R3Y TRADEWIND

CONVAIR A DIVISION OF GENERAL DYNAMICS CORPORATION

Prepared by Engineering Service Publications San Diego Division

Sections

PEACETIME OPERATIONS

New mobility and versatility for water based transports. Functional in every aspect—designed for minimum dependence on fixed facilities and maximum advantage of range, payload and performance. No other weapon designed for wartime use has the peacetime advantages of the R3Y's adaptability to routine operations.

WARTIME OPERATIONS

Adaptability of the R3Y airframe and structural design to specific logistical and tactical missions . . . showing optimum use of water based capability and unique applications of the bow loader principle in the concept of amphibious warfare.

APPENDIX

Three-view and plan-view drawings. Air conditioning, heating and ventilation and anti-icing systems. Fuel, oil, pneumatic and electrical systems in brief schematic form. Performance data charts, cargo loading tables and beaching and servicing equipment.

San Francisco

Midway

Hawaii

Honolulu

N

W E

S

PEACETIME OPERATION

R3Y TRADEWIND
PEACETIME OPERATION
FOR THE U. S. NAVY

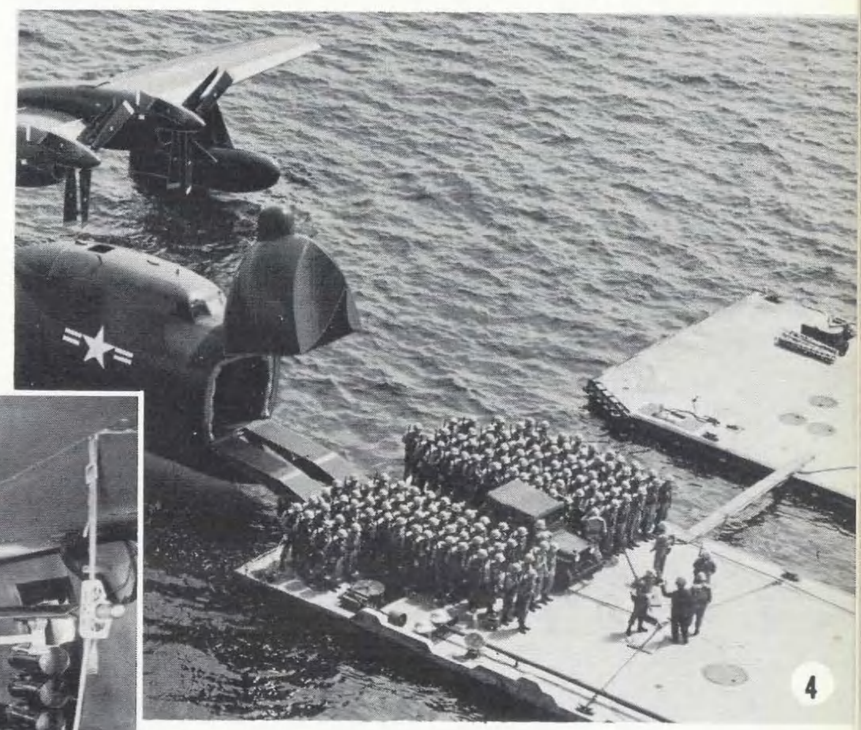
Functional Peacetime Operations

THE NAVY'S LATEST WATER-BASED
PRESSURIZED TRANSPORT AIRPLANE


1


2

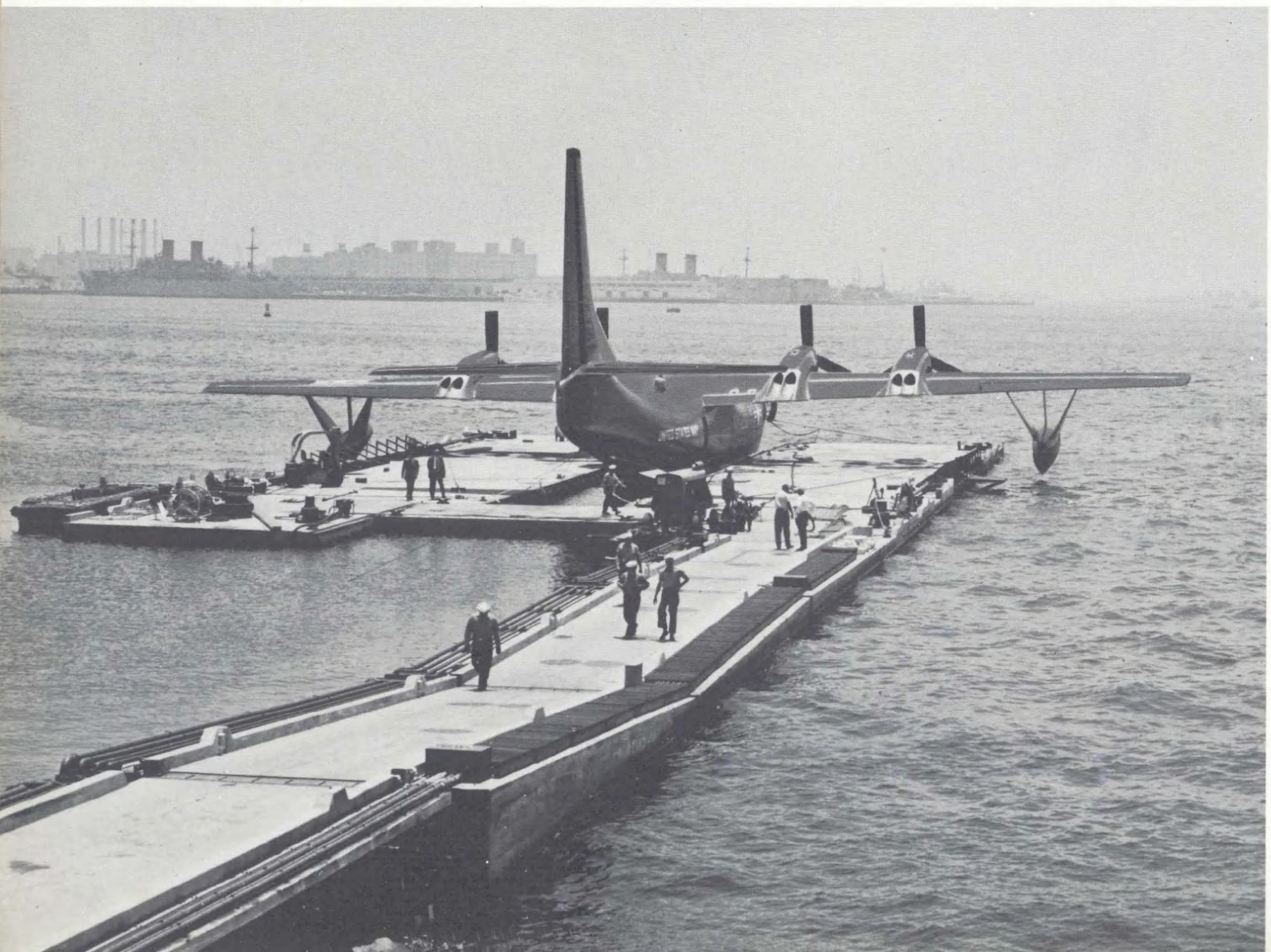

3


4

1. Cargo Transport
2. Personnel Transport
3. Evacuation Transport
4. Troops Transport

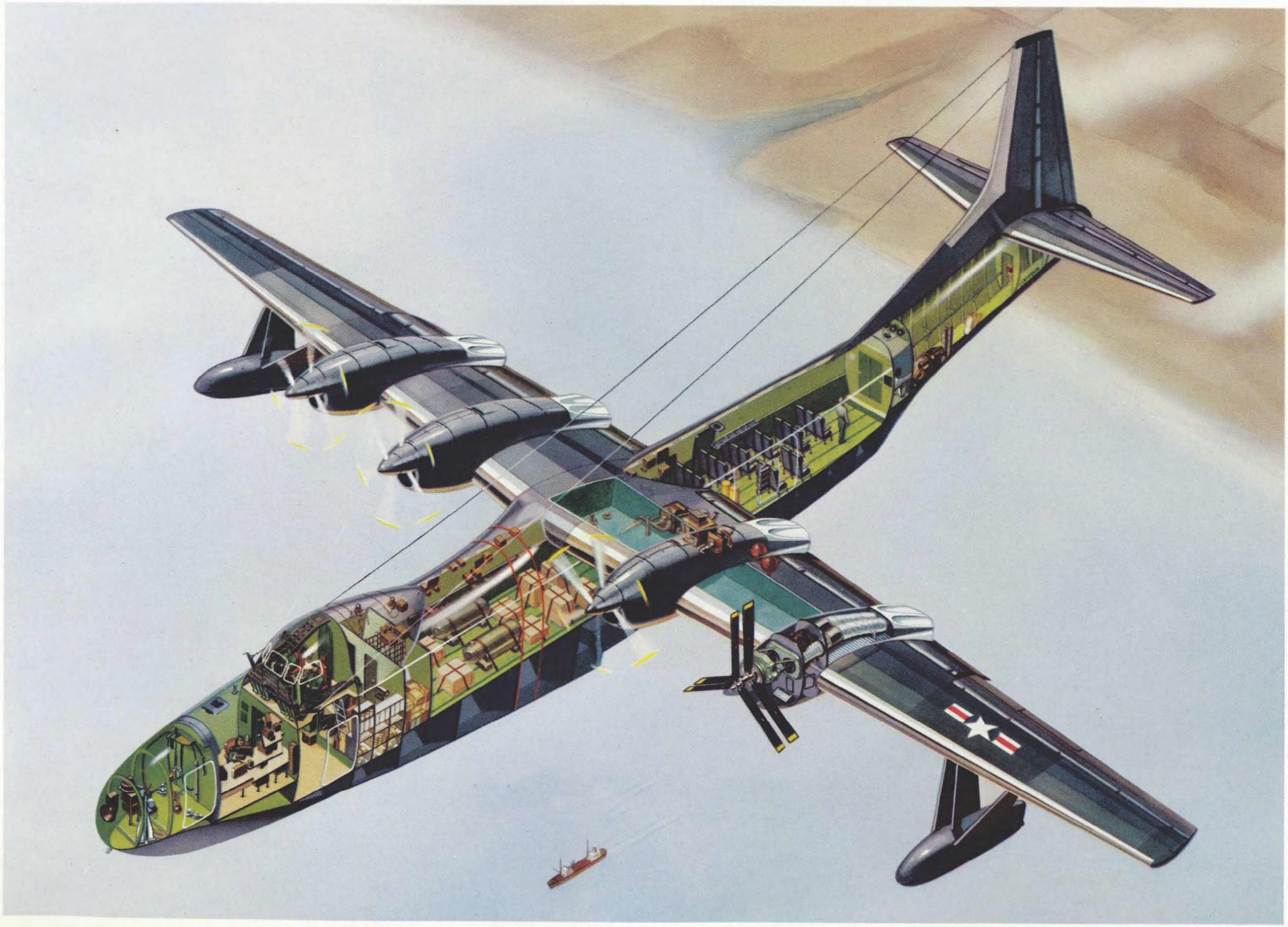
Peacetime Operations

The R3Y water based transport airplane is capable of performing peacetime functions comparing favorably with the best land based contemporary transports. No contemporary weapon having the wartime potential of the R3Y can perform a peacetime mission with comparable economic advantage.



The TRADEWIND is designed to provide maximum versatility, comfort, ease of maintenance and operation. It is created to permit the performance of missions from advanced and temporary bases where fixed servicing, repair and docking facilities are not available.

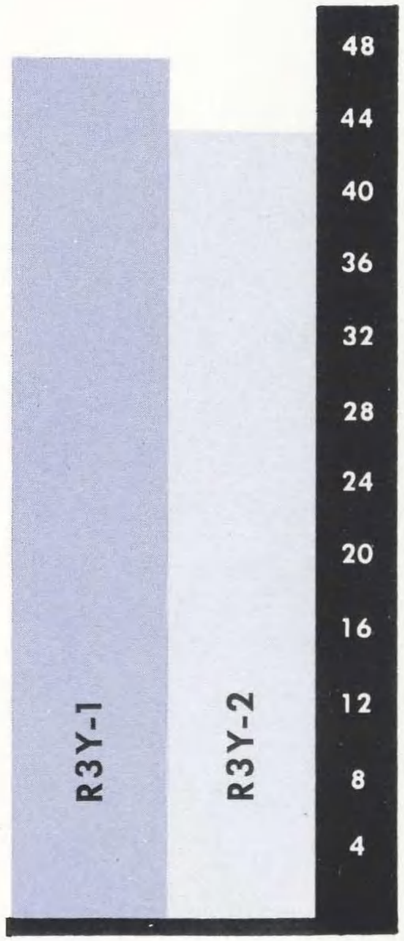
R3Y TRADEWIND
PEACETIME OPERATION
FOR THE U. S. NAVY



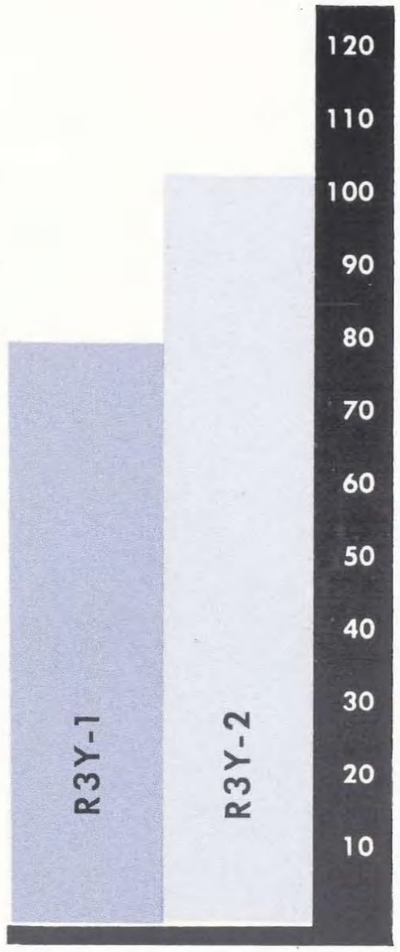
Versatility of Interior Arrangements

THE CARGO COMPARTMENT OF THE R3Y TRADEWIND IS ONE INTEGRAL COMPARTMENT

The entire cargo floor withstands a uniform load of 300 lbs. per sq. ft. Recessed fittings and rings, placed in the floor in a 20-inch grid pattern secure cargo, hold seat units and support litter structure.



IN THOUSANDS OF POUNDS
CARGO



CARGO-PASSENGER COMPARTMENT		
DIMENSIONS	R3Y-1	R3Y-2
Length — Max.	67 ft. 6 in.	88 ft. 3 in.
Width	9 ft. 8 in.	9 ft. 8 in.
Height	6 ft. 8 in.	6 ft. 8 in.
Volume (Projected above floor area)	4105.83 cu. ft.	5396.94 cu. ft.
Floor Area	615.86 sq. ft.	809.5 sq. ft.

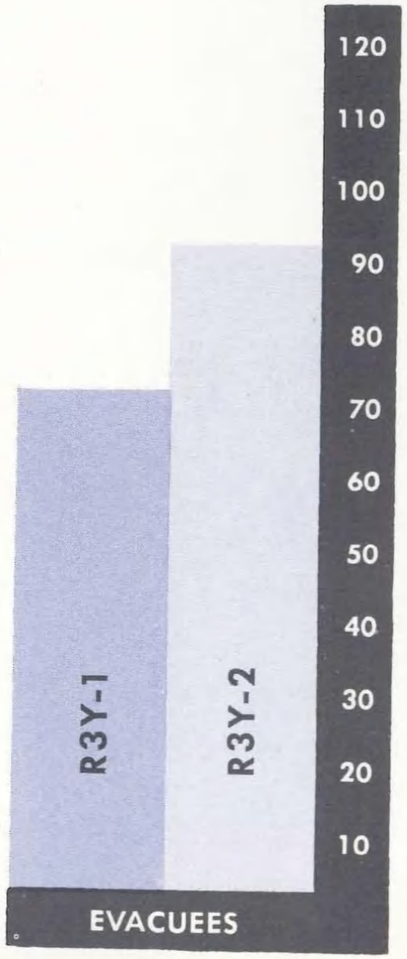
COMPLETE TRANSFORMATION FROM CARGO TO PASSENGER CARRIER . . . IN LESS THAN 1 HOUR.

Passenger seat units may be installed in the total area of the unobstructed, spacious cargo compartment.

Alternate Arrangement . . .

Lightweight, easily installed litter support structure transforms the unobstructed cargo compartment into a mercy mission airplane.

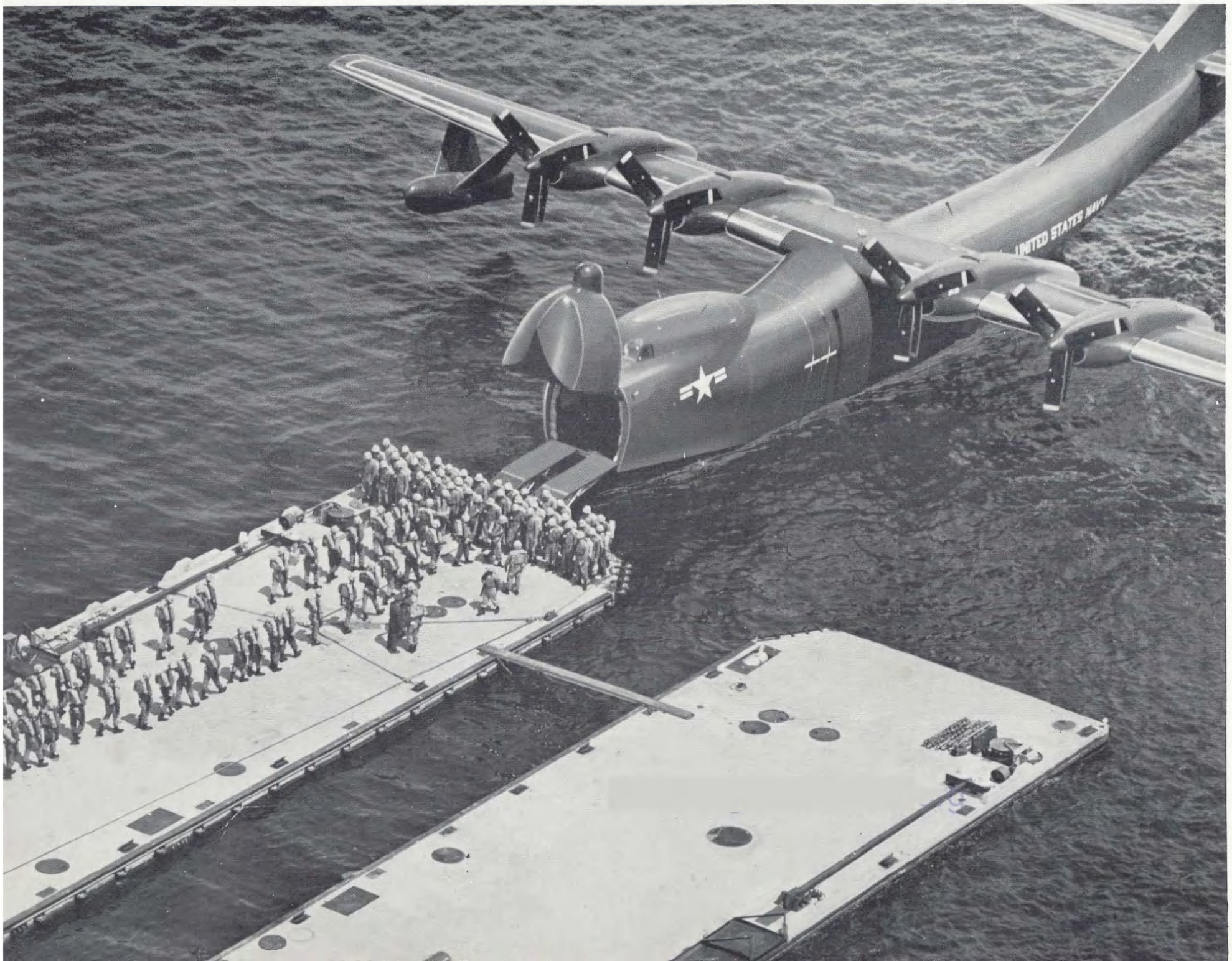
Stanchions, straps with handle supports and AN type litters are arranged in three rows of litters grouped 4-high. Adequate space for aisles and attendant seats complete the arrangement.



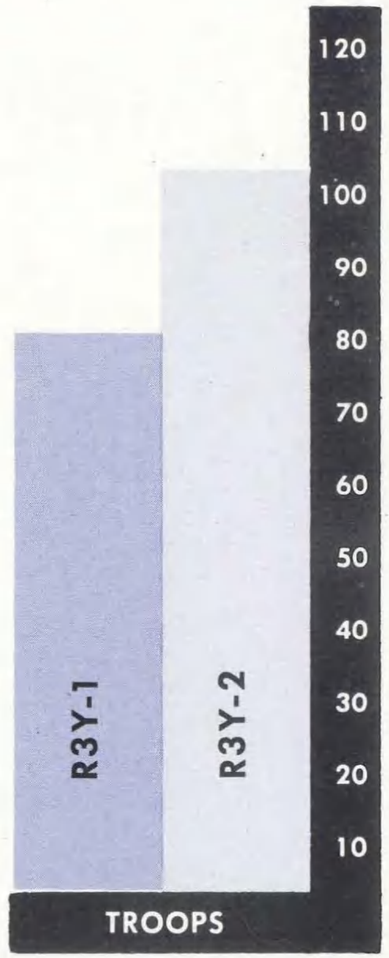
R3Y TRADEWIND
PEACETIME OPERATION
FOR THE U.S. NAVY

. . . Change-Over . . . in Less Than an Hour

With standard AN 4-man troop seat units, the R3Y transports combat-equipped troops on maneuvers or missions. 15 additional men can be carried in this troop arrangement.

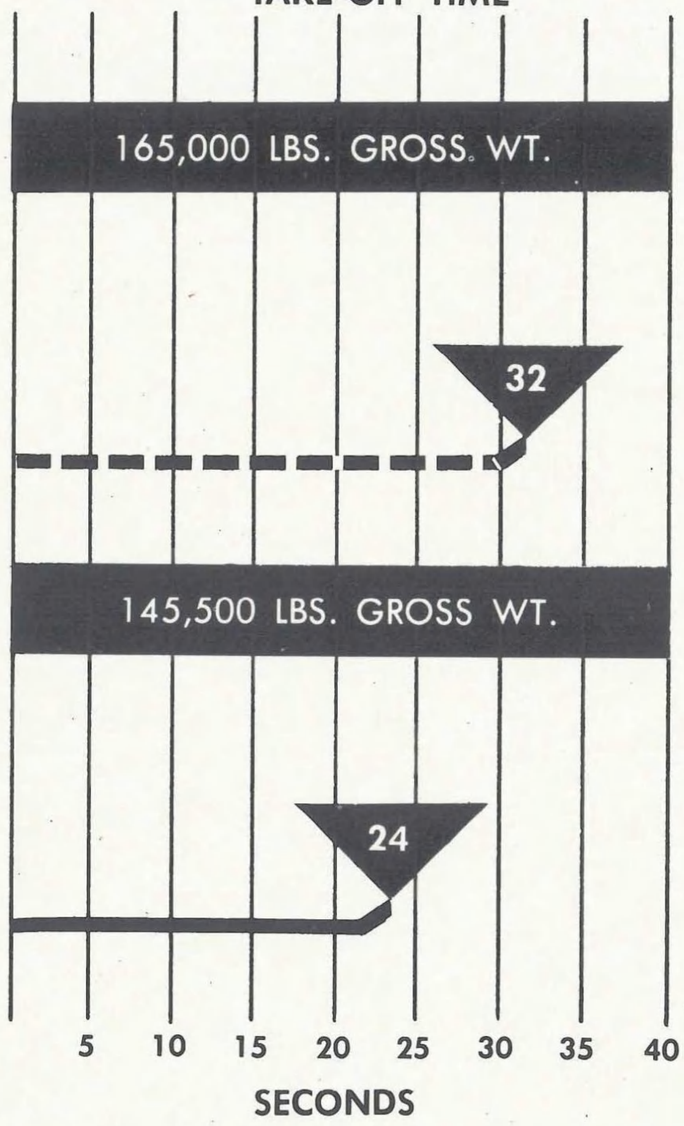


Combination TROOP-CARGO arrangements are made by removing center aisle seats and folding side seats against bulkheads.

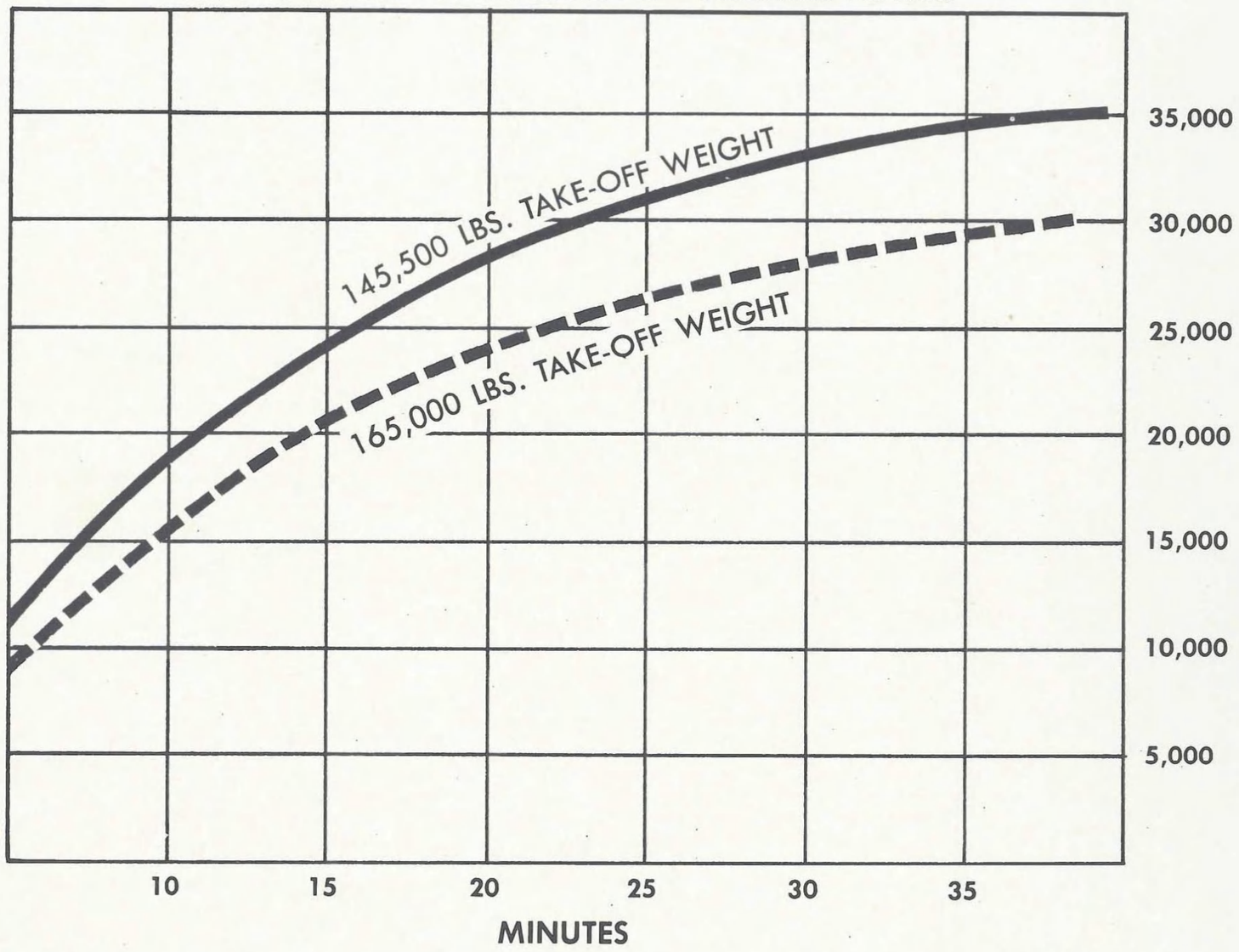


Power Performance . . .

TAKE-OFF TIME



TIME TO CLIMB — FOUR ENGINES — NORMAL POWER



STANDARD CONDITIONS
R3Y-1 Airplane
Clean Configuration
NACA Standard Day
Zero Wind

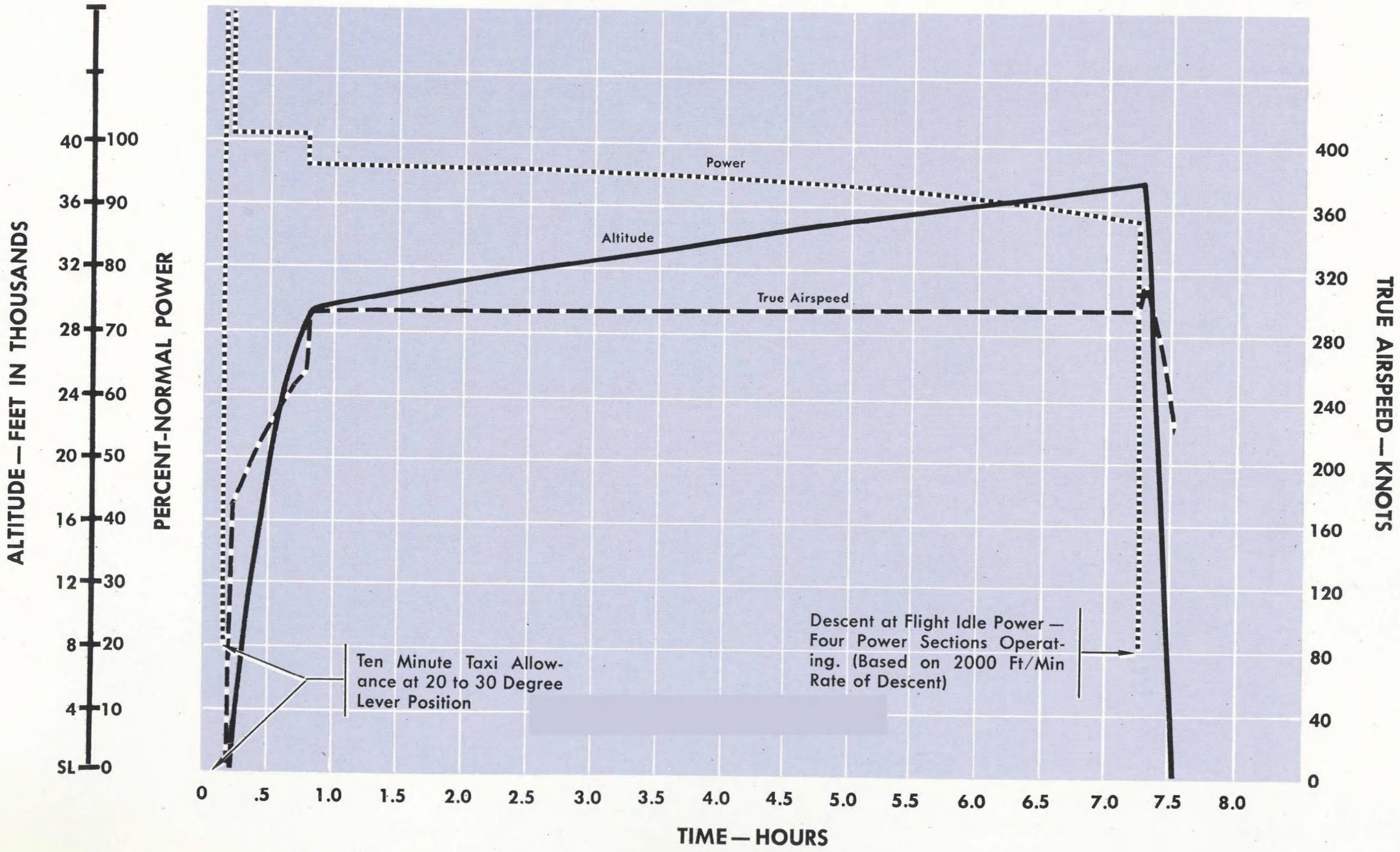
Four Allison T40-A-1O turbo prop constant speed engines develop a totol of 22,000 horsepower. Each engine consists of two power sections which ore geared To o contra-rotating, six-bladed propeller.

R3Y TRADEWIND
PEACETIME OPERATION
FOR THE U. S. NAVY

. . . for Operational Utility

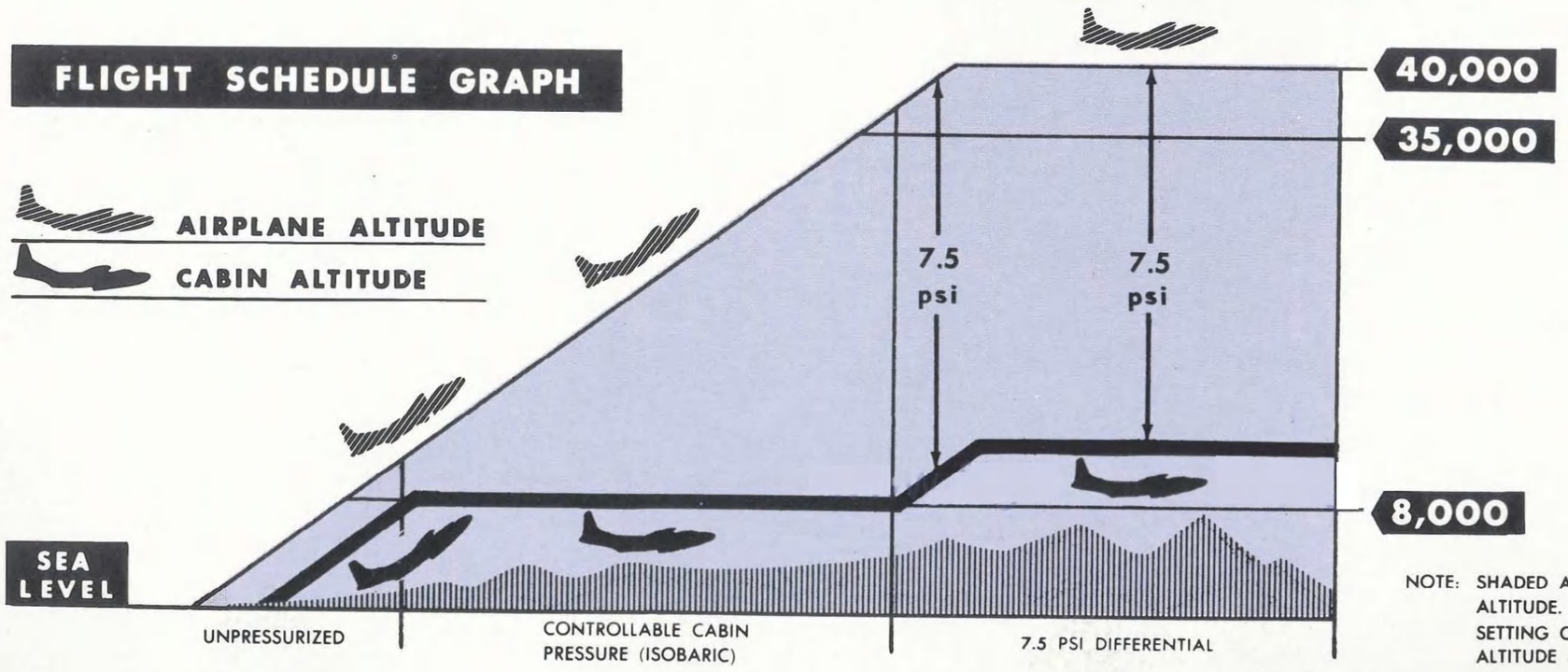
ESTIMATED FLIGHT PLAN FOR R3Y-1 AIRPLANE

2100 Nautical Miles (Alameda to Honolulu) Max. Range Operation T40-A10 Engines — Take-off gross wt. = 165,000 lbs.



Cabin Pressurization and Air Conditioning

Eight sources from the turbo prop engines supply air for both cabin pressurization and air conditioning. Clean cabin air may be heated, cooled or humidified for greater crew and passenger comfort.



