Australia	1 427-1 452 MHz: FS. MS: aeronautical telemetry has priority. Not suitable for public mobile/MSS systems due to sharing constraints. 1 452-1 492 MHz: broadcasting/broadcasting-satellite, for digital audio systems. Not suitable for public mobile/MSS systems due to sharing constraints. 1 492-1 525 MHz: FS. MS: aeronautical telemetry has priority. Not suitable for public mobile/MSS systems due to sharing constraints
South Africa	**1 429-1 465/1 477-1 513 MHz** – shared FWA. **1 452-1 492 MHz** – S-DAB/T-DAB
Brazil	**1 427-1 452/1 492-1 517 MHz** – in Brazil, these bands are used for low capacity digital radio relay systems of the FS. **1 452-1 492 MHz** – Brazil is planning the introduction of DAB in this band
New Zealand	**1 429-1 462/1 490-1 525 MHz** – FS, multi-access radio: used extensively for reticulation of telecommunications in rural areas; suitable but unavailable for IMT-2000 extension. **1 462-1 490 MHz** – reserved for BS. BSS. Unsuitable and unavailable for IMT-2000 extension
Morocco	FS and MS. Point-to-multipoint systems. **1 452-1 492 MHz** – FS (point-to-multipoint systems). BSS

Current and planned utilization	
Terrestrial component (*cont.*)	
1 710-1 785/1 805-1 885 MHz	
CEPT[1]	**1 710-1 785/1 805-1 880 MHz** – this band is also used in Europe for 2G mobile (GSM 1800). Availability of this band for IMT-2000 can only be made progressively in the longer term as current usage of the band decreases. Time-scales for availability of this band for IMT-2000 may differ on national basis. On this basis, this band as a whole is also considered by CEPT to be a candidate for IMT-2000 expansion. **1 880-1 885 MHz** – this band in Europe currently forms the lower part of the DECT band. The upper part of the DECT band (1 885-1 900 MHz) is already identified for IMT-2000. The band 1 880-1 885 MHz is considered by CEPT as a candidate for IMT-2000 expansion. The whole of the DECT band (1 880-1 900 MHz) can only be made available for IMT-2000 in the longer term however as DECT usage decreases
United States of America	**1 710-1 755 MHz** – re-allocated for mixed (government/non-government use after January 1999) available for commercial use in January 2004. This band may be suitable for IMT-2000. **1 805-1 850 MHz** – satellite ground link system (SGLS). Exclusive government allocation. Not suitable or available for IMT-2000. **1 755-1 805 MHz** – Exclusive government allocations to FS, MS and in parts of the band, space operations. Not suitable or available for IMT-2000. **1 850-1 910/1 930-1 990 MHz** – USA PCS Band. Suitable for IMT-2000 as pre-IMT-2000 services evolve to IMT-2000. **1 910-1 930 MHz** – unlicensed low-power PCS. May be suitable for low-power IMT-2000 applications as pre-IMT-2000 services evolve to IMT-2000
Malaysia	DCS 1800. **1 880-1 900 MHz** – DECT (for indoor use only)
Korea	These bands were assigned for land mobile service (using CDMA system): 1 710-1 750 MHz: MS (existing FS will be relocated) 1 750-1 780 MHz: PCS(T) 1 780-1 800 MHz: MS (existing FS will be relocated) 1 800-1 805 MHz: APC 1 805-1 840 MHz: MS (existing FS will be relocated) 1 840-1 870 MHz: PCS(R) 1 870-1 885 MHz: MS (existing FS will be relocated)
China	**1 710-1 755/1 805-1 850 MHz** – cellular system. **1 880-1 900/1 960-1 980 MHz** – wireless access system of frequency division duplex (FDD) mode. **1 900-1 920 MHz** – wireless access systems of time division duplex (TDD) mode
Japan	These bands were assigned for FS, MS, space research and space operation services

