As a practical matter, frequency planners are working toward the same methods for both Part 94 and Part 21 bands. Thus, TIA, in association with NSMA, should work toward developing and then publishing common frequency coordination standards for Part 94 and Part 21 bands.[103]

2. Interference protection

Interference standards for private users are different than standards for common carriers. The Commission, however, recognizes that interference protection standards under Part 21 and Part 94 are converging.[104] Consequently, the Commission concludes that "[d]e-spite the current differences in Part 21 and Part 94 interference standards, and the claim by UTC that inadequate protection is offered to private users who may need to relocate to the common carrier bands, we believe that many private uses can be accommodated in those bands without jeopardizing the quality of service."[105]

ANS agrees with the Commission's recognition that industry groups should establish interference coordination criteria between private and common carrier users sharing the relocation bands above 3 GHz. In this regard, it should be noted that TIA soon will adopt its Bulletin 10F, which is a revised set of interference protection

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[103] Id.

[104] FNPRM, 7 FCC Rcd at 6105.

[105] Id.

standards for both private and common carrier users sharing the Part 94 private bands.

3. Growth channels

The Commission, in the FNPRM, solicits "comment on whether frequency coordinators should establish time limits for the reservation of growth channels such as a six month reservation period."[106] The comments on this proposal vary.

UTC supports a short period for channel reservation, which could last as long as one (1) year.[107] In contrast, most common carriers argue that a longer period should be established to provide sufficient time for justifying the investment common carriers make in their microwave systems and for earning a return on such investment.[108]

This is a sensitive issue to all users. As a manufacturer, it would be inappropriate for ANS to take a position regarding this user issue. Accordingly, ANS recommends that the Commission seek out and adopt the consensus of the user community.

4. Antenna standards

To increase spectral efficiency, ANS, in its Petition, proposed that the more stringent Category A antenna standards be applied to all displaced 2 GHz microwave systems moving into the

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[106] Id.

[107] UTC at 10-11.

[108] AT&T, Appendix E at 1; Bell Atlantic at 2-3; Pacific Telesis Group at 5-6; WTCI at 5-6; Northern Telecom at 7.

bands above 3 GHz.[109] Most parties support this proposal, and there is even strong sentiment among these parties that the Category A standards should be updated.[110]

Only API opposes imposing stricter antenna standards.[111] Due to cost considerations, it urges the Commission to maintain the minimum Part 94 standards.[112]

ANS appreciates API's justified concerns regarding the costs of updating its members' antenna facilities. Nonetheless, ANS supports adoption of more stringent antenna standards for all relocated fixed microwave users. Available spectrum is decreasing and the remaining spectrum is becoming harder to reuse. Unless microwave users initially are required to take all appropriate measures for ensuring spectrally efficient operation, these spectrum shortage problems will intensify. Adoption of the stricter Category A antenna standards thus is necessary.

5. Digital loading

Recognizing the existence of substantial embedded analog microwave equipment, the Commission, in the FNPRM, proposes adopting digital standards while maintaining existing voice channel loading requirements and analog standards.[113] Moreover, the

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[109]Petition, Attachment 1 at Section 4.4.

[110]Comsearch at 20; MCI at 2; GTE at 10; USTA at 7.

[111]API at 8-9.

[112]Id.

[113]FNPRM, 7 FCC Rcd at 6105.

Commission solicits comments on whether implementation of digital standards should be imposed on a phased-in basis or should be imposed immediately.[114]

Imposing only digital loading standards, as ANS proposed in its Petition, would maximize spectral efficiency. However, in deference to the needs of the numerous users with analog systems, ANS generally agrees with the Commission's approach in the FNPRM and supports imposing loading standards for digital and for analog systems that satisfy these users.

6. ATPC

There has been uncertainty as to whether ATPC can be used for Part 94 operations. In response, the Commission declares in the FNPRM that Section 94.45 of its Rules permits ATPC, provided that the change does not exceed 3dB.[115] Moreover, the Commission proposes clarifying Sections 21.710 and 94.79 to explicitly authorize ATPC.[116]

Permitting implementation of ATPC by common carriers and private users generally is supported in the comments.[117] Some parties suggest that the 3dB limit is too conservative and propose a 10dB limit instead to account for typical levels of degradation

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[114] Id.

