

RECEIVED

ORIGINAL
FILE

DEC 11 1992

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

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

In the Matter of)
)
Redevelopment of Spectrum to)
Encourage Innovation in the Use of New)
Telecommunications Technologies)

ET Docket No. 92-9 ✓

COMMENTS

GTE SERVICE CORPORATION,
*on behalf of its affiliated domestic
telephone, satellite, and cellular
companies*

Daniel L. Bart
1850 M Street, N.W.
Suite 1200
Washington, DC 20036
202-463-5212

December 11, 1992

Their Attorney

No. of Copies rec'd
List A B C D E

044

TABLE OF CONTENTS

	<u>Page</u>
SUMMARY	iii
DISCUSSION.....	2
Alcatel's Proposal To Restructure The 4 GHz Band Will Adversely Impact Satellite Services.	2
With Respect To Other Proposed Bands, Re-Channelization Must Accommodate Established Frequency Plans To Permit Normal Growth.	5
While Initially Common Carrier Coordination Procedures Will Be Used In Common Carrier Bands And Private Band Procedures Will Be Used In Private Bands, The Long-Term Goal Should Be Harmonization.	6
GTE Continues To Urge Access To Government Bands.	8
The Proposed Automatic Transmitter Power Control System Must Operate With Certain Restrictions To Protect Satellite Services.	9
Now Is The Time To Upgrade Antenna Performance.	10
CONCLUSION	12

Figure 1

SUMMARY

In the event incumbent 2 GHz microwave users are forced to relocate out of that band and need to move to higher frequencies, GTE supports the FCC's efforts to establish the technical parameters and procedures for the higher frequencies. However, in establishing the technical rules for this relocation, the Commission should not adversely impact the current users of these higher bands. GTE previously advised the FCC about the possible issues involved trying to share the 4 GHz Common Carrier band between terrestrial microwave users and satellite services and at the same time changing the channelization plan. GTE cannot support the proposed 4 GHz channelization plan. One early-filed set of Comments labeled it a "blueprint for disaster." GTE can only support the 4 GHz Common Carrier band for this reallocation if the current channelization is maintained, and even then, believes this band should not be a first choice option.

With respect to other higher frequency bands, the Commission should ensure that established frequency plans are grandfathered to allow current systems to grow normally. Narrowband systems should first be located in the upper portion of the 6 GHz band. Coordination procedures and interference criteria should be harmonized between common carrier and private use over the long haul. The Commission should plan for this convergence now. Now is also the appropriate time to require upgraded antenna specifications.

GTE supports the FCC's and NTIA's efforts to allow commercial use of the Government bands and hopes the FCC is able to reflect such agreements in the final Rules. The Commission's proposal on Automatic Power Control Systems will require additional restrictions on the use of such equipment. By

addressing the concerns identified by GTE the Commission can facilitate a smoother transition to the joint use of spectrum by private users and common carriers who are displaced from the 2 GHz band.

RECEIVED

DEC 11 1992

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

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

In the Matter of)
)
Redevelopment of Spectrum to)
Encourage Innovation in the Use of New) ET Docket No. 92-9
Telecommunications Technologies)

COMMENTS

GTE Service Corporation, on behalf of its affiliated domestic telephone, satellite, and cellular companies ("GTE"), herein offers its Comments in response to the FCC's above-referenced Further Notice of Proposed Rulemaking ("FNPRM").¹ With this Further Notice of Proposed Rulemaking, the Federal Communications Commission is essentially adopting the recommendations made by Alcatel for changing Parts 21 and 94 of the Commission's Rules to accommodate the displaced 2 GHz terrestrial microwave users who may be required to relocate to establish new emerging technologies.