Current and planned utilization	
Terrestrial component (*cont.*)	
1 710-1 785/1 805-1 885 MHz	
Canada	**1 710-1 850 MHz** – in Canada, this band is used for low capacity fixed systems. Canada's view is that fixed systems can be phased out at an appropriate time and this band has been identified by Canada as a candidate for IMT-2000. **1 850-1 885 MHz** – this band forms part of the frequency range referred to as the PCS Band Plan and has also been identified as a candidate for IMT-2000
Australia	**1 710-1 980 MHz** – FS/MS in extensive use. Not available for any MSS due to sharing difficulties with terrestrial systems. The bands 1 710-1 785 MHz and 1 805-1 880 MHz could be refarmed for IMT-2000. **1 980-2 010 MHz** – FS/MS in extensive use. Potentially available for MSS sharing
South Africa	**1 710-1 785/1 805-1 880 MHz** – DCS 1800. **1 880-1 900 MHz** – DECT. **1 900-1 920 MHz** – extended DECT. **1 885-2 025/2 110-2 200 MHz** – identified for IMT-2000 in the RR. **1 980-2 010/2 170-2 200 MHz** – identified for satellite component of IMT-2000
Brazil	**1 710-1 850 MHz** – in Brazil, this band is used for low capacity fixed systems although new licenses have not been granted since 1996. Suitable and available for IMT-2000. **1 850-1 885 MHz** – in Brazil, this band is used for low capacity fixed systems. It forms part of the frequency range referred to as the PCS Band Plan, although Brazil has not implemented it. The bands 1 850-1 870/1 930-1 950 MHz are planned for introduction of FWA systems. Parts of this band might be suitable for IMT-2000
New Zealand	**1 706.5-1 880 MHz** – FS, potentially suitable and available for IMT-2000 extension. **1 880-1 920 MHz** – FS, PHS, DECT potentially suitable but unavailable for IMT-2000 extension; clearance may be difficult
Morocco	**1 710-1 785/1 805-1 880 MHz** – FS and MS. To be used by MS. **1 880-1 885 MHz** – FS and FWA systems
2 025-2 110/2 200-2 290 MHz(2)	
CEPT(1)	Sharing between space services and IMT-2000 is impossible in these bands (see RR No. S5.391/ Recommendation ITU-R SA.1154(3).(4)
United Sates of America	Extensive government use in space operations, earth exploration satellite service (EESS) and space research service (SRS) and auxiliary BS. Sharing between space services and IMT-2000 is impossible in these bands (see RR No. S5.391/Recommendation ITU-R SA.1154)(4). Not suitable or available for IMT-2000
Korea	2 025-2 110 MHz: FS, MS, SRS, EESS. 2 200-2 290 MHz: FS, MS, SRS, EESS
China	FS, MS and space service
Japan	These bands were assigned for FS and MS in extensive use
Canada	RR No. S5.391 precludes use of these bands for IMT-2000. In addition, these bands are heavily used by fixed systems in Canada and Canada is adopting a FS plan for these bands in accordance with *recommends* 1 of Recommendation ITU-R F.1098

Current and planned utilization	
Terrestrial component (*cont.*)	
2 025-2 110/2 200-2 290 MHz[2]	
Australia	**2 010-2 025 MHz** – extensively used for FSs. Not available for any MSS due to sharing difficulties with terrestrial systems. **2 025-2 110 MHz** – extensively used for FSs Not available for any MSS due to sharing difficulties with space sciences and fixed services. **2 076-2 111 MHz** – licensed to fixed point-to-multipoint pay TV services until 2002. **2 110-2 070 MHz** – extensively used for FSs. Not available for any MSS due to sharing difficulties with terrestrial systems. **2 070-2 200 MHz** – extensively used for FSs. Potentially available for MSS sharing. **2 200-2 290 MHz** – not available for any MSS due to sharing difficulties with FS, space sciences and aeronautical telemetry services
South Africa	**1 980-2 010/2 170-2 190 MHz** – reserved for satellite component of IMT-2000
Brazil	These bands are used for medium capacity fixed systems. Brazil intends refarming the use of such bands as Annex 1 of Recommendation ITU-R F.1098. Not suitable for IMT-2000
New Zealand	**2 025-2 110 MHz** – FS, unsuitable and unavailable for IMT-2000 extension. **2 200-2 290 MHz** – FS, unsuitable and unavailable for IMT-2000 extension
Morocco	FS
2 290-2 300 MHz	
CEPT[1]	The size of this band is rather limited. Studies to address protection of earth stations for deep space research have indicated that large separation distances (of several hundred km) are required around the 10 earth stations that are used for deep space research world-wide (the number of earth stations is planned to increase by 20 within the next decade). There are two existing earth stations in CEPT (Spain and Germany). Plan for other stations is under consideration. Also, used for radio astronomy very long base line interferometry (VLBI)
United States of America	Exclusive government allocation FS and MS. Allocation to space research (deep space) (government/non-government) will require large separation distances. Not available for IMT-2000
China	FS, MS and space service
Japan	This band was assigned for the FS, MS and space research service
Australia	**2 290-2 300 MHz** – sharing with deep space earth stations and mobile or base stations is not possible in the same geographical area. Separation distances of the order of 400 km are required between deep space earth stations IMT-2000 mobile and bases stations
South Africa	**2 290-2 300 MHz** – various services
Brazil	**2 290-2 300 MHz** – used for medium capacity fixed systems. After phasing out of existing systems, this band might be suitable for IMT-2000
New Zealand	**2 290-2 300 MHz** – FS, unsuitable and unavailable for IMT-2000 extension
Morocco	**2 290-2 300 MHz** – FS and MS

