

GENESIS STAGE EXPERIMENT
Flight Pattern Description

Experiment/Module: Favorable Air Mass (FAM)

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Requirements: Pre-genesis disturbances (pre-TDs), including NHC-designated “Invests”

Genesis Stage Science Objective(s) Addressed:

The overarching objective is to investigate the physical processes that determine if a pre-genesis disturbance will mature into a TC, including the organization of convection and the development of a closed low-level circulation.

- 1) To investigate the favorability in both dynamics (e.g., vertical wind shear) and thermodynamics (e.g., moisture) for tropical cyclogenesis in the environment near a pre-TD, especially the downstream environment [*APHEX Goal 3*].

P-3 Pattern #1:

What to Target: The environment near a pre-TD or “invest” (such as an African easterly wave), especially ahead of the pre-TD’s trajectory. In most cases, this will be the environment to the west and north of a pre-TD.

When to Target: Every 12 h. Could be every 6 h if it is determined that the environment is evolving rapidly and aircraft/crew availability allows it.

Pattern: Standard Lawnmower

Flight altitude: 20-25 kft

Leg length or radii: 600–1000 n mi (1110–1850 km) x 150 n mi (280 km) with the longer leg oriented approximately perpendicular to the trajectory of the pre-TD. The length of the longer leg should be set based on an analysis of the environment to be measured.

Estimated in-pattern flight duration: 3–6 h depending on the number of lawnmower legs and the length of the ferry

Expendable distribution: dropsondes every ~150 n mi (280 km)

Instrumentation Notes: Use straight flight legs as safety permits. See attached figure below for more information.

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G-IV Pattern #1:

What to Target: The environment near a pre-TD or “invest” (such as an African easterly wave), especially ahead of the pre-TD’s trajectory. In most cases, this will be the environment to the west and north of a pre-TD.

When to Target: Every 12 h

Pattern: Standard Lawnmower

Flight altitude: 40–45 kft

Leg length or radii: 600–1000 n mi (1110–1850 km) x 150 n mi (280 km) with the longer leg oriented approximately perpendicular to the trajectory of the pre-TD. The length of the longer leg should be set based on an analysis of the environment to be measured.

Estimated in-pattern flight duration: 3–6 h depending on the number of lawnmower legs and the length of the ferry.

Expendable distribution: dropsondes every ~150 n mi (280 km).

Instrumentation Notes: Use straight flight legs as safety permits. See attached figure for more information.

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