

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of
Amendment of Parts 2 and 87 of the Commission's
Rules to Accommodate Advanced Digital
Communications in the 117.975-137 MHz Band
and to Implement Flight Information Services in the
136-137 MHz Band
WT Docket No. 00-77
RM Nos. 9376, 9462

NOTICE OF PROPOSED RULEMAKING

Adopted: May 8, 2000

Released: May 15, 2000

Comment Date: July 14, 2000

Reply Comment Date: August 14, 2000

By the Commission:

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## I. INTRODUCTION AND EXECUTIVE SUMMARY

1. In this *Notice of Proposed Rulemaking (Notice)*, we seek comment on proposals regarding the use of the 136-137 MHz frequency band by the Aviation Services and certain modifications to Parts 2 and 87 of the Commission's Rules in response to two Petitions for Rulemaking.<sup>1</sup> SAMA, in its Petition, proposes revision of the aviation rules to allow the use of advanced digital data transmissions and to designate four channels, to be suggested by the FAA, for the implementation of Flight Information Services (FIS)<sup>2</sup> in the 136-137 band.<sup>3</sup> The FAA, in its Petition and Revised Petition, seeks reallocation of the 136-136.475 MHz portion of the 136-137 MHz band to allow Federal Government operations to share this band with non-Federal Government operations. The FAA also requests amendment of various aviation rules to permit the implementation of FIS and to promote the transition to high-capacity digital communications systems for future requirements of air traffic control (ATC)<sup>4</sup> for civil aviation.<sup>5</sup> In response to the petitions and comments received, this *Notice* proposes to: (1) modify the footnote allocation in Part 2 of the Commission's Rules to permit the FAA use of twenty channels in the 136-136.475 MHz band on a shared basis with non-Federal Government users for ATC purposes, including FIS;<sup>6</sup> (2) revise certain technical rules in Part 87 for the 117.975-137 MHz band to accommodate digital communications systems; and (3) modify those rules pertaining to special purpose enroute services in the Gulf of Mexico.<sup>7</sup>

## II. BACKGROUND

2. In 1990, the Commission amended Parts 2 and 87 of its Rules to permit stations in the aviation services to use certain frequencies in the 136-137 MHz band.<sup>8</sup> The Commission allotted forty 25 kHz

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<sup>1</sup>See Small Aircraft Manufacturers Association (SAMA) Petition for Rulemaking, filed September 14, 1998 (SAMA Petition); Federal Aviation Administration (FAA) Petition for Rulemaking, filed November 19, 1998 (FAA Petition); FAA Comments (revising its original Petition), filed August 3, 1999 (FAA Revised Petition).

<sup>2</sup>FIS are defined as the non-air traffic control (non-ATC) information needed by pilots to operate in domestic and international airspace. It may incorporate information such as automatic terminal information services (ATIS), Notices to Airmen (NOTAMs), Visual Flight Rules (VFR, rules for conducting flights under visual conditions), pilot initiated weather reports (PIREPs), and other non-ATC data. See *Aeronautical Spectrum Planning for 1997-2010*, Doc. No. RTCA/DO-210 January 27, 1997, published by RTCA, Inc., Appendix A at page A-2 and A-3. For these and other aeronautical communications services and designations discussed *infra*, see generally *FAA Aeronautical Information Manual*, chapters 4-5.

<sup>3</sup>SAMA Petition at 2.

<sup>4</sup>Air Traffic Control (ATC) is a service operated by an appropriate authority to promote the safe, orderly and expeditious flow of air traffic. It consists of communications between aircraft pilots and airport control towers or FAA aeronautical enroute stations regarding aircraft landings and take-offs, aircraft transiting the airport traffic area on approach and departure, and aircraft traveling along domestic or international air routes. See 47 C.F.R. §§ 87.237, 87.261, and 87.417.

<sup>5</sup>See FAA Petition at 1.

<sup>6</sup>See 47 C.F.R. § 2.106, n. US244.

<sup>7</sup>These include the following: (1) 47 C.F.R. § 87.131 (Power and emissions); (2) 47 C.F.R. § 87.133 (Frequency stability); (3) 47 C.F.R. § 87.137 (Types of emission); (4) 47 C.F.R. § 87.139 (Emission limitations); (5) 47 C.F.R. § 87.173 (Frequencies) [General List]; (6) 47 C.F.R. § 87.187 (Frequencies) [Aircraft Stations]; and (7) 47 C.F.R. § 87.263 (Frequencies) [Aeronautical Enroute and Aeronautical Fixed Stations].

<sup>8</sup>See Amendment of Parts 2 and 87 of Commission's Rules to Permit the Aviation Services to Use Frequencies in the

channels in the 136-137 MHz band for assignment to aeronautical mobile (R) radio service.<sup>9</sup> Specifically, the Commission allocated fifteen channels on a shared basis with the FAA for ATC purposes, such as automatic weather observation services (AWOS),<sup>10</sup> automatic terminal information service (ATIS),<sup>11</sup> and airport control tower communications (ACTC)<sup>12</sup> for general aviation. Additionally, the Commission allocated twenty channels for aeronautical enroute services (with six of these channels being allotted for special purpose enroute services in the Gulf of Mexico). The Commission also held five channels temporarily in reserve for future general aviation purposes.<sup>13</sup>

3. On May 1, 1998, the Administrator of the FAA issued the Airborne Flight Information Services Policy Statement (FAA Policy Statement). In the FAA Policy Statement, the FAA stated its goal for FIS as follows: “FIS in the cockpit is to use digital data link to deliver information to the pilot, . . . improve safety, reduce costs to users and the FAA, and increase the utility efficiency and capacity of the National Airspace System.”<sup>14</sup> Additionally, the FAA stated that its objective was to ensure development and provision of services for sending FIS to aircraft via data link.<sup>15</sup> FIS includes information necessary for continued safe flight and for flight planning whether in the air or on the ground.<sup>16</sup> The FAA indicated that it would work with the aviation industry to develop a joint petition to the FCC to assign four 25 kHz radio frequency channels in the 136.0-136.9 MHz VHF band and to select qualified vendors on a competitive basis to be providers of FIS.<sup>17</sup>

4. On September 14, 1998, SAMA filed a petition requesting revision of the Commission’s Rules to permit the implementation of the FAA’s FIS program in the 136-137 MHz frequency band.<sup>18</sup> SAMA

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136-137 MHz Band, *Report and Order*, Gen. Dkt. No. 89-295, 5 FCC Rcd. 3954 (1990), *Memorandum Opinion and Order*, 6 FCC Rcd. 2291 (1991).