[115] Id.

[116] Id.

[117] AT&T, Appendix E at 1; NSMA at 8-9; USTA at 8; Northern Telecom at 8.

that ATPC is intended to rectify.[118] ANS agrees with this proposal and supports its adoption. However, the Commission's rules should only outline the general acceptance of the ATPC concept. Although a 10 dB limit is appropriate now, future technology may dictate change. Specific standards should be established within the industry (e.g., in TIA Bulletin 10).[119]

7. Grandfathering existing systems

Numerous parties recommend that the Commission grandfather existing frequency plans.[120] These recommendations were prompted, in large part, by ANS' original proposal to rechannelize the common carrier 6 GHz band from 29.65 MHz to 30 MHz.

Inasmuch as ANS has decided that this proposed rechannelization is not appropriate at this time, these concerns over grandfathering the existing 29.65 MHz systems no longer are justified. However, should there be other reasons for grandfathering systems, the Commission should consider an appropriate set of standards to permit existing channelization plans to be maintained on a limited basis so that the higher bands can be used in the most efficient manner.

CONCLUSION

Inauguration of PCS drives the Commission's reallocation of the 2 GHz band. In its push to establish these new services, the

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[118]AT&T, Appendix E at 1; Joint Commenters at 20.

[119]See NSMA at 9; USTA at 8.

[120]USTA at 2; NSMA at 4-5; GTE at 6; Comsearch at 11; Bell Atlantic at 2-3; WTCI at 3-4.

Commission cannot neglect the needs of fixed microwave users. Their public safety, health, utility and commercial services are in the public interest and must be protected.

Reallocation of the 2 GHz band has been a wrenching experience for fixed microwave users. Finally, the time is ripe for the Commission to act in their interest. Of equal importance, the time also has come for incumbent users to make reasonable sacrifices comparable to those already being made by 2 GHz fixed microwave users.

ANS, in its Petition, proposed rules for how displaced 2 GHz users would operate in the bands above 3 GHz, the public expressed their support for these proposals, the Commission established the FNPRM to adopt these proposals, and industry participants worked together and resolved most of their differences.

Now the Commission has a set of proposed rules that will satisfy fixed microwave users and that should satisfy replacement band licensees. All that is left is for the Commission to finish the coda of this proceeding and enact the rules proposed in the

FNPRM, as revised in the Modified Plan.

Respectfully submitted,

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REPLY COMMENTS

FURTHER NOTICE OF PROPOSED RULE MAKING
FEDERAL COMMUNICATIONS COMMISSION
ET Docket 92-9
RM-8004

Composed by
Alcatel Network Systems, Inc.
Technical Staff

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1. INTRODUCTION

Alcatel Network Systems, Inc. ("Alcatel") has reviewed the comments in this proceeding and finds merit with many of the issues raised regarding the proposed rechannelization plan and associated technical rules. To resolve these issues, we recommend that certain changes be made to the channelization plan, as originally proposed by Alcatel and UTC, and subsequently modified and issued for public comment in the Further Notice of Proposed Rule Making, ET Docket No. 92-9, RM-8004, ("Further Notice").

By making these reasonable changes, we believe that the rules proposed in the Further Notice can be adopted expeditiously.

The channelization plan published in the Further Notice will be referred to in this report as the "FCC Plan." Our new proposal will be titled the "Modified Plan."

A group of manufacturers, including Harris Farinon, Telesciences, and DMC, are proposing an alternate channelization plan. The Telecommunications Industry Association Fixed Point-to-Point Communication Section ("TIA") also has issued comments in support of this plan. In the text below, this plan will be referred to as the "TIA Plan." TI and these manufacturers are referred to as the "TIA joint commentators."

We believe that certain features of the TIA Plan are excellent and have incorporated these features into our Modified Plan. However, the TIA Plan has certain technical deficiencies and does not adequately balance the needs of the various spectrum user groups. As a result, Alcatel cannot support adoption of the TIA Plan.

