3) Press button (on PHI control panel) relative to the station previously selected.

4) The amber light of the Vector Adder will go OFF and the PHI indicator will display bearing and distance as before addition of the vector.

NOTE Range and bearing settings can be performed on the Vector Adder either before flight or during flight.

ADF 102 RADIO COMPASS SYSTEM

The ADF 102 is a completely transistorized system using etched circuitry which gives automatic indication of airplane bearing to a station to which the ADF-102 is tuned. In addition, the system incorporates the functions of both automatic and manual directional finding and audio reception of modulated and non-modulated radio signals. Reception ranges from 200 to 1600 kilocycles, divided into two bands, one from 200 to 550 kilocycles and the other from 550 to 1600 kilocycles.

The system consists of a receiver, an indicator, a control unit (fig. 4-8) a sense antenna, a fixed loop antenna (fig. 4-9) and an automatic goniometer. The controls are mounted in the control panel located on the right console.

The system operates on power from the primary bus.

CONTROLS

All operating controls are mounted on the front panel of the control unit.

MAIN SWITCH

The main switch has four positions:

a) OFF - System is cut off from power supply.

CAUTION Instrument lighting system is independent from main switch. Lighting of control panel does not mean the system is operating.

b) COMP - System is energized and operates as an automatic direction finder using both antennas.

c) ANT - System is energized and operates only as a receiver using sense antenna.

d) LOOP - System is energized and operates as a manual direction finder by rotating loop antenna in either direction at a slow or fast speed with the 4 position LOOP knob.

VOLUME CONTROL KNOB

The volume control knob is used for adjusting audio output.

CW SWITCH

The CW switch is normally OFF. It is turned to CW when a weak or very distant station cannot be heard distinctly, this energizes the BF oscillator in the system. The set is then tuned for sonic null. A-I type stations require the use of the CW switch.

LOOP-L-R Control knob is used to rotate compass left (L) or right (R) when main switch is on LOOP position. Direction and speed of rotation are controlled by the direction and displacement of the control. When released, the control should return to neutral position.

TUNING handle is used for easy and precise tuning of the desired frequency on the indicator in the center of the panel.

BUTTONS FOR PRESELECTED STATIONS

When one of the five buttons are pressed a preselected frequency can be tuned instead of using the TUNING control handle.

The first 4 buttons are used for frequencies on the first wave band and the fifth is used for a frequency on the second wave band. Kilocycles related to preselected frequencies can be read in windows above each button.

INDICATOR

The indicator is located on the upper left side of the instrument panel.

The needle of the indicator points to the bearing from which radio signals are being received.

The azimuth scale of the indicator may be rotated to convert (mechanically) the bearings to true or magnetic bearings.

ANTENNAS

The system has two antennas:

The *fixed loop Antenna* located in the upper side of the fuselage behind the canopy picks-up the signals from a radio station.