NOTE: SHADED AREA REPRESENTS AIRPLANE FLIGHT ALTITUDE. LINE GRAPH REPRESENTS ISOBARIC SETTING OF 8,000 FEET WITH THE CABIN ALTITUDE SELECTOR.

Anti-Icing

Stainless steel leading edges protect the wing and tail surfaces and safely disseminate the very high temperature exhaust gases taken directly from each power section tail pipe.

R3Y TRADEWIND
PEACETIME OPERATION
FOR THE U. S. NAVY

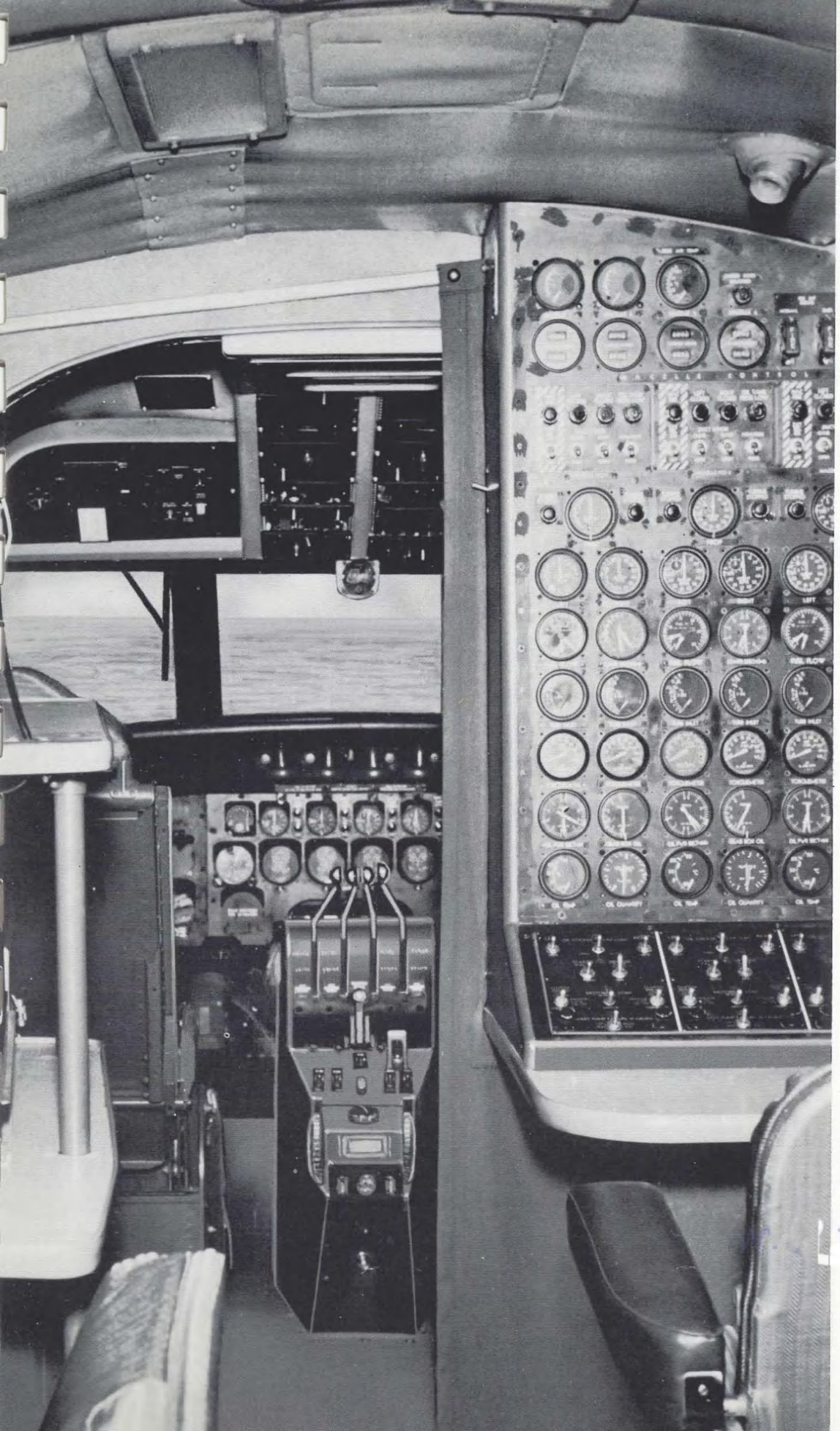
Designed for Service...

STRUCTURAL INTEGRITY—R3Y airplanes are capable of withstanding rough water landings at 145,000 lbs. gross weight. Static tests combined with pressurization testing make the R3Y testing program the most comprehensive ever given a water based airplane.

CLEAN WATER ENTRY—The R3Y has a high length-beam ratio of 10. This permits a clean water entry and greatly reduces the spray pattern on take-off and landing.

High wing to hull attachment and location of nacelles above the wing upper surface prevent spray entry into engine air inlets.

Pilot's and Copilot's Compartment . . .



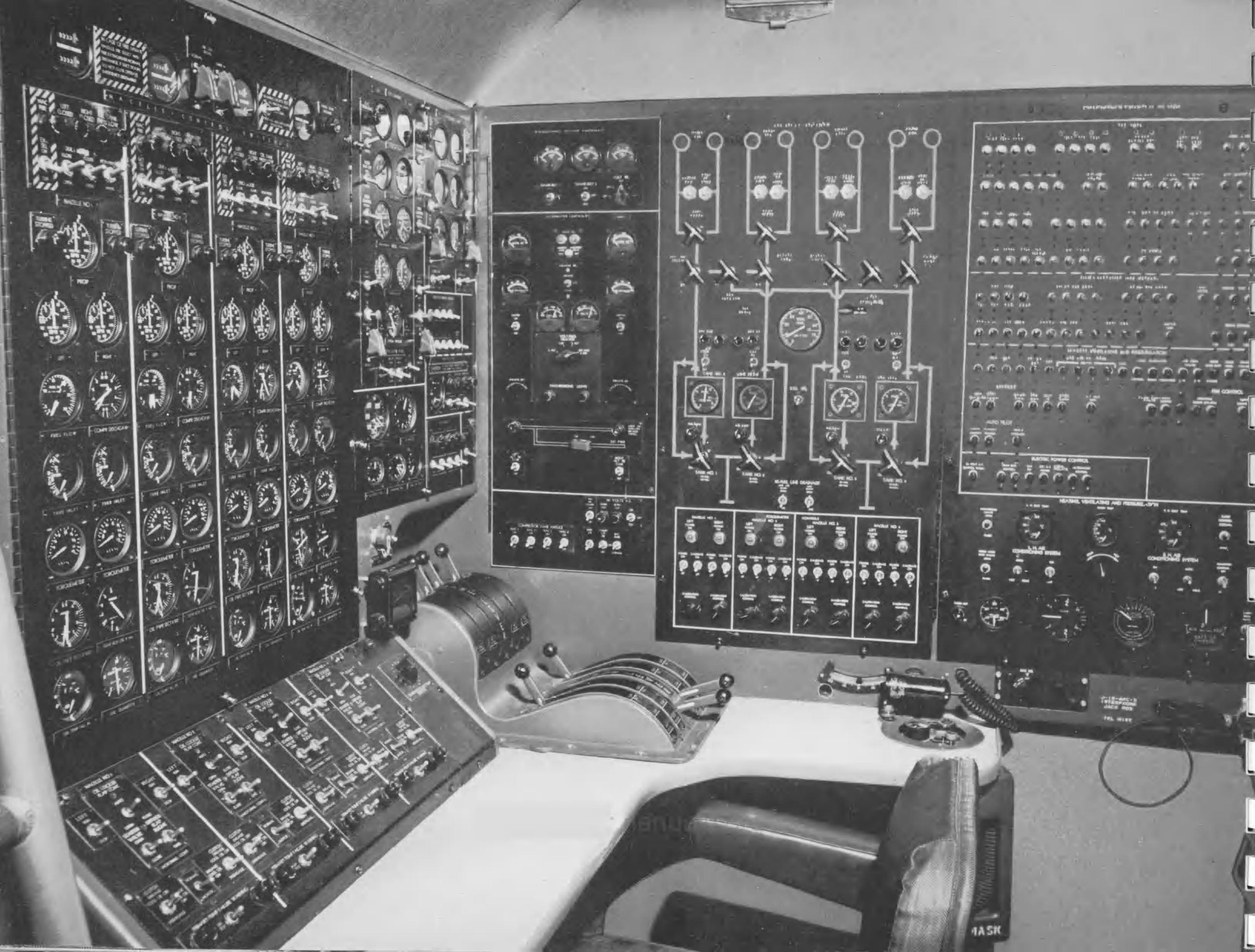
R3Y TRADEWIND
PEACETIME OPERATION
FOR THE U. S. NAVY

Functional Economy of Space

Four Power Control Levers . . . a simplified one-lever system for each engine. In the Flight Range all power setting adjustments are accomplished by positioning the power lever. The propellers automatically maintain constant speed.

Between Max. Reverse and Flight Idle positions of the power levers, the propeller governing system is disconnected. The propeller operates as a controllable fixed pitch prop. Blade angles are controlled directly by power lever positions.

Positive feathering by direct mechanical control of propellers. Feather control levers interconnect within the coordinating control — to close power section fuel valves and to declutch both power sections. Feather controls always override power lever controls.



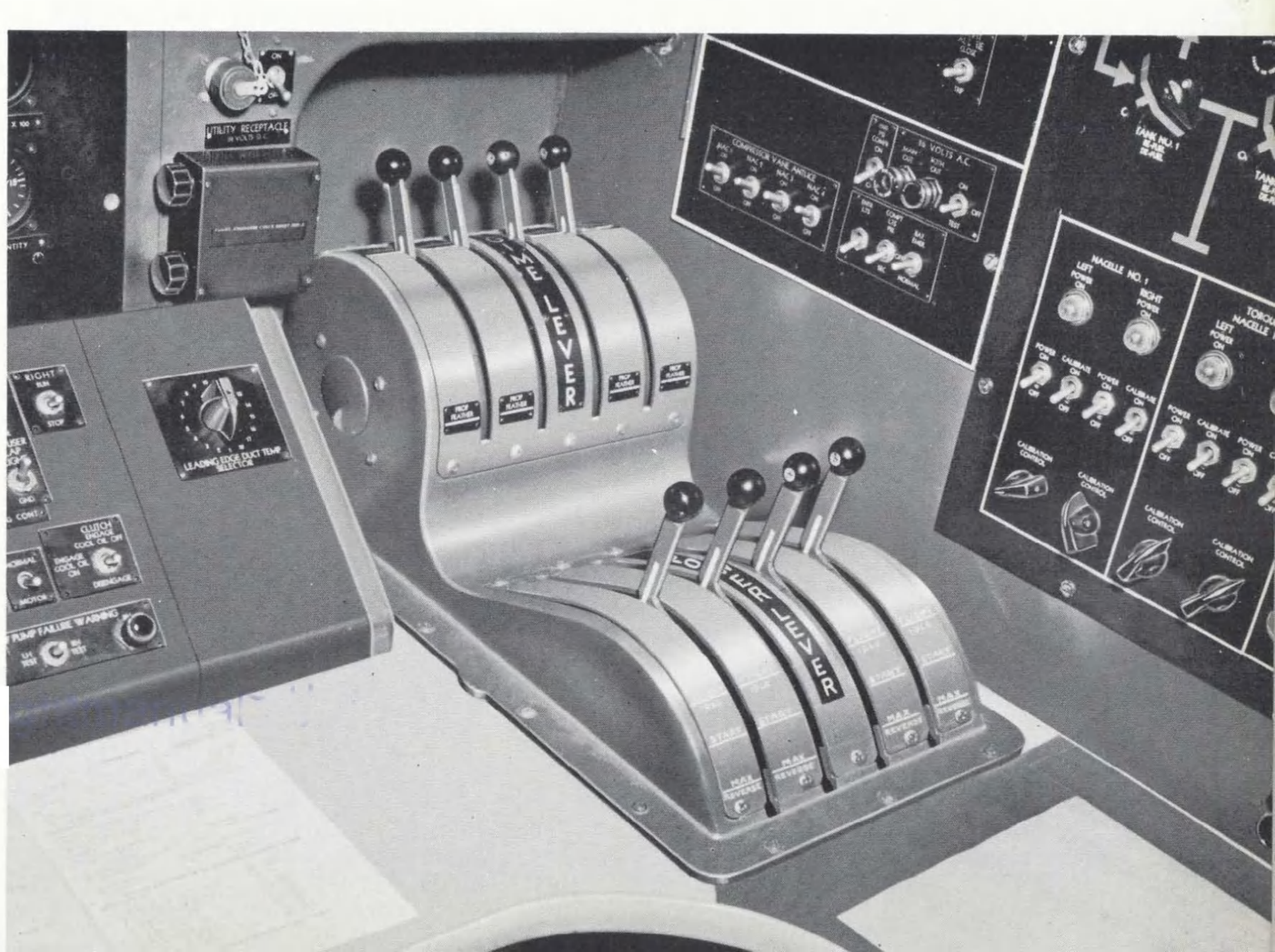
R3Y TRADEWIND
PEACETIME OPERATION
FOR THE U. S. NAVY

Flight Engineer's Compartment . . .

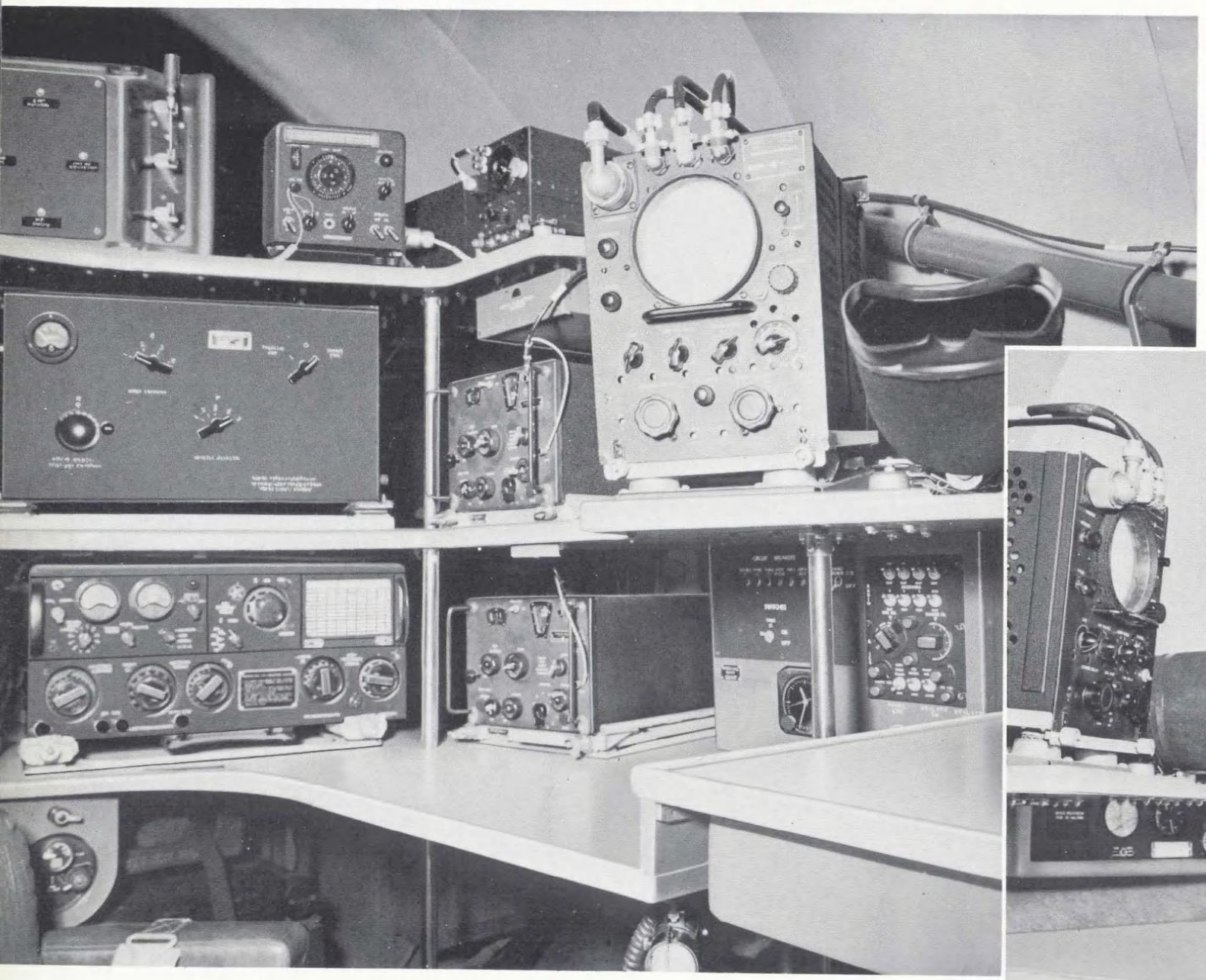
COMPLETE INSTRUMENTATION AND CONTROLS PLACED FOR EASY AND CONVENIENT OPERATION

Maximum electrical load during any cruise configuration can be supplied by either of two alternators. Turbine driven AC generators with a capacity of 200 volts, 400 cycles save weight. Small electric motors with high HP output and smaller, lightweight wiring is used throughout the airplane.

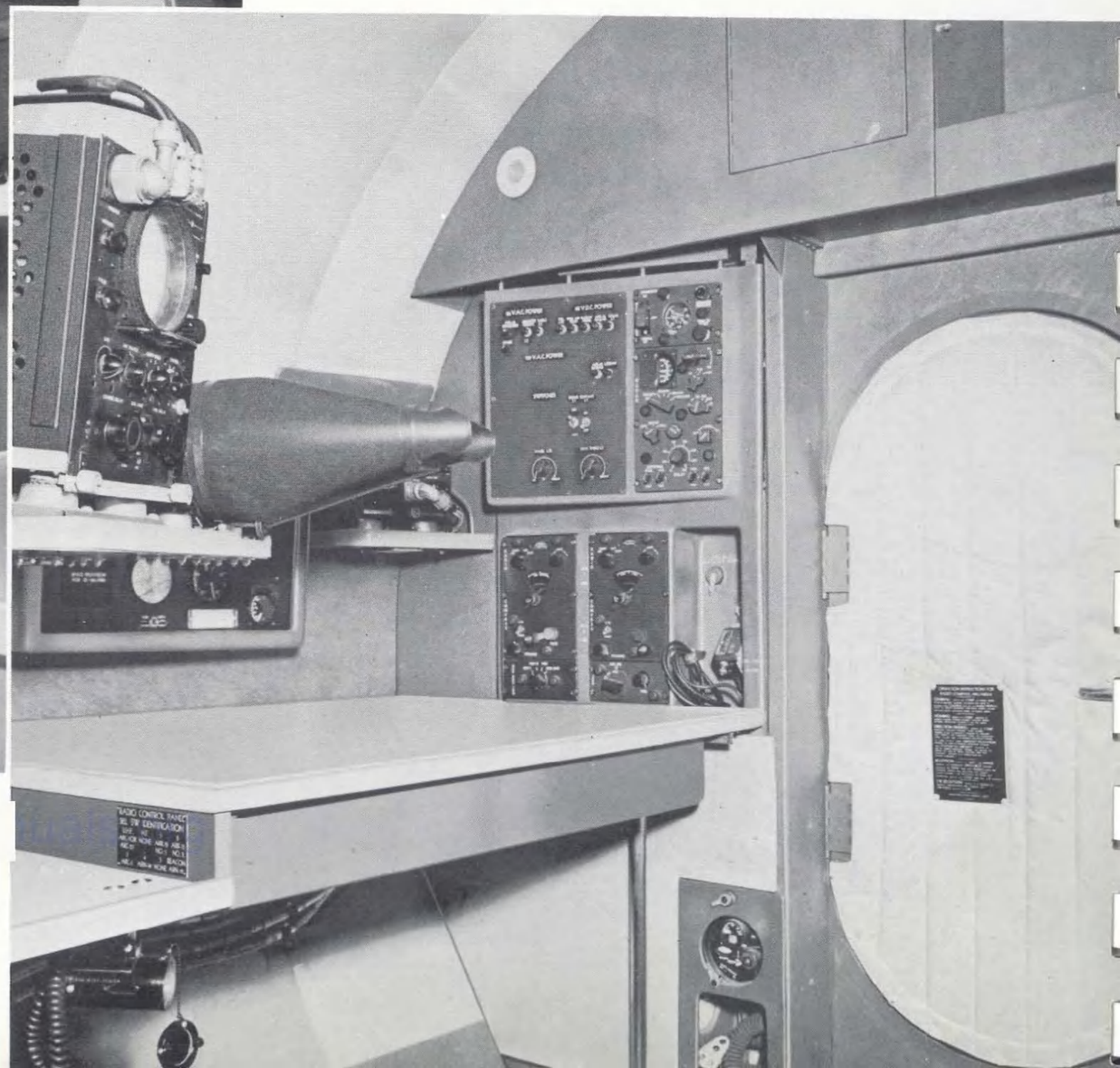
The turbine which drives the AC generator is normally operated as a gas turbine motor. It can also be operated as an air turbine motor. This provides an added degree of reliability.



Radio and Navigation Compartment

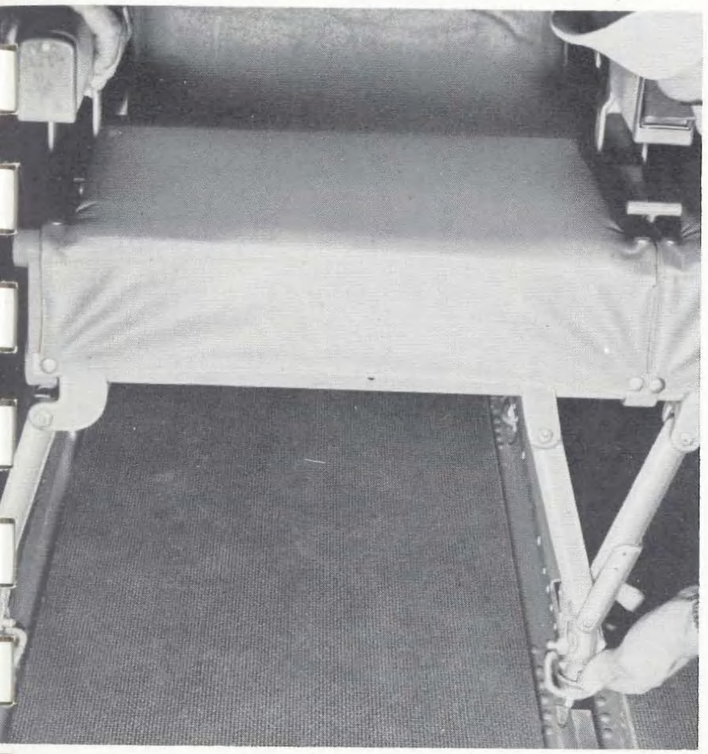


Ample working area is provided by careful utilization of available space and compact location of equipment. Space and weight savings are achieved without sacrificing accessibility.



Interior Appointments

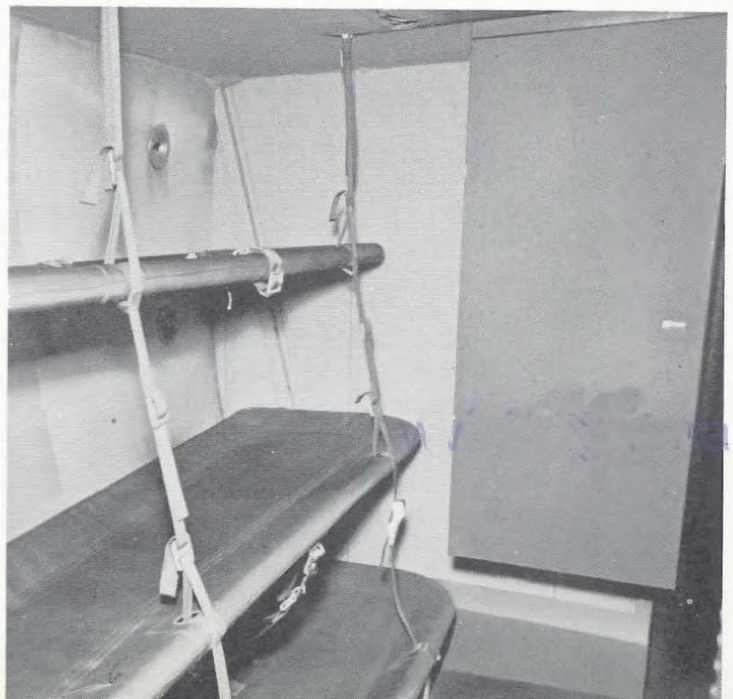
R3Y TRADEWIND
PEACETIME OPERATION
FOR THE U. S. NAVY



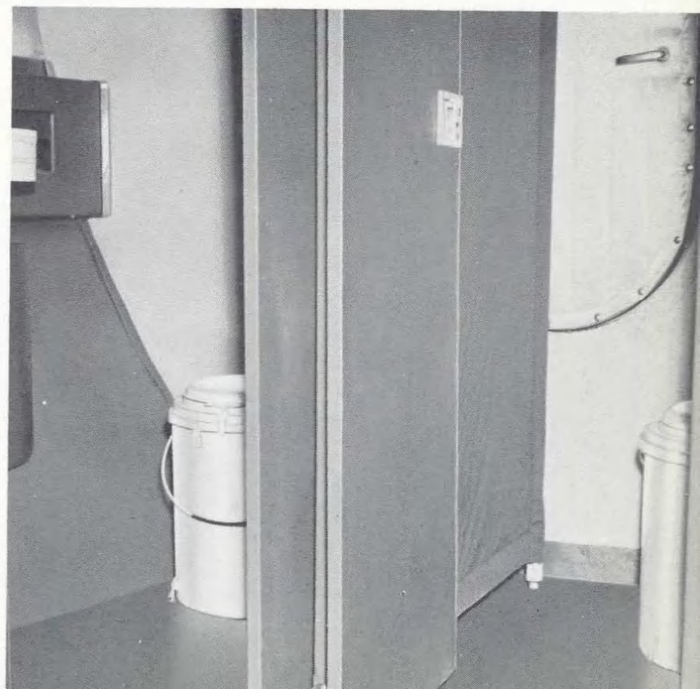
SEATS... Face aft, in two and three passenger units. Adjustable legs and a simple locking sleeve device provide quick attachment to recessed floor fittings.

BUFFET . . . Compact, easily cleaned. Two-plate electric range, utility space, sink, hot cups and vacuum beverage containers.

BUNKS... Three in Entrance Compartment. Upper berths fold against bulkhead. The lower bunk is usable as take-off, landing or ditching station.



LAVATORIES . . . Two at aft end of cargo-passenger compartment. Facilities include toilet, wash basin, shelf, mirror, paper towel dispenser.

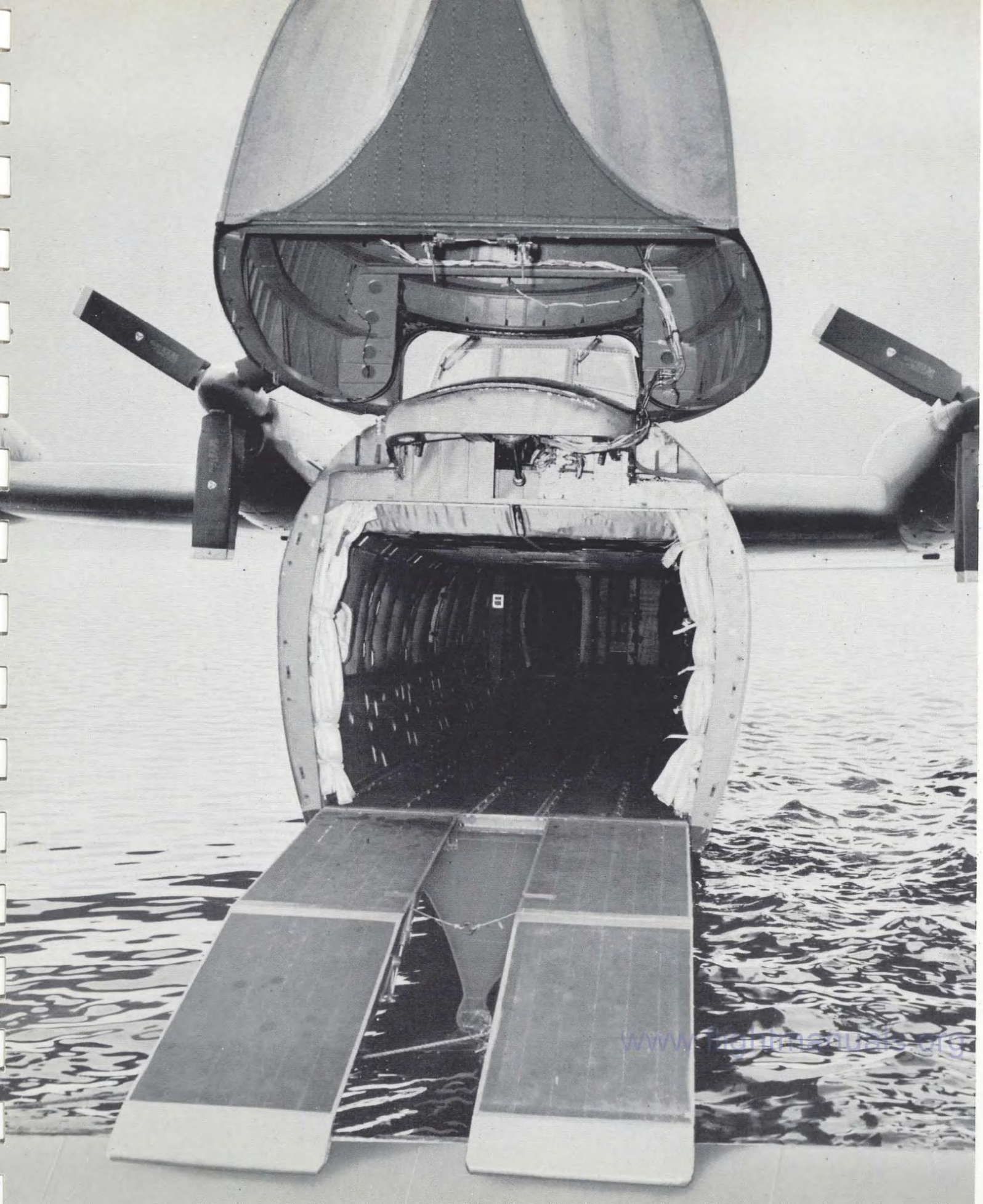


Fast—Efficient Cargo Handling

SIDE LOADING—The cargo door is on the left side — safely aft of propellers. Opening upward and outward it is approximately 120 inches wide and 88 inches high.

A portable cargo loading platform, hoist and beam unit is used to handle cargo while the airplane is on the beaching cradle or offshore into barges, amphibious vehicles or landing craft. Pneumatic winches and pulley-type pogo sticks move cargo to any desired location.

Safe approach to the side loading door is made within a 75° quadrant between the tail and the fixed auxiliary wing float.



R3Y TRADEWIND
PEACETIME OPERATION
FOR THE U. S. NAVY

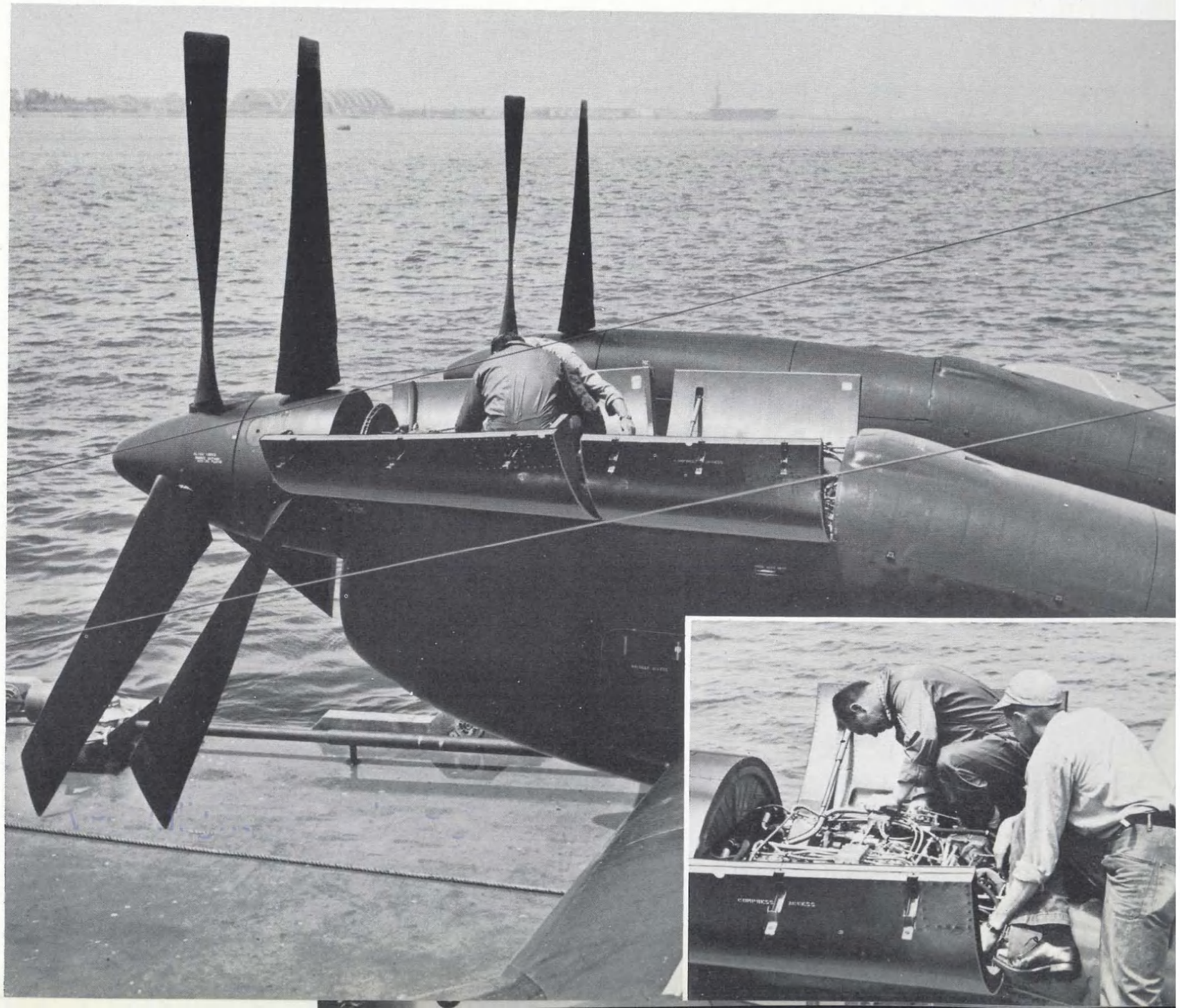
BOW LOADING—In addition to the Side Loading Door, the R3Y-2 has a bow door which consists of the entire nose section providing an opening 100 inches wide and 80 inches high.

