T.O.1T-37C-2-1

TECHNICAL MANUAL

ORGANIZATIONAL MAINTENANCE

GENERAL AIRPLANE

USAF SERIES

T-37C

AIRCRAFT

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USAF

GENERAL AIRPLANE

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INTRODUCTION

The T-37 SECTIONALIZED Maintenance Manual has been prepared to meet the need of the line system mechanic or maintenance specialist. Each manual is designed to contain all the information necessary to fully understand any functional system or component.

The information of each system is divided into five basic subsections which are:

DESCRIPTION AND OPERATION
This subsection gives descriptive information pertaining to the particular system in a specific series of airplanes and it is also designed to provide an over-all working knowledge of the complete system and its units.

OPERATIONAL CHECKOUT
Operational checkout gives a complete step-by-step operational check to determine that the system or equipment meets the minimum operational standard.

TROUBLE SHOOTING
A trouble shooting guide is included to provide a procedure for identifying malfunctions, isolating the malfunction to a particular component, accessory, assembly, or sub-assembly, and the remedy of such malfunctions.

SERVICING
The servicing discussion gives information for filling, cleaning, draining, and lubricating of the particular system or component.

MAINTENANCE
This gives step-by-step procedure for removal, installation and adjustment of all systems or components.

HOW TO FIND INFORMATION

1 Consult the Table of Contents in the front of the manual.

2 Turn to the page number of the desired section and consult the Table of Contents of that section. To further help in finding information, the section number and paragraph numbers are carried in the upper outer corner of each page.

3 If you are looking for one specific item, consult the alphabetical index in the back of the manual.

4 For supplementary information on the T-37 airplane, consult the following publications:

T.O. 1T-37C-1	Flight Manual
T.O. 1T-37C-3	Structural Repair Instructions
T.O. 1T-37C-4	Illustrated Parts Breakdown
T.O. 1T-37C-5	Basic Weight Checklist
T.O. 1T-37C-6	Inspection Requirements

THE FOLLOWING IS A COMPLETE LIST OF THE T-37 SECTIONALIZED MAINTENANCE MANUAL

T.O. 1T-37C-2-1 GENERAL AIRPLANE

SECTION I GENERAL INFORMATION
SECTION II HANDLING, SERVICING AND LUBRICATION
SECTION III AIRFRAME GROUP OPERATING SYSTEMS
SECTION IV HYDRAULIC SYSTEM AND UTILITY SYSTEMS
SECTION V POWER PLANT
SECTION VI FUEL SYSTEM
SECTION VII INSTRUMENTS
SECTION VIII ELECTRICAL POWER SUPPLY AND DISTRIBUTION
SECTION IX RADIO, COMMUNICATION AND NAVIGATION EQUIPMENT
SECTION X ARMAMENT
ALPHABETICAL INDEX

T.O. 1T-37C-2-2 GROUND HANDLING, SERVICING, AND AIRFRAME MAINTENANCE

SECTION I GROUND HANDLING
SECTION II SERVICING
SECTION III LUBRICATION
SECTION IV AIRFRAME GROUP MAINTENANCE
SECTION V ARMAMENT
ALPHABETICAL INDEX

T.O. 1T-37C-2-3 HYDRAULICALLY OPERATED SYSTEMS AND UTILITY SYSTEMS

SECTION I HYDRAULICALLY OPERATED SYSTEMS
SECTION II UTILITY SYSTEMS
ALPHABETICAL INDEX

T.O. 1T-37C-2-4 FLIGHT CONTROL SYSTEMS

SECTION I PRIMARY FLIGHT CONTROL SYSTEMS
SECTION II SECONDARY FLIGHT CONTROL SYSTEMS
ALPHABETICAL INDEX

T.O. 1T-37C-2-5 POWER PLANT, FUEL SYSTEM AND OIL SYSTEM

SECTION I POWER PLANT
SECTION II FUEL SYSTEM
SECTION III OIL SYSTEM
ALPHABETICAL INDEX

T.O. 1T-37C-2-6 INSTRUMENTS, RADIO, COMMUNICATION AND NAVIGATION EQUIPMENT

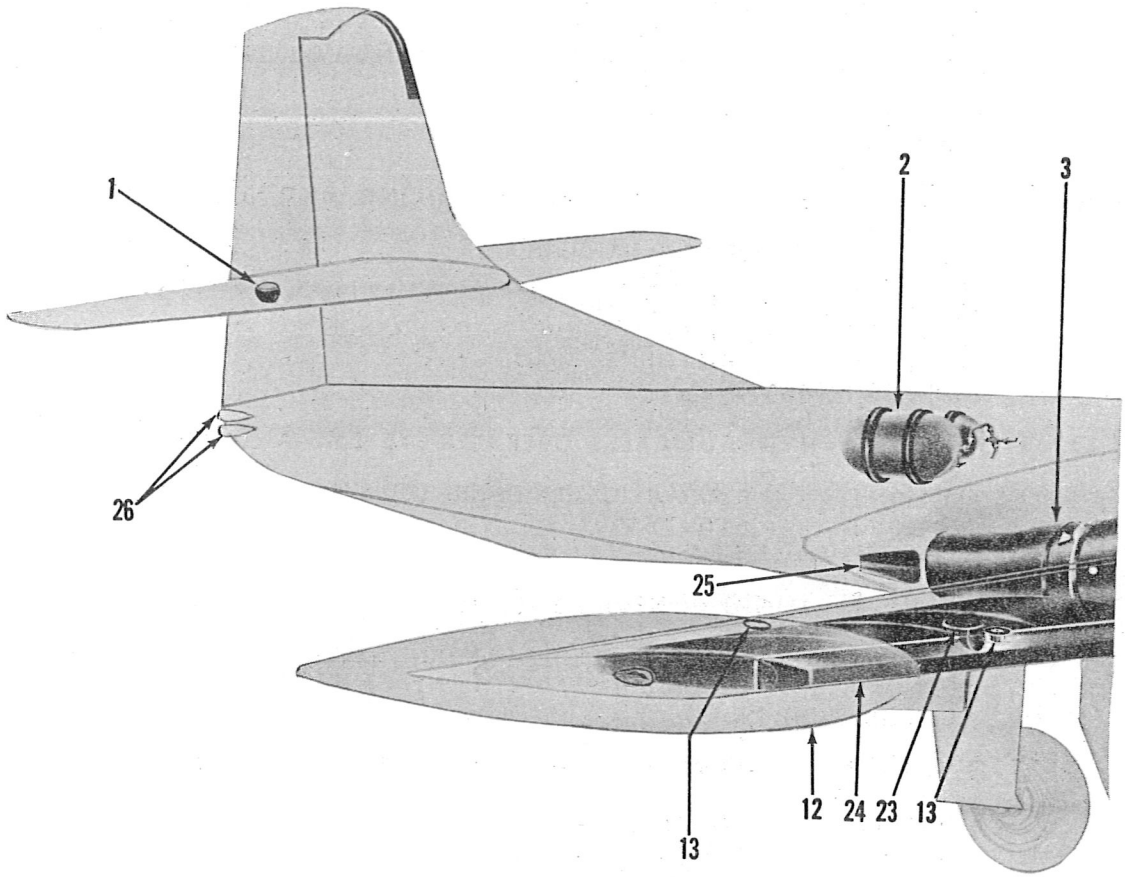
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SECTION II RADIO, COMMUNICATION AND NAVIGATION EQUIPMENT
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SECTION II ELECTRICAL POWER SUPPLY
SECTION III LIGHTING SYSTEMS
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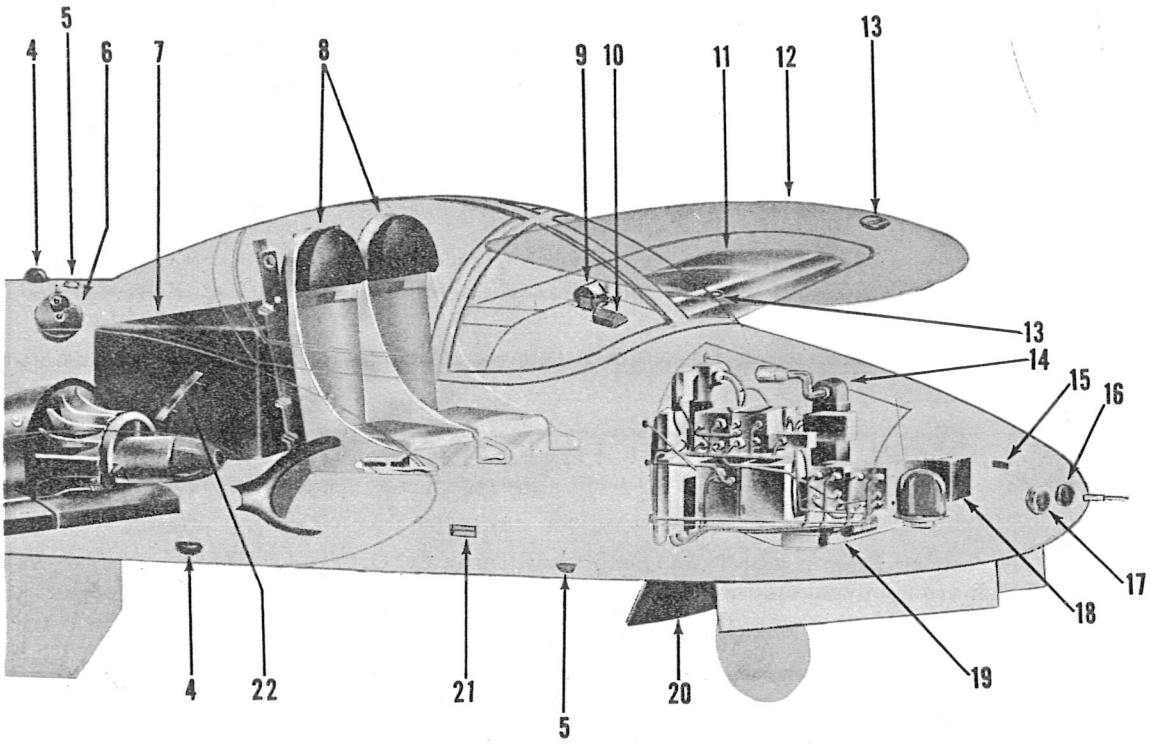
T.O. 1T-37C-2-8 WIRING DIAGRAMS AND DATA

SECTION I WIRING DIAGRAMS AND DATA



1. J2 compass magnetic detector
2. Oxygen bottles
3. J69-T-25 engine
4. Anti-collision beacon
5. Position light
6. Hydraulic reservoir
7. Fuselage fuel tank
8. Ejection seats
9. Gunsight
10. Gun camera
11. Left wing fuel tank
12. Wing tip fuel tank
13. Fuel filler

Figure 1-1. Interior Arrangement (Sheet 1 of 2)



14. Air conditioning unit
15. External power receptacle
16. Passing light
17. Taxi light
18. Battery
19. Radio equipment
20. Speedbrake
21. Step well
22. Right spoiler
23. Right landing light
24. Right wing fuel tank
25. Right thrust attenuator
26. Tail navigation lights

Figure 1-1. Interior Arrangement (Sheet 2 of 2)

INTRODUCTION

The General Airplane Manual is designed to give maintenance personnel a general but factual overall description of the airplane. This description has been kept to a familiarization level, and no specific maintenance instructions have been given. Technical phraseology has been strictly avoided, except where no other wording would clearly convey the intended meaning. Illustrations have been used freely to supplement the text.

TIME COMPLIANCE TECHNICAL ORDER STATUS

The following is a list of Time Compliance Technical Orders (TCTO's) which are applicable to the manual.

TCTO NO.	TITLE	DATE	SERIALS
T.O. 1T-37C-501	Installation of AN/ARN-21 TACAN (MAP T-37C Aircraft)	30 April 1964	62-12485 thru 62-12489 Inclusive

SECTION I

GENERAL INFORMATION

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1-6.	Walkways	1-2

1-1. GENERAL DESCRIPTION. The T-37 Airplane, manufactured by Cessna Aircraft Company, is an all metal, low wing jet trainer with a two place side-by-side seating arrangement. Equipped with conventional dual controls, ejection seats, jettisonable canopy, and two jet engines, the airplane is designed to teach primary phase students the maneuvers and techniques required of a military pilot.

1-2. GENERAL ARRANGEMENT. Figure 1-1 shows the general arrangement of the airplane with tip tanks and an armament pylon which can be removed and installed as conditions dictate. The semimonocoque fuselage, one structural unit, is discussed under three sections; nose, center and aft. The nose section comprises a nose cap, a wheel well, one compartment on the right side and two on the left side. Behind the nose cap are the passing and taxi lights. The pitot tube protrudes through the nose cap. The wheel well encloses hydraulic and pneumatic equipment and the nose wheel which is equipped with power steering and retracts forward up into the well. The right side of the nose section houses communication and navigation equipment. The left side of the nose section houses other electrical equipment and part of the air conditioning system. The center section (from the windshield to the rear spar carry-thru) comprises the cockpit, fuselage fuel cell area, and two nacelles. The cockpit, enclosed by the windshield and jettisonable canopy, contains instruments, controls, two ejection seats, and various hydraulic and electrical equipment. The fuselage fuel cell area, enclosed by the front and rear spar carry-thru assemblies, includes the number one fuel cell and hydraulic and electrical equipment. The nacelles house the jet engines and oil tanks. The aft section, (from the rear carry-thru) includes oxygen bottles, hydraulic equipment, and control cables. The wings attach to the front and rear spar carry-thru assemblies and consist of a flap, aileron, tip tank, and pylon. Each wing contains hydraulic, electric, and control system components, six fuel cells, a retractable landing light, and main gear which retracts inboard into its well.

