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AUTHORITY

30 Apr 1969, Group-4, per document marking, DoDD 5200.10; SAMSO USAF ltr, 28 Feb 1972

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ANALYSIS
PREPARED BY
CHECKED BY
REVISED BY

C O N V A I R
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO

PAGE
REPORT NO.
MODEL
DATE

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INTRODUCTION

In recognition of the scarcity of compiled information pertaining to this country's present missile systems and the need for such material, this is an attempt toward such a compilation.

Since this report is based upon information available in our own library, it is limited; however, an attempt will be made to keep this material up to date. Any additions or amplifications by readers of this report are earnestly solicited.

Sincere thanks is extended to the Engineering Library Personnel for their invaluable contributions to the acquisition of these data.

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SAN DIEGO

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REPORT NO.
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DATE

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CHARACTERISTICS OF STRATEGIC AND TACTICAL MISSILES

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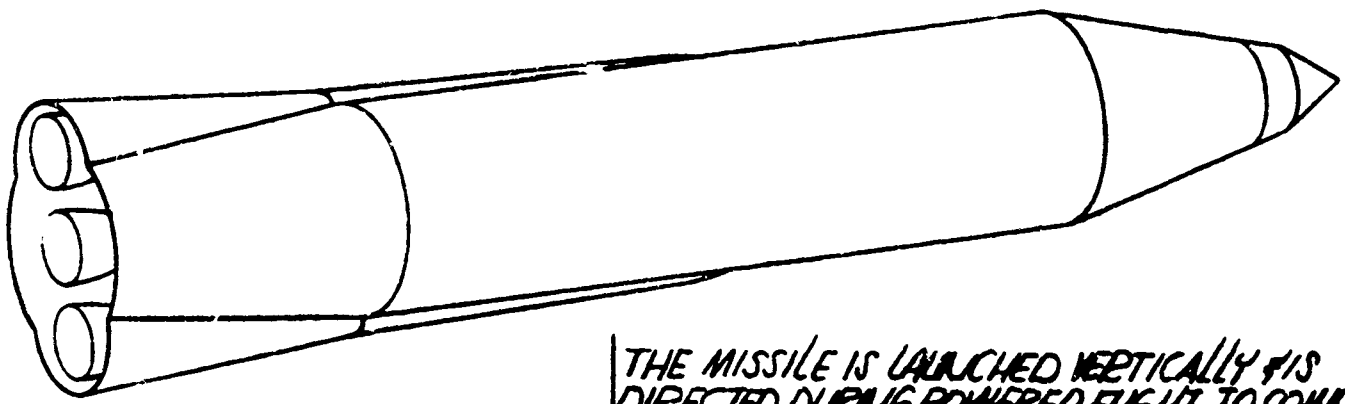
Date 4/22/57
Prepared By C. H. HANSON
Checked By
Revised Date 7/22/57

CONFIDENTIAL
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model SM 67A

Page [] Temp [] Penn []
Report No. ZM-486

SPONSOR: AIE FORCE
MFR. CONVAIR-ASTRONAUTICS DIV.

ATLAS



LENGTH: 82'
DIAMETER: 150"
SPAN: NO SURFACES
WEIGHT: 240,000#

THE MISSILE IS LAUNCHED VERTICALLY & IS DIRECTED DURING POWERED FLIGHT TO COME AT THE POWER CUT-OFF POINT WITH AN ELLIPTICAL PATH WHICH INTERSECTS THE TARGET. FOLLOWING POWER CUT-OFF THE NOSE IS SEPARATED FROM THE AIR FRAME; IT THEN FOLLOWS THIS ELLIPTICAL PATH IN A FREE-FALL TRAJECTORY. ALL GUIDANCE IS ACCOMPLISHED DURING THE BRIEF PERIOD OF POWERED FLIGHT.

WARHEAD: 1500#

GUIDANCE: COMMAND & BALLISTIC (AZUSA)

PROPULSION: LIQUID PROPELLANT ROCKETS (SEE PROPULSION DATA SHEET)

RANGE: 5500 N.M.I.

VELOCITY: M=23

ALTITUDE: 500 N.M.I.

REMARKS: CAPTIVE FLIGHT TESTS IN MID-1957
FIRST FLIGHT JUNE '57

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GR. 4
DOWNGRADED AT 3 YEAR INTERVALS
DECLASSIFIED AFTER 12 YEARS
DOD DIR 5200.10

REFERENCE: CONVAIR-TM 339-42-2 SEPT. 1956
Form 1277-C

Date 4/23/57
Prepared By M. HANSON
Checked By
Revised Date

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model _____

SECRET

Page _____
Temp _____
Penn _____
Report No. ZM-486

ATLAS

<u>DIMENSIONS, IN FEET</u>	<u>SM-65</u>	<u>XSM-65A</u>
LENGTH-OVERALL, (ASSEMBLED)	82.0	82.0
-NOSE SECTION	3.5	3.5
-ADAPTER SECTION	5.1	5.1
-TANK SECTION	61.1	61.1
-BODY SECTION (TANKS & ADAPTER)	64.0	64.0
-PROPULSION SECTION	14.8	14.8
DIAMETER-MAX. (PROPULSION SECTION)	16.2	16.2
-TANK'S	10.0	10.0

<u>WEIGHT, IN POUNDS</u>		
GROSS (LAUNCHING WT.)	20,254	20,254
EMPTY WEIGHT (INCL. PAYLOAD & RESIDUALS)	16,426	17,028
FABRICATED WT. (NO P.L., BALLAST OR RESIDUALS)	13,002	14,673
PAYLOAD	1,500	NONE
EXPENDABLE FLUIDS & GASES		
FUEL, JP-4	69,174	56,012
OXIDIZER LOX	156,368	126,026
OTHER	279	188
TOTAL EXPENDABLE	225,821	182,226
JETTISONED WEIGHT	6,584	NONE

SECRET

Date 4/23/57
 Prepared By C.M. HANSON
 Checked By
 Revised Date

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 DIVISION OF GENERAL DYNAMICS CORPORATION
 SAN DIEGO, CALIFORNIA
 Model _____

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 Temp Perm
 Report No. ZM-486

ATLAS

<u>WEIGHTS, IN POUNDS</u>	<u>SM-65</u>	<u>XSM-65A</u>
NOSE SECTION	3,500	3,500
BODY SECTION (TANKS & ADAPTER)	2,857	4,972
PROPULSION SECTION (NON-JETTISONED)	1,849	5,018
FIXED EQUIPMENT (NON-JETTISONED)	879	1,550
TEST EQUIPMENT	NONE	2,373
PAINT	NONE	100
RESIDUAL FLUIDS & GASES (UNEXPENDED)	985	1,515
BURNOUT WEIGHT	10,070	19,028

PROPULSION DATA.

① BOOSTER ROCKET ENGINE (2 THRUST CHAMBERS) SEA LEVEL THRUST	300,000*	270,000*
SUSTAINER ROCKET ENGINE (1 THRUST CHAMBER) SEA LEVEL THRUST	60,000*	NONE
③ VERNIER ROCKET ENGINE (2 THRUST CHAMBERS) SEA LEVEL JET THRUST EACH CHAMBER	1,000*	1,000*
SEA LEVEL AXIAL THRUST EACH CHAMBER	940*	940*
TOTAL AXIAL THRUST @ SEA LEVEL	361,880*	271,880*

SECRET

REF: TECH. PROGRESS INFO. (CONVAIR) ZR-7-056-1 JAN. '56.

Date 9/15/57
Prepared By CM. HANSON
Checked By
Revised Date

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model MX-1601

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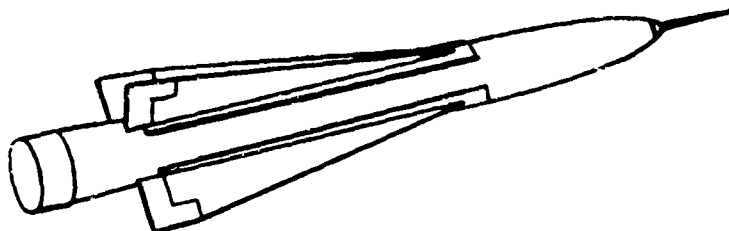
Penn

Repts: ZM-486

SPONSOR: C. DENELL

MFGR: RAYTHEON

B-DM



LENGTH: 195'

DIAMETER: 7.9'

SPAN: 25"

WEIGHT: 1300^{lb} WITHOUT BOOSTER

WARHEAD:

GUIDANCE: TELEMETERING SYSTEM

PROPULSION: SOLID PROPELLANT ROCKET

RANGE: 13 N.MI.

VELOCITY: M=25

ALTITUDE: 60,000'

REMARKS: CONTROL SYSTEM TO PRODUCE 180° TURNS.
JET VALVES ARE USED. OPERATIONAL 1960.
BOMBER DEFENSE MISSILE CAPABLE
OF VERTICAL OR REARWARD LAUNCH
AND TURN IN ANY DIRECTION.

SECRET

REFERENCE:
Form 1277-C

NRL/SHU/TG-60-19 JUNE 15/55. CONVAIR-TM 339-42-2

Date 3/19/57
Prepared By C.M. HANSON
Checked By
Revised Date 7/22/57

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model MX-1964

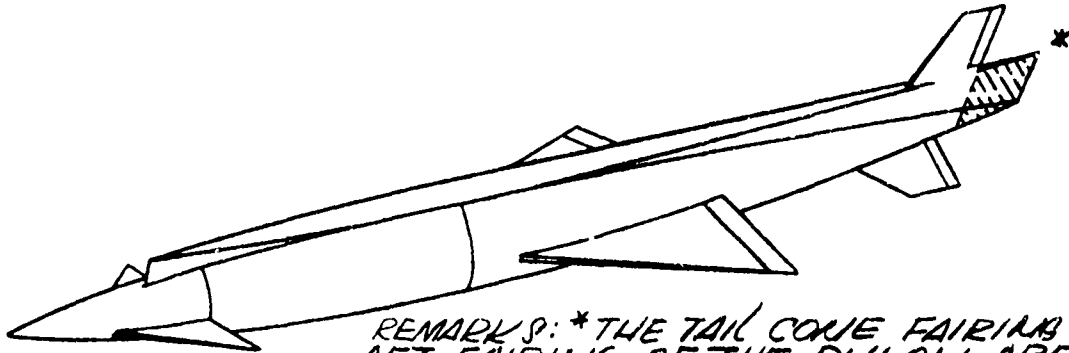
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Report No. ZM-486

SPONSOR: AIR FORCE
LAFGR: CONVAIR F.W.

B-58 POD



REMARKS: *THE TAIL CONE FAIRING AND
JET FAIRING OF THE PYLON ARE JETTISONED FOR ROCKET POWERED
FLIGHTS.

LENGTH. 669"

DIAMETER: 60' MAX

SPAN. WING = 205.62' CANARD = 111.9"

WEIGHT: (2800# W.H.) 11,295#, (7000# W.H.) 14,555#,
(20,000# W.H.) 28,545#

WARHEAD: 2800#, 7,000#, 20,000#

GUIDANCE: BOOST-GLIDE = NON EMANATING, TWO AXIS
INERTIAL TYPE SYSTEM.

PROPULSION LIQUID ROCKET, 15,000# THRUST FOR 65 SEC.

RANGE: (2800# W.H.) 173 N.M.I., (7,000# W.H.) 121 N.M.I.,
(20,000# W.H.) 63 N.M.I.

VELOCITY: M = 2.0

ALTITUDE. LAUNCH @ 60,000'

REMARKS THE POD IS CARRIED TO ITS OPERATIONAL AREA BY THE B-58
AIRPLANE OF WHICH IT IS A COMPONENT PART UNTIL SEPAR-
ATION. AFTER LAUNCH THE ROCKET ENGINE BOOSTS
THE POD TO HIGHER MACH NUMBERS & ALTITUDE. THE
POD THEN GLIDES TO THE IMMEDIATE
TARGET AREA AND DESCRIBES A TERMINAL
DIVE TO THE TARGET

REFERENCE. CONVAIR-FZA-4-098 1 JULY 54.

Form 1277-C

Date 6/18/57
Prepared By C.M. HAUSOU
Checked By
Revised Date

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model _____

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Report No ZM-486

SECRET

B-58 POD

PROPULSION UNIT DATA

THRUST = 15,000[#] @ 70,000' ALT. (THRUST VARIES WITH ALTITUDE).

I_{sp} = 255 SEC.

PROPELLANT FLOW RATE = 58.77 LBS/SEC.

PROPELLANT = JP-4 FUEL & RED FUMING NITRIC ACID OXIDIZER.

CHAMBER PRESSURE = 550 PSIA.

MIXTURE RATIO = 4.25[#] RFNA TO 1[#] JP-4.

THE MOTOR INCORPORATES A SELF FED TURBINE PUMP UNIT WHICH INCLUDES A SOLID PROPELLANT IGNITER, GAS GENERATOR, TURBINE, ACID PUMP AND FUEL PUMP.

THE INSIDE DIA. OF THE NOZZLE @ EXIT = 18 IN, AND THE DIA. OF THE AREA WHICH ENCOMPASSES THE TURBINE PUMP AND LINES TO THE COMBUSTION CHAMBER IS APPROX. 22 IN.

REF: FZA-4-293, 1 JULY 1954

SECRET

Date 25 OCT 53
Prepared By DITMARS
Checked By
Revised Date 3/18/57
CM HANSON

CONVAIR SECRET

A DIVISION OF GENERAL DYNAMICS CORPORATION

SAN DIEGO, CALIFORNIA

Model XAAM

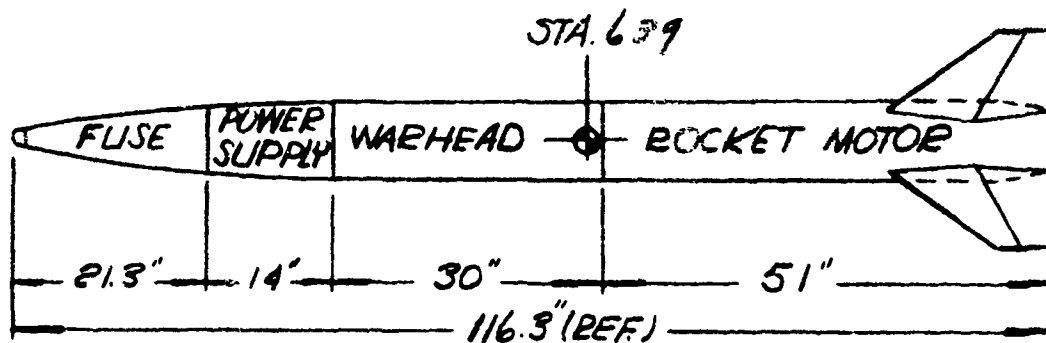
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Temp Penn

Report No. ZM-486

SPONSOR: AIR FORCE

MFGR. DOUGLAS

BIRD DOG



LENGTH: 116.3" TARGET PHASE II 100" MAX.

DIAMETER: 80" NOSE RADIUS = .75"

SPAN: 24" ROOT CHORD = 18.5" TIP CHORD = 6"

WEIGHT: 311^{lb}

WARHEAD: 150* FRAGMENTATION (140 GRAIN; TENTATIVE)

GUIDANCE: NONE - POWER SUPPLY FOR FLUSE

PROPULSION: SPARROW S.P. ROCKET I-14,400 LB. SEC.

RANGE: LETHAL RADIUS = 100'

VELOCITY: SUPERSONIC

ALTITUDE:

REMARKS: F102 REQUIRES MISSILE BAY EXTENSION TO CARRY 6 MISSILES.

SFC, E.

REFERENCE: DITMARS' TRIP TO DOUGLAS 11-27-53

Form 1277-C

Date 10-3-54
Prepared By DITMARS
Checked By
Revised Date 8-20-57
C.M. HANSON

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model XASM-XAAM

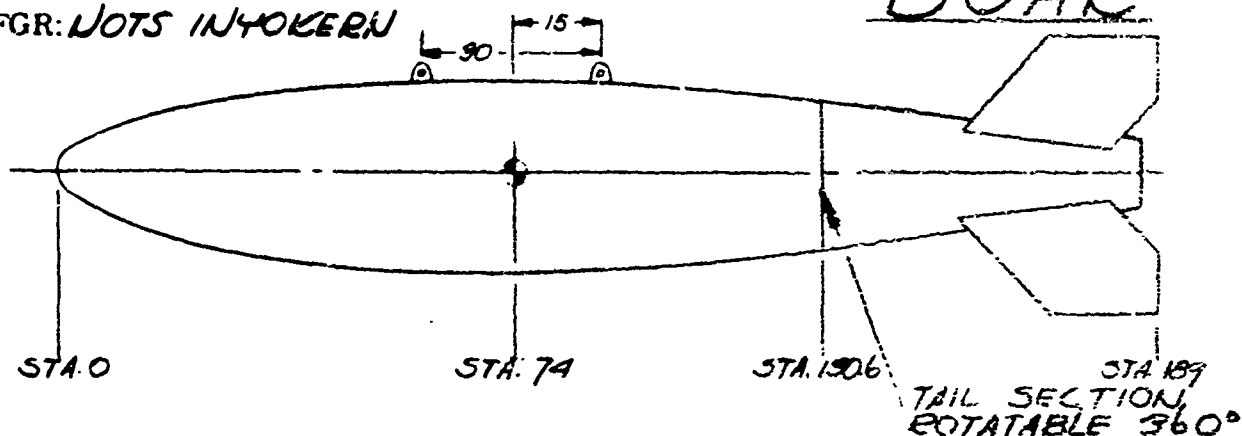
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Report No. ZM-486

SPONSOR: BUORD
MFGR: NOTS INYOKERU

BOARD



LENGTH: 189"
DIAMETER: 30.5" (11.25" @ BASE)
SPAN: 54" $C_R = 30"$ $C_T = 19"$ SWEEP = 45°
WEIGHT: LAUNCH = 1950* BURN-OUT = 1720*
WARHEAD: MARK VII
GUIDANCE: NONE ~ DETONATION TIMER
PROPULSION: S.P. ROCKET ~ E7DS-16,000 ($T = 14,500$, $t_b = 2.97$)
RANGE:
VELOCITY: SUB SONIC SHAPE
ALTITUDE:
REMARKS: FINS ROTATABLE & FOLDABLE

SECRET

REFERENCE: SK-368861 - NOTS (4-17-53)

Form 1277-C

Date *2/11/57*
Prepared By *C. M. HANSON*
Checked By
Revised Date

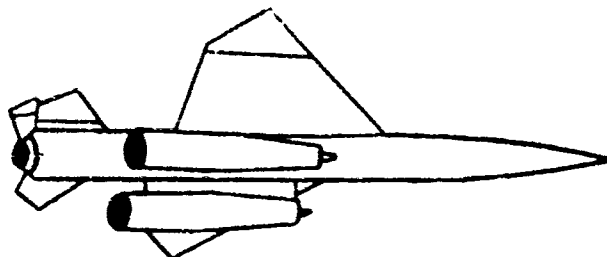
CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model *1M-99*

Page
Temp Form

Report No. *ZM-486*

SPONSOR: *AIR FORCE*
MFGR: *BOEING*

BOMARC



LENGTH: *420"*

DIAMETER: *35"*

① MISSILE $\frac{1}{4}$ N	<i>623.3</i>
GROSS WT.	<i>11,550</i>
EMPTY WT.	<i>5781</i>
OXIDIZER WT. (ACID)	<i>3946</i>
FUEL WT. (JP-3)	<i>1071</i>
RAM JET FUEL WT (JP-3)	<i>752</i>

SPAN: *WING = 168", WING AREA = 45 FT², HORIZ. TAIL = 15 FT.²
VERT. TAIL = 4 FT.²*

WEIGHT: *12,300 # MAX. FOR 50,000' ALT., 8,000 # TARGET (TACTICAL)*

WARHEAD: *300 # (ULTIMATELY NUCLEAR)*

GUIDANCE: *PROGRAMMED CLIMB, COMMAND CRUISE, ACTIVE TARGET SEEKER
(PULSE TYPE RADAR) AN/APQ-41 AI*

PROPULSION: *CRUISE - 2 MARQUARDT 28" DIA RAM JETS (XRJ-43-MA-3)
BOOST - 1 AEROJET LIQUID ROCKET (XR-59-AJ-5) WFNJA+JPA*

RANGE: *185 N.MI. (ULTIMATE 250 N.MI.)*

VELOCITY: *M = 2.7*

ALTITUDE: *50,000' (ULTIMATELY - 80,000')*

REMARKS: *INTEGRAL BOOSTER - TIPS OF ALL SURFACES MOVE-
ABLE FOR CONTROL - WING PLAN FORM - RAKED
TIP DELTA.*

SECRET

REFERENCE: *D 11508 BOMARC PR. 48 DEC. '52 (01757)
D P.B.#11 SEPT. 53*

Form 1277-C

Date 7 SEPT. 1956
Prepared By CHALK
Checked By 7/22/57
Revised Date 9/1/57
C.M. HANSON

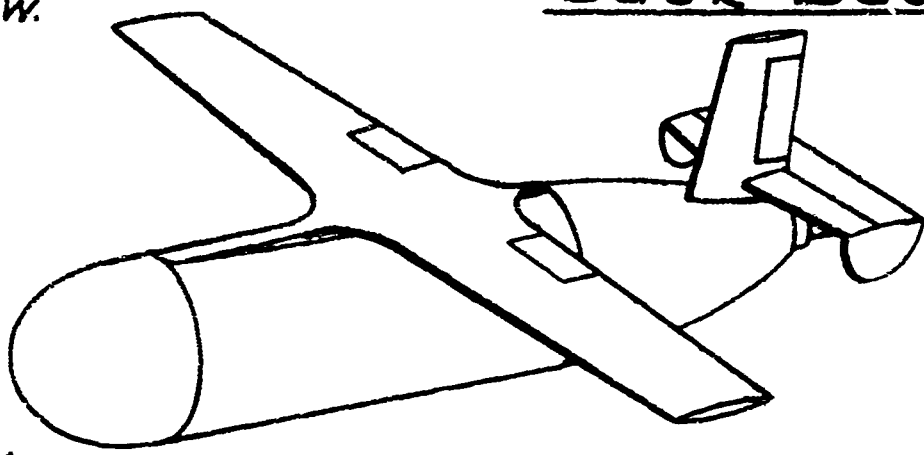
ONVAIR SECRET
DIVISION OF GEORGE L. BRYAN CORPORATION
SAN DIEGO, CALIFORNIA
Model XEAM-71

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Temp Fenn

Report No. ZM-486

SPONSOR: AIR FORCE
MFR: COLLIER-F.W.

BUCK DUCK



LENGTH: 13'
DIAMETER: 2.5'
SPAN: OPEN 14' FOLDED 5'
WEIGHT: 1550#
WARHEAD: NONE
GUIDANCE: AUTOMATIC CONTROL SYSTEM - SCHMIDT AUTO PILOT FOR STABILIZATION
PROPULSION: LIQUID MONO-PROPELLANT ROCKET, ETHYL-ISOPROPYL NITRATE - MAX. FUEL CAPACITY = 103.5 GAL, ONE XLRP-AJ-1 (AEROJET)
RANGE: 200 N.M.
VELOCITY: M = .55
ALTITUDE: 40,000 FT.
REMARKS: THIS IS A DECOY MISSILE, DESIGNED TO CONFUSE, DILUTE, SATURATE OR OTHERWISE DEGRADE A HOSTILE RADAR CONTROLLED AIR DEFENSE SYSTEM.

SECRET

REFERENCE: 6024-ND
Form 1277-C

Date 9/20/57
Prepared By CM HANSON
Checked By
Revised Date 7/27/57

CONVAIR
DIVISION OF GENERAL DYNAMIC CORPORATION
SAN DIEGO, CALIFORNIA
Model XASM-11-7

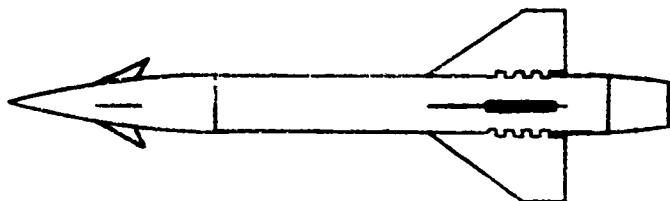
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Report No. ZM-186

SPONSOR: BUIOED
MFGR: MARTIN

BULL PUP



LENGTH: 126"
DIAMETER: 12"
SPAN: 37.9"
WEIGHT: 541.1#
WARHEAD: AN-M57-GENERAL PURPOSE BOMB, WT: 254.0#; AL-M-81 FRAGMENTATION BOMB, WT: 258.0#; MK81 MOD 0 LOW DRAG BOMB, WT: 248.5#
GUIDANCE: VISUAL RADIO COMMAND
PROPULSION: SOLID PROPELLANT ROCKET (1.5XS-12000 AERJET)
RANGE: 50 MI.
VELOCITY: M = 2
ALTITUDE: 22,000'
REMARKS: OPERATIONAL IN 1958 AIMED TO REDUCE ATTRITION OF DIVE BOMBERS DUE TO SMALL ARMS FIRE.

REFERENCE: CONVAIR TM 339-42-2 SEPT. 1956
Form 1277-C

Date 7-SEPT. 56
 Prepared By DITMAPS
 Checked By
 Revised Date 9/11/57
 C.M. HANSON

CONVAIR
 A DIVISION OF GENERAL DYNAMICS CORPORATION
 SAN DIEGO, CALIFORNIA
 Model. D-40

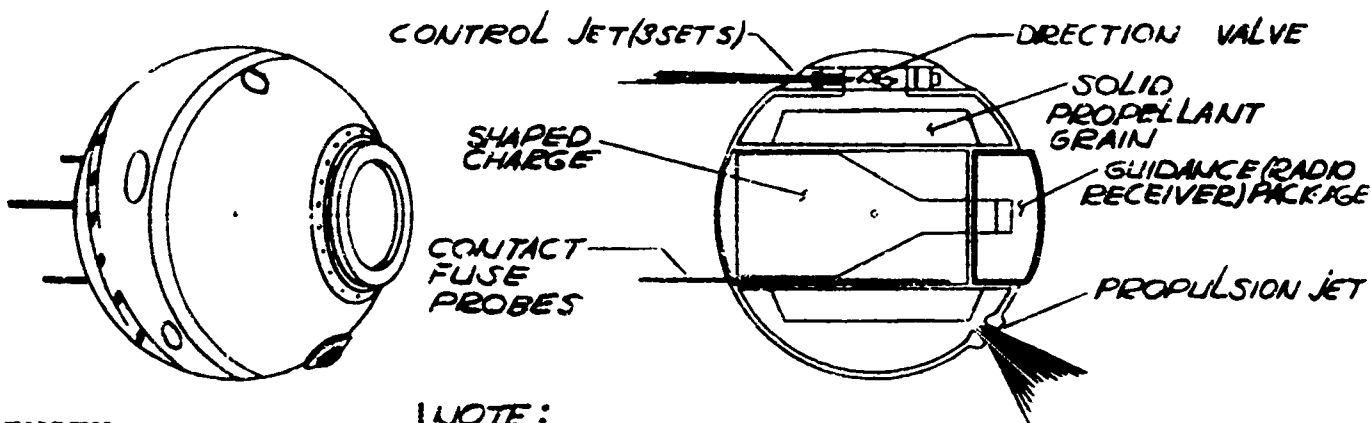
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 Temp Penn

Report No. ZM-486

SPONSOR: BUORD (JHU)
 MFGR:

CANNON BALL



LENGTH:
 DIAMETER. 19.75"
 SPAN:
 WEIGHT: 170#
 WARHEAD:
 GUIDANCE:
 PROPULSION
 RANGE
 VELOCITY:
 ALTITUDE:

NOTE:
 PITCH, YAW, & ROLL IS SENSED BY ONE OF THREE GYROSCOPES IN MISSILE.
 CANNONBALL IS GUIDED VISUALLY BY TWO OPERATORS. ONE CONTROLS PITCH, AND THE OTHER YAW. JOY STICKS ARE USED TO GIVE MISSILE COMMANDS DESIGNED TO MAINTAIN IT ON THE LINE-OF-SIGHT COURSE TO THE TARGET. THE COMMANDS ARE TRANSMITTED TO MISSILE BY SHORT-WAVE RADIO LINK OR BY A DIRECT WIRE LINK.
 THE ONE MAN CONTROL IS A PART OF THE SUBMARINE FEASIBILITY PROGRAM. A FOUR-OR EIGHT-POSITION JOY STICK IS USED.

6.5" PLASTIC CHARGE OR 50" SHAPED-CHARGE TYPE WARHEAD.
 AUXILIARY JETS- RADIO DIRECTED
 SOLID ROCKET
 3,000 YDS.
 350 FT/SEC.
 SEALEVEL
 REMARKS: 28 FLIGHT TESTS OF D-40-2 AIR TANK PROTOTYPE MISSILES HAVE BEEN MADE TO DATE.
 15 FLIGHT TESTS OF D-40-3 UNDERWATER PROTOTYPE MISSILES HAVE BEEN MADE TO DATE.

