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Hugh Kinser
Authorizing Official
Date: 12-19-2018

CNLM-1988
October 9, 1959

NUCLEAR J-58 TURBOJET POWERED LOW ALTITUDE MISSILE

NO. 2 2 PAGES

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Classification

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10-9-59
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A preliminary characteristics summary is presented for a low altitude, supersonic missile powered by the solid fuel element, 2000F lithium-cooled PWAR-11 reactor and a Pratt & Whitney Aircraft J-58 turbojet engine modified to incorporate a lithium-to-air heat exchanger. The powerplant and missile are designed for operation at Mach 2.0 at sea level, but the performance at the design point has been compromised somewhat to improve the operating characteristics at lower speeds and higher altitudes.

The general configuration of the missile is shown on Fig 1, and its geometrical characteristics are tabulated in Table 1. The estimated weight breakdown of the missile, which has a gross weight of 40,000 pounds, is presented in Table 2. An estimate of the missile thrust and drag is shown on Fig 2, and the operating speed-altitude envelope of the missile on a standard day is presented on Fig 3.

WOG:mp

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TABLE I
MISSILE GEOMETRY

Wing	
Area (gross), ft ²	320
Span, ft	22.5
Aspect ratio	1.59
Thickness ratio	0.025
Sweep (1/4 chord), degrees	47
Taper ratio	0.143
Canards	
Area, ft ²	15
Aspect ratio	1.59
Thickness ratio	0.025
Sweep (1/4 chord), degrees	47
Taper ratio	0.143
Tail	
Area, ft ²	25
Thickness ratio	0.025
Sweep (1/4 chord), degrees	55
Taper ratio	0.143
Fuselage	
Length, ft	57
Fineness ratio	18
Inlet	
Type	Fixed, circular external compression
Capture area, ft ²	6.3

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TABLE 2

WEIGHT BREAKDOWN

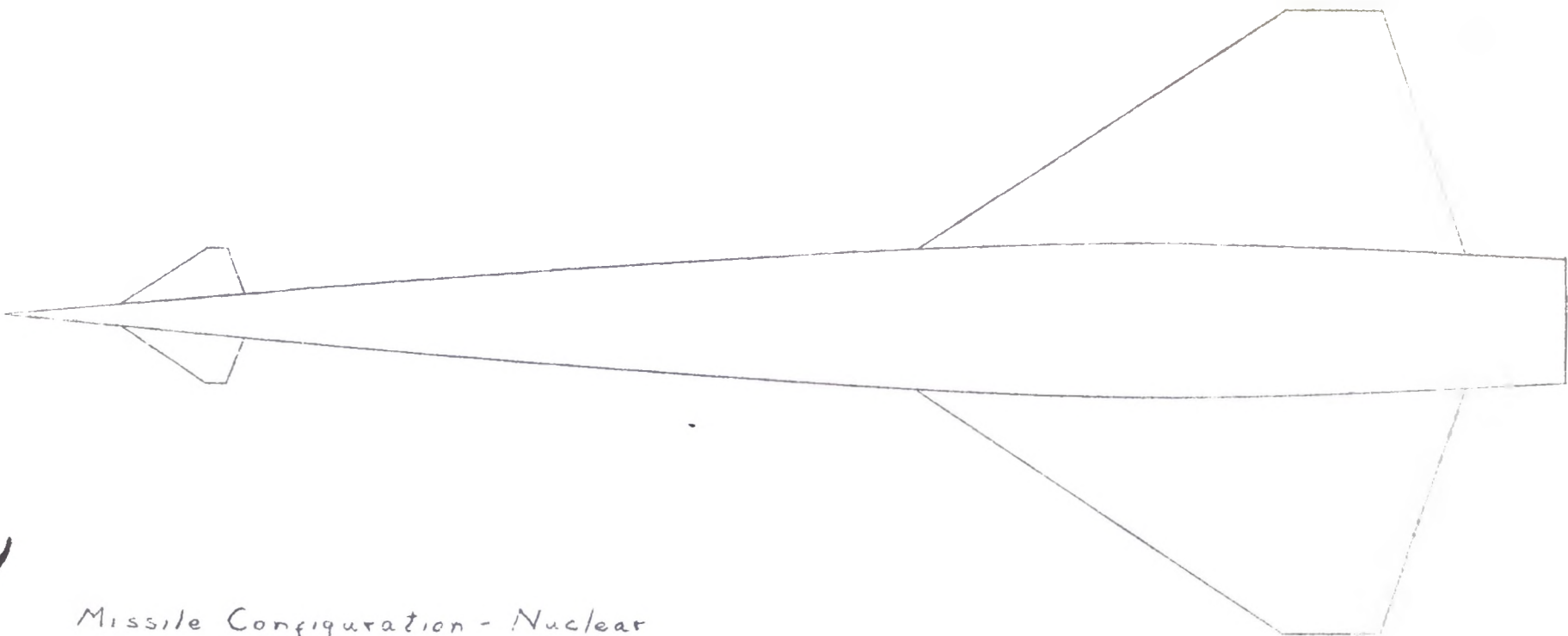
	<u>Weight, lb</u>
Wing	2,000
Canards	150
Vertical tail	250
Body	1,900
Powerplant	21,000
Reactor	6900
Engine	5300
Radiator	5700
Engine inlet	1500
Liquid metal system	2600
Miscellaneous	2000
Cooling system	600
Insulation	100
Airframe equipment	1,600
Guidance system	1,000
Payload and shielding	8,400
Total	40,000