1-3. AIRPLANE DIMENSIONS.

GENERAL	
Span	33.78 FT
Span with tip tanks installed	430.61 IN.
Length	29.28 FT
Height	6.63 FT
Design Gross Weight	8000 LB
WINGS	
Type	Low
Airfoil Section	NACA 2418 (MOD) NACA 242 (at STA 190)
Chord at root	79.15 IN.
Chord at wing STA 190	53.97 IN.
Dihedral	3°
Sweepback at 22.5%	0°
Aspect ratio	6.20
STABILIZER	
Span	13.96 FT
Chord (MAC)	3.58 FT
Incidence	+1.0°
Dihedral	0°

FUSELAGE

Width (maximum) (including nacelles)	7.5 FT
Height (maximum)	42.0 IN.
Length	29.28 FT

AREAS

Wings	183.90 SQ FT
Aileron (aft of hinge line but including overhanging external balance forward to hinge, including 0.42 SQ FT of Tab Area)	11.30 SQ FT
Stabilizer	46.99 SQ FT
Elevator (including 0.676 SQ FT of Tab Area)	11.76 SQ FT
Fin	11.54 SQ FT
Rudder (including 0.38 SQ FT of Tab Area)	6.24 SQ FT

1-4. STATIONS. A station diagram is given in figure 1-3 to assist in locating equipment when a written description is inadequate or impractical.

1-5. ACCESS AND INSPECTION PROVISIONS. Figure 1-4 shows the access and provisions, along with the items to which they provide access. Each removable panel is numbered with the corresponding number stenciled adjacent to the panel on the surrounding skin. The panels are numbered in this manner to aid in locating and installing the panel in its proper location. The number of the panel is used throughout the Sectionalized Maintenance Manual to identify the panels.

1-6. WALKWAYS. Refer to figure 1-5 for No Step Diagram.

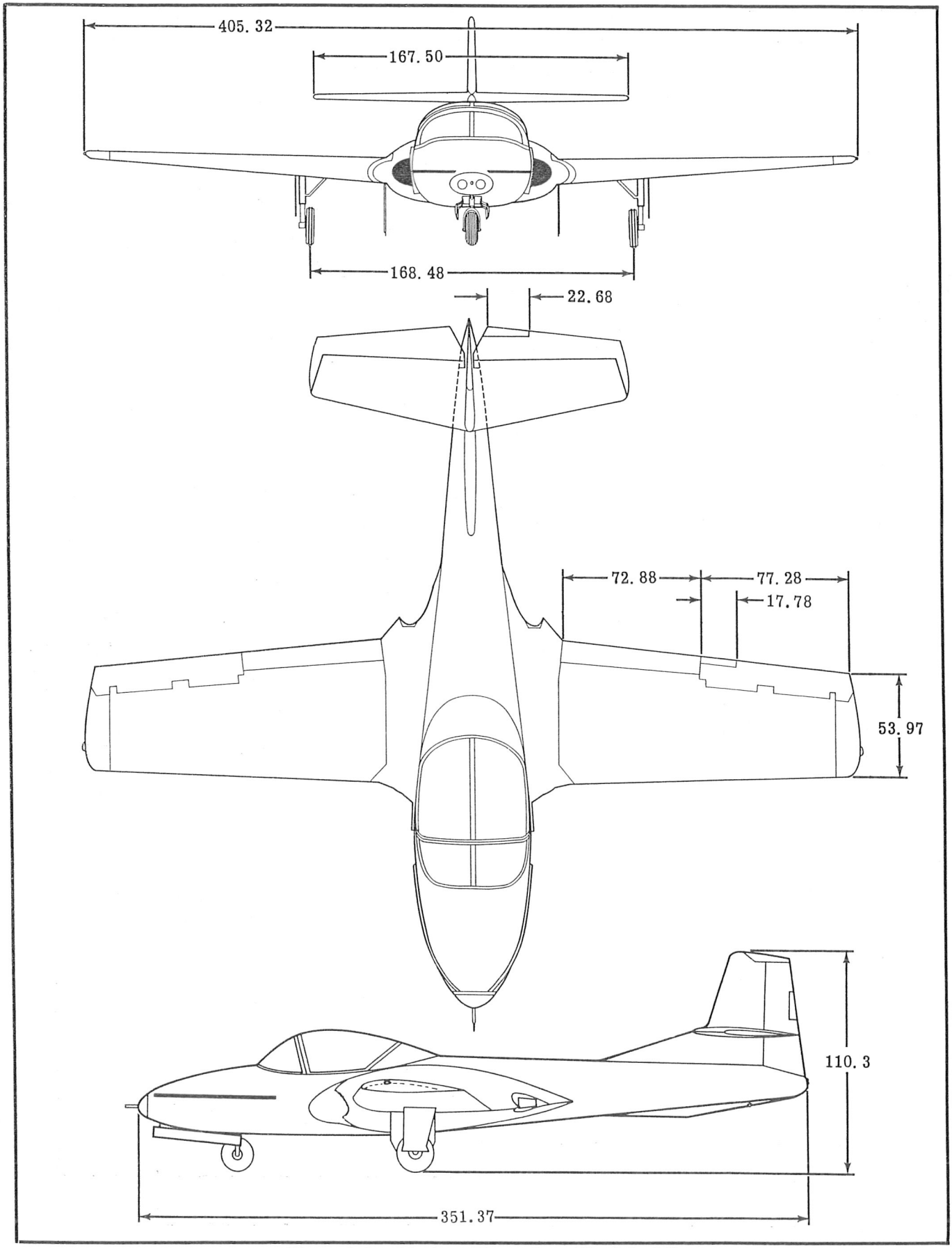


Figure 1-2. Airplane Dimensions (Sheet 1 of 2)
(Without Tip Tanks Installed)

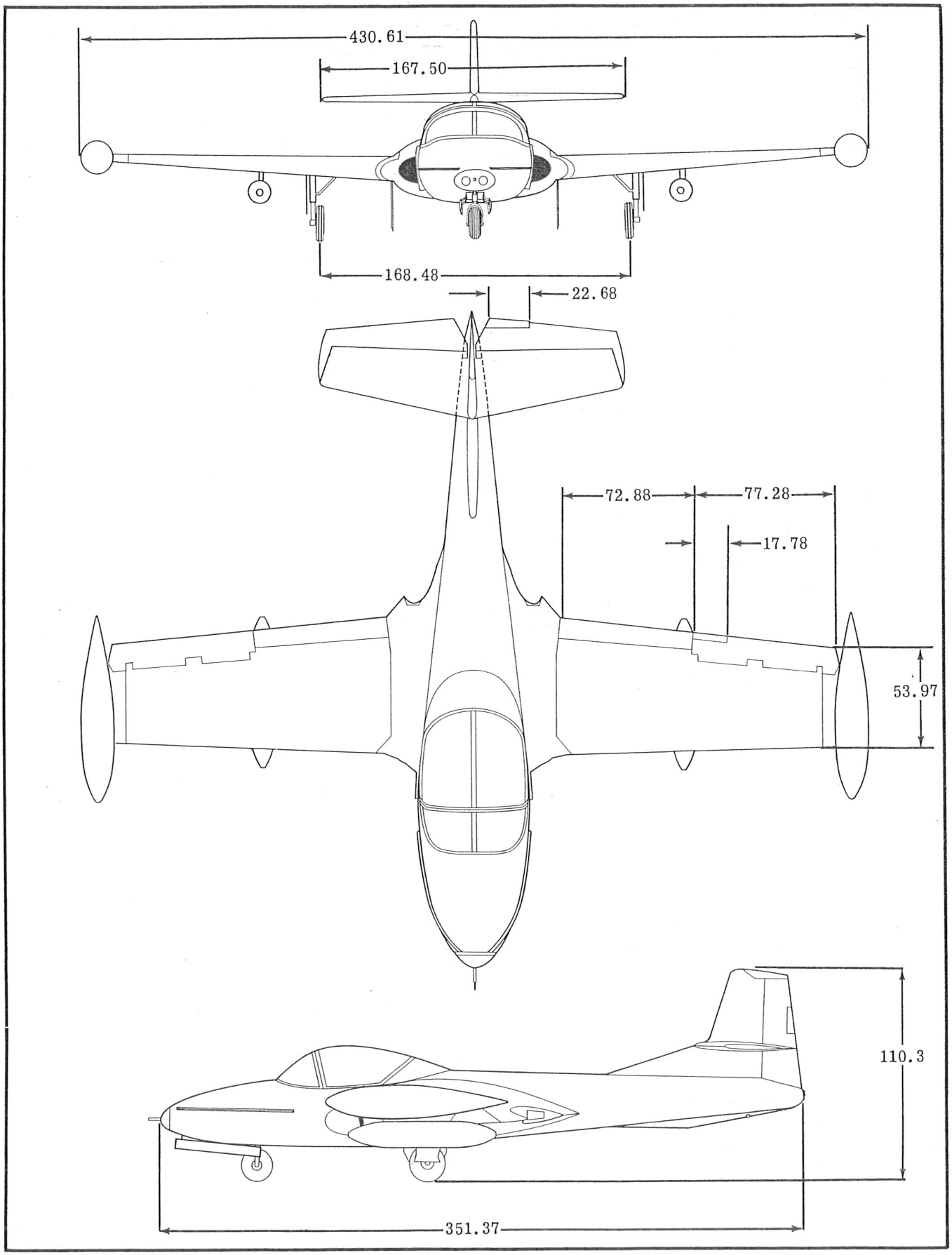


Figure 1-2. Airplane Dimensions (Sheet 2 of 2)
(With Tip Tanks Installed)

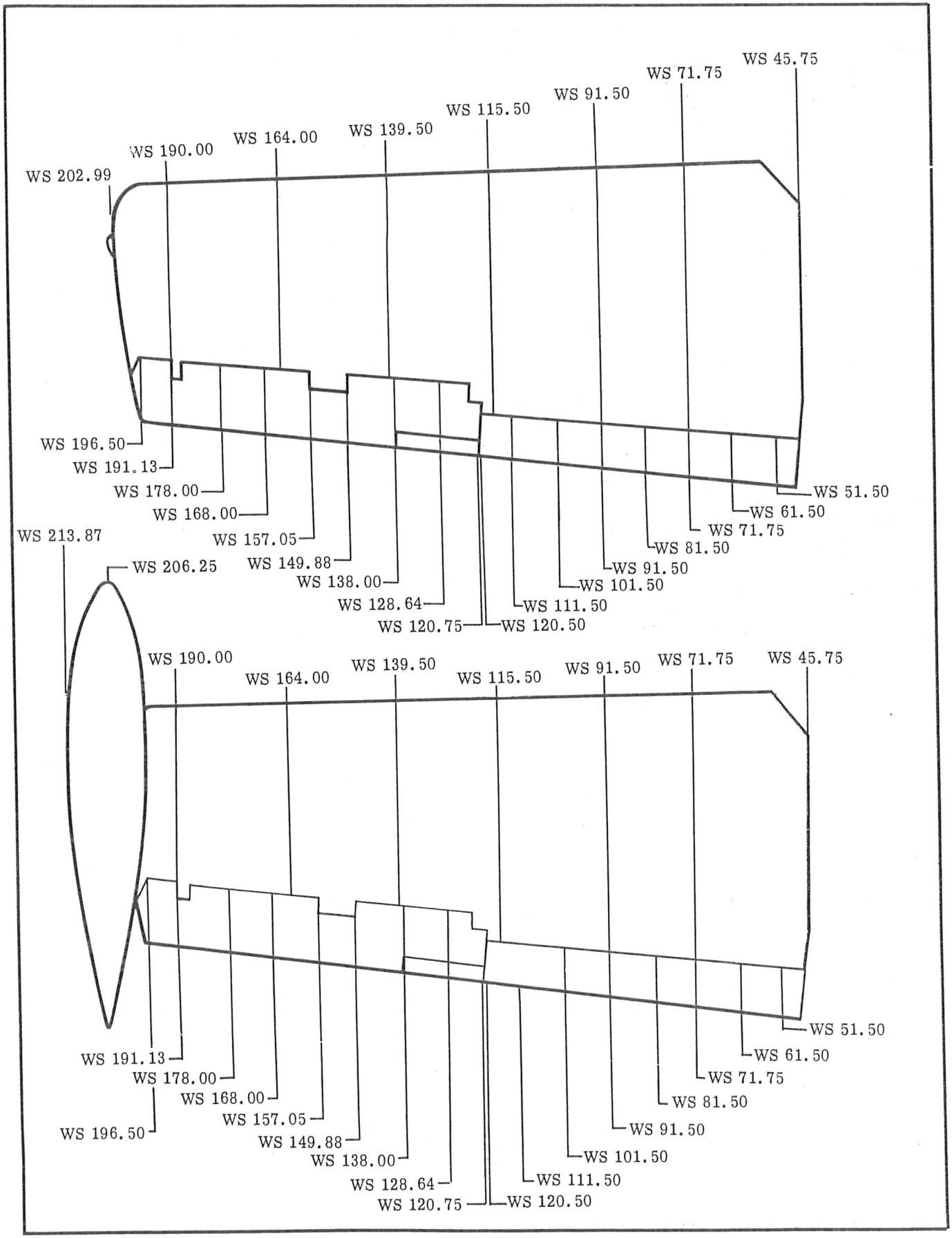


Figure 1-3. Station Diagram (Sheet 1 of 2)

