PARTIAL FLIGHT MANUAL

USAF SERIES

AC-47D

AIRCRAFT

EACH TRANSMITTAL OF THIS DOCUMENT OUTSIDE OF THE DEPARTMENT OF DEFENSE MUST HAVE APPROVAL OF THE TECHNICAL ORDER DISTRIBUTION CONTROL ACTIVITY. REFER TO T.O. 00-5-2.

Basic And All Changes Have Been Merged to Make This A Complete Publication.

THIS PUBLICATION IS INCOMPLETE WITHOUT T.O. 1C-47-1

COMMANDERS ARE RESPONSIBLE FOR BRINGING THIS TECHNICAL PUBLICATION TO THE ATTENTION OF ALL AIR FORCE PERSONNEL CLEARED FOR OPERATION OF AFFECTED AIRCRAFT.

SEE WEEKLY INDEX T.O. 0-1-1-3A FOR CURRENT STATUS OF FLIGHT MANUALS, SAFETY SUPPLEMENTS, OPERATIONAL SUPPLEMENTS, AND FLIGHT CREW CHECKLISTS.

PUBLISHED UNDER AUTHORITY OF THE SECRETARY OF THE AIR FORCE

19 DECEMBER 1967

CHANGE 2 - 17 FEBRUARY 1969

AF - Hooven-Dayton Co. - May 1969 - 1800 (Reprint)

Technical Orders are normally distributed promptly after printing. Date(s) shown on the title page (lower right) are for identification only. This is not a distribution date. Processing time sometimes causes distribution to only appear to have been delayed.

INSERT LATEST CHANGED PAGES, DESTROY SUPERSEDED PAGES.

LIST OF EFFECTIVE PAGES

NOTE: The portion of the text affected by the changes is indicated by a vertical line in the outer margins of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

Dates of issue for original and changed pages are:

Original .....0 ..... 19 Dec 67
Change .....1 ..... 3 Jan 68
Change .....2 ..... 17 Feb 69

TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 56, CONSISTING OF THE FOLLOWING:

Page No.	Change No.
*Title	2
*A	2
*Flyleaf-1	2
*Flyleaf-2 Blank	2
i	0
ii Blank	0
1-1	0
1-2 Blank	0
*2-1/3-1 thru 3-4	2
3-5	0
*3-6	2
4-1 thru 4-21	0
4-22 thru 4-24	1
4-25 thru 4-30	0
5-1/6-1/7-1	0
7-2 Blank	0
8-1	0
*8-2 thru 8-5	2
8-6	0
*8-7 thru 8-8	2
9-1/10-1	0
10-2 Blank	0

Upon receipt of the second and subsequent changes to this technical order, personnel responsible for maintaining this publication in current status will ascertain that all previous changes have been received and incorporated. Action should be taken promptly if the publication is incomplete.

* The asterisk indicates pages changed, added, or deleted by the current change.

ADDITIONAL COPIES OF THIS PUBLICATION MAY BE OBTAINED AS FOLLOWS:

USAF ACTIVITIES.—In accordance with Technical Order No. 00-5-2. **USAF**

NAVY ACTIVITIES.--Use Publications and Forms Order Blank (NAVAIR 140) and submit in accordance with instructions thereon. For listing of available material and details of distribution see Naval Air Systems Command Publications Index NAVAIR 00-500.

CURRENT FLIGHT MANUAL AND SAFETY AND OPERATIONAL SUPPLEMENT STATUS

This page will be published with each Safety and Operational Supplement, Flight Manual Change, and Flight Manual Revision. It provides a comprehensive listing of the current flight manual, flight crew checklist, and safety and operational supplements. The supplements you receive should follow in sequence and if you are missing one listed on this page, see your publications distribution officer and get your copy. The appropriate indexes should be checked periodically to make sure you have the latest publications.

FLIGHT MANUAL	DATE	CHANGED
1C-47(A)D-1	19 December 1968	*17 Feb 69

CHECKLIST	DATE	CHANGED
1C-47(A)D-1CL-2	19 December 1968	*17 Feb 69

SAFETY SUPPLEMENTS	DATE	SHORT TITLE	PAGES AFFECTED

OPERATIONAL SUPPLEMENTS	DATE	SHORT TITLE	PAGES AFFECTED

SUPPLEMENTS INCORPORATED, RESCINDED OR REPLACED

TABLE OF CONTENTS

SECTION I - DESCRIPTION

THIS SECTION IS INCOMPLETE WITHOUT T.O. 1C-47-1

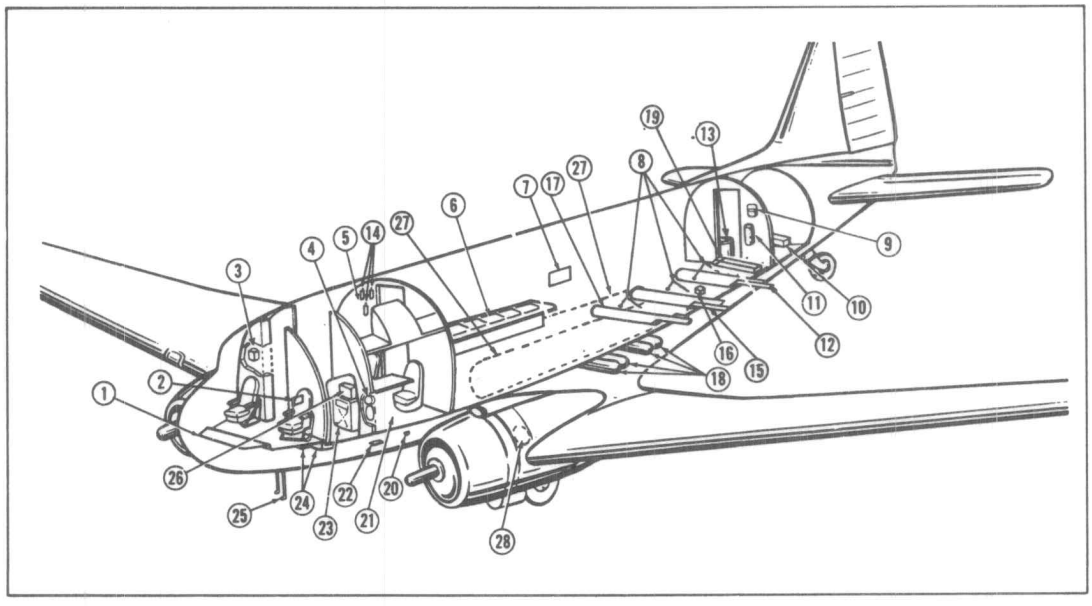
THE AIRCRAFT

The AC-47D Aircraft is a special version of the C-47 series aircraft. It is designed primarily for sidefiring capability by installation of three MXU-470A 7.62 mm Gun Modules, a 875732 Illuminated Sight, a 66001 Flare Launcher, additional communication and navigation equipment, and associated electronic accessories. These items are described in detail in Section IV.

INTERIOR ARRANGEMENT

The main cargo compartment of the AC-47D Aircraft is equipped with a folding bench which will accommodate five crewmen. Three MXU-47A Gun Modules are located to fire through various openings in the left side of the cargo compartment. A launcher is located to fire mark 24 flares through an opening in floor of the cargo compartment. Special lighting is also provided in this area. An Illuminated Sight is located near the pilot's left side window (Figure 1-1).

The forward door of the cargo compartment door has been removed and stowed, and a cargo door safety net installed in the cargo compartment. Redring eyebrow lights have been added to all instruments on the pilot's instrument panel.



1. Pilot's Compartment
2. Gun Sight
3. Hydraulic Pressure Accumulator
4. Portable Oxygen Cyl.
5. Radio Operator's Compartment
6. Folding Troop Seats
7. Armament Control Panel
8. Gun Lighting
9. Misc. Stowage
10. Eng. Cover Stowage
11. Surface Control Locks Stowed
12. No. 3 Gun Position
13. Toilet
14. Portable Oxygen Bottles (3)
15. No. 2 Gun Position
16. Low Pres. Sys. Oxy. Filler Valve
17. No. 1 Gun Position
18. Low Pres. Sys. Oxy. Tanks
19. Flare Launcher
20. Alternate Static Source
21. Navigator's Compartment
22. External Power Receptacle
23. Main Electrical Junction Box
24. Batteries
25. Pitot Static Tube
26. Power Systems Junction Box
27. L.R. Fuel Tanks
28. C.B. Container

Figure 1-1. General Arrangement Diagram - Typical

SECTION II - NORMAL PROCEDURES

THIS SECTION IS INCOMPLETE WITHOUT T.O. 1C-47-1

INTERIOR INSPECTION

1. Guns loaded.
2. Flares and ammunition properly stowed.

BEFORE LANDING

1. Guns cleared (copilot)
2. Flare launcher cleared (copilot)

SECTION III - EMERGENCY PROCEDURES

THIS SECTION IS INCOMPLETE WITHOUT T.O. 1C-47-1

FIRE

FIRE ON GROUND

WARNING

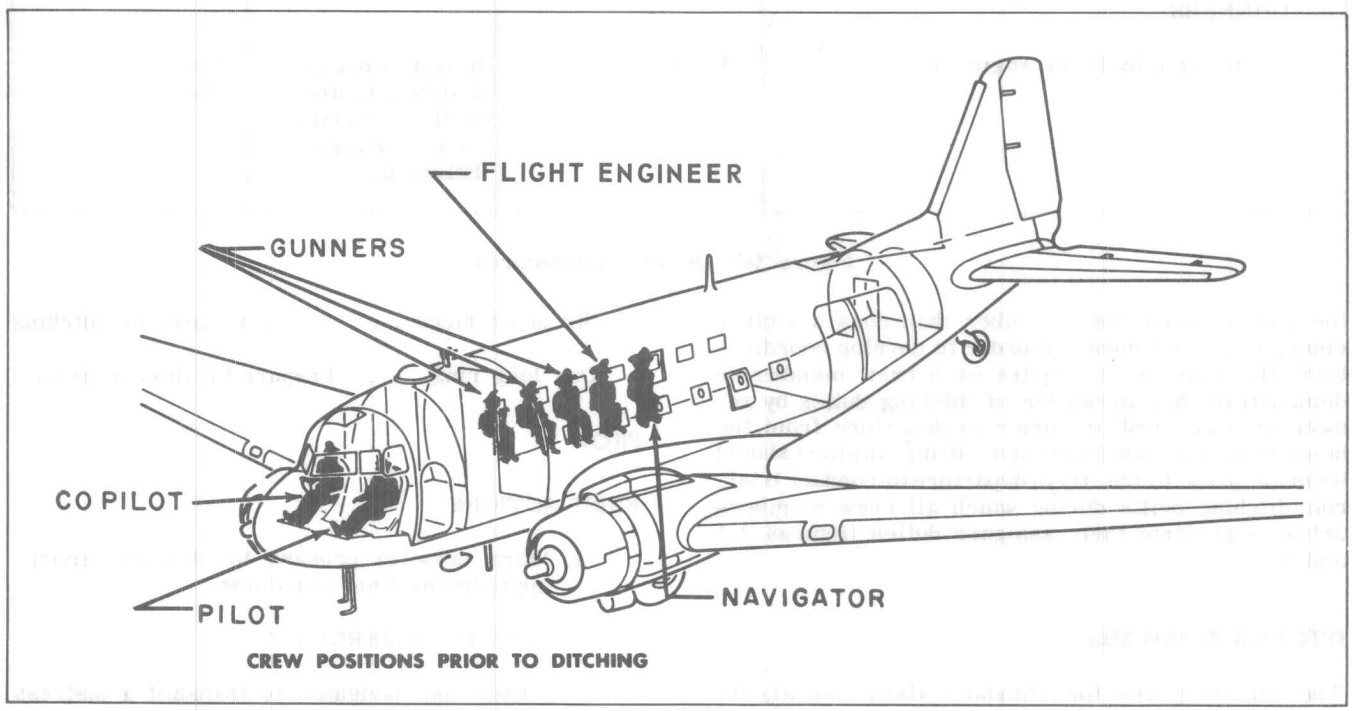
Fight fire: Remove all transportable munitions.

DITCHING

DITCHING PROCEDURE

The following ditching procedures are based on experience gained in ditching similar aircraft.

Ditching an aircraft requires more coordination on



CREW POSITIONS PRIOR TO DITCHING

Figure 3-1. Ditching Stations

CREW MEMBER/DUTY	PROVIDE	POSITION	EXIT
PILOT Warn crew to prepare for ditching. Order evacuation controller to assume duties. Order navigator to start emergency procedures. Order all on board to secure themselves in ditching position	Flashlight	Pilot's seat	Main cargo door
COPILOT As directed by pilot.			
NAVIGATOR Send emergency signal (SOS) giving position, altitude, course, speed, and intention of aircraft pilot as to ditching. Assume duties as assistant evacuation controller.	Emergency equipment bag Launch and inflate life rafts	If seat is not available, seated on floor of main cabin, forward bulkhead.	Main cargo door
FLIGHT ENGINEER Assume evacuation controller duties, supervise preparation of crew, jettison and/or tie down cargo and secure hatches and doors for ditching.	Launch and inflate life rafts	If seat is not available, seated on floor of main cabin, forward bulkhead.	Main cargo door
GUNNERS As directed by flight engineer.	Flashlight	If seat is not available, seated on floor of main cabin, forward bulkhead.	Main cargo door

Figure 3-2. Ditching Procedures

the part of each crew member than does any other emergency procedure. In order to develop coordination, the pilot must require each crew member to demonstrate his knowledge of ditching duties by answering oral questions prior to departure from the home base. Circumstances permitting, an effort should be made prior to the day of departure to conduct trial-run ditching drills during which all crew members actually perform their assigned duties (figures 3-1 and 3-2).

DITCHING ALARM BELL

The following are the standard alarm signals for ditching:

Six short rings . . . . . Prepare for ditching

One long ring . . . . Prepare for ditching impact

PILOT

FIRST ACTIONS

1. Warn crew to prepare to abandon, giving approximate time remaining.
2. IFF/SIF - EMERGENCY
3. Order the navigator to transmit a distress signal and position report and continue to do so.

4. Order copilot to don antiexposure suit and life vest, and fasten safety belt and harness.

5. Loosen tie, don life vest and antiexposure suit, and fasten shoulder harness and safety belt.

6. Take over controls from copilot and prepare to ditch.

WHEN DITCHING IS IMMINENT (10 MINUTES LEFT)

1. Alert cabin personnel: six short rings on alarm bell, or give signal over interphone.

2. Order the navigator to send final distress signal.

3. Order the copilot to assist him as required.

4. Order all crew members to turn on emergency flashlights connected to life vests.

   This procedure will provide light after ditching and will aid in locating persons injured during ditching.

5. Order all on board to secure themselves in ditching position.

6. If at night, turn on formation lights.

7. Immediately before ditching, give signal No. 2: "Brace for impact" or give signal over interphone.

DITCHING STATION - Pilot's Seat

AFTER DITCHING

1. Leave the aircraft through the main cargo door and assist with the life rafts. Take command.

COPILOT

FIRST ACTIONS

1. Take over the controls while the pilot adjusts his equipment.

2. Loosen tie, and don antiexposure suit and life vest.

3. Fasten shoulder harness and safety belt.

WHEN DITCHING IS IMMINENT (10 MINUTES LEFT)

1. Assist pilot.

DITCHING STATION - Copilot's Seat

AFTER DITCHING

1. Leave through the main cargo door.

NAVIGATOR

FIRST ACTIONS

1. On pilot's orders, send an emergency signal (SOS), followed as soon as possible by an emergency message giving position, flight time, nature of the emergency, and any other information available.

2. Obtain Direction Finding Service, bearing, etc., on normal air ground frequency if possible.

3. Stow essential equipment (Very pistol, signal flares, smoke signals, navigation aids, crew water tank, etc.) in emergency bag and stow bag in lavatory.

4. Loosen tie, don antiexposure suit and life vest, and fasten shoulder harness and safety belt.

5. Continue sending emergency signals every 10 minutes.

WHEN DITCHING IS IMMINENT (10 MINUTES LEFT)

1. Send final distress signal (SOS), position, altitude, course, speed, and intention of pilot as to ditching.

DITCHING STATION - If seat is not available, seated on floor of main cabin, back braced against main cabin forward bulkhead.

AFTER DITCHING

1. Pass out emergency equipment bag.

2. Carry out emergency radio transceiver.

3. Leave through main cargo door.

FLIGHT ENGINEER

FIRST ACTIONS

1. Monitor interphone.

2. Acknowledge pilot's verbal order.

3. Crew - prepared for ditching: loosen ties, don antiexposure suits, life vests, and fasten seat belts.

4. Cargo jettisoned if time permits: remaining cargo tied down.

5. Emergency/survival equipment in place and tied down.

WHEN DITCHING IS IMMINENT (10 MINUTES LEFT)

1. Monitor interphone.
2. Crew - assume ditching positions and fasten seat belts: flashlights on life vests turned on.
3. Pilot notified on interphone - cabin prepared for ditching.

DITCHING STATION - If seat is not available, seated on floor, back braced against main cargo compartment forward bulkhead.

AFTER DITCHING

1. Life rafts launched and inflated through main cargo door.
2. Crew evacuated.
3. Emergency/survival equipment aboard rafts.
4. Board raft.
5. Disconnect raft from aircraft as soon as all possible crew are aboard rafts.
6. Secure all emergency/survival equipment to raft.

GUNNERS

FIRST ACTIONS

1. Assist flight engineer as directed.
2. Loosen tie, and don antiexposure suit and life vest.

WHEN DITCHING IS IMMINENT (10 MINUTES LEFT)

1. Assist flight mechanic as directed.

DITCHING STATION - If seat is not available, seated on floor of main cabin, back braced against main cabin bulkhead.

AFTER DITCHING

1. Destroy guns on command of the pilot.
2. Leave through main cabin door.

EMERGENCY ENTRANCE

The structure of the fuselage is so designed in various areas that ground personnel can chop through the structure to gain emergency entrance to the aircraft interior. These areas are clearly outlined by a dotted line as shown in figure 3-3.

EMERGENCY EQUIPMENT

LIFE VESTS

One life vest will be conveniently located for each person on board. Each crew member will make sure that his life vest and CO_2 cartridges are in serviceable condition before each flight.

EMERGENCY RADIO TRANSCEIVER

The emergency radio transceiver will be carried by the navigator.

ABANDONING THE AIRCRAFT

Leave the aircraft as quickly as possible. Do not overlook necessary equipment or assigned duties. Hold ditching position until the aircraft comes to rest: then proceed as follows:

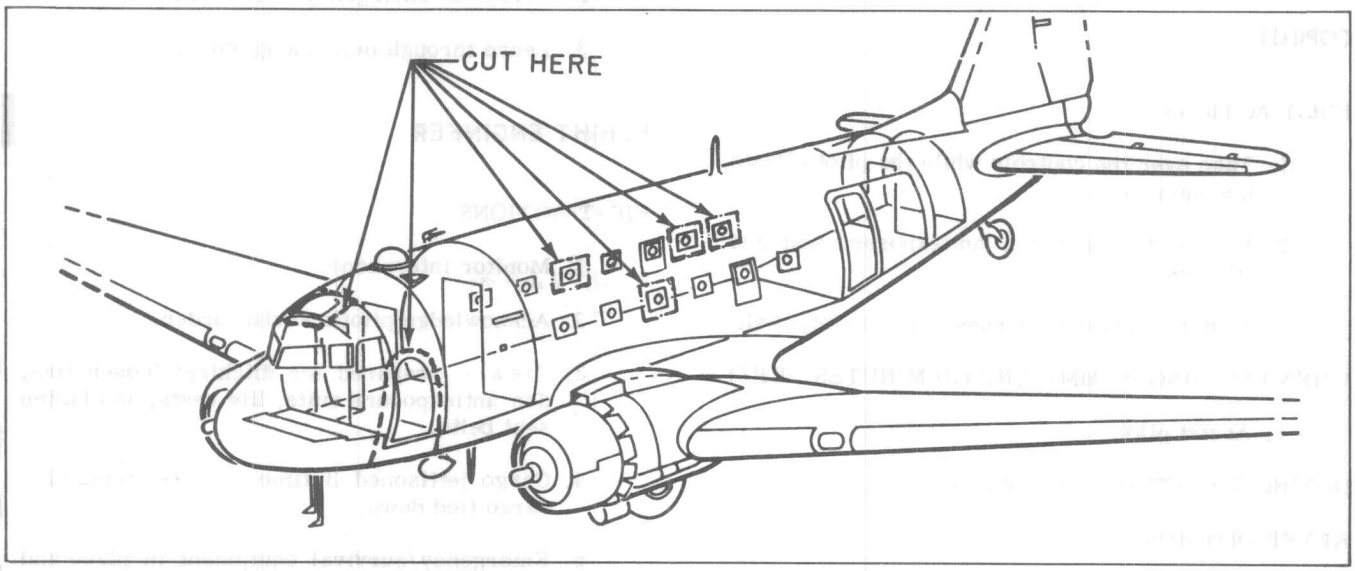


Figure 3-3. Emergency Entrances (Cut-Thru Areas)

Ditching equipment should be in readiness at all times when flying over water. Prior to each over-water flight, the pilot will make sure that the following equipment is aboard, in serviceable condition, and stowed in the proper places (figure 3-4).

