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

In the Matter of	)	
	)	
Amendment of Part 87 of the Commission's Rules to Permit Automatic Operation of Aeronautical Advisory Stations (Unicoms)	)	WT Docket No. 96-1 RM-8495
	)	
and	)	
	)	
Amendment of Part 87 to Permit the Use of 112-118 MHz for Differential Global Positioning System (GPS) Correction Data and the Use of Hand-held Transmitters on Frequencies in the Aeronautical Enroute Service	)	WT Docket No. 96-211 RM-8607, 8687
	)	
and	)	
	)	
Amendment of Part 17 Concerning Construction, Marking, and Lighting of Antenna Structures	)	

REPORT AND ORDER

Adopted: February 25, 1999 **Released:** March 3, 1999

By the Commission:

I. INTRODUCTION AND EXECUTIVE SUMMARY

1. By this action, we are amending Part 87 of our rules to implement state-of-the-art radio technologies and promote operational flexibility in the Aviation Services. We are permitting the operation of aeronautical advisory stations (unicoms) in an unattended, automatic mode, and allowing aeronautical ground stations to transmit differential Global Positioning System (GPS) augmentation data to aircraft.[1] Additionally, we are allowing the use of mobile radios for direct communications between ground service personnel and flight crews on frequencies allocated to the Aeronautical Enroute Service. These actions will improve safety in air navigation by increasing pilots' access to advisory information, promoting the use of satellite technology for the precision landing of aircraft, and allowing ground crews to communicate directly with aircraft on aeronautical frequencies. Finally, we are amending Part 17 of our rules to incorporate by reference two recently revised Federal Aviation Administration (FAA) Advisory Circulars. As a result, this action unifies federal guidelines concerning the painting and lighting of antenna structures.

[1] Section 87.5 of the Commission's Rules, 47 C.F.R. § 87.5, defines unicoms as aeronautical stations used for advisory and civil defense communications primarily with private aircraft stations. GPS and differential GPS technologies are described in para. 0, *infra*.

II. BACKGROUND

2. In 1996, the Commission released two Notices of Proposed Rule Making aimed at increasing air safety by promoting the use of state-of-the-art radio technologies in the Aviation Services, providing operational flexibility in the use of Aviation Service frequencies, and unifying federal guidelines concerning the painting and lighting of potential obstructions to air navigation. On January 29, 1996, the Commission released a *Notice of Proposed Rule Making* (*Unicom NPRM*) in WT Docket No. 96-1, proposing to allow the operation of unicoms in unattended, automatic mode.[2] The *Unicom NPRM* was initiated by a Petition for Rule Making filed by the Potomac Aviation Technology Corporation (PATC).[3] Nine comments and two reply comments were filed in response to the *Unicom NPRM*.[4]

3. In another matter concerning aviation safety issues, the Commission released a *Notice of Proposed Rule Making* (*Aviation Safety NPRM*) in WT Docket No. 96-211 on November 21, 1996, proposing to: (a) permit aeronautical ground stations to transmit differential GPS augmentation data to aircraft; (b) allow ground crews to communicate directly with aircraft on aeronautical enroute frequencies; and, (c) update Part 17 of our rules to incorporate two recently revised FAA Advisory Circulars.[5] The *Aviation Safety NPRM* was initiated by Petitions for Rule Making filed by the FAA and Aeronautical Radio, Inc. (ARINC).[6] Two comments and two reply comments were filed in response to the *Aviation Safety NPRM*.[7]

II. DISCUSSION

A. Automatic Operation of Unicoms

4. *Background.* The unicom service was established in 1950 to provide for air-ground communications primarily between general aviation aircraft and airport facilities.[8] Unicom transmissions

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[2] Amendment of Part 87 of the Commission's Rules to Permit Automatic Operation of Aeronautical Advisory Stations (Unicoms), WT Docket No. 96-1, *Notice of Proposed Rule Making*, 11 FCC Rcd 1084 (1996) *(Unicom NPRM)*.

[3] *See* PATC Request for Rule Interpretation, RM No. 8495 (filed Nov. 3, 1993), treated as Petition for Rulemaking (PATC Petition); PATC Supplemental Request (filed Nov. 8, 1994) (PATC Request).

[4] A list of commenters is provided in Appendix A.

[5] Amendment of Part 87 to Permit the Use of 112-118 MHz for Differential Global Positioning System (GPS) Correction Data and the Use of Hand-held Transmitters on Frequencies in the Aeronautical Enroute Service and Amendment of Part 17 Concerning Construction, Marking, and Lighting of Antenna Structures, WT Docket No. 96-211, *Notice of Proposed Rule Making*, 11 FCC Rcd 15391 (1996) *(Aviation Safety NPRM)*.

[6] *See* FAA Petition for Rule Making, RM No. 8687 (filed Aug. 7, 1995) (FAA Petition); ARINC Petition for Rule Making, RM No. 8607 (filed Feb. 2, 1995) (ARINC Petition).

[7] A list of commenters is provided in Appendix A.

[8] *Unicom NPRM* at ¶ 2.

are limited to the necessities of safe and expeditious operation of aircraft, including runway conditions, types of fuel available, wind conditions, weather information, dispatching, and other necessary safety information.[9] Unicoms generally may not be used for air traffic control except to relay certain limited information between the pilot and the air traffic controller.[10] Unicom transmissions may include, on a secondary basis, communications pertaining to the efficient portal-to-portal transit of an aircraft, such as available ground transportation, food, and lodging.[11] Unicoms must provide impartial information concerning available ground services, and must provide service to any aircraft station upon request and without discrimination.[12]

5. Unicoms may operate at both controlled and uncontrolled airports.[13] Regardless of the type of airport, however, only one of the eight assignable unicom frequencies may be authorized at any airport.[14] Controlled airports are those that are equipped with either a control tower, a control tower remote communications outlet (RCO), or an FAA flight service station (FSS).[15] Unicoms at controlled airports may not transmit information regarding runway conditions, wind, or weather during the hours of operation of the controlling facility.[16] At uncontrolled airports, unicoms are often the only available source of this type of information. The vast majority of airports in the United States are uncontrolled airports.[17]

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[9] 47 C.F.R. § 87.213(b)(1).

[10] 47 C.F.R. § 87.213(c).

[11] 47 C.F.R. § 87.213(b)(2).

[12] 47 C.F.R. § 87.213(a).

[13] At controlled airports, more than one unicom may operate but all unicoms share a single frequency, 122.950 MHz. *See* 47 C.F.R. §§ 87.217(b) and 87.217(a)(1). At an uncontrolled airport, only one unicom station may be authorized. *See* 47 C.F.R. § 87.215(b).

[14] Nine frequencies are listed at 47 C.F.R. § 87.217. The frequency 121.500 MHz, however, may only be used for emergency and distress.

[15] Control towers provide air traffic control services to aircraft landing on, taking off from, and taxiing at an airport as well as aircraft transiting an airport's traffic area. 47 C.F.R. § 87.417(a). An RCO is an aeronautical radio station at a small uncontrolled airport located near a large airport with a control tower (a controlled airport). The RCO is connected via land lines to the control tower (or other FAA control facility), and enables the FAA to provide air traffic services to more airports and aircraft than would normally be served by the control facility alone. *See* Amendment of the Aviation Services Rules (Part 87) to Provide for the Licensing of Control Tower Remote Communications Outlet Stations at Airports Without Control Towers, *Order*, 5 FCC Rcd 4550, (1990). An FAA FSS is part of a network of 131 stations that covers all 50 states. FSSs provide weather briefings, information on flight facilities, and monitor the navigational radio net. John F. Welch, ed., *Van Sickle's Modern Airmanship* 737 (1981).