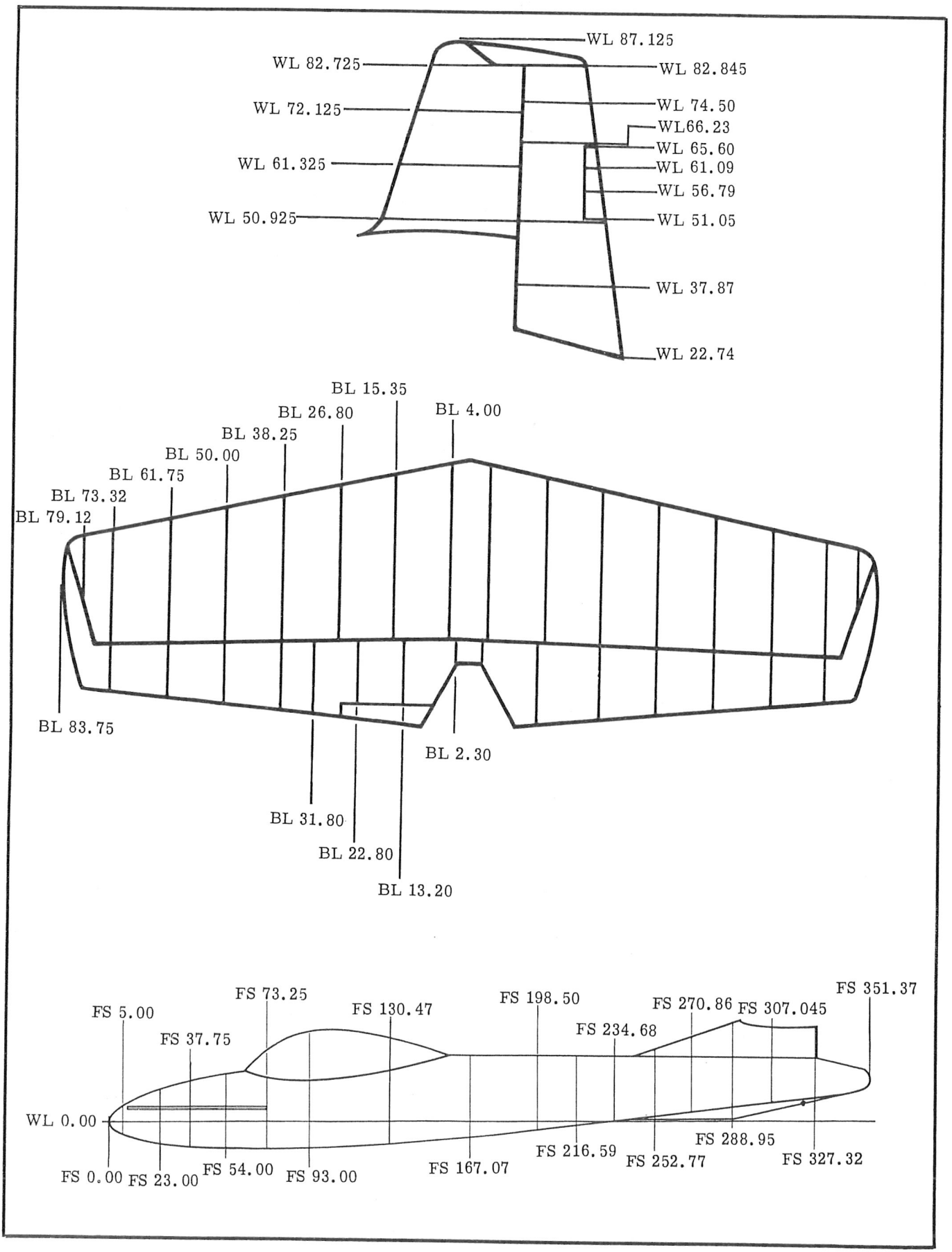
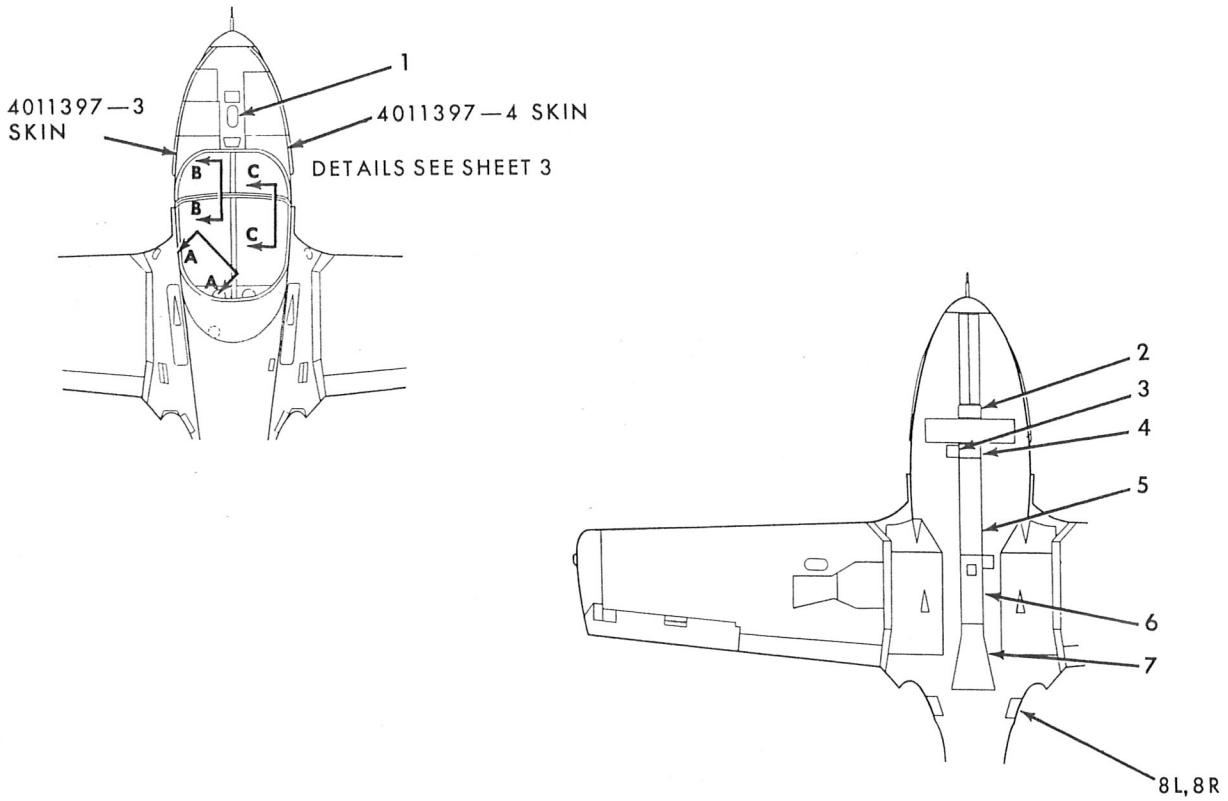


Figure 1-3. Station Diagram (Sheet 2 of 2)

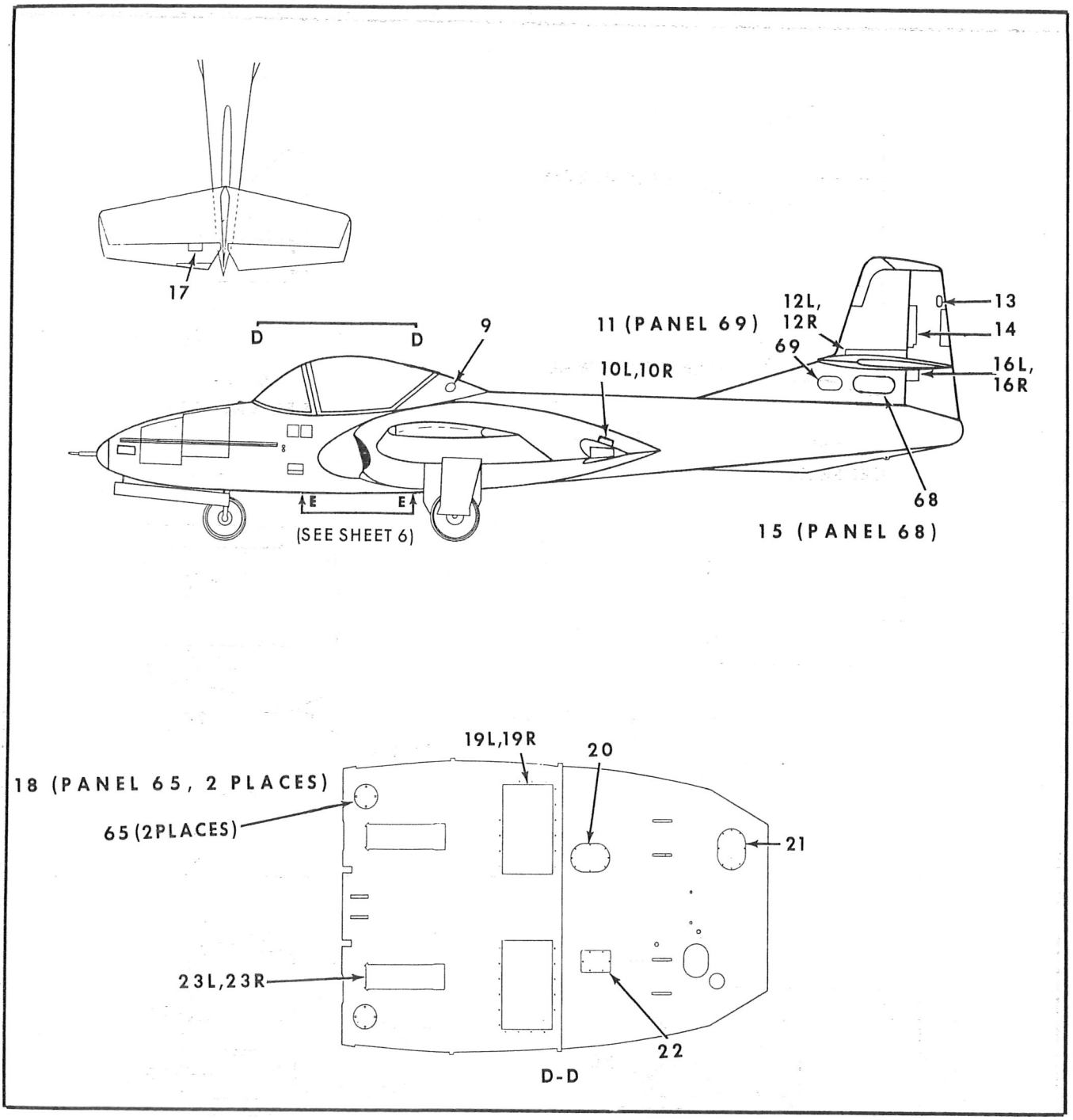


1. Nose gear steering pressure compensator
   Emergency gear release control valve
   Speed brake control valve
   Landing gear selector valve
   Uplock and downlock switches
   Nose gear uplock
2. Rudder control cables and pulleys
   Emergency gear air release tube
   Landing gear hydraulic tubes
   Speed brake hydraulic tubes
3. Elevator control cables and pulleys
   Inter-control stick wiring tube
4. Elevator and rudder control cables
   Emergency gear air release tube
   Landing gear hydraulic tubes
5. Aileron and elevator bellcranks
   Aileron, elevator and rudder control cables
   Flap teleflex conduit
   Fuel boost pump wiring conduit
   Aileron bellcrank torque tube
   Fuel proportioner drain tube
   Landing gear hydraulic tubes
6. Elevator and rudder control cables and pulleys
   Fuel system drain
   Fuel boost pump
   Landing gear hydraulic tubes
7. Hydraulic accumulator
   Elevator and rudder control cable turnbuckles
   Accumulator pressure gage
   Oxygen cylinders
   Rear spar hydraulic lines and equipment
   Hydraulic reservoir
   Pitot-static system static tubes
   Hydraulic system test stand coupling
   Thrust attenuators
   Flap position transmitter
   Flap synchronizing valve
   Spoiler control valve
   Thrust attenuator control valve

