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Serial No. **12**

SECRET

File No.

Report No. **NA-56-454**

NORTH AMERICAN AVIATION, INC.

INTERNATIONAL AIRPORT
LOS ANGELES 45 CALIFORNIA

ENGINEERING DEPARTMENT

DEVELOPMENT PLAN REPORT

FOR THE

SPECIAL RECONNAISSANCE AIRPLANE

WEAPON SYSTEM 118P

CONTRACT AF33(600)-31243

(E.O. NO. 55-6-118L)

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PREPARED BY

DESIGN ANALYSIS GROUP

APPROVED BY

H. A. Evans

H. A. Evans, Chief Designer

REVISIONS

i, ii, iii
No. of Pages **1 thru 114**

Date **4 June 1956**

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SECRET

PHASE II 1/2

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SECRET

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NA-56-454

PHASE III



SECRET

iii

56-56-454

OPERATIONAL DATE

PHASE II 1/2	PHASE III
1961	1963

INTRODUCTION

↓ This system development plan presents in the planning for a system providing the best possible solution to the requirements stated in AF33(600)-31243.

Estimated schedules for the over-all system and the component parts are included, and indicate that this system will be available for operational use in 1961 (Phase II 1/2) and 1963 (Phase III).

In order to meet the schedule, funds, facilities, and decisions or approvals are required as shown.

↑

PART I - GENERAL

- A. STATEMENT OF THE PROBLEM
- B. APPROACH
- C. SOLUTION
 - 1. Preparation of Engine Data
 - 2. Weight Estimate Procedure
 - 3. Investigation of Old and New Aerodynamic Features
 - 4. Investigation of Equipment
 - 5. Airframe Design
 - 6. Base-point Airplanes
 - 7. Configuration Analysis
- D. LOGISTICS

PART I - GENERAL**A. STATEMENT OF THE PROBLEM**

The purpose is to design a special reconnaissance weapon system for use in tactical and strategic reconnaissance operations. Particular emphasis is placed on capabilities of accurate data procurement by use of daylight photography, high-order ferret, and high-resolution radar reconnaissance. Emphasis is also placed on maximum survival and minimum cost, with a high degree of weapon system reliability.

B. APPROACH

The approach is consistent with the purpose, that is, to obtain the optimum weapon system for maximum reconnaissance results, operational capability, survival, and reliability with minimum cost, development time, maintenance, and gross weight of the air-borne vehicle. With the purpose established, the minimum requirements that this system must have become apparent. With the operational time established, the state of the art commands a finite quality of the weapon system which becomes limited by the state of the art in terms of the technology. These conditions describe a family of airplanes which, through design layout work, analytical investigation, and systematic configuration analysis using the IBM 701 high-speed digital computer, are represented by the designs for Phase II-1/2 and Phase III presented herein.

The following "ground rules" have been arrived at to obtain the optimum weapon system.

- a. The number of airplanes to be procured is relatively few. This results in a custom-type production line as opposed to the mass production line.
- b. The maintenance and operational crew are specialized and of Air Force Test Center calibre.
- c. Deviations, maintaining a high degree of capability, are made from Air Force Specifications.
- d. Through the refinements outlined above, a lighter and higher-performance type airplane results, with the following:
 1. A limit load factor of 1.6 is adequate for this type of airplane with high altitude performance.
 2. Minimum equipment weight is obtained for the capabilities required for this system.
 3. Structural refinements such as the reduction of access doors to a minimum number, are incorporated.

C. SOLUTION**1. Preparation of Engine Data**

The various engine and fuel manufacturers were contacted to determine the state of the art in the required time period and to obtain from them data on engines that are being studied and developed. On the basis of these data, the contractor estimated the installed weights and performance characteristics suitable for the calculation of aircraft performance. A comparison chart was prepared as an aid in the selection of the proper engine-fuel combination. Fuel studies were conducted with relation to inherent characteristics such as boiling and cracking temperatures. Fuel pressures, structures, and insulation requirements were also investigated. Investigations were conducted with various types of inlets best suited for each design.

2. Weight Estimation Procedure

It is expected that this system will result in an airplane that will differ somewhat from current aircraft in regard to both type of structure and materials. Investigations have been conducted on these items in sufficient detail to estimate gross weights. This involved contacting material suppliers. Design testing and fabrication work of related projects that the Contractor is involved in are very helpful in this step. Static and dynamic loading along with thermal requirements of the designs were investigated to determine type and quantity of materials necessary.

3. Investigation of Old and New Aerodynamic Features

Existing aerodynamic test data applicable to this class of aircraft were analyzed and correlated to provide a basis for calculating performance capability. This supplemented the contractor's present data for calculating performance. NAA NAVAHO intercontinental missile experience, related development projects, and test results are great assets to this development. The contractor and NACA test data were used extensively to arrive at the present aerodynamic configuration.

4. Investigation of Equipment

A survey was made of the equipment manufacturers to determine the weight and space requirements of equipment meeting the performance characteristics given in the work statement. A comprehensive study was made on the reconnaissance subsystems.

The results are discussed in the "Reconnaissance Subsystem, Weapon System 118P," Report No. NA-56-372, and the "Equipment Survey, Weapon System 118P," Report No. NA-56-446.

5. Airframe Design

Layouts were made of various aircraft arrangements which appeared promising. Emphasis was placed on the structural design operational characteristics, maintenance and servicing provisions, and production capability. Experience gained on other projects is very helpful in this step; however, the advanced performance requirements in terms of high-altitude operation with attendant high-speed operation necessitate a large volume of analytical work on stress, aeroelasticity, control systems, and cooling systems to supplement the layout work. Designs were prepared around the most promising combinations of engines, fuels and aerodynamic features investigated. These designs have been carried far enough to permit the selection of a particular combination. Balance, stability, and control computations were made to ensure that these items are satisfactory. Layouts have been made of such items as crew provisions, armament, fuel equipment, power plants, and landing gear in sufficient detail to ensure adequate space for operation and maintenance.

6. Base-point Airplanes

Estimates were made of a number of aircraft designs for fulfilling each of the design points called for in the work statement. These estimated airplanes were laid out and detail weight estimates and performance calculations computed for each of the designs. These are used as base points in each succeeding step.

7. Configuration Analysis

The base-point airplanes usually have certain performance deficiencies and will not be minimum weight designs. The purpose of the configuration analysis step is to modify the design in whatever way may be necessary to satisfy the performance requirements with the least take-off gross weight for each particular engine airframe arrangement. Various requirement trade-offs are also analyzed to facilitate the selection of the optimum design. Engine data are also "rubberized" to determine the optimum number and size required.

The configuration analysis program utilizes the IBM 701 computer and is prepared to systematically vary such parameters of the base-point airplanes as engine size, wing loading, aspect ratio, sweep, thickness ratio, and arriving at the fuel load and gross weight of the airplane required to meet a set of requirements coded into the program. These requirements are supersonic cruise altitude and speed, design range, etc. Each of the thousands of combinations of these parameters that define an airplane are "flown" in a mission profile. The program searches for the minimum weight configuration to meet or exceed the requirements. The best designs determined are then laid out to check all practical aspects of the computed designs and eliminate those that show poor arrangements. The remaining designs, (check-point airplanes) are again processed through detail weight and performance calculations. These "check-points," encompassing various power plants and design features, are again screened for the best design. Detail refinements and promising features of the other design are then incorporated, if possible, into the optimum design. The configuration analysis procedure is repeated until a final design is determined.

D. LOGISTICS

The concept of logistics and the approach to ground support for Weapon System 118P varies with the operational base suitability and the study phase. Missions requiring departure, shuttle, or termination of flight at nonpermanent installations would involve capacity air transportation in addition to problems in fuel logistics for the Phase III study.

Problem areas in logistics include:

1. Reconnaissance pod handling (a minimum of five, and a maximum of 11 pod configurations with an additional 2000 pounds of modular equipment for modified technical ferret operation).
2. Ground data correlation (equipment and data processing logistics)
3. Phase III fuel servicing

Reconnaissance pod handling is complicated by the number, configuration, and required automaticity of the equipment and the pods. Aircraft performance requirements dictate mission breakdown of equipment, which necessitates many separate units or pods to accomplish the whole mission. An approximate figure per pod for the Phase II-1/2 study is 352 cubic feet at 1000 pounds. Six pods could be transported in a C-133 type airplane. For the inclusion of technical ferret capabilities, two C-133 type airplanes would be required to transport the reconnaissance pod complement for Weapon System 118P. The van-type ground data correlation equipment would require approximately three N-2, N-3, or K-55 type vans. The inclusion of inflight data correlation could reduce this number by one. The mission termination point and data correlation areas would require shuttling of data to a common data compilation area to enable evaluation of total mission information.

Limited availability of the fuel for the Phase III study requires special logistic considerations. Support aircraft similar to the C-133 type could carry the proposed 50,000-gallon-capacity liquid hydrogen tanks. Boil-off of the liquid hydrogen in-transit requires a portable reliquification plant at the servicing area. The problem would be to establish a shuttle link between the strategically located

hydrogen generating plants and the Weapon System 118P realm of operations. Presently, development work at another agency is under way toward the development of portable hydrogen generating plants. The state of the art in this field is embryonic, and it is unknown whether the capacity of a portable plant could readily satisfy the volume of fuel required for Weapon System 118P.

The design requirement of "hands-off" maintenance limits maintenance support to the logistical support of preflight and minor maintenance equipment requirements. The support phase of Weapon System 118P could be handled using five C-133 type airplanes.

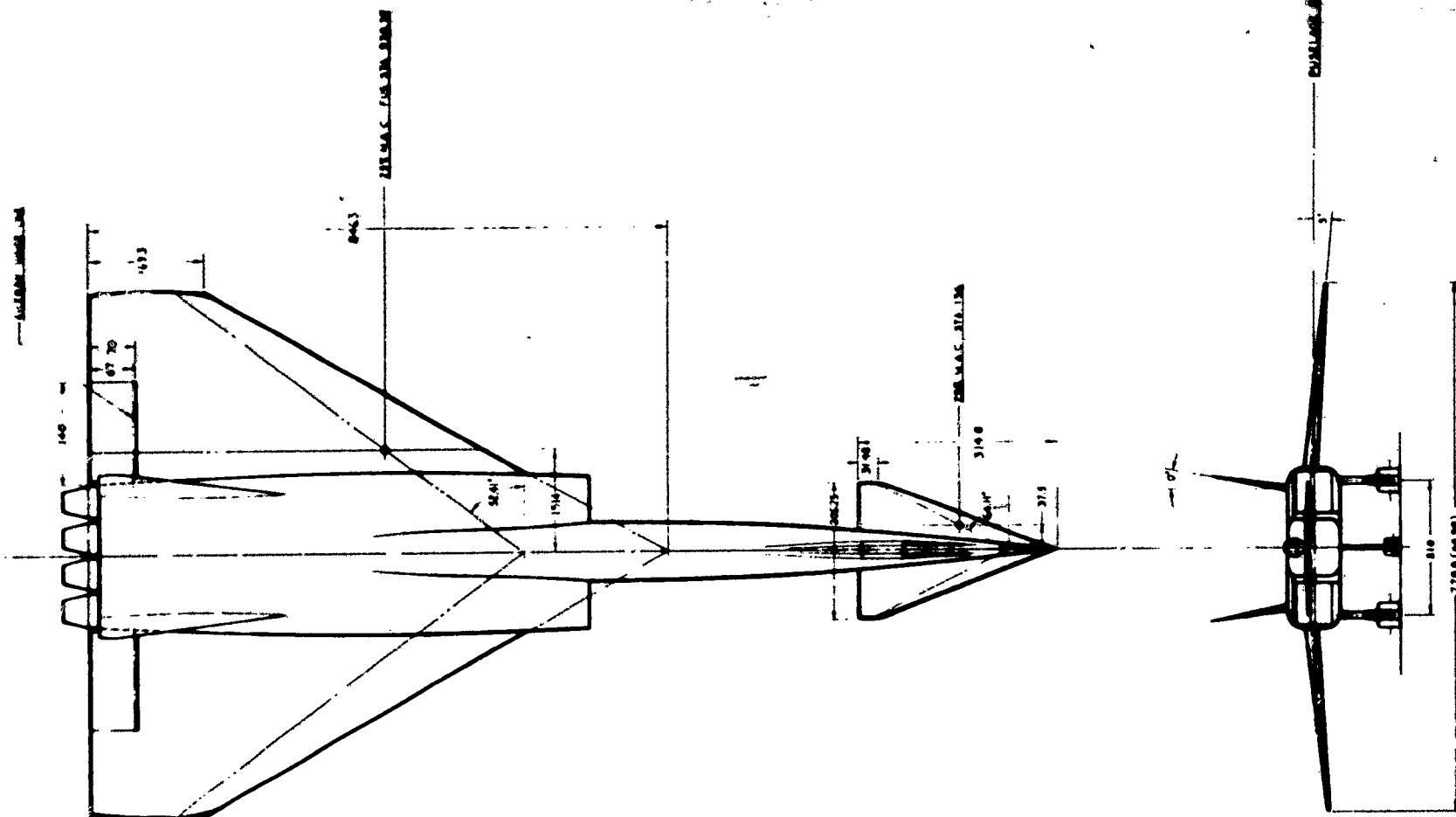
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DIMENSIONAL DATA

WING		VERTICAL TAIL	
AREA	2737.30 FT.	AREA	169.50 FT. EACH
ASPECT RATIO	0.928	ASPECT RATIO	0.761
TAPER RATIO	0.2	TAPER RATIO	0.1
SWEEPBACK (25% ELEMENT)	32.41°	SWEEPBACK (25% ELEMENT)	30.13°
ALBEO. SECTION	NACA 64093 (NAA W-20)	AERO. SECTION	NACA 65003 (NAA W-20)
MAC LENGTH	30.22 IN	MAC LENGTH	27.2 IN
ALTERN. AREA (EXPOSED)	31.71 IN ²	EXPOSED AREA	37.036 FT. EACH
CANARD SURFACE (EXPOSED)			
AREA	174.95 FT.		
ASPECT RATIO	1.147		
TAPER RATIO	0.119		
SWEEPBACK (25% ELEMENT)	65.11°		
AERO. SECTION	NACA 64003 (NAA W-20)		
MAC LENGTH	21.18 IN		

GENERAL DATA

MAIN LIGHTING GEAR	35-11 TYPE XII	FOUR WHEEL DOGLE
AUXILIARY LIGHTING GEAR	26-56 TYPE XII	DOGLE
ENGINE DESIGNATION	FOUR G1 X278	
TAKE-OFF GROSS WEIGHT	207500 LBS	
TOTAL LOAD (MAXIMUM)	241361 LBS	

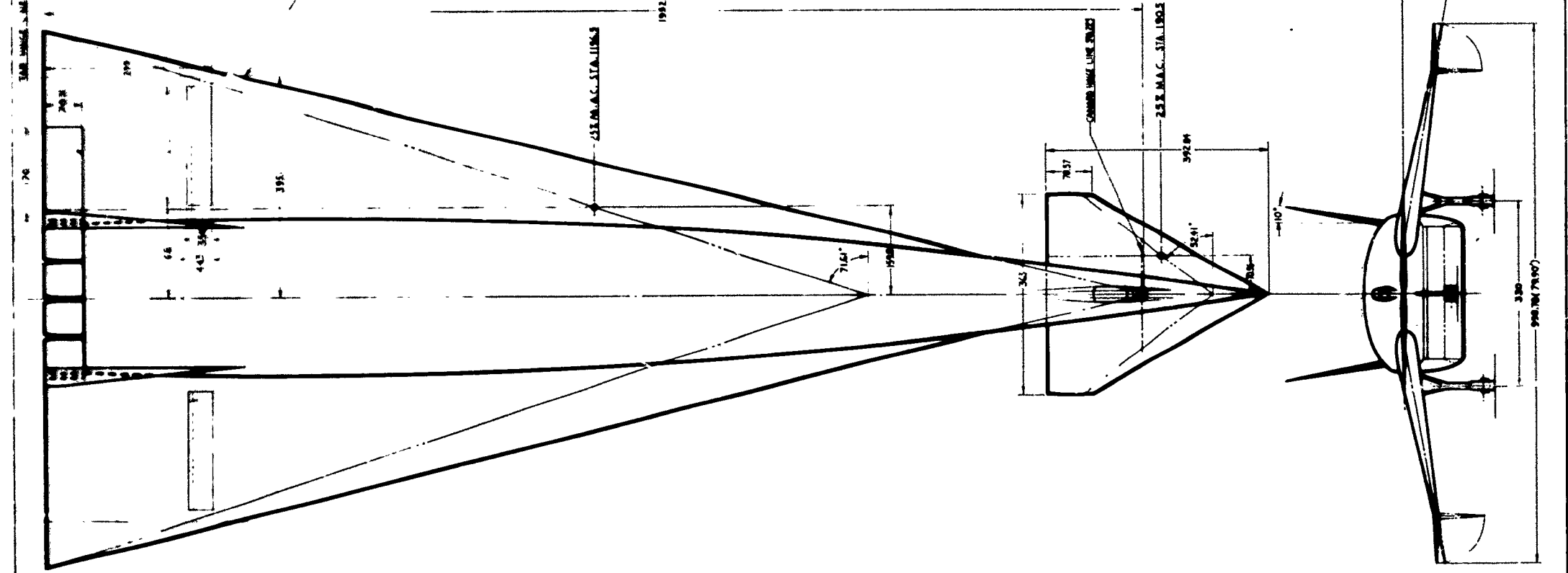


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Q-60	GENERAL ARRANGEMENT SYSTEM IIP PHASE II W -	Q-61
Q-62		Q-63
Q-64		Q-65
Q-66		Q-67
Q-68		Q-69
Q-70		Q-71
Q-72		Q-73
Q-74		Q-75
Q-76		Q-77
Q-78		Q-79
Q-80		Q-81
Q-82		Q-83
Q-84		Q-85
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Q-300		Q-301

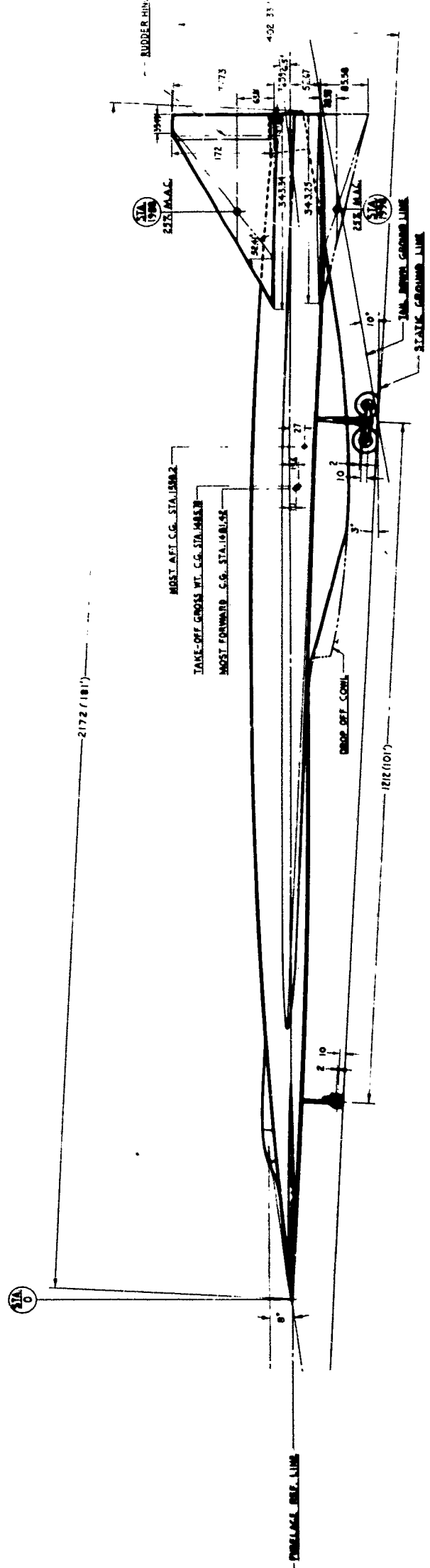
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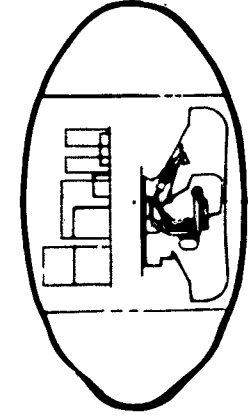


WING	
AREA (INCL. VENTRALS)	6600 SQ. FT.
ASPECT RATIO	0.9672
TAPER RATIO	0.0
SWEEPBACK (25% ELEMENT)	71.6°
AIRFOIL SECTION	NACA 66003 (NAA-MOD)
M.A.C. LENGTH	1301.6 IN.
SPOILER AREA	5323 SQ. FT. EA. DEFLECTION 60°
DEFLECTOR AREA	3223 SQ. FT. EA. DEFLECTION 60°
TRIM TAB AREA	83.0 SQ. FT. DEFLECTION 3.10°
CANARD SURFACE (EXPOSED)	
AREA	434.77 SQ. FT.
ASPECT RATIO	1.439
TAPER RATIO	0.232
SWEEPBACK (25% ELEMENT)	52.41°
AIRFOIL SECTION	NACA 66003 (NAA-MOD)
M.A.C. LENGTH	235.6 IN.
VERTICAL TAIL	
AREA	285 SQ. FT. EACH
ASPECT RATIO	0.996
TAPER RATIO	0.234
SWEEPBACK (25% ELEMENT)	52.41°
AIRFOIL SECTION	NACA 66003 (NAA-MOD)
M.A.C. LENGTH	231.1 IN.
RUDDER AREA	4525 SQ. FT. EACH
VENTRAL	
AREA	102 SQ. FT. EACH
ASPECT RATIO	0.439
TAPER RATIO	0.0
SWEEPBACK (25% ELEMENT)	71.61°
AIRFOIL SECTION	NACA 66003 (NAA-MOD)
M.A.C. LENGTH	228.83 IN.

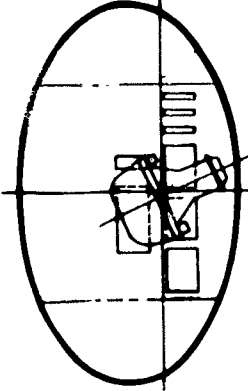
GENERAL DATA

MAIN ALIGHTING GEAR
46x14 TYPE XII TANDEM
AUXILIARY ALIGHTING GEAR
24x25 TYPE XII DUAL
ENGINE DESIGNATION
FOUR IO3.17 HYDROGEN AIR TURBO ROCKET
TAKE-OFF GROSS WEIGHT 206,800 LB.
USEFUL LOAD (BASIC MISSION) 63,958 LB.

