DP-2

duPONT JET TRANSPORT

MODEL SPECIFICATION

REV MAR. 6, 1984

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TITLE: Specification

MODEL: DP-2

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MODEL: DUPONT JET MODEL DP-2 REPORT NO.: DAC-3

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R E V I S I O N S

Page	Date	Page	Date	Page	Date	Page	Date
1-1	06/01/73	1-3 *	10/26/78	A-6	06/08/82		
1-3	"	1-4	"	A-7	"		
Fig.1-1	"	1-5	"	3-3	01/02/83		
3-1	"	1-6	"	3-5	"		
3-2	"	1-7	"	3-6	"		
3-3	"	3-1	"	1-5	"		
3-4	"	3-2	"	ii	06/24/83		
3-5	"	3-3	"	iii	"		
3-6	"	3-7	"	vi	"		
3-7	"	3-10	"	1-1	"		
3-9	"	4-1	"	1-6	"		
4-1	"	4-3	"	3-1	"		
4-2	"	5-4	"	3-2	"		
4-3	"	5-6	"	3-3	"		
4-4	"	6-1	"	3-4	"		
4-5	"	7-2	"	3-6	"		
5-1	"	7-3	"	3-7	"		
5-2	"	7-4	"	3-8	"		
5-3	"	7-5	"	4-1	"		
5-4	"	8-4	"	4-2	"		
Fig.7-2	"	9-4	"	4-3	"		
9-1	"	10-6	"	4-4	"		
Fig.9-1	"	10-7 *	"	4-5	"		
10-2	"	12-2	"	5-1	"		
Fig.10-2	"	15-2	10/26/78	5-5	"		
16-1	"	10-5	11/03/80	7-2	"		
A-1	"	A-6	11/14/80	7-3	Added"		
A-2	"	A-7	"	8-1	"		
A-3	"	A-8	"	8-4	Added"		
10-3	"	1-7	05/25/81	11-1	"		
3-5	11/29/74	3-3	"	13-1	"		
4-4	"	3-6	"	15-2	"		
4-5	"	3-7	"	A-8	"		
Fig.1-1	01/08/75	12-3	"				
Fig.1-2	"	A-1	09/14/81				
		A-4	"				

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MODEL: DUPONT JET MODEL DP-2 REPORT NO.: DAC-3

TITLE: SPECIFICATION

R E V I S I O N S				A D D I T I O N S			
Page	Date	Page	Date	Page	Date	Page	Date
A-6	06/08/82						
A-7	"						
3-3	01/02/83						
3-5	"						
3-6	"						
3-3	03/06/84						
3-4	"						
3-5	"						
4-1	"						
7-1	"						
7-2	"						
7-3	"						
8-1	"						
8-4	"						

INTRODUCTION

This specification describes a duPont Aerospace Company Model DP-2 Airplane powered by two General Electric CF34-1A turbofan engines.

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLE OF CONTENTS

APPENDICES

LIST OF ILLUSTRATIONS

SECTION 1
AIRPLANE GENERAL DESCRIPTION

1.1 DESCRIPTION

The airplane described in this specification is the duPont Aerospace Company duPont Jet Transport Model DP-2 airplane. The airplane shall be a composite material, pressurized, low wing monoplane. The general arrangement and the interior arrangement of the airplane shall be substantially as shown in Figure 1-1 and 1-2. Cockpit arrangement is substantially as shown in Figure 1-3.

1.2 TYPE AND PURPOSE

Two engine land plane for long range high speed transportation of passengers and cargo with capability for operation from small fields and unprepared surfaces.

1.3 SELLER's NAME AND MODEL NUMBER

duPont Aerospace Company, Inc.
DP-2

1.4 CAPACITIES FOR CREW, PASSENGERS, BAGGAGE AND CARGO

Arrangements shown in Figure 1-2.

1.4.1 Crew. Two pilots.

1.4.2 Passengers. Thirty to Forty Four.

1.4.3 Baggage. Baggage shelves 900 pounds.

1.4.4 Cargo. 10,000 pounds.

1.5 NUMBER AND TYPE OF ENGINES

Two General Electric turbofan engines as described in Paragraph 3.3 shall be used.

1.6 DEFINITIONS

The terms and abbreviations defined below shall have the meanings specified in this Paragraph 1.6 wherever used in this Specification.

a. The term "FAR" shall mean Federal Aviation Regulation promulgated by the United States Federal Aviation Agency.

b. The term "FAA" shall mean the United States Federal Aviation Agency.

c. The term "GE" shall mean the General Electric Company.

d. The term "Seller" shall mean duPont Aerospace Company,. and the term "Buyer" shall mean the purchaser of the airplane described in this Specification.

The words "provisions for," "structural provisions for," and "space provisions for" shall have the following meanings wherever used in this specification.

a. "Provisions for" a specific item of equipment or assembly or installation, shall mean that all supports, brackets, tubes and fittings, electrical wiring, hydraulic lines, etc. have been installed and adequate weight and space allocated in order that the equipment can be installed without alteration to the specific equipment or the airplane, and that no additional parts are required for installations other than the item itself. Standard stock items such as nuts, bolts, cotter pins, etc. need not be furnished by the Seller.

b. "Structural provisions for" a specific installation shall mean that the primary structure will be structurally adequate for the installation, but that brackets, bolt holes, electrical wiring, hydraulic lines, etc. will not be provided. Detail engineering designs of tubing, wiring, parts and installations will not be made. Attaching structure for a specific item will be provided only when attaching structure is part of the primary structure.

c. The term "primary structure" includes all structural components that are essential to the safety and structural integrity of the airplane. Typical examples of primary structure are: wing spars, ribs, skin and stiffeners; body bulkheads, frames, beams and skin stiffeners. The primary structure does not include items such as brackets, angles, channels, fittings or similar parts that are provided only for the purpose of attaching equipment or accessories to the primary structure.

d. "Space provisions for" a specific installation shall mean that space has been allocated for the installation but that brackets, bolt holes, electrical wiring, hydraulic lines, etc. will not be furnished, designed or installed, nor will the installation itself be furnished. "Space provisions for" does not imply that adequate attaching structure is provided, unless otherwise stated.

1.7 DEFINITIONS OF WEIGHT TERMINOLOGY

1.7.1 Operational Weights.

a. Maximum taxi weight - the maximum aircraft weight for operation on the ground.

b. Maximum takeoff weight - the maximum weight at the start of takeoff for which operation is certificated according to FAR criteria.

c. Maximum landing weight - the maximum landing weight for which operation is certificated.

d. Maximum weight for vertical takeoff and landing - the maximum aircraft weight at which the aircraft can be operated in the vertical takeoff and landing mode. The useful load may consist of any combination of fuel and payload consistent with other criteria.

e. Manufacturers weight empty - the weight of the aircraft with zero fuel and zero payload less operators items.

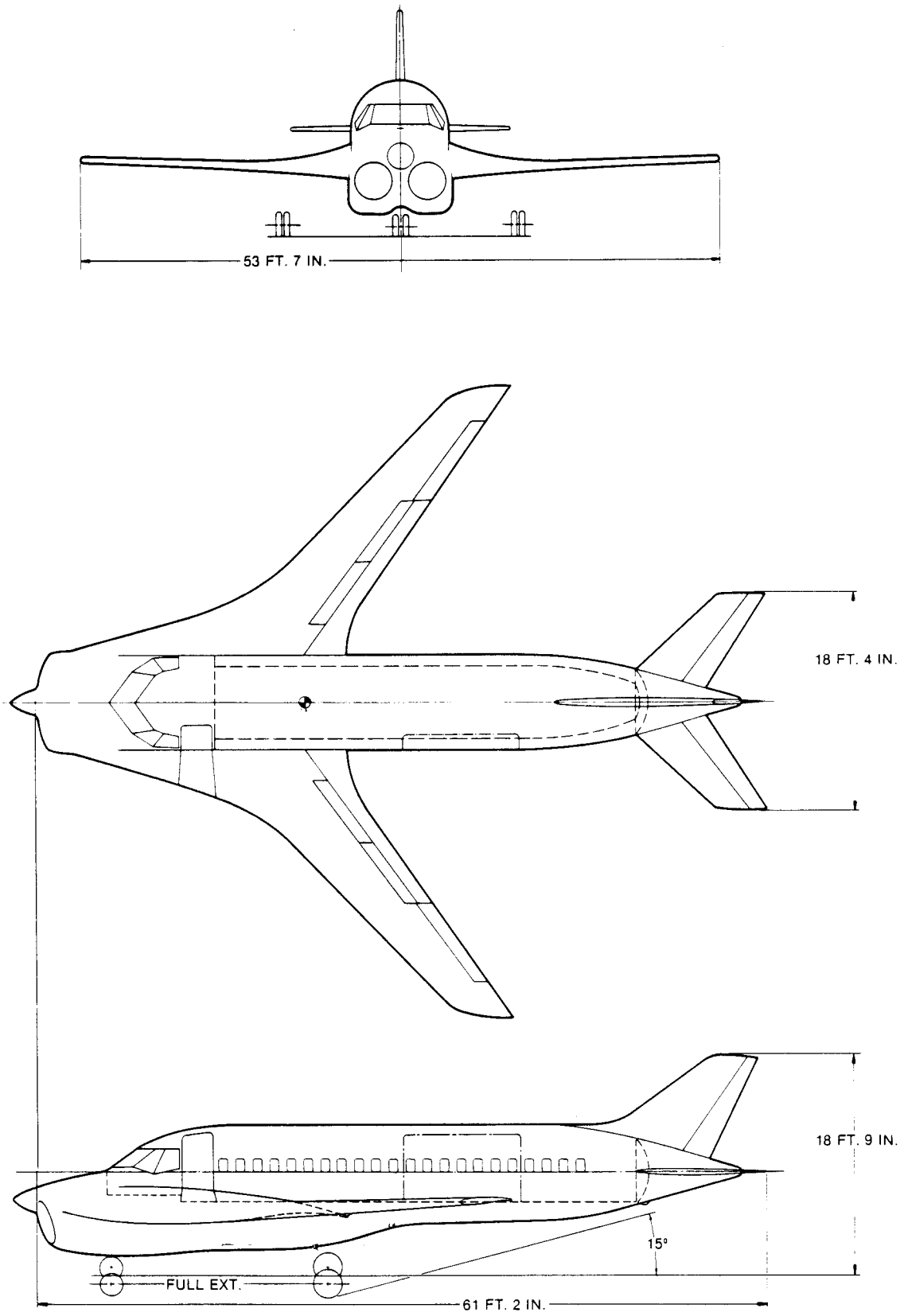
f. Allowable payload - the maximum payload that can be carried with a specific amount of fuel.

1.7.2 Structural Design Weights.

a. Design maximum weight - the maximum weight of the airplane for which FAR compliance is shown.

b. Design landing weight - the maximum weight of the airplane used in structural design for landing conditions at the maximum velocity of descent.

c. Design minimum weight - the minimum aircraft weight at which compliance is shown with FAR structural loading conditions.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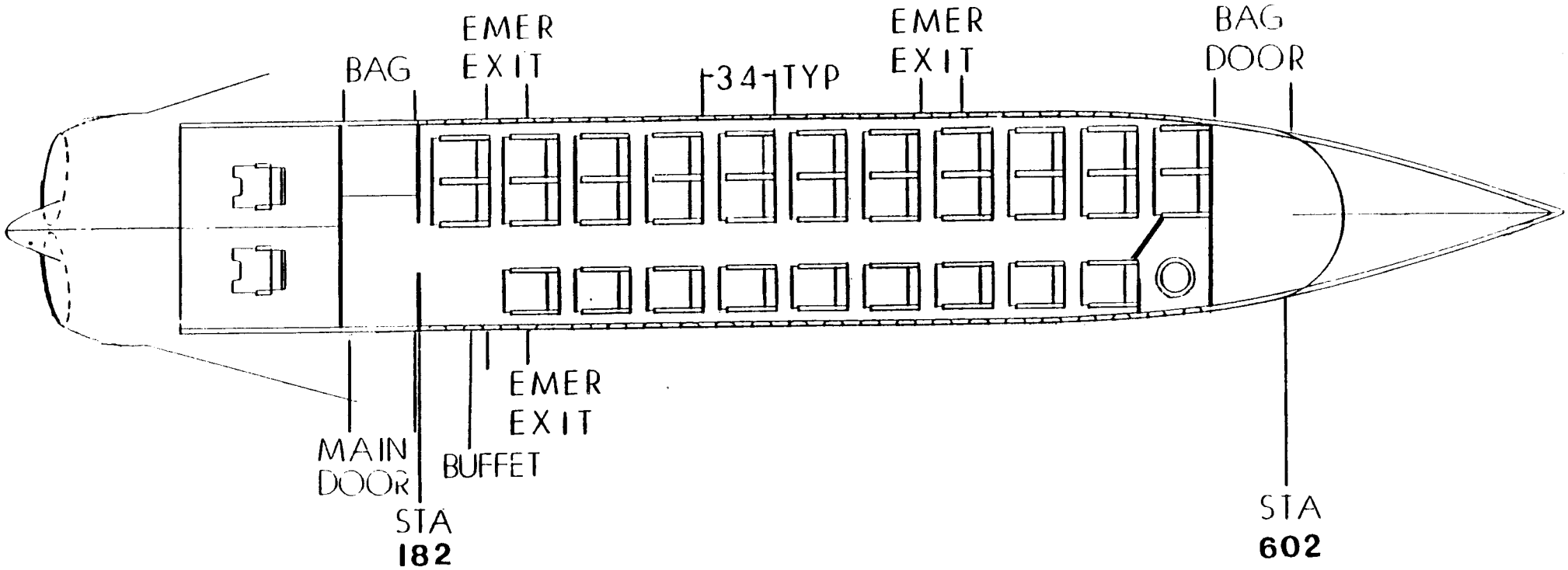
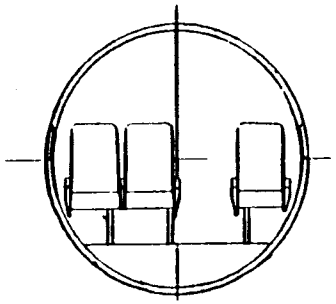
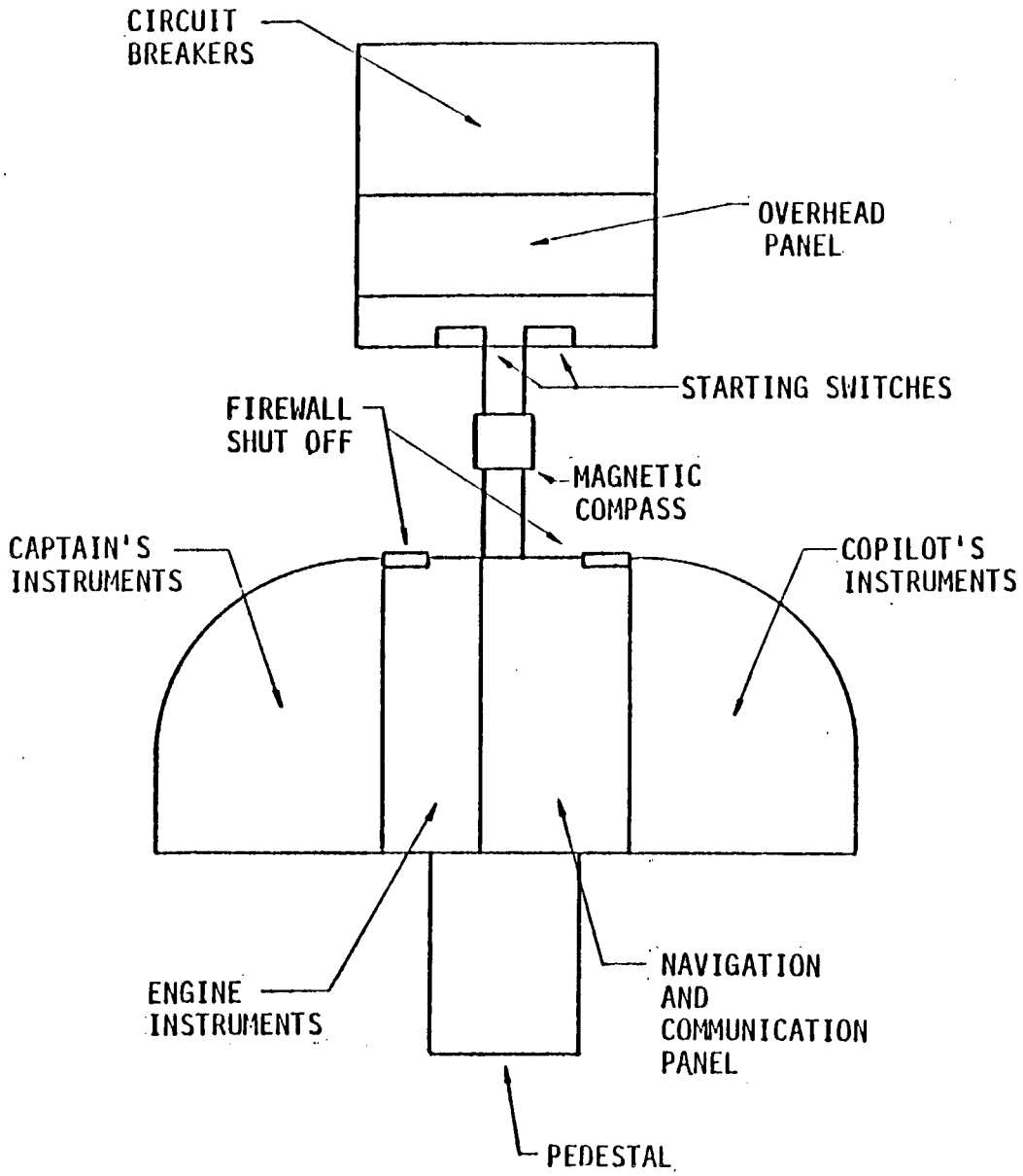
61 FT. 2 IN.





