Standard Aircraft Characteristics

NAVY MODEL
AGM-84A
AIRCRAFT

(TITLE UNCLASSIFIED)

This publication shall not be carried in aircraft on combat missions or when there is a reasonable chance of its falling into the hands of an unfriendly nation, unless specifically authorized by the "Operational Commander."

PUBLISHED BY DIRECTION OF THE
COMMANDER OF THE NAVAL AIR SYSTEMS COMMAND

NOTICE—This document contains information affecting the national defense of the United States within the meaning of the Espionage Laws, Title 18, U. S. C., Sections 793 and 794. The transmission or the revelation of its contents in any manner to an unauthorized person is prohibited by law.
NAVAIR 00-110AGM-1

Reproduction for non-military use of the information or illustrations contained in this publication is not permitted without specific approval of the issuing service (NAVAIR or USAF). The policy for use of Classified Publications is established for the Air Force in AFR 205-1 and for the Navy in Navy Regulations, Article 1509.

---

LIST OF CHANGED PAGES ISSUED

INSERT LATEST CHANGED PAGES. DESTROY SUPERSEDED PAGES.

NOTE: The portion of the text affected by the current change is indicated by a vertical line in the outer margins of the page.

---

* The asterisk indicates pages changed, added or deleted by the current change.

ADDITIONAL COPIES OF THIS PUBLICATION MAY BE OBTAINED AS FOLLOWS:

ASA F ACTIVITIES.—In accordance with Technical Order No. 00-1-2.

NAVY ACTIVITIES.—Use DD FORM 1548 and submit in accordance with the instructions contained in NAVSUP PUBLICATION 437—Military Standard Requisitioning and Issue Procedures.

For information on other available material and details of distribution refer to NAVSUP PUBLICATION 2002, SECTION VIII and NAVAIR 00-500A.
STANDARD AIRCRAFT CHARACTERISTICS
GUIDED MISSILE
AGM-84A "HARPOON"
MCDONNELL DOUGLAS CORPORATION

AUGUST 1974
NAVAIR 00-110 AGM-1

CONFIDENTIAL

POWER PLANT

| SUSTAINER | NO. & MODEL | (2) XHNP-CA-400 |
| MFR | TELEDYNE CAE |
| TYPE | SINGLE SPOOL TURBOJET |
| ENG. LENGTH | 28.41 IN. |
| BOOSTER | NO. & MODEL | (1) 12P25000 |
| MFR | AEROJET |
| TYPE | SOLID ROCKET |

RATINGS

| SLS THRUST | 660 LB |
| SLS SFC | 2.0 |
| Rotor Speed | 10,000 RPM |
| BOOSTER | TOTAL IMPULSE | 36,735 LB SEC |
| BURN TIME | 2.84 SEC |

ELECTRONICS

RADAR SEEKER

KU BAND, FREQUENCY AGILE ACTIVE RADAR
35 KW PEAK POWER
GIMBALED PLANAR ARRAY ANTENNA, MONOPULSE TRACKING
EXTENSIVE ECCM FEATURES
SIZE: 12.5 IN. DIA. 16.0 IN. LENGTH
WEIGHT: 63 LB
POWER: 85 W AVERAGE
MIDCOURSE GUIDANCE UNIT
INTEGRATED DIGITAL COMPUTER, AND 3 AXIS STRAPDOWN ATTITUDE REFERENCE
COMPUTER MEMORY - 8000 WORD, ADD TIME = 3.5 MICROSECOND
ATTITUDE REFERENCE
3 LEAR 1903 HF RATE INTEGRATING GYROS
3 SUNSTRAND 116A ACCELEROMETERS
SIZE: 12 X 10.2 X 6 INCH
WEIGHT: 26 LB
POWER: 127W
RADAR ALTIMETER
C-BAND, SHORT PULSE ACTIVE RADAR
(AN/APN 194)
100 WATT PEAK TRANSMITTED POWER
10 TO 5000 FT ALTITUDE MEASUREMENT
3 FT OR 0.1% ALTITUDE ACCURACY
SIZE: (RECEIVER/TRANSMITTER) 7.4X3.8X3.1 IN.
WEIGHT (INCLUDING 2 ANTENNAS) 55 LBS

MISSION AND DESCRIPTION

THE AGM-84A HARPOON MISSILE IS AN ANTISHIP MISSILE DESIGNED FOR LAUNCH FROM AIRCRAFT, SURFACE SHIPS, SUBMARINES AND SHORE-BASED INSTALLATIONS. IT WILL DELIVER A PENETRATION BLAST WARHEAD TO TARGETS IN EXCESS OF 30 NAUTICAL MILES. THE HARPOON IS DESIGNED FOR LOW ALTITUDE CRUISE TO MAXIMIZE RADAR SEEKER ACQUISITION PROBABILITY AND MISSILE SURVIVABILITY.


AT A PRESET DISTANCE FROM THE TARGET, THE FREQUENCY-AGILE PULSE RADAR SEARCHES A PRESELECTED OPERATIONAL AREA (NARROW, MEDIUM, WIDE) DEPENDENT ON TARGETING INFORMATION AND TARGET AREA CONSIDERATION. THE ALL-WEATHER SEEKER AND GUIDANCE PROVIDE HIGH HIT PROBABILITY AGAINST A SPECTRUM OF TARGETS RANGING FROM A PATROL BOAT (60 PERCENT P40) THROUGH A LARGE CRUISER TARGET (5 PERCENT P10) FOR SEA STATES 6 THROUGH 5 WITH 12 FT SWELL.