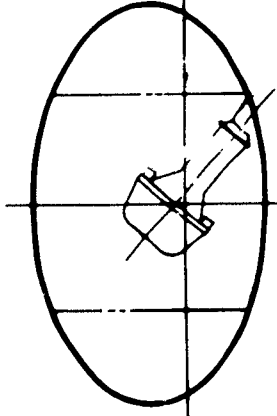




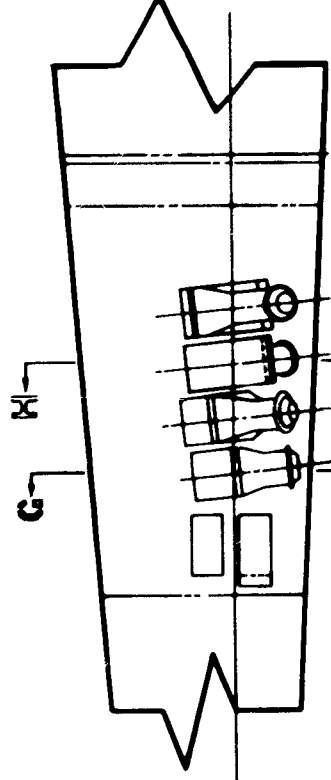
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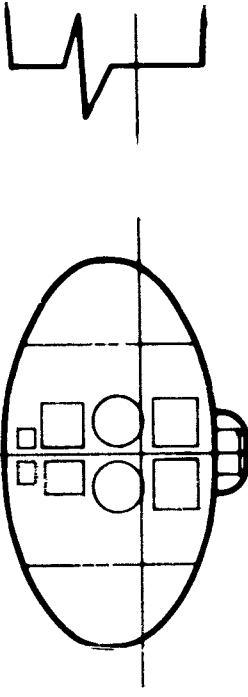
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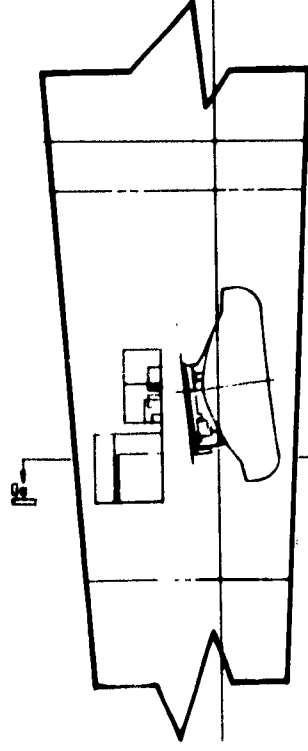
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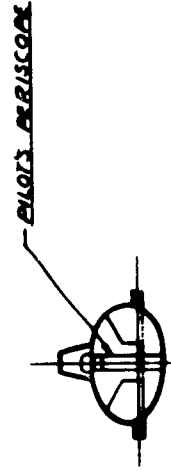
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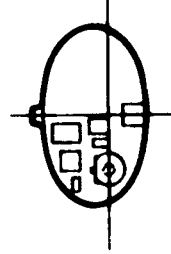
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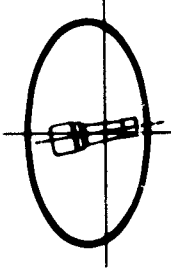
SCALE
AZIMUTH SCAN RADAR INSTAL.



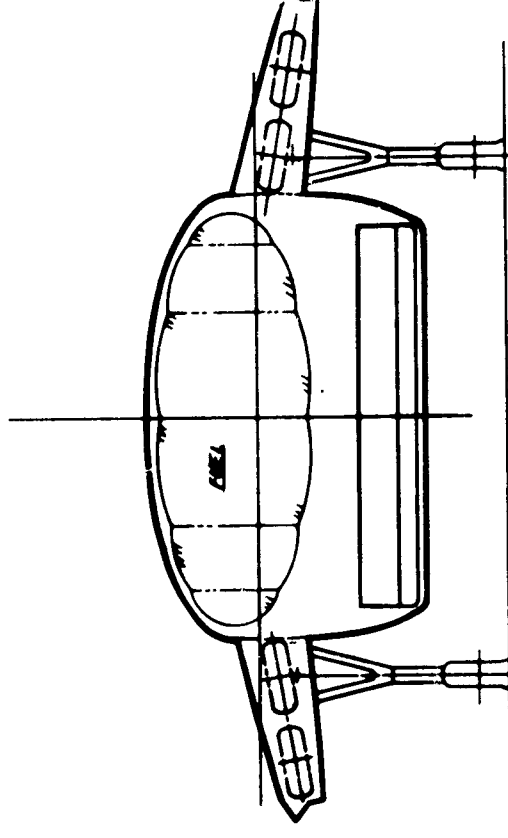
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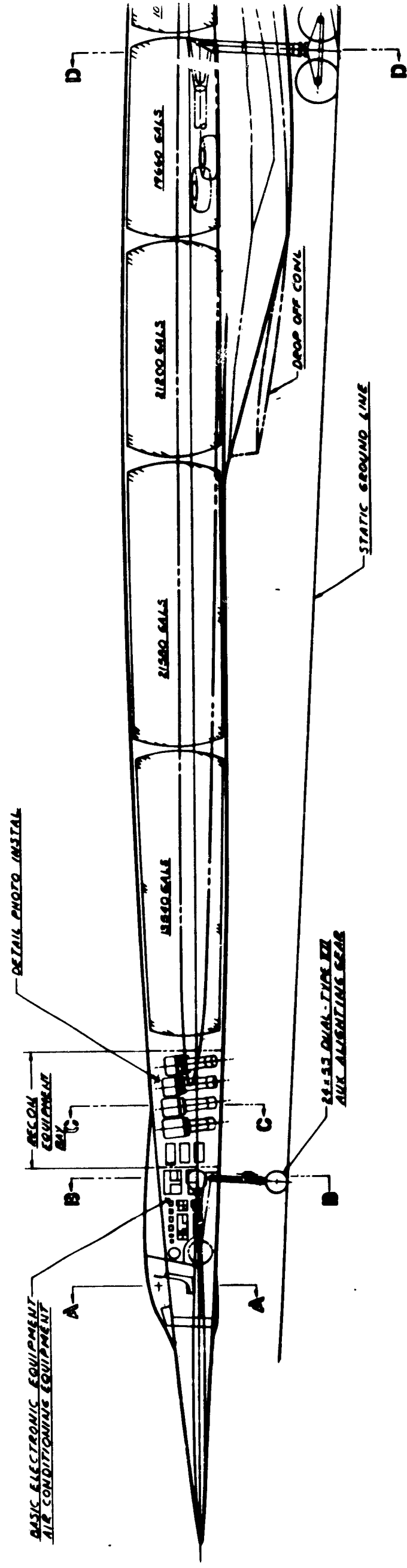
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SECTION C-C



SECTION D-D





EQUIPMENT LIST

BASIC ELECTRONICS (CARRIED ON ALL MISSIONS)

ARC-52 UNF COMM.
ARA-37 (XN-1) UNF Q/R
ANH-3 RECORDER
APX-19 A/G IFF (XN)
APX-27 A/G IFF (XN)
ART-27 CRASH LOCATOR
AUTOMATIC FLIGHT C
N9C AUTONAVIGATOR
STANDBY PLATFORM

RECON. EQUIPMENT

DETAIL PHOTO

SEARCH PHOTO

(2) 30" F.L. 9x9 FORMT CAMERAS
(2) 18" F.L. 9x18 FORMT CAMERAS

MAPPING RADAR

CONCURRENT DOPPLER

MAPPING RADAR

ARIMUTH SCAN RADAR

FERRET ELECTRONICS

OLD-2 P/F EQUIP.

OLD-1 O/F EQUIP
CN O/F EQUIP

END OF EQUIP.

TOTAL FUEL CAPACITY 100,000 GALS

INBOARD PROFILE-RECUM.
SYSTEM : 2P PHASE III

02051

PART II - DESCRIPTION**A. AIR-BORNE SYSTEMS****1. Airframe****a. Configuration**

- (1) Cooling and Ventilating System
- (2) Heating Systems
- (3) Anti-icing Systems
- (4) Electrical System
- (5) Hydraulic System
- (6) Structure
- (7) Weight Summary

b. Performance**c. Flight Controls**

- (1) Primary Control Mode
- (2) Automatic Control Mode
- (3) Alternate Control Mode

d. Structural Load Factors**e. Crew Provisions**

- (1) Environment
- (2) Visibility Requirements
- (3) Emergency Protection

2. Power Plant**a. Engine Installation****b. Air Induction System****c. Fuel System****3. Equipment****a. Navigation****b. Reconnaissance**

- (1) Radar
- (2) Ferret
- (3) Photographic
- (4) Weather Reconnaissance
- (5) Infrared Equipment

c. Communications

- (1) AN/ARC-52
- (2) AN/ARA-37
- (3) Attitude Reference
- (4) AN/APX-19 and AN/APX-27
- (5) AN/ART-27
- (6) AN/ANH-5

d. Aerial Refueling**B. GROUND SYSTEMS****1. Ground Servicing****2. Training Aids**

- a. Types of Training Aids
- b. Training Aids Support
- c. Time Phasing Schedule

PART II - DESCRIPTION

The Phase II-1/2 and Phase III airplanes were designed to fulfill the requirement for a special reconnaissance weapon for use in tactical and strategic reconnaissance operations. The operational availability date for the Phase II-1/2 airplane is 1961, and for the Phase III airplane 1963.

The Phase II-1/2 airplane is powered by four General Electric X278 turbojet engines using JP-5 fuel. All fuel is stored internally and totals 120,399 pounds. The airplane is operated by a crew of one and will cruise at an altitude of 75,000 feet at Mach 3.2, having a range of 3000 nautical miles.

The Phase III airplane is powered by four aero-jet turbo-rocket engines using liquid hydrogen fuel. All fuel is internally stored and totals 59,278 pounds. The airplane is operated by a crew of one and will cruise at an altitude of 100,000 feet at Mach 4.0, having a range of 3000 nautical miles.

A. AIR-BORNE SYSTEMS**1. Airframe****a. Configuration****(1) Cooling and Ventilating System****(a) Phase II-1/2**

Several cooling systems were investigated for the Phase II-1/2 Weapon System 118P. The integrated cooling arrangement which appears to be most favorable is basically a recirculating system, making use of the latent heat of vaporization of water as a heat sink via a water boiler heat exchanger. Make-up air for leakage is provided by a conventional air cycle system in which the air is cooled by performing work in a refrigeration turbine. A ram system is provided for emergency operation.

Both cabin and electronic equipment will be pressurized in order to provide adequate environmental conditions for pilot comfort and equipment operation. The make-up system bleeds air from the engine compressors. The air then goes through three successive reductions in temperature via a ram-air heat exchanger, a water boiler heat exchanger, and a turbine. The work from the turbine is absorbed by a compressor which recirculates air back to the upstream side of the ram-air heat exchanger, and provides hot air to mix with the cold air discharged from the turbine, in order to provide temperature control. The mixed air is then provided to equipment which requires air controlled to a narrow temperature band. Where there is appreciable difference in the temperature levels of these items, additional mixing valves may be used with individual temperature controls. This air may then be discharged either into the cabin or elsewhere in the main system. A by-pass and pressure-limiting valve are also provided to supply additional air to make up leakage, on the assumption that this will be needed.

Consideration may be given to an optional make-up system which would replace the water boiler and turbine arrangement by a single boiler, making use of an aqueous ammonia solution mixed in the right proportions to give the desired boiling temperature throughout the altitude range required. This would increase the dependability of the system, but would impose the additional hazard of handling the aqueous ammonia.

Items such as tires, electrical system flight control system, utility system, etc. are not adequately defined at this stage of the design to outline a complete cooling formulation although the following possibilities appear at this time to hold some promise:

Components associated with hydraulics and large bearings, such as servos, hydraulic actuators, and loaded mechanisms, may be cooled by oil as a carrier, making use of fuel as a heat sink to be shared with other oil systems such as engine oil, generator and constant-speed drive oil, etc. If the fuel cannot provide enough heat sink capacity for the various oil systems, an auxiliary water evaporative system may be provided to handle the excess heat.

Small parts such as electrical components other than the generator, flight control bearings and cranks, etc. may be cooled by a ram-air system with a water boiler heat exchanger for heat sink. All components to be cooled in this manner, however, will be limited to a few well-insulated compartments to prevent excessive penalty to the weapon System in terms of water weight.

The cooling of tires may be provided by a direct water spray, or ram-air system in which the air is cooled by direct evaporation.

(b) Phase III

The cooling system for Phase III is based on the latent and sensible heats of the liquid hydrogen engine fuel as a heat sink. Intermediate helium systems may be used to provide acceptable temperature levels at the heat sources, with heat exchangers to keep the fluids separated.

The fuel circuit is, in essence, a parallel system to the engine tail-pipe heat exchanger, and it is assumed here that provision will be available to tap the main fuel line between the final-stage pump and a fuel control so that a pressure margin will be available for circulation and control of the cooling circuits. If this margin is not available, then a boost pump will be provided as required.

The helium circuits are required in order to provide a cushion between the heat sources and the sink as direct contact with an X-35 fuel heat exchanger will freeze any of the carriers

normally used in aircraft fluid systems, including air. Also, the use of the fuel in heat-exchanger contact with other aircraft systems is considered dangerous from the standpoint of fire hazard. The helium systems will be closed-circuit sealed systems maintained at a pressure above the fuel circuit pressure by means of a helium storage bottle and pressure regulator.

The general breakdown shows three helium circuits. The oil cooling circuit provides a carrier for the heat from all the oil systems on the airplane. These systems may include engine oil, hydraulic oil, electrical generators, and constant-speed drives and/or auxiliary power units, or whatever source of power is made available to drive airframe accessories. Sources of heat within the systems will include heat of combustion, oil flow friction heat, and heat absorbed from the aerodynamically heated environment. A by-pass and a mixing valve are provided to maintain the helium-to-oil heat exchanger at a temperature above the congealing temperature of the oil.

One circuit provides a medium for cooling landing gear tires, small electrical components, and other items that cannot be cooled by other means. The air circuit associated with this system is an open circuit taking in ram air which is cooled in the helium-to-air heat exchanger, used as a coolant, and then dumped overboard.

The other circuit provides cooling for electronic and camera equipment, cabin, and ventilated suit. Mixers and by-pass lines are provided in the circuits to the pilot's ventilated suit and to items of equipment requiring close temperature control, in order to maintain the temperature within the required range. With the exception of the pilot's ventilated suit, this is a closed pressurized system. Engine compressor air will be brought in to make up for leakage and the ventilated suit air. The ventilated suit air is dumped because the moisture content would impose an unacceptable burden on the drying system employed to prevent frosting of the heat exchanger.

An emergency ram system is shown, with a provision for by-passing the heat exchanger during low-altitude operation where it is considered that frosting will make the heat exchanger unusable.

(2) Heating Systems

No special provisions will be made to heat the cabin. It is expected that ground operations will be supplemented by sufficient equipment to maintain the cabin at a comfortable level until take-off. At this point, the Phase II-1/2 system ventilated suit is provided with conditioned air which should be adequate for pilot comfort. On the Phase III system, it is considered that if heat is required in the short times after take-off and prior to landing, when aerodynamic heating is not significant, the cabin may be heated by a manually controlled bleed from the windshield anti-icing line.

(3) Anti-icing Systems

Anti-icing systems are provided for both the Phase II-1/2 and III systems. Due to the short time that the airplane will be exposed to icing conditions, deicing of the windshield and engine inlet duct lips only is considered to be the best design compromise.

The Phase II-1/2 system is a conventional system, making use of engine compressor bleed air as a source of heat and air out of the cooling system primary heat exchanger as a source of mixing air to keep the deicing air at a level compatible with the ability of the windshield to take the heat shock.

The design of an anti-icing system for Phase III is faced with two problems, one being the low compression ratio of the engine compressors, and the other being the fact that the product of combustion of the engine fuel is water. This requires that combustion gas not be mixed directly to provide the heat for deicing because of the possibility of build-up of ice downstream from the anti-iced area. Thus, air is bled from the engine compressor, through a heat exchanger, to a first-stage blower which increases the pressure to a level sufficient to anti-ice the engine scoop lips.

(4) Electrical System

The electrical system is planned to consist of a primary and an emergency ac power supply. Secondary dc power will be supplied to that equipment which, for various reasons, will require this type of input electrical energy.

The primary system will deliver 115-to 200-volt, 400-cycle, three-phase ac from automatically paralleled, engine-drive, constant-speed generators. The emergency system will deliver substantially the same type of power from a hydraulically driven, remotely mounted, controlled-speed generator.

The secondary 24- to 31-volt dc power will be obtained from static-type converters.

(5) Hydraulic System

The use of higher operating pressures in the weapon system to deliver maximum power at optimum weight involves the design and development of a 4000 psi, constant-pressure system capable of satisfactory operation in ambient environments up to 1200°F. The development of a 4000 psi system is now in progress at NAA and various suppliers for other aircraft projects.

(6) Structure**(a) Phase II-1/2**

The Phase II-1/2 Airplane is a high-performance, low-load-factor, and low-wing-loaded airplane. These factors lead to a thin skin structure of materials which are capable of high-temperature applications.

The wings are designed around three main requirements: torsional stiffness for flutter control, bending stiffness parallel with the aileron axis for aileron effectiveness, and strength requirements. The wing contains an inboard constant-chord aileron extending from the fuselage to 50-percent wing span. Fuel is carried in integral tanks in the inboard portion of the wing. The wing, for the inboard 50-percent of the span, is three-spar multi-rib construction, welded for fuel seal. The outboard 50-percent of the span is full-depth brazed honeycomb construction. The structure type was determined by studying a number of structure systems and using the lightest type. The material used is AM350 corrosion-resistant steel.

The canard surface is mounted at the forward extremity of the fuselage and forms the nose section of the fuselage. The canard is hinged to the fuselage. The canard is hinged to the fuselage from approximately the 50-percent spar in the canard. The actuator is tied to the centerline rib of the surface. The canard is full-depth brazed honeycomb construction of AM350 corrosion-resistant steel.

The two verticals are constructed in a similar manner to the wings, and of the same material.

The fuselage is of semimonocoque construction. The frames and longerons are fabricated of steel, and the fuselage is covered with titanium alloy. The structure is riveted together, and the sealing in the integral tank area is accomplished by the insulation. The fuselage skin for a large portion of the fuselage is minimum gage that is feasible to fabricate. The wing is attached to the fuselage at three main bulkhead-type frames. The duct ramps and the flat-sided portions of the duct are fabricated of brazed-steel honeycomb paneling. The main gear is mounted in the fuselage and retracts inboard.

(b) Phase III

The Phase III Airplane is a high-performance, low-load-factor, and low-wing-loaded airplane. These factors lead to a thin skin structure of materials which are capable of high-temperature applications.

The delta wing arrangement provides an extremely long chord and short span. The wing is divided into three main structural sections. The first section, from the landing gear forward, is constructed as part of the fuselage. The fuselage frames are extended on out into the wing contour and form the wing structure. The main section of the wing is constructed of a three-spar, multirib arrangement. Aft of the spoiler slot, the wing is one-spar multirib construction. The wing contains no integral fuel. The wing material is AM350 corrosion-resistant steel. Due to the high temperatures from aerodynamic heating, the leading edge assembly is constructed of Inconel "X."

The canard surface is mounted at the forward extremity of the fuselage and forms the nose section of the fuselage. The canard is hinged to the fuselage from approximately the 50-percent spar in the canard. The actuator is tied to the centerline rib of the surface. The canard is full-depth honeycomb construction of AM350 corrosion-resistant steel, except for the leading edge which is Inconel "X."

The two verticals are constructed in a similar manner to the wings, for the lower portion of the span, and full-depth honeycomb, as in the canard, for the upper portion of the span.

The fuselage is of semimonocoque construction. The frames and longerons are fabricated of steel, and the fuselage is covered with titanium alloy. The fuel cells are separate internal tanks. This is necessary due to the large temperature gradient from the fuselage skin at 750°F to the tank skin at -423°F (from the liquid hydrogen fuel). The internal tank is fabricated from 6061-T6 aluminum alloy welded construction and floats in the fuselage to allow for the temperature differences. The wing is attached to the fuselage at four main bulkhead-type frames. The duct ramps and the flat-sided portions of the duct are fabricated of brazed Inconel "X" honeycomb paneling.

The main landing gear is mounted to the front span of the main wing box and retracts forward into the wing.