ADF-102 RADIO COMPASS CONTROL PANEL

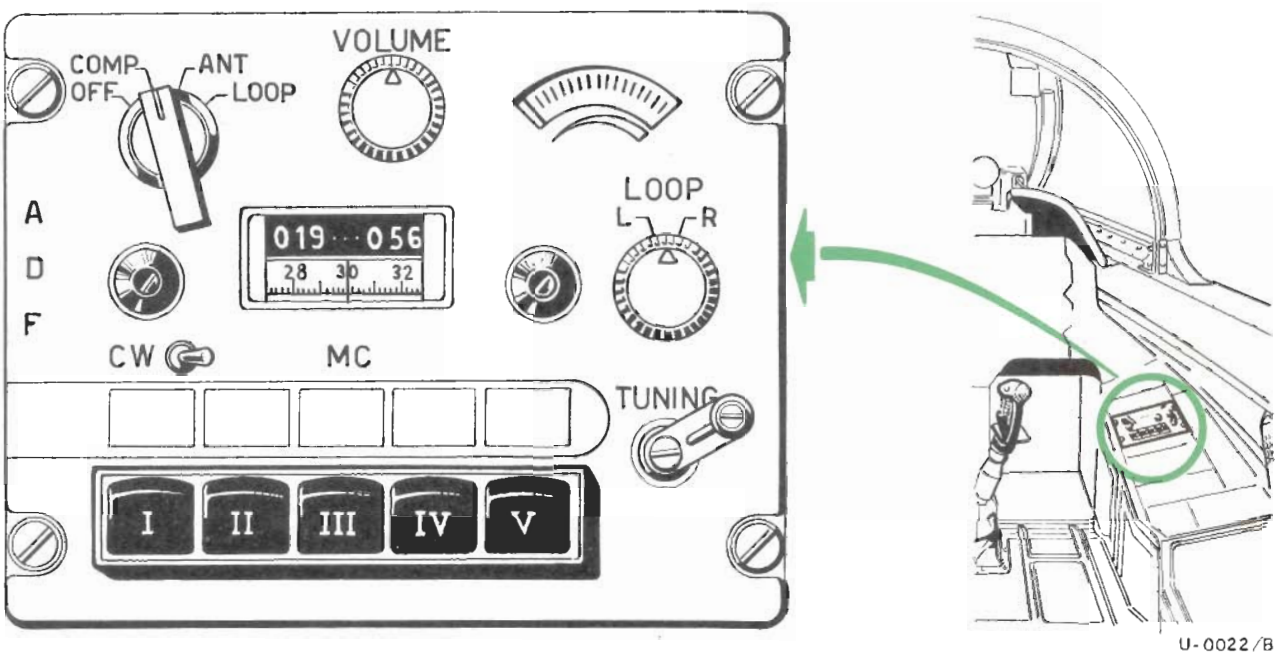

Figure 4-8

RADIO COMPASS ANTENNA
LOCATION DIAGRAM

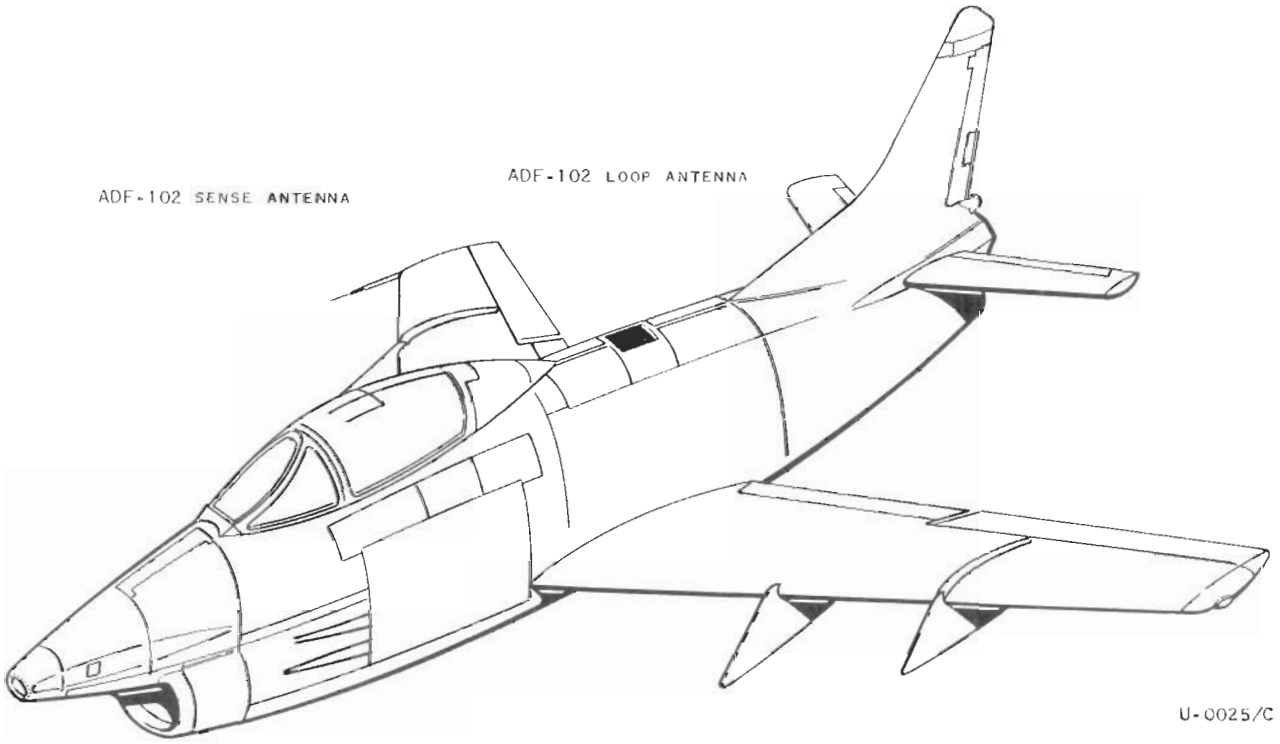

Figure 4-9

The *sense antenna* located in the canopy glass indicates the direction of the radio station from which signals have been received.

The receiver located on the radio equipment bay, receives the signals picked-up by the fixed loop antenna, amplifies and compares them with the signals picked-up by the sense antenna and feeds the automatic goniometer.

AUTOMATIC GONIOMETER

Located on the upper side of the aft fuselage behind the loop antenna it automatically searches the aural null.

OPERATION OF SYSTEM

The radiocompass system can accomplish one of the following functions:

1) Operate as a radio compass to determine course of airplane in relation to destination.

2) Operate as a receiver with the sense antenna.

OPERATION AS A COURSE INDICATOR

1) Turn main switch to ANT.

2) Tune to station using control or pressing related button of a preselected frequency.

3) Turn main switch to comp.

4) Indicator on instrument panel will give position of station.

5) Turn main switch OFF to cut off system.

OPERATION AS A RECEIVER

1) Turn main switch to ANT.

2) Turn CW switch to CW when tuning A-I stations.

3) Tune to required frequency with TUNING control.

4) Adjust volume with control knob.

CAUTION For better definition of radio range stations adjust headset volume to minimum signal strength. Continue reducing volume as A and N signal intensity increases.

5) Turn main switch OFF to cut system OFF.

AN/APX-25 IFF AND SIF RADAR

The AN/APX-25 is an airborne pulse-type transponder which enables the aircraft to identify itself whenever it is challenged by either Mark X (AN/APX-6) or Selective Identification Feature (SIF) interrogating systems. The set does not operate simultaneously in both SIF and normal Mark X systems. This provision is included to permit continual operation