

16 April 1980

MEMO TO: Cliff Murino

FROM : V. E. Lally *VEL*

SUBJECT: Overflight Clearance for RACOON Flights from Kourou, French Guiana, September 1980.

It is requested that you forward to the National Science Foundation a request (draft attached) to arrange with the Department of State for flight approval of RACOON flights from Kourou.

It is expected that the flight trajectory will be east-to-west. The equatorial winds at these flight altitudes have been described by observations of the Quasi-Biennial Oscillation. It will be possible for the balloons to overfly the following equatorial countries:

Surinam, Guyana, Venezuela and Columbia.

The balloon flight train specifications are the same as described in my memo of 10 September 1979 (copy attached).

END OF MEMO

VEL:n1

Attachments

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DRAFT

16 April 1980

Dr. Giorgio Tesi
Head, Atmospheric Research Centers Section
Division of Atmospheric Sciences
National Science Foundation
1800 "G" Street, NW
Washington, D.C. 20550

Dear Giorgio:

The purpose of this letter is to request Foundation assistance in coordinating the overflight clearances through the Department of State for the RACoon flights from Kourou, French Guiana.

Approval has been received from France for the launches. We expect these balloons to fly from 10 to 15 days. They will be cut down if they drop below the 20 km altitude or if they go beyond 22°N latitude.

It is expected that the flight trajectory will be east-to-west, flying between 25 km and 40 km altitude, at an average rate of 6° longitude per day.

We will overfly Surinam, Guyana, Venezuela and Columbia. The expected impact area is between the equator and 10°N, 100°W to 150°W.

Total payload will be 5 kg with no individual package weighing more than 2.5 kg. The flight system will therefore be considered a "light payload" under ICAO classifications and no special lighting or flight notification are required except for the diplomatic clearances for overflight of the four countries.

If you have further questions, please contact me or Vincent Lally.

Sincerely,

Clifford J. Murino
Director,
Atmospheric Technology Division

Enclosures

cc: J. Firor
V. Lally

September 1979

MEMO TO: C. Murino

FROM : V. E. Lally, *rel*

SUBJECT: Approval of RACCOON Flights from Kourou, French Guiana, Sept. 1980.

It is requested that you forward to NSF a request to negotiate with CNES for approval of three Radiation-Controlled Balloon (RACCOON) flights from the Guiana Space Center (CSG), Kourou, French Guiana, during September 1980.

The objectives of this program are to:

- a) Document the long duration flight of a zero-pressure poly balloon in the stratosphere.
- b) Provide base-line data for the Palestine anchor-balloon flights.
- c) Demonstrate that the RACCOON concept can provide a global sounding system for the tropical stratosphere. The system has the potential to fill the gap in climate measurement programs left by the phase-out of rocket soundings. It can provide twice-daily measurements of winds and temperature from 20 to 40 km as well as provide a platform for measurement of atmospheric aerosols and gases in the critical middle atmosphere. I presented the concept at a NASA sponsored meeting where representatives from CNES (Morel, et. al) and NSF (G. Tesi) were in attendance.

Radiation-Controlled Balloon (RACCOON) Specifications

Purpose - To document and demonstrate the feasibility of a radiation controlled balloon as a vertical sounding system in the tropical stratosphere.

Launch Location - Guiana Space Center (CSG), Kourou, French Guiana.

Planned Launch Dates - September 1980 for 3 weeks (Oct. or Nov is acceptable).

Planned Flight Duration - 3 to 6 weeks.

Flight Altitude - Maximum daytime altitude is 38 Km. The day-night excursion is calculated to be 10 Km with clear skies over a tropical ocean. With cold, high cirrus clouds nighttime temperatures of the balloon are the coldest. Daytime temperatures are increased by absorption from both the direct sun and the strong reflected sunlight from the clouds. Day-night excursions in this case can be as much as 15 Km.

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Flight Trajectory - It is expected that the flight trajectory will be approximately 10°N to 10°S . The equatorial winds at these flight altitudes have been described by observations of the Quasi-Biennial Oscillation. It will be possible within these latitudes for the balloons to overfly all equatorial countries, such as:

North/South America

Brazil
Peru
Columbia
Venezuela
Guyana
Surinam
French Guiana
Panama
Costa Rica
Bolivia

Equatorial Africa

Sierra Leone
Guinea
Liberia
Ivory Coast
Ghana
Toga
Dahomey
Nigeria
Rio Muni
Gabon
Central Afr. Rep.
Dem. Rep. of Congo
Mauritania, Mali
Algeria
Niger
Saudi Arabia

Chad
Sudan
Uganda
Kenya
Tanzania
Ethiopia
Somali
Cameroon
Zaire
Angola

Indian and Pacific Oceans

India
Ceylon
Indonesia
Malaysia
New Guinea
Central Pacific Islands

The system will be equipped with a minimum-altitude cut-down set for 60,000 ft pressure-altitude. Flights which wander south of 25° latitude in winter or 45° latitude in summer will not be able to make the day-night transition successfully and will be cut down when they reach the 60,000 ft level.

Location Systems - (1) TIROS-N/ARGOS, Day and Night, 4 times daily
(2) TIROS-N/ARGOS, Day only (back-up), 2 times daily

Cut-down Systems - (1) Magnetometer used will be proven TCLBS design set to prevent balloon from traveling north of 25°N .
(2) Pressure cut-down set at a pressure-altitude of 60,000 ft (70 mb).

Data Telemetered - Air temperature, IR radiation, vertical motion, gas temperature, balloon skin temperature, pressure

Balloon and Flight Train - Volume: 0.7 Mcf (zeropressure)
Shape : Natural
Film: Stratofilm (polyethylene), 0.7 mil
Gas: Helium
Payload Weight: 3.9 Kg suspended 30 m below balloon

Launch Support Requirements

NCAR will provide:

1. All test equipment for package checkout.
2. All launch equipment
3. All helium required for the flights (will send by ship)
4. International Flight Clearances, for "Light Payloads" (ICAO).

Support Required at Kourou Launch Site from CSG:

1. Housing for four people for three weeks
2. Two small passenger sedans for three weeks
3. One pick-up type truck to launch instrument package
4. Field lighting equipment for pre-dawn launches
5. Weather forecasts and prelaunch briefing on surface conditions (wind and precipitation observations only).
6. ARGOS data collection (NCAR will fly certified TCLBS transmitters and ID's.)
7. Work space, minimum requirements:

Electronics Lab, 30m² (similar to blockhouse near Halle Veronique, air conditioned)

Launch Preparation - Sheltered, 60m² (air conditioning not required.)

8. Launch Area - CBS launch pad is acceptable (with slight preparation such as cutting the grass).