LIFE RAFTS

A sufficient quantity of life rafts will be aboard to accommodate maximum authorized crew.

a. Crew members detailed to life raft removal will launch life rafts through the main cargo door and inflate.

b. Crew members will leave through assigned escape exit and, upon emerging, inflate life vests (figure 3-5).

BAIL-OUT

BAIL-OUT ALARM BELL

Standard alarm signals for bail-out are: Three short rings for Prepare to Bail Out and one long ring for Bail Out.

BAIL-OUT PROCEDURE

When the decision has been made to abandon the aircraft in flight, the pilot will give a warning signal to "Prepare for bail-out." This signal will be three short rings on the alarm system, or a verbal order over the interphone/PA system. When all the crew members are ready, the pilot will be notified. When the pilot desires to have all on board abandon the aircraft, he will give a warning signal to "Bail out," which will be one long sustained ring, or a verbal order over the interphone. Primary exit from the aircraft will be through the main cargo door.

PILOT

The pilot will:

a. Notify crew and receive acknowledgement. Ring alarm bell three short rings, or give verbal signal over interphone for crew members to perform all preparatory duties for bail-out. IFF/SIF - EMERGENCY.

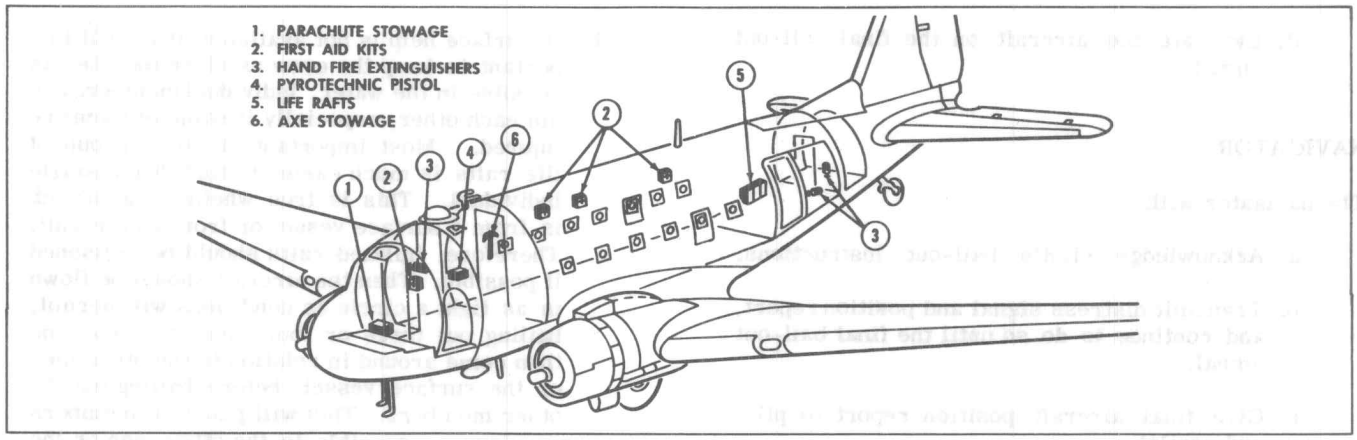


Figure 3-4. Emergency Equipment

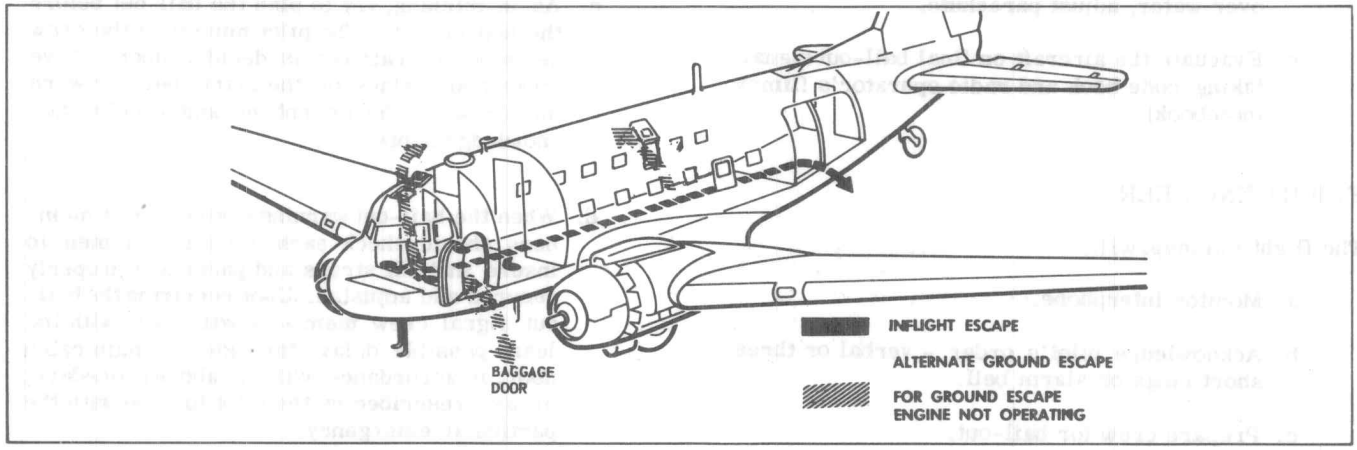


Figure 3-5. Emergency Escape Routes

b. Reduce the air speed, if possible, to approximately 100 knots (115 mph) IAS.

c. Put aircraft on autopilot control.

d. Don an antiexposure suit and life vest if over water, adjust parachute.

e. Place alarm bell on continuous signal, give signal for bail-out over interphone.

f. After receipt of "All clear" signal from the copilot, the pilot will order him to bail out and will follow him out.

COPILOT

The copilot will:

a. Acknowledge the pilot's bail-out instructions and adjust his parachute. Don an antiexposure suit and life vest if over water. Adjust parachute.

b. Transmit emergency voice signals.

c. Assist the pilot until the final bail-out signal is given.

d. Evacuate the aircraft on the final bail-out signal.

NAVIGATOR

The navigator will:

a. Acknowledge pilot's bail-out instructions.

b. Transmit distress signal and position report, and continue to do so until the final bail-out signal.

c. Give final aircraft position report to pilot and copilot.

d. Don an antiexposure suit and life vest if over water, adjust parachute.

e. Evacuate the aircraft on final bail-out signal, taking code book and radio operator's flimsy (notebook).

FLIGHT ENGINEER

The flight engineer will:

a. Monitor interphone.

b. Acknowledge pilot's order - verbal or three short rings on alarm bell.

c. Prepare crew for bail-out.

d. Notify pilot - cabin prepared for bail-out.

e. Bail out on signal after all gunners have evacuated.

OVERWATER RECOMMENDATIONS

Bail-out is not recommended unless visual contact is made with adequate surface help. If no rescue vessels are in the vicinity, bail-out should be used only as a last resort because of the extreme difficulty of getting the crew together in the water. The life rafts offer survival and signaling equipment. In any but the warmest seas, a man will survive only a few hours if kept afloat by means of a life vest alone. Wearing an antiexposure suit will increase this time, but this still cannot compare with the length of time survival is possible in a life raft. If bail-out is required or decided upon, the following procedure is recommended:

a. If surface help is available, it is much easier for rescue crews to find and rescue two or three men at a time in a small area than to rescue 10 or more men strung out in a long line in the water. Always head the aircraft in a direction to allow the crew to drift into the course and just ahead of the rescue vessel.

b. If surface help is not available, it is still important to keep the crew as close together as possible in the water. Individual members can aid each other, especially if some of them are injured. Most important of all, a group of life rafts is much easier to find than a single individual. This is true whether the search is from a surface vessel or from an aircraft. Therefore, inflated rafts should be jettisoned if possible. Then the aircraft should be flown in as tight a circle as conditions will permit, bailing out three or four men at a time, and then come around in relation to the other men or the surface vessel, before bailing out the other members. This will place the members as close as possible to the other men or the surface vessel.

c. As in ditching, try to plan the bail-out before the last minute. The pilot must warn the crew as soon as bail-out is decided upon. Give three short rings on the alarm bell, or warn the crew on the interphone and receive acknowledgements.

d. When the bail-out warning is given, crew members should check each other's equipment to insure that all straps and packs are properly secured and adjusted. Upon receiving the bail-out signal crew members will leave with the least possible delay, through the main cabin door, in accordance with the above procedure, or as prescribed by the pilot to cope with the particular emergency.

SECTION IV - DESCRIPTION AND OPERATION OF AUXILIARY EQUIPMENT

THIS SECTION IS INCOMPLETE WITHOUT T.O. 1C-47-1

OXYGEN SYSTEM

CREW OXYGEN SUPPLY

Some AC-47D aircraft have crew oxygen supply for pilot, copilot, navigator and radio operator positions.

Some AC-47D aircraft have portable oxygen supply systems. Portable oxygen bottles are located on the forward main cargo compartment bulkhead.

LIGHTING EQUIPMENT

INTERIOR LIGHTING AND ARMAMENT LIGHTING SYSTEM

GUN POSITION AND FLARE LAUNCHER LIGHTING.

An adjustable gooseneck type light is located at the flare launcher position and at each gun position in the main cargo compartment. An OFF-BRIGHT placarded switch is located forward of the flare launcher light. Clockwise rotation of this switch will turn light ON and intensify brightness.

Gun position lighting switches are a part of the fire control box located on the right side of the main cargo compartment. Each gun position has its own switch placarded OFF-BRIGHT. Clockwise rotation will turn the light ON and intensify brightness.

The gun position and flare launcher light circuits are connected to a 5 amp circuit breaker, placarded GUN LIGHTING, which is located in the inverter junction box.

ILLUMINATED SIGHT LIGHTING

A placarded OFF-BRIGHT switch is located adjacent to the base of the sight. Clockwise rotation will turn light ON and intensify brightness. A NORMAL-STANDBY switch is located adjacent to the OFF-BRIGHT switch. The illuminated sight light circuit breaker is also located in the inverter junction box.

FLARE LAUNCHER, MARK 24, MOD 3

DESCRIPTION

The 66001 Flare Launcher is a pneumatic, manually operated, flare launcher. The launcher functions to supply a launching force sufficient to eject a flare perpendicularly into a 250 mph air stream at an operating pressure of 800 plus or minus 100 psi.

The flare launcher consists primarily of an air storage bottle, a regulator, a tube assembly, a mounting plate, and an ejector assembly. The air storage bottle gages, regulator, and ejector are interconnected by means of tubing and hose. The regulator is calibrated to allow the correct amount of air pressure to flow into the ejector. Stored pressure and regulated pressures are indicated on the gages. The ejector consists of a manually operated air valve, mounted on the aft end of an air cylinder assembly. A bracket assembly is mounted on the lower end of the air cylinder assembly.

The manually operated air valve contains the pilot and main valve components, a pneumatically controlled ejector indexing piston, and a slow-approach piston control system. The air cylinder provides an opening through which the piston finger extends to make contact with and eject the flare. The bracket assembly contains the spring and reaction latch. A piston return tube assembly is mounted on the air cylinder, porting high pressure air from the manually operated air valve to a small check valve assembly, located on the cylinder.

Air Storage Cylinder Shutoff Valve Knob. An air storage cylinder shutoff valve knob is located on the flare launcher, and is used to turn system pressure on and off.

Air Pressure Regulator Valve. An air pressure regulator valve is located on the flare launcher and is used to regulate air pressure to the ejector mechanism.

Air Storage Cylinder Pressure Indicator. A direct reading air storage cylinder pressure indicator, located on the flare launcher, indicates usable pressure in psi in the air storage cylinder.

Manual Release Lever. A manual-release lever, located on the flare launcher, is used for operation.

Ejector Pressure Indicator. A direct reading ejector pressure indicator, located on the flare launcher, indicates pressure in psi in the ejection chamber.

OPERATION

To prepare a flare for launching, first remove the weather cap.

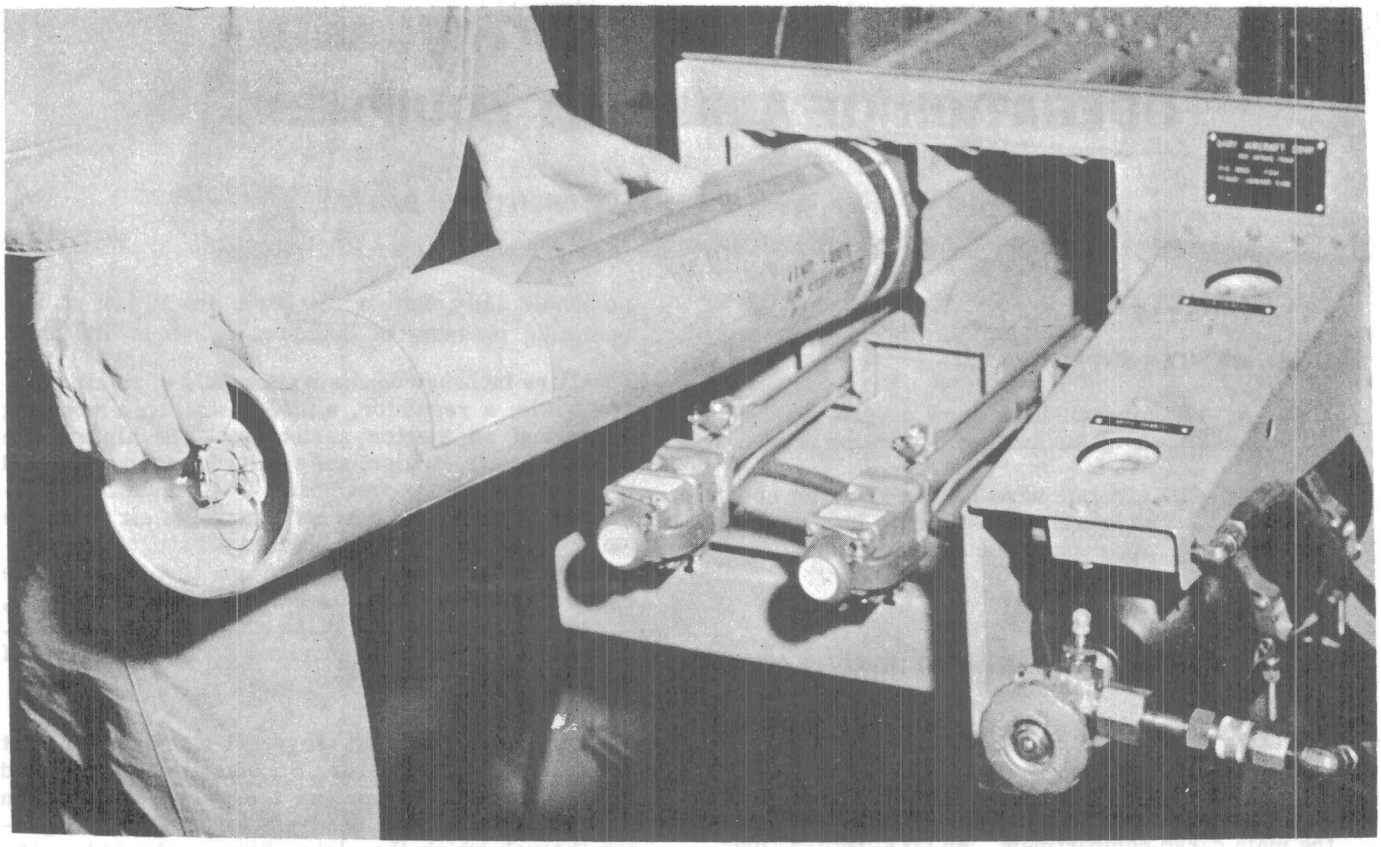


Figure 4-1. Inserting Flare

WARNING

With red tag safety pin in place a 200 lb. lanyard pull is required to actuate fuze. Once safety pin is removed a 12 lb. pull on lanyard will actuate fuze.

With manual release lever safety locks in the UP position, insert the flare in the launcher tube, fuzed end toward the operator (figure 4-1). Be sure forward end of flare is resting against reaction latch (figure 4-2). Secure the lanyard to the lanyard clip and remove the safety pin.

To launch the flare, set the manual release lever safety locks in the DOWN position (figure 4-3) and press either or both release levers (figure 4-4) as directed by the pilot.

WARNING

To launch the round, it is necessary to actuate the manual release lever for at least 3 seconds to ensure positive operation of the launcher. At least 500 psi is required to launch the flare.

Visually observe that piston assembly returns to aft position.

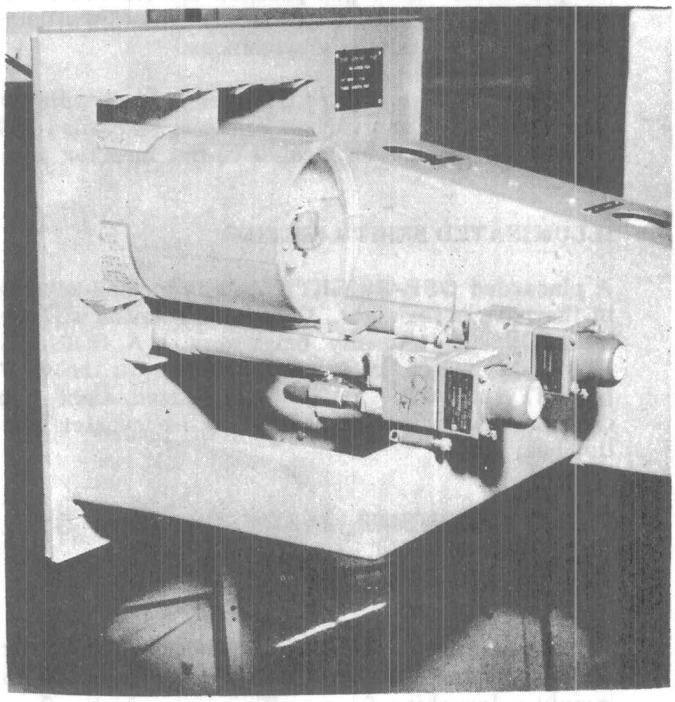


Figure 4-2. Flare in Position

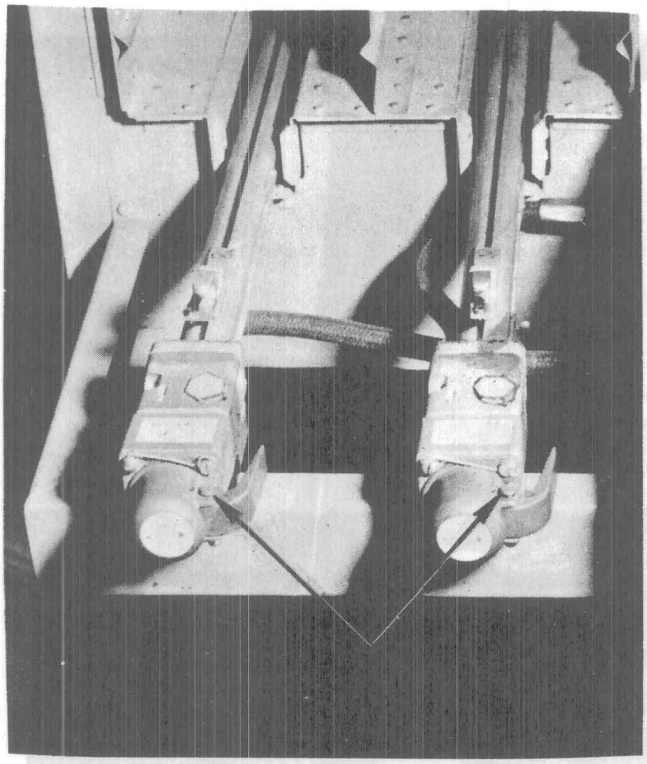


Figure 4-3. Safety Lock in Down Position

WARNING

If piston assembly does not return within 15 seconds check system pressure. If pressure is up, that particular launch tube must not be used for flare operation and corrective maintenance must be performed. If main system pressure is zero, but bottle pressure is up, entire flare launcher shall be rejected for operation.

After launching, reposition manual release lever safety locks in UP position and remove lanyard ring from retaining clip.

ILLUMINATED SIGHT

The 875732 Gun Sight is located at the left side window at the pilot's position (figure 4-5).

The sight light operates on 28 volt d-c. Power is supplied thru the sight lighting circuit breaker on the Junction Box control panel. This light is controlled by a placarded OFF-BRIGHT variable switch. Brightness of sight reticle light can be controlled by turning switch clockwise.