[16] 47 C.F.R. § 87.213(b)(1).

[17] There are currently 18,345 airports in the United States. Control towers operate at 462 of these, and are supplemented by 1,702 RCOs. There are 77 FAA FSSs. *Administrator's Fact Book* (October 1998).

6. The Commission's Rules currently do not permit the unattended, automatic operation of unicoms. The rules, however, do permit the operation of FAA-certified automatic weather stations, such as Automatic Weather Observation Stations (AWOSs), at airfields that do not have a full-time control tower or FSS.[18] Like unicoms, AWOS systems may provide terminal information, but only with FAA approval. Unlike unicoms, AWOS systems are relatively complex and expensive, require FAA-certification prior to operation, and are normally assigned an air traffic control frequency after coordination with FAA.[19] These factors have impeded the widespread installation of AWOSs at smaller airports.

7. PATC, a developer of automated unicoms, has operated automated unicoms under a developmental license since February 5, 1994.[20] PATC describes its automated unicom as a computerized system that automatically transmits aviation advisory information, weather reports, and a radio check service to pilots.[21] A pilot monitoring local unicom frequencies would receive computer-generated voice instructions to operate the PATC system by "clicking" his or her radio microphone three times to request an advisory, or four times to request a radio check. "Clicks" are generated by momentarily depressing the "push to talk" button on an aircraft radio's microphone.[22] A recorded or computer-generated voice responds with the requested advisory information or a radio check.

8. *Proposal.* In the *Unicom NPRM*, we proposed to eliminate the station operator requirement for unicoms and to permit their automatic operation.[23] We proposed to license automatic unicoms in the same manner as manually-operated unicoms and proposed technical criteria to govern their operation.[24] Under the technical criteria proposed in the *Unicom NPRM*, automated unicoms would be required to: transmit only in response to aircraft interrogating signals; use a three-second delay between interrogating signals and unicom transmissions; shut down automatically after three minutes of continuous operation; and include the date and time of the most recent update.[25]

9. *Decision.* The commenters addressing this issue, including those representing the FAA, equipment manufacturers, unicom operators, and pilots, agree that automated unicoms could improve air safety by increasing pilots' access to advisory information.[26] PATC states that permitting unicoms to

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18 47 C.F.R. § 87.525.

19 47 C.F.R. § 87.529.

20 PATC operates automated unicoms at Potomac Airfield (Maryland), Bay Bridge Airport (Maryland), Chesapeake Tidewater Airport (Virginia), Barre-Montpelier Airport (Vermont), Lebanon Municipal Airport (Tennessee), and Reelfoot Lake Airport (Tennessee).

21 PATC Request at 5.

22 Currently, radio clicks may be used to turn on airfield runway lights. 47 C.F.R. § 87.187(y).

23 *Unicom NPRM*, 11 FCC Rcd at 1084.

24 *Id.* at 1085-86.

25 *Id.* at 1085.

26 *See e.g.*, Aircraft Owners and Pilots Association (AOPA) Comments at 1; L.J. Aunchman Comments at 1;

operate in an unattended, automatic mode will "substantially improve the quality and timeliness of critical advisory information to general aviation pilots, thereby improving the safety of life and property in flight."[27] PATC estimates that 85% of U.S. airports do not have control tower facilities or FAA-certified automated weather systems, and therefore, pilots must presently rely on manually-operated unicoms or other pilots for advisory information at these uncontrolled airports.[28] The Aircraft Owners and Pilots Association (AOPA), representing more than 340,000 general aviation pilots and aircraft owners operating mostly from uncontrolled airports, also agrees that permitting automated unicom services will improve air safety by increasing pilots' access to advisory information at airports that presently have part-time or no unicom stations.[29] AOPA points out that smaller airports often do not have sufficient resources to staff a unicom station, and that automated unicom systems would be an economically viable alternative.[30] PATC notes that, even when uncontrolled airports have unicom facilities, advisory services are not normally offered to pilots on a twenty-four hour basis.[31] In contrast, PATC points out that automated unicom services could be available at any time of day, without requiring substantial staff resources at smaller airports.[32] Mark J. Swaney (Swaney), a commercial pilot and flight instructor, and PATC contend that automated unicom stations could be used as a primary means of unicom services, or to supplement a manually-operated unicom service.[33]

10. The commenters also agree that the technical criteria proposed in the *Unicom NPRM* will ensure that automated operations do not interfere with voice communications on unicom frequencies.[34] In this connection, PATC notes that there have been no complaints of interference to voice communications during its operation of six automated unicoms under developmental licenses.[35] Swaney notes that automated unicoms, operating under the technical criteria proposed in the *Unicom NPRM*, would not cause harmful interference to voice communications on unicom frequencies, even when used at the same airport as a manually-operated unicom. Further, Swaney claims that automated unicoms can reduce frequency congestion at airports that also have manual services, because pilots may quickly obtain advisory

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FAA Reply Comments at 1-2; National Association of State Aviation Officials Comments at 1; Mark J. Swaney (Swaney) Comments at 1; Robert J. Hepp Comments at 1; PATC Comments at 1-2.

27 PATC Comments at 1.

28 PATC Reply Comments at 3. PATC estimates that there are 700 airports in the U.S. with control tower facilities and 1,000 airports with FAA-approved automated weather facilities. *Id.*

29 AOPA Comments at 1.

30 *Id.*

31 PATC Reply Comments at 3.

32 *Id.*

33 Swaney Comments at 2; PATC Comments at 4.

34 *See e.g.*, PATC Comments at 4-5; Swaney Comments at 1.

35 PATC Comments at 1-6.

information or a radio check by "clicking" their microphones, rather than occupying the frequency while establishing voice contact with a live operator.[36]

11. Therefore, because automated unicoms have the potential to promote air safety and reduce congestion on unicom frequencies, we are amending Part 87 of our rules to permit the operation of unicom stations in an unattended, automatic mode. We agree with the commenters' contention that increasing the availability of unicom advisory information to pilots will improve air safety.[37] For example, up-to-date information concerning runway and weather conditions is important for safe flight operations. Similarly, advisory information pertaining to available ground services is also an important source of in-flight information -- especially for pilots approaching unfamiliar airfields. Further, radio checks facilitate verification of the proper operation of what is often a pilot's lifeline: his or her radio. We also believe that automatic transmission of aviation advisory information could make this vital information available at more airfields, providing increased safety services to the aviation community. As the commenters point out, small airports often have part-time, or no, unicom services at all because of the costs associated with staffing a full-time unicom.[38] Automated unicoms could be used to supplement, or in lieu of, a full-time unicom station. By eliminating the need for a live operator and permitting the use of state-of-the-art technology, we anticipate that more airports may elect to provide unicom services and thereby improve air safety.

12. Consistent with our policy for manually-operated unicoms, we will authorize only one licensee at uncontrolled airports, and multiple licensees at controlled airports. In cases where multiple licensees are authorized at a single airport or approach, we will require the licensees to sign an agreement stating which licensee(s) will control the automated unicom operations and, if control is to be shared among several operators, how that control will be divided or scheduled. The licensees will be required to maintain a copy of the agreement with the station's records.