GROUP WEIGHT STATEMENT

PHASE II-1/2

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NAME

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GROUP WEIGHT STATEMENT

WEIGHT EMPTY

PAGE

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1	WING GROUP					8927
2	CENTER SECTION - BASIC STRUCTURE					
3	INTERMEDIATE PANEL - BASIC STRUCTURE					
4	OUTER PANEL - BASIC STRUCTURE (INCL. TIPS LBS.)				7858	
5						
6	SECONDARY STRUCTURE (INCL. WINGFOLD MECHANISM LBS.)					
7	AILERONS (INCL. BALANCE WEIGHT LBS.)				1069	
8	FLAPS - TRAILING EDGE					
9	- LEADING EDGE					
10	SLATS					
11	SPOILERS					
12	SPEED BRAKES					
13						
14						
15	TAIL GROUP					1978
16	STABILIZER - BASIC STRUCTURE				753	
17	FINS - BASIC STRUCTURE (INCL. DORSAL LBS.)				1225	
18	SECONDARY STRUCTURE (STAB. & FINS)					
19	ELEVATOR (INCL. BALANCE WEIGHT LBS.)					
20	RUDDERS (INCL. BALANCE WEIGHT LBS.)					
21						
22						
23	BODY GROUP					20077
24	FUSELAGE OR HULL - BASIC STRUCTURE				17652	
25	BOOMS - BASIC STRUCTURE					
26	SECONDARY STRUCTURE - FUSELAGE OR HULL				950	
27	- BOOMS					
28	- SPEEDBRAKES					
29	- DOORS, PANELS & MISC.				1475	
30						
31	ALIGHTING GEAR GROUP - LAND (TYPE:)					6471
32						
33	LOCATION	WHEELS, BRAKES TIRES, TUBES, AIR	STRUCTURE	CONTROLS		
34	Main - Fuselage	2563	2408	550	5521	
35	Nose - Fuselage	122	478	350	950	
36						
37						
38						
39						
40	ALIGHTING GEAR GROUP - WATER					
41	LOCATION	FLOATS	STRUTS	CONTROLS		
42						
43						
44						
45						
46	SURFACE CONTROLS GROUP					1412
47	COCKPIT CONTROLS				22	
48	AUTOMATIC PILOT					
49	SYSTEM CONTROLS (INCL. POWER & FEEL CONTROLS LBS.)				1390	
50						
51	ENGINE SECTION OR NACELLE GROUP					553
52	INBOARD					
53	CENTER				553	
54	OUTBOARD					
55	DOORS, PANELS & MISC.					
56						
57	TOTAL (TO BE BROUGHT FORWARD)					39418

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GROUP WEIGHT STATEMENT
WEIGHT EMPTY

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1	PROPULSION GROUP			37217
2		AUXILIARY	MAIN	
3	ENGINE INSTALLATION		21940	
4	AFTERBURNERS (IF FURN. SEPARATELY)			
5	ACCESSORY GEAR BOXES & DRIVES		958	
6	SUPERCHARGERS (FOR TURBO TYPES)			
7	AIR INDUCTION SYSTEM		9273	
8	EXHAUST SYSTEM		327	
9	COOLING SYSTEM		28	
10	LUBRICATING SYSTEM			
11	TANKS			
12	COOLING INSTALLATION			
13	DUCTS, PLUMBING, ETC.			
14	FUEL SYSTEM		3929	
15	TANKS - PROTECTED			
16	- UNPROTECTED			
17	PLUMBING, ETC.		3929	
18	WATER INJECTION SYSTEM			
19	ENGINE CONTROLS		268	
20	STARTING SYSTEM		494	
21	PROPELLER INSTALLATION			
22				
23				
24	AUXILIARY POWER PLANT GROUP			
25	INSTRUMENTS & NAVIGATIONAL EQUIPMENT GROUP			489
26	HYDRAULIC & PNEUMATIC GROUP			1395
27				
28				
29	ELECTRICAL GROUP			682
30				
31				
32	ELECTRONICS GROUP			1438
33	EQUIPMENT		823	
34	INSTALLATION		615	
35				
36	ARMAMENT GROUP (INCL. GUNFIRE PROTECTION	LBS.)		
37	FURNISHINGS & EQUIPMENT GROUP			1140
38	ACCOMMODATIONS FOR PERSONNEL		324	
39	MISCELLANEOUS EQUIPMENT		51	
40	FURNISHINGS		300	
41	EMERGENCY EQUIPMENT		435	
42				
43	AIR CONDITIONING & ANTI-ICING EQUIPMENT GROUP			1744
44	AIR CONDITIONING		1650	
45	ANTI-ICING		94	
46				
47	PHOTOGRAPHIC GROUP			
48	AUXILIARY GEAR GROUP			141
49	HANDLING GEAR		141	
50	ARRESTING GEAR			
51	CATAPULTING GEAR			
52	ATO GEAR			
53				
54				
55	MANUFACTURING VARIATION			
56	TOTAL FROM PG. 2			39418
57	WEIGHT EMPTY			93664

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NAME

DATE 4 June 1956

GROUP WEIGHT STATEMENT
USEFUL LOAD & GROSS WEIGHT

PAGE

MODEL

REPORT

Sys 118P

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1	LOAD CONDITION	DESIGN GROSS WEIGHT	DETAIL PHOTO MISSION				
2			270				
3	CREW (NO.)						
4	PASSENGERS (NO.)						
5	FUEL	Type	Qals.				
6	UNUSABLE	L. B. S. F.	53.1	356			
7	INTERNAL	L. B. S. F.	17970	120399			
8							
9							
10	EXTERNAL						
11							
12	BOMB BAY						
13							
14	OIL						
15	TRAPPED	8 Gals.		60			
16	ENGINE	20 Gals.		150			
17							
18	FUEL TANKS (LOCATION)						
19	WATER INJECTION FLUID (GALS)						
20							
21	BAGGAGE						
22	CARGO						
23							
24	ARMAMENT						
25	GUNS (Location)	Fin. or Flex.	Qty.	Cal.			
26							
27							
28							
29							
30							
31							
32	AMMUNITION						
33							
34							
35							
36							
37							
38							
39	INSTALLATIONS (BOMB, TORPEDO, ROCKET, ETC.)						
40	BOMB OR TORPEDO RACKS						
41							
42	RECONNAISSANCE PACKAGE			1958			
43							
44							
45							
46	EQUIPMENT						
47	PYROTECHNICS						
48	PHOTOGRAPHIC						
49							
50	OXYGEN						
51							
52	MISCELLANEOUS						
53	WATER - EQUIPMENT COOLING			500			
54	LIQUID NITROGEN			443			
55	USEFUL LOAD			124138			
56	WEIGHT EMPTY			83664			
57	GROSS WEIGHT			207800			

*If not specified as weight empty.

Land Base Supersonic Fuel

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NAME

DATE 4 June 1958

GROUP WEIGHT STATEMENT
USEFUL LOAD & GROSS WEIGHT

PAGE

MODEL

Sys II8P

REPORT NA-56-454

1	LOAD CONDITION	ALTERNATE	AN/APQ-56	AZIMUTH RADAR	SEARCH PHOTO MISSION	FERRET MISSION
2						
3	CREW (NO.)		270	270	270	270
4	PASSENGERS (NO.)					
5	FUEL	Type Gals.				
6	UNUSABLE	L. B. S. F. 53.1	356	356	356	356
7	INTERNAL	L. B. S. F. 17970	120399	120399	120399	120399
8						
9						
10	EXTERNAL					
11						
12	BOMB BAY					
13						
14	OIL					
15	TRAPPED	8 Gals.	60	60	60	60
16	ENGINE	20 Gals.	150	150	150	150
17						
18	FUEL TANKS (LOCATION)					
19	WATER INJECTION FLUID (GALS)					
20						
21	BAGGAGE					
22	CARGO					
23						
24	ARMAMENT					
25	GUNS (Location)	Fix. or Flex. Qty. Cal.				
26						
27						
28						
29						
30						
31						
32	AMMUNITION					
33						
34						
35						
36						
37						
38						
39	INSTALLATIONS (BOMB, TORPEDO, ROCKET, ETC.)					
40	BOMB OR TORPEDO RACKS					
41						
42	RECONNAISSANCE PACKAGE		1952	1746	1638	1854
43						
44						
45						
46	EQUIPMENT					
47	PYROTECHNICS					
48	PHOTOGRAPHIC					
49						
50	OXYGEN					
51						
52	MISCELLANEOUS					
53	WATER - EQUIPMENT COOLING		500	500	500	500
54	LIQUID NITROGEN		443	443	443	443
55	USEFUL LOAD		124130	123924	123816	124032
56	WEIGHT EMPTY		83864	83864	83864	83864
57	GROSS WEIGHT		207794	207588	207480	207696

*If not specified as weight empty.
Land Base Supersonic Fuel

SECRET

NA-

GROUP WEIGHT STATEMENT

PHASE III

SECRET

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GROUP WEIGHT STATEMENT
WEIGHT EMPTY

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1	WING GROUP					24343
2	CENTER SECTION - BASIC STRUCTURE					
3	INTERMEDIATE PANEL - BASIC STRUCTURE					
4	OUTER PANEL - BASIC STRUCTURE ~~XXXXXXXXXXXX~~				21733	
5						
6	SECONDARY STRUCTURE (INCL. WINGFOLD MECHANISM LBS.)					
7	AILERONS (INCL. BALANCE WEIGHT LBS.)					
8	FLAPS - TRAILING EDGE					
9	- LEADING EDGE					
10	SLATS					
11	SPOILERS				1710	
12	SPEED BRAKES					
13	TIP-FOLDING WING				850	
14	TAB-TRIM (L. H. WING ONLY)				250	
15	TAIL GROUP					3040
16	STABILIZER - BASIC STRUCTURE (CANARD)				1400	
17	FINS - BASIC STRUCTURE (INCL. DORSAL LBS.) (2)				1640	
18	SECONDARY STRUCTURE (STAB. & FINS)					
19	ELEVATOR (INCL. BALANCE WEIGHT LBS.)					
20	RUDDERS (INCL. BALANCE WEIGHT LBS.)					
21						
22						
23	BODY GROUP					29876
24	FUSELAGE OR HULL - BASIC STRUCTURE					
25	BOOMS - BASIC STRUCTURE					
26	SECONDARY STRUCTURE - FUSELAGE OR HULL					
27	- BOOMS					
28	- SPEEDBRAKES					
29	- DOORS, PANELS & MISC.					
30						
31	ALIGHTING GEAR GROUP - LAND (TYPE: TRICYCLE)					11806
32						
33	LOCATION	WHEELS, BRAKES TIRES, TUBES, AIR	STRUCTURE	CONTROLS		
34	Main - Wing	2147	8044	825	11016	
35	Nose - Fuselage	90	400	300	790	
36						
37						
38						
39						
40	ALIGHTING GEAR GROUP - WATER					
41	LOCATION	FLOATS	STRUTS	CONTROLS		
42						
43						
44						
45						
46	SURFACE CONTROLS GROUP					4996
47	COCKPIT CONTROLS				22	
48	AUTOMATIC PILOT					
49	SYSTEM CONTROLS (INCL. POWER & FEEL CONTROLS 1373 LBS.)				4974	
50						
51	ENGINE SECTION ~~XXXXXXXXXXXX~~					306
52	INBOARD					
53	CENTER				306	
54	OUTBOARD					
55	DOORS, PANELS & MISC.					
56						
57	TOTAL (TO BE BROUGHT FORWARD)					74367

GROUP WEIGHT STATEMENT
WEIGHT EMPTY

1	PROPULSION GROUP				56025
2		AUXILIARY		MAIN	
3	ENGINE INSTALLATION			15660	
4	AFTERBURNERS (IF FURN. SEPARATELY)				
5	ACCESSORY GEAR BOXES & DRIVES			1010	
6	SUPERCHARGERS (FOR TURBO TYPES)				
7	AIR INDUCTION SYSTEM			25680	
8	EXHAUST SYSTEM - SHROUD			340	
9	COOLING SYSTEM & DRAIN PROV.			280	
10	LUBRICATING SYSTEM (INTEGRAL IN ENGINE)			-	
11	TANKS				
12	COOLING INSTALLATION				
13	DUCTS, PLUMBING, ETC.				
14	FUEL SYSTEM			12755	
15	TANKS - PROTECTED				
16	- UNPROTECTED		6860		
17	PLUMBING, ETC.		5895		
18	WATER INJECTION SYSTEM				
19	ENGINE CONTROLS			300	
20	STARTING SYSTEM (INTEGRAL IN ENGINE)			-	
21	PROPELLER INSTALLATION				
22					
23					
24	AUXILIARY POWER PLANT GROUP				
25	INSTRUMENTS & ~~CONTROLS~~ ~~GROUP~~				564
26	HYDRAULIC & PNEUMATIC GROUP				5090
27					
28					
29	ELECTRICAL GROUP				815
30					
31					
32	ELECTRONICS GROUP				1438
33	EQUIPMENT			823	
34	INSTALLATION			615	
35					
36	ARMAMENT GROUP (INCL. GUNFIRE PROTECTION	LBS.)			
37	FURNISHINGS & EQUIPMENT GROUP				1241
38	ACCOMMODATIONS FOR PERSONNEL			324	
39	MISCELLANEOUS EQUIPMENT			52	
40	FURNISHINGS			400	
41	EMERGENCY EQUIPMENT			465	
42					
43	AIR CONDITIONING & ANTI-ICING EQUIPMENT GROUP				3092
44	AIR CONDITIONING			2880	
45	ANTI-ICING			212	
46					
47	PHOTOGRAPHIC GROUP				
48	AUXILIARY GEAR GROUP				210
49	HANDLING GEAR			210	
50	ARRESTING GEAR				
51	CATAPULTING GEAR				
52	ATO GEAR				
53					
54					
55	MANUFACTURING VARIATION				
56	TOTAL FROM PG. 2				74367
57	WEIGHT EMPTY				142842

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GROUP WEIGHT STATEMENT
USEFUL LOAD & GROSS WEIGHT

PAGE _____

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1	LOAD CONDITION	DESIGN GROSS WEIGHT	DESIGN PHOTO MISSION			
2			270			
3	CREW (NO.)					
4	PASSENGERS (NO.)					
5	FUEL	Type	Gals.			
6	UNUSABLE	LIQUID H ₂	320	187		
7	INTERNAL	LIQUID H ₂	101330	59278		
8						
9						
10	EXTERNAL					
11						
12	BOMB BAY					
13						
14	OIL					
15	TRAPPED	8 Gals.		60		
16	ENGINE	12 Gals.		90		
17						
18	FUEL TANKS (LOCATION)					
19	WATER INJECTION FLUID (GALS)					
20						
21	BAGGAGE					
22	CARGO					
23						
24	ARMAMENT					
25	GUNS (Location)	Fix. or Flex.	Qty.	Cal.		
26						
27						
28						
29						
30						
31						
32	AMMUNITION					
33						
34						
35						
36						
37						
38						
39	INSTALLATIONS (BOMB, TORPEDO, ROCKET, ETC.)					
40	BOMB OR TORPEDO RACKS					
41						
42						
43						
44						
45						
46	EQUIPMENT					
47	PYROTECHNICS					
48	PHOTOGRAPHIC					
49	RECONN. PACKAGE, DEE PHOTO MIS.			1958		
50	OXYGEN					
51						
52	MISCELLANEOUS					
53	DROP-OFF COWL			2115		
54						
55	USEFUL LOAD			63958		
56	WEIGHT EMPTY			142842		
57	GROSS WEIGHT			206800		

*If not specified as weight empty.

GROUP WEIGHT STATEMENT
USEFUL LOAD & GROSS WEIGHT

RADAR MAPPING MIS.

1	LOAD CONDITION	ALTERNATE	DOPPLER	AZIMUTH	SEARCH	FERRET
2			RADAR	RADAR	MISSION	MISSION
3	CREW (NO.)		270	270	270	270
4	PASSENGERS (NO.)					
5	FUEL	Type Gals.				
6	UNUSABLE	LIQUID H ₂ 320	187	187	187	187
7	INTERNAL	LIQUID H ₂ 101330	59278	59278	59278	59278
8						
9						
10	EXTERNAL					
11						
12	BOMB BAY					
13						
14	OIL					
15	TRAPPED	8 Gals.	60	60	60	60
16	ENGINE	20 Gals.	90	90	90	90
17						
18	FUEL TANKS (LOCATION)					
19	WATER INJECTION FLUID (GALS)					
20						
21	BAGGAGE					
22	CARGO					
23						
24	ARMAMENT					
25	GUNS (Location)	Fin. or Flex. Qty. Cal.				
26						
27						
28						
29						
30						
31						
32	AMMUNITION					
33						
34						
35						
36						
37						
38						
39	INSTALLATIONS (BOMB, TORPEDO, ROCKET, ETC.)					
*40	BOMB OR TORPEDO RACKS					
41						
42	RECONNAISSANCE PACKAGE		1952	1746	1638	1854
43						
44						
45						
46	EQUIPMENT					
47	PYROTECHNICS					
48	PHOTOGRAPHIC					
49						
*50	OXYGEN					
51						
52	MISCELLANEOUS					
53	DROP-OFF COWL		2115	2115	2115	2115
54						
55	USEFUL LOAD		63952	63746	63638	63854
56	WEIGHT EMPTY		142842	142842	142842	142842
57	GROSS WEIGHT		206794	206588	206480	206696

*If not specified as weight empty.

b. PERFORMANCE

PHASE II-1/2

POWER PLANT

No. & Model . (4) X275A 135% Size
Mfr General Electric
Engine Spec No. R56AQT 120, R56AQT 16
Type Axial
Length 210.8"
Diameter 48.8"
Weight (dry) 5480 lb
Tail Pipe Mech, Dual Area
Augmentation Afterburner

ENGINE RATINGS

S.L. Static - lb - RPM
Max reheat: *28,540 - 7283
Partial reheat: *24,826 - 7283
Mil: **21,128 - 7283
Nor: 19,710 - 7195

*With afterburner operating
** Maximum non-reheat

DIMENSIONS

Wing Span 64.9'
Incidence (root) 0°
Incidence (tip) 0°
Dihedral -5°
Sweepback (25% chord) 52.4°
Length 120.9'
Height 23.5'
Tread 17.3'

Mission and Description

Navy Designation: None

Mfr's Model: None
The primary mission of this aircraft is the high altitude reconnaissance of hostile ground installations.

Special features of this airplane are a mechanically controlled convergent-divergent nozzle, interchangeable reconnaissance equipment packages, a canard configuration, and airframe construction of steel and titanium.

The crew of one consists of the pilot.

The pilot is provided with automatic flight control and navigation systems.

Development

Design initiated. Oct 55

WEIGHTS

Loading	Lb	L.F.
Empty	83,664 (E)	
Basic	86,038 (F)	
Design	207,800 . .	1.6
Combat	*133,733 . .	1.6
Max T.O.	+207,800 . .	1.6
Max in Flt	+207,800 . .	1.6
Max Land.	+207,800 . .	1.6

(E) Estimated
* For Design Mission
+ Limited by Mission
++ By Refueling

FUEL

Location . .	No. Tanks . .	Gal
Fuselage	8	14,870
Wing	2	3,100
Total		17,970

Grade Land based
Specification supersonic fuel
Specification Unclassified

OIL

Fuselage 4 20
Specification Unclassified

ELECTRONICS

UNF Command	ARC-52
UNF D/F	ARA-37 (XN-1)
Recorder	ARM-5
A/G IFF (XP)	APT-19
A/A IFF (XP)	APT-27
Crash Locator Beacon	ART-27
Autonavigator	NSC
Standby Platform	
Auto Flt Control System	

PACKAGES

No.	Type
1 .	Search Photo System .
1 .	Detail Photo System .
1 .	Mapping Radar APQ-56
1 .	Ferret System
1 .	Azimuth Radar

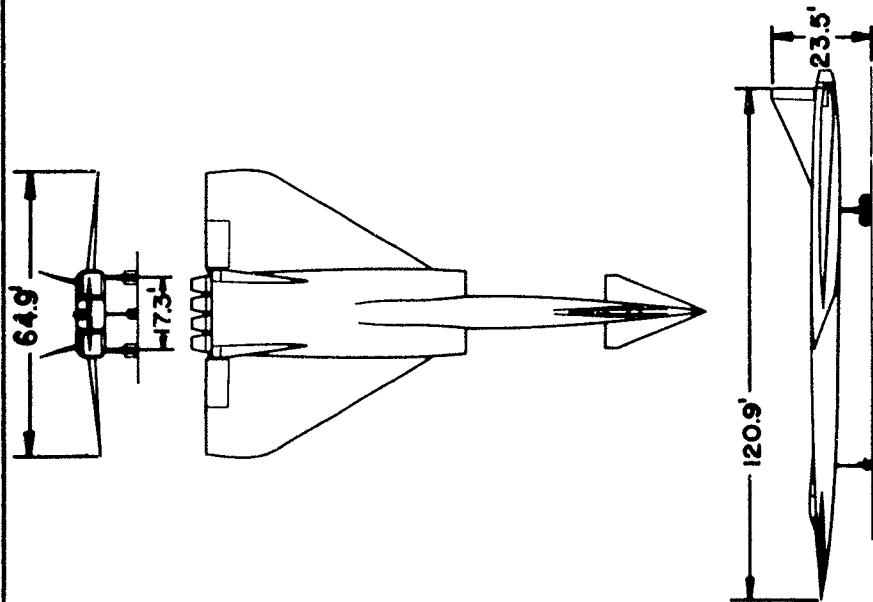
BOMBS**GUNS****ROCKETS**

NOT APPLICABLE

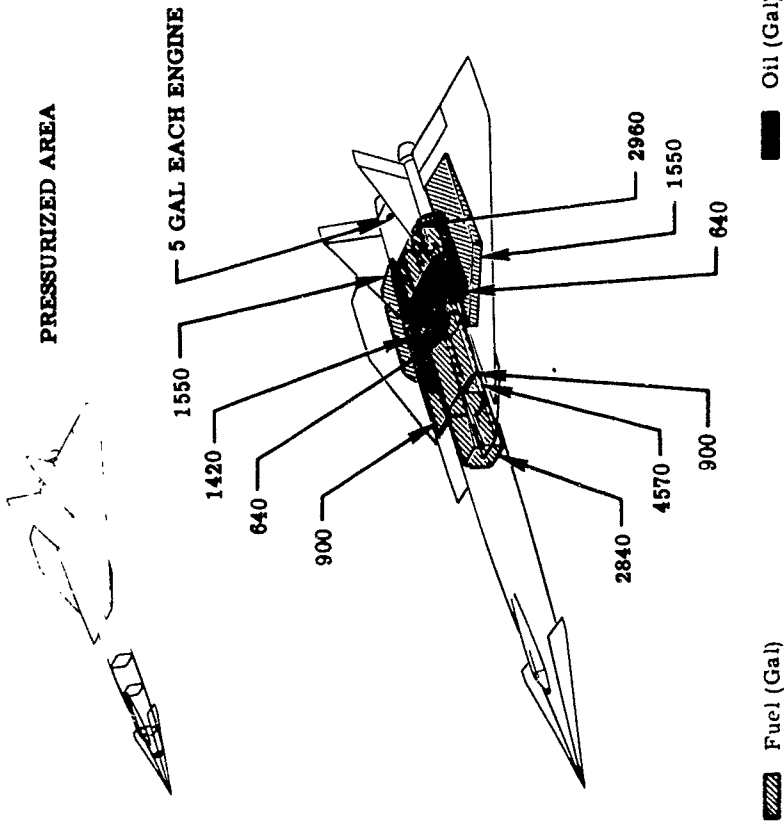
4 JUNE 1956

SECRET

SYSTEM NO. 118P



Wing Area 2757 sq ft
Aspect Ratio 1.53
Wing Section . NACA 66003 (Mod)
M.A.C. 583.03 in

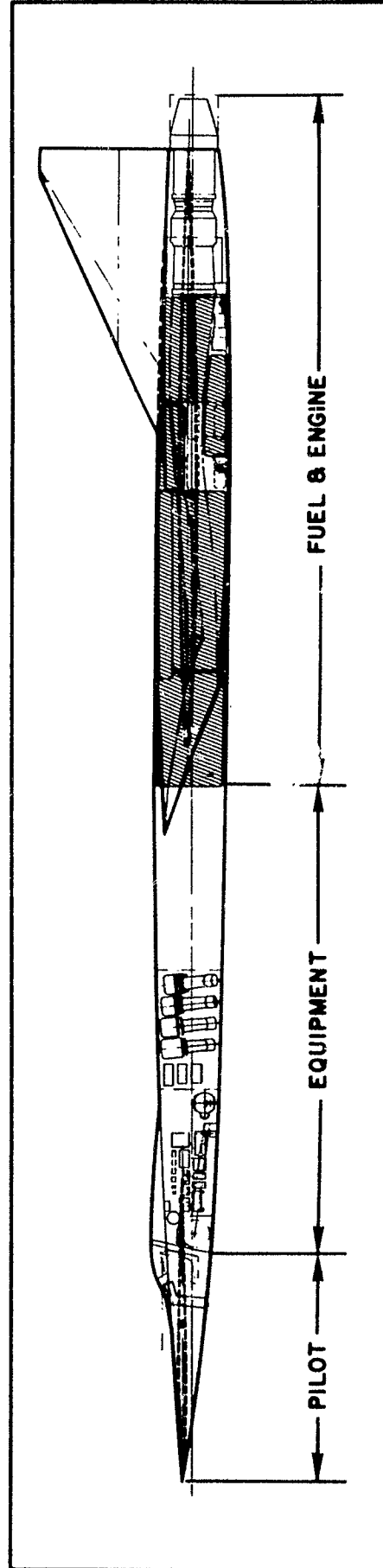


PRESSURIZED AREA

5 GAL EACH ENGINE

Fuel (Gal)

Oil (Gal)



Loading and Performance — Typical Mission

C O N D I T I O N S		DESIGN MISSION I	DESIGN FERRY MISSION II
TAKE-OFF WEIGHT Fuel at 6.7 lb/gal (grade unclassified) Payload (ammunition) Payload (bombs) Wing loading Stall speed (power off) Take-off ground run at SL Take-off to clear 50 ft Rate of climb at SL Time: SL to 20,000 ft Time: SL to 30,000 ft Service ceiling (100 fpm)		207,800 120,399 none none 75.4 178.5 3400 5150 6850 3.4 5.7 40,000	207,800 120,399 none none 75.4 178.5 3400 5150 6850 3.4 5.7 40,000
COMBAT RANGE (n mi)		3032	3032
COMBAT RADIUS Average speed Initial cruising altitude Total mission time		1835 75,000 2.07	1835 75,000 2.07
MISSION WEIGHT Mission altitude Mission speed Mission climb Mission ceiling (500 fpm) Service ceiling (100 fpm) Max rate of climb at SL Basic speed at 35,000 ft Max speed at optimum altitude		133,733 75,000 1835 15,000 83,000 47,900 19,700 1200 1835/83,500	99,441 79,000 1835 18,000 88,150 52,500 21,800 1200 1835/83,500
LANDING WEIGHT Ground roll at SL Total from 50 ft		99,441 4630 6690	99,441 4630 6690

PERFORMANCE BASIS:
 (a) Data source: Estimated.
 (b) Performance is based on powers shown on page 6.
 (c) Fuel flow data used in computing RADIUS and RANGE are increased 5%.