2. SUMMARY

2.1 ALCATEL MODIFIED PLAN

In response to concerns raised in the comments, Alcatel, based upon further analysis, proposes the following changes to the rules set forth in the Further Notice:

* Rechannelize the 4 Ghz band so that all 10 Mhz, 5 Mhz, and narrow band channels are centered at the same frequencies as the existing 20 Mhz wideband channels.

* Recommend that 4 Ghz band "A" channels are paired with "B" channels to maintain compatibility with the existing frequency plan.

* Retain the existing 29.65 Mhz channel spacings and 30 Mhz maximum bandwidth in the 6 Ghz common carrier band.

* Revise the proposed 11 Ghz channel pairings to ensure compatibility with existing DE and PJ frequency plans.

* Permit continued use of the 40 Mhz DE frequency plan for 11 Ghz band operations.

* Add a 13th frequency pair to the existing PJ plan in the 11 Ghz band.

* Promote establishment of a joint industry technical committee to review or develop concatenated frequency plans and frequency planning guidelines.

* Revise spectrum efficiency requirements to correspond with other changes set forth in the Modified Plan.

* Clarify Part 94 to ensure that use of automatic transmit power control ("ATPC") is permissible.

* Require the Part 21 prior coordination procedure in Part 94 bands above 1 Ghz.

* Recommend rule changes to provide for an orderly phase-in of spectrum efficiency requirements over a 2 year transition period.

2.2 TIA PLAN

In its comments, the TIA and certain member manufacturers propose a channelization plan and specific technical rules that differ from the rules in the Further Notice. As the leading industry representative, TIA's proposals, as set forth in the TIA Plan, deserve careful and considered analysis.

Alcatel appreciates the constructive criticism, as reflected in the TIA Plan, of certain provisions proposed in the Further Notice. Many proposals made therein improve the Further Notice. Alcatel includes the following TIA proposals in its Modified Plan and recommends their adoption:

* Creation of additional 5 Mhz channels in the upper 6 Ghz operational fixed band and in the point-to-point section of the 10 Ghz band.

* Continued use of a 40 Mhz channel plan in the 11 Ghz band.

Notwithstanding the merits of certain proposals in the TIA Plan, other proposals therein must be rejected because they degrade spectral efficiency and reduce available narrowband channels for displaced 2 Ghz users. These unacceptable proposals are:

* Elimination of all 10 Mhz bandwidths and lower capacity channels from the 4 Ghz band.

* Adoption of 2.5 Mhz-based channel bandwidths for the common carrier and private 6 Ghz bands, the 10 Ghz band, and the 11 Ghz band, instead of Alcatel's proposed spectrally efficient 1.6 Mhz-based bandwidths.

* Implementation of a temporary 15 Mhz channel plan for the 6 Ghz common carrier band during a 5-year transition period.

* Reserving the 6 Ghz common carrier band until all channels in the 6 Ghz private band are blocked.

3. ANALYSIS OF THE CHANNELIZATION PLANS

3.1 3.7 - 4.2 GHZ COMMON CARRIER BAND

Figure 1 shows the FCC plan for the 4 Ghz common carrier band.

3.1.1 SATELLITE COORDINATION

A number of commenters, including GE Americom, HBO, GTE, the Satellite Broadcasting and Communications Association, and Hughes, oppose the inclusion of 10 Mhz channels in the 4 Ghz band as proposed in the FCC plan. These parties claim that "TI filters" could not be used to reduce terrestrial interference from point-to-point transmitters since the proposed channels would be offset by only 5 Mhz from satellite transponder frequencies. TI filters are only effective if the interfering transmitter is offset by 10 Mhz from the satellite center frequency. Since the proposed 10 Mhz channels would extend across the entire 4 Ghz band, 100% of all transponders would be affected.

Satellite users also comment on the proposed narrow band channels at the band edges. According to the commenters, TI filters would be ineffective against the narrow band channels. The narrow band channels would affect 4 out of 24 satellite transponders (16.6% of the total).

Most of the commenters stated that satellite broadcasters could coexist with terrestrial systems as they have in the past. However, to do so, the current 20 Mhz frequency spacings must be maintained.