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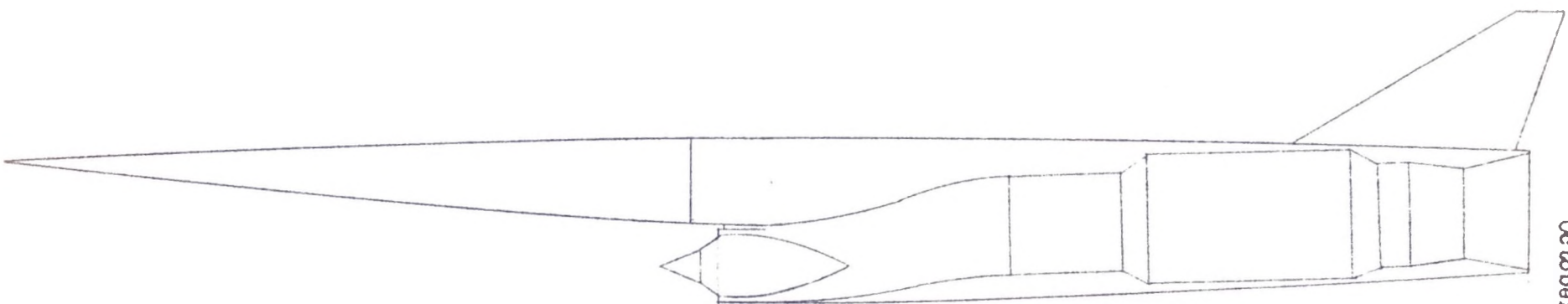
FIG 1

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Missile Configuration - Nuclear
J58 Turbojet Powerplant
Scale: 1 in. = 6 ft.



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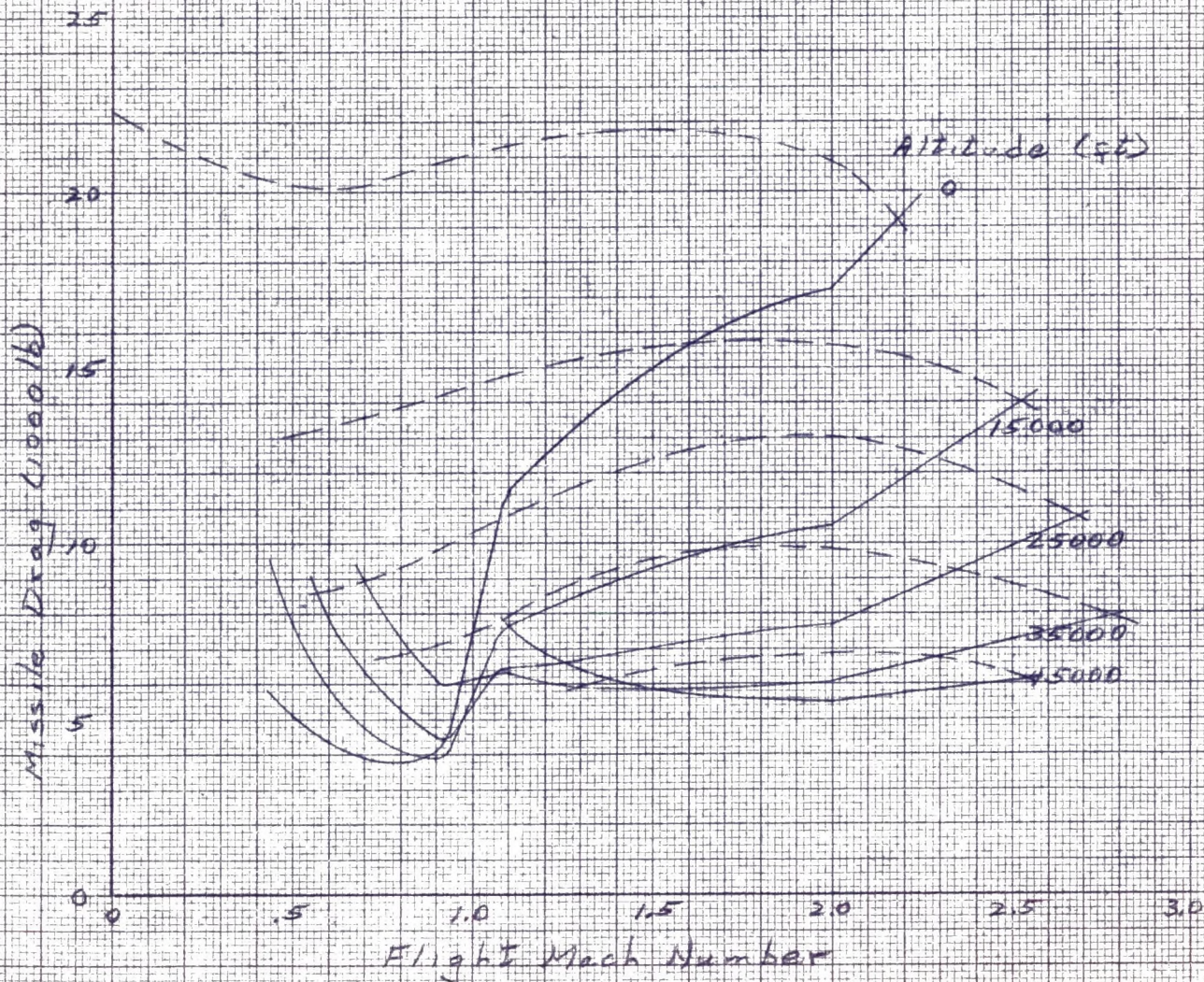
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October 9, 1959Missile Drag and ThrustNuclear J58 Turbojet Powered
Low Altitude Missile