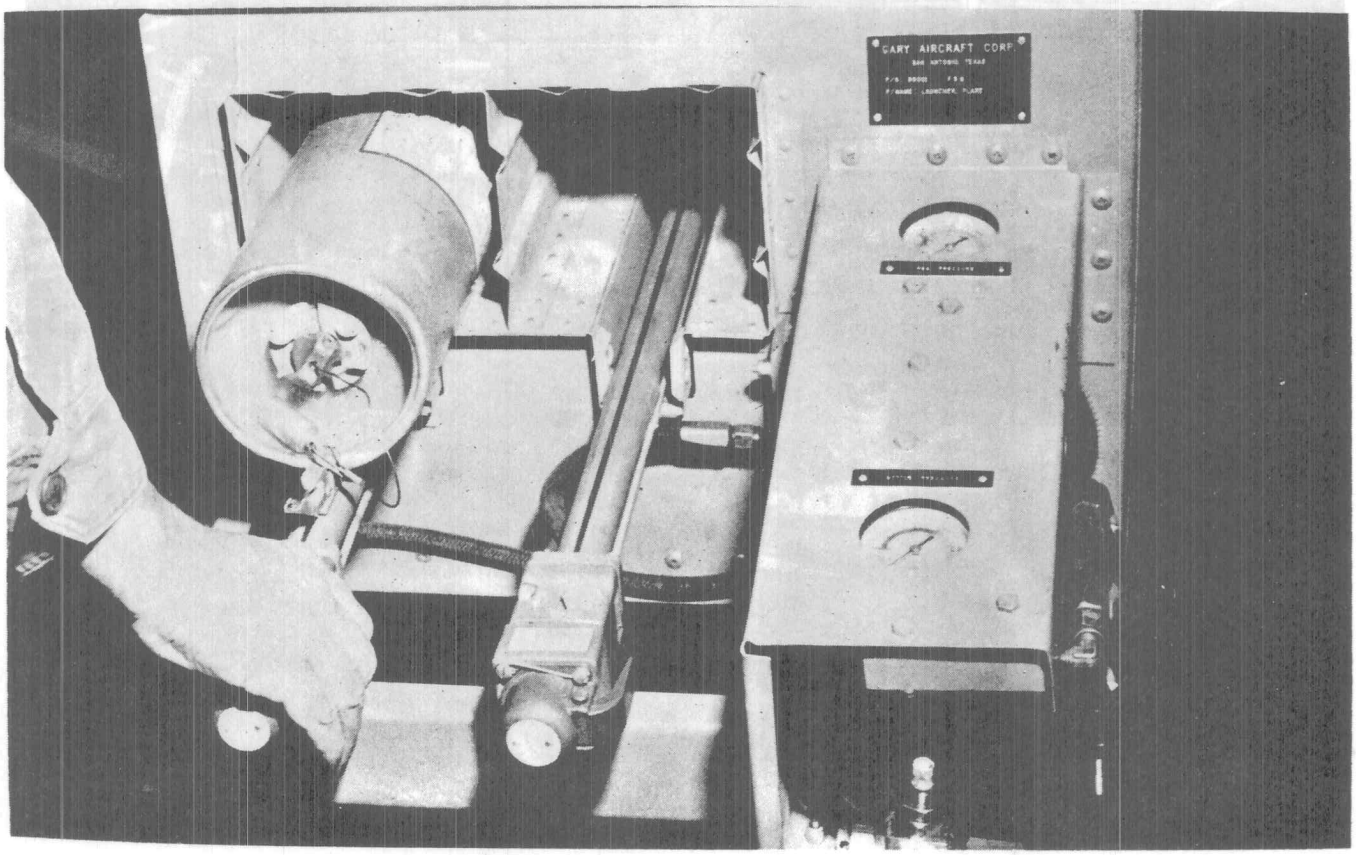


Figure 4-4. Releasing Flare

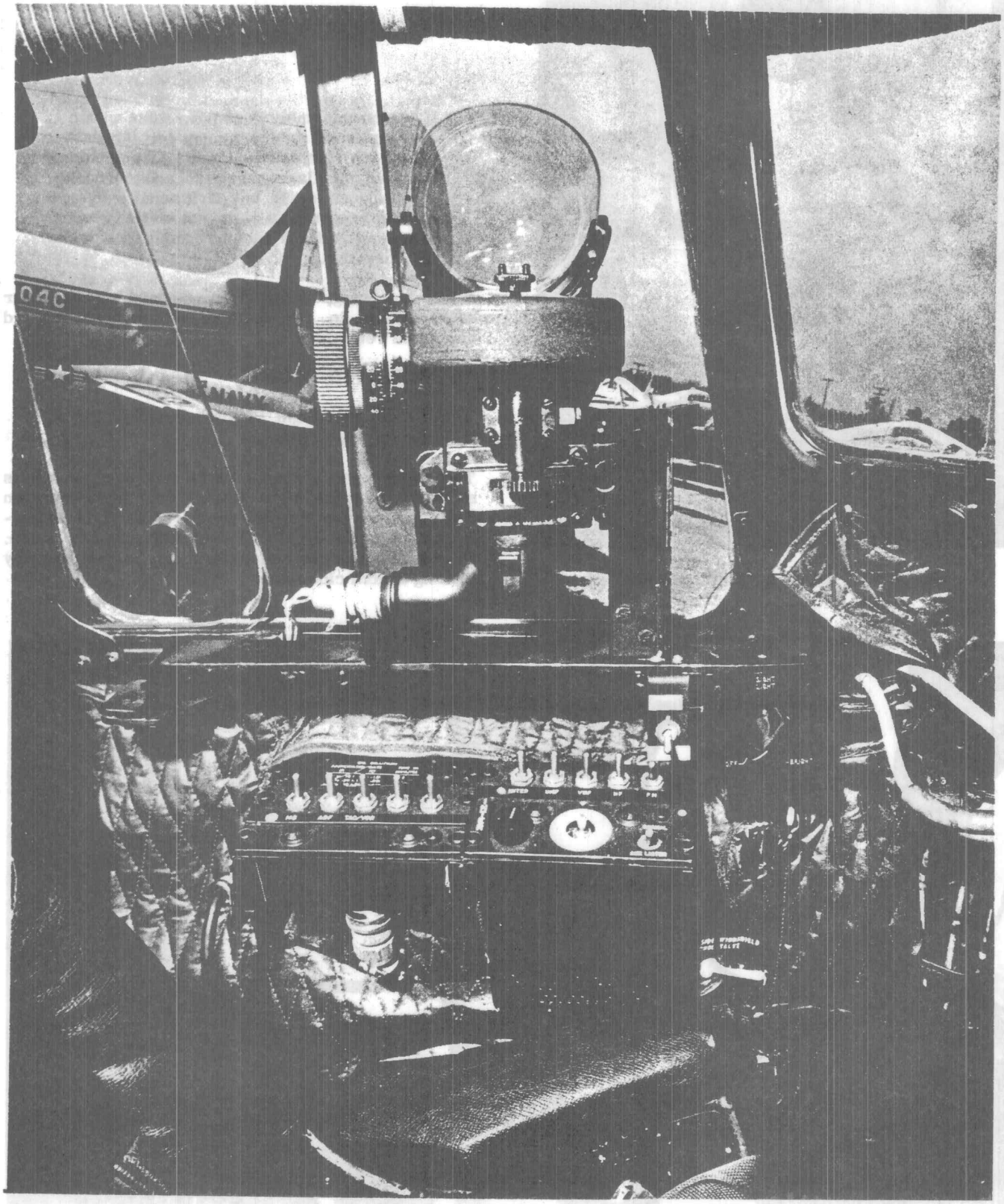


Figure 4-5. Illuminated Sight Mark 20, Mod 4

A NORMAL-STANDBY Switch is located adjacent to the OFF-BRIGHT Switch. The lamp in the sight is a dual filament type. Operation should be in the NORMAL position. In the event of failure of the filament, the other can be selected through the use of the STANDBY position.

NOTE

In the event of failure of both filaments, a spare lamp is located in the spare lamp holder.

GENERAL

Illuminated Sight Mark 20 Mod 4 provides the pilot with a selection of three types of reticle image patterns and light filters. Reticle selection is accomplished by rotating a reticle control knob located directly above the crash pad at the rear of the sight. When the reticle is properly positioned, the reticle mechanism in the sight is locked by a spring loaded detent arrangement. The selected reticle pattern is projected onto the reflector plate so that the line of sight through the reticle pip is parallel to a boresight datum line.

RETICLE PATTERNS

The type of pattern that will be used in any one operation will depend mainly upon the visibility of the target.

NIGHT RETICLE. The night reticle, shown in figure 4-6, is intended for use in specialized night aircraft operations where the visibility of the target is extremely low. The pattern markings of this reticle are held to a minimum so as to decrease the illumination of the image. The red-orange light filter, used in conjunction with the night reticle, also serves to decrease the brilliancy and alter the color of the pattern so that it does not obscure the target. Thus, these features provide an ideal night-use pattern.

DAY RETICLE. The day reticle (figure 4-7) is best suited for use in daylight operations. The day reticle pattern is more brilliant than the night or combination patterns and contains more detailed markings, such as the 50- and 100-mil circles. The yellow light filter used with this reticle allows the reticle pattern to be illuminated to a greater extent for better image visibility against light backgrounds.

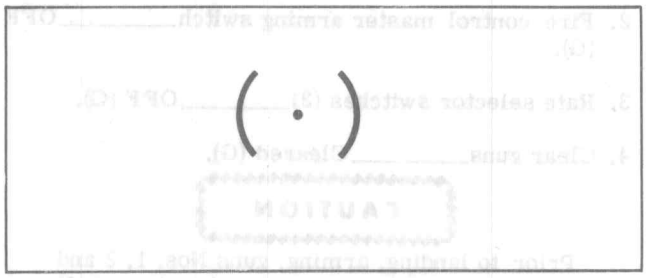


Figure 4-6. Night Reticle Pattern

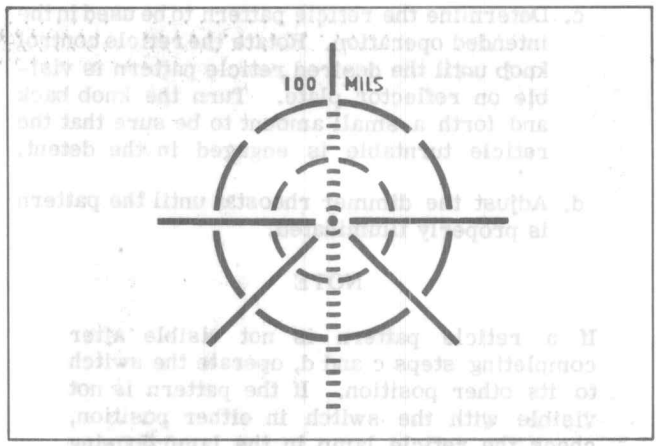


Figure 4-7. Day Reticle Pattern

COMBINATION RETICLE. The combination reticle (figure 4-8) is to be used under conditions of reduced target visibility which exist at dawn, twilight, or during overcast periods. The night reticle, while theoretically ideal for night tactics, will not provide sufficient reticle pattern for daylight attacks, and conversely, the day reticle contains comparatively complicated markings and is illuminated to the extent that the target would be obscured during periods of low visibility. The combination reticle provides a compromise between the night reticle and a minimum acceptable day reticle. The flashed-opal light filter used with this reticle provides a constant degree of illumination through a considerably wider range of eye movement.

OPERATION

The following steps are necessary to place the sight in operation:

a. Close sight light circuit breaker.

b. Turn the switch that controls the power to the lamp circuit to the BRIGHT position.

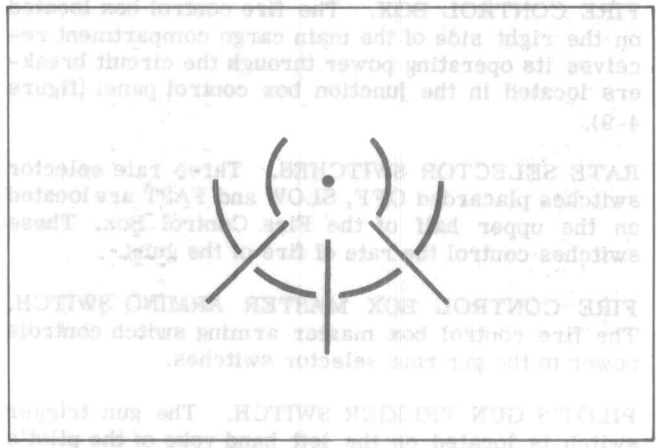


Figure 4-8. Combination Reticle Pattern

c. Determine the reticle pattern to be used in the intended operation. Rotate the reticle control knob until the desired reticle pattern is visible on reflector plate. Turn the knob back and forth a small amount to be sure that the reticle turntable is engaged in the detent.

d. Adjust the dimmer rheostat until the pattern is properly illuminated.

NOTE

If a reticle pattern is not visible after completing steps c and d, operate the switch to its other position. If the pattern is not visible with the switch in either position, check the reticle lamp in the lamp housing and replace it if necessary.

7.62MM AUTOMATIC GUN, GAU-2B/A

DESCRIPTION. The major components of the 7.62-MM Automatic Gun GAU-2B/A, are the rotor assembly, six bolt assemblies, six removable tracks, the gun housing, the safing sector, the housing cover, the guide bar, rear gun support, six barrels, and the barrel clamp.

GUN ELECTRICAL SYSTEM

GUN MODULES. MXU-470A Gun modules operate on 28 volt dc; power is obtained from the fire control box located on the right side of the main cabin.

CIRCUIT BREAKERS. The circuit breakers for the master arming switches and guns number one, two and three, sight lighting and gun lighting, are located in the junction box control panel (figure 4-9).

CO-PILOT MASTER ARMING SWITCH. The Co-Pilot's master arming switch is located on the co-pilot's electrical control panel (figure 4-10). This switch controls all electrical power to the gun firing circuits.

FIRE CONTROL BOX. The fire control box located on the right side of the main cargo compartment receives its operating power through the circuit breakers located in the junction box control panel (figure 4-9).

RATE SELECTOR SWITCHES. Three rate selector switches placarded OFF, SLOW and FAST are located on the upper half of the Fire Control Box. These switches control the rate of fire of the guns.

FIRE CONTROL BOX MASTER ARMING SWITCH. The fire control box master arming switch controls power to the gun rate selector switches.

PILOT'S GUN TRIGGER SWITCH. The gun trigger switch is located on the left hand yoke of the pilot's control wheel. The gun trigger switch is powered thru the arming circuit breaker.

ARMING PROCEDURES

The co-pilot will read the following check list. Appropriate personnel will respond. Symbols used in the following checklist are (G) for gunner, (N) for navigator, (P) for pilot, and (CP) for co-pilot.

WARNING

Do not connect the feeder solenoid electrical connector (P-3) until directed to do so by the Aircraft Commander.

GUN FIRING PROCEDURE

The following sequence of events will enable the pilot to fire the gun. Communications with gunners shall be established by the pilot.

1. Feeder electrical connecter (P-3)_____connected (G).
2. Personnel clear of guns_____clear (G).
3. Set rate selector switches_____fast position set (G).
4. Fire control master arming switch_____ON (G).
5. Arming; Gun Nos. 1, 2 and 3, and gun sight light circuit breaker_____IN (N).
6. Sight Reticle_____set (P).
7. Co-pilot master arming switch_____ON (CP).
8. Personnel clear of guns_____clear (G).

CAUTION

If malfunction occurs during firing of guns, place rate selector switch OFF for malfunctioning gun. Clear malfunction as directed.

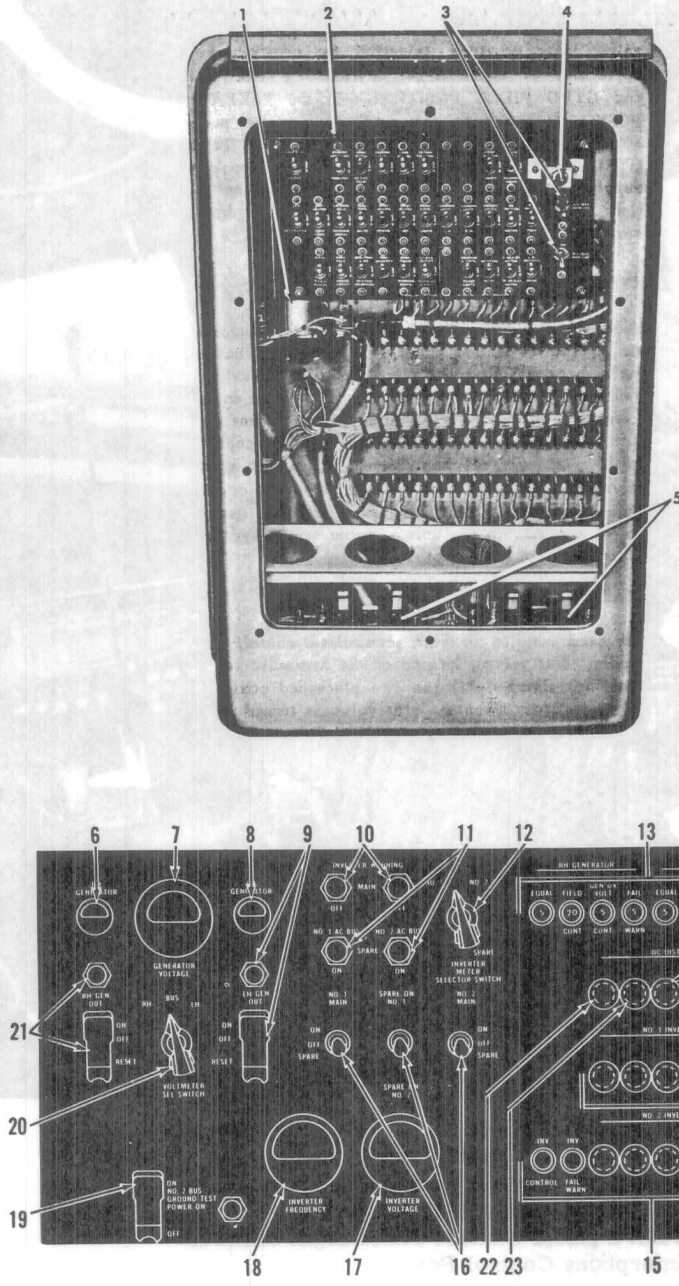
9. Guns ready to fire.

GUN SAFING PROCEDURES

1. Co-pilot master arming switch_____OFF (CP).
2. Fire control master arming switch_____OFF (G).
3. Rate selector switches (3)_____OFF (G).
4. Clear guns_____Cleared (G).

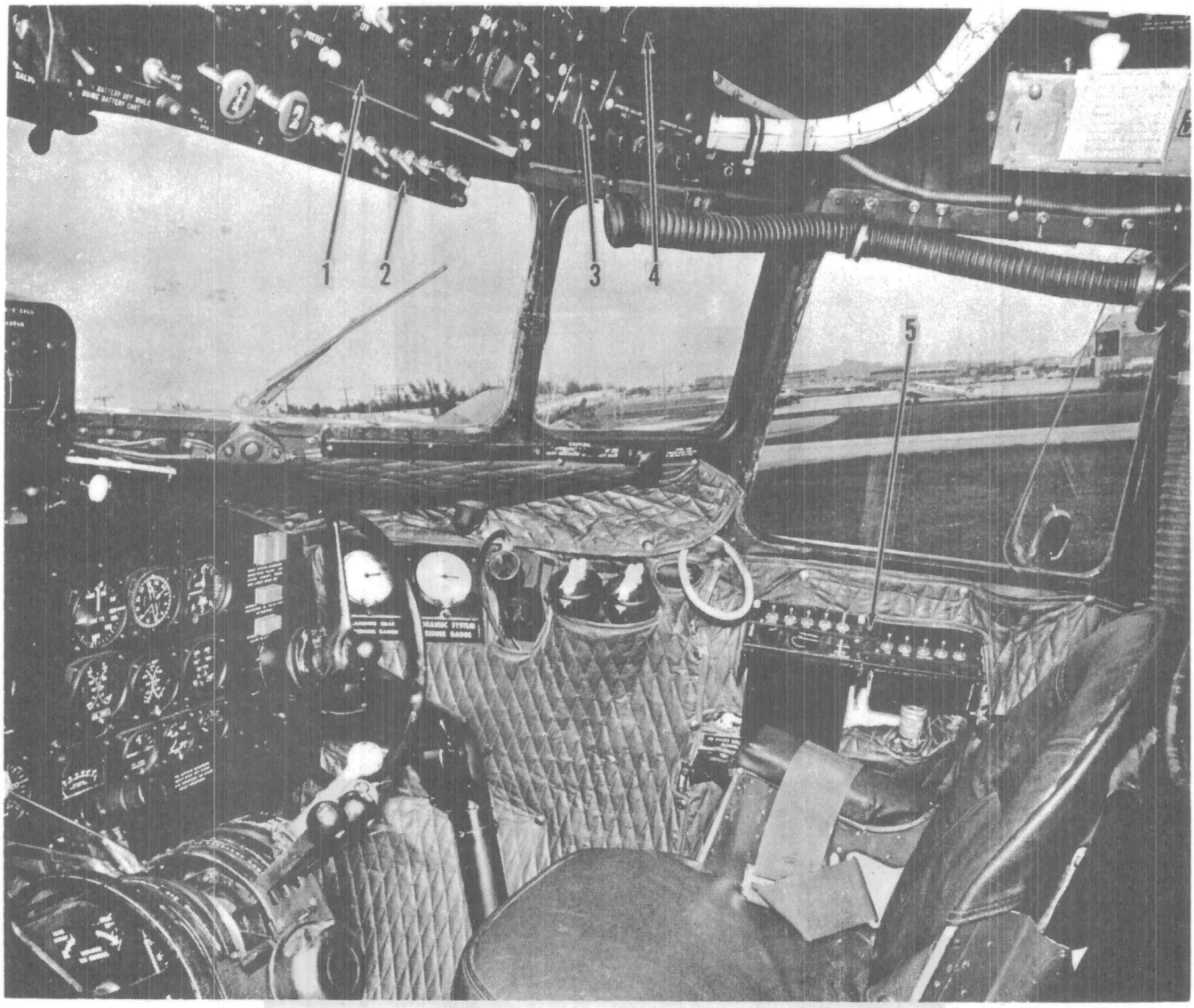
CAUTION

Prior to landing, arming, guns Nos. 1, 2 and 3 and gun sight light circuit breaker shall be pulled OUT_____OUT (N).



