§ 87.143 Transmitter control requirements.

output exceeding 10 watts must be capable of automatically preventing modulation in excess of 100 percent.

(c) If any licensed radiotelephone transmitter causes harmful interference to any authorized radio service because of excessive modulation, the Commission will require the use of the transmitter to be discontinued until it is rendered capable of automatically preventing modulation in excess of 100 percent.

(d) Single sideband transmitters must be able to operate in the following modes:

<table>
<thead>
<tr>
<th>Carrier mode</th>
<th>Level (dB) of the carrier with respect to peak envelope power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full carrier (H3E)</td>
<td>O&gt;N&gt;6</td>
</tr>
<tr>
<td>Suppressed carrier (J3E)</td>
<td>Aircraft stations Nc&gt;26; Aeronautical stations Nc&gt;40.</td>
</tr>
</tbody>
</table>

(e) Each frequency modulated transmitter operating in the band 72.0–76.0 MHz must have a modulation limiter.

(f) Each frequency modulated transmitter equipped with a modulation limiter must have a low pass filter between the modulation limiter and the modulated stage. At audio frequencies between 3 kHz and 15 kHz, the filter must have an attenuation greater than the attenuation at 1 kHz by at least 40 \( \log_{10}(f) \) dB where \( f \) is the frequency in kilohertz. Above 15 kHz, the attenuation must be at least 28 dB greater than the attenuation at 1 kHz.

(g) Except that symmetric sidebands are not required, the modulation characteristics for ELTs must be in accordance with specifications contained in the Federal Aviation Administration (FAA) Technical Standard Order (TSO) Document TSO-C91a titled “Emergency Locator Transmitter (ELT) Equipment,” dated April 29, 1985. TSO-C91a is incorporated by reference in accordance with 5 U.S.C. 552(a). TSO-C91a may be obtained from the Department of Transportation, Federal Aviation Administration, Office of Airworthiness, 800 Independence Avenue SW., Washington DC 20591.

(h) ELTs must use A3X emission and may use A3E or NON emissions on an optional basis while transmitting. Each transmission of a synthesized or recorded voice message from an ELT must be preceded by the words “this is a recording”; transmission of A3E or NON emission must not exceed 90 seconds; and any transmission of A3E or NON emissions must be followed by at least three minutes of A3X emission.

(i) ELTs manufactured on or after October 1, 1988, must have a clearly defined carrier frequency distinct from the modulation sidebands for the mandatory emission, A3X, and, if used, the A3E or NON emissions. On 121.500 MHz at least thirty per cent of the total power emitted during any transmission cycle with or without modulation must be contained within plus or minus 30 Hz of the carrier frequency. On 243.000 MHz at least thirty percent of the total power emitted during any transmission cycle with or without modulation must be contained within plus or minus 60 Hz of the carrier frequency. Additionally, if the type of emission is changed during transmission, the carrier frequency must not shift more than plus or minus 30 Hz on 121.500 MHz and not more than plus or minus 60 Hz on 243.000 MHz. The long term stability of the carrier frequency must comply with the requirements in § 87.133 of this part.

(j) Transmitters used at Aircraft earth stations must employ BPSK for transmission rates up to and including 2400 bits per second, and QPSK for higher rates.

(k) Universal Access Transceiver transmitters must use F1D modulation without phase discontinuities.


§ 87.143 Transmitter control requirements.

(a) Each transmitter must be installed so that it is not accessible to, or capable of being operated by persons other than those authorized by the licensee.

(b) Each station must be provided with a control point at the location of the transmitting equipment, unless otherwise specifically authorized. Except for aeronautical enroute stations governed by paragraph (e) of this section, a control point is the location at which the radio operator is stationed.
§ 87.147 Authorization of equipment.

(a) Certification may be requested by following the procedures in part 2 of this chapter. Aircraft transmitters must meet the requirements over an ambient temperature range of -20 degrees to +50 degrees Celsius.

(b) ELTs manufactured after October 1, 1988, must meet the output power characteristics contained in §87.141(i) when tested in accordance with the Signal Enhancement Test contained in §87.147(e).