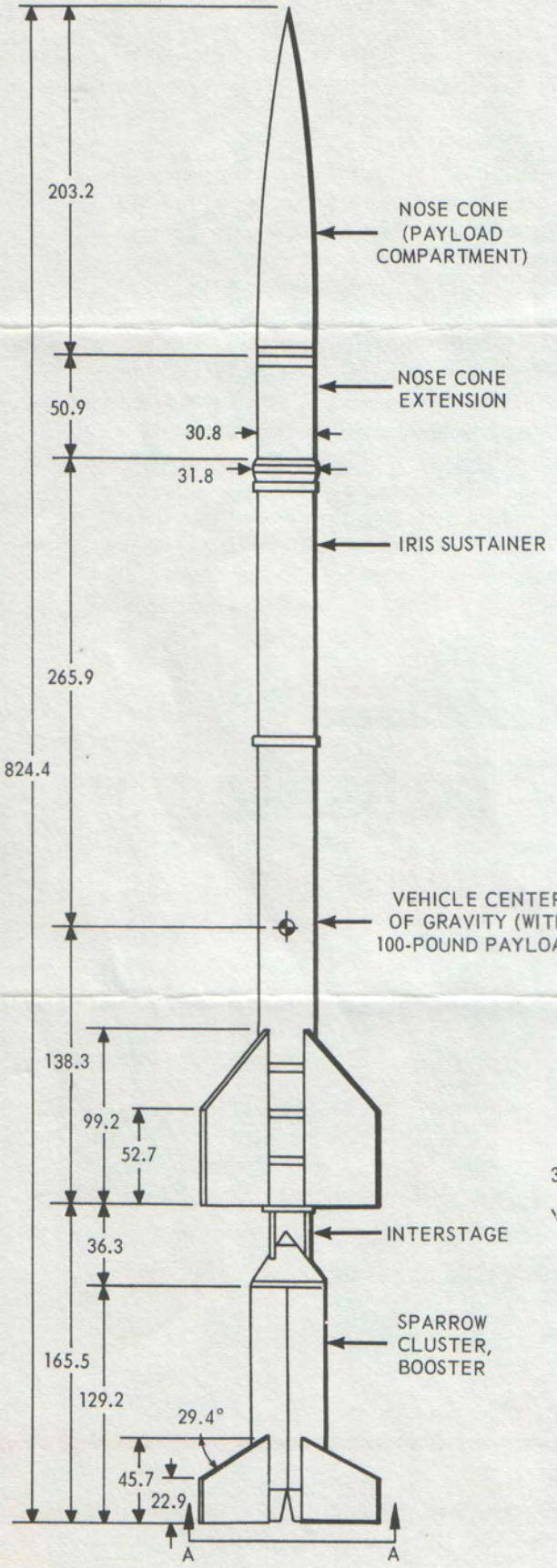
PROPULSION DIVISION

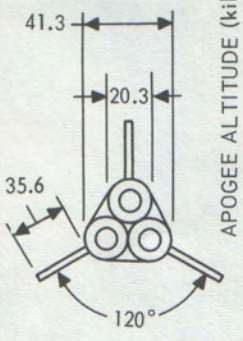
UPPER ATMOSPHERE SOUNDING VEHICLES

IRIS®

HYDRA-IRIS VEHICLE



Note: All dimensions in centimeters.



SECTION A-A

	HYDRA-IRIS Standard Nose Cone	Plus 51 cm (20 in) Extension
Payload Capacity		
Volume	0.13 m^3 (4.5 ft^3)	0.16 m^3 (5.5 ft^3)
Length	203 cm (80 in)	254 cm (100 in)
Outside Diameter	30.8 cm (12.12 in)	30.8 cm (12.12 in)
Nose Cone Weight	5.45 kg (12 lb)	14.5 kg (32 lb)

Vehicle Performance, Typical for 121-Pound Payload

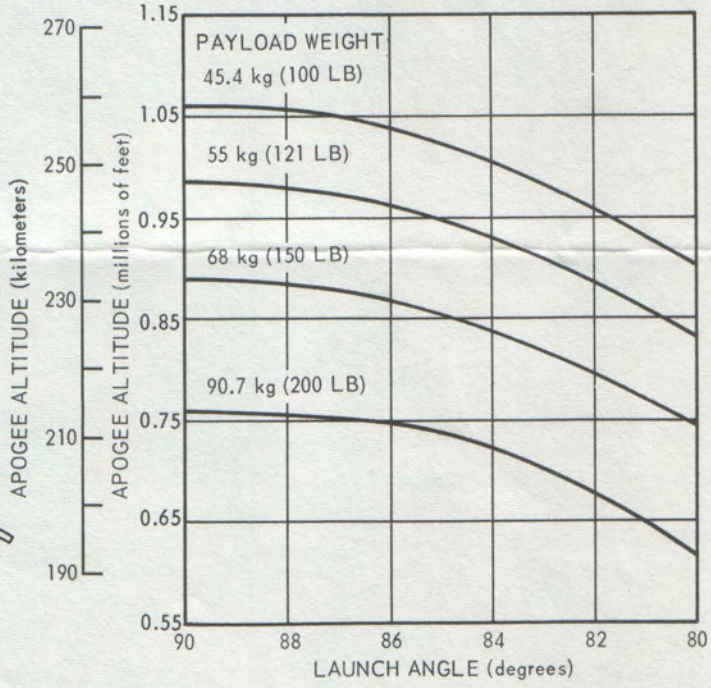
Apogee Altitude	277 km (172.4 miles)
Impact Range	267 km (166 miles)
Burnout Velocity (second stage)	2070 m/sec (6800 ft/sec)
Time to Apogee	298 sec
Nominal Spin Rate at Burnout (second stage)	2.6 r/s