An unobstructed approach to the bow ramp is possible within a 270° forward quadrant. Fork-lift trucks and mechanized equipment can be driven up the bow ramp directly into the cargo compartment.

Ease of Maintenance . . .

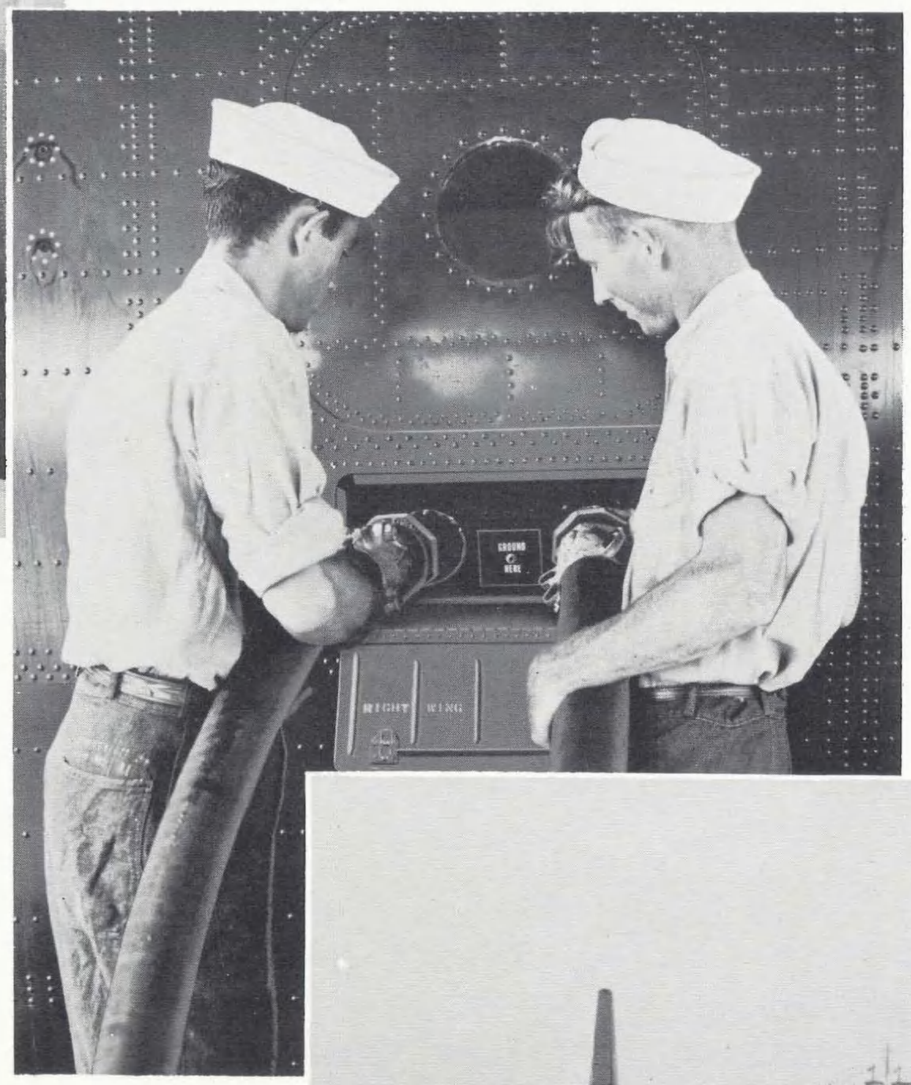
This airplane can be serviced, refueled, inspected, loaded or unloaded on the water, at a dock or while the airplane is on the beaching cradle.

Handling equipment designed for waterborne maintenance makes it possible to install, remove or repair such major items as engines, propellers, GTC's and GTM's, leading edges and float assemblies.



R3Y TRADEWIND
PEACETIME OPERATION
FOR THE U. S. NAVY

and Quick Turn-Around Time



The location of access doors and removable plates make it possible to perform postflight and preflight inspections while the airplane is waterborne . . .

Hoist, beam and ladder assemblies, lowering cables, slings and bosun chairs are available to perform maintenance tasks which might be required at forward and advanced bases where permanent shore facilities are not available.

Aleutian Islands

Korea

Japan

San Francisco

Midway

Indo China

Philippine Islands

Guam

Honolulu

Australia

N

W

E

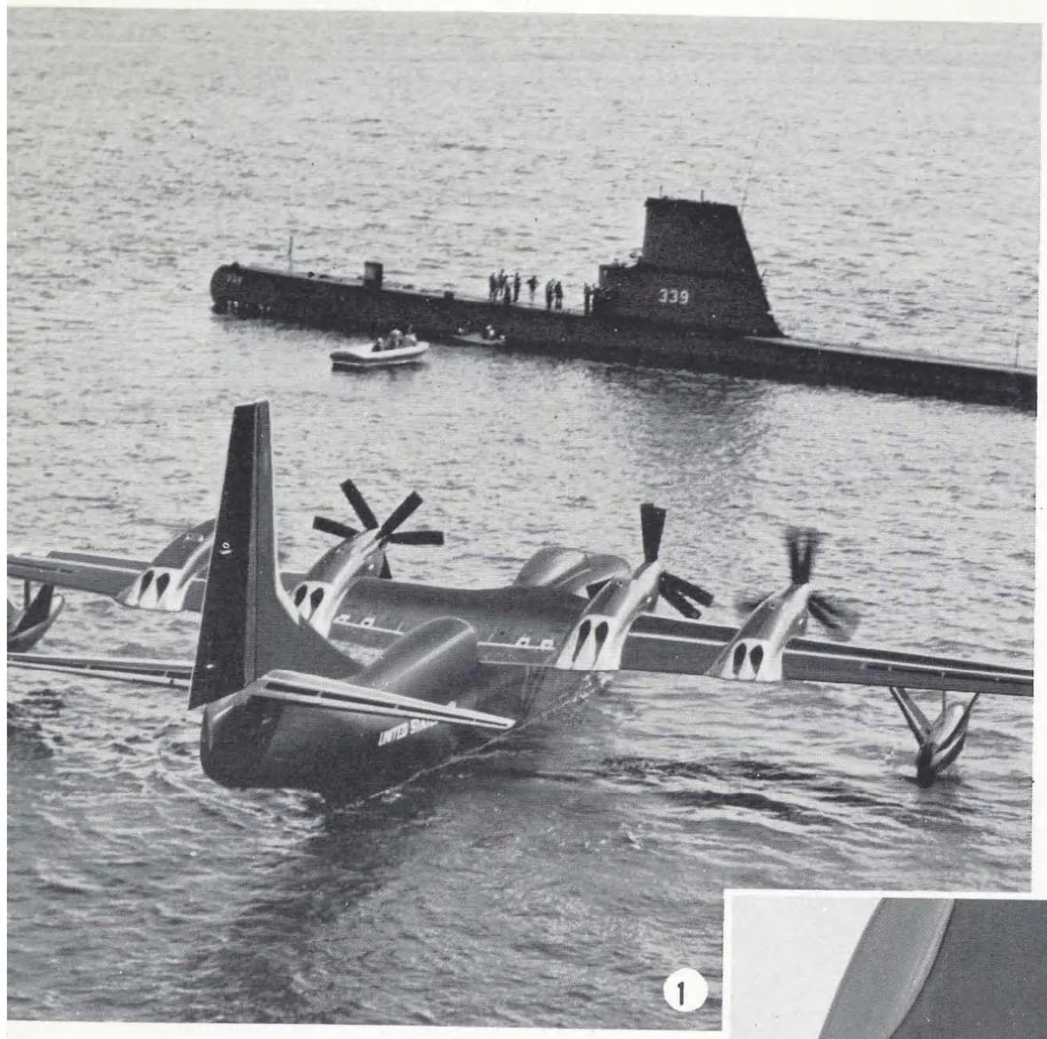
S

WARTIME OPERATION

R3Y TRADEWIND
WARTIME OPERATION
FOR THE U. S. NAVY

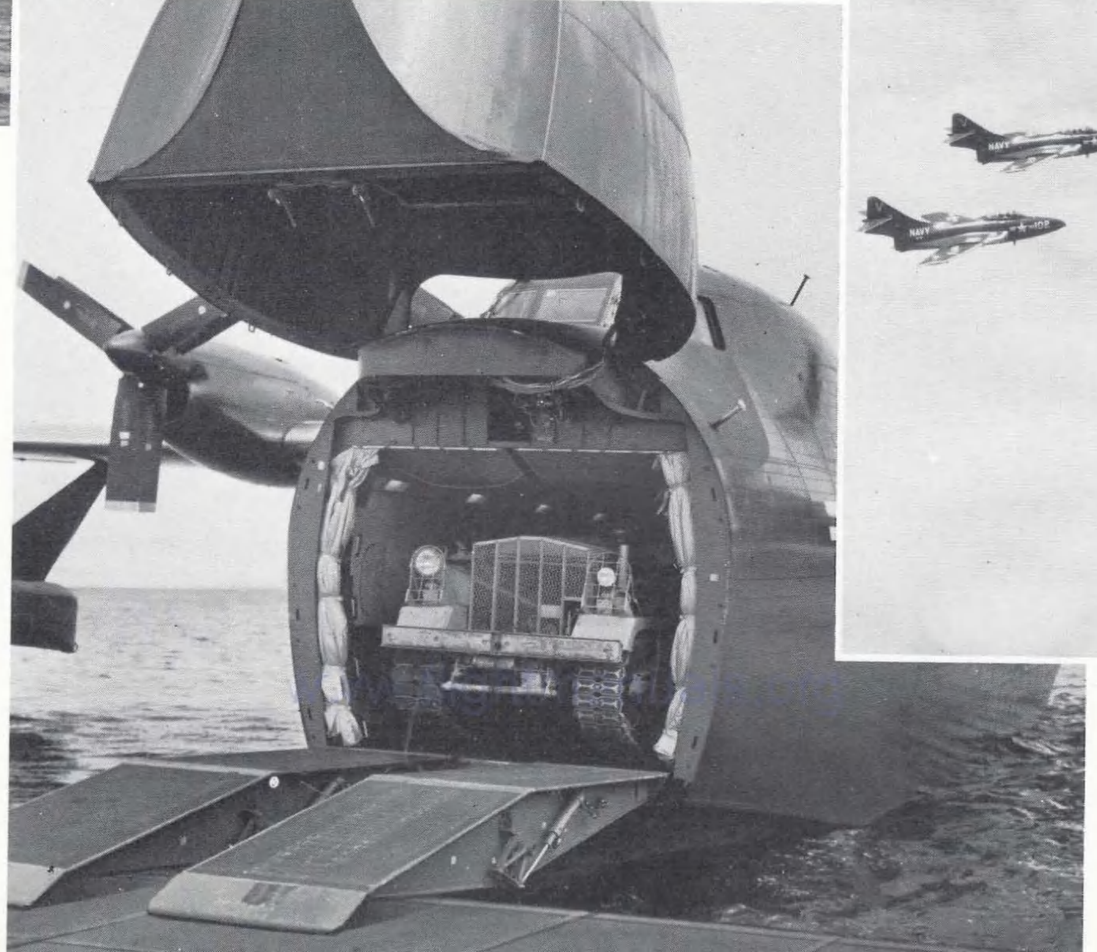
Functional Wartime Operations

AS A LOGISTICAL WEAPONS TRANSPORT AIRPLANE



1

1. Open Sea Rendezvous



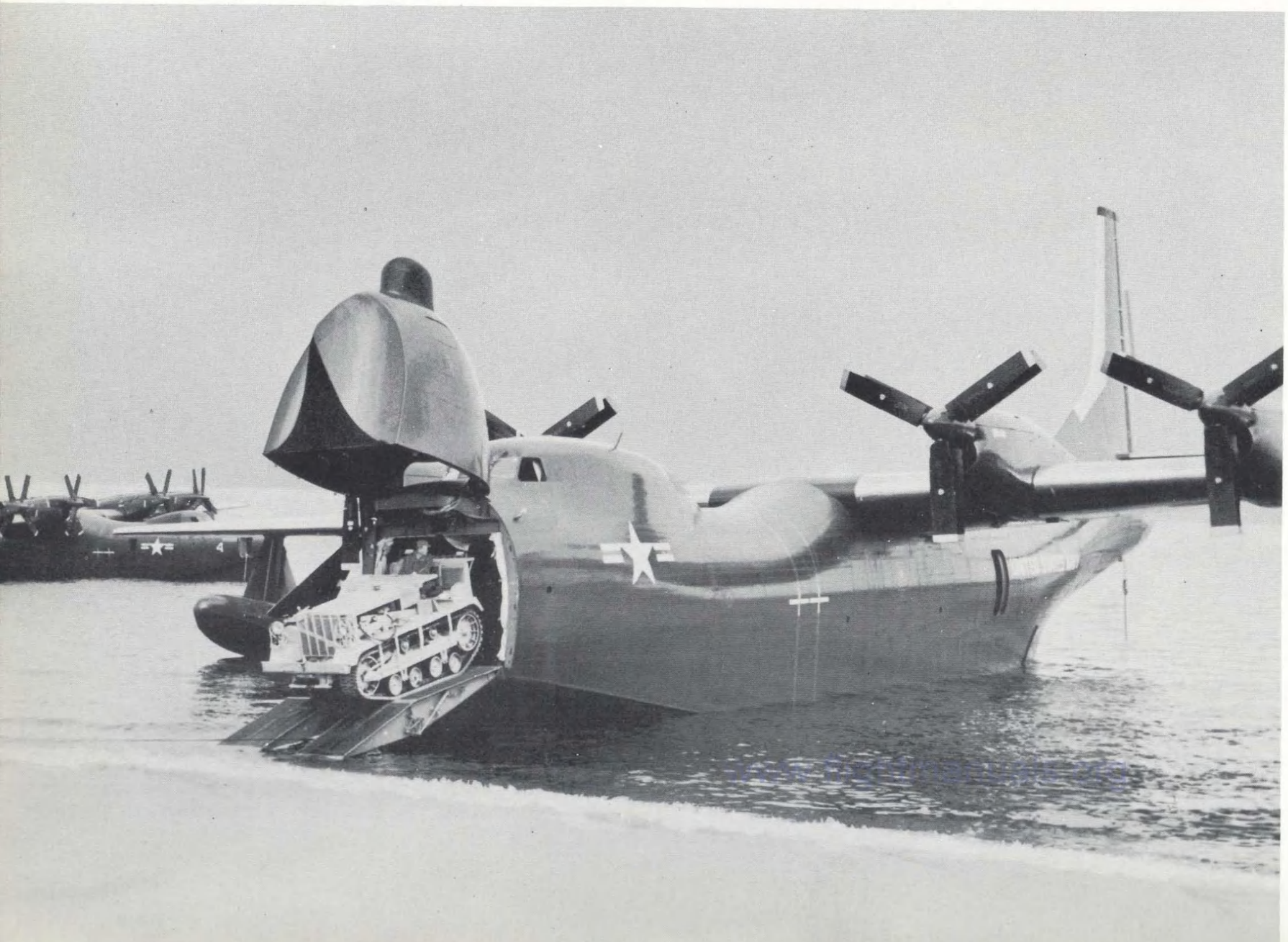
2. Amphibious Assault

3

3. In-Flight Refueling

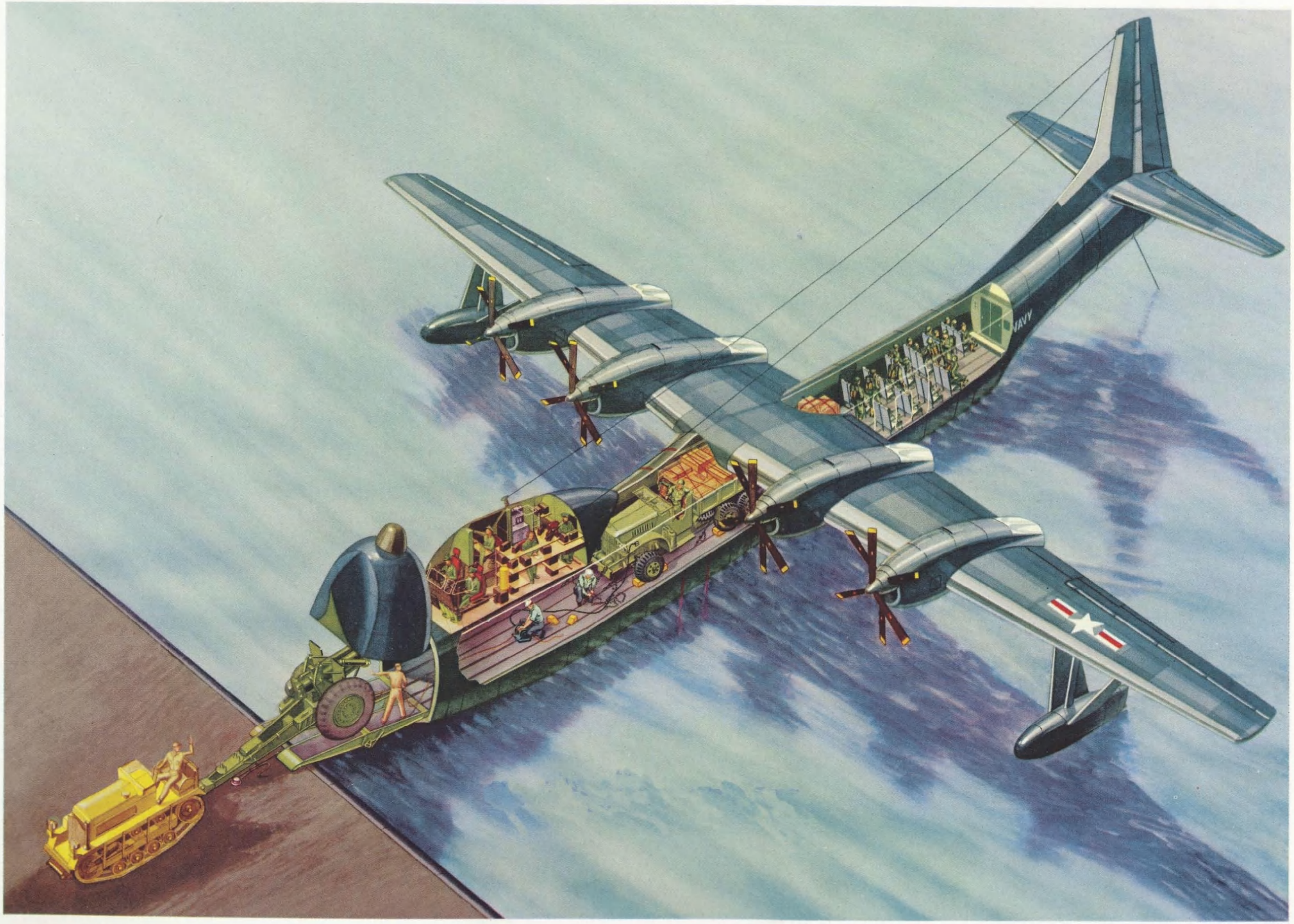
Wartime Operations

The R3Y TRADEWIND as a logistical weapon is adaptable to a variety of missions impossible to other airplanes than those of the water based type. Few weapons have the peacetime value of the R3Y airplane, but only in wartime does it fully develop its potential value.



The bow loader makes maximum use of the inherent design of the R3Y, by giving perfect access to its straight-through, unobstructed cargo space. It exploits the operational advantage of loading and unloading directly onto beach or shore with a minimum of facilities.

R3Y TRADEWIND
WARTIME OPERATION
FOR THE U. S. NAVY



Open Sea Rendezvous with . . .

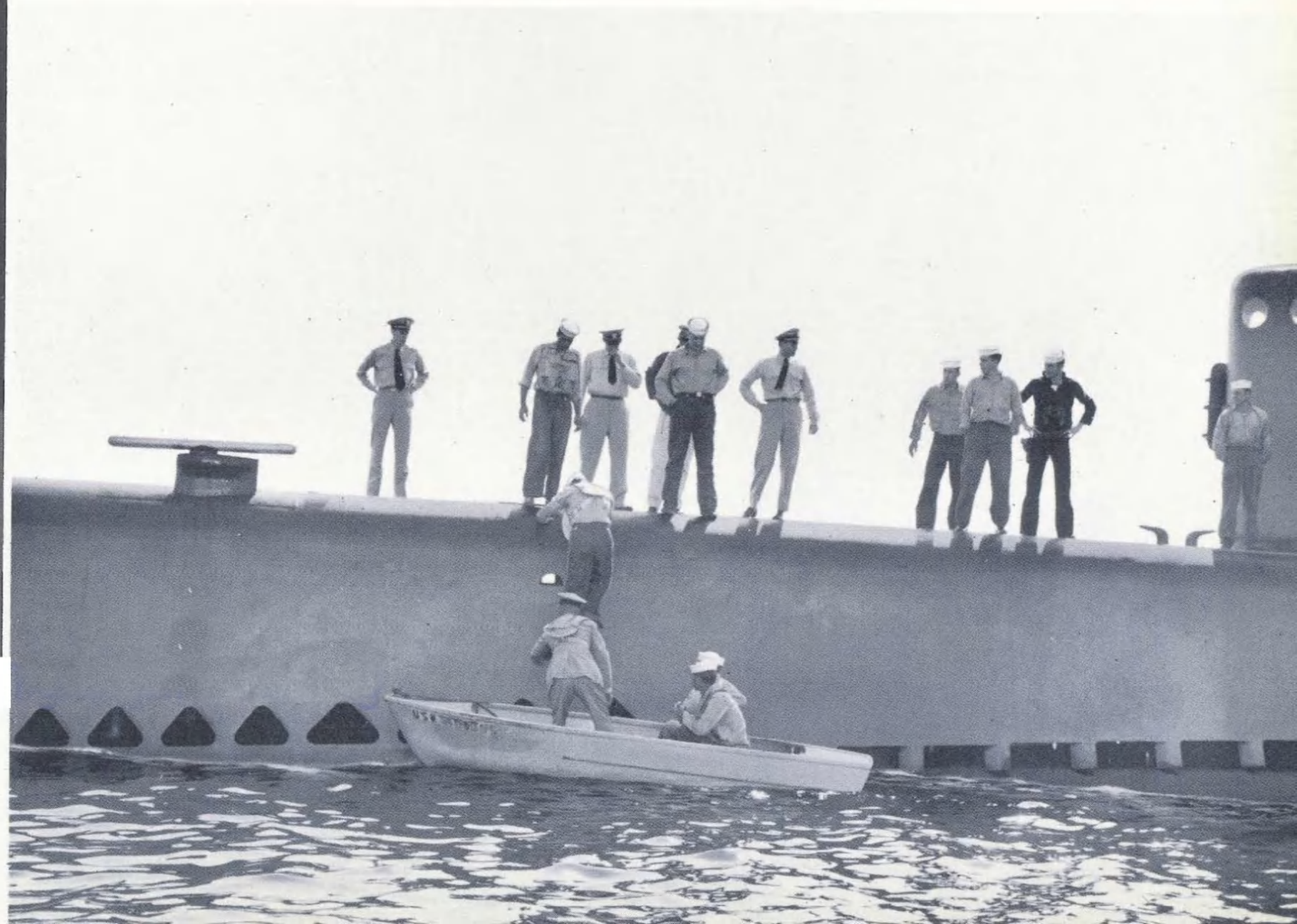
The capability of the R3Y to withstand rough water landings at high gross weights makes it possible to rendezvous in open seas.

Surface rendezvous of water based airplanes with submarines takes maximum advantage of the element of surprise and secrecy.

R3Y TRADEWIND
WARTIME OPERATION
FOR THE U. S. NAVY

Submarine, Tanker or Fighter Planes

An R3Y rendezvous with killer type submarines at sea to replenish supplies and exchange crews, increases the efficiency of submarine operations... by freeing surface ships or submarines normally used, and by cutting down the time interval from days to hours.



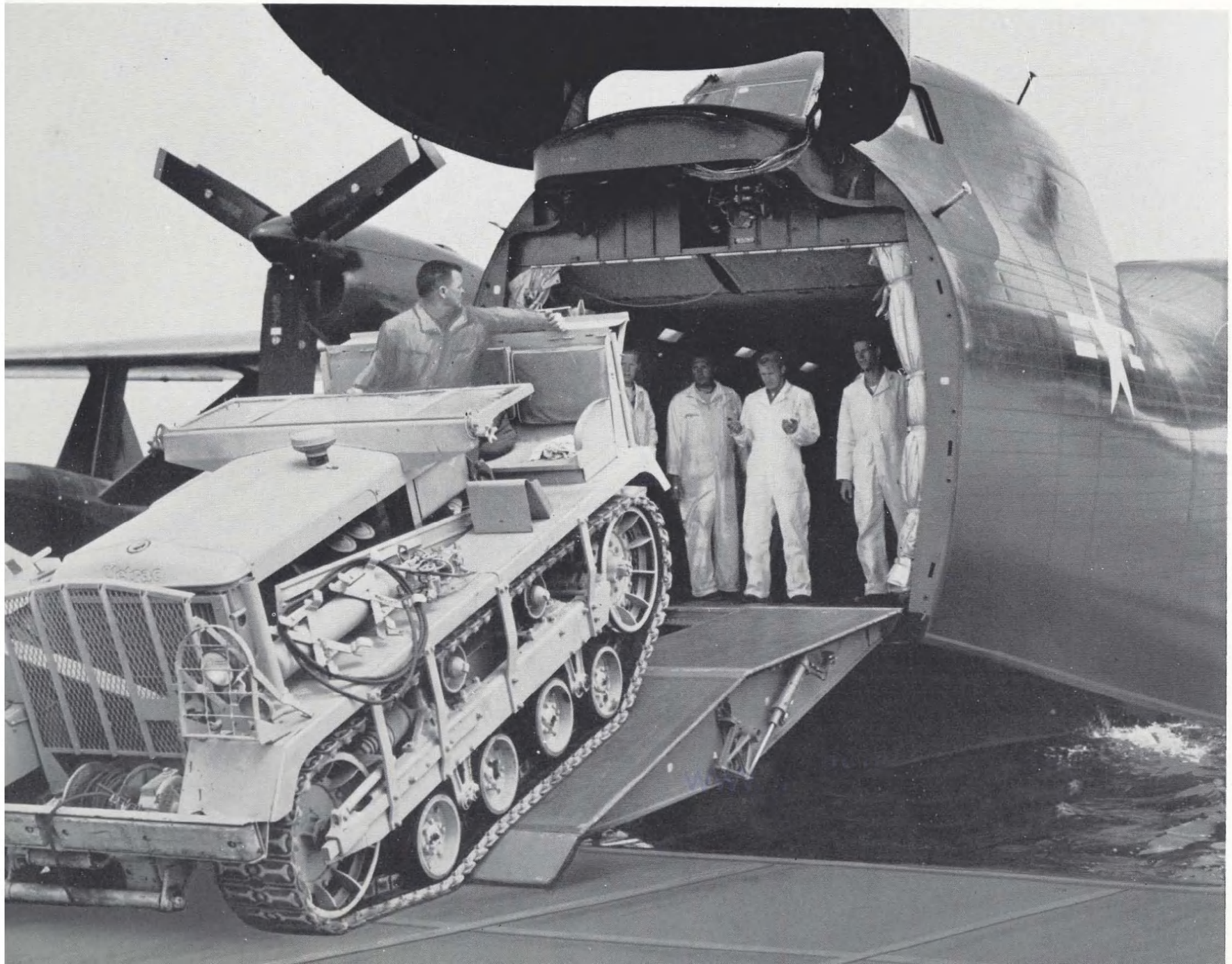
Assault Seaplane Transport for . . .

R3Y seaplanes can deliver asault forces at company or battalion strength at undefended beaches where prepared landing fields do not exist.

The R3Y-2 with its bow door and ramp, the unobstructed interior, broad level deck and great volume make it possible to carry large and varied cargoes, rapid boarding of men, guns and vehicles, and fast unloading of men and equipment instantly ready for action. Amphibious vehicle using the bow ramps supported by beams can enter or leave the cargo ramp at sea.

R3Y TRADEWIND
WARTIME OPERATION
FOR THE U. S. NAVY

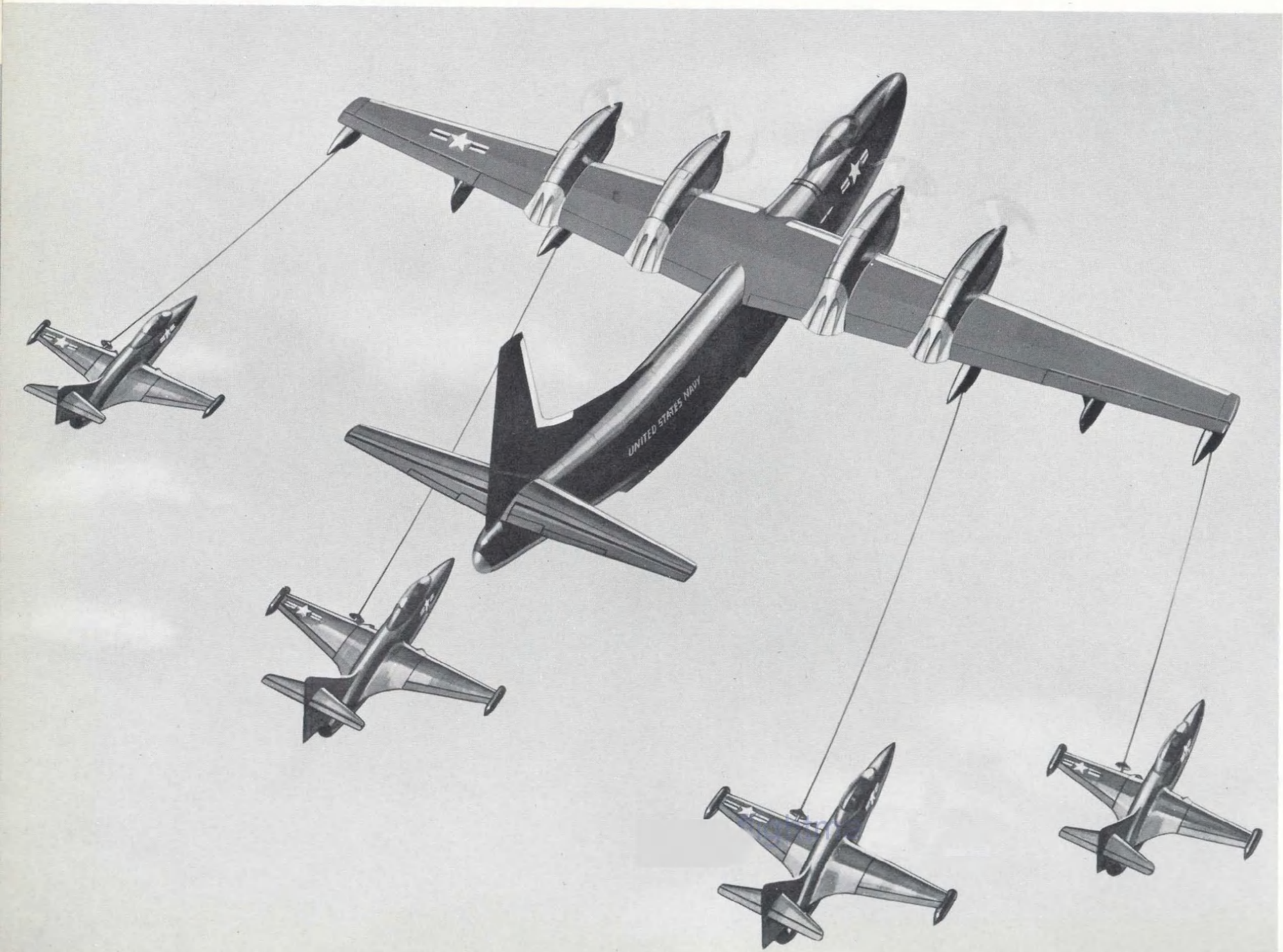
Beach Head Landings and Logistical Support



The R3Y has the power per pound of weight of a World War II fighter. Troops and their gear can be landed ready for action a thousand miles away in less than 4 hours — and their transport airplane return to point of departure without refueling.

Never before have all these factors been achieved in water based air transportation.

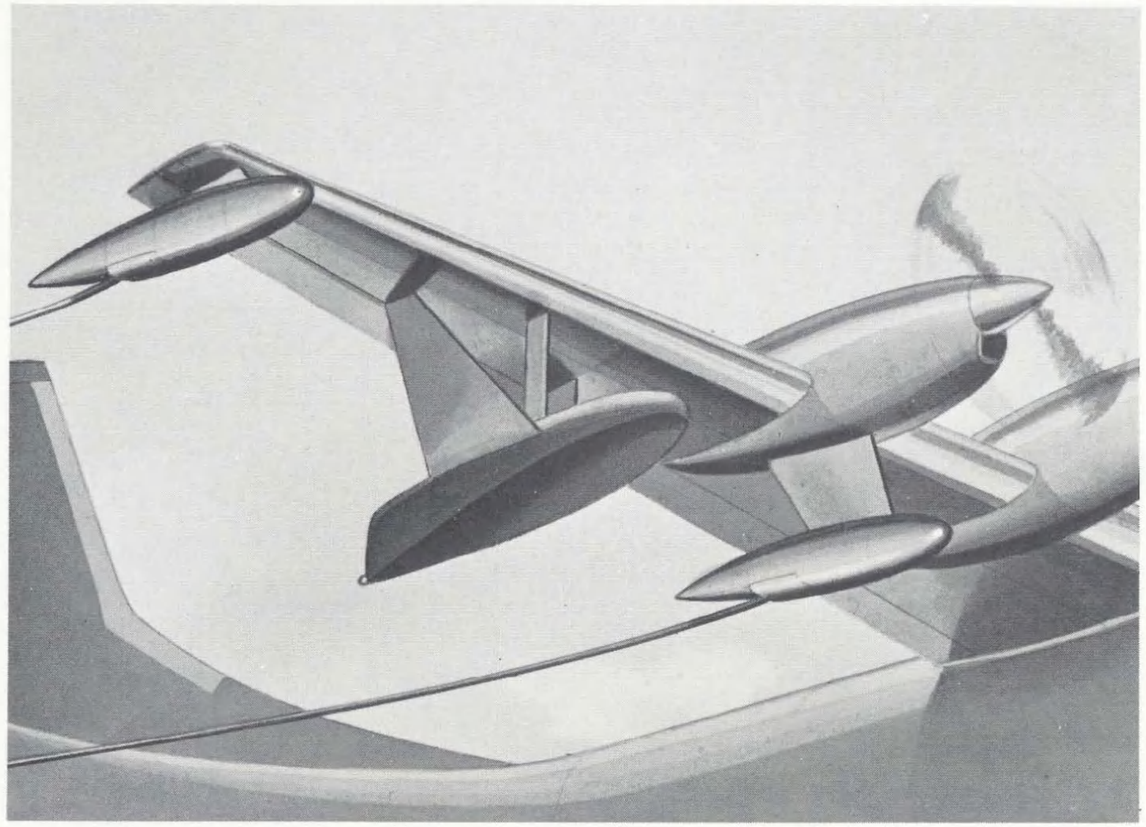
In Flight Refueling . . .