1. Battery Connector Relay
2. Circuit Breaker Panel
3. Generator Main Line Switches
4. Junction Box Lamp Switch
5. Voltage Regulator Mounts
6. RH Generator Loadmeter
7. Voltmeter
8. LH Generator Loadmeter
9. LH Generator Switch and Light
10. Main Inverter Warning Lights
11. Spare Inverter Warning Lights
12. Inverter Meter Selector Switch
13. Generator Circuit Breakers
14. No. 1 Inverter Bus Circuit Breakers
15. No. 2 Inverter Bus Circuit Breakers
16. Inverter Switches
17. Inverter Voltage Meter
18. Inverter Frequency Meter
19. Ground Test Power Switch
20. Voltmeter Selector Switch
21. RH Generator Switch and Light
22. Sight Light
23. Gun Position Lighting
24. No. 1 Gun
25. Arming
26. No. 3 Gun
27. No. 2 Gun

Figure 4-9. Junction Box Control Panel



1. Pilot's Radio Control Panel
2. Electrical Control Panel
3. Co-Pilot's Master Arming Switch
4. Pilot's Radio Control Panel Light Rheostat
5. Interphone Control Box

Figure 4-10. Cockpit Arrangement - Typical - Right

DEMOLITION TO PREVENT ENEMY USE

GENERAL. If demolition is required, destroy the gun by any appropriate means; mechanically by smashing, bending, or breaking parts, by burning, or by disassembling into major components and throwing the parts into deep water.

To destroy the gun mechanically, use an axe, sledge, or other heavy implement to smash barrels, housing cover, safing sector, guide bar, and gun rear support.

To destroy the gun by burning, remove the safing sector and housing cover, set an M-14 incendiary grenade on the bolt assemblies and rotor assembly, and fire the grenades. If complete destruction of the aircraft is desired, pull lanyard on at least one flare while exiting aircraft.

GUN AIMING

SLANT RANGE CURVES. The Curves (figures 4-11 thru 4-16) give information on the slant range to the target as related to the bank angle. Use the curves to obtain the slant range to the target for a given bank angle which places the sight pip on the target when the elevation adjustment is in zero position. Use the curves also to find the bank angle required to orbit the target as a constant slant range.