Current and planned utilization	
Terrestrial component (*cont.*)	
2 300-2 360 MHz	
CEPT[1]	**2 300-2 400 MHz** – fixed and mobile allocation : point-to-point, video cameras and electronic news gathering/outside broadcasting (ENG-OB) (Recommendation ERC 25-10). military use. Parts of the band are used for aeronautical telemetry on a national basis according to Recommendation ERC 62-02
Korea	2 300-2 330 MHz: FS (FWA, remote area). 2 330-2 370 MHz: FS (remote area, private). 2 370-2 400 MHz: FS (FWA, remote area)
China	**2 300-2 400 MHz** – FS, MS, radiolocation, and space services
Australia	**2 300-2 400 MHz** – used for fixed point-to-multipoint pay TV services and thus not available for MSS. Also used for aeronautical telemetry purposes
South Africa	**2 300-2 360 MHz** – FS
Brazil	**2 300-2 400 MHz** – used by auxiliary BS (ENG and studio-transmitter links) as well as by relay stations, which re-transmit television signals
New Zealand	**2 300-2 396 MHz** – BS multipoint distribution service (MDS) TV; spectrum privately owned. Potentially suitable and available for IMT-2000 extension
Morocco	FS and MS. **2 300-2 400 MHz** – to be used by multiple microwave distribute systems (MMDSs) (television FSs)
2 360-2 400 MHz	
CEPT	See above
United States of America	**2 360-2 385 MHz** – used for telemetry operations and is not suitable for IMT-2000. **2 385-2 390 MHz** – available for commercial use in January 2005; availability and suitability for IMT-2000 is not yet determined. **2 390-2 400 MHz** – for amateur radio operations and unlicensed devices
Japan	This band was assigned for FS and MS
Australia	2 300-2 400 MHz: point-to-multipoint pay TV services
Brazil	Used by auxiliary BS (ENG and studio-transmitter links) as well as relay systems, which re-transmit television signals
Morocco	FS and MS. **2 300-2 400 MHz** – to be used by MMDS systems (television FSs)
2 400-2 483.5 MHz	
CEPT[1]	FA and MS allocations. ISM, short-range device, radio LANs, radio TAGS
United States of America	**2 400-2 483.5 MHz** – heavy use by unlicensed devices and ISM devices. Not suitable for IMT-2000. Government allocation to radiolocation and non-government allocation to amateur and amateur satellite

Current and planned utilization	
Terrestrial component (*cont.*)	
2 400-2 483.5 MHz	
Malaysia	ISM low-power device
China	Spread spectrum data communication system. ISM applications
Japan	These bands are used for low power channels for data communication systems
Canada	Spread spectrum data communication system ISM applications
Australia	ISM band. MSS operation may be difficult
Brazil	Used by auxiliary BS (ENG and studio-transmitter links) as well as relay systems, which re-transmit television signals. Also unlicensed spread spectrum communication systems
Morocco	FS and MS. To be used by MMDS systems (television FSs) and ISM applications
2 500-2 690 MHz	
CEPT	This band is considered by CEPT as a prime candidate band for IMT-2000 expansion after phasing out of existing usage (fixed and ENG/OB). Geographical sharing (urban/rural) is one solution to facilitate the transition, or where sharing between services in the longer term is required
United States of America	MDS instructional television FS, point-to-multipoint video links to homes, schools and businesses. Two-way response use as well. This band is also assigned to the BSS. Coordination of the BSS service with additional satellite and terrestrial systems would be difficult. This band is currently not available for IMT-2000, however some licencees may choose to evolve to technologies and services such as IMT-2000
Malaysia	MMDS application
Korea	2 500-2 690 MHz: FS, MS (TV relay) 2 500-2 535 MHz: MSS, FS 2 535-2 655 MHz: DAB, CATV 2 655-2 690 MHz: MSS, FS
Japan	This band is used for mobile satellite systems and was assigned to the BSS
China	**2 535-2 599 MHz** – MMDS of cable TV transmission system; BSS (audio)
Canada	This band has been identified for use for multipoint communication service (MCS) (2 500-2 596 MHz) and MDS (broadcasting) (2 596-2 686 MHz). Canada has extensive licensing activity for MCS and MDS underway in this band. No other types of radio systems are currently being licensed in this range
Australia	**2 450-2 690 MHz** – ENG/OB in extensive use. Current use would make usage by MSS difficult

Current and planned utilization	
Terrestrial component (*cont.*)	
2 500-2 690 MHz	
South Africa	**2 690-2 700 MHz** – MMDS/FS. radio astronomy. **2 520-2 593/2 597-2 670 MHz** – FS
Brazil	**2 500-2 690 MHz** – This band is used for multichannel MDS. At this time Brazil is concluding an extensive licensing activity for MMDS in this band. No other type of radio systems are currently being licensed in this range. Not suitable for IMT-2000
New Zealand	**2 498.5-2 690 MHz** – FS. used extensively for ENG/OB. Suitable for IMT-2000 extension, but currently unavailable due to extensive ENG/OB applications
Morocco	FS. To be used by MMDS systems (television FSs)
2 700-3 400 MHz	
CEPT(1)	2.7-2.9 GHz: this band is still under consideration in Europe as a possible candidate band for IMT-2000; no final decision has yet been reached. 2.9-3.4 GHz: recent studies carried out within the CEPT have indicated that this band is not a viable option for IMT-2000 expansion
United States of America	2 700-2 900 MHz: government exclusive allocation to aeronautical radionavigation, meteorological aids and radiolocation. 2 900-3 000 MHz: allocated for maritime radionavigation, meteorological aids and radiolocation. 3 000-3 100 MHz: allocated for maritime radionavigation and radiolocation. 3 100-3 400 MHz: allocated for radiolocation. No changes are planned in any of these bands and current usage is expected to increase. The band 2 700-3 400 MHz is not suitable or available for IMT-2000
Malaysia	2 700-3 000 MHz: radar (DCA). 3 000-3 400 MHz: point-to-point links; must vacate by 2002
Korea	3 000-3 300 MHz: radiolocation service
China	2 700-2 900 MHz: radiolocation and aeronautical radionavigation. 2 900-3 100 MHz: radiolocation and radionavigation. 3 100-3 300 MHz: radiolocation. 3 300-3 600 MHz: radiolocation. FS and MS
Japan	This band was assigned for aeronautical radionavigation service, FS and MS
Canada	It is noted that in Canada fewer systems are deployed in the band 2 700-2 900 MHz than at 2 900-3 400 MHz. The band 3 100-3 400 MHz is a military essential band in Canada. The band 3 300-3 500 MHz is also used by the amateur service
Australia	**2 700- 3 100 MHz** – aeronautical radionavigation and radiolocation usage make any MSS use very difficult. **3 100- 3 400 MHz** – radiolocation usage. MSS sharing is not possible. FWA services are being introduced in the 3.5 GHz band