REFERENCE: (JHU) BUMBLEBEE SERIES RPT #262 (DEC. 1956)
 Form 1277-C

Date 6 MAY '54
Prepared By DITMARS
Checked By
Revised Date 3/15/57
C.M. HANSON

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model JSM-A-17

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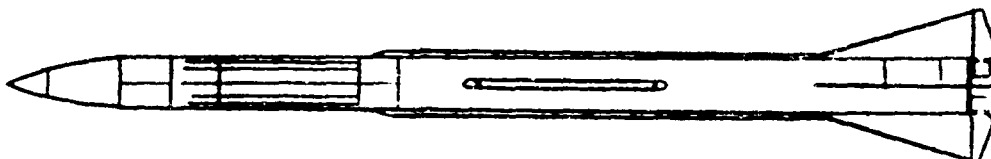
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Temp Penn

Report No. ZM-486

SPONSOR: ARMY ORD.
MFGR: FIRESTONE-GILFILLAN

CORPORAL



LENGTH: 45'
DIAMETER: 30"
SPAN: 80" (EST)
WEIGHT: 11,000[#]
WARHEAD: 1500[#]
GUIDANCE: X-BAND FLIGHT RADAR, INERTIAL RADIO
PROPULSION: LIQUID PROP. ROCKET. THRUST = 20,000[#] (12FUA[#] LDMH) MFD. BY RYAN.
RANGE: 30 TO 80 MI.
VELOCITY: M = 3.8
ALTITUDE: 22-26 MI. PEAK
REMARKS: VTO FROM SPECIAL CRADLE. JET VANES IN ROCKET EXHAUST FOR LOW SPEED CONTROL. DEVELOPED FROM JPL-CAL TECH CORPORAL E. ARTILLERY BOMBARDMENT MISSILE.

REFERENCE:
Form 1277-C

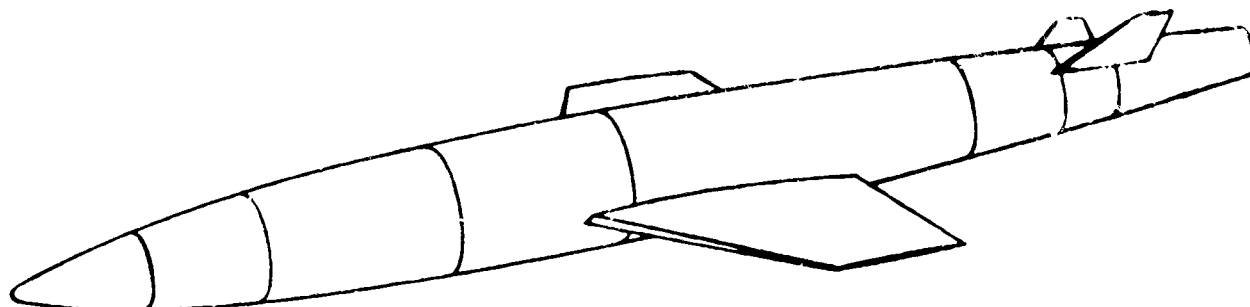
JPL GINS #50 (03766) CORPORAL BIMONTHLY SUMMARY RPT. #39A.

Date 4/15/57
Prepared By E. M. HANSON
Checked By
Revised Date 7/22/57
CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO CALIFORNIA
Model XASM-1-B

Page
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Form
Report No 2 M-406

SPONSOR: NAVY
MFGR: TEMCO

CONVLIS



LENGTH: 192"
DIAMETER: 18", 80"
SPAN: 60"
WEIGHT: 1599²
WARHEAD: XN-25 (NUCLEAR, 230² EST.)
GUIDANCE: PASSIVE HOMING-RANGE, 170 MI AGAINST RADIATING TARGETS, 100 MI AGAINST ILLUMINATED TARGETS
PROPULSION: LIQUID (OXIDIZER = HYD. PROX., FUEL - JP-5) THRUST 1000² DURATION 185 SEC.
RANGE
VELOCITY: M=3.75 WHEN AIR LAUNCHED @ 40,000'
ALTITUDE: SEMI-BALLISTIC PATH-BURGLUT @ 70,000'
REMARKS: RADAR BLISTER WEAPON

SECRET

REFERENCE
Form 1277 C

TRIP REPT. CR. TUTTLE (10 JUNE '57)
NAVY, TS-149 (19 FEB., 1957)

Date *3/15/57*
Prepared By *C.M. HANSON*
Checked By
Revised Date

C O N V A I R SECRET
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model *XVSM*

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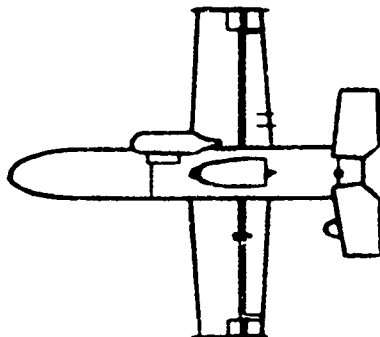
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Temp Penn

Report No. *ZM-468*

SPONSOR: *ARMY*
MFGR. *AEROPHYSICS DEVELOPMENT CORPN.*

DART



LENGTH: *69"*
DIAMETER: *8.5*
SPAN: *34" INTERDIGITATED CRUCIFORM*
WEIGHT: *85⁺*
WARHEAD: *20"*
GUIDANCE: *COMMAND (WIRE-GUIDED)*
PROPULSION: *SOLID PROPELLANT ROCKET, 1:88/49-3-MS-616/639,
XM-23*
RANGE: *3 N.MI.*
VELOCITY: *M = .3*
ALTITUDE: *GROUND LEVEL*
REMARKS: *WIRE GUIDED ANTI-TANK WEAPON
BASED ON FRENCH AND GERMAN
CONCEPTS. MAY BE LAUNCHED FROM
A JEEP.*

SECRET

REFERENCE: *CONVAIR TM 339-42-2*
Form 1277-C

Date *2/26/57*
Prepared By *C.M. HANSON*
Checked By
Revised Date

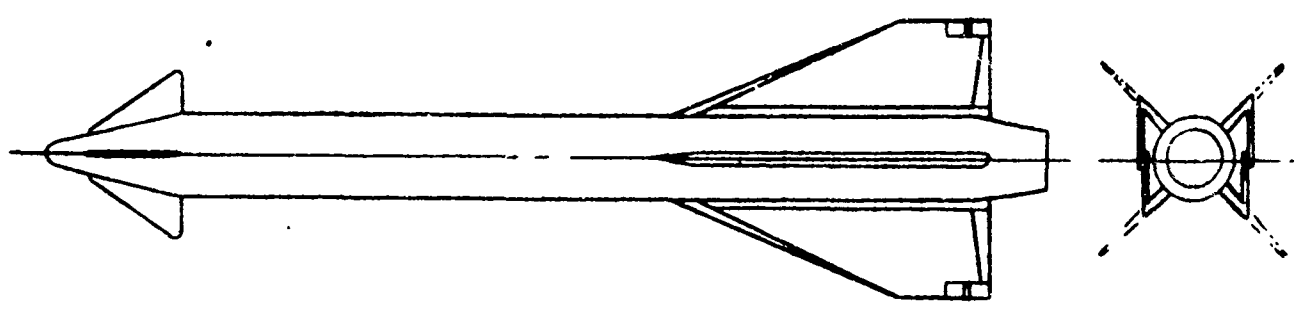
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A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model *AAM/ASM*

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Report No *ZM 486*

SPONSOR: *NOTS*
MFGR:

DIAMONDBACK



- LENGTH: *148"*
- DIAMETER: *12"*
- SPAN: *CANARD 22", WING: OPEN 40", CLOSED 22"*
- WEIGHT: *850**
- WARHEAD: *EITHER HIGH-LETHALITY CONTINUOUS-ROD HIGH-EXPLOSIVE W.H. OR LOW-YIELD (0.75 KT) ATOMIC W.H., W.H. = 172**
- GUIDANCE: *IR & PASSIVE RADAR HOMING*
- PROPULSION: *LIQUID ROCKET PROPELLANT: UDMH/RFNA*
- RANGE: *TAIL ATTACKS @ RANGES of 15-20 MI FROM ALTITUDES OF 20,000' - 70,000'*
- VELOCITY: *CRUISE @ MACH 3.0 ABOVE 35,000'*
- ALTITUDE: *DESIGN FOR 80,000' MAX.*
- REMARKS: *STATUS; OPERATIONAL 1960**

SECRET

REFERENCE: *NOTS REPORT 1504 (7-2-56)*
Form 1277-C * TRIP REPORT: ALLPORT, LA FORCE & LEGUE DATED 7-30-56

Date 6/19/57
Prepared By C. M. VANSON
Checked By
Revised Date

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
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Report No. ZNI-406

DIAMONDBACK

PROPELLSION

PROPELLANTS = UNSYMMETRICAL DIMETHYL
HYDRAZINE AND RED FUMING NITRIC ACID.
WEIGHT OF PROPELLANTS = 372#
 $I_{sp} = 292 \text{ LB-SEC/LB.}$
CHAMBER PRESSURE (BOOST PHASE) = 1800 P.S.I.
OVERALL THRUST RATIO OF THE SUSTAIN-
ER AND BOOSTER COMBINATION IS 33.3 TO
1 (10,000 LB / 300 LB).

SECRET

REF: NOTES 1504 (13871)

Date 10 SEPT 1956
Prepared By CHALK
Checked By
Revised Date 3/7/57
G.M. HANSON

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model MB-1

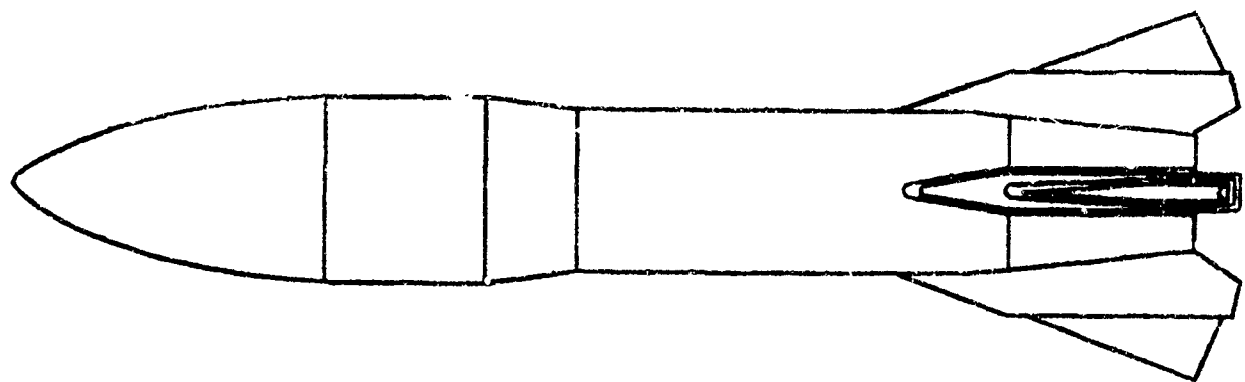
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Report No. ZM-486

SPONSOR: AIR FORCE
MEGR: DOUGLAS

DING-DONG



LENGTH: 115"
DIAMETER: 17.35" (MAX), BODY 15"
SPAN: EXTENDED = 39.5" RETRACTED = 28.5"
WEIGHT: $W_0 = 812^{\#}$ $W_6 = 488^{\#}$
WARHEAD: 230[#] XW-25
GUIDANCE: UNGUIDED (AIMED BY LAUNCHING A/C FIRE CONTROL)
PROPULSION: SOLID ROCKET AJB-2KS-36, 250
RANGE: 5 MI. @ HIGH ALT. - 3 MI. @ LOW ALT.
VELOCITY: 3,000 FT/SEC. ADDED TO THAT OF LAUNCHING AIRCRAFT.
ALTITUDE: 65,000' (MAX.)
REMARKS: FOR INSTALLATION ABOARD ALL-WEATHER INTERCEPTOR AIRCRAFT. (F102C - F106)

SECRET

REFERENCE. DOUGLAS AC. J5591129, RPT # SM-27125 (8-1-56)
Form 1277-C

Date 4/22/57

Prepared By M. HANSON

Checked By

Revised Date

CONVAIR

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SAN DIEGO, CALIFORNIA

Model: MB-L

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Report No. ZM-86

DING-DONG

$$W_0 = 812^{\#}$$

$$W_e = 488^{\#}$$

$$\mu = 1.66$$

$$l_{\mu} \mu = 507$$

$$l = 114.9$$

$$d_{w4} = 17.35$$

$$d_b = 15" \text{ (15.5" OVER HEATING BLANKET)}$$

$$R(\text{LOW ALT.}) = 15,000'$$

$$R(\text{HIGH ALT.}) = 30,000'$$

$$\text{SPAN (EXT.)} = 39.5"$$

$$\text{SPAN (FOLDED)} = 22.5"$$

$$A_F = 218 \text{ IN}^2 / \text{PANEL}$$

Date 4/28/57

Prepared By C. M. HANSON

Checked By

Revised Date

CONVAIR

A DIVISION OF GENERAL DYNAMICS CORPORATION

SAN DIEGO, CALIFORNIA

Model MB-1

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Report No. ZM-486

DING-DONG

MOTOR 2KS-36, 250, E1

$l_{oa} = 66.5''$

$l_{CH} = 46.81''$

$D_e = 11.875''$

$D_c = 15.0'' \pm .015'' (OD)$

$W_{CH} = 120''$

$W_{NOZ} = 48''$

$W_{LINER} = 5''$

$W_{IGN} = 3''$

$a_{max} = 100g (28g \text{ NORMAL})$

$W_p = 324''$

$C^* = 4730 \text{ 1/SEC}$

$T_c = 4600^\circ F$

Date 4/22/57

Prepared By C. M. HANSEN

Checked by

Revised Date

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SAN DIEGO, CALIFORNIA

Model: 118-1

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Report No. ZM-486

DING-DONG

WARHEAD POWER REQUIREMENTS:

FLIASE: TOTAL POWER SUPPLY VOLTAGE =
400V, DC ± 28 V
FILAMENT VOLTAGE (AC RMS OR DC) =
12.6V $\pm 5\%$

ARM: 20V, DC CATALYST RESEARCH CORP.
B-415 THERMAL BATTERY

FIRE: OUTPUT OF 4 MICROFARAD CAPACITOR
CHARGED TO 200 V MIN. THRU 2
TYPE 5643 SUB-MINIATURE THYRATROUS
IN SERIES.

FLIASE WEIGHT: 24 #

Date 28 OCT '57
 Prepared By DITHMPS
 Checked By 2/23/57
 Revised Date 3/5/57
 C.M. HANSON

CONVAIR
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 SAN DIEGO, CALIFORNIA
 Model GAR-1, IA, IB

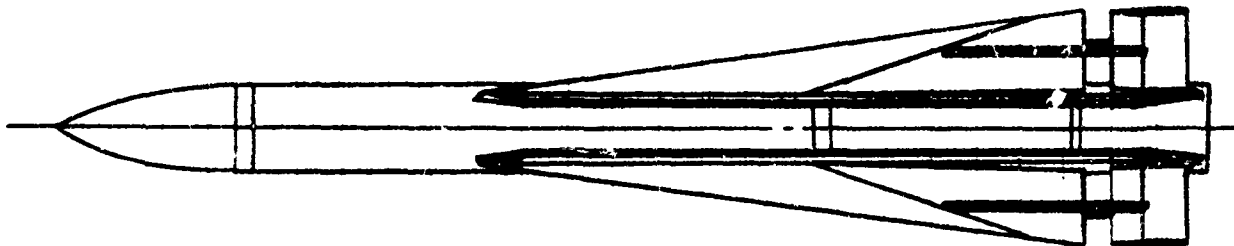
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Report No. Z.M-486

SPONSOR: USAF
 MFGR: HUGHES AIRCRAFT CORP

FALCON



	GAR-1	GAR-1A	GAR-1B
LENGTH:	77.84'	86.5'	77.84'
DIAMETER:	6.4"	6.4"	6.4"
SPAN:	20'	24'	20'
WEIGHT:	124 [±]	135 [±]	124 [±]
WARHEAD:	8"	5" HBX CONTACT	8"
GUIDANCE:	SEMI ACTIVE PULSE	RADAR HOMING	INFRA-RED
PROPULSION:	5560 [±] /1.2 SEC	4500 [±] /0.6 SEC 700-0 [±] /3.0 SEC	5560 [±] /1.2 SEC.
RANGE:	5,000'-25,000'	5,000'-25,000'	5,000'-25,000'
VELOCITY:	2,000 FT/SEC + LAUNCH	2,000 FT/SEC + LAUNCH	2,000 FT/SEC + LAUNCH
ALTITUDE:	50,000'	70,000'	50,000'

REMARKS:

SKETCH ABOVE IS OF GAR-1A, GAR-1B IS SAME AIRFRAME AS GAR-1 WITH INFRA RED GUIDANCE.
 ~595 @ BUZZOUT

SECRET

REFERENCE: PR 40-28P 4th QUARTER 52 (HAC)
 Form 1277-C

Date 3/6/57

Prepared By C.M. HANSON

Checked By

Revised Date

CONVAIR

DIVISION OF GENERAL DYNAMICS CORPORATION

SAN DIEGO, CALIFORNIA

Model GAR-1C

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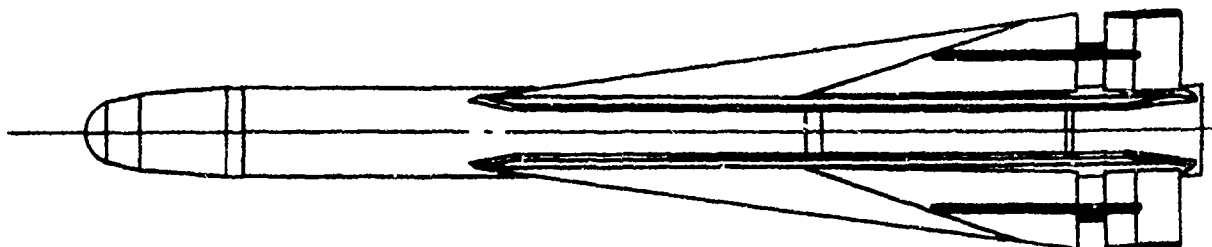
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Report No. ZM-486

SPONSOR: USAF

MFGR: HUGHES AIRCRAFT CORP

FALCON



LENGTH: 83.4"

DIAMETER: 6.4"

SPAN: 24"

WEIGHT: 135#

WARHEAD: 5[#] HBX CONTACT

GUIDANCE: INFRA-RED

PROPULSION: 4500[#]/0.6 SEC , 700[#]-0[#]/3.0 SEC.

RANGE: 3500' TO 35,000'

VELOCITY: 1200'/SEC + LAUNCH

ALTITUDE: 70,000'

REMARKS:

SECRET

REFERENCE
Form 1277-C

206-54 , 6591-55

Date 10 SEPT. 1956

Prepared By CHALK

Checked By

Revised Date 3/18/57

C.M. HANSON

CONVAIR

A DIVISION OF GENERAL DYNAMICS CORPORATION

SAN DIEGO, CALIFORNIA

Model GAR-1 (E-47)

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Report No. ZM-486

SPONSOR: U.S.A.F.
MFR: HUGHES

FALCON ROCKET MOTOR

NOZZLE EXPANSION RATIO $\frac{A_e}{A_t} = 8.27$

DIA. OF EXIT

$D_e = 4.79"$

PROPELLANT SPECIFIC IMP. $I_{sp} = 194 @ S.L. 60-70^\circ F$

ADIABATIC FLAME TEMP $T_c = 3990^\circ F @ 1,000 PSI$

CHAMBER PRESSURE $P_c = 1370 PSIA$

TOTAL IMPULSE $I = 6690 LB-SEC.$

DURATION, 1.36 SEC.

IMPULSE/WEIGHT RATIO $I/W = 157 SEC.$

PROPELLANT TYPE - POLY-SULFIDE-TIOE2
OXIDIZER (SIMILAR TO JPL-100L)

REMARKS: ADDITIONAL INFO. IN TECH. MANUAL-
#270, HUGHES A. C. ON T47 ROCKET
MOTOR.

REFERENCE: CONVERSATION WITH HOWARD
BELMONT 3-31-55 & CALL TO HUGHES A.C. TEXAS
0-7111 EXT. 3629

SECRET

Date SEPT. 7, 1956
Prepared By CHALK
Checked By
Revised Date 9/15/57
C.M. DANSON

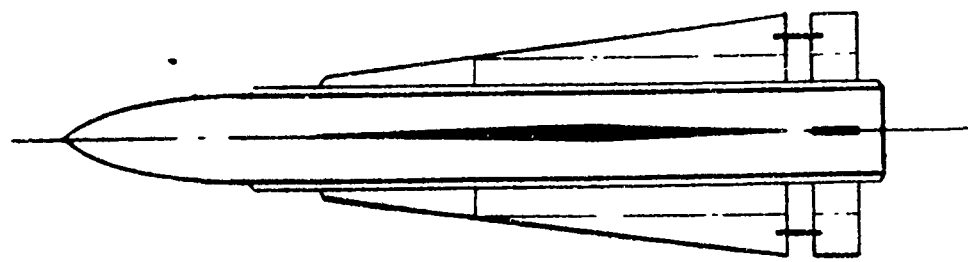
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A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model AAM

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Report No ZM-486

SPONSOR A.F.
MEGR HUGHES

GAR-X



LENGTH. 134.5"
DIAMETER. 12.75"
SPAN. 41" (FOLDED 15.25)
WEIGHT 619# (W_E = 466.5)
WARHEAD. 125#
GUIDANCE PASSIVE RADAR/IR
PROPULSION SOLID ROCKET
RANGE
VELOCITY: 38 INCLUDED IS VELOCITY OF LAUNCHER.
ALTITUDE 75,000' LAUNCHED @ 55,000'
REMARKS ALL WORK STOPPED AUG, 31 '56 EXCEPT FURTHER STUDY.

SECRET

REFERENCE SWC-65-21, 442/72 3 AUGUST 1956
Form 1277-C

Date 7/24/57

Prepared By E.M. HANSON

Checked By

Revised Date

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A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA

Model SAM

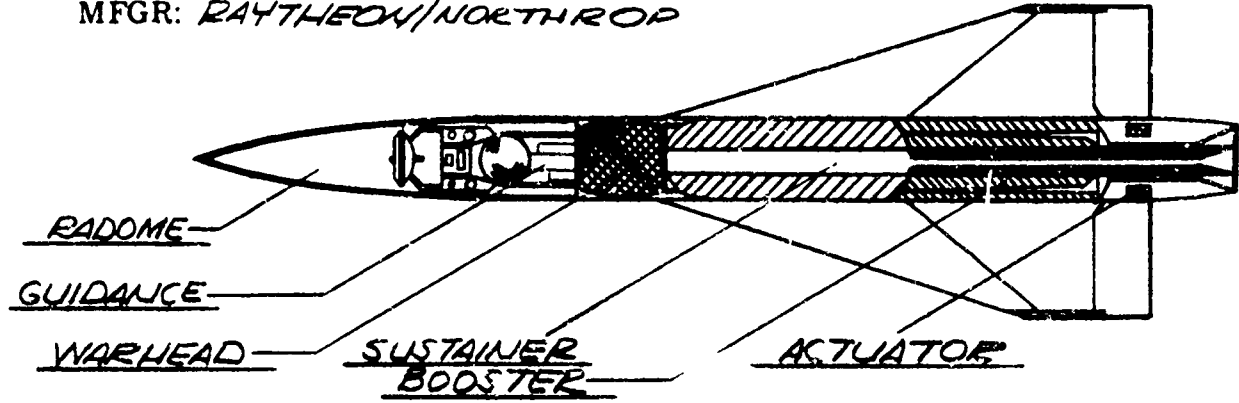
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Report No. ZM-486

SPONSOR: USARMY

MFGR: RAYTHEON/NORTHROP

HAWK I



LENGTH 195.6"

DIAMETER 14.0"

SPAN: 47.4"

WEIGHT: 1266#

WARHEAD. (SECTION) 120# C.E. WARHEAD

GUIDANCE. CW SEMIACTIVE HOMING SYSTEM OF THE TYPE USED IN SPARROW III.

PROPULSION SOLID PROPELLANT ROCKET, 5.0/27.0 KS-15,000/2000 (AEROJET)

RANGE: APPROX. 19 N.MI.

VELOCITY: M=20

ALTITUDE. DESIGNED TO DEFEND AGAINST LOW-LEVEL AIR ATTACKS.

REMARKS HAWK I IS AN ANTI-AIRCRAFT GUIDED MISSILE SYSTEM, USING SUPERSONIC HOMING MISSILES, WITH THE ABILITY TO DEFEND FORWARD AREAS AGAINST LOW-ALTITUDE AIR ATTACKS

SECRET

REFERENCE. (16102) JAN-MAR, 56"
Form 1277-C

Date 7/22/57
Prepared by CARL HANSON
Checked By
Revised Date

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO CALIFORNIA
Model SAM

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Temp Penn
Report No. ZM 486

HAWK I

PROPELLSION

DUAL-CHAMBER (HF-D) MOTOR

	SUSTAINER	BOOSTER
PROPELLANT WT. (LBS.)	316	308
IMPULSE (LB-SEC)	58,900	67,500
BURNING TIME (SEC)	31	4.5
THRUST (AVG., LBS.)	1900	15000
AVG. OPERATING PRESSURE (LBS./IN ²)	750	1500

REF: (16109)

DATE:

Date 12 MAY 54
Prepared By DITMARS
Checked By
Revised Date 5/3/57
G.M. HANSON

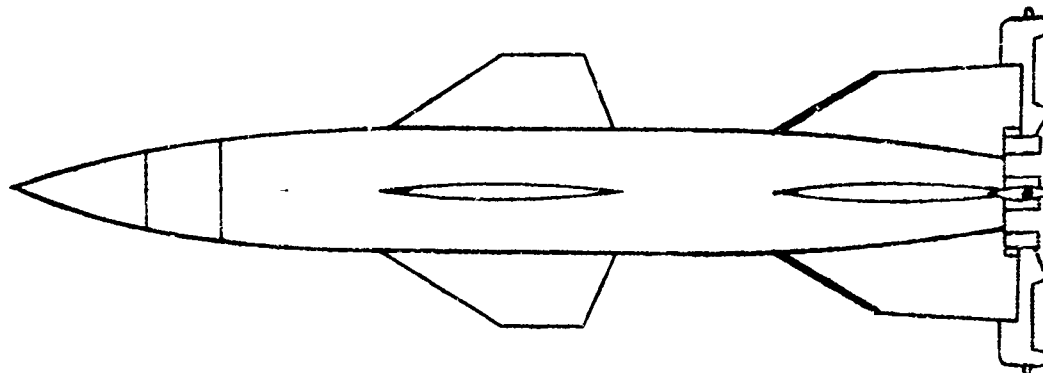
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SAN DIEGO, CALIFORNIA
Model A-1E1 (RV-A-5)

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Report No. ZM-486

SPONSOR: ARMYFORD
MFGR: GENERAL ELECTRIC

HERMES



LENGTH: 305 9/32"

DIAMETER: 34 5/8"

SPAN: 99 7/8"

WEIGHT: 8858 #

WARHEAD: 1450 #

GUIDANCE: COMMAND & GUIDANCE SYSTEM: MPQ-12 CONICAL SCAN
RADAR & MISSILE-BORNE COMMAND UNIT.

PROPULSION: LIQUID ROCKET (ALCOHOL-LOX)

RANGE: 245,000'

VELOCITY: M=4.0

ALTITUDE: 90,000'

REMARKS: PROGRAM CANCELLED

REFERENCE: 6514-54 FINAL RPT. RV-A-5 (MAR '54)

Form 1277-C

Date 9/15/57
Prepared By C.M. HANSON
Checked By
Revised Date

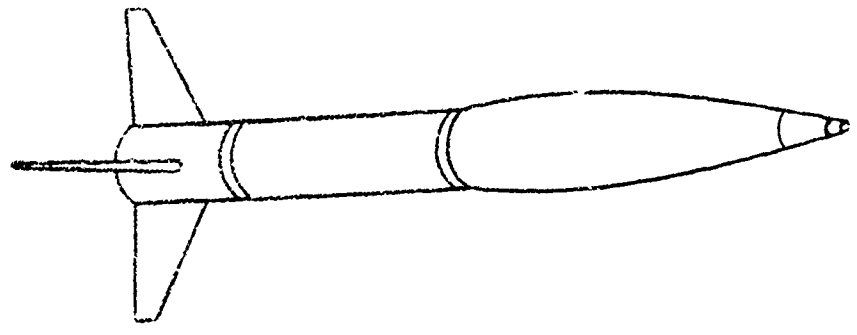
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SAN DIEGO, CALIFORNIA
Model S.S.M.