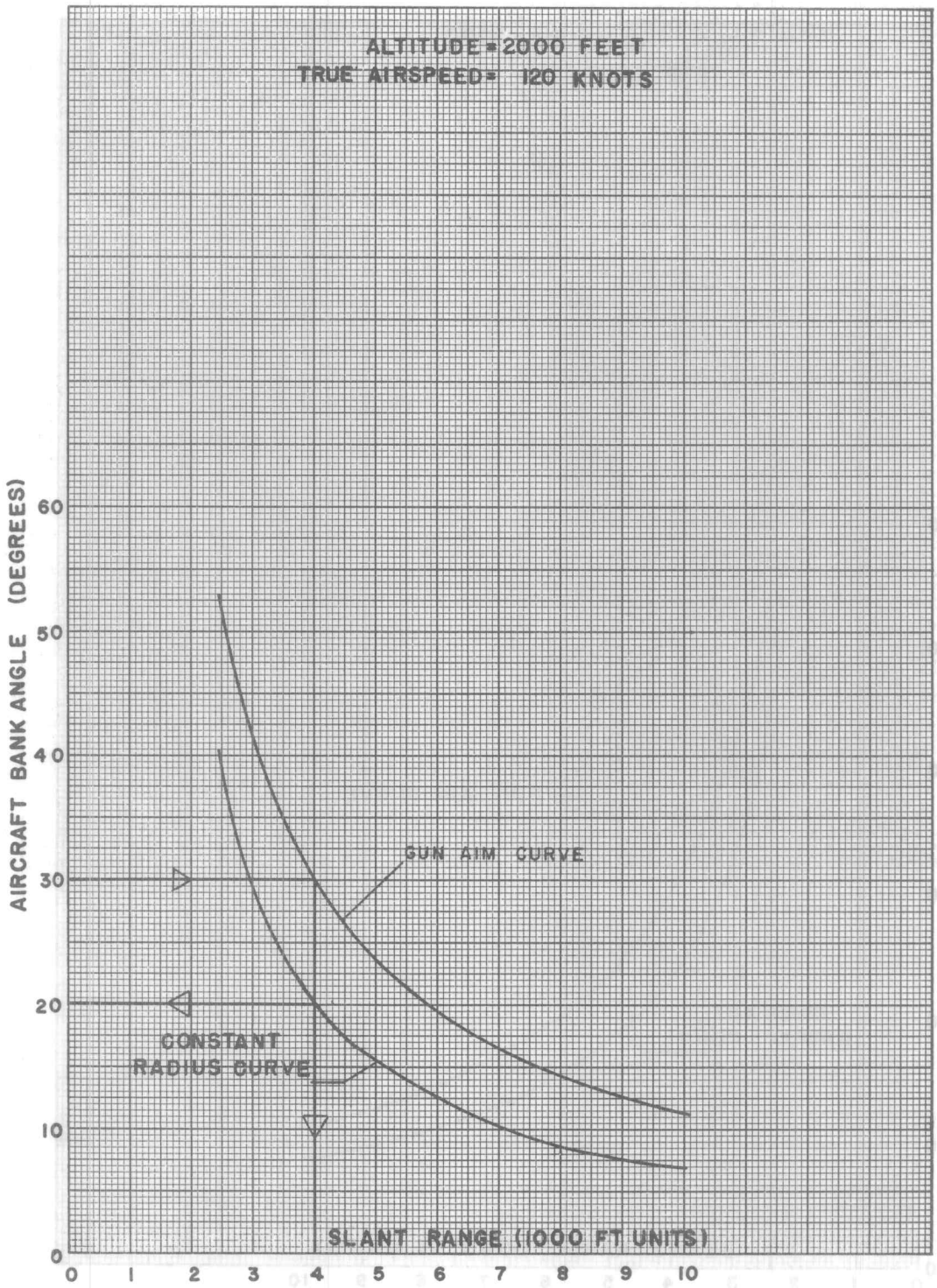


Figure 4-11. Gun Aiming Curve

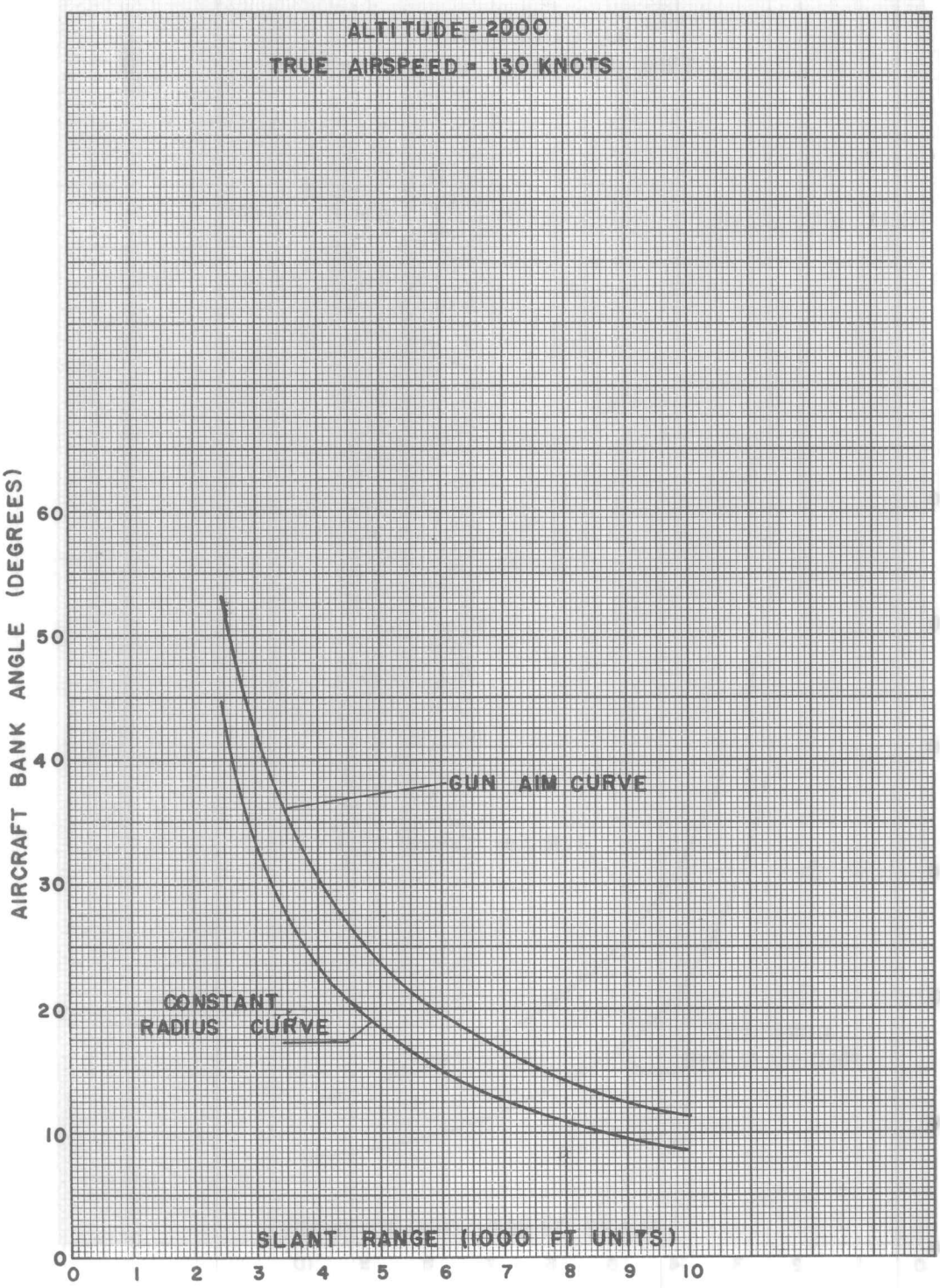


Figure 4-12. Gun Aiming Curve

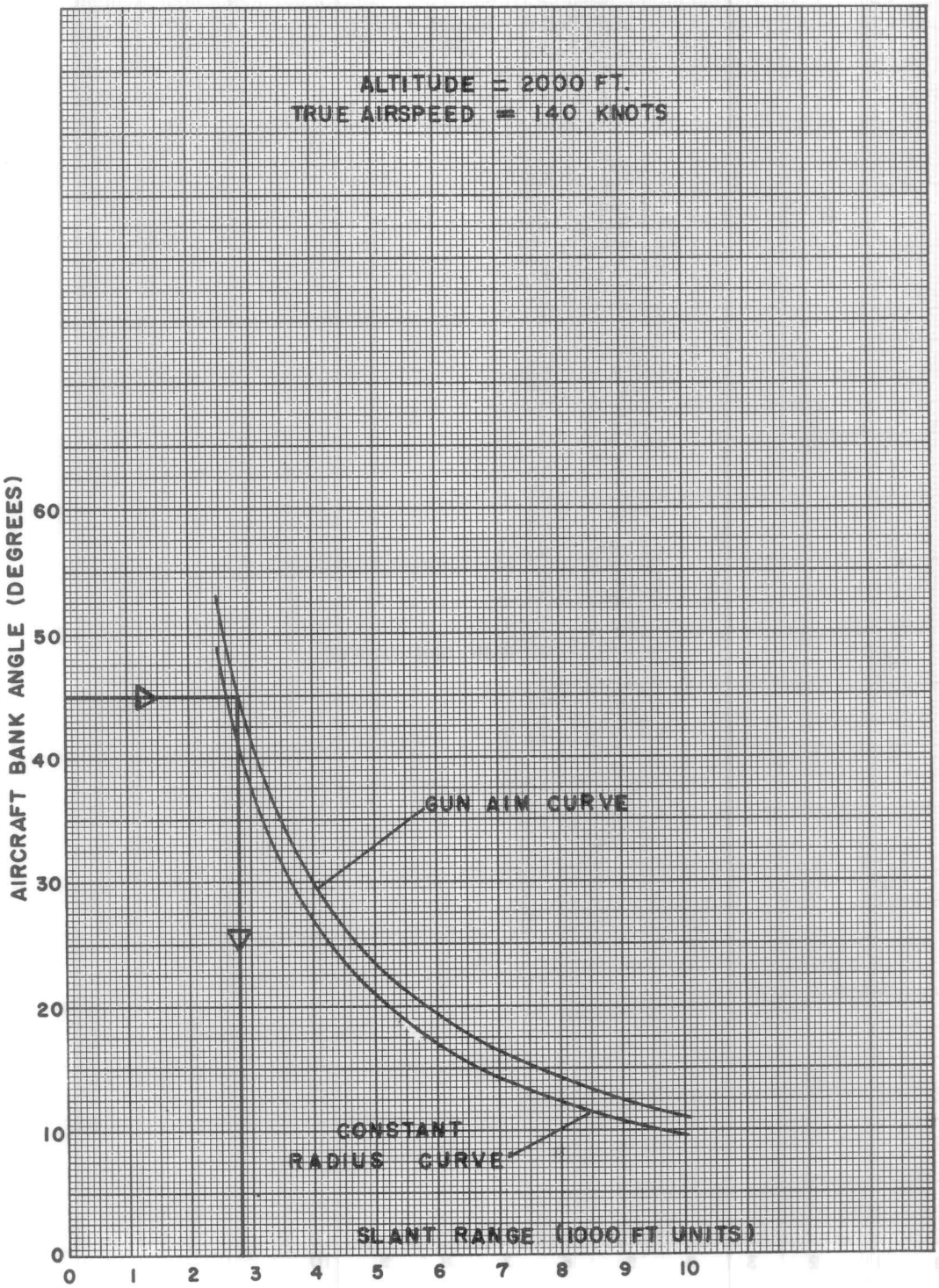


Figure 4-13. Gun Aiming Curve

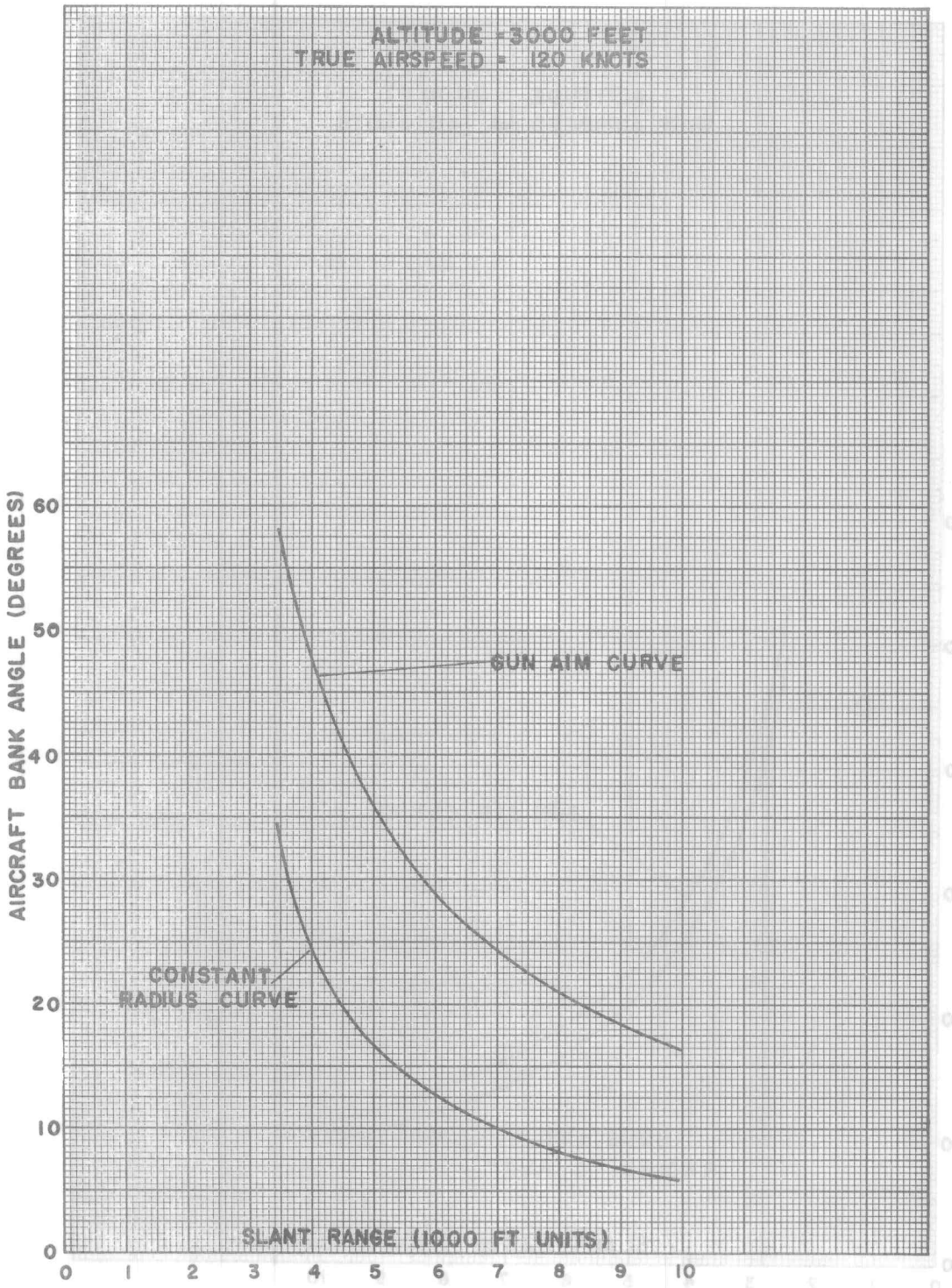


Figure 4-14. Gun Aiming Curve

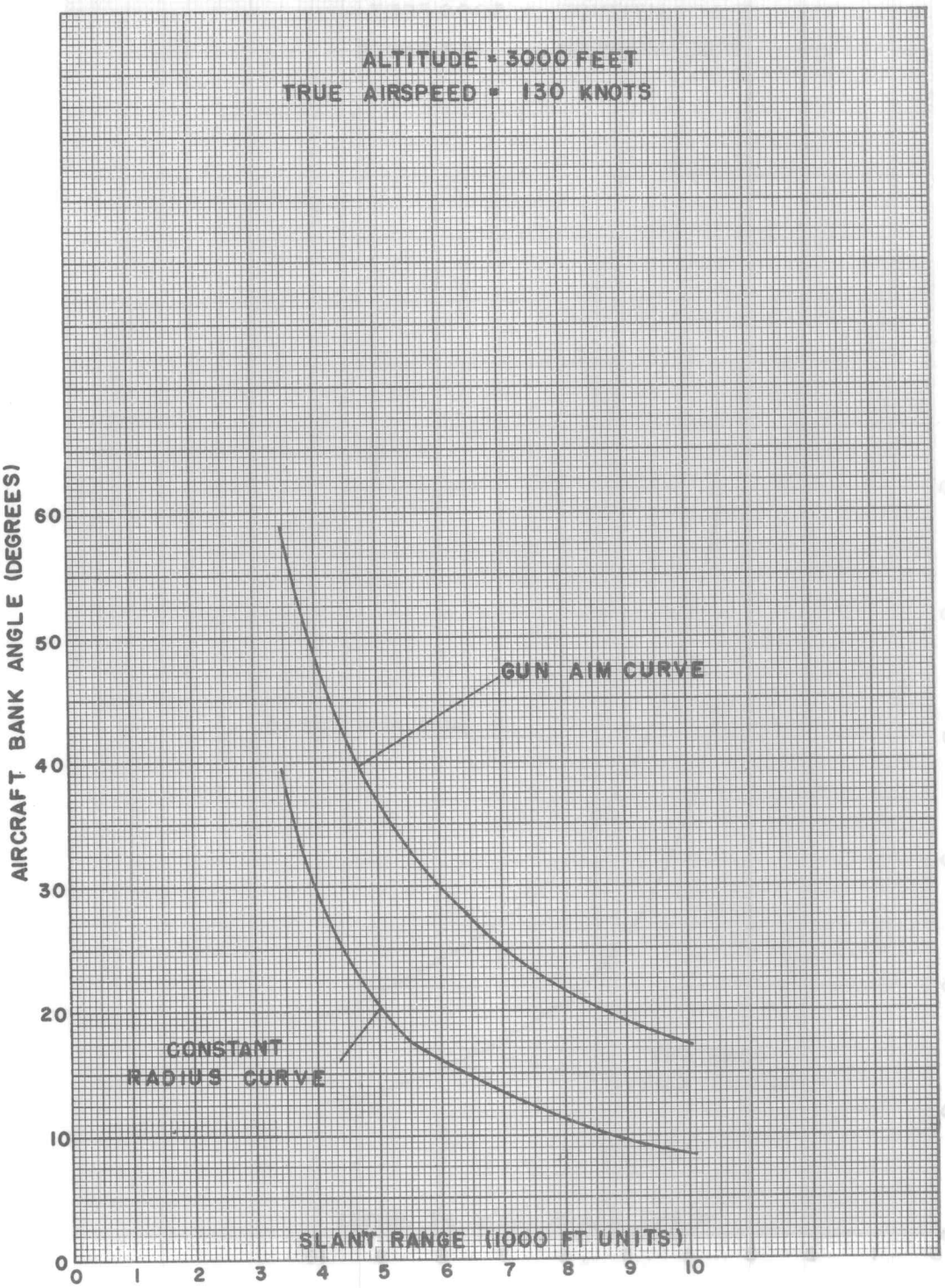


Figure 4-15. Gun Aiming Curve

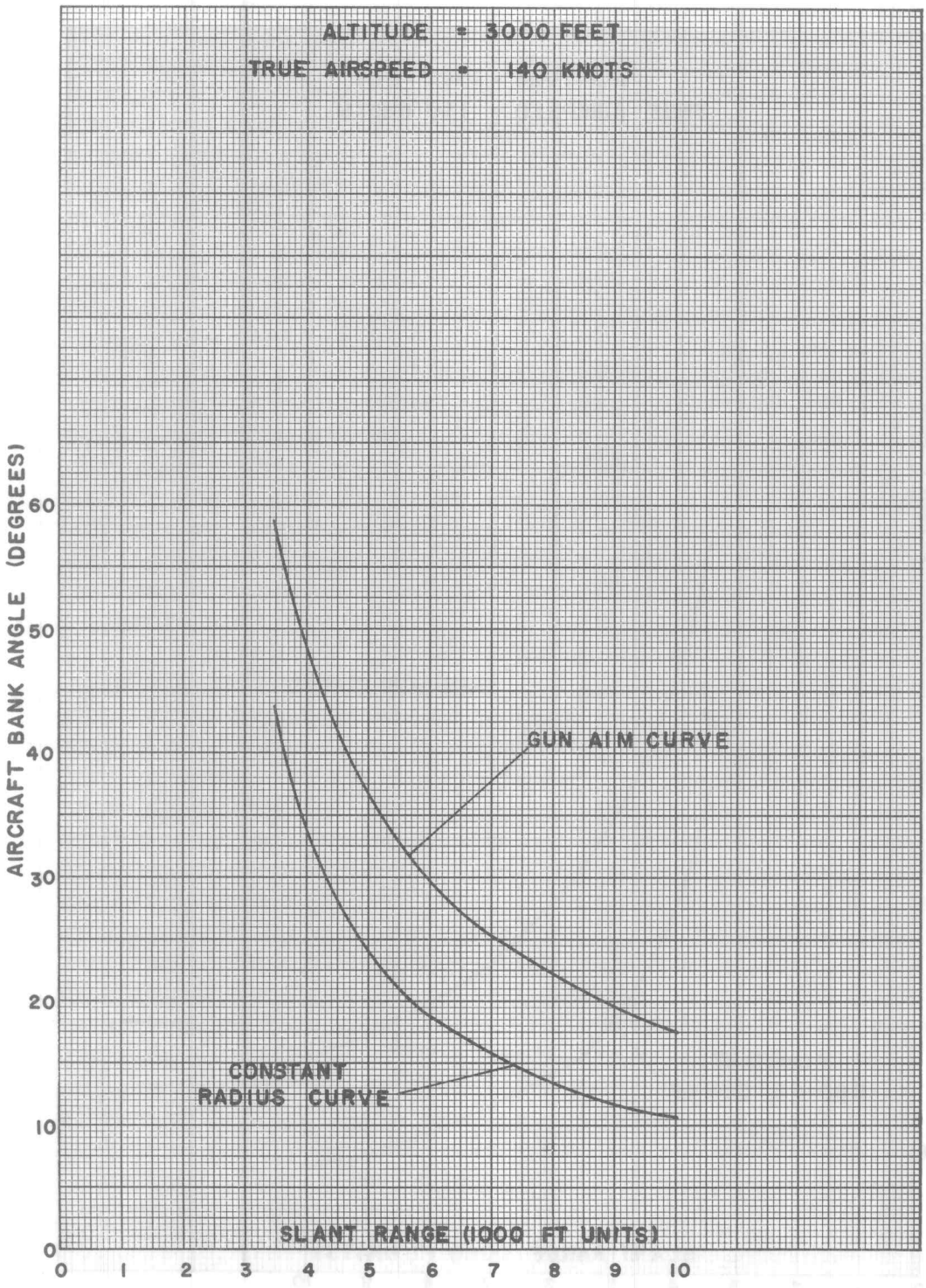


Figure 4-16. Gun Aiming Curve

Obtain the slant range to the target for a given altitude above ground level (AGL) and true air speed (TAS) as follows:

a. Place the sight elevation adjustment in the zero position.

b. Bank the aircraft until the pip is on the target. Determine the angle from the altitude indicator (gyro horizon).

c. Enter the proper curve corresponding to the aircraft's altitude A.G.L. and the TAS.

d. Find the bank angle in the left margin; then go laterally across to intersect the gun aim curve.

e. Read down from this position to obtain the slant range to the target at the bottom of graph.

Obtain the bank angle necessary to orbit the target at a constant slant range as follows:

a. Enter the curve corresponding to the aircraft's altitude A.G.L. and true airspeed with the slant range at the bottom of the curve.

b. Move vertically upward until the constant radius curve is intersected.

c. Move laterally across to the left and read the bank angle necessary to maintain this constant slant range.

As an example, assume that the aircraft is flying at 2000 feet AGL at an airspeed of 120 knots TAS and that the gun aim angle to the target is 30 degrees. Enter curve (figure 4-11) with 30 degrees and move laterally across, intersecting the gun aim curve. Move down from the point of intersection and read the slant range of 4000 feet to target. Move up from the slant range of 4000 feet and intersect the constant range curve. Move laterally to the left from the point of intersection and read 20 degrees. 20 degrees is the bank angle necessary to keep the target at a constant slant range of 4000 feet.

GUN AIMING CORRECTIONS

The sight is bore sighted for given conditions of gun aim angle (taken from slant range and altitude), true air speed and slant range. A card should accompany the sight, giving the settings for which the sight was bore sighted. A typical reading could be, "Aircraft bore sighted for TAS 130 K, gun aim angle 42 degrees (alt 3000 AGL), and slant range of 4500 feet. Elevation setting 25 mils down." While elevation of the sight is adjustable, azimuth is set with bolts when the sight is bore sighted. If the firing conditions vary from the bore sight conditions in either altitude, true air speed, or slant range, the correct target lead may be computed as follows:

a. First obtain the vertical mil deflection and total lateral mil deflection for the bore sight conditions (figures 4-17 and 4-18) and the desired firing conditions.

b. Subtract the vertical mil deflection for the desired firing conditions from the vertical mil deflection for the bore sight conditions. The result is the number of mils the target must be led in the vertical plane.

c. Subtract the lateral mil deflection for the desired firing conditions from the lateral mil deflection for the bore sight conditions. The result is the number of mils the target must be led in the lateral plane.

As an example, assume that the guns are bore sighted for the conditions of 130 K TAS, gun aim angle 42 degrees (3000 feet altitude AGL) and 4500 feet slant range. It is desired to fire at 45 degrees gun aim angle, from an altitude of 2000 feet at a TAS of 140 K. From curve (figure 4-13) it is seen that the gun aim angle of 45 degrees gives a slant range of 2800 feet. Compute the mil lead for boresight conditions as follows:

a. Enter curve (figure 4-17) with the 4500 feet slant range at the bottom and move up to the 42 degree gun aim angle. Move laterally to the left to read minus 21 mils vertical deflection for the bore sight conditions.

b. Enter curve (figure 4-18) with the airspeed of 130 K and move up to the intersection of 4500 feet slant range curve. Move laterally to the left to read 81 mils lateral jump deflection.

d. Enter curve (figure 4-18) with 4500 feet slant range at bottom, move up to parallax curve and move laterally to the right to read lateral parallax deflection of minus 6 mils.

d. The mil lead for the bore sight conditions are determined to be minus 21 vertical deflection and 81 minus 6, or 75 mils lateral deflection.

In the same manner, the mil lead for the desired firing conditions are computed to be minus 6 mils vertical deflection and 77 mils lateral deflection. The difference between the desired and bore sight conditions are 21 minus 6, or 15 mils vertical deflection. The sight pip should be 15 mils above target. The lateral difference between desired and bore sight conditions is 77 mils minus 75 mils or 2 mils, the amount by which the pip must lead the target in the lateral plane.

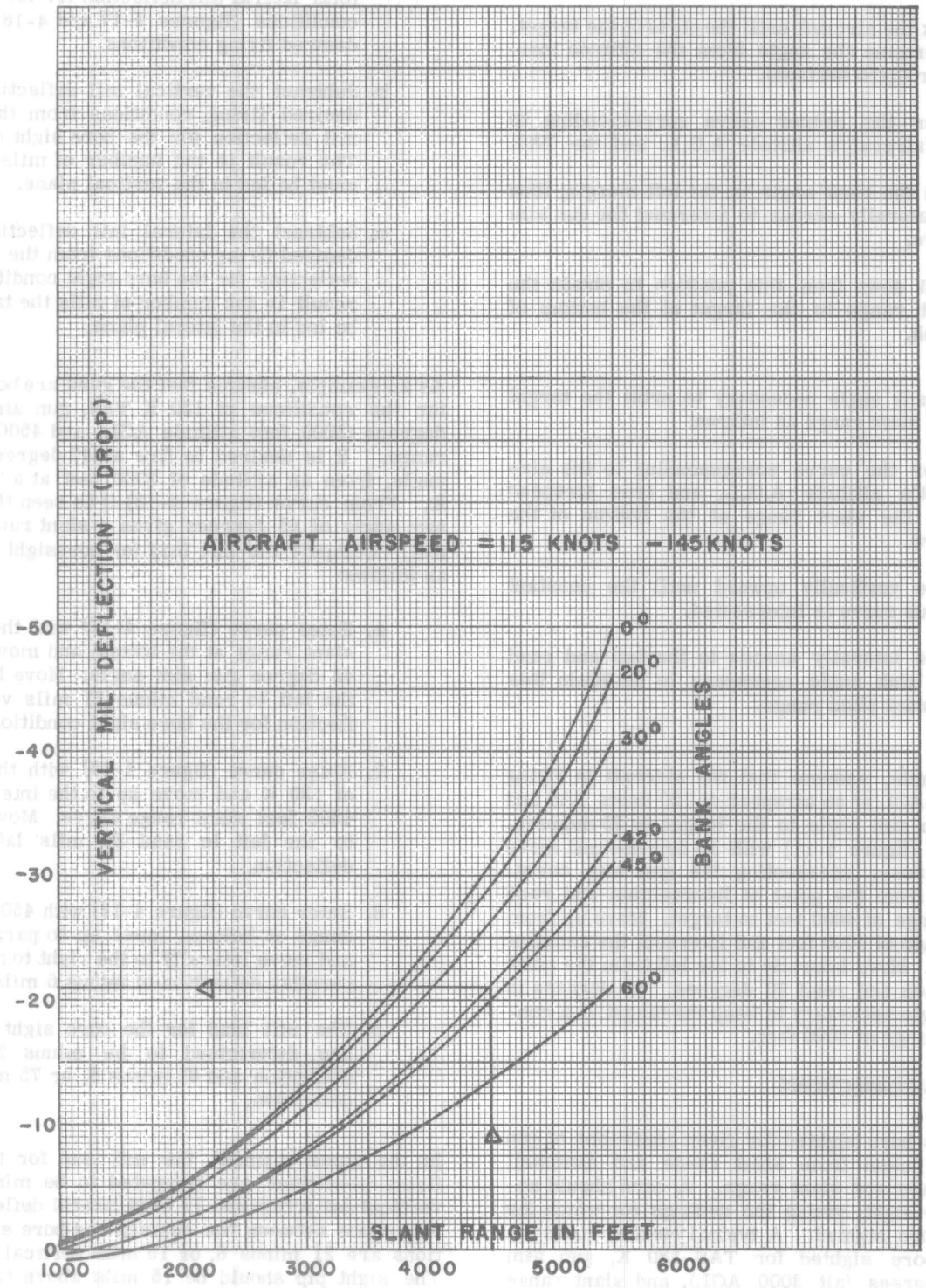


Figure 4-17. Gun Aiming Curve

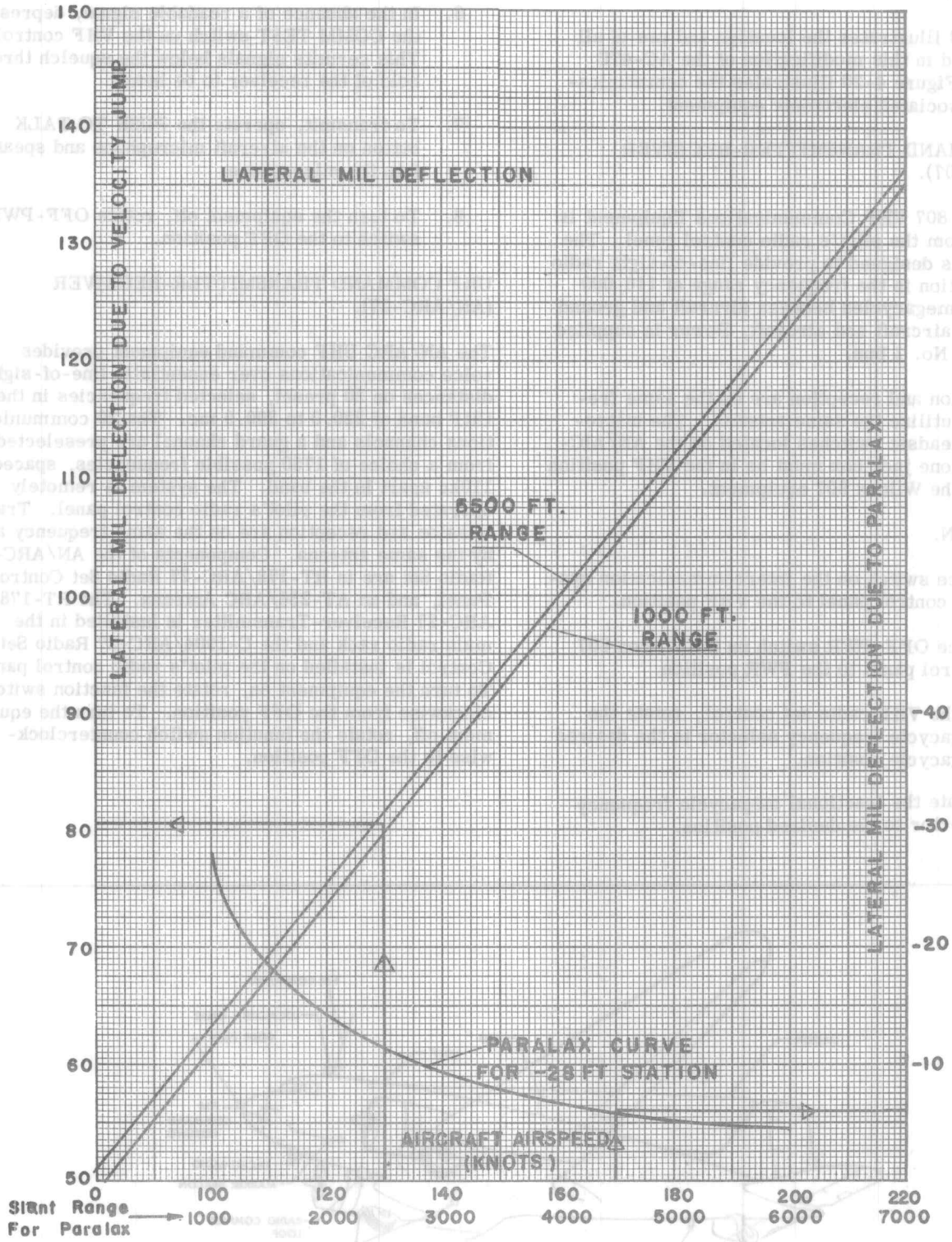


Figure 4-18. Gun Aiming Curve

COMMUNICATION AND ASSOCIATED ELECTRONIC EQUIPMENT.

ANTENNAS.

Figure 4-19 illustrates the location and use of all antenna used in this modification of the AC-47D Aircraft. Figure 4-20 illustrates the communication and associated electronic equipment.

VHF COMMAND TRANSMITTER-RECEIVER (WILCOX 807).

The Wilcox 807 VHF Communications Equipment is operated from the pilot's radio control panel. The equipment is designed to provide line-of-sight radio communication in the frequency range of 116,000 to 149,975 megacycles between aircraft and ground or between aircraft and aircraft, Power is supplied through the No. 1 bus.

Transmission and reception are on the same frequency and utilize the same antenna. The microphone and headset switches located on the AN/AIC-10A interphone jack box must be in the VHF position to operate the Wilcox 807 equipment.

OPERATION.

1. Place switch on the intercommunication system control panel to the VHF position.
2. Place OFF-PWR switch on the Wilcox 807 control panel to the PWR position.
3. On the VHF radio set control, rotate the megacycle frequency selector to the desired megacycle position.
4. Rotate the fractional megacycle frequency selector to the desired position.
5. Adjust VOL control until the control unit voice signals heard in the headset are clearly audible.
6. In the absence of a readable signal, depress the COMM TEST switch on the VHF control. This permits signals below the squelch threshold of the receiver to be heard.
7. To transmit, operate the PUSH TO TALK button on the aircraft microphone and speak into the microphone.
8. To turn the equipment off, rotate OFF-PWR switch to the OFF position.

UHF COMMAND TRANSMITTER-RECEIVER (AN/ARC-27).

The AN/ARC UHF command equipment provides voice communications over essentially line-of-sight distances on 20 preset, selected frequencies in the UHF band of 220.0 to 399.9 mc. The 20 communications channels and a guard channel are preselected from a choice of 1750 possible frequencies, spaced 110kc apart in the band. The system is remotely operated from the pilot's radio control panel. Transmission and reception are on the same frequency and by the same antenna. Components of the AN/ARC-27 Radio Set are in RT-178/ARC-27 Radio Set Control Panel, and an AT-256/ARC Antenna. The RT-178/ARC-27 Receiver-Transmitter is installed in the main radio rack and the C-1904/ARC-27 Radio Set Control is installed on the pilot's radio control panel. To turn the equipment on, rotate the function switch clockwise from the OFF position. To turn the equipment off, rotate the function switch counterclockwise to the OFF position.