13. Each of the commenters generally agrees that the technical parameters proposed in the *Unicom NPRM* will allow the efficient operation of automated unicoms without causing interference to voice communications.[39] The FAA and PATC, however, ask the Commission to further refine these technical parameters and suggest minor changes to ensure the integrity of voice communications on unicom frequencies. Specifically, the FAA and PATC recommend that: (a) automated unicoms should transmit only in response to interrogating signals from aircraft; (b) there should be a brief delay between an aircraft's interrogating signal and the unicom transmission; and, (c) messages should be no longer than one minute in duration.[40] Further, the FAA and PATC recommend limiting station power to 0.5 watts, but permitting up

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36 Swaney Comments at 1.

37 *See e.g.,* National Association of State Aviation Officials Comments at 1; Aircraft Owners and Pilots Association (AOPA) Comments at 1; National Association of State Aviation Officials Comments at 1; FAA Reply Comments at 1-2.

38 AOPA Comments at 1; PATC Comments at 5.

39 *See e.g.,* Swaney Comments at 1; AOPA Comments at 1; Robert J. Hepp Comments at 2; PATC Comments at 4.

40 FAA Reply Comments at 2; PATC Reply Comments at 9-10.

to 2 watts in order to ensure reliable communications up to 15 nautical miles from an airport.[41] We agree with the recommendations of the FAA and PATC and have included these technical parameters in the final rules we adopt today. We believe that these specifications are flexible enough to permit technological innovation in the provision of automated unicom services while preventing harmful interference to voice communications on unicom frequencies.

14. The FAA and PATC also ask the Commission to place certain additional requirements on automated unicoms, but not manually-operated unicoms, so that pilots will have a clear understanding of the reliability of the information being provided. First, the FAA and PATC recommend that automated unicoms providing weather information should: (a) precede such information with the word "advisory" to denote that it is not an FAA-certified weather system; (b) refrain from providing such information at airports equipped with an FAA-certified weather system, unless the automated unicom becomes certified by the FAA; and (c) place weather sensors where they can best represent the weather conditions of the airport being served.[42] Second, the FAA and PATC suggest that automated unicom messages include the time and date of the latest update, except in cases where the system uses automated sensors to gather real-time data.[43] Again, we agree with the recommendations of the FAA and PATC and have included these requirements in the final rules. We believe that these measures will assist pilots in evaluating the reliability of automated unicom messages. Further, this approach helps to draw a clear distinction between the automated messages provided by unicom stations, and the automated messages provided by FAA-certified automated weather stations, such as AWOS.

15. In the *Unicom NPRM*, we also proposed several minor, administrative amendments to Part 87 of our rules in order to update certain sections in accordance with current FAA practices.[44] These amendments are noncontroversial in nature and none of the commenters in this proceeding specifically addressed such amendments. Therefore, we are amending Sections 87.525, 87.527, and 87.529 to permit the use of Automatic Surface Observation Stations (AMOS) in addition to the Automatic Weather Observing Stations (AWOS) already permitted.[45] We are also amending Section 87.419 to eliminate the requirement that applicants provide a written statement from the appropriate FAA Regional Office with an application for an RCO authorization. Finally, we are making a non-substantive, editorial amendment to Section 87.187(y)(4).

B. Differential Global Positioning System (GPS) Augmentation Data

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41 FAA Reply Comments at 1; PATC Reply Comments at 6.

42 FAA Reply Comments at 1; PATC Reply Comments at 4-5.

43 FAA Reply Comment at 2; PATC Reply Comments at 11-12.

44 *Unicom NPRM*, 11 FCC Rcd at 1086.

45 Both types of stations provide weather information to pilots, but are administered by different organizations. The AWOS system is administered by the FAA, while the AMOS system is administered by the National Weather Service.

16. *Background.* The FAA has developed a Special Category I (SCAT-I) precision landing and approach specification to enable the near-term use of GPS by privately-owned landing operations.[46] The purpose of the SCAT-I specification is to provide a standard means of transmitting GPS augmentation data from a ground reference station near an airport to aircraft approaching the landing area. The Commission's rules, however, do not currently provide a means for licensing the necessary data transmissions between the ground reference stations and aircraft.

17. By way of background, GPS is a satellite-based global navigation system originally developed by the U.S. Department of Defense to enhance the effectiveness of U.S. military forces. Over the years, GPS also has been used in civilian applications requiring precise location information (*e.g.*, mapping, surveying, and navigation). The GPS consists of twenty-four satellites, with the orbits of these satellites designed so that multiple satellites are passing over any given spot on the earth's surface at any given time. Each satellite transmits a time-coded signal. A GPS receiver then uses data from multiple satellites to rapidly calculate the location, altitude, and velocity of the vehicle or aircraft carrying the receiver.

18. The location accuracy achieved by a particular GPS receiver depends on the accuracy of each satellite's clock, variances in each satellite's orbit, and daily fluctuations in the radio propagation characteristics of the ionosphere. In addition, the accuracy of the GPS system is purposefully degraded by the Department of Defense for national security reasons. For civilian use, GPS receivers are generally considered to be accurate within approximately 100 meters horizontally. However, this accuracy can be improved to better than one meter by using a technique called "differential GPS." Differential GPS employs two GPS units or receivers. In addition to the mobile GPS receiver (*e.g.*, the receiver on an aircraft), another receiver (stationary receiver) is placed at a location where the precise coordinates are already known (reference point). The stationary receiver calculates the difference between the reference point and the predicted location using GPS data. The difference between the two locations is the error in the GPS signal. Differential GPS augmentation data can then be transmitted to a mobile GPS unit to increase the accuracy of the position information shown by that unit.

19. *Proposal.* On August 7, 1995, the FAA filed a Petition for Rule Making asking the Commission to authorize the use of VHF band frequencies for differential GPS transmissions.[47] We proposed in the *Aviation Safety NPRM* to allow entities participating in the FAA's SCAT-I landing and approach system to use unassigned VHF omni-range (VOR) frequencies in the 112-118 MHz band to transmit differential GPS augmentation data to aircraft.[48] We proposed a method of licensing differential GPS ground stations and asked for comment on the technical parameters that would govern their

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[46] The SCAT-I specification is formalized in RCA Document No. DO-217.

[47] FAA Petition at 1.

[48] *Aviation Safety NPRM*, 11 FCC Rcd at 15393. Frequencies in the 112-118 MHz band are now used exclusively by VOR stations and, pursuant to 47 C.F.R. § 87.475(a), all frequency assignments are made in accordance with recommendations made by the FAA. VOR stations are radio beacons that transmit two phase-related radio signals to aircraft in flight. Signals received from two VOR stations can be used by a pilot to determine the position of his or her aircraft. Differential GPS equipment, however, yields greater accuracy than using VOR stations to determine the position of an aircraft.

operation.[49] The FAA, the sole commenter addressing this issue, supports our proposal.[50]

20. *Decision.* We believe that permitting the use of unassigned VOR frequencies in the 112-118 MHz band by ground stations transmitting differential GPS augmentation data will improve safety in air navigation by promoting the use of satellite technology for the precision landing of aircraft. Using differential GPS augmentation data, aircraft equipped with a GPS unit will have access to extremely accurate position information. This position information will be critical in efforts to facilitate approaches and landings in poor weather conditions. Further, providing a means for private entities to license these ground reference stations will increase pilots' access to differential GPS augmentation data at airports where the FAA does not provide such information.