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Temp Penn

Report No. ZM-486

SPONSOR: ARMY
MFGE: DOUGLAS

HONEST JOHN



- LENGTH 400"
- DIAMETER. 30" @ WARHEAD, 23" ALONG BODY
- SPAN: 8'
- WEIGHT: 10,000 #
- WARHEAD: 1500 #
- GUIDANCE: NO GUIDANCE, IT IS SPIN-STABILIZED BY (4) M-7 ROCKETS.
- PROPULSION: SOLID PROPELLANT ROCKET, $W_p = 218 \frac{1}{2}$, $T = 83,000 \frac{1}{2}$
 $T_b = 4.4 \text{ SEC. (4DS-105,000)}$
- RANGE: 25 N. MI.
- VELOCITY: $M = 1.5$
- ALTITUDE: 30,000'
- REMARKS: OVER 600 POUNDS HAVE BEEN FIRED.

SECRET

REFERENCE CONVAIR TM-359-42-2
Form 1277-C

SECRET

Date 3/22/57
Prepared By W. HANSON
Checked By
Revised Date 7/29/57

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A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model LEBA

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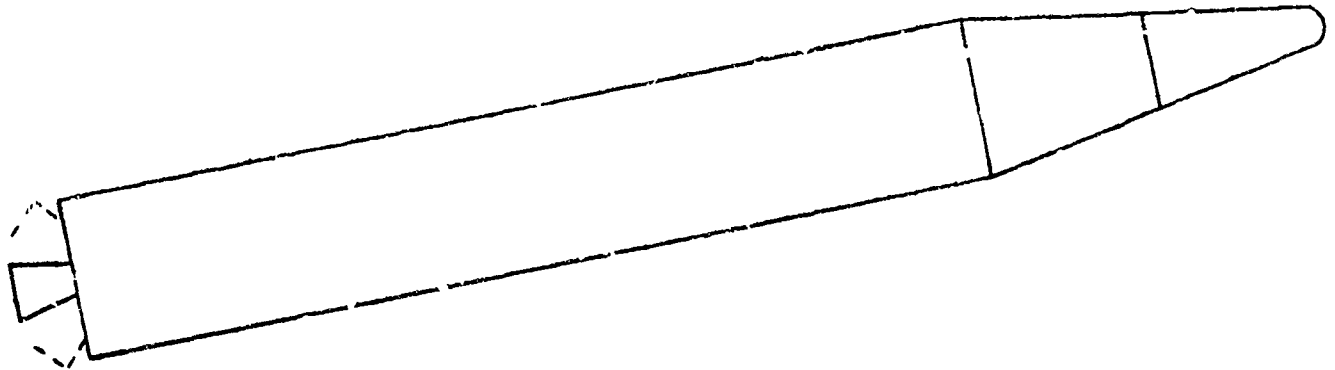
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Report No. ZM-986

SPONSOR: ARMY
MFGR: CHEVSELER

JUPITER



LENGTH: 58'

DIAMETER: 105"

SPAN: NONE

WEIGHT: TAKE-OFF WT = 110,000*

WAI HEAD: 1500*

GUIDANCE: INERTIAL (MFG. BY FORD INSTRUMENT CO.)

PROPULSION: GIMBAL MOUNTED, U. AMER. NAA 150-800-SSD
ROCKET ENGINE PROP. - IP-5 KEROSENE/LOX.
BURNING TIME = 160-165 SEC. THRUST = 142,000*

RANGE: 1500 N. MI.

VELOCITY: 15,000-16,000' / SEC. 20. VELOCITY.

ALTITUDE: PEAK = 950 MI. (APPROX)

REMARKS: OPERATIONAL IN LATE 1960. CIRCULAR PROB-
ABLE ERROR OF 15,000' HDS. WILL BE EVALUATED
AGAINST THOR FOR AIR FORCE USE

REFERENCE: 16028, 15899

Form 1277-C

SECRET

Date 9/22/57
Prepared By J. MANSON
Checked By
Revised Date 7/22/57
CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model LEBM

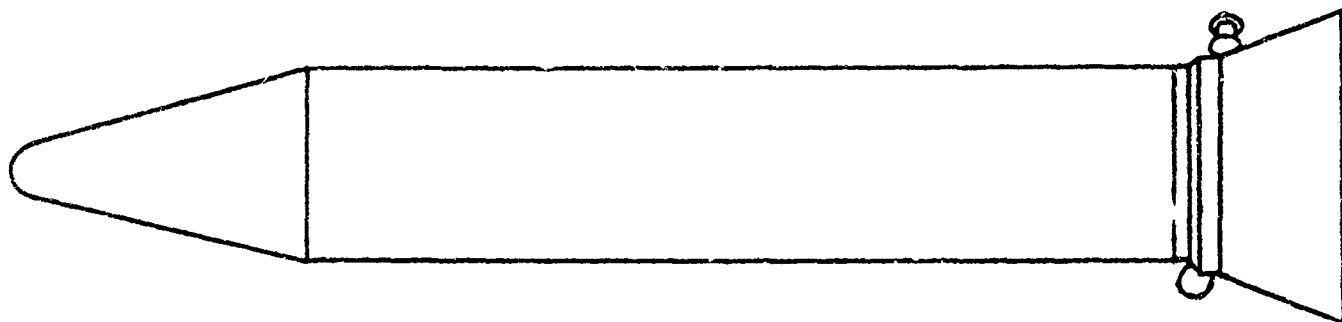
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Report No. ZM-486

SPONSOR: U.S. NAVY
MFR: CHRYSLER

JUPITER



LENGTH: 58'

DIAMETER: 105"

SPAN: NONE

WEIGHT: TAKE-OFF WT. = 103,080⁺

WARHEAD: 1500⁺

GUIDANCE: INERTIAL (MFG. BY REDSTONE)

PROPULSION: SOLID PROPELLANT ROCKET (AEROJET) GIMBAL-MOUNTED, 4 AMER. NAA RD-20-53D ROCKET ENGINE, PROP. 1F-5 KEROSENE. BURNING TIME = 160-165 SEC. THRUST = 142,000⁺ LBS.

RANGE: 1500 N.M.I.

VELOCITY: 1500-1600' / SEC. B.O. VELOCITY

ALTITUDE:

REMARKS: OPERATIONAL IN LATS 1960. FLEET BALLISTIC MISSILE DESIGNED FOR SHIPBOARD & SUBMARINE LAUNCHING. CIRCULAR PROBABLE ERROR OF 15,000 YDS.

SECRET

REFERENCE: CONVAIR: TM 334-42-2, & 16088

Date 4/28/57
Prepared By C. MANWSON
Checked By
Revised Date

CONVAIR
A DIVISION OF GENERAL DYNAMIC CORPORATION
SAN DIEGO, CALIFORNIA
Model IRBM

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Report No. JM-486

SECRET

JUPITER

CONTROL

CONTROL OF THE MISSILE VELOCITY FOLLOWING THE SEPARATION OF BODY FROM THE THRUST UNIT, SUBSEQUENT TO CUTOFF OF THE MAIN POCKET ENGINE, IS PROVIDED BY TWO HINGE-MOUNTED VERNIER THRUST UNITS HOUSED IN THE AFT SECTION OF THE BODY. ATTITUDE AND ROLL CONTROL OF THE BODY, AFTER SEPARATION DURING FLIGHT ABOVE THE SENSIBLE ATMOSPHERE, IS MAINTAINED BY A SERIES OF EIGHT HIGH-PRESSURE HELIUM JET NOZZLES.

GUIDANCE

THE INERTIAL GUIDANCE SYSTEM IS HOUSED IN THE BODY. A TILT PROGRAM SERVES TO KEEP THE LONGITUDINAL AXIS OF THE BODY ALIGNED WITH THE FLIGHT PATH TANGENT. THE PREDICTED IMPACT POINT OF THE NOSE CONE IS CONTINUALLY CALCULATED BY THE RANGE GUIDANCE COMPUTER. AT THE PROPER TIME, FINAL CUTOFF IS EFFECTED IN ORDER TO ACCOMPLISH IMPACT AT THE DESIRED POINT. UPON REENTRY INTO THE ATMOSPHERE, THE HEAT-PROTECTED NOSE CONE IS SEPARATED FROM THE REST OF THE BODY AND CONTINUES IN AN UNCONTROLLED DIVE TO THE TARGET.

SECRET

REF: 15778, JUPITER MISSILE PROGRAM,
PR 3AC (CHRYSLER CORP. MISSILE OPERATIONS).

Date *9/22/57*
Prepared By *GMHANSON*
Checked By
Revised Date

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model *JEBM*

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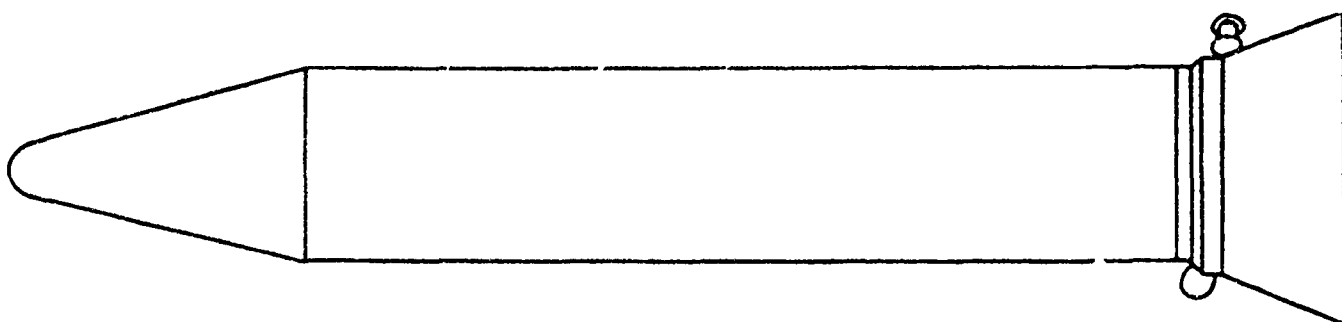
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Report No. *ZM-486*

SPONSOR: *US NAVY*
MFGR: *CHRYSLER*

JUPITER-5



LENGTH. *684"*
DIAMETER. *105"*
SPAN.
WEIGHT. *175,000**
WARHEAD: *1500**
GUIDANCE. *INERTIAL*
PROPULSION. *SOLID PROPELLANT ROCKET (AEROJET)*
RANGE: *1500 N.MI.*

VELOCITY:

ALTITUDE.

REMARKS. *OPERATIONAL IN LATE 1960. FLEET BALLISTIC MISSILE DESIGNED FOR SHIPBOARD & SUBMARINE LAUNCHING.*

SECRET

REFERENCE. *CONVAIR: TM 339-42-2*
Form 1277-C

Date 5-5-54

Prepared By DITMAR'S

Checked By 7/2/57

Revised Date 2-20-56

C.M. HANSON

CONVAIR

A DIVISION OF GENERAL DYNAMICS CORPORATION

SAN DIEGO, CALIFORNIA

Model X5SM-A-1E

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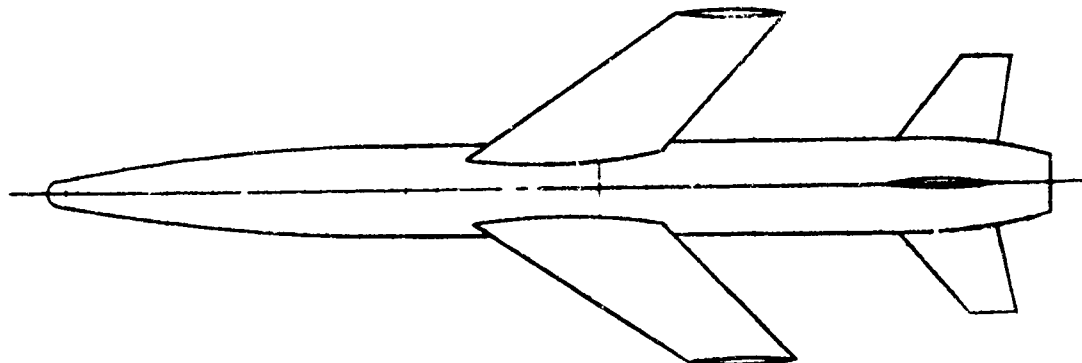
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Report No. ZM-486

SPONSOR: ARMY

MFGR: MARTIN

LACROSSE



LENGTH: 230" (19'2")

DIAMETER: BODY = 20.5" BASE = 14"

SPAN: WING = 108" TAIL = 56.5" INTERDIGITATED CRUCIFORM

WEIGHT: 2300# LAUNCH 1645# BURN-OUT

WARHEAD: 500#

GUIDANCE: MID-COURSE, LAUNCH SITE COMMAND-TERMINAL, COMMAND FROM FWD. POSITION (1000 YDS FROM TARGET)

PROPULSION: SOLID PROP ROCKET SES: 97000

RANGE: 11.9 N.MI.

VELOCITY: 1500'/SEC

ALTITUDE: 5000'

REMARKS: DESIGNED FOR CLOSE SUPPORT OF GROUND TROOPS - CORNELL AERO. LAB IS ACTING AS THE CENTRAL CONTRACTING AGENCY AND IS RESPONSIBLE FOR DESIGN. SPIN OF 400°/SEC. IMPARTED BY LAUNCHER. BALLISTIC, WINGLESS CONFIGURATION IS IN DEVELOPMENT.

SECRET

REFERENCE: APL/SHU-TG-60-12 (6 NOV. '52)

Form 1277-C

Date 6/12/57

Prepared By CM HALSON

Checked By

Revised Date

CONVAIR

A DIVISION OF GENERAL DYNAMICS CORPORATION

SAN DIEGO, CALIFORNIA

Model

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Penn

Report No. ZM-486

LACROSSE

PROPULSION UNIT (3.0ES-3200, 752)

LENGTH (OVERALL) = 101.02 IN.

DIAMETER (MAX) = 17.27 IN.

WEIGHT:

LOADED = 846 #

EXPENDED = 341 #

TIME OF BURN (t_b @ 70°F) = 3.00 SEC.

THRUST = 34,250 #

IMPULSE = 97,610 # SEC.

NOSE-TO-THROAT RATIO, $L/D = 3.5$

NOZZLE EXPANSION CONE ANGLE = 25°

NOZZLE THROAT DIA. = 5.00 IN.

NOZZLE EXIT DIA. = 17.26 IN.

REF: JATO MANUAL.

Date *5/25/57*
Prepared By *C.W. HANSON*
Checked By
Revised Date

C O N V A I R
A DIVISION OF GENE DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model *LSM*

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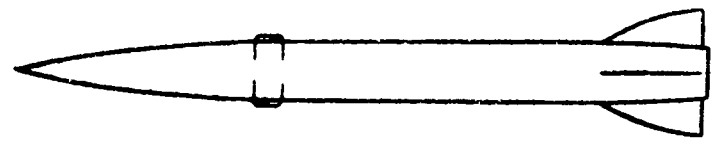
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Temp Penn

Report No. *ZM-486*

SPONSOR: *ARMY*
MFGR: *DOUGLAS*

LITTLE JOHN-XM47



LENGTH: *12'*
DIAMETER: *12.5"*
SPAN: *30"*
WEIGHT: *980^{lb}*
WARHEAD: *NUCLEAR*
GUIDANCE:
PROPULSION: *SOLID PROPELLANT ROCKET MOTOR (ABL)*
RANGE: *18,000 YDS.*

VELOCITY:
ALTITUDE:

REMARKS: *SPIN STABILIZED TO CANCEL THRUST MISALIGNMENT. SCALED DOWN HOMER, JOHN. FINS ARE MOVABLE AND EQUIPPED FOR FLARES.*

SECRET

REFERENCE *FLIGHT, 7 DEC. 1956*
Form 1277-C

Date 5/16/57
Prepared By C.M. HANSON
Checked By
Revised Date
CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model XSAM

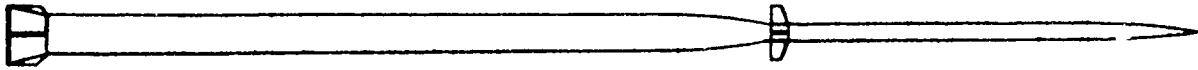
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Temp Penn

Report No. ZM-486

SPONSOR: ARMY
MFGR. BENDIX AVIATION CORP.

LOKI



LENGTH BOOSTER = 61.5" , MISSILE = 34"
DIAMETER. BOOSTER = 3.00" , MISSILE = 1.3"
SPAN. 4"
WEIGHT. 24.40^{lb}
WARHEAD. 5.5"
GUIDANCE NONE
PROPULSION LIQUID ROCKET (BOOST) SOLID ROCKET (END STAGE)
OBBS-3850 (INTERIM)
RANGE
VELOCITY. 4500 FT/SEC.
ALTITUDE 84,000'
REMARKS ANTI-AIRCRAFT ROCKET.

SECRET

REFERENCE
Form 1277-C

BENDIX RPT. # 55-801 (NOV. 26, 1948)

Date 4/MAY/54
Prepared By DITMARS
Checked By
Revised Date CIN HAUSON
2/11/57

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model SSM

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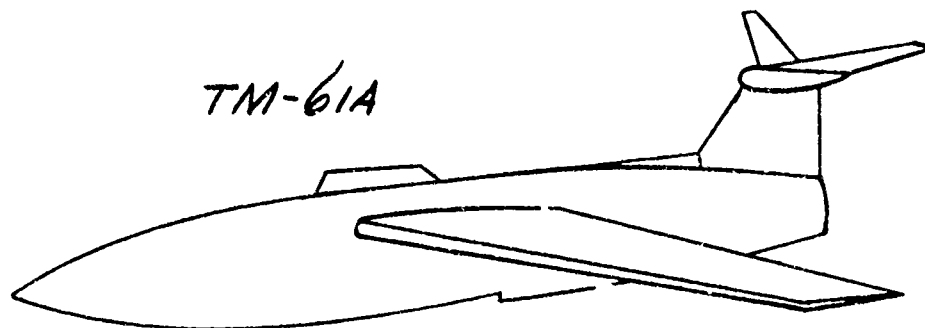
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Report No. ZM-486

SPONSOR: AIR FORCE
MFGR: MARTIN

MATADOR



LENGTH: 180" (39.6')

DIAMETER: 54"

SPAN: 336" (28.7')

WEIGHT: 11,467^{lb}

WARHEAD: 3050^{lb} (BLAST, ATOMIC OR CHEMICAL)

GUIDANCE: COMMAND CONTROL AND SHAKLE HYPERBOLIC NAVIG. SYSTEM... SEMI-BALLISTIC DIVE-IN.

PROPULSION: J-33-A-37 TURBO-JET (CRUISE) 2.4 ES-57,000 (T-50) ROCKET (BOOST)

RANGE: 650 MI. LAUNCH TO TARGET

VELOCITY: HIGH SUBSONIC

ALTITUDE: 45,000' APPROX.

REMARKS: B-61A CURRENT PRODUCTION RATE-18/MO.

SECRET

REFERENCE:
Form 1277-C

APL/JHU TG-60-15 (2-15-54)

Date 30 APRIL 54
Prepared By DITMARS
Checked By
Revised Date 2-20-57
C.M. HANSON

CONVAIR **SECRET**
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model SM-64 (G-26)

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Temp Penn

Report No. ZM-486

SPONSOR: AIR FORCE
MFGR: NORTH AMERICAN

NAVAHO-II



LENGTH: 815"

DIAMETER: 68"

SPAN: 348"

WEIGHT: 65,000[#], BOOSTER = 69,600[#] (GROSS = 134,600[#])

WARHEAD: MK IV (NOT DEFINITE)

GUIDANCE: INERTIAL AUTO NAVIGATION

PROPULSION: CRUISE - 2 WRIGHT 48" DIA. RAM JETS
BOOST - 2 NO. AMER. 120,000[#] LOX-ALC. POCKETS (ALR-43-NA-3)

RANGE: B-64 = 3600 N.MI. B-64A = 5500 N.MI.

VELOCITY: M = 2.75

ALTITUDE: START OF CRUISE = 57,000' FINAL = 77,500'

REMARKS: XB-64 PROTOTYPE SCHEDULED FOR FIRST
FLIGHT OCT '54. XI0 FLIGHT TEST VEHICLES
NOW FLYING. (2 XJ-40 ENGINES, M=1.8)

SECRET

REFERENCE: AL-1575 NAVAHO P.R.#38 JAN'53 & PREVIOUS
Form 1277-C

Date 30 APRIL '54 **CONVAIR**
Prepared By DITMAPS A DIVISION OF GENERAL DYNAMICS CORPORATION

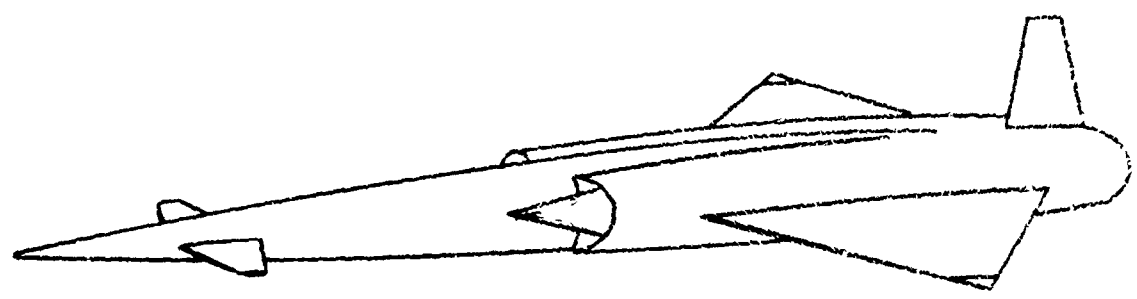
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Checked By C. M. HANSON SAN DIEGO, CALIFORNIA
Revised Date 3/11/57 Model SM-64-A (G-38)

Report No. ZM-486

SPONSOR: AIR FORCE
MFGR: NORTH AMERICAN

NAVAHO III



- LENGTH: 1048" BOOSTER 1098"
- DIAMETER: 78" BOOSTER 92.85"
- SPAN: 482" WING AREA = 750.7 FT.²
- WEIGHT: BEGIN CRUISE = 120,500[#] END CRUISE = 38,300[#]
BOOSTER-LAUNCH = 169,500[#], BURNDOUT = 16,450[#]
- WARHEAD: 15,000[#] - 4800 N.MI. RANGE, 7000[#] - 5500 N.MI. RANGE,
3,000[#] - 5820 N.MI. RANGE
- GUIDANCE: INERTIAL AUTO NAVIGATION (N6-B)
- PROPULSION: BOOST - 3 NO. AMER. 135,000[#] LOX-ALC. ROCKETS
(XLB-48-NA-3), CRUISE - 2 WRIGHT 48" DIA. RAM JETS.
- RANGE: 5500 N.MI. - 7000[#] WARHEAD, 8000 N.MI. - 7000[#]
(HIGH ENERGY FUELS)
- VELOCITY: M = 3.25 (CRUISE)
- ALTITUDE: 57,400' (START CRUISE), 82,900' (END)
- REMARKS: FWD. TRIMMER AREA = 52 FT.², VERTICAL = 40.1 FT.²
WT.-DRAG RATIO = 5.15. SUPPLEMENT PROPULSION:
TOTAL PRESSURE RECOVERY = .90
ENG. INLET MACH NO. = 0.125
C_{DB} = 7 C_T(NOZZLE) = 0.97
ENGINE C_T = 0.69 η_c = 0.94 I_F = 1587 SEC.

REFERENCE: PR 46 (AL-1900-46) DEC. 1954
Form 1277-C

Date 6/12/57
Prepared By R. W. HANSON
Checked By
Revised Date

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model _____

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Temp Penn
Report No. ZM-486

NAVAHO II BOOSTER

DIMENSIONAL DATA

LENGTH = 1098 IN.
DIAMETER = 93.85 IN.
STABILIZER AREA = 142 SQ. FT.
SEPARATION SURFACE AREA = 24 SQ. FT.

PROPULSION DATA

TOTAL THRUST (SEA LEVEL) = 405,000 #
 I_{sp} (SEA LEVEL) = 245 SEC.
BURNING TIME (NORMAL) = 93 SEC.
PROPELLANTS = JP-5 & LOX.

PERFORMANCE (NORMAL) AND WEIGHT DATA

ROCKET CUTOFF MACH. NO. = 3.45
ROCKET CUTOFF ALTITUDE = 59,000 FT.
SEPARATION ALTITUDE = 70,000 FT.
GROSS WEIGHT = 169,500 #
END BOOST WT. = 16,450 #

REMARKS:

BOOSTER IS PARALLEL AND UNDER
SLUNG.

REF: AL-1900-46 / 15 JAN 1955

Date 10 SEPT. 1956
Prepared By CHALK
Checked By
Revised Date 9/7/57
HANSON

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model SAM

SECRET

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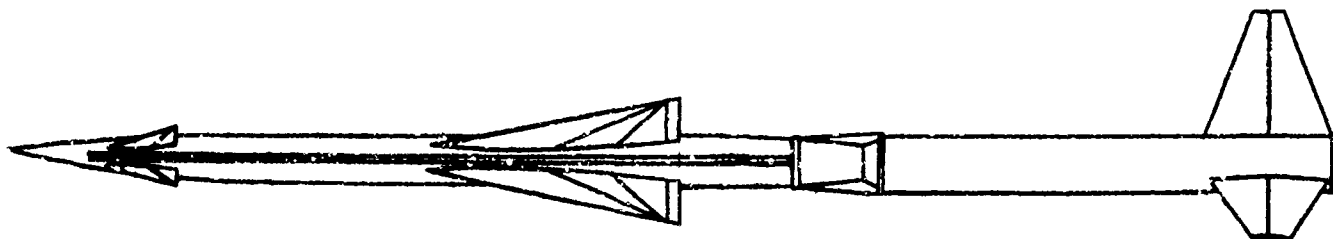
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Fenn

Report No. ZM-486

SPONSOR: ARMY ORD
MFGR: DOUGLAS

NIKE-AJAX



LENGTH: 32' 7 3/8"
DIAMETER: MISSILE 13.5" BOOSTER 16.5"
SPAN: NOSE FINN = 1 FT. — TAIL FINN 5.25 FT.
WEIGHT: MISSILE = 1125# MISSILE & BOOSTER 2325#
WARHEAD: HE 5th CLUSTERS FRAGMENTATION
GUIDANCE: GROUND COMMAND
PROPULSION: SOLID PROP BOOSTER, LIQUID PROP SUSTAINER
3DS-47,000-X201AZ
RANGE: 25 N. MI.
VELOCITY: M=2.0
ALTITUDE: 60,000'
REMARKS: MAX LIVER ACCELERATIONS - 5g @ 40,000'
2.5g @ 60,000'

SECRET

REFERENCE: 9095-53-9195-54

Form 1277-C

Date 6/11/57
Prepared By C.M. HANSON
Checked By
Revised Date

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model. _____

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Penn _____

Report No. ZM-486

NIKE-AJAX

BOOSTER PROPELLANT UNIT

LENGTH (OVERALL) = 135 IN.
DIAMETER:
PRINCIPAL = 16.5 IN.
MAXIMUM = 17.562 IN.
WEIGHT:
LOADED = 1165 #
EXPENDED = 370 #
THRUST (T) = 49,000 #
IMPULSE (I) = 147,500 # SEC.
TIME OF BURN (t_b @ 77°F) = 2.89 SEC.
AVERAGE PRESSURE (P_b) = 1080 PSI
SPECIFIC IMPULSE (I_{sp}) = 197.9
THRUST-TO-PRESSURE CONVERSION FACTOR = 0.022
PORT-TO-THROAT AREA RATIO, A/A^* = 1.95
NOZZLE EXPANSION CONE ANGLE = 30°
NOZZLE THROAT DIAMETER = 6.150"
NOZZLE EXIT DIAMETER = 16.541"

REF: JATO MANUAL

Date 3/7/57

Prepared By

Checked By

Revised Date

C O N V A I R

A DIVISION OF GENERAL DYNAMICS CORPORATION

SAN DIEGO, CALIFORNIA

Model SAM

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Temp Penn

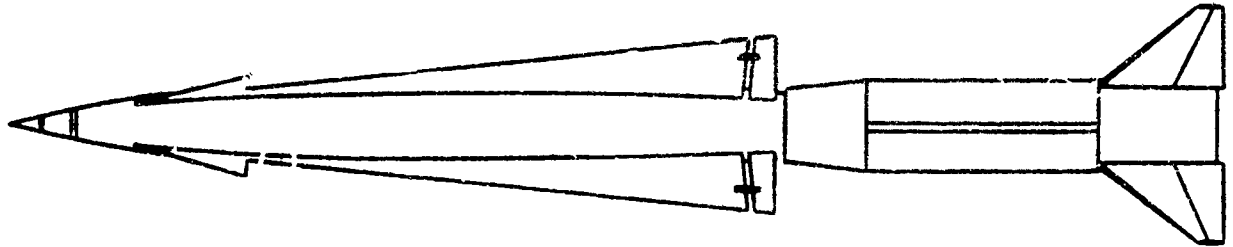
Temp Penn

Report No. ZM-486

SPONSOR: ARMY ORD

MFGR: DOUGLASS

NIKE-HERCULES



LENGTH: 39' 1 7/8" OVERALL, MISSILE = 26' 11"

