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Change No. 1

-to-

RTCA DO-228

**Minimum Operational Performance Standards for Global Navigation Satellite
System (GNSS) Airborne Antenna Equipment**

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This document constitutes Change No. 1 to RTCA DO-228, *Minimum Operational Performance Standards for Global Navigation Satellite System (GNSS) Airborne Antenna Equipment*. The changes derive from updated information provided by RTCA Special Committee 159.

1. General Changes

Change all references to RTCA DO-160C to RTCA DO-160D.

2. Specific Changes

a. Page 6, paragraph 2.2.1.1, GPS Operating Frequency - Replace with the following:

The antenna shall operate over the minimum frequency range of 1575.42 MHz \pm 10MHz. The gain shall not vary more than 3 dB over the frequency range.

b. Page 7, paragraph 2.2.1.5, Axial Ratio - Replace with the following:

The axial ratio shall not exceed 3.0 dB for all operating frequencies as measured at the boresight of the antenna.

c. Page 9, paragraph 2.2.2.5, Burnout Protection - Replace with the following:

The preamplifier shall withstand a CW input carrier of +20 dBm without damage. Under these conditions, the output of the preamplifier shall be limited to +20 dBm.

Note: The burnout protection of +20 dBm may not guarantee compatibility with all aircraft or all operations. Some contemporary commercial airborne installations require +30 dBm with the output limited to +20 dBm.

d. Page 10, Add paragraph 2.2.3, Differential Group Delay -

The differential group delay of the antenna, or antenna with an integrated preamplifier shall not exceed 50 nanoseconds.

The differential group delay is defined as:

$$\left| \frac{d\phi}{d\omega}(f_c) - \frac{d\phi}{d\omega}(f_{3dB}) \right|$$

where:

f_c is the pre-correlation band pass filter center frequency

f_{3dB} are the 3dB cut off points of the filter

ϕ is the phase response of pre-correlation band pass filter

ω is the frequency

- e. Page 10, paragraph 2.2.2.6, Include the following data with the Replacement Figure 2-3 (provided below):

Frequency (f in MHz)	Rejection (dB)
$1315 \leq f < 1495$	50 dB
$1495 \leq f < 1565$	Linearly decreasing from 50 to 0 dB
$1565 \leq f \leq 1585$	0 dB
$1585 < f \leq 1625$	Linearly increasing from 0 to 50 dB
$1625 < f \leq 2000$	50 dB

- f. Page 10, paragraph 2.2.2.6, Replace existing Figure 2-3 with the following:

Figure 2-3 Frequency Selectivity Requirements