8L. (See 8R)

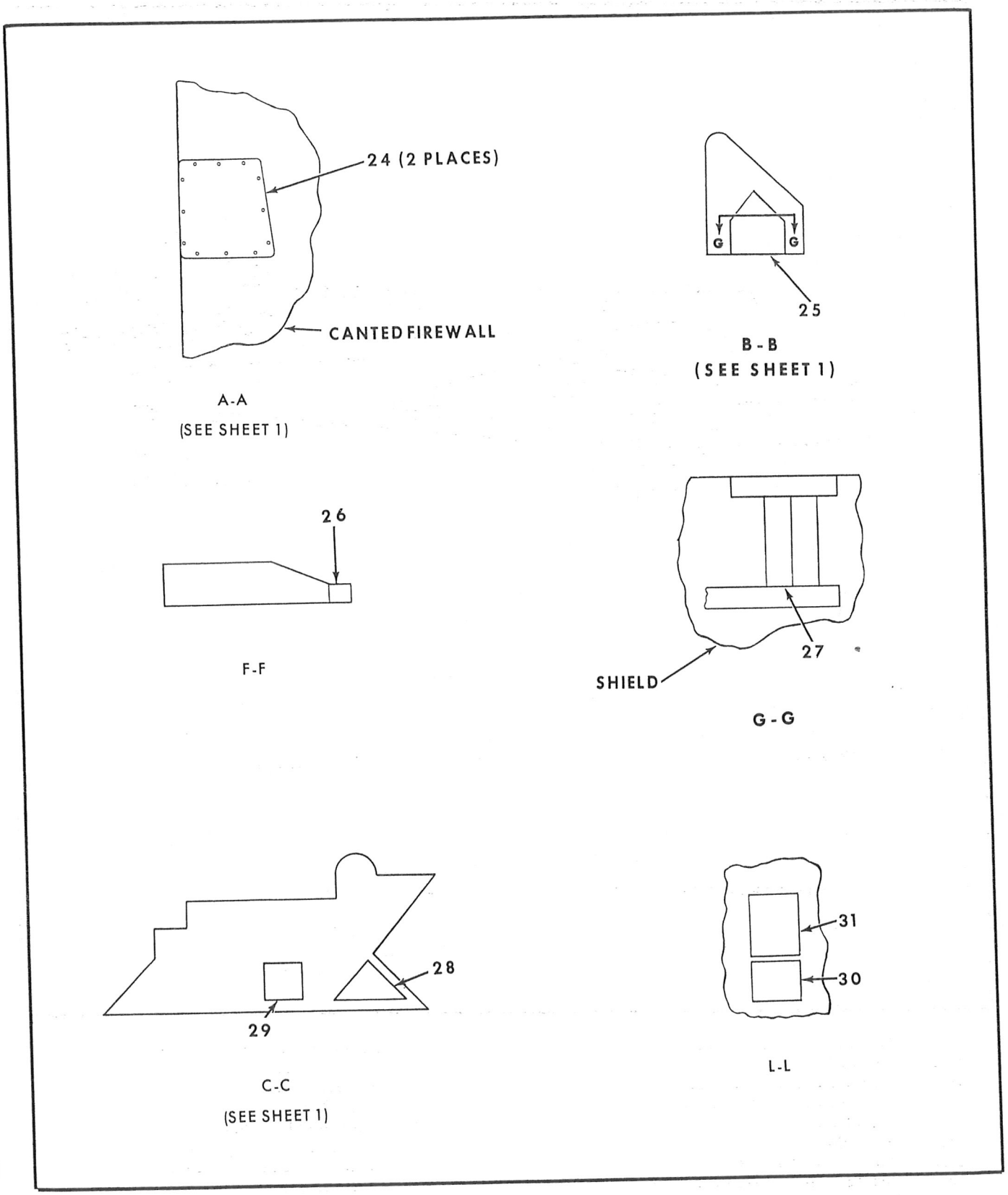
8R. Thrust attenuator linkage

Figure 1-4. Access and Inspection Provisions (Sheet 1 of 8)



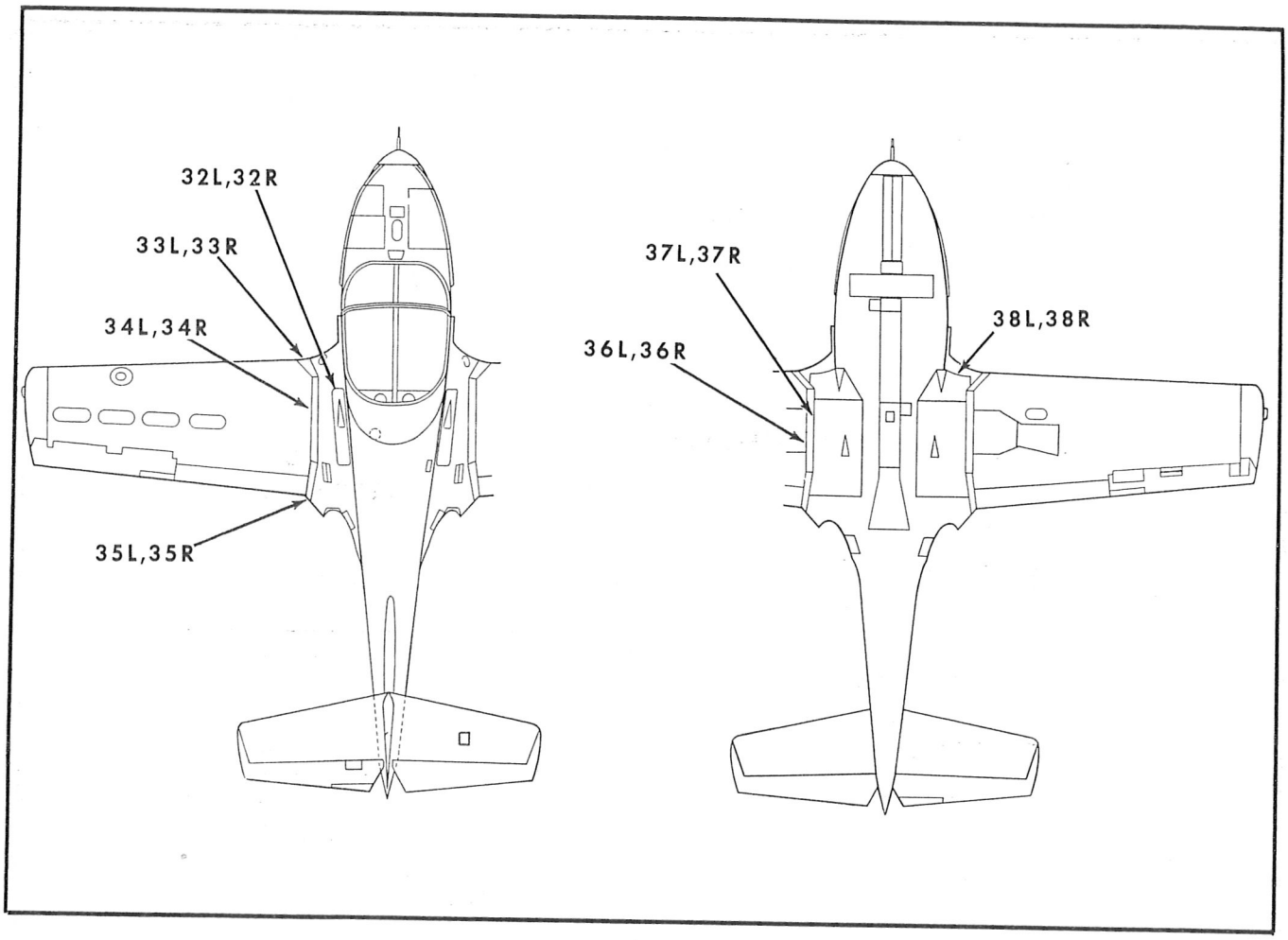
9. Fuselage fuel cell probe
10L. (See 10R)
10R. Thrust attenuator linkage
11. (69) Elevator control cables and linkage
12L. (See 12R)
12R. Empennage removal
13. Rudder trim tab removal
14. Rudder trim tab actuator
15. (68) Elevator control quadrant and travel stops
16L. (See 16R)
16R. Elevator linkage
17. Elevator trim tab actuator and screwjack
18. (65) Speed brake hinge bolt
19L. (See 19R)
19R. Aileron bellcrank and linkage
Secondary aileron and elevator control stops
Control stick yoke
20. Aileron cable and pulley
21. Aileron cable and pulley
22. Elevator cable and pulley
23. Speed brake cylinder

Figure 1-4. Access and Inspection Provisions (Sheet 2 of 8)



24. Canopy aft downlock linkage
25. Flap control linkage
    Power control linkage
26. Power control linkage
27. Interconnect tube
28. Power control linkage
29. Power control linkage
30. Power control linkage
31. Power control linkage

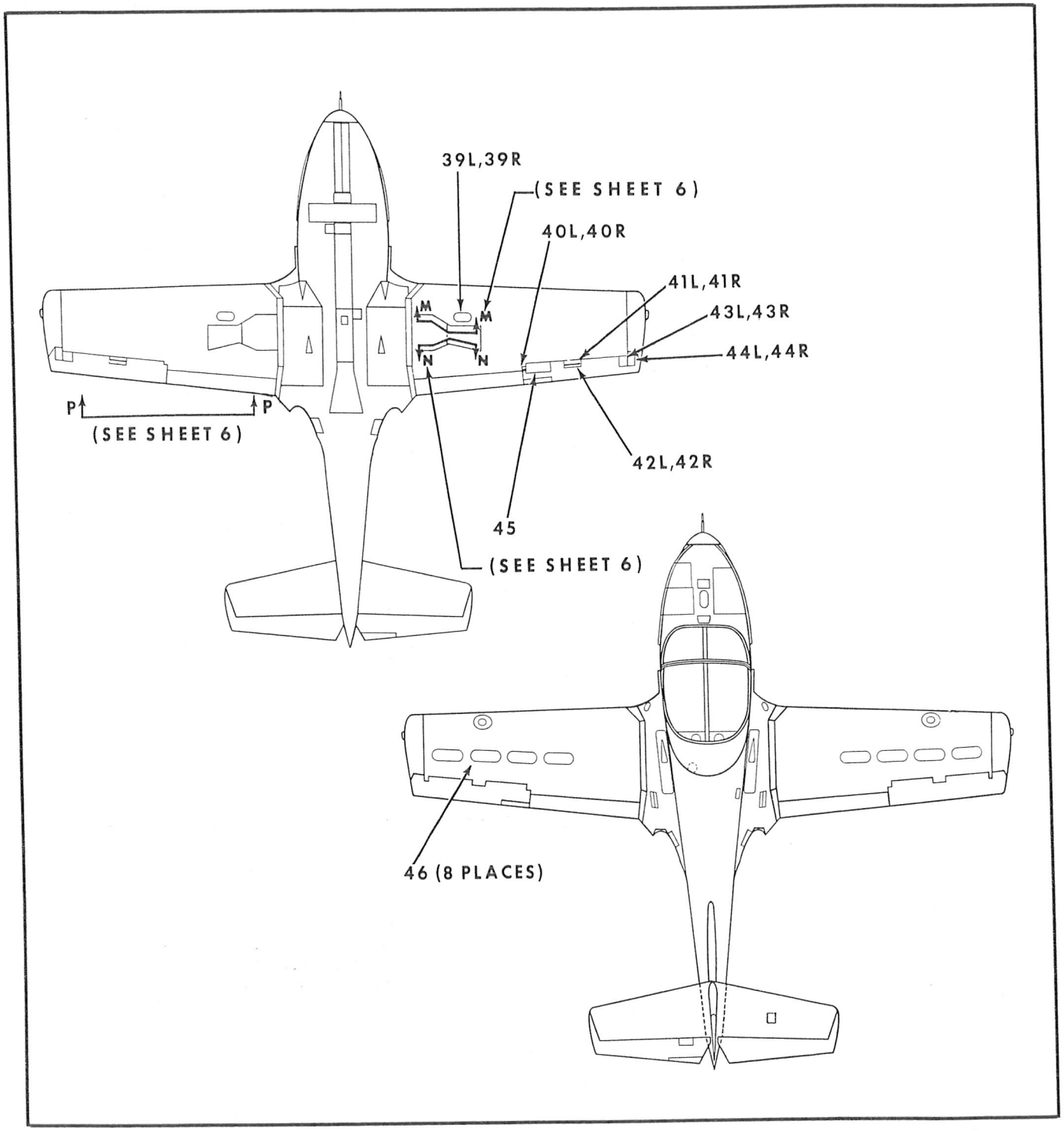
Figure 1-4. Access and Inspection Provisions (Sheet 3 of 8)