<sup>9</sup>This allocation was added immediately adjacent to the VHF aeronautical mobile (R) radio band at 117.975-136 MHz. *See Report and Order*, 5 FCC Rcd. at 3958 ¶ 32.

<sup>10</sup>Automatic Weather Observation Services (AWOS) provide pilots with up-to-date weather information including the time of the latest weather sequence, altimeter setting, wind speed and direction, dewpoint, temperature, visibility, and other pertinent data for airports lacking either a full-time control tower or a full-time FAA Flight Service Station. *See* 47 C.F.R. § 87.525.

<sup>11</sup>Automatic Terminal Information Services (ATIS) provide pilots with information regarding aircraft movement within an airport. *See* 47 C.F.R. § 87.525.

<sup>12</sup>Air Traffic Control Tower Communications (ACTC) are operational control communications between aircraft pilots and airport control towers regarding aircraft landings and take-offs, and aircraft transiting the airport traffic area on approach and departure. *See* 47 C.F.R. § 87.417.

<sup>13</sup>*See Report and Order*, 5 FCC Rcd. at 3958 ¶ 32.

<sup>14</sup>FAA Policy Statement at 1.

<sup>15</sup>*Id.*

<sup>16</sup>*Id.*

<sup>17</sup>*Id.*

<sup>18</sup>SAMA Petition at 1. The SAMA Petition was assigned RM-9376, and placed on Public Notice, Report No. 2301 (October 14, 1998).

indicates that FIS includes broadcasts of weather and other advisory information that are identical in purpose to AWOS and ATIS weather reports, except that instead of voice transmission, they are sent using advanced data transmissions.<sup>19</sup> SAMA indicates that this data is provided to the flight crew on a display, depicting either textual or graphical information.<sup>20</sup> Examples of FIS include: text of weather observations identical to the type of information provided over AWOS by voice; graphical representation of weather hazard areas, such as thunderstorms; Notices to Airmen; and status of special use airspace.<sup>21</sup> In order to implement the FAA's FIS program, SAMA also seeks amendment of Section 87.131<sup>22</sup> of the Rules to modify the aeronautical authorized emissions classification to allow not only A3E (double sideband amplitude modulation), but also to allow F1D and G1D (frequency and phase modulated digital).<sup>23</sup> Three parties filed comments in response to the SAMA Petition: the National Air Transportation Association (NATA);<sup>24</sup> the National Business Aviation Association (NBAA);<sup>25</sup> and Aeronautical Radio, Inc. (ARINC).<sup>26</sup>

5. On November 19, 1998, the FAA filed a petition seeking a shared allocation for the 136-137 MHz band<sup>27</sup> for the future requirements of civil aviation ATC.<sup>28</sup> Specifically, the FAA proposes that the 136-137 MHz band be changed from a non-Federal Government allocation with shared access to fifteen channels to a shared Federal Government/non-Federal Government allocation. It further suggests a channeling plan as follows – twenty-four frequencies for ATC with four (specifically, 136.525 MHz, 136.625 MHz, 136.725 MHz and 136.825 MHz) designated as FIS, and the remaining sixteen frequencies for aeronautical operational control (AOC).<sup>29</sup> The FAA avers that it has decided to implement a new digital communications system as a solution to the growing spectrum congestion in the aeronautical

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<sup>19</sup>See SAMA Petition at 3.

<sup>20</sup>*Id.*

<sup>21</sup>*Id.* at 3-4.

<sup>22</sup>47 C.F.R. § 87.131.

<sup>23</sup>SAMA Petition at 2.

<sup>24</sup>NATA, an association of 2,000 members, represents the interests of aviation businesses nationwide, including such industries as aircraft fueling, maintenance, and flight instruction. NATA Comments at 1.

<sup>25</sup>NBAA represents the interests of business aviation in the U.S., and whose membership is comprised of more than 5,650 companies that operate more than 7,200 aircraft. NBAA Comments at 1.

<sup>26</sup>ARINC is the communications company of the air transport industry, and has been entrusted by that industry and the Commission with the management of the aeronautical enroute spectrum. ARINC Comments at 1.

<sup>27</sup>The FAA proposed to modify the Table of Frequency Allocations, 47 C.F.R. § 2.106, and consequential changes to footnote US244. FAA Petition at 4.

<sup>28</sup>FAA Petition at 1. The FAA Petition was assigned RM-9462, and placed on Public Notice, Report No. 2315 (February 5, 1999).

<sup>29</sup>FAA Petition at 4. Aircraft Operational Control (AOC) is communications required for the exercise of authority over the initiation, continuation, diversion, or termination of a flight in the interest of the safety of the aircraft and the regularity and efficiency of a flight. (Such communications are normally required for the exchange of messages between aircraft and aircraft operating agencies.)

mobile communications spectrum.<sup>30</sup> The FAA further noted it has adopted an FIS policy statement, which seeks to implement an FIS system in the 136-137 MHz band; and therefore, it supports the SAMA petition.<sup>31</sup> On April 19, 1999, ARINC and Air Transport Association of America (ATA) filed joint comments opposing the FAA Petition and submitted further revisions based on an agreement negotiated among the various elements of the air transport industry, including the FAA.<sup>32</sup>

6. On August 3, 1999, the FAA filed a Revised Petition to take into account agreements reached between the FAA and air transport industry on implementation of FIS<sup>33</sup> data link capability.<sup>34</sup> In its Revised Petition, the FAA requested a shared allocation of the 136-136.475 MHz portion of the 136-137 MHz,<sup>35</sup> and proposed four other frequencies (namely, 136.425 MHz, 136.450 MHz, 136.475 MHz, and 136.500 MHz) for FIS.<sup>36</sup> Additionally, the FAA proposed changes to technical parameters such as emissions and frequency stability.<sup>37</sup> On November 15, 1999, further comments were filed on behalf of ARINC.<sup>38</sup>

### III. DISCUSSION

7. Currently, the 136-137 MHz band is allocated to the non-Federal Government aeronautical mobile (R) service on a primary basis.<sup>39</sup> This one megahertz of spectrum is used by the civil aviation community, in particular ARINC, for AOC communications, and pursuant to footnote US244, by the FAA for general aviation ATC purposes.<sup>40</sup> SAMA, in its Petition, requests the FCC to set aside four

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<sup>30</sup>FAA Petition at 1.

