U.S. Department
of Transportation

**Federal Aviation
Administration**

Memorandum

Subject: ACTION: Equivalent Level of Safety, EXTRA Flugzeugbau EA-300/200, 14 CFR Part 23, §§ 23.963(e), 23.1337(b), and 23.1553, "Marking of Fuel Quantity Indicator No. ACE-96-6

Date: DEC 04 1996

From: Manager, Standards Office, ACE-110

Reply to Attn. of:

To: Manager, Small Airplane Directorate, Aircraft Certification Service, ACE-100

This memo documents concurrence with an equivalent level of safety to the requirements of 14 CFR Part 23, §§ 23.963(e), 23.1337(b), and 23.1553.

BACKGROUND:

The EA-300/200 is a two place, composite (steel tube fuselage), low wing cantilever, fixed conventional gear, unpressurized, single reciprocating engine airplane with a maximum weight of 1,770 pounds in the acrobatic category and 1,858 pounds in the normal category.

APPLICABLE REGULATIONS:

Sections 23.963(e) and 23.1337(b) require the fuel quantity indicator to be calibrated to read "zero" quantity during level flight when the fuel quantity remaining in the tank equals the unusable fuel supply determined under § 23.959. If the unusable fuel supply exceeds one gallon, or five per cent of tank capacity, whichever is greater, § 23.1553 requires the fuel quantity indicator to be marked with a red arc extending from the calibrated "zero' reading to the lowest reading obtainable in level flight.

DISCUSSION:

For unlimited acrobatic maneuvers, including inverted flight, an airplane must have a fuel supply system that functions independently of flight attitude. Such a system is provided on the EA-300/200 by a separate tank (called acro tank) incorporating a flop tube. The acro tank is attached to the lower side of, and is open to, the fuselage tank. On the ground and in level flight attitude, the acro tank functions as a collector tank and is gravity filled; all fuel from the fuselage tank flows through the acro tank to the engine. During inverted flight and certain other acrobatic maneuvers the engine is fed exclusively by the flop tube in the acro tank; the acro tank has a capacity of 8.6 liters. Because of the flop tube feature, the acro tank cannot employ a fuel

quantity sensor; fuel quantity is sensed in the fuselage tank. Unusable fuel quantity determined under § 23.959 is 2.8 liters for the fuselage tank and 1.2 liters for the acro tank, a total of 4 liters; this exceeds five per cent of fuselage and acro tank capacity. Because of the special design of the fuselage and acro tank system, the fuel quantity remaining in the system at the lowest indicator reading obtainable in level flight, is larger than the unusable fuel supply determined under § 23.959.

FAA'S POSITION:

EXTRA Flugzeugbau can provide a level of safety equivalent to that intended by §§ 23.963(e), 23.1337(b), and 23.1553 for the EA-300/200 by: (a) marking the fuel quantity indicator with a red radial at the lowest reading obtainable in level flight, and (b) by including in the Limitations Section of the Airplane Flight Manual pertinent information regarding the fuel remaining in the acro tank at the lowest reading obtainable in level flight.

Marking the fuel quantity indicator in accordance with (a), above, will be conservative relative to unusable fuel because the fuel quantity remaining in the system at the lowest indicator reading obtainable in level flight is larger than the unusable fuel quantity determined under § 23.959.

Type certification basis for the EA-300/200 will include this equivalent level of safety finding.

CONCURRED BY:

ACTING Manager, Standards Office, ACE-110 — 12-3-96 Date

ACTING Manager, Small Airplane Directorate, Aircraft Certification Service, ACE-100 — 12/4/96 Date