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Part 89 —Remote Identification of Unmanned Aircraft

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Subpart D—Requirements for Standard Remote Identification Unmanned Aircraft and Remote Identification Broadcast Modules

§ 89.301 Applicability.

This subpart prescribes the minimum message element set and minimum performance requirements for standard remote identification unmanned aircraft and remote identification broadcast modules.

§ 89.305 Minimum message elements broadcast by standard remote identification unmanned aircraft.

A standard remote identification unmanned aircraft must be capable of broadcasting the following remote identification message elements:

(a) The identity of the unmanned aircraft, consisting of:

(1) A serial number assigned to the unmanned aircraft by the person responsible for the production of the standard remote identification unmanned aircraft; or

(2) A session ID.

(b) An indication of the latitude and longitude of the control station.

(c) An indication of the geometric altitude of the control station.

(d) An indication of the latitude and longitude of the unmanned aircraft.

(e) An indication of the geometric altitude of the unmanned aircraft.

(f) An indication of the velocity of the unmanned aircraft.

(g) A time mark identifying the Coordinated Universal Time (UTC) time of applicability of a position source output.

(h) An indication of the emergency status of the unmanned aircraft.

§ 89.310 Minimum performance requirements for standard remote identification unmanned aircraft.

A standard remote identification unmanned aircraft must meet the following minimum performance requirements:

(a) ***Control station location.*** The location of the control station of the unmanned aircraft must be generated and encoded into the message elements and must correspond to the location of the person manipulating the flight controls of the unmanned aircraft system.

(b) ***Time mark.*** The time mark message element must be synchronized with all other remote identification message elements.

(c) ***Self-testing and monitoring.***

(1) Prior to takeoff, the unmanned aircraft must automatically test the remote identification functionality and notify the person manipulating the flight controls of the unmanned aircraft system of the result of the test.

(2) The unmanned aircraft must not be able to take off if the remote identification equipment is not functional.

(3) The unmanned aircraft must continuously monitor the remote identification functionality from takeoff to shutdown and must provide notification of malfunction or failure to the person manipulating the flight controls of the unmanned aircraft system.

(d) ***Tamper resistance.*** The unmanned aircraft must be designed and produced in a way that reduces the ability of a person to tamper with the remote identification functionality.

(e) ***Error correction.*** The remote identification equipment must incorporate error correction in the broadcast of the message elements in § 89.305.

(f) ***Interference considerations.*** The remote identification equipment must not interfere with other systems or equipment installed on the unmanned aircraft, and other systems or equipment installed on the unmanned aircraft must not interfere with the remote identification equipment.

(g) ***Message broadcast.***

(1) The unmanned aircraft must be capable of broadcasting the message elements in § 89.305 using a non-proprietary broadcast specification and using radio frequency spectrum compatible with personal wireless devices in accordance with 47 CFR part 15, where operations may occur without an FCC individual license.

(2) Any broadcasting device used to meet the requirements of this section must be integrated into the unmanned aircraft without modification to its authorized radio frequency parameters and designed to maximize the range at which the broadcast can be received, while complying with 47 CFR part 15 and any other applicable laws in effect as of the date the declaration of compliance is submitted to the FAA for acceptance.

(h) ***Message elements performance requirements.***

(1) The reported geometric position of the unmanned aircraft and the control station must be accurate to within 100 feet of the true position, with 95 percent probability.

(2) The reported geometric altitude of the control station must be accurate to within 15 feet of the true geometric altitude, with 95 percent probability.

(3) The reported geometric altitude of the unmanned aircraft must be accurate to within 150 feet of the true geometric altitude, with 95 percent probability.

(4) The unmanned aircraft must broadcast the latitude, longitude, and geometric altitude of the unmanned aircraft and its control station no later than 1.0 seconds from the time of measurement to the time of broadcast.

(5) The unmanned aircraft must broadcast the message elements at a rate of at least 1 message per second.

(i) ***Take-off limitation.*** The unmanned aircraft must not be able to take off unless it is broadcasting the message elements in § 89.305.

§ 89.315 Minimum message elements broadcast by remote identification broadcast modules.

Remote identification broadcast modules must be capable of broadcasting the following remote identification message elements:

(a) The identity of the unmanned aircraft, consisting of the serial number assigned to the remote identification broadcast module by the person responsible for the production of the remote identification broadcast module.

(b) An indication of the latitude and longitude of the unmanned aircraft.

(c) An indication of the geometric altitude of the unmanned aircraft.

(d) An indication of the velocity of the unmanned aircraft.

(e) An indication of the latitude and longitude of the take-off location of the unmanned aircraft.

(f) An indication of the geometric altitude of the take-off location of the unmanned aircraft.

(g) A time mark identifying the Coordinated Universal Time (UTC) time of applicability of a position source output.

§ 89.320 Minimum performance requirements for remote identification broadcast modules.

Remote identification broadcast modules must meet the following minimum performance requirements:

(a) ***Take-off location.*** The remote identification broadcast module must be capable of determining the take-off location of the unmanned aircraft.

(b) ***Time mark.*** The time mark message element must be synchronized with all other remote identification message elements.

(c) ***Self-testing and monitoring.***

(1) Prior to take-off, the remote identification broadcast module must automatically test the remote identification functionality and notify the person manipulating the flight controls of the unmanned aircraft system of the result of the test.

(2) The remote identification broadcast module must continuously monitor the remote identification functionality from takeoff to shutdown and must provide notification of malfunction or failure to the person manipulating the flight controls of the unmanned aircraft system.

(d) ***Tamper resistance.*** The remote identification broadcast module must be designed and produced in a way that reduces the ability of a person to tamper with the remote identification functionality.

(e) ***Error correction.*** The remote identification broadcast module must incorporate error correction in the broadcast of the message elements in § 89.315.

(f) ***Interference considerations.*** The remote identification broadcast module must not interfere with other systems or equipment installed on compatible unmanned aircraft, and other systems or equipment installed on compatible unmanned aircraft must not interfere with the remote identification equipment.

(g) ***Message broadcast.***

(1) The remote identification broadcast module must be capable of broadcasting the message elements in § 89.315 using a non-proprietary broadcast specification and using radio frequency spectrum compatible with personal wireless devices in accordance with 47 CFR part 15, where operations may occur without an FCC individual license.

(2) The remote identification broadcast module must be designed to maximize the range at which the broadcast can be received, while complying with 47 CFR part 15 and any other applicable laws in effect as of the date the declaration of compliance is submitted to the FAA for acceptance.

(h) ***Message elements performance requirements.***

(1) The reported geometric position of the unmanned aircraft must be accurate to within 100 feet of the true position, with 95 percent probability.

(2) The reported geometric altitude of the unmanned aircraft must be accurate to within 150 feet of the true geometric altitude, with 95 percent probability.

(3) The reported geometric position of the take-off location must be accurate to within 100 feet of the true geometric position, with 95 percent probability.

(4) The reported geometric altitude of the take-off location must be accurate to within 150 feet of the true geometric altitude, with 95 percent probability.

(5) The remote identification broadcast module must broadcast the latitude, longitude, and geometric altitude of the unmanned aircraft no later than 1.0 seconds from the time of measurement to the time of broadcast.

(6) The remote identification broadcast module must broadcast the message elements at a rate of at least 1 message per second.