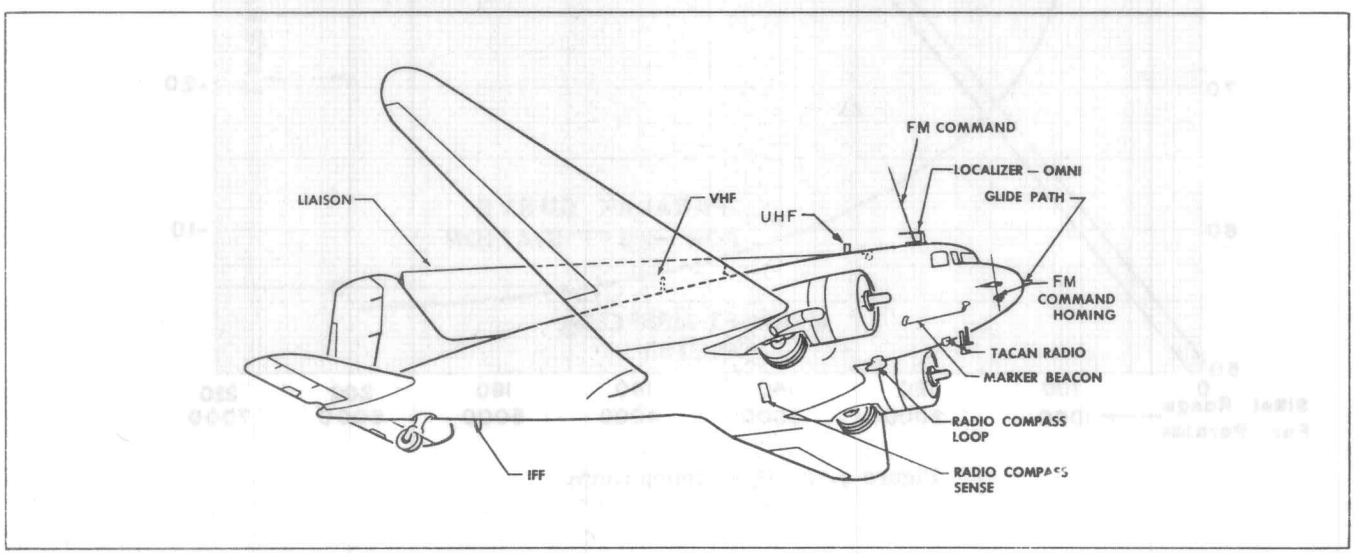
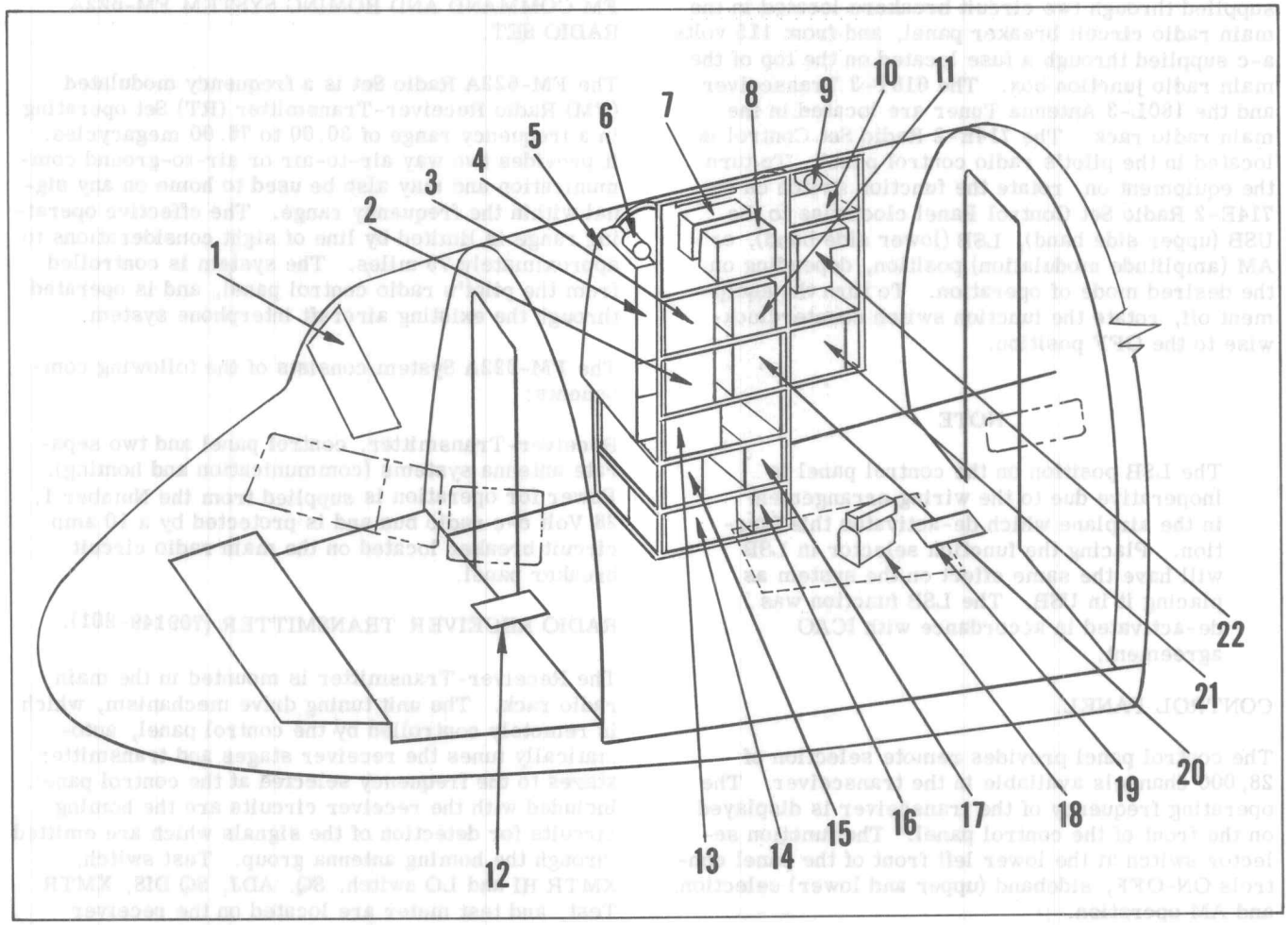


Figure 4-19. Location and Use of Antennas



1. Pilots Radio Control Panel
2. VHF Radio Receiver
3. Radio Circuit Breaker Panel
4. VHF Radio Transmitter
5. Main Radio Junction Box
6. OMNI Bearing Indicator
7. Compass Repeater Amplifier
8. Fluxgate Compass Amplifier
9. Azimuth Indicator
10. TACAN Radio Transmitter-Receiver
11. Glide Path Receiver
12. Pilots Interphone Panel
13. FM Command Receiver-Transmitter
14. Automatic Radio Compass Receiver
15. UHF Transmitter-Receiver
16. Marker Beacon Receiver
17. OMNI Localizer Receiver Dynamotor
18. LORAN Receiver
19. Navigators Interphone Panel
20. OMNI Localizer Receiver
21. Liaison Radio Receiver-Transmitter
22. Liaison Antenna Coupler

Figure 4-20. Communication and Associated Electronic Equipment (Typical)

CAUTION

To proclude damage to the equipment, allow at least one minute for the set to warm up before operating.

CAUTION

Do not rotate the channel selector while the tuning cycle is in progress.

HF LIAISON COMMUNICATIONS SYSTEM (Collins HF-103).

The Collins HF-103 Liaison Communications System provides long range voice communications in the frequency range of 2.0 to 30.0 megacycles on any one of 28,000 directly selectable frequencies. The system consists of a 618T-3 Transceiver, a 714E-2 Radio Set Control Panel, a 180L-3 Antenna Tuner, and a long wire antenna. An antenna coupler, used with the system, permits the liaison antenna to be used for AN/APN-70 LORAN reception as well as for liaison transmission and reception, but not simultaneously. The system is operated from 28 volts d-c

supplied through two circuit breakers located in the main radio circuit breaker panel, and from 115 volts a-c supplied through a fuse located on the top of the main radio junction box. The 618T-3 Transceiver and the 180L-3 Antenna Tuner are located in the main radio rack. The 714E-2 Radio Set Control is located in the pilot's radio control panel. To turn the equipment on, rotate the function switch on the 714E-2 Radio Set Control Panel clockwise to the USB (upper side band), LSB (lower side band), or AM (amplitude modulation) position, depending on the desired mode of operation. To turn the equipment off, rotate the function switch counterclockwise to the OFF position.

NOTE

The LSB position on the control panel is inoperative due to the wiring arrangement in the airplane which de-activates this function. Placing the function selector in LSB will have the same effect on the system as placing it in USB. The LSB function was de-activated in accordance with ICAO agreement.

CONTROL PANEL.

The control panel provides remote selection of 28,000 channels available in the transceiver. The operating frequency of the transceiver is displayed on the front of the control panel. The function selector switch at the lower left front of the panel controls ON-OFF, sideband (upper and lower) selection, and AM operation.

An RF SENS on the right side of the panel controls the radio frequency gain of the transceiver. Frequency selection is accomplished by rotating the four knobs on the control panel until the desired frequency appears in the window.

ANTENNA TUNER.

An antenna tuner is installed for the liaison antenna to vary the effective impedance of the antenna. The tuner automatically tunes the antenna to match the impedance of the transceiver. During transmission, the tuner breaks the receiving circuit to prevent feedback into the receiver. The liaison antenna tuner is mounted over the Collins 618T-3 transceiver in the main radio rack. An SWR (Standing Wave Ratio) meter on the front panel of each antenna tuner indicates the accuracy of antenna tuning for any particular operating frequency. The meter is graduated from 0 to 10, and the meter should indicate less than 3.5 during all transmissions.

NOTE

The liaison antenna tuner automatically disconnects the AN/APN-70 LORAN receiver from the liaison antenna during transmissions on the liaison communications system.

FM COMMAND AND HOMING SYSTEM FM-622A RADIO SET.

The FM-622A Radio Set is a frequency modulated (FM) Radio Receiver-Transmitter (RT) Set operating in a frequency range of 30.00 to 76.00 megacycles. It provides two way air-to-air or air-to-ground communication and may also be used to home on any signal within the frequency range. The effective operating range is limited by line of sight considerations to approximately 75 miles. The system is controlled from the pilot's radio control panel, and is operated through the existing aircraft interphone system.

The FM-622A System consists of the following components:

Receiver-Transmitter, control panel and two separate antenna systems (communication and homing). Power for operation is supplied from the Number 1, 28 Volt d-c radio bus and is protected by a 10 amp circuit breaker located on the main radio circuit breaker panel.

RADIO RECEIVER-TRANSMITTER (709149-801).

The Receiver-Transmitter is mounted in the main radio rack. The unit tuning drive mechanism, which is remotely controlled by the control panel, automatically tunes the receiver stages and transmitter stages to the frequency selected at the control panel. Included with the receiver circuits are the homing circuits for detection of the signals which are emitted through the homing antenna group. Test switch, XMTR HI and LO switch, SQ, ADJ, SQ DIS, XMTR Test, and test meter are located on the receiver transmitter.

CONTROL PANEL 709150-801.

The control panel is mounted on the pilot's radio control panels. It contains the receiver transmitter unit frequency selector, mode control switch, receiver volume control, squelch switch, and frequency indicators (which displays hundredths megacycles, tenths megacycles, units megacycles, and tens megacycles).

ANTENNA (ANTENNA COUPLER 709150-801 AND ANTENNA ELEMENT 709226-801).

The communication antenna coupler and element (whip) are mounted on top of the fuselage above the navigator's station.

RELAY C-3519.

The relay is mounted in the radio rack and is used in conjunction with the ARC-54/FM-622A switch located in the radio rack.

Radio Set AN/ARC-54 may be used in place of the FM-622A system. It consists of Receiver-Transmitter RT-348/ARC-54 and Control C-3835/ARC-54. The AN/ARC-54 radio set utilizes the same antenna installed for the FM-622A unit.

NOTE

The FM-622A Receiver-Transmitter and the AN/ARC-54 Receiver-Transmitter are functionally interchangeable and either may be installed. However, when the AN/ARC-54 RT Unit is installed, perform functional check in accordance with T.O. 12R2-2ARC-54-1, Operation and Organizational Maintenance Manual.

OPERATING PROCEDURES.

PRELIMINARY STARTING PROCEDURES.

1. Control Panel.

   a. Set the FM-622A control mode switch to the OFF position.

   b. Set the SQUELCH switch to CARR.

   c. Rotate the VOL control to the full counterclockwise position.

FM RECEPTION.

Engage the FM-622A System circuit breaker and perform the following:

1. Control Panel.

   a. Set the FM-622A control mode switch to T/R and SQUELCH control for desired squelch mode. (DIS position disables the squelch circuits, CARR position provides selective squelch, and TONE position provides selective calling (tone squelch).) Allow a 20 second warmup period.

   b. Adjust frequency controls to a desired frequency and listen for a channel-changing tone in the headset as the radio set is tuned.

   c. Adjust the VOL control for comfortable volume.

The system will now operate as an FM Communications Receiver and the receiver signal can be heard at the pilot, copilot and navigator's interphone system stations.

FM TRANSMISSION

The pilot, copilot or navigator may transmit by using their respective existing microphones.

HOMING RECEPTION

To operate the equipment as a homing receiver, place the SQUELCH control in CARR or TONE, however, the carrier squelch is automatically selected by an internal contact arrangement in the HOME position. Operation is possible in the DIS position; however, the flags will be inoperative.

Adjust frequency control to the frequency of a known local VHF/FM station.

Observe homing indicator ID-48/ARN. The vertical pointer flag should disappear and the vertical pointer should deflect right or left depending on bearing to transmitter (indicator pointer remains centered if aircraft is aligned with bearing to transmitter).

Over the station, position is indicated by the homing indicator horizontal pointer. Increasing signal strength as the aircraft approaches the homing station is indicated by the rising of the horizontal pointer.

HOMING INDICATOR (ID-48/ARN)

Indicator ID-48/ARN is used with the FM-622A homing capability. Signals received for the left or right impedance matching networks (CU-459/AR) and antenna elements (AT-624A/AR) are relayed to the FM-622A receiver-transmitter through the homing circuits, then relayed to the homing indicator. Deviation of the aircraft course either left or right, to or from will be indicated by the displacement of the vertical or horizontal pointers, regardless of position of aircraft in relation to the station.

To turn the system off, place the FM-622A control mode switch to the OFF position.

SEEK SILENCE EQUIPMENT (KY-8)

The aircraft incorporates a KY-8 Seek Silence capability. The unit is located in the radio rack. The control panel is mounted on the pilot's radio control panel (figure 4-23). The 28 volt dc power for the KY-8 unit is supplied through the No. 1 bus.

OPERATING PROCEDURES

WARNING

If operation does not proceed as outlined, switch to PLAIN VOICE. DO NOT PASS CLASSIFIED TRAFFIC.

1. Push in KY-8 Circuit Breaker.

2. Daily Key: SET.

3. Connectors: Assure that all connectors are installed correctly.

4. Local-Remote Switch LOCAL.

5. Plain Cipher Switch: CIPHER.

6. Power Switch: ON.

7. Alarm Test: Rotate clockwise. Pause at each setting. Red light should blink.

8. Alarm Test: OFF.

9. Local-Remote Switch: REMOTE.

10. Power Switch: ON.

11. KY-8 Control C-7213/ARC, On Power Switch: ON.

12. Delay Switch: OFF (DOWN).

13. Mode Switch: PLAIN.

NOTE

Accomplish Test Transmission in both VHF/FM and UHF Mode of operation.

14. Mode Switch:

a. Set mode switch to C/RAD 1 (VHF/FM). Push mike switch, listen for beep (should be heard in approximately three seconds). After beep, system is ready for secure transmission with equivalent secure speech equipment.

b. Set mode switch to C/RAD 2 (UHF). Check in accordance with step 14. a.

15. Upon completion of operational check, turn power switch OFF.

NOTE

Installation and removal of KY-8 Unit will be accomplished by USAFSS personnel.

INTERCOMMUNICATION SYSTEM. (AN/AIC-10A).

The AN/AIC-10A intercommunication system provides interior communication between each of the crew members and permits the pilot, copilot, and navigator to monitor all radio communications receivers as well as the ADF, VOR, TACAN, and the Marker Beacon navigation receivers. Provisions are made for the pilot, copilot, and navigator to transmit over the VHF Command, UHF Command, FM Command, and HF Liaision Communications System through the AN/AIC-10A intercommunication system.

An intercommunication station, with the capability for interior communication only, is provided on the right side of the cabin approximately half way between the cargo door and the forward cabin bulkhead. This intercommunication station is provided with four long headset cords, one for the flight mechanic, long enough to reach to the pilot's compartment and capable of transmission and reception, and three retractable coil cords for the gunners.

The pilot, copilot, and navigator are each provided with a C-824A/AIC-10 Control Panel and a C-826/AIC-10 Control Panel. The flight mechanic and the gunners operating from the cabin station are provided with one C-823A/AIC-10 Control Panel. Each crew member is provided with a Headset Microphone.

Some aircraft incorporate hot mic capability at the pilot's and copilot's positions. This capability allows the pilot and copilot to speak into the headset microphone without the necessity of depressing the microphone button.

C-824A/AIC-10 INTERCOMMUNICATION MONITORING CONTROL PANEL (FIGURE 4-21).

The C-824A/AIC-10 Control Panel has three operating controls and a set of five mixing switches. The three operating controls are: a volume control, marked VOL, which varies the volume of the incoming signals; a two-position (NORMAL, AUX LISTEN) switch, which is usually in the NORMAL position and is shifted to the AUX LISTEN position for emergency operation; and a six-position selector switch which selects any one of six different channels for reception-transmission. The six positions of the selector are marked CALL, INTER, UHF, VHF, HF, and FM.

On aircraft incorporating hot mic capability, the six positions of the selector are marked CALL, INTER, UHF/HOT MIC, VHF, HF, and FM (figure 4-21).

The CALL position interrupts all communications over all other stations having a C-824A/AIC-10 Control Panel, and enables the operator to address all intercommunications stations at the same time. When the CALL function on the cargo compartment C-823A/AIC-10 Control Panel is used, any channel on the flight deck is interrupted, and the message from the cargo compartment is heard at all stations. This is a momentary position and the selector switch must be held on CALL while it is being used. When the switch is released it automatically returns to the INTER position, which is the normal position for intercommunication use.

The UHF position permits communication on the AN/ARC-27 Radio Set. On aircraft incorporating hot mic capability at the pilot's and copilot's stations, the UHF/HOT MIC position serves a dual purpose. At this position and with the INTER mixing switch in the ON (up) position, the headset microphone is hot (on). This permits intercommunication by the pilot and copilot without the necessity to depress the microphone button. To communicate over the UHF radio set, place the INTER mixing switch in the OFF (down) position and depress the microphone button. The VHF position permits communication on the AN/ARC-3 Radio Set. The HF position permits communication on the HF-103 Radio Set. The FM position permits communication on the FM-622A Radio Set.

The five mixing switches along the top of the panel connect output from the various radio receivers into the intercommunication panel, and allow the operator to monitor these channels in addition to the

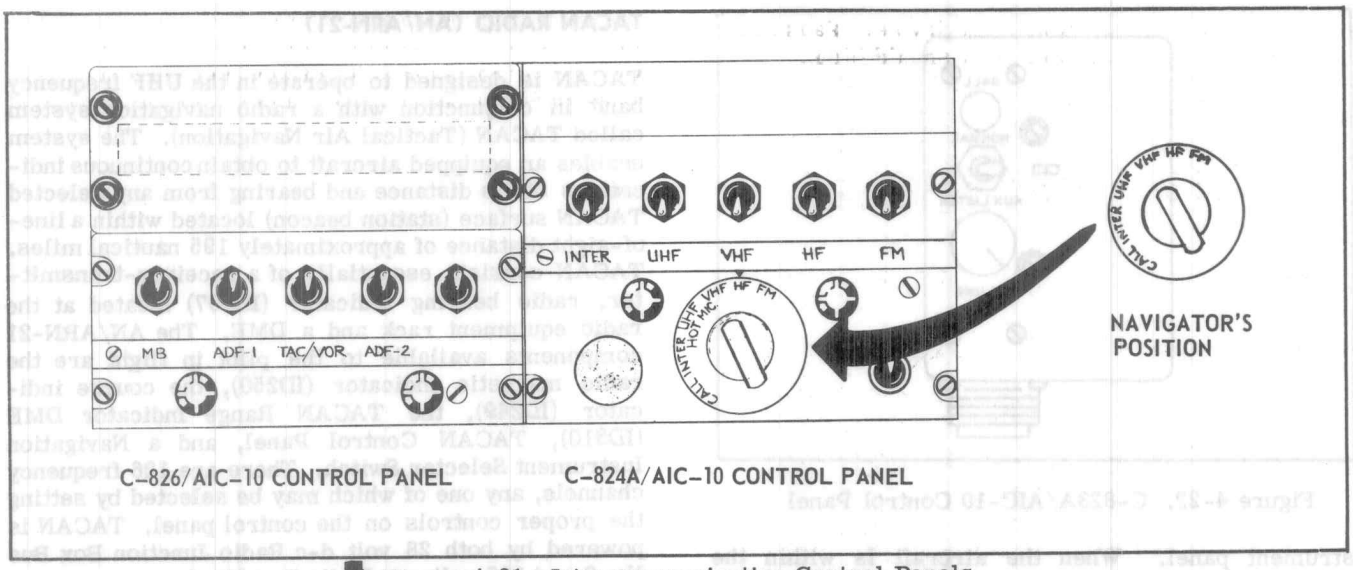


Figure 4-21. Intercommunication Control Panels

channel set by the selector switch. The five switches are labeled INTER, UHF, VHF, HF, and FM. Placing any one of these switches in ON (up) position mixes the signal from that channel with the signal on the channel set by the selector switch.

C-826/AIC-10 INTERCOMMUNICATION MONITORING SWITCH PANEL (FIGURE 4-21).

The C-826/AIC-10 control panel is used with the C-824A/AIC-10 control panel to provide additional monitoring channels. The only operating controls on this panel are a set of five mixing switches, which operate in the same manner as the mixing switches on the C-824A/AIC-10 control panel. The switches are labeled MB (marker beacon), ADF-1, TAC/VOR (TACAN or VOR, depending on the position of the TACAN/VOR selector switch located on the pilot's radio control panel), and ADF-2. The other switch is a spare and is not in use.

