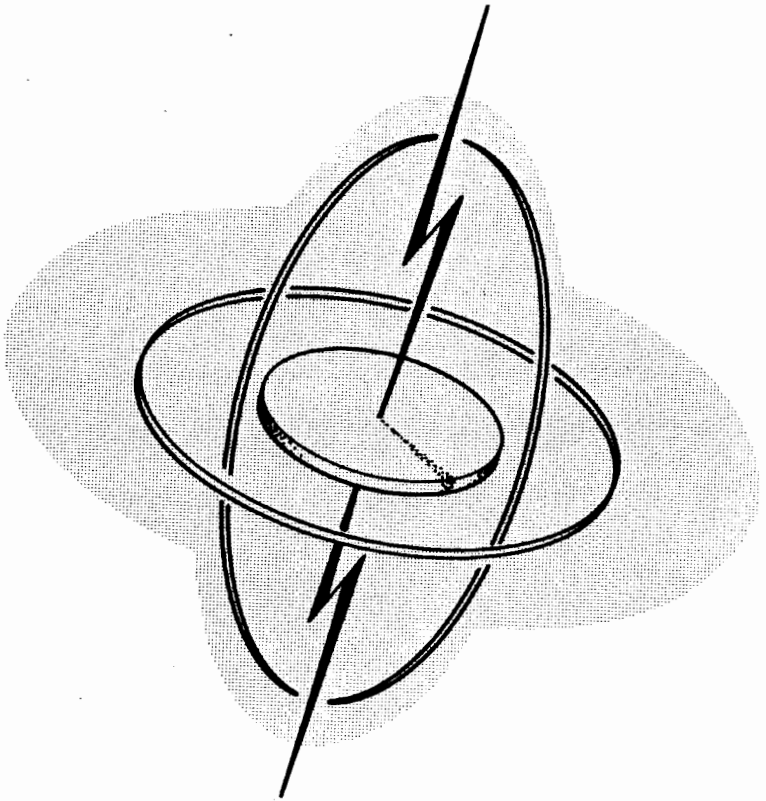
PIPER

ALTIMATIC III B-I

WITH GLIDESLOPE COUPLER



OPERATING INSTRUCTIONS

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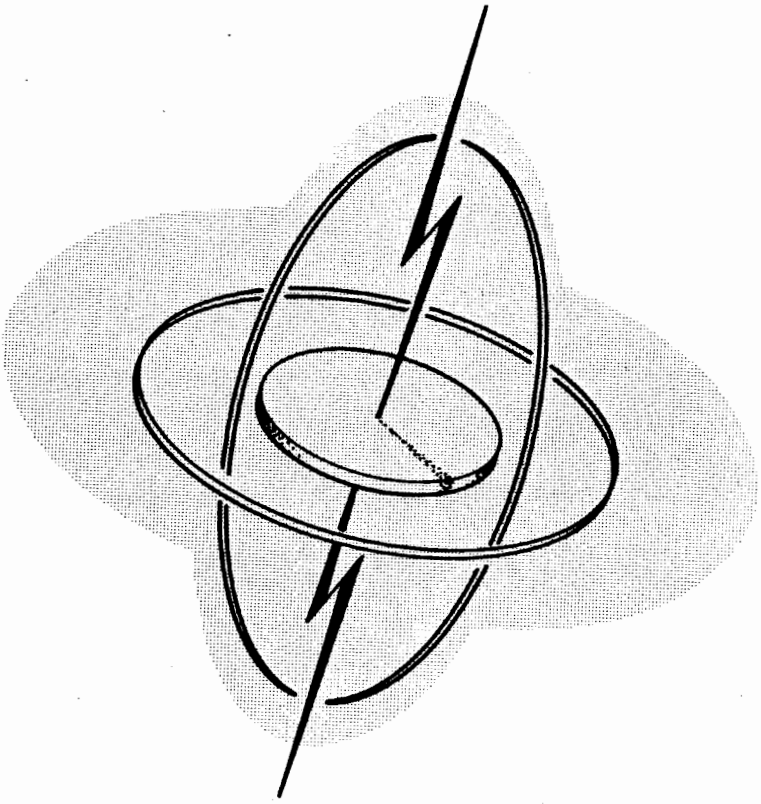

OPERATING INSTRUCTIONS

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INTRODUCTION

The Piper AltiMatic III B-1 is a lightweight automatic flight system using an advanced electronic design and offering maximum utility and reliability. It operates in the 5,000 cycle audio frequency range.

The AltiMatic III B-1 offers a new concept in flight control. The conventional servo follow-up is not employed. It has been replaced by a solid state analytical computer. Roll and Pitch responses are controlled by the amplifier, with the aerodynamics of the aircraft supplying follow-up information, resulting in smooth attitude and altitude transitions.

The ALTIMATIC III B-1 IS A LIGHTWEIGHT AUTOPILOT OFFERING A BACK-UP SYSTEM ENTIRELY INDEPENDENT OF BOTH THE FLIGHT REFERENCE INSTRUMENTS (DIRECTIONAL GYRO AND ATTITUDE GYRO), AND THE VACUUM SYSTEM OF THE AIRCRAFT.