GTE is a major provider of both satellite and terrestrial microwave communication services, and is, therefore, fully aware of the necessity to balance the spectrum needs between these services. GTE is concerned, however, that the Commission may solidify its position regarding the proposed rule changes before having had adequate opportunity to fully analyze the impact

¹ See Further Notice of Proposed Rulemaking, In the Matter of Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies, ET Docket No. 92-9, FCC 92-357 (Sept. 4, 1992). By an Order Extending Time for Comments and Reply Comments, DA 92-1599 (Nov. 24, 1992), the Office of Engineering and Technology extended the Comment date until December 11, 1992 and the Reply Comment date until January 13, 1993.

that some of these changes will have on satellite communications in general and on satellite broadcast TV services in particular as well as on the planned growth of existing systems at the higher frequencies. GTE also believes the Commission can provide leadership in harmonizing interference criteria, coordination procedures, and improving equipment design.

DISCUSSION

Alcatel's Proposal To Restructure The 4 GHz Band Will Adversely Impact Satellite Services.

As pointed out in GTE's response to the Alcatel Petition for Rulemaking, the proposed restructuring of the 4 GHz Common Carrier band will severely and adversely impact the interference potential for all satellite services using that band.² Most affected will be satellite broadcast services which often rely on the interference protection that is inherent in the current 4 GHz frequency plan. In particular, many thousands of uncoordinated and unregistered Television Receive Only ("TVRO") stations are being operated on the premise that potentially interfering microwave services will be 10 MHz removed from their

² See Comments of GTE Service Corporation, In the Matter of ALCATEL NETWORK SYSTEMS, INC., Petition to Amend Parts 2, 21, 25, and 94 of the Commission's Rules to Accommodate Common Carrier and Private Op-Fixed Microwave Systems in Bands Above 3 GHz, RM-8004 (Jul. 2, 1992), at 5-12. Also see GTE's Reply Comments in RM-8004 (Jul. 16, 1992) and GTE's Comments In the Matter of Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies and NTIA Report on 1710-1850 and 2200-2290 MHz Bands, ET Docket No. 92-9 (June 5, 1992) at 15-17. GTE also opposed the Utilities Telecommunications Council ("UTC") in its proposals that adversely impacted satellite services. See GTE's Comments on UTC's Petition for Rulemaking, RM-7981 (June 1, 1992).

desired signals.³ GTE does not believe that the satellite TV program providers and the general public are fully aware of the impact that the proposed restructuring of the band will have on their services, if adopted by the FCC. Any deviation from the currently-established frequency plan will adversely affect the inherent interference protection afforded these unregistered services.⁴

The Commission states on page 10, ¶19, of the FNPRM that registered or licensed earth station services will be adequately protected through the frequency coordination process. GTE would like to point out that the current frequency coordination process is not geared to routinely deal with interference reduction by means of variable frequency offset. Under the current 4 GHz frequency plan, and with the limited choices in available wideband radio equipment, it is already extremely difficult to find agreement within the frequency coordination community as to the interference reduction advantage gained by frequency offset. GTE believes that the proposed restructuring of the band and the introduction of new narrowband equipment will make it virtually impossible to guarantee any amount of interference reduction by means of frequency offset.

³ In its RM-8004 Comments, GTE provided a Figure 1 which demonstrated the current 10 MHz offset used to minimize interference between satellite transponders and terrestrial microwave at 4 GHz. A copy is included as an Attachment here.

⁴ In early-filed Comments, GE American Communications, Inc. ("GE American") also identifies the impact that the proposed rechannelization proposal will have on C-Band satellites and antennas. See GE American Communications, Inc. Comments (Dec. 4, 1992), at 4-15. As unregistered users find out about the FCC's plan, there may be a stampede to register and coordinate these stations. This will yield a tremendous burden on the parties and further tax the Commission's limited resources. As noted by GE American at 12, disputes over recoordination and sharing would further entangle the limited resources of the Commission. GE American calls the FCC's plan "a blueprint for disaster." (GE American at 7)

The current 4 GHz band structure may be perceived by some as being spectrum inefficient when one considers terrestrial services' use of this band. However, when the band is analyzed with a balanced view toward the needs of satellite users, then it becomes obvious that there is, in fact, no waste or inefficient use of spectrum.⁵ Many licensed and registered earth stations are designed to operate in the guardbands between terrestrial services, enjoying an interference-free environment similar to those thousands of backyard TVROs. GTE, therefore, recommends that the existing 4 GHz Common Carrier band structure be preserved, and that narrowband users be allowed to use a wideband channel when their services cannot be accommodated in one of the other frequency bands. GTE submits that this approach balances the needs of both the terrestrial and satellite service providers.⁶