Current and planned utilization	
Terrestrial component (*end*)	
2 700-3 400 MHz	
South Africa	FSs and government services
Brazil	**2 700-2 900 MHz** – this band is allocated to aeronautical radionavigation in Brazil. **2 900-3 100 MHz** – this band is allocated to radionavigation and radiolocation in Brazil. **3 100-3 300 MHz** – this band is allocated to radiolocation, Earth exploration-satellite and space research in Brazil. **3 300-3 400 MHz** – used by auxiliary BS (studio transmitter links) as well as by relay stations, which re-transmit television signals
New Zealand	**2 700-2 900 MHz** – aeronautical, radionavigation, radiolocation. Unsuitable and unavailable for IMT-2000 extension. **2 900-3 100 MHz** – radionavigation. Unsuitable and unavailable for IMT-2000 extension. **3 100-3 300 MHz** – radiolocation. Unsuitable and unavailable for IMT-2000 extension. **3 300-3 400 MHz** – radiolocation, amateur. Unsuitable and unavailable for IMT-2000 extension
Morocco	Aeronautical radionavigation

(1) Agreed and developed within European Radiocommunications Committee Task Group 1 of the Conférence Européenne des Administrations des Postes et des Télécommunications (CEPT ERC TG1).

(2) Radiocommunication Study Group 7 requested not to consider these bands due to their importance for space science services and the increasing use by developed as well as developing countries. It should also be noted that Radiocommunication Study Groups 7, 8 and 9 have adopted nine ITU-R Recommendations that establish mutually beneficial, long term, provisions for sharing between space science and compatible FS and MS.

(3) Studies indicated that despite the increasing use of higher frequency bands, the space science services make extensive use of these bands.

(4) The expected increasing spectrum requirements for all services in these bands (FS, MS and space service) have resulted in RR Recommendation 622 (WRC-97) which emphasizes the need to implement enhancements in technology as early as practicable with a view to minimizing the total bandwidth required by systems of each service. This will allow accommodation of the increasing number of systems within the currently available bandwidth. There are also harmonised North Atlantic Treaty Organization (NATO) requirements in these bands for military tactical radio relay (2 025-2 070 MHz/2 200-2 245 MHz).

Current and planned utilization in relation with the satellite component

Current and planned utilization	
Satellite component	
1 525-1 559/1 626.5-1 660.5 MHz	
CEPT[1]	The existing MSS allocations could be made available for IMT-2000 satellite component. All these bands are used for second generation satellite mobile systems. Their refarming could only be made progressively in the long term when second generation system use will decrease and IMT-2000 use will increase
United States of America	1 525-1 544/1 545-1 559 MHz: MSS systems operational in the band will preclude early implementation of the satellite component of IMT-2000. Availability in a portion of the band: Only with priority and pre-emption for AMS(R)S communications. See RR footnotes Nos. S5.357A and S5.362A. 1 626.5-1 645.5/1 646.5-1 660 MHz: MSS systems operational in the band will preclude early implementation of the satellite component of IMT-2000. Availability in a portion of the band: only with priority and pre-emption for AMS(R)S communications. See RR Nos. S5.357A and S5.362A. 1 544-1 545/1 645.5-1 646.5 MHz: government usage only in this band for NOAA search and rescue satellite (SARSAT) retransmit emergency transmitter signal on 1 544.5 MHz to surface stations
Malaysia	1 626.5-1 645.5 MHz 1 656.5-1 660.5 MHz 1 525-1 544 MHz 1 555-1 559 MHz All of the above frequencies have been filed by MEASAT for MSS/GEO use
Korea	These bands were assigned for MMSS applications
China	MSS
Japan	These bands were assigned for MSS
Australia	In the band 1 525-1 535 MHz Australia operates fixed systems. The existing MSS allocations (*except the search and rescue band*) could be made available for the IMT-2000 satellite component. All these bands are used for 2G satellite mobile systems. Their refarming could only be made progressively in the long term when 2G system use will decrease and IMT-2000 use will increase. However, it must be noted that AMS(R)S and GMDSS are given priority in terms of spectrum use and availability in the bands 1 545-1 555/1 646.5-1 656.5 and 1 530-1 544/1 626.5-1 645.5 MHz respectively
Brazil	These bands were assigned for mobile satellite systems
Morocco	FS and MS services. Point-to-multipoint systems. To be available for MSS systems
1 610-1 626.5/2 483.5-2 500 MHz	
CEPT[1]	The existing MSS allocations could be made available for IMT-2000 satellite component. All these bands are used for 2G satellite mobile systems. Their refarming could only be made progressively in the long term when 2G system use will decrease and IMT-2000 use will increase
United Stated of America	1 610-1 626.5/2 483.5-2 500 MHz: these bands are to be used by MSS systems providing GMPCS. The band 1 610-1 626.5 MHz is also allocated to the AMS(R)S, see RR footnote No. S5.367, and the ARNS, RR footnote No. S5.366 reserves the band on a worldwide basis for the use and development of airborne electronic aids to air navigation and any directly associated ground-based or satellite-borne facilities