If the Directional Gyro, the Attitude Gyro or the vacuum system fails, the AltiMatic III B-1 will no longer control the aircraft. The pilot should disengage the Roll and Pitch of the AltiMatic III B-1 and switch the "AutoFlite II" (back-up system) to the ON position. The electrical AutoFlite II will then control the Roll axis of the aircraft.

NOTE

ALTHOUGH THE PIPER ALTIMATIC III B-1 WILL GIVE LONG AND TROUBLE FREE SERVICE, IT MAY IN TIME REQUIRE ADJUSTMENT. AS WITH ANY HIGH QUALITY ELECTRONIC EQUIPMENT, THE PIPER ALTIMATIC III B-1 SHOULD BE SERVICED, WHEN REQUIRED, BY PROPERLY TRAINED PERSONNEL. IT IS RECOMMENDED THAT THE OWNER CONSULT THE FACTORY

APPROVED ALTIMATIC III B-1 SERVICE CENTER LISTING AND MAKE CERTAIN A FACTORY REGISTERED PIPER ALTIMATIC III B-1 SPECIALIST PERFORMS THE ACTUAL MAINTENANCE ON THE UNIT. THE LIST IS AVAILABLE AT YOUR PIPER DISTRIBUTOR, OR WRITE FOR A COPY TO PIPER AIRCRAFT CORPORATION, LOCK HAVEN, PENNSYLVANIA 17745, U.S.A.

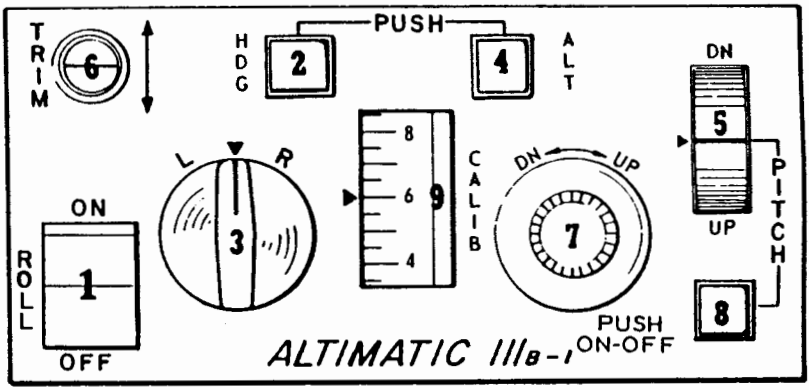
CAUTION

THE ALTIMATIC III B-1 AUTOPILOT IS APPROVED FOR FULL TIME USE IN FLIGHT, BUT MUST BE OFF DURING TAKE-OFF AND LANDING.

SECTION I

DESCRIPTION

CONSOLE



1. Roll Engage/Disengage
2. Hdg. Preselect Switch
3. Roll Command Knob
4. Altitude Preselect Switch
5. Pitch Command Disk
6. Trim Indicator
7. Altitude Selector Knob
8. Pitch Engage/Disengage
9. Altitude Dial (incorporates barometric pressure calibration)

FIGURE 1

Within the AltiMatic III B-1 Console are all the control functions except the Course Selector (C/S incorporated in the Directional Gyro) and the quick-disengage button on the pilot's control wheel. If the system employs radio coupling, the pilot selects the mode of operation at the coupler. For night operation the console and coupler are indirectly illuminated with lighting intensity controlled at the instrument lights rheostat switch. Switches are lighted when in the ON position.

NAV/APPROACH COUPLER

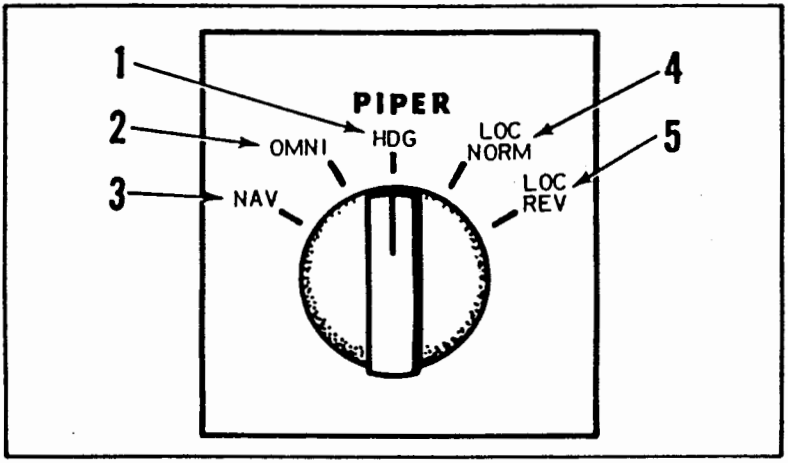


FIGURE 2

The Piper OMNI/LOC COUPLER, which is available as optional equipment, is used in conjunction with the AltiMatic III B-1 and is a complete analog computer. The following is a description of the five "MODES" as shown in Figure 2 above.

1. HDG (HEADING) MODE – When selected to the HDG Mode the AltiMatic III B-1 operates as a standard AutoPilot without coupling, see - HEADING HOLD AND PRESELECT, Page 12.

2. OMNI MODE – When selected to the OMNI Mode the coupler will automatically intercept, capture, track and correct for crosswind on any desired VOR radial the pilot selects as explained in the operations section of this manual, - OMNI APPROACH, Pages 29 & 30. (Crosswind correction up to 15°.)