DIAMETER: 30"

SPAN: WING = 7' 6"

WEIGHT: MISSILE & BOOSTER = 9800#, W_M = 4800#, W_B = 3020#

WARHEAD: 1200# X W 7

GUIDANCE: BEAM RIDER

PROPULSION (4) NIKE-A JAX BOOSTERS, LIQUID PROP. ROCKET SUSTAINER (4)

RANGE: 50 N.M.I. (LIMIT OF RADAR)

VELOCITY: M = 3.5

ALTITUDE: 80,000'

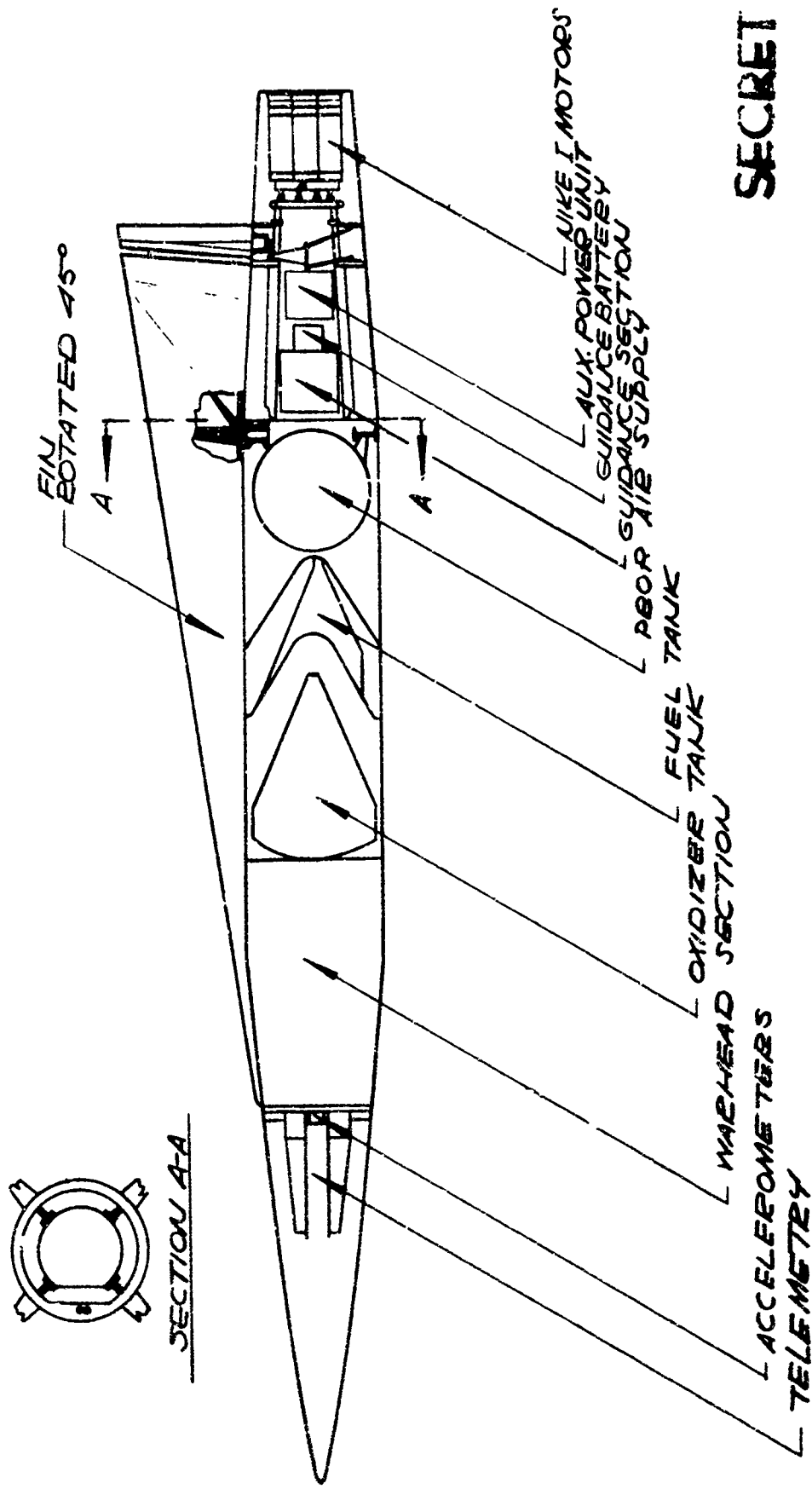
REMARKS: WARHEAD DETONATION: @ S.L. SHOULD BE 4000' ABOVE TARGET, @ 60,000' COALTITUDE. MANEUVER ACCEL. - 5g @ 60,000' 2 1/2 g @ 80,000'

SECRET

REFERENCE: Form 1277-C

87675-WS-66-23, CONV AIR RPTS. 9096-53, 9096-54

SECRET



SECRET

1) PRODUCTION VERSION USES SOLID PROPELLANT
SUSTAINER MOTOR.

NIKE-HERCULES
6/10/57 REF. 9096-57A
PBT. ZM-476

Date 9/18/57

Prepared By C.M. HANSON

Checked By

Revised Date

CONVAIR

A DIVISION OF GENERAL DYNAMICS CORPORATION

SAN DIEGO, CALIFORNIA

Model XSAM

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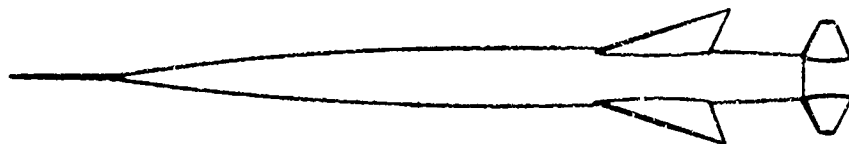
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Report No. ZM-486

SPONSOR: AIR FORCE

MFGR: SWISS (OERLIKON)

OERLIKON



LENGTH: 178"

DIAMETER: SLIGHTLY OVER 15"

SPAN: 4'

WEIGHT: 600[±]

WARHEAD:

GUIDANCE: BEAM RIDER

PROPULSION: LIQUID PROPELLANT ROCKET

RANGE: 100 MI.

VELOCITY: M=2.0

ALTITUDE: 65,000'

REMARKS: AIR FORCE EVALUATION UNDER MX 1869 PROGRAM

SECRET

REFERENCE: CONVAIR, TM-339-42-2

Form 1277-C

Date 10 SEPT. 1956
Prepared By CHALK
Checked By
Revised Date 3/7/57
C.M. HANSON

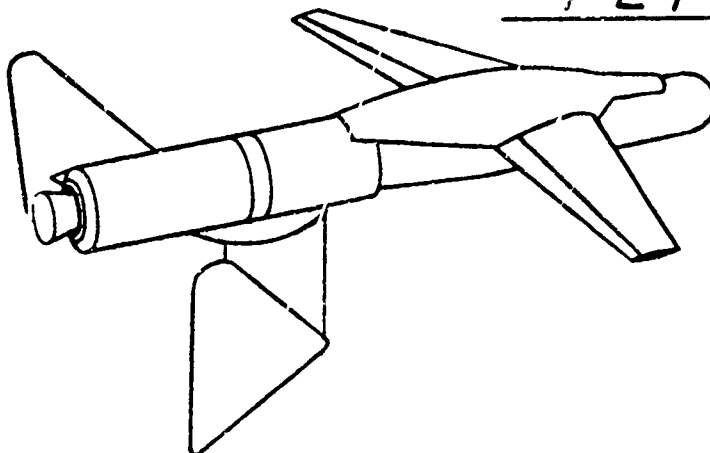
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A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model XAUM-11-2

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Temp Penn

Report No ZM-486

SPONSOR: BUORD
MFGR:

PETREL



LENGTH: 23'

DIAMETER:

SPAN: 13'

WEIGHT: 3800^{lb}

WARHEAD: TORPEDO

GUIDANCE: MK-21 ACOUSTIC HOMING TORPEDO, AN/DPA-9 RADAR AND AUTOPILOT

PROPULSION FAIRCHILD TURBO-JET ENGINE (J-44)

RANGE:

VELOCITY:

ALTITUDE:

REMARKS: LAUNCHED FROM PEV-CB

SECRET

REFERENCE: DIGEST, U.S. NAV. AV. ELECT. (SEPT. 1954)
Form 1277-C

Date *17 FEB 1958*
Prepared By *C. HANSON*
Checked By
Revised Date

C O N V A I R
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model *FBM*

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Temp Penn

Report No. *ZM-486*

SPONSOR: *NAVY*
MFGR: *LOCKHEED*

POLARIS

GENERAL DATA SHEET

LENGTH: *28.5 FT.*

DIAMETER: *54 IN.*

SPAN: *NONE*

WEIGHT: *29,082* (SEE WEIGHT BREAKDOWN SHT.)*

WARHEAD: *NUCLEAR- 600* EST.*

GUIDANCE: *DRAPER SHIP INERTIAL NAVIGATION SYSTEM (SINS)*

PROPULSION: *SOLID PROPELLANT (SEE PROP. DATA SHT.)*

RANGE: *700 - 1500 N. MI*

VELOCITY: *M-15*

ALTITUDE: *350 N. MI.*

REMARKS: *SEE REMARKS SHT.*

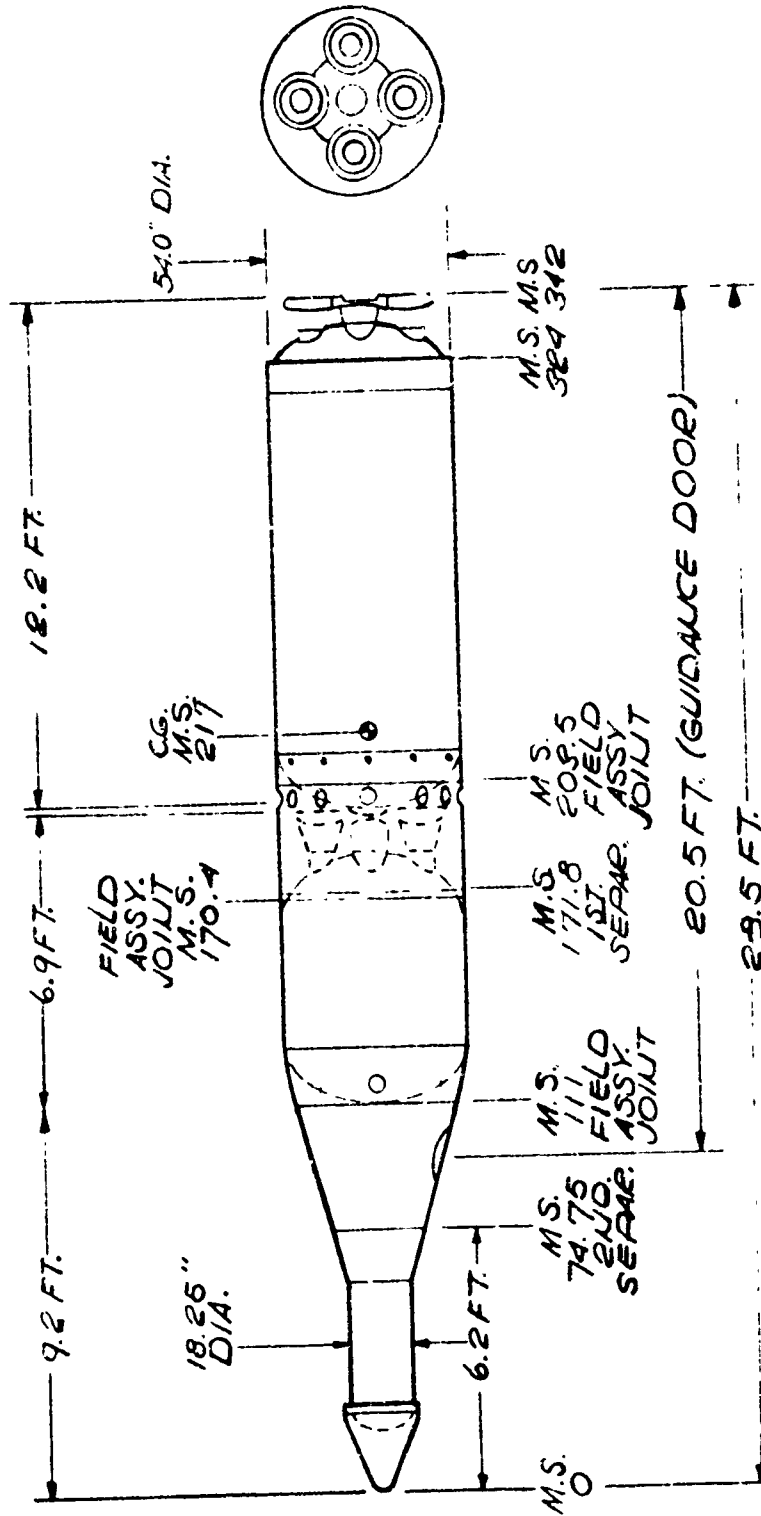
REFERENCE *17156*
Form 1277-C

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Date
 Prepared By
 Checked By
 Revised Date

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 A DIVISION OF GENERAL DYNAMICS CORPORATION
 SAN DIEGO CALIFORNIA
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 Report No. _____



POLARIS
GENERAL ARRANGEMENT

REF: 17156

Date
Prepared By
Checked By
Revised Date

CONVAIR
SAN DIEGO CALIFORNIA
Model

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Report No

POLARIS WEIGHT BREAKDOWN

<u>LAUNCH GROSS WT</u>			<u>29,082</u>
<u>1ST STAGE GROSS</u>			<u>16,778</u>
PROPULSION		18,346	
PROPELLANT	16,300		
MOTOR CASE & IGNITER	1,943		
JETEVATORS	37		
ATTACH STRUCTURE	20		
LAUNCH STRUCTURE	46		
AIRFRAME		182	
STRUCTURE	142		
EQUIPMENT & DISCONNECT	40		
FLIGHT CONTROL		48	
DESTRUCT		20	
<u>2ND STAGE GROSS</u>			<u>9,469</u>
PROPULSION		7,600	
PROPELLANT	7,600		
MOTOR CASE & IGNITER	796		
JETEVATORS	57		
THRUST TERMINATION	57		
ATTACH STRUCTURE	37		
AIRFRAME		204	
STRUCTURE	135		
NOSE CAP	20		
EQUIPMENT & DISCONNECT	49		
FLIGHT CONTROL		93	
CONTROLS	48		
AUTOPILOT	45		
AUXILIARY POWER		58	
GUIDANCE		205	
BEACON		15	
CONTINGENCY		50	
<u>REENTRY BODY</u>			<u>835</u>
WARHEAD	600		
SHIELD, STRUCTURE & EQUIP	185		
CONTINGENCY	50		

REF: 17156

Date 2/18/58

Prepared By C. HANSON

Checked By

Revised Date

C. O. P. M. A. I. R.

U. S. AIR FORCE

WALLINGFORD, CONNECTICUT

MODEL

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Penn

Report No. ZM-486

POLARIS PROPELLANT DATA

1ST STAGE:

1. TOTAL IMPULSE = 3.8×10^6 LB-SEC.
2. TIME OF BURN = 60 SEC.
3. BURNING RATE OF PROPELLANT = 0.3 IN/SEC.
4. PROPELLANT SPECIFIC IMPULSE = 240 SEC.
5. CHAMBER PRESSURE = 1000 PSIA
6. WEIGHT OF PROPELLANT = 16,300 LBS.
7. THRUST VECTOR CONTROL $\approx 8^\circ$ THRUST DEFLECTION
8. THRUST TERMINATION HOLDS TOTAL IMPULSE WITHIN 120 LB.-SEC.

2ND STAGE:

1. TOTAL IMPULSE = 2×10^6 LB-SEC.
2. TIME OF BURN = 65 SEC.
3. BURNING RATE OF PROPELLANT = 0.33 IN/SEC.
4. PROPELLANT SPECIFIC IMPULSE = 240 SEC.
5. CHAMBER PRESSURE = 400 PSIA
6. WEIGHT OF PROPELLANT = 7600 LBS.

REF: POLARIS DATA FROM DITMARS 30 JAN. 1958

Date 2/18/58
Prepared By K. HANSON
Checked By
Revised Date

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model.

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Temp Penn
Report No. ZM-486

POLARIS REMARKS

POLARIS USES TWO STAGES OF SOLID PROPELLANT ROCKET MOTORS WITH I_{sp} OF APPROXIMATELY 240 #SEC/# IN A LIGHT WEIGHT CASE AND NOZZLE DESIGN. EACH ROCKET MOTOR HAS FOUR NOZZLES WITH MOVABLE OUTER RIMS (JETEVATORS) WHICH ARE OPERATED TO PROVIDE PITCH, YAW, & ROLL CONTROL OF THE MISSILE. THE THRUST OF THE SECOND STAGE MOTOR MAY BE TERMINATED BY ACTIVATING BLOW OUT PLUGS WHEN THE DESIRED VELOCITY IS OBTAINED. THE THRUST TERMINATING DEVICE IS EXPECTED TO PROVIDE THRUST CUTOFF ACCURATE TO WITHIN THREE MILLI-SECONDS OF THE DESIRED CUTOFF TIME WHICH RESULTS IN A VELOCITY ERROR OF $1/2$ FT/SEC. THE CHAMBER OPERATING PRESSURE OF THE FIRST AND SECOND STAGE MOTORS ARE 1000 AND 400 #/SQ. IN. RESPECTIVELY. THE ROCKET MOTORS ARE DESIGNED TO PROVIDE A REGRESSIVE THRUST CHARACTERISTIC IN ORDER TO KEEP THE MISSILE ACCELERATION DOWN TO A REASONABLE LEVEL. THE FIRST STAGE MOTOR PROVIDES AN AVERAGE THRUST OF APPROXIMATELY 63,000 POUNDS FOR 60.0 SECONDS WHILE THE SECOND STAGE PROVIDES AN AVERAGE THRUST OF 31,000 POUNDS FOR 65 SECONDS.

SECRET

REF: 17156

Date 2/18/58

Prepared By K. HANSON

Checked By

Revised Date

CONVAIR

A DIVISION OF GENERAL DYNAMICS CORPORATION

SAN DIEGO, CALIFORNIA

Model

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Report No. ZM-486

POLARIS REMARKS

POLARIS USES TWO STAGES OF SOLID PROPELLANT ROCKET MOTORS WITH I_{sp} OF APPROXIMATELY 240 #SEC/# IN A LIGHT WEIGHT CASE AND NOZZLE DESIGN. EACH ROCKET MOTOR HAS FOUR NOZZLES WITH MOVABLE OUTER RIMS (JETEVATORS) WHICH ARE OPERATED TO PROVIDE PITCH, YAW, & ROLL CONTROL OF THE MISSILE. THE THRUST OF THE SECOND STAGE MOTOR MAY BE TERMINATED BY ACTIVATING BLOW OUT PLUGS WHEN THE DESIRED VELOCITY IS OBTAINED. THE THRUST TERMINATING DEVICE IS EXPECTED TO PROVIDE THRUST CUTOFF ACCURATE TO WITHIN THREE MILLI-SECONDS OF THE DESIRED CUTOFF TIME WHICH RESULTS IN A VELOCITY ERROR OF 1/2 FT/SEC. THE CHAMBER OPERATING PRESSURE OF THE FIRST AND SECOND STAGE MOTORS ARE 1000 AND 400 #/SQ. IN. RESPECTIVELY. THE ROCKET MOTORS ARE DESIGNED TO PROVIDE A REGRESSIVE THRUST CHARACTERISTIC IN ORDER TO KEEP THE MISSILE ACCELERATION DOWN TO A REASONABLE LEVEL. THE FIRST STAGE MOTOR PROVIDES AN AVERAGE THRUST OF APPROXIMATELY 63,000 POUNDS FOR 60.0 SECONDS WHILE THE SECOND STAGE PROVIDES AN AVERAGE THRUST OF 31,000 POUNDS FOR 65 SECONDS.

SECRET

REF: 17156

Date **5 MAY '54**
Prepared By **DITMARS**
Checked By **7/2/57**
Revised Date **2-24-57**
C.M. HAUSON

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model **GAM-63**

SECRET

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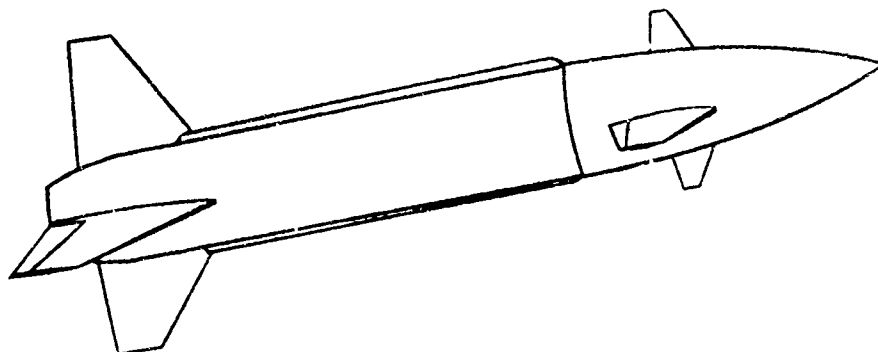
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Report No. **ZM-486**

SPONSOR: **AIR FORCE**
MFGR: **BELL A/C**

RASCAL



LENGTH. **384" (32')**

DIAMETER. **48" (4')**

SPAN: **204" (17') MAX. OVER HORIZ. SURFACES**

WEIGHT: **18,800[#]**

WARHEAD: **3000[#] (PROVISIONS FOR 5000[#])**

GUIDANCE: **LAUNCH & CRUISE PROGRAMMED FROM INFO GATHERED BY LAUNCHING A/C. TERMINAL COMMAND BY RADAR RETURN-RELAY**

PROPULSION. **LIQUID ROCKET-12,000[#] ACCEL, 4000[#] CRUISE BELL DEV. MOTOR (WVNA-JP-9)**

RANGE: **75 U.MI. ACCURACY; MAX. RANGE = 90 U.MI.**

VELOCITY: **M=1.5 TO M=2.5**

ALTITUDE.

REMARKS. **PILOTLESS PARASITE BOMBER LAUNCHED FROM B-36, B-47 AND B-52. B-63 TO BE OPERATIONAL WITH B-47 IN 1957. MX-776A "SHRIKE" IS SUPER SONIC TEST VEHICLE LENGTH-277" DIA-21" WT-3500[#] RANGE-50 U.MI., M=2.0**

SECRET

REFERENCE. **BELL QPR - #8MPR31 (31 DEC '52), #0831-54**

Date 6/19/57

Prepared By M. HANSON

Checked By

Revised Date

CONVAIR

A DIVISION OF GENERAL DYNAMICS CORPORATION

SAN DIEGO, CALIFORNIA

Model _____

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Report No. ZN-496

RASCAL

PROPULSION

THE RASCAL IS A TWO PHASE LIQUID BI-PROPELLANT ROCKET. THE BOOST PHASE OF 12,000# THRUST ACCELERATES THE MISSILE TO SUPERSONIC SPEEDS QUICKLY. THE CRUISE PHASE OF 4000# THRUST MAINTAINS THE SUPERSONIC SPEEDS.

$I_{sp} = 242 \text{ SEC.}$

WT. OF ENGINE (XLR-67-BA-1) = 600#

PROPELLANT = WHITE FUMING NITRIC ACID
AND AVIATION FUEL (JP-4)

RATIO OF OXIDIZER TO FUEL:

WFNA = 615 GAL., JP-4 = 295 GAL.

DESIGNED FOR COMPLETE GAS EXPANSION
@ 12,000#

REF (03431-54)

Date 15 MAY '54
Prepared By DITMARS
Checked By
Revised Date 3/8/57
C.M. HANSON

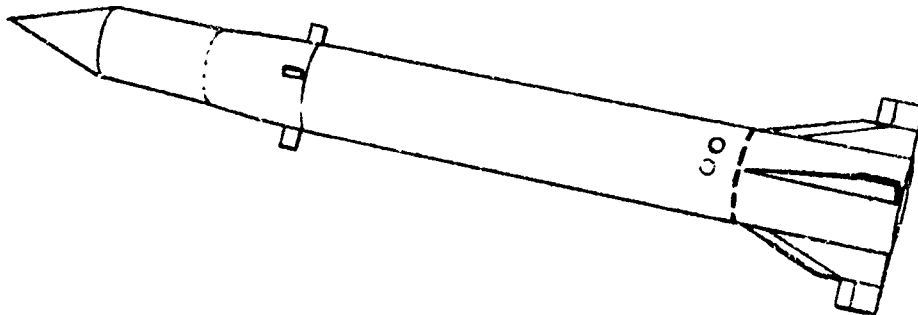
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A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model XSSM-A-14

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Report No. ZM-986

SPONSOR: ARMY ORD. (REDSTONE ARSENAL)
MFGR: CHRYSLER CORP.

REDSTONE



LENGTH: 720"

DIAMETER: WARHEAD SECT = 69" BOOSTER BODY = 70"

SPAN: 120"

WEIGHT: 60,000* (WH = 10,664*, CENTER SECT = 2,121*, TAIL SECT = 2,515*
POWER PLANT = 1,500*, LOX = 22,520*, ALCOHOL 17,000*
HYD. PROX. 680*)

WARHEAD: 6900*

GUIDANCE: BALLISTIC TRAJECTORY-CONTROLLED ROCKET
CUT-OFF. INERTIAL GUIDANCE

PROPULSION: LOX-ALCOHOL LIQUID ROCKET

RANGE: 150 N. MI.

VELOCITY: > M = 2.0 (DIVE IN) M = 4.5 @ BURN-OUT

ALTITUDE: 45 N. MI.

REMARKS: NOSE (W.H.) SECTION SEPARATES FROM BOOSTER
BOOSTER TO HAVE ABOUT 5 N. MI. GREATER
RANGE THAN W.H.
75 MISSILES SCHEDULED FOR FIRING
BY DEC '56.

REFERENCE: ARMY ORD: REDSTONE ARSENAL PR-5, 6 (DEC '52)

Form 1277-C

Date 5 MAY '54

Prepared By DITMARS

CONVAIR

A DIVISION OF GENERAL DYNAMICS CORPORATION

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Checked By

Revised Date 3/8/57

C.M. HANSON

SAN DIEGO, CALIFORNIA

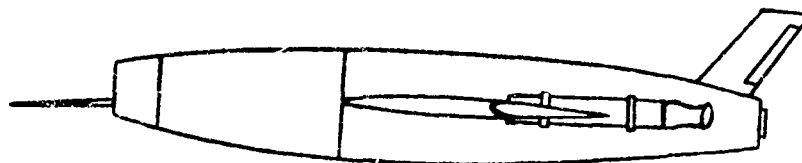
Model XSSM-N-C

Report No ZM-486

SPONSOR: BUAER

MFGR: CHANCE-VOUGHT

REGULUS



LENGTH: BODY = 32.2' OVERALL 34.5'

DIAMETER: 56.5'

SPAN: 21' BICONVEX, SWEEP (40° @ 1/4 CHORD)

WEIGHT: GROSS = 13,300#

WARHEAD: 3000#

GUIDANCE: COMMAND FROM LAUNCHING SUBMARINE (INITIAL PHASE)
COMMAND FROM SUB. OR 1/2 (TERM PHASE) TELESCOPE

PROPULSION J39-A-14 TURBO JET - 3KS - 33,000 BOOST SAE(2)

RANGE: 500 N.MI.

VELOCITY: CRUISE, M=0.9 DIVE IN, M=1.15

ALTITUDE: 35,000'

REMARKS: DESIGNED TO BE LAUNCHED FROM SURFACED
SUBMARINE CONVERSION OF USS TUNNY TO
REGULUS MISSILE SUBMARINE STARTED
IN '52

REFERENCE: C-V. PR-1 (JUNE '51), PR-2 (DEC. '51)

Form 1277-C

Date 11/4/57
Prepared By S.M. HANSON
Checked By
Revised Date

CONVAIR
AERONAUTICAL RESEARCH CORPORATION
SAN DIEGO, CALIFORNIA
Model

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Report No ZM-486

REGULUS I BOOSTER

ROCKET ENGINE CHARACTERISTICS, (EACH) (3KS-30,000)

DURATION = 3 SEC.

THRUST @ 60°F (ALONG AXIS OF NOZZLE) = 30,000 #

TOTAL IMPULSE = 90,000 #/SEC

LOADED WEIGHT = 1150 #

EMPTY WEIGHT = 730 #

PROPELLANT:

TYPE = AERODLEX AN-623

WEIGHT = 420 #

I_{sp} = 214 SEC.

REF: AROJET-GENERAL (TECH. INFO. HANDBOOK)
SOLID PROPELLANT ROCKETS.

