Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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

To: The Commission

COMMENTS

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Allocation of Spectrum Below 5 GHz Transferred From Federal Government Use	)	ET Docket No. 94-32
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To: The Commission

COMMENTS

Pursuant to Section 1.415 of the Commission's Rules,[1] Alcatel Network Systems, Inc. ("ANS"),[2] by its attorneys, hereby comments on the Commission's above-captioned Notice of Proposed Rule Making (FCC 94-272, released November 8, 1994) ("NPRM").

In the NPRM, the Commission proposes to transfer 50 MHz of spectrum from government to private sector users, including 25 MHz in the 4 GHz band. As a leading manufacturer of fixed microwave radio equipment, ANS enthusiastically supports allocation of additional spectrum for fixed radio uses. However, the Commission's proposed reallocation of the 4 GHz band is inadequate because: (i) it does not specify frequency bands for particular uses; and (ii) the frequencies are not useful for fixed point-to-point licensees since such applications require greater bandwidths with paired frequency groupings. Thus, as detailed below, ANS urges the Commission to modify the proposed rules: (i) by conducting service-specific rulemakings and adopting appropriate technical standards for

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[1] 47 C.F.R. Section 1.415 (1994).

[2] ANS is a wholly-owned subsidiary of Alcatel Alsthom ("Alcatel"), one of the world's largest corporations (with annual sales in excess of $30 billion) and the world's largest manufacturer and supplier of telecommunications equipment. In particular, Alcatel is the world's largest independent manufacturer and supplier of microwave radios. Formerly Collins Radio and a division of Rockwell International, ANS, with over $500 million in annual sales, is a world leader in manufacturing microwave and light wave transmission systems. ANS' equipment is used for a wide range of services, including short, medium and long-haul voice, video and data transmission. Its microwave customers include all the Bell Operating Companies, most major independent telephone companies, cellular operators, power and other utility companies, oil companies, railroads, industrial companies, and state and local government agencies.

the reallocated spectrum; and (ii) by working with NTIA for the allocation of more spectrum, at one time, in the 4 GHz band to accommodate fixed users.

ANS OPPOSES THE COMMISSION'S PROPOSAL FOR ALLOCATING THE 4 GHz BAND

The Commission's proposal would reallocate 50 MHz, 25 MHz of which is in the 4 GHz band, from government to private-sector use. The proposal would open the 4660-4685 MHz band to broadcast auxiliary service, fixed, fixed-satellite, mobile, fixed microwave systems and MSS feeder links, without displacing existing non-government fixed satellite use and government fixed mobile use.

Specifically, the Commission proposes allocating the 4660-4685 MHz band "for general Fixed and Mobile services, rather than specify[ing] these frequency bands for particular uses."[3] This approach is proposed to promote "a flexible allocation that relies substantially on market forces" and to permit competitive bidding.[4]

> We propose to allow technical flexibility in the provision of services. In particular, we propose to allow users freedom to choose the channelization, signal strength, modulation techniques and antenna characteristics they employ in providing service, consistent with not causing interference to other users. Interference to operations in adjacent service areas would be controlled through power limits at the service area boundaries. Licensees would also be free to negotiate and develop agreements for interference conditions at the boundaries between their service areas.[5]

A. Chaos will result from the proposed open-market allocation.

Eschewing service-specific technical standards, and relying solely on market negotiations for band sharing, will be disastrous. Uncertainty over what services will be provided and what technical standards will govern would deter manufacturers from investing in developing new products. Benign band-sharing by disparate users will be difficult and costly to achieve. Product costs will skyrocket.

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[3] NPRM at para. 9.

[4] Id.

[5] Id. at para. 10.

Even the Commission acknowledges this scenario, stating that "such an approach may be difficult to implement given certain factors that are unique to these bands."[6]

Contrary to precedent, the Commission proposes allocating frequencies to the private sector without administrative deliberation, allowing the market to direct the frequencies to their highest-valued use. The Commission believes this market approach will provide economic growth and encourage private sector development of emerging technologies. ANS wholeheartedly supports the Commission's objectives. Unfortunately, the Commission's market-based approach to reallocating the 4 GHz band from the federal government will not work and will defeat, rather than promote, such noteworthy goals.