<sup>31</sup>FAA Petition at 5-6.

<sup>32</sup>ATA is the national trade and service association of the United States airline industry, representing 23 major U.S. passenger and cargo carriers and 5 associated (non-U.S.) carriers. ARINC/ATA Joint Comments at 2. See footnote 22, *supra*, for a description of ARINC.

<sup>33</sup>FAA Revised Petition refers to a broadcast mode of delivery for FIS known as "Flight Information Services-Broadcast (FIS-B)," a concept currently under development. With FIS-B, an on-board server will be responsible for personalizing products to pilot's needs. See *Aeronautical Spectrum Planning for 1997-2010*, Doc. No. RTCA/DO-210 January 27, 1997, published by RTCA, Inc., Section 4.1.2.3. For this *Notice*, we will use the term FIS that appears to encompass FIS-B. We seek comments on the use of these terms. See para. 12 and note 73, *infra*.

<sup>34</sup>The FAA states that the original petition remains valid except as amended in its revision. FAA Revised Petition at 1.

<sup>35</sup>The FAA proposes a 25 kHz channeling plan for the 136-137 MHz band as follows: seventeen channels in the 136-136.400 MHz band for ATC; four channels in the 136.425-136.500 MHz band for FIS; and nineteen channels in the 136.525-136.975 MHz band for AOC. FAA Revised Petition at 2-3.

<sup>36</sup>FAA Revised Petition at 3.

<sup>37</sup>FAA Revised Petition at 3-4.

<sup>38</sup>See Letter from John Bartlett to D'wana Terry seeking to clarify necessary rule changes (dated November 15, 1999) (ARINC Clarification).

<sup>39</sup>See 47 C.F.R. § 2.106.

<sup>40</sup>Pursuant to footnote US244, the FAA shares fifteen channels in the 136-136.475 MHz band for general aviation ATC purposes. See 47 C.F.R. § 2.106, n. US244.

channels in the 136-137 MHz band for FIS to support general aviation.<sup>41</sup> The FAA, in its Revised Petition, supports this request but also seeks a reallocation of approximately half of the band (136-136.475 MHz) to accommodate a new, digital communications system.<sup>42</sup> While generally supporting both requests, it appears that the aviation community challenges the amount of spectrum needed and the manner in which it is allocated. The community counsels caution when evaluating the petitions and stresses the need to balance future Federal Government services against the existing and planned improvements in non-Federal Government data communications services.<sup>43</sup> All parties also request that 47 C.F.R. Part 87 be amended to permit digital communications for general aviation.

**A. The Table of Frequency Allocations for the 136-137 MHz Band (47 C.F.R. § 2.106).**

8. In its initial petition, the FAA sought a shared Federal Government/non-Federal Government allocation of the 136-137 MHz band in its entirety, but later, after subsequent talks with industry, the FAA revised its request to the 136-136.475 MHz band only.<sup>44</sup> The FAA stated that it requires the Federal Government allocation because spectrum congestion within the 117.975-136 MHz band, due to increasing ATC communications requirements, has caused frequency assignments in this band to grow about four percent annually.<sup>45</sup> The FAA believes that the 136-137 MHz band segment should be reallocated in order to accommodate the requirements of civil aviation, and, in particular, to provide benefits to general aviation by "freeing up" radio frequencies below 136 MHz where most general aviation radios operate.<sup>46</sup> Moreover, the FAA reiterates that it does not use this spectrum for its own operations, but that this radio spectrum is used to provide communications regarding air traffic services to private sector aircraft.<sup>47</sup> Finally, the FAA contends that the new Federal Government allocation is solely to allow the FAA to implement ground facilities that will support the critical safety communications needs of civil aviation.<sup>48</sup> The FAA indicates that it needs a sufficient "sub-band" so that current air/ground communications will not receive interference during the transition to the future, digital air/ground communications system.<sup>49</sup>

9. ARINC/ATA oppose the FAA's proposal for a shared Federal Government/non-Federal Government allocation in the 136-137 MHz band. Specifically, ARINC/ATA assert that the FAA Petition exceeds the FAA's future needs concerning its transition to a digital system and the implementation of FIS.<sup>50</sup> By exceeding its future requirements, ARINC/ATA maintain that the FAA's proposals would negatively impact the current use of the band by ARINC and civil aviation for AOC

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<sup>41</sup>SAMA Petition at 2.

<sup>42</sup>See FAA Revised Petition at 2 and 5.

<sup>43</sup>ARINC/ATA Joint Comments at 2-3.

<sup>44</sup>See FAA Petition at 4 and FAA Revised Petition at 2.

<sup>45</sup>FAA Petition at 2.

<sup>46</sup>*Id.* at 1.

<sup>47</sup>*Id.*

<sup>48</sup>*Id.*

<sup>49</sup>*Id.*

<sup>50</sup>*Id.*

communications.<sup>51</sup> In this regard, ARINC notes that presently it has 6,740 frequency assignments on the 148 channels available in the aeronautical enroute service, which equals more than forty-five assignments per channel.<sup>52</sup> ARINC/ATA further assert that the FAA's proposals would be devastating to the existing and planned safety services of the civil aviation community.<sup>53</sup>

10. After reviewing the matter, we agree with ARINC/ATA and believe that a Federal Government allocation within the 136-137 MHz band is unnecessary to achieve the goals of both the FAA and industry. Instead, we propose to amend 47 C.F.R § 2.106, n. US244 to extend FAA's access from fifteen to twenty channels within the 136-136.475 MHz band on a shared basis with non-Federal Government users. Specifically, we propose to add channels 136.100 MHz, 136.200 MHz, 136.275 MHz, 136.375 MHz, and 136.475 MHz to the list of FAA's shared channels.<sup>54</sup> SAMA, NATA, NBAA, and ARINC all support providing the FAA with access to these additional channels.<sup>55</sup> In making this proposal, we emphasize that this band is first and foremost a non-Federal Government band. When the band was available for aeronautical use on January 1, 1990, the Commission designated the entire band as non-Federal Government and determined that the FAA's spectrum requirements would be satisfied with an allotment of fifteen channels for general aviation ATC use.<sup>56</sup> We continue to believe that the FAA's spectrum requirements can be met in ways other than taking spectrum from the private sector and reallocating it as shared Federal Government/non-Federal Government spectrum. We invite comments on these views.