Date 11-9-54

Prepared By DITMARS

Checked By 7/23/57

Revised Date 6-21-57

C.M. HANSON

CONVAIR

A DIVISION OF GENERAL DYNAMICS CORPORATION

SAN DIEGO, CALIFORNIA

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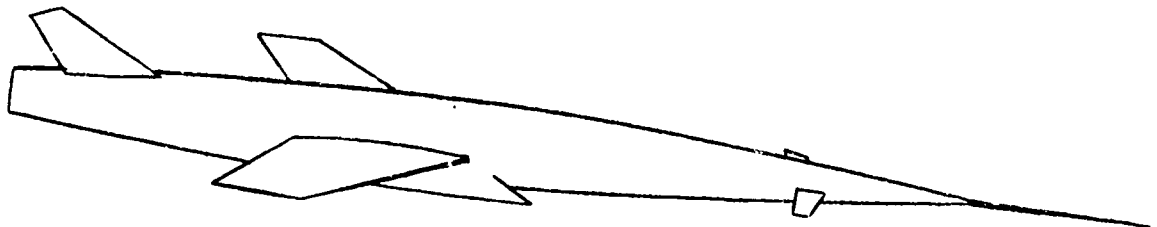
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Temp Penn

Report No. ZM-406

SPONSOR: BU ORD
MFGR: CHANCE-VOUGHT

REGULUS 2



LENGTH. 56.9 FT.

DIAMETER: 56.4" (4.7')

SPAN: WING = 20.29' TAIL = 6.5'

WEIGHT: LAUNCH = 23,235 - FLT. GROSS = 18,535 - EMPTY = 13,460

WARHEAD: 3000 #

GUIDANCE: (MID COURSE) - BENDIX BI-POLAR OR TROUJCE (TERM)
SAME AS REGULUS

PROPULSION: J65-W (11000 # WITH A.B.) SOLID PROP ROCKET BOOST
11,000 # @ 8500 RPM COMBAT THRUST, 7,600 # @ 8500 RPM MILITARY
THRUST.

RANGE: UP TO 1000 N. MI. (EST.)

VELOCITY: M = 2.0 CRUISE

ALTITUDE: 55,000' CRUISE

REMARKS: GUIDANCE HAS NOMINAL RANGE OF 200 N. MI.
FROM PICKET INSTAL (AU/DPU-22 BEACON)
TERMINAL - PROGRAMMED OR RADIO CONTROL.
SOLID PROP. ROCKET BOOSTER (R) = 4KS-115000

SECRET

REFERENCE: C.V. RPT # 4879 (PROPOSAL)

Form 1277-C

Date 7-SEPT-56
Prepared By CHALK
Checked By 7/22/57
Revised Date 9/17/57
C.M. HANSON

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A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model _____

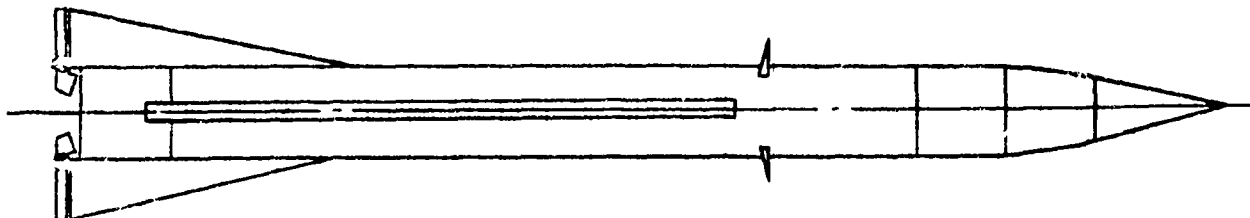
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Temp _____
Penn _____

Report No. ZM 486

SPONSOR: ARMY ORD.

MFGR: FIRESTONE - GILFILLAN

SERGEANT



LENGTH: 31'

DIAMETER: 31"

SPAN: 78"

WEIGHT: GROSS = 10,140[#] BURN-OUT = 4,945[#]

WARHEAD: 1500[#]

GUIDANCE: INERTIAL

PROPULSION: SOLID PROPELLANT ROCKET (26KS-48,000)

RANGE: 25-75 N.M. (CEP < 100 YDS.)

VELOCITY: AV. 2650 FT./SEC.

ALTITUDE:

REMARKS: BALLISTIC MISSILE DEVELOPED FROM CORPORAL

SECRET

REFERENCE: CNAK-03766, RPT. GMS[#]50-57
Form 1277-C

Date 6/19/57
Prepared By C. M. HANSON
Checked By
Revised Date

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model _____

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Report No ZM-486

SERGEANT

PROPULSION UNIT

LENGTH (OVERALL) = 231.08 IN.

DIAMETER = 31.00 IN.

WEIGHT:

LOADED = 8542 LB.

EXPENDED = 1281 LB.

PROPELLANT TYPE = T17E-1 (POLYSULFIDE-
PERCHLORATE)

TIME OF BURN (T_b @ 70°F) = 24.0 SEC.

THRUST = 47,500 LBF.

TOTAL IMPULSE = 1,310,000 LBF-SEC.

AVERAGE PRESSURE ($P_{OVERT.}$) = 525 PSIA.

I_{sp} = 186 LBF-SEC/LB.

CROSS-SECTION LOADING DENSITY = 86.2%

NOZZLE EXPANSION CONE ANGLE = 30°

NOZZLE THROAT DIA. = 9.13 IN.

NOZZLE EXIT DIA. = 22.6 IN.

PORT-TO-THROAT AREA RATIO, A_1/A_2 = 1.59

NOZZLE DESIGNED FOR OPTIMUM EX-
PANSION @ 10,000 FT. ALT.

REF: JATO MANUAL

Date 5 NOV '59
Prepared By DITMARS
Checked By
Revised Date 2/21/57
C.M. HANSON

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model XAAM-N-7

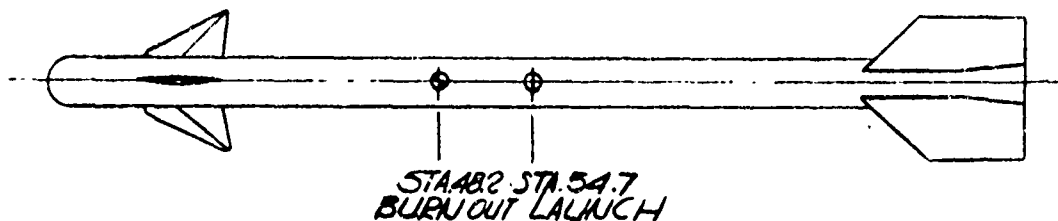
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Temp Penn
Report No. ZM-496

SPONSOR: BUORD (NOTS-RFD)
MFGR: PHILCO

SIDEWINDER I



LENGTH: 109" | WING- $C_R=21.0"$ $C_T=14.8"$
DIAMETER: 5" | CANARD- $C_R=9.1"$
SPAN: WING 21.0" CANARD=15.06" (INTERDIGATED CRUCIFORM)
WEIGHT: 155#
WARHEAD: 20# (13# EXP. - 4# FRAG) $R_R=50\%$ $R_L=30'$
GUIDANCE: INFRARED SEEKER CONTACT FUSE
PROPULSION: SOLID PROP. HPAG ROCKET - 2.2KS-4000
RANGE: 2500 YDS. @ 5000' - 7000 YDS @ 50,000'
VELOCITY: $M=2.3$ ($\sqrt{2} M=.8$)
ALTITUDE: 50000' (4G) 7G @ 5,000'
REMARKS: SOLID PROPELLANT HOT GAS TURBINE
POWER SUPPLY & SERVO ACTUATORS
10 G MANEUVER LIMITATION, COST \$800 @
RATE OF 100,000/YEAR

REFERENCE:
Form 1277-C

NOTS PUBLICATION #343 (APRIL '54)
(O1610-53) DIGEST-U.S. NAV. AV. ELECTRONICS (SEPT. '54)

Date 5 MAY '54
Prepared By DITMARS
Checked By 7/22/57
Revised Date 9/13/57
C. HANSON

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model X-55M-A-3

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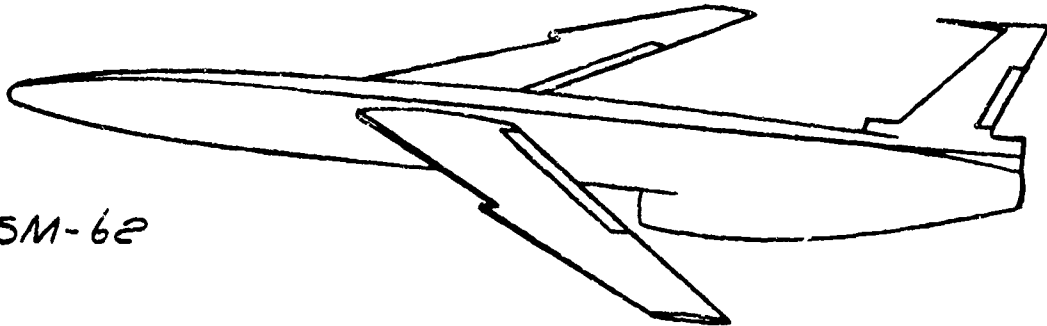
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Report No. ZM-456

SPONSOR: AIR FORCE
MFGR: NORTHROP

SNARK



SM-62

LENGTH: 806.44"
DIAMETER: 60"
SPAN: 510"
WEIGHT: 45,000[#] (DESIGN GROSS) 38,000[#] LIMIT WITH PRES. BOOSTER.
WARHEAD: 7000[#]
GUIDANCE: INERTIAL-DROPLER RADAR-MID-COURSE-AUTO. CELESTIAL NAVIG., TERMINAL-INERTIAL, CONTROLLED-DIVE
PROPULSION: 4J-71A-3 (9700[#] MIL.)-BOOST (2) 4DS-105,000 SPR.
RANGE: 5500 N.MI.
VELOCITY: CRUISE-M=0.94 TERMINAL-M=1.3 TO M=1.4
ALTITUDE: 40,000'
REMARKS: 65 MISSILE TEST PROGRAM SCHED. FOR COMPL. JUNE '54. SUBSONIC OPERATIONAL 1954 SUPERSONIC (WITH A.B.) OPERATIONAL 1955.

SECRET

REFERENCE: NORTHROP RPT. #GM 932 (JUNE '52)

Form 1277-C

Date 6/12/57

Prepared By C. HANSON

Checked By

Revised Date

CONVAIR

A DIVISION OF GENERAL DYNAMICS CORPORATION

SAN DIEGO, CALIFORNIA

Model _____

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SECRET

Report No. ZM-486

SNARK

BOOSTER PROPELLSION UNIT (2) (A. DS-105,000)

LENGTH (OVERALL) = 200 IN

DIAMETER:

PRINCIPAL = 22.875 IN.

MAXIMUM = 24.250 IN.

$W_p = 2050^{\text{lb}}$

TIME OF BURN = 3.58 SEC.

AVERAGE PRESSURE (\bar{p}) = 1190 PSI

FOET-TO-THROAT AREA RATIO, A/A^* = 2.48

NOZZLE EXPANSION CONE ANGLE = 30°

NOZZLE THROAT DIAMETER = 8.59 IN.

NOZZLE EXIT DIAMETER = 21.65 IN.

REF: JATO MANUAL

SECRET

Date 3 NOV '54
Prepared By DITMARS
Checked By 7/1/57
Revised Date 9/1/57
CM. HANSON

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model XA6M-61-E

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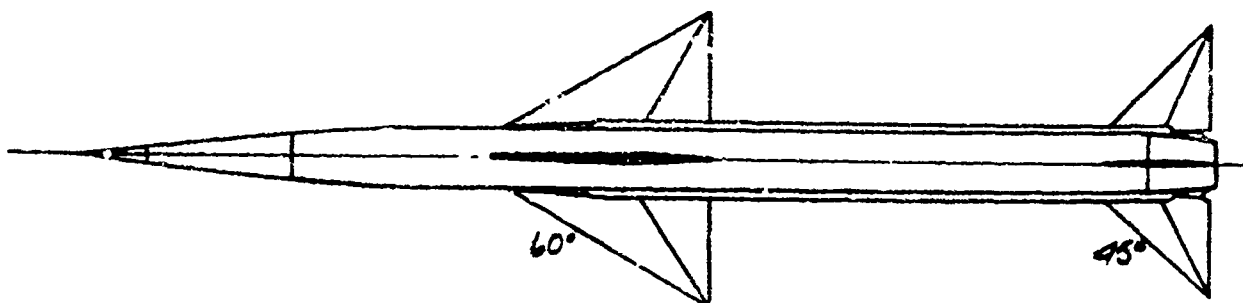
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Report No. ZM-486

SPONSOR: BLAIR
MFGR: SPERRY-DOUGLAS

SPARROW I



LENGTH: 155.5"
DIAMETER: 8"
SPAN: WING=37" FIN=34.8" IN LINE CRUIFORM
WEIGHT: 335#
WARHEAD: 44# FRAGMENTATION (PROXIMITY FUSE)
GUIDANCE: LINE OF SIGHT BEAM RIDER
PROPULSION: SOLID ROCKET 1.8KS-7800, X113C4
RANGE: 3800 TO 14,000 YDS (SLANT RANGE)
VELOCITY: M=1.15 (MIN) M=2.7 (MAX)
ALTITUDE: 50,000'
REMARKS: WING SPAN PRECLUDES COMPLETELY
SUBMERGED STOWAGE IN F-102A

SECRET

REFERENCE:
Form 1277-C

SPERRY (OLD FILE) = 5256-2247
5257-2328
SPERRY PR-19 & SPERRY RPT. 14.2A (REV. 4'54)

Date 29 OCT '55
Prepared By DITMARS
Checked By 7/2/57
Revised Date 5/4/57
C.M. HANSON

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model XAAM-11-3

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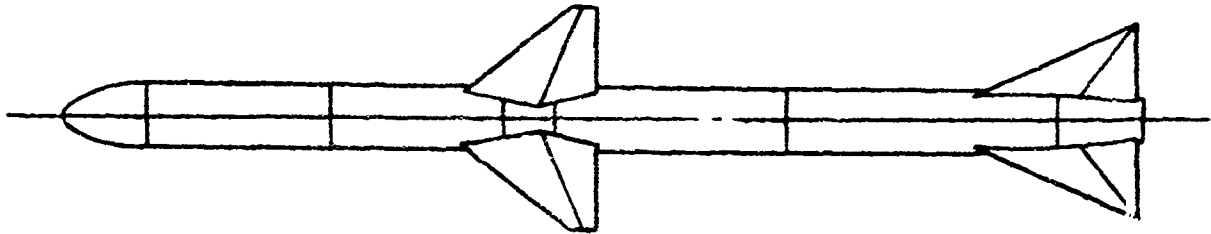
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Report No. ZM406

SPONSOR: BU AIR
MFGR: SPERRY-DOUGLAS

SPARROW II



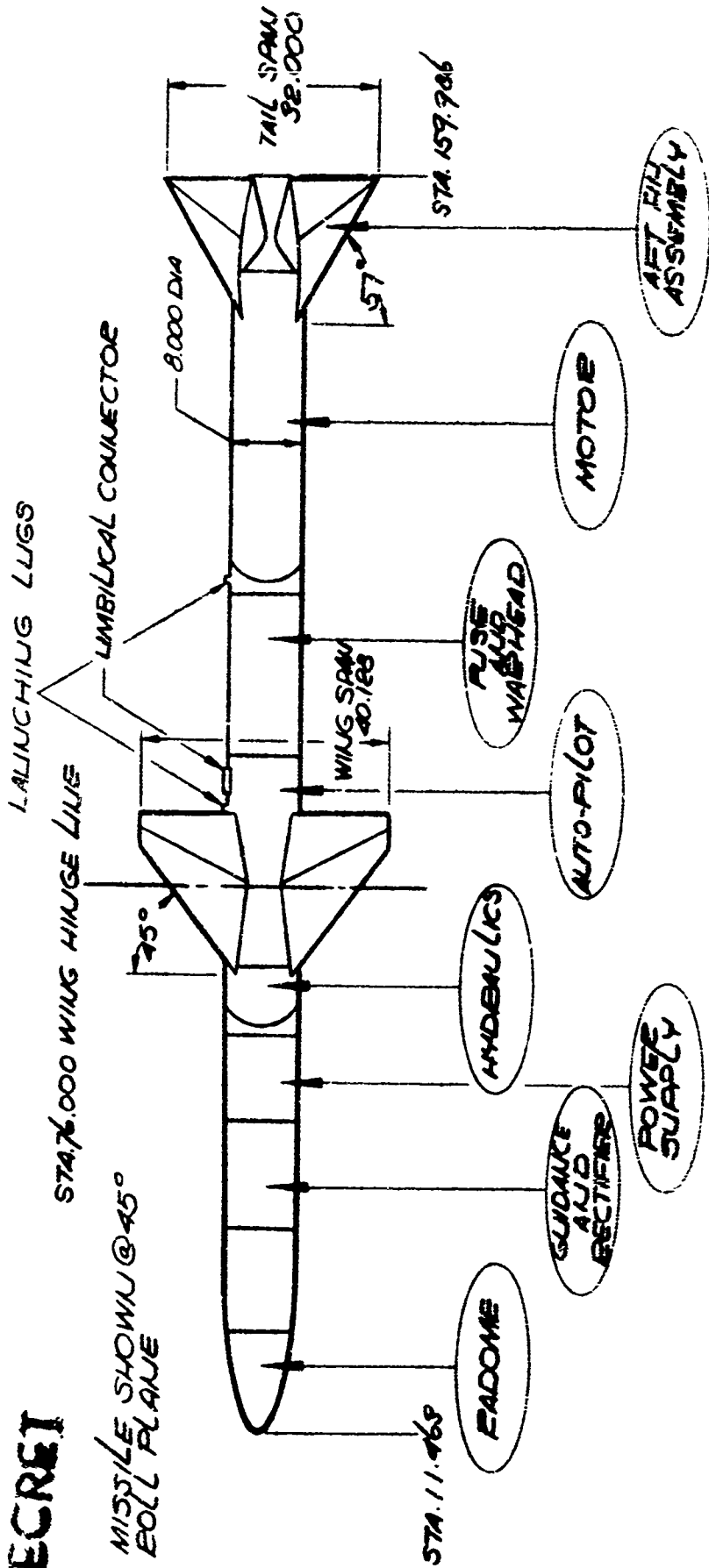
LENGTH: 148"
DIAMETER: 8"
SPAN: WING=40.128", TAIL=32"
WEIGHT: 420[±]
WARHEAD: 72[±] INCL FUSE (FRAGMENTATION WARHEAD = 49[±])
GUIDANCE: ACTIVE RADAR TARGET SEEKER (BENDIX SEEKER A/D/PN-21)
WT. = 47[±] 7.5" DIA. X 26" LONG
PROPULSION: SOLID PROPELLANT ROCKET. 1.84 KS-8000
I/W = 125
RANGE: 6 N.MI.
VELOCITY: 3000 FT/SEC
ALTITUDE: 100-60,000 FT.
REMARKS: WINGS ARE ALL MOVEABLE. MAX. MAN. EQ. POWER
SUPPLY - ETHYLENE OXIDE MONO PROPELLANT
HOT GAS GENERATOR - TURBINE DRIVES
ALTERNATOR & HYDRAULIC PUMP.

REFERENCE: 8279-55 (NOV. 1955)

Form 1277-C

SECRET

MISSILE SHOWN @ 45°
ROLL PLANE



SEEKER CHARACTERISTICS

FREQUENCY	K-BAND
MODULATION	PULSE
AUTENAIR SCAN	COILICAL
SCAN FREQUENCY	2000 CPS
CONE OF VISION	15°
BEAM WIDTH	7
PULSE DURATION	.125 SEC.
BEAM GATE	.14 SEC.
REPETITION RATE	4000 PPS
PEAK POWER	50 KW
WEIGHT	47 LBS.
LENGTH	86 IN.
MAX. DIA.	7.5 IN.



SEEKER AND RADOME

SECRET

SPARROW II

Date 28 DEC. '59
Prepared By DITMARS
Checked By
Revised Date 3/4/57
C.M. HANSON

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model XAAM-N-6

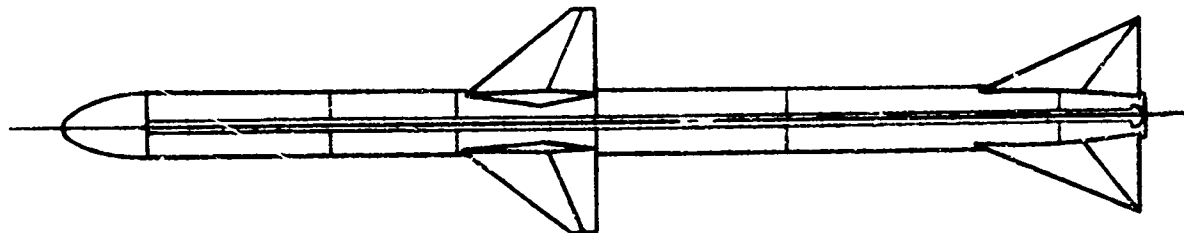
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Temp Penn
Report No ZM486

SPONSOR: BLAIR
MFGR: RAYTHEON

SPARROW III



LENGTH: 144"
DIAMETER: 8"
SPAN: WING - 40" FIN - 32" (TAJDEM CELCIFORM)
WEIGHT: 380#
WARHEAD: 65# CONTINUOUS ROD W.H.
GUIDANCE: SEMI-ACTIVE, FM-CW INTERCHANGABLE WITH IR.
PROPULSION: 1.8K5-7800 SOLID FUEL ROCKET
RANGE: 5-6 N.MI.
VELOCITY: 2460 FT/SEC. ΔV - 1300 FT/SEC.
ALTITUDE: 50,000'
REMARKS: RAYTHEON GUIDANCE CONFIGURATION
POWER SUPPLY IS S.P. GAS GEN. TO DRIVE
GENERATOR INSTEAD OF SILVER-ZINC
BATTERIES AS IN SPARROW I & II

SECRET

REFERENCE: OPERATIONAL & DESIGN INFO. - RAYTHEON-3/16/55
Form: 1277-C

Date 5/7/57
Prepared By K. HANSEN
Checked By
Revised Date

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model X SAM

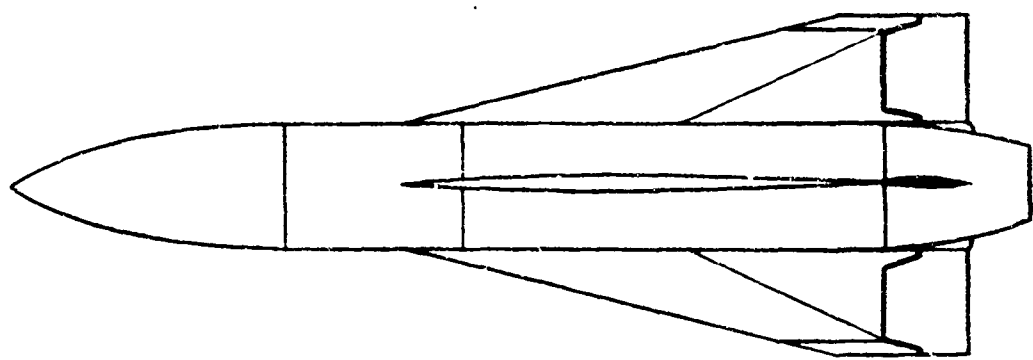
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Report No. ZM-406

SPONSOR: NAVY
MFGR: RAYTHEON MFG. CO.

SPARROW-X



LENGTH 130"
DIAMETER 4.8"
SPAN 44"
WEIGHT LAUNCH-825.7#, B.O 645.7#
WARHEAD: FRACTIONAL KT-ATOMIC. WWH=120#
GUIDANCE: PROPORTIONAL HOMING ON TARGET ILLUMINATED BY LAUNCHING AIRCRAFT. SAME EQUIPMENT AS SPARROW III.
PROPULSION: SOLID ROCKET $t_0=3$ SEC., AV=M 2.5, T=17,500' (3KS-17500)
RANGE 6 MI. @ SL. & 25 MI. @ HIGH ALTITUDE.
VELOCITY: M.7-M 5.
ALTITUDE SEA LEVEL TO 80,000'
REMARKS LOCK ON RANGE FOR RADAR = 20 MI.

SECRET

REFERENCE REF. 14217 BE-81 RAYTHEON (DRAW# KR70-178-757)
Form 1277-C

Date *SMAY '54*
Prepared By *DITMAES*
Checked By *7/22/57*
Revised Date *8/27/57*
C.M. HANSON

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model *XSAM-N6B*

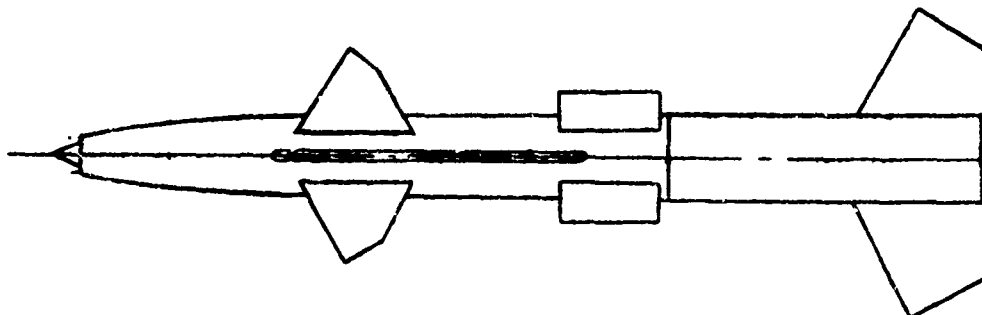
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Temp Penn

Report No. *ZM 486*

SPONSOR: *BU ORD*
MFR: *BENDIX-MCDONNELL*

TALOS



	<u>MISSILE</u>	<u>BOOSTER</u>	<u>COMBINATION</u>
LENGTH:	<i>236"</i>	<i>120"</i>	<i>356"</i>
DIAMETER:	<i>28'</i>	<i>30"</i>	<i>30"</i>
SPAN:	<i>WING=110", FIN=68"</i>		
WEIGHT:	<i>2875 #</i>	<i>3950 #</i>	<i>6825 #</i>
WARHEAD:	<i>420 #</i>		
GUIDANCE:	<i>PROGRAMMED BEAM RIDER PLUS HOMING</i>		
PROPULSION:	<i>RAM JET</i>	<i>BOOSTER-SOLID PROPR 4-DS-111,000</i>	
RANGE:	<i>10,000-100,000 YDS. (50 N.M.)</i>		
VELOCITY:	<i>2000 FT./SEC.</i>		
ALTITUDE:	<i>60,000'</i>		
REMARKS:	<i>ADVANCED ANTI-AIRCRAFT MISSILE FOR FLEET DEFENCE.</i>		

SECRET

REFERENCE:
Form 1277-C

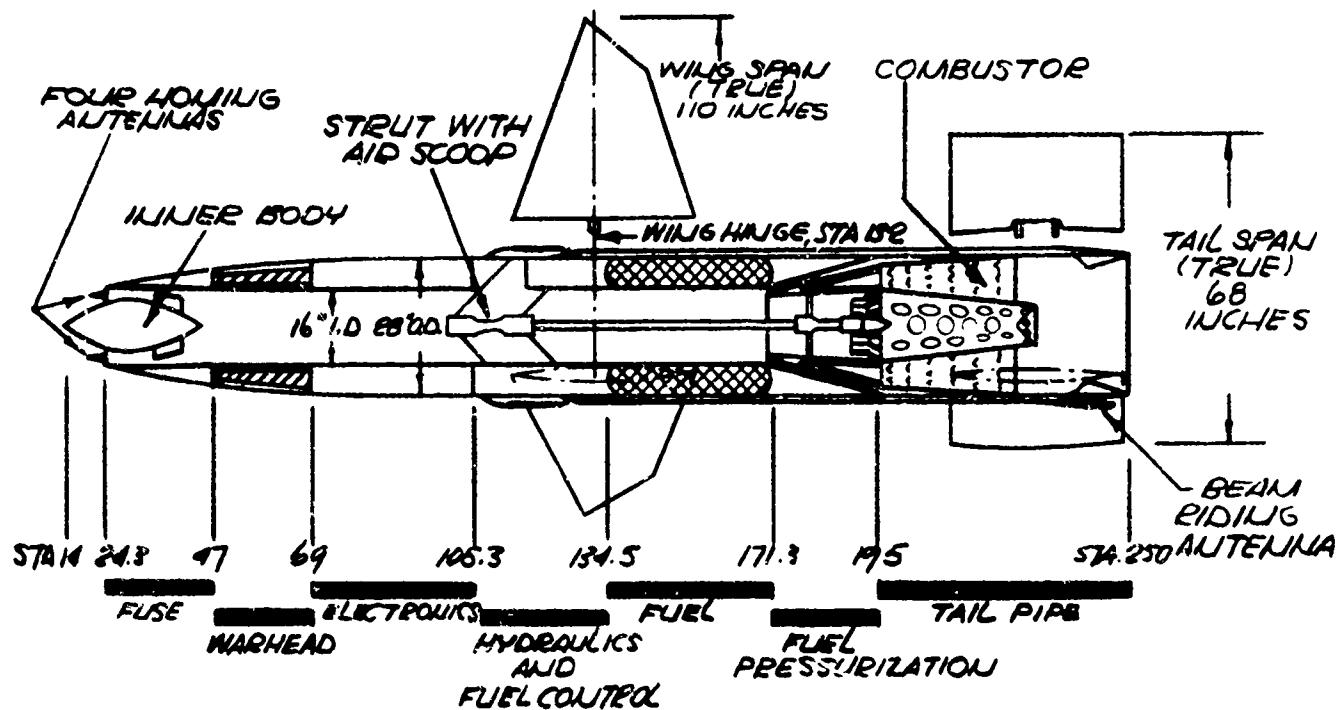
① *APL/JHU TG 60-15 (2-15-54)* ② *BUMBLEBEE SERIES REPORT #262 (12-56)*

Date 11/1/57
 Prepared By CM HANSON
 Checked By
 Revised Date

CONVAIR
 SAN DIEGO, CALIFORNIA
 Model

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 Report No ZM-486

TALOS



INTERNAL ARRANGEMENT OF TALOS MISSILE, VERSION XSAM-U-6B

REF. BULLETIN of ORD. INFO. (Oct 31, 1956) 4-56

Date 7 SEPT 1956
Prepared By CHALK
Checked By
Revised Date 9/18/57
CMH/ANSON

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model _____

SECRET

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Temp _____
Penn _____

Report No. ZM 486

SPONSOR: BU ORD.