Chaos will result from the absence of basic rules governing the use of these bands and the absence of any meaningful agreements to share the spectrum. Operation in the 4660 - 4685 MHz band by fixed and mobile users requires specific channel and loading requirements, path length and propagation characteristics, and reliability standards. Without such rules, inefficient and ineffective use of the spectrum results.[7]

B. Product development will be stifled.

Many equipment manufacturers and users are extremely interested in the outcome of the present Commission deliberations. The Commission's Notice of Inquiry[8] in this proceeding generated 77 comments and 17 reply comments, an indication of interest on the part of manufacturers and users in the spectrum being reallocated.

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[6]Id. at para. 11.

[7]The Commission has a statutory obligation, when it allocates spectrum, to "[a]ssign bands of frequencies to the various classes of stations, and assign frequencies for each individual station and determine the power which each station shall use . . . ." 47 USC Section 303(c) (1994). This obligation is ignored under the Commission's proposal in the NPRM.

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

Such interest will be stilled, however, by the Commission's proposal to allocate the 4 GHz band without technical rules. This lack of rules discourages immediate investment. ANS and other manufacturers are very interested in developing products for this bandwidth. The sheer number of potential users that could be unleashed as the result of the open market approach will deter these manufacturers from making any large capital investment because there will be no rules restricting the potential for inter-user interference.

Manufacturers must evaluate the development and retail cost of products, costs that will depend on the other users of the frequency band. Because product development takes several years and millions of dollars, product designers would take a "wait-and-see" position to make sure there is a market before making that kind of investment.

The cost of products also will increase due to the cost of interference-compensation components made necessary under the Commission's proposal. Spectrum interference is one of the primary considerations the Commission must consider in allocating spectrum.[9] Interference among various users is uncertain in the rule-free bands the Commission proposes, so products must be designed for a wide variety of environments. Under the Commission's proposed rules, not only must devices filter interference from adjacent bands, but also interference from other users on overlapping bands. Development of these components will be quite costly.

The number of units each manufacturer will be able to sell is a major factor to be considered before making a large research-and-development investment. Uncertainty over how a band will be used will handicap a manufacturer's ability to estimate production requirements. This inability to project market demand likely will drive developers out of the marketplace, hindering, rather than advancing, technological advances.

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[9]See 47 USC Section 923 (1994).

Performance of devices will be another casualty of the proposal. Eliminating specific technical standards will make it difficult, if not impossible, for a prior user to prevent the merchandising of a later, higher-power device.

At a minimum, the Commission's proposal will paralyze manufacturers. They will be forced to defer product development to the last minute -- until the actual use of the band is determined -- which will delay significantly implementation of service.[10]

C. **National and international device inter-operability will suffer.**

Inter-operability of devices in a national and worldwide marketplace will suffer under the Commission's proposal. Many developers look to national and international markets to recover their development expenses.

With different areas of the spectrum available in different markets, devices must be built to survive under any conditions, in any electromagnetic environment. Devices sold to new markets may be inoperable there. Since many other countries use Commission regulations as a model for their own technical and operating requirements, the international market for devices operating in this band will be just as chaotic as it will be domestically.

D. **Congress' goals for reallocating federal spectrum are ignored.**

Under the proposals in the NPRM, the Commission fails to meet Congress' goals in requiring reallocation of federal spectrum for private sector users. Unless the Commission revises its proposal to meet these requirements, its action would be unlawful.

Congress expressly prohibited the Commission from making its allocation decisions based upon the promise of auction revenues,[11] and has required the Commission to consider non-financial

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[10]Manufacturers also could delay finalizing and filing necessary applications for required Commission equipment authorization.

[11]47 USC Section 309(j)(7)(A) (1994). Auctions for services, such as fixed microwave links, are not, and should not, be permitted. 47 C.F.R. Section 1.2101 (1994).

benefits, such as "rapid deployment of new technologies" and "efficient and intensive use" of the spectrum, in making allocation decisions.[12] Congress has imposed an unavoidable duty on the Commission to consider designated entities, small enterprises, and minority-owned concerns. Such enterprises may be swallowed-up in the bidding war. Methods of payments, service, performance, and public convenience also must be considered. In the NPRM, the Commission fails these requirements.

Furthermore, Congress has emphasized the need to reallocate the federal government's full 200 MHz as quickly as possible.[13] In selecting frequencies for reallocation, the Commission should pursue the reallocation of frequencies most likely to encourage scientific progress.[14] This scientific progress, however, would be hampered if technology developers were hesitant about investing in projects likely to face spectrum interference. If the Commission is only going to make 25 MHz available, it should at least make that band useful.[15]

The Commission has an obligation to optimize use of the electromagnetic spectrum. Given the unprecedented variety and number of potential users in the band and given the Darwinian approach to spectrum allocation proposed in the NPRM, the Commission disregards this obligation. Manufacturers should not be expected to develop devices without some indication of the environment under which their products will be expected to perform. Regulation is indispensable to orderly

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[12]47 USC Section 309((j)(3) (1994).