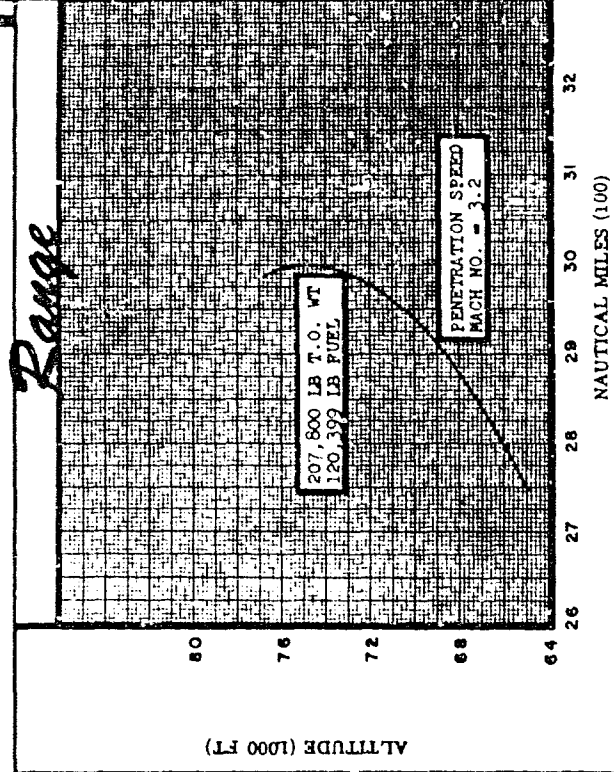
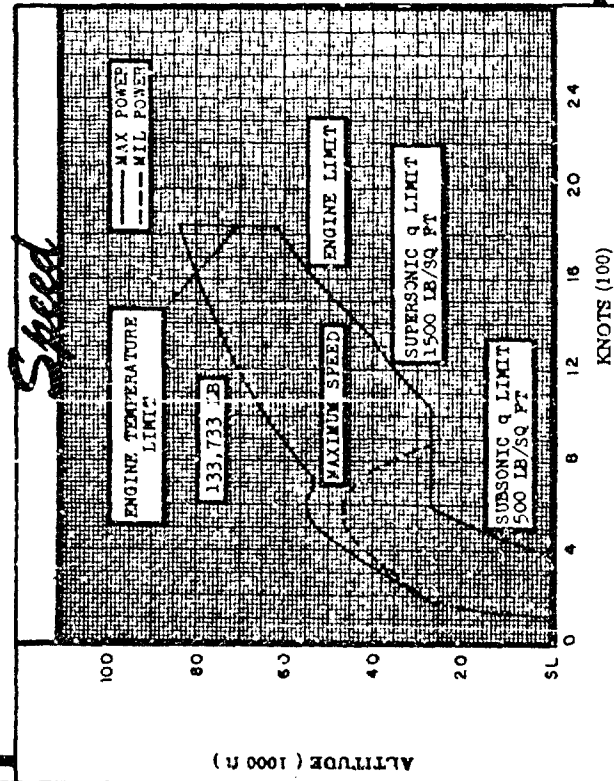
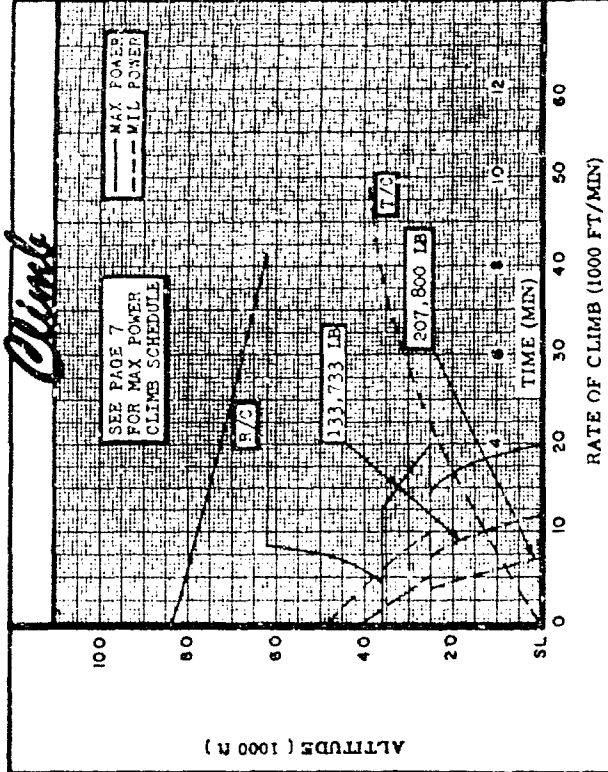
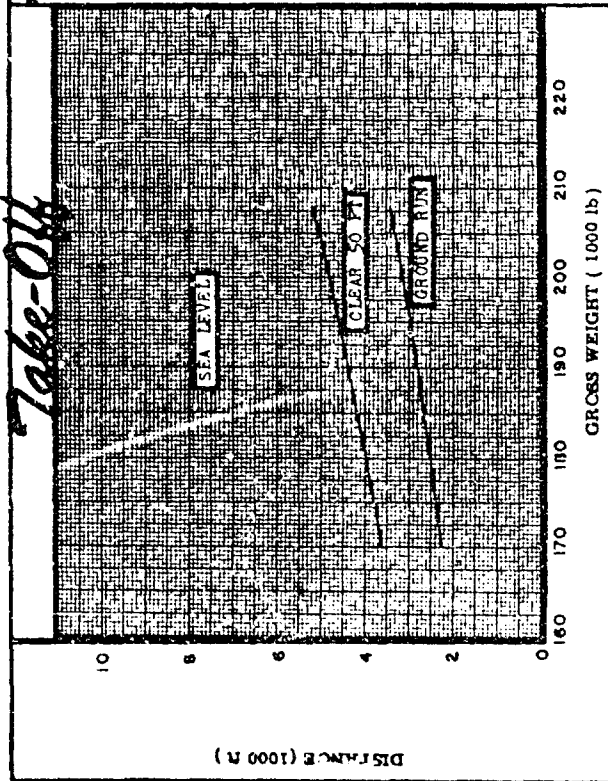
⑤ Mission weight denotes combat weight and is arbitrarily the weight at a point 1500 n.mi. from base.
 ⑥ See note "b" page 6

① Maximum power
 ② Military (max non-reheat) power
 ③ Allows for weight reduction during ground operation and climb
 ④ Detailed descriptions of RANGE missions given on page 6

NA-56-454

SECRET

PROPOSAL



4 JUNE 1953

SECRET

SYSTEM NO. 118P

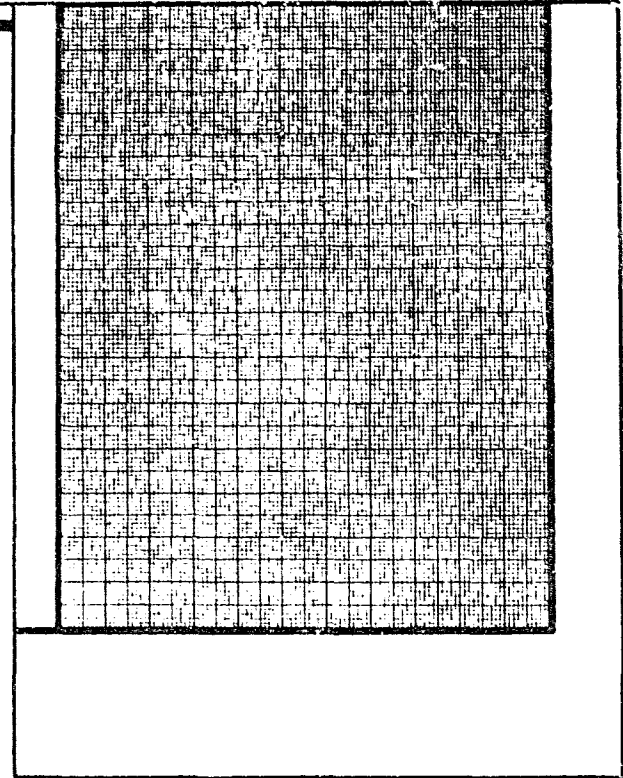
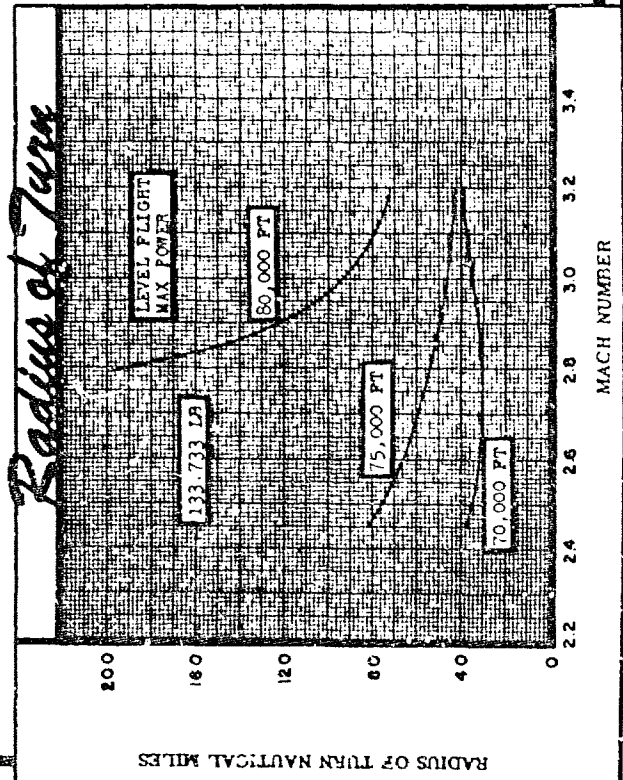
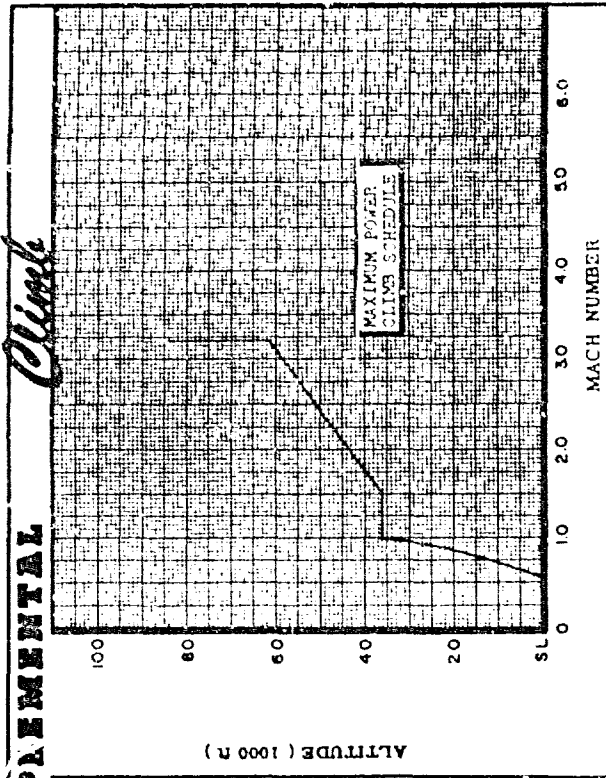
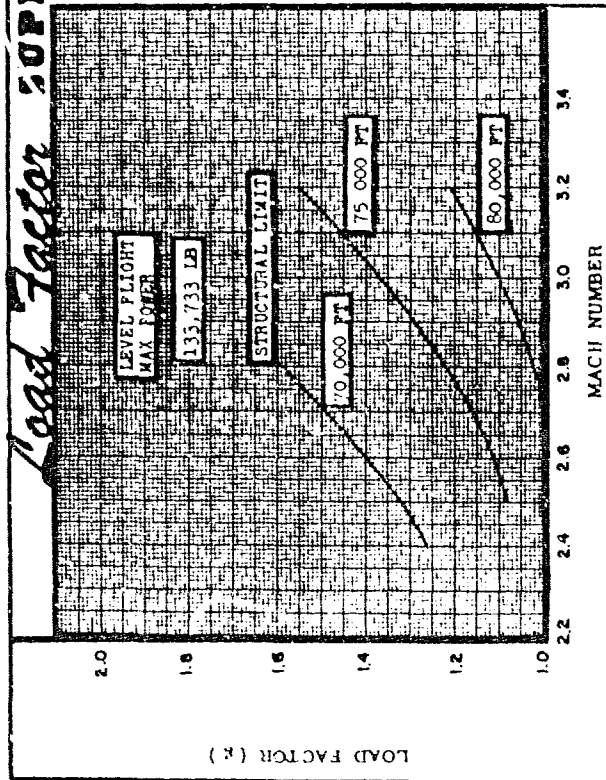
NA-56-454

PROPOSAL

SECRET

Load Factor Supplemental

Circle



Radius of Turn

NA-56-434

SYSTEM NO. 118P

SECRET

4 JUNE 1956

NOTES

FORMULA: RANGE MISSION I

Take-off and accelerate to climb speed with maximum power, climb on course to the isothermal level with military (maximum non-reheat) power, accelerate and climb to cruise altitude with maximum power, cruise out at penetration speed, cruise to maximum penetration, complete mission, cruise to base at penetration speed. Range free allowances include 5 minutes of normal power at sea level for starting engines and take-off and a reserve of 10% of initial fuel.

FORMULA: RANGE MISSION II

Take-off and accelerate to best climb speed with maximum power, climb on course to the isothermal level with military (maximum non-reheat) power, accelerate and climb to best cruise altitude with maximum power, cruise out at long range speed. Range free allowances include 5 minutes of normal power at sea level for starting engines and take-off and a reserve of 10% of initial fuel.

GENERAL DATA

(a) Engine ratings shown on page 3 are guaranteed values. Installed values used in performance calculations are as follows:

(4) X275A 135% Size			
S.L. STATIC	IS		RPM
Max:	*22,500		7283
Min:	**17,000		7283
Nor:	15,800		7195
	* With afterburner operating		
	** Maximum non-reheat		

(b) Stall speed limited by 13° tail down ground angle in presence of ground.

PERFORMANCE BASIS:

Performance data are based on North American Report No. NA-56-566, dated 31 May 1956, "Aerodynamic Characteristics System 118p - Phase II 1/2".

REVISION BASIS:

Initial issue.

b. PERFORMANCE

PHASE III

POWER PLANT

No. & Model (4) ATR-2040, 103.1% Size
 Mfr Aero Jet General
 Engine Spec No. No. 1090
 Type Axial
 Length 197"
 Diameter 68"
 Weight (dry) 3940 lb
 Tail Pipe Mech, Dual Area
 Augmentation None

ENGINE RATINGS

S.L. Static	Lb	Min
Max:	27,425	Limited
Max cont:	17,320	Cont

Mission and Description

Navy Designation: None
 Mfr's Model: None
 The primary mission of this aircraft is the high altitude reconnaissance of hostile ground installations.

Special features of this airplane are hydrogen fueled air turbo rocket engines, interchangeable reconnaissance equipment packages, a canard configuration, folding wing tips for supersonic flight, a blow-off cowl and airframe construction of steel and titanium.

The crew of one consists of the pilot.

The pilot is provided with automatic flight control and navigation systems.

Development

Design initiated. Oct 55

WEIGHTS

Loading	Lb	L.F.
Empty	142,842 (E)	
Basic	147,162 (E)	
Design	206,800	1.6
Combat	+164,585	1.6
Max T.O.	+206,800	1.6
Max in flt	+206,800	1.6
Max Landing	+206,800	1.6

(E) Estimated
 * For Design Mission
 + Limited by Mission

FUEL

Location	No. Tanks	Gal
Fuselage	7	101,330
Total		101,330
Grade		Liquid Para Hydrogen
Specification		Unclassified

OIL

Fuselage	4	Unclassified
Specification		Unclassified

DIMENSIONS

Wing Span	79.9'
Folding Tips Down	65.9'
Incidence (root)	0°
(tip)	0°
Dihedral	-10°
Sweepback (25% chord)	71.6°
Length	180.9'
Height	33.3'
Tread	27.5'

BOMBS**GUNS****ROCKETS**

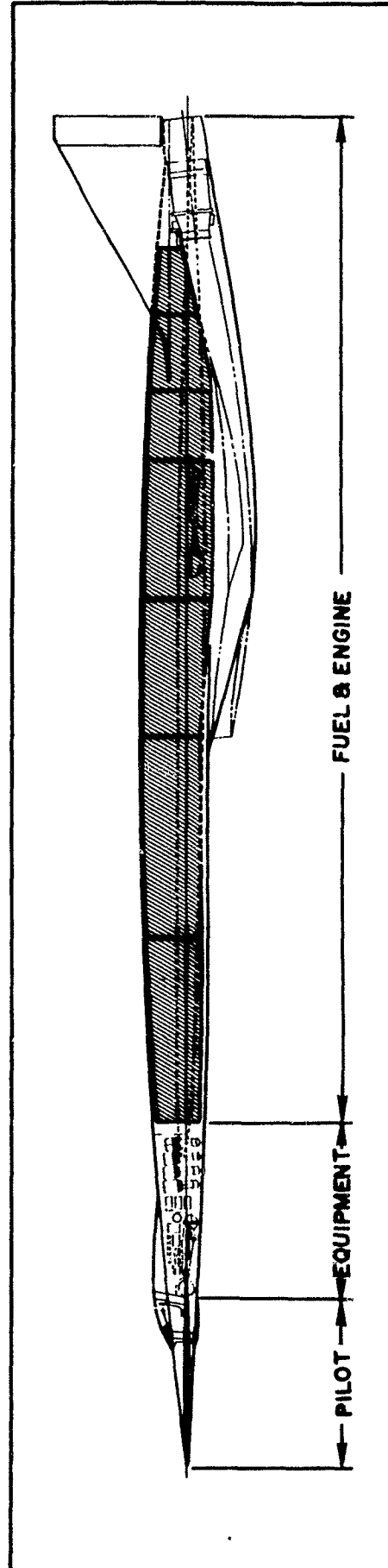
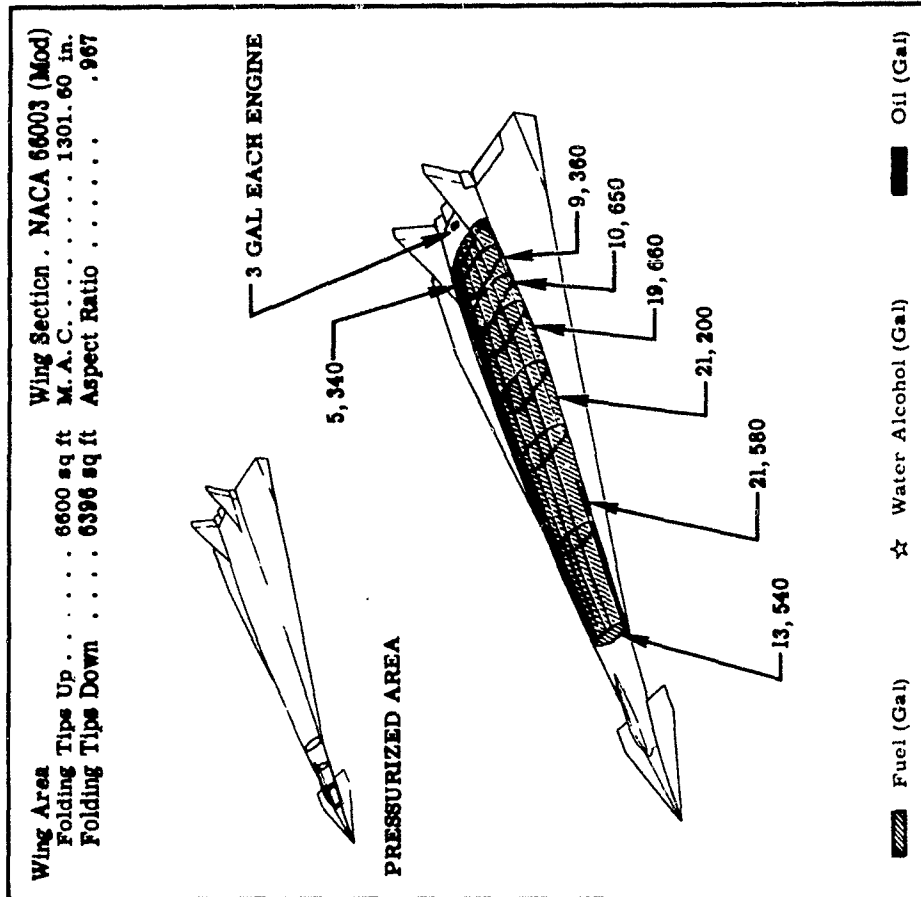
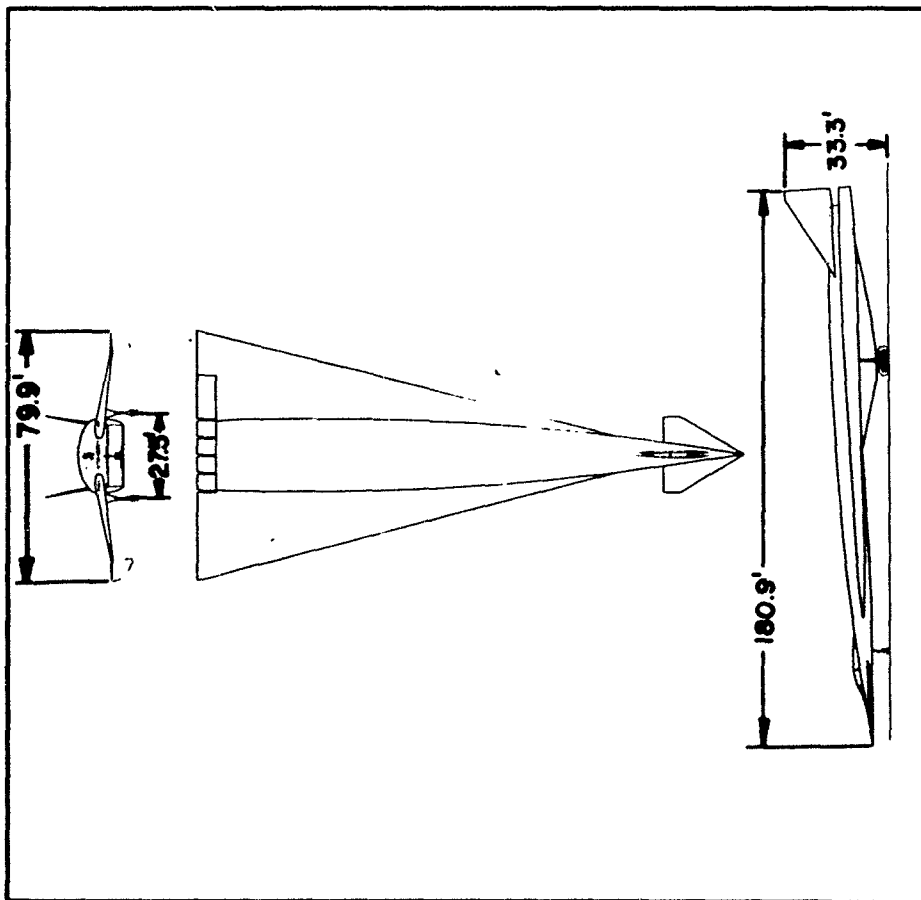
NOT APPLICABLE

