Standard Missile Characteristics

GAR-1

FALCON

HUGHES

ONE SOLID ROCKET M9

THIOKOL CHEM. CORP.

GAR-1

1 MAY 59

C3/GAR-1/char
**POWER PLANT**

No. and Model (1) Solid Rocket M9
Mfr. Thiokol Chem., Corp
Engine Spec No. SP-40A
Type Single-phase Boost
Length 36.75 in.
Diameter 5.775 in.
Weight (loaded) 44.9 lb

Flight Operating Condition:
Temperature -20 to 150°F
Altitude S.L. to 60,000 ft

**MISSION AND DESCRIPTION**

Navy Equivalent: None
Mfr's Model: D

The GAR-1 (FALCON) is a small supersonic guided aircraft rocket, whose prime mission is the destruction of subsonic and supersonic bombers. It is launched from F-80H or F-102A Interceptors.

The wings, stabilizers and fuselage are assembled in a cruciform arrangement. The nose is radome, fabricated from laminated fiberglass impregnated with a thermo-setting resin. The power plant consists of built-in solid rocket motor.

The FALCON uses a semi-active target seeker consisting of a gyro-controlled antenna and a receiver which depends upon the launching aircraft for radar illumination of the target. The seeker receiver contains circuitry which synchronizes with the launching aircraft radar to maintain "lock-on." The seeker, in so maintaining the "line-of-sight" to the target, generates signals which are applied to the guidance circuits so as to produce a proportional navigation correction at all times.

The rocket is launched forward from an interceptor on a collision course and depends upon a direct hit for detonation. The GAR-1 has a launching range of 5000 ft to 25,000 ft with speeds at the end of boost equal to the launching aircraft speed plus 2000 feet per second. The weapon is effective at altitudes up to 50,000 feet.

**DEVELOPMENT**

Project Initiated Mar 47
Complete Guided Aircraft Rocket Project Initiated Mar 48
First Air-to-Air Hit Jun 52
First Falcon-Equipment Squadron Early 56
Production Completed Nov 56
Out of Inventory Late 59
Replaced by GAR-1D

**ENGINE RATINGS**

S.L. Static @ 70°F LB SEC
Max: 4900 1.26
Nominal: 4420 1.38

Total Impulse (lb-sec) 6670
Over-all Specific Impulse (lb-sec/lb) 148

**DIMENSIONS**

Span 20.0"
Length 77.8"
Height 20.0"
Diameter 6.4"

**GUIDANCE**

(a) INITIAL
None during boost phase

(b) MID-COURSE & TERMINAL
Semi-Active X-Band Pulse Radar, Proportional Navigation

ACCURACY
P_k = 0.78 for salvo of 3 rockets against subsonic bombers.

CONTROL
Hydraulically Initiated by the Error Signal from Target Seeker

**WEIGHTS**

Loading LB
Max Launch 127 (A)
Burnout 96 (A)

(A) Actual

**FUEL**

Type Thiokol Base T21
Useful Weight (lb) 30.8

**LAUNCHING**

METHOD
Short Length Rail: Extended from wing tip pods in F-80H and from missile bays in F-102A. A total of 6 rockets carried in each aircraft.

LAUNCH TIME
Approximately 20 seconds required from time target is sighted to time rocket is launched.

**WARHEAD**

Blast Type
Gross Weight (lb) 8
Net Weight (lb) 2.7
FUZE
Contact Type
DATA NOT AVAILABLE