11. As requested by SAMA and supported by the FAA and industry, we further propose that FIS be accommodated in the 136-137 MHz band. SAMA contends that locating the FIS within in the 136-137 MHz band is most appropriate.<sup>57</sup> It notes that frequencies in the 136-137 MHz band are not currently being used because very few general aviation aircraft have voice radios that can tune to this band.<sup>58</sup> NATA, NBAA, and ARINC/ATA all support authorization of FIS within the 136-137 MHz band.<sup>59</sup> According to SAMA, most general aviation aircraft have 720-channel transceivers that tune up to 136 MHz; only the newest radios are 760-channel transceivers that also tune to the forty channels in the 136-137 MHz band.<sup>60</sup> SAMA maintains that aircraft desiring to receive FIS broadcasts could purchase an FIS

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<sup>51</sup>*Id.*

<sup>52</sup>ARINC/ATA Joint Comments at 2.

<sup>53</sup>*Id.* at 2-3.

<sup>54</sup>These are the five channels originally held in reserve. *See* para. 2, *supra*.

<sup>55</sup> SAMA Petition at 1 and 4; NATA Comments at 1; NBAA Comments at 3 (supports channels for digital use); ARINC/ATA Joint Comments at 5 (support providing access to additional channels in the lower half of the 136-137 MHz band).

<sup>56</sup>*See Report and Order*, 5 FCC Rcd. at 3954, 3958.

<sup>57</sup>SAMA Petition at 2.

<sup>58</sup>*Id.* at 3.

<sup>59</sup>NATA Comments at 1, NBAA Comments at 3, and ARINC/ATA Joint Comments at 4.

<sup>60</sup>SAMA Petition at 3.

receiver that tunes to these frequencies only.<sup>61</sup> Finally, SAMA avers that avionics manufacturers have already introduced low-cost radio receivers for FIS broadcasts for the general aviation market in anticipation of the FAA's initiation of this service.<sup>62</sup>

12. Consequently, we propose to add the FIS designation to footnote US244; however, we tentatively conclude that specifying four channels for FIS in US244 is unnecessary and could curtail flexibility. In its Revised Petition, the FAA proposes that the four channels jointly selected by the FAA and industry representatives (136.425 MHz, 136.450 MHz, 136.475 MHz, and 136.500 MHz) be added to footnote US244.<sup>63</sup> Three of the channels are from the ATC portion of the band and the fourth is from the AOC portion of the band.<sup>64</sup> In its Petition, SAMA also proposes modifying our Rules to permit FIS on the frequencies that the FAA selects.<sup>65</sup> Although both the FAA and SAMA requested that four frequencies be designated for the FIS, ARINC/ATA argues that specific FIS frequencies need not be listed in our Rules.<sup>66</sup> In this connection, ARINC contends that FIS could be implemented in the 136-136.475 MHz band by adding FIS to footnote US244 and modifying 47 C.F.R. § 87.137 to include the 14K0G1D emission designator.<sup>67</sup> NBAA also states that further FIS studies by RTCA, Inc., should be completed and its recommendations considered before decisions are made regarding specific applications on assigned channels.<sup>68</sup> In further comments, ARINC clarifies that although the FAA will make three of the ATC channels available for FIS and ARINC will make one of the AOC channels available to an FIS provider, such commitment would expire on December 31, 2004.<sup>69</sup> ARINC/ATA avers that adding the FIS designation to footnote US244 rather than specifying the frequencies would fully meet FAA and SAMA's requirements while providing for future requirements.<sup>70</sup> We seek comments on our tentative conclusion to add FIS but not list specific frequencies in the footnote allocation 47 C.F.R. § 2.106, n. US244. Finally, in their filings, both SAMA and the FAA use the term "Flight Information Service (FIS)," while ARINC/ATA use the term "Flight Information Service-Broadcast (FIS-B)."<sup>71</sup> It is unclear whether these terms reflect actual and distinct characteristics and requirements or are synonymous. However, it appears that FIS-B permits user-customized data display whereas FIS is intended for uniform

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<sup>61</sup>*Id.*

<sup>62</sup>*Id.* at 4.

<sup>63</sup>FAA Revised Petition at 3.

<sup>64</sup>The 136-136.475 MHz band, which contain the 20 channels that are shared with FAA for ATC purposes, are commonly referred to as ATC channels or band, while the remainder of the band 135.5-137 MHz, which contains 20 channels used for AOC by the industry, is commonly referred to as the AOC channels or band. *See* discussion in para. 7, *supra*.

<sup>65</sup>SAMA Petition at 2.

<sup>66</sup>ARINC/ATA Joint Comments at 8.

<sup>67</sup>ARINC Clarification at 2-3.

<sup>68</sup>NBAA Comments at 2.

<sup>69</sup>ARINC Clarification at 2.

<sup>70</sup>ARINC/ATA Joint Comments at 5.

<sup>71</sup>*See* SAMA Petition at 2-4, FAA Revised Petition at 1-3; *but see* ARINC/ATA Joint Comments at 1 and Appendix A, ARINC Clarification at 1-2 and Appendix A. *See also* notes 2 and 33, *supra*.



user presentation. We therefore seek comment clarifying whether the term “FIS” is more suitable than “FIS-B” for our Rules.

