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

In the Matter of	)
	)
Amendment of Sections 87.131, 87.133,	)
87.137, 87.173, 87.345, and 87.349 of	)
the Commission's Rules Regarding	)
Aeronautical Utility Mobile Stations	)

PETITION FOR RULEMAKING

OF THE

NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION

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Pursuant to Section 1.401 of the Federal Communications Commission's ("Commission's") rules, 47 C.F.R § 1.401, the National Telecommunications and Information Administration (NTIA) hereby submits this petition for rulemaking to amend 47 C.F.R. Part 87, to allow Aeronautical Utility Mobile Stations to use the 1090 MHz frequency for runway vehicle identification and collision avoidance. The Federal Aviation Administration (FAA) strongly supports this new application in order to improve runway safety. This petition proposes to change the following rule sections:

Rule Section	Title	Description
§ 87.131	Power and emissions	Table governing authorized emissions and maximum power
§ 87.133 (a)(7)	Frequency stability	Governs frequency stability requirements
§ 87.137 (a)	Types of emission	Types of emission
§ 87.173	Frequencies	Table listing assignable carrier frequencies, the subparts of Part 87 that are applicable to the use of

		that frequency, and the class of station that is assignable
§ 87.345	Scope of service	Defines the scope of service of Aeronautical Utility Mobile Stations
§ 87.349	Frequencies	Governs the frequencies that may be used for Aeronautical Utility Mobile Stations

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In this petition, NTIA proposes to add the 1090 MHz frequency for use by Aeronautical Utility Mobile Stations, together with limitations on, and technical requirements for, such use. The proposals would allow air traffic control (ATC) to identify service vehicles transiting within the airport movement area, enhance ATC ability to control vehicle movement, and thereby reduce the risk of aircraft colliding with vehicles on the airport surface. Providing ATC with the ability to control service vehicle movement on the airport movement area would significantly reduce the number of incidents occurring there and increase overall safety. NTIA therefore requests that the Commission make the following amendments to Part 87 of Title 47 of the Code of Federal Regulations:

1. Add 1090 MHz as a frequency that can be used by the Aeronautical Utility Mobile class of station (Sections 87.131; 87.173(b); and 87.349);

2. Add an authorized emission of M1D (Section 87.131);

3. Add a maximum transmit power of 20 watts (Section 87.131);

4. Add a frequency stability requirement of 1 part per million for Aeronautical Utility Mobile Stations operating on 1090 MHz (Section 87.133(a)(7));

5. Add the assignable emission designator of 14M00M1D (Section 87.137(a));

6. Add an authorized -20dB bandwidth of 14 MHz for a 1090 MHz Aeronautical Utility Mobile Station (Section 87.137(a)); and

7. Add 1090 MHz vehicle squitters to the scope of service for Aeronautical Utility Mobile Stations, but with the following limitations (Section 87.345):

a. the license may only be issued to airport authorities or entities approved by the FAA and coordinated by the Commission through the Interdepartment Radio Advisory Committee (IRAC) process;
b. limit the license to cover a maximum of two hundred (200) 1090 MHz Aeronautical Utility Mobile Stations per location;
c. limit the licensing to only those locations that are within the vicinity of an FAA ASDE-X multilateration system or ADS-B equipment, and/or where the primary purpose for seeking transmit authorization is to provide surface data to aircraft and air traffic control authorities.
d. limit transmissions to a maximum of twice per second if the vehicle is in motion or a maximum of once every five seconds if the vehicle is stationary.

The proposed amendments would advance the public interest in reducing runway incursions; help to protect the flying public, airlines, and airport employees from injury or death arising from an aircraft collision with a vehicle when landing, departing, or taxiing at an airport; protect the flying public and airline crew members from injury or death due to evasive maneuvers that may be required to avoid a vehicle operating on the airport surface; and reduce the risk of property loss due to damage resulting from a runway incursion.[1] Accordingly, NTIA requests that the Commission initiate a rulemaking to modify the applicable sections of its rules as requested herein.[2]

In response to growing concern about airplanes and vehicles colliding on the airport surface, the FAA has taken steps to reduce the risk of runway incursions. Chief among these is the introduction of the new technology: airport surface detection equipment (ASDE).