Current and planned utilization	
Satellite component (*cont.*)	
1 610-1 626.5/2 483.5-2 500 MHz	
Malaysia	1 610-1 626.5 MHz 2 483.5-2 520 MHz All of the above frequencies have been filed by MEASAT for LEO/MEO use
Korea	These bands are assigned for both CDMA (Globalstar) and TDMA (Iridium). Spectrum sharing between CDMA and TDMA has not been studied extensively
China	RDSS and MSS
Japan	These bands were assigned for MSS
Australia	See comments under 1 525-1 559/1 626.5-1 660.5 MHz. Use of channels centred on 2 477.5 MHz and 2 505.5 MHz for ENG and OB may cause infrequent interference to reception of MSS
Brazil	These bands were assigned for RDSS and MSS systems. 2 483.5-2 490 MHz: used by auxiliary BS (ENG and studio-transmitter links) as well as relay systems, which re-transmit television signals
Morocco	**2 483.5- 2 500 MHz** – FS
1 559-1 567 MHz (part of 1 675-1 690 MHz)	
CEPT[1]	Studies are ongoing in ITU-R and in CEPT in this band. Availability for IMT-2000 will depend on the outcome of these studies
United Stated of America	1 559-1 567 MHz: aeronautical radionavigation, and radionavigation-satellite (space-to-Earth). Current use is expected to increase. There is a need to retain this band for exclusive use by ARNS and RNSS. Not suitable or available for IMT-2000. 1 675-1 690 MHz: meteorological aids (radiosonde), meteorological-satellite (space-to-Earth). No changes are planned in these bands, current use is expected to increase. Not suitable or available for IMT-2000
Malaysia	Allocated for MSS
China	1 559-1 567 MHz: ARNS and space service. 1 675-1 690 MHz: meteorological aids and meteorological satellites (space-to-Earth)
Japan	These bands were assigned for MSS
Australia	**1 559-1 567 MHz** – sharing difficulties with the RNSS. Current ITU-R sharing studies are needed to show that sharing with MSS is not feasible. **1 660.5-1 670 MHz** – not available for public mobile/MSS systems, due to sharing difficulties with radioastronomy and with METAIDS above 1 688.4 MHz. **1 670-1 675 MHz** – not available for public mobile/MSS systems, due to sharing difficulties with METAIDS. **1 675-1 683 MHz** – may be available for MSS supporting IMT-2000 subject to WRC-2000 conclusions. ITU-R sharing studies have concluded that sharing with METAIDS is not possible. **1 683-1 710 MHz** – not available for public mobile/MSS systems, due to sharing difficulties with METSAT service

Current and planned utilization	
Satellite component (*cont.*)	
1 559-1 567 MHz (part of 1 675-1 690 MHz)	
Brazil	This band is used for ARNS and RNSS. Sharing with MSS is not feasible. Not suitable for IMT-2000
Morocco	Radionavigation and aeronautical services. **1 675-1 690 MHz** – METSAT service
2 500-2 520/2 670-2 690 MHz	
CEPT(1)	This frequency band could be made available for IMT-2000 in Europe, pending market demand
United States of America	MDS/instructional television FS, point-to-multipoint video links to homes, schools and businesses. Two-way response use as well. Not suitable for IMT-2000. Not allocated to MSS on a worldwide basis until 2005
Malaysia	Frequencies have been filed by MEASAT for LEO/MEO use
Korea	These bands were allocated for MSS at WARC-92. Any assignment for these bands is reserved until specific plans in Korea
China	Space service
Japan	These bands are extensively used for mobile-satellite systems
Canada	These bands have been identified for terrestrial services
Australia	Current Australian usage of these bands would make usage by MSS in Australia difficult
Brazil	These bands are used for multichannel MDS. At this time Brazil is concluding an extensive licensing activity for MMDS in these bands. No other types of radio systems are currently being licensed in this range. Not suitable for IMT-2000
2 520-2 535/2 655-2 670 MHz	
CEPT(1)	These bands have been identified as possible candidate bands for the terrestrial component of IMT-2000, and are therefore not identified as suitable for satellite component. However, it is envisaged that these bands may be used for MSS in some areas, where the demand for satellite services is high.
United States of America	2 520-2 655 MHz: MDS/instructional television FS, point-to-multipoint video links to homes, schools and businesses. Two-way response use as well. This band is currently not available for IMT-2000, however some licencees may choose to evolve to technologies and services, such as IMT-2000. 2 655-2 670 MHz: MDS/instructional television FS, point-to-multipoint video links to homes, schools and businesses. Two-way response use as well. Also used for radio astronomy. This band is currently not available for IMT-2000, however some licences may choose to evolve to technologies and services, such as IMT-2000
Malaysia	Available
Korea	These bands were allocated for MSS at WARC-92. Any assignment for these bands is reserved until specific plans in Korea
China	Space service

Current and planned utilization	
Satellite component (*end*)	
2 520-2 535/2 655-2 670 MHz	
Japan	These bands are extensively used for mobile-satellite systems
Canada	Currently identified for terrestrial services
Australia	Current Australian usage of these bands would make usage by MSS in Australia difficult
Brazil	These bands are used for multichannel MDS. At this time Brazil is concluding an extensive licensing activity for MMDS in these bands. No other types of radio systems are currently being licensed in this range. Not suitable for IMT-2000

(1) Agreed and developed within European Radiocommunications Committee Task Group 1 of the Conférence Européenne des Administrations des Postes et des Telécommunications (CEPT ERC TG1).