32L. (See 32R)
32R. Air bleed line
Airplane hoist attachment
Engine hoist attachment
Ignition unit
Starter generator electrical plug
33L. (See 33R)
33R. Aileron cables and pulleys
Electrical wiring disconnect
Fuel interconnect
Fuel vent interconnect
Emergency gear air release tube
Brake hydraulic tube
Landing gear hydraulic tube
Wing attaching bolt heads
34L. (See 34R)
34R. Aileron cables, pulleys, and turnbuckles
Flap teleflex disconnect
Brake hydraulic tubes
Flap hydraulic tubes
Landing gear hydraulic tubes
Wing attaching bolts
35L. (See 35R)
35R. Aileron flap linkage cables and pulleys
Flap hydraulic tubes

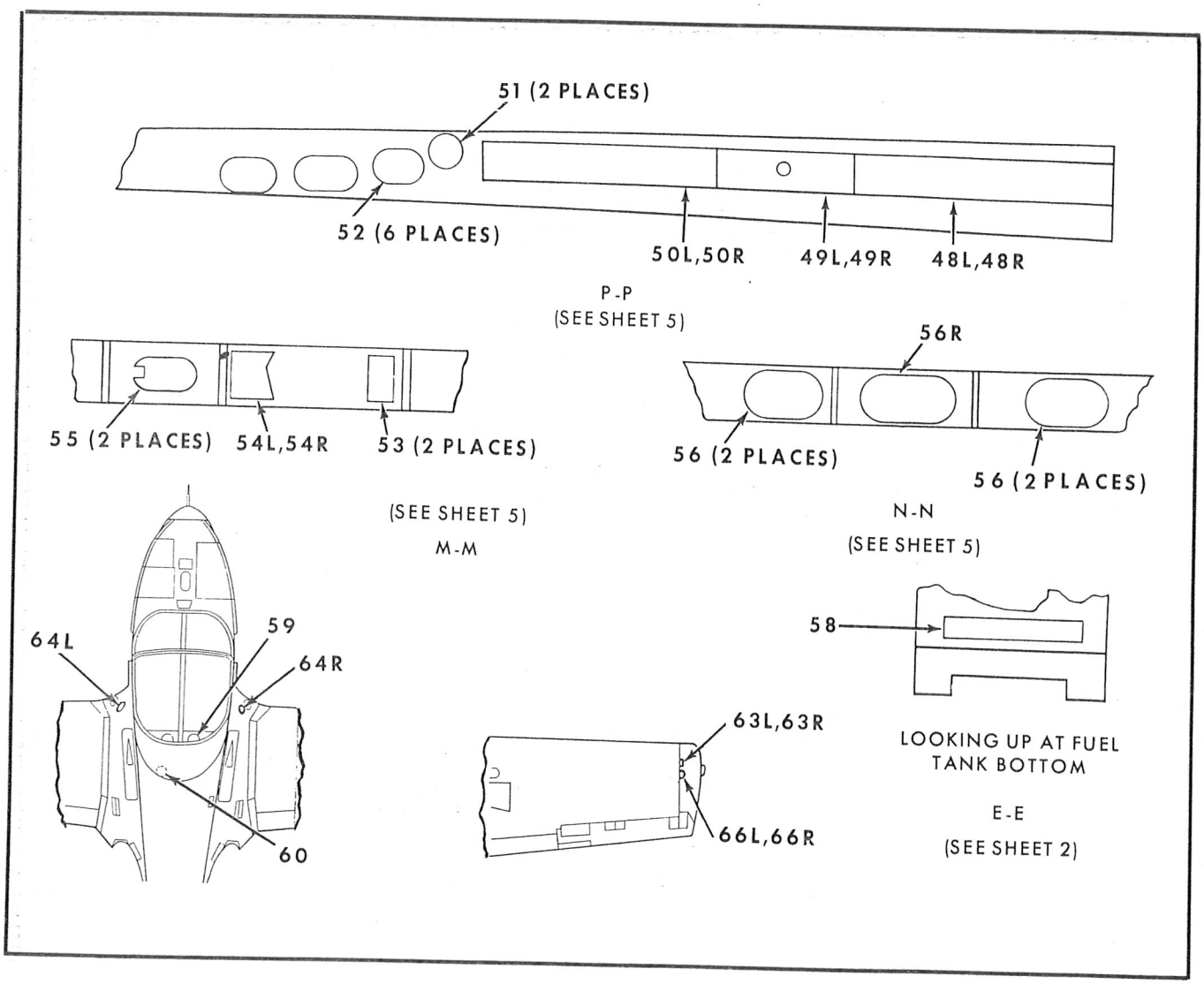
36L. (See 36R)
36R. Aileron cables, pulleys, and turnbuckles
Flap teleflex disconnect
Flap hydraulic tubes
Brake hydraulic tubes
Landing gear hydraulic tubes
Wing attaching bolts -nut end
37L. (See 37R)
37R. Engine and engine accessories
Fire and overheat cables
Fuel control adjustment
Sump accumulator and drain
Tailpipe clamp
38L. (See 38R)
38R. Aileron cables and pulleys
Main fuel line
Ice detector and interpreter (38L only)
Oil tank and drain
Power control linkage
Fuel flow transmitter
Hydraulic pressure transmitter (38L only)
Oil pressure transmitter
Landing gear hydraulic tubes
Oil pressure tubes

Figure 1-4. Access and Inspection Provisions (Sheet 4 of 8)



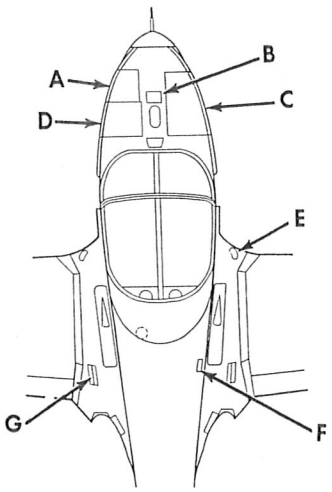
39L. (See 39R)
39R. Fuel line coupling
Door cylinder bellcrank stop bolt
Landing gear hydraulic tubes
Emergency gear air release tube
Gear and door sequence valves
40L (See 40R)
40R. Aileron hinge bracket
41L. (See 41R)
41R. Aileron quadrant
42L. (See 42R)
42R. Aileron primary travel stops
Aileron quadrant
43L. (See 43R)
43R. Aileron hinge
44L. (See 44R)
44R. Aileron balance weights
45. Aileron bellcrank and pushrod
Aileron trim tab actuator
46. Fuel cells
Fuel probe - cell number 5
Fuel cell vent - cell number 7

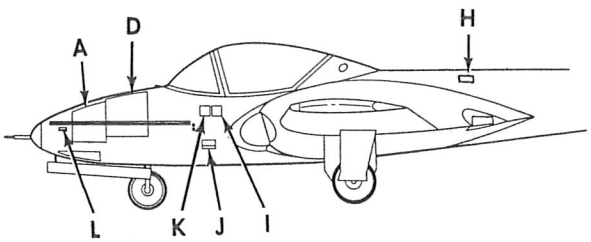
Figure 1-4. Access and Inspection Provisions (Sheet 5 of 8)



48L. (See 48R)
48R. Aileron cables and pulleys
Flap hydraulic tubes
49L. (See 49R)
49R. Aileron cables and pulleys
Flap hydraulic tubes
50L. (See 50R)
50R. Aileron cables and pulley
51. Aileron cables
52. Aileron cables
53. Emergency gear air tube
Gear door hydraulic tube
54L. (See 54R)
54R. Door actuating cylinder
Door linkage
Gear sequence switch
Emergency gear air tube
Gear door hydraulic tube
55. Door bungee
Hydraulic door cylinder
Door linkage and uplock tube
Emergency gear air tube
Landing gear hydraulic tubes
Door cylinder bellcrank stop bolt
56. (Inboard)
Brake hydraulic tubes
Landing gear hydraulic tubes
56. (Center, left)
Landing light
Landing gear hydraulic tubes
Brake hydraulic tubes
Flap hydraulic tubes
56. (Outboard)
Flap actuating cylinder
Brake hydraulic tubes
Flap hydraulic tubes
56R. Landing light
Brake hydraulic tubes
Landing gear hydraulic tubes
Flap hydraulic tubes
58. Solenoid-locked check valve
59. Fuel cell vent fuselage
60. Fuel probe
63L. (See 63R)
63R. Vent tube
64L. (See 64R)
64R. Spoiler actuator
65. (See 18)
66L. (See 66R)
66R. Vent tube

Figure 1-4. Access and Inspection Provisions (Sheet 6 of 8)



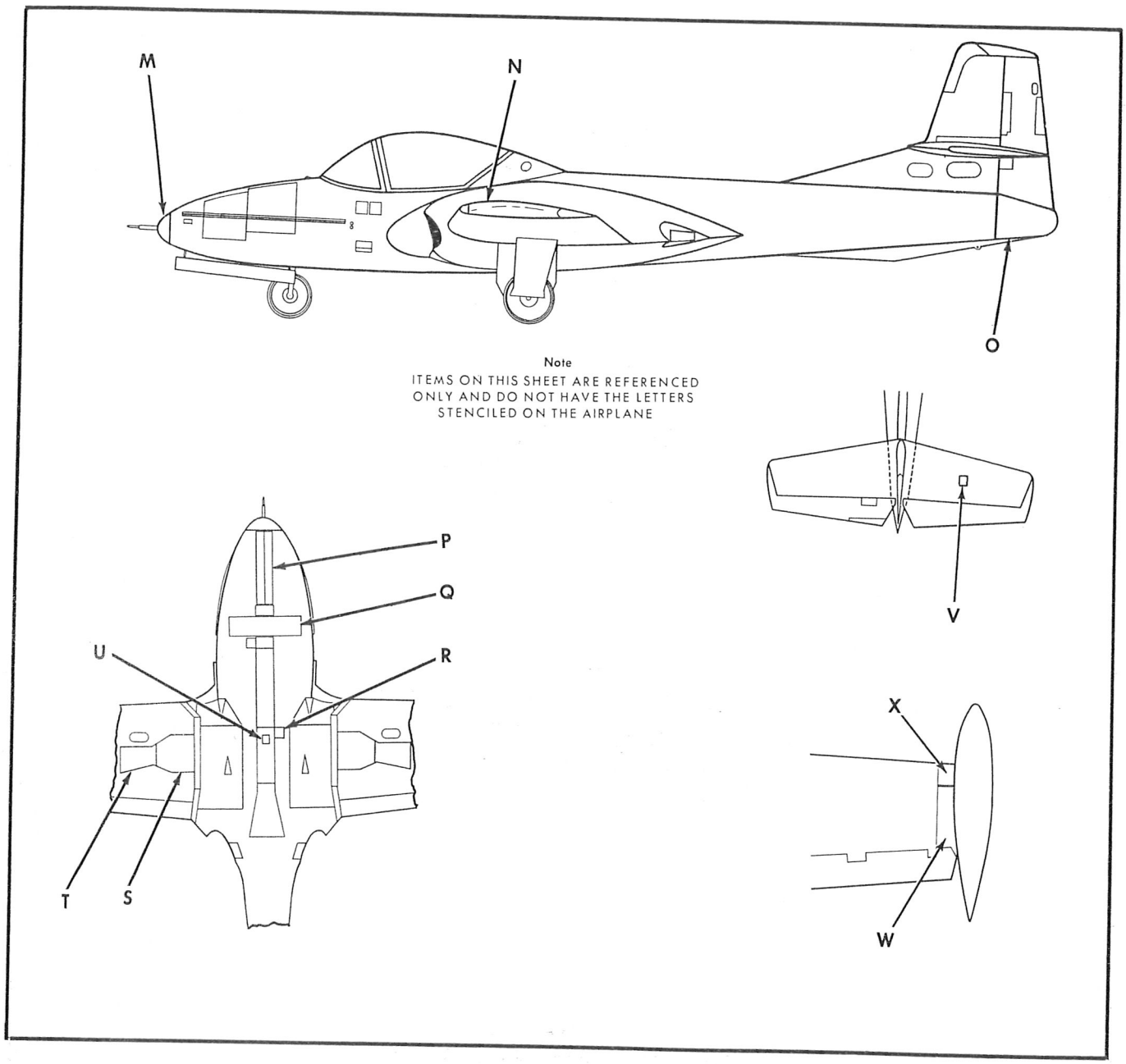


Note

ITEMS ON THIS SHEET ARE REFERENCED ONLY AND DO NOT HAVE THE LETTERS STENCILED ON THE AIRPLANE

A. Battery
B. Nose gear bungee
Nose gear downlock
C. Jack pad stowage box
Radio equipment
Emergency gear release air valve and gage
D. Electrical equipment
Refrigeration equipment
E. Oil tank filler
F. Accumulator gage
Hydraulic reservoir filler
Hydraulic reservoir gage
G. Fire extinguisher door
H. Oxygen filler valve
I. Manual declutch handle
J. Step
K. Canopy external jettison handle
L. External power receptacle

Figure 1-4. Access and Inspection Provisions (Sheet 7 of 8)



M. Nose cap
Passing light
Pitot tube
Taxi light

N (Wing tips when tip tanks are not installed)
Wing tip navigation lights
Fuel cell vent
Lift transducer (left tip only)

O. Stinger
Stinger navigation lights
Rudder stops, primary
Rudder bellcrank
Rudder cables

P. Gear emergency release air bottle
Landing gear hydraulic tubes
Speed brake hydraulic tubes
Speed brake manual shutoff valve
Speed brake selector valve