21. We remain sensitive to the potential for harmful interference to VOR transmissions in the 112-118 MHz band. By limiting ground reference station use to unassigned VOR frequencies, however, we eliminate the possibility of interference to VOR operations. Presently, the Commission assigns a VOR frequency to a particular landing approach based on a recommendation by the FAA.[51] The FAA recommends a particular frequency assignment in order to prevent interference to existing VOR frequencies at nearby landing approaches. By following the same approach for assigning new differential GPS ground station frequencies, we believe that we can avoid harmful interference to existing VOR transmissions in the 112-118 MHz band, as well as new VOR and differential GPS assignments in the future. In fact, the Commission has already granted nine developmental licenses for such systems and has received no complaints of harmful interference to VOR stations.[52] Therefore, we believe, and the FAA agrees, that the present method of coordinating VOR frequency assignments in the 112-118 MHz band is also an appropriate means to assign new differential GPS frequencies and prevent interference to existing VOR stations.[53]

22. Therefore, we are amending Part 87 of the rules to authorize the use of unassigned VOR frequencies in the 112-118 MHz band by ground reference stations transmitting differential GPS augmentation data. As discussed above, these ground stations will provide valuable navigation information to pilots in areas where FAA facilities are not available without causing harmful interference to existing VOR stations. Applicants for new ground reference stations will be required to file FCC Form 406,

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[49] *Id.* at 15394.

[50] FAA *ex parte* Summary (filed Apr. 3, 1997) (FAA *ex parte* Summary).

[51] *Id.* at 1.

[52] The nine systems are Interstate Electronics Corp., (landing area not listed), Anaheim, CA, granted 6/11/96; Intersate Electronics Corp., Mojave Airport, Mojave, AZ, granted 6/11/96; Continental Airlines Inc., Newark International Airport, Newark, NJ, granted 6/05/96; Metropolitan Airports Commission, Minneapolis-St Paul International Airport, Minneapolis, MN, granted 4/04/96; Aeronautical Radio Inc., Alliance Fort Worth Airport, Fort Worth, TX, granted 9/15/95; Honeywell Inc., Rochester Airport, Rochester, MN, granted 6/30/95; State of Wisconsin, Wittman Regional Airport, Oshkosh, WI, granted 10/28/93; Aeronautical Radio Inc., (landing area not listed), Newark, NJ, granted 11/15/93; Aeronautical Radio Inc., (landing area not listed), Houston, TX, granted 11/15/93.

[53] FAA *ex parte* Summary at 1.

"Application for Ground Station in the Aviation Services,"[54] and coordinate a frequency assignment, time slot, and three-letter station identifier with the FAA prior to application.[55] As suggested by the FAA, we will not limit the number of licensees serving a particular landing area approach so long as the FAA is able to recommend a frequency assignment and time slot consistent with the National Airspace System.[56]

23. Further, we will require that differential GPS ground station transmitters be certificated by the Commission under the technical specifications set forth in 47 C.F.R. §§ 87.131, 87.133(a)(5), 87.137(a), and 87.139(j). Consistent with our current procedure for certificating transmitters operating in the 108-137 MHz band, we will also provide a twenty-one day period for the FAA to object to any application for certification of transmitters that would adversely affect the performance of the National Airspace System.[57] This approach ensures that differential GPS ground station transmitters certificated by the Commission will not cause harmful interference to other types of radio-based navigation equipment installed in aircraft. Further, this approach provides flexible technical criteria under which entities can manufacture differential GPS equipment and promotes innovations in differential GPS equipment consistent with the National Airspace System (*e.g.*, changes in coding methodology or data timing structure) without requiring the Commission's Rules to be amended to incorporate changes unrelated to radiofrequency interference.

C. Use of Mobile Transmitters on Aeronautical Enroute Frequencies

24. *Background.* The Aeronautical Enroute Service provides air-ground communications for the operation control (flight management) of aircraft by aircraft operating companies. Communications relate to safe and efficient aircraft operation. Typical messages concern aircraft performance, fuel, weather, position reports, essential services, and supplies. Public correspondence (*i.e.*, private or personal messages of passengers or crew) is not permitted on enroute frequencies. The Aeronautical Enroute Service uses frequencies in the 128.825-132 MHz and 136.5-136.975 MHz bands.[58]

25. Functionally, aeronautical enroute stations can be divided into two basic categories: (a) networked stations, providing continuous communications along flight routes; and (b) local area stations, providing communications for the purpose of serving a particular airport. The network stations permit an aircraft operating company to maintain communications with its aircraft throughout their flights and for the aircraft to have immediate access to ground-based information and services in the event of an inflight

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[54] We are currently implementing the Universal Licensing System (ULS), an integrated licensing database for the wireless services which will replace eleven separate licensing databases and allow applicants to file all license-related applications electronically. *See* Biennial Regulatory Review -- Amendment of Parts 0, 1, 13, 22, 24, 26, 27, 80, 87, 90, 95, 97 and 101 of the Commission's Rules to Facilitate the Development and Use of the Universal Licensing System in the Wireless Telecommunications Services, *Report and Order*, WT Docket No. 98-20, __ FR _____ (_____, 1998). Implementation of the ULS will replace FCC Form 406 with FCC Form 601.

[55] The SCAT-I specification permits up to eight time slot assignments per frequency.

[56] FAA *ex parte* Summary at 1.

[57] 47 C.F.R. § 87.147(d).

[58] 47 C.F.R. § 87.263

emergency or flight diversion. The local area stations are used to communicate with aircraft approaching an airport or aircraft moving about the airport grounds. Typical messages handled by local area stations relate to terminal area operational matters, such as final weight and balance, predeparture clearance of the aircraft, aircraft servicing and parking information, systems status reports, and weather reports.

26. By way of background, in the early days of the aviation transport industry it was recognized that the limited number of suitable frequencies allocated for aeronautical use was not sufficient to allow each aviation organization in the United States to have its own system of radio stations along its various air routes. With encouragement from the Commission's predecessor, the Federal Radio Commission, the early air transport companies adopted a plan calling for coordination and cooperation in the use of aeronautical frequencies. As a result, Aeronautical Radio, Inc. (ARINC) was incorporated in 1929 as a private communications company dedicated to serving the communications need of the air transport industry on a non-profit, cost-sharing basis.

27. Of the approximately 5,000 local area stations in the continental United States and Hawaii, all are licensed to ARINC. Often, however, the stations licensed to ARINC are in fact staffed by a particular local user, *e.g.*, an airline or other organization operating aircraft at a local airport. ARINC exercises its control over these stations through lease-contract arrangements, whereby it leases the station from the user and executes an agreement with an appropriate user's employees binding them to ARINC's control. Nominal compensation is paid to ARINC under these agreements to cover the cost of ARINC's frequency management, licensee oversight, and liability insurance. ARINC makes periodic inspections of these stations in order to maintain control of station operations.

28. *Proposal.* On February 2, 1995, ARINC filed a Petition for Rule Making asking the Commission to amend Part 87 of the rules to permit the use of hand-held radios at local area aeronautical enroute stations operating in the 128.825-132 MHz band (air-band radios).[59] ARINC contends that these hand-held radios are needed in order to facilitate communications directly between flight crews and ground service personnel at an airport while an aircraft is on the ground.[60] ARINC contends that this need for a wireless radio link arises from recent FAA regulations concerning de-icing aircraft prior to take-off, increased traffic on airport runways, and the safety hazards associated with using tethered connections (*e.g.*, a wired connection between the aircraft and ground service personnel).[61] ARINC argues that the lack of a direct wireless communications capability compromises safety of airport personnel and can delay the provision of services or supplies to aircraft.[62] On November 21, 1996, we released the *Aviation Safety NPRM* proposing to permit the use of air-band radios to facilitate direct communications between flight crews and ground service personnel.