APPENDIX E: FEDERAL GOVERNMENT FIXED MICROWAVE STATIONS IN THE 1710-1755 MHZ BAND EXEMPT FROM REALLOCATION

INTRODUCTION

This Appendix contains information regarding Federal Government fixed microwave stations in the 1710-1755 MHz band that are exempt from reallocation. These stations were authorized as of February 10, 1994 to operate in this band, and are predominantly fixed microwave stations used by Federal Power Agencies ("FPAs") where the majority of communications carried involve safety-of-life operations. In addition, certain fixed microwave stations belonging to Federal agencies where operation of these stations supports FPAs in the generation and distribution of electric power energy are also exempt from reallocation.

EXEMPT FPA FIXED MICROWAVE STATIONS

Any frequency assigned to, or any frequency assignment used by, an FPA either may not be reallocated to non-Federal sector use or may be reallocated only on a mixed Federal/non-Federal sector use basis. These facilities are mainly operated by the Federal Aviation Administration, Coast Guard, and Treasury Department. FPA operations conducted on frequencies reallocated for mixed use must be protected from harmful interference by non-Federal sector users. The geographical representation of FPA fixed microwave stations exempt from reallocation is shown in Figure E-1. A marker indicates the location of one or more fixed microwave stations.

EXEMPT SAFETY-OF-LIFE FIXED MICROWAVE STATIONS

Because spectrum is in great demand by non-Federal users in urban areas, NTIA has provided protection to only those safety-related fixed microwave stations operating in the 1710-1755 MHz band that are outside a 150 km radius of the 25 most populated cities in the United States. The geographical representation of the location of these stations is shown in Figure E-2. As before, a marker represents one or more fixed microwave stations supporting safety-related operations.

LIST OF EXEMPT FIXED MICROWAVE STATIONS

A list of exempt fixed microwave stations is included in the docket file of this proceeding. Electronic access to this list is available to the public via the set of Internet servers operated by NTIA. Detailed instructions for gaining access to these servers can be obtained by connecting through the Internet to http://www.ntia.doc.gov.

FIGURE E-1: Geographic Distribution of Federal Power Agencies Fixed Microwave Stations in the 1710-1755 MHz Band Exempt from Reallocation.

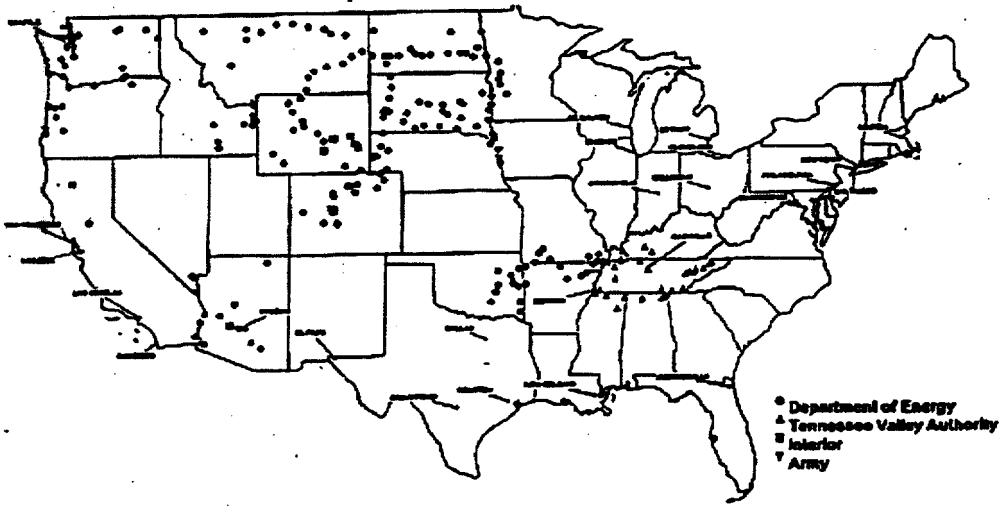
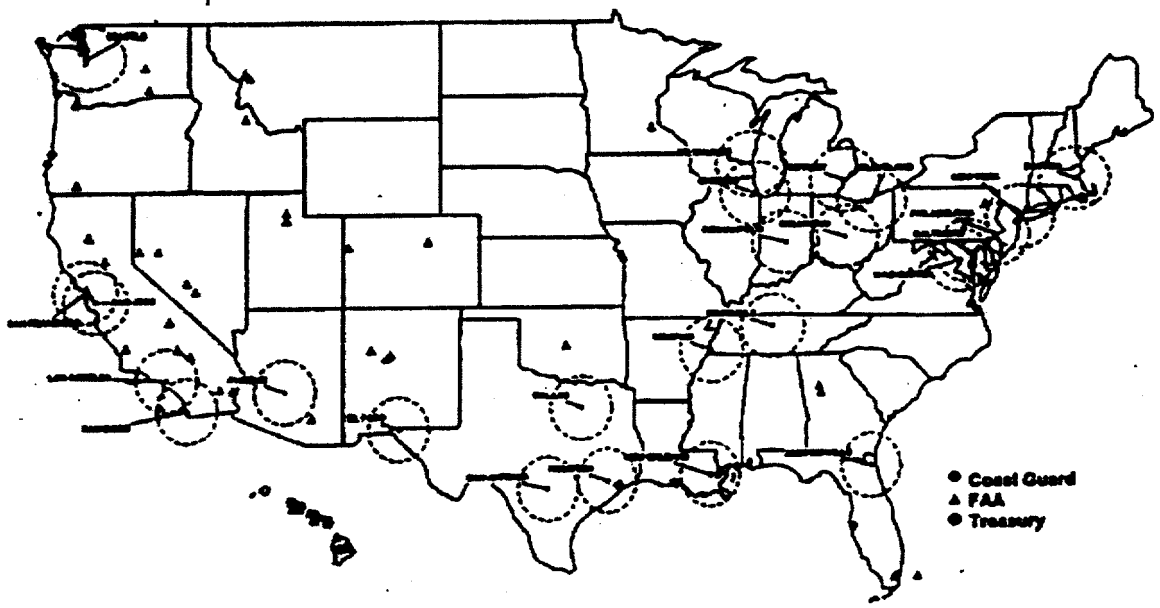