MFGR: BENDIX-MS DONNELL

TALOS
DEVELOPMENT

MISSILE	LENGTH	WEIGHT LB.	VELOCITY FT/SEC	MANEUVER (g)		ALTITUDE FT.	RANGE N.MI.
				@60,000	@SEALEVEL		
XSAM-U-6B	236	2875	2000	3	12	60,000	50
XSAM-U-6BI	254	3200	21-2400	4	12	70,000	100
XSAM-U-6BW	249	3100	2000	2	9	60,000	50
XSAM-U-6BWI	254	3200	21-2400	3	12	70,000	100

TWO GROUPS:

(1) SAM-U-6B AND SAM-U-6BW HAVE A RANGE OF 50 MI. AND ALT. OF 50,000 FT. THE TRAJECTORY OF SAM-U-6BI= BOOST PHASE, MIDCOURSE GUIDANCE PHASE AND A TERMINAL GUIDANCE PHASE, CAPABLE OF MACH 2. DURING THE BOOST PHASE, THE MISSILE IS BOOSTED FROM A ZERO LENGTH TRAINABLE LAUNCHER TO SUPERSONIC SPEED BY A SOLID-PROPELLANT BOOSTER. THE MIDCOURSE GUIDANCE SYSTEM COMMENCES AFTER BOOSTER SEPARATION, AND DURING THIS PHASE, THE MISSILE RIDES A RADAR BEAM. DURING THE TERMINAL PHASE OF THE TRAJECTORY, THE MISSILE HOMES ON THE TARGET BY MEANS OF A SEMI-ACTIVE RADAR HOMER.

(2) SAM-U-6BW TRAJECTORY IS SIMILAR TO SAM-U-6B ACCEPT THE SAM-U-6BW DOES NOT HAVE THE TERMINAL HOMING PHASE AND IT HAS A SPECIAL WARHEAD.

REFERENCE: APL/JHU-T660-18, FEB. 55 (0394-55)
BULLETIN of ORD. INFO., 31 MARCH 1957

SECRET

Date 7/SEPT-56
Prepared By DITMARS
Checked By
Revised Date 2/28/57
C.M. HANLSON

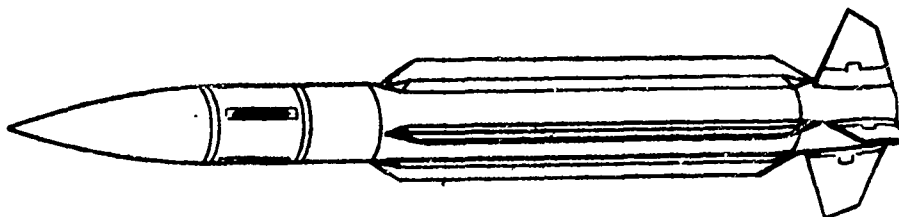
CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model. SAM

Page
Temp Penn

Report No. ZM-486

SPONSOR: BUORD (JHU)
MFGR: CONVAIR (POMONA)

TARTAR



LENGTH: 176"
DIAMETER: 13.5"
SPAN: TAIL: OPEN=42," CLOSED=29." DORSAL FINNS=29"
WEIGHT: 1150[#]
WARHEAD: 115[#] CONTINUOUS-ROD [(2) INTERCHANGEABLE MICROWAVE PROXIMITY FUSE]
GUIDANCE: CW HOMING
PROPULSION: DUAL-THRUST SOLID-PROPELLANT ROCKET
4.0/27.0-KS-15,000/2,000
RANGE: 15,000-20,000 YDS.
VELOCITY: M1.5 - M2.0
ALTITUDE: 50-55,000'

REMARKS: THE PROPELLANT GRAINS BURN IN TWO STAGES: DURING BOOST A THRUST OF 15000[#] FOR 4 SEC. DURING REMAINDER OF FLIGHT THE SLOWER-BURNING SUSTAINER SECT. OF ROCKET PRODUCES THRUST OF 2,000[#] FOR 22 SEC. THIS MISSILE HAS NO ADDITIONAL BOOSTER LENGTH. DESIGNED FOR USE ON DESTROYER AND OTHER SPACE LIMITED CRAFT.

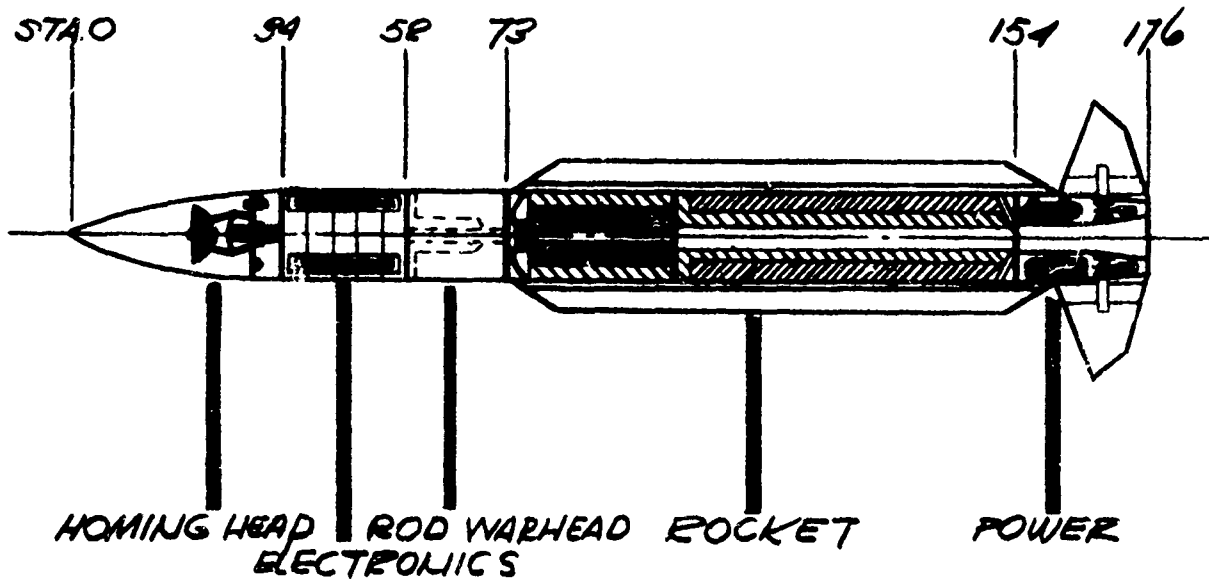
REFERENCE:
Form 1277-C

(JHU) BUMBLEBEE SERIES, RPT #262 (DEC. 56)
POMONA REPT 334-80A "AERO TRIM STAB. & ROUTED CHAR."

Date 11/15/57
Prepared By E. M. HAUSOJ
Checked By
Revised Date

Report No. ZM-486

TARTAR



TARTAR INTERNAL ARRANGEMENT

SECRET

REF: BULLETIN OF ORDNANCE INFO: DEC. 31-56 (49-56)

Date 4 MAY '54
Prepared By DITMARS
Checked By
Revised Date 8/27/57
C.M. HANSON

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model SAM-N-7

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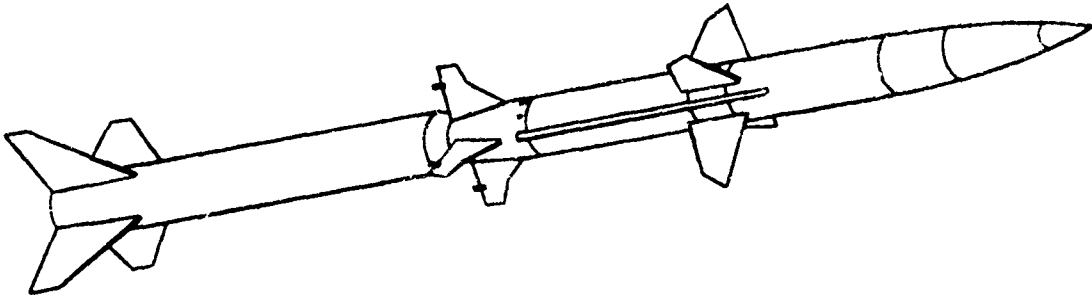
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Report No. ZM 406

SPONSOR: BUORD (JHU)
MFGR: CONVAIR

TERRIER



LENGTH: MISSILE = 183" BOOSTER = 146" TOTAL = 329"
DIAMETER: MISSILE = 13.5" BOOSTER = 16.4"
SPAN: WING = 47.3" TAIL = 40.5"
WEIGHT: MISSILE = 1100# BOOSTER = 1300# GROSS = 2400#
WARHEAD: 220# (MICROWAVE PROXIMITY FUSE)
GUIDANCE: BEAM RIDER
PROPULSION: SUSTAINER = 20 DS-2350 BOOSTER = 2.5 DS-59,000
SOLID PROPELLANT ROCKETS
RANGE: 5,000 TO 20,000 YDS.
VELOCITY: M = 1.5
ALTITUDE: 40,000'
REMARKS: FLEET DEFENCE MISSILE.

SECRET

REFERENCE.
Form 1277-C

① APL/JHU TG-60-15 (2-15-54) ② BUMBLEBEE
SERIES REPT. #262 (DEC. '56)

Date 2/28/57
Prepared By C.M. HANSON
Checked By
Revised Date

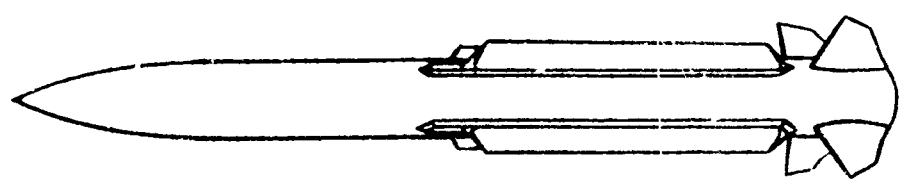
CONVAIR
DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model SAM-HT-2

Page
Temp Penn

Report No. ZM 486

SPONSOR: BUORD (JHU)
MFGR: CONVAIR

ADVANCED TERRIER



LENGTH: 162"
DIAMETER: 13.5"
SPAN: DORSAL FINNS = 24.0", TAIL FINNS = 42.3"
WEIGHT: 1140#
WARHEAD: 211# CONTINUOUS ROD (WITH MICROWAVE PROXIMITY FUSE)
GUIDANCE: HOMER (BT VERSION HAS BEAM RIDER)
PROPULSION: SOLID ROCKET (2200# THRUST, $t_b = 28.5$ SEC)
RANGE: 40,000 YDS.
VELOCITY: $M = 2.9$
ALTITUDE: 50-80,000'

REMARKS: TERRIER (BT) HAS BEAM RIDER GUIDANCE, IS 7" SHORTER THAN (HT) WITH SAME WT. AS (BH). CURRENT TERRIER BOOSTER CAN BE USED (BT-2, BH-2), OR CIG-COMPATIBLE BOOSTER (BT-3, BH-3) OVER-ALL LAUNCHING LENGTH OF BT-2 IS 25'11" WITH HT-3 LONGER BY 7" WT = 2940# BT-3 MISSILES PILOT PRODUCTION TO START THE FIRST OF '58. REGULAR PROD. BY MIDDLE OF THAT YEAR. PROD. OF HT-3 MISSILES WILL FOLLOW 15 MO. LATER.

REFERENCE: (JHU) BUMBLEBEE SERIES, RPT # 262 (DEC. 56)
Form 1277-C

Date 6/7/57
Prepared By JHANSON
Checked By
Revised Date

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model SM-75

SECRET

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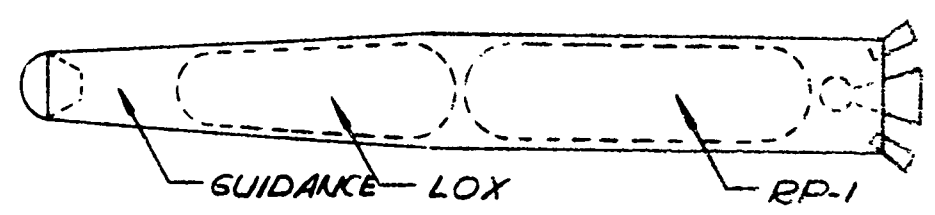
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Report No. ZM-486

SPONSOR: USAF
MFGR: DOUGLAS

THOR



LENGTH. 65'

DIAMETER. 8' MAX.

SPAN. NONE

WEIGHT. 110,000[#]

WARHEAD. 1500[#]

GUIDANCE. INERTIAL

PROPULSION. SINGLE STAGE. ONE NAA 150,000[#] THRUST MOTOR, LIQUID PROP. = RP-1, LOX.

RANGE. 1500 N.M.I.

VELOCITY. ~15,000'/SEC.

ALTITUDE. APOGEE @ ~350 MI.

REMARKS

SECRET

REFERENC
Form 1277-C

Date 6/7/57
Prepared By C. M. HANSON
Checked By
Revised Date

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model SM-75

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Temp Penn

SECRET

Report No. ZM-486

THOR

MISSILE DATA

STRUCTURE-SELF SUPPORTING ALUMINUM STRUCTURE, USING MILLED SKIN FOR TANKS. ACCESSORY POWER-HYDRAULIC, PUMP AND BATTERY INVERTER. CONTROL-MAIN MOTOR, TWO NAA 1000 LB. THRUST VERNIER MOTORS. NOSE CONE-3500 LB. GENERAL ELECTRIC NOSE CONE, COPPER HEAT SINK, SUB SONIC IMPACT. GUIDANCE SOURCE -(1) AC SPARK PLUG, TYPE ALL-INERTIAL, (2) BELL TELEPHONE LAB., TYPE RADIO INERTIAL. FIRST GUIDED FLIGHT IN OCT. 1957, OPERATIONAL, JULY, 1958. THOR DELIVERIES AFTER THE MIDDLE OF 1959 = 11/MO.

SECRET

Date 6/7/57
 Prepared By M. HANSON
 Checked By
 Revised Date

C O V A I R
 A DIVISION OF GEA DYNAMICS CORPORATION
 SAN DIEGO CALIFORNIA
 Model SM-68

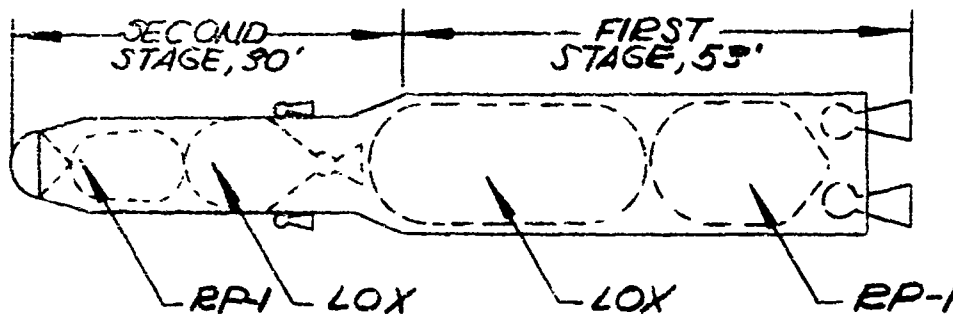
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SECRET

Report No. ZM-486

SPONSOR: USAF
 MFGR. MARTIN

TITAN



LENGTH.	FIRST STAGE 53'	SECOND STAGE 30'
DIAMETER.	10'	8'
SPAN:	NONE	
WEIGHT:	222,000#	
WARHEAD:	1500#	
GUIDANCE	INERTIAL	
PROPULSION	(1) STAGE (BOOSTER) - TWO AEROJET 150,000# THRUST MOTORS. (2) STAGE (SUSTAINER) - ONE AEROJET 60,000# THRUST MOTOR. PROP. = RP-1, LOX.	
RANGE:	5500 N. MI.	
VELOCITY	~ M. 23	
ALTITUDE	~ 500 MI.	
REMARKS		

SECRET

REFERENCE.
 Form 1277-C

Date 6/7/57
Prepared By C. HANSON
Checked By
Revised Date

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model SM-68

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Temp

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Report No. ZM486

SECRET

TITAN

MISSILE DATA

TWO STAGE TANDEM MISSILE. STRUCTURE SELF-SUPPORTING ALUMINUM STRUCTURE, USING FRAME-STRINGER CONSTRUCTION. ACCESSORY POWER-AEROJET GAS TURBINE. CONTROL-BOOSTER MOTORS, FIRST STAGE SUSTAINER MOTOR, SECOND STAGE, FOUR 200* THRUST VERNIER MOTORS DURING FIRST AND SECOND STAGE. NOSE CONE-3500* AVCO NOSE CONE, COPPER HEAT SINK, SUBSONIC IMPACT. GUIDANCE-FIRST SOURCE-BELL TELEPHONE LAB., TYPE-RADIO INERTIAL VERNIER STAGE-50 TO 65 SECONDS. ULTIMATE SOURCE-ARMA, TYPE-ALL-INERTIAL. FLIGHT TEST SERIES #1 AND #2 IS IN JUNE AND JULY 1958 RESPECTIVELY. FIRST GUIDED FLIGHT, APRIL 1959. OPERATIONAL JULY 1959. TITAN DELIVERIES BEGINNING FIRST OF 1960 5/MO. THE FLIGHT TEST SERIES #1 WILL BE SINGLE STAGE BOOST PORTION ONLY. THE FLIGHT TEST SERIES #2 WILL BE SECOND STAGE FIRED SEPARATELY.

SECRET

Date 7 SEPT. 1956

Prepared By CHALK

Checked By 7/22/57

Revised Date 9/27/57

C.M. HANSON

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION

SAN DIEGO, CALIFORNIA

Model X-SSM-A-2

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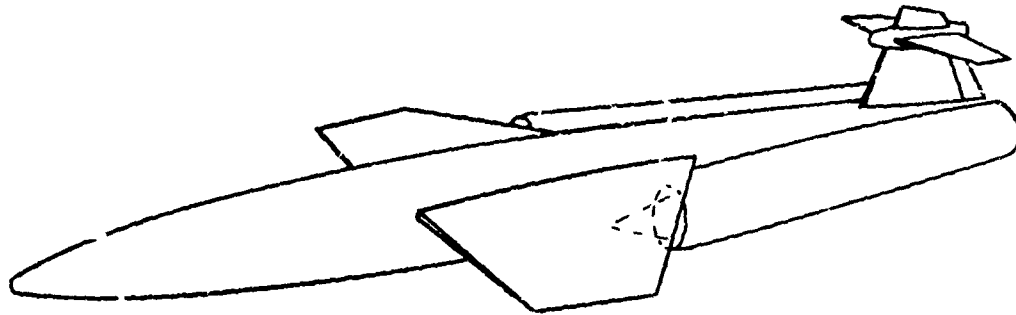
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Report No. ZM-486

SPONSOR: BUORD (JHU)

MFGR:

TRITON



LENGTH: 414" (34.5')

DIAMETER: 34.5"

SPAN: 140"

WEIGHT: GROSS LAUNCH=27,000⁺ START CRUISE=9500⁺

WARHEAD: 1500⁺ (EST.)

GUIDANCE: PHASE I INERTIAL (ATRAM)
" II " & RADAR (SIDE-LOOKING, MAP MATCHING)
" III "

PROPULSION: 2 RAM JETS (CRUISE) (4) 4.1DS-111,000 SOLID
ROCKETS (BOOST)

RANGE: 1200 N.MI.

VELOCITY: M=2.7 (M=3.5)

ALTITUDE: INITIAL 78,000' FINAL 85,000'

REMARKS: TEST VEHICLE TO USE TALOS J-2 COMBUSTOR.
OPERATE @ M 2.7. SUBMARINE LAUNCHED.
INITIAL FLIGHT DEC '57, TACTICAL-PHYSICAL
1963.

SECRET

C.M.C.

REFERENCE: ' APL/JHU T663-DEA (30 MAY '56) (0396-56)

Form 1277-C

Date 5 NOV. '53
Prepared By OITMARS
Checked By
Revised Date 3/25/57
C.M. WATSON

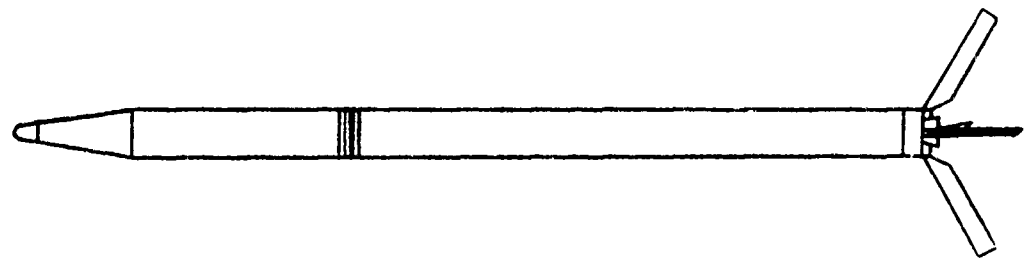
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A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model AAM-5 ASM

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Temp Penn

Report No. ZM-406

SPONSOR: NOTS
MFGR:

ZUNI



LENGTH: 109"
DIAMETER: 5.0" (5.12" OVER FOLDED FILMS)
SPAN: 27.2"
WEIGHT: 124#
WARHEAD: 5", 48" CONTINUOUS ROD
GUIDANCE: NONE
PROPULSION: SOLID PROPELLANT ROCKET MOTOR
RANGE: 1,500' WHEN AIR-LAUNCHED @ 500 KNOTS.
VELOCITY: 2,250'/SEC. FOR 7 SEC.
ALTITUDE
REMARKS: HIGH-VELOCITY AIRCRAFT ROCKET WITH FOLDING FILMS.

REFERENCE: NOTS DWG - PICKENS' FILE, NOTS RPT. # 872 JUNE '52
Form 1277-C

ANALYSIS
PREPARED BY
CHECKED BY
REVISED BY

C O N V A I R
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO

PAGE
REPORT NO.
MODEL
DATE

CHARACTERISTICS OF RESEARCH MISSILES

Date
 Prepared By 5/25/57
 Checked By C. HANSON
 Revised Date

CONVAIR
 A DIVISION OF GENERAL DYNAMICS CORPORATION
 SAN DIEGO, CALIFORNIA
 Model RESEARCH

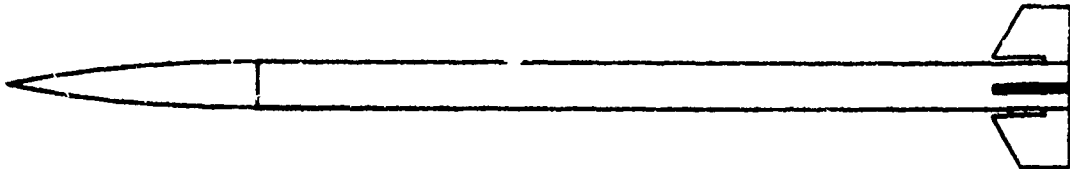
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Report No. ZM-486

SPONSOR: NAVY
 MFGR: ATLANTIC RESEARCH CORP.

ARCON



	<u>10# PAYLOAD</u>	<u>40# PAYLOAD</u>
LENGTH:	<u>11'-2"</u>	<u>11'-2"</u>
DIAMETER:	<u>6.094"</u>	<u>6.094"</u>
SPAN:	<u>22.3"</u>	<u>22.3"</u>
WEIGHT:	<u>206.55# MASS RATIO = .692</u>	<u>244.75# MASS RATIO = .584</u>
WARHEAD:		
GUIDANCE:		
PROPULSION:	<u>SOLID: 142.4#, 800 PSI. 32.2 SEC. BURNING TIME, THRUST = 945#</u>	<u>SOLID: 142.4#, 1200 PSI. 32.2 SEC. BURNING TIME, THRUST = 975#</u>
RANGE:		
VELOCITY:	<u>5850'/SEC.</u>	<u>4,550'/SEC.</u>
ALTITUDE:	<u>115 MI.</u>	<u>68 MI.</u>
REMARKS:	<u>EXPANSION RATIO 7.5 HIGH ALTITUDE SOUNDING ROCKET.</u>	<u>EXPANSION RATIO 10</u>

SECRET

REFERENCE: 16277 VOL. I
CHARACTERISTICS OF ARCON ROCKET, DITMARS.
 Form 1277-C

Date 9/21/57
Prepared By E. HANSON
Checked By
Revised Date 7/22/57

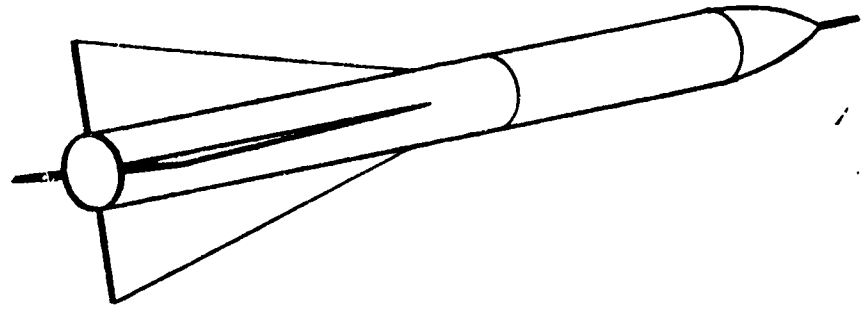
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A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model RESEARCH

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Temp Penn

Report No. ZM-986

SPONSOR: BU SHIPS
MFGR: COOPER DEVELOPMENT CORP. ASP
 & GRAND CENTRAL ROCKET CO.



LENGTH: 12'
DIAMETER: 6.5"
SPAN: 20"
WEIGHT: 245#
WARHEAD: NONE
GUIDANCE: NONE
PROPULSION: SOLID, SINGLE STAGE, CAN BE USED WITH NIKE BOOSTER
RANGE: VERTICAL TRAJECTORY
VELOCITY: 5700'/SEC.
ALTITUDE: 200,000' WITH 25# PL. & 170,000' WITH 50# PL.
 WITH NIKE BOOSTER ASP REACHES 850,000' WITH 25# PL.

REMARKS: 51 FLIGHT TESTS HAVE BEEN MADE WITH PERFECT RELIABILITY OF 100% SUCCESSFUL FIRINGS. MOTOR = 55 K'S, 5800 LBS SEC. BURNING TIME, AVERAGE THRUST = 5,800#, 106" LONG, 6 1/2" DIA. TOTAL IMPULSE = 31,000# SEC. Isp = 210. W = 169 CAN BE INCREASED TO 188.