Q. Rudder cables
Speed brake cylinders
Gear emergency air release tube
Landing gear hydraulic tubes
Speed brake hydraulic tubes

R. Fuel strainer drain

S. Main gear uplock

T. Door sequence switch
Downlock switch
Uplock switch

U. Defueling and bleeding valve

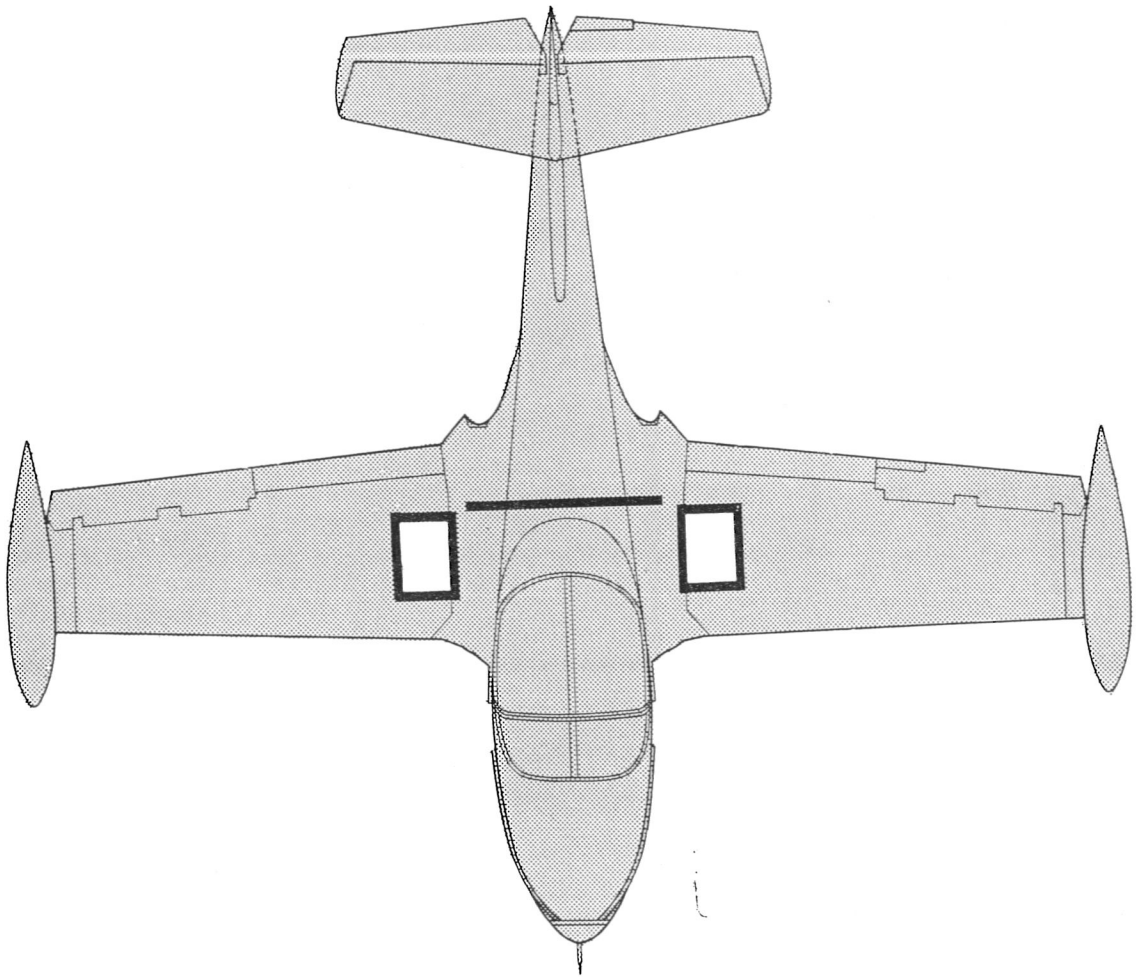
V. J2 compass detector

W. Fuel transfer pressure switch

Tip tank attaching bolts

X. Tip tank attaching bolts

Figure 1-4. Access and Inspection Provisions (Sheet 8 of 8)



Key

No Step Area

Figure 1-5. No Step Diagram

SECTION II

HANDLING, SERVICING, AND LUBRICATION

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2-1. GROUND HANDLING. For a complete discussion of ground handling and the use of ground handling equipment refer to T.O. 1T-37C-2-2, Ground Handling, Servicing, and Airframe Maintenance Manual.

2-2. TOWING PROVISIONS. The axle retaining nuts on the nose gear provide points for attaching a tow bar. Pins on the tow bar are inserted into these nuts and the tow bar is locked in place. Rings which are an integral part of each main gear trunnion are provided for attaching tow ropes or cables.

CAUTION

The nose gear torque links must be disconnected before attaching tow bar to the airplane. During towing, the nose gear must not be turned beyond the black limit strips painted on the gear doors. Non compliance with this caution can damage the airplane.

WARNING

When towing the airplane with cables or ropes the cockpit must be occupied so the brakes can be applied to keep the airplane from advancing upon the towing vehicle.

2-3. PARKING.

2-4. PARKING BRAKES. Parking brakes are set by depressing either set of brake pedals, pulling the parking brake handle located below the left shock panel, releasing the brake pedals, and releasing the handle. The brakes are released by depressing and releasing either set of brake pedals.

2-5. GUST LOCK. A gust lock is mounted below the instrument panel in front of the student pilot's seat. The lock rotates up and is attached to the control stick. When the gust lock is installed all primary control surfaces and the throttle are locked. It is impossible for the pilot to takeoff with the gust lock properly installed because the throttle cannot be advanced.

2-6. ANCHORING AND MOORING. Mooring provisions are provided at four different places on the airplane. These places are: (1) a removable combination jack pad and mooring ring, which may be attached to the underside of the fuselage, aft of the speed brake, (2) rings on the trunnion of each main gear, and (3) the tail bumper.

2-7. JACKING PROVISIONS. There are seven points in the airplane for placement of jacks. These points are located as follows; one on the underside of each main gear axle fitting; one on the underside of each wing, aft of the wheel well; one on the fuselage underside, aft of the speedbrake and one at each side of the rear spar carry-thru. (See T.O. 1T-37C-2-2 for additional information.)

CAUTION

The airplane gross weight must be reduced to 6,600 pounds, prior to jacking at the nose jack point.

2-8. HOISTING PROVISIONS. The airplane is hoiste by using a sling which fits around the nose section, an links which attach to the fuselage rear spar. Provision are also made on the wing to attach a sling to lift th wing.

CAUTION

To keep the airplane or wing from becoming unbalanced when it is hoisted no additional load should be placed upon it at any point.

2-9. LEVELING PROVISIONS. Leveling provisions on the airplane consist of leveling lugs on the front spar carry-thru for lateral leveling. For longitudinal leveling, lugs are located on top of the tailcone. Leveling points are identified by a small decal reading LEVEL HERE.

2-10. GROUND HANDLING DOLLIES. The only special ground handling dolly for this airplane is an engine dolly. The engine is lowered from the airplane to the dolly by the engine hoist and then secured to the dolly.

2-11. PROTECTIVE COVERS AND SHIELDS. Two protective cover assemblies, the canopy-windshield and the pitot tube covers, have been provided. Eight shields, the engine intake, the engine cooling air intake, the engine exhaust, and the refrigeration intake and exhaust shields, are also provided. The covers should be used to prevent collection of dust, frost or ice and damage to plexiglas. The shields should be installed whenever the airplane is on the ground to prevent dirt, water and foreign objects from blowing into the intakes and exhausts. For further information, see T.O. 1T-37C-2-2.

2-12. GROUND SAFETY LOCKS AND PINS. Ground safety downlocks are provided for each main gear and the nose gear. These locks are used to prevent inadvertent retraction of the landing gears while the airplane is on the ground. Safety pins are provided for the ejection seat hand grips, seat and canopy initiators to prevent accidental firing while the airplane is on the ground. There is also a safety pin and streamer assembly for insertion into the speed brake shutoff valve. This pin should always be inserted when maintenance work is being performed in or around the speed brake to prevent accidental closing of the speed brake.

WARNING

All ground safety locks and pins must be removed before the airplane is flown.

2-13. SERVICING. Complete and detailed service instructions are given in T.O. 1T-37C-2-2, Ground Handling, Servicing, and Airframe Maintenance. These instructions give the system or component to be serviced along with fluid capacities, type of fluid, expansion volume, and required air pressure.

2-14. LUBRICATION REQUIREMENTS. Complete lubrication requirements are listed in T.O. 1T-37C-2-2, Ground Handling, Servicing, and Airframe Maintenance. The lubrication diagram gives the item to be lubricated, type of lubricant and interval of application.

SECTION III

AIRFRAME GROUP OPERATING SYSTEMS

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3-1. CANOPY CONTROL SYSTEM. The canopy can be locked down mechanically, raised to any position within its limits, either electrically or mechanically, or jettisoned ballistically. These operations can be controlled from either inside or outside the cockpit. For more information, see T.O. 1T-37C-2-2.

3-2. SEAT CONTROL SYSTEM. Each seat can be raised or lowered mechanically or ejected ballistically. Neither seat can be ejected before the canopy is jettisoned unless the canopy ballistics system fails to operate. After ejection, the seat belt automatically unlocks to free the occupant. For more information, see T.O. 1T-37C-2-2.

3-3. MAIN GEAR. Each hydraulically operated main gear is suspended from bearing supports attached to the wheel well structures. Each retracts inboard and up into its wheel well where it is held by its inboard main gear door. The nose gear and main gear operate together and share a common emergency system. The shock struts are an air-oil type. For more information, see T.O. 1T-37C-2-3.

3-4. MAIN GEAR WHEELS AND BRAKES. Each main gear incorporates a Type VII, 20 X 4.4 wheel which includes a multi-disc, self-adjusting brake. The hydraulically powered brake system includes a parking brake (see paragraph 2-4), and four brake control units. For more information, see T.O. 1T-37C-2-3.

3-5. NOSE GEAR. The hydraulically powered nose gear is suspended from bearing supports attached to the nose wheel well webs. It retracts forward and up into the wheel well where it is held by a mechanical lock. The nose gear and main gear operate together and share a common emergency extension system. Two doors, linked to the gear drag brace, open and close with gear extension and retraction. The shock strut is an air-oil type. For more information, see T.O. 1T-37C-2-3.

3-6. NOSE GEAR WHEEL AND TIRE. The nose gear incorporates a Type VII, 16 X 4.4 high pressure tire and wheel.

3-7. NOSE GEAR STEERING. The nose gear is steerable through a maximum of 40° right or left from center. The hydraulically powered steering system reduces brake wear and eases turning during ground operation. Operated by the rudder pedals, it is turned on by depressing either of two switches (one on each control stick grip) when the airplane is on the ground. Releasing the switch turns off the system. For more information, see T.O. 1T-37C-2-3.

3-8. FLIGHT CONTROL SYSTEMS. For detailed discussions, see T.O. 1T-37C-2-4.

3-9. PRIMARY FLIGHT CONTROL SYSTEMS. The primary flight control systems are those systems which control direction of flight. They are the aileron, elevator, and rudder control systems. All primary flight control surfaces can be operated from either the student's or instructor's position.

3-10. AILERON CONTROL SYSTEM. The ailerons are hinged to the rear spar at the outboard trailing edge of each wing and are controlled by side-to-side movement of either control stick. A conventional cable system operates the ailerons with the cables routed through pulleys and fairleads to the aileron quadrant mounted on the aft spar of each wing. Aileron movement is 15° (+1°, -0°) up and down from neutral.

3-11. ELEVATOR CONTROL SYSTEM. The elevators are hinged to the aft spar of the horizontal stabilizer and are controlled by fore or aft movement of either control stick. The elevators are linked to a conventional cable system which is routed over pulleys through the fuselage to the elevator rear quadrant. A pushrod connects the quadrant to the elevator horns. Elevator movement is 26° (+1°, -0°) up from neutral and 15° (+1°, -0°) down from neutral.

3-12. RUDDER CONTROL SYSTEM. The rudder is hinged to the aft spar of the vertical stabilizer; movement is 25° ±30' to the left or right of neutral. Cables are routed from the rudder pedal bellcrank through the fuselage and are attached to the rudder torque tube bellcrank. The rudder pedal bellcranks are interconnected, making operation of the rudder possible from either set of rudder pedals.

3-13. SECONDARY FLIGHT CONTROL SYSTEMS. The secondary flight controls are all electrically operated and consist of the aileron, elevator, and rudder trim tab systems. Switches for the aileron and elevator trim tabs are located on the hand grip of each control stick. The rudder trim tab switch is mounted below the student's power quadrant.

3-14. AILERON TRIM TAB CONTROL SYSTEM. The aileron trim tab is electrically actuated and controlled by a switch mounted on each control stick. The actuator is mounted to the leading edge of the aileron spar and is connected to the trim tab by a push-pull rod. Aileron tab movement is 20° ±2°30' up or down from neutral.