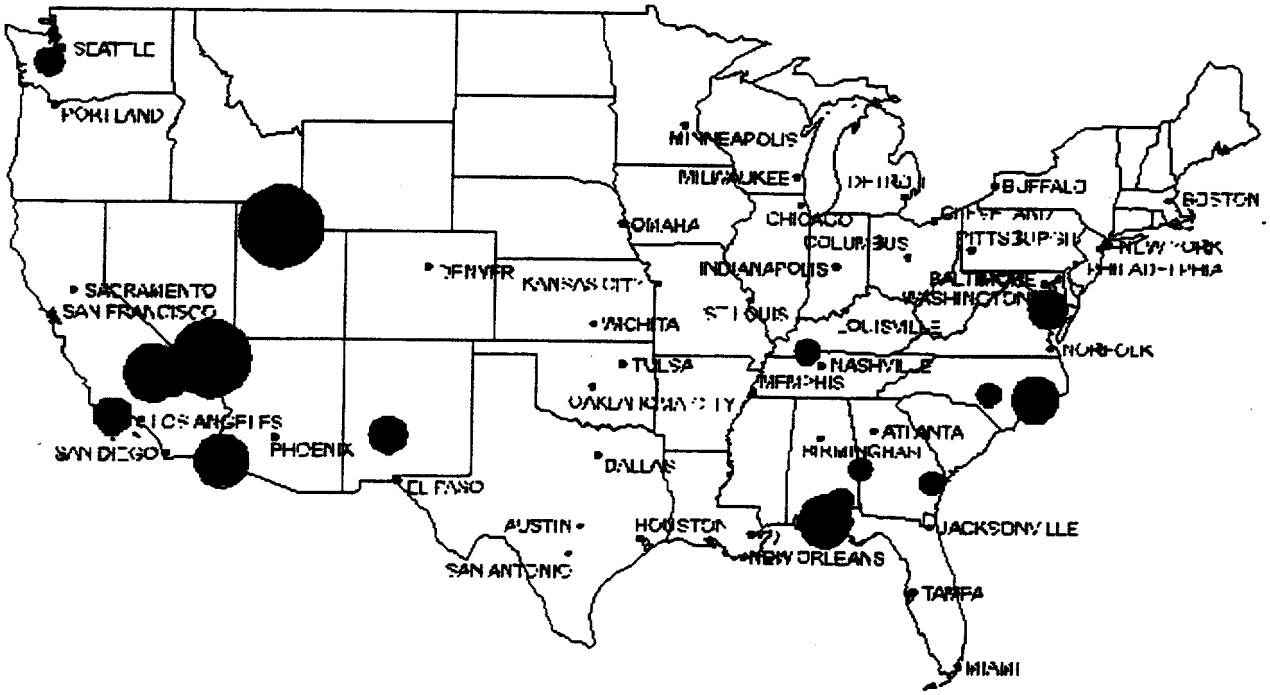
FIGURE E-2: Geographic Distribution of Safety-of-Life Fixed Microwave Stations in the 1710-1755 MHz Band Exempt from Reallocation.