Alcatel believes that its 4 Ghz plan can be improved to address these concerns. Figure 3 shows our Modified Plan. In the Modified Plan, all 10 Mhz channels are centered at the same frequencies as the existing 20 Mhz wideband channels. Although this change reduces the number of 10 Mhz channels by half, it still provides 12 pairs and allows TI filters to be used. Since 10 Mhz radios have narrower bandwidths than wideband 20 Mhz systems, they will contribute less interference into satellite receivers.

A number of narrow band 5 Mhz, 1.6 Mhz, 800 Khz, and 400 Khz channels also are defined in the Modified Plan. These channels are all centered on the existing 20 Mhz channels, allowing TI filters to be used in every case. Six of the 12 wideband 20-Mhz channels are reserved for high capacity traffic (20 and 10 Mhz bandwidths). Four of the wideband channels are shared by high capacity and medium capacity traffic (5 Mhz and 1.6 Mhz bandwidths). The remaining two wideband channels are designated for low capacity traffic (1.6 Mhz, 800 Khz, and 400 Khz bandwidths).

In its comments, Hughes states that a number of single carrier per channel (SCPC) systems have been installed at the lower band edge of the 4 Ghz band. To minimize the impact on these systems, Alcatel proposes moving the low capacity 400 and 800 Khz channels away from the lower band edge. Alcatel also proposes moving the unpaired 20 Mhz wideband channel to the upper band edge. The upper band edge frequency is currently defined as an auxiliary channel for terrestrial systems. Since little use is made of this channel, it would be an ideal location for future SCPC systems.

Alcatel's modified 4 GHz plan is an attempt to share the band with the satellite users. The new narrow band channels are placed in that portion of the satellite spectrum that is protected by the band reject filters as shown in HBO's comments. This plan was sent to all of the satellite commenters to solicit their response, however, they haven't had sufficient time to fully analyze the potential for interference. We plan to continue a dialog with the satellite users to reach an acceptable solution.

The Modified Plan is a short term solution for narrow band traffic. As Alcatel proposed in its Petition for Rule Making (RM-8004), a longer term solution is to make the 3.6 to 3.7 Ghz band available as a shared band for government and non-government point-to-point microwave systems. This reallocation may involve a long term program of retiring existing radionavigation equipment in the band or relocating it to the adjacent 3.5 to 3.6 Ghz band. It would be in the best interest of satellite users to make their opinions known regarding the 3.6 - 3.7 Ghz band to the NTIA and other policy makers.

If this reallocation were to occur, microwave equipment manufacturers, like Alcatel, should be willing to modify 3.7 - 4.2 Ghz radios to be applicable in the adjacent 3.6 - 3.7 Ghz band. This would allow rapid deployment when the band becomes available. Due to the known satellite coordination problems in the 3.7 - 4.2 Ghz band, we believe that use of the 3.7 - 4.2 Ghz band among narrow band users would drop to near zero if the adjacent 3.6 - 3.7 Ghz band were made available.

3.1.2 CHANNEL PAIRINGS

Several commenters, including AT&T, Comsearch, and NSMA, note that there is a problem with the channel pairings proposed by Alcatel. The 4 Ghz frequency plan originally established by AT&T in the 1940's did not place all transmitters in one half of the band and all receivers in the other half as in other plans: it alternated transmitters and receivers every 40 Mhz across the band (i.e., two 20 Mhz channels are transmit, two 20 Mhz channels are receive, etc.). These are designated "A" channels and "B" channels in Figure 1.

To be compatible with paths using the old plan, Alcatel should have paired "A" channels with "B" channels. Instead, there are cases where its frequency plan pairs two "A" or two "B" channels. This would make frequency coordination with existing systems very difficult. Alcatel corrects this problem in the Modified Plan, as shown in Figure 3.

In its comments, Northern Telecom recommends that the old AT&T channel pairings be retained for the 4 Ghz band, mixing transmitters and receivers across the band. Alcatel does not support this proposal because it requires that separate transmit and receive antennas be used on every path (i.e., a minimum of 4 antennas per path or 6 antennas with space diversity). Under the Alcatel plan, there is sufficient separation between transmit and receive frequencies that common transmit/receive antennas can be used (i.e., 2 antennas per path). Most new microwave systems installed today require only a single transmit/receive frequency pair. It would not be cost effective to require multiple antennas on every path.