29. *Decision.* Currently, Part 87 of our rules does not permit direct communications between

[59] ARINC Petition at 1.

[60] *Id.*

[61] *Id.* at 2.

[62] *Id.*

flight crews and ground service personnel via air-band radios. Instead, flight crews and ground service personnel must communicate through an aeronautical enroute ground station (base station) at the airport or through a tethered connection to the plane. Although Part 90 of our rules permits the use of private land mobile radio (PLMR) frequencies in the 450 MHz band for communications around an airport terminal, this approach is not always practical because the air-band radios carried aboard aircraft are not usually capable of operation on air-band frequencies and the 450 MHz band PLMR frequencies.[63] Similarly, for ground service personnel, using the 450 MHz band to communicate with aircraft would mean that two separate hand-held units, an air-band radio and a private land mobile radio, would be needed to communicate with both the aeronautical enroute station and aircraft on the ground.

30. The FAA initially objected to the use of mobile transmitters in the Aeronautical Enroute Service because of the potential for interference to air traffic control communications and possible difficulty to protect the communications against this potential interference.[64] ARINC, in its Reply Comments, states that these mobile transmitters will be licensed and under the supervisory control of ARINC, its contract staffing agencies, and the air carriers, all of which would exercise reasonable measures to assure control of the mobile transmitters.[65] ARINC also notes that for the last three years ARINC has been authorized to use portable transmitters at temporary locations in conjunction with de-icing operations and no reports of interference have been received.[66] Further, on March 13,1998, ARINC filed Supplemental Comments, in which it states that ARINC, the Aeronautical Frequency Committee (AFC),[67] and FAA have met and agreed to a compromise to meet FAA's concerns.[68] Specifically, ARINC indicated that the FAA would rescind its objection to the proposed use of mobile transmitters on aeronautical enroute frequencies provided that the mobile transmitters will not operate on the air traffic control frequencies or cause interference to air traffic control communications and the operators of such transmitters will ensure that the personnel are properly trained in use of the equipment and know the limitations placed on its use.[69] Subsequently, the FCC received correspondence from FAA indicating its concurrence with such agreement.[70]

31. Therefore, we are amending Part 87 of the rules to allow the use of mobile radios for direct

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63 *See* 47 C.F.R. § 90.75(c)(25).

64 FAA Comments at 2.

65 ARINC Reply Comments at 2-3.

66 *Id.* at 5.

67 The Aeronautical Frequency Committee (AFC) is an ARINC sponsored industry committee providing assistance to ARINC and users of its services in the formulation of industry recommendations and policies relating to the allocation, assignment and use of the radio spectrum and international and domestic regulatory matters.

68 ARINC Supplemental Comments (filed March 13, 1998) (ARINC Supplemental)

69 *Id.* at 1.

70 *See* Letter from Gerald J. Markey, Program Director for Spectrum Policy and Management, Federal Aviation Administration to Magalie Salas, Secretary, Federal Communications Commission, dated April 2, 1998.

communications between ground service personnel and flight crews on frequencies allocated to the Aeronautical Enroute Service. As discussed above, the use of mobile radios at airports for communications by ground service personnel with aircraft or the associated enroute station will not operate on air traffic control frequencies or cause interference to air traffic control communications. Also, the operators of an aeronautical enroute station will ensure that personnel using the mobile radios are properly trained and made aware of the restriction on the use of the equipment.

D. Revised FAA Advisory Circulars

32. In the *Report and Order* in WT Docket No. 95-5, we incorporated, by reference, two FAA Advisory Circulars, "Obstruction Marking and Lighting" (AC 70/7460-1H), August 1991, as amended by Change 2, July 15, 1992, and "Specification for Obstruction Lighting Equipment" (AC 150/5345-43D), July 1988, in Part 17 of our rules.[71] The Commission chose this approach in order to unify federal guidelines concerning the painting and lighting of antenna structures. In doing so, the Commission stated that if the FAA makes substantive amendments to either of these Advisory Circulars, it would initiate a public proceeding prior to updating Part 17 of our rules.[72] In this connection, the FAA has made substantive amendments to both Advisory Circulars. Therefore, in the *Aviation Safety NPRM*, the Commission proposed to incorporate the revised FAA Advisory Circulars, AC 70/7460-1J (January 1, 1996) and AC 150/5345-43E (October 19, 1995), in Part 17 of our rules.[73]

33. The FAA, the single commenter addressing this issue, supports our proposal.[74] Therefore, we are amending Section 17.23 of the Commission's Rules, 47 C.F.R. § 17.23, to incorporate by reference the revised FAA Advisory Circulars, AC 70/7460-1J (January 1, 1996) and AC 150/5345-43E (October 19, 1995). Antenna structure owners that have previously been assigned painting and/or lighting specifications by the Commission, however, are not required to update their structures in accordance with the revised Advisory Circulars unless specifically recommended by the FAA. This approach ensures that new antenna structures will comply with the FAA's latest recommendations concerning air safety, and gives the Commission the flexibility to require owners to update existing painting and/or lighting systems in cases where the FAA believes that such action is warranted and would increase safety in air navigation.

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[71] *See* Streamlining the Commission's Antenna Structure Clearance Procedure and Revision of Part 17 of the Commission's Rules Concerning Construction, Marking, and Lighting of Antenna Structures, *Report and Order*, WT Docket No. 95-5, 11 FCC Rcd 4272 (1996). FAA Advisory Circulars are available upon request, free of charge, from Department of Transportation, Utilization and Storage Section (Publications), M443.2, 400 7th Street SW, Washington, DC 20591, telephone (202) 366-0039 or (202) 366-0451.

[72] *Id.* at 4292.

[73] *Aviation Safety NPRM*, 11 FCC Rcd at 15391. The Advisory Circulars are available in the Commission's docket file in this proceeding or may be purchased from the Commission's copy contractor, International Transcription Service, Inc., 2100 M Street, Suite 140, Washington, D.C. 20037, telephone (202) 857-3800. The Commission has obtained authorization from the Director of the Federal Register in order to incorporate by reference the two FAA Advisory Circulars in Part 17 of our rules. *See* 1 C.F.R. Part 51.

[74] FAA Comments at 2.

III. CONCLUSION

34. In view of the foregoing, we are amending Parts 17 and 87 of the rules to: (1) permit the operation of automated unicom stations, (2) facilitate the transmission of differential GPS augmentation data to aircraft, (3) allow ground crews at airports to communicate directly with flight crews using aeronautical enroute frequencies, and (4) incorporate, by reference, two revised FAA Advisory Circulars concerning antenna structure painting and lighting. These amendments will improve air safety by facilitating the implementation of state-of-the-art radio technologies promoting operational flexibility in the Aviation Services and will unify federal guidelines concerning the painting and lighting of antenna structures.

IV. PROCEDURAL MATTERS

A. Regulatory Flexibility Act

35. A Final Regulatory Flexibility Analysis with respect to the *Report and Order* is contained in Appendix B.

B. Ordering Clauses

36. Accordingly, **IT IS ORDERED** that, pursuant to the authority of Sections 4(i), 303(r), 307(e), and 332(a)(2) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 303(r), 307(e) and 332(a)(2), Parts 80 and 87 of the Commission's Rules, 47 C.F.R. Parts 17 and 87 **ARE AMENDED** as set forth in the attached Appendix, effective [**THIRTY DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER**].

