Standard Aircraft Characteristics

YGAR-1

FALCON
HUGHES

BY AUTHORITY OF
THE SECRETARY
OF THE AIR FORCE

14 AUG 53

SECRET

GUIDED AIRCRAFT ROCKET

53HC-12001
**PROPULSION**

**SUSTAINER**
- No. & Type: (1) Solid Rocket Motor
- Model: T-47
- Manufacturer: Hughes Aircraft Co.
- Max Thrust (lb): 5500
- Duration (sec): 1.2
- Length (incl. nozzle): 37.0"
- Diameter: 5.8"
- Weight (lb): Before burn-out: 48.8
  After burn-out: 14.8

**PROPELLANT**
- Type: Thiokol Base T1031
- Useful Weight (lb): 34

**BOOSTER**
- Not applicable

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**MISSION AND DESCRIPTION**

The YGar-1 FALCON is a small supersonic guided aircraft rocket whose primary mission is the destruction of enemy bombers when launched from a modified F-89 or F-102 aircraft.

The design of the wings and tail will have a cruciform arrangement while the nose is a radome made of laminated fiberglass impregnated with a thermosetting resin. The cylindrical afterbody, wings, and tail are constructed of magnesium.

The FALCON uses a semi-active target seeker consisting of a gyro-controlled antenna and a seeker receiver which depends upon the launching aircraft radar for illumination of the target. The seeker receiver contains circuitry which synchronizes with the launching aircraft radar and searches within a predetermined range for a target; finding one, the seeker locks on and tracks in range and position, generating a position error signal which guides the rocket on a proportional navigation course to the target.

This guided aircraft rocket is launched forward from a fighter on a collision course and depends upon a direct hit for detonation and launching in a salvo of four to six rockets to provide a kill probability of over 50%.

The FALCON has a maximum range up to 4,34 nautical miles (horizontal) with speeds from Mach 2.5 to 1.2 maximum at altitudes ranging from a minimum of 5,000 feet to a maximum of 50,000 feet against subsonic bombers.

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**DEVELOPMENT**

- Project Initiated: Mar 47
- Complete Guided Aircraft Rocket Project Initiated: Mar 48
- Component Development & Testing in Progress
- Tests being Conducted on Complete Rocket (except Warhead & Fusing)
- Actual Air-Launching started in May 1951
- Service Procurement: Jan 54

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**WARHEAD**

- BLAST TYPE
  - Gross Weight (lb): 8
  - FUZE
    - Type: Contact

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**GUIDANCE SYSTEMS**

(a) INITIAL:
- E9(A) Fire Control System
(b) MID-COURSE & TERMINAL:
- Semi-Active Radar Target Seeker
  - TARGET ACCURACY
    - 50% hits for salvo of 4 to 6 rockets against a B-29 bomber type target
  - CONTROL
    - Operated by the error signal from target seeker

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**LAUNCHING**

(a) Phase I:
- Short-Length Rail
(b) Phase II:
- Wing Pod Stowage

**LAUNCH TIME**

25 seconds required from time target spotted to launch rocket. Rocket boosted to over Mach 2.5 in 1.2 seconds.