[1] *See generally* Runway Safety Improvement Act of 2008, S. 2941, 110 Cong. 2d Sess. introduced by Senator Lautenberg Apr. 30, 2008); Sniffen, M., *High Risk of Runway Collision Plagues U.S.*, Associated Press, *available at* http://www.aviation.com/safety/071206-ap-us-runway-collision-danger.html (posted Dec. 6, 2007).

[2] These proposed changes appear in the attached Annex in bold italics.

ASDE developed in two stages. The first phase implemented greater control over aircraft movement on the airport movement area by deploying a system referred to as ASDE-X. ASDE-X uses multilateration in conjunction with aircraft transponder transmissions on 1090 MHz. By receiving the responses of aircraft on 1090 MHz at multiple locations on the airport surface, the multilateration equipment triangulates and determines the precise location of the aircraft. Additionally, the identification information contained in aircraft's transmission on 1090 MHz is received and displayed in the ATC tower. This capability enables air traffic controllers to better manage the movement of air traffic on the runway movement area regardless of visibility.

However, the current system does not allow the positive identification of vehicles transiting the runway movement area. The second phase of the program uses ASDE-X to tackle this problem by enhancing the identification of vehicles and aircraft operating on the airport movement area. Currently, snowplows, emergency vehicles, and maintenance vehicles that routinely operate on the runway movement area are not quickly identified by air traffic control. These vehicles must contact the control tower on very high frequency (VHF) radio prior to entering the runway movement area. Unless the control tower can actually see the vehicle, the tower, even if equipped with surface movement radars such as provided by ASDE-X, can tell the precise location of the vehicle relative to aircraft only by its unidentified icon on the radar screen. There is no means to identify the specific type of vehicle or the operator.

Since many different vehicles often transit the runway movement area, a controller's ability to identify a vehicle quickly and give appropriate directions to the driver (via VHF radio) can be critical to the safe flow of traffic. Vehicles "squittering" on 1090 MHz will provide this identification, and equip air traffic controllers with both visual and audible communication with

vehicles.[3] This enables the control and safe management of aircraft and vehicle flow on runways, taxiways, and other areas of the airport used by aircraft. Additionally, because vehicles squittering on 1090 MHz will be detected by ASDE-X, air traffic controllers will receive an audible alert prior to a potential mishap if an aircraft is entering or approaching a runway occupied by a vehicle.

Both 1090 MHz and 978 MHz were originally chosen to support another FAA program called Automatic Dependent Surveillance-Broadcast (ADS-B). To allow use of 978 MHz as a radio link for ADS-B, Part 87 was amended to permit transmission for Aeronautical Utility Mobile Stations on 978 MHz by Universal Access Transceivers (UAT). However, the development of equipment to receive 978 MHz and integrate this information into the existing ASDE-X system is not mature.

Air traffic control already uses 1090 MHz for other applications such as secondary surveillance radar, traffic collision and avoidance system, and precision runway monitoring. Thus, aircraft are already equipped with the electronics to transmit on 1090 MHz. The maturity of 1090 MHz systems made the development of a 1090 MHz vehicle squitter simpler and more cost effective than at 978 MHz. In addition, the existing ASDE-X system supports the reception of 1090 MHz transmissions, which expedites the development and deployment of vehicle identification capabilities on the airport surface.

Minimum Operational Performance Standards (MOPS) have been written that define the performance requirements for vehicle radios transmitting on 1090 MHz.[4] The FAA is finalizing

[3] "Squitter" refers to random output pulses from a transponder caused by ambient noise, or by an intentional random triggering system, but not by the interrogation pulses. ANSI/IEEE Std. 100-1988. Institute of Electrical and Electronic Engineers (IEEE) Standard Dictionary of Electrical and Electronic Terms, American National Standards.

[4] *See* RTCA/DO-260A, *Minimum Operational Performance Standards for 1090 MHz Extended Squitter Automatic Dependent Surveillance – Broadcast (ADS-B) and Traffic Information Services – Broadcast (TIS-B)* (dated Apr. 10, 2003), as modified by Change 1 to RTCA/DO-260A (dated June 27, 2006), and Change 2 to RTCA/DO-260A

an Advisory Circular (AC) that will further define the performance and operational requirements of 1090 MHz vehicle squitters. When an applicant for Commission equipment certification notifies the FAA of a filing with the Commission, in addition to the technical requirements proposed herein, the FAA will evaluate the transmitters against the MOPS and AC.[5] Each location will also need to be coordinated through the IRAC process.