37. **IT IS FURTHER ORDERED** that these proceedings are **TERMINATED**.

C. Contacts for Information

38. For further information, contact Jim Shaffer of the Public Safety and Private Wireless Division, Wireless Telecommunications Bureau at (202) 418-0680 or via E-Mail to "mayday@fcc.gov".

FEDERAL COMMUNICATIONS COMMISSION

Magalie Roman Salas

Magalie Roman Salas
Secretary

APPENDIX A

List of Commenters to the *Unicom NPRM*
Aircraft Owners and Pilots Association
AIRTAXI Inc.
Artais Weather Check, Inc.
Federal Aviation Administration
L. J. Aunchman
Robert J. Hepp
National Association of State Aviation Officials
Potomac Aviation Technology Corporation
Mark J. Swaney

List of Reply Commenters to the *Unicom NPRM*
Federal Aviation Administration
Potomac Aviation Technology Corporation

List of Commenters to the *Aviation Safety NPRM*
Aeronautical Radio Inc.
Federal Aviation Administration

List of Reply Commenters to the *Aviation Safety NPRM*
Aeronautical Radio Inc.
Federal Aviation Administration

List of Supplemental Commenters to the *Aviation Safety NPRM*
Aeronautical Radio Inc.
Federal Aviation Administration

APPENDIX B

Final Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act, 5 U.S.C. § 603 (RFA), Initial Regulatory Flexibility Analyses (IRFA) were incorporated in the *Notice of Proposed Rule Makings* WT Docket 96-1 and WT Docket 96-211.[75] The Commission sought written public comments on the proposals in the *Unicom NPRM* and *Aviation Safety NPRM*, including on the IRFA. The Commission's Final Regulatory Flexibility Analysis (FRFA) in this *Report and Order* (*R&O*) conforms to the RFA, as amended by the Contract With America Advancement Act of 1996.[76]

I. Need For and Objective of the Proposed Rules

2. Our objective is to improve safety in air navigation by increasing pilots' access to advisory information, promoting the use of satellite technology for the precision landing of aircraft and allowing ground crews to communicate with aircraft on aeronautical enroute frequencies, and to incorporate by reference two recently revised FAA Advisory Circulars. The *Report and Order* in this proceeding modified the Commission's rules to increase the safety and efficiency of aircraft navigation and movement of aircraft in and around airports.

3. The public interest is served by modifying our rules to permit the operation of aeronautical advisory stations (unicoms) in an unattended, automated mode, allow aeronautical ground stations to transmit differential GPS augmentation data to aircraft, allow the use of mobile radios for direct communications between ground service personnel and flight crews on Aeronautical Enroute Service frequencies and incorporate, by reference, two FAA Advisory Circulars.

II. Summary of Significant Issues Raised by the Public Comments in Response to the Initial Regulatory Flexibility Analysis

4. No comments were submitted in direct response to the IRFA. We have, however, reviewed general comments that may impact small businesses.

5. Much of the impact will be on small businesses that use, manufacture, design, import, or sell equipment, and will increase safety and efficiency at airports by allowing new uses and technologies for the purpose of communicating important information for flight and ground safety. Commenters submitted suggestions to improve the technical and operational criteria of the proposals. This *Report and Order*

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[75] Amendment of Part 87 of the Commission's Rules to Permit Automatic Operation of Aeronautical Advisory Stations (Unicoms), WT Docket 96-1, *Notice of Proposed Rule Making*, 11 FCC Rcd 1084 (1996) (*Unicom NPRM*); Amendment of Part 87 to Permit the Use of 112-118 MHz for Differential Global Positioning System (GPS) Correction Data and the Use of Hand-held Transmitters on Frequencies in the Aeronautical Enroute Service and Amendment of Part 17 Concerning Construction, Marking, and Lighting of Antenna Structures, WT Docket No. 96-211, *Notice of Proposed Rule Making*, 11 FCC Rcd 15391 (1996) (*Aviation Safety NPRM*).

[76] Pub. L. No. 104-121, 110 Stat. 847 (1996) (CWAAA). Title II of the CWAAA is "The Small Business Regulatory Enforcement Fairness Act of 1996" (SBREFA), *codified at* 5 U.S.C. § 601 *et seq.*

directly benefits small businesses by providing smaller airports that do not have sufficient resources to staff a unicom station with an automated and economically viable alternative to provide important advisory information, providing airports with satellite technology for the precision landing of aircraft to facilitate approaches and landings in poor weather conditions, and improving the safe ground operations at airports and improve the provision of services and supplies to aircraft on the ground. These actions should increase the safety and efficiency of aircraft navigation and movement of aircraft in and around airports.

III. Description and Estimate of the Number of Small Entities to which the Rules Apply

6. The rules adopted in this *Report and Order* will affect small businesses that use, manufacture, design, import, sell, or use aviation equipment designed for an automated unicom, a GPS augmentation system operating in the 112-118 MHz band, and mobile radios used for direct communications between ground service personnel and flight crews on Aeronautical Enroute Service frequencies. There are no Commission-imposed requirements, however, for any entity to use these products.

Estimates for unicoms

7. The unicom service provides for air-ground communications primarily between general aviation aircraft and airport facilities. Unicom transmissions are limited to the necessities of safe and expeditious operation of aircraft, including runway conditions, types of fuel available, wind conditions, weather information, dispatching, and other necessary safety information. Unicom transmissions may include, on a secondary basis, communications pertaining to the efficient portal-to-portal transit of an aircraft, such as available ground transportation, food, and lodging. Unicoms must provide impartial information concerning available ground services, and must provide service to any aircraft station upon request and without discrimination. For the purpose of determining whether a licensee is a small business as defined by the Small Business Administration (SBA), each licensee would need to be evaluated within its own business area.

8. Because the Regulatory Flexibility Act amendments were not in effect until the record in this proceeding was closed, the Commission was unable to request information regarding the number of small entities that are unicoms. Therefore, the Commission is unable at this time to determine the number of small businesses which could be impacted by the rules. However, the Commission's data indicates that there were 2775 unicoms licensees operating at the end of October 1996. Further, because any entity engaged in providing unicom service is eligible to hold a unicom license, these rules could potentially impact every small business involved in aviation. Additionally, there are small businesses that will manufacture, design, import, or sell equipment. We concluded that these small businesses are classified in Communications Equipment, N.E.C., (Standard Identification Code 3669) as entities employing less than 750 employees as defined in 13 C.F.R. § 121.201. The size data provided by the SBA shows that 469 firms out of 498 firms in the Communications Equipment, N.E.C. classification have less than 750 employees but did not enable us to make a meaningful estimate of the number of potential manufacturers which are small businesses.[77]

Estimates for differential GPS

[77] U.S. Small Business Administration 1992 Economic Census Industry and Enterprise Report, Table 1D, SIC Code 3669, (Bureau of the Census data adapted by the Office of Advocacy of the U.S. Small Business Administration).