PACKAGES

No.	Type
1 .	Search Photo System .
1 .	Detail Photo System .
1 .	Mapping Radar APQ-56
1 .	Ferret System
1 .	Azimuth Radar

ELECTRONICS

UHF Command	ARC-52
UHF D/F	ARA-37 (XN-1)
Recorder	ANH-5
A/G IFF (XP)	APX-19
A/A IFF (XP)	APX-27
Crash Locator Beacon	ART-27
Autonavigator	N5C
Standby Platform	
Auto Flt Control System	



NA-56-454

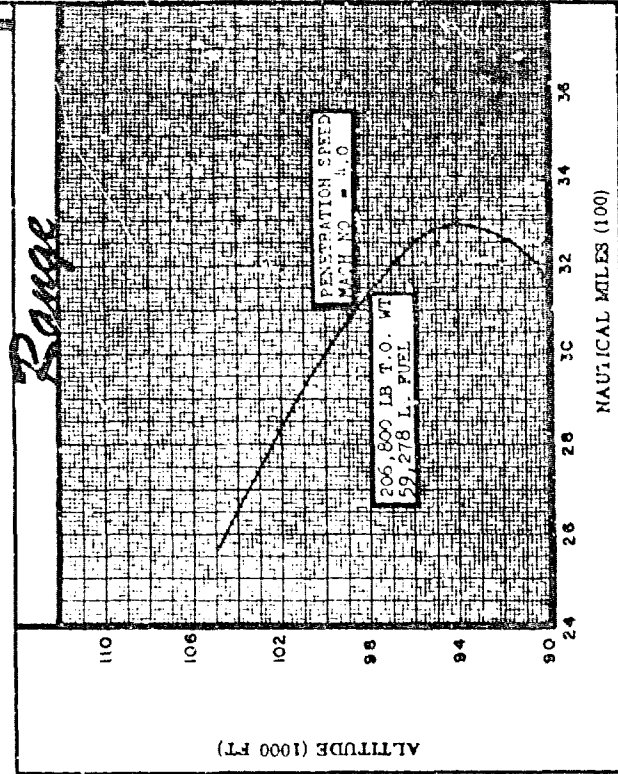
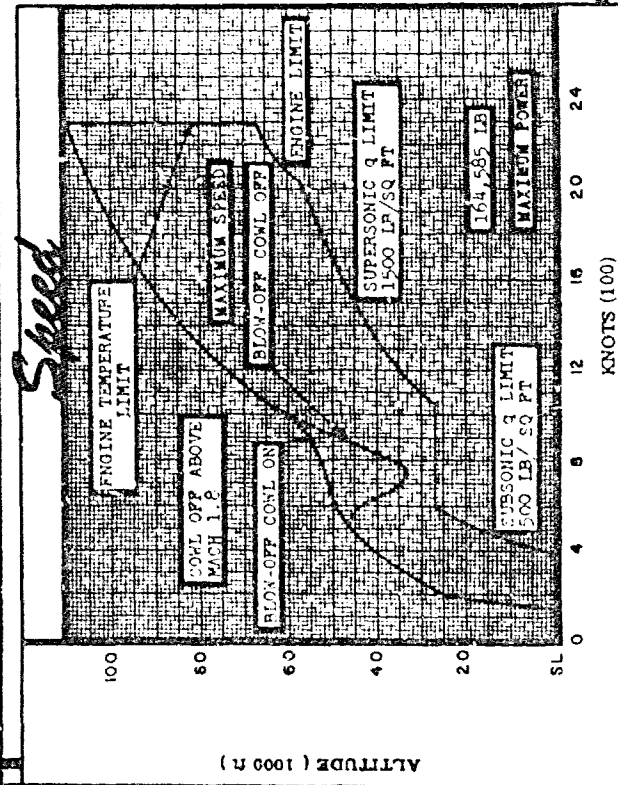
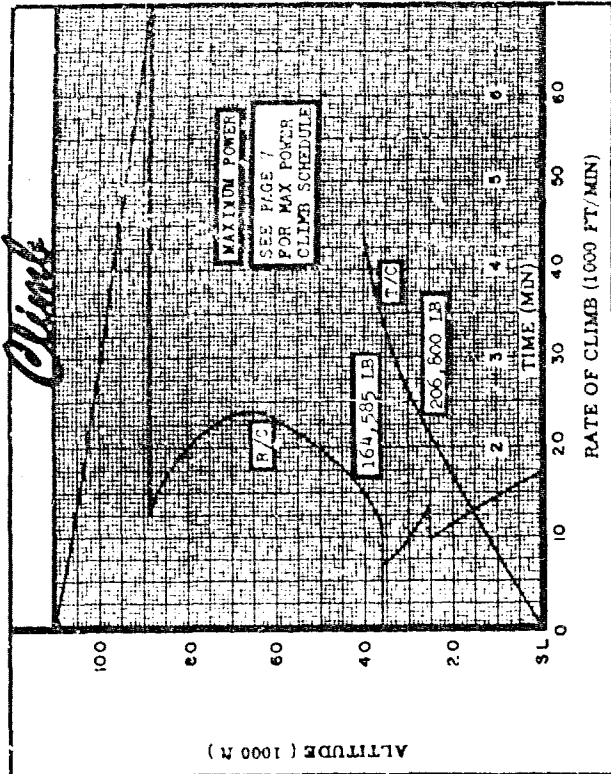
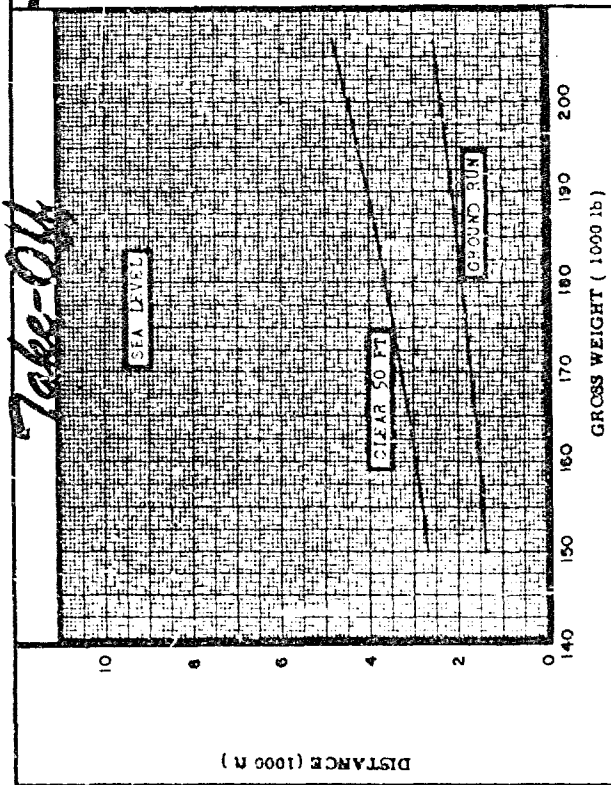
Loading and Performance - Typical Mission

C O N D I T I O N S	DESIGN MISSION I	DESIGN FERRY MISSION II
TAKE-OFF WEIGHT Fuel at 585 lb/gal (grade unclassified) Payload (ammunition) Payload (bombs) Wing loading Stall speed (power off) Take-off ground run at SL Take-off to clear 50 ft Rate of climb at SL Time: SL to 20,000 ft Time: SL to 30,000 ft Service ceiling (100 fpm)	206,800 59,278 none none 31.3 141.3 2515 4800 14,100 1.7 2.6 99,500 3000 2294 100,000 1.66	206,800 59,278 none none 31.3 141.3 2515 4800 14,100 1.7 2.6 99,500 3290 2294 94,000 1.66
COMBAT RANGE COMBAT RADIUS Average speed Initial cruising altitude Total mission time	(lb) (lb) (lb) (par) (kn) (ft) (ft) (fpm) (min) (min) (ft) (n ml) (n ml) (kn) (ft) (hr)	206,800 59,278 none none 31.3 141.3 2515 4800 14,100 1.7 2.6 99,500 3000 2294 100,000 1.66
MISSION WEIGHT Mission altitude Mission speed Mission climb Mission ceiling (500 fpm) Service ceiling (100 fpm) Max rate of climb at SL Basic speed at 35,000 ft Max speed at optimum altitude	(lb) (ft) (kn) (fpm) (ft) (ft) (fpm) (kn) (km/ft)	151,335 94,000 2294 58,100 111,300 111,500 20,100 1200 2294/94,000
LANDING WEIGHT Ground roll at SL Total from 50 ft	(lb) (ft) (ft)	151,335 4730 7250

NOTE ① Maximum power ② Mission weight denotes combat weight and is arbitrarily the weight at a point 1500 n mi from base. ③ Allows for weight reduction during ground operation and climb	④ Detailed descriptions of Range missions given on page 6 ⑤ See note "b" page 6 ⑥ See note "c" page 6	PERFORMANCE BASIS: (a) Data source: Estimated. (b) Performance is based on powers shown on page 6. (c) Fuel flow data used in computing RADIUS and RANGE are increased 5%.
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SECRET

PROPOSAL



SECRET

SYSTEM NO. 118P

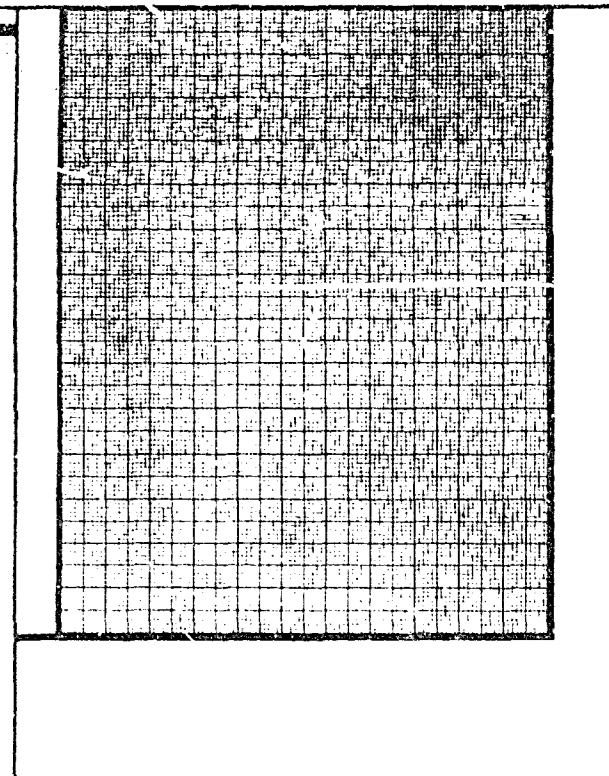
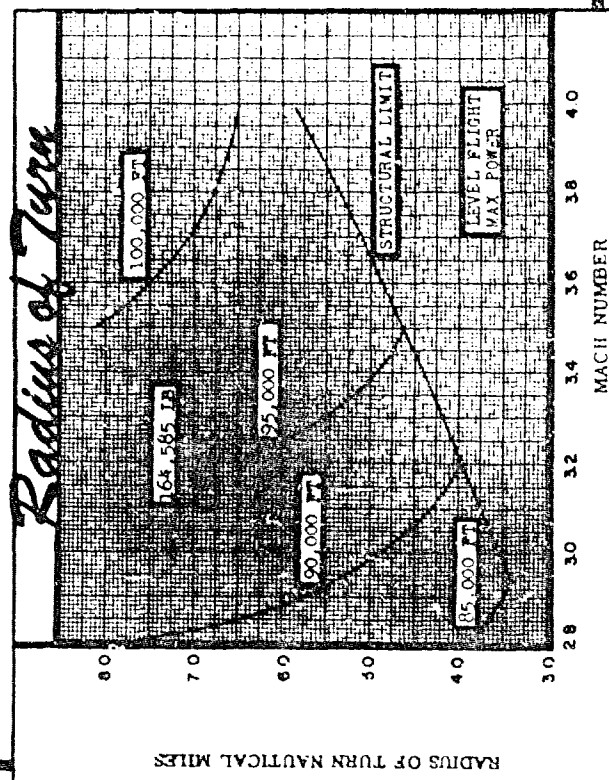
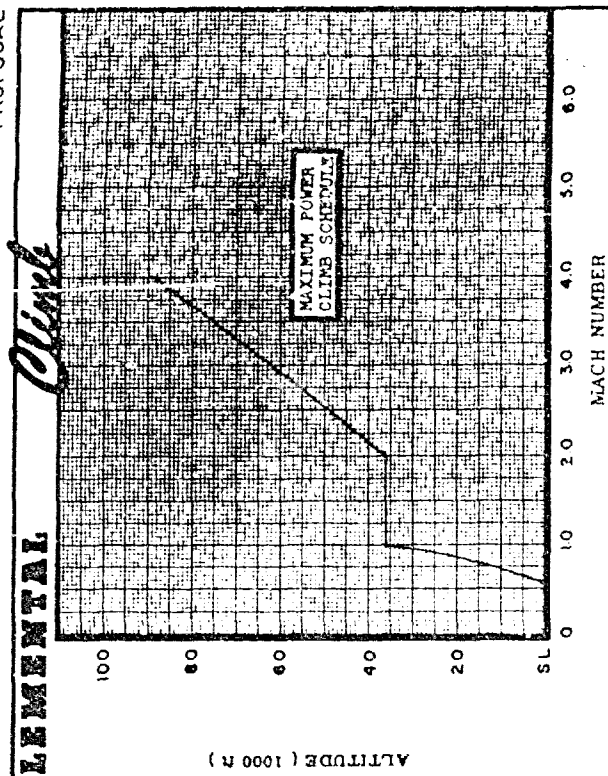
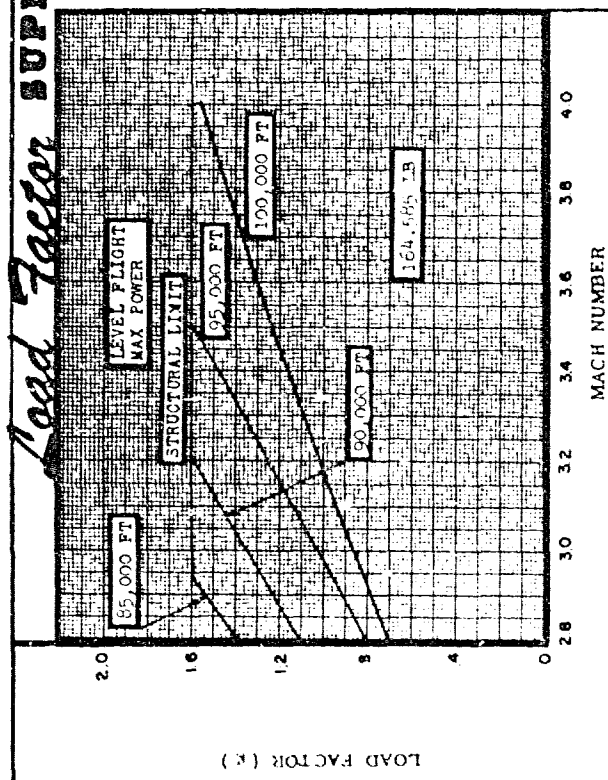
4 JUNE 1956

PROPOSAL

SECRET

Load Factor **SUPPLEMENTAL**

Climb



4 JUNE 1956

SECRET

SYSTEM NO. 118P

NOTES

FORMULA: RANGE MISSION I

Take-off and accelerate to climb speed with maximum power, climb on course to 36,089 feet with maximum power, accelerate and climb to cruise altitude with maximum power, cruise out at penetration speed, cruise to maximum penetration, complete mission, cruise to base at penetration speed. Range free allowances include 5 minutes of maximum continuous power at sea level for starting engines and take-off and a reserve of 10% of initial fuel.

FORMULA: RANGE MISSION II

Take-off and accelerate to climb speed with maximum power, climb on course to 36,089 feet with maximum power, accelerate and climb to cruise altitude with maximum power, cruise out at long range speeds. Range free allowances include 5 minutes of maximum continuous power at sea level for starting engines and take-off and a reserve of 10% of initial fuel.

GENERAL DATA:

(a) Engine ratings shown on page 3 are guaranteed values. Installed values used in performance calculations are as follows:

(4) ATR-2040 103.1% Size	
S.L. STATIC	LB
Maximum:	*14,700
Maximum Continuous:	**14,450
	* With blow-off cowl installed
	** With blow-off cowl off

(b) Stall speed limited by 10° tail down ground angle in presence of ground.

(c) Denotes folding tips up; all other performance is based on folding tips down.

PERFORMANCE BASIS:

Performance data are based on North American Report No. NA-56-613, dated 31 May 1956, "Aerodynamic Characteristics System 118p - Phase III".

REVISION BASIS:

Initial issue.

c. Flight Controls

The flight control system proposed for Weapon System 118P is an integrated system composed of mechanical, hydraulic, electromechanical, and electronic components. The aerodynamic flight control surfaces are positioned by irreversible dual hydraulic actuators and dual mechanical control valves. Pilot inputs to the valves are accomplished through a single mechanical linkage system from the pilot's controls to the actuator valves. Automatic flight control (AFCS) inputs to the valves are accomplished through series and parallel hydraulic actuators with electromechanical control valves and associated electronic components. Three basic modes of operation are provided: the primary manual control mode, the automatic control mode, and the alternate manual control mode.

(1) Primary Control Mode

The primary manual control mode provides for pilot control of the airplane flight path through the cockpit control stick and pedals. The AFCS is utilized in this mode to add or subtract from the pilot inputs to the control surfaces so as to provide optimum static, accelerated, and dynamic handling qualities over the airplane flight range. "Fail-safety" is accomplished in this mode through the use of redundancy with automatic shutoff centering and locking. When this cycle of operation occurs, the alternate control mode is automatically in use.

(2) Automatic Control Mode

Automatic control of the airplane is accomplished through the AFCS providing the following functions:

- Pilot Relief
- Mach hold
- Altitude hold
- Heading hold
- Attitude hold
- Tie-in to Electronic Subsystem
- Automatic navigation

"Fail-safety" in the automatic mode is accomplished by the use of command limiters in addition to the provisions of the primary control mode.

(3) Alternate Control Mode

An alternate manual control mode is provided for pilot control of the airplane through the mechanical and hydraulic system components only. This mode is available for use only if the AFCS is inoperative. Based on mission capability considerations, configurations with canard surfaces for pitch axis control were selected which require artificial stabilization. A simple mechanical and hydraulic system is proposed which provides these stabilizing canard motions, which are superimposed on inputs applied by the pilot. This system is in operation during the primary manual and automatic modes as well as the alternate manual control mode. The alternate manual control mode is included to permit completion of the mission in the event that airplane electrical power is not available or the AFCS is inoperative.

d. Structural Load Factors

The airplane is designed to a limit maneuvering load factor of 1.6 g. The ultimate load factor is $1.6 \text{ G} \times 1.25 = 2.0 \text{ G}$.

The gust load factor is identical to the above maneuvering load factor.

e. Crew Provisions

The flight crew for Weapon System 118P consists of only one man. Careful study of all of the systems involved indicates that one man can adequately perform all of the desired functions.