Gross Weight = 40,000 lb

Payload + Shielding = 8400 lb

Design Reactor Power = 200 MW

ICAO Standard Atmosphere

— Drag
--- Thrust~~CONFIDENTIAL~~ R. D.
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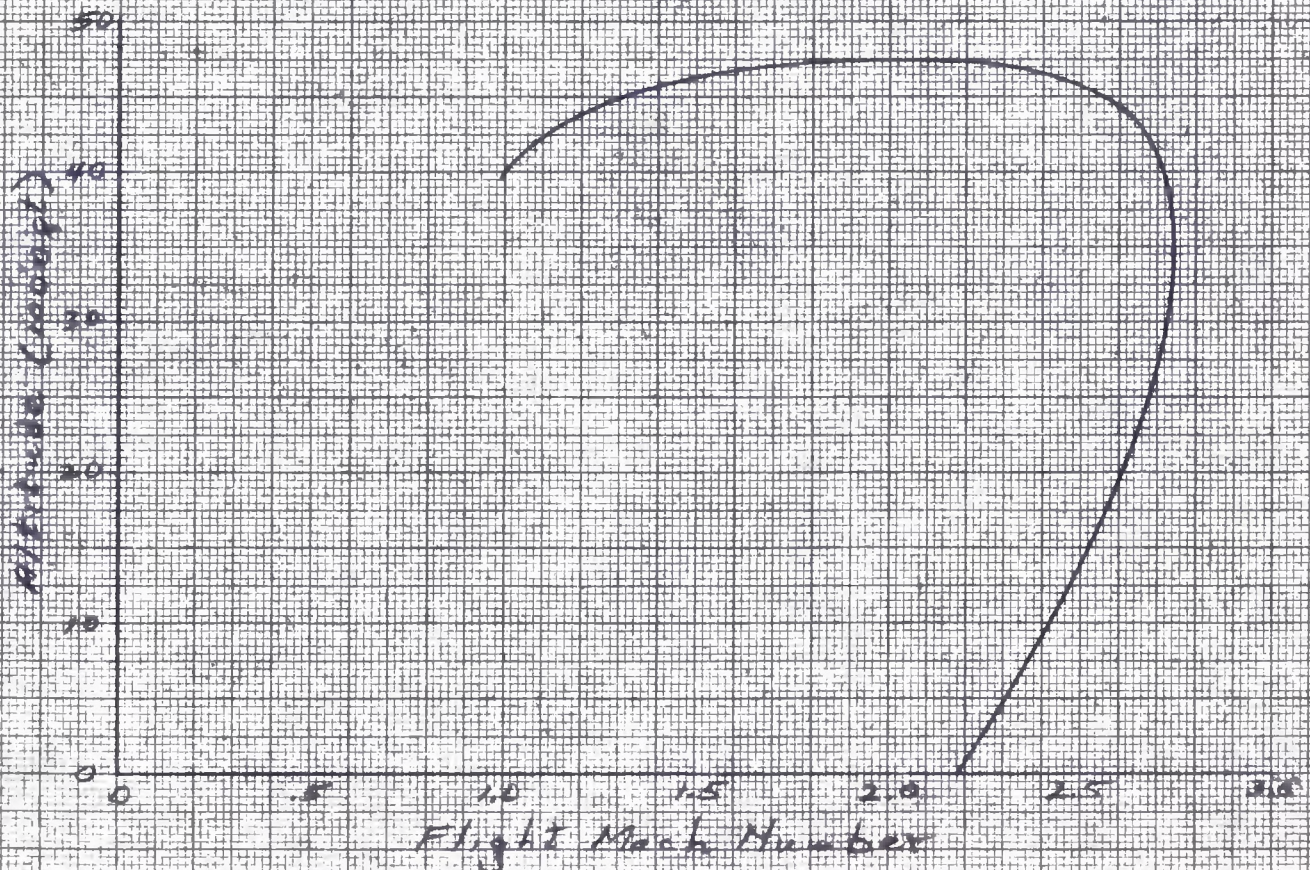
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October 9, 1959Speed-Altitude EnvelopeNuclear J58 Turbojet Powered
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Gross Weight = 40,000 lb

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