9. Differential GPS is ground reference stations licensed to private entities using unassigned VOR frequencies in the 112-118 MHz band to transmit differential GPS augmentation data to aircraft to improve safety in approach and landing of aircraft. For the purpose of determining whether a licensee is a small business as defined by the Small Business Administration (SBA), each licensee would need to be evaluated within its own business area. Additionally, there are small businesses that will manufacture, design, import, or sell equipment. We concluded that these small businesses are classified in Communications Equipment, N.E.C., (Standard Identification Code 3669) as entities employing less than 750 employees as defined in 13 C.F.R. §121.201. We invited comment on whether this is the correct definition to use, but received no comment on this issue. The size data provided by the SBA shows that 469 firms out of 498 firms in the Communications Equipment, N.E.C. classification have less than 750 employees but did not enable us to make a meaningful estimate of the number of potential GPS manufacturers which are small businesses.[78] However, based on information from the U.S. GPS Industry Council we estimate that this would include approximately 110 small businesses that would be affected by this proposed rule change.

IV. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements of the Rules

10. There are several reporting, recordkeeping, and compliance requirements applicable to the Commission licensees and equipment manufacturers. These new requirements are necessary to minimize radiofrequency interference of the equipment, and to specify the responsibilities in operating unicom .

(1) In order to facilitate operation of aviation equipment, these rules may have significant economic impact on a substantial number of small businesses. Prior to marketing aviation equipment in the U.S., a manufacturer must have the unit type accepted by the Commission under the technical criteria set forth in the Commission's Rules. In order to have a unit type accepted, a small entity would have to test the radio equipment and provide clerical support to file the requisite FCC application forms. Both of these functions could be handled by a third party. We estimate that the initial cost to the manufacturer to meet this requirement, if done by a third party, is $900 to test the equipment and complete the filing information, and would require the electronic engineering professional skills. Additionally, there would be a $425 equipment authorization fee to file the application for type acceptance. These costs are one time costs to type accept the equipment and assure that interference to other radio users is minimized.

(2) In order to clarify the responsibilities in operating unicoms, we require all unicom licensees at airports having more than one unicom to jointly sign a letter of agreement, prior to the operation of a unicom in automatic mode at such an airport, stating the name(s) of the licensee(s) who will control the automatic unicom and, if applicable, how control of the automatic unicom will be divided. A copy of the agreement must be kept with each licensee's station authorization. We estimate that approximately 50 licensees will require 0.7 hours to prepare and file the agreement required.

[78] U.S. Small Business Administration 1992 Economic Census Industry and Enterprise Report, Table 1D, SIC Code 3669, (Bureau of the Census data adapted by the Office of Advocacy of the U.S. Small Business Administration).

V. Steps Taken By Agency to Minimize Significant Economic Impact on Small Entities Consistent with Stated Objectives

11. The rules would require differential GPS transmitters to be type accepted in accordance with the technical criteria set forth in Part 87 Subpart D of our rules, in lieu of the more exacting specifications contained in RTCA Document No. DO-217. This flexible approach promotes technological innovations in differential GPS equipment so long as such equipment is compatible with the National Airspace System. Under our present treatment of transmitters operating in the 108-137 MHz band, the FAA is given a 21-day period to object to any application for type acceptance that would adversely affect the performance of the National Airspace System. The rules also take measures to expedite coordination procedures between applicants, the FAA, and the Commission concerning the assignment of a frequency and time slot for differential GPS ground stations. In order to reduce administrative burdens on both the public and the Commission, we permit mobile units in the aeronautical enroute service to operate under the same authorization and call sign as the associated aeronautical enroute station. This approach would eliminate the need for aviation service organizations to submit forms and fees to the Commission. These decisions benefit small entities and give them an opportunity to provide recommendations to further improve the impact and processes.

VI. Report to Congress

12. The Commission shall send a copy of this Final Regulatory Flexibility Analysis, along with the Report and Order, in a report to Congress pursuant to the SBREFA.[79] A copy of this FRFA will also be published in the Federal Register.

[79] *See* 5 U.S.C. § 801(a)(1)(A).

APPENDIX C

FINAL RULES

Parts 17 and 87 of Chapter I of Title 47 of the Code of Federal Regulations are amended as follows:

PART 17 - CONSTRUCTION, MARKING, AND LIGHTING OF ANTENNA STRUCTURES

1. The authority citation for Part 17 continues to read as follows:

Authority: Secs. 4, 303, 48 Stat. 1066, 1082, as amended; 47 U.S.C. 154, 303. Interpret or apply secs. 301, 303 48 Stat. 1081, 1085 as amended, 47 U.S.C. 301, 309.

2. Section 17.23 is revised to read as follows:

§ 17.23 Specifications for painting and lighting antenna structures.

Unless otherwise specified by the Commission, each new or altered antenna structure to be registered on or after January 1, 1996, must conform to the FAA's painting and lighting recommendations set forth on the structure's FAA determination of "no hazard," as referenced in the following FAA Advisory Circulars: AC 70/7460-1J, "Obstruction Marking and Lighting," January 1, 1996, and AC 150/5345-43E, "Specification for Obstruction Lighting Equipment," October 19, 1995. These documents are incorporated by reference in accordance with 5 U.S.C. 552(a). The documents contain FAA recommendations for painting and lighting structures which pose a potential hazard to air navigation. For purposes of this part, the specifications, standards, and general requirements stated in these documents are mandatory. The Advisory Circulars listed above are available for inspection at the Commission Headquarters in Washington, DC, or may be obtained from Department of Transportation, Property Use and Storage Section, Subsequent Distribution Office, M483.6, Ardmore East Business Center, 3341 Q 75th Avenue, Landover, MD 20785, telephone (301) 322-4961, facsimile (301) 386-5394.

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, unless otherwise noted. Interpret or apply 48 Stat. 1064-1068, 1081-1105, as amended, 47 U.S.C. 151-156, 301-609.

4. Section 87.5 is amended by revising the definition of "automatic weather observation station" to read as follows:

§ 87.5 Definitions.

* * * * *

Automatic weather observation station (AWOS) or automatic surface observation station (ASOS). A land station located at an airport and used to automatically transmit weather information to aircraft.

* * * * *

5. Section 87.131 is amended by adding a footnote to Aeronautical utility mobile entry and adding to the end of the table, the class of station for Differential GPS to read as follows:

§ 87.131 Power and emissions.

Class of Station	Frequency band/frequency	Authorized emission	Maximum power[1]
* * * * *			
Aeronautical utility mobile	VHF	A3E	10 watts[10]
* * * * *			
Aircraft earth	UHF	G1D,G1E,G1W	60 watts.[8]
Differential GPS	VHF	G7D	Various.[2]

[1] The power is measured at the transmitter output terminals and the type of power is determined according to the emission designator as follows:
(i) Mean power (pY) for amplitude modulated emissions and transmitting both sidebands using un modulated full carrier.
(ii) Peak envelope power (pX) of all emissions designators other than those referred to in paragraph (i) of this row.

[2] Power and antenna height are restricted to the minimum necessary to achieve the required service.

* * * * *

[8] Power may not exceed 60 watts per carrier. The maximum EIRP may not exceed 2000 watts per carrier.

* * * * *

[10] Power is limited to 0.5 watts, but may not exceed 2 watts when station is used in an automatic unattended mode.

6. Section 87.133 is amended by adding to the table in paragraph (a) in the (5) Band-100 to 137 MHz: entry, the category of station Differential GPS to read as follows:

§ 87.133 Frequency stability.

Frequency band (lower limit exclusive,upper limit inclusive), and categories of stations.	Tolerance[1]	Tolerance[2]
* * * * *		
(5) Band-100 to 137 MHz:		
Aeronautical stations [4]	50	50
* * * * *		
Radionavigation stations	20	20
Differential GPS [2]		
* * * * *		

[1] This tolerance is the maximum permitted until January 1, 1990, for transmitters installed before January 2, 1985, and used at the same installation. Tolerance is indicated in parts in 10^6 unless shown as Hertz (Hz).