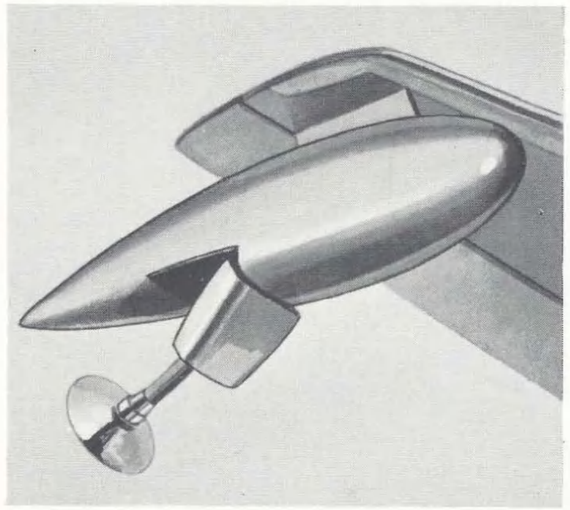
Weight of the permanent provisions for all refueling equipment is approximately 1000 lbs. Hose reel units, mounted within individual streamlined pods are located on each wing tip and directly below each outboard nacelle.

R3Y TRADEWIND
WARTIME OPERATION
FOR THE U. S. NAVY

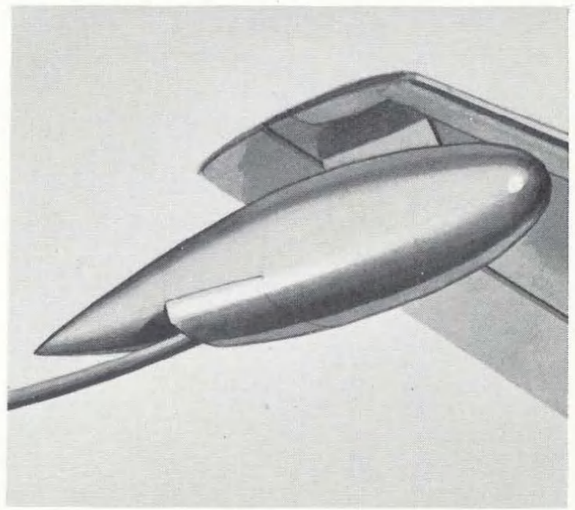
. . . four fighters simultaneously



THE R3Y AIRPLANE IS STRUCTURALLY SUITED FOR QUICK CONVERSION TO AN AERIAL REFUELING TANKER.



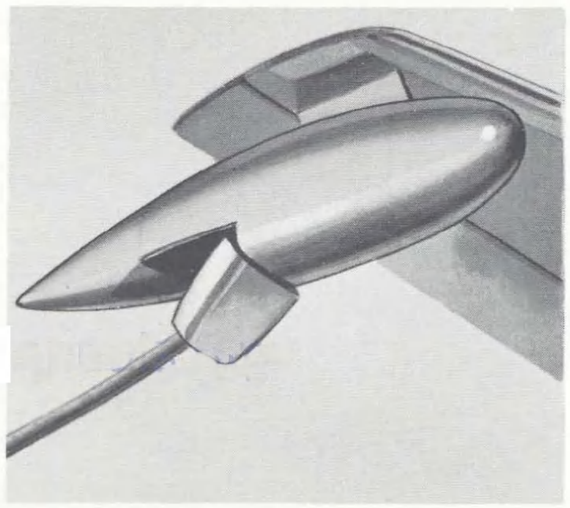
1. EXTENDING DROGUE



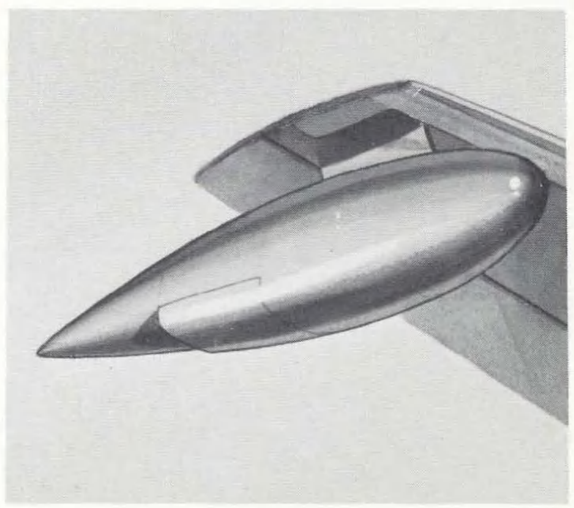
2. IN-FLIGHT REFUELING

250 gallon per minute fuel pumps are mounted in each of the 4 wing tanks, and a portable flight refueling operator's station is installed in the cabin by means of quick disconnect fittings. Estimated conversion time to a four-fighter refueling configuration is less than 5 hours on the R3Y transport airplane.

Drogue units, offset from the center line of the hose make it possible to preset the trailing position of the drogues and give maximum clearances between the tanker and refueling fighters.



3. RETRACTING DROGUE

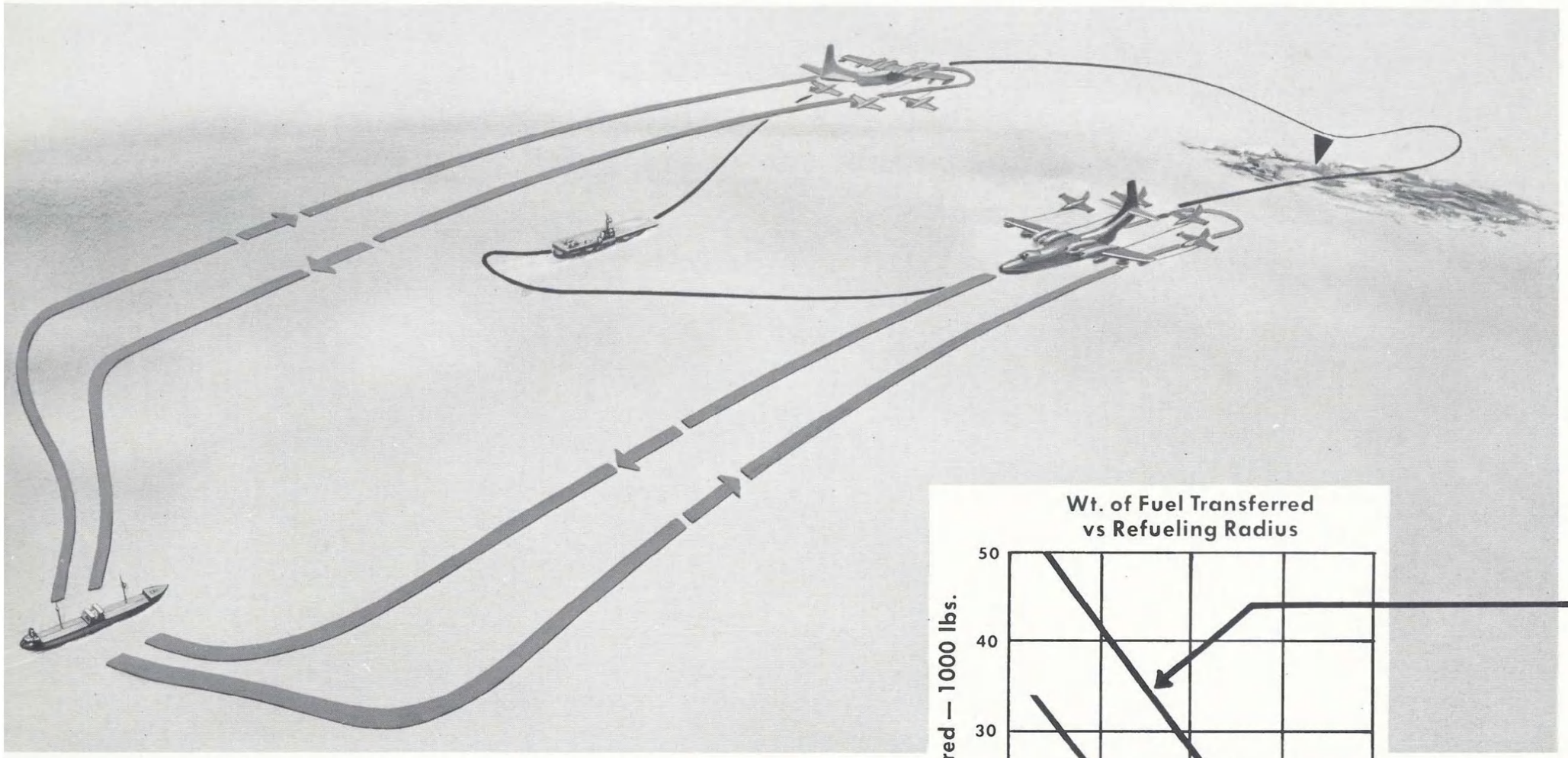


4. NORMAL FLIGHT


UNITED STATES NAVY
NAVY
1
NAVY
101
NAVY
102

R3Y TRADEWIND
WARTIME OPERATION
FOR THE U. S. NAVY

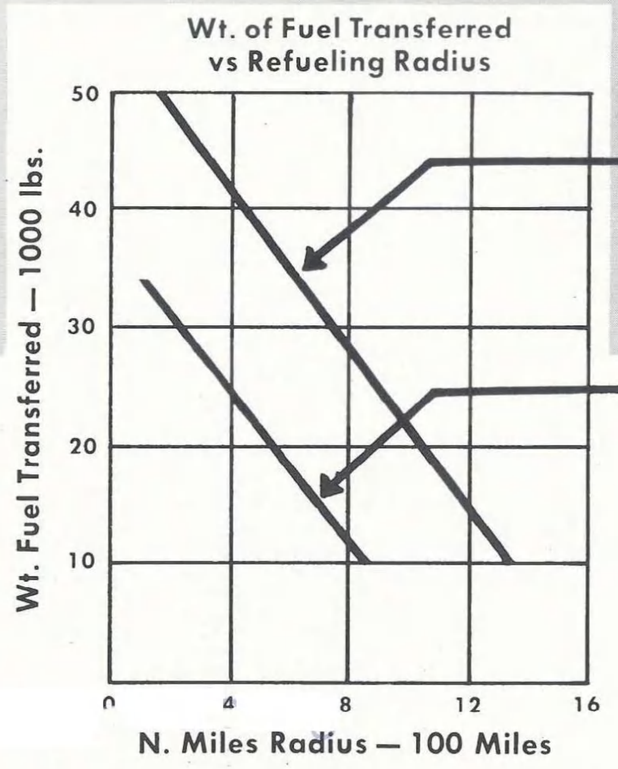
Tactical Mission Advantages . . .



Two divisions of carrier based fighters take-off in intervals to rendezvous with the R3Y tanker. Fighter take-off is effected with 45% of fuel capacity. Balance of maximum catapult take-off weight consists of armament for mission.

Total fuel load is carried in 4 wing tanks. The R3Y is capable of refueling each fighter at the rate of 250 gallons per minute.

An alternate application of this tactical mission using two R3Y refueling tankers is pictured above further increasing the fighter range.



R3Y-1 TANKER
Estimated Performance*

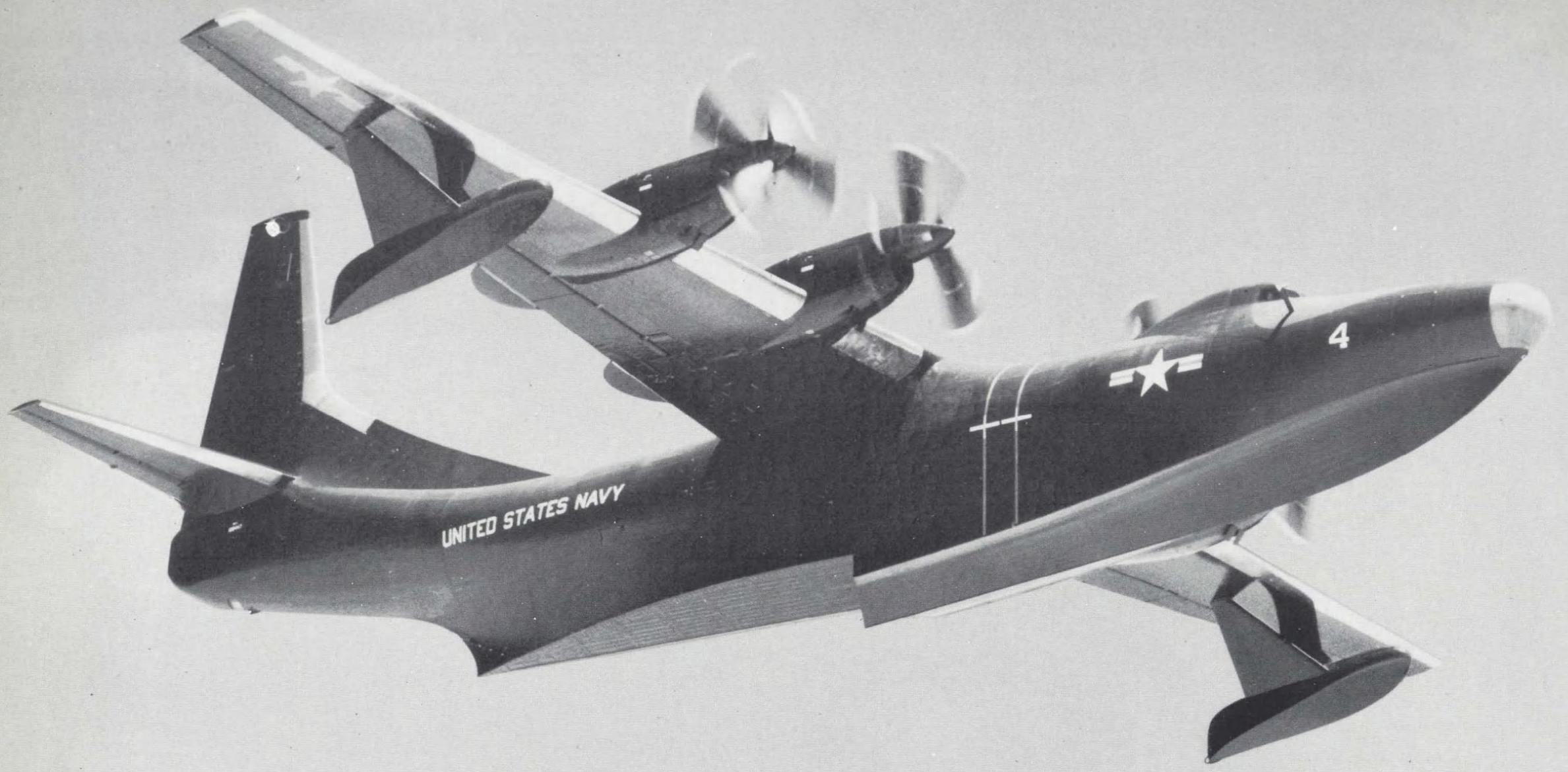
SHELTERED WATER OPERATION
165,000 lb. T.O. wt.
77,000 lb. Fuel

ROUGH WATER OPERATION
143,000 lb. T.O. wt.
55,000 lb. Fuel

NOTES
1. All Fuel is JP-4
2. Radius based on MIL-C-5011A**
3. Refueling altitude 25,000 to 30,000 ft.
4. Engine performance based on Spec. 300-C

*Estimated on the basis that T40-A-10 engines will be qualified for JP-4 fuel.

**Requires 1 hour rendezvous time. Operating radius may be increased 100 N. miles by reducing rendezvous time to 10 minutes.



Versatility

Performance

Utility

An Operational Airplane Designed for Service

MARINE DIVISION EQUIPMENT—TYPICAL TASK ORGANIZATION

Transportable in Four R3Y-2 Bow Loader Seaplanes

UNIT	PERSONNEL	WEAPONS	TRANSPORTATION
Rifle Company	216	251 Rifles, Machine Gun and three 60mm mortars.	Two ¼ Ton (4 x 4) trucks with one trailer.
AT Assault Section	19	2 Rocket launchers 2 Flame throwers	
Demolition Team	4	Assorted Demo	
75mm Recoilless Gun Section	19	Two 75mm Recoilless Guns	Four ¼ Ton (4 x 4) trucks.
Det TACP	4		
Det H & S Co. Medical Personnel	9		

TOTAL PERSONNEL . . . . . 271 **TOTAL WEIGHT 85,990 lbs.**

A typical task unit, suitably organized and equipped for a surprise raid. Transporfable in four R3Y-2's, if could operate against an objective as much as 1,000 miles from its base and return without refueling.

Appendix

CONTENTS

GENERAL DATA and DIMENSIONS

POWER PLANT RATINGS*

RATINGS	RPM	SHP	JET THRUST
Take-Off	14,300	5332	1296
Military	14,300	5332	1296
Normal (100%)	14,300	4444	1240
Cruise (80%)	14,300	3556	1160
Cruise (60%)	14,300	2666	1084

* Four Allison T40-A-10 Propeller Turbine Engines

GENERAL

Design Gross Weight.....145,500 lbs
Maximum Gross Weight.....165,000 lbs
Wing Span.....145 ft 9.7 in
Length.....R3Y-1.....139 ft 8.3 in
Length.....R3Y-2.....139 ft 8.3 in
Height (On Beaching Cradle).....51 ft 5 in

WING

Wing Area, Total.....2100.7 sq ft
Aspect Ratio (Geometric).....10:1
Airfoil, at root section.....NACA 4420
Airfoil, at splice section.....NACA 4417
Airfoil, at construction tip section.....NACA 4412
Airfoil, average.....18%
Mean Aerodynamic Chord.....15 ft 8.5 in
Incidence.....4°
Dihedral.....1° 45′

HORIZONTAL STABILIZER

Horizontal Tail Area, Total.....440 sq ft
Span.....51 ft 4 in
Incidence.....4°
Aspect Ratio.....6:1
Section and Thickness.....NACA 0012-64

VERTICAL FIN

Vertical Tail Area, Total (inc Dorsal Fin).....458 sq ft
Aspect Ratio.....2.16:1
Section and Thickness.....NACA 0012-64

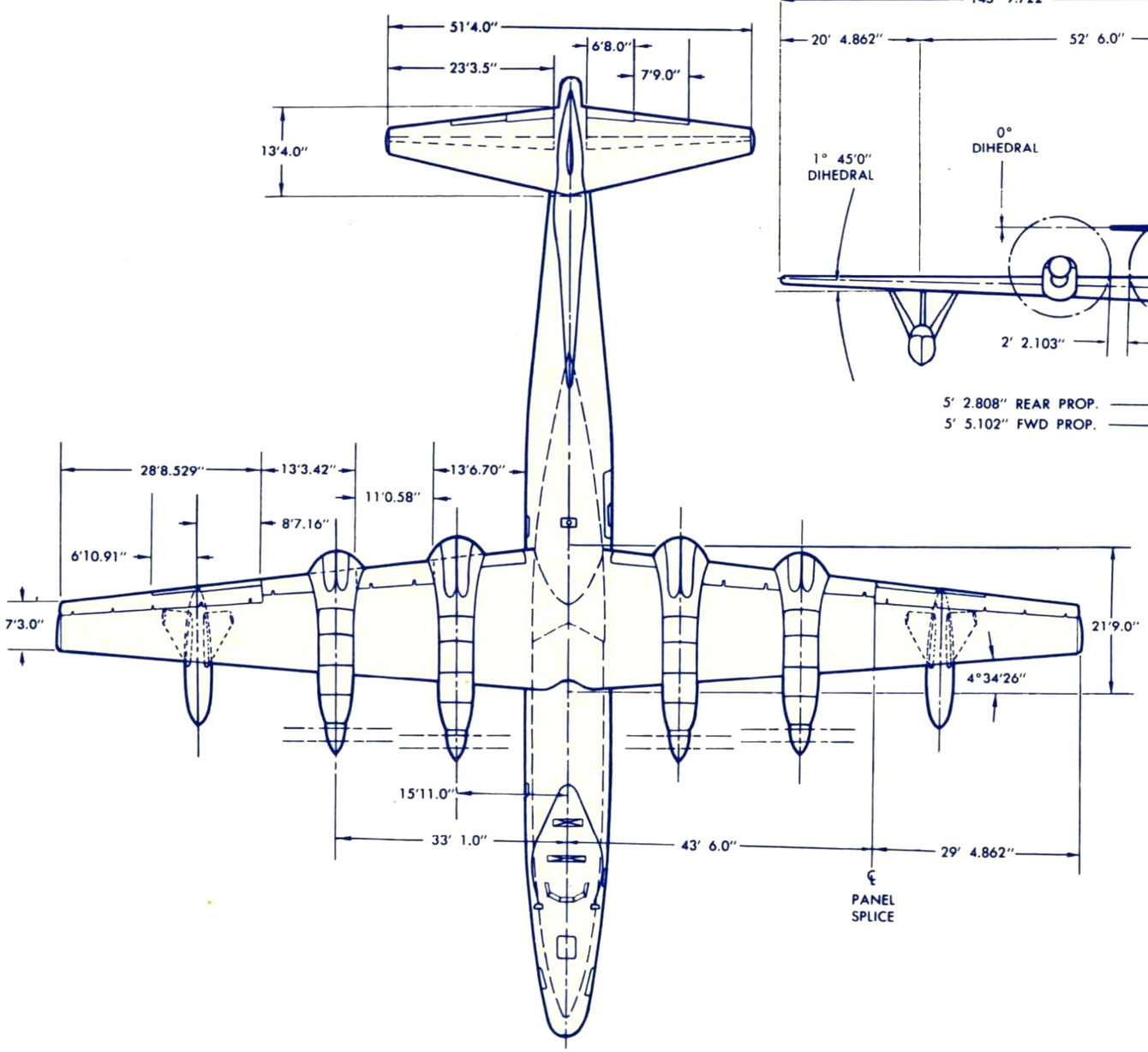
HULL

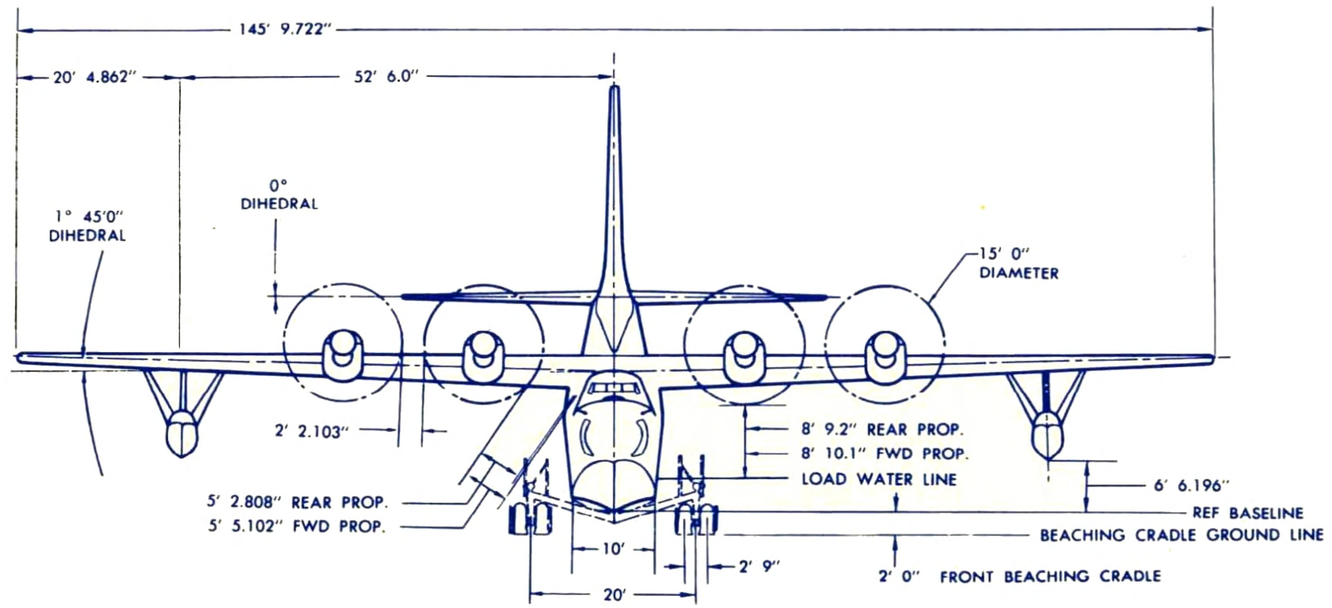
Width at Chine (Max).....10 ft
Height (Max).....17 ft 6 in
Draft (145,500 lbs).....6 ft 0.5 in
Draft (165,000 lbs).....6 ft 4 in
Draft, required for Beaching Cradle.....10 ft 9 in
Height of CG above center of buoyancy.....12 ft

AUXILIARY FLOATS

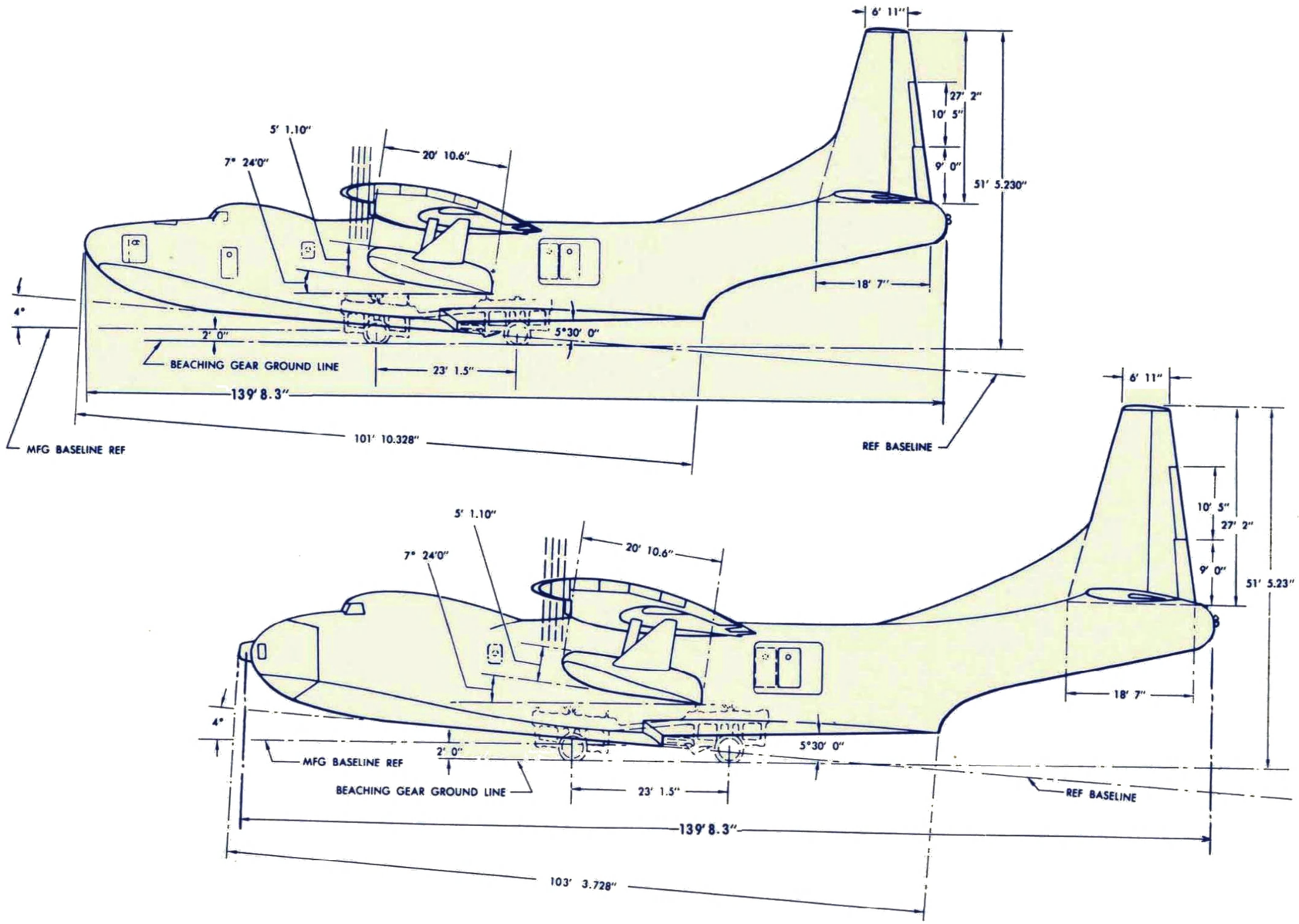
Width.....3 ft 9.5 in
Length.....20 ft 10.6 in
Height.....5 ft 1 in
Submerged Displacement (64 lb/cu ft).....12,850 lbs
Angle of Heel to Submerge.....7° 25′
Distance from CL of Hull to Center of Buoyancy of Float..52 ft 6 in

THREE-VIEW

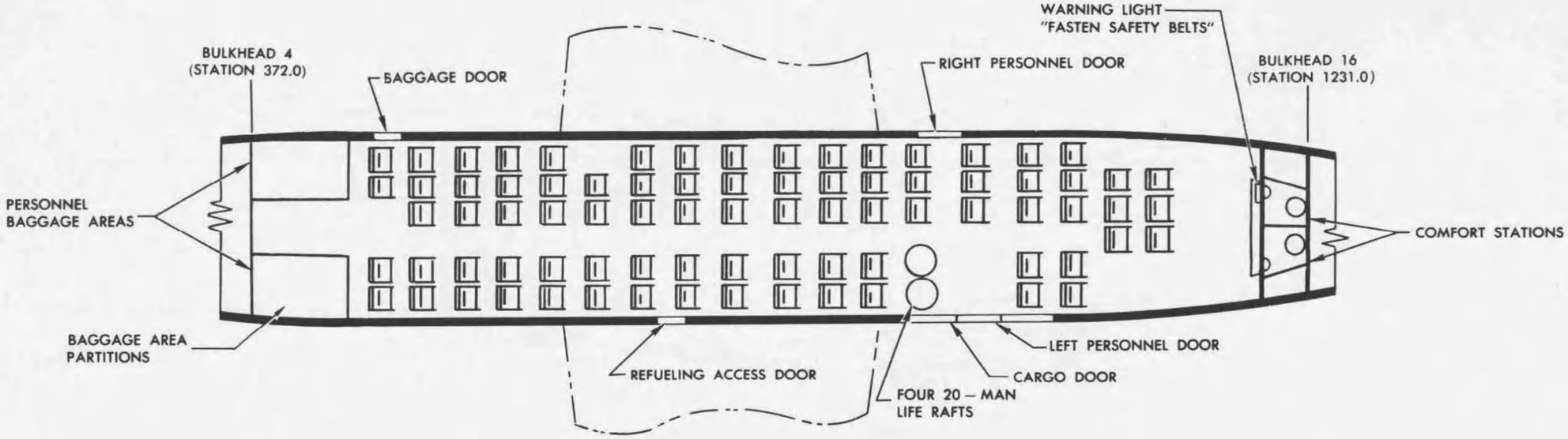

51'4.0"
6'8.0"
23'3.5"
7'9.0"
13'4.0"
28'8.529"
13'3.42"
13'6.70"
11'0.58"
8'7.16"
6'10.91"
7'3.0"
21'9.0"
4°34'26"
15'11.0"
33' 1.0"
43' 6.0"
29' 4.862"
℄
PANEL
SPLICE

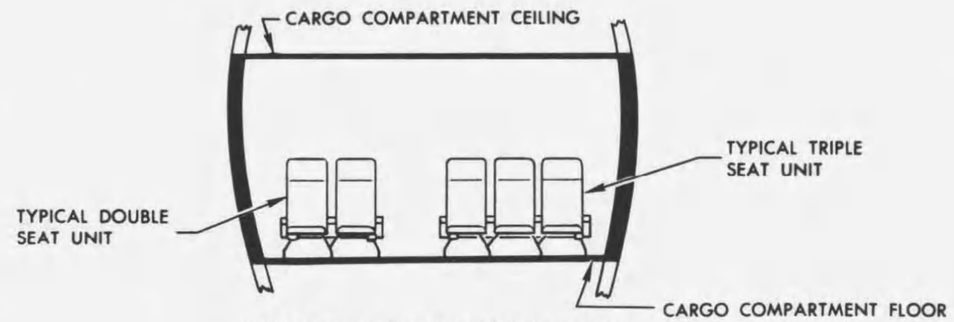

145' 9.722"
20' 4.862"
52' 6.0"
1° 45'0"
DIHEDRAL
0°
DIHEDRAL
15' 0"
DIAMETER
2' 2.103"
8' 9.2" REAR PROP.
8' 10.1" FWD PROP.
LOAD WATER LINE
6' 6.196"
REF BASELINE
BEACHING CRADLE GROUND LINE
5' 2.808" REAR PROP.
5' 5.102" FWD PROP.
10'
2' 9"
2' 0" FRONT BEACHING CRADLE
20'

DRAWINGS

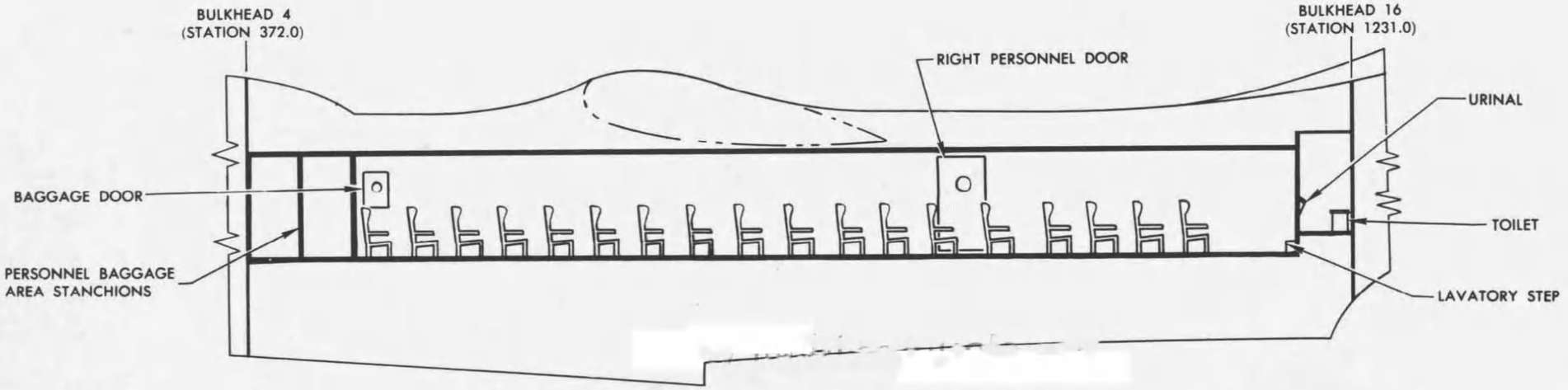

6' 11"
27' 2"
10' 5"
9' 0"
51' 5.230"
5' 1.10"
7° 24'0"
20' 10.6"
18' 7"
4°
2' 0"
5°30' 0"
BEACHING GEAR GROUND LINE
23' 1.5"
139' 8.3"
101' 10.328"
MFG BASELINE REF
REF BASELINE
6' 11"
10' 5"
27' 2"
9' 0"
51' 5.23"
5' 1.10"
7° 24'0"
20' 10.6"
18' 7"
4°
2' 0"
5°30' 0"
MFG BASELINE REF
BEACHING GEAR GROUND LINE
23' 1.5"
REF BASELINE
139' 8.3"
103' 3.728"

GENERAL ARRANGEMENT...