Weights (excluding payload)

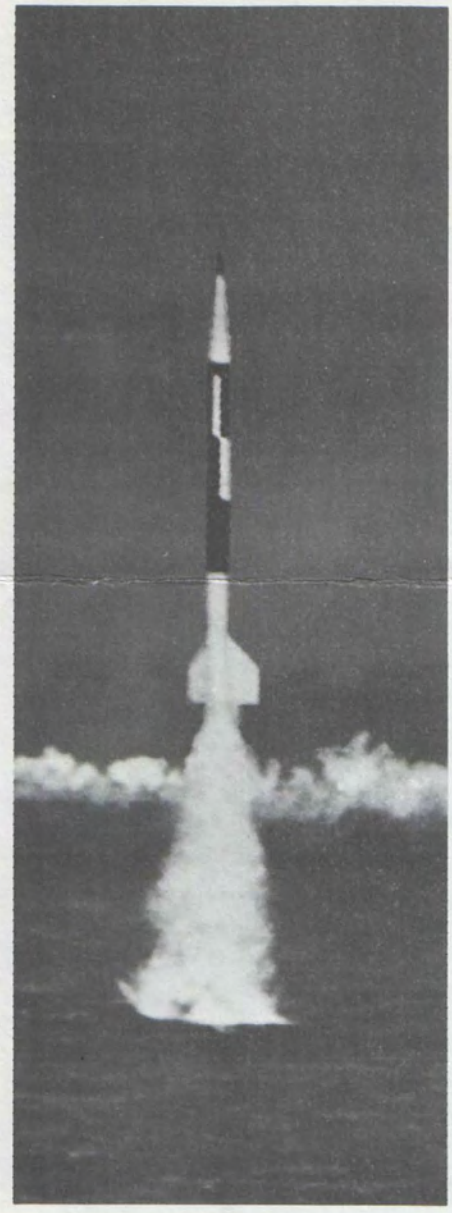
Launch	780 kg (1720 lb)
Second Stage Ignition	596 kg (1315 lb)
Second Stage Burnout	176 kg (377 lb)

Rocket Motors

First Stage	(3) Sparrow, Manifolded 30 amp ignition current
Second Stage	MARC 13A1 IRIS, 52 ks 3850 1 amp ignition current



ATLANTIC RESEARCH



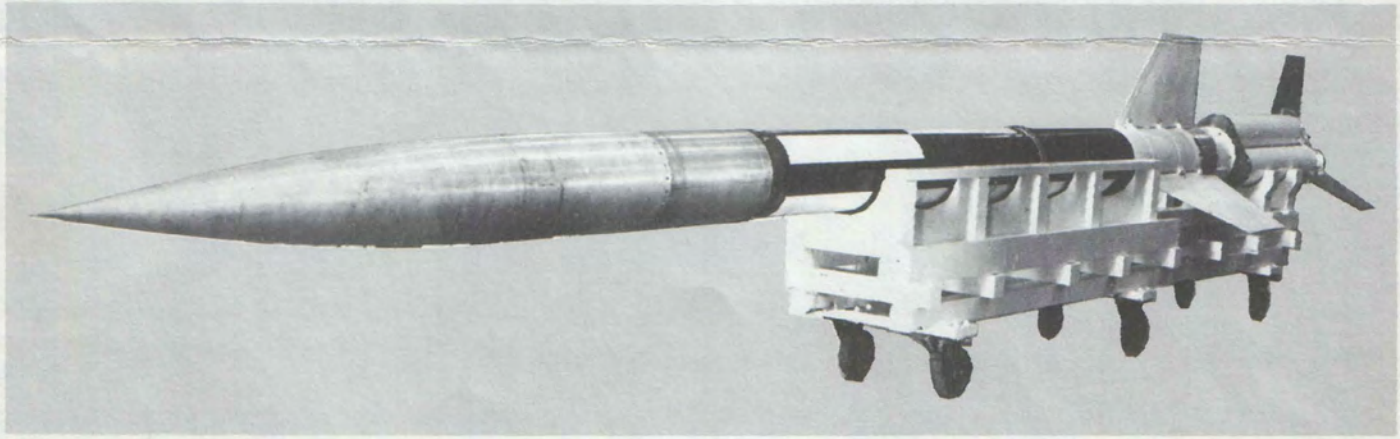
The IRIS® vehicle development program was originally sponsored by the U.S. Naval Research Laboratory and later transferred to the Goddard Space Flight Center, NASA. The vehicle configuration included four fins and a seven-rocket cluster for launch boost. The program was completed in May 1962 with four full-scale flights from the 150-foot launch tower at NASA's Wallops Island Station.

Concurrent with the latter part of the original program, the Cambridge Research Laboratory, U. S. Air Force, authorized a change of the design to a three-fin configuration and procured a number of production vehicles.

The Naval Missile Center then selected the three-fin IRIS vehicle to fulfill a high-altitude scientific mission sponsored by the U. S. Atomic Energy Commission, University of California Lawrence Radiation Laboratory, Livermore. Launch was accomplished by the hydra-launch technique, in which the vehicle and the short rail launcher are floating, totally submerged, at time of launch. The shorter rail necessitated an increase in booster thrust, which was provided by a cluster of three Sparrow missile rocket motors. Two test and evaluation vehicle flights proved this launch technique and vehicle configuration to be feasible. Six vehicles with scientific payloads have been flown.

ATLANTIC RESEARCH

PROPULSION DIVISION



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