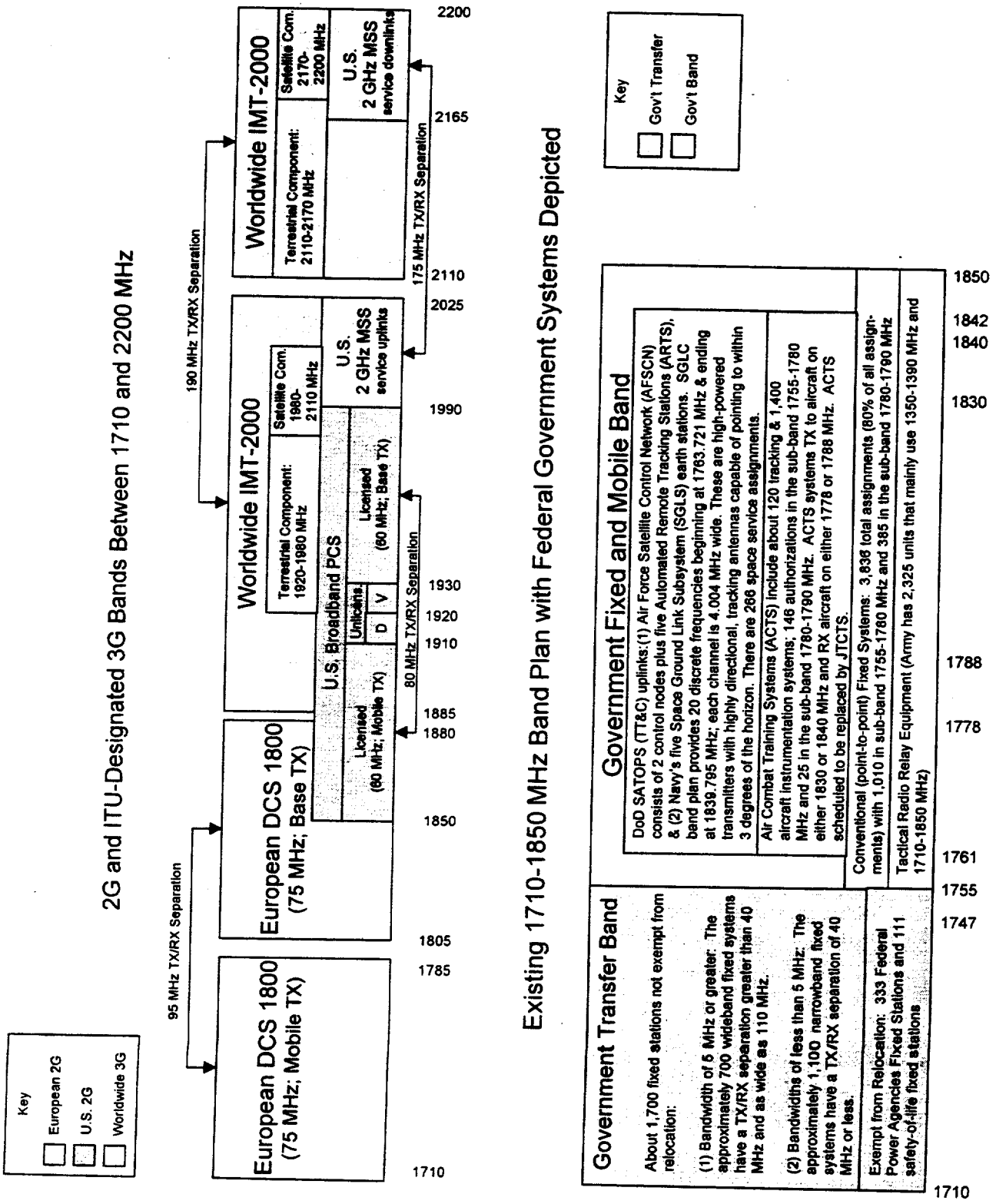
APPENDIX F: SITES AT WHICH GOVERNMENT OPERATIONS WILL CONTINUE INDEFINITELY IN THE 1710-1755 MHz BAND

Sites include fixed microwave, tactical radio relay, and aeronautical mobile stations.

Location	Coordinates	Operating Radius (km)
Eglin AFB, FL	30°29'N, 86°31'W	120
Yuma, AZ	32°29'N, 114°29'W	120
Pacific Missile Test Range, CA	34°07'N, 119°30'W	80
China Lake, CA	35°41'N, 117°41'W	120
Nellis AFB, NV	36°14'N, 115°02'W	160
Hill AFB, UT	41°08'N, 115°58'W	160
Holloman AFB, NM	33°29N, 106°50'W	80
Cherry Point, NC	34°58'N, 76°56'W	100
Patuxent River, MD	38°17'N, 76°25'W	80
Ft. Irwin, CA	35°16'N, 116°41'W	50
Ft. Bragg, NC	35°09'N, 79°01'W	50
Ft. Campbell, KY	36°41'N, 87°28'W	50
Ft. Rucker, AL	31°13'N, 85°49'W	50
Ft. Lewis, WA	47°05'N, 122°36'W	50
Ft. Benning, GA	32°22'N, 84°56'W	50
Ft. Stewart, NC	31°52'N, 81°37'W	50



Radio Observatory Areas

Hat Creek Observatory Hat Creek, California	Rectangle between latitudes 40°00'N and 42°00'N and between longitudes 120°15'W and 122°15'W.
Owens Valley Radio Observatory Big Pine, California	Two contiguous rectangles, one between latitudes 36°00'N and 37°00'N and between longitudes 117°40'W and 118°30'W and the second between latitudes 37°00'N and 30°00'N and between longitudes 118°00'W and 118°50'W
Haystack Radio Observatory Tyngsboro, Massachussetts	Rectangle between latitudes 41°00'N and 43°00'N and between longitudes 71°00'W and 73°00'W.
National Astronomy and Ionosphere Center Arecibo, Puerto Rico	Rectangle between latitudes 17°30'N and 19°00'N and between longitudes 65°10'W and 68°00'W.
National Astronomy Radio Observatory Green Bank, West Virginia	Rectangle between latitudes 37°30'N and 39°15'N and between longitudes 78°30'W and 80°30'W.

APPENDIX G: 2G AND POSSIBLE 3G USE OF THE 1710-2200 MHz BAND AND U.S. GOVERNMENT USE OF THE 1710-1850 MHz BAND