## **B. Aviation Service Rules (47 C.F. R. Part 87).**

13. To foster improved spectrum efficiencies, we also propose to amend various service and technical rules pertaining to the aviation services, 47 C.F.R. Part 87. The specific rule provisions we propose to amend are: (1) 47 C.F.R. § 87.131 (Power and emissions); (2) 47 C.F.R. § 87.133 (Frequency stability); (3) 47 C.F.R. § 87.137 (Types of emission); (4) 47 C.F.R. § 87.139 (Emission limitations); (5) 47 C.F.R. § 87.173 (Frequencies) [General List]; (6) 47 C.F.R. § 87.187 (Frequencies) [Aircraft Stations]; and (7) 47 C.F.R. § 87.263 (Frequencies) [Aeronautical Enroute and Aeronautical Fixed Stations]. We believe that these changes would serve to promote the transition from analog voice communications to digital voice and data transmissions. NBAA contends that recent studies indicate a twenty percent per annum growth in the use of the 136-137 MHz band for data communications alone.<sup>72</sup> Because aviation communications represent a vital area of public safety, and due to the increased demand by the aviation industry for radio spectrum, we wish to assist the FAA and the aviation industry as they bring aviation communications into the digital age.

14. First, we propose to amend our Rules concerning emission standards to include phase modulation data transmissions (G1D and G7D)<sup>73</sup> for the 117.975-137 MHz bands.<sup>74</sup> To accommodate FIS, SAMA suggests that we amend the aviation emission rules to allow not only the current A3E (double sideband amplitude modulation) but also to add F1D and/or G1D (digital frequency and phase modulation, respectively) as suggested by FAA.<sup>75</sup> The FAA, in its Revised Petition, proposes to add G1D and G7D to the 117.975-137 MHz band.<sup>76</sup> ARINC/ATA agree.<sup>77</sup> It asserts that to meet requirements for future systems, we should permit these emissions throughout the 117.975-137 MHz band.<sup>78</sup>

15. In its Petition, the FAA notes that there is a long history of spectrum congestion in the 117.975-136 MHz band due to increasing ATC communications requirements which cause frequency assignments to grow approximately four percent a year.<sup>79</sup> After several years of comprehensive study within the aviation community, RTCA, Inc., recommended implementation of a future air/ground communications system based on time division multiple access (TDMA).<sup>80</sup> Parallel studies within the

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<sup>72</sup>NBAA Comments at 1.

<sup>73</sup>G1D refers to a phase-modulated emission of a single channel containing quantized or digital information without the use of a modulating sub-carrier, excluding time division multiplex for data transmission. G7D refers to a phase-modulated emission of two or more channels containing quantized or digital information, together with one or more channels containing analog information, for data transmission. See 47 C.F.R. § 2.201.

<sup>74</sup>See 47 C.F.R. §§ 87.131, 87.133, 87.137, and 87.139.

<sup>75</sup>SAMA Petition at 2 and 5.

<sup>76</sup>FAA Revised Petition at 3-4.

<sup>77</sup>ARINC/ATA Joint Comments at 6.

<sup>78</sup>ARINC/ATA Joint Comments at 6.

<sup>79</sup>FAA Petition at 2.

<sup>80</sup>Time division multiple access (TDMA) is a multiple access technique whereby users share a transmission medium

International Civil Aviation Organization (ICAO) reached similar conclusions. Based on these recommendations, the FAA indicates that it has decided to start replacing its current amplitude modulated air/ground voice communications system with the modern digital VHF digital link (VDL) Mode 3 system as the future air/ground communications system in the 117.975-137 MHz band.<sup>81</sup> Implementation of that system is to begin by the year 2002.<sup>82</sup> This new system provides four independent voice/data links on each 25 kHz radio frequency channel, and is defined by ICAO as VDL Mode 3 using TDMA transmissions.<sup>83</sup>

16. Although the parties agree to add both G1D and G7D emission standards, they disagree on certain limitations. While the FAA proposes both G1D and G7D emission designators, it appears to suggest that communications within the ATC 136-136.475 MHz band be limited to VDL Mode 3 data transmissions.<sup>84</sup> Noting that the frequencies in the 136-137 MHz band are currently not widely used, the FAA states that this is the ideal “sub band” to be used for transition to the new digital ATC communications system – VDL Mode 3.<sup>85</sup> Additionally, the FAA seeks to limit the use of the 136-137 MHz band to digital-only communications systems using ICAO standards for VDLs or systems compatible with those standards.<sup>86</sup> ARINC/ATA submit that we should not place any restrictions, such as digital-only communications, on the use of the 136.5-137 MHz band that is used by civil aviation for AOC.<sup>87</sup> They further state that the FIS system would use VDL Mode 2 as least initially.<sup>88</sup> To accommodate future requirements, ARINC/ATA urges the FCC to permit VDL Mode 2 (14K0G1D) and VDL Mode 3 (14K0G7D) emissions throughout the 136-137 MHz band.<sup>89</sup> NBAA agrees that the VDL Mode 3 system should be the eventual communications format.<sup>90</sup> NBAA adds, however, that subsequent to approving the VDL Mode 3 recommendation for future systems, the industry has continued to develop

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by being assigned and using (one-at-a-time) for a limited number of time division multiplexed channels; implies that several transmitters use one channel for sending several bit streams. *See* 47 C.F.R. § 27.5. In other words, it is a communications technique that uses a common channel, multipoint or broadcast, for communications among multiple users by allocating unique time slots to different users. *See* National Communications System, Technology and Standards Division, *Telecommunications: Glossary of Telecommunications Terms*, Federal Standard 1037C (1996).

<sup>81</sup>*Id.*

<sup>82</sup>*Id.*

<sup>83</sup>FAA Petition at 2.

<sup>84</sup>FAA Petition at 4-5 and FAA Revised Petition at 2-3.

<sup>85</sup>FAA Petition at 3.

<sup>86</sup>FAA Petition at 2.

<sup>87</sup>ARINC/ATA Joint Comments at 6.

<sup>88</sup>*Id.* at 8.

<sup>89</sup>*Id.* at 6.