3. NAV (NAVIGATION) MODE – When selected to the NAV Mode the coupler will automatically intercept, capture, track and correct for crosswind on any desired VOR radial the pilot selects. This position is used to cancel any short term deviations of the transmitted VOR signal by FAA stations, resulting in a smooth and positive flight path to or from any VOR facility. See Operations section of this manual, - INTERCEPTING VOR RADIALS, Pages 25 & 26 and VOR NAVIGATION, Pages 27 & 28.

NOTE

ALTHOUGH THE OMNI AND NAV MODES CAN BOTH BE USED FOR VOR NAVIGATION, IT IS RECOMMENDED PROCEDURE TO USE ONLY THE OMNI MODE FOR VOR APPROACH WORK. (See Pages 29 & 30.)

Because of ILS radio transmission characteristics, it is necessary to correct away from the course deviation indicator (vertical needle) during certain phases of an ILS approach. It is for this reason that the coupler provides mode 5.

4. LOC NORM (Localizer Normal) – When selected to the LOC NORM Mode the coupler will automatically intercept, capture, track and correct for crosswind conditions up to 15° during ILS approach work. Also, this mode automatically adjusts for the increased sensitivity that accompanies the ILS system. The use of this function is explained in the Operations section of this manual, Pages 31 thru 34.

5. LOC REV (Localizer Reverse) – When selected to the LOC REV Mode, the coupler will automatically intercept, capture, track and correct for crosswind conditions during ILS approach work, when it is necessary to correct AWAY from the course deviation indicator (vertical needle). Also, this mode automatically adjusts for the increased sensitivity that accompanies the ILS system. The use of this function is explained in the operations section of this manual, Pages 35 & 36.

IMPORTANT NOTE

The information supplied the coupler from the omni converter is magnetic. The Directional Gyro supplies heading information to the coupler, also magnetic. IT IS MOST IMPORTANT THAT THE DIRECTIONAL GYRO BE ACCURATELY SET WITH THE

COMPASS AND THAT THE COMPASS BE ACCURATE. For example: Should the Directional Gyro be set to 90° (either because of misreading the compass or because of compass error) when actually it should have been set to 80°, this would result in the coupler having automatic crosswind correction of 25° on one side and only 5° on the other side, instead of 15° and 15° designed into it to cope with crosswind conditions. This would result, eventually, in noting that the Omni Indicator calls for the aircraft to be directed to one side or the other and it would appear that the coupler is not capable of correcting. Should a condition exist which requires more correction to one side or the other than the 15° crosswind correction angle built into the coupler, this can be had by adjusting the Course Selector a few degrees into the crosswind to center the Omni needle.

COUPLER RADIO SELECTOR SWITCH

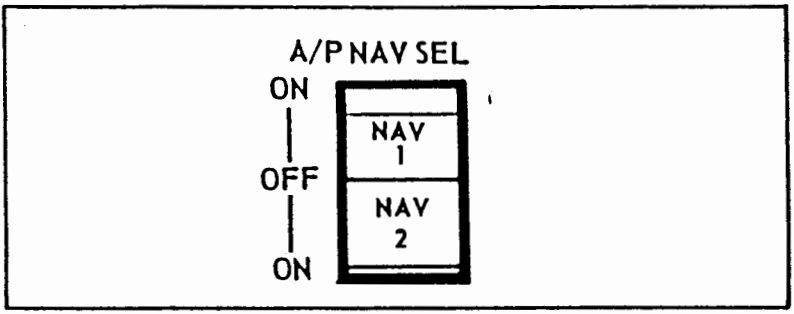


FIGURE 3 (NOT ON PA-31 OR PA-31-300)

This switch connects the coupler to either the #1 or #2 radio. The switch can also be positioned to the center in the event the coupler malfunctions. In the center position both #1 and #2 radios are disconnected from the coupler.

GYROS

Employed in the Piper AltiMatic III B-1 are three inch lightweight gyros of recent manufacture. The Attitude Indicator and Directional Gyro are air-driven and supply attitude and heading signals to the amplifier. The Directional Gyro incorporates the heading Preselect feature, hereafter referred to as the Course Selector. The air to these gyros passes through a central filter. Periodically, this filter should be changed to increase gyro life, and insure correct performance.

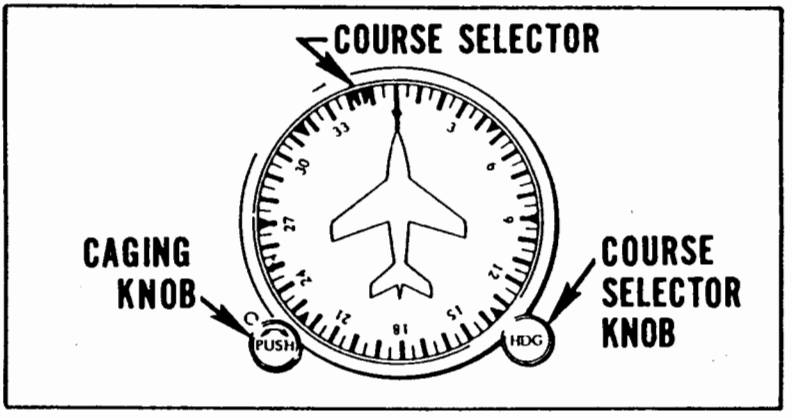


FIGURE 4

The Course Selector Directional Gyro is set to agree with the magnetic compass in the usual manner, with the caging knob located in the lower left corner of the instrument. To set the D.G., the caging knob is pushed in and rotated and the magnetic heading from the magnetic compass is set in the top of the instrument, under the nose of the airplane pictured on the instrument. (See Important Note on Page 3.)