GTE is also concerned about the maximum channel bandwidth limits and the channel separation criteria proposed for the 4 GHz and the 6 GHz Common Carrier bands under proposed Sections 21.701 (d) and (e) of the Commission's Rules, respectively. Satellite transponders have much wider

⁵ Many Commenters have pointed out the extensive congestion that already exists in the 4 GHz band due to this shared use. As noted by GTE in its RM-8004 Reply Comments at page 2, footnote 4: "In its Comments, COMSEARCH noted over 40,000 frequencies in the 4 GHz Common Carrier Band have been licensed, applied for, or proposed," which is significantly higher than the 6 GHz or 11 GHz Common Carrier bands. In its early-filed Comments GE American at 8, points out that: "More than a decade ago, the Commission characterized the 4 GHz band as becoming increasingly intensively used," citing Microwave Radio Relay Systems, 88 FCC 2d 135, 137 (1981).

⁶ GTE's recommendation for the 4 GHz Common Carrier band does not differ significantly from the way the Commission proposed to use the 6 GHz Private band. The Private band is structured for 10 MHz wide channel slots. The 5 MHz channels are overlaid to take up a full 10 MHz channel, leaving 5 MHz guardbands between channel assignments.

bandwidth capability, and existing frequency assignments do not conform to the proposed plan. Satellite services must, therefore, be exempted from these requirements.

In summary, while GTE generally supports the FCC's attempts to find new spectrum to accommodate the incumbent 2 GHz band microwave users who may be forced to relocate, GTE stated in its June 5, 1992 Comments at 16, that "any proposal to restructure the 4 GHz band must be thoroughly examined to ensure that such restructuring would not involve the adverse effects described herein. If it is determined that a restructuring proposal at 4 GHz would have such adverse effects on satellite operations, GTE would not support a reallocation of this candidate frequency band." Since the FCC's proposal adversely affects satellite operations, GTE can only support this band for reallocation if the current channelization is maintained.

With Respect To Other Proposed Bands, Re-Channelization Must Accommodate Established Frequency Plans To Permit Normal Growth.

As already noted, the 4 GHz Common Carrier band is already very congested and this band may be less accommodating than other options for displaced 2 GHz licensees. The FCC may wish to force applicants to consider this band a last choice option. However, even use of the bands higher than 4 GHz needs to take into consideration the existing and established frequency plans to permit normal growth and future system expansion. For example, the proposed 6 GHz plan offers a 30 MHz bandwidth compared to today's 29.65 MHz. Since a 4:1 ratio exists between private carrier analog and digital systems in congested areas, the creation of frequency offsets (220 kHz to 2.2 MHz) will impact these analog systems as a result of carrier beat interference potentials. The interleaving of predominantly narrowband private systems in wideband slots

will also contribute to these interference problems. Thus, in order to maximize the available spectrum, the continued use of existing frequency plans must also be supported.

GTE would support rule amendments that require proposed 6 GHz narrowband/analog systems to use the upper portion of the band (6525-6875 MHz) which is now designated for narrowband and, in particular, use of that portion of the band by those systems requiring 10 MHz or less. This will ensure that the predominantly wideband 6 GHz channels are preserved for maximum wideband use. The need to access wideband slots for narrowband use would not be precluded, but strong consideration of first choice requirements should be the concentration of like systems within available frequency channels which will ensure spectrum efficiency and facilitate the required coordination procedures.

With respect to the 11 GHz rechannelization plan, limiting factors in reducing the existing 40 MHz bandwidth to 30 MHz are the embedded frequency plans featuring 40 MHz channel allocations. GTE supports consideration of new, more spectrally-efficient frequency plans, but recognizes that active and growth plans need to be protected (or grandfathered) and new plans implemented for new microwave routes in a way which maintains spectrum efficiency and allows for planned growth.