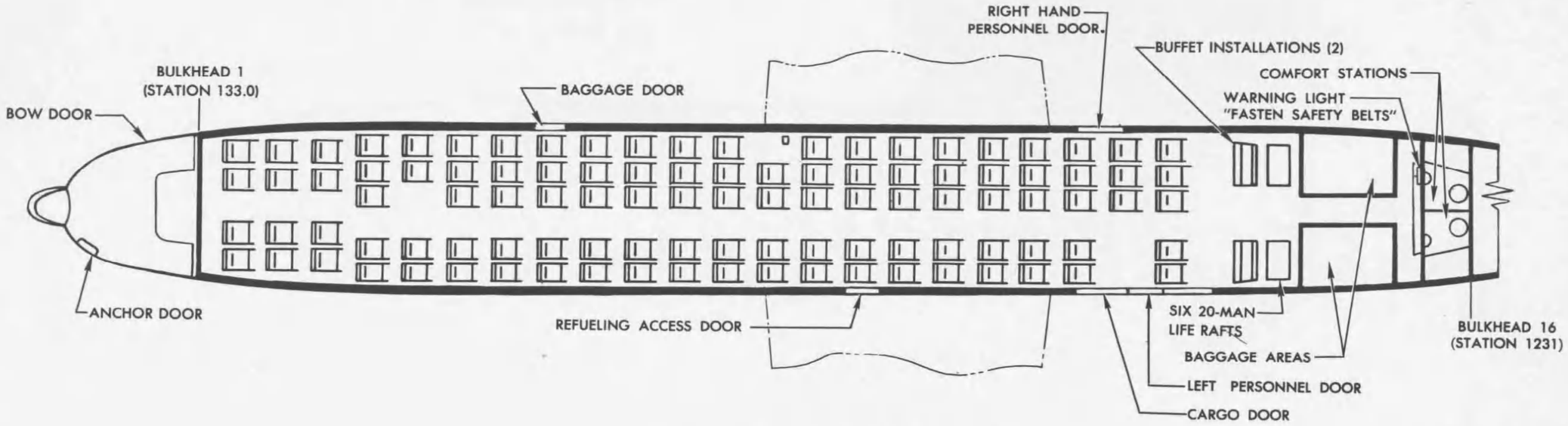


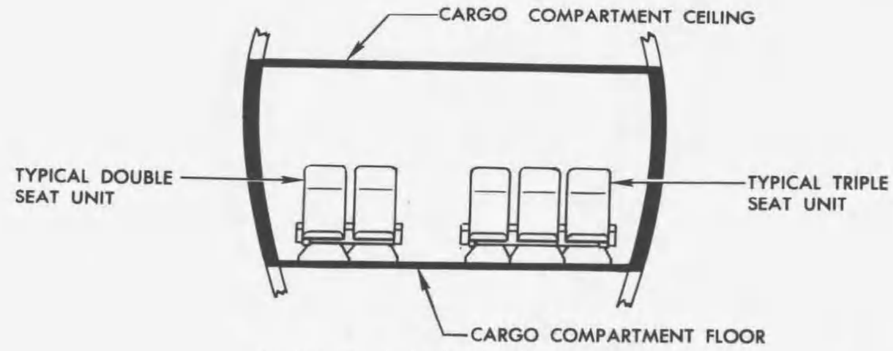
COMPARTMENT CROSS SECTION
VIEW LOOKING FORWARD



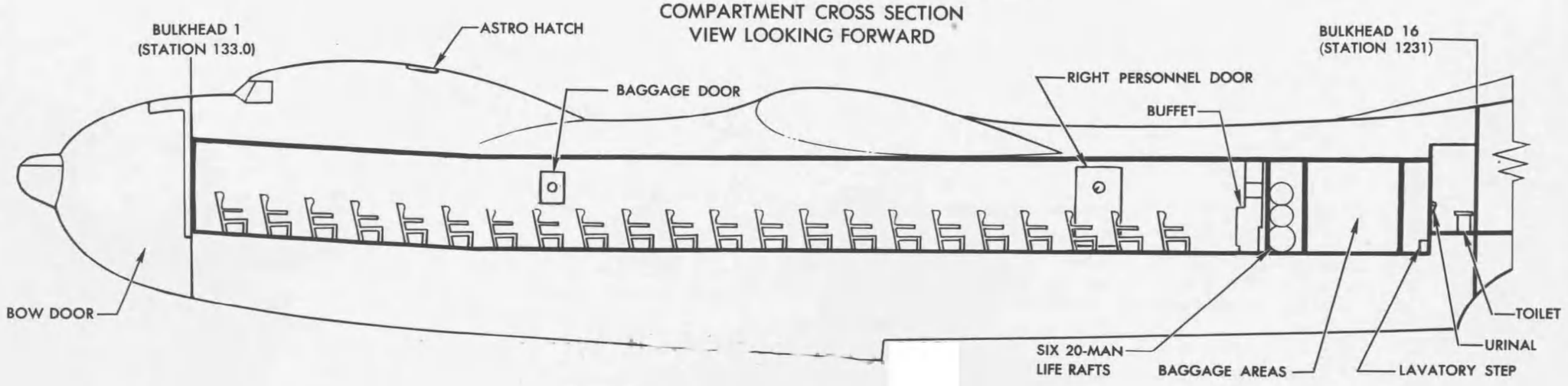
PERSONNEL SEAT ARRANGEMENT R3Y-1

PLAN VIEWS



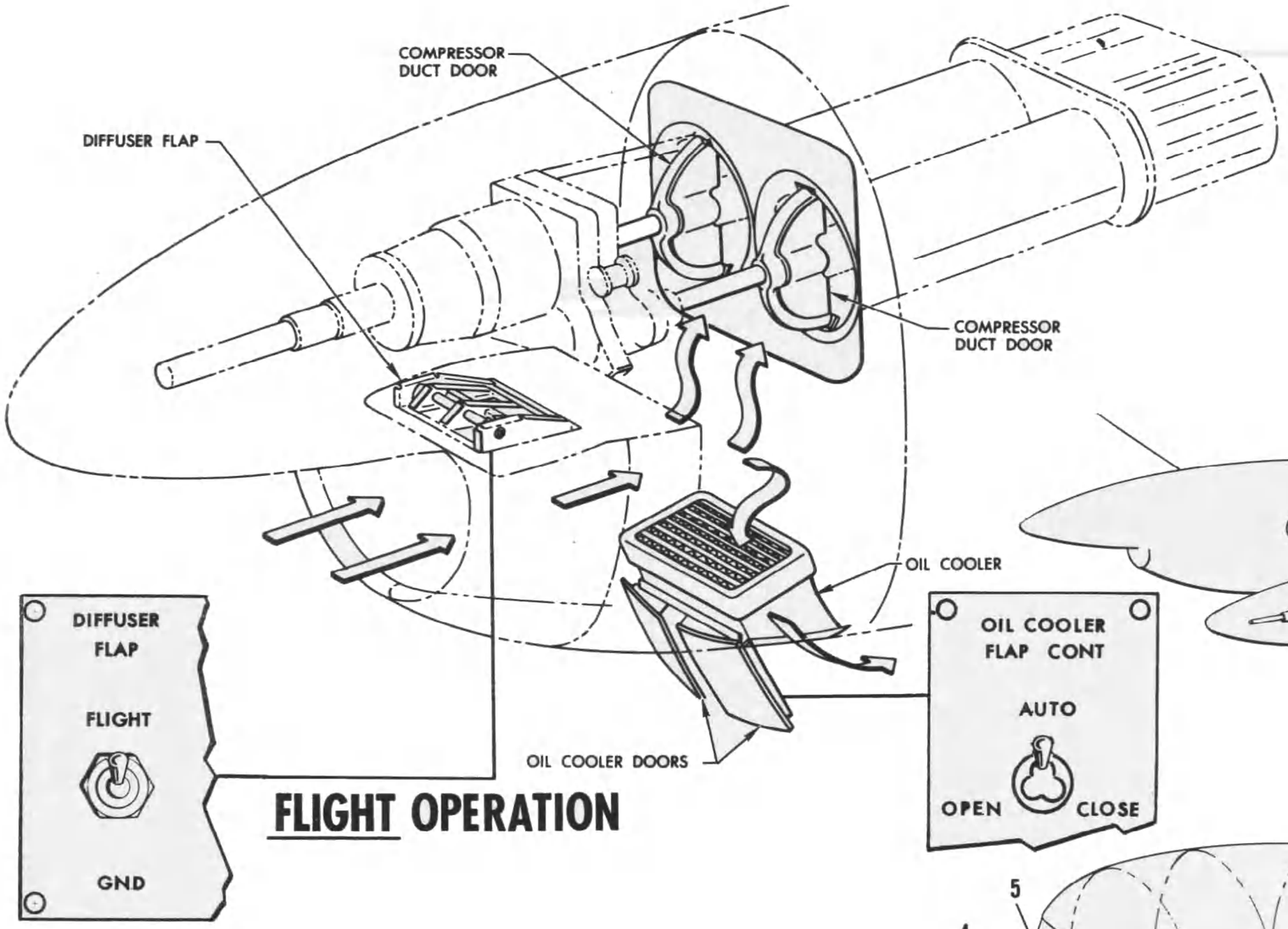


COMPARTMENT CROSS SECTION
VIEW LOOKING FORWARD



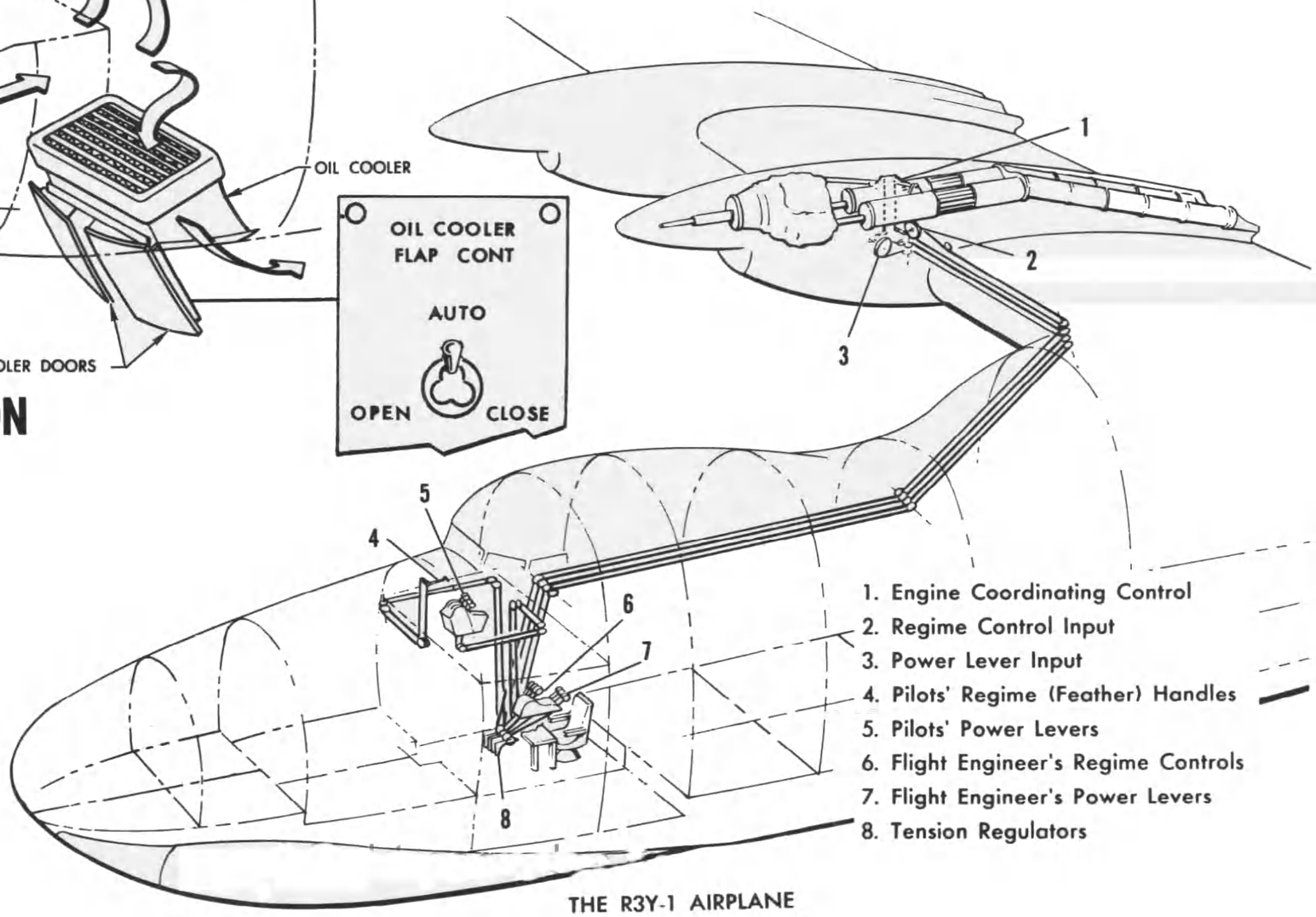
PERSONNEL SEAT ARRANGEMENT R3Y-2

AIR INDUCTION SYSTEM



FLIGHT OPERATION

POWER PLANT CONTROLS



1. Engine Coordinating Control
2. Regime Control Input
3. Power Lever Input
4. Pilots' Regime (Feather) Handles
5. Pilots' Power Levers
6. Flight Engineer's Regime Controls
7. Flight Engineer's Power Levers
8. Tension Regulators

THE R3Y-1 AIRPLANE

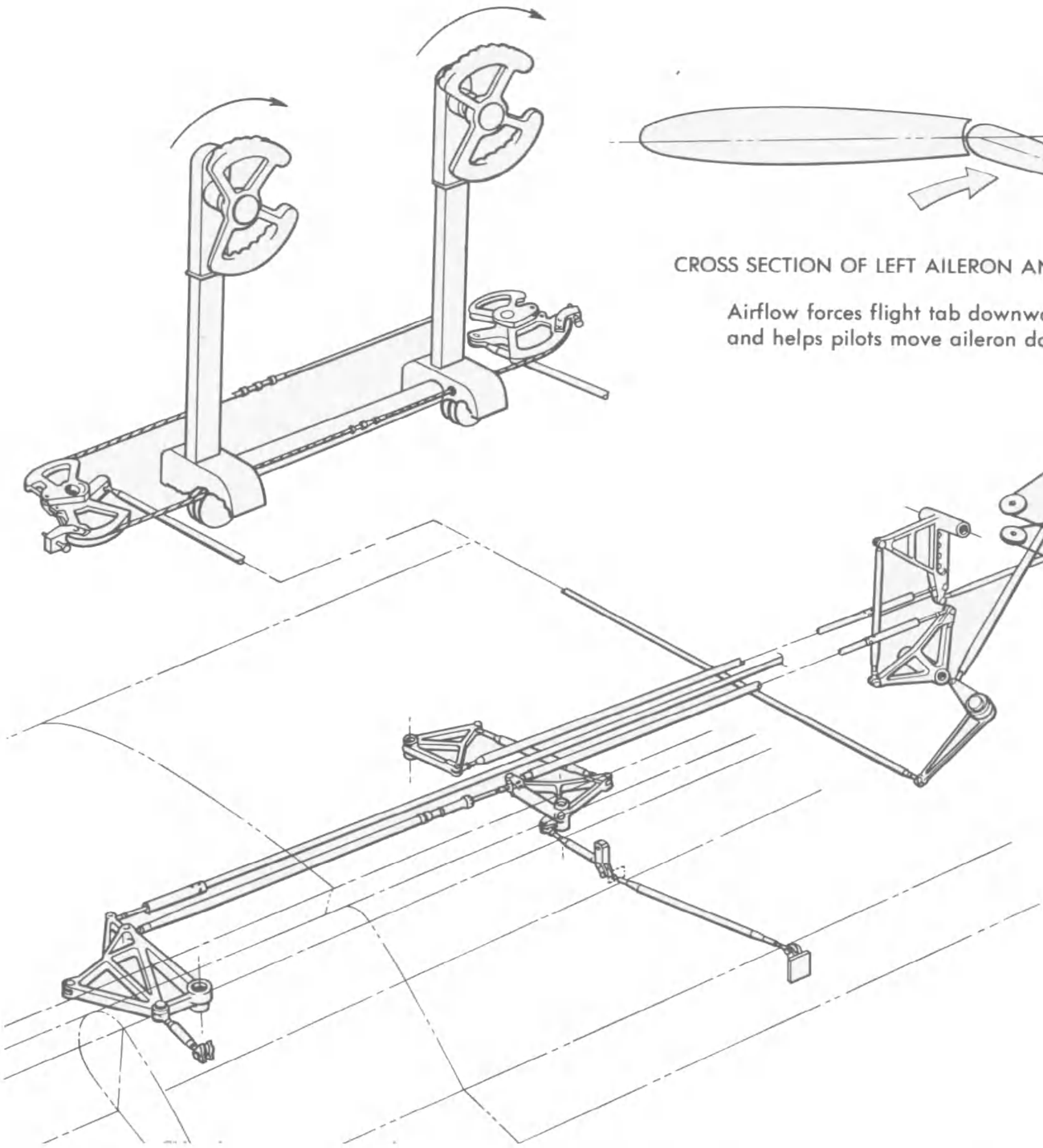
SURFACE CONTROLS (Typical)

THE AILERON GROUP includes two ailerons, two flight tabs, and two trim tabs. Duplicate control wheels operate the flight tabs and the ailerons through a system of tension control tubes and rods. Compression relief springs are incorporated in some of the control tubes in order to prevent the build-up of excessive compression forces in the system.

THE ELEVATOR GROUP consists of two elevators, two elevator flight tabs, and two elevator trim tabs. Movement of either the pilot's or copilot's control column operates the elevator and the flight tabs through a tension control tube system.

THE RUDDER GROUP consists of the rudder, the rudder flight tab, the rudder trim tab, and the rudder tip. Duplicate sets of rudder pedals operate the rudder and the rudder flight tab through a tension control tube system.

The flight tabs act as servo tabs and assist the pilots in moving the ailerons, elevator, and rudder. An electrical actuator operates each of the trim tabs. An autopilot servo is connected to each flight control system for autopilot operation. An elevator trim tab emergency system is installed.

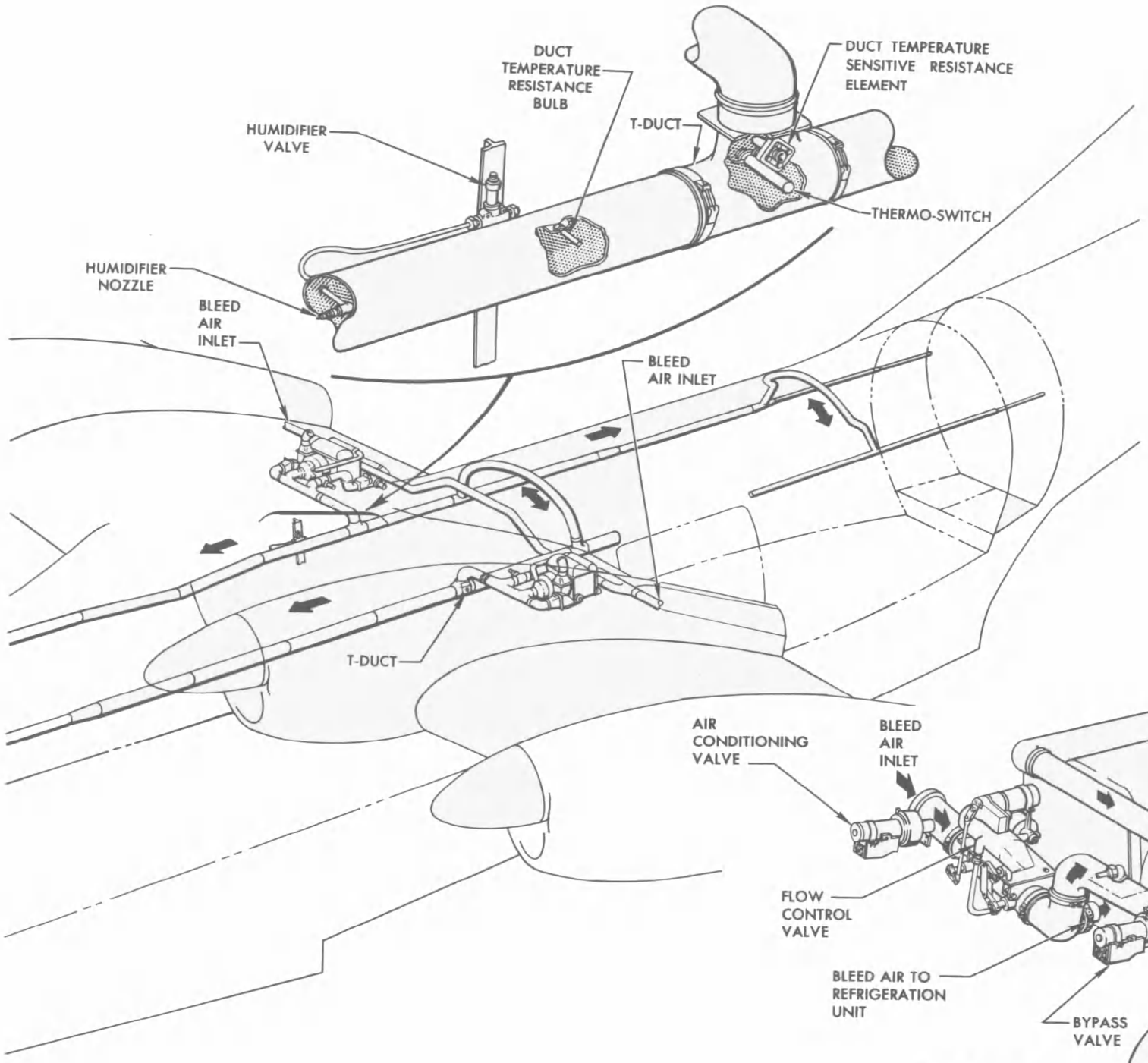


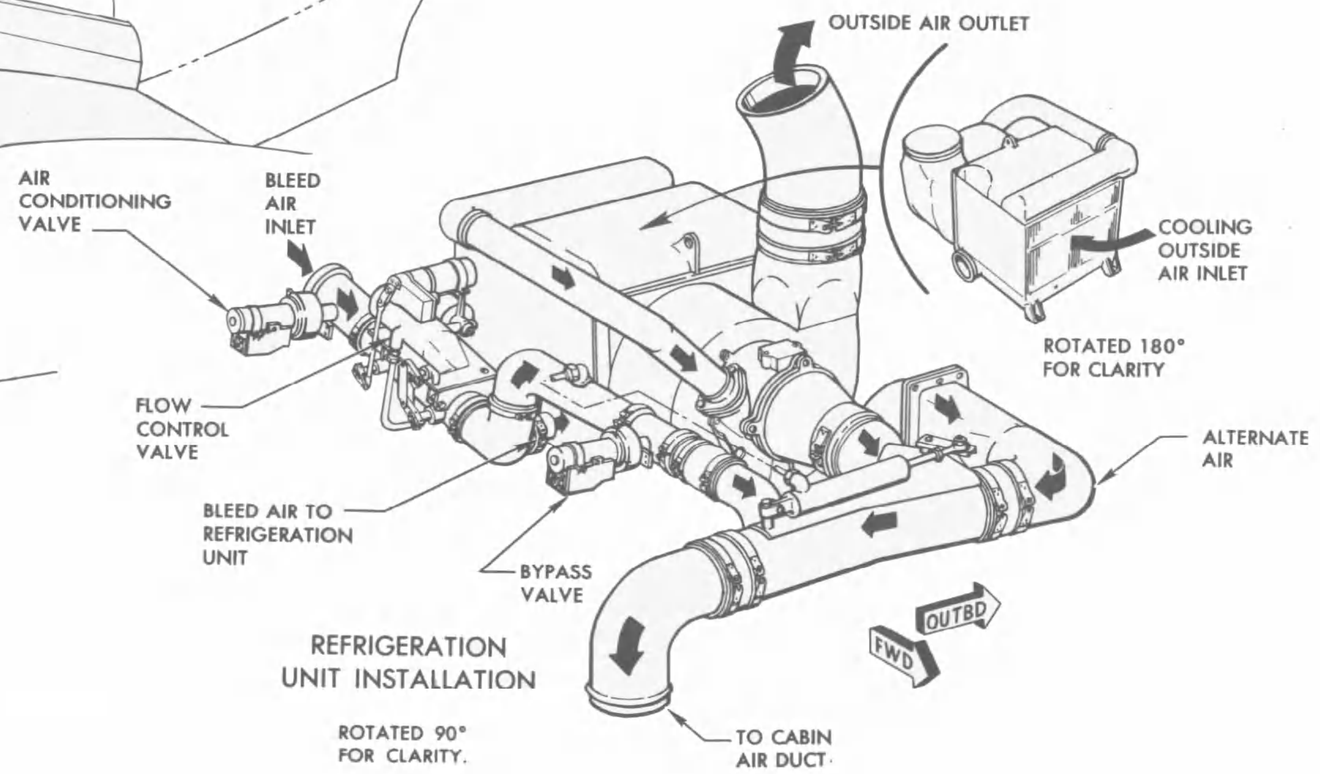
CROSS SECTION OF LEFT AILERON AND FLIGHT TAB

Airflow forces flight tab downward
and helps pilots move aileron downward

LEFT AILERON DOWN — LEFT FLIGHT TAB UP

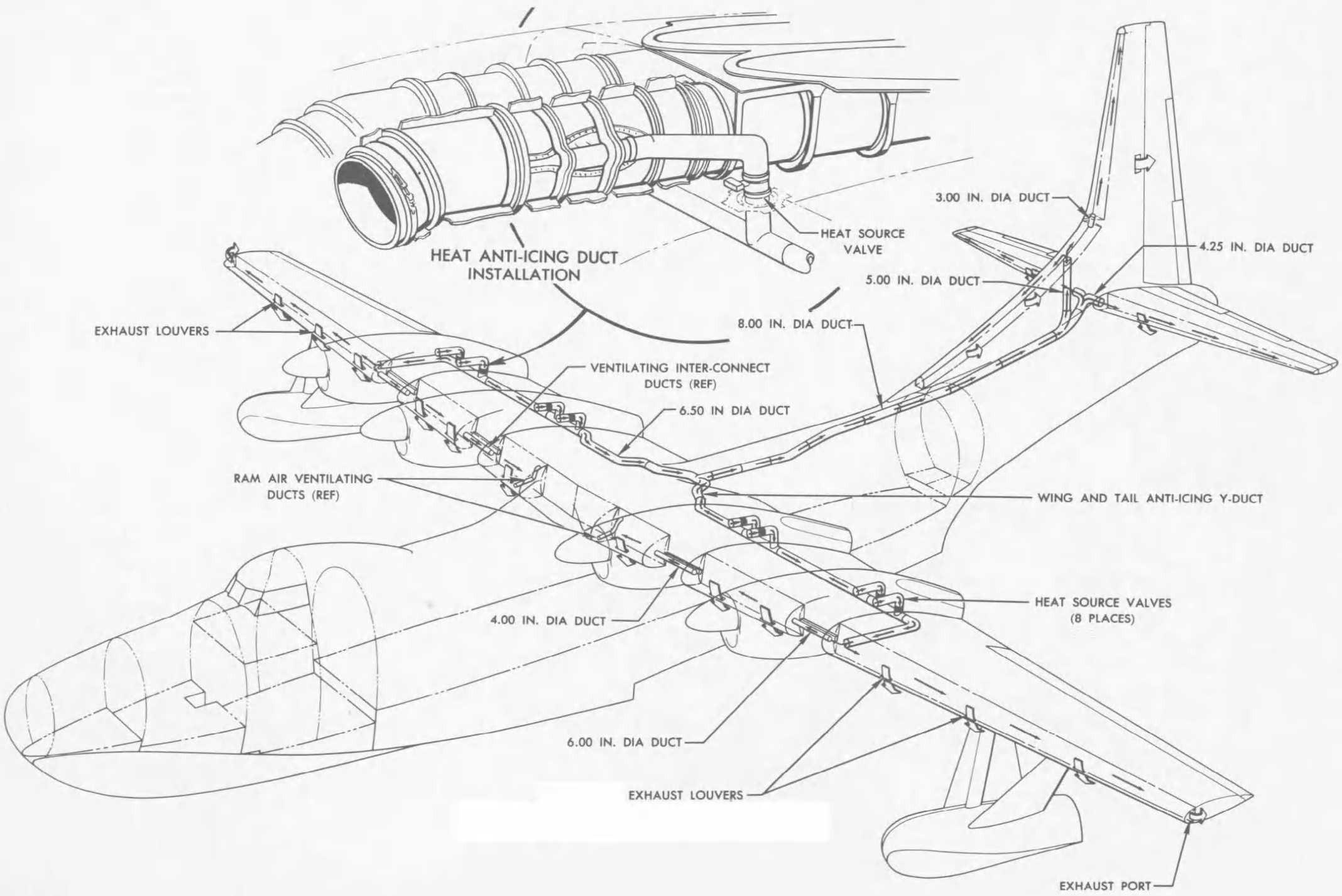
AIR CONDITIONING, HEATING and VENTILATING SYSTEM