(1) Environment

The cockpit environment is based on the following assumptions:

Ventilated suit worn
Closed, recirculating ventilation system
Minimum possible leakage, of the order of 0.1 square inches equivalent area (CA = 0.1)
Leakage make-up to maintain cabin pressure from stored liquid gas

Greatest efficiency for the recirculation system is achieved with a low cabin altitude; 15,000 feet or 5.0 psia may be assumed. The required cockpit temperature will be established by equipment and instrumentation in the cockpit rather than by the man, since the ventilated suit provides protection for two hours at environmental temperatures up to 200°F or more.

For the Phase II-1/2 Airplane, the partial-pressure suit may be worn as a protection against possible decompression and in case of bail-out above 50,000 feet. Experience may show that survival of a decompression at 75,000 feet is possible by diving the airplane, without reliance on a pressure suit. Such a procedure will require a dive rate capability of the order of 2000 feet per second or better and the wearing of a full face helmet - permitting oxygen positive pressures up to 24 inches of water.

For the Phase III Airplane, the partial-pressure suit will be necessary to survive a decompression.

A full-pressure suit may be preferred on the basis of comfort and mobility, providing a suitable suit has achieved standardization by the time of mock-up of the airplane. The full-pressure suit has the advantage of permitting continuance of a mission at peak altitudes following a decompression, whereas, the tolerable duration wearing the partial-pressure suit is limited to a few minutes at or above 75,000 feet. The significance of this advantage depends on the feasibility of unpressurized flight from the standpoint of equipment operation.

(2) Visibility Requirements

Present indications are that the best method for achieving adequate vision in this design, with least amount of drag, is the use of a slightly raised transparent enclosure and a periscope. Several tests with gratifying results have been conducted utilizing periscopes. The periscope provides an exit pupil of adequate diameter and eye relief, thereby, permitting the pilot to maintain a normal body position and head movements. The field of view of a large enough angle to provide adequate forward and downward vision. The transparent canopy will allow forward, overhead, and side vision. In order that the proper orientation may be maintained by the pilot, overlap of the field of view by a minimum of 5 degrees between the periscope and transparent canopy will be achieved.

During taxiing, the periscope will allow the necessary forward and downward vision. The transparent canopy, with its large areas of side vision, will be used for side obstruction clearance. Once aligned on the runway, the periscope will provide adequate vision for take-off. Its field of view will provide a 30-degree cone of vision which is normally considered essential for visual reference. Another assistance to the pilot will be the projecting of the airspeed and altitude information on the periscope face, allowing the pilot to have the required information without shifting his field of view. Climb-out will be carried out by simply switching the vision from the periscope to the windshield area; once in the air both sources of vision can be utilized, the periscope for ground reference and the transparent area for all-around vision.

(3) Emergency Protection

Emergency protection for the pilot will consist of protection during crash landing, excessive maneuvers, and emergency egress, as well as the environment encountered due to altitude and velocity.

The personal equipment, that is the equipment worn by the pilot, will include the MB-3 partial-pressure suit, MB-5 helmet immersion or exposure suit, ventilated garment, and integrated harness torso suit.

Protection for crash landing will consist of the lap belt and shoulder harness fastened to the integrated harness. The harness in the integrated suit will protect the pilot from movement relative to the seat during crash landing, excessive maneuvers, and emergency in-flight egress. This suit will also position the parachute harness on the occupant for correct support during descent with the parachute.

The seat will be designed to provide protection of the occupant from limb flailing, wind blast, and tumbling during ejection and descent. The occupant will be retained in the seat during the entire escape sequence, landing in the seat. The occupant's arms will be retained within the seat envelope by large side guards, and the hands will be shielded from wind blast to help the occupant retain his grip on the trigger handgrips. The legs will be retained by side guards and one automatic quick-release yoke over each ankle. The ejection control will be located so that flight loads will not hamper the occupant from reaching and activating the jettison control. This control will be a single-movement device which will position the occupant for safe ejection, jettison the canopy, deploy the seat-attached main parachute, and eject the seat without further action by the escapee.

The tumbling protection will consist of a aerodynamic fins attached to the upper extremity of the seat. These fins will extend upon separation of the seat from the airplane.

An aneroid timer device will be used for automatic deployment of the main parachute. If escape is accomplished above 20,000 feet, the seat attached parachute will deploy upon reaching 20,000 feet; if escape is below 20,000 feet, the parachute will deploy 2-1/2 seconds after ejection. If the occupant wishes to leave the seat at any time with his emergency parachute and survival kit, a manual release handle is operated.

2. Power Plant

a. Engine Installation

(1) Phase II-1/2

Four afterburning General Electric X278 (135 percent X275A) engines are installed side by side in the aft fuselage. All airplane power supply accessories are mounted on separately cooled and lubricated, remotely located gear boxes. A quick-disconnect drive shaft transmits power from the single power take-off pad on each engine to its respective gear box. No accessories are located in the inaccessible nose bullet. A reversible hydraulic pump on each engine remote gear box will be utilized for starting each engine. Ground power supply will furnish power to the reversible hydraulic pump for starting.

Each of the four remote gear boxes will mount a single surface control and a single utility hydraulic pump. In addition one alternator will be mounted on two of the four gear boxes (total of 2 alternators). Constant-speed drives will be provided for the two alternators.

Advantages to be gained from using these remote gear boxes are as follows:

1. All accessories per engine will be located in one compartment thus making maintenance problems more simplified.
2. Accessibility problems will be decreased because no accessories are in the bullet nose.
3. Engine removal is simplified.
 - a. Only a drive shaft will have to be disconnected as compared to disconnecting numerous hydraulic lines and electrical lines.
 - b. Engine removal will be simplified, with no requirement for disconnect or removal of nose-mounted accessories.
4. All inflammable fluids are eliminated from the bullet nose, thus eliminating the possibility of air contamination and fire hazard due to this cause.
5. Accessories can be located in a cooler compartment, thereby reducing compartment fire hazard.

(2) Phase III

Four Aerojet ATR-2040, 103.1 percent size regenerative hydrogen-fueled air turbo rocket engines are installed side by side in the aft fuselage. All airplane power supply accessories are mounted on separately cooled and lubricated, remotely located gear boxes. A quick-disconnect drive shaft transmits power from the single power take-off pad on each engine to its respective gear box. No accessories will be mounted in the nose bullet. Ground engine starting will be accomplished in the following manner: Ground support equipment, consisting of a liquid hydrogen supply, high-pressure pump, and heat exchanger, will supply hydrogen to the engine turbine at 300°F to 400°F and 700 psia. The expansion of the hydrogen through the turbine will initiate operation of the compressor-turbine system, permitting ignition and burning of turbine exhaust hydrogen. This starting procedure is continued until engine idle speed is obtained. Operation is then switched to main engine operation, and fuel is fed to the engine from the airplane supply. Starting is estimated at under 30 seconds from the time conditioned hydrogen is supplied to turbine.

Each of the four remote gear boxes will mount a single surface control and a single utility hydraulic pump. In addition one alternator will be mounted in two of the four gear boxes (total of two alternators) and one hydraulic pump on each of the other two gear boxes to furnish power to the fuel system hydraulically powered fuel pumps.

Advantages to be gained from using the remote gear boxes are as follows;

1. Accessories per engine will be located in one compartment, thus making maintenance problems more simplified.
2. The accessibility problem will be decreased because no accessories are in the bullet nose.
3. Engine removal is simplified since only a drive shaft will have to be disconnected as compared to disconnecting numerous hydraulic lines and electrical lines.
4. All inflammable fluids are eliminated from the bullet nose, thus eliminating the possibility of air contamination and fire hazard due to this cause.
5. Accessories can be located in a cooler compartment, thereby reducing compartment fire hazard.

b. Air Induction System**(1) Phase II-1/2**

Air to the four engines located in the aft fuselage of the Phase II-1/2 Airplane is supplied by two inlets located symmetrically on the sides of the fuselage. Air entering each inlet flows through a single duct which divides into two branches just forward of the compressor inlet station. The engines are provided with ejector nozzles, and the secondary air required plus all cooling air will be bled from the main engine duct. Ground cooling will be provided by reverse flow through auxiliary doors; the air being pumped forward into the engine duct and aft provides a means of exiting all of the excess air taken on board by the inlet but not needed by the engine, cooling, or bleed system.

The variable-geometry inlet design for the Phase II-1/2 Airplane is a two-dimensional, external-compression, internal-contraction type. For high-speed flight, the supersonic stream entering the inlet is partially decelerated through two external oblique shock waves formed by an external ramp. The entering stream is further decelerated to a low supersonic Mach number as a result of the internal contraction. The inlet design incorporates the use of porous-area suction on the ramp and over the engine duct surface for a short distance aft of the start of the cowl. Use of porous-area suction is utilized to prevent separation due to shock wave boundary layer interaction. The inlet has been geometrically arranged on the side of the fuselage to give the best possible angle of attack and yaw angle characteristics.

The inlet geometry and by-pass system will be automatically controlled in flight to give optimum performance. The variable internal ramp of the inlet will be controlled only as a function of Mach number. The by-pass system will automatically exit the correct amount of air to maintain low drag, high pressure recovery, and stable operation of the inlet.

(2) Phase III

Air to the four air-turbo rocket engines located in the aft fuselage of the Phase III Airplane is supplied by a single inlet located on the bottom of the fuselage. Air entering the inlet flows through a single duct to a station just upstream of the compressor inlet station where the main duct divides into four branches. All air needed for the cooling and the ejector nozzle are bled from the main engine duct. All excess air entering the inlet and not needed by the engine or auxiliary systems is exited through a by-pass.

The air induction system also includes a blow-off cowl extension. At low supersonic speeds (less than Mach 1.7) the inlet size (which is selected for operation at Mach 4.0) is approximately 300 percent too large. The blowoff cowl is provided to reduce the large inlet drag that results from the oversize inlet. The blowoff cowl extension converts the inlet to a fixed, normal shock inlet of proper size for operation upto about Mach 1.7. The cowl section is automatically jettisoned as a Mach number of 1.7 is reached.

Geometry and other details of the inlet and details of the inlet control system are similar to the Phase II-1/2 design. However, certain geometry changes were required because of the higher Mach number design.

c. Fuel System

(1) Phase II-1/2

The fuel system is designed to operate with land-based supersonic (LBSS) fuel. Total fuel quantity is approximately 21,400 gallons and is contained in a forward insulated fuselage sump tank of 10,140 gallons, an aft insulated fuselage transfer tank of 6,560 gallons, and two wing tanks of 2,350 gallons each. The tanks are integral with the airframe structure.

Fuel is supplied to the engine and transferred by hydraulic tank-mounted pumps. The tanks are pressurized to 15 psia with a liquid nitrogen system to avoid autoignition, to eliminate venting, and to provide an emergency engine feed system. CG is controlled by appropriate throttling of transfer from the aft tank.

Refueling is accomplished at a rate of 1200 gpm at 50 psi inlet pressure, for in-flight or ground operations.

(2) Phase III

The fuel system is designed to operate with liquid hydrogen. Total fuel quantity is approximately 101,330 gallons and is contained in seven interconnected fuselage tanks. The tanks are insulated and separate from the structure.

Fuel is supplied to the engine by four hydraulically driven booster pumps in an aft sump tank. Fuel transfer is accomplished by gravity through check valve interconnectors which are limited through insulation to avoid loss. Maximum tank pressure is 35 psia.

Ground refueling is accomplished by a recirculating system from the forward to aft tank into a purged system. In-flight refueling is not provided.

3. Equipment

a. Navigation

Navigation is accomplished by a subsystem called the N5C, designed by the Autonetics Division of North American Aviation, Inc. This subsystem uses the inertial platform from the N5A subsystem, which has been extensively flight tested, and electronics from the N6B subsystem which is now in production for missile application.

The N5C navigation subsystem weighs 414 pounds and requires 10.7 cubic feet of space and 526 watts of electrical power. Its main components are the inertial platform and the associated electronic units, one of which is a digital computer.

The platform is isolated from angular flight motions by means of a four-axis gimbal arrangement. It is maintained normal to the earth's gravitational field by means of gyroscopes and torque computers. Inertial distance meters are mounted on this stabilized platform. (These are instruments which sense acceleration and yield its double integral, which is distance.) The output of an inertial distance meter is an amplitude-modulated carrier signal. This signal is demodulated so that it is suitable as an input to the digital differential analyzer which then performs the linear transformations necessary to put the position data into latitude and longitude coordinates.

The digital differential analyzer, into which a program for the mission has been inserted, also computes the correction signals to the automatic flight control unit. It is capable of computing paths consisting of, at most, three arcs of great-circle routes.

In addition to navigation data, this subsystem also furnishes timing marks; pitch, roll, and yaw angles for stabilization of camera platforms and radar data; and true ground velocity.

The navigation subsystem is also capable of automatically switching the reconnaissance subsystem on and off during a programmed flight.

b. Reconnaissance

(1) Radar

Scanning, Forward-looking Radar - for general area-mapping and gap-filling. This is a PPI radar of exceptional resolution capability (2700-foot ground resolution at 80 nautical miles). The PPI scope pictures provide for basic, over-all ground-mapping of the entire enemy territory. The pictures may also be used as comparison overlays in bomber guidance. In addition, this radar provides the high-resolution capability in the near range (approximately 550-foot ground resolution at 16 nautical miles) necessary to fill the gap left by the dual, high-resolution, side-looking radar.

High-resolution Side-looking radar - for detection of targets such as missile launching centers. Phase II-1/2 employs the APQ-56 equipment while the Phase III employs the advanced coherent Doppler radar techniques to provide ground resolution up to 200 feet at 70 miles. It will also provide records resembling good aerial photographs.

(2) Ferret

The ferret reconnaissance system is used for locating, detecting, and describing enemy ground radar stations. This system operates automatically and employs dozens of direction-finding and frequency-analyzing antennas to obtain complete information on enemy radars within the total frequency range of 30 to 70,000 megacycles. This information may be rapidly read out and correlated on the ground by computers such as the standard IBM 704.

(3) Photographic

The photographic reconnaissance system is used for target search and detailed target description. The system includes two automatically controlled, high-capability camera sets.

Search Cameras - approximately 24-inch focal length - capable of 20-foot ground resolution and 50-nautical-mile lateral coverage for detecting missile launchers, distinguishing aircraft types, etc.

Detail Cameras - 48-inch focal length - capable of 4- to 5-foot ground resolution and 20-nautical-mile lateral coverage - for fine discrimination of target detail.

(4) Weather Reconnaissance

Potential outputs of the navigation subsystem and the airplane air data computer include complete weather data at flight level. The reconnaissance subsystem provides for complete in-flight recording of these data.

(5) Infrared Equipment

For detecting temperature differences on the ground and identifying underground or camouflaged installations. This equipment scans the ground, employing sensitive thermal detection devices. (The state of the art to permit efficient infrared work in the high-altitude, supersonic mission is still in doubt.)

c. Communications

Consistent with the operational use and the time schedule of Weapon System 118P, the general requirements of the CNI subsystem are minimum weight, high reliability, and the most advanced state-of-the-art development. The choice of equipment and installation is based on the assumption that the pilot and maintenance personnel are of Air Force Test Center calibre, that maintenance and turnaround time are of secondary importance, and that there is adequate support of chosen equipment. Specifically, the functions of the CNI subsystem will be limited to the essential requirements of uhf communications, uhf automatic direction finding, stand-by altitude reference, identification air-to-air and ground-to-ground transponding equipment, radio distress beacon, and tape recorder.

Equipment that best fulfills the requirements of this weapon system, from both a functional and schedule standpoint, are as follows:

(1) AN/ARC-52

This equipment provides line-of-sight communication capable of conventional uhf, am, voice link with the present ground and air-borne facilities and is capable of operation with adf equipment. This equipment is an improvement over the AN/ARC-34 and was specifically designed and developed for space-premium, high-reliability installations. The basic characteristics of the AN/ARC-52 are a frequency range of 225.0 to 399.9 mc, 1750 available channels with 19 present channels and one guard channel, a power output of 20 watts minimum unmodulated power into a 50-ohm load, and a range up to 300 air-to-ground miles and 650 air-to-air miles (depending on altitude).

(2) AN/ARA-37

This equipment is an air-borne homing adapter used in conjunction with the command radio as a navigational aid. It provides right-left bearing-to-signal information and was designed and developed with the primary objectives of simplicity and lightness of weight.

The basic characteristics of the AN/ARA-37, automatic direction finder are a frequency range of 225 to 400 mc, accuracy to 3 degrees under operational conditions, and right-left indication sensitivity increase as the station is approached.

(3) Attitude Reference

This equipment provides stand-by navigation. Study has indicated that pitch, roll, and azimuth can be obtained with much greater accuracy and less weight with a stable platform than with a combined vertical and directional gyro. The equipment will be tied in with the main inertial platform for accuracy checks and correction. Several systems providing these functions are under development by Lear, Kearfott, Kollsman, and Sperry. The accuracy characteristics of the attitude reference system are one-degree-per-hour drift in azimuth and 5-degrees-per-hour drift in elevation.

(4) AN/APX-19 and AN/APX-27

The AN/APX-19 is an air-to-ground transponder, and the AN/APX-27 is an air-to-air transponder. These units automatically transmit an identification signal whenever properly challenged by friendly air or surface forces. They are also capable of identifying the weapon system as a specific airplane and of transmitting a distress code (SIF - selective identification function).

(5) AN/ART-27

This equipment transmits distress signals which indicate to rescue facilities the existence and location of the disabled airplane. It transmits alternately on hf for 5 minutes and uhf for 10 minutes for a period of 24 hours. It is ejected manually, on impact, from the airplane, if so selected, by a light-weight catapult system. It will operate satisfactory if ejected while air-borne, on the ground, or on the surface of a body of water. The system is normally in the "crash silent" condition and is provided with a manual override that requires the pilot to take positive action to activate the system.

(6) AN/ANH-5

This equipment is a lightweight tape recorder capable of recording audio signals from radio receivers or microphones. It provides a means of recording the pilot's oral descriptions of observations made during the mission for evaluation upon return to base. It has sufficient magnetic tape to permit recording on a selective basis throughout the mission. Automatic cutoff is provided when no audio signal is received.

d. Aerial Refueling (Phase II-1/2 Only)

An in-flight refueling system of the flying-boom type, having a transfer capacity of 1200 gpm, is provided to refuel the internal tanks. The receptacle is installed in the upper fuselage, forward of the wing. A switch is provided in the cockpit for actuating doors that cover the receptacle and energizing a light in the receptacle compartment to illuminate the receptacle.

B. GROUND SYSTEMS

1. Ground Servicing

Ground servicing of Weapon System 118P differs from the normal concept primarily in the reconnaissance pod equipment pre-flight and in the Phase III fuel servicing. The reconnaissance pod ground servicing is handled apart from the airplane. Pod maintenance, data servicing, preflight, and postflight data correlation is accomplished adjacent to the ground data correlation vans. The mated (pod to airplane) check need be one to ensure the airplane-to-pod system operation. The airplane systems pertinent to reconnaissance operations can be functionally checked by the "go, no-go" system checker.

Fuel servicing and ground handling of the fuel servicing devices requires extreme care and preplanning in its operation, due to the volatility of the fuel. Refueling requires gaseous nitrogen purging followed by gaseous hydrogen purging prior to the liquid hydrogen fueling operation. Because boiloff of the liquid hydrogen occurs in transit, reliquification is required prior to fueling. A combination reliquification and pumping device can be made as a portable unit. The gaseous nitrogen can be made by a portable generator, and the gaseous hydrogen is made available through the boiloff of the liquid hydrogen tanks. To date, some problems, pertinent to refueling, not fully resolved include: 1) designing pumps and stopcocks which would not permit temperature rise and contamination, 2) consideration of handling techniques and equipment to establish hazard-minimizing procedures, 3) consideration of ducting techniques to decrease liquid hydrogen boil-off losses in transfer from tank to airplane.

Ground servicing of the hydraulic systems is combined with system check-out, as accomplished by the hydraulic service equipment mounted on the airplane ground power unit.

The communication, navigation, and identification electronic equipment, as well as the inertial platform and electronics, use the "go, no-go" flight line testing and module equipment replacement concept. In addition, alignment of the inertial platform is either through autocollimation or by referencing a master azimuth, depending on the turnaround time requirements.

2. Training Aids

This contractor will make a detailed design analysis of the proposed weapon system design, with regard to estimations of new training equipment requirements imposed by the system and its subsystems. This analysis will consider all types and phases of training aids and equipment which will be necessary for the training of personnel in the operation, maintenance, and special technique requirements of Weapon System 118P.

a. Types of Training Aids

In the contractor's final analysis, based upon detailed design studies, all known training aid mediums will be carefully considered. A combination of the best possible mediums to aid instructor personnel in transmitting the knowledge necessary to effectively operate and maintain this weapon system will be recommended.

The main general types of training aids to be considered are:

Aircrew

- Graphics
- Procedure trainers
- Mission simulator
- Pilot transition airplane

Ground Crew

- Graphics
- Animated training aids
- Operable training aids

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b. Training Aids Support

(All of the recommended training aids will with complete special tools, test equipment, ground handling system and equipment technical orders, airplane handbook operating and maintenance instruction handbooks for each.

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c. Time-phasing Schedule

Paramount to the customer's best interest in the development of an effective training program is the timely delivery of the properly selected and accurately constructed training aid. Delivery must be accomplished well in advance of test site or operational delivery of the weapon system. In keeping with current Air Force regulations and this contractor's policy, all training aids will be delivered sufficiently in advance of the weapon system to effectively support initial maintenance and aircrew training programs, either at this contractor's facility or at Air Force installations in the field.