Revised June 24, 1983

FIGURE 1-2 INTERIOR ARRANGEMENT



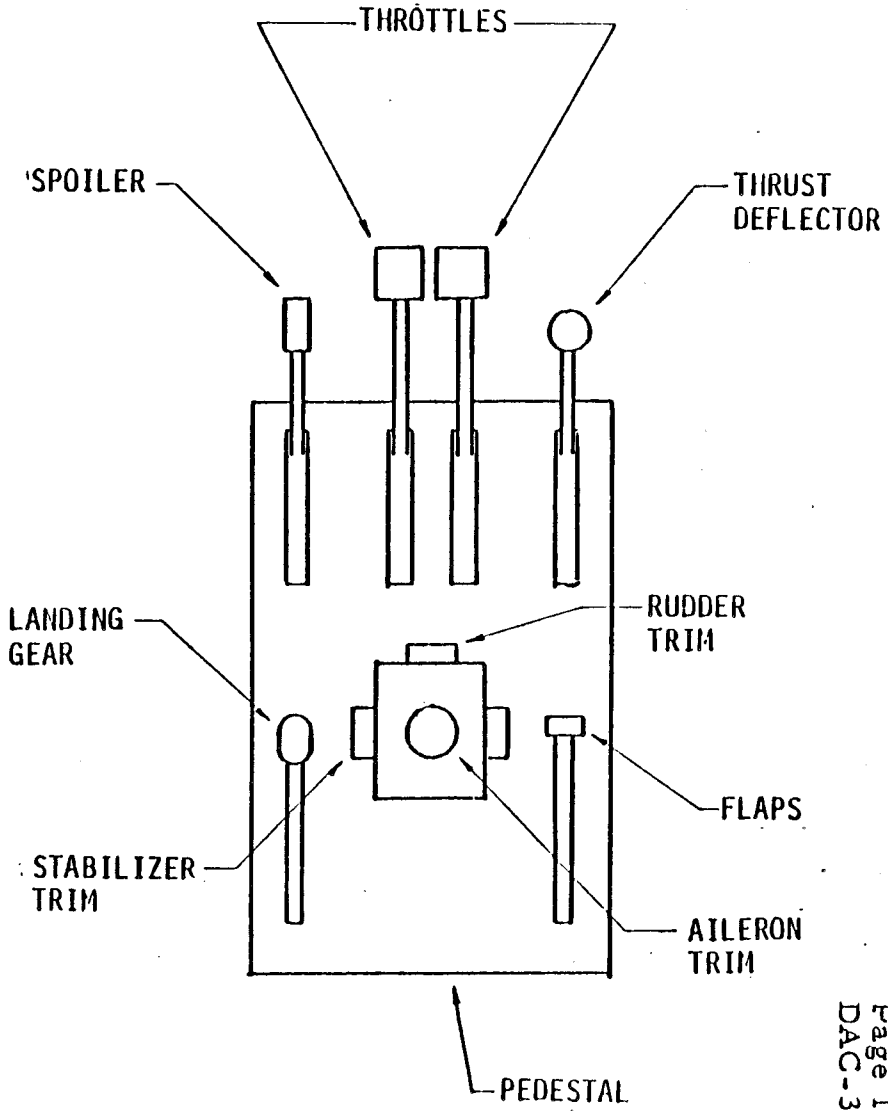


FIGURE 1-3 COCKPIT COMPARTMENT

Revised May 25, 1981

SECTION 2
GENERAL REQUIREMENTS

2.1 PURCHASE AGREEMENT GOVERNS

In the event of any conflict or discrepancy between this Specification and the Purchase Agreement, the terms specified in the Purchase Agreement shall govern.

2.2 SPECIFICATION CONTROLLING

In the event of any conflict or discrepancy between this Specification and the supplemental specifications listed below, the terms specified in this specification shall govern.

Listed below are the supplemental specifications:

a. General Electric specification No. E1130-C

b. duPont Aerospace Company Specification No. S 1001

c. duPont Aerospace Company Specification No. I 1001

2.3 CERTIFICATION

Certification of each airplane shall be in accordance with FAR Part 25 and special conditions for the duPont Jet Model DP-2.

FAA Approved Flight Manual data shall be provided to define the limitations for operation of the airplane.

The airplace and its equipment shall be so constructed that it will function satisfactorily in any temperature condsitions that will be encountered. A ground temperature range of $-40^{\circ}F$ to $+120^{\circ}F$ has been established as the range at which the airplane will operate.

2.4 WORKMANSHIP, MATERIALS, AND METHODS

Workmanship, materials, and methods in accordance with requirements of the FAA and consistent with the current state of the art for airplanes of this type shall be used in the construction of the airplane.

2.5 DESIGN CHANGES

Changes in design of the airplane as specified in this Specification shall be defined and handled as follows:

2.5.1 Development Changes. Development changes are defined as those changes from the design specified herein which duPont Aerospace Company reserves the right to make where such changes are deemed necessary to correct defects, make improvements, prevent delay, or insure compliance with the Purchase Agreement. Any such changes will not adversely affect price, delivery, weight, or performance of the Aircraft. The duPont Aerospace Company shall make available to the Buyer information on such changes in accordance with Paragraph 2.5.2.

2.5.2 Changes Required to Obtain Certification. Changes required to obtain certification are those changes described in the Purchase Agreement under the article entitled Federal Aviation Agency Approval. Any such changes may require revision of the Purchase Agreement and Specification.

The Seller may issue "Specification Revision Insert" sheets reflecting changes in current design or specification items.

2.6 METHOD OF INSPECTION AND TEST

An accurate and complete system of inspection covering all materials, fabrication methods, and finished parts shall be maintained. Inspection and testing of materials or parts shall be in accordance with procedures established by the duPont Aerospace Company and approved by the FAA.

2.7 PACKING AND MARKING

Each airplane shall be prepared by the Seller for flyaway delivery as set forth in the Purchase Agreement.

2.8 FINISH, COLORS, AND FABRICS

Protective finish and interior finish requirements shall be provided as specified in Paragraph 2.2.

2.9 UNITS OF WEIGHT AND MEASURE

All placards, nameplates, signs, stencils, instructions, etc. shall be in the English language and in the following units unless stated otherwise:

Dimension	Units
Linear	inches, feet, nautical miles
Area	sq. inches, sq. feet

Volume	cu. inches, cu. feet
Liquid Measure	fluid ounces, U. S. gallons
Weight	ounces, pounds
Speed	knots
Temperature	degrees centigrade

2.10 IDENTIFICATION AND MARKINGS

The airplane and its components shall be identified and otherwise marked to insure ease of identification in accordance with the best commercial practice.

SECTION 3
CHARACTERISTICS

3.1 DESIGN CRITERIA

3.1.1 General. The structural design shall conform to the criteria specified in FAR Part 25.

3.1.2 Design Operating Weights (See Paragraph 1.7)

a. Maximum taxi weight - 32,500 pounds

b. Maximum takeoff weight - 32,000 pounds

c. Maximum landing weight - 28,000 pounds

d. Manufacturer's weight empty - 16,338 pounds

e. Allowable payload - 10,000 pounds

3.1.3 Structural Design Weights (See Paragraph 1.7)

a. Design maximum weight - 32,000 pounds

b. Design landing weight - 32,000 pounds

c. Design minimum weight - 12,500 pounds

3.1.4 Load Factors. The limit loads specified below shall be multiplied by 1.5 to obtain ultimate load for structural design as prescribed by applicable federal aviation regulations.

a. Limit maneuver load factors

- Flaps retracted - Positive: plus 3.3
  Negative: minus 2.0
- Flaps extended - Positive: plus 2.0
  Negative: 0.0

b. Limit gust load criteria - gust load criteria shall be in accordance with FAR Part 25.

3.1.5 Limit Speeds.

a. Limit diving speeds, V_D

- Design V_D - 400 knots EAS sea level to 23,000 feet
- Design M_D - 1.00 Mach above 23,000 feet

b. Limit maximum operating speed

o* Placard V_{MO} - 350 knots CAS sea level to 29,000 feet
o* Placard M_{MO} - 0.95 Mach above 29,000 feet

*Indicated by variable pointer of airspeed indicator.

c. Limit flaps extended speed - design and placard speed

Flap Extension	Design V_{FE}	Placard V_{FE}
20 degrees	240 knots EAS	240 knots CAS
30 degrees	215 knots EAS	215 knots CAS
40 degrees	180 knots EAS	180 knots CAS

d. Landing gear operating and extended speeds

o Design V_{LO} 260 knots EAS; Design M_{LO} .82M

o Placard V_{LO} 260 knots CAS sea level to 37,000 ft.
Placard M_{LO} .80M

o Design V_{LE} 260 knots EAS; Design M_{LE} .80M

o Placard V_{LE} 260 knots CAS; Placard M_{LE} .80M

e. Spoiler speeds - extension of the spoilers to their normal operating position shall be permissible at any speed, however, the resultant position of the spoilers shall be a function of the airspeed.

3.1.6 Other Design Criteria.

a. Jacking and mooring - jacking points shall be designed for an ultimate vertical load factor and airplane weight as specified by ANC-2. The axle jacking point shall be designed for jacking the airplane at the maximum taxi weight. Mooring attachments shall be provided.

b. Towing - towing lugs shall be provided on the nose strut for attachment of a tow bar. The structure shall be designed for maximum loads as specified by ANC-2. Maximum allowable airplane weight for towing shall be 32,500 pounds.

c. Main cabin floor loading - the main cabin floor and supporting structure shall be designed for 300 pounds per square foot and a compartment weight capacity of 10,000 pounds.

d. Seat loads - seats shall be designed to the following ultimate load factors, acting separately:

FAR 25.785

- o Upward 2.0
- o Downward 4.5
- o Forward 9.0
- o Sideward 1.5

These load values shall be multiplied by 1.33 for design of seat and safety belt attachments.

e. Pressurized fuselage - the fuselage shall provide for pressurizing the compartment for the crew, passengers and baggage to a design operating pressure differential of 12.6 psi.

3.2 DIMENSIONS AND AREAS

All dimensions and areas are theoretical and are not to be used for inspection or rejection purposes.

3.2.1 Wing Group

a.	Wing Area, based on trapezoidal wing	419.22 sq. feet
b.	Span	53 feet 7 inches
c.	Root Chord	138.36 inches
d.	Tip Chord	50.33 inches
e.	Mean Aerodynamic Chord (MAC) (leading edge at fuselage sta.)	101.255 inches 246.280
f.	Sweepback - at 25% chord	42 degrees, 14.5 minutes
g.	Aspect Ratio	6.849
h.	Taper Ratio	.364
i.	Airfoil Section	Modif. Whitcomb supercritical airfoil
j.	Incidence 2.5 degrees	(Relative to Ref. Plane of supercritical wing)
k.	Dihedral 5.0 degrees	(Relative to Ref. Plane of supercritical wing)
l.	Root Thickness	12.4% (Actual chord at side of fuselage)

m. Tip Thickness (streamwise chord)	9.0%
n. Flap Area (total)	73.7 square feet
o. Flap Span (each)	161 inches
p. Flap Extension	40 degrees
q. Spoiler Area (total)	27.6 square feet
r. Spoiler Span (each)	132 inches
s. Spoiler Extension (maximum)	65 degrees

3.2.2 Control Surfaces

a. Aileron Area, total aft of hinge line	15.4 square feet
b. Aileron Span	92 inches
c. Aileron Deflection	up, 20 degrees down, 20 degrees

3.2.3 Tail Group

a. Horizontal Tail Surfaces

1. Span	18 feet 4 inches
2. Area (total)	114.58 square feet
3. Root Chord	100 inches
4. Tip Chord	50 inches
5. Aspect Ratio	2.93
6. Taper Ratio	.50
7. Airfoil Section	supercritical airfoil
8. Thickness Ratio	10.0%
9. Sweepback - at 25% chord	44 degrees 10 minutes
10. Incidence (variable)	up, 5 degrees down, 15 degrees

11.	Dihedral	Zero
12.	Elevator Area (total)	27.7 square feet
13.	Elevator Deflection	up, 25 degrees down, 10 degrees

b. Vertical Tail Surface

1.	Area total excluding dorsal fin	53.5 square feet
2.	Root Chord	114 inches (L.E. at Sta.572)
3.	Tip Chord	48 inches
4.	Aspect Ratio	1.17
5.	Taper Ratio	.315
6.	Airfoil Section	supercritical airfoil
7.	Thickness Ratio	12.0%
8.	Sweepback - at 25% chord	50 degrees
9.	Rudder Area, aft of hinge line	13.8 square feet
10.	Rudder Deflection	25 degrees

3.2.4 Alighting Gear

a. Wheel Size

1.	Main Gear	26 x 6.6 inches
2.	Nose Gear	18 x 4.4 inches

b. Tire Size

1.	Main Gear	26 x 6.6 inches
2.	Nose Gear	18 x 4.4 inches

c.	Tread (at strut centerline)	19 feet 7 inches
d.	Wheel Base	18 feet 5 inches

e. Vertical Travel of Axle from Extended to Full Compressed Strut Position

1.	Main Gear	16.5 inches
2.	Nose Gear	16.5 inches

3.2.5 Fuselage

a. External

1.	Length	60 feet 7 inches
2.	Maximum Cross Section	
	(a) Height	10 feet 6 inches
	(b) Width	8 feet
3.	Static Ground Angle (nose up)	0
4.	Height Over Highest Fixed Part of Aircraft	18 feet 9 inches
5.	Maximum Ground Angle (tail down)	15 degrees

b. Internal

1.	Length of Cabin (from aft of crew compartment to back of last seat row	34 feet 0 inch
2.	Height of Cabin	6 feet 5 inches
3.	Length from last seat row to pressure bulkhead	4 feet 0 inches
4.	Rudder Pedal Movement	3 inches forward and aft
5.	Elevator Control Column Movement (at wheel center)	5 inches forward 8 inches aft
6.	Aileron Control Wheel	
	(a) Left	120 degrees
	(b) Right	120 degrees
7.	Wing Flap Control Handle Movement	90 degrees
8.	Throttles, Maximum Movement (cut-off to maximum)	90 degrees

3.3 ENGINE DATA

3.3.1 General. The airplace shall be equipped with two General Electric CF34-1A turbofan engines.

3.3.2 Manufacturer's Specification. See Paragraph 2.2 for applicable engine specification.

3.3.3 Engine Performance. The sea level static standard day performance as guaranteed by General Electric under U. S. Standard Atmosphere 1962 conditions is given in the following table:

Engine Performance	Jet Thrust Lb.	Specific Fuel Consumption Lb/Hr/Lb Thrust
Takeoff (5 minutes)	9,140	.365
Maximum Continuous	8,980	.363
Ground Idle	474 (max)	375 (Max fuel flow, lb/hr.)