The Course Selector Knob is located at the lower right-hand corner of the instrument and controls the Course Selector as seen in Figure 4. To use this control the pilot must push in on the Course Selector Knob and by rotating this control knob he can select any course by placing

the Course Selector on the desired heading. When the AltiMatic III B-1 is engaged the Course Selector function of this instrument becomes the primary control of the aircraft around the roll axis. When the Course Selector agrees with the Heading of the aircraft the AutoPilot will maintain that heading. If the pilot desires to turn to a new heading, he has simply to "dial" the heading, using the Course Selector, and the aircraft will turn to the new heading.

SERVOS

The electro mechanical servos engage electrically and are easily overridden. They cause no friction in the aircraft control system when disengaged. They disengage automatically if the electrical system fails.

AMPLIFIER

One channel of the solid state amplifier controls the Roll axis, while the other controls Pitch. The analytical computer is incorporated within the amplifier and results in smooth control.

CONSOLE

The Roll Engage Switch is of the magnetic rocker type to distinguish it from the other switches of the Console. The Heading, Altitude, and Pitch Buttons are of the push engage type and are illuminated when engaged.

PITCH TRIM

The Piper AltiMatic III B-1 offers Automatic Pitch Trim as standard. A specially designed sensor constantly monitors stabilator or elevator control cable tension when the AutoPilot is engaged. Signals from the sensor are supplied to an amplifier located in the Pitch Trim Servo. The Pitch Trim Servo may be overridden by operation of the aircraft's manual trim crank.

PITCH TRIM WARNING SYSTEM

When the AltiMatic III B-1 is engaged the Pitch Trim Warning System is operational. The function of this system is to provide the pilot with a visual indication of abnormally long or continuous Pitch Trim Servo Operation. It consists of a compact electronic timing device and an indicator light mounted on the instrument panel. The electronic timing device is controlled by the trim sensor contacts. When the trim sensor contacts remain closed in either position for longer than 3 to 4 seconds, the timing device actuates the indicator light on the instrument panel. The pitch trim system will normally maintain trim with servo operations of less than one second duration. The 3 seconds required to actuate the timing device is sufficient for proper system operation.

MANUAL ELECTRIC TRIM

When the AltiMatic III B-1 is disengaged, the pilot can adjust pitch trim electrically through a switch on the pilot's control wheel (see Figure 7, Page 20.)

SECTION II

OPERATION

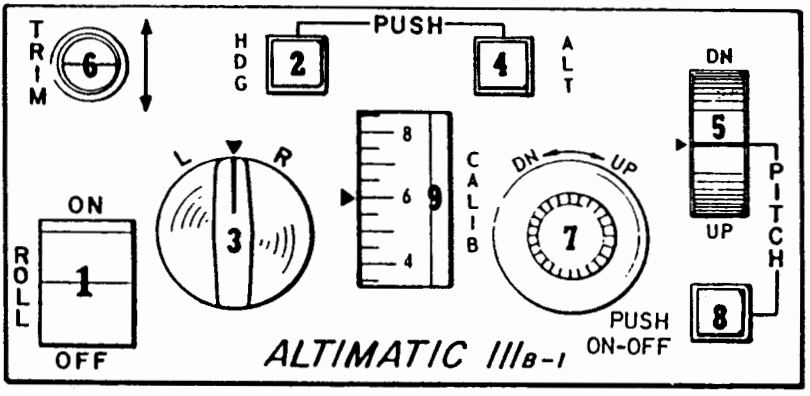


FIGURE 5

1. Roll Engage/Disengage
2. Hdg. Preselect Switch
3. Roll Command Knob
4. Altitude Preselect Switch
5. Pitch Command Disk
6. Trim Indicator
7. Altitude Selector Knob
8. Pitch Engage/Disengage
9. Altitude Dial (incorporates barometric pressure calibration)

PRE-FLIGHT GROUND CHECK

ROLL COMMAND AND HEADING PRESELECT

For a proper ground check of the AltiMatic III B-1, the gyros must be erected and the following items checked:

a. All console switches and buttons should be OFF or out.

b. With the Roll Command Knob (#3) centered, engage Roll Switch (#1).

c. Move the Roll Command Knob (#3) to the right. Control wheel should move to the right. Manually overpower the wheel in the opposite direction to check the override clutch. Make same check to the left.

d. With the Roll Engage Switch (#1) engaged, position the Roll Command Knob to stop control wheel movement to either side. Without feed back from the servo, the control wheel should move against its stop when the Roll Command Knob is off center.

HEADING PRESELECT

a. Set Directional Gyro to correspond with the magnetic compass.

b. Center the Course Selector over this heading employing the right-hand knob of the Directional Gyro.

c. If coupler equipped, the Coupler Knob should be in Heading (Hdg) position.

d. Engage Heading Lock Button (#2) by pushing it in.

e. Set the Course Selector for a heading change to the right - - control wheel should turn right. Make same check to the left. As in the case of the Bank Command, the control wheel should turn against its aileron stop on each side.

f. Center the Course Selector until the control wheel ceases to turn to either side.