<sup>90</sup>NBAA Comments at 2.

standards for VDL Mode 2.<sup>91</sup> According to NBAA, the VDL Mode 2 standards were developed because a transition period is necessary while VDL Mode 3 development occurs.<sup>92</sup>

17. Considering the varying views expressed, we propose to allow the use of both VDL Mode 2 and VDL Mode 3 for the 117.975-137 MHz band without limitations. Specifically, we propose to add both G1D and G7D emission designators to 47 C.F.R. § 87.131 (Power and emissions), 47 C.F.R. § 87.133 (Frequency stability), 47 C.F.R. § 87.137 (Types of emission), and 47 C.F.R. § 87.139 (Emission limitations) as set forth in Appendix B hereto. We believe this approach would promote compatibility, flexibility, and efficiency while the aviation community transitions to the future digital air/ground communications system. We further believe that these proposed revisions will allow single-channel, phase modulation digital transmission (14K0G1D) to accommodate the VDL Mode 2 system of communications, needed for FIS and ARINC's system; they will also allow the FAA to implement its TDMA multiple-channel, phase modulation digital transmission (14K0G7D) for the VDL Mode 3 system of communications. We seek comments on this approach. Comments should address the standard that will meet future and current requirements.

18. Additionally, we propose to modify 47 C.F.R. § 87.173 (Frequencies) [General List] to reflect the proposed realignment of frequency use of the 136-137 MHz band, and 47 C.F.R. § 87.187 (Frequencies) [Aircraft Stations] to identify the four FIS frequencies and prohibit aircraft transmissions on these frequencies.<sup>93</sup> The FAA, in its Revised Petition, recommends adding the four FIS frequencies to 47 C.F.R. § 87.187.<sup>94</sup> ARINC/ATA suggests slightly broader text regarding the FIS frequencies: it would identify the same four frequencies for one-way broadcast service (rather than FIS) and prohibit aircraft transmissions on these frequencies.<sup>95</sup> Our proposal is a combination of these recommendations. We seek comments on the proposed revisions to 47 C.F.R. §§ 87.173 and 87.187 as set forth in Appendix B hereto.

19. Finally, we propose to modify 47 C.F.R. § 87.263 (Frequencies) [Aeronautical Enroute and Aeronautical Fixed Stations] regarding the six frequencies reserved for special purpose enroute services in the Gulf of Mexico. In 1990, in response to a request by American Petroleum Institute (API), we reserved these frequencies for special purpose enroute services such as "helicopter flight following systems" through December 31, 1993.<sup>96</sup> To date, only two frequencies (*viz.*, 136.750 and 136.825 MHz) have been implemented.<sup>97</sup> ARINC/ATA recommends deleting this provision for all but the licensed frequencies.<sup>98</sup> It contends that the rapid growth of the aeronautical enroute service throughout the Nation

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<sup>91</sup>*Id.*

<sup>92</sup>*Id.*

<sup>93</sup>These proposed modifications are consequential to the proposed new division of use between ATC and AOC, as discussed in para. 12, *supra*.

<sup>94</sup>FAA Revised Petition at 4.

<sup>95</sup>See ARINC/ATA Joint Comments at 6-7 and A-3, and ARINC Clarification at 3-4 and 8.

<sup>96</sup> See Amendment of Parts 2 and 87 of Commission's Rules to permit the Aviation Services to use frequencies in the 136-137 MHz band, *Report and Order*, 5 FCC Rcd 3954, 3957 ¶ 27 (1990).

<sup>97</sup>FCC license records indicate that frequency 136.750 MHz is licensed to Chevron USA, Inc. (issued on December 30, 1993) and frequency 136.825 MHz is licensed to Offshore Logistics, Inc. (issued on June 12, 1997).

<sup>98</sup>ARINC/ATA Joint Comments at 7.

requires these channels to be unambiguously available.<sup>99</sup> We seek comments on the proposed revisions to 47 C.F.R. §§ 87.263 as set forth in Appendix B hereto.

#### **IV. PROCEDURAL MATTERS**

##### ***Ex Parte* Rules -- Permit-but-Disclose Proceeding**

20. This is a permit-but-disclose notice and comment rulemaking proceeding. *Ex parte* presentations are permitted, except during the Sunshine Agenda period, if they are disclosed as provided in the Commission's Rules. *See generally* 47 C.F.R. §§ 1.1200(a), 1.1203, 1.1206.

##### **Regulatory Flexibility Act**

21. An Initial Regulatory Flexibility Analysis with respect to the *Notice* is included in Appendix A.

##### **Paperwork Reduction Act**

22. This *Notice* contains either a new or modified information collection. The Commission, as part of its continuing effort to reduce paperwork burdens, invites the general public to comment on the information collection contained in this *Notice* as required by the Paperwork Reduction Act of 1995, Pub. L. No. 104-13. Public and agency comments are due 60 days from date of publication of this *Notice* in the Federal Register. Comments should address: (a) whether the new or modified collection of information is necessary for the proper performance of the functions of the Commission, including whether the information shall have practical utility; (b) the accuracy of the Commission's burden estimates; (c) ways to enhance the quality, utility, and clarity of the information collected; and (d) ways to minimize the burden of the collection of information on the respondents, including the use of automated collection techniques or other forms of information technology. These comments should be submitted to Judy Boley, Federal Communications Commission, 445 12th Street, SW, Washington, D.C. 20554, or via the Internet to <jboley@fcc.gov>. Furthermore, a copy of any such comments should be submitted to Virginia Huth, OMB Desk Officer, 725 17th Street, N.W., Room 10236 NEOB, Washington, D.C. 20503, or via the Internet to <vhuth@omb.eop.gov>.

##### **Alternative Formats**

23. Alternative formats (computer diskette, large print, audio cassette and Braille) are available from Martha Contee at (202) 418-0260, TTY (202) 418-2555, or at <mcontee@fcc.gov>. This *Notice* can also be downloaded at <<http://www.fcc.gov/dtf>>.

##### **Pleading Dates**

24. Pursuant to Sections 1.415 and 1.419 of our Rules, 47 C.F.R. §§ 1.415, 1.419, interested parties may file comments on or before July 14, 2000, and reply comments on or before August 14, 2000. Comments may be filed using the Commission's Electronic Comment Filing System (ECFS), or by filing paper copies. *See Electronic Filing of Documents in Rulemaking Proceedings*, 63 Fed. Reg. 24,121 (1998).

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<sup>99</sup>ARINC/ATA aver that only one frequency (136.750 MHz) is licensed. *See* ARINC Clarification at 4-5.