3.4 ESTIMATED WEIGHTS

3.4.1 Airplane Weight and Balance Loading Summary (Example)

		Pounds
Manufacturers Weight Empty		16,338
Operators' Items		
Two Pilots + Stewardess	465	
Pilots' + Stewardess's Baggage	100	
Engine Oil (3 gal.) @7.4 lbs/gal,	22	
Unusable Fuel	60	
Toilet Chemicals	20	
Refreshments	30	
Operating Weight Empty		17,035
Thirty Passengers @ 170 lbs.	5,100	
Baggage	900	
Fuel(1,338 gal.)@6.7 lbs/gal.	8,965	
Maximum Takeoff Gross Weight		32,000

3.4.2 Weight Empty

a. Manufacturer's weight empty - the manufacturer's weight empty shall be 16,338 pounds.

3.5 BALANCE

Permissible Center of Gravity Limits (% of MAC). The allowable center of gravity limits shall be:

Gross Weight 28,000 pounds and below

0% (± 2%) and 35% (± 2%)

Gross Weight 32,000 pounds

4% (± 2%) and 33% (± 2%)

3.6 AIRCRAFT PERFORMANCE

3.6.1 Guaranteed Performance. All speeds are true air speeds.

Speed in level flight at 40,000 feet pressure altitude. Gross 26,000 pounds.	545 knots ± 5%
Range at a pressure altitude of 40,000 feet with a usable fuel load of 8,000 pounds and a gross weight of 28,000 pounds.	2,600 n. mi. ± 250 n. mi.
Pressure altitude at which the gradient of climb in the one engine inoperative enroute configuration equals 1.1%. The other engine is operating at maximum continuous thrust. Gear and flaps are retracted. Gross weight equals 26,000 pounds.	29,000 ft ±3,000 ft.
Pressure altitude at which the gradient of climb in the second segment takeoff climb configuration equals 2.4% with one engine inoperative and the other engine operating at maximum takeoff thrust available at that altitude. Flaps are in the takeoff position and the gear is retracted. Gross weight is 28,000 pounds.	21,800 ft. ±2,500 ft.
Pressure altitude at which the gradient of climb in the approach configuration equals 2.1% with one engine inoperative and the other engine operating at the takeoff thrust available at that altitude. Flaps are in the approach setting and the gear is extended. Gross weight is 24,000 pounds.	12,000 ft. ±2,500 ft.

FAA takeoff runway length at sea level for airports without obstacles. Flaps are in the takoff position. Gross weight is 28,000 pounds.	3,000 ft. ± 300 ft.
FAA landing runway length at sea level for airports without obstacles. Gross weight is 24,000 pounds.	3,000 ft. ± 300 ft.

3.6.2 Conditions for Guaranteed Performance. Guaranteed performance is based on U. S. Standard Atmosphere, 1962. All FAR guarantees are based on Special Civil Air Regulation No. SR 422B issued and effective 9 July 1959. Guarantees are contingent upon achieving in-flight thrust and fuel consumption specified in General Electric Model Specification No. E 1130C dated 17 March 1972 for the TF34-GE-2 engine. Guaranteed range performance and level flight speed performance include allowance for normal bleed and power extraction. Normal bleed is defined as that required to maintain a sea level cabin altitude. No allowances are made for warm up, taxi, takeoff, maneuver, climb, wind, ice protection, or descent.

3.6.3 Takeoff and Landing Data. All takeoff and landing data are for hard surface, level, dry runways with no wind and without use of thrust reversers but with use of deflected thrust. Landing performance is based on main gear actuated spoilers. Aircraft shall be certificated for operation for a maximum of 5 minutes at takeoff thrust throughout the range of certificated takeoff temperatures and altitudes.

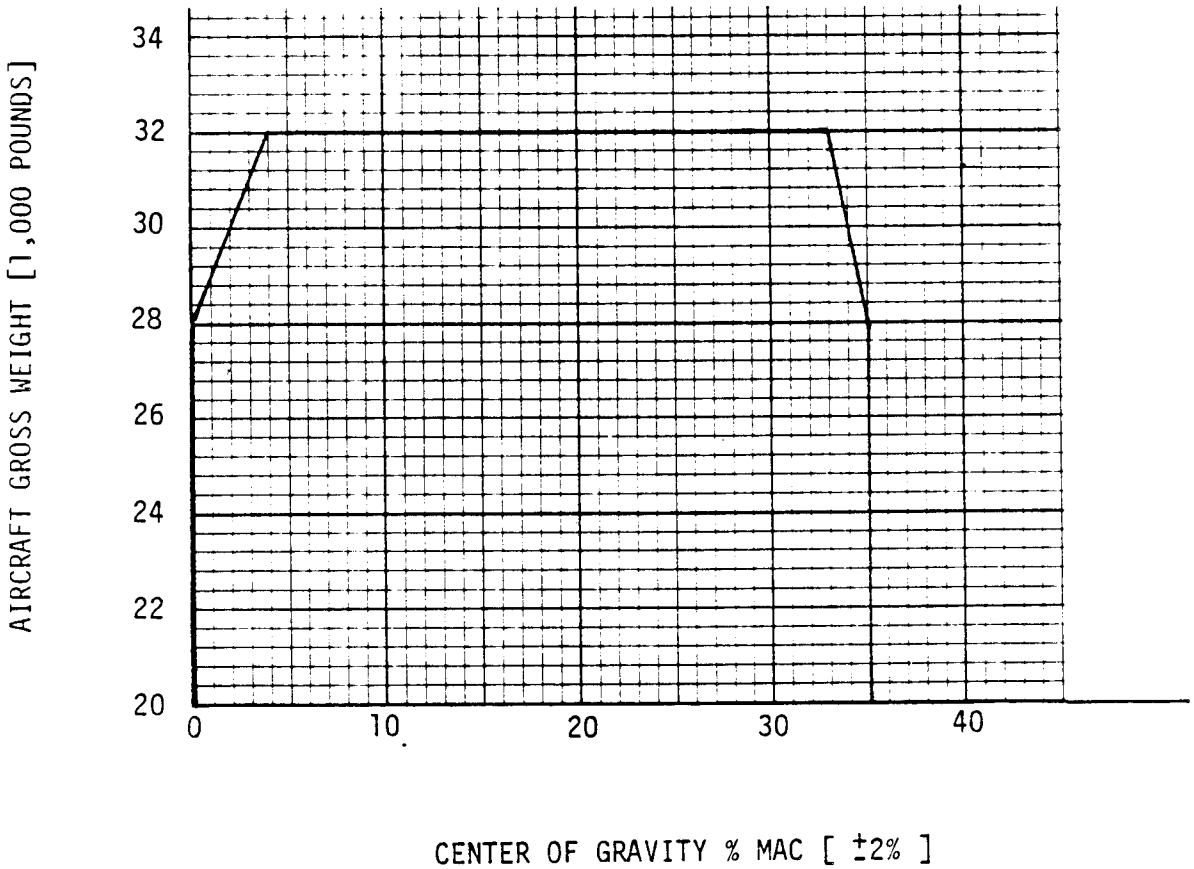


FIGURE 3-1 ALLOWABLE C. G. LIMITS

SECTION 4
STRUCTURE

4.1 GENERAL

4.1.1 Materials. In general, the materials used in the structure shall be epoxy resin impregnated materials, such as aramid, graphite and fiberglass fibers; honeycomb cores of resin impregnated aramid fiber or aluminum; foam cores; and aluminum alloy, titanium and steel in sheet stock, pressed and milled parts, castings and forgings. All materials with the exception of the thrust diverter and nozzle, shall be painted or coated with epoxy. Material strength shall be based on Sikorsky Air- craft specifications for composite structures, MIL-HDBK-5 and other commercially recognized material specifications. Miscellaneous hardware shall, in general, be selected from existing AN and MS Aeronautical Standards.

4.1.2 Jacking and Hoisting Provisions. Jacking and hoisting provisions shall be described in Section 14 of this specification.

4.1.3 Drainage. Drainage shall be provided at points where water, moisture, condensation, or flammable liquids may collect.

4.1.4 Smoothness. The smoothness criteria of the structure as determined by the Seller shall be compatible with the speed characteristics of the airplane.

4.2 WING GROUP

4.2.1 General Description. The fully cantilevered, swept back wings shall be of all composite one-piece construction, mounted to the carry through spars and joined at the edges of the fuselage. The wing shall incorporate trailing edge flaps, ailerons, main landing gear, integral wing fuel tanks and spoilers located on top of the wing forward of the flaps. The dimensions of the wing shall be as indicated in Paragraph 3.2.

4.2.2 Basic Structure. The primary wing structure shall be of composite material bonded to form an integral structure of skins, ribs and spars. The wing structure shall be designed for the use of integral fuel tanks.

The leading edges shall be integral with the wing.

4.2.3 Wing Attachment. The wing shall be attached to the fuselage at hard attachment points designed to prevent wing deflections from inducing secondary loads into the pressurized portion of the fuselage.

The trailing edge fairings ahead of the flaps shall be attached to the rear spar and shall consist essentially of composite construction.

4.2.4 Aileron. Two ailerons shall be provided, one left and one right. Mass balance shall be obtained by weights distributed spanwise along the leading edge. The structure shall consist of composite construction and shall be attached to the rear wing spar by three hinges.

4.2.5 Flaps. Double slotted wing trailing edge flaps shall be provided and shall be of composite construction, extending aft as they are actuated.

4.3 EMPENNAGE

The empennage shall include a fixed vertical fin, a movable horizontal stabilizer, rudder and elevators.

4.3.1 Fixed Vertical Surfaces.

a. Vertical Stabilizer - the vertical stabilizer shall be of composite construction and attached to the fuselage structure by means of bolts.

b. Vertical Stabilizer Tip - the vertical stabilizer tip shall be constructed of composite material and attached to the vertical stabilizer with screws.

c. Dorsal Fin - a dorsal fin, constructed of composite material shall be attached to the fuselage ahead of the vertical stabilizer.

d. Tail Bumper - a tail bumper shall be located on the lower side of the fuselage opposite the vertical fin.

4.3.2 Horizontal Stabilizer. The horizontal stabilizer shall be of composite construction. The incidence of the stabilizer shall be changed by redundant hydraulic actuators in response to movement of the control column. Longitudinal trim shall be accomplished by adjusting the null point of the control column feel springs.

4.3.3 Rudder. The rudder shall be of composite construction and attached to the vertical stabilizer at three hinge points. The surface shall be aerodynamically balanced and shall incorporate static balance weights to mass balance the surface.

4.3.4 Elevators. The elevators shall be of composite construction. They shall be inter-connected with a torque tube and attached to the horizontal stabilizer at four

hinge points. Each elevator shall be aerodynamically balanced and shall incorporate static balance weights to mass balance the surfaces.

4.4 BODY GROUP

4.4.1 General Description. the body shall be composed of the air intakes, engine compartment, cockpit, engine exhaust duct, passenger compartment and tailcone. The main body section shall enclose the wing carry through structure, and provide the required wing attach points.

The dimensions of the body shall be substantially as shown in Paragraph 3.2.5.

4.4.2 Basic Structure. The fuselage shall be of composite construction incorporating a full monocoque stressed skin structure.

4.4.3 Interior Arrangement. The pressurized compartment shall consist of the area encompassing the crew compartment and cabin compartment. The structure shall be designed to withstand a pressure differential of 16.7 psi without permanent structural deformation.

For further description of the crew compartment and cabin compartment, see Section 2.

4.4.4 Windshield. The windshield sections shall consist of outer and inner vinyl bonded glass panels and shall have the best obtainable optical characteristics.

4.4.5 Windows. Passenger cabin windows shall be rectangular in shape. Cabin windows shall be approximately 9 inches wide by 14 inches high. Fourty-four windows, twenty-two on the right side of the fuselage and twenty-two on the left, shall be provided in the cabin. The outer pane and the inner fail-safe panel shall be of stretched acrylic. A third inner acoustic pane shall be provided which shall be able to withstand the cabin pressure differential in an emergency.

4.4.6 Doors and Emergency Exits. The main entrance door shall be located on the left side of the cabin forward of the wing and the emergency exits shall be on either side of the cabin above the wing, and on the right side behind the wing. A baggage loading door is located in the rear on the right side of the airplane. The baggage door, entrance door and emergency escape hatches shall be designed for reliability and ease of operation.

A one-piece passenger door, 31 inches wide by 65 inches high shall be located on the left side of the airplane, forward of the wing and open outward. The entrance door shall contain integral steps to form a stairway for entrance to the cabin and crew compartment and when closed shall form an integral part of the fuselage structure. It shall be possible to open the entrance door from either inside or outside of the airplane.

Two plug type passenger emergency exits, approximately 19 by 26 inches shall be located over the wing, one on each side of the fuselage, and shall be removable from inside the airplane. One plug type passenger emergency exit, approximately 20 by 44 inches shall be installed on the right side of the fuselage aft of the wing. The main entrance door shall also serve as an emergency exit on the left side of the airplane.

Means shall be provided at the entrance door and baggage door to warn the crew when the doors are not closed and fully locked. Door stops and catches shall be provided for the entrance doors to hold the doors in the open position.

4.4.7 Flooring. The cabin flooring arrangement shall provide for track mounted passenger seats. Tracks shall be flush with the cabin floor. The cabin compartment floor shall be resistant to absorption of water.

4.5 LANDING GEAR

4.5.1 General Description. The landing gear shall be of tricycle arrangement with principal dimensions as shown on Figure 1-1. The landing gear and support structure shall be designed for a limit sinking speed of 10 ft/sec at design landing weight and 20 ft/sec at VTOL weight. It shall be fully retractable and completely contained within the airplane contour. Refer to Section 8 for details of landing gear operations.

4.5.2 Main Gear. Dual wheels shall be mounted on each main shock strut, retracting inboard into the wing. Outboard fairing doors shall be actuated by attachment to each strut. Inboard wheel well doors shall be hinged at the inboard side.

The main landing gear structure shall be constructed of aluminum alloy and steel. The shock strut outer cylinder shall be forged aluminum.