1. R & D SCHEDULE										2. REPORTS CONTROL SYMBOL									
☒ SYSTEM ☐ PROJECT ☐ TASK ☐ OTHER										3. DATE 4 June 1956									
4. TITLE SPECIAL RECONNAISSANCE AIRPLANE PHASE II 1/2										5. INITIAL CHANGE ☒									
6. NUMBER 118P																			
7. SCHEDULE										8. CALENDAR YEARS									
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1. R & D SCHEDULE										2. REPORTS CONTROL SYMBOL											
☒ SYSTEM ☐ PROJECT ☐ TASK ☐ OTHER										3. DATE				4. NUMBER							
4. TITLE										5. INITIAL				6. NUMBER							
SPECIAL RECONNAISSANCE AIRPLANE (PHASE III)										CHANGE				118P							
SCHEDULE										CALENDAR YEARS											
PROJECT OR TASK NR										19											
TITLE										19											
Propulsion																					
Engine - Prototype																					
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3. Procurement Release										19									
4. Production Engineering										19									
Drawing Release										19									
a. Date Required										19									
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Communications										19									
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b. Prototype Test										19									
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Tape Recorder										19									
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b. Prototype Test										19									
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1. R & D TEST ANNEX										2. REPORTS CONTROL SYMBOL		
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4. TITLE										5. INITIAL ☒ CHANGE		
SPECIAL RECONNAISSANCE AIRPLANE PHASE II-1/2										6. NUMBER 118P		
7. RESP CENTER		8. PROJECT OFFICER		9. SUPPORTS (Sys or Prod)		10. CONTRACTOR North American Aviation, Inc.		11. CONTR NR		12. PRIORITY AND PREC		
13. SECURITY SECRET												
14. ITEM NUMBER	15. TEST ITEM	16. TEST DESCRIPTION	17. TEST AGENCY AND SITE	18. TEST ITEM AVAILABLE	19. RQO TEST COMPL DATE							
1.	Sub-system Development Tests of the Search Photographic Package, Detail Photographic Package, and the Digital Recorder.	Photographic packages will be installed and tested in a B-58 type aircraft for development tests in support of 118P program.	Sub-contractor @ Sub-contractor's test facilities.	April 1, 1960	July 1, 1961							
2.	Sub-system Development Tests of the Radar Package (Low resolution - azimuth scan)	Radar package will be installed and tested in a B-58 type aircraft for development tests in support of 118P program.	Sub-contractor @ Sub-contractor's test facilities.	April 1, 1960	July 1, 1961							
3.	Sub-system development tests of the Radar package (High resolution - side looking)	Radar Package will be installed and tested in a B-58 type aircraft for development tests in support of the 118P program.	Sub-contractor @ Sub-contractor's test facilities.	April 1, 1960	July 1, 1961							
4.	Sub-system development tests of the Ferret package.	Ferret package will be installed and tested in a B-58 type aircraft for development tests in support of the 118P program.	Sub-contractor @ Sub-contractor's test facilities.	April 1, 1960	July 1, 1961							
TEST CENTER APPROVAL												
20. NAME		ORGANIZATION		DATE								
21. NAME		ORGANIZATION		DATE								
RESPONSIBLE CENTER APPROVAL												
22. NAME		ORGANIZATION		DATE								

1. R & D TEST ANNEX				2. REPORTS CONTROL SYMBOL	
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4. TITLE SPECIAL RECONNAISSANCE AIRPLANE		5. INITIAL ☒ CHANGE		5. NUMBER 118P	
7. RESP CENTER		9. PROJECT OFFICER		9. SUPPORTS (Sys or Proj)	
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14. ITEM NUMBER	15. TEST ITEM	16. TEST DESCRIPTION		17. TEST AGENCY AND SITE	18. TEST ITEM AVAILABLE
5.	Airplane No. 1	A. Ground Tests and first 10 flight hours of Phase I Flight Testing B. Remaining portion of Phase I Flight Testing (Approx. 35 hours) C. Air Force Phase II Flight Test Evaluation D. Phase III Flight Testing 1. Stability and Control 2. Power Plant and Performance 3. Automatic Flight Control 4. Air Force Evaluation		NAA @ Edwards AFFTC NAA @ Palmdale Air Force @ Edwards AFFTC NAA @ Palmdale	Sept. 1, 1960 Nov. 1, 1960 Feb. 1, 1961 April 1, 1961
6.	Airplane No. 2	A. CTCI (Contractor's Technical Compliance Inspection) B. Installation of Flight Test Instrumentation C. Phase III Flight Testing 1. Power Plant & Performance 2. Stability and Control 3. Air Force Evaluation		Air Force @ Palmdale Air Force @ NAA NAA @ NAA NAA @ Palmdale Air Force @ Palmdale	Oct. 31, 1960 Jan. 31, 1961 March 31, 1961 May 15, 1963 Jan. 31, 1961 April 30, 1961 May 15, 1963
TEST CENTER APPROVAL					
20. NAME		ORGANIZATION		DATE	
21. NAME		ORGANIZATION		DATE	
RESPONSIBLE CENTER APPROVAL					
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1. R & D TEST ANNEX				2. REPORTS CONTROL SYMBOL	
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				3. DATE 4 June 1956	
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7. RESP CENTER	8. PROJECT OFFICER	9. SUPPORTS (Sys or Proj)	10. CONTRACTOR North American Aviation, Inc.	11. CONTR NR	12. PRIORITY AND PNEC
13. SECURITY SECRET					
14. ITEM NUMBER	15. TEST ITEM	16. TEST DESCRIPTION		17. TEST AGENCY AND SITE	18. TEST ITEM AVAILABLE
19. RQO TEST COMPL DATE					
7.	Airplane No. 3	Phase III Flight Testing 1. Stability and Control 2. Structural Demonstration 3. Power Plant and Performance		NAA @ Palmdale	March 1, 1961
8.	Airplane No. 4	Phase III Flight Testing 1. Power Plant and Performance 2. Stability and Control		NAA @ Palmdale	April 1, 1961
9.	Airplane No. 5	Phase III Flight Testing 1. Automatic Flight Control 2. Inertial Navigation 3. Air Force Evaluation		NAA @ Palmdale	May 1, 1961
10.	Airplane No. 6	Phase III Flight Testing 1. Electrical Systems, Antennas, Hydraulics Instruments, and Communication 2. Cabin Systems and De-icing 3. Air Force Evaluation		Air Force @ Palmdale	June 1, 1961
April 30, 1963					
April 30, 1963					
April 30, 1963					
April 30, 1963					
TEST CENTER APPROVAL					
20. NAME		ORGANIZATION		DATE	
21. NAME		ORGANIZATION		DATE	
22. NAME		ORGANIZATION		DATE	
RESPONSIBLE CENTER APPROVAL					
		ORGANIZATION		DATE	

1. R & D TEST ANNEX										2. REPORTS CONTROL SYMBOL			
☒ SYSTEM ☐ PROJECT ☐ TASK ☐ OTHER										PAGE 4 OF 6 PAGES			
										3. DATE 4 June 1966			
4. TITLE SPECIAL RECONNAISSANCE AIRPLANE										5. INITIAL ☒ CHANGE		6. NUMBER 118P	
7. RESP CENTER		8. PROJECT OFFICER		9. SUPPORTS (Sys or Proj)		10. CONTRACTOR		11. CONTR NR		12. PRIORITY AND PREC		13. SECURITY	
14. ITEM NUMBER		15. TEST ITEM		16. TEST DESCRIPTION		17. TEST AGENCY AND SITE		18. TEST ITEM AVAILABLE		19. RQD TEST COMPL DATE			
11.		Airplane No. 7		Phase III Flight Testing 1. Search Photographic, Detail Photo-graphic, and Digital Recorder 2. Cabin Systems and De-icing 3. Air Force Evaluation		NAA @ Palmdale		July 1, 1961		April 30, 1963			
12.		Airplane No. 8		Phase III Flight Testing 1. Radar Package (Low resolution - azimuth scan) and standby airplane for high resolution radar. 2. Ferret 3. Air Force Evaluation		Air Force @ Palmdale NAA @ Palmdale		July 1, 1961		April 30, 1963			
13.		Airplane No. 9		Phase III Flight Testing 1. Radar Package (High resolution - side looking) and standby airplane for low resolution radar 2. Ferret 3. Air Force Evaluation		NAA @ Palmdale Air Force @ Palmdale		Aug. 1, 1961		April 30, 1963			
TEST CENTER APPROVAL													
20. NAME		ORGANIZATION										DATE	
21. NAME		ORGANIZATION										DATE	
RESPONSIBLE CENTER APPROVAL													
22. NAME		ORGANIZATION										DATE	

1. R & D TEST ANNEX				2. REPORTS CONTROL SYMBOL	
☒ SYSTEM ☐ PROJECT ☐ TASK ☐ OTHER				PAGE 5 OF 6 PAGES	
				3. DATE 4 June 1956	
4. TITLE SPECIAL RECONNAISSANCE AIRPLANE				5. INITIAL ☒ CHANGE	6. NUMBER 118P
7. RESP CENTER		8. PROJECT OFFICER	9. SUPPORTS (Sys or Proj)	10. CONTRACTOR	11. CONTR NR
					12. PRIORITY AND PREC
					13. SECURITY SECRET
14. ITEM NUMBER	15. TEST ITEM	16. TEST DESCRIPTION	17. TEST AGENCY AND SITE	18. TEST ITEM AVAILABLE	19. RQO TEST COMPL DATE
14.	Airplane No. 10	Phase III Flight Testing 1. Inertial Navigation System 2. Automatic Flight Control 3. Stability and Control 4. Air Force Evaluation	NAA @ Palmdale	Sept. 1, 1961	April 30, 1963
15.	Airplane No. 11 12	Phase IV - Performance & Stability	Air Force @ Palmdale		
16.	Airplane No. 13 14	Phase VI - Functional Development	Air Force @ Edwards AFFTC		
17.	Airplane No. 15 16	Phase VII - Operational Suitability	Air Force @ Edwards AFFTC		
18.	Airplane No. 17	Phase V - All Weather	Air Force @ Eglin Field APGC		
			Ladd Field & Eglin Field		
TEST CENTER APPROVAL					
20. NAME		ORGANIZATION		DATE	
21. NAME		ORGANIZATION		DATE	
RESPONSIBLE CENTER APPROVAL					
22. NAME		ORGANIZATION		DATE	

1. REPORTS CONTROL SYMBOL									
R & D TEST ANNEX ☒ SYSTEM ☐ PROJECT ☐ TASK ☐ OTHER PAGE 6 OF 6 3. DATE 4 June 1956									
4. TITLE		SPECIAL RECONNAISSANCE AIRPLANE		9. INITIAL ☒ CHANGE		6. NUMBER 118P			
7. RESP CENTER		8. PROJECT OFFICER		9. SUPPORTS (Sys or Proj)		10. CONTRACTOR		11. CONTR NR	
12. PRIORITY AND PREC		13. SECURITY		14. TEST ITEM AVAILABLE		15. TEST AGENCY AND SITE		16. RQO TEST COMPL DATE	
17. TEST ITEM		18. TEST AGENCY AND SITE		19. TEST DESCRIPTION		20. TEST AGENCY AND SITE		21. RQO TEST COMPL DATE	
19. Airplane No. 18 19 20		To support Contractor's or the Air Force's Test Program to serve as possible replacements for assigned airplanes, and to handle additional testing requirements which always arise during complex programs of this nature.		Not Specified					
TEST CENTER APPROVAL									
20. NAME		ORGANIZATION		DATE					
21. NAME		ORGANIZATION		DATE					
RESPONSIBLE CENTER APPROVAL									
22. NAME		ORGANIZATION		DATE					

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1. R & D TEST ANNEX				2. REPORTS CONTROL SYMBOL			
☒ SYSTEM ☐ PROJECT ☐ TASK ☐ OTHER				PAGE 1 OF 5 PAGES 3. DATE 4 JUNE 1966			
4. TITLE SPECIAL RECONNAISSANCE AIRPLANE PHASE III				5. INITIAL ☒ CHANGE 118P			
7. RESP CENTER		8. PROJECT OFFICER		9. SUPPORTS (Sys or Proj)		10. CONTRACTOR North American Aviation, Inc.	
11. CONTR NR		12. PRIORITY AND PREC		13. SECURITY Secret			
14. ITEM NUMBER	15. TEST ITEM	16. TEST DESCRIPTION	17. TEST AGENCY AND SITE	18. TEST ITEM AVAILABLE	19. RQD TEST COMPL DATE		
1.	Sub-system development tests of the Search Photographic Package, Detail Photographic Package, and the Digital Recorder.	Photographic packages will be installed and tested in a B-58 type aircraft for development tests in support of 118P program.	Sub-contractor @ sub-contractor's test facilities.	January 1, 1962	March 31, 1963		
2.	Sub-system development tests of the Radar Package (low resolution-azimuth scan).	Radar package will be installed and tested in a B-58 type aircraft for development tests in support of 118P program.	Sub-contractor @ sub-contractor's test facilities.	January 1, 1962	March 31, 1963		
3.	Sub-system development tests of the Radar Package (high resolution-side looking).	Radar package will be installed and tested in a B-58 type aircraft for development tests in support of the 118P program.	Sub-contractor @ sub-contractor's test facilities.	January 1, 1962	March 31, 1963		
4.	Sub-system development tests of the ferret package.	Ferret package will be installed and tested in a B-58 type aircraft for development tests in support of the 118P program.	Sub-contractor @ sub-contractor's test facilities.	January 1, 1962	March 31, 1963		
TEST CENTER APPROVAL							
20. NAME				DATE			
21. NAME				DATE			
RESPONSIBLE CENTER APPROVAL							
22. NAME				DATE			

R 6 D TEST ANNEX

☒ SYSTEM ☐ PROJECT ☐ TASK ☐ OTHER

SPECIAL RECONNAISSANCE AIRPLANE

4. TITLE

5. INITIAL ☒ CHANGE

7. RESP CENTER

8. PROJECT OFFICER

9. SUPPORTS (Sys or Proj)

10. CONTRACTOR
North American
Aviation, Inc.

11. CONTR NR

12. PRIORITY AND PREC

13. SECURITY
SECRET14. ITEM
NUMBER

15. TEST ITEM

16.

17. TEST AGENCY AND SITE

18. TEST ITEM
AVAILABLE19. RQO TEST
COMPL DATE

5. Airplane No. 1

- A. Ground tests and first 10 flight hours of Phase I Flight Testing.
- B. Remaining portion of Phase I Flight Testing (Approx. 35 hours)
- C. Air Force Phase II Flight Test Evaluation.
- D. Phase III Flight Testing
1. Stability and Control
 2. Power Plant and Performance

June 1, 1962

July 31, 1962

6. Airplane No. 2

- A. CTCI (Contractor's Technical Compliance Inspection)
- B. Installation of Flight Test Instrumentation
- C. Phase III Flight Testing
1. Power Plant and Performance
 2. Stability and Control
 3. Air Force Evaluation

October 1, 1962

October 31, 1962

20. NAME

ORGANIZATION

DATE

21. NAME

ORGANIZATION

DATE

22. NAME

ORGANIZATION

DATE

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1. REPORTS CONTROL SYMBOL

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3. DATE
4 June 1956

6. NUMBER

118P

R & D TEST ANNEX										1. REPORTS CONTROL SYMBOL	
☒ SYSTEM ☐ PROJECT ☐ TASK ☐ OTHER										PAGE 3 OF 5 PAGES 2. DATE 4 June 1966	
4. TITLE SPECIAL RECONNAISSANCE AIRPLANE				5. INITIAL ☒ CHANGE		6. NUMBER 118P					
7. RESP CENTER		8. PROJECT OFFICER		9. SUPPORTS (Sys or Proj)		10. CONTRACTOR North American Aviation, Inc.		11. CONTR NR		12. PRIORITY AND PREC SECRET	
14. ITEM NUMBER	15.	TEST ITEM		16. TEST DESCRIPTION		17. TEST AGENCY AND SITE		18. TEST ITEM AVAILABLE		19. RQO TEST COMPL DATE	
7.	Airplane No. 3			Phase III Flight Testing 1. Stability and Control 2. Structural Demonstration 3. Power Plant and Performance 4. Air Force Evaluation		NAA @ Palmdale		January 1, 1963		May 31, 1965	
8.	Airplane No. 4			Phase III Flight Testing 1. Power Plant and Performance 2. Stability and Control		Air Force @ Palmdale		Feb. 1, 1963		May 31, 1965	
9.	Airplane No. 5			Phase III Flight Testing 1. Automatic Flight Control 2. Inertial Navigation 3. Stability and Control		NAA @ Palmdale		March 1, 1963		May 31, 1965	
10.	Airplane No. 6			Phase III Flight Testing 1. Cabin Systems and De-icing 2. Electrical Systems, Antennas, Hydraulics, Instruments, Communications		NAA @ Palmdale		April 1, 1963		April 30, 1965	
TEST CENTER APPROVAL											
20. NAME		ORGANIZATION				DATE					
21. NAME		ORGANIZATION				DATE					
RESPONSIBLE CENTER APPROVAL											
22. NAME		ORGANIZATION				DATE					

R & D TEST ANNEX

☒ SYSTEM ☐ PROJECT ☐ TASK ☐ OTHERPAGE 4 OF 5
S. DATE 4 June 1966
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4. TITLE SPECIAL RECONNAISSANCE AIRPLANE				5. INITIAL ☒ CHANGE		6. NUMBER 118P							
7. RESP CENTER		8. PROJECT OFFICER		9. SUPPORTS (Sys or Proj)		10. CONTRACTOR North American Aviation, Inc.		11. CONTR NR		12. PRIORITY AND PREC		13. SECURITY SECRET	
14. ITEM NUMBER		15. TEST ITEM		16. TEST DESCRIPTION		17. TEST AGENCY AND SITE		18. TEST ITEM AVAILABLE		19. RQO TEST COMPL DATE			
11.		Airplane No. 7		Phase III Flight Testing 1. Search photographic, detail photographic, and digital recorder 2. Cabin Systems and De-icing 3. Air Force Evaluation		NAA @ Palmdale		May 1, 1963		April 30, 1965			
12.		Airplane No. 8		Phase III Flight Testing 1. Radar Package (low resolution - azimuth scan) and standby airplane for high resolution radar. 2. Ferret 3. Air Force Evaluation		Air Force @ Palmdale NAA @ Palmdale		May 1, 1963		March 31, 1965			
13.		Airplane No. 9		Phase III Flight Testing 1. Radar Package (high resolution - side looking) 2. Ferret 3. Air Force		Air Force @ Palmdale NAA @ Palmdale		June 1, 1963		March 31, 1965			
14.		Airplane No. 10		Phase III Flight Testing 1. Inertial Navigation 2. Automatic Flight Control		NAA @ Palmdale		July 1, 1963		April 30, 1965			
TEST CENTER APPROVAL													
20. NAME				ORGANIZATION				DATE					
21. NAME				ORGANIZATION				DATE					
RESPONSIBLE CENTER APPROVAL													
22. NAME				ORGANIZATION				DATE					

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1. R & D TEST ANNEX ☒ SYSTEM ☐ PROJECT ☐ TASK ☐ OTHER										2. REPORTS CONTROL SYMBOL			
										PAGE 5 OF 5 PAGES			
										3. DATE 4 June 1956			
4. TITLE SPECIAL RECONNAISSANCE AIRPLANE										5. INITIAL ☒ CHANGE			
7. RESP CENTER		8. PROJECT OFFICER		9. SUPPORTS (Sys or Fms)		10. CONTRACTOR North American Aviation, Inc.		11. CONTR NR		12. PRIORITY AND PREC		13. SECURITY SECRET	
14. ITEM NUMBER		15. TEST ITEM		16. TEST DESCRIPTION		17. TEST AGENCY AND SITE		18. TEST ITEM AVAILABLE		19. RDT TEST COMPL DATE			
15. Airplane No. 11 12				Phase IV Flight Testing - Performance and Stability		Air Force @ Edwards AFFTC							
16. Airplane No. 13 14				Phase IV Flight Testing - Functional Development		Air Force @ Edwards AFFTC							
17. Airplane No. 15 16				Phase VII Flight Testing - Operational Suitability		Air Force @ Eglin Field APGC							
18. Airplane No. 17				Phase V Flight Testing - All Weather		Ladd Field and Eglin Field							
19. Airplane No. 18 19 20				To support the Contractor's or the Air Force's test program, to serve as possible replacements for assigned airplanes, and to handle additional testing requirements which always arise during complex programs of this nature.		Not specified.							
TEST CENTER APPROVAL													
20. NAME				ORGANIZATION				DATE					
21. NAME				ORGANIZATION				DATE					
RESPONSIBLE CENTER APPROVAL													
22. NAME				ORGANIZATION				DATE					

1. R & D TEST AND TEST SUPPORT AIRCRAFT ANNEX ☒ SYSTEM ☐ PROJECT ☐ TASK ☐ OTHER						2. REPORTS CONTROL SYMBOL PAGE 1 OF 3 PAGES 3. DATE 4 June 1956				
4. TITLE SPECIAL RECONNAISSANCE AIRPLANE PHASE II 1/2				5. INITIAL ☒ CHANGE		6. NUMBER 118 P				
7. ITEM NUMBER	8. QTY	9. AIRCRAFT REQUIRED TYPE, MODEL AND SERIES	10. SERIAL NUMBER	11. ASG CODE	12. DATE REQD AND LOCATION	13. ESTIMATED RELEASE DATE	14. RECOMMENDED DISPOSITION	15. EST. COST	16. EST. COST	
1 NAA	4	B-58 (Sub-contractor's sub-system development testing of the high resolution radar package, low resolution radar package, ferret package, search photographic package, and the detail photographic package.)		ES	April 1, 1960 @ NAA	June 30, 1960	Other Projects	FY-60 4-120 FY-61 1-120 2-120 3-120 4-120		
2 NAA	1	118P (Phase I, Phase II, and Phase III - Stability and Control, Power Plant Performance, and Automatic Flight Control)	Airplane No. 1	BT	Oct. 1, 1960 @ NAA	May 15, 1963		FY-61 2-30 3-60 4-21 FY-62 1-21 2-21 3-21 4-21 FY-63 1-21 2-21 3-21 4-11		
3 NAA	1	118P (CTCI, Instrumentation for Flight Test, and Phase III Flight Tests - Power Plant, Performance, and Stability and Control)	Airplane No. 2	BT	Jan. 1, 1961 @ NAA	May 15, 1963		FY-61 3-0 4-14 FY-62 1-21 2-21 3-21 4-21 FY-63 1-21 2-21 3-21 4-11		
4 NAA	1	118P (Phase III Flight Tests - Stability and Control, Structural Demonstration, Power Plant, and Performance)	Airplane No. 3	BT	April 1, 1961 @ NAA	April 30, 1963		FY-61 4-21 FY-62 1-21 2-21 3-21 4-21 FY-63 1-21 2-21 3-21 4-7		