[2] This tolerance is the maximum permitted after January 1, 1985, for new and replacement transmitters after January 2, 1990. Tolerance is indicated in parts in 10^6 unless shown as Hertz (Hz).

* * * * *

[4] The tolerance for transmitters approved between January 1, 1966, and January 1, 1974, is 30 parts in 10^6. The tolerance for transmitters type accepted after January 1, 1974, and stations using offset carrier techniques is 20 parts in 10^6.

* * * * *

7. Section 87.137 is amended by adding to the table in paragraph (a) in its alphabetical order, the class of emission G7D to read as follows:

§ 87.137 Types of emission.

* * * * *

Class of emission	Emission designator	Authorized bandwidth (kilohertz) Below 50 MHz	Above 50 MHz	Frequency Deviation
* * * * *				

G7D..... 14K0G7D 25

* * * * *

8. Section 87.139 is amended by revising paragraph (a), and adding a new paragraph (j) to read as follows:

§ 87.139 Emission limitations.

(a) Except for ELTs and when using single sideband (R3E, H3E, J3E), or frequency modulation (F9) or digital modulation (F9Y) for telemetry or telecommand in the frequency bands 1435-1535 MHz and 2310-2390 MHz or digital modulation (G7D) for differential GPS, the mean power of any emission must be attenuated below the mean power of the transmitter (pY) as follows:

* * * * *

(j) When using G7D for differential GPS in the 112-118 MHz band, the amount of power during transmission under all operating conditions when measured over a 25 kHz bandwidth centered on either of the second adjacent channels shall not exceed -25 dBm and shall decrease 5 dB per octave until -52 dBm.

9. Section 87.171 is amended by adding in its alphabetical order the symbol and class of station for DGP to read as follows:

§ 87.171 Class of station symbols.

* * * * *

DGP - Differential GPS

* * * * *

10. Section 87.173 is amended by revising the frequency table in paragraph (b) to add the listing 112-118 MHz.

§ 87.173 Frequencies

(b) * * *

Frequency or frequency band	Subpart	Class of station	Remarks
* * * * *			
112-118 MHz.....	Q	DGP	Differential GPS

* * * * *

11. Section 87.187 is amended by revising paragraph (y) introductory text and the first sentence in paragraph (y)(4) to read as follows:

§ 87.187 Frequencies.

* * * * *

(y) Brief keyed RF signals (keying the transmitter by momentarily depressing the microphone "push-to-talk" button) may be transmitted from aircraft for the control of automated unicoms on the unicom frequencies listed in paragraph (y)(3) of this section, or for the control of airport lights on the following frequencies:

* * * * *

(4) Aviation support station frequencies listed in § 87.323(b): * * *

* * * * *

12. A new Section 87.219 is added to Subpart G to read as follows:

§ 87.219 Automatic operations.

(a) A station operator need not be present when an automated unicom is in operation.

(b) Unicoms operating in an automated mode must comply with the requirements of (1)-(5) below, in addition to the requirements applicable to non-automated unicom operations.

(1) An automated unicom must transmit only in response to interrogating signals from aircraft, including but not limited to the brief keyed RF signals specified in § 87.187(y).

(2) An automated unicom must monitor the unicom frequency prior to transmission, and provide a brief delay between the aircraft's interrogating signal and the automatic unicom's response.

(3) Automated advisory transmissions must be as brief as possible, and must never exceed one minute in length.

(4) An automated unicom may not provide weather information at an airport that has an operational, FAA-certified, automatic weather facility, unless the unicom itself is certified by the FAA.

(5) If weather information is provided by an automated unicom:

(i) weather sensors must be placed in order to adequately represent the weather conditions at the airport(s) to be served;

(ii) the weather information must be proceeded by the word "advisory;"

(iii) the phrase "automated advisory" must be included when the weather information was gathered

by real-time sensors or within the last minute; and,

(iv) the time and date of the last update must be included when the weather information was not gathered within the last minute.

(c) Only one automated unicom may be operated at an uncontrolled airport. Prior to the operation of an automated unicom at an airport with more than one unicom licensee, all of the licensees at that airport must sign a letter of agreement stating which licensee(s) control the automated unicom operations, and, if control is to be shared among several operators, how that control will be divided or scheduled. The original or a copy of the letter of agreement must be kept with each licensees' station records. Within 90 days of the date upon which a new unicom operator is licensed at an airport where more than one unicom is authorized, and an automated unicom is being operated, an amended letter of agreement that includes the new licensee's signature must be signed or automated unicom operations must cease.

13. Section 87.261 is amended by adding paragraph (e) and (f) to read as follows:

§ 87.261 Scope of Service

* * * * *

(e) Mobile units may be operated under an aeronautical enroute station authorization so long as the units are limited to use at an airport and are only used to communicate with aircraft on the ground or the associated aeronautical enroute station. Mobile units are further limited to operation on the VHF frequencies listed in 87.263(a)(1).

(f) Mobile units licensed under paragraph (e) shall not be operated on air traffic control frequencies, nor cause harmful interference to, communications on air traffic control frequencies.

14. Section 87.419 is revised to read as follows:

§ 87.419 Supplemental eligibility.

Only one control tower or RCO will be licensed at an airport.

15. Section 87.475 is amended by adding paragraph (e) to read as follows:

§ 87.475 Frequencies.

* * * * *

(e) *Frequencies available for differential GPS stations.* Frequencies in the 112-118 MHz band may be assigned to Special Category I (SCAT-I) ground stations for differential GPS data links.

(1) The frequencies available are on 25 kHz centers with the lowest assignable frequency being centered at 112.000 MHz and the highest assignable frequency being centered at 117.950 MHz

(2) Applicants must coordinate a frequency, time slot assignment, and three-letter identifier with the FAA and provide this information to the Commission upon application.

16. Subpart S is amended by revising the heading to read as follows:

Subpart S - Automatic Weather Stations (AWOS/ASOS)

17. Section 87.525 is revised to read as follows:

§ 87.525 Scope of service.

Automatic weather observation stations (AWOS) and automatic surface observation stations (ASOS) must provide up-to-date weather information including the time of the latest weather sequence, altimeter setting, wind speed and direction, dew point, temperature, visibility and other pertinent data needed at airports having neither a full-time control tower nor a full-time FAA Flight Service Station. When a licensee has entered into an agreement with the FAA, an AWOS or an ASOS may also operate as an automatic terminal information station (ATIS) during the control tower's operating hours.

18. Section 87.527 is amended by revising the first sentence of paragraph (b) and paragraph (c) to read as follows:

§ 87.527 Supplemental eligibility.

* * * * *

(b) Eligibility for an AWOS, an ASOS, or an ATIS is limited to the owner or operator of an airport or to a person who has entered into a written agreement with the owner or operator for exclusive rights to operate and maintain the station. Where applicable a copy of the agreement between the applicant and owner or operator of the airport must be submitted with an application.

(c) Only one AWOS, ASOS, or ATIS will be licensed at an airport.

19. Section 87.529 is amended by revising the fourth and fifth sentences to read as follows:

§ 87.529 Frequencies.

* * * Normally, frequencies available for air traffic control operations set forth in subpart E will be assigned to an AWOS, ASOS, or to an ATIS. When a licensee has entered into an agreement with the FAA to operate the same station as both an AWOS and as an ATIS, or as an ASOS and an ATIS, the same frequency will be used in both modes of operation.