4.5.3 Nose Gear. The nose gear shall consist of dual wheels supported by a forward retracting vertical shock strut. The nose gear shall be constructed of aluminum alloy and

steel. Doors shall be provided on either side of the nose wheel well. which shall completely enclose the nose gear when retracted.

4.5.4 Wheels and Brakes, Tires. The aircraft shall be equipped with dual wheels on the main landing gear struts and dual wheels on the nose landing gear strut. Tires shall be tubeless. Four multiple disc type brakes shall be used, one with each main landing gear wheel.

4.5.5 Steering. The nose gear shall be provided with wheel controlled steering. The maximum steering angle shall be 10 degrees each side of center with full wheel deflection for takeoff and landing and 75 degrees each side of center for taxi. The nose wheel will automatically center during retraction. Full time shimmy damping shall be provided.

4.5.6 Tail Support. A tail support shall be provided in the aft fuselage for use of tail stands when performing maintenance.

4.5.7 Brake System. Multiple disc hydraulic brakes shall be installed on each of the four main gear wheels. Actuation of the brakes shall be by power brake valves selectively controlled by toe pressure on the rudder pedals. It shall be possible for either the pilot or co-pilot to operate the brakes. A parking brake control shall be located in the cockpit convenient to the pilot. Automatic braking shall be provided to stop wheel rotation during retraction.

4.5.8 Emergency Brake System. In case of hydraulic system failure, an emergency air system is incorporated to provide manual control of braking with air pressure.

4.6 ENGINE COMPARTMENT

4.6.1 General Description. The engine compartment shall be of composite construction. Fire protection shall be provided in critical structural areas. Access panels shall be provided for normal checking and maintenance. Removable panels shall be provided for ease in maintenance and engine removal.

The engines will be mounted to the forward cockpit bulkhead and to the cockpit floor structure. The engines shall be attached by fittings located on the top of the engines.

4.6.2 Engine Mounting. The engine mounting system shall be statically determinate and free from undesirable vibratory responses.

SECTION 5
POWER PLANT

5.1 ENGINE

The airplane shall be equipped with two GE CF-34-1A turbofan engines in accordance with the GE specification listed in Paragraph 2.2.

The engine shall be supported by two engine mounts with attachment at 2 points on the engine. Support fittings shall be designed to allow for thermal expansion of the engine.

The thrust of each of the engines shall be controlled by individual throttle levers located on a pedestal between the pilot and co-pilot. The levers shall be connected to the engines by means of push-pull control and linkage systems. Means shall be provided to prevent throttle lever creep. The throttles shall also control the "cutoff" functions of the engines. Positive stops shall be provided in the quadrant to hold the throttle levers in the "off" position and to prevent inadvertent reduction of thrust below "idle."

5.2 ENGINE ACCESSORIES

Engine accessories shall be provided as listed in Appendix 1-A in addition to the accessories furnished with the engine in accordance with the GE specification listed in Paragraph 2.2.

5.3 EXHAUST SYSTEM

The exhaust system shall consist of a composite tailpipe attached to the rear flange of the fan case leading to a stainless steel thrust vectoring cascade. The thrust vectoring cascade and nozzle door shall be designed to retract to a forward thrust position in the absence of actuator loads. The exit of the cascade shall contain a means of trim and control of the thrust vector.

5.4 STARTING SYSTEM

5.4.1 General Description. Each engine shall be fitted with a starter-generator. It shall be possible to energize the starter from the aircraft battery or an external power source.

A separate switch shall be provided for each starter-generator. Each switch shall be labeled "Start," "Off," "Generator." The spring loaded start position shall

energize the starter and ignition circuits. When sufficient engine rpm is attained, electrical circuitry shall de-energize the ignition. The "Generator" position of the switch connects the starter-generator to the aircraft's electrical system.

5.4.2 Ignition System. An ignition control switch shall be provided for each engine labeled "Airstart," "Off," "Normal." The "Normal" position shall be used for normal ground starting, ignition being energized simultaneously with the starter. The "Off" position shall de-energize the ignition for motoring the engine without ignition. The "Airstart" position shall energize the ignition directly and continuously as long as the switch is in the "Airstart" position.

5.5 ENGINE LUBRICATION SYSTEM

The engine lubrication system, including the oil tank, and fuel-oil heat exchanger, shall be an integral part of the engine. For detailed description of the lubrication system, refer to the engine manufacturer's specification listed in Paragraph 2.2. A steel oil tank shall be mounted on each engine. The capacity of the oil tank, exclusive of expansion space, shall be 1.5 gallons of which 1.1 are usable. A small quick opening door shall be provided in the engine compartment for checking and filling the oil tank.

A dual oil pressure gage shall be installed on the pilot's instrument panel and engine oil shall be used in accordance with GE specifications.

5.6 COOLING SYSTEM

The engine compartment shall be cooled by means of an air inlet at the forward end of the engine strut fairing and an exit at the rear of the core engine cowling. This cooling air flow shall be sufficient to keep all accessories well below their maximum permissible temperature operating limits.

5.7 ENGINE INSTRUMENTS

Instruments on the pilot's panel shall be provided for measuring the following for each engine:

a. EPR (engine pressure ratio)

b. Exhaust Gas Temperature

c. Engine RPM

d. Fuel Flow (Dual); Oil Pressure (Dual)

The two-inch indicators, centrally located on the panel in a vertical line of four, shall read from top to bottom.

5.8 FUEL SYSTEM

5.8.1 General Description. An independent fuel system shall be provided for each engine with an emergency means of supplying fuel pressure in case of primary boost pump failure. The fuel system shall be substantially as shown on Figure 5-1.

5.8.2 Fuel. The fuel tanks, tank sealant and all fuel system components shall be designed structurally and from a fuel resistance standpoint to be suitable for kerosene type fuels, including 30% aromatic fuels.

5.8.3 Operating Limits. The fuel system shall be designed for operation at any altitude up to the absolute ceiling of the airplane.

5.8.4 Fuel Tanks. The fuel tank arrangement and approximate capacities shall be substantially as shown on Figure 5-1. The integral wing tank shall have a system of vents and flapper valves to allow fuel to flow inboard and restrict outboard flow. The compartments formed by the spars and ribs shall all be interconnected, allowing fuel to flow by gravity to the wing root with a minimum of trapped fuel.

5.8.5 Fuel Boost and Transfer Pump Locations. Two submerged main fuel boost pumps shall be located in the wing sumps such that the pump inlets will not be uncovered in any normal flight condition or maneuver for which the airplane is intended. The pumps shall be located so that there is a minimum of unusable fuel.

5.8.6 Sump Drains. Sump drains shall be provided at the lowest point of each tank with the aircraft in taxi attitude. Each drain shall discharge clear of all portions of the airplane and shall be provided with a means for positively locking the drain in the closed position.

5.8.7 Fuel Boost Pumps. Two fuel jet powered main fuel boost pumps, one in each tank, shall be capable of supplying sufficient fuel flow and pressure to meet the maximum engine requirements at all altitudes and flight conditions. The pressurized fuel flow to operate the boost pumps is

supplied by the engine fuel pumps. Pressure switches, which illuminate lights in the cockpit, shall be provided as a means of indicating inadequate fuel pressure.

5.8.8 Fuel Usage Sequence. All fuel is contained in two wing tanks from which the boost pumps supply fuel to the engines. The main boost pumps shall draw fuel from the interconnected wing sump compartments making all fuel available to either main boost pump.

Fuel sequence controls shall not be required to maintain the center of gravity within limits.

5.8.9 Fuel Filters. Each pump inlet shall be equipped with an 8-mesh strainer. Each main fuel supply line to the engine shall be equipped with a low pressure filter equipped with a bypass that shall permit the fuel flow required under takeoff thrust conditions.

5.8.10 Fuel Flowmeter Installation. A flowmeter shall be installed for each engine.

5.8.11 Vent System.

a. Design conditions - the vent system shall maintain all tank and dry bay cavity pressures within the limits under the following conditions of operation:

- o Maximum emergency descent rate with empty tanks
- o Maximum rates of climb with kerosene or JP-4 fuels

b. Internal tank pressure - the vent system shall be designed to maintain a positive internal differential pressure in all tanks.

c. Vent outlet location - the vent outlets for the fuel system shall be located at the wing tip.

5.8.12 Fuel Heaters. A fuel heater is provided as part of the engine fuel system.

5.8.13 Fuel Quantity Measurement. Float type fuel quantity sensors shall be located in each wing tank.

One fuel quantity gage shall be arranged to read the total quantity in pounds of fuel in both tanks, or each individual tank as selected by a switch in the cockpit.

5.8.14 Fueling. Wing tanks shall be fueled directly through a filler cap located on the top of the right wing forward fillet. Fuel shall flow by gravity into all compartments of the wing tanks through holes in the spars and ribs

provided for this purpose. Air replaced by the fuel shall escape through vent holds in the upper portion of the ribs and spars.

5.8.15 Defueling. It shall be possible to completely drain the fuel tanks by disconnecting the fuel lines at the engine.

5.9 COWLING

The engine cowling shall consist of a forward section and readily removable lower section and upper and lower core engine sections. The anti-iced portion of the inlet and duct shall be removable. Quick opening inspection and access doors shall be provided for normal inspection functions and checking oil quantity.

5.10 ENGINE COMPARTMENT DRAINAGE AND VENTING

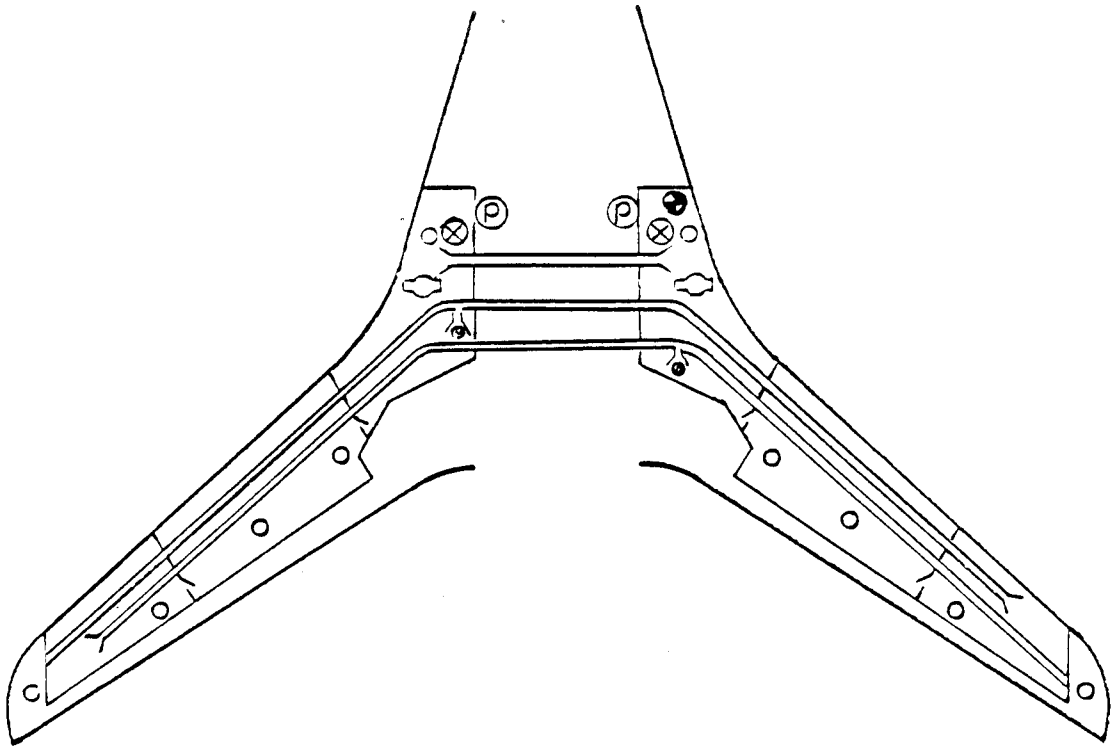
All drain lines which provide drainage of combustible fluids shall be fabricated of stainless steel tubing or fireproof hose. All others shall be aluminum alloy.

5.11 FIRE PROTECTION

The composite fire-resistant walls of the engine nozzle shall provide a firewall between the cockpit and the engine compartment.

5.11.1 Fire Warning System. A 28v DC continuous wire type detection system shall be provided for each engine compartment. The warning lights shall be located on the pilot's readout panel. Means shall be provided to enable the pilot to check the integrity of the system.

5.11.2 Firewall Shut-Off Handles. Two firewall shut-off handles shall be located accessible to both pilot and co-pilot. These two handles manually actuate shut-off valves in the fuel, bleed air and hydraulic lines. Pulling of these handles will shut off fluid flow to the respective engine compartment in case of fire warning.



FLAPPER CHECK VALVE

VENT FLOAT DRAIN VALVE

VENT STANDPIPE

FUEL BOOST PUMP

FILL POINT

DIP STICK

SUMP DRAIN VALVE

FIGURE 5-1 FUEL SYSTEM

SECTION 6
INSTRUMENT AND CONTROL PANELS

6.1 GENERAL

All flight, engine and miscellaneous instruments, in addition to all radio controls, shall be located on the main instrument panel. The main instrument panel shall be divided into five individual panels, each of which shall be removable without interference with the other panels. A glare shield shall be provided above the instrument panel.

The flight, engine and miscellaneous instruments as specified in Appendix 1-B, shall be installed. All standard instruments shall be graduated per Paragraph 2.9.

Instrument panels shall be hard mounted. Vibration isolation shall be provided at the instrument as required to insure instrument accuracy.

6.2 INSTRUMENT AND CONTROL PANEL ARRANGEMENT

The arrangement of instruments and instrument panels and the radio control panels shall be located in full view and within easy reach of the pilot.

6.3 PILOT'S AND CO-PILOT'S CONSOLES

The side consoles for the pilots shall be arranged so that all switches and controls are easily accessible.

6.4 CENTER CONTROL PEDESTAL

The control pedestal shall be located between the two cockpit seats with all controls accessible to either crew member.

6.5 MAGNETIC COMPASS

A direct reading magnetic compass shall be provided.

6.6 PITOT STATIC SYSTEM

Duel pitot tubes and three static ports shall be provided to supply pitot and static pressures to the flight instruments, pressurization system and to the autopilot.

SECTION 7
SURFACE CONTROL SYSTEM

7.1 GENERAL

The surface control system shall include controls for rudder, ailerons, elevators, stabilizer, wing flaps, and spoilers.

Control cable quadrants, brackets, cranks and horns shall be fabricated from aluminum alloy or steel alloy forgings and castings or aluminum sheet stock.

The elevators, rudder and ailerons shall be controlled by cable type systems using conventional rudder pedals, control wheels and columns. The horizontal stabilizer shall be controlled by hydraulic actuators controlled by the same cable system that controls the elevator.

Cables shall be protected against fouling, chafing, corrosion, or ice from internal or external sources that would impair operation. Routing of cables shall be as direct as possible with a minimum of pulleys required. Cables shall be located in the unpressurized areas on each side of the fuselage and along the rear spar of the wing.

Means for inspection and maintenance of all parts of the system shall be provided.

7.2 PRIMARY FLIGHT CONTROLS

7.2.1 Aileron Control System. The ailerons shall be operated by conventional wheel controls mounted on a control column forward of each pilot. The control wheels shall be interconnected. The control wheels shall be connected through a closed loop cable system to a torque tube located under the cockpit floor. Cables driving the ailerons shall be driven by the torque tube. System stops shall be provided. The lateral control system shall be essentially as shown in Figure 7-1.

7.2.2 Rudder Control System. The rudder shall be controlled by a cable system connected to the rudder pedal assembly through bellcranks, push-pull rods and control cables Conventional rudder pedals for the pilot and co-pilot shall be interconnected. The rudder control system shall be essentially as shown in Figure 7-2.