It should be emphasized that the frequency pairings listed in Part 21 are <u>recommended</u> pairings. Only in certain bands under Part 94, which are designated "PAIRED FREQUENCIES", are the pairings mandatory (i.e., 6.525 - 6.875 Ghz, 10 Mhz channels). Consequently, if the Modified Plan were adopted, frequency planners still would be able to use the old 4 Ghz pairing plan if required for a specific application.

Alcatel strongly agrees with Comsearch that frequency planners should be able to choose non-standard frequency pairings in the 4, 6, and 11 Ghz common carrier bands because standard pairings have not been required in the past. If pairings became mandatory, it would be extremely difficult to find any available frequency pairs in congested areas. In less congested areas, frequency planners normally use the standard pairs as listed in the FCC regulations.

3.1.3 PROPOSED 40 MHZ BANDWIDTH

In its comments, Northern Telecom proposes a new 40 Mhz channel plan for the 4 Ghz band. Northern Telecom recently has developed a SONET compatible radio for the Canadian market, which can carry 6 DS3's in a 40 Mhz bandwidth. It would like to sell this product without modification in the U.S. market.

There are some technical problems with this proposal. Due to the wide bandwidth, it would not be possible for satellite users to use TI filters to reduce terrestrial interference. The 40 Mhz plan would therefore have a similar effect as the 10 Mhz plan originally proposed by Alcatel. A typical 5+1 frequency diversity system would occupy 480 Mhz of the 4 Ghz band and would affect all 24 satellite transponders.

For an interexchange carrier upgrading an existing 64 QAM digital radio system, the available system gain on each path would be reduced by about 10 dB. This reduction in gain must be made up in larger antennas, increased use of space diversity, or other countermeasures. Interference susceptibility from other terrestrial systems also would be about 9 dB worse due to the more complex 512 QAM modulation used in the radio.

As an alternate proposal, Northern Telecom could consider modifying its radio to carry 3 DS3's in a 20 Mhz bandwidth (i.e., half the bit rate in half the bandwidth). The same 512 QAM modulation could be used. Since the radio would be operating at a lower bit rate, the modifications to hardware and software should be relatively straightforward.

3.1.4 TIA CHANNEL PLAN

Figure 2 shows the channelization proposed in the TIA plan for the 4 Ghz common carrier band. Note that all 10 Mhz and lower capacity channels would be eliminated. The TIA Plan also includes the 40 Mhz channel plan proposed by Northern Telecom.

The principal goal for the channelization set forth in the Further Notice was to make additional spectrum available for narrow band systems in the 2 Ghz band that need to relocate due to PCS. The heaviest use of the 1.85 - 1.99 Ghz band is in 10 Mhz channels. Alcatel can see no justification for eliminating 10 Mhz and lower capacity channels.

Alcatel currently manufacturers a 1-DS3 64-QAM radio in the 4 Ghz band using a 10 Mhz bandwidth. The change proposed in the TIA would prevent 2 Ghz network operators from using a radio currently available in the market.

The radio propagation characteristics of the 4 Ghz band are similar to the 2 Ghz band. As a result, 4 Ghz will be useful in rural areas with difficult propagation conditions, such as South Carolina and the Gulf coast region. If no narrow band channel plan is defined, any use of the band by lower capacity systems is totally precluded. Satellite coordination problems will limit the use of the band in urban areas. However, future technological developments should reduce the interference susceptibility of satellite systems and improve the utility of the band.

The hallmark of the Modified Plan is that it provides needed spectrum for the potentially incoming narrow band 2 Ghz users and maintains the availability of wideband channels for interexchange and other carriers. The Modified Plan serves both classes of users. The TIA Plan does not. With its proposed elimination of narrow band channels (i.e., 10 Mhz or less), the 4 Ghz TIA Plan is unacceptably biased toward the wideband needs of inter-

exchange carriers. Consequently, Alcatel opposes the adoption of the 4 Ghz TIA plan. Alcatel believes that there should be a better balance between interexchange carriers, satellite users, cellular operators, and private users.