REFERENCE: JET PROPELLSION (MARCH 1951)

Date 5/20/57

Prepared By C.M. HANSON

Checked By

Revised Date

CONVAIR

DIVISION OF GENERAL DYNAMICS CORPORATION

SAN DIEGO, CALIFORNIA

Model RESEARCH

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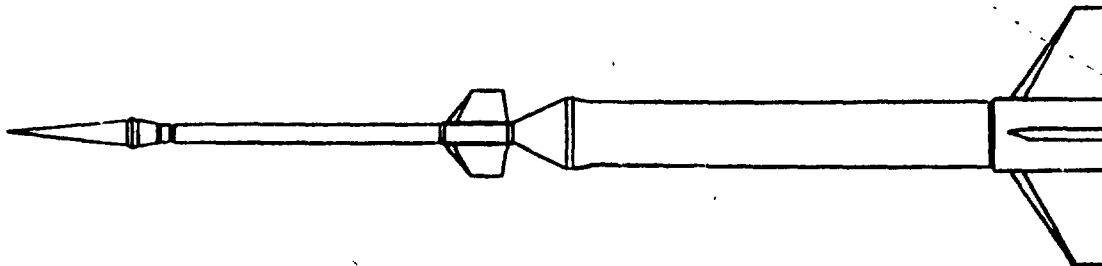
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Report No. ZM 486

SPONSOR: AIR FORCE

MFGR: NACA

DAN (DEACON NIKE)



LENGTH: DEACON MISSILE = 155.5" NIKE BOOSTER 150.5"

DIAMETER: DEACON MISSILE = 6.25" NIKE BOOSTER 16.5"

SPAN: DEACON MISSILE = 27" NIKE BOOSTER 62.5"

WEIGHT: DEACON MISSILE = 216^{lb} NIKE BOOSTER 1,324^{lb}

WARHEAD: NONE

GUIDANCE: AN/DPL-19 RADAR BEACON IN NOSE OF DEACON

PROPULSION: SOLID = NIKE BOOSTER & DEACON MISSILE

RANGE: VERTICAL TRAJECTORY

VELOCITY: 5150'/SEC (M=5)

ALTITUDE: 556,000' PEAK

REMARKS: TWO TEST FIRINGS OF DAN (DEACON-NIKE) ROCKET INDICATED THAT ALTITUDES BETWEEN 385,000' & 487,000' MAY BE REACHED WITH PAYLOADS FROM 60^{lb} TO 10^{lb}

SECRET

REFERENCE: MISSILES & ROCKETS OCT. 1956

Form 1277-C

Date 3/22/57
Prepared By C. HANSON
Checked By
Revised Date

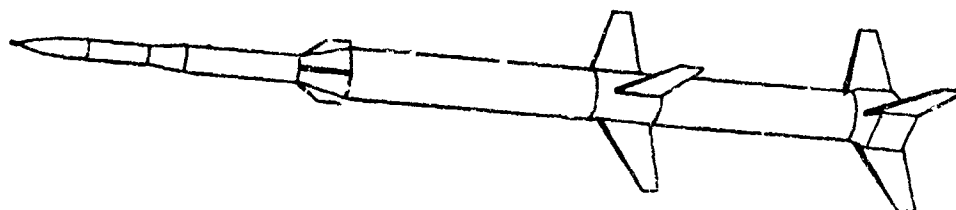
CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model RESEARCH

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Temp Penn

Report No. ZM-486

(4) STAGE HYPERSONIC
TEST MISSILE

SPONSOR: NACA
MFGR: COMPOSITE



LENGTH: STAGE (1&2) 135" EA., STAGE (3) 47.69", STAGE (4) 36.7"

DIAMETER: STAGE (1&2) 16.5" EA., STAGE (3) 8.3", STAGE (4) 5.9"

SPAN: STAGE (1&2) 52.5"

WEIGHT: STAGE (1&2) 1180^{lb}, STAGE (3) 47.69^{lb}, STAGE (4) 36.7^{lb}

WARHEAD: NONE

GUIDANCE: NONE

PROPULSION: STAGE (1&2) M-5, SOLID; STAGE (3) THICKOL T-40, SOLID;
STAGE (4) THICKOL T-55, SOLID.

RANGE: VERTICAL TRAJECTORY

VELOCITY: M=10.4

ALTITUDE: 219 STATUE MI.

REMARKS: RESEARCH VEHICLE FOR AERODYNAMIC
HEATING STUDIES

REFERENCE: JATO MANUAL,
Form 1277-C

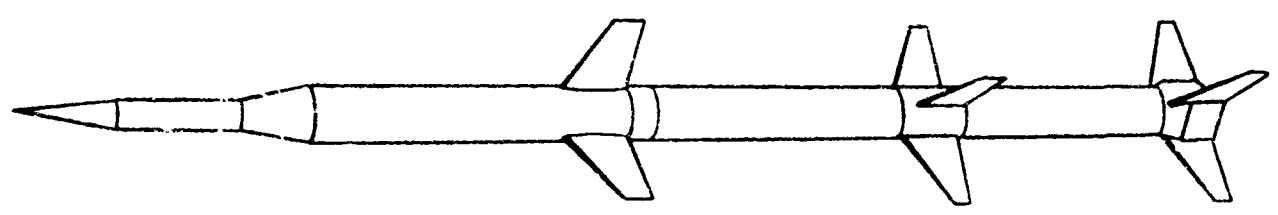
Date 3/22/57
Prepared By CHAUSSON
Checked By
Revised Date
CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model RESEARCH

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Temp Penn

Report No. ZM-486

SPONSOR: NACA
MFGR: COMPOSITE

FOUR-STAGE TANDEM BOOSTER



LENGTH. STAGE (1) 135", STAGE (2) 135", STAGE (3) 68.8", STAGE (4) 47.7"

DIAMETER: STAGE (1) 16.5", STAGE (2) 16.5", STAGE (3) 15", STAGE (4) 8.3"

SPAN: STAGE (1+2) = 52.5, STAGE (3) 51"

WEIGHT: STAGE (1) 1,180^{lb}, STAGE (2) 1,180^{lb}, STAGE (3) 3 DEACON @ 93^{lb} EA., STAGE (4) 132^{lb}

WARHEAD: NONE

GUIDANCE: NONE

PROPULSION. STAGE (1+2) T-15, SOLID; STAGE (3) 3 DEACON, SOLID; STAGE (4) T-40, SOLID.

RANGE:

VELOCITY: 3RD STAGE = M=6

ALTITUDE. 3RD STAGE = 50,000'

REMARKS. HIGH SPEED RESEARCH VEHICLE

Subsonic

REFERENCE. NACA RML 56E 20 JULY 27, 1956 & JATO MANUAL
Form 1277-C

Date 5/25/57

Prepared By C.M. HANSON

Checked By

Revised Date

CONVAIR RESEARCH

A DIVISION OF GENERAL DYNAMICS CORPORATION

SAN DIEGO, CALIFORNIA

Model RESEARCH

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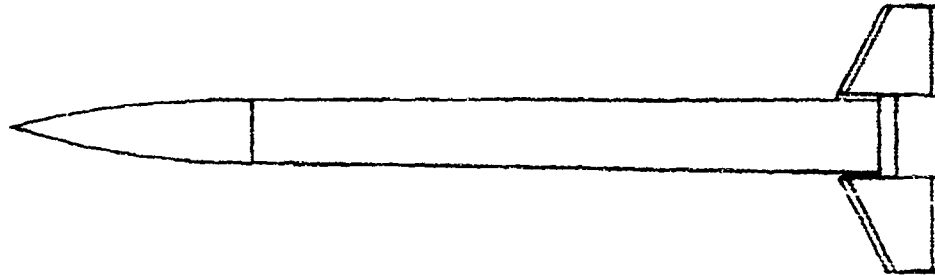
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Report No. ZM-486

SPONSOR: NAVY (URL)

MFGR: ATLANTIC RESEARCH CORP.

IRIS



LENGTH: 17'-4"

DIAMETER: 12"

SPAN: 40" (EST)

WEIGHT: 1006.5# MASS RATIO = 3.98

WARHEAD: PAYLOAD 100#

GUIDANCE:

PROPULSION 748# SOLID, 600 PSI, 4220# THRUST, 40 SEC BURNING TIME.

RANGE:

VELOCITY: 7597'/SEC. MAX.

ALTITUDE: 197.1 MI. MAX.

REMARKS: EXPANSION RATIO = 12
READY IN 1958.

SECRET

REFERENCE: CHARACTERISTICS OF IRIS ROCKET, DITMARS

Form 1271-C

Date *9/22/57*
Prepared By *C.M. HANSON*
Checked By
Revised Date *7/22/57*

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A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model *RESEARCH*

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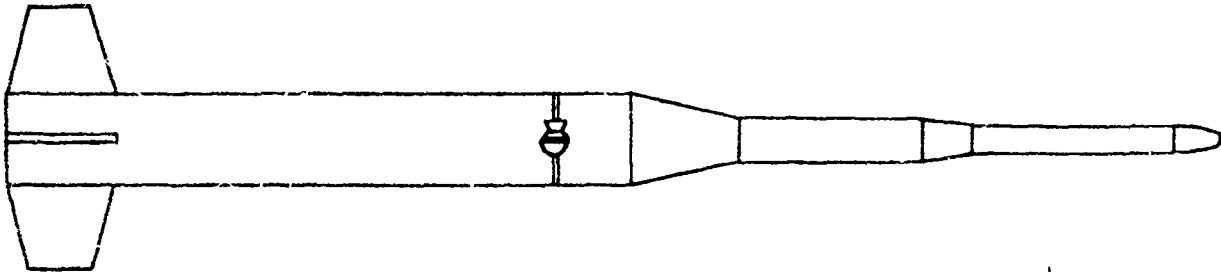
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Report No. *ZM-486*

SPONSOR: *AIR FORCE*
MFGR: *LOCKHEED*

LOCKHEED-X-17



LENGTH: *430"*

DIAMETER: *1ST STAGE = 31", 2ND STAGE = 17.5", 3RD STAGE = 8.2"*

SPAN: *98"*

WEIGHT: *APPROX. 10,200⁺*

WARHEAD: *NONE*

GUIDANCE: *NONE*

PROPULSION: *SOLID PROPELLANT ROCKETS.*

RANGE: *300-900 N. MI. (EST.)*

VELOCITY: *12,000'/SEC MAX. (EST.)*

ALTITUDE: *HAS REACHED APPROX. 600 MI.*

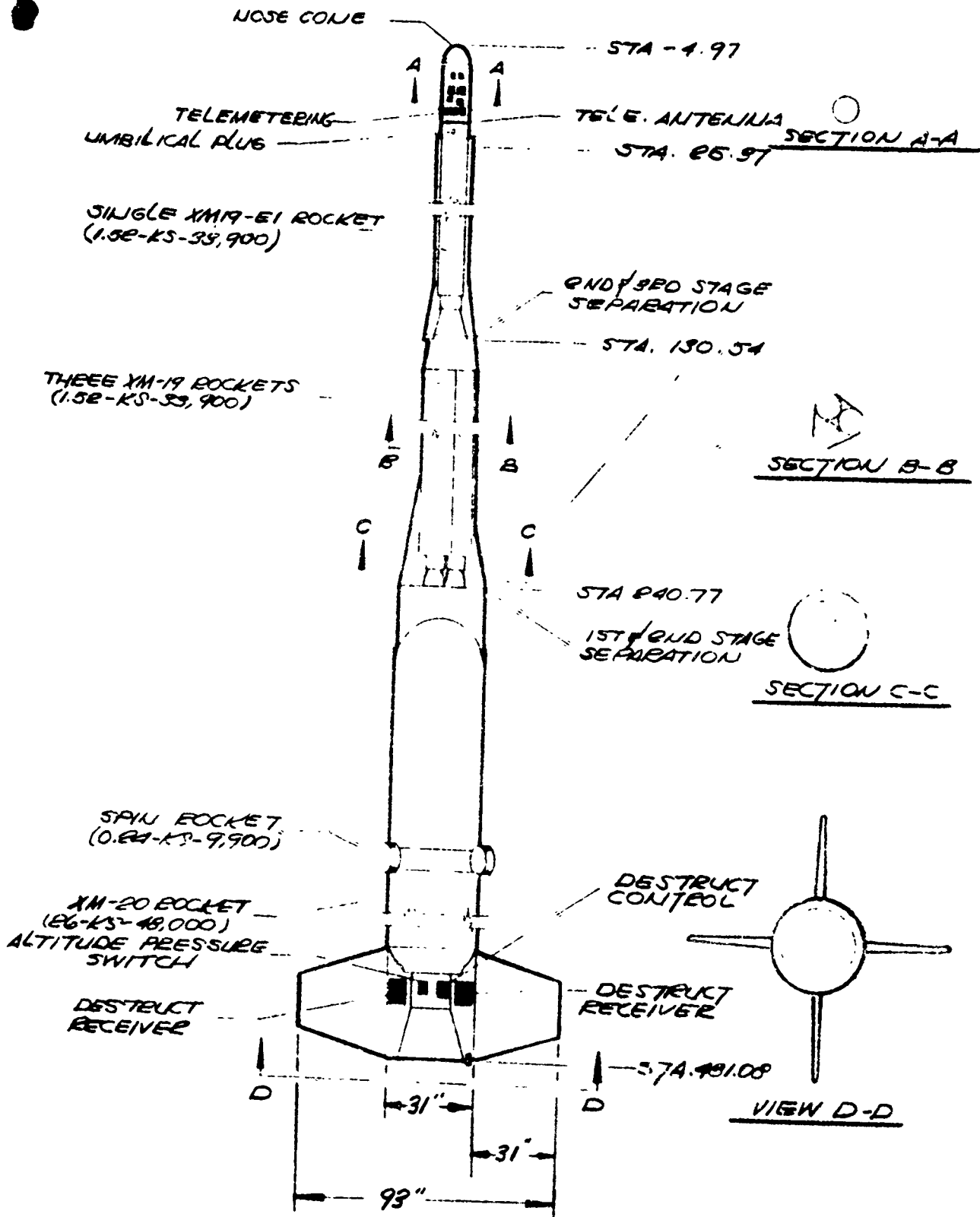
REMARKS: *RE-ENTRY TEST VEHICLE BUILT FROM STOCK
SOLID-PROPELLANT UNITS; STAGE 1 = SERGEANT,
STAGE 2 = RECRUIT, STAGE 3 = RECRUIT JATO.*

SECRET!
*STAGE 1 = SERGEANT - 26 KS - 48,000 -
STAGE 2 = RECRUIT - 15 KS - 33,500
STAGE 3 = RECRUIT - 152 KS - 33,500
SPIRAL ROCKETS - 0.24 KS - 48,000*

REFERENCE: *AVIATION WEEK, FEB. 4, 1957, & JATO MANUAL.*

SECRET

LOCKHEED X-17



REF: 16006

SECRET

Date 11-3-54
Prepared By DITMARS
Checked By 7/27/57
Revised Date 9/2/57
C.M. HANSON

CONVAIR SECRET
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model MX-683

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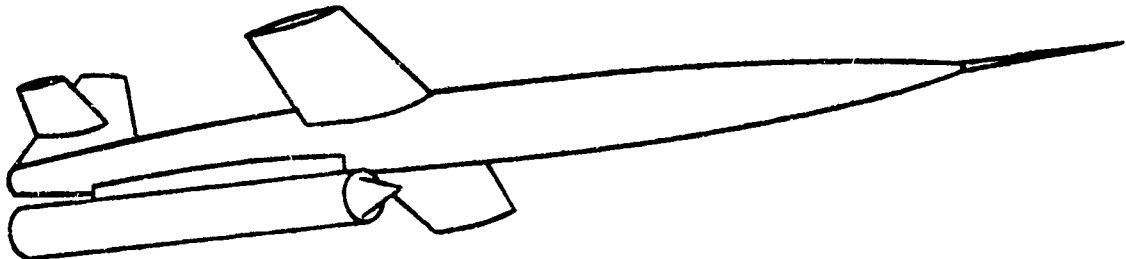
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Report No. ZM-486

SPONSOR: AIR FORCE
MFGR: LOCKHEED

X-7 & Q-5



LENGTH: MISSILE = 595" BOOSTER = 239"
DIAMETER: " = 20" " = 32"
SPAN: " = 144" " = 258"
WEIGHT: " = 3018# " = 5020#
WARHEAD: NONE - RAMJET TEST VEHICLE
GUIDANCE: AUTOPILOT & PROGRAMMER + RADAR GROUND COMMAND
PROPULSION: RAMJET CRUISE - SOLID PROP. ROCKET BOOST
(405-105,000)
RANGE: UP TO 165 MI (CLOSED COURSE)
VELOCITY: M=1.7 TO M=3.0
ALTITUDE: SEA LEVEL TO 80,000'
REMARKS: DESIGNED TO TEST 20" TO 28" DIA. RAMJET ENGINES,
AIE LAUNCHED FROM B-29 BOOSTED, TO SUPERSONIC
VELOCITY FOR RAMJET OPERATION. DECELERATED
BY DIVE BRAKES, PARACHUTE DEPLOYED,
RECOVERY BY GROUND PENETRATION
SPIKE. DEVELOPED INTO Q-5 RECOVERABLE DROUE.
SECRET
REFERENCE: PR 27 X 7 RITV (JAN '55) LOCKHEED A. CO.
Form 1277-C

Date 11-3-54
Prepared By DITMARS
Checked By
Revised Date 3/8/57
C.M. HANSON

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model X-7

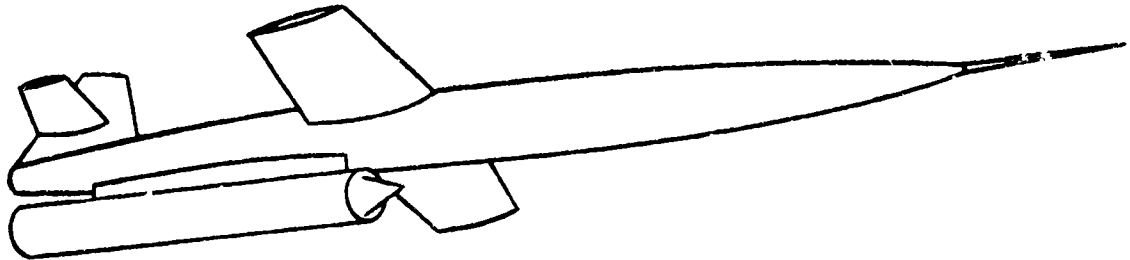
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Temp Penn

Report No. ZM-486

SPONSOR: AIR FORCE
MFGR: LOCKHEED

MX-883



LENGTH: MISSILE = 395" BOOSTER = 239"
DIAMETER: " = 20" " = 32"
SPAN: " = 144" " = 258"
WEIGHT: " = 3018# " = 5020#
WARHEAD: NONE - RAM JET TEST VEHICLE
GUIDANCE: AUTOPILOT & PROGRAMMER + RADAR GROUND COMMAND
PROPULSION: RAM JET CRUISE - SOLID PROP. ROCKET BOOST (405-105,000)
RANGE: UP TO 165 MI (CLOSED COURSE)
VELOCITY: M=1.7 TO M=3.0
ALTITUDE: SEA LEVEL TO 80,000'
REMARKS: DESIGNED TO TEST 20" TO 28" DIA. RAM JET ENGINES, AIR LAUNCHED FROM B-29 BOOSTED, TO SUPERSONIC VELOCITY FOR RAM JET OPERATION, DECELERATED BY DIVE BRAKES, PARACHUTE DEPLOYED, RECOVERY BY GROUND PENETRATION SPIKE.
REFERENCE: PR #27 X-7 R/TV (JAN '53) LOCKHEED A.CO.
Form 1277-C

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Date *3/21/57*
Prepared By *CHANSON*
Checked By
Revised Date

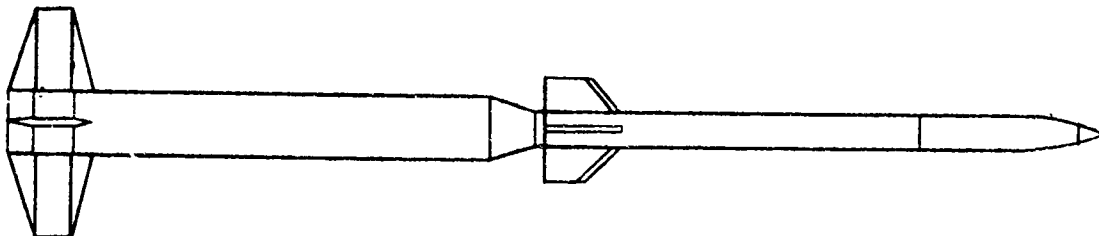
CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model *RESEARCH*

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Report No. *ZM-486*

SPONSOR: *AIR FORCE*
MFGR: *UNIVERSITY OF MICHIGAN*

NIKE-CAJUN



LENGTH: *296.5*

DIAMETER: *NIKE BOOSTER = 16.5", CAJUN MISSILE = 6.75"*

SPAN: *BOOSTER = 59.5", MISSILE = 24.75"*

WEIGHT: *1550^{lb}*

WARHEAD: *NONE*

GUIDANCE:

PROPULSION: *SOLID ROCKET*

RANGE:

VELOCITY: *M=5.7*

ALTITUDE: *100 MI.*

REMARKS: *CARRIES EQUIPMENT TO TEST OR MEASURE
WATER-VAPOR DISTRIBUTION, EARTH'S MAGNETIC
FIELD, CLOUD STRUCTURE, PRESSURE, TEMP.,
DENSITY, WINDS, COSMIC RAYS, & AURORAL PARTICLE.*

REFERENCE: *JET PROPULSION (MARCH 1957)*

Form 1277-C

Date 5/1/57
Prepared By C.M. HANSON
Checked By
Revised Date 7/2/57

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A DIVISION OF GENERAL DYNAMICS CORPORATION
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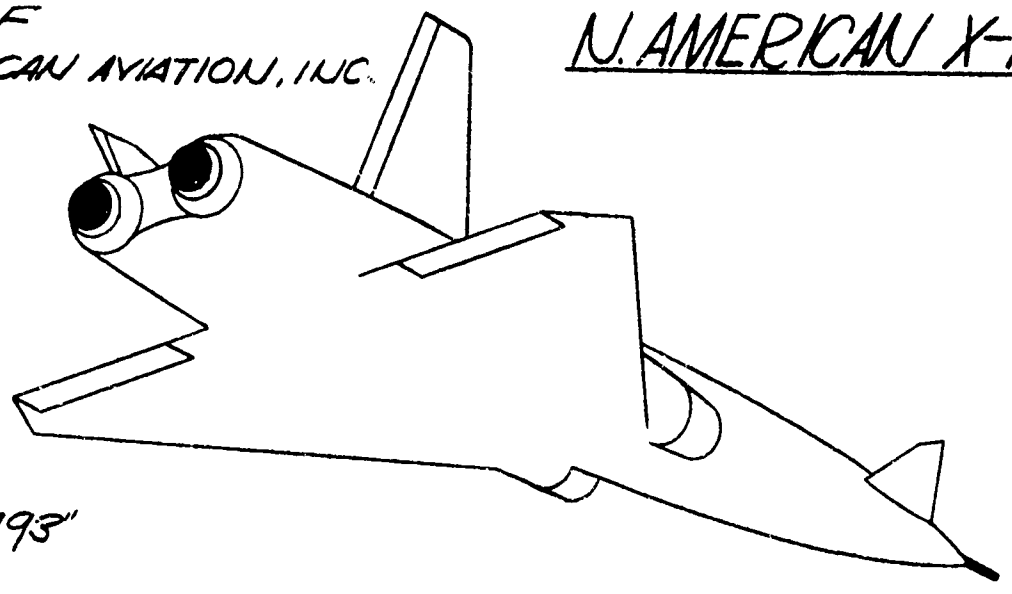
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Report No. ZM-486

SPONSOR: USAF
MFGR. N.AMERICAN AVIATION, INC.

N.AMERICAN X-10



LENGTH 793"
DIAMETER 68"
SPAN 337"
WEIGHT (W6) 42,000#
WARHEAD: NONE
GUIDANCE: RADIO COMMAND
PROPULSION (2) XRJ47-W-5 TURBOJET
RANGE 400-500 N.MI.
VELOCITY M=1.76
ALTITUDE 50,000'

REMARKS AERODYNAMIC TEST VEHICLE FOR NAUHAO CONFIGURATION. RECOVERABLE, TRICYCLE GEAR AND DROUGE CHUTE.

SECRET

REFERENCE CONVAIR, POMONA RPT. TM 339-42-2 (SEPT. 1956)
Form 1277-C

Date 5/2/57

Prepared By C. M. HANSON

Checked By

Revised Date

CONVAIR

A DIVISION OF GENERAL DYNAMICS CORPORATION

SAN DIEGO, CALIFORNIA

Model RESEARCH

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Report No. ZM-486

N. AMERICAN X-10

THE X-10 MISSILE REPRESENTS THE FIRST PHASE OF A THREE PHASE MISSILE DEVELOPMENT PROGRAM, DESIGNATED AS AIR FORCE PROJECT MX-770. THE OBJECTIVE OF PROJECT MX-770 IS THE DEVELOPMENT OF A SURFACE-TO-SURFACE MISSILE, CRUISING AT A MACH NUMBER OF 2.75 OR HIGHER, CAPABLE OF CARRYING A HEAVY SPECIAL WARHEAD A DISTANCE OF 5500 N. MILES WITH AN ACCURACY SUCH THAT 50% OF THE MISSILES WILL STRIKE WITHIN 1500 FEET OF A PREDETERMINED TARGET.

THE X-10 MISSILE IS POWERED BY TWO TURBOJET ENGINES AND IS PROVIDED WITH A LANDING GEAR FOR AIRPLANE-TYPE LANDINGS AND TAKEOFFS. AS A TEST VEHICLE, ITS PURPOSE IS TO PROVE THE OVERALL SOUNDNESS OF THE BASIC DESIGN; TO PROVIDE OPERATIONAL EXPERIENCE, AND TO PROVIDE AERODYNAMIC, STRUCTURAL, ENVIRONMENTAL, AND SYSTEMS DATA.

SECRET

REF: N. AMERICAN RPT. AL 1952 (26 MARCH, 54)

Date 5/3/57

Prepared By C.M. HANSON
Checked By
Revised Date

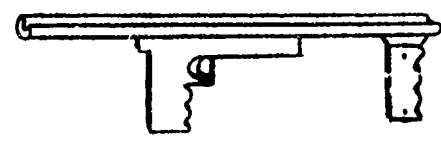
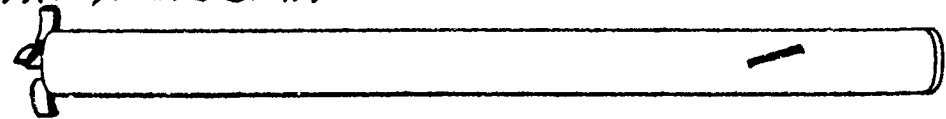
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SAN DIEGO, CALIFORNIA
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Report No. ZM-486

SPONSOR NAVY
MFGR. CONVAIR, PONOMA

RED EYE



LENGTH. 42.75"

DIAMETER. 2.5"

SPAN: AFT FINS = 5"

WEIGHT: 14.5# MISSILE, 18.2# COMPLETE

WARHEAD. 2.35# (COMPLETE WITH 1.2# HBX)

GUIDANCE. INFRARED HOMING SYSTEM

PROPULSION DUAL STAGE SOLID ROCKET

RANGE 4600 YDS.

VELOCITY. THE INITIAL STAGE = 100' / SEC FOR 0.06 SEC.
SECOND STAGE = 2700' / SEC FOR 5 SEC.

ALTITUDE. DESIGNED FOR DEFENSE AGAINST LOW LEVEL AIR ATTACK.

REMARKS

SECRET

REFERENCE. CONVAIR, PONOMA RPT. # 26-300-008 (NOV. 1956)
Form 1277-C

Date 5/3/57

Prepared by C. H. HANSON

Checked By

Revised Date

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A DIVISION OF GENERAL DYNAMICS CORPORATION

SAN DIEGO, CALIFORNIA

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Report No. ZM 486

RED EYE

THE RED EYE MISSILE IS 2.5" IN DIA., WEIGHS 14.5# AND IS 42.75" IN LENGTH. IN THIS ENVELOPE ARE PACKAGED AN INFRARED HOMING SYSTEM, EXTENSIBLE CANARD TYPE CONTROL SURFACES, A WARHEAD & FUSE, A DUAL-STAGE ROCKET MOTOR, & FOLDING TAIL SURFACES. THE MISSILE IS ENCLOSED IN A 2.75" DIA. SEALED SHIPPING TUBE THAT, WITH END CAPS REMOVED, BECOMES THE LAUNCHER TUBE.

THE COMPLETE, LAUNCHER ASSEMBLY, WHICH RESEMBLES A BAZOOKA IN SIZE AND APPEARANCE, COMPRISES THE LAUNCHER TUBE CLAMPED TO A GRIPSTOCK. THE GRIPSTOCK CONTAINS A TRIGGER MECHANISM, AND A BATTERY FOR MISSILE WARM-UP AND FIRING. THE ENTIRE WEAPON SYSTEM WEIGHS ONLY 18.2#, APPROXIMATELY THE WEIGHT OF A LOADED BROWNING AUTOMATIC RIFLE.

SECRET

REFERENCE: CONVAIR, FONOMA RPT. #
E6-300-008 (NOV. 1956)

Date 9/19/57

Prepared By C.M. HANSON

Checked By

Revised Date

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A DIVISION OF GENERAL DYNAMICS CORPORATION

SAN DIEGO, CALIFORNIA

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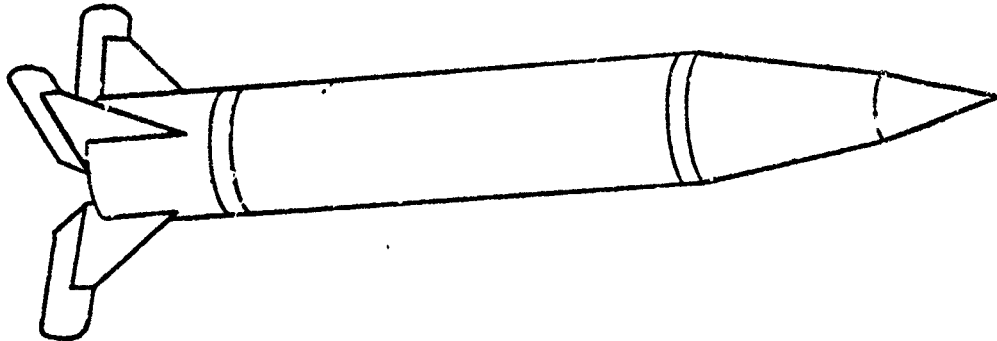
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Report No. ZM-486

SPONSOR: ARMY ORD

MFGR: GENERAL ELECTRIC

RV-A-10



LENGTH: 238"

DIAMETER: 31"

SPAN: 95"

WEIGHT: 6861

WARHEAD: NONE (TEST VEHICLE)

GUIDANCE:

PROPULSION: SOLID, ROUND (1) 4622#, ROUND (2) 4586, # ROUND (3) 4573#

RANGE: ROUND (1) 54 N.M.I., ROUND (2) 50 N.M.I., ROUND (3) 38 N.M.I., ROUND (4) 22 N.M.I.