7.2.3 Elevator Control System. The stabilizer and elevators shall be controlled by a cable and pulley system. The control columns shall be interconnected by a torque tube beneath the cockpit floor. The elevator control system shall be essentially as shown in Figure 7-3.

7.3 SECONDARY FLIGHT CONTROLS

7.3.1 Lift and Drag Increasing Devices.

a. Wing flap system - the trailing edge, double-slotted wing flaps shall be actuated by two hydraulic cylinders mounted at the center hinge of each flap. The flaps shall be bussed together. The flap selector valve shall be operated by a follow-up mechanism arranged so that any intermediate position for takeoff, approach, or full landing flap may be preselected by the pilot. A remote position transmitter and a position indicator shall be provided.

b. Spoilers - hydraulically actuated spoilers shall be installed on the upper surface of the wing ahead of the wing flaps. At high speeds the control wheel shall move these surfaces instead of the ailerons for later control. For use as speed brakes, control shall be effected by a lever on the pedestal. Aft movement of the lever shall cause the spoilers to extend to the position indicated except as limited by aerodynamic forces at high speeds. In the maximum open position the outboard spoilers shall maintain a margin for control at high speeds.

7.3.2 Trim Control System.

a. Longitudinal trim shall be accomplished by changing the incidence of the horizontal stabilizer and by means of the elevator trim tab located on the left elevator. Adjusting the control column feel springs to change the zero force position of the column shall be used as the primary means of trim.

b. Lateral trim shall be accomplished by adjusting the trim tab located on the left aileron.

c. Directional trim shall be accomplished by adjusting the rudder trim tab.

d. trim position indicators shall be provided for all axes.

7.4 CONTROL SURFACE GUST LOCK SYSTEM

A lever accessible to the pilot shall be used to lock the control columns and rudder pedals in a neutral position and lock the control surfaces in a neutral position.

7.5 STABILIZER LOCK

In the event of a complete failure of all hydraulic power, the stabilizer shall be locked in position and the elevators shall control the aircraft in pitch with direct manual actuation by the pilot.

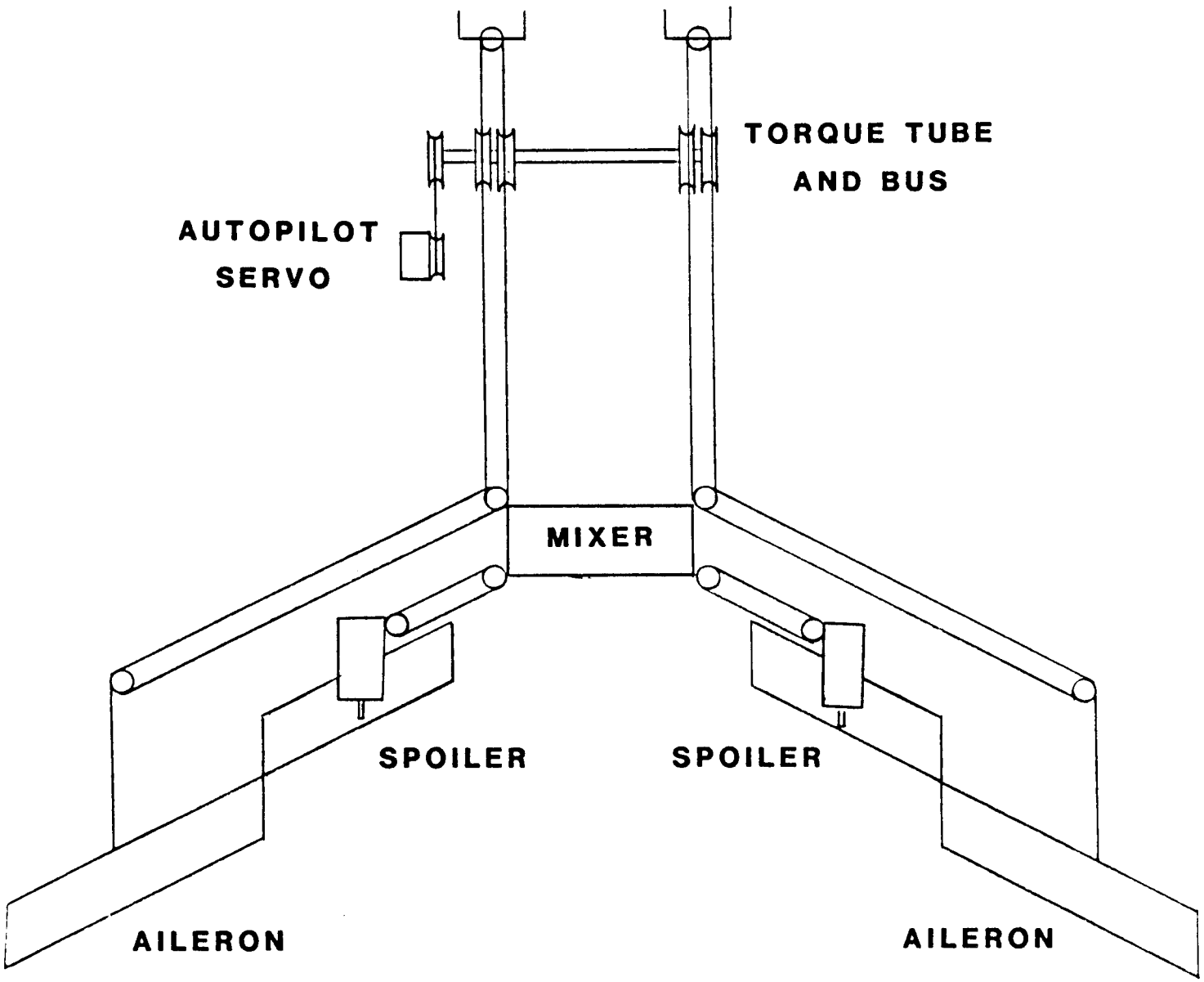


FIGURE 7-1 AILERON CONTROL SYSTEM

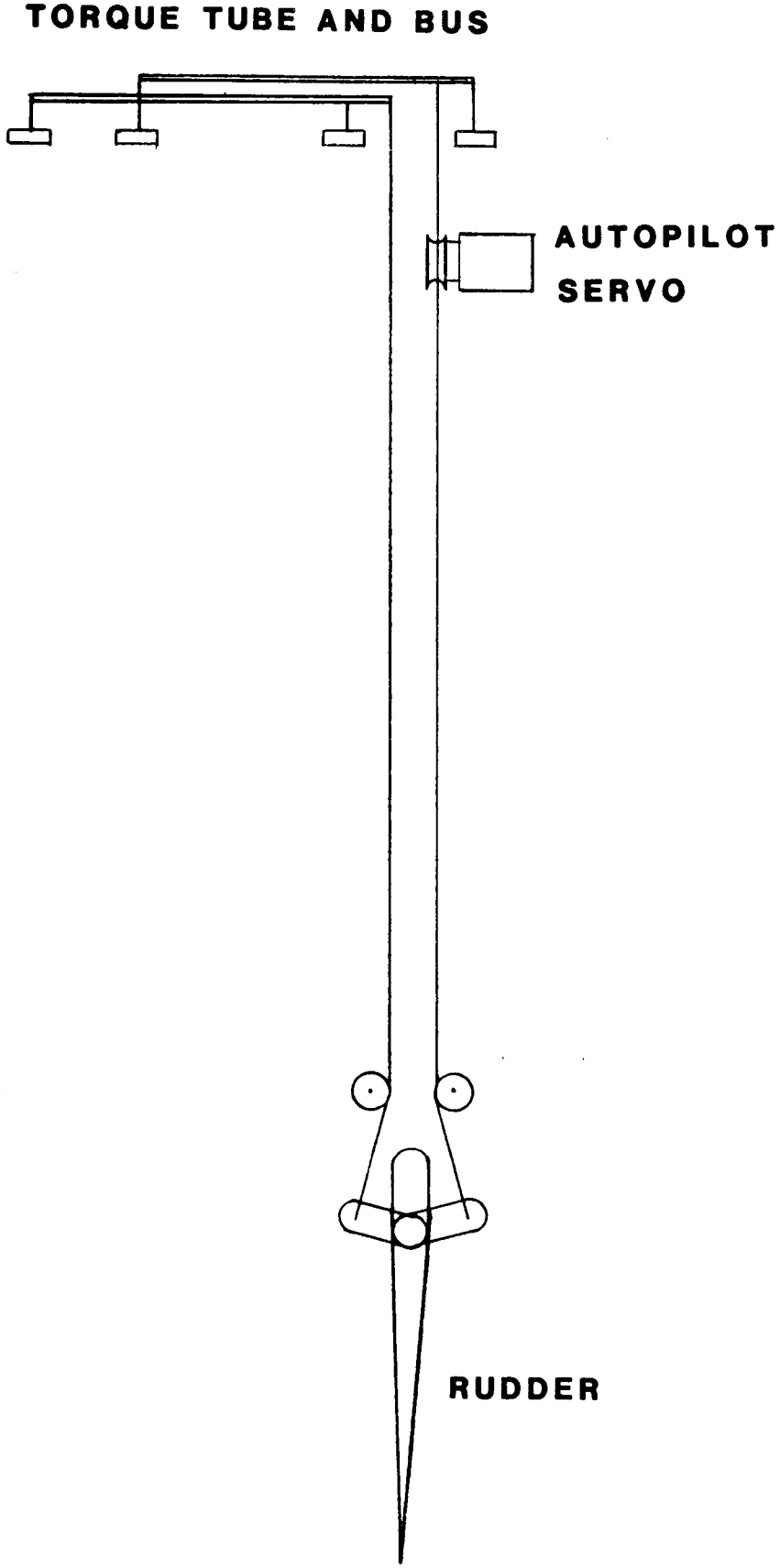


FIGURE 7-2 RUDDER CONTROL SYSTEM

Revised March 6, 1984

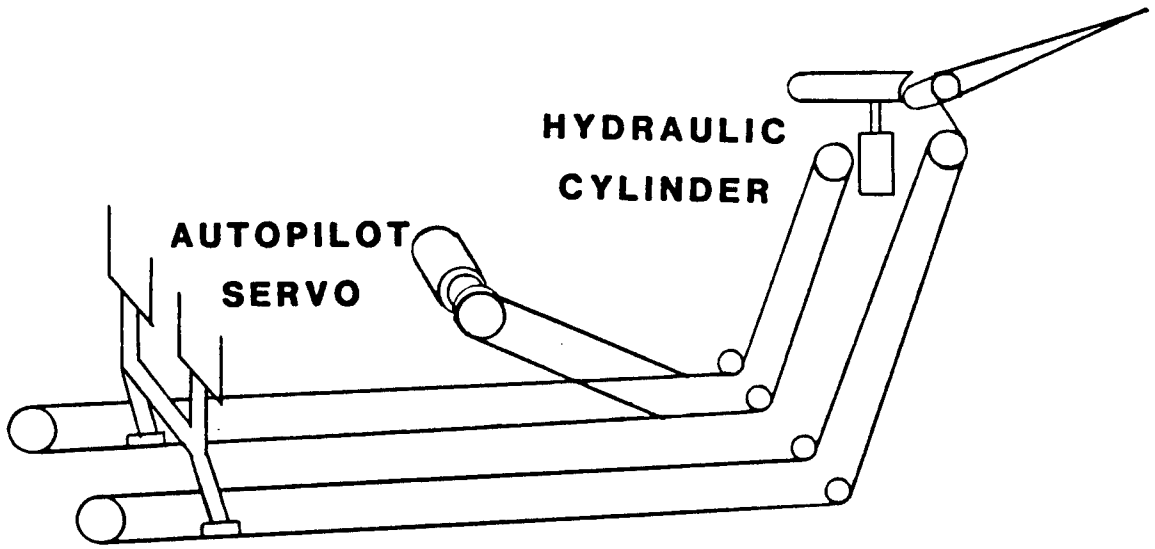


FIGURE 7-3 STABILIZER AND ELEVATOR CONTROL SYSTEM

SECTION 8
HYDRAULIC AND BRAKE SYSTEM

8.1 SYSTEM DESCRIPTION

Two independent hydraulic systems shall be installed, one driven by each engine. The hydraulic systems shall be designed for 3,000 psi operating pressure using Skydrol IV or Chevron IV fluids.

The hydraulic systems shall operate the stabilizer, thrust deflector, vector control vanes, landing gear, landing gear doors, spoilers, wing flaps and wheel brakes. The hydraulic system shall be substantially as shown on Figure 8-1.

Fluid pressure for the normal systems shall be supplied by variable displacement pumps mounted on each engine. An electrically driven hydraulic pump shall be provided for emergency operation of the hydraulic system and for ground checkout of the system without an auxiliary power supply or starting the aircraft engines.

An air bottle charged to 2200 psi shall be installed to provide a means of emergency gear extension and emergency wheel braking. Two manual handles in the cockpit shall control the air pressure for emergency landing gear extension and wheel braking.

For testing and servicing of the hydraulic system and its components, self-sealing ground test connections shall be provided.

Hydraulic equipment as listed in Appendix 1-C shall be provided.

8.2 FLUID TANKS

Two identical hydraulic reservoirs shall be installed and mounted in the upper portion of the aft fuselage, aft of the cabin pressure bulkhead. The reservoirs shall be equipped with a visual means of checking volume, as well as low-level warning systems with the warning lights located on the pilot's instrument panel.

A "bootstrap" system shall be used which pressurizes the reservoirs when hydraulic pressure is available from the engine hydraulic pumps.

8.3 FILTERS

The hydraulic system shall be protected by the installation of filters in the pressure and return lines.

8.4 THERMAL RELIEF

The hydraulic system shall incorporate thermal relief protection.

8.5 PRESSURE INDICATORS

Hydraulic pressure indicators shall be mounted on the instrument panel to indicate the amount of pressure in the hydraulic systems.

8.6 LINES AND HOSES

Pressure and return lines shall be aluminum alloy, except that corrosion-resistant steel lines shall be used where protection is required from fire or physical damage.

Flexible hoses shall be of high and medium pressure construction. Engine section hoses shall be fire retardant.

8.7 FIRE PROTECTION

Manual shut-off valves shall be installed in the engine driven pump supply lines.

In the design of the hydraulic system, careful consideration shall be given to the location of components and lines to minimize the potential fire hazards created by hydraulic leaks.

8.8 WING FLAP OPERATION

Each trailing edge flap shall be extended and retracted by hydraulic cylinders mounted at each of the two tracks for each flap. The flaps shall be mechanically bussed together. (See Paragraph 7.3.1a). A relief valve shall relieve flap position under excessive aerodynamic load and the flap control shall reposition the flap after such load is relieved.

8.9 LANDING GEAR OPERATION

Operation of the landing gear shall be effected by a single control handle located on the left side of the control pedestal. The handle shall actuate switches to control the

landing gear selector valve which shall control the gear position. Detents shall be provided to hold the handle in either the "up" or "down" position.

Dual filament green indicator lights shall be provided to indicate when the gear is down and locked. A dual filament red warning light shall be provided to indicate when any gear position is not consistent with the lever position. In addition, the light will indicate when the landing gear doors are not locked with the gear retracted. A warning horn shall be provided to signal alarm and the red warning light will illuminate in the event that the throttles are retarded and all three gears area not down and locked.

Emergency landing gear extension shall be accomplished by directing air pressure from the emergency gear extension air bottle into the down side of all landing gear and gear door actuators.

No emergency means of gear retraction shall be provided. Once extended by the emergency system, the gear shall remain locked down until the failure is corrected and the emergency system reset.