[13]Congress required the Secretary of Commerce to "consider the need to reallocate bands of frequencies as early as possible . . . ." 47 USC Section 923(e)(3)(A) (1994).

[14]47 USC Section 923(c)(2) (1994) reads:

> In determining whether a frequency band meets the criteria specified in subsection (a)(3) of this section, the Secretary shall --
> ... (C) seek to include frequencies which can be used to stimulate the development of new technologies. . . .

[15]Local, small-scale noncommercial users, including public safety concerns, will suffer dramatically under this proposal. Unable to compete with the larger commercial players, they will have to negotiate with the larger bidders for customized services if they are to continue at all.

development of the spectrum, given the high development costs of the nascent technologies that the Commission is obligated to promote. Thus, to avoid such a "Tower of Babel," the Commission must, at a minimum, specify rules for each service regarding frequencies, frequency-tolerances and bandwidth-separations, types and bandwidths of emission, antenna design limitations, and transmitter power, as well as mean field strength limits at adjacent markets.

ADDITIONAL SPECTRUM MUST BE ALLOCATED IN THE 4 GHz BAND

Under Congress' mandate to reallocate spectrum for private sector use,[16] the Department of Commerce proposed immediate reallocation of the 4660-4685 MHz band and proposed deferring reallocation of the 4635 - 4660 MHz band until January 1997.[17] In its initial response to this proposed reallocation of the 4 GHz band, the Commission concluded that "[n]ew technologies will . . . likely require greater than [this] 50 MHz," that "significant opportunities for additional non-Government use exist" in this band, and that "further consideration should be given to reallocating a significantly greater portion of the 4400 - 4990 MHz band for exclusive non-Government use as well as to the potential for sharing all of this spectrum with non-Government services."[18] Furthermore, the Commission urged that, in "revisiting its reallocation proposals, it would be useful if bands could be identified [by the Commerce Department] that can be paired to provide full . . . service, are large enough to provide for development of new technologies, and sufficient to satisfy communications

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[16]47 USC Sections 901 et seq. (1994).

[17]Preliminary Spectrum Reallocation Report, U.S. Dept. of Commerce, NTIA Special Publication 94-27 (Feb. 1994) at Table 5-4 ("Preliminary Report").

[18]Report from the Federal Communications Commission to Ronald H. Brown, Secretary, U.S. Department of Commerce, Regarding the Preliminary Spectrum Reallocation Report, FCC 94-213 (released Aug. 9, 1994) at para. 67 (emphasis added) ("FCC Report"). The Commission's clarion call to the Commerce Department for additional spectrum was repeated throughout this report. For example, the Commission stated that "significant amounts of spectrum are required for the development of services above 3 GHz . . . ." FCC Report at para. 76.

needs that have recently been identified."[19] In this regard, the Commission criticized the Commerce Department for proposing reallocation of "band segments that are too small . . . ."[20] Before proceeding with the allocation proposed in the NPRM, it would be in the public interest for the Commission to recall its foregoing response to the Commerce Department approach and to fulfill its statutory mandate by formally requesting the changes it had recommended in the FCC Report.

In particular, the Commission must remain sensitive to the needs of fixed microwave users. To clear spectrum for PCS, point-to-point fixed-microwave developers are being dislocated from the 2 GHz band. Providers of PCS have been given designated bandwidths totalling at least 140 MHz, while spectrum allocated for fixed point-to-point microwave licensees has been slashed significantly by the reallocation in ET Docket No. 92-9.[21]

Loss of this spectrum by fixed microwave users regrettably is ignored by the Commission. In the NPRM, it concludes "that the issue of reaccommodating fixed microwave operations has been addressed adequately in [ET Docket No. 92-9], so that it is not necessary to reallocate additional spectrum for this purpose."[22] The Commission is mistaken.

A. Fixed users need additional spectrum in the 4 GHz band.

The Commission's conclusion regarding fixed users is unjustified, especially with respect to the 4 GHz band. In reallocating the 4 GHz band to accommodate displaced 2 GHz users, the Commission did not adopt proposed rules that provided such fixed microwave licensees interference protection comparable to the protection provided incumbent satellite users. This decision by the

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[19]FCC Report at para. 54.

