DESCRIPTION AND MAINTENANCE INSTRUCTIONS

GROUND TO EARTH CONDUCTIVITY FOR RCAF AIRCRAFT

(This EO replaces EO 05-1-2V dated 24 Sep 63)

PURPOSE

1   Aircraft stored in hangars and aircraft undergoing maintenance operations have a tendency to accumulate an electrostatic charge which presents a potential fire hazard. This charge, therefore, is to be brought to the ground.

GENERAL

2   Grounding is to be accomplished by means of a connection from the approved metallic part of the aircraft to an approved grounding point when:

(a)   Aircraft are hangared, refer to EO 05-1-5A/11.

(b)   Electrical facilities or equipment is used, i.e., electrical extensions, electric drills, testing of electrical components, etc.

(c)   Maintenance work is contemplated and jacking up of the aircraft is necessary.

(d)   Polishing, buffing or rubbing down.

3   For grounding instructions during refuelling or defuelling aircraft, refer to EO 00-80-4/6.

4   Units are to ensure that the following is accomplished:-

(a)   Grounding chains or springs on aircraft which ensure ground to earth when the aircraft is in normal taxiing position are kept in a serviceable state.

(b)   Aircraft high tension grounding cables are complete with approved clamps and are checked monthly for continuity.

(c)   To have the CE section check grounding rods for resistance yearly or when the validity of adequate grounding is in doubt. A grounding connection of 10,000 ohms resistance or less at the connection is preferred. However, grounding connections up to 100,000 ohms are acceptable. Grounding connections in excess of 100,000 ohms will not be used for the dissipation of static electricity.

METHOD OF MEASUREMENT

5   The approved technique to be used in determining the resistance value of grounding rods is called the three point method and requires the following procedure. Let R_1 = resistance of first grounding rod in ohms; R_2 = resistance of second grounding rod in ohms; and R_3 = resistance of third grounding rod in ohms. The resistance for each of the three grounding rods may be determined by using a 24 volt aircraft battery and a multirange ammeter connected in series between any two grounding rods. As a safety measure, to prevent possible battery

damage during rod resistance measurement where the rods may have extreme low resistance, connect a known resistance of say 100 ohms in series with the battery and grounding rods. The measured battery voltage and the resistance of the grounding rods in pairs is to be calculated using Ohms Law (e = IR), and the following equations:

$$A = R_1 + R_2 + 100, \qquad B = R_1 + R_3 + 100, \qquad B = R_2 + R_3 + 100,$$

$$A' = A - 100, \qquad B' = B - 100, \qquad C' = C - 100$$

The individual resistances are then to be calculated using the following equations:

$$R_1 = \frac{A' + B' - C'}{2} \qquad R_2 = \frac{A' + C' - B'}{2} \qquad R_3 = \frac{B' + C' - A'}{2}$$

ISSUED ON AUTHORITY OF THE CHIEF OF THE AIR STAFF