The landing gears shall be held in the "down" position by integrally locking actuating cylinders. The downlocks shall be disengaged by hydraulic pressure when the gear selector valve is moved to the "up" position. the landing gear doors shall be held in the "down" position by integrally locking actuating cylinders.

The landing gears shall be held in the "up" position by mechanical engagement with the gear door linkage. The landing gear doors shall be held in the "up" position by a mechanical uplock system. Each main landing gear door shall be hydraulically operated by two cylinders. The landing gear and landing gear doors shall be sequenced by mechanically operated controllable check valves positively operated by the gear and gear door linkage. Hydraulic pressure shall not be required to maintain the gear or gear doors in the locked up or locked down position. Loss of hydraulic pressure shall not cause disengagement of the uplocks or downlocks.

8.10 SPOILER OPERATION

Airspeed reduction, wing lift reduction and lateral control at high speeds are accomplished by spoilers located forward of each wing flap slot. The spoilers shall be actuated by pressure from the main hydraulic system and controlled by the aileron control system for lateral control, and by a

switch on the console for use as speed brakes. Operation as speed brakes shall be possible at any airspeed. Load relief shall be provided for high aircraft speeds.

8.11 WHEEL BRAKE SYSTEM

The wheel brake system shall be powered by the aircraft hydraulic system, or in emergencies, by compressed gas. A parking brake control shall be provided.

8.12 THRUST DEFLECTOR OPERATION

The thrust deflectors for both engines shall be operated by dual hydraulic actuators located in the wing center section. Positioning control shall be obtained by a follow-up system.

8.13 CONTROL SURFACE OPERATION

The stabilizer shall be operated by actuators located at the center of the stabilizer. These actuators are controlled by the cable control system which operates the elevators. In the event of a complete hydraulic system failure, the stabilizer shall be locked in position when no hydraulic pressure is available.

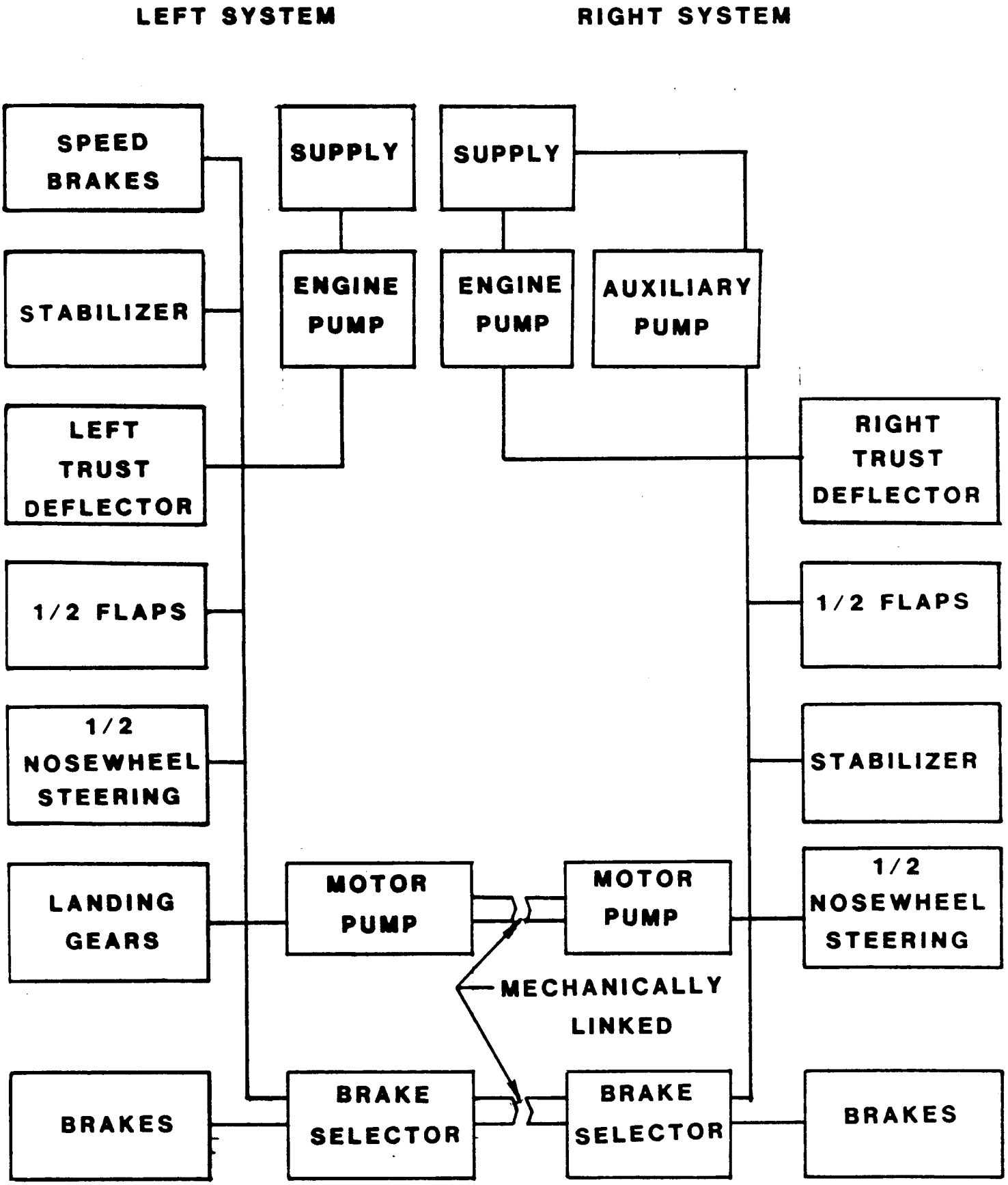


FIGURE 8-1 HYDRAULIC AND BRAKING SYSTEMS

SECTION 9
ELECTRICAL SYSTEM

9.1 GENERAL

The primary electrical system shall be a single-wire negative ground 28v DC system.

The system shall incorporate multiple busses for power distribution and protection against complete system failure. The design shall be as simple as possible, employing a minimum quantity of relays and switches for improved reliability. Electrical equipment substantially as listed in Appendix 1-D shall be installed. The electrical power system shall be substantially as shown in Figure 9-1.

The installation of electrical accessory equipment, switch, and circuit breaker panels shall be designed to permit ready inspection and replacement.

Consideration shall be given to critical environmental conditions, such as temperature, pressure, humidity, position, acceleration, vibration, and presence of detrimental substances. Electrical equipment, controls and wiring shall be installed so that operation or malfunction of any one unit or system does not affect adversely the simultaneous operation of any other electrical unit or system essential to safe operation of the aircraft. Multiple power cables are used so that damage to essential circuits shall be minimized in the event of faults in heavy-current-carrying cables. Solid state inverters, drawing power from the main DC system, shall provide alternating current for radio, radar and electronics. Transformers shall reduce voltage to 26v where required for instrument operation.

9.2 POWER SUPPLY

One DC starter generator shall be mounted on the accessory gearbox of each engine. One generator shall be capable of exceeding the electrical power requirements for safe flight. Adequate cooling for the generators shall be provided to ensure proper generator operation.

Carbon pile voltage regulators shall maintain generator voltage within tolerances and equalize the output from the two generators. A loadmeter shall indicate the percent of rated output of each generator. It shall be possible to power all electrical equipment from one

generator in the event of single-engine operation. (Loadmeters shall indicate the maximum generator output which may be permitted for such operation). A "generator out" warning light for each generator shall be located on the pilot's panel to indicate that a generator has become disconnected from the bus.

Selective overvoltage trip circuits shall protect aircraft and equipment by shutting off the malfunctioning generating system.

Two nickel-cadium storage batteries shall be installed in the aft fuselage. The area shall be protected against corrosion from fumes and spillage of battery electrolyte.

An external power receptacle shall be provided for connecting external 28v DC to the aircraft electrical system and starter bus.

9.3 DISTRIBUTION SYSTEM

Aircraft wire shall be MIL-W-5086 or the equivalent. Power plant wiring shall be high temperature type and resistant to all fluids used in the airplane. All load circuit wiring shall be protected by circuit breakers of suitable rating. Circuit breaker panels shall be accessible to the crew during flight. Electrical terminals, terminal strips, busses, etc., shall be so installed as to minimize the probability of shock hazard and accidental shorting due to loose washers, nuts, drill cuttings or similar hazards. Emergency circuits and circuits where inadvertent operation can create an emergency or dangerous condition shall be designed with the minimum practicable number of breaks to improve reliability. Preinsulated crimp type terminals shall be used for all wire sizes. The use of disconnect plugs other than at the firewall shall, in general, be limited to accessory equipment. In high temperature areas, the wire connection shall be suitable for the temperatures expected. Conduit shall be used where required to provide mechanical protection, or facilitate routing and maintenance. Conduit shall not be filled to more than 75% of the cross section area.

9.4 STARTING AND IGNITION

Starter, generator and ignition switches shall be provided as described in 5.4.2.

9.5 LIGHTING

9.5.1 Interior Lighting. Interior lighting shall be provided for general illumination of the cabin, for individual passenger reading and for cockpit lighting. Single contact bulbs shall be used wherever possible and shall be replaceable without special tools. Spare bulbs shall be stowed in a position accessible during flight. White instrument and cockpit lighting shall be provided with an intensity control. General cabin illumination shall be dimmable and shall be controlled from a switch in the cockpit. Courtesy lights shall be provided to illuminate the steps when the door is open. These lights shall be controlled by the cabin general lighting switch on the pilot's console. Battery operated emergency lighting shall be provided in the cabin. Emergency lighting for each emergency exit shall be provided.

9.5.2 External Lighting. The landing lights shall consist of 600 watt bulbs controlled by a switch in the cockpit. Decreased intensity of the landing lights shall be used for taxi lighting. Oscillating position lights shall be installed.

9.6 BONDING AND RADIO NOISE

Bonding and grounding to minimize radio noise shall be accomplished with bonding jumpers to all movable surfaces.

Disturbing electrical interference from the aircraft equipment and/or power supplies shall not degrade the performance of any receiving system by more than 5 db. Switching transients of a duration of .25 seconds or less and occurring at a rate of not more than one every ten minutes shall be excluded from this requirement.

9.7 WARNING INDICATIONS

A readout warning light panel shall be installed on the pilot's panel with suitable color lights for indication of malfunctions, dangerous conditions, or other information. Fire warning lights for each engine shall be installed in the edge of the glare shield. Fire shut-off handles shall be installed adjacent to the fire warning lights and be safety wired to prevent inadvertent actuation. These handles shall control firewall shut-off valves for fuel and hydraulic fluid.

Aural warning devices shall be provided for warning the pilot in case of excessively high airspeed, approaching stall, attempted takeoff with takeoff configuration incorrect, low cabin pressure and unsafe gear condition for landing.

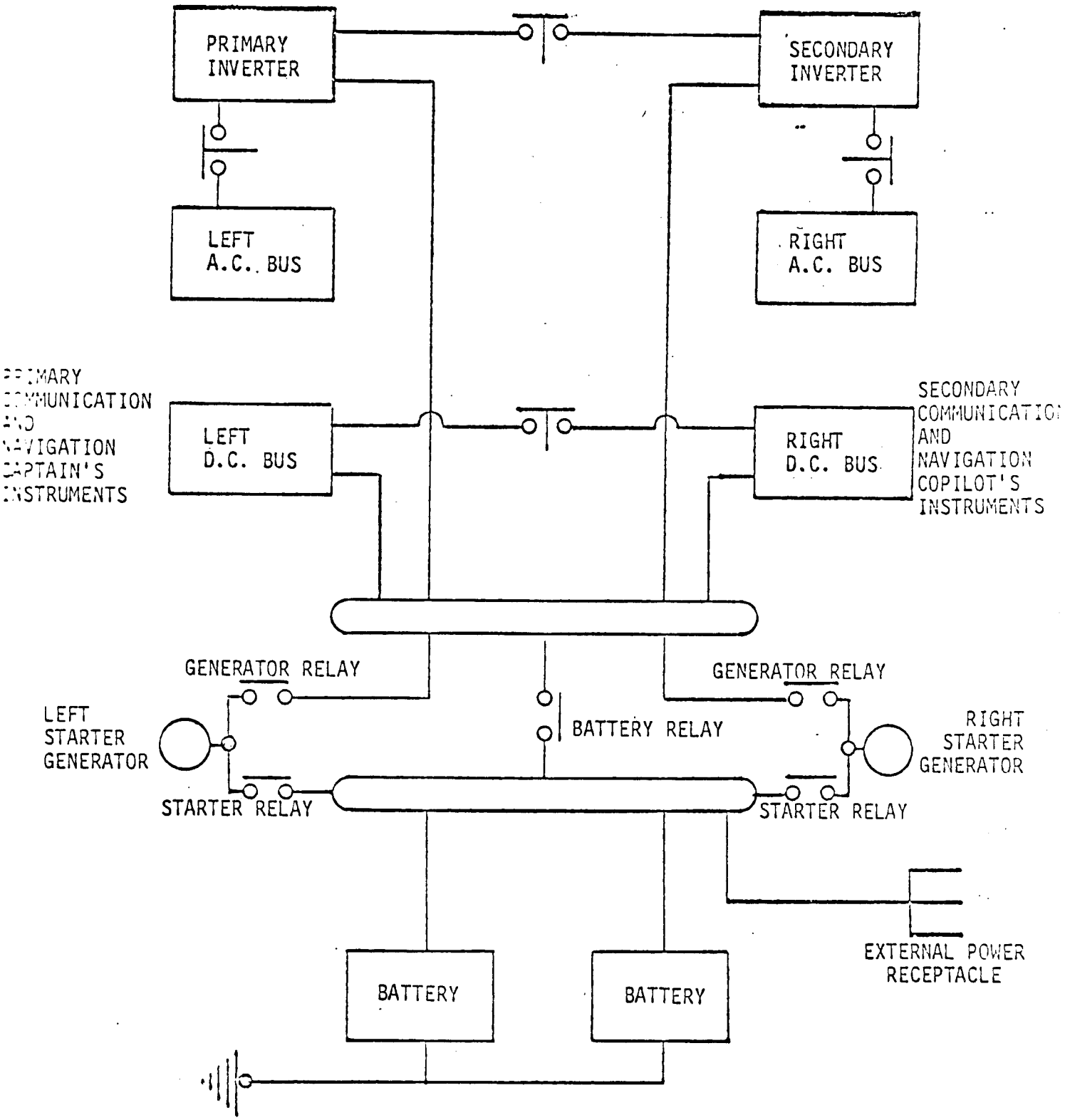


FIGURE 9-1 ELECTRICAL SCHEMATIC

SECTION 10
RADIO AND ELECTRONICS

10.1 GENERAL

The radio and electronic equipment furnished and installed by the Seller shall consist of the equipment listed in Appendix 1-E except as permitted or required by Paragraph 2.5.

10.1.1 Grounding and Shielding. Grounding and shielding of electronic equipment shall be in accordance with duPont Aerospace Company Specifications. Ground return wires shall be used between units of a system when use of structural ground returns could cause noise or malfunctioning because of circulating currents in aircraft structure.

10.1.2 Power Distribution. Toggle circuit breakers shall be used in all input power circuits to the electronic equipment. All circuit breakers shall be located in the cockpit.

10.1.3 Radio Rack. All radio equipment shall be mounted in a radio rack on the forward pressure bulkhead.

10.2 ELECTRONICS SYSTEMS INSTALLATION

The detailed installation of the major components of the electronics system is described in the following paragraphs. These major components are listed in Appendix 1-E for specific identification.