3-15. ELEVATOR TRIM TAB CONTROL SYSTEM. An electrically operated trim tab is in the inboard trailing edge of the left elevator. The tab actuator is attached to the front spar of the left elevator. A flexible shaft is routed from the actuator to a screwjack which attaches to the tab. Elevator tab movement is 8° ±1° up from neutral and 25° +1° down from neutral.

3-16. RUDDER TRIM TAB CONTROL SYSTEM. The rudder trim tab is electrically actuated and is attached to the trailing edge of the rudder. The tab is controlled by a switch mounted below the student's power control quadrant. The trim tab actuator is mounted in the leading edge of the rudder, and is connected to the tab by a push-pull rod. Rudder trim tab movement is 20° ±2° to the left or right of neutral.

3-17. DRAG AND LIFT DEVICES. The drag and lift devices are those controllable surfaces whose movement will increase the lift of the airplane or decrease its speed during flight. They are two flaps, a speed brake, and two thrust attenuators. For more information, see T.O. 1T-37C-2-3.

3-18. FLAPS. The hydraulically powered flaps, when up, form a continuation of each wing trailing edge, inboard of the ailerons. They are operated from either control quadrant by flap levers, and can be extended 40° down from wing configuration.

3-19. SPEED BRAKE. The hydraulically powered speed brake, when up, is flush with the fuselage, aft of the nose wheel well. It is actuated by either of two switches, one in each right engine throttle knob; however, the instructor's switch must be at SOLO before the student's switch will work. A manual shutoff valve in the nose wheel well can be used to lock the speed brake open for maintenance in the area.

3-20. THRUST ATTENUATORS. The hydraulically powered thrust attenuators, when retracted, form a part of the nacelle fairing aft of the engines. When extended, they reduce effective thrust without engine RPM reduction, permitting a larger approach angle while maintaining safe engine RPM. They will extend when the speed brake is open and the control quadrant limit switch is actuated by the throttles.

3-21. STALL WARNING SYSTEM. Two hydraulically powered spoilers, when retracted, lie flat on top of the nacelles. They are actuated when the flaps are extended 10° or more and a lift transducer in the left wing tip senses a stalling condition. When extended, they create a slight buffeting which warns the pilot. For more information, see T.O. 1T-37C-2-3.

3-22. POWER CONTROL SYSTEM. The engine throttles are mounted on two interconnected quadrants, located in the center and the left side of the cockpit. A friction adjustment knob on the student's quadrant is used to prevent throttle lever creeping. For more information, see T.O. 1T-37C-2-5.

3-23. LIGHTING. For detailed discussions, see T.O. 1T-37C-2-7.

3-24. EXTERIOR LIGHTS. Exterior lights are controlled by a landing and taxi lights switch, a navigation and position lights switch, and an anti-collision beacon passing light switch. Setting the landing and taxi lights switch at LANDING will extend and turn on the two landing lights mounted aft of the main gear; at any other switch position the two lights are off and retracted. Setting the switch at TAXI will light the taxi light in the nose. Setting the "nav lights" switch at BRIGHT and FLASH will cause the wing tip light and the white tail light to flash on and off alternately with the yellow tail light, and light the bright lamps in the upper and lower fuselage position lights. At DIM and STEADY, the switch will light the dim lamps of the position lights and turn on the navigation lights through a resistor circuit. The anti-collision beacon-passing light switch will operate either upper and lower anti-collision beacons or the red passing light in the nose. The passing light will flash unless one or more of the landing gear struts is not down and locked; then it will glow steadily.

3-25. INTERIOR LIGHTS. Interior lights comprise two cockpit utility lights and the instrument lights. The utility lights, containing removable red filters, and socket-mounted on the windshield frame, can be removed from their bases for use as utility lights. Three rheostats on the center quadrant support control the instrument lights. The SECONDARY INST LIGHTS rheostat controls the five glare shield lights. The PRIMARY FLIGHT INST LIGHTS rheostat controls the lights for the compass, the clock, and all flight instruments except the acclerometer. The PRIMARY INST LIGHTS rheostat controls the lights for the rest of the instruments, the radio control panels and the edge-lighted switch panel.

SECTION IV

HYDRAULIC SYSTEMS AND UTILITY SYSTEMS

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4-4.	Fire and Overheat Detection System	4-1/4-2

4-1. HYDRAULIC SYSTEM. The primary components of the hydraulic system are the hydraulic reservoir, accumulator and two engine driven pumps. The reservoir supplies hydraulic fluid to the pumps which pressurize the system. The accumulator provides an emergency source of power in case of pump failure, and also acts as a cushion during normal operation of the hydraulic system. Also included in the system are the necessary filters, relief valves, a pressure regulator, and a pressure gage. The hydraulic system provides hydraulic pressure for the operation of the landing gear retraction system, wing flaps, speed brake, nose gear steering, spoilers and thrust attenuators. See paragraph 3-4 for the hydraulic brake system. For more information see T.O. 1T-37C-2-3.

4-2. AIR CONDITIONING, VENTILATING, AND DEFROSTING SYSTEM. The system is operated by two switches and three controls. Hot air, bled from the turbine section of each engine, is ducted to the cockpit through check valves which prevent loss of bleed air during single engine operation. When the air control lever is moved to AIR COND, the hot air moves to an electrically controlled modulating valve which portions it between the mixing muff and the refrigeration unit. The refrigerated air from the refrigeration unit mixes with the hot air at the mixing muff and moves through a water separator, past a temperature sensing thermoresistor, to two distribution valves which direct the air either to the feet or to two piccolo tube outlets and to four adjustable air outlets. The opening in the modulating valve is governed by the position of a temperature selector switch in conjunction with a temperature control unit and the thermoresistor. With the air conditioning system turned on, pulling the DEFROST knob directs hot air to the defrost tubes. Before the hot air reaches the defrost outlets, it is mixed with cabin air to cool it somewhat. The cockpit is ventilated by moving the air control lever to VENT, closing the bleed air shutoff valve and allowing ram air to reach the cockpit distribution valves and air outlets. For more information, see T.O. 1T-37C-2-3.

4-3. OXYGEN SYSTEM. The low pressure oxygen system includes two cylinders, a filler valve, and two regulators. The cylinders are mounted in the fuselage aft section near the filler valve which is behind a small door on the left side of the fuselage. The pressure-demand regulators, located on each side of the instrument panel, supply the correct amount of oxygen at all times, automatically compensating for changes in altitude. Each regulator incorporates an oxygen flow gage and an oxygen pressure gage. For more information, see T.O. 1T-37C-2-3.

4-4. FIRE AND OVERHEAT DETECTION SYSTEM. Each of the two fuel shutoff tee handles contains a red hooded light which either glows or flashes to indicate either fire or overheat in the corresponding engine nacelle. The system includes five sensing elements, each comprising one or more detector cables, attached to the engine compartment structure. The fire sensing elements, located forward of the engine fireseals are rated at 147°C (345°F) per 16 feet of cable. The overheat sensing elements, located aft of the fireseals are rated at 332°C (630°F) per 21 feet of cable. Two test switches near the warning lights are provided to check continuity and operation of the system components. For more information, see T.O. 1T-37C-2-3.

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SECTION V

POWER PLANT

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5-1. ENGINE INSTALLATION. An engine is installed on each side of the airplane in nacelles located between the fuselage and the root rib of the wing. Access to the engine is provided by a large access door on the bottom of each engine nacelle. An access door on the top of each nacelle must be removed for the attachment of engine hoist straps for removal or installation of the engine. Fire seals surround the engine in the nacelle area. The top portion of these seals is a permanent part of the airplane structure while the lower portion of the seals is removable and must be taken out before the engine can be removed. The tailpipe is attached to the aft part of the engine by a clamp. This clamp must be removed from the engine and the tailpipe slid aft as far as possible, to allow clearance for the engine as it is being removed or installed. For more information, see T.O. 1T-37C-2-5.

5-2. ENGINE STARTER - IGNITION SYSTEM. There are two starter-ignition systems, one for each engine. Each system consists of two ignitors, a starter genera - tor, an ignition unit and start and ignition switches. Energizing the starter brings the engine up to a starting speed at which time the ignitors are fired by a standard jet ignition unit. Ignition is used for starting only and not to sustain combustion.

5-3. ENGINE OIL SYSTEM. There are two completely independent oil systems, one for each engine. Oil is supplied to each engine from tanks located in the forward portion of the engine nacelles. Access to the tanks is provided by an access panel located on the underside and near the leading edge of the nacelle. Access to the filler neck is provided by a door on the top side of the nacelle, and is identified by the words ENGINE OIL CAP, CAPACITY 1.5 U.S. GAL., SPEC. MIL-L-7808. The oil tanks will supply oil to the engines for an indefinite period of inverted flight. For more information, see T.O. 1T-37C-2-5.

5-4. ENGINE NACELLES. The engine nacelles are located on each side of the fuselage and form streamlined coverings for the engines, air inlets, and tailpipes. An air boundary fence extends forward of each engine along the side of the fuselage. Two large doors on the bottom of each nacelle provide access to the engine compartment. An engine hoist access door, a fire extinguisher door, and a stall warning spoiler are located on the top of each nacelle. In the aft end of each nacelle is a thrust attenuator. For more information, see T.O. 1T-37C-2-3 and T.O. 1T-37C-2-5.

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FUEL SYSTEM

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6-6.	Engine Fuel System	6-1/6-2

6-1. FUEL SYSTEM. The fuel system is divided into two sub-systems: the airplane fuel system and the engine fuel system. The airplane fuel system delivers fuel to both engine systems, and consists of the fuel system components remaining with the airplane when both engines are removed. The engine fuel system consists of two identical engine systems which regulate the fuel flow to the combustion section of each engine.

6-2. AIRPLANE FUEL SYSTEM. The airplane fuel system includes two gaging systems (fuel flow and fuel quantity), a vent system, thirteen fuel cells plus two wing tip tanks, a fuel control system, fuel strainer, two motorized shutoff valves and dump valves and transfer pumps in the tip tanks. Fuel is transferred from the tip tanks to the wing cells from which it flows by gravity to the fuel control system which meters it as needed, to the fuselage fuel cell. If the control system fails, fuel flow is by gravity directly from the wing to the fuselage cell. A boost pump in the fuselage cell forces fuel through a strainer to each engine. The boost pump is mounted in a reservoir which holds enough fuel for 30 seconds inverted flight. A fuel pressure switch is mounted between the fuel strainer and motorized shutoff valve. This switch is connected to a light on the instrument panel and when the boost pump is producing insufficient pressure the light comes on.

Note

Power for the tip tanks comes from the spare inverter. If the main inverter fails, the pumps will operate only if the inverter switch is in the main position. However, in this condition all AC operated instruments will not function.

6-3. FUEL GAGING SYSTEMS. Two fuel flow indicators measure the rate of flow to each engine. A fuel quantity indicator measures pounds of fuel in the right wing, the left wing, or the whole fuel system. A fuel warning light warns the pilot when only 385 LB of fuel remain in the fuselage fuel cell. For more information, see T.O. 1T-37C-2-6.

6-4. FUEL VENT SYSTEM. The fuel vent system is a series of inter-cell vent tubes and external vent ports guarded by float valves. It is designed to maintain ambient pressure, aid free fuel flow, and prevent use of expansion space during refueling. For more information, see T.O. 1T-37C-2-5.

6-5. FUEL CONTROL SYSTEM. The fuel control system is designed to prevent unequal fuel flow from the wings to the fuselage, and to maintain a particular fuel level in the fuselage cell. When there is no electricity or when the fuel control switch is set at EMERGENCY, the system does not function. Instead, check valves open to permit uncontrolled gravity flow from each wing into the fuselage fuel cell. As long as the DC Bus is powered, a gravity feed light will warn the pilot whenever the fuel control system is not functioning. For more information, see T.O. 1T-37C-2-5.

6-6. ENGINE FUEL SYSTEM. The engine fuel system includes an engine driven fuel pump, a fuel control unit, and a fuel distributor. The engine driven fuel pump maintains constant fuel pressure to the control unit. The control unit, operated by the throttles, provides starting and operating fuel to get and maintain a selected RPM regardless of altitude and airspeed changes. The fuel distributor, in the turbine rotor assembly, slings fuel into the combustion chamber. For more information, see T.O. 1T-37C-2-5.

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SECTION VII

INSTRUMENTS

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7-1. GENERAL. All instruments are mounted on the instrument panel except the following: the accumulator air pressure gage, on the rear spar; the gear emergency release air pressure gage, in the radio equipment compartment; the compass, on the windshield channel above the instrument panel; and the two oxygen pressure and flow gages, one at each side of the instrument panel.

7-2. FLIGHT INSTRUMENTS. Flight instruments comprise an accelerometer, two airspeed indicators, two altimeters, an attitude indicator, a rate of climb indicator, and two turn and slip indicators. An airspeed indicator, an altimeter and a turn and slip indicator are mounted on the right shock panel. The accelerometer is adjacent to the left shock panel, on the stationary panel. The rest are on the left shock panel. For more information, see T.O. 1T-37C-2-6.