C-823A/AIC-10 CONTROL PANEL

The C-823A/AIC-10 control panel (figure 6-28) is used only on the intercommunication circuit. The panel has three operating controls: VOL control, a two-position (NORMAL, AUX LISTEN) switch, and a CALL button. These controls operate in the same manner as the controls on the C-824A/AIC-10 control panel, except that to call, the CALL button cover must be unscrewed and the button pressed.

NOTE

On the C-823A/AIC-10 control panel, never set the volume control so low that a "call" signal from another station will not be heard.

EMERGENCY OPERATION OF CONTROL PANELS

Emergency operation of the control panels is provided by the NORMAL-AUX LISTEN switch. When the switch is placed in the AUX LISTEN position, the control panel amplifier is bypassed, and incoming signals are heard at line-level volume. At the C-824A/AIC-10 and C-826/AIC-10 control panels, the AUX LISTEN position also places the incoming channels on a priority basis, and only one channel at a time can be heard. When all mixing switches are in the off (down) position, the audible signal will be that on the channel selected by the channel selector switch. If one or more mixing switches are in the on (up) position, the audible signal will be that from the mixing switch with the highest priority. The switches are assigned priority from left to right, starting on the C-824A/AIC-10 control panel, and continuing through the C-826/AIC-10 control panel. The switch with the highest priority is the left-hand switch on the C-824A/AIC-10 panel. The switch with the lowest priority is the right-hand switch on the C-826/AIC-10 panel.

HEADSET MICROPHONE

Headset microphones are located at each intercommunication station for reception and transmission over the channels covered at the individual stations. Each set consists of two earphones mounted on a head band, a boom-type microphone attached to a bracket on one earphone, and a cable assembly which ends in a telephone plug. The plug connects the head set to the intercommunication control panel when it is inserted in a connector jack on the end of a cable from the control panel.

IFF/SIF EQUIPMENT

Power for the identification radio equipment is provided by the 28 volt d-c Radio Bus No. 2 and the 115 volt a-c Radio Bus No. 1. Refer to appropriate manual for operating instructions.

MARKER BEACON RECEIVER (RC193A or AN/ARN-12)

The 28 volt d-c marker beacon receiver has no controls, but comes on automatically when power is supplied to the No. 2 Radio d-c bus. The marker beacon indicator light is mounted on the main in-

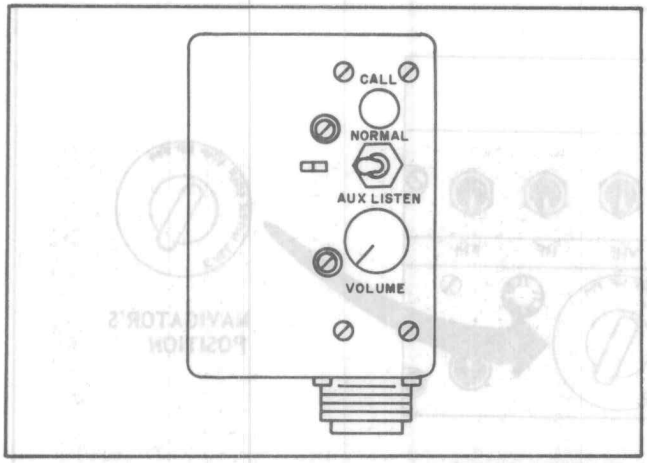


Figure 4-22. C-823A/AIC-10 Control Panel

strument panel. When the aircraft is within the radiation pattern of a 75 megacycle marker beacon transmitter, the indicator light illuminates and the aural signal is received.

AUTOMATIC RADIO COMPASS (AN/ARN-7)

The radio compass is operated from the radio control panel (figure 4-23) in the pilot's compartment. Power is supplied to the equipment from the 28 volt d-c bus and from the 115 volt inverter system. The automatic compass system is used for the reception of radio voice or code communications and for navigation and homing. To turn on the radio compass, place the function selector switch on the automatic compass tuning control panel at COMP, ANT, or LOOP, as desired. To turn the equipment off, place the function selector switch in the OFF position.

OMNI-RANGE AND LOCALIZER RECEIVER AND GLIDE PATH RECEIVER (AN/ARN-14 and AN/ARN-18)

This equipment is controlled from the VHF NAV radio control panel in the pilot's compartment (25, figure 6-29). Its power sources are the 28 volt d-c No. 1 Radio Bus for the course indicator (ID249) except the heading pointer. 115 volts a-c power from the No. 2 a-c radio bus is required for the heading pointer and the radio magnetic indicator (ID250). Omni-range and instrument landing system approach localizer frequencies are selected on the frequency control unit. Glide path frequencies are automatically paired with their respective localizer frequencies. Omni-range courses are selected with reference to the head or tail of the (VOR NO. 2) bearing indicator and set in the course selector window located on the main instrument panel. The function of the equipment is radio navigation and instrument landing. To turn on the equipment, place the VHF NAV POWER switch in the ON position. To turn off the equipment, turn the VHF NAV POWER switch OFF.

NOTE

In case of complete inverter failure power is still available to operate the CDI of the ID249 when used with the ARN-14.

TACAN RADIO (AN/ARN-21)

TACAN is designed to operate in the UHF frequency band in conjunction with a radio navigation system called TACAN (Tactical Air Navigation). The system enables an equipped aircraft to obtain continuous indications of its distance and bearing from any selected TACAN surface (station beacon) located within a line-of-sight distance of approximately 195 nautical miles. TACAN consists essentially of a receiver-transmitter, radio bearing indicator (ID307) located at the radio equipment rack and a DME. The AN/ARN-21 components available to the pilot in flight are the radio magnetic indicator (ID250), the course indicator (ID249), the TACAN Range Indicator DME (ID310), TACAN Control Panel, and a Navigation Instrument Selector Switch. There are 126 frequency channels, any one of which may be selected by setting the proper controls on the control panel. TACAN is powered by both 28 volt d-c Radio Junction Box Bus No. 2 and 115 volt a-c Radio Bus No. 1.

TACAN CONTROL PANEL

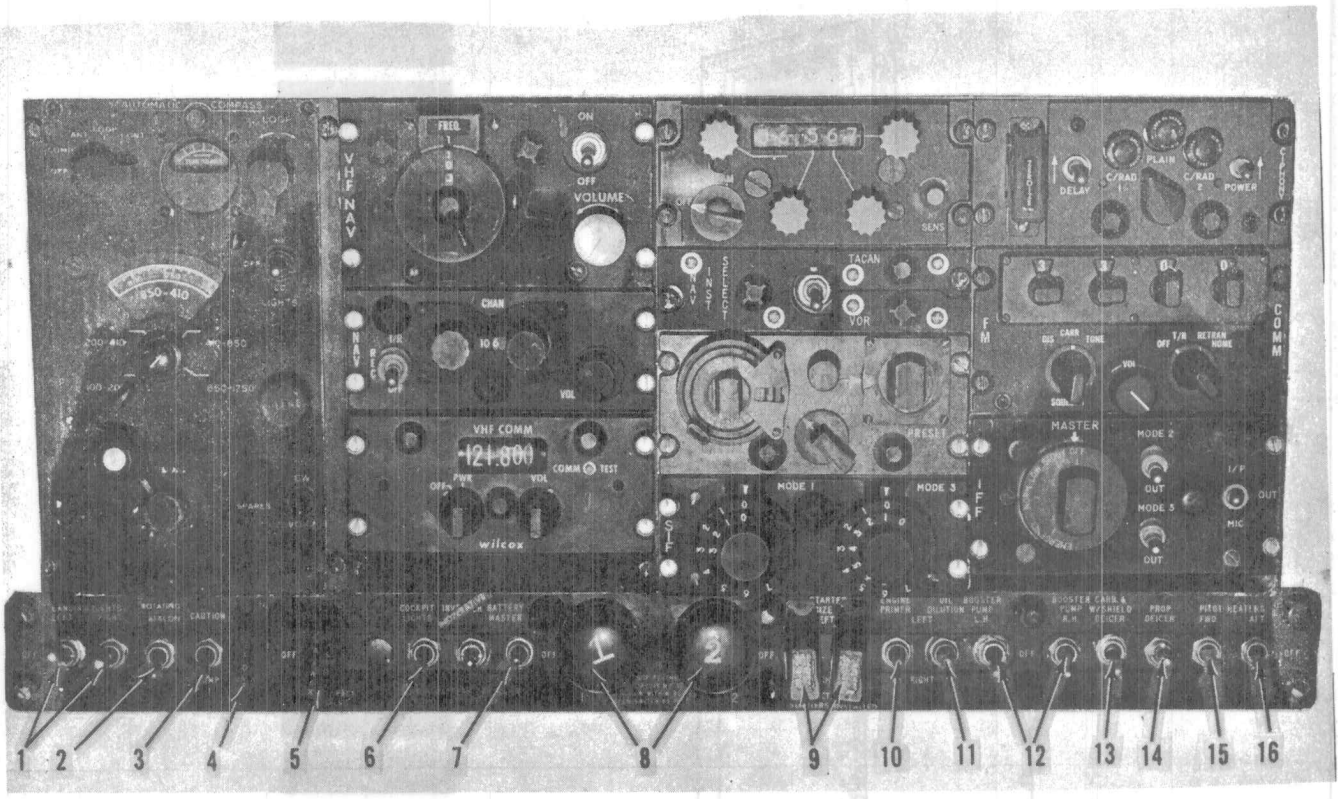
The TACAN control panel located on the pilot's radio control panel, has a power switch with OFF, REC and T/R positions, two channel selector knobs, a channel window, and a volume control knob. With the power switch in the REC position, the distance function of the set is disabled, and only bearing information is available. With the power switch in the T/R position, both bearing and distance information is displayed on the indicators. The left or outside on the concentric channel selector knob selects the first two figures of the TACAN beacon channel number, and the right or inside channel selector knob selects the third number. The volume control knob is used to adjust the volume of aural identification signals received from the TACAN surface beacon.

NAVIGATION INSTRUMENT SELECTOR SWITCH

A navigation instrument selector switch with TACAN and VOR positions is located on the pilots' radio control panel. When the switch is positioned to VOR, the omni-range receiver controls the course indicator and the No. 2 needle of the radio magnetic indicator (RMI). When the switch is positioned to TACAN, the TACAN radio controls the course indicator and the No. 2 needle of the radio magnetic indicator. The switch receives power from the 28 volt d-c system through a circuit breaker on the radio circuit breaker panel (figure 4-24).

COURSE INDICATOR (ID 249/ARN)

The course indicator ID249 is used in conjunction with both the VOR and TACAN. Signals received from either radio are relayed to the course deviation indicator of the course indicator. Deviation of the aircraft course either left or right of the selected course will be indicated by the displacement of the course deviation indicator, regardless of position of aircraft in relation to the station.



1. Landing Light Switches
2. Passing Lights Switch
3. Jump Warning Switch
4. Bail-out Warning Switch
5. Para Pack Salvo Switch
6. Cockpit Lights Switch
7. Battery Master Switch
8. Propeller Feathering Switches
9. Starter Switches
10. Engine Primer Switch
11. Oil Dilution Switch
12. Booster Pump Switches
13. Carb, and Windshield Deicer Switch
14. Propeller Deicer Switch
15. Forward Pitot Heater Switch
16. Aft Pitot Heater Switch.

Figure 4-23. Electrical Control Panels - Typical

RADIO MAGNETIC INDICATOR ID 250

The radio magnetic indicator (figure 4-25) is also used with AN/ARN-21 (TACAN) as well as with the AN/Radio Compass. It consists of a rotating compass card, actuated by the directional indicator (slaved) system, and two bearing indicators. The bearing indicators are connected to function as a single unit and are actuated by the receiver portion of the AN/ARN-21 when TACAN is selected. Azimuth signals from the TACAN surface beacon are then received by the AN/ARN-21 and relayed to the radio magnetic indicator, causing the bearing indicators to indicate the magnetic bearing of the TACAN surface beacon. With the control switch in the REC position bearing information may be received even though the transmitter portion of the set is not energized.

TACAN RANGE INDICATOR

A TACAN range indicator is installed on the pilot's instrument panel. The indicator displays the slant range distance in nautical miles between the airplane and the TACAN surface beacon. The numerals in the window are controlled by the range circuits of the AN/ARN-21 TACAN. While the indicator is "searching" for the correct range or when the switch is in the REC position, the rotating numbers are partially covered by a red flag, which warns

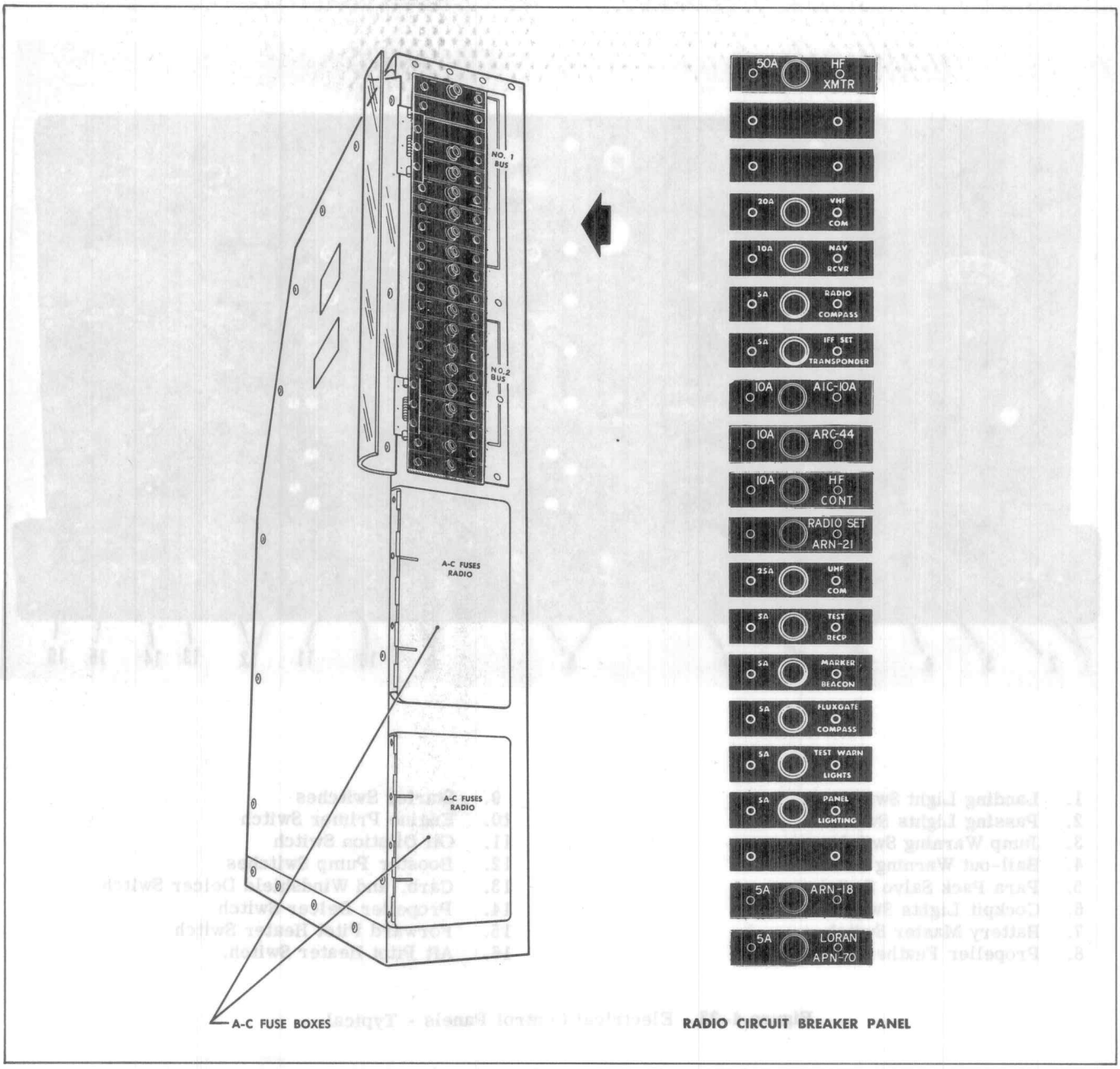


Figure 4-24. Main Radio Circuit Breaker Panel

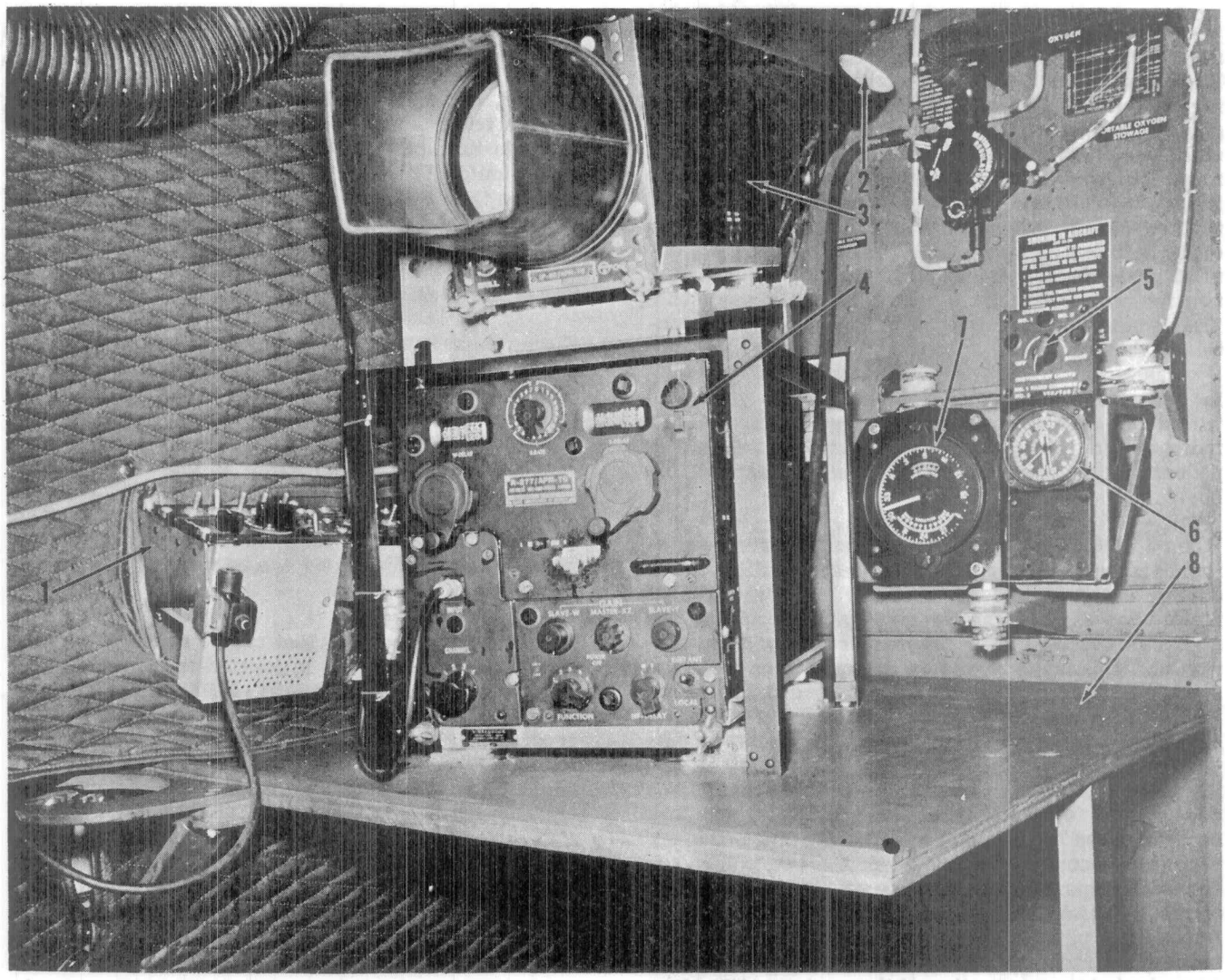
the pilot against reading incorrect distance indications.

TACAN RADIO OPERATION

1. Navigation instrument selector switch - TACAN.
2. Function switch - T/R or REC.
3. Channel selector knobs - Desired Channel.
4. Volume control knobs - As Required.
5. Bearing selector knob (course indicator) - Desired Bearing.
6. To Stop, function switch - OFF.

NOTE

The AN/ARN-21 and AN/ARN-18 installation wiring has been specially modified on the FC-47D aircraft to disable the glide path flag, on the 1D-249/ARN Course Indicator, when the TACAN/VOR selector switch on the pilots radio control panel is in the TACAN position. The glide path flag will therefore always be in sight when the course indicator is being used for TACAN, thereby warning the pilot not to use the course indicator for instrument approaches (ILS).