10.2.1 ATC Radar Beacon. An ATC Transponder shall be installed in the radio rack. A blade antenna shall be installed in the lower fuselage. The controls shall be accessible to the pilots.

10.2.2 Automatic Direction Finding System. One ADF receiver shall be installed in the radio rack. A goniometer indicator and fixed loop shall be installed and all controls shall be accessible to the pilots.

10.2.3 Interphone System. The interphone system shall be operated by a dual interphone amplifier unit installed in the radio control panel. Jack outlets for headphones and microphones shall be installed at the pilot's and co-pilot's stations. Microphone switches shall be located in the hand-held microphone, and on the control wheel outboard grip. Headphone and microphone stowage hooks shall be installed for the pilot and co-pilot. An audio selector panel and isolation amplifier for each pilot is an integral part of the radio control panel.

One radio range filter shall be provided for the ADF radio receiver audio output. An interphone system connecting the cockpit and the stewardess station shall be provided. A public address system operated by either of the pilots or the stewardess shall be installed.

10.2.4 VHF Communication System. Two transceiver units including two power units, shall be installed in the radio rack. The blade antenna for the communication system shall be mounted on the top of the fuselage. The remote controls of both systems shall be accessible to both pilots.

10.2.5 Weather Radar. A radome suitable for a weather radar with a 12" antenna will be provided in the nose of the aircraft.

10.2.6 VOR Navigation System. Two navigation units, each providing VOR and ILS information, shall be installed in the radio rack. The primary and secondary navigation systems shall share the same antenna located on the vertical fin. Primary and secondary remote controls shall be accessible to both pilots and shall provide control of the self-contained glide slope receivers and DME equipment. Refer to Figure 10-1.

10.2.7 Marker Beacon. The marker beacon receiver shall be installed in the radio control panel. One 75 mc antenna shall be installed. The audio and high-low sensitivity control shall be accessible to both pilots. One set of marker beacon lights shall be installed on the radio control panel.

10.2.8 Glide Slope System (ILS). The glide slope receiver is part of the navigation unit package. An antenna shall be installed. Each glide slope receiver shall be connected directly to the antenna by a separate transmission cable. The antenna shall provide satisfactory matching characteristics.

10.2.9 Distance Measuring Equipment. One DME unit shall be installed in the radio rack. One "L" bank antenna shall be installed on the lower fuselage and one indicator shall be installed on the pilot's and co-pilot's interphone control panel for audio monitoring. DME channel selection can be controlled by either VOR Primary channel selector or VOR Secondary channel selector by means of a selector switch.

10.2.10 Magnetic - Gyro Compass System. Two magnetic slaved gyro compass systems shall be installed. The rack-mounted components shall be installed in the radio rack on the forward bulkhead. The systems shall be

compensated such that the deviation on the indicator shall not exceed plus or minus three degrees on any heading. The directional gyro shall provide signals to the auto-pilot including heading hold and shall power the course indicator heading cards.

10.2.11 Flight Instrument System. An independent flight instrument system shall be provided for each pilot. The rack-mounted remote gyro components shall be mounted in the radio rack.

10.2.12 Vertical Gyro System. Two vertical gyro systems shall be installed in the radio rack. The output signals shall be connected to the pilot's flight instruments, the auto-pilot and the weather radar system.

10.2.13 Automatic Flight Control System. An autopilot system shall be provided with all operating controls accessible to both the pilots.

10.2.14 Gyro Data Sources. The autopilot shall receive vertical and directional gyroscopic information from either of the two sets of data generators provided in the aircraft. Selector switches shall be provided to allow the pilot to individually select which of the two sets of data generators shall provide information to the autopilot system.

10.2.15 Navigation Data Sources. The autopilot shall receive navigation information consisting of VOR localizer and glide slope information from either the Primary or Secondary navigation receiver. The pilot shall be able to select, by means of a selector switch, which navigation receiver supplies information to the autopilot.

10.2.16 Operation Modes.

a. Heading hold - a heading hold mode is provided to hold the airplane on the heading existing at the time of engagement. This mode engages automatically whenever the autopilot is engaged.

b. Heading select mode - the heading select mode allows the pilot to select a desired heading on the course indicator. When the heading select mode button on the flight controller is depressed, the aircraft automatically turns to the selected heading and maintains it thereafter.

c. Navigation mode - the navigation mode, when engaged by depressing the navigation button on the flight controller causes the aircraft to locate and track any selected VOR radial or ILS course.

The navigation coupler determines when the aircraft approaches the VOR zone of confusion and provides a smooth crossing of the zone. The coupler further provides optimum bank angle limits for the various phases of intercept and tracking. A special reverse course button on the flight controller allows the aircraft to fly a back course approach.

d. Altitude hold mode - the altitude hold mode maintains the altitude existing at the time of engagement of the altitude hold mode. Altitude is maintained within limits of +30 feet except during times of severe turbulence.

e. Glide slope arm mode - the glide slope arm mode arms the automatic glide slope engage circuits so that automatic engagement of the glide slope mode will occur whenever the aircraft intercepts the glide slope during an ILS approach.

10.2.17 Damper Modes. The damping functions of the pitch, roll and yaw axes may be individually engaged using engage buttons provided for that purpose on the radio control panel.

a. Yaw axis - engagement of the yaw axis damper provides rate damping in the yaw axis. The damper resists yawing motions although it does not resist steady state turns brought about by the pilot. It may be used at any time during manual flight.

b. Roll axis - the roll axis damper (control augmentation) may be engaged by means of a button provided for that purpose on the radio control panel. It resists rolling motions caused by turbulence but does not resist roll commands by the pilot through the normal aircraft controls.

c. Pitch axis - pitch axis damping is provided in exactly the same manner as the roll axis damping system. An additional feature of the pitch axis damper system is that the system operates the aircraft's pitch trim as required to maintain a zero force gradient on the control column. This functions to maintain the aircraft in longitudinal trim at all times, since it senses long-term forces required by the pilot to keep the aircraft in a given attitude and trims the aircraft as required to reduce these forces to zero.

10.2.18 Flight Controller. The flight controller is located in the cockpit center pedestal and contains the following controls and indications.

a. Mode select buttons to command the modes discussed in the section dealing with Operation Modes (see 10.2.17).

b. A turn control to allow the pilot to select a desired rate of turn.

c. A pitch command control to allow the pilot to command a desired pitch attitude.

d. A pitch trim indicator to indicate proper synchronization of the autopilot system prior to engagement and to monitor pitch servo effort after engagement.

10.2.19 Enunciator. An enunciator shall be provided within the radio control panel to indicate the status of the autopilot and/or damper systems. Separate enunciators shall be provided for the pitch functions and for the combined roll and yaw functions.

a. Pitch functions - the enunciator shall provide the following indications pertaining to the pitch axis:

1. Availability of suitable power.

2. Engagement of the pitch damper system.

3. Engagement of the autopilot system and pitch.

4. Engagement of the altitude mode.

5. Engagement of glide slope arm mode.

6. Automatic glide slope engaged.

b. Lateral and yaw enunciator - the lateral and yaw enunciator shall provide the following indications:

1. Suitable power available.

2. Yaw damper engaged.

3. Roll damper engaged.

4. Roll and yaw dampers engaged.

5. Autopilot engaged.

6. Heading select engaged.

7. Navigation mode engaged.

10.2.20 Emergency Conditions. The autopilot system may be manually overridden at any time by the pilot or co-pilot. The servos control mechanical slip clutches which permit the pilots to override the autopilot in any situation. The autopilot may be disengaged by momentarily depressing the horizontal stabilizer trim switch on either control wheel.

10.2.21 VTOL Conditions. For VTOL operations the autopilot will provide rate damping about all three control axes. An automatic power lever control can be engaged during VTOL operations to provide altitude hold. The altitude hold mode maintains the altitude existing at the time of engagement of the altitude hold mode. In the altitude hold mode altitude is maintained within limits of ± 30 feet except during times of severe turbulence.

10.2.22 Category III Landing System. space provisions for a Category III blind landing system will be provided. This system can be installed at the customer's option.

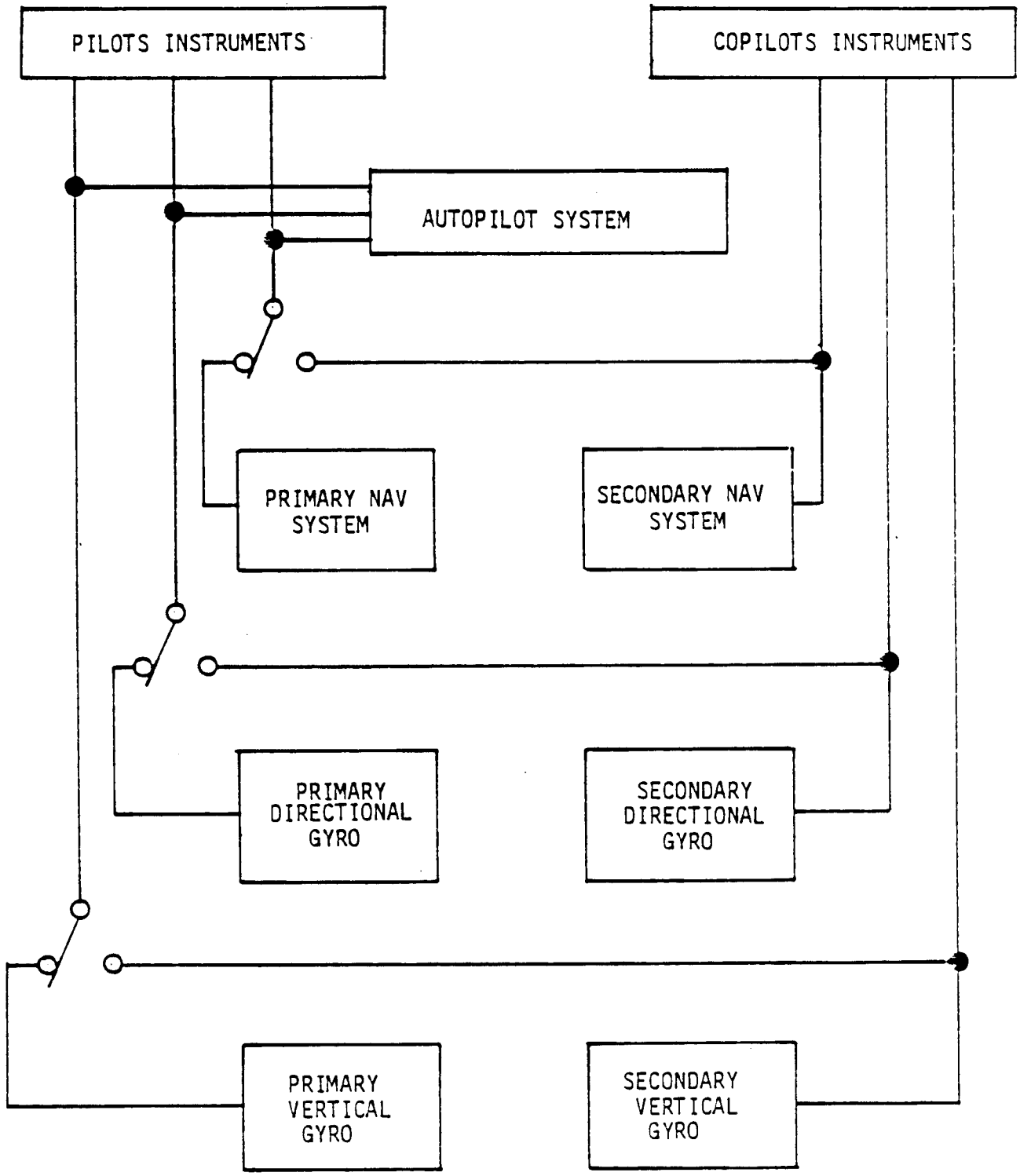


FIGURE 10-1 NAVIGATION INSTRUMENT EQUIPMENT INTERCONNECTIONS

Revised 26 October 1978

SECTION 11
FURNISHINGS

11.1 GENERAL

Detail finish requirements for the interior color scheme, upholstery and floor covering shall be in accordance with duPont Aerospace Company interior finish specification, reference Paragraph 2.2.

Furnishings and equipment shall be provided as listed in Appendix 1-F.

11.2 CREW ACCOMMODATIONS

11.2.1 General. The cockpit shall include accommodations for a pilot and co-pilot. A jump seat shall be provided for an observer. The following shall be provided for at the pilot and co-pilot positions:

a. Oxygen mask with diluter-demand/100% oxygen provision

b. Headphone and "clamp-on" microphone

c. Ashtray.

A door shall be provided aft of the pilot and co-pilot to prevent light spillage from the cabin into the cockpit.

11.2.2 Crew Seats. The pilot and co-pilot seats shall be adjustable fore and aft and in height. Arm rests shall fold to facilitate entry. Upholstered seat backs, cushions, arm rests, and safety belts shall be provided.

11.3 PASSENGER ACCOMMODATIONS

11.3.1 Arrangement. The cabin arrangement shall be substantially as shown in Figure 1-2. Accommodations shall be provided for up to forty-four passengers and one stewardess in the cabin.

11.3.2 Seats. Conventional three abreast seating will be provided in the cabin, or provisions can be made for any interior desired by the customer. Seats shall be mounted on tracks and be removable for cargo operation.

11.3.3 Washroom. A washroom with toilet facilities will be provided.

11.3.4 Buffet. A buffet for snacks and liquid refreshments will be provided.

11.4 SOUNDPROOFING

The cabin and cockpit sound levels shall permit normal conversation under all normal flight conditions.

11.5 FIRE EXTINGUISHER

Space provisions for a fire extinguisher shall be made in a location easily accessible to passengers and crew.

11.6 OXYGEN SYSTEM

An oxygen system shall be installed to provide supplemental oxygen for the crew and passengers. Oxygen equipment as listed in Appendix 1-F shall be installed.

11.6.1 Oxygen Supply. A high-pressure oxygen bottle of 48 cubic foot capacity shall be installed in the tail cone. A convenient means of servicing the bottle shall be provided near the bottle.

11.6.2 Distribution. Both pilots shall be provided with oxygen masks with mask mounted regulators with "Diluter-Demand" or "100%" positions. Up to forty-four drop-out ccnstant flow type masks shall be installed in up to eleven ceiling compartments. A pressure sensitive valve shall turn on the passengers' oxygen and automatically open the compartment doors when cabin altitude exceeds 14,000 feet. Manual controls shall be provided to open the doors and turn on the oxygen at any cabin altitude.

11.6.3 Indicators. A pressure gage shall be installed in the cockpit for indication of supply oxygen pressure. A gage at the oxygen bottle shall indicate the bottle pressure during servicing.

11.7 BAGGAGE

The baggage rack is located opposite the main cabin door. Baggage rack lining shall be of fiberglas or other durable material. Suitable baggage and cargo tie-down will be provided.

SECTION 12
AIR CONDITIONING AND PRESSURIZATION

12.1 COOLING SYSTEM

Engine bleed air shall be passed through a heat exchanger, a bootstrap compressor and a simple air-cycle cooling turbine to provide refrigeration. The bleed air shall be supplied by both engines with individual shut-off valves and check valves in each supply line. The check valves shall prevent loss of bleed air in case of an engie failure. Either engine shall provide sufficient bleed air for cooling. The system shall be substantially as shown in Figure 12-1.

12.2 HEATING SYSTEM

Air for cabin heating shall be provided by bypassing bleed air around the refrigeration unit.