VELOCITY: MAX. VEL., ROUND (1) 3600'/SEC., ROUND (2) 3400'/SEC., ROUND (3) 3400'/SEC.

ALTITUDE: ROUND (1) 190,000', ROUND (2) 195,000', ROUND (3) 60,000', ROUND (4) 35,000'

REMARKS: FLIGHT TEST EQUIPMENT: BEACON SIGNAL IN TAIL, & TELEMETRY EQUIPMENT.

SECRET

REFERENCE: G.E. 254A0502 - JAN. '54

Form 1277-C

Date 9/21/57

Prepared by F. HANSON

Checked By

Revised Date

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A DIVISION OF GENERAL DYNAMICS CORPORATION

SAN DIEGO, CALIFORNIA

Model. RESEARCH

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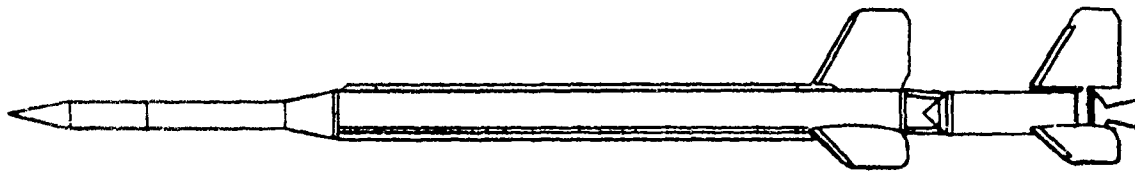
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Report No. ZM-486

SPONSOR: U.S. NAVY/JHU

MFGR: AEROJET

SPAEROBEE



LENGTH: 375.7"

DIAMETER: STAGE (1) 18.75", STAGE (2) 15", STAGE (3) 8"

SPAN: STAGE (1) 61.99", STAGE (2) 62" STAGE (3) FLARED SKIRT

WEIGHT: STAGE (1) 570#, STAGE (2) 993#, STAGE (3) 116#, PAYLOAD 20-60#

WARHEAD: NONE

GUIDANCE:

PROPULSION STAGE (1) AEROBEE BOOSTER (SOLID), STAGE (2) AEROBEE (LIQUID), STAGE (3) SOLID, SPARROW SUSTAINER.

RANGE:

VELOCITY: 10,500'/SEC.

ALTITUDE: 400 MI. SUMMIT

REMARKS: HIGH ALTITUDE SOUNDING ROCKET.

SECRET

REFERENCE Form 1277-C

JET PROPULSION (MARCH 1957) JATO MANUAL, AEROJET-LIQUID & SOLID PROPELLANT ROCKETS HANDBOOK.

Date 3/20/57

Prepared By C.M. HANSON

Checked By

Revised Date

CONVAIR

DIVISION OF GENERAL DYNAMICS CORPORATION

SAN DIEGO, CALIFORNIA

Model RESEARCH

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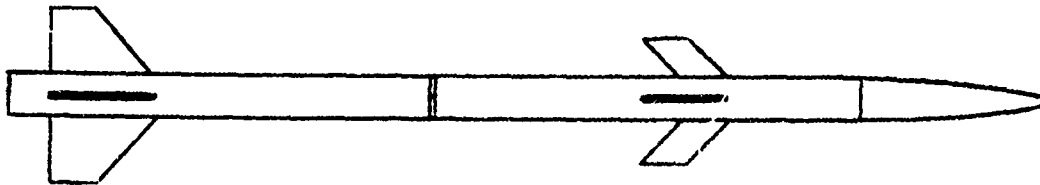
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Report No. ZM 486

SPONSOR: DEPT. OF DEFENSE
MFGR: REPUBLIC AVIATION

TERRAPIN



LENGTH: LESS THAN 15'

DIAMETER: MAX. 6.5"

SPAN: MISSILE - APPROX. 19.9," BOOSTER - APPROX. 26.25"

WEIGHT: 224#

WARHEAD: NONE

GUIDANCE: ALL TRANSISTORIZED TELEMETERING SYSTEM.

PROPULSION: SOLID

RANGE: VERTICAL TRAJECTORY

VELOCITY: 6000'/SEC

ALTITUDE: 80 MI.

REMARKS: PRELIMINARY DESIGN OF THIRD STAGE ROCKET
DESIGNED TO SEND THE TERRAPIN TO 200 MI.

SECRET

REFERENCE: AVIATION WEEK: OCT. 8, 1956

Date 4/15/57

Prepared By C. M. HANSON A DIVISION OF GENERAL DYNAMICS CORPORATION

Checked By

Revised Date 7/22/57

SAN DIEGO, CALIFORNIA

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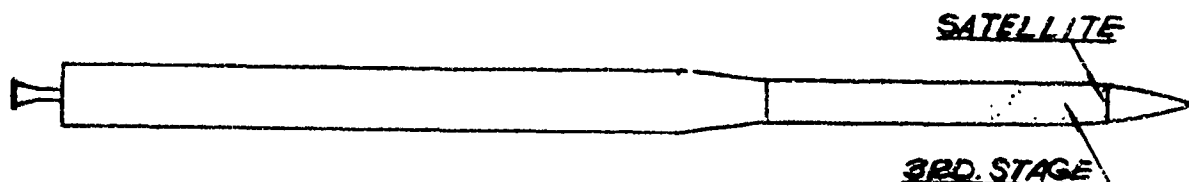
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Report No. ZM-486

SPONSOR: IGY

MFGR: MARTIN

VANGUARD



LENGTH: STAGE (1) = 45', STAGE (2) = 30'

DIAMETER: STAGE (1) = 45", STAGE (2) = 32"

SPAN: NO SURFACES

WEIGHT: 11 TONS, 22,600*

WARHEAD: NONE, 20 IN. SPHERE (SATELLITE), 21# WITH 10% INSTRUMENTATION, ORBITING @ 200 N.M.I. - 800 N.M.I. ALT.

GUIDANCE: RADIO-INERTIAL GUIDANCE SYSTEM MOUNTED SECOND STAGE 3RD STAGE SPIN STABILIZED, VICKERS AUTO-PILOT-ASSISTED RADIO GUIDANCE

PROPULSION: STAGE (1) LIQUID (G.E. X405 - KEROSENE & OX) STAGE (2) LIQUID (AEROJET GENERAL A110-37 - UNSYMMETRICAL DIM-ETHYL HYDRAZINE & WHITE FUMING NITRIC ACID) STAGE (3) SOLID.

RANGE: SATELLITE

VELOCITY: STAGE (1) 6075' / SEC, STAGE (2) 14,010' / SEC, STAGE (3) 26,000' / SEC

ALTITUDE: STAGE (1) 35 MI., STAGE (2) 130 MI., STAGE (3) 300 MI.

REMARKS: JOINT EFFORT BY THE SERVICES & NACA
PROPULSION = 90,000* SEC GRAND CENTRAL MOTOR. 1ST STAGE THRUST = 27,000*, $t_b = 146$ SEC.
2ND STAGE THRUST = 7,500*, $t_b = 120$ SEC., 3RD STAGE THRUST 2,350* $t_b = 30$ SEC.

REFERENCE: AMER. ROCKET SOCIETY 424-57, ASTRONAUTICS AUG '57

Form 1277-C

SECRET

Date 7 SEPT. 1956
Prepared By CHALK
Checked By
Revised Date

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A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO, CALIFORNIA
Model RTV-N-12A

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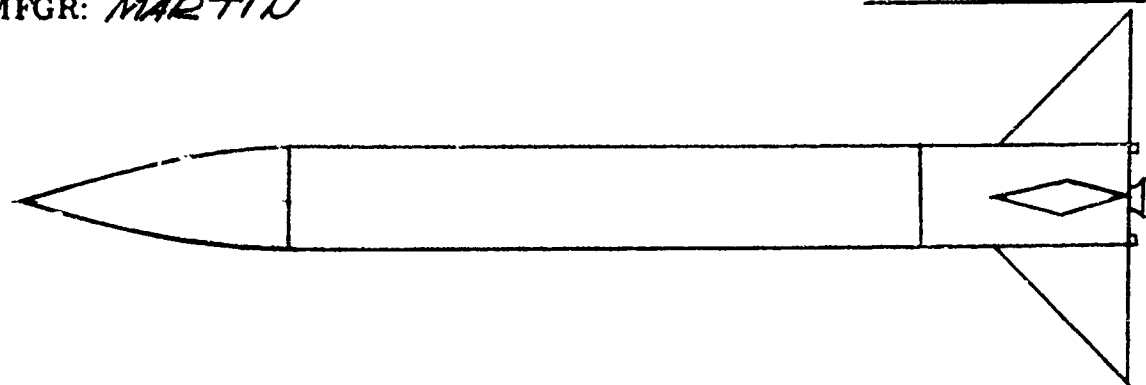
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Report No. ZM486

SPONSOR: NAY4
MFGR: MARTIN

VIKING



LENGTH: 505"

DIAMETER: 45"

SPAN: 160"

WEIGHT: 15,000*

WARHEAD: 500*

GUIDANCE: ALITO-PILOT — GROUND COMMAND

PROPULSION LIQUID ROCKET (ALCOHOL, OXYGEN, & PEROXIDE)
XLR 10-EM-1, 21,000* TH @ S.L.

RANGE: VERTICAL TRAJECTORY

VELOCITY: 7623 FT/SEC.

ALTITUDE: 227.3 MI

REMARKS: ROCKET GIMBALLED (PITCH & YAW) ROLL CONTROL-
ALXILLIARY JETS (H₂O₂) & TABS ON TWO FINS-
ATTITUDE JETS ALSO H₂O₂

REFERENCE. 06114
Form 1277-C

Date 3/25/57

Prepared By M. J. HANSON

Checked By

Revised Date

CONVAIR
A DIVISION OF GENERAL DYNAMICS CORPORATION

SAN DIEGO, CALIFORNIA

Model RESEARCH

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Report No. ZM-486

SPONSOR:

MFGR: COOPER DEVELOPMENT
GRAND CENTRAL ROCKET CO.

WASP

LENGTH: MISSILE = 40" , BOOSTER = 63"

DIAMETER: MISSILE = 1 3/8" , BOOSTER = 3"

SPAN:

WEIGHT: 24# (TYPE #1 BOOSTER) , 29# (TYPE #2 BOOSTER)

WARHEAD:

GUIDANCE:

PROPULSION: SOLID PROPELLANT ROCKET

RANGE:

VELOCITY: TYPE #2 BOOSTER => 3400 M.P.H.

ALTITUDE: 21 MI. MAX RANGE

REMARKS:

EXTREMELY LIGHT-WEIGHT VEHICLE, IS
INTENDED FOR METEOROLOGICAL AND
OTHER SCIENTIFIC RESEARCH AT MODERATE
ALTITUDE. TWO BOOSTERS ARE AVAILABLE.

SECRET

REFERENCE:
Form 1277-C

MISSILES # ROCKETS MARCH, 1957

ANALYSIS
PREPARED BY
CHECKED BY
REVISED BY

C O N V A I R
A DIVISION OF GENERAL DYNAMICS CORPORATION
SAN DIEGO

PAGE
REPORT NO.
MODEL
DATE

The following tables are reproduced from Convair Pomona Report TM 339-42-2. The source of these data is unspecified and are consequently unchecked. The information contained should be used accordingly.

SECRET

S.A.M. PHYSICAL CHARACTERISTIC

NAME	COUNTRY	RANGE IN NAUTICAL MILES	ALTITUDE		TOTAL LAUNCH WEIGHT IN LBS	TOTAL LAUNCH LENGTH IN INCHES	MAXIMUM MISSILE VELOCITY
			MAXIMUM IN FT - 10}	MINIMUM IN FEET			
SEA SPARROW	U.S.A.	6	40	50	WITHOUT BOOSTER 375	WITHOUT BOOSTER 144	MACH 2.5
TARTAR	U.S.A.	9	50	50	1150	174	MACH 1.86
HAWK I	U.S.A.	13	60	50	1300	195	MACH 2.5
TERRIER BW-1	U.S.A.	10	37	ANGLE OF P°	2470	319	MACH 1.75
TERRIER BT-3	U.S.A.	15	65	ANGLE OF P°	2775	320	MACH 3.5
TERRIER HT-3	U.S.A.	26	80	50	3700	ABOUT 320	MACH 3.4
NIKE I	U.S.A.	25	60	NO LOW ALTITUDE CAPABILITY	2325	396	MACH 2.5
NIKE B	U.S.A.	50	80	NO LOW ALTITUDE CAPABILITY WITHOUT NUCLEAR WARHEAD	9965	470	MACH 3.5
TALOS SAM-N-66	U.S.A.	50	60	VERY LIMITED LOW ALTITUDE CAPABILITY	6950	360	MACH 1.85
TALOS SAM-N-66W	U.S.A.	50	60	VERY LIMITED LOW ALTITUDE CAPABILITY WITHOUT NUCLEAR WARHEAD	7100	372	MACH 1.85
TALOS SAM-N-661	U.S.A.	100	70	VERY LIMITED LOW ALTITUDE CAPABILITY	7500	386	MACH 2.1
TALOS SAM- N-66W1	U.S.A.	100	70	VERY LIMITED LOW ALTITUDE CAPABILITY WITHOUT NUCLEAR WARHEAD	7650	398	MACH 2.1
BOMARC F 99A	U.S.A.	125	60	VERY LIMITED LOW ALTITUDE CAPABILITY	12,250	494	MACH 2.5
BOMARC ADV	U.S.A.	250	80	VERY LIMITED LOW ALTITUDE CAPABILITY		494	MACH 2.7
PLATO	U.S.A.	(STUDY - ASRB)					
ADVANCE SAM	U.S.A.	(BELL LAB STUDY - AICBM)					
AKBM	U.S.A.	(CONVAIR STUDY)					
OERLIKON	SWISS	10	65		600	178	MACH 2.0
SEASLUG	BRITISH	15	50	15°	3650	234	MACH 2.0
RED SHOES	BRITISH	25	40	100	3500	249	MACH 2.0
RED DUSTER	BRITISH	20	60	100	4000	306	MACH 2.2

TABLE I

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1

SECRET

ANCILLARY EQUIPMENT

NAME	AIR SEARCH	HEIGHT FINDING	DESIG SYSTEM	ILLUMINATE OR CONTROL	TRACKING	HOMING	LAUNCHER
SEA SPARROW	SPS-6	NONE	MANUAL			DPN-24	ZERO LENGTH
TARTAR	SPS-28	SPS-26	MK 5	SPG-51	SPG-51	MOD DPN-24	ZERO LENGTH
HAWK I	MOD. TPS-1D	MOD. MPS-6	NO INFO	MOD. SP-1M	MOD. SP-1M	DPN-24	ZERO LENGTH
TERRIER BW-1	SPS-12	SPS-8A	MK 7	MK 25-7 SPQ-5	MK 25-7	NO	ZERO LENGTH
TERRIER BT-3	SPS-12	SPS-26	MK 7	SPQ-6	JPQ-6	NO	ZERO LENGTH
TERRIER MT-3	SPS-28	SPS-26	MK 7	SPQ-6	SPQ-6	MOD DPN-24	ZERO LENGTH
NIKE I	FPS-2	FPS-6	M-33	MTR MONOPULSE	TTR MONOPULSE	NO	MONORAIL -85°
NIKE B	FPS-2	FPS-6	M-33	MTR MONOPULSE	TTR MONOPULSE	NO	MONORAIL -85°
TALOS	SPS-28	SPS-26	NO INFO	SPG-49	SPG-49	INTER FEROMETER	ZERO LENGTH
BOMARC	FPS-2	FPS-6	SAGE	FPS-3	FPS-3	APQ-41	CONCRETE LAUNCH PAD

TABLE II

SECRET

SUPPLEMENTARY INFORMATION ON ELECTRONIC EQUIPMENT

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RADAR	FREQ BAND	RANGE (N.M.)*	STABILIZED	USE
SPS-6	L	50	NC	E/W
SPS-12	L	50	YES (ROLL ONLY)	E/W
SPS-28	P OR L	150	NO	E/W
SPS-26	S	90	YES	E/W AND H/F
SPS-8A	S	50	YES	H/F
FPS-2	P	500	YES	E/W AND H/F
TPS-1D	L	58	NO	E/W
FPS-3	L	300	NO	E/W
MK-25-7	X	20	YES	(TERRIER) TRACKING
SPQ-5	X	27	YES (+CW INJECTION FOR HT-3)	(TERRIER) TRACKING
SPQ-6	X	30	YES (+CW INJECTION FOR HT-3)	(TERRIER) TRACKING
SPG-51	X	20	YES (+CW INJECTION FOR TARTAR)	(TARTAR) TRACKING
SPG-49	X	50 (WILL BE INCREASED TO 100 N.M.)	YES	(TALOS) TRACKING
CXRX (MOD SPS-8A)	S	30	YES	(TARGET) TRACKING

*90% P_d ON 1 SQ METER TARGET @ 2 VF JETS

TABLE III

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SECRET

S.A.M. GENERAL INFORMATION

NAME	DEFENSE APPLICATION CONTRACTOR	PRIME CONTRACTOR		MAJOR SUB-CONTRACTORS		PRESENT STATUS	RELIABILITY	BASIS	GENERAL OBSERVATIONS	FUTURE
		CONTRACTOR	CONTRACTOR	GUIDANCE	PRODUCTION AIRFRAME					
SEA SPARROW (USN)	TASK FORCE RAYTHEON	CONVAIR	RAYTHEON	CONVAIR	RAYTHEON	DOUGLAS	70%	12 ENGINEERING TEST FLIGHTS	NONE	PROBABLY NONE
TARTAR (USN)	TASK FORCE CONVAIR	CONVAIR	RAYTHEON	CONVAIR	RAYTHEON	CONVAIR	DESIGN		COULD BE ADAPTED TO USMC USE	HAS GOOD GROWTH POTENTIAL IN RANGE & ALTITUDE
NARE (USA)	POINT DEFENSE	RAYTHEON	RAYTHEON	RAYTHEON	THOMSON	NORTHROP	ENGINEERING TEST FLIGHTS		MAJOR TARTAR COMPETITOR	MARK JUNE RESULTS DESTROYED DRONE
TERRIER BT-1 (USN)	TASK FORCE AND POINT DEFENSE	CONVAIR	CONVAIR	MOTOROLA	ALLEGANY BALLISTICS	CONVAIR	PILOT LINE PRODUCTION	10 ENGINEERING TEST FLIGHTS	ON 535 ROUNDS TERRIER TA EXHIBITED A 60% SUCCESS AS OF JAN 74	GROWTH INTO BT-3
TERRIER BT-3 (USN)	TASK FORCE AND POINT DEFENSE	CONVAIR	CONVAIR	CONVAIR	ALLEGANY BALLISTICS	CONVAIR	DESIGN			GROWTH INTO HT-3
FERRIER HT-3 (USN)	TASK FORCE AND POINT DEFENSE	CONVAIR	CONVAIR	CONVAIR	ALLEGANY BALLISTICS	CONVAIR	DESIGN			PROBABLE USE AGAINST ASM SSCM POSSIBLE USE AGAINST SRBM & ICBM
NIRE 1 (USAF)	POINT DEFENSE	BELL TEL.	WESTERN ELECTRIC	WESTERN ELECTRIC	AEROJET	DOUGLAS	PRODUCTION	61% 600 POUNDS ALL FLIGHTS		GROWTH POTENTIAL INTO NIRE 8
NIRE B (USAF)	AREA	WESTERN ELECTRIC	WESTERN ELECTRIC	WESTERN ELECTRIC	AEROJET	DOUGLAS	SYSTEM FLIGHT TESTS	29% 16 ENGINEERING TEST FLIGHTS		PROBABLE USE AGAINST ASM SSCM POSSIBLE USE AGAINST SRBM & ICBM
TALOS 45 (USN & USAF)	TASK FORCE AREA	BENDIX	FEDERAL TEL	FEDERAL TEL	MCDONNELL	MCDONNELL	PILOT PRODUCTION	70% TESTS WITH SLEEKER 30% FLIGHTS WITHOUT SLEEKER		PROBABLE USE AGAINST ASM SSCM POSSIBLE USE AGAINST SRBM & ICBM
UOMARC F 99A (USAF)	AREA	BOEING	BOEING	BOEING & G.E.	MARQUARDT	BOEING	ENGINEERING TEST FLIGHTS	60% 25 TEST FLIGHTS NOT INCLUDING GUIDANCE		PROBABLE USE AGAINST ASM SSCM POSSIBLE USE AGAINST SRBM & ICBM
BOMARC ADV. (USAF)	AREA	BOEING	BOEING	BOEING & G.E.	MARQUARDT	BOEING	DESIGN			PROBABLE USE AGAINST ASM SSCM POSSIBLE USE AGAINST SRBM & ICBM
PLATO (USAF)	POINT D DEFENSE	CORNELL	SYLVANIA	SYLVANIA			STUDY		FEASIBILITY STUDIES FOR AN ASBDM	
ADV. BELL (USAF)		BELL TEL.					STUDY		AN AICBM STUDY	
AICBM (USAF)	POINT DEFENSE	CONVAIR	CONVAIR	CONVAIR			STUDY		AN AICBM STUDY	
AICBM (USAF)		DOUGLAS	DOUGLAS	DOUGLAS			STUDY			
AICBM (USAF)		LOCKHEED	LOCKHEED	LOCKHEED			STUDY			
DERLION (COMMERCIAL)	POINT DEFENSE	DERLION	DERLION	DERLION					5 YRS REMAIN NIRE PROGRAM	
SEA SLUG (BRITISH NAVY)	TASK FORCE	WHITWORTH AIRCRAFT LTD.					SYSTEM TESTS		COMPETITION FOR BRITISH TERRIER BUSINESS	
RED SHOES (BRITISH ARMY)	POINT DEFENSE	ENGLISH ELECTRIC CO.					SYSTEM TESTS			
RED DUSTER (BRITISH ARMY)	POINT DEFENSE	BRISTOL AERO CO.					SYSTEM TESTS			

TABLE IV

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SECRET

S.A.M. PROGRAM SCHEDULES

NAME	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	
SEA SPARROW																							
TARTAR																							
HAWK I																							
FERRIER																							
BT-3																							
MIKE I																							
MIKE B																							
TALOS SAM-N-44																							
TALOS SAM-N-45																							
TALOS SAM-N-46																							
BOMARC F-98A																							
BOMARC																							
PLATO																							
BELL LAB ADVANCE SAM																							
CONVAIR AICBM																							
OORLIKON																							
SEA SLUG																							
RED SHOES																							
RED DUSTER																							

LEGEND:
 DESIGN - STUDY & ENGINEERING
 P.T. - FLIGHT TEST
 O.E. - OPERATIONAL EVALUATION
 S - FIRST TEST VEHICLE FLIGHT
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TABLE V

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A. A. M. PHYSICAL CHARACTERISTICS

NAME	DESIG	MAX RANGE IN NAUTICAL MILES	ALTITUDE		TOTAL LAUNCH WEIGHT IN LBS	TOTAL LAUNCH LENGTH IN INCHES	MISSILE VELOCITY ABOVE LAUNCH A/C SPEED	SPAN IN INCHES	DIAMETER IN INCHES	WARHEAD WEIGHT IN LBS
			MAX IN FT - 10'	MINIMUM IN FT						
FALCON	GAR-1	4.1	50	1,500	134	77.8	1900	20	6.4	2.8
FALCON	GAR-1A	4.1	50	1,500	135	86.5	1200	24	6.4	5.0
FALCON	GAR-1B	5.8	50	1,500	134	77.8	2000	20	6.4	2.8
SPARROW I	AAM-N-2	5.4	50	700	335	150	2700	37.1	8	44.0
SPARROW I	AAM-N-2b	6.0	60	25	360	150.17	2700	37.1	8	46.0
SPARROW II	AAM-N-3	4.6	60	25	388	144	1700	40	8	49.0
SPARROW III	AAM-N-6	6.5	60	100	375	144	2500	40	8	65.0
SIDE WINDER	AAM-N-7	3.5	60	NONE	154	109	1700	21	5	25
DINGDONG		5.5	60	100	812	111		33.5	15	5-10 KT. NUCLEAR
PATROL PLANE DEFENSE										
LONG RANGE										
BRITISH BLUE JAY		1.5	50	100	--	123	2000	29	8.5	42
BRITISH BLUE SKY		2.0			285	87		28	5.5	42

TABLE I

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A. A. M. SYSTEM - INFORMATION

NAME	DESIG	SERVICE	AIRCRAFT SCHEDULED TO CARRY	DATE	TYPE GUIDANCE EQPMT	NO TO BE CARRIED	PK OR CPE	LAUNCHER TYPE
FALCON	GAR-1	USAF	F89H	1956	E9	6	.5-.9 SALVO OF 6	MOD D ZERO LENGTH & FINITE
	GAR-1A	USAF	F102A	1956	MG3	6	.5-.95 SALVO OF 6	MOD D
			F102B	1958	MX-1179			ZERO LENGTH & FINITE
SPARROW I	AAM-N-2	USAF	F89H	1957	MX-1179	6	.5-.95 SALVO OF 3	PYLON
			F102B	1959	E9 & MG3			AERO-1A FINITE
			F100		I.R. SEEKER			
SPARROW I	AAM-N-2	USN	F7U-3M	1956	APQ 51	4	.78 FOR RIPPLE OF 2	
			F3H-2M	1957				
SPARROW II	XAAM-N-1	USN	F5D	1959	MODIFIED APQ-51	4	33 FT	EXTENDED ARM
					APN-21			EXTENDED ARM
SPARROW III	XAAM-N-6	USN			APN-24	4	25 FT	EXTENDED ARM
SIDEWINDER	AAM-N-7	USN	F9F FJ-3 & 4	1956	I.R. SEEKER	6	5 FT	MOD D
				1956				SPECIAL RAIL.
DINGDONG		USAF	F89H F102A	1956	(UN-GUIDED)	2	.99 SALVO OF 2	RAIL
				1958				
				1958				
BLUE JAY		RAF	F106 F101	1958	I.R. SEEKER		5 FT	
				1958				
BLUE SKY		RAF	HUNTER & SWIFT SWIFT & FA	1957				

TABLE II

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A. A. M. GENERAL INFORMATION

NAME	PRIME CONTRACTOR	MAJOR SUB-CONTRACTORS			PRESENT STATUS	RELIABILITY	BASIS	GENERAL OBSERVATION	FUTURE
		GUIDANCE	PROPULSION	AIRFRAME					
FALCON	GAR-1 HUGHES	HUGHES	THIokol	HUGHES	PRODUCTION	30%	APPROX 300 TEST VEHICLES		
	GAR-1A HUGHES	HUGHES	THIokol	HUGHES	R & D				
	GAR-1B HUGHES	HUGHES	THIokol	HUGHES	R & D				
SPARROW I	AAM-N-1 SPERRY	SPERRY	AEROJET	DOUGLAS	PRODUCTION FLIGHT		228 FLTS 7/54		
	AAM-N-2B SPERRY	SPERRY	AEROJET	DOUGLAS	TESTING				
SPARROW II	XAM-N-3 DOUGLAS	BENDIX	AEROJET	DOUGLAS	FLIGHT TESTING				
SPARROW III	XAM-N-6 RAYTHEON	RAYTHEON	AEROJET	DOUGLAS	FLIGHT TESTING				
DING DONG	DOUGLAS	HUGHES	AEROJET	DOUGLAS	OPS EVAL.	70%	APPROX 10 FLTS		
SIDE WINDER	AAM-N-7 PHILCO	PHILCO	REACTION MFRS.	PHILCO	PRODUCTION	70%	APPROX 100 TEST FLIGHTS		
BLUE JAY	DEHAVILAND								
BLUE SKY	FAIREY				PRODUCTION				

TABLE III

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A.A.M. PROGRAM SCHEDULES

NAME	CALENDAR YEAR																				
	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	
FALCON (CAR-1)	DESIGN																				
(CAR-1a)																					
(CAR-1b)																					
SPARROW I	DESIGN																				
SPARROW II																					
SPARROW III																					
SIDE-WINDEO																					
BING DONG																					
VPDE FENSE MISSILE																					
LONG RANGE MISSILE (100-150 NM)																					

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TABLE IV

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