PITCH COMMAND AND ALTITUDE PRESELECT

a. Select the Altitude Preselect Button (#4) to its OFF or out position.

b. Center Pitch Command Disk (#5).

c. Position the control column to level flight position.

d. Engage Pitch Engage Button (#8).

e. Rotate Pitch Command Disk fully UP. When the control column moves rearward to its UP stop, overpower the wheel by pushing forward to check the override clutch. Rotate the Pitch Command Disk fully down. Check the override clutch in a similar manner by pulling rearward on the control wheel.

Since the aerodynamic response of flight is absent during ground checks, the control column will continue its travel until control stops are reached or until the pilot moves the Pitch Command Disk in the direction opposite to control column movement. If the Pitch check is prolonged, the Automatic Trim system will run the trim to its extremities and begin slipping both the pitch servo clutch and the trim servo clutch. Pitch Command should therefore be checked speedily and disengaged promptly.

The Preselect feature cannot be ground checked effectively.

CHECKING THE OVERRIDE

Approximately nine to fifteen pounds of force on the control wheel should override either the Roll or Pitch functions when either is engaged. Override settings may vary with different models of aircraft. The AltiMatic III B-1 Roll and Pitch servos have the new carbon/copper clutch assemblies which are not subject to excessive wear during prolonged or frequent use of the override feature. The override should be checked prior to each flight.

PITCH TRIM CHECK - AUTOMATIC

The Automatic Pitch Trim system is engaged at the time the Pitch is activated through Engage Button (*8). The Roll Engage Switch (*1) must be engaged to activate the system.

At the time the operation of the Pitch Command Disk (*5) is checked, Pitch Trim function should be observed. As the control wheel moves rearward, observe that trim crank or wheel adds NOSE UP trim. Conversely, forward movement of the control wheel should result in NOSE DOWN trim.

AUTOMATIC - PITCH - TRIM - WARNING CHECK

The Automatic Pitch Trim system must be engaged for this check. The system is activated through Engage Button (*8). The Roll Engage Switch (*1) must be engaged to activate the system.

On installations incorporating the press-to-test trim warning light on the instrument panel, push the press-to-test trim warning light. When the light is pushed and held in with the AutoPilot pitch function engaged, the lamp should glow within 3 to 4 seconds. If it does not, there is a malfunction in the warning system.

On installations incorporating the disengage button in the trim switch with no press-to-test trim warning light installed, movement of the trim switch in either direction without pressing the disengage button should not operate the trim.

ELECTRIC - PITCH - TRIM - CHECK

With the AutoPilot completely disengaged, (switches #1 and #8 to the OFF position) check electric trim operation.

a. On installations with a separate control-wheel-mounted disengage button, as shown in Figure 7, moving the trim switch on the pilot's control wheel forward should result in NOSE DOWN trim; NOSE UP trim should result from moving the switch rearward.

b. On installations where the disengage button is incorporated in the control-wheel-mounted trim switch, the disengage button must be depressed to make the electric trim switch effective. Also the control-wheel-mounted and/or panel mounted trim quick disconnect switch, when installed, must be pushed to the ON position. (Refer to Figure 7.) With the disconnect button depressed (trim quick disconnect switch in the on position), moving the trim switch on the pilot's control wheel forward should result in NOSE DOWN trim. NOSE UP trim should result from moving the switch rearward. The trim switch should be inoperative in both directions if the disconnect button is not depressed.

COUPLER

a. Tune in any available Omni station on the top receiver.

b. Center Omni needle with a "TO" flag by using the OBS.

c. Cage and set the Directional Gyro to coincide with the selected Omni bearing.

d. Set Course Selector to coincide with the selected Omni bearing.

e. Place A/P NAV SEL to the NAV 1 position.

f. Place Coupler in the Omni Mode.

g. Turn Omni Bearing Selector to swing Omni needle for a full deflection to the RIGHT - the control wheel should follow.

h. Turn Omni Bearing Selector to swing Omni needle for a full deflection to the LEFT - the control wheel should follow.

i. Disengage the AutoPilot by pushing the Roll Engage Switch (*1) to the OFF position. (The AutoPilot may also be disengaged by momentarily pressing the control wheel disengage button.)

j. This completes the pre-flight ground check.

ENGAGING IN FLIGHT

Since the Roll Engage Switch acts as a master switch for the AltiMatic III B-1, the Roll function must always be engaged before the Pitch function. When the roll is disengaged, the pitch is electrically and mechanically disengaged. It is also advisable to push the Pitch Button to the OFF position. This will prepare the AltiMatic for re-engagement when it is needed. MAKE CERTAIN THAT THE BALL IS CENTERED IN THE RATE OF TURN INDICATOR OR IN THE TURN COORDINATOR BEFORE ENGAGING THE ALTIMATIC III B-1.

CAUTION

During AutoPilot operation there is a limit to the amount of flaps which may be used, depending on the airplane. For the various Piper models these are:

Aztec - no flaps.
Chieftain and Navajo - 15° max.
Pressurized Navajo - 15° max.
Single Comanche - No Restriction.
Twin Comanche - No Restriction.
Seneca - 25° max.