While Initially Common Carrier Coordination Procedures Will Be Used In Common Carrier Bands And Private Band Procedures Will Be Used In Private Bands. The Long-Term Goal Should Be Harmonization.

With respect to coordination procedures, in the FNPRM (§30) the Commission states that "it would be least disruptive to existing users to maintain current procedures in each band . . . [t]hus, in the 4, 6, 10, and 11 GHz common carrier bands, we propose that Part 21 coordination procedures be used,

whereas in the 6 GHz private band, we propose that part 94 procedures be used." For the initial implementation of the reallocation rules, GTE advocated such a "When in Rome, do as the Romans do" approach.⁷ Alcatel had proposed that Part 21 coordination standards be applied to all bands. (FNPRM, ¶25) GTE agrees with Alcatel's proposal as a mid- to long-term goal of the FCC and believes the Commission should establish "harmonized" prior coordination procedures as its goal for the following reasons:

- Common carriers have historically secured future growth channels through the prior coordination process. This process has proven invaluable for establishing long-range growth plans, particularly in frequency-congested areas. In addition, this procedure has worked well to eliminate potential interference prior to filing and subsequent operation of desired facilities.
- Currently under the Commission's Part 94 Rules, private microwave licensees are not required to coordinate frequency use, but rather are required to perform interference studies to ascertain if the proposed system could potentially cause interference to other operators. Private microwave applications must include a showing of stations and call signs that were included in the study. Private microwave data bases are updated only after a filing appears on public notice. Under this scenario, path data information is never current but rather lagging both the engineering and filing period.
- Common Carrier data base information is updated immediately on receipt of the Prior Coordination Notice. This process allows common carriers to avoid the possibility of pursuing system development in parallel with another operator without prior knowledge of possible interference conflicts. Potential problems are thus identified and eliminated prior to the engineering and filing period. This has served the common carriers well from both a planning and economical standpoint. Likewise, the Commission has been spared numerous "Petitions to Deny" that would have resulted if conflicts had not been identified in advance.

⁷ See GTE's June 5, 1992 Comments at 17.

GTE recommends that as the first step the FCC establish common carrier coordination procedures for all the shared bands except the upper 6 GHz (6525-6875 MHz), which is currently limited to private use. However, the FCC should set forth a plan to require the users to come up with a "harmonized" coordination plan. The FCC notes (FNPRM, ¶30) that for interference standards, the private and common carrier standards are "converging."⁸ The same should be the goal for coordination procedures. Rather than maintaining two sets of rules, the Commission should set as its mid- to long-term goal, consistent coordination procedures. Without such rules, the upper 6 GHz band could potentially become a target for those licensees who choose the upper 6 GHz band to avoid the 30-day notification period.

GTE Continues To Urge Access To Government Bands.

In its June 5, 1992 Comments GTE urged the FCC to include the Government 2 GHz band in its analysis for possible locations for displaced 2 GHz incumbents. In the FNPRM, ¶¶23-24, the Commission reports that the National Telecommunications and Information Administration ("NTIA") has advised the FCC that NTIA will: "continue working with the Commission to consider ways to meet the valid needs of commercial operators using the [government] frequencies at issue."

⁸ GTE, is an active participant in industry standardization groups, and recognizes that joint/common usage of microwave frequency bands requires a uniform/common interference performance objective be established for equipment, engineered designs, and growth considerations in utilizing available spectrum. To this end, GTE calls the Commission's attention to the efforts of the National Spectrum Managers Association and the Telecommunications Industry Association (TIA 14.11) which are jointly working to resolve these issues and aid in the "convergence" or "harmonization" of different criteria.

GTE continues to support NTIA's efforts and encourages the NTIA to negotiate access to adjacent government bands (1710 to 1850 MHz) for relocation of displaced 2 GHz users. Access to this band would benefit 2 GHz users in that minimal equipment and antenna structure facility changes would have to be made, compared to upper band (i.e., greater than 3 GHz) usage. GTE is pleased that the FCC is continuing its discussions with NTIA and promises "appropriate modifications when we issue our final decision."