25. Comments filed through the ECFS can be sent as an electronic file via the Internet to <<http://www.fcc.gov/e-file/ecfs.html>>. Generally, only one copy of an electronic submission must be filed. If multiple docket or rulemaking numbers appear in the caption of this proceeding, however, commenters must transmit one electronic copy of the comments to each docket or rulemaking number referenced in the caption. In completing the transmittal screen, commenters should include their full name, Postal Service mailing address, and the applicable docket or rulemaking number. Parties may also submit an electronic comment by Internet e-mail. To get filing instructions for e-mail comments, commenters should send an e-mail to <[ecfs@fcc.gov](mailto:ecfs@fcc.gov)>, and should include the following words in the body of the message, "get form <your e-mail address.>" A sample form and directions will be sent in reply.

26. Parties who choose to file by paper must file an original and four copies of each filing. If more than one docket or rulemaking number appear in the caption of this proceeding, commenters must submit two additional copies for each additional docket or rulemaking number. All filings must be sent to the Commission's Secretary, Magalie Roman Salas, Office of the Secretary, Federal Communications Commission, 445 Twelfth Street, S.W., TW-A325, Washington, D.C. 20554.

## V. ORDERING CLAUSES

27. Accordingly, IT IS ORDERED that, pursuant to Sections 1, 4(i), 302, 303(f) and (r), 332, and 337 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 1, 154(i), 302, 303(f) and (r), 332, 337, NOTICE IS HEREBY GIVEN of the proposed regulatory changes described in this *Notice of Proposed Rulemaking*, and that COMMENT IS SOUGHT on these proposals.

28. IT IS FURTHER ORDERED that the Commission's Office of Public Affairs, Reference Operations Division, SHALL SEND a copy of this *Notice of Proposed Rulemaking*, WT Docket No. 00-77, including the Initial Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration in accordance with Section 603(a) of the Regulatory Flexibility Act.<sup>100</sup>

### Contact for Information

29. For further information, contact John Fernández or Ghassan Khalek, Policy and Rules Branch, Public Safety and Private Wireless Division, Wireless Telecommunications Bureau, (202) 418-0680, <[jfernand@fcc.gov](mailto:jfernand@fcc.gov)> or <[gkhalek@fcc.gov](mailto:gkhalek@fcc.gov)>.

FEDERAL COMMUNICATIONS COMMISSION

Magalie Roman Salas  
Secretary

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<sup>100</sup>Pub. L. No. 96-354, 94 Stat. 1165, 5 U.S.C. §§ 601-612 (1980).

## APPENDIX A

### Initial Regulatory Flexibility Analysis

As required by the Regulatory Flexibility Act ("RFA"),<sup>101</sup> the Commission has prepared this present Initial Regulatory Flexibility Analysis ("IRFA") of the possible significant economic impact on small entities by the policies and rules proposed in this *Notice*. Written public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments on this *Notice* provided above in paragraph 24. The Commission will send a copy of the *Notice*, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration ("SBA"). See 5 U.S.C. § 603(a). In addition, the *Notice* and IRFA will be published in the Federal Register. See *id.*

#### **A. Need for, and Objectives of, the Proposed Rules:**

1. Increased spectrum congestion within the 117.975-136 MHz band, due to increasing air traffic control communications requirements that cause frequency assignments in this band to grow about four percent annually, compels the transition to digital communications technology. Further pressuring our aviation communications spectrum capacity is the explosive growth in data communications within the civil aviation communications spectrum band. This, combined with the FAA's role in administering the civil aviation communications spectrum, along with the public safety issues inherent with aviation communications, provides justification for our proposals in this *Notice*. The objective is to develop aviation communications spectrum policies for the civil aviation community while providing the FAA with the latitude it needs to meet its statutory requirements. Our proposals are aimed at being as least intrusive on the private sector as feasible, while achieving our public interest objectives.

#### **B. Legal Basis.**

2. The proposed action is authorized by sections 4(i), 303(r), and 332(a)(2) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 303(r) and 332(a)(2).

#### **C. Description and Estimate of the Number of Small Entities to Which the Proposed Rules Will Apply.**

3. Under the RFA, small entities may include small organizations, small businesses, and small governmental jurisdictions, or entities. 5 U.S.C. § 601(6). 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. The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction." 5 U.S.C. § 601(3). In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act. A small business concern is one that: (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. Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency after consultation with the Office of Advocacy of the SBA, and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register."

4. The Commission has not adopted a definition of small business specific to the Air-Ground Radiotelephone Service, which is defined in section 22.99 of the Commission's Rules. 47 C.F.R. § 22.99.

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<sup>101</sup>See 5 U.S.C. § 603.

Accordingly, we will use the SBA's definition applicable to radiotelephone companies, *i.e.*, an entity employing no more than 1,500 persons. There are approximately 100 licensees in the Air-Ground Radiotelephone Service, and we estimate that almost all of them qualify as "small" under the SBA definition.

**D. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements.**

5. No new reporting, recordkeeping, or other compliance requirements would be imposed on applicants or licensees as a result of the actions proposed in this rulemaking proceeding.

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

6. Throughout this *Notice*, we seek comment on the impact of the proposals in the *Notice* on small entities.

**F. Federal Rules that May Duplicate, Overlap, or Conflict with the Proposed Rules.**

7. None.

**APPENDIX B  
Proposed Rules**

Parts 2 and 87 of Title 47 of the Code of Federal Regulations are proposed to be amended as follows:

1. The authority citation for Part 2 continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 302, 303, 307, 336, and 337, unless otherwise noted.

2. Footnote US244 to the Table of Frequency Allocations is amended as follows:

**§ 2.106 Table of Frequency Allocations.**

\*\*\*\*\*

US244 The band 136.000-137.000 MHz is allocated to the non-Federal Government aeronautical mobile (R) service on a primary basis, and is subject to pertinent international treaties and agreements. The frequencies 136.000, 136.025, 136.050, 136.075, 136.100, 136.125, 136.150, 136.175, 136.200, 136.225, 136.250, 136.275, 136.300, 136.325, 136.350, 136.375, 136.400, 136.425, 136.450, and 136.475 MHz are available on a shared basis to the Federal Aviation Administration for air traffic control purposes, such as automatic weather observation stations (AWOS), automatic terminal information services (ATIS), flight information services (FIS), and airport control tower communications. Existing operational meteorological satellites in the band 136-137 MHz may continue to operate on a not-to-interfere basis to aeronautical mobile (R) stations, until January 1, 2002. No new assignments will be made to stations in the meteorological-satellite service.