Pressurized Navajo - 15 max. flaps Seneca -

USE OF ROLL COMMAND FUNCTION

In order to employ this function, the Heading Lock Button (#2) should be OFF or out and the Roll Engage Switch (#1) should be turned on. Banks up to 30° may be obtained with the use of the Roll Command Knob (#3).

USE OF HEADING PRESELECT (AutoPilot disengaged)

a. If the system includes Radio Coupling, set the Coupler Selector Knob to the Heading mode.

b. Cage the Directional Gyro and set to the same heading as the magnetic compass.

c. Set the Course Selector of the Directional Gyro to align with the heading you are flying.

d. Center the Roll Command Knob (#3).

e. Engage the Heading Lock Button (#2).

f. Engage the Roll Engage Switch (#1).

Heading changes may now be made by setting the Course Selector of the Directional Gyro to the desired heading. It should be noted that with the Heading Preselect engaged, the Roll Command Knob (#3) is inoperative.

NOTE

If the AutoPilot is already in Roll mode, it is only necessary to set the Course Selector to the aircraft heading and engage the Heading Lock Button (#2) to go into the Heading mode.

ENGAGING PITCH COMMAND

To control the pitch attitude of the aircraft with the Pitch Command Disk (#5), the aircraft should be in level flight in a cruise

configuration with the Roll and Heading functions of the AltiMatic III B-1 engaged. Utilize the following procedure for engaging the pitch command function of the AutoPilot:

a. Insure that the Altitude Preselect Button (#4) is in its off position (switch out and light out). The Trim Indicator (#6) will then indicate the correct position for setting the Pitch Command Disk prior to engagement of Pitch Engage Button (#8). Once the Pitch Engage Button (#8) is on the trim indicator will indicate the output signal from the preselect function.

b. Rotate the Pitch Command Disk (#5) in the appropriate direction to horizontally center the Trim Indicator (#6).

c. Engage pitch control by pressing Pitch Button (#8).

The pitch attitude of the aircraft may now be controlled by use of the Pitch Command Disk (#5).

NOTE

The Trim Indicator (#6) lags when it is being centered by use of the Pitch Command Disk (#5) or the Altitude Selector Knob (#7). This apparent lag is caused by a delay network required for smooth transitions when attitude or altitude changes are commanded.

ALTITUDE PRESELECT

To employ the Altitude Preselect function of the AutoPilot the Roll and Heading functions should be engaged.

Insure that the Pitch Engage Button (#8) and the Altitude Preselect Button (#4) are in the OFF position. Rotate the Pitch Command Disk (#5) in the appropriate direction to horizontally center the Trim Indicator (#6) and then:

a. Engage Altitude Preselect Button (#4).

b. Rotate the Altitude Selector Knob (#7) until the altitude indicated on the altimeter appears opposite the index on the Altitude Dial (#9).

c. Observe the Trim Indicator (#6). If the indicator points upward, this indicates that if the pitch were engaged, the aircraft altitude would be changed upward. In this case the Altitude Selector Knob (#7) must be rotated counterclockwise, slowly, until the trim indicator indicates level flight. If the indicator points down the Altitude Selector Knob (#7) should be rotated clockwise until the indicator indicates level flight.

d. With the trim indicator lined up horizontally, engage the Pitch Engage Button (#8) by pushing it in.

e. Calibrate or set the Altitude Dial (#9) to indicate the same altitude as shown in the altimeter by rotating the drum by means of knurled portion on the right side of the drum.

f. Altitude changes can now be made by turning the Altitude Selector Knob (#7) clockwise for up, counterclockwise for down.

g. Should it be desirable to change the attitude of the aircraft during climb out or let downs on preselect, rotate the Pitch Command Disk (#5) in the appropriate direction! For example in a let down, if the attitude is too steep rotate the Pitch Command Disk (#5) upward to reduce the angle of descent.

NOTE

Moving or calibrating the Altitude Selector Dial (#9) has no effect on either the AltiMatic III B-1 or on the attitude of the aircraft. The function of the dial is one of calibration. It should correspond to the aircraft altimeter in its reading.

FROM PRESELECT TO PITCH COMMAND

When transitioning from the Preselect function to the Pitch Command function, utilize the following procedure.

a. Center the Pitch Command Disk (#5).

b. Disengage the Altitude Preselect Button (#4), by punching it so that it moves to the out position.

c. Control the attitude of the aircraft by moving the Pitch Command Disk (#5).

TRIM INDICATOR

The Trim Indicator (#6) serves a dual purpose. With the Roll engaged, whether the trim indicator supplies trim information for the Preselect mode or the Pitch Command mode, would be dependent upon where the Preselect Button (#4) has been set. With the Preselect Button (#4) in its out position and the Pitch Engage Button (#8) in the out position, the Trim Indicator (#6) supplies Pitch Command Disk information. The Pitch Command Disk (#5) can be rotated to horizontally center the trim indicator and then, when the Pitch Engage Button (#8) is engaged, there will be no attitude change. With the Pitch Engage Button (#8) in the IN position, the Trim Indicator (#6) then reads altitude Preselect information. If the aircraft were at 8,000 feet with the Altitude Dial (#9) set at 4,000 feet and Pitch Engage Button (#8) in the engage position with Preselect Button (#4) in the OFF or out position, the trim indicator would indicate downward until the Altitude Selector Knob (#7) was turned clockwise. The Altitude Dial (#9) would read approximately 8,000 feet. Altitude Dial (#9) has approximately a range of 3,000 feet for calibration purposes.