during a transitional period while the expanding network of SIF installations are replacing the older Mark X stations. A preset adjustment of the S-103 switch within the receiver-transmitter enables operation in either one or the other system. This switch cannot be set during flight, therefore the pilot should know which system is selected by the switch.

The SIF permits the aircraft to not only reveal itself as friendly when interrogated, but also identify itself with regard to serial number, flight number, mission or any other method previously arranged. The system is usually operated in conjunction with search radar which automatically actuates the transmission of a coded reply which is received and portrayed on a planned position indicator or letter symbol indicator which enables specific identification and location of the aircraft.

The C-1158/APX-25 control panel permits turning the equipment on and selecting the various modes of operation. When the S-103 switch located within the receiver transmitter in the nose section is in the NORM position the set responds only to Mark X interrogations.

MARK X RADAR IDENTIFICATION

The purpose of Mark X radar identification is to enable the aircraft to identify itself automatically as friendly whenever it is challenged by Mark X interrogation signals from other appropriate radar recognition equipment located at land bases, aboard ships or in other aircraft. Two supplementary purposes of the equipment are:

a) To enable specific friendly aircraft to identify themselves apart from numerous other friendly aircraft.

b) To provide means for the transmission of a special coded signal known as the emergency realy.

C-1158/APX-25 CONTROL PANEL (fig. 4-10)

The C-1158/APX-25 control panel is located in the cockpit on the right hand console. The panel has the following controls:

EMERGENCY DIAL STOP

The emergency dial stop must be pressed in order to rotate the master switch from NORM to the EMERGENCY position.