3.2 5.925 - 6.425 GHZ COMMON CARRIER BAND

Figure 4 shows the FCC plan for the 6 Ghz common carrier band.

3.2.1 CHANNEL SPACINGS - 29.65 vs 30 Mhz

A large number of commenters, including AT&T, Northern Telecom, GTE, MRC, EMI, Comsearch, and the NSMA, favor retaining the 29.65 Mhz channel spacings in the 6 Ghz common carrier band. Currently, most microwave systems in the 6 Ghz band use the T-plan from AT&T, which is based on 29.65 Mhz channel spacings.

Alcatel initially proposed a 30 Mhz channel plan, instead of a 29.65 Mhz plan, for the following reasons:

- Most existing radios have been type accepted and licensed for a full 30 Mhz bandwidth. Reducing the maximum allowable bandwidth from 30 to 29.65 Mhz would adversely affect huge numbers of existing radios.

- Using 30 Mhz bandwidths would allow common modulator designs to be used in the 6 and 11 Ghz bands, resulting in manufacturing efficiencies and more cost effective radios. It also would allow common modulator designs for 10 Mhz, 5 Mhz, and lower capacity radios in the various bands.

- Using 30 Mhz bandwidths allows common spectrum efficiency requirements to be specified for all bands below 15 Ghz.
- Most new radios will be digital and will not be affected by analog carrier beat problems from a small offset in center frequency.

- Frequencies using integer multiples are easier to work with than frequencies based on multiples of 29.65 Mhz.

It is clear from the comments that there is a strong industry consensus to maintain the 29.65 Mhz channel spacing based on the standard T-plan from AT&T. It also is clear that, if a 30 Mhz plan were adopted, there would be a large number of waiver requests to use the 29.65 Mhz plan to overbuild existing systems, coordinate spur paths at junction stations, add analog video systems, etc.

After considering these comments, Alcatel proposes that the 29.65 Mhz channel spacings be maintained. In addition, we propose that the 30 Mhz maximum allowable bandwidth be maintained as it has been for the past 40 years. This proposal will cause the least impact to existing systems and provide most of the advantages inherent in the FCC/Alcatel 30 Mhz channel plan.

The Alcatel Modified Plan for the 6 Ghz band is shown in Figure 6. The table in the lower left corner indicates that using 30 Mhz bandwidths with 29.65 Mhz channel spacings results in an overlap between adjacent channels of approximately 0.6 percent of the channel bandwidth, for a total of 1.2 percent for both edges. <u>This is in fact what the industry has been doing for 40 years</u>.

Under the Modified Plan, if 10 Mhz channels were spaced equally by 29.65/3 = 9.88 Mhz and 5 Mhz channels were spaced by 29.65/6 = 4.94 Mhz, the maximum overlap per channel still would be 1.2 percent of the channel bandwidth. Due to the "spectrum remnants" described in the TIA comments, there is no channel overlap between the 1.6 Mhz, 800 Khz, or 400 Khz channels in this plan. In addition, there is room in the center of the band for 3 additional unpaired 1.6 Mhz channels. Since digital radios only occupy 70 to 80 percent of the channel bandwidth, an overlap between channels of 1.2 percent will not have any significant effect on the frequency coordination.

Even though Alcatel acknowledges that the 29.65 Mhz channel spacings would be appropriate, Alcatel also believes it is critical that the 30 Mhz maximum bandwidth be maintained. The 0.35 Mhz difference between a 29.65 and 30 Mhz bandwidth can prevent a radio from meeting the transmit spectrum mask requirements of Part 21.106. This is a potential problem for any manufacturer modifying a 10 Mhz radio from the upper 6 Ghz band for the lower 6 Ghz band.

If the 30 Mhz bandwidth were reduced, a 10 Mhz radio would need to fit into a 9.88 Mhz mask. Lower capacity radios would face similar problems. This is also a concern in the design of next generation SONET compatible radios which must transmit a significantly higher data rate. Moreover, having a 30 Mhz bandwidth and 29.65 Mhz channel spacing is currently permitted under FCC rules. For these reasons, Alcatel does not support reducing the maximum channel bandwidth to 29.65 Mhz.