1. Interphone Control Box
2. Table Work Lamp
3. Loran Indicator
4. Loran Receiver
5. Work Lamp Dimmer
6. Radio Magnetic Indicator
7. MDI, Flux Gate Compass
8. Navigator's Work Table

Figure 4-25. Navigator's Station - Typical

LORAN NAVIGATIONAL EQUIPMENT (AN/APN-70)

The AN/APN-70 LORAN (long range navigation) system provides a means of determining the geographic location of the airplane for navigational purposes. The equipment consists of a receiver for detecting LORAN signals and a cathode ray tube indicator for displaying the received signals in the form of pulses. Two decade-type revolution counters on the receiver enable the operator, mechanically, to measure and retain the indicated time difference between reception of the pulses from different LORAN transmitters. This indicated time difference is used with LORAN navigation charts to determine the geographical location of the airplane. The system operates in the standard high frequency band from 1700 to 2000 kilocycles. The LORAN system consists of a R-277/APN-70 Receiver, a IP-58/APN-70 Indicator, and a CU-308/U Antenna Coupler all of which are mounted on the navigator's worktable. All operating controls for the system are located on the face of the receiver, convenient to the navigator. The receiver is connected to the liaison communication system antenna through an antenna coupler. The receiver may be used at any time that transmissions are not being made on the liaison communication systems. For operation, the LORAN system obtains 28 volt d-c through the main radio circuit breaker panel, and 115 volt a-c through a fuse located on top of main radio junction box.

OPERATION

Readings from two LORAN transmitting systems are

required to determine the exact location of the airplane. Each system consists of two transmitters broadcasting on the same frequency, but situated at different geographical locations. The receiver detects the signals from both transmitters and displays them in the form of pulses on the LORAN indicator. By determining the indicated time difference between reception of the two signals, the operator is able to fix the position of the airplane along a LORAN line of position. By obtaining readings from two different LORAN systems, two intersecting LORAN lines of position are found. The location of the airplane is fixed at the intersection of these lines.

In operation, a variable time interval is generated within the receiver and is displayed on the LORAN indicator in the form of two horizontal sweeps. A pedestal, or reference pip, appears on each of the horizontal sweeps.

When a LORAN transmitting system is within receiving distance of the airplane (700 to 900 nautical miles during the day, and up to 1,400 nautical miles at night), two signals are detected by the receiver. One signal is detected from the master transmitting station and a delayed signal is detected from the slave station. These signals are displayed on the indicator in the form of pulses on the reference sweep lines generated by the receiver. The master pulse is displayed on the top sweep line. The slave pulse is displayed on the bottom sweep line. The received pulses are aligned with the reference pedestals, and then superimposed by means of a W-DELAY or a Y-DELAY revolution counter crank. When the two pulses are correctly superimposed, the reading on the W-DELAY or the Y-DELAY (whichever control is used to superimpose the pulses) revolution counter gives a direct reading of the indicated time difference, in microseconds, between reception of the master and the slave pulses. This time difference is then used to find one line of position on the LORAN navigation chart. Repeating the same procedure for a second set of LORAN transmitting stations, using the opposite DELAY controls, a second indicated time difference and LORAN line of position is found. The intersection of these two lines determines the location of the airplane.

RECEIVER (See figure 4-25).

The LORAN receiver contains all operating controls for the LORAN system. The work of the receiver is to receive and interpret signals from LORAN transmitters and supply them to the cathode ray tube indicator for display. The operating controls on the receiver include a W-DELAY revolution counter, a Y-DELAY revolution counter, an R. RATE selector, a DRIFT control, a L-R control, a CHANNEL selector, a FUNCTION selector, an HF-DELAY switch, a SLAVE-W gain control, a MASTER-XZ gain control, and a LOCAL-DISTANT switch. The work of each of these controls is discussed in subsequent paragraphs.

The main housing of the receiver includes three sub units: an r-f receiver unit, a deflection unit, and a timer unit. The r-f receiver unit is mounted in a recess on the lower side of the receiver. The unit may be removed without taking off the receiver dust cover. The work of the r-f receiver sub unit is to receive, detect, and amplify radio signals from the LORAN transmitting stations. The deflection unit is located to the right of the r-f receiver unit, below the timer unit. The work of the deflection sub unit is to prepare the received signals for display on the cathode ray tube indicator. The function of the timer sub unit is to generate the timing base for the system and to synchronize the repetition rate of the receiver with that of the received signals.

Eleven adjustment screws and nine voltmeter jacks on the right side of the receiver, and two adjustment screws and two voltmeter jacks on the bottom of the receiver are provided for adjustment purposes. Six adjustment screws and one voltmeter jack can be reached through access holes in the receiver dust cover. The remaining adjustment and test points are located under the dust cover. The receiver must be removed from the airplane and installed in a bench test set before adjustment can be made at these latter points.

The voltmeter test jack that can be reached from the outside of the receiver is located on the front of the receiver, and is labeled 115V-LINE. Using this test point, the a-c input voltage can be measured at the receiver. The six adjustment screws that can be reached from the outside of the receiver are located on the right side (facing the front of the receiver) and are identified as PED. DUR., SLOW SW. HOR. CENT., MED. TO FAST SW. HOR. CENT., SLOW SW. AMPL., MED. SW. AMPL., and FAST SW. AMPL. The function of these adjustment points is given in the following list:

ADJUSTMENT SCREW	FUNCTION
PED. DUR.	Adjusts width of the pedestal
SLOW SW. HOW. CENT.	Adjusts horizontal centering in position 1 of the FUNCTION selector
MED. TO FAST SW. HOR. CENT.	Adjusts horizontal centering in positions 2, 3, 4, and 5 of the FUNCTION selector
SLOW SW. AMPL.	Adjusts sweep length in position 1 of the FUNCTION selector
MED. SW. AMPL.	Adjusts sweep length in positions 2 and 4 of the FUNCTION selector
FAST SW. AMPL.	Adjusts sweep length in positions 3 and 5 of the FUNCTION selector

REVOLUTION COUNTERS

Two cranks are located near the top of the receiver one on each side, for operating the W- delay and the Y-delay revolution counters. The left crank operates the W-delay and the right crank the Y-delay. Each crank has two speeds. When pushed in and turned, the crank turns its counter at the rate of 1,000 units per revolution. When pulled out and turned, the crank turns its counter at the rate of 100 units per revolution.

RATE SELECTOR

The R. RATE (pulse repetition rate) selector selects any one of the 24 predetermined repetition rates to match the repetition rate of the selected transmitting stations.

DRIFT CONTROL

A manual DRIFT control and an ADC (automatic drift control) switch mounted on a common center, are located at the upper right corner of the receiver. The ADC switch has ON and OFF positions and is usually left in the ON position. In this position, the repetition rates of the transmitting group and the receiving set are automatically synchronized. If the signal - to - noise ratio of the received pulses is too low for effective ADC operation, or if interfering signals cause pulse jitter, the ADC switch may be turned to the OFF position and the manual DRIFT control used to keep the repetition rates synchronized.

L-R CONTROL

The received signals are properly positioned on the indicator screen by means of the L-R control, located near the center of the receiver. When the switch is moved to the R (right) position, the repetition rate is raised and signals drift to the right. When the switch is moved to the L (left) position, the repetition rate is lowered and the received pulses drift to the left.

CHANNEL SELECTOR

The CHANNEL selector is located at the bottom of the receiver. The selector permits selection of any one of the six preset LORAN frequencies. The first four channels are in the expanded high frequency (HF) band, while the other two are low frequency (LF) channels.

NOTE

The low frequency(LF) channels are not used in theis LORAN installation.

FUNCTION SELECTOR

The function selector is a five position switch located at the bottom of the receiver. This switch arranges the deflection circuits for obtaining readings, for navigation along a LORAN line of positions, or for a self check of the radio receiver. Five positions on the switch are labelled 1 thru 5. In position 1, the LORAN indicator displays all signals received on the channel frequency, but only those pulses at the selected repetition rate will remain steady on the indicator. The others will drift across the screen. In position 2, the sweep is expanded to cover the reference pip sections of the traces seen in position 1. Only the signals situated on the pips will be observed in this position. In position 3, the sweep is further expanded to cover only the first third of the pips seen in position 1, and the master and slave traces are superimposed for ease in matching received signals. The presentation in position 4 is similar to the position 2 presentation but is more suitable for navigation along a fixed line of position. With the function switch in position 5, the RF receiver unit is disconnected and an internal marker source is coupled to the deflection circuits for checking variable delay system accuracy.

HF DELAY SWITCH

Only one variable delay system is needed to take a reading on the high frequency channels. The HF DELAY switch selects either the W or the Y system and disables the other. Both systems are needed on the low frequency channels and the HF-DELAY switch is inoperative.

GAIN CONTROLS

Since signals from the master and slave transmitting stations may arrive at the airplane at different levels of signal strength, individual gain controls are included for each station. The strength of the individual signals can be varied by adjusting these controls to permit all signals to be presented on the indicator at the same intensity. A SLAVE-W gain control knob is provided for the slave W station, a SLAVE-Y gain control knob for the slave Y station, and a MASTER -XZ control knob for the master transmitting station. The MASTER-XZ control knob also contains a two-position (on-off) power control switch for the LORAN system. Power is disconnected from the system when the knob is turned fully counterclockwise to the POWER OFF position.

LOCAL-DISTANT SWITCH

The LOCAL-DISTANT switch determines the input signal level to the antenna coupler. When the switch is used in the DISTANT position, the full input signal is applied to the LORAN amplifier in the antenna coupler. The LOCAL position is used when the airplane is flying in the vicinity of the LORAN transmitter or when high interfering signals are present. When the switch is in LOCAL position, the input level to the LORAN amplifier in the antenna coupler is reduced approximately 20 decibels for better operating characteristics.

INDICATOR

The indicator consists of a rectangular housing containing a cathode ray tube and the necessary control circuits to present LORAN signals. All operating controls for the indicator are located on the LORAN receiver. Two screwdriver adjustment points are located on the front of the indicator. One adjustment point marked BRILL is used to adjust the trace brilliance, and the other point, marked FOCUS, is used to focus the indicated trace. Two additional screwdriver points are located on the side of the indicator. These are a VERT CENTER (vertical centering) screw, which positions the trace up or down on the face of the indicator, and an ASTIGMATISM screw, which corrects astigmatism on multiple traces and provides a sharp, distinct trace.

ANTENNA COUPLER

NOTE

The liaison antenna tuner automatically disconnects the AN/APN-70 LORAN receiver from the liaison antenna during transmission on the liaison communications system.

An antenna coupler connected in the antenna input to the receiver permits the LORAN system to use the same antenna as the liaison communication system. In operation, the coupler varies the effective impedance of the antenna to match the operating characteristics of the LORAN. During transmission on the liaison system, the coupler isolates the LORAN system from the antenna. This prevents feedback into the system with possible resulting damage to the equipment. The coupler is mounted next to the IP-58/APN-70 on the navigator's worktable. The COMM and AUX receptacles are not used.

SECTION V - OPERATING LIMITATIONS

SECTION VI - FLIGHT CHARACTERISTICS

SECTION VII - SYSTEMS OPERATION

(See T.O. 1C-47-1 for any information under the headings listed above)

SECTION V - OPERATING LIMITATIONS

SECTION VI - FLIGHT CHARACTERISTICS

SECTION VII - SYSTEMS OPERATION

SECTION VIII - CREW DUTIES

THIS SECTION IS INCOMPLETE WITHOUT T.O. 1C-47-1.

INTRODUCTION.

YOUR RESPONSIBILITY.

Crew members are required to use this checklist, in accordance with AFR 60-9 when performing duties as aerial gunner in the AC-47. When more than one gunner is performing duties on a crew, the First Gunner will be responsible to insure completion of the checklist in the proper sequence, at the appropriate time. When crewmembers other than the gunner's are responsible to accomplish the action on a checklist item, the abbreviated crew position is indicated following the response. P, CP, LM, and G denote pilot, copilot, loadmaster, and gunner respectively. Those items requiring coordination between crew positions will be completed over the interphone employing the basic challenge - response method. Standard interphone procedures will be used.

PREFLIGHT

1.	Form 781 Check Form 781 for aircraft status, amount of ordnance, weapon system and condition.	Checked	
2.	Tie-down equipment When Loadmaster is not on crew, check availability of tie down equipment.	Checked	LM(G)
3.	Emergency and Survival Equipment When Loadmaster is not on crew, check condition and stowage of A/C Emergency and Survival Equipment required for mission.	Checked	LM(G)
4.	Aircraft battery switch	OFF	
5.	Copilot master arming switch	OFF	
6.	Gun system circuit breakers	IN	
7.	Spare gun sight bulb Check that there is a spare bulb for gun sight in the aircraft spare bulb rack.	Checked	
8.	Spare gun fuses Check spare gun fuses (2 amp and 20 amp) aboard aircraft.	Checked	
9.	Fire control master arming switch	OFF	

10. Rate selectors — OFF

Check all three rate selector switches off.

11. Battery charger switches — OFF

Check battery charger switch off on all guns.

12. Drive Motors — Disconnected

Disconnect cannon plugs from drive motors on all guns.

WARNING

Injury to personnel could result from performing maintenance on the gun with the drive motor cannon plug connected.

13. Loading sector — Installed

Install loading sector with two quick release pins insuring the two top bolts are forward of loading sector guide.

14. Safing bar — Removed

15. Gun — Cleared

Insure that no ammunition is present in gun. Visually check bolt and chamber at firing position (2 o'clock position). Manually rotate barrels counter clockwise one revolution, simultaneously observing each bolt and chamber approaching the firing position.

WARNING

If ammunition is present in gun, discontinue operation until gun is cleared. If barrel cluster is rotated with safing sector installed, the gun will fire.

16. Safing bar — Installed

17. Rounds counter — Set

If drum is empty, set rounds counter at 0006. If drum contains ammunition, do not change setting.

18. Gun condition — Checked

Check general condition of entire module for excessive wear, and security of all mounts and connectors.

19. Clearing solenoid — Connected

20. Gun switch — Fire position

21. Loader — Firing position (Check micro-switch)

Insure that loader micro-switch is depressed.

22. Copilot master arming switch — On

23. Aircraft battery switch — On

WARNING

Prior to turning on battery, announce "Battery switch coming on" to any other personnel in vicinity of the aircraft.

CAUTION

To prevent damage to aircraft electrical system, do not turn aircraft battery switch on if external power unit is connected.

24. Gun lights — Checked

Check operation of overhead gun lights and press-to-test lights on gun control panels.

25. Battery charging light — Checked

Place gun battery switch in Auto-Position. Observe that battery condition light illuminates. Return switch to Off position.

26. Fire control master arming switch — On

27. Rate selector (For applicable gun) — Slow

28. Trigger — Depress (Solenoid Checked)

Instruct additional crew member to depress trigger. Simultaneously observe that solenoid engages when trigger is depressed and disengages when trigger is released.

29. Rate Selector (for applicable gun) — Fast

30. Trigger — Depress (Solenoid Checked)

Instruct additional crew member to depress trigger. Simultaneously observe that solenoid engages when trigger is depressed, and disengages when trigger is released.

31. Gun switch — Safe Load Position

32.	Repeat Steps 13 through 32 for each module.		
33.	Gun sight condition Check general condition of gun sight, security of mounts, and cleaniness of lens.	Checked	
34.	Sight reticles Rotate reticle pattern selection knob to insure that all three reticle patterns are properly illuminated and that pipper aiming point is identical on all three patterns.	Checked	
35.	Sight illumination Check operation of rheostat on both position of Normal/Standby switch.	Checked	
36.	Aircraft battery switch	Off	
37.	Copilots master arming switch	Off	
38.	Fire control master arming switch	Off	
39.	Rate selectors Check that all three rate selector switches off.	Off	

BEFORE TAKEOFF

1.	Cargo and loose equipment When Loadmaster is not on board, check that all cargo and equipment is secured for flight.	Secured	LM(G)
2.	Cabin Check that all personnel in cabin are seated, and safety belts are fastened. Then notify pilot, "Cabin Secure."	Secured (Notify pilot)	LM(G)

AFTER TAKEOFF

1.	Battery charging switches Place battery charging switches on each gun to Auto Position, observe charging light.	Auto	

BEFORE FIRING

NOTE

THIS CHECKLIST WILL BE ACCOMPLISHED WHEN INSTRUCTED BY PILOT.

1.	Loading Sector	Removed	
2.	Safing Sector	Installed	
	Install safing sector and housing cover by installing three quick release pins.		
3.	Drive motors	Connected	
4.	Gun switches	Fire Position	
5.	Safing bars	Removed	
6.	Rate selector(s)	As Required	
	Select fast or slow on gun(s) as instructed by pilot.		
7.	Fire control master arming switch	On	
8.	Copilot master arming switch	As Required	(CP)
	Advise copilot to check position of copilot master arming switch.		
9.	Gun sight	Set	(P)
	Advise pilot to check gun sight setting.		
10.	Notify Pilot "GUN(S) --- ON THE LINE-FAST/SLOW"		
	Advise pilot which gun(s) are armed by numbered position, and rate of fire.		

AFTER FIRING

1.	Copilot master arming switch	Off	(CP)
	Advise copilot to check master arming switch off.		
2.	Safing Bars	Installed	
3.	Notify Pilot "GUNS SAFE"		

LOADING

1.	Gun switch	Safe Load Position
2.	Drive motor	Disconnected
3.	Safing sector	Removed
4.	Safing bar	Removed
5.	Gun	Clear

Insure that no ammunition is present in gun. Visually check bolt and chamber at firing position (2 o'clock position). Manually rotate barrels one revolution counter clockwise, simultaneously observing each bolt and chamber approaching the firing position.

WARNING

If ammunition is present in gun, discontinue operation until gun is cleared. If barrel cluster is rotated with safing sector installed, the gun will fire.

6. Loading sector — Installed

   Install Loading sector with two quick release pins insuring the two top bolts are forward of loading sector guide.

7. Rounds counter — Set

   Set rounds counter at 9996 when drum is empty. If drum is partially loaded, do not reset rounds counter.

8. Loader — Load Position (check micro-switch)

   Check that loader is in Load Position, and micro-switch is depressed.

NOTE

For a partially loaded drum rotate the barrels counter clockwise until a round appears in the loader. Rotate barrels clockwise exposing the first empty sprocket in loader.

9. Ammo — Engaged (double link first)

   Insert belt, double link first, into loader and manually rotate barrels clockwise until five or six rounds feed into loader.

10. Drive motor — Connected

11. Ammo — Load

    Intermittently depress loading button to control rate of loading.

NOTE

In event of malfunction in electrical loading circuit, ammunition may be loaded manually by hand cranking.

WARNING

Keep hands clear of moving parts while loading ammunition.

12. Drive motor	Disconnected	
13. Loader	Firing Position (check micro-switch)	
14. Loading sector	Removed	
15. Safing sector	Installed	
16. Safing bar	Installed	
17. Drive motor	connected	

BEFORE LANDING

1. Fire control master arming switch	Off	
2. Rate selectors	Off	
3. Drive motor	Disconnected	
4. Safing sector	Removed	
5. Safing bar	Removed	
6. Gun	Cleared	

Insure that no ammunition is present in gun. Visually check bolt and chamber at firing position, (2 o'clock position). Manually rotate barrels counter clockwise one revolution, simultaneously observing each bolt and chamber approaching the firing position.

7. Loading sector	Installed	
8. Safing bar	Installed	
9. Battery charging switch	Off	
10. Repeat Steps 3 thru 9 for each module		
11. Notify Pilot "Guns Safe and Cleared"		
12. Loose Equipment	Stowed	LM(G)

If Loadmaster is not on crew, check that all loose equipment is stowed.

13. Cabin	Secured (Notify Pilot)	LM(G)

If Loadmaster is not on crew, check that all personnel in cabin are seated and safety belts are fastened. Then notify pilot, "Cabin Secure".

AFTER ENGINE SHUTDOWN

1. Dust Covers		Installed
2. Form 781 Entries		As Required

List malfunctions and ordnance expended.

EMERGENCY PROCEDURES

GUN MALFUNCTION

The following steps will be performed prior to attempting corrective action on any malfunctioning weapon.

1. ADVISE PILOT		
2. RATE SELECTOR		OFF
3. GUN SWITCH		SAFE LOAD POSITION
4. DRIVE MOTOR		DISCONNECTED
5. CLEARING SOLENOID		DISCONNECTED

WARNING

If gun must be removed from module during flight the following steps in addition to those above must be performed.

6. GUN - CLEAR

NOTE

Insure that no ammunition is present in gun. Visually check bolt and chamber at firing position (2o'clock position). Manually rotate barrels counter-clock-wise one revolution, simultaneously observing each bolt and chamber approaching the firing position.

7. SAFING SECTOR - REMOVED.

WARNING

If the safing sector cannot be removed and ammunition still remains in the gun, perform steps 8 and 9.

8. SAFING BAR INSTALLED

9. ADVISE PILOT

SECTION IX - ALL-WEATHER OPERATION

SECTION X - PERFORMANCE DATA

(See T.O. 1C-47-1 for any information under the headings listed above)

☆ U.S. GOVERNMENT PRINTING OFFICE: 1969— 346-592/1849

SECTION IX - ALL-WEATHER OPERATION

SECTION X - PERFORMANCE DATA

(See T.O. 1C-47-1 for any information under the headings listed above)