The Proposed Automatic Transmitter Power Control System Must Operate With Certain Restrictions To Protect Satellite Services.

The Commission proposes to amend the Rules to explicitly authorize the use of Automatic Transmitter Power Control ("ATPC") systems under both Parts 21 and 94, but does not impose sufficient restrictions on their operation.⁹ GTE believes that it is necessary to place boundaries on the operating parameters of such systems. ATPC systems came into being for two reasons. First and foremost, to permit better frequency re-use, and secondarily to operate transmitters at reduced power for improved equipment reliability. Both objectives are met when the transmitters are operated at some level (typically 10 dB) below their maximum operating power, under non-fading propagation conditions. Users of ATPC systems will, therefore, frequency coordinate their systems for the reduced power, and then license them for the maximum power. Since terrestrial microwave systems are designed with large fade margins, and since fading among systems is uncorrelated, ATPC is an acceptable method for increasing frequency re-use without exposing other microwave services to unacceptable risks of interference.

⁹ See FNPRM, p. 14, ¶33.

Satellite earth stations, on the other hand, operate with very small fade margins, and increasing the power of an interferer by 10 dB can significantly degrade performance, or, under the worst scenario, cause total system outage. For this reason, it is necessary for the Commission to limit the difference between coordinated and licensed power for ATPC systems and to impose restrictions on the percentage of time that such systems are permitted to operate above the coordinated power. Applicants for such systems must also be required to justify the interference advantage claimed and provide an explanation of how their systems are monitored for compliance with the established operating boundaries. Failing to make such showings, ATPC applicants must be required to coordinate their systems at the licensed maximum transmitter power and that maximum power must not be exceeded under any circumstance. GTE suggests that existing industry bodies should be permitted to develop uniform procedures governing interference analysis that will be used for ATPC systems.

Now Is The Time To Upgrade Antenna Performance.

In its RM-8004 Comments at 12-13, GTE urged the Commission to consider changes to the technical standards for each of the higher frequency bands to which displaced 2 GHz users may be reallocated. In the interest of improving frequency re-use and facilitating accommodation of the displaced 2 GHz users, GTE believes that this is an opportune time to upgrade the terrestrial antenna performance standards to reflect current state-of-the-art technology. All new services, at least those in the 4 and 6 GHz Common Carrier and Private Carrier bands, should be implemented using state-of-the-art antennas. Since the reasonable costs of the relocation are to be borne by the party forcing the

relocation, any slight increase to higher-cost antennas should not be an issue. Antenna standards reflected in Section 21.108(c) and proposed Section 94.75(b) should be specified as a single new standard. By both adopting a single standard and improving the standard by specifying a more stringent performance level, the Commission will ensure that available frequency allocations are maximized when higher performance standards are implemented. Antennas in existing systems in these bands should be upgraded to the new standard only if the use of these older antennas results in harmful interference or prevents the implementation of a new service.

CONCLUSION

GTE supports the FCC's efforts to establish channelization plans, coordination criteria, interference criteria, and equipment criteria, to allow incumbent 2 GHz users who are forced to move to be relocated to higher bands. However, any final FCC rules should not impact the satellite services and their users or fail to consider the existing growth plans of the current users of the higher bands. This rulemaking is also an opportune time for the FCC to update antenna performance criteria, establish rules for ATPC, and plan for the harmonization of private and common carrier interference criteria and coordination procedures.