3.2.2 TIA CHANNEL PLAN

Figure 5 shows the TIA Plan for the 6 Ghz common carrier band. The 30, 10, and 5 Mhz channel plans are identical to the FCC Plan. In the TIA Plan, 3.75, 2.5, and 1.25 Mhz bandwidths are proposed instead of 1.6 Mhz, 800 and 400 Khz bandwidths for medium and low capacity traffic. This change also is proposed for the upper 6 Ghz, 10 Ghz, and 11 Ghz bands. Alcatel does not support this change and will discuss our reasons in Sections 4 and 5 of this report.

The TIA joint commenters recommend a temporary 15 Mhz channel plan, which would be in effect during a 5 year transition period. This plan typically would be used by 1-DS3 radios using 16-QAM modulation, which would not meet spectrum efficiency requirements after the transition period.

Alcatel believes that the 15 Mhz plan is unnecessary. As shown in Figure 21, most microwave manufacturers currently offer 1-DS3 64-QAM radios in the upper 6 Ghz private band. These 64-QAM radios operate in 10 Mhz of bandwidth. To be competitive, manufacturers without a lower 6 Ghz common carrier product quickly will modify their upper 6 Ghz radios to cover the lower 6 Ghz band.

During the proposed transition period, 1-DS3 16-QAM radios could be accommodated in either a concatenated 20 Mhz channel or in a 30 Mhz channel. The number of such radios should be relatively few, particularly if the transition period is kept short. Thus, Alcatel proposes a 2 year transition period.

The TIA joint commenters further recommend that the 6 Ghz common carrier band should not be used until all channels in the upper 6 Ghz private band are blocked. Alcatel believes that this proposal also is unnecessary. To optimize flexibility, microwave users should be able to use the band of their choice.

Common carrier radios may be less costly than private band radios or have other desired features. A microwave user may have plans to upgrade a 1-DS3 radio to 2 or 3 DS3's in the future, which would not be possible in the upper 6 Ghz private band. Users may want to standardize on a particular manufacturer's equipment to reduce maintenance spares and technician training. All of these factors affect the choice of a frequency band.

The TIA Plan requires use of the 6 GHz private band before the common carrier band. This approach favor incumbent manufacturers of upper 6 GHz private radios and limits competition. Alcatel opposes this proposal.

3.3 6.525 - 6.875 GHZ OPERATIONAL FIXED BAND

Figure 7 shows the FCC Plan for the upper 6 Ghz band. Figure 8 shows the TIA Plan. Note the following differences:

a. In the TIA Plan, a number of new 5 Mhz channels have been defined which are co-channel with existing 10 Mhz channels. Alcatel supports this proposal and believes that it will increase the flexibility of the band significantly.

   Using the proposed TIA 5-Mhz plan, it would be possible to upgrade a 12-DS1 radio occupying a 5 Mhz channel to a 1-DS3 10-Mhz radio without a frequency change. For systems with no need to upgrade, the interstitial 5 Mhz channels could be used as in the past.

   Alcatel has adopted the TIA recommendation and defined 5 Mhz channels across the band in its Modified Plan, with the exception of two segments of spectrum co-channel with the 10 Mhz emergency restoration channels (see Figure 9). Two 5 Mhz channels, designated 31 and 31', would be authorized for unpaired use.

   Alcatel also proposes removing the 5 Mhz channel at 6870 Mhz since it overlaps the low capacity 800 and 400 Khz channels at the band edge.

b. The TIA Plan defines 3.75, 2.5, and 1.25 Mhz channels across most of the band. Alcatel does not support this change and will detail the reasons for this conclusion in Sections 4 and 5 of this report.

c. There appears to be certain errors and omissions in the TIA Plan. For example, four 1.25 Mhz channels from 6530 to 6535 Mhz are co-channel with one of the emergency restoration channels. These appear to be shifted by 5 Mhz.

