

TASK GROUP 7.1
JOINT TASK FORCE 7
Los Alamos, New Mexico

8-64

5 February 1953

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TO: Commander
Joint Task Force 7
Washington 25, D.C.

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FROM: Commander, Task Group 7.1

FILE 8-64

SUBJECT: CLOUD SAMPLING REQUIREMENTS FOR CASTLE (u) DOCUMENTS

1. In order to permit timely action in support of all anticipated cloud sampling activities for CASTLE, the following requirements are submitted. It is pointed out that further reduction of IVY data and development of operational concepts may modify, to some extent, these requirements.

2. Cloud sampling requirements for CASTLE are, in general, based upon IVY experience and determined for the expected devices to be tested in CASTLE. These requirements are summarized below and a detailed discussion of the requirements is contained in Appendix I attached hereto.

3. Number of Samples

- a. Six (6) primary samples of each of six (6) devices to be tested.
- b. One (1) special sample at the highest possible altitude (55,000 feet true altitude) for at least four (4) of the devices to be tested.

4. Size of Each Sample

a. Amount of material collected on seven (7) to eight (8) square feet of special filter paper by filter devices of equivalent performance to the Fletcher wing tip type, when:

- (1) Sampling pilot exposure on landing is 3.5R.
- (2) Aircraft speed is at least 0.8 mach.
- (3) Samples are taken later than two hours after shot time.

5. Collection Times

a. Cloud penetrations based on the following time intervals:

(1) Primary samples:

- 1st phase: H^h2:00 to H^h3:00 hours.
- 2nd phase: H^h3:00 to H^h4:00 hours.
- 3rd phase: H^h4:00 to H^h5:30 hours. (IVY type sampling aircraft provides less than a 50% probability in obtaining an acceptable sample during this phase)

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(2) Special sample:

H²4:00 to H²4:30 hours.

6. Collection Altitudes

a. Six (6) primary samples - initial true altitude 42,000 feet, final true altitude at least 47,000 feet (a higher altitude would be most desirable) over the time intervals listed in paragraph 5.

b. One (1) special sample - at least 55,000 feet true altitude.

7. Sampling Aircraft Operational Requirements

a. Primary sampling aircraft:

- (1) Flight time capability (paragraph 5)
- (2) Altitude capability (paragraph 6)
- (3) Axial flow engines with turbine and air intake located not less than ten feet from the crew's compartment.
- (4) Speed about 0.8 mach.
- (5) Capable of carrying high performance filter devices.
- (6) Filtered air to crew's compartment.
- (7) Carry gas sampling equipment.

b. Special sampling aircraft:

- (1) Flight time capability (paragraph 5).
- (2) Altitude capability (paragraph 6).
- (3) Speed and engine type as required.
- (4) If a medium speed aircraft is used, the "shoe-box" type filter is recommended.
- (5) If a higher speed jet-type aircraft is used (0.8) mach, a type of filter similar to that used in IVY is recommended.
- (6) Filtered air to crew's compartment.

8. Control Aircraft Operational Requirements

- a. Three scientific personnel.
- b. Position in the immediate vicinity of the cloud.
- c. Initial true altitude 35,000 to 40,000 feet with capability of climbing to 45,000 feet as required by cloud structure.
- d. Medium speed with endurance capability of remaining aloft for 10 hours.
- e. Two 8 channel VHF systems.
- f. One HF liaison set.
- g. One low frequency homer with about 200 mile ranging capacity.
- h. Continuous positioning to within five miles.
- i. Suitable back-up aircraft.

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W. E. Ogle
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Commander

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