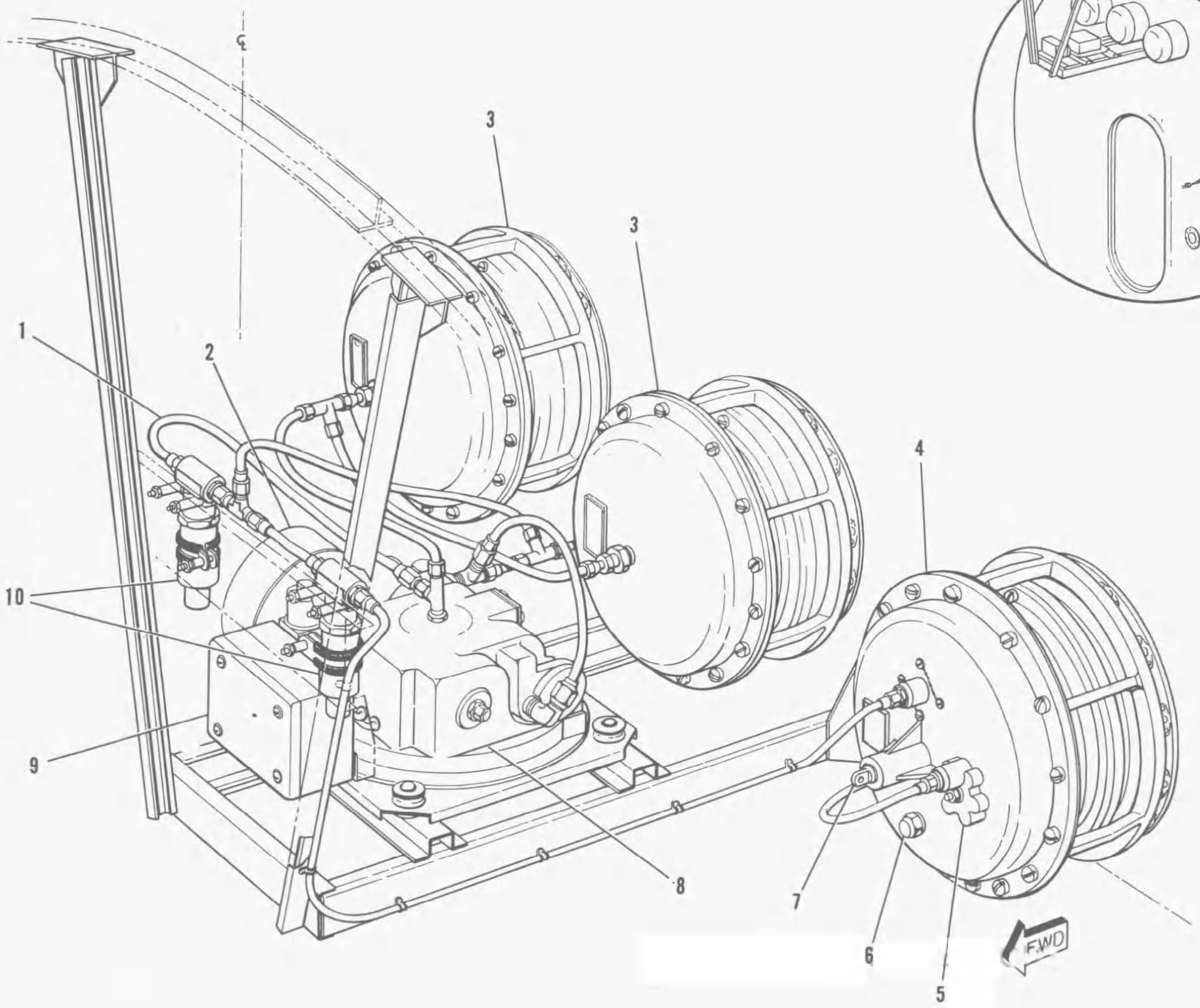


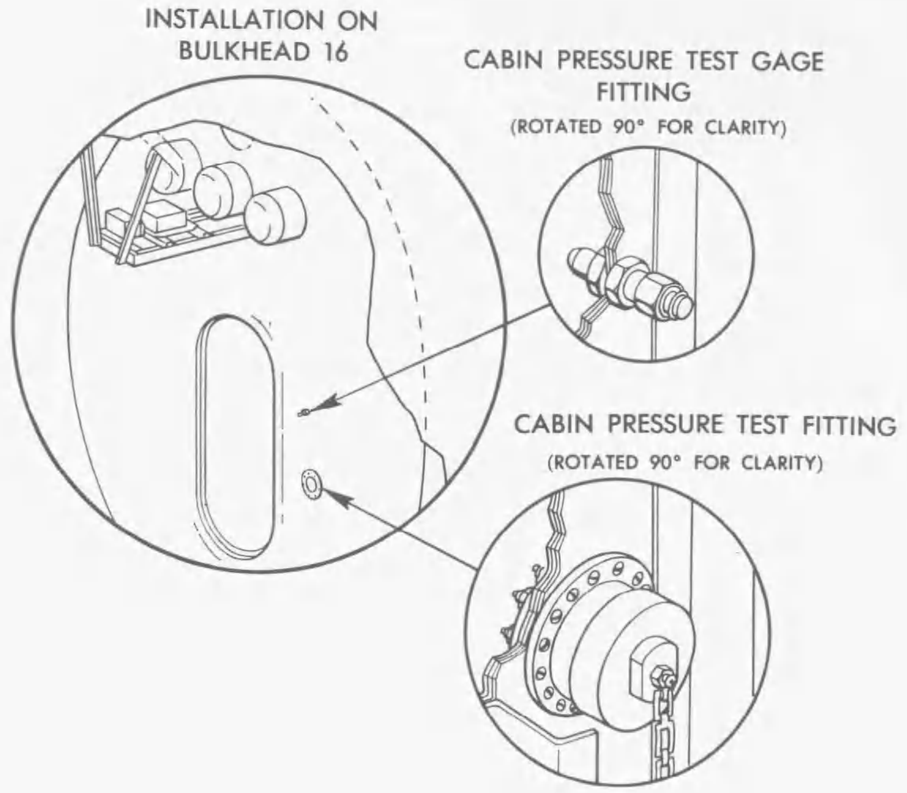
REFRIGERATION UNIT INSTALLATION

WING and TAIL ANTI-ICING SYSTEM



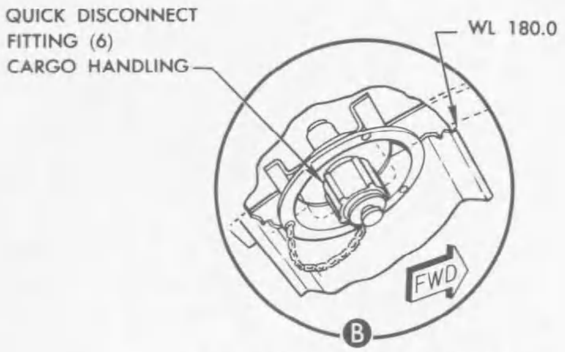
CABIN PRESSURIZATION SYSTEM



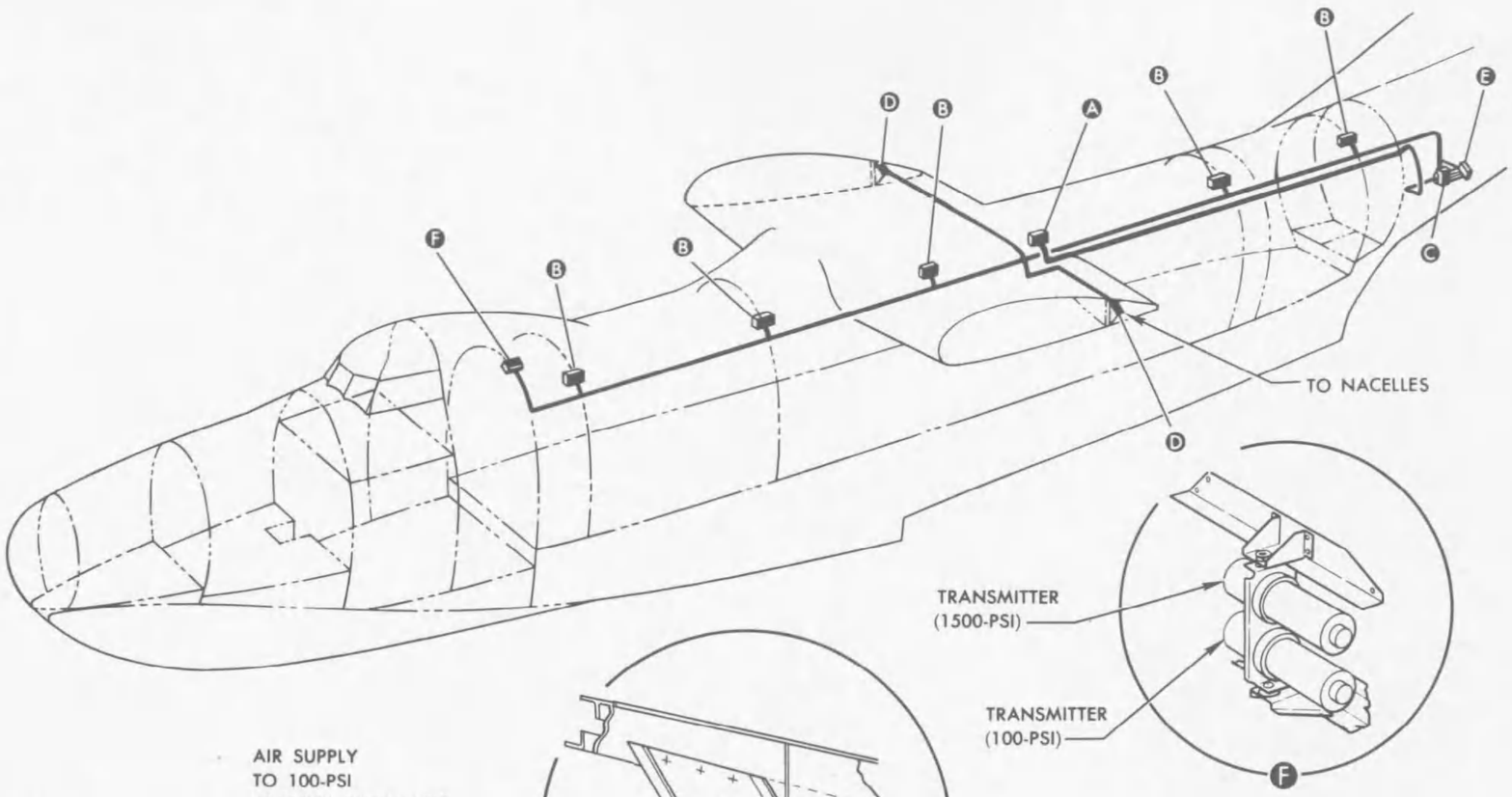


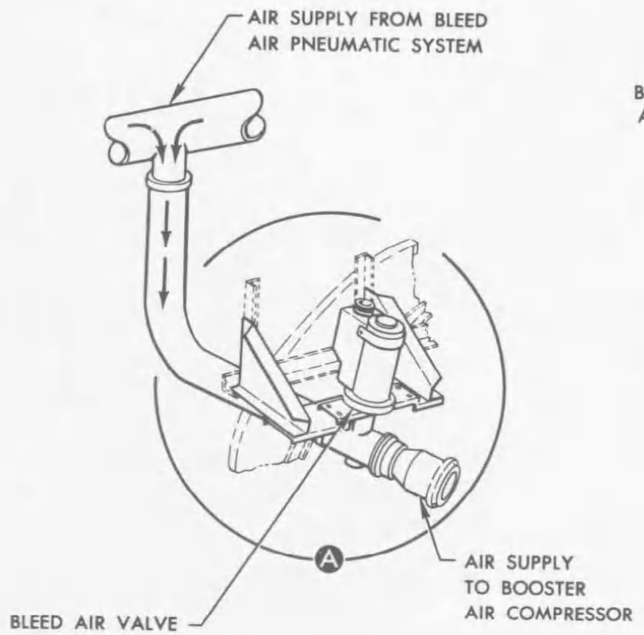
1. Vent To Atmosphere
2. Isobaric Changer
3. Outflow Valve (2)
4. Cabin Pressure Safety Valve
5. Differential Pressure Relief Valve
6. Cabin Air Sensing Filter
7. Manual Dump Valve
8. Cabin Pressure Regulator
9. Cabin Pressure Regulator Relay Box
10. Solenoid Valve (2)

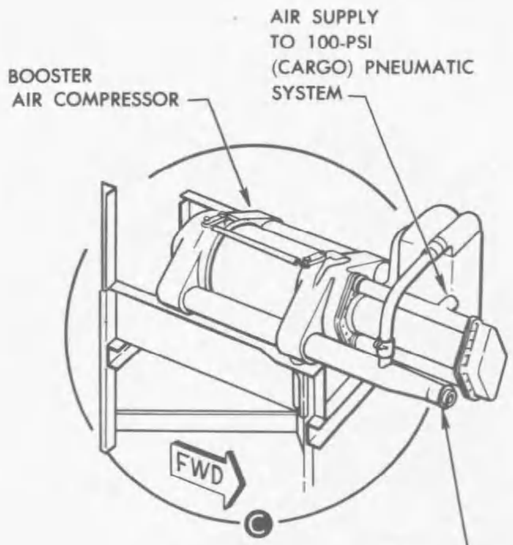
100-PSI PNEUMATIC SYSTEM

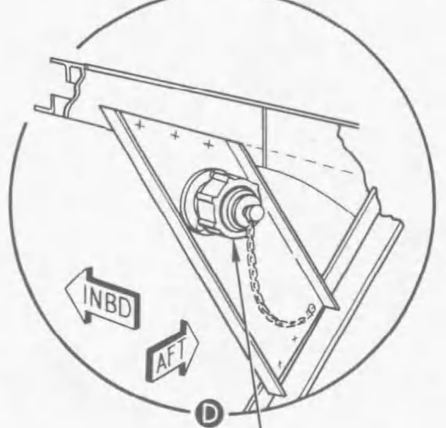


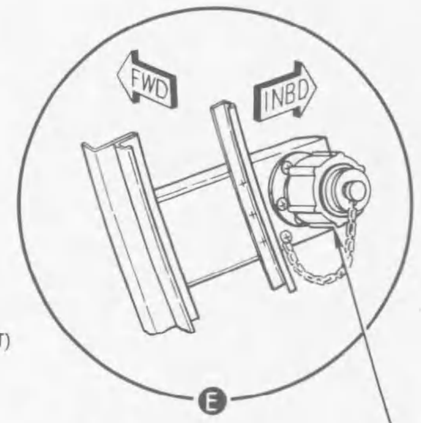
VIEW LOOKING OUTBOARD & UP
ROTATED 180°

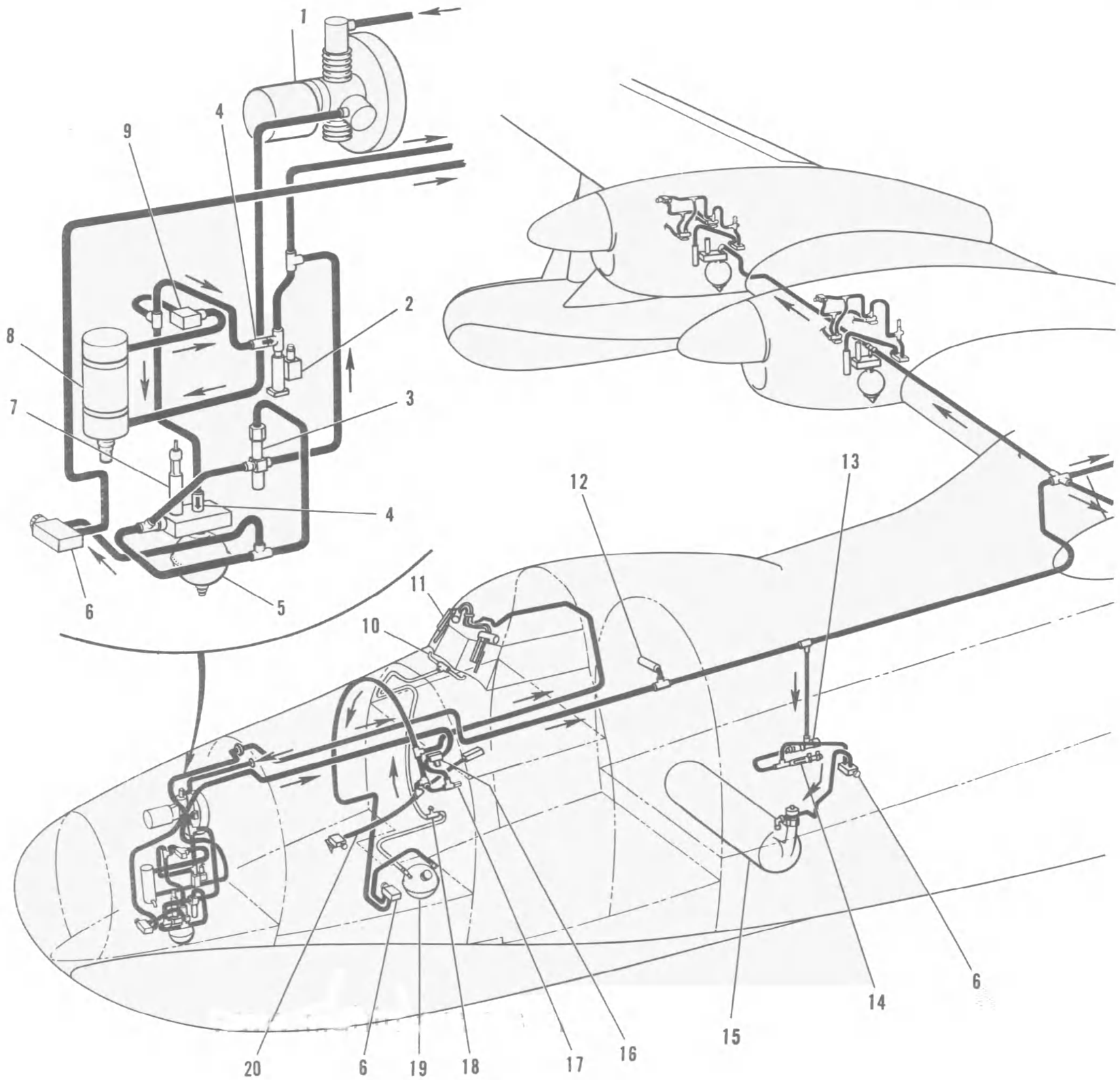






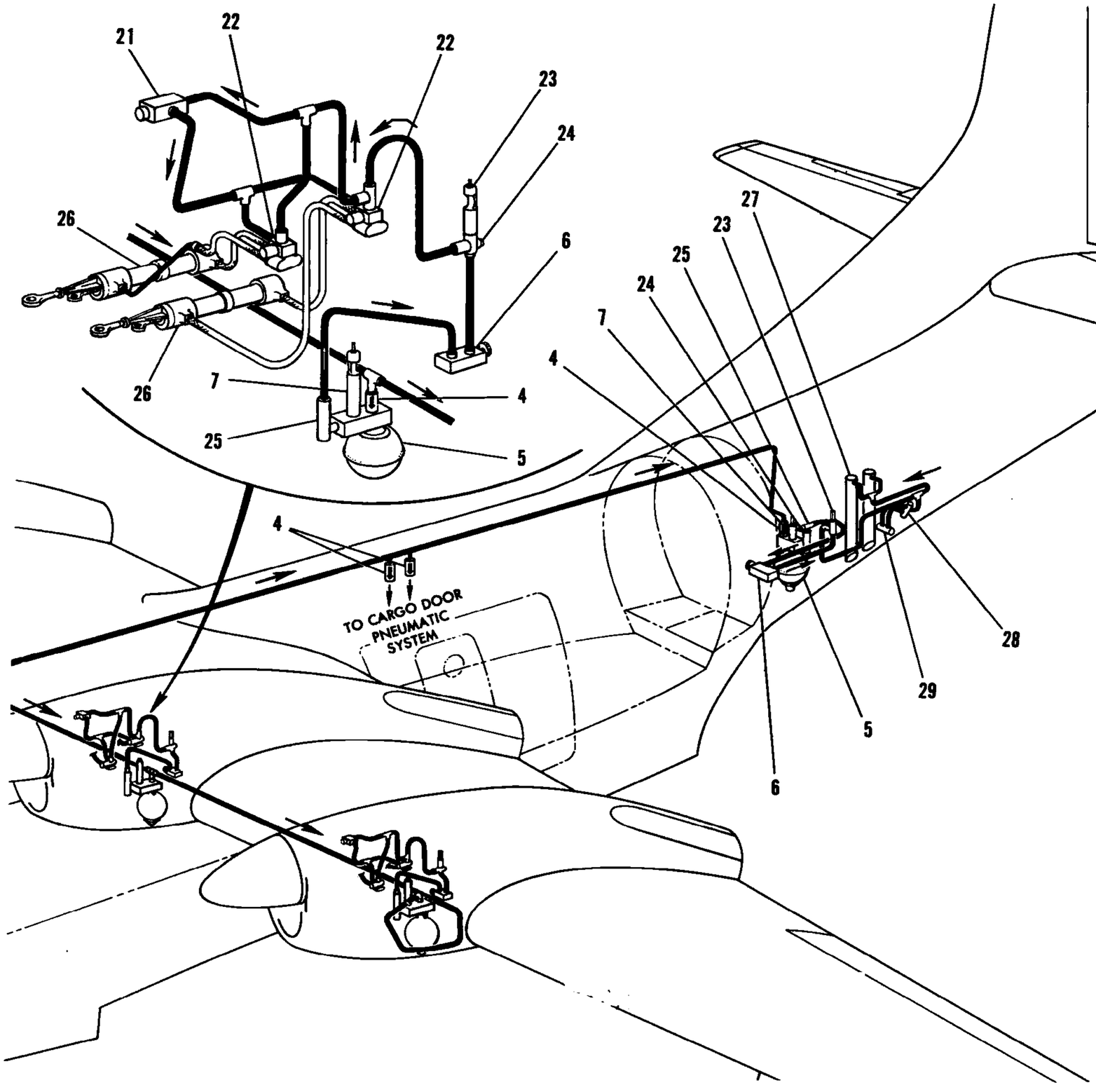






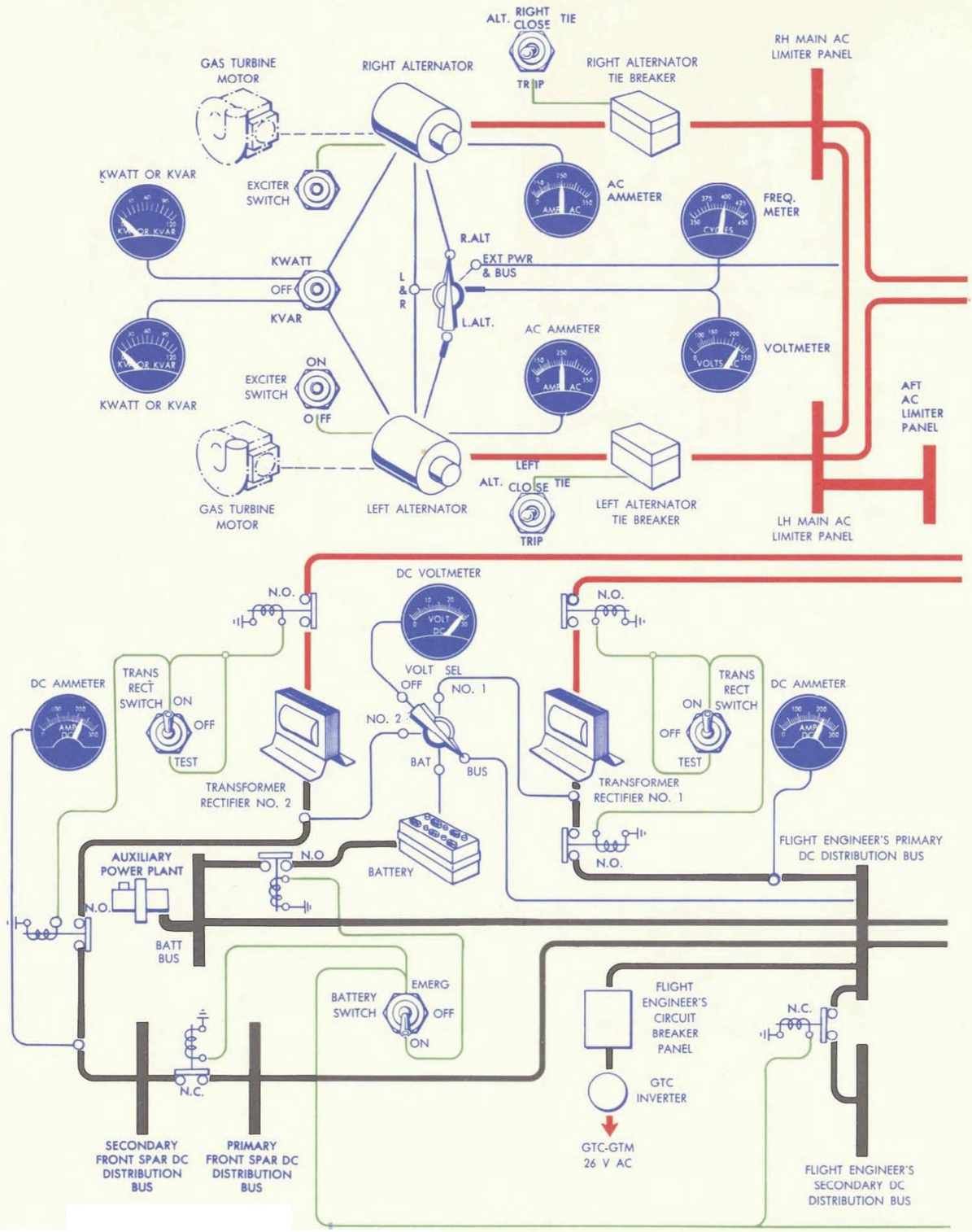
1. 1500-psi Air Compressor
2. Compressor Control Pressure Switch
3. Pressure-Operated Shut-Off Valve
4. Check Valve
5. Air Bottle
6. Manual Shut-Off Valve
7. 1725-psi Relief Valve
8. Moisture Separator
9. Back Pressure Valve
10. Windshield Washer
11. Windshield Wiper
12. Pressure Transmitter
13. 28-psi Pressure Regulator
14. 35-psi Relief Valve
15. Lavatory Fresh Water Tank
16. 100-psi Pressure Regulator

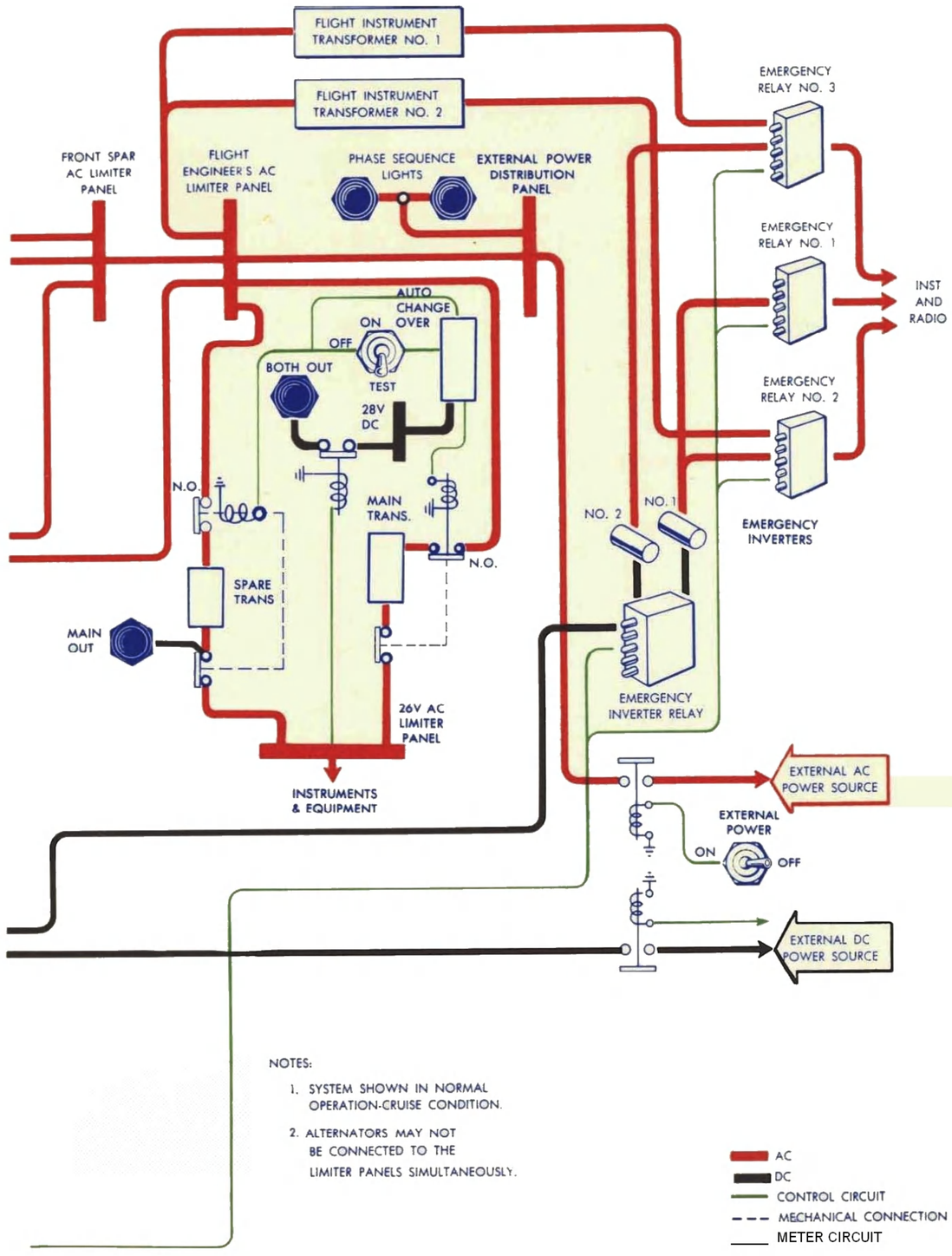
PNEUMATIC SYSTEM



17. 115-psi Relief Valve
18. Windshield Washer System Solenoid Valve
19. Windshield Washer Storage Tank
20. Message Carrier Pneumatic Tubing
21. Emergency Control Valve
22. Selector Valve, Air Intake Duct Door
23. 900-psi Relief Valve
24. High Pressure Air Valve
25. 780-psi Pressure Regulator
26. Pneumatic Cylinder, Air Intake Duct Door
27. Flare Launcher
28. Flare Door Solenoid Valve
29. Flare Door Actuating Cylinder

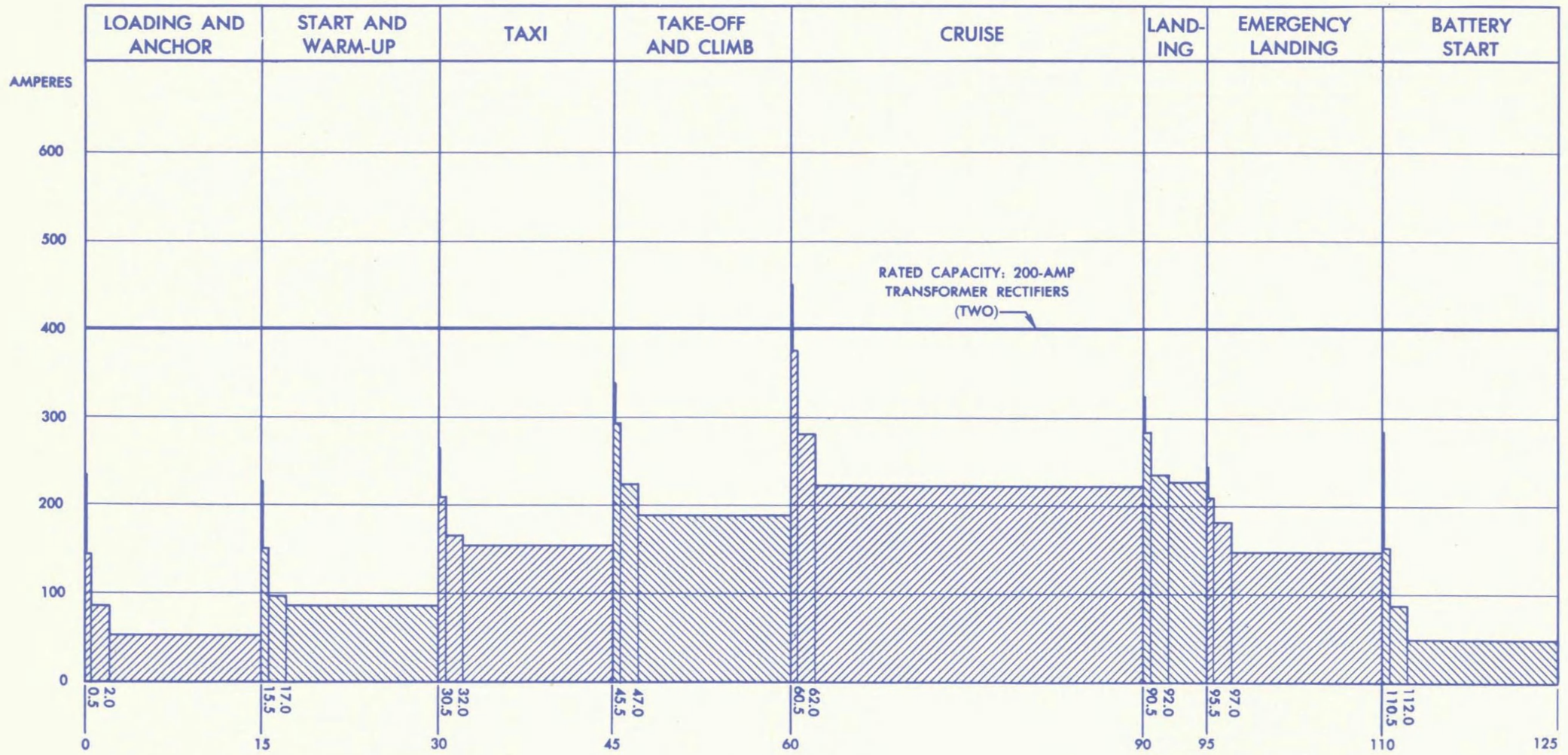
ELECTRICAL POWER DISTRIBUTION SYSTEM





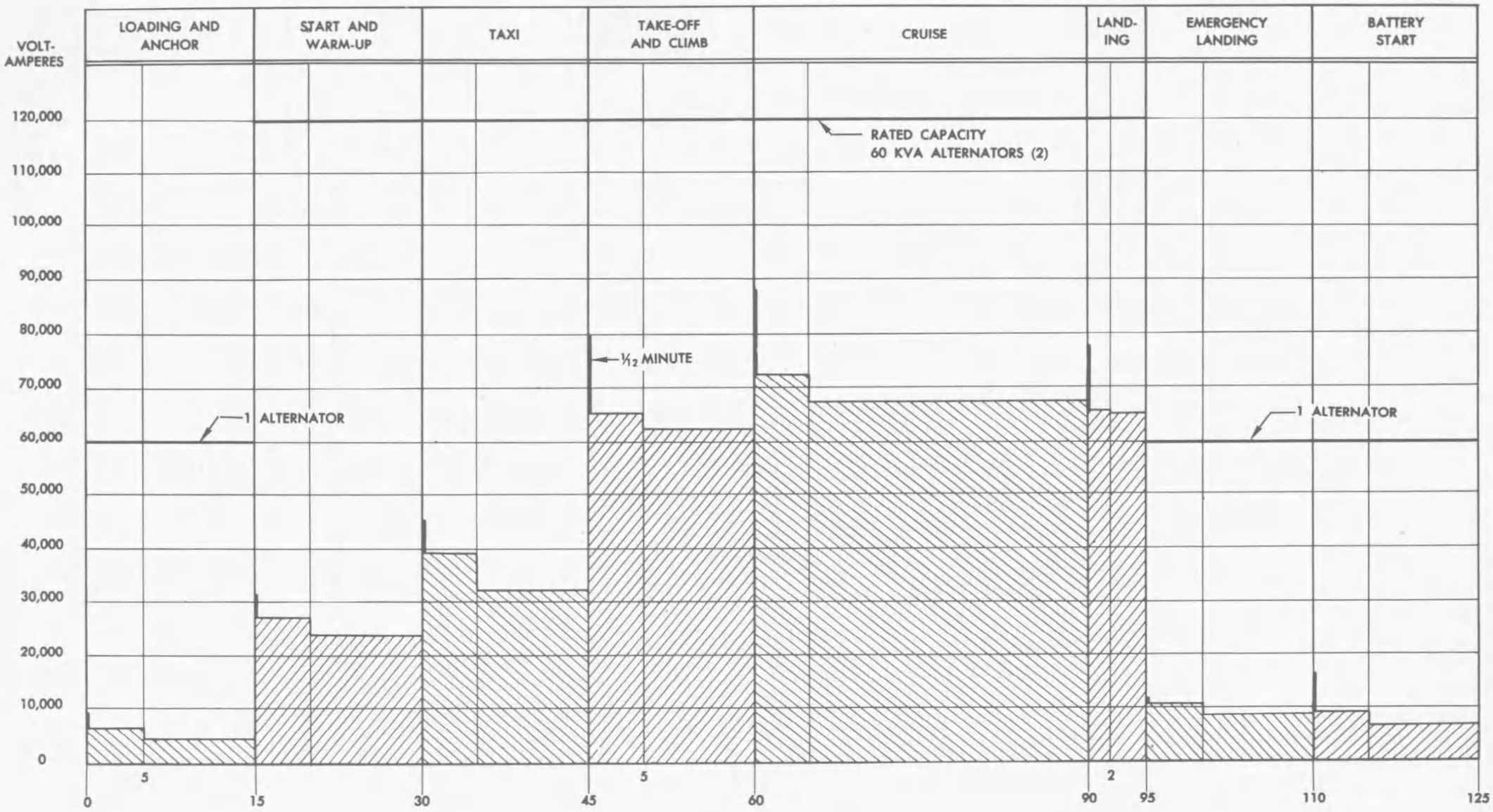
ELECTRICAL POWER is supplied by five systems. The 200/115-volt three-phase a-c system is supplied by either one of two alternators driven by gas turbine motors. The 200 115-volt three-phase a-c system supplies power for the 115-volt single and three-phase a-c systems. The 115-volt three-phase a-c system is supplied through transformers. The 26-volt single-phase a-c system is supplied by transformers from the 115-volt single-phase a-c system. The 28-volt d-c system is supplied from the 200-volt three-phase a-c system through transformer rectifiers. The auxiliary power plant (APP) generator supplies power for the 28-volt d-c system for ground and starting operations. External power receptacles are provided for the connection of external 200 115-volt three-phase a-c and 24-28-volt d-c power sources. All electrical power instruments and indicators are located on the flight engineer's alternator control panel.

DC ELECTRICAL LOAD ANALYSIS GRAPH



NOTE: BATTERY START IS DEFINED AS STARTING WITHOUT THE AID OF EXTERNAL POWER. THE CONDITION SHOWN IS FOR STARTING THE FIRST ENGINE ONLY.