[20]FCC Report at para. 49.

[21]See Second Report and Order, ET Docket No. 92-9, 8 FCC Rcd 6495 (1993) ("Second Report and Order").

[22]NPRM at para. 22.

Commission undermined its goal of protecting the migrating 2 GHz users because it effectively precludes the use of the 4 GHz band by any more than a relatively limited number of fixed microwave licensees.[23]

This decision is regrettable. The 4 GHz band is an optimal frequency for fixed point-to-point microwave services because it is attractive for long-distance, high-reliability paths, and because it has propagation characteristics similar to the 2 GHz band.

Under these circumstances, it is incumbent upon the Commission to use the federal spectrum allocation as a platform for restoring effective access by fixed microwave users to the 4 GHz band. In its proposed reallocation timetable, NTIA recommends reallocating the 4635-4660 MHz band by January 1997. Reallocating spectrum on this piecemeal basis is counter-productive because it stymies users from taking full advantage of the newly available frequencies. Thus, to meet this need, the Commission should urge NTIA to expedite its timetable and reallocate the remaining 25 MHz now.

For the 4 GHz band to be available to fixed microwave users, paired channels must be created. At least 100 MHz of spectrum in the 4 GHz band must be reallocated to accommodate these paired channels. In its ongoing negotiations with NTIA, the Commission should promote such an allocation, consistent with its findings in the FCC Report, supra.

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[23]See Second Report and Order. It should not be forgotten that fixed microwave users were authorized to use the 4 GHz band first. Microwave systems began using the 4 GHz band in 1947. The first active satellite to receive and transmit simultaneously (at 4 and 6 GHz), AT&T's TELSTAR, was not launched until 1962. Other active satellite systems (operating on 4 GHz) rapidly proliferated thereafter. Only after satellite users "invaded" the 4 GHz band was the need for interference standards established. The standards established by satellite users for terrestrial microwave systems were quite restrictive. This situation was further complicated in the mid-1970's when home owner TV receive-only stations became popular and further restricted implementation of new 4 GHz terrestrial microwave systems. When the satellite-terrestrial microwave coordination standards were introduced to increase protection of satellite users, the noose was tightened on the fixed microwave licensees and their ability to operate in the 4 GHz band. Nevertheless, fixed microwave users have accepted such cohabitation and have expended substantial resources to ensure that their systems are coordinated with the satellite users. Moreover, in ET Docket No. 92-9, ANS proposed technical methods to allow increased access to the 4 GHz band by fixed point-to-point users, but, due to unjustified and undocumented satellite carrier opposition, this proposal was not adopted.

In addition, in the Preliminary Report analyzing what federal spectrum would be available for private sector reallocation, the Commerce Department acknowledges that "portions of the 4400-4990 MHz band could provide useful spectrum resources for a variety of fixed . . . applications."[24] Although the Commerce Department declares that various military uses prevent widespread access to this band, it does not substantiate or document why more of it could not be shared. Indeed, most government applications in this band appear to be for isolated military installations, which should not impact commercial fixed use.

B. Private sector spectrum management should be encouraged.

Lost in the "momentum" to reallocate federal spectrum is the value of effective spectrum management. Although government users utilize spectrum management techniques, it is critical that all approaches be employed so that spectrum availability can be maximized. The Commission and NTIA must coordinate their activities to more efficiently manage frequency use, promote spectrum management techniques, and permit band sharing. Such coordination should be facilitated by the fact that the same products used on these bands by private sector licensees are also used by the government.

CONCLUSION

ANS supports the Commission's efforts to implement the directives of Congress and reallocate federal spectrum for private users. However, 25 MHz in the 4 GHz band, which is a very crowded region of the spectrum, without any rules limiting inter-user operation and interference, simply is not enough bandwidth.

ANS encourages the Commission to take a more aggressive approach toward implementing these policies by conducting service-specific rule makings for use of the 4660-4685 MHz band and by negotiating with NTIA for the immediate allocation of additional spectrum, including the 4635-

[24] Preliminary Report at 4-32.

4660 MHz band scheduled for reallocation in 1997. These measures are necessary so that fixed microwave point-to-point equipment manufacturers and users may better plan their technological investments and provide service to public safety and commercial users.

Respectfully submitted,

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December 16, 1994

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CERTIFICATE OF SERVICE

I do hereby certify that a copy of the foregoing Comments will be hand-delivered on the 19th day of December, 1994, to:

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December 16, 1994

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