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**Part 87 - AVIATION SERVICES**

3. The authority citation for Part 87 continues to read as follows:

AUTHORITY: 48 Stat. 1066, 1082, as amended; 47 U.S.C. 154, 303, 307(e) unless otherwise noted. Interpret or apply 48 Stat. 1064-1068, 1081-1105, as amended; 47 U.S.C. 151-156, 301-609.

4. Section 87.131 is revised to read as follows:

**§ 87.131 Power and emissions.**

\*\*\*

Class of station	Frequency band/ frequency	Authorized emission(s)	Maximum power <sup>1</sup>
*** Aeronautical enroute and aeronautical fixed.	*** VHF.....	*** A3E, A9W, G1D.....	*** 200 watts. <sup>2</sup>
*** Airport control tower.....	*** VHF.....	*** A3E, G1D, G7D.....	*** 50 watts.
Aeronautical Frequencies			
*** Aircraft (Communication).....	*** VHF.....	*** A3E, A9W, G1D, G7D.....	*** 55 watts.
***	***	***	***

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5. Section 87.133(a) is revised to read as follows:

**§ 87.133 Frequency stability.**

(a) \*\*\*

Frequency band (lower limit exclusive, upper limit inclusive), and categories of stations	Tolerance <sup>1</sup>	Tolerance <sup>2</sup>
***	***	***
(5) Band—108 to 137 MHz:	***	***
Aeronautical stations.....	<sup>4</sup> 50	20 <sup>12</sup>
***	***	***
Aircraft and other mobile stations in the Aviation Services.	50 <sup>5</sup>	30 <sup>13</sup>
***	***	***

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<sup>12</sup> For emissions G1D and G7D, the tolerance is 2 parts per 10<sup>6</sup>.

<sup>13</sup> For emissions G1D and G7D, the tolerance is 5 parts per 10<sup>6</sup>.

\*\*\*\*\*

6. Section 87.137(a) is amended, by adding new entries to the table, to read as follows:

**§ 87.137 Types of emission.**

(a) \*\*\*

Class of emission	Emission designator	Authorized bandwidth (kilohertz)		
		Below 50 MHz	Above 50 MHz	Frequency deviation
***	***	***	***	***
G1D	14K0G1D		25	
***	***		***	
G7D	14K0G7D		25	
***	***		***	

\*\*\*\*\*

7. Section 87.139 is amended, by adding paragraphs (j), (1), (2), and (3), to read as follows:

**§ 87.139 Emission limitations.**

\*\*\*\*\*

(j) For VHF aeronautical stations and aircraft stations operating with G1D or G7D emissions:

(1) The amount of power measured across either first adjacent 25 kHz channel shall not exceed 0 dBm.

(2) The amount of power measured across either second adjacent channel shall be less than -25 dBm and the power measured in any other adjacent 25 kHz channels shall monotonically decrease at a rate of at least 5 dB per octave to a maximum value of -52 dBm.

(3) The amount of power measured over a 16 kHz channel bandwidth centered on the first adjacent 25 kHz channel shall not exceed -20 dBm.

8. Section 87.173(b) is amended to read as follows:

**§ 87.173 Frequencies.**

\*\*\*\*\*

(b) Frequency table:

Frequency or frequency band	Subpart	Class of station	Remarks
***	***	***	***
136.000-136.400 MHz .....	O, S	MA, FAC, FAW	Air traffic control operations; 25 kHz channel spacing.
136.425 MHz.....	O, S	MA, FAC, FAW	Air traffic control operations.
136.450 MHz.....	O, S	MA, FAC, FAW	Air traffic control operations.
136.475 MHz.....	O, S	MA, FAC, FAW	Air traffic control operations.
136.500 MHz.....	O, S	MA, FAC, FAW	Domestic VHF.
136.525-136.875 MHz.....	I	MA, FAE	Domestic VHF; 25 kHz channel spacing.
136.900 MHz.....	I	MA, FAE	International and domestic VHF.
136.925 MHz.....	I	MA, FAE	International and domestic VHF.
136.950 MHz.....	I	MA, FAE	International and domestic VHF.
136.975 MHz.....	I	MA, FAE	International and domestic VHF.
***	***	***	***

9. Section 87.187 is amended, by adding paragraph (z)(dd), to read as follows:

**§ 87.187 Frequencies.**

\*\*\*\*\*

(dd) The frequencies 136.425, 136.450, 136.475, and 136.500 MHz are designated for flight information services (FIS) and may not be used by aircraft for transmission.

10. Section 87.263 is amended, by revising paragraphs (a)(1) and (a)(5), to read as follows:

**§ 87.263 Frequencies.**

(a) *Domestic VHF service.* (1) Frequencies in the 128.8125-132.125 MHz and 136.4875 -137.00 MHz bands are available to serve domestic routes, except that the frequencies 136.750 MHz and 136.825 MHz are also available to aeronautical enroute stations located at least 288 kilometers (180 miles) from the Gulf of Mexico shore line (outside the Gulf of Mexico Region). Frequency assignments are based on 25 kHz spacing. Use of these frequencies must be compatible with existing operations and must be in accordance with pertinent international treaties and agreements.

\*\*\*\*\*

(5) The frequencies 136.750 MHz and 136.825 MHz are available in the Gulf of Mexico Region to serve domestic routes over the Gulf of Mexico and adjacent coastal areas. Assignment of these frequencies in the Gulf of Mexico Region shall be to licensees first licensed on this frequency in the Gulf of Mexico Region prior to January 1, 1994, their successors and assigns, and is not subject to the conditions in § 87.261(c) and paragraph (a)(2) of this section. For the purpose of this paragraph, the Gulf of Mexico Region is defined as an area bounded on the east, north, and west by a line 288 km (180 miles) from the Gulf of Mexico shore line. Inland stations must be located within forty-eight kilometers (30 miles) of the Gulf of Mexico shore line.

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