The FAA has analyzed whether the use of 1090 MHz by vehicles would degrade the performance of existing systems that rely on 1090 MHz.[6] The analysis showed that if the number of vehicles "squittering" on 1090 MHz was 200 or fewer, and if the transmit power was 20 watts or less, there was no operational impact to the performance of existing systems.[7]

In addition the FAA, through RTCA, assessed external and on-board interference to the Global Positioning System (GPS) frequency 1176.45 ± 12 MHz (L5) including 1090 MHz systems.[8] While this assessment was not specific to vehicles on the surface movement area, FAA calculations for vehicle squitters show that there is no impact to GPS L5 operations.

The FAA then conducted tests on the feasibility of integrating 1090 MHz vehicle squitters into the ASDE-X system. The testing allowed for the fine adjustment of the technology and monitoring impact to existing 1090 MHz systems. The FAA is confident that 1090 MHz

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(dated Dec. 13, 2006). RTCA documents can be purchased at RTCA, Inc, 1828 L Street, N,W., Suite 805, Washington, DC 20036 or ordered through the RTCA website: http://www.rtca.org

[5] *See* Title 47 CFR Section 87.147(d) (requiring that an applicant for certification of equipment intended for transmission in the 960-1215 MHz band notify the FAA of the filing of a certification application).

[6] *See* DOT VOLPE Center, "Effects of Extended Squitter Position Reporting From Ground Vehicles on the Performance of the Mode-S Radar System" (Oct. 18, 2002).

[7] *See* DOT VOLPE Center, "Predicted Interference Effects of Various 1030/1090 MHz Systems on SSR and TCAS" (Jan. 12, 2007).

[8] *See* RTCA SC-159 *Assessment of Radio Frequency Interference Relevant to the GNSS L5/E5A Frequency Band*, DO-292 (dated July 29, 2004). *See* note 3 *supra* for information on how RTCA documents may be obtained.

vehicle squitters can be successfully integrated into the National Airspace System without degrading the performance of existing systems that rely on 1090 MHz.

As the number of aircraft increase, the risk of incidents between aircraft and vehicles operating on the airport movement area also grows. Airports are consequently experiencing more runway incursions.

Vehicle squitters would increase ATC awareness of vehicles operating on the movement area, give ATC the ability to positively identify the involved vehicles, and, as a result, decrease the time to respond to an impending incident. Thus, vehicle squitters will reduce the likelihood of a mishap on the runway surface.

Airport authorities familiar with the FAA's testing of vehicle squitters are eager to add this technology to their vehicles and have expressed this need many times to the FAA. The press has noted the benefits to be derived from vehicle squitters and questioned why implementation of this technology is lagging.[9]

The flying public directly benefits from reductions in aircraft mishaps. The United States has the safest air traffic control system in the world. Additions such as 1090 MHz vehicle squitters will only improve the nation's safety record.

In conclusion, ASDE-X technology, when used for vehicle identification and collision avoidance in the runway movement area, can enhance aviation safety. To deploy ASDE-X for this purpose in a timely fashion, associated vehicle squitters need to be implemented on the 1090

[9] *See, e.g.*, Levin, A. "Runway safety system has gap," USA Today, (posted April 5, 2007), available at http://www.usatoday.com/news/nation/2007-04-05-runway-safety_N.htm.

MHz frequency. NTIA accordingly asks that the Commission modify Part 87 to permit the implementation of 1090 MHz vehicle squitters within the National Airspace System.

Respectfully submitted,

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ANNEX

Proposed Amendments to

47 CFR Part 87

TITLE 47--Telecommunication

CHAPTER I--FEDERAL COMMUNICATIONS COMMISSION

SUBCHAPTER D--SAFETY AND SPECIAL RADIO SERVICES

PART 87--AVIATION SERVICES

Subpart D--TECHNICAL REQUIREMENTS

§ 87.131 Power and emissions.

The following table lists authorized emissions and maximum power. Power must be determined by direct measurement.

Class of station	Frequency band/frequency	Authorized emission(s)[9]	Maximum power[1]
….			
Airport control tower	VHF	A3E, G1D, G7D	50 watts.
	Below 400 kHz	A3E	15 watts.
Aeronautical utility mobile	VHF	A3E	10 watts.
	1090 MHz	***M1D***	***20 watts***
Radionavigation land test	108.150 MHz	A9W	1 milliwatt.
	334.550 MHz	A1N	1 milliwatt.
…..			