AC ELECTRICAL LOAD ANALYSIS GRAPH

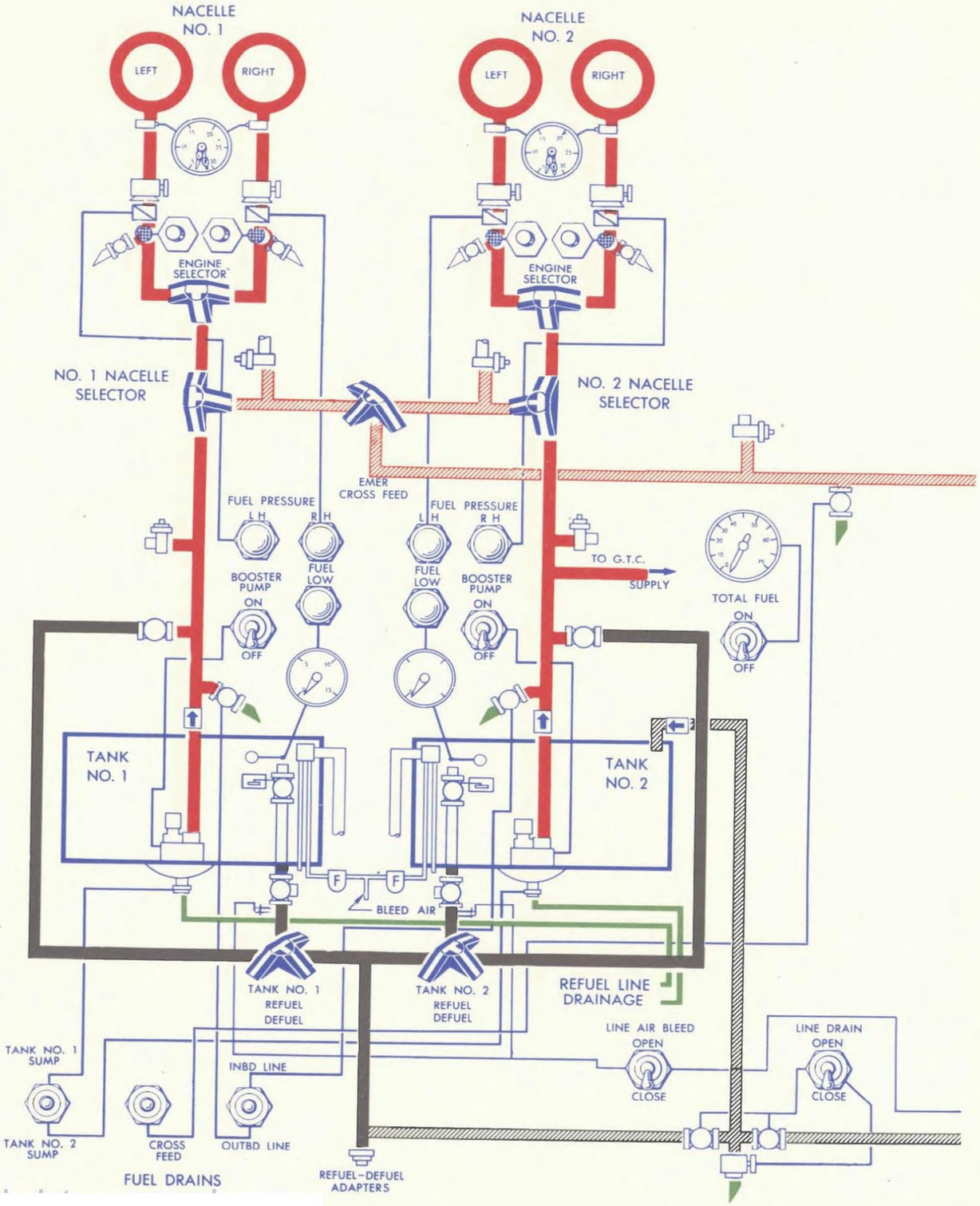


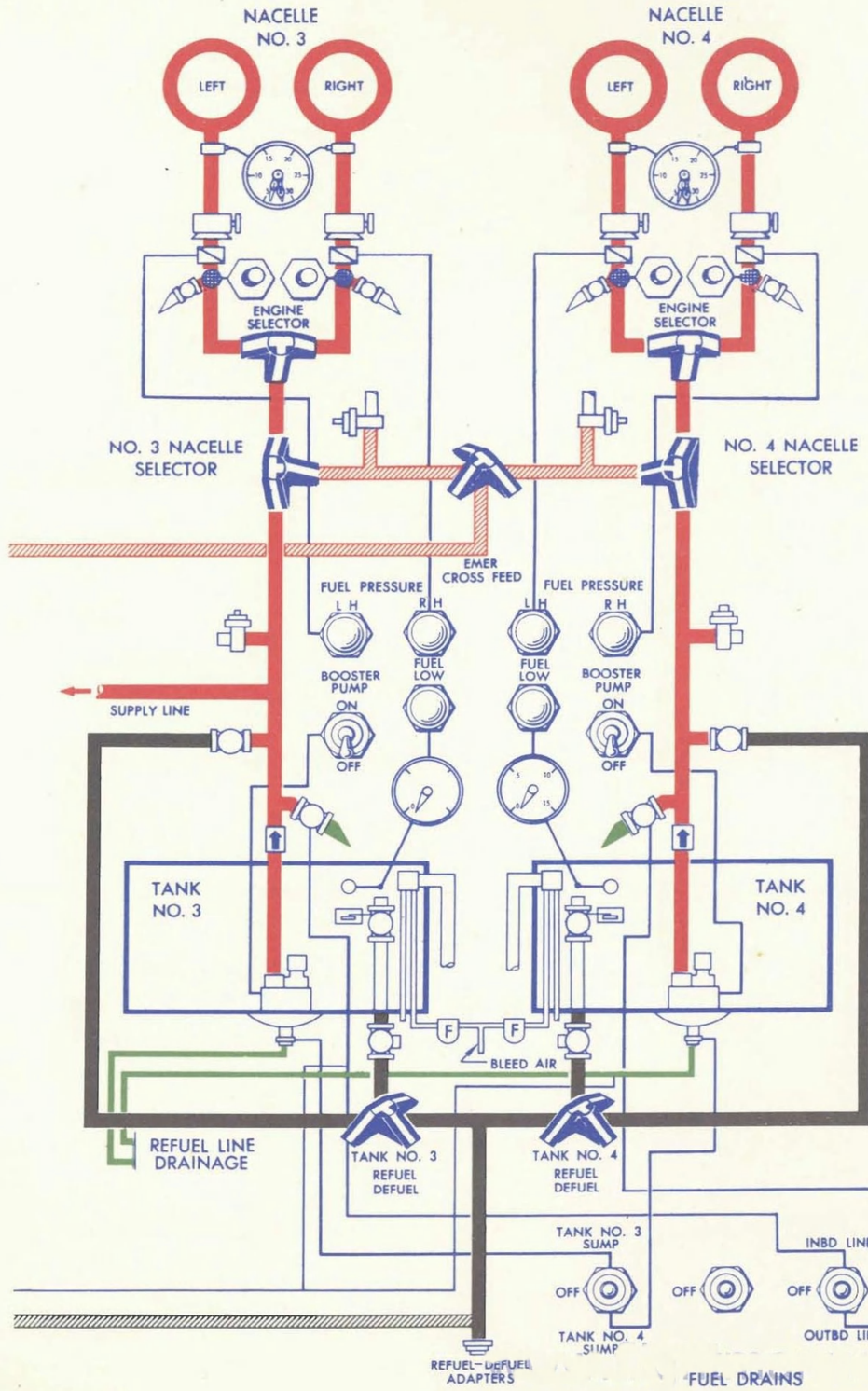
NOTE: BATTERY START IS DEFINED AS STARTING WITHOUT THE AID OF EXTERNAL POWER. THE CONDITION SHOWN IS FOR STARTING THE FIRST ENGINE ONLY.

FUEL SYSTEM

ENGINES

Four integral wing tanks supply fuel to the engines. The four tanks are interconnected with a normal and an emergency cross-feed system. A multi-point single station pressure system is used for refueling and defueling operations. Pressurization for high altitude operation is provided by an automatic tank vent system. Each power section is provided with a primary and a secondary engine-driven fuel pump, and each fuel tank is equipped with a submerged type booster pump.




NACELLE NO. 3
LEFT
RIGHT
NACELLE NO. 4
LEFT
RIGHT
ENGINE SELECTOR
ENGINE SELECTOR
NO. 3 NACELLE SELECTOR
NO. 4 NACELLE SELECTOR
EMER CROSS FEED
FUEL PRESSURE
L H
R H
FUEL PRESSURE
L H
R H
BOOSTER PUMP
FUEL LOW
FUEL LOW
BOOSTER PUMP
ON
OFF
ON
OFF
SUPPLY LINE
TANK NO. 3
TANK NO. 4
BLEED AIR
REFUEL LINE DRAINAGE
TANK NO. 3 REFUEL DEFUEL
TANK NO. 4 REFUEL DEFUEL
TANK NO. 3 SUMP
INBD LINE
OFF
OFF
OFF
TANK NO. 4 SUMP
OUTBD LINE
REFUEL-DEFUEL ADAPTERS
FUEL DRAINS

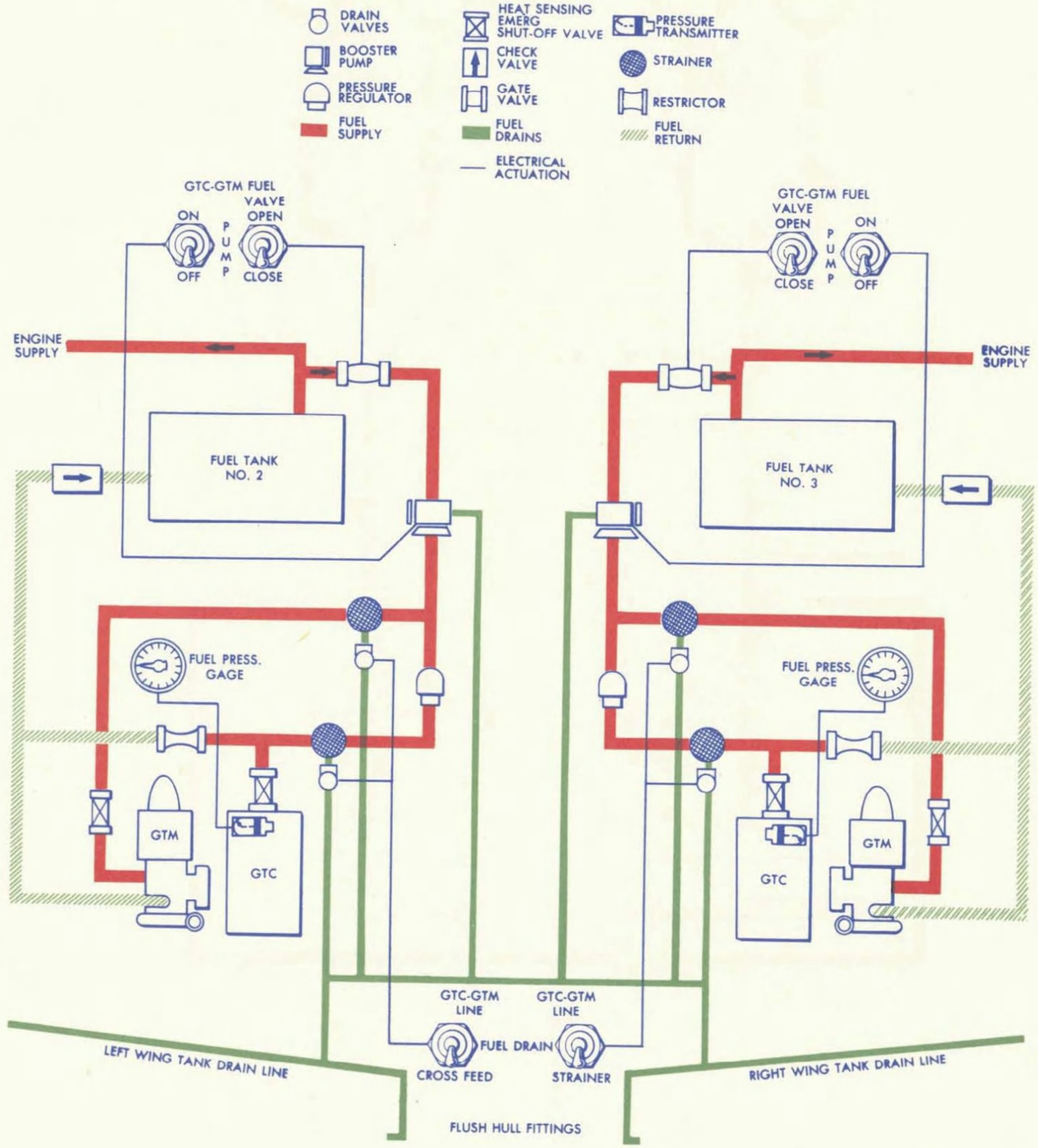

THERMAL RELIEF VALVE
FLOWMETER
CHECK VALVE
AIR BLEED VALVE
DRAIN VALVE (ELECT)
LEVEL CONTROL VALVE
GATE VALVE (ELECT)
ENGINE PUMPS
DRAIN PUMP
VENT VALVE AND PRESSURE REGULATOR
BOOSTER PUMP (SUBMERGED ELECT)
SUMP AND DRAIN VALVE (ELECT)
FILTER (AIR)
FUEL QUANTITY
MAIN FUEL LINE
CROSS FEED LINE
REFUEL DEFUEL LINE
REFUEL DEFUEL DRAIN LINE
DRAIN LINE
VENT
ELECTRICAL ACTUATIONS

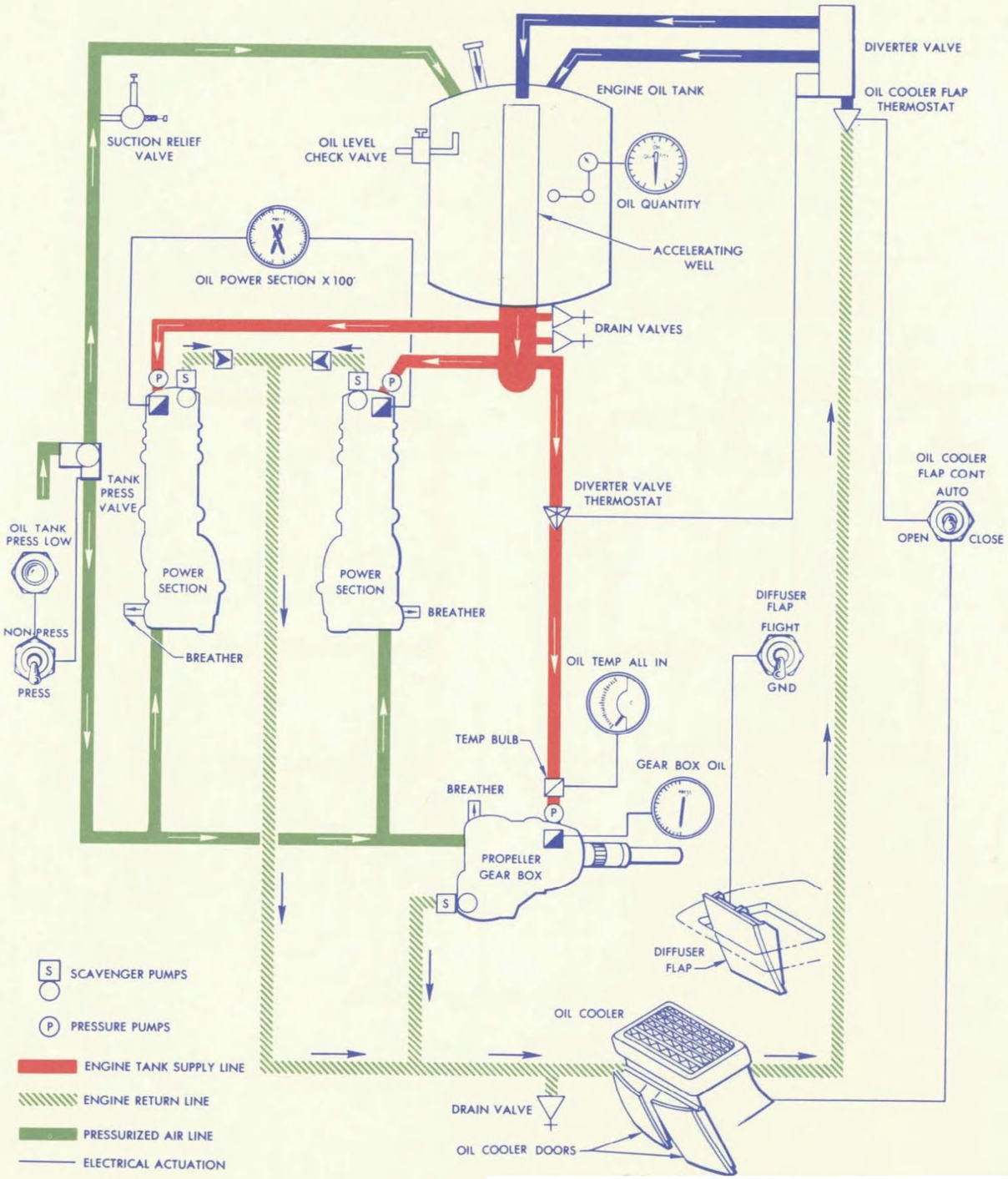
FUEL SYSTEM

GTC and GTM

GAS TURBINE COMPRESSORS (GTC). The gas turbine compressor is a self contained enclosed compressor unit designed as a source of compressed air for the air turbine starters and ground operation of units which comprise the bleed air system. Two GTC units are installed, one in each wing trailing edge inboard of engine nacelle.

GAS TURBINE MOTORS (GTM). The gas turbine motors furnish continuous power to drive the alternators, which supply 200/115-volt a-c power for the electrical system. The GTM utilizes compressed air from the bleed air system, fuel from the main fuel supply, and incorporates a self-contained oil system with an integral cooling system. The units operate either as gas turbine motors (GTM) or as air-driven turbine motors (ATM).



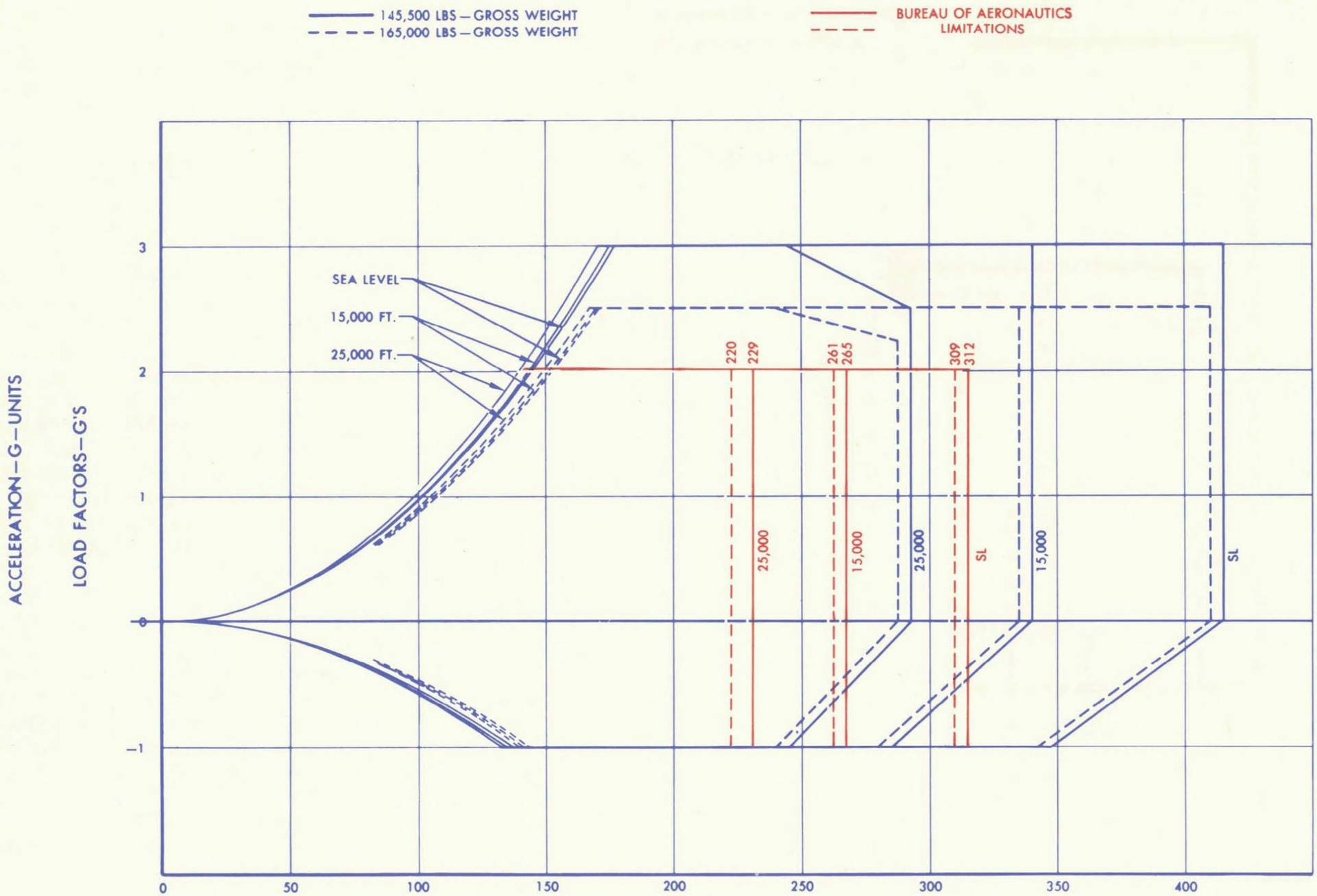


OIL SYSTEM

OIL SYSTEM. Each engine nacelle is provided with an independent lubricating system consisting of a bladder-lined metal oil tank, a cooling radiator, and distribution plumbing. The oil tank is pressurized to provide a positive head of oil to the pressure pumps for engine starting and for high altitude operation. Oil cooling air is obtained from the plenum chamber during flight and through the electrically-actuated oil cooler flap doors during ground operation.

A pressure pump and four scavenge pumps in each power section circulate the oil for lubrication and return the oil through the oil cooler to the tank. Two pressure pumps in the reduction gear case circulate oil for lubrication, provide pressure oil for clutch operation, clutch cooling, and for the propellor brake. Two scavenge pumps return the oil through the oil cooler to the tank.

OPERATING FLIGHT STRENGTH DIAGRAM



R3Y 1 V-n DIAGRAM

STALL CHART (KNOTS) ESTIMATED

POWER-OFF									
Wing	GROSS WEIGHT								
Flap	145,500 LBS.			165,000 LBS.			100,000 LBS.		
Position	DEGREE OF BANK								
Degrees	0°	15°	30°	0°	15°	30°	0°	15°	30°
0°	116	118	125	123	125	133	96	97	103
20°	99	100	106	105	107	113	82	83	88
50°	91	92	98	97	99	104	76	77	81

POWER-ON									
Wing	GROSS WEIGHT								
Flap	145,000 LBS.			165,000 LBS.			100,000 LBS.		
Position	DEGREE OF BANK								
Degrees	0°	15°	30°	0°	15°	30°	0°	15°	30°
0°	110	112	118	117	119	126	91	92	98
20°	93	95	101	100	102	107	77	79	83
50°	85	87	92	91	93	98	71	72	76

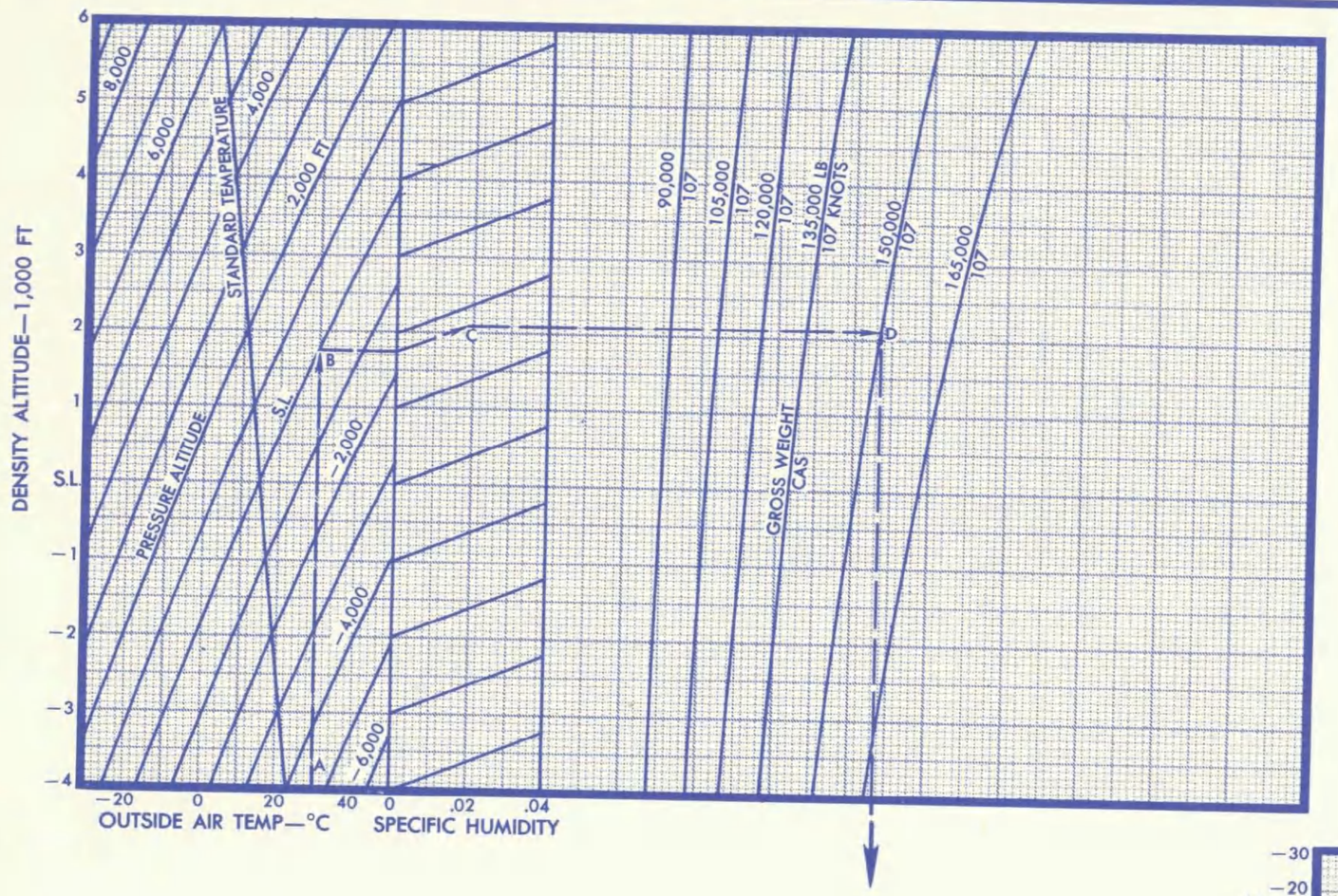
FOUR-ENGINE TAKE-OFF DISTANCE

TAKE-OFF POWER AND FLAP SETTING

SHELTERED WATER

MODEL: R3Y-1

ENGINES (4) T40-A-10



SAMPLE PROBLEM:

A. Outside air temperature = 30°C

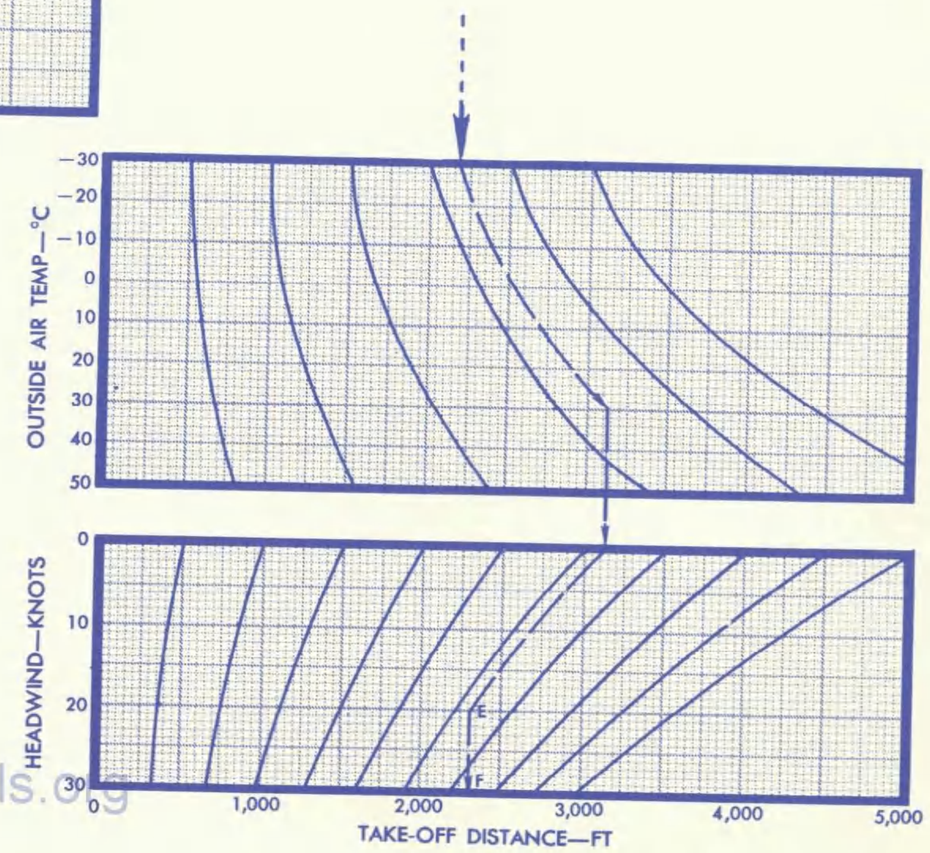
B. Pressure altitude = sea level

C. Specific humidity = .02

D. Take-off gross weight = 150,000 lb

E. Headwind = 20 knots

F. Take-off distance = 2300 ft



NOTE:

Take-off weights above 120,000 lb use 20° flap setting—weights below 120,000 lb use 15° flap setting.

FUEL GRADE: 100/130

FUEL DENSITY: 6.0 LB/GAL

DATA AS OF: 1 MAY 1954

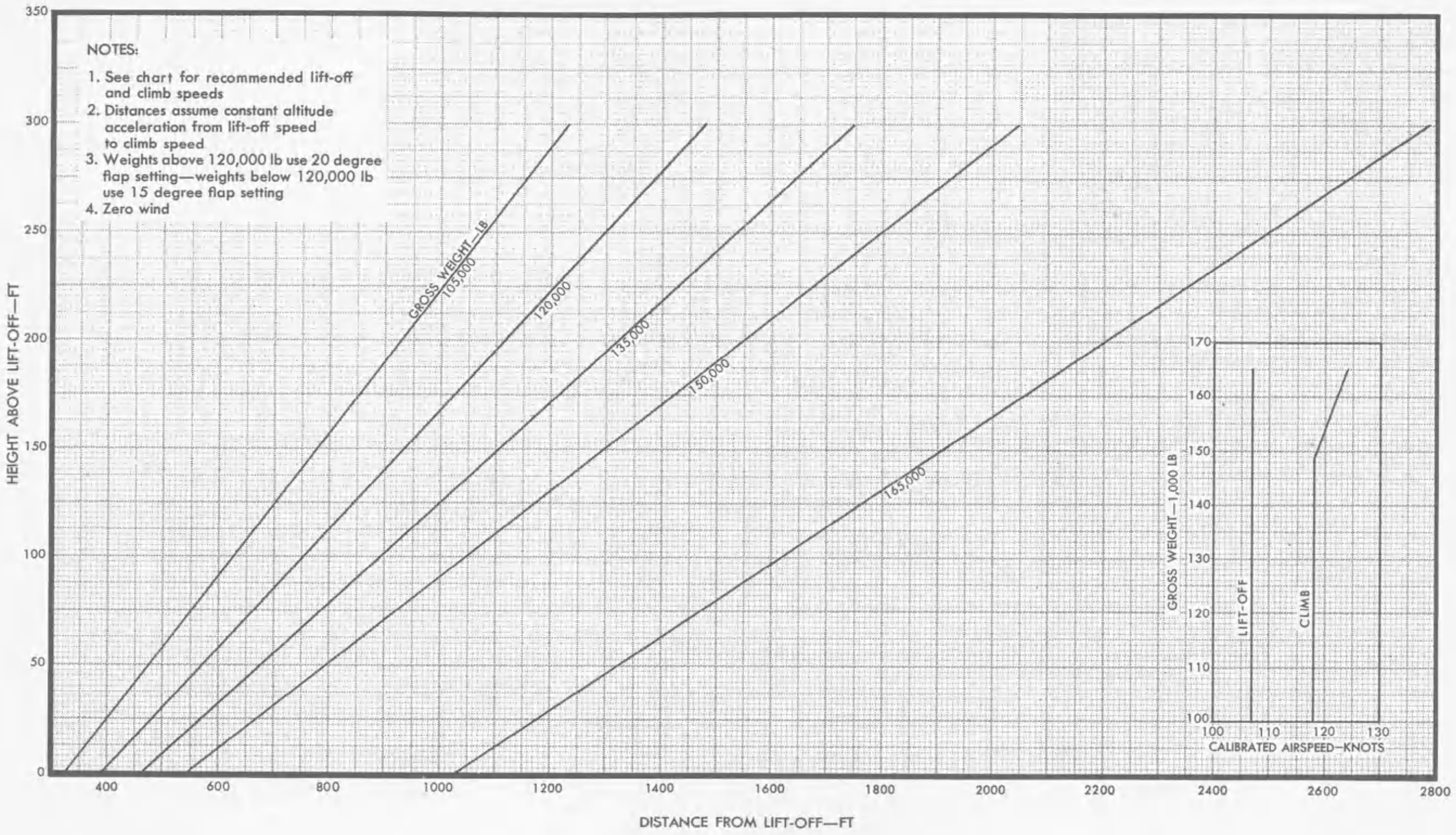
DATA BASIS: ESTIMATED

FOUR-ENGINE CLIMB-OUT FLIGHT PATH

TAKE-OFF POWER AND FLAP SETTING
SEA LEVEL—NACA STANDARD DAY

MODEL: R3Y-1

ENGINES (4) T40-A-10



DATA AS OF: 1 MAY 1954
DATA BASIS: ESTIMATED

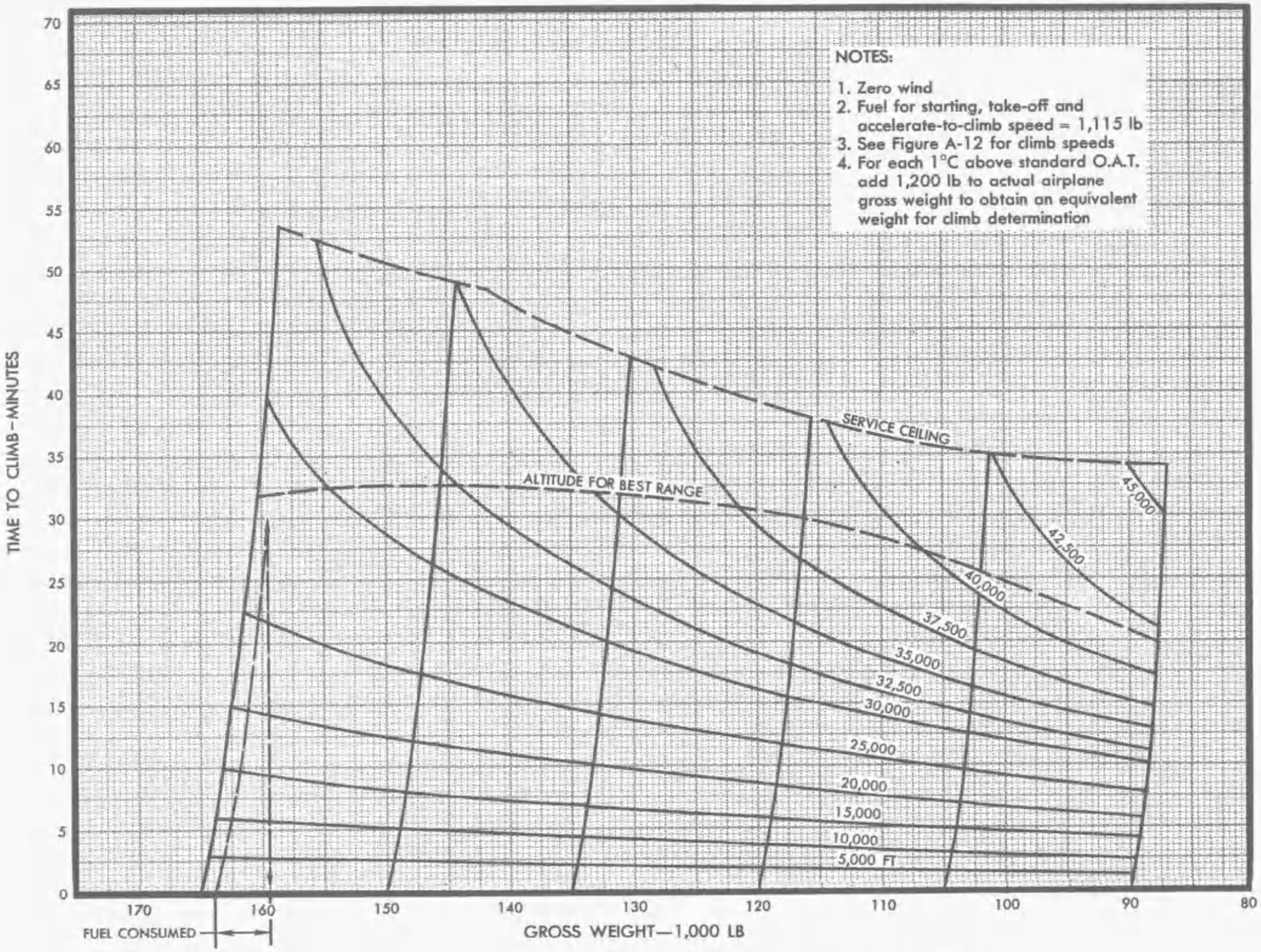
FUEL GRADE: 100/130
FUEL DENSITY: 6.0 LB/GAL