DEVELOPMENT

CONTRACT AWARD | JUNE 1971
FIRST FLIGHT | MAY 1972
EXPECTED SERVICE USE | JUNE 1976

DIMENSIONS

LENGTH (INCL. 29.5" BOOSTER) | 180.37 IN.
FUSELAGE DIA | 13.50 IN.
SPAN | 36.00 IN.
WING AREA | 253.13 IN²
CONTROL SURFACE AREA | 98.89 IN²
REF. AREA | 0.994 FT²

PRE SERVICE

WEIGHTS

| AIR LAUNCH | POUNDS |
| INITIAL | 2230.66 |
| SUSTAINER STARTED | 1296.63 |
| BURNOUT | 1096.79 |

| SHIP LAUNCH |
| INITIAL | 1528.88 |
| BOOSTER BURNOUT | 1379.38 |
| BOOSTER JETTIIONED | 1208.28 |
| SUSTAINER STARTED | 1204.25 |
| BURNOUT | 1094.41 |

FUEL

SUSTAINER TYPE | JP-4
WEIGHT | 113.24 LB
BOOSTER TYPE | C-1 POLYURETHANE
WEIGHT | 146.6 LB

ORDNANCE

THE WARHEAD SECTION CONSISTS OF A PENETRATING AND LOAD CARRYING STEEL STRUCTURE, EXPLOSIVE, SAFE AND ARM DEVICE, CONTACT FUZE AND PROXIMITY FUZE COMPONENTS.

TOTAL WEIGHT | 510 LB
EXPLOSIVE WEIGHT | 215 LB
(DESTEX)
SAFETY-ARMING | DYNAMIC PRESSURE PROBE ARMING
PRIMARY FUZE | DECELERATION ACTIVATED CONTACT WITH DELAY
BACKUP FUZE | PROXIMITY USING PENCIL SIDE-LOOKING LASER BEAMS

AUGUST 1974

3

CONFIDENTIAL

AGM-84A
## FLIGHT PATH SUMMARY

<table>
<thead>
<tr>
<th>LAUNCH CONDITION NUMBER</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAUNCH ALTITUDE, FEET</td>
<td>200</td>
<td>200</td>
<td>10,000</td>
<td>20,000</td>
<td>20,000</td>
<td>0 (A)</td>
</tr>
<tr>
<td>LAUNCH MACH NUMBER</td>
<td>0.43</td>
<td>0.90</td>
<td>0.60</td>
<td>0.38</td>
<td>0.90</td>
<td>0</td>
</tr>
<tr>
<td>MAXIMUM MACH NUMBER</td>
<td>0.85</td>
<td>0.90</td>
<td>0.90</td>
<td>0.97</td>
<td>1.0</td>
<td>0.86</td>
</tr>
<tr>
<td>RANGE AT CRUISE PULLOUT, NMI</td>
<td>0</td>
<td>0</td>
<td>3.2</td>
<td>5.1</td>
<td>5.9</td>
<td>3.1</td>
</tr>
<tr>
<td>CRUISE MACH NUMBER</td>
<td>0.851</td>
<td>0.851</td>
<td>0.851</td>
<td>0.851</td>
<td>0.851</td>
<td>0.864 (H)</td>
</tr>
<tr>
<td>MAXIMUM RANGE, NMI</td>
<td>61.9</td>
<td>65.2</td>
<td>64.4</td>
<td>65.0</td>
<td>66.1</td>
<td>64.8</td>
</tr>
<tr>
<td>TIME TO MAXIMUM RANGE, SEC</td>
<td>423.0</td>
<td>419.0</td>
<td>422.9</td>
<td>433.3</td>
<td>428.8</td>
<td>423.9</td>
</tr>
</tbody>
</table>

### NOTES

(A) SURFACE LAUNCH
(B) MAXIMUM RANGE BASED ON FUEL EXHAUSTION AT IMPACT (109.84 L.B)
(C) NOMINAL STANDARD DAY PERFORMANCE
(D) BASED ON CRUISE AT 200 FEET
(E) SUSTAINER AT MAXIMUM POWER AT LAUNCH FOR ALL AIR LAUNCHES
(F) ALL PERFORMANCE DATA ARE BASED ON CALCULATIONS UTILIZING WIND TUNNEL DATA
(G) ALL TRAJECTORIES TERMINATED WITH A POP-UP MANEUVER INITIATED 2.5 NMI FROM IMPACT
(H) SURFACE LAUNCH CONFIGURATION HAS SLIGHTLY LESS DRAG THAN AIR LAUNCH
(I) ALL DATA ARE BASED ON THE DESIGN PHASE CONFIGURATION (JULY 1972)
TYPICAL MISSION PROFILES

- AIR LAUNCH
- SURFACE LAUNCH

TYPICAL SEQUENCE OF EVENTS

AIR LAUNCH

1. Sustainer started approximately 10 seconds before launch
2. Sustainer at maximum power approximately 6.5 seconds after start
3. Launch
4. Descend to cruise altitude
5. Cruise at 50 to 200 feet at maximum power
6. Initiate terminal maneuver
7. Target impact

SURFACE LAUNCH

1. Booster ignition (2.84 sec burn time)
2. Booster burnout, booster/missile separation, command sustainer start, initiate aerodynamic control
3. Descend to cruise altitude
4. Cruise at 50 to 200 feet at maximum power
5. Initiate terminal maneuver
6. Target impact