AUTOMATIC PITCH TRIM

In flight the automatic pitch trim becomes part of the AutoPilot system when the Pitch function is engaged. Anytime the AutoPilot changes the attitude of the aircraft or anytime a power change is made, the trim system will automatically correct the trim of the aircraft.

On installations incorporating the pitch trim warning system; the instrument panel mounted indicator light will illuminate whenever the trim sensor contacts are closed in either position for more than 3 seconds. During normal system operation, if an occasional flash of the trim warning light is observed, this should not be mistaken for a system malfunction. If the trim warning light remains on or flashes constantly, a system malfunction probably does exist. Should a malfunction condition arise, pull the electric trim circuit breaker and retrim the airplane manually.

With the pitch function disengaged, the automatic trim ceases to function and the electric trim switch on the control wheel or the normal mechanical pitch control must be used to change the trim.

a. With installations utilizing a separate control-wheel-mounted disengage button (as shown in Figure 7), for nose-down trim, move the switch forward. For nose-up trim move the switch rearward.

b. With installations having the disengage button incorporated in the control-wheel-mounted trim switch (as shown in Figure 7), the disengage button must be depressed during electric trim system operation. Also the control-wheel-mounted and/or panel mounted trim quick disconnect switch, when installed, must be pushed to the ON position.

MALFUNCTION

AUTOPILOT

If the AutoPilot malfunctions:

a. Depress the disconnect button mounted on the control wheel and/or the control wheel trim switch. (This is the same button used for AutoFlite II disengage during turns.) See Figure 7, page 20.

b. After the AutoPilot has been disengaged by the quick disconnect, it will be completely disengaged from the aircraft control system. When the control wheel button is released, the AutoPilot will not automatically re-engage. Push all engage buttons on the console to the OFF or out position.

AUTOMATIC PITCH TRIM SYSTEM

Should a malfunction occur in the Automatic Pitch Trim system:

a. Maintain a safe attitude with the control wheel.

b. Use manual trim control (trim crank or wheel) to override the electric trim and set trim to desired position.

c. If AutoPilot is engaged turn it off by one of the following:

1. Press control wheel disengage button,
2. Push Roll Engage Switch (# 1) to OFF position or
3. Pull AutoPilot circuit breaker.

d. If AutoPilot is not engaged, turn off electric trim by pulling electric trim circuit breaker and/or placing the panel mounted electric trim switch to the OFF position. Also on installations incorporating the control-wheel-mounted trim quick disconnect switch, place the switch in the OFF position. Verify the correct circuit breaker and/or trim switch was opened by actuating the electric trim switch on the pilot's control wheel. If trim can be activated, the wrong circuit breaker and/or switch was opened.

e. With the electric trim system disabled, the AltiMatic III B-1 can be re-engaged. However, it will be necessary to set trim by hand for any attitude changes.

NOTE

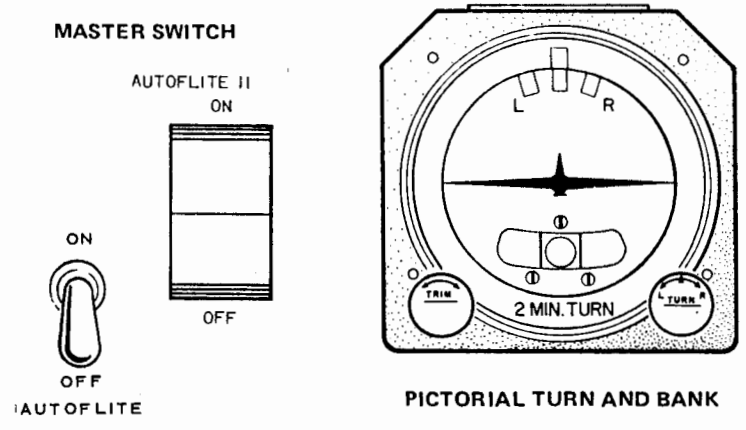
Circuit breakers for the AutoPilot and electric trim are located on the lower right instrument panel on PA-23-250, PA-24-260, PA-34-200 and PA-39 airplanes, and on the circuit breaker panel to the left of the pilot's control wheel on PA-31, PA-31-350 and PA-31P airplanes. Pilots are advised to know exactly where the circuit breakers are located so they may be pulled if it becomes necessary. On PA-34-200 airplanes the circuit breakers may be reset when tripped. However, they cannot be pulled manually.

STANDBY SYSTEM - - AUTOFLITE II

The AltiMatic III B-1 often incorporates a back-up system known as the Piper AutoFlite II. If the AltiMatic III B-1 malfunctions, or if a loss of vacuum or gyros occurs, the pilot need not revert to flying the aircraft manually with needle and ball as the sole reference.

The AutoFlite II uses the electric rate gyro of the turn indicator combined with a solid state computer/amplifier to achieve reduced heading drift and constant monitoring of the roll attitude of the aircraft. This system operates electrically and is independent of other instruments.