[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 sideband using unmodulated full carrier.

(ii) Peak envelope power (pX) for all emission designators other than those referred to in paragraph (i) of this note.

....

[9]Excludes automatic link establishment.

....

§ 87.133 Frequency stability.

(a) Except as provided in paragraphs (c), (d), and (f) of this section, the carrier frequency of each station must be maintained within these tolerances:

Frequency band (lower limit exclusive, upper limit inclusive), and categories of stations	**Tolerance[1]**	**Tolerance[2]**

….

(7) Band-470 to 2450 MHz:		
Aeronautical stations	100	20
Aircraft stations	100	20
Aircraft earth station		320 Hz[11]
Aeronautical utility mobile station	***1***	***1***
Radionavigation stations:		
470–960 MHz	500	500
960–1215 MHz	20	20
1215–2450 MHz	500	500

….

[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 in Hertz (Hz).

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

….

[11] For purposes of certification, a tolerance of 160 Hz applies to the reference oscillator of the AES transmitter. This is a bench test.

…..

§ 87.137 Types of emission.

(a) The assignable emissions, corresponding emission designators and authorized bandwidths are as follows:

Class of emission	Emission designator	Authorized bandwidth (kilohertz)		
		Below 50 MHz	Above 50 MHz	Frequency deviation
	….			
J9W[11]	2K80J9W	3.0		
M1A	620HM1A			
M1D	***14M00M1D***	***14.0***		
NON	NON		None[15]	
PON[13]	([9])		([9])	
R3E[1112]	2K80R3E	3.0		
XXA[14]	1K12XXA	2.74		

.....

[9] To be specified on license.

….

[11]For A1A, F1B and single sideband emissions, except H2B, the assigned frequency must be 1400 Hz above the carrier frequency.

[12]R3E, H3E, and J3E will be authorized only below 23000 kHz. Only H2B, J3B, J7B and J9W are authorized, except that A3E and H3E maybe used only on 3023 kHz and 5680 kHz for search and rescue operations.

[13] The letters “K, L, M Q, V , W and X” may also be use din place of the letter ‘P” for pulsed radars.

[14]Authorized for use at radiobeacon stations.

[15]Applicable only to transmitters of survival craft stations, emergency locator transmitter stations and emergency locator transmitter test stations approved after October 21, 1973.

….

Subpart E—Frequencies

§ 87.173 Frequencies.

….

(b) Frequency table:

Frequency or frequency band	Subpart	Class of station	Remarks
….			
979.000 MHz	Q	RLT	
1030.000 MHz	Q	RLT	
1090.000 MHz	***L***	***MOU***	***Vehicle Squitter.***
1104.000 MHz	Q	RLT	
1300–1350 MHz	F, Q	MA, RLS	Surveillance radars and transponders.
….			

Subpart L—Aeronautical Utility Mobile Stations

§ 87.345 Scope of service.

Aeronautical utility mobile stations provide communications for vehicles operating on an airport movement area. An airport movement area is defined as the runways, taxiways and other areas utilized for taxiing, takeoff and landing of aircraft, exclusive of loading ramp and parking areas.

….

(***g) Transmissions by aeronautical utility mobile stations operating with 1090 MHz vehicle squitters may be authorized based on:***

(1) A single license can be obtained for operation of up to two hundred (200) 1090 MHz aeronautical Utility Mobile Stations.

(2) Not more than 200-1090 MHz Aeronautical Utility Mobile Stations can be licensed at any location.

(3) To be eligible to apply for a license to operate 1090 MHz Aeronautical Utility Mobile Stations, the applicant must be an Airport authority or an entity certified by the FAA and coordinated through the Interdepartment Radio Advisory Committee (IRAC) process.

(4) A license to operate up to 200 -1090 MHz Aeronautical Utility Mobile Stations can only be approved at locations that are within the vicinity of an FAA ASDE-X multilateration system or ADS-B equipment, and/or where the primary purpose for which the licensee is seeking transmit authorization is to provide surface data to aircraft and air traffic control authorities.

(5) Transmissions are limited to a maximum of twice per second if the vehicle is in motion or a maximum of once every five seconds if the vehicle is stationary.

§ 87.349 Frequencies.

. …..

(f) The frequency 1090 MHz is authorized for Aeronautical Utility Mobile Station transmission.