12.3 TEMPERATURE CONTROL

Cabin temperature shall be controlled both manually and automatically. In the automatic position, the selected temperature is maintained by varying the amount of hot bleed air that is diverted around the refrigeration unit and mixed with the cold refrigerated air. The mixture proportions are determined by the amount of unbalance between the temperature selector and the cabin sensing element. Rapid temperature fluctuations are prevented by an anticipator in the supply duct. A high temperature limit switch prevents the cabin supply air temperature from exceeding safe limits. In the manual position, the position of the hot air bypass valve is controlled directly by the pilot.

12.4 VENTILATION

In the event that bleed air is not available for the air conditioning system, a check valve allows ram air to enter directly into the cabin air distribution system.

12.5 PRESSURIZATION

Cabin pressurization shall be provided by the air conditioning system. Pressurization shall be controlled either automatically or manually. In the automatic mode, the cabin pressure is controlled according to a pre-set schedule up to a differential pressure of 13.0 psi. Provision is made on the

controller for the pilot to set the destination airport altitude and barometric setting. This assures equalization of pressure immediately prior to landing.

A rate limiter prevents excessive cabin altitude rate of change. Pressure is controlled by modulating the air as it is exhausted from the cabin. In the manual mode, the pilot can adjust the position of the outflow valve directly with the automatic controller inoperative. Cabin altitude, differential pressure, and rate-of-climb instruments shall be installed in the view of the pilot for monitoring the cabin pressurization. A safety valve shall be installed in the aft pressure bulkhead to provide pressure relief, vacuum relief and pressure dump functions. The maximum relief pressure shall be 13.2 psi differential.

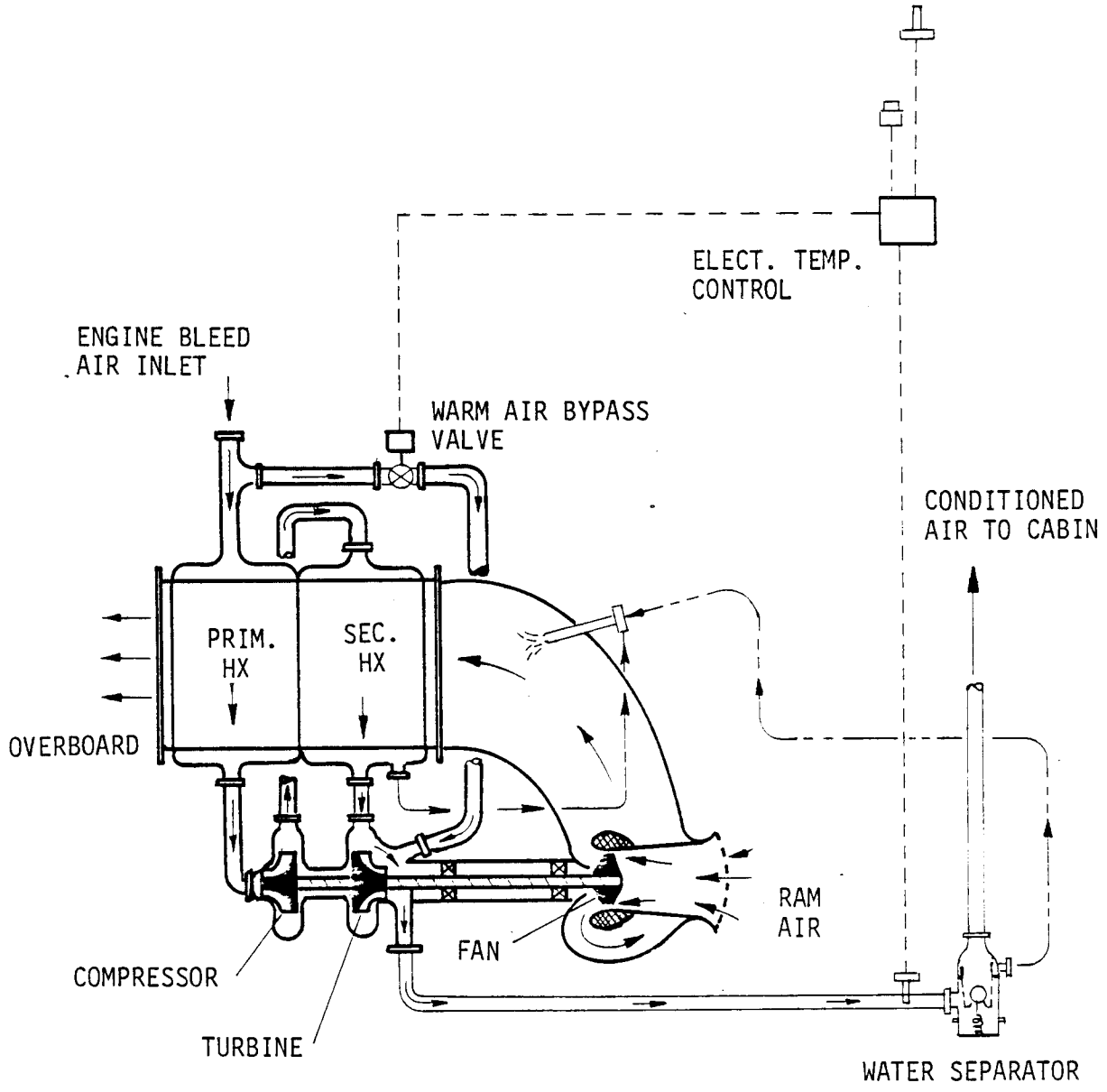


FIGURE 12-1 AIR CONDITIONING SYSTEM SCHEMATIC

SECTION 13
ICE PROTECTION AND DEFOGGING

13.1 ANTI-ICING

Anti-icing of the cowl leading edges of the engine inlet ducts and wing leading edges shall be accomplished by hot bleed air from the engine. An ice detect probe shall be installed in the left inlet duct which illuminates a cockpit light when icing conditions exist. Engine anti-icing by bleed air shall be an integral part of the engine. Pilot-operated switches shall select engine, engine inlet and wing anti-icing.

13.2 DE-ICING

Information will be added when available.

13.3 DEFOGGING

Windshield defogging shall be accomplished by circulating warm air over the inside surface.

13.4 PITOT HEAT

An electrically-heated pitot tube shall be provided.

13.5 RAIN REMOVAL

Windshield wipers shall be provided for both pilots and co-pilots windshields.

SECTION 14
SPECIAL EQUIPMENT

14.1 GENERAL

A minimum of special equipment shall be required for ground handling.

14.2 GROUND SUPPORT EQUIPMENT

Ground support equipment shall be subject to separate negotiation.

14.3 JACKING

Three jacking points shall be provided for the airframe. Jack pads shall be gound support equipment items. Jacking provisions shall also be made on each landing gear.

14.4 HOISTING

Attachment provisions shall be made for hoisting fittings on wing panels and fuselage. Attachment provisions for hoisting the engines are provided on the engine.

14.5 TOWING

Towing lugs shall be installed on the nose gear for quick attachment of a tow bar.

14.6 LEVELING

Provisions shall be made for leveling the airplant laterally and longitudinally.

SECTION 15
STANDARD PARTS AND INTERCHANGEABILITY

15.1 STANDARD PARTS

AN, MS and NAS standard parts, including rivets, bolts, screws, nuts, fittings, bearing, etc., shall be used insofar as practicable. duPont Aerospace Company parts or other commercial parts may be used at the option of the Seller.

15.2 INTERCHANGEABILITY

The following parts and assemblies subject to ready removal from the airplane shall be made interchangeable from one airplane to another insofar as practicable without undue forcing and without cutting, filing, drilling or reaming except as specified. Interchangeability shall be confined to items having identical part or assembly numbers. Interchangeabiity of assemblies shall not mean that parts or subassemblies are necessarily interchangeable.

15.2.1 Fuselage Group.

a. Windshield panels

b. Cockpit and cabin windows

c. Emergency exit window

15.2.2 Empennage Group.

a. Rudder assembly

b. Elevator assembly

c. Stabilizer assembly

15.2.3 Wing Group.

a. Wing

b. Wing flaps

c. Spoilers

d. Ailerons

15.2.4 Controls Group.

a. Controls component

15.2.5 Power Plant Group.

a. Engine build-up assembly

b. Engine mount assemblies

c. Tailpipe assemblies

d. Thrust vectoring cascade assemblies

15.2.6 Landing Gear Group.

a. Main landing gear

1. Strut assembly

2. Cylinder assembly

3. Piston assembly

b. Nose landing gear

1. Strut assembly

2. Cylinder assembly

3. Piston assembly

15.2.7 Equipment Group.

a. Pilots' seats

b. Passenger seats

15.3 REPLACEABILITY

The following parts shall be manufactured in a manrer employing jigs, fixtures or similar means to ensure replaceability:

15.3.1 Fuselage Group.

a. Nose section

b. Main entrance door

c. Radome

d. Nose landing gear door

e. Nose equipment doors

f. All inspection doors

15.3.2 Empennage Group.

a. Vertical stabilizer assembly

b. Vertical stabilizer tip assembly

15.3.3 Wing Group.

a. Main landing gear doors

15.3.4 Power Plant Group.

a. Engine compartment doors.

SECTION 16
MAINTENANCE AND INSPECTION

16.1 ACCESS AND INSPECTION OPENINGS

Access openings and inspection panels shall be provided as required in the airplane structure. Permanently installed metal nameplates to indicate type of fluid, volumes and/or pressures, shall be provided at fuel, oil and hydraulic servicing areas. Marking shall be either photo-etched, engraved or steel stamped. Generally stenciling or plastic film decals shall be used for external markings. Paint to be used for exterior decorative markings shall be compatible with aircraft fluids.

APPENDIX 1-A
POWER PLANT AND FUEL SYSTEM

ITEM NO.	NO. REQD.	DESCRIPTION	MANUFACTURER	PART NO.
1	2	Engines - Turbofan Including Fuel Control Fuel Pump Oil Pump Oil Tank Fuel-Oil Heat Exchanger	General Electric	CF34-1A
2	2	Boost Pumps	Parker	

APPENDIX 1-B
INSTRUMENTS

ITEM NO.	NO. REQD.	DESCRIPTION	MANUFACTURER	PART NO.
1	4	Engine RPM - Indicator		
2	2	Exhaust Gas Temperature		
3	1	Fuel Flow - Indicator (Dual)		
4	2	Engine Pressure Ratio (EPR)		
5	1	Oil Pressure - Indicator (Dual)		
6	1	Fuel Quantity Totalizer		
7	1	Fuel Quantity Totalizer		
8	2	Fuel Tank Quantity XMTR		
9	2	Airspeed Indicator		
10	2	Altimeter		
11	2	Rate-of-Climb		
12	1	Turn-and-Bank Indicator		
13	1	Compass - Stand-by Magnetic		
14	1	Clock - 8-day with Elapsed Time Feature		
15	2	Thrust Deflector Position Indicator		
16	2	Machmeter		
17	2	Horizontal Situation Indicator		
18	1	Cross Pointer		
19	1	Radio Magnetic Indicator		
20	2	Vertical Gyro		

APPENDIX 1-B
INSTRUMENTS (continued)

ITEM NO.	NO. REQD.	DESCRIPTION	MANUFACTURER	PART NO.
21	1	Ram Air Temperature Probe		
22	1	Ram Air Temperature Indicator		
23	1	Pitot Head - Heated		
24	1	Stall Warning System		
25	1	Mach Warning Switch		
26	1	Flap Position Indicator		
27	1	Cabin Altimeter & Differential Pressure Indicator		
28	1	Cabin Rate-of-Climb		
29	1	Hydraulic Pressure Indicator		
30	1	Loadmeter DC		
31	1	Voltmeter DC		
32	1	Voltmeter AC		
33	1	Hydraulic Accumulator Air Pressure Gage		
34	1	Hydraulic Emergency Air Pressure Gage		
35	1	Oxygen Pressure Gage		
36	1	Rudder Trim Position Ind.		
37	1	Aileron Trim Position Ind.		
38	1	Stabilizer Position Ind.		
39	2	Directional Gyro		

APPENDIX 1-C
HYDRAULIC EQUIPMENT AND LANDING GEAR

ITEM NO.	NO. REQD.	DESCRIPTION	MANUFACTURER	PART NO.
1	2	Pump - Engine-Driven		
2	2	Main Landing Gear Strut		
3	4	Wheel - Main Gear		
4	4	Brake - Main Gear		
5	4	Tire - Main Gear		
6	1	Nose Gear Strut		
7	2	Wheel - Nose Gear		
8	2	Tire - Nose Gear		
9	1	Pump - Electric, Auxiliary		
10	1	Nose Gear Steering System		

APPENDIX 1-D
ELECTRICAL EQUIPMENT

ITEM NO.	NO. REQD.	DESCRIPTION	MANUFACTURER	PART NO.
1	2	Battery - 24V (Nicad)		
2	2	Inverters - Static	King	1A1000
3	2	Starter Generator	General Electric	2CM504C1
4	1	Audible Warning System		

APPENDIX 1-E
RADIO AND ELECTRONICS

ITEM NO.	NO. REQD.	DESCRIPTION	MANUFACTURER	PART NO.
1	1	Audio Amplifier and Control	King	KAA 455
2	2	Communications Transceiver	King	KTR 908
3	1	Audio Control Console	King	KA 119
4	3	Communications Frequency Selector	King	KFS 590B
5	2	VOR/Localizer/Receiver	King	KNR 634
6	1	ADF System	King	KDF 806
7	2	NAV Frequency Selector	King	KFS 560B
8	1	Integrated Flight Director/Autopilot Sys.	King	KFC 300
9	2	Marker Beacon Presentation	King	KA 35A
10	1	ADF Frequency Selector	King	KFS 580 B
11	1	Flight Control Indicator	King	KCI 310
12	1	Pictorial Navigation Indicator	King	KPI 553A
13	2	ATC Transponder W/Antenna	King	KXP 756
14	1	DME	King	KDM 706
15	1	Slave DME Display	King	KDI 573
16	1	RNAV Computer/Waypoint Selector	King	KNS 81
17	2	VOR/LOC Antenna		
18	2	Glide Slop Antenna	King	KA 22
19	1	DME/Transponder Antenna	King	KA 60
20	1	Marker Beacon Antenna	King	KA 23

APPENDIX 1-E
RADIO AND ELECTRONICS (continued)

ITEM NO.	NO. REQD.	DESCRIPTION	MANUFACTURER	PART NO.
21	1	Color Weather Radar System	King	KWX 56
22	3	Microphone		
23	2	Annunciator Panel	King	KAP 315
24	2	RMI Indicator	King	KNI 582
25	2	VOR/Localizer/ Glideslope/Indicator	King	KI 206

APPENDIX 1-F
FURNISHINGS

ITEM NO.	NO. REQD.	DESCRIPTION	MANUFACTURER	PART NO.
1	2	Seat - Pilot		
1	1	Seat - Observer		
2	1	Seat - Stewardess		
3	up to 44	Seat - Passenger		
4	up to 12	Oxygen Service Unit (3 or 4 Drop-Out Masks)		
5	2	Oxygen Mask - Pilot (with Regulator & Microphone)		
6	1	Washroom		
7	1	Buffet		

APPENDIX 1-G
AIR CONDITIONING AND PRESSURIZATION

ITEM NO.	NO. REQD.	DESCRIPTION	MANUFACTURER	PART NO.
1	4	Refrigeration Unit	Hamilton Standard	R70-3W
2	1	Temperature Selector		
3	1	Cabin Altitude Controller		

APPENDIX 1-H
AUXILIARY EQUIPMENT

ITEM NO.	NO. REQD.	DESCRIPTION	MANUFACTURER	PART NO.
1	1	Pitot Cover		
2	2	Engine Plug		
3	2	Air Conditioning Plug		
4	1	Baggage Tie-Down Kit		