Respectfully submitted,

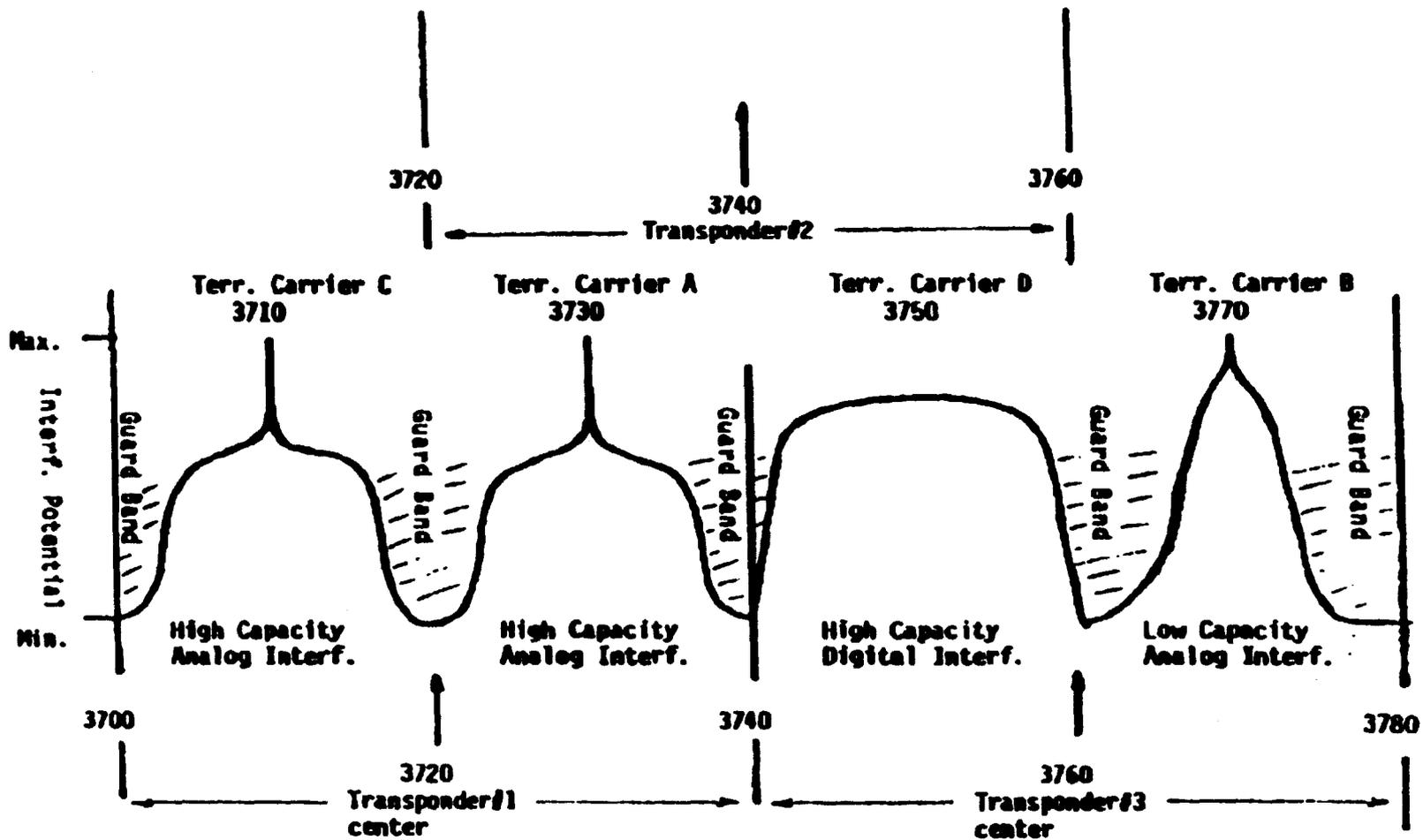
GTE SERVICE CORPORATION,
on behalf of its affiliated domestic
telephone, satellite, and cellular
companies

By: 

Daniel L. Bart
1850 M Street, N.W.
Suite 1200
Washington, DC 20036
202-463-5212

December 11, 1992

Their Attorney



Transponder Interference Potential from Terrestrial Systems with various channel loading

Certificate of Service

I, Jennifer R. McCain, hereby certify that copies of the foregoing "Comments" have been mailed by first class United States mail, postage prepaid, on the 11th day of December, 1992 to all parties of record.


Jennifer R. McCain