TIME AND FUEL TO CLIMB

FOUR ENGINES OPERATING
NORMAL POWER—NACA STANDARD DAY
CLEAN CONFIGURATION

MODEL: R3Y-1

ENGINES (4) T40-A-10



DATA AS OF: 1 MAY 1954
DATA BASIS: ESTIMATED

SAMPLE PROBLEM:

Take-off weight = 165,000 lb
Gross weight at beginning of climb = 165,000 − 1,115 = 163,885 lb

Climb from sea level to 28,000 ft
Time to climb = 30 min
Gross weight at end of climb = 159,500 lb
Fuel consumed during climb = 163,885 − 159,500 = 4,385 lb

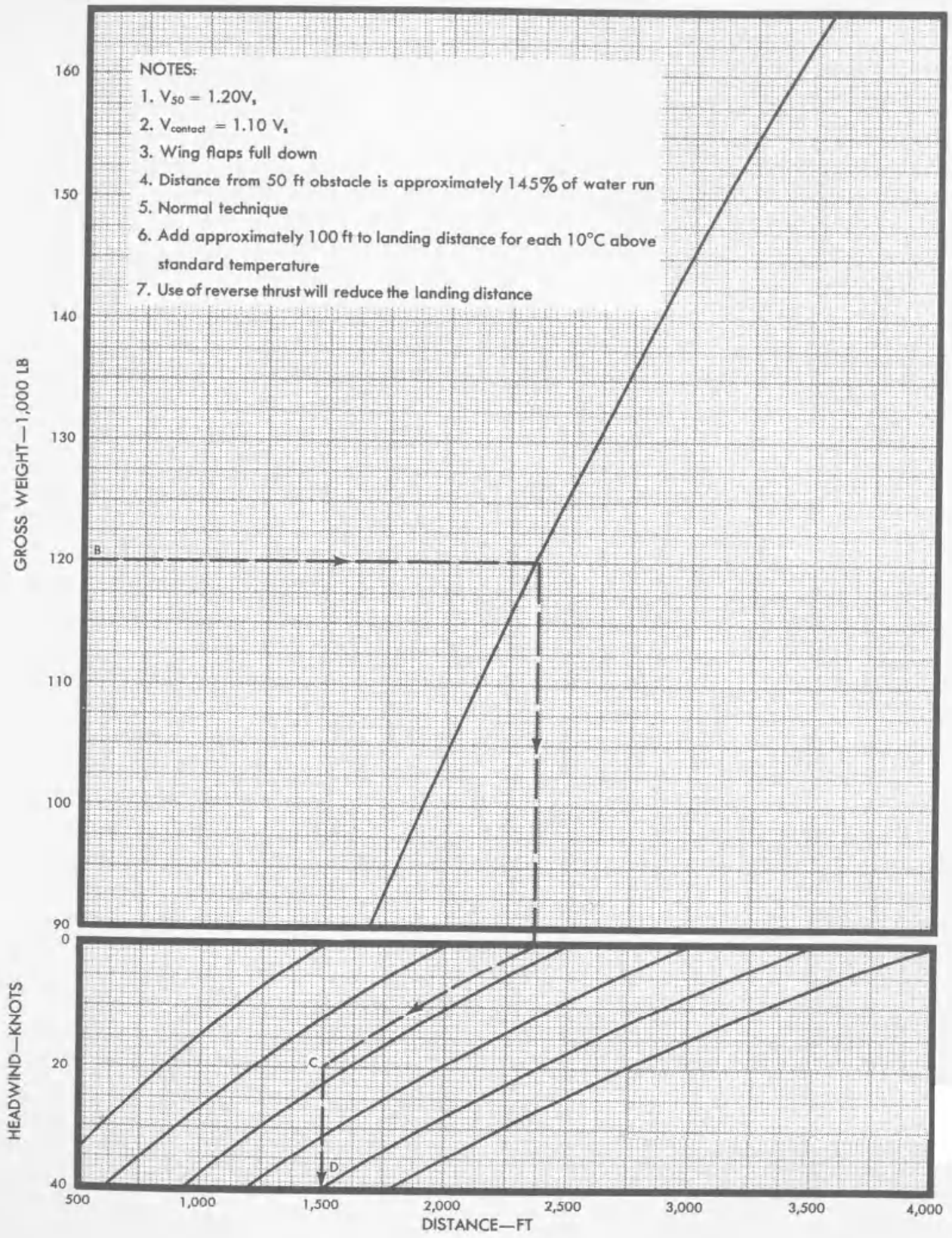
FUEL GRADE: 100/130
FUEL DENSITY: 6.0 LB/GAL

LANDING DISTANCE

SHELTERED WATER

SEA LEVEL—NACA STANDARD DAY

MODEL: R3Y-1 ENGINES (4) T40-A-10



SAMPLE PROBLEM:

A. Outside air temperature = 15°C
B. Gross weight = 120,000 lb
C. Headwind = 20 knots
D. Landing distance = 1500 ft
E. Total distance over 50 ft obstacle = 1.45 × 1500 = 2175 ft

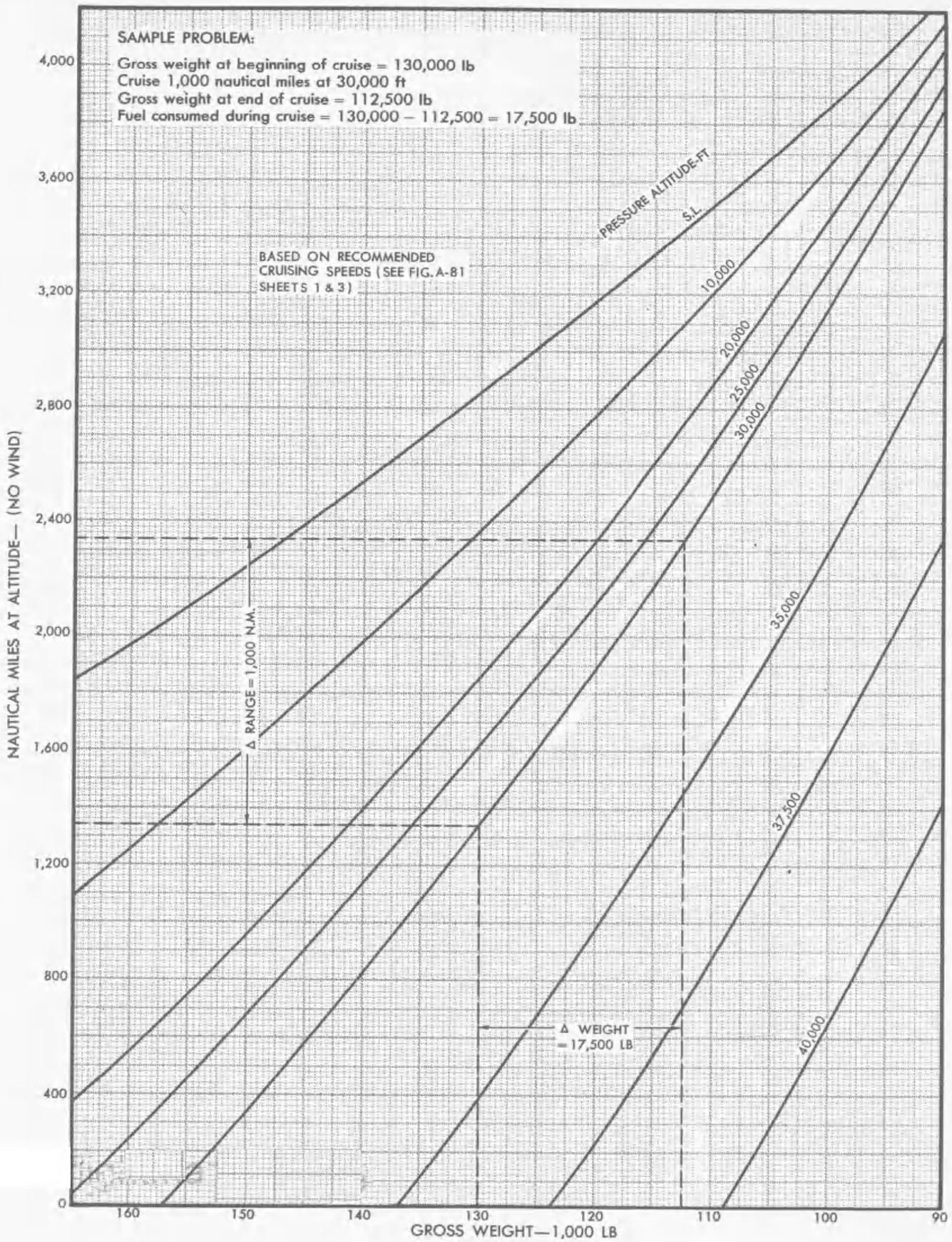
FUEL GRADE: 100/130
FUEL DENSITY: 6.0 LB/GAL
DATA AS OF: 1 MAY 1954
DATA BASIS: ESTIMATED

FOUR ENGINE
LONG RANGE PREDICTION - DISTANCE
VARYING NUMBER OF POWER SECTIONS OPERATING
NACA STANDARD DAY
CLEAN CONFIGURATION

MODEL: R3Y-1 ENGINES (4) T40-A-10

FUEL GRADE: 100/130
FUEL DENSITY: 6.0 LB/GAL

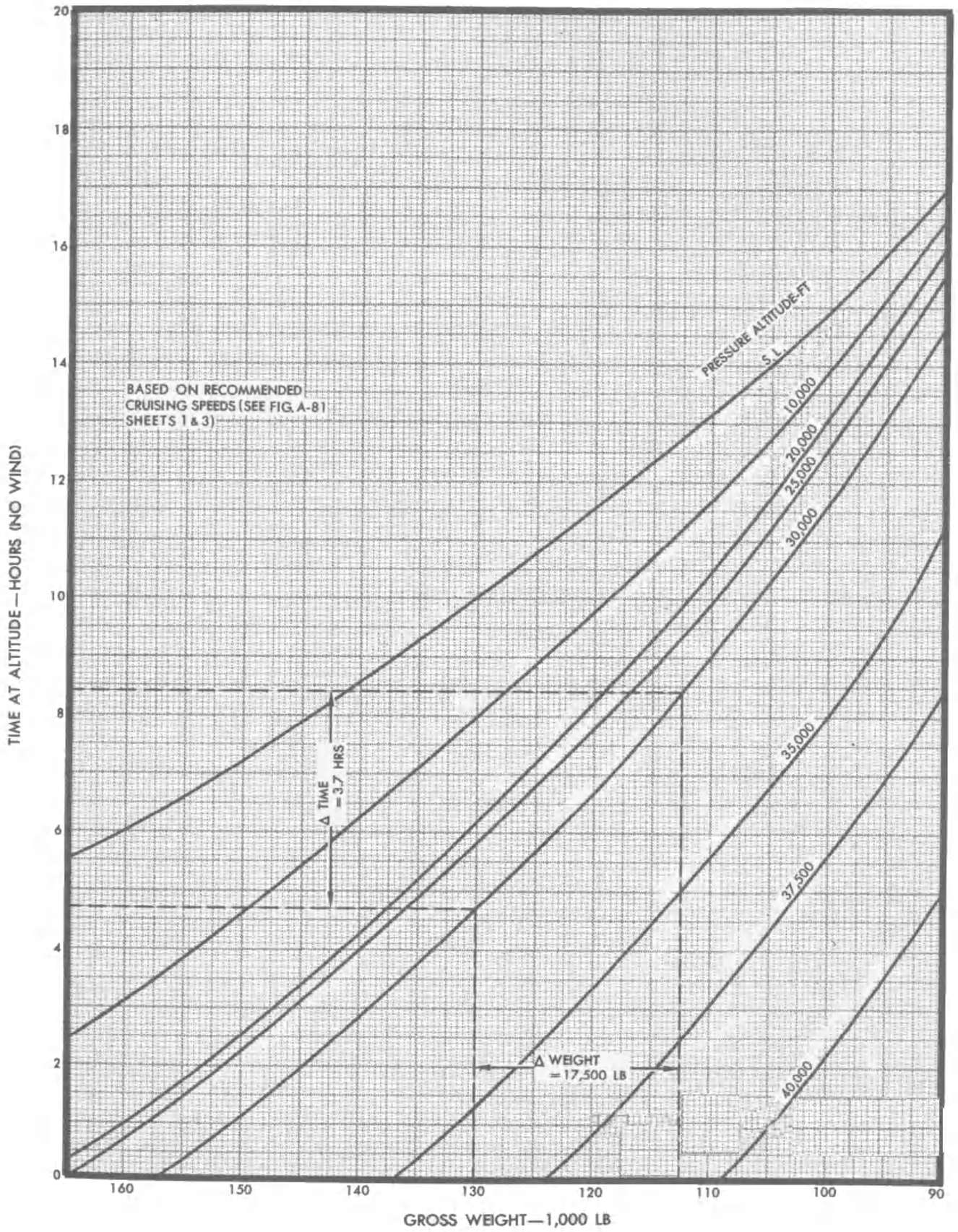
DATA AS OF: 1 MAY 1954
DATA BASIS: ESTIMATED



FOUR ENGINE
LONG RANGE PREDICTION—TIME
VARYING NUMBER OF POWER SECTIONS OPERATING
NACA STANDARD DAY
CLEAN CONFIGURATION

MODEL: R3Y-1

ENGINES (4) T40-A-10



SAMPLE PROBLEM:

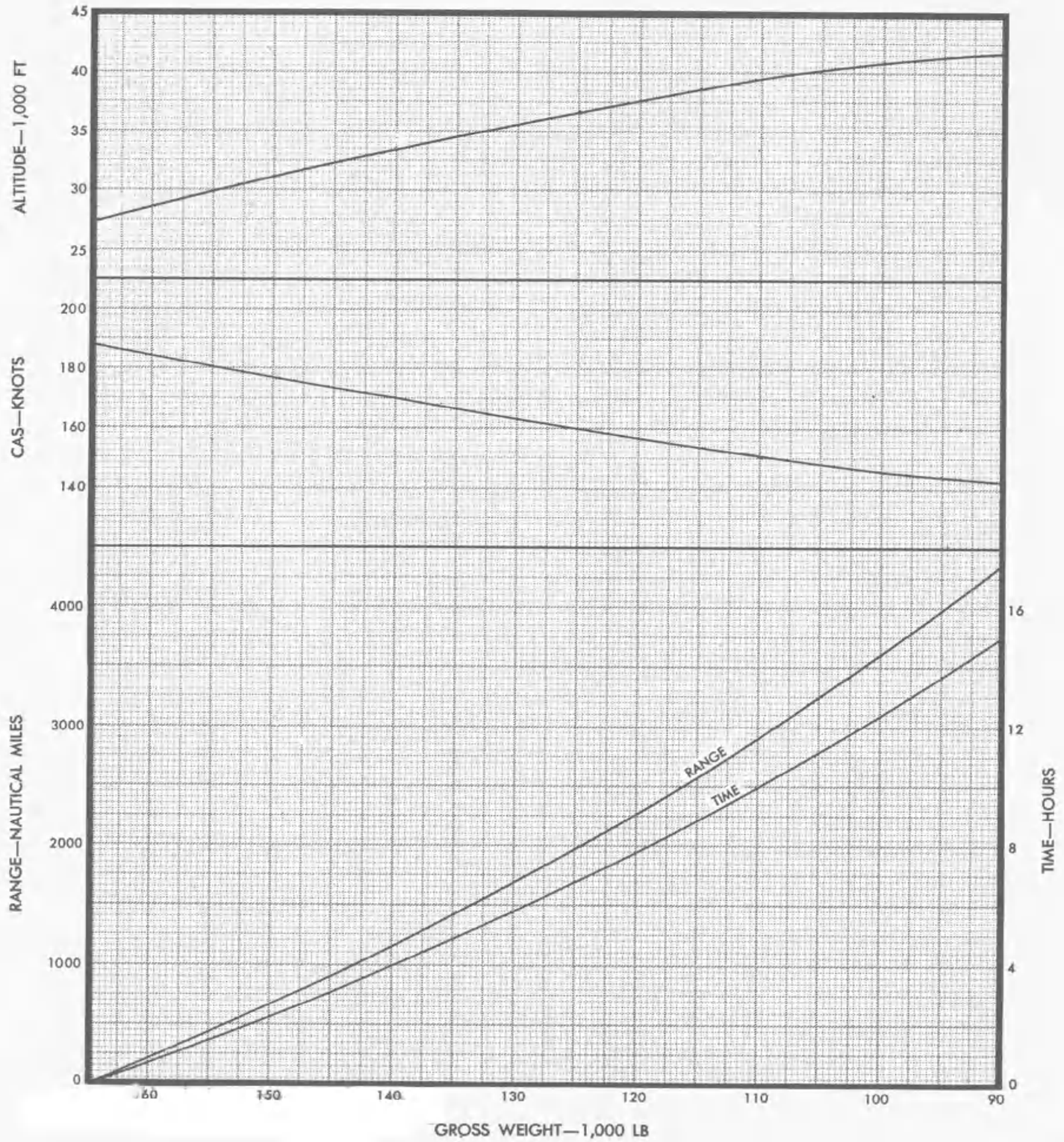
Gross weight at beginning of cruise = 130,000 lb
Cruise 1,000 nautical miles at 30,000 ft
Gross weight at end of cruise = 112,500 lb
Fuel consumed during cruise = 130,000 – 112,500 = 17,500 lb
Time at 30,000 ft = 8.4 – 4.7 = 3.7 hrs

FUEL GRADE: 100/130
FUEL DENSITY: 6.0 LB/GAL

DATA AS OF: 1 MAY 1954
DATA BASIS: ESTIMATED

FOUR ENGINE
MAXIMUM RANGE—VARIABLE ALTITUDE
TIME AND DISTANCE
NACA STANDARD DAY
CLEAN CONFIGURATION

MODEL: R3Y-1 ENGINES (4) T40-A-10

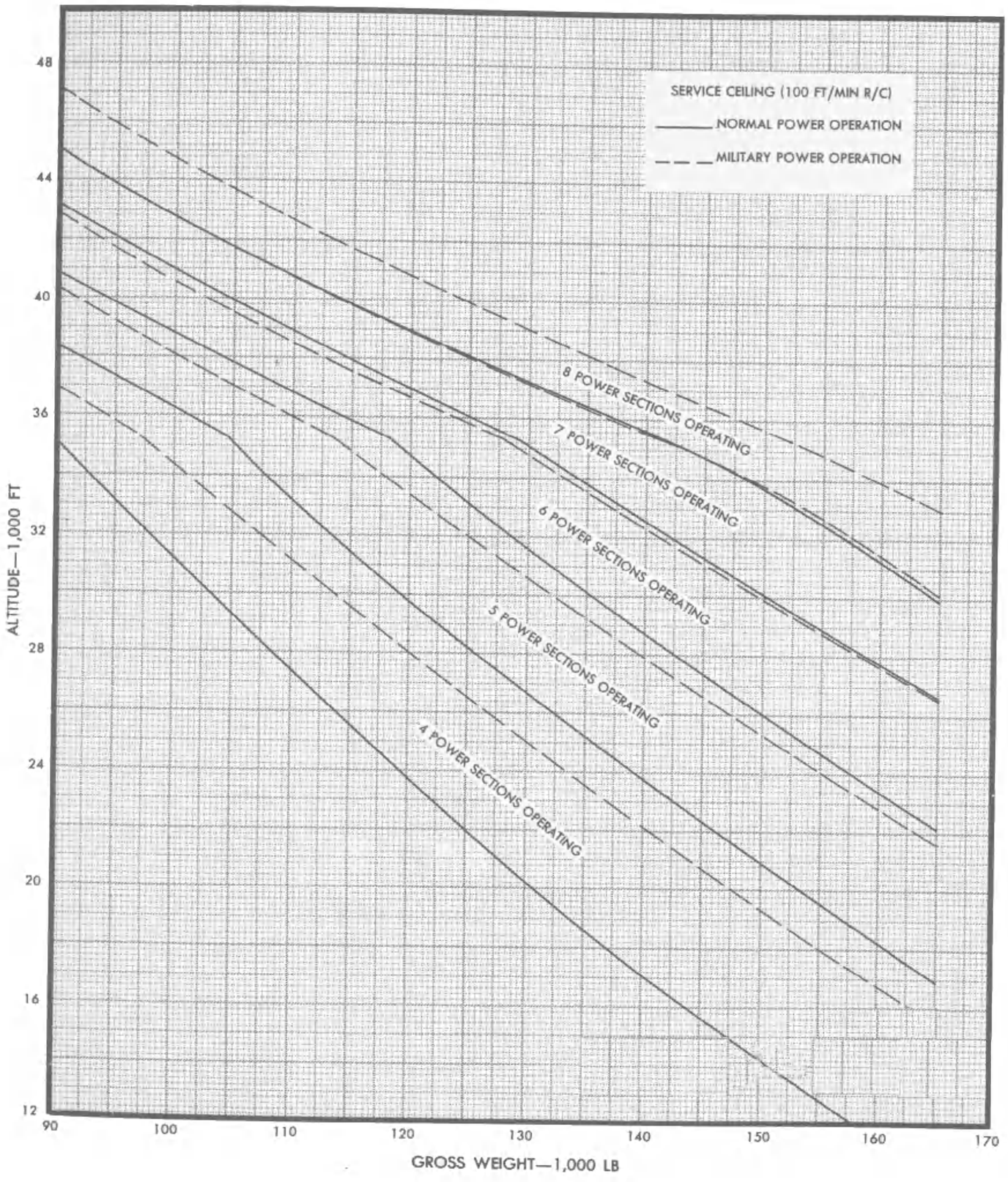


NOTES:

1. Zero wind
2. Power settings are approximately 90% to 100% normal power (eight power sections operating)
3. The maximum range cruise altitudes shown above are limited to cruise ceiling (300 ft/min R/C).

FUEL GRADE: 100/130
FUEL DENSITY: 6.0 LB/GAL

DATA AS OF: 1 MAY 1954
DATA BASIS: ESTIMATED



FOUR-ENGINE EMERGENCY CEILING

NACA STANDARD DAY

CLEAN CONFIGURATION

MODEL: R3Y-1 ENGINES (4) T40-A-10

NOTES:

1. When above the ceiling for one or more inoperative power sections as shown above, the rates of descent will be approximately as shown below.
   One Power Section Inoperative – 300 to 500 ft/min
   Two Power Sections Inoperative – 500 to 1000 ft/min
2. Decrease ceilings approximately 300 ft for each 1°C above standard O.A.T.

FUEL GRADE: 100/130
FUEL DENSITY: 6.0 LB/GAL

DATA AS OF: 1 MAY 1954
DATA BASIS: ESTIMATED

FOUR-ENGINE MAXIMUM CONTINUOUS POWER SUMMARY

(NORMAL POWER)
NACA STANDARD DAY

CAS—Calibrated airspeed, knots
TAS—True airspeed, knots
LB/HR—Fuel consumption

Red figures are preliminary data, subject to revision after flight check.

FUEL GRADE: 100/130
FUEL DENSITY: 6.0 LB/GAL

DATA AS OF: 1 MAY 1954
DATA BASIS: Estimated

MODEL: R3Y-1 **ENGINES: (4) T40-A-10**

CONFIGURATION: CLEAN
WEIGHT: 165,000 LB

APPROXIMATE				PRESSURE ALTITUDE FEET	
LB/HR	TAS KNOTS	CAS KNOTS	% RPM		% RPM
13,870	281	281	100	Sea Level	100
10,940	293	254	100	10,000	100
8,440	298	221	100	20,000	100
7,300	293	200	100	25,000	100
6,340	278	173	100	30,000	100

CONFIGURATION: CLEAN
WEIGHT: 150,000 LB

APPROXIMATE		
LB/HR	TAS KNOTS	CAS KNOTS
13,875	282	282
10,945	295	256
8,450	302	224
7,305	301	206
6,355	295	184

CONFIGURATION: CLEAN
WEIGHT: 135,000 LB

APPROXIMATE				PRESSURE ALTITUDE FEET	
LB/HR	TAS KNOTS	CAS KNOTS	% RPM		% RPM
13,880	284	284	100	Sea Level	100
10,945	297	258	100	10,000	100
8,455	307	228	100	20,000	100
7,315	307	210	100	25,000	100
6,365	305	190	100	30,000	100
5,480	296	169	100	35,000	100

CONFIGURATION: CLEAN
WEIGHT: 120,000 LB

APPROXIMATE		
LB/HR	TAS KNOTS	CAS KNOTS
13,880	285	285
10,950	299	260
8,460	309	230
7,320	312	214
6,375	313	195
5,500	309	176

CONFIGURATION: CLEAN
WEIGHT: 105,000 LB

APPROXIMATE				PRESSURE ALTITUDE FEET	
LB/HR	TAS KNOTS	CAS KNOTS	% RPM		% RPM
13,880	286	286	100	Sea Level	100
10,950	301	262	100	10,000	100
8,465	312	232	100	20,000	100
7,330	316	217	100	25,000	100
6,380	318	199	100	30,000	100
5,510	318	182	100	35,000	100
4,330	300	152	100	40,000	100

CONFIGURATION: CLEAN
WEIGHT: 90,000 LB

APPROXIMATE		
LB/HR	TAS KNOTS	CAS KNOTS
13,880	287	287
10,950	302	263
8,470	314	234
7,335	319	219
6,380	323	202
5,525	325	186
4,350	315	160

CONFIDENTIAL

FOUR-ENGINE—COMBAT ALLOWANCE CHART

MODEL: R3Y-1

ENGINES: (4) T40-A-10

GROSS WEIGHT

145,500 LB

PRESSURE ALTITUDE FEET	FUEL REQUIRED POUNDS PER MINUTE	
	100% RPM (NORMAL POWER) MAX CONTINUOUS	100% RPM (MILITARY POWER) 30 MINUTE LIMIT
SEA LEVEL	231	262
10,000	183	208
20,000	141	158
25,000	122	137
30,000	106	119
35,000	91	104

CLEAN CONFIGURATION

NACA STANDARD DAY

NOTES:

1. Turbine inlet temperature, T_{t_5}, for military power at 14,300 rpm = 910°C
2. Turbine inlet temperature, T_{t_5}, for normal power at 14,300 rpm = 854°C

Red figures are preliminary data, subject to revision after flight check.

FUEL GRADE: 100/130

FUEL DENSITY: 6.0 LB/GAL

DATA AS OF: 1 MAY 1954

DATA BASIS: ESTIMATED

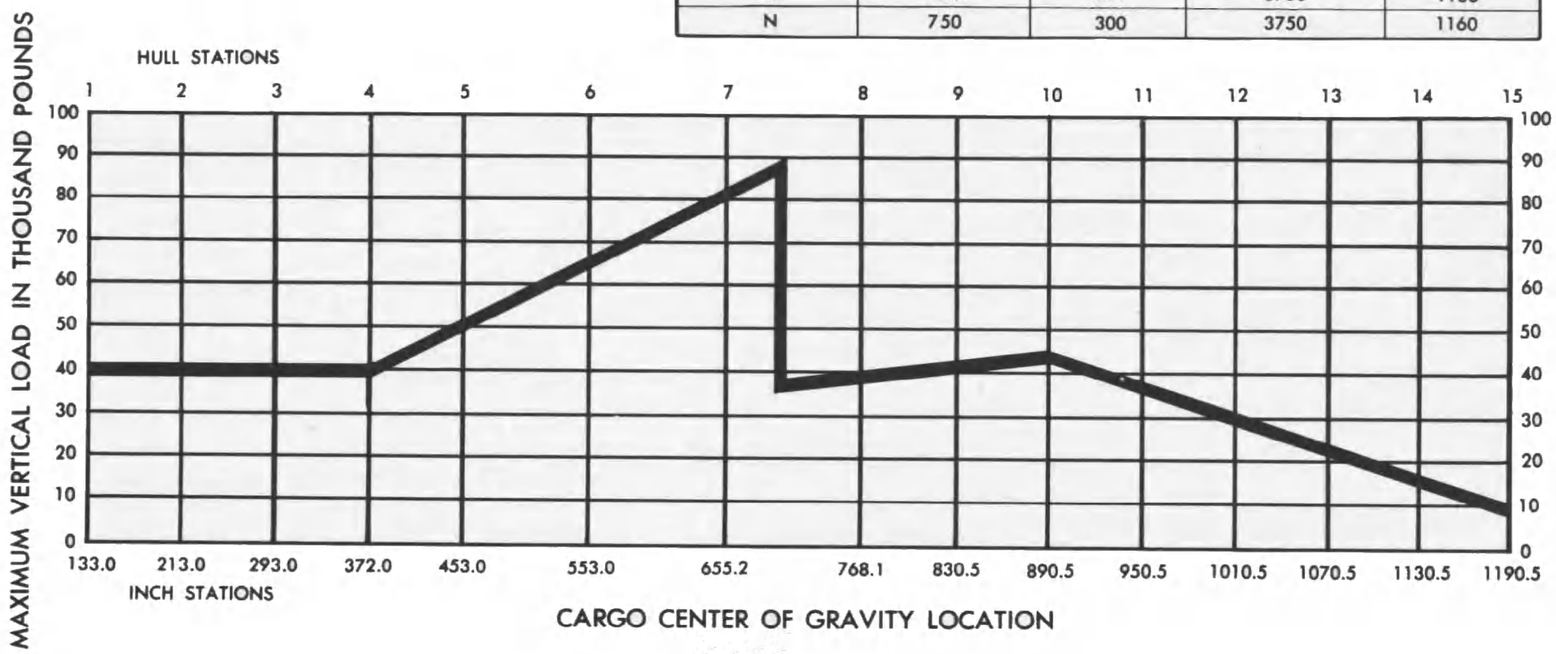
CARGO COMPARTMENT LOADING RESTRICTIONS

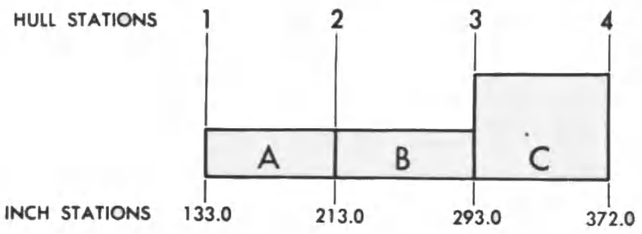
CARGO COMPARTMENT LOAD LIMITS BETWEEN HULL STATIONS

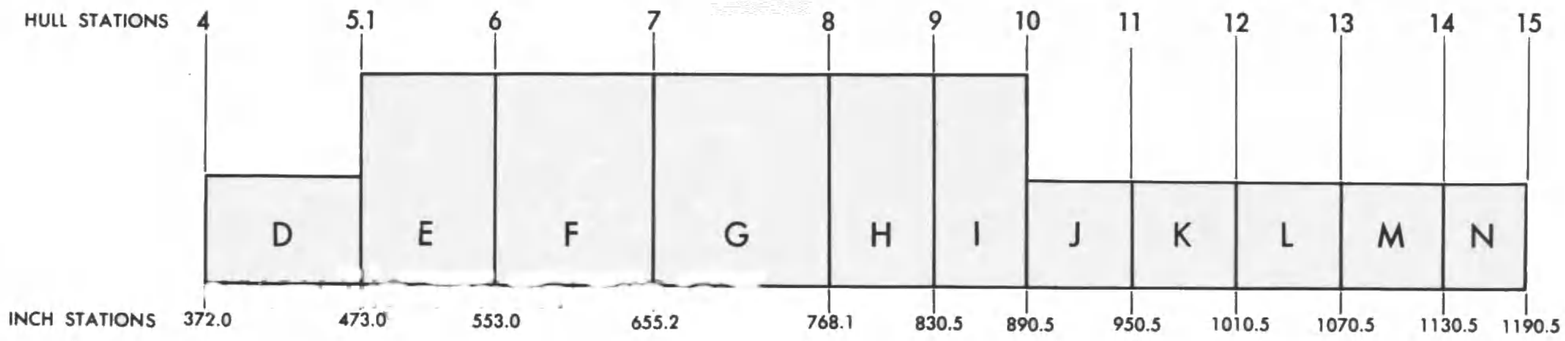
COMPARTMENT	MAX. LOAD PER RUNNING FOOT	MAX. LOAD PER SQUARE FOOT	AREA STRUCTURAL CAPACITY (POUNDS)	AREA CENTROID (INCH STATION)
A	300	300	2000	175
B	300	300	2000	253
C	750	300	5000	333
D	750	300	6300	423
E	1500	300	10,000	513
F	1500	300	12,900	604
G	1500	300	14,000	712
H	1500	300	7800	799
I	1500	300	7500	861
J	750	300	3750	920
K	750	300	3750	980
L	750	300	3750	1040
M	750	300	3750	1100
N	750	300	3750	1160

NOTE: The area shown between hull station 1 (inch station 133.0) and hull station 4 (inch station 372.0) is applicable to the R3Y-2 aircraft only.

NOTE:
Compartments A, B and C are applicable to the model R3Y-2 aircraft only. Compartments D through N are typical to models R3Y-1 and R3Y-2 aircraft.







BEACHING CRADLE and SERVICING EQUIPMENT

1. Platform—Aircraft Servicing SE0838
2. Hoist Assembly - Propeller and Engine Removal, SE0503
3. Platform Assembly - Work Propeller, SE0522
4. Sling Assembly - Rudder, SE0506
5. Ladder Assembly - Rudder and Vertical Stabilizer Access, SE0559
6. Support - Hull Aft Airplane Hoisting, SE0520
7. Guard Rail - Wing Overflap, SE0529
8. Support - Wing Airplane Hoisting LH and RH, SE0518
9. Cradle Assembly—Beaching, SE0502
10. Support, Hull Airplane Hoisting, SE0552
    (R3Y-2 Airplane Only)
11. Support, Hull Forward Airplane Hoisting, SE0519
    (R3Y-1 Airplane Only)