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1. R & D TEST AND TEST SUPPORT AIRCRAFT ANNEX										2. REPORTS CONTROL SYMBOL					
☒ SYSTEM ☐ PROJECT ☐ TASK ☐ OTHER										PAGE 2 OF 3 PAGES					
4. TITLE SPECIAL RECONNAISSANCE AIRPLANE PHASE II-1/2										5. INITIAL ☒ CHANGE			6. NUMBER 118P		
7. ITEM NUMBER	8. QTY	9. AIRCRAFT REQUIRED		10. ASG CODE	11. DATE REQD AND LOCATION	12. ESTIMATED RELEASE DATE	13. RECOMMENDED DISPOSITION	14. EST COST	15. EST COST						
		TYPE, MODEL AND SERIES	SERIAL NUMBER												
5 NAA	1	118P (Phase III Flight Tests - Power Plant, Performance, and Stability and Control)	Airplane No. 4	BT	May 1, 1961 @ NAA	April 30, 1963		FY-61 4-14 FY-62 1-21 2-21 3-21 4-21 FY-63 1-21 2-21 3-21 4-7							
6 NAA	1	118P	Airplane No. 5	BT	June 1, 1961	April 30, 1963		FY-61 4-7 FY-62 1-21 2-21 3-21 4-21 FY-63 1-21 2-21 3-21 4-7							
7 NAA	1	118P (Phase III Flight Tests - Electrical System, Antennas, Hydraulics, Instruments, Communications, Cabin Systems and De-icing.)	Airplane No. 6	BT	July 1, 1961 @ NAA	April 30, 1963		FY-62 1-21 2-21 3-21 4-21 FY-63 1-21 2-21 3-21 4-7							
8 NAA	1	118P (Phase III Flight Testing - Search Photographic, Detail Photographic Digital Recorder, Cabin Systems and De-icing)	Airplane No. 7	BT	Aug. 1, 1961 @ NAA	April 30, 1963		FY-62 1-18 2-27 3-27 4-27 FY-63 1-27 2-30 3-30 4-10							

1. R & D TEST AND TEST SUPPORT AIRCRAFT ANNEX ☒ SYSTEM ☐ PROJECT ☐ TASK ☐ OTHER						2. REPORTS CONTROL SYMBOL			
						PAGE 3 OF 3 PAGES			
						3. DATE 4 June 1966			
4. TITLE SPECIAL RECONNAISSANCE AIRPLANE PHASE II-1/2				5. INITIAL ☒ CHANGE		6. NUMBER 118P			
7. ITEM NUMBER	8. AIRCRAFT REQUIRED			9. ASS CODE	10. CODE	11. DATE REQD AND LOCATION	12. ESTIMATED RELEASE DATE	13. RECOMMENDED DISPOSITION	14. EST. COST
	QTY	TYPE, MODEL AND SERIES	SERIAL NUMBER						
9 NAA	1	118P (Phase III Flight Testing - Radar Package - Low resolution - azimuth scan - and ferret.)	Airplane No. 8	BT		Aug. 1, 1961 ● NAA	April 30, 1963		FY-62 1-30 2-30 3-30 4-30 FY-63 1-30 2-30 3-30 4-10
10 NAA	1	118P (Phase III Flight Testing - Radar Package - High resolution - side looking, and ferret.)	Airplane No. 9	BT		Sept. 1, 1961 ● NAA	April 30, 1963		FY-62 1-10 2-30 3-30 4-30 FY-63 1-30 2-30 3-30 4-10
11 NAA	1	118P (Phase III Flight Testing - Inertial Navigation, Automatic Flight Control, and Stability and Control.)	Airplane No. 10	BT		Oct. 1, 1961 ● NAA	April 30, 1963		FY-62 2-24 3-24 4-24 FY-63 1-24 2-24 3-24 4-8

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1. R & D TEST AND TEST SUPPORT AIRCRAFT ANNEX ☒ SYSTEM ☐ PROJECT ☐ TASK ☐ OTHER							2. REPORTS CONTROL SYMBOL			
							PAGE 1 OF 3 PAGES			
							3. DATE 4 June 1956			
4. TITLE SPECIAL RECONNAISSANCE AIRPLANE PHASE III					5. INITIAL ☒ CHANGE		6. NUMBER 118P			
7. ITEM NUMBER	8. AIRCRAFT REQUIRED			9. ASG CODE	10. MOD REQ	11. DATE REQD AND LOCATION	12. ESTIMATED RELEASE DATE	13. RECOMMENDED DISPOSITION	14. EST COST	15. EST COST
	QTY	TYPE, MODEL AND SERIES	SERIAL NUMBER							
1. NAA	4	B-58 (Sub-contractor's development testing of the high resolution radar package, low resolution radar package, ferret package, search photographic package, and the detail photographic package.)	Sub-system	ES		Jan. 1, 1962 @ Sub-contractor's test facilities.	March 31, 1963	Other projects	FY-62 3-120 4-120 FY-63 1-120 2-120 3-120	
2. NAA	1	118P (Phase I, Phase II, and Phase III Stability and Control, Power Plant and Performance)	Airplane No. 1	BT		July 1, 1962 @ NAA	April 30, 1965		FY-63 1-30 2-60 3-21 4-21 FY-64 1-21 2-21 3-21 4-21 FY-65 1-21 2-21 3-21 4-7	
3. NAA	1	118P (CTCI, Instrumentation for Flight Test, and Phase III Flight Tests - Power Plant, Performance, and Stability and Control)	Airplane No. 2	BT		Oct. 1, 1962 @ NAA	April 30, 1965		FY-63 2-21 3-21 4-21 FY-64 1-21 2-21 3-21 4-21 FY-65 1-21 2-21 3-21 4-7	
4. NAA	1	118P (Phase III Flight Testing - Stability and Control, Structural Demonstration, Power Plant, and Performance.)	Airplane No. 3	BT		Jan. 1, 1963 @ NAA	April 30, 1965		FY-63 3-21 4-21 FY-64 1-21 2-21 3-21 4-21 FY-65 1-21 2-21 3-21 4-7	

SECRET

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1. R & D TEST AND TEST SUPPORT AIRCRAFT ANNEX ☒ SYSTEM ☐ PROJECT ☐ TASK ☐ OTHER						2. REPORTS CONTROL SYMBOL				
						PAGE 2 OF 3 PAGES				
						3. DATE 4 June 1956				
4. TITLE SPECIAL RECONNAISSANCE AIRPLANE PHASE III				5. INITIAL ☒ CHANGE		6. NUMBER 118P				
7. ITEM NUMBER	8. AIRCRAFT REQUIRED			9. ASG CODE	10. MOD NO	11. DATE REQD AND LOCATION	12. ESTIMATED RELEASE DATE	13. RECOMMENDED DISPOSITION	14. EST. COST	15. EST. COST
	QTY	TYPE, MODEL AND SERIES	SERIAL NUMBER							
5. NAA	1	118P (Phase III Flight Testing - Power Plant, Performance, and Stability and Control.)	Airplane No. 4	BT		Feb. 1, 1963 @ NAA	May 31, 1965			
6. NAA	1	118P (Phase III Flight Testing - Automatic Flight Control, Inertial Navigation, and Stability and Control)	Airplane No. 5	BT		March 1, 1963 @ NAA	May 31, 1965			
7. NAA	1	118P (Phase III Flight Testing - Cabin Systems and De-icing, Electrical System, Antennas, Hydraulics, Instruments, and Communications.)	Airplane No. 6	BT		April 1, 1963 @ NAA	May 31, 1965			
8. NAA	1	118P (Phase III Flight Testing - Search Photographic, Detail Photographic Digital Recorder, Cabin Systems and De-icing.)	Airplane No. 7	BT		May 1, 1963 @ NAA	April 30, 1966			

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1. R & D TEST AND TEST SUPPORT AIRCRAFT ANNEX ☒ SYSTEM ☐ PROJECT ☐ TASK ☐ OTHER						2. REPORTS CONTROL SYMBOL			
						PAGE 3 OF 5 PAGES			
						3. DATE 4 June 1956			
4. TITLE SPECIAL RECONNAISSANCE AIRPLANE PHASE III					5. INITIAL ☒ CHANGE		6. NUMBER 118P		
7. ITEM NUMBER	8. QTY	9. AIRCRAFT REQUIRED TYPE, MODEL AND SERIES SERIAL NUMBER		10. ASG CODE	11. DATE REQD AND LOCATION	12. ESTIMATED RELEASE DATE	13. RECOMMENDED DISPOSITION	14. FRS P E C S T	15. EST COST
9. NAA	1	118P (Phase III Flight Testing - Radar Package - Low Resolution-Azimuth Scan and Ferret)	Airplane No. 8	BT	May 1, 1963 @ NAA	April 30, 1965		FY-63 4-20 FY-64 1-30 2-30 3-30 4-30 FY-65 1-30 2-30 3-30 4-10	
10. NAA	1	118P (Phase III Flight Testing - Radar Package - High Resolution-Side Looking, and Ferret)	Airplane No. 9	BT	June 1, 1963 @ NAA	March 30, 1965		FY-63 4-10 FY-64 1-30 2-30 3-30 4-30 FY-65 1-30 2-30 3-30	
11. NAA	1	118P (Phase III Flight Test - Inertial Navigation and Automatic Flight Control)	Airplane No. 10	BT	July 1, 1963 @ NAA	April 30, 1965		FY-64 1-24 2-24 3-24 4-24 FY-65 1-24 2-24 3-24 4-8	

1. R & D MATERIEL ANNEX		2. REPORTS CONTROL SYMBOL	
☒ SYSTEM ☐ PROJECT ☐ TASK ☐ OTHER		PAGE 1 OF 1 PAGES 3. DATE 4 June 1966	
4. TITLE		5. INITIAL CHANGE	6. NUMBER
SPECIAL RECONNAISSANCE AIRPLANE PHASE II-1/2			118P
7. MATERIEL REQUIREMENTS (Indicate items in Columnar Form using Columns as cited in Examples)			
	FY-61	FY-62	FY-63
FUEL (JP-5)	2,804,000 gallons	15,020,000 gallons	13,660,000 gallons
FILM			
For Digital Recorder Cameras Radar Ferret			

1. R & D MATERIEL ANNEX ☒ SYSTEM ☐ PROJECT ☐ TASK ☐ OTHER		2. REPORTS CONTROL SYMBOL PAGE 1 OF 1 PAGES 3. DATE 4 June 1956 6. NUMBER 118P	
4. TITLE SPECIAL RECONNAISSANCE AIRPLANE PHASE III		5. INITIAL ☒ CHANGE	
7. MATERIEL REQUIREMENTS (Indicate items in Columnar Form using Columns as cited in Examples)			
FY-63		FY-65	
FUEL (X-35)	94, 190, 000 gallons		206, 390, 000 gallons
FILM			
For Digital Recorder Cameras Radar Ferret			

1. R & D FACILITIES ANNEX ☒ SYSTEM ☐ PROJECT ☐ TASK ☐ OTHER				2. REPORTS CONTROL SYMBOL PAGE 1 OF 1 PAGES 3. DATE 4 June 1956	
4. TITLE SPECIAL RECONNAISSANCE AIRPLANE PHASE II-1/2			5. INITIAL ☒ CHANGE		6. NUMBER 118P
7.	P - 100	P - 300	P - 694	OTHER	TOTAL
RESPONSIBLE CENTERS					
PARTICIPATING CENTERS					
CONTRACTOR					
OTHER					
SUB - TOTAL					
FY					
FY					
FY					
FY					
FY					
FY					
TO COMPLETE					

8. FACILITIES REQUIREMENTS Airplane Flight Test

Part V Existing Contractor Facilities - Other Pertinent Data

The general plan is to utilize the Contractor's existing Palmdale facility as the test base for the actual flight operations for the ten Ws/118 flight test airplanes. The contractor's Los Angeles facility will be used in a supporting role and will require the use of existing warehousing, Labs, Shops and Instrumentation Design and Development Offices. No additional major structures are contemplated at Palmdale or LA hangar the W/s 118 flight test airplanes. It is planned to provide separate nose-in and tail sheds for each System 118 Airplane to protect maintenance crews from the weather. The main hangar will be used occasionally to house several airplanes for specialized maintenance & preflight operations. During the period Sept. 1960 thru April 1963 approx. 19,532 sq ft of ramp space will be required as hangar space for each airplane, totaling 195,320 sq ft for all ten airplanes. A total of approx. 429,000 sq ft of ramp space is currently available at the Palmdale Test Site, and approx. 339,000 sq ft of ramp space is currently available at LA to support this program.

Current Facilities Available Are Summarized Below

<u>Los Angeles Facility</u>		<u>Palmdale Facility</u>	
Hangar	36,000 sq ft	Hangar	59,000 sq ft
Warehousing, Labs, Shops, Instrumentation	22,000 sq ft	Office, Shops, Labs, Stockroom, Engineering Office, Instrumentation, Warehousing, Storage	55,000 sq ft
Total (LA)	58,000 sq ft	Total (Palmdale)	114,000 sq ft
Ramp Area	339,000 sq ft	Ramp Area	429,000 sq ft
Land	13 Acres	Land	273 Acres

R & D FACILITIES ANNEX ☒ SYSTEM ☐ PROJECT ☐ TASK ☐ OTHER				2. REPORTS CONTROL SYMBOL PAGE 1 OF 1 PAGES 3. DATE 4 June 1966	
4. TITLE SPECIAL RECONNAISSANCE AIRPLANE PHASE III			5. INITIAL ☒ CHANGE		6. NUMBER 118P
7.	P - 100	P - 300	P - 594	OTHER	TOTAL
RESPONSIBLE CENTERS					
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8. FACILITIES REQUIREMENTS Airplane Flight Test

Part V Existing Contractor Facilities - Other Pertinent Data

The general plan is to utilize the Contractor's existing Palmdale facility as the test base for the actual flight operation for the ten w/s 118 flight test airplanes. The Contractor's Los Angeles facility will be used in a supporting role and will require the use of existing warehousing, labs, shops and instrumentation design and development offices. No additional major structures are contemplated at Palmdale or LA to hangar the w/s 118 flight test airplanes. It is planned to provide separate nose-in and tail sheds for each System 118 Airplane to protect maintenance crews from the weather. The main hangar will be used occasionally to house several airplanes for specialized maintenance and preflight operations. Special fuel storage and handling facilities will also be required. During the period June 1962 thru April 1965 approx. 38,200 sq ft of ramp space will be required as hangar space for each airplane, totaling 382,000 sq feet for all ten airplanes. A total of approx 429,000 sq ft of ramp space is currently available at the Palmdale Test Site, and approx. 339,000 sq ft of ramp space is currently available at LA to support this program.

Current Facilities Available Are Summarized:

<u>Los Angeles Facility</u>		<u>Palmdale Facility</u>	
Hangar	38,000 sq ft	Hangar	59,000 sq ft
Warehousing, Labs, Instrumentation, Shops	22,000 sq ft	Offices, Shops, Labs, Stockroom, Engineering Office, Instrumentation, Warehousing, Storage	55,000 sq ft
Total	58,000 sq ft	Total	114,000 sq ft
Ramp Area	339,000 sq ft		
Land	13 acres	Ramp Area	429,000 sq ft
		Land	273 acres

1. R & D CONTRACT FUNDS ANNEX										2. REPORTS CONTROL SYMBOL	
☒ SYSTEM ☐ PROJECT ☐ TASK ☐ OTHER										PAGE OF PAGES	
										3. DATE	
										4 JUNE 1966	
4. TITLE										9. NUMBER	
SPECIAL RECONNAISSANCE AIRPLANE PHASE II-1/2 AND PHASE III											
5. INITIAL ☒ CHANGE											
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8. PROJOR TASK NR										14. FY	
9. END ITEM CAT										15. FY	
10. CONTRACT NUMBER										16. FY	
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1. REPORTS CONTROL SYMBOL									
PAGE 1 OF 2 PAGES									
3. DATE 4 June 1956									
6. NUMBER 118P									
2. TITLE SPECIAL-RECONNAISSANCE AIRPLANE PHASE II 1/2 AND PHASE III This report is incomplete as Air Force Flight Test schedule is not available at this date.									
5. INITIAL <u>29</u> CHANGE									
7. ORGANIZATION TITLE	8. TYPE ORGANIZATION	9. JOB TITLE	10. MAN-YEARS REQUIRED		11. AFSC OR CIVILIAN CLASS SERIES CODE	12. RATED OR NON-RATED	13. PERIOD REQUIRED		
			MILITARY	CIVILIAN			FY	QUARTER	
APOC	T	Project Officer	(05)			R			
		Project engineer							
		pilot	(04)		4317E	R			
		Crew Chief	(E7)		4317E	N			
		Asst Crew Chief	(E6)		4315E	N			
		A/C Mechanics	(E5)		4315E	N			
		A/C Mechanics	(E4)		4315E	N			
		Jet Eng Tech.	(E6)		43270	N			
		Jet Eng Mech	(E4)		43250	N			
		A/C Elect Tech	(E6)		42370	N			
		A/C Elect Rprmn	(E4)		42350	N			
		A/C Hyd Rprmn	(E5)		42152	N			
		A/C Electronic	(E6)		30171	N			
		Nav Eq Mnt Tec	(E6)		30151	N			
		A/C Electronic	(E5)		30151	N			
		Nav Eq Rprmn	(E4)		30151	N			
		A/C Rad Maint	(E6)		30170	N			
		Tech	(E6)		30170	N			
		A/C Radio	(E4)		30150A	N			
		Rprmn Command	(E4)		30150A	N			

14. For additional Personnel Data use blank sheet and attach. (SEE ATTACHED SHEET)

SECRET

NO-58-454

R & D PERSONNEL AND TRAINING ANNEX

☒ SYSTEM ☐ PROJECT ☐ TASK ☐ OTHER

1. REPORTS CONTROL SYMBOL									
PAGE 2 OF 2 PAGES									
3. DATE 4 June 1956									
9. NUMBER 118P									
4. TITLE SPECIAL-RECONNAISSANCE AIRPLANE PHASE II 1/2 AND PHASE III									
5. INITIAL ☐ CHANGE									
7. ORGANIZATION TITLE	8. TYPE ORGANIZATION	9. JOB TITLE	10. MAN-YEARS REQUIRED		11. AFSC OR CIVILIAN CLASS SERIES CODE	12. RATED OR NON-RATED	12. PERIOD REQUIRED		
			MILITARY	CIVILIAN			PV	QUARTER	
APOC	T	A/C Radio Nav Equip Rprmn	(E4)		30150C	N			
		Instrumentation Technician	(E6)		31370	N			
		Photo Equip Repair Tech.	(E6)		40270	N			
		Aer Photo Tech	(E6)		23170	N			
		Aer Photographer	(E4)		23150	N			
		*Aircraft Electronic recon- nassance equip. tech.	(E7)		30174	N			
		*Aircraft Elec- tronic reconal- sance equipment rprmn.	(E5)		30154	N			
		*Automatic flight control system mech	(E5)		42450	N			
*These AFSC's do not at present appear in AFM 35-1. However the development of this weapon system at the present time indicates a need for specialists to be furnished in the fields indicated. As the development of 118P progresses a more specific explanation of the requirements for these AFSC's will be submitted.									
NOTE: Factory training will be required in the following area:									
Maintenance Electric-Electronic Hydraulics HATR 2040 N5C Autonavicator Liquid Hydrogen Handling Photo Equipment Radar Reconnaissance Auto Flight Control									

14. For additional Personnel Data use blank sheet and attach.

SECRET

ARDC FORM 115
(BLOCK 14 SUPPLEMENT)

It is not expected that there will be any unusual civilian recruiting requirements imposed by Weapon System 118P.

New skill requirements will be offered by the advanced electronic equipment involved in the radar reconnaissance and navigation systems. Handling of liquid hydrogen fuel and servicing of the aircraft will also present new problems on the Phase III version.

An unusual job hazard will be presented by the liquid hydrogen fuel used in the Phase III version. Production, storage in large quantities and the vicinity of this fuel will be a new experience for nearly all personnel required to handle it. It will be necessary to conduct considerable training for those people who will be servicing the fuel or powerplant system, or working the vicinity of this equipment.

Due to the advanced nature of the electronic equipment installed on this weapon it is recommended that the new AFSC's indicated in block 9 page 2 be considered for inclusion in the Air Force personnel structure.

1. R & D COST ESTIMATE RECAPITULATION										2. REPORTS CONTROL SYMBOL		
										PAGE	OF	PAGES
										3. DATE 4 JUNE 1956		
4. UNCLASSIFIED TITLE										6. NUMBER		
SPECIAL RECONNAISSANCE AIRPLANE PHASE II-1/2 AND III										5. INITIAL CHANGE		
ITEM		A. PREVIOUS YEARS		B. FISCAL YEAR		C. FISCAL YEAR		D. FISCAL YEAR		E. TO COMPLETE		
		600	OTHER	600	OTHER	600	OTHER	600	OTHER	600	OTHER	
7.	A. TOTAL											
CONTRACT	3. AVAILABLE											
	C. NEW REQ											
8.	A. TOTAL											
MATERIEL	B. AVAILABLE											
	C. NEW REQ											
9.	FACILITIES											
10.	MANPOWER											
11.	TRAINING											
12.	TEST ITEMS											
13.	TEST SUPPORT AIRCRAFT											
14.	SUBTOTAL											
15.	TOTAL											

1. R & D TEST ITEM ANNEX ☒ SYSTEM ☐ PROJECT ☐ TASK ☐ OTHER				2. REPORTS CONTROL SYMBOL PAGE _____ OF _____ PAGES 3. DATE 4 JUNE 1958	
4. TITLE SPECIAL RECONNAISSANCE AIRPLANE PHASE II-1/2 AND III		5. INITIAL ☒ CHANGE		6. NUMBER	
7. ITEM NUMBER	8. FISCAL YEAR REQ	9. NOMENCLATURE	10. QUANTITY	11. UNIT COST	12. OTHER COST
THIS INFORMATION NOT AVAILABLE AT THIS TIME			13. TOTAL COST		



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 88TH AIR BASE WING (AFMC)
WRIGHT-PATTERSON AIR FORCE BASE OHIO

18 Dec 2007

88 CG/SCCMF
3810 Communications Blvd
Wright-Patterson AFB OH 45433-7802

Defense Technical Information Center
Attn: Ms. Kelly Akers (DTIC-R)
8725 John J. Kingman Rd, Suite 0944
Ft Belvoir VA 22060-6218

Dear Ms. Akers

This concerns Technical Report AD158502, Special Reconnaissance Airplane Weapon System 118P, 9 Sep 1956,

Subsequent to WPAFB FOIA Control Number 06-648LK, the current distribution statement: "Distribution authorized to DoD only; Proprietary Information; 09 Sep 1956. Other requests shall be referred to Department of the Air Force, Attn: Public Affairs Office (Information Management) Washington, DC 20330." **is no longer applicable.**

The document has been reviewed by the Aeronautical Systems Center STINFO Officer within the Reconnaissance Systems Wing, 303 AESW/EN, Wright-Patterson AFB and it has been determined that the distribution statement should be changed to statement A (publicly releasable). The record is fully releasable to the public.

Point of contact is Lynn Kane at (937) 522-3091.

Sincerely

SHEREE COON
Freedom of Information Act Manager
Management Services Branch
Base Information Management Division

Attachments

1. FOIA Request
2. Cover sheets of AD158502
3. Full Citation of AD158502
4. Copy of AFMC Form 559
5. USAF Ltr to Contractor
6. Contractor Response Email to USAF