7-3. ACCELEROMETER. The accelerometer measures positive or negative acceleration in terms of "G" units from -5G to +10G. The main pointer normally indicates +1G when the airplane is at rest or in level flight.

7-4. AIRSPEED INDICATORS. Each airspeed indicator, operated by the pitot-static system, measures the airspeed of the airplane in knots from 0 to 650. It also indicates the maximum structurally safe airspeed at the existing altitude.

7-5. ALTIMETERS. Each altimeter converts static pressure into a visual indication of the altitude of the airplane within a range of 50,000 feet. Each instrument can be adjusted to indicate zero altitude at any existing ground pressure within the range of the barometric scale in the face of the instrument.

7-6. ATTITUDE INDICATOR. The MM3 converts the relative position of its AC powered gyroscope and the airplane into visual indication of the attitude of the airplane in relation to the earth's horizontal plane.

7-7. VERTICAL VELOCITY INDICATOR. The instrument uses static pressure to indicate the rate of climb or descent of the airplane in feet per minute. It has a single pointer and two adjoining scales, each graduated in feet from 0 to 6000.

7-8. TURN AND SLIP INDICATORS. Each instrument comprises an electrically driven, gyroscopic rate of turn indicator and a fluid-damped inclinometer. The turn indicator measures direction and rate of turn, and the inclinometer indicates the apparent lateral attitude of the airplane.

7-9. ENGINE AND PRESSURE INSTRUMENTS. These instruments indicate operational conditions of the engine and pressure operated systems. They comprise two exhaust temperature indicators, two fire and overheat lights, two fuel flow indicators, one fuel quantity indicator and fuel low warning light, an ice warning light, two loadmeters, two tachometers, an accumulator air pressure gage, an emergency air pressure gage, a hydraulic pressure indicator and two oil pressure indicators. All are on the left shock panel except the accumulator air pressure gage on the rear spar and the emergency air pressure gage in the radio equipment compartment. For more information, see T.O. 1T-37C-2-6.

7-10. EXHAUST TEMPERATURE INDICATORS. The instruments indicate the exhaust gas temperatures in the engines in degrees centigrade from 0 to 1000. The indicators are powered by thermocouples mounted in the tailpipes.

7-11. FIRE AND OVERHEAT WARNING LIGHTS. The lights are mounted in the fuel shutoff handles. Fire in a nacelle forward of the fireseal results in the steady glow of the corresponding red light. Fire or excessive heat in a nacelle aft of the fireseal results in the flashing of the corresponding red light.

7-12. FUEL FLOW INDICATORS. Each autosyn type instrument indicates the rate of fuel flow to the corresponding engine in pounds per hour.

7-13. FUEL LOW WARNING LIGHT. The red, press-to-test light will light whenever there is only 385 LB of fuel in the fuselage fuel cell.

7-14. FUEL QUANTITY INDICATOR. This instrument indicates fuel quantity in pounds. Used with a selector switch, it will indicate fuel quantity in either wing or in the entire system.

7-15. ICE WARNING LIGHT. The amber, press-to-test light is lit whenever ice forms on a detector probe in the left engine inlet.

7-16. LOADMETERS. Each loadmeter indicates the percent of load being drawn from its corresponding generator.

7-17. TACHOMETERS. Each tachometer indicates the speed of its corresponding engine in percent of RPM.

7-18. ACCUMULATOR AIR PRESSURE GAGE. The direct reading gage indicates air pressure in the hydraulic accumulator from 0 to 2000 PSI.

7-19. EMERGENCY AIR PRESSURE GAGE. The direct reading gage indicates air pressure in the emergency landing gear release system from 0 to 4000 PSI.

7-20. HYDRAULIC PRESSURE INDICATOR. The remote reading indicator indicates hydraulic pressure in the utility hydraulic system from 0 to 4000 PSI.

7-21. OIL PRESSURE INDICATORS. The remote reading indicators indicate oil pressure in the oil system from 0 to 100 PSI.

7-22. POSITION INDICATORS AND WARNING LIGHTS. These instruments indicate positions or condition of the canopy, elevator trim tab, fuel control system, flaps, and landing gear. For more information, see T.O. 1T-37C-2-6.

7-23. CANOPY-NOT-LOCKED WARNING LIGHT. This red, press-to-test light is lit whenever either side of the canopy is unlocked.

7-24. ELEVATOR TRIM TAB NEUTRAL LIGHT. This green, press-to-test light is lit whenever the elevator trim tab is in neutral.

7-25. FUEL GRAVITY FEED LIGHT. This amber, press-to-test light is lit whenever the fuel system gravity check valves are open.

7-26. FLAP POSITION INDICATOR. Controlled by a flap position transmitter, this instrument indicates flap position from 0% to 100% (UP to DOWN), with 40° of flap extension being 100% deflection.

7-27. LANDING GEAR POSITION INDICATING AND WARNING SYSTEM. The system includes three position lights on the left shock panel, two warning lights in the gear control handles, and a warning signal electrically connected to the headsets. It provides a visual warning if any gear is not locked in the position indicated by the control handle and a visual and aural warning if any gear is not down and locked when the control quadrant limit switch is actuated by a throttle. External position indication is provided by a flasher through which the red passing light in the nose is operated when all three gear struts are down and locked.

7-28. NAVIGATION AND MISCELLANEOUS INSTRUMENTS. These are the compass, course indicator, radio magnetic indicator, J2 compass V8 indicator, clock, and oxygen pressure and flow gages. For more information, see T.O. 1T-37C-2-6.

7-29. COMPASS. The compass, on the windshield above the instrument panel, is a short period, magnetic compass intended to indicate continuously the airplane's heading with reference to the earth's magnetic field.

7-30. COURSE INDICATOR. The instrument indicates the magnetic bearing of the airplane in relation to a VOR station, whether the bearing is to or from the station, and the airplane's lateral position relative to the on course signal of an omni or localizer beam.

7-31. RADIO MAGNETIC INDICATOR. This instrument indicates the magnetic heading of the airplane. It is actuated by the VOR receiver and points to the magnetic heading of the omni station being received.

7-32. J2 COMPASS V8 INDICATOR. The instrument indicates true magnetic heading in degrees relative to a pre-selected fixed reference.

7-33. CLOCK. The eight-day clock includes an elapsed time mechanism incorporating a sweep second pointer and a minute totalizer.

7-34. OXYGEN PRESSURE AND FLOW GAGES. These gages are incorporated in the oxygen regulators located at either side of the instrument panel.

7-35. PITOT STATIC SYSTEM. The system operates the airspeed indicators, the altimeters, and the vertical velocity indicator. The electrically heated pitot tube is in the nose cap and the two static ports are on the sides of the tail cone. For more information see T.O. 1T-37C-2-6.

SECTION VIII

ELECTRICAL POWER SUPPLY AND DISTRIBUTION

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8-1. AC POWER SUPPLY. Powered by the DC power system, the AC power supply system comprises two 250 VA inverters [1] or one 750 VA main inverter and one 250 VA inverter on [2], an inverter switch and two transformers which reduce the 115V inverter output to lower voltage for certain systems and instruments.

8-2. AC POWER DISTRIBUTION. The system supplies AC power for the stall warning system, the attitude indicator, fuel quantity indicating system, fuel transfer pump when tip tanks are installed, the fuel flow indicating system, J2 compass system, VHF radio navigation system, air conditioning system, and the oil and hydraulic pressure indicating systems. For more information see T.O. 1T-37C-2-7.

8-3. DC POWER SUPPLY. DC power is supplied by the 28V generator system, the 28V external power system, or the 24V battery system. The generator system comprises two paralleled generator circuits operated by the engines. The external power system is used when the engines aren't running and during ground operations. The nickel-cadmium battery can be used for starting. Two loadmeters indicate the percentage of total generator current capacity being used. For more information, see T.O. 1T-37C-2-7.

8-4. DC POWER DISTRIBUTION. Power from the three sources is supplied to a DC bus, comprising parallel wired bus bars and jumpers. The DC bus distributes the power, through circuit breakers, to all DC systems and equipment except the canopy control switch. The canopy control system, connected to both sides of the battery relay, can be operated from either the DC bus, or the battery. The spare inverter switch is connected thru a circuit breaker to the battery side of the battery to provide AC power if the DC generator system fails. For more information, see T.O. 1T-37C-2-7.

[1] Aircraft 62-5926 thru 63-9830 except aircraft modified per T.O. 1T-37C-501 and Aircraft 63-9841 thru 63-9846.

[2] Aircraft 62-12485 thru 62-12489 when modified per T.O. 1T-37C-501, Aircraft 63-9831 thru 63-9840 and 63-9847 thru 63-9851.

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SECTION IX

RADIO, COMMUNICATION, AND NAVIGATION EQUIPMENT

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9-1. RADIO SYSTEMS. There are several radio systems which are or can be installed in the T-37C aircraft. Refer to figure 9-1 to determine which systems are installed in each particular aircraft. The AIC-10A Interphone System is installed in all T-37C aircraft.

9-2. LF NAVIGATION SYSTEM. An ARN 59 Automatic Direction Finder is provided for LF navigation. The receiver may be used as a range receiver or as a direction finder within the frequency range of 190 to 1750 kilocycles. The frequency range is covered in three separate bands which may be selected on the LF navigation control panel.

9-3. UHF COMMAND RADIO. The ARC 34 UHF Command radio provides short range voice transmission and reception in the UHF range of 225.0 to 399.9 MC in one-tenth MC steps. The system is operated through the C1057 control which can be preset, in any order, to any 20 of the 1750 possible frequencies.

9-4. VHF NAVIGATION SYSTEM. The Collins VOR 101 System provides (VOR) reception, runway localizer (LOC) reception, and VHF voice reception in the frequency range of 108 - 122 MC. Visual indications are on the course indicator, the radio magnetic indicator, and the V8 indicator of the J2 compass.

9-5. INTERPHONE SYSTEM. The AIC-10A System has three types of operation: intercommunication within the airplane; UHF and VHF communication beyond the airplane, and reception of incoming signals including MA1 tone signals (landing gear warning system). The system is operated through the C824A controls except for the radio interrupt relay switch which is used to stop reception of UHF and VHF signals.

9-6. COLLINS VHF 17L-8A TRANSMITTER. The collins 17L-8A transmitter is located aft of the instructor's quadrant and operates within a frequency range of 118.0 to 126.9 megacycles in 100 KC increments. Power is supplied to the transmitter from the modulator power supply which receives its power from the 28 volt DC bus.

9-7. VHF COMMUNICATION SYSTEM. The ARC type 210B VHF Communication system is installed for VHF simplex communication. The system is electrically tuned and crystal controlled, and covers the frequency range of 118.0 to 137.95 megacycles in 50 kilocycle steps to provide a total of 400 channels. Two modes of operation are available. Single channel simplex (SCS), during which the transmitter and receiver operate on the same frequency, and double channel simplex (DCS), during which the transmitter operates 6.0 megacycles above the receiver frequency. The control panel on the instrument panel incorporates an ON - OFF volume control knob, frequency indicator window, selector knobs, and a mode-of-operation knob.

9-8. TACTICAL AIR NAVIGATION SYSTEM (TACAN). The TACAN is a short-range navigation system which supplies continuous, accurate slant range distance and bearing information. The TACAN system consists of a C-866 radio set control, an ID351 course indicator, an ID663 or ID1103/ARN bearing distance heading indicator, a receiver-transmitter unit, indicator coupler and antenna. The TACAN system has a total of 126 two-way channels. Air-to-ground frequencies for these channels are in the 1025-1150 MC range; associated ground-to-air frequencies are in the 962-1024 MC and 1151-1213 MC ranges. Channels are spaced at one MC intervals in these bands.

★ INDICATES EQUIPMENT IS INSTALLED

● INDICATES PROVISIONS FOR INSTALLING EQUIPMENT IS PROVIDED

	VOR-101	ARN-59	ARC-34	AIC-10A	ARC-210B	17L-8A	TACAN
62-5926 thru 62-5949	★	★	★	★			
62-5957 thru 62-5975	●	★	★	★			
62-12485 thru 62-12489	★	★	★	★			⚠
62-12490 thru 62-12495	★	★	●	★	★		
62-12496 thru 62-12501	★	★	★	★			
62-12502 thru 62-12506	●	★	★	★			
63-9818 thru 63-9830	●	★	★	★			
63-9831 thru 63-9840		★	★	★			★
63-9841 thru 63-9845	★	★	●	★	★		
63-9846	★	★	★	★		★	
63-9847 thru 63-9851		★	★	★			★

Figure 9-1. Radio Combinations

⚠ Aircraft 62-12485 thru 62-12489 when modified per T.O. 1T-37C-501

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ARMAMENT

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10-1. ARMAMENT. Armament consists of a pylon under each wing to which can be attached an armament training pod or a 250 pound general purpose bomb. The training pod will accomodate rockets, practice bombs, or a machine gun. A gunsight, camera, and all controls necessary for utilization of the armament are mounted in the cockpit. Refer to T. O. 1T-37C-2-2 for a complete description of the armament equipment.

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