   There are several 5 Mhz channels that were not subdivided into lower capacity channels (designated 1, 28, 1', and 28' in the drawing). Two of the 5 Mhz channels (designated 1 and 3) are paired with the wrong 10 Mhz channels. Additional 5 Mhz channels could have been defined in some of the gaps.

d. The TIA Plan also eliminates the existing low capacity 1.6 Mhz and 800 Khz channels at the band edges, as well as the 400 Khz channels proposed by Alcatel. We do not support this change and will discuss our reasons in Section 5.

3.4 10.55 - 10.68 GHZ BAND

3.4.1 POINT-TO-MULTIPOINT SYSTEMS

In its comments, SR Telecom recommends that most of the point-to-multipoint section of the 10.55 - 10.68 Ghz band be retained for point-to-multipoint service. Alternatively, it proposes that point-to-point and point-to-multipoint services share the spectrum on a co-channel basis. SR Telecom notes that the 10.55 - 10.68 Ghz is the only band available for Part 94 point-to-multipoint service. Currently, the 18 Ghz band is only available to Part 21 users.

As a manufacturer of point-to-multipoint equipment, SR Telecom's statements are understandable. However, we note that not a single user of this equipment has commented on the Alcatel Petition or on the Further Notice. We further contend that many of the same services can be provided using future PCS systems in the 2 Ghz band on a more cost effective basis. The Commission has recommended frequency bands below 3 Ghz as the preferred bands for PCS systems. Proposed wireless local area network systems at 2 Ghz would transport data in a similar manner as 10 Ghz point-to-multipoint systems.

Alcatel strongly opposes the co-primary sharing of the spectrum by point-to-point and point-to-multipoint services. Based on our extensive experience with 454 Mhz exchange radio systems, band sharing by point-to-point and point-to-multipoint systems presents extremely difficult frequency coordination problems. Omnidirectional point-to-multipoint systems broadcast frequencies over a large geographical area, preempting use by point-to-point systems. This is a sub-optimal solution for both services.

SR Telecom states that point-to-multipoint equipment will be more expensive in the 18 Ghz band than the 10 Ghz band. We see no evidence supporting this claim. Alcatel notes that point-to-point microwave radios in the 18 Ghz band are typically less expensive than comparable 10 Ghz equipment. Smaller antennas also can be used at 18 Ghz due to the shorter wavelength.

It is true that rain outage will restrict potential path lengths at 18 Ghz. However, in urban environments, path lengths will tend to be short in any case. We note that Cellular Vision recently announced a 28 Ghz point-to-multipoint radio for the delivery of cable television channels over the air.[1] The 28 Ghz band is even more susceptible to rain outage than 18 Ghz.

Alcatel sees no technical problem with Part 94 systems sharing the 18 Ghz band with Part 21 systems for point-to-multipoint applications. We suggest that SR Telecom request FCC consideration of this issue.

3.4.2 TIA CHANNEL PLAN

The FCC Plan for the 10 Ghz band is shown in Figure 10. The TIA Plan is shown in Figure 11. The following is a comparison of the two plans:

a. The TIA Plan defines three additional 5 Mhz channels in the current point-to-point section of the band from 10550 - 10565 Mhz and 10615 - 10630 Mhz. Alcatel supports this recommendation and includes it in the Modified Plan (see Figure 12).

b. The TIA Plan replaces the Alcatel 1.6 Mhz, 800 Khz, and 400 Khz channels with 3.75 and 1.25 Mhz channels across the band. Alcatel does not support this change, and details the reasons for this conclusion in Sections 4 and 5.

c. In our original channel plan, as shown in Figure 10, Alcatel recommended that the existing 3.75, 2.5, and 1.25 Mhz channels in the 10 Ghz band should be retained. Since Alcatel does not manufacture 10 Ghz radios, we did not think it was appropriate to eliminate the existing channelizations and impact incumbent manufacturers of 10 Ghz equipment. Instead, we proposed an alternate 1.6 Mhz channel plan comparable to the plans in the 4, lower 6, and upper 6 Ghz bands. It is our belief that, as manufacturers adjust to the higher spectrum efficiency requirements in the Further Notice, the use of these older channelization plans will decline over time.

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1. New York Times, December 11, 1992, p. A1