The operator must familiarize himself with the operational features of the system to obtain satisfactory performance. The AutoFlite II should not be considered an automatic pilot. It is a stability system with the capacity to hold the wings level in calm or turbulent air. It performs a memory-like function without having a directional gyro or magnetic compass in the system. With the aircraft properly in trim, the AutoFlite II will hold a desired heading for periods of twenty minutes with no corrections necessary.



PICTORIAL TURN AND BANK

FIGURE 5A

DESCRIPTION

The Piper AutoFlite II consists of four main components.

TURN AND BANK INSTRUMENT

The Turn and Bank instrument is located in the instrument panel and contains the Trim Control and the Turn Command Control, as well as the electronics of the Computer/Amplifier and the Electric Rate Gyro. The gyro is running anytime the aircraft master switch is turned "ON." This insures that the gyro is always monitoring the aircraft's flight and is always ready to "take over" at anytime. This Rate Gyro is relatively trouble-free and normally has a long service life. (It also drives the Pictorial Turn and Bank Indicator.) It should be noted that this instrument replaces the conventional Turn and Bank instrument and provides the same attitude information (yaw and roll) to the AutoFlite II as it does to the pilot.

CONTROL SERVO

The electrically-operated control servo simplifies maintenance in that it does not use the conventional "follow-up" method of operation. The computer/amplifier derives feedback through the dynamics of the aircraft and this eliminates many service and maintenance problems normally encountered with conventional systems. The control servo will automatically disengage if the entire electrical system fails.

The control servo and amplifier are activated at the discretion of the pilot through the AutoFlite II master switch (see Figure 6) with the AltiMatic III B-1 disengaged. The control servo also contains a friction disk which allows the human pilot to override the AutoFlite II at any time. The override should be tested during preflight to insure that the override clutch is working.

When the AltiMatic III B-1 is engaged in any mode the AutoFlite II is inoperative.

AUTOFLITE II MASTER SWITCH

The AutoFlite II master switch is located on the instrument panel. With the turn command knob (lower right-hand knob on turn and bank instrument) centered for wings level flight, the AutoFlite II may be engaged by placing the master switch in the ON position. Unless the roll function of the AltiMatic III B-1 is disengaged, the master switch of the AutoFlite II will not engage this back-up system. With the roll engage switch in the ON position an automatic lock out of the AutoFlite II occurs. The "ON/OFF" master switch of the AutoFlite II activates the amplifier and control servo, but does not control the source of power to the gyro unit. Power for this gyro is supplied by the master switch of the aircraft. Although the trim control knob (lower left-hand knob on turn and bank instrument) of the AutoFlite II can be rotated left and right, it should not be used as a bank control knob; it is simply an adjustment used to cancel drift to either side of the desired heading. The turn command knob (lower right-hand knob on turn and bank instrument) is for turn commands up to standard rate. The Turn and Bank Circuit Breaker when pulled disables the AutoFlite II.

FIGURE 6

PILOT'S DISENGAGE BUTTON

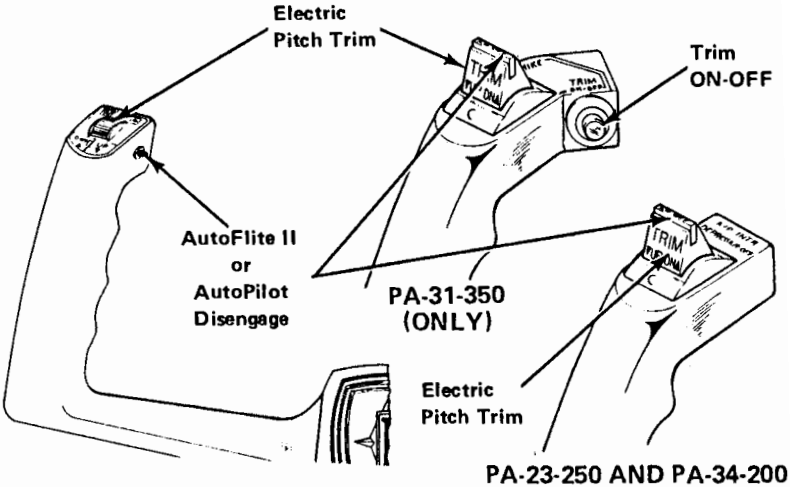


FIGURE 7

Although the AutoFlite II can be overpowered manually with control wheel pressure, it is easier to disengage the servo by depressing the control wheel button before and during a turn to a new heading, or by commanding the turn through use of the turn command knob (lower right-hand corner of the turn and bank instrument). The pilot can complete the turn with little effort and reactivate the AutoFlite II by releasing the button when the new heading is established.

PREFLIGHT GROUND CHECK

The amplifier circuit of the AutoFlite II requires an aerodynamic response to control wheel travel. Since there is no air resistance on the ailerons, and since there is no limit imposed on the servo during ground operation, the ground check consists of engaging the switch and observing control wheel movement during taxiing.

The AutoFlite II system is an entirely new concept wherein the servo does not incorporate a follow-up. The amplifier of the AutoFlite II has a computer type circuit which requires aerodynamic response to proportional aileron travel; therefore, there are no travel limits to the control wheel during ground operation. The only ground check possible is to engage the system by placing the AutoFlite II engage switch in the ON position and observing that the control wheel, during taxiing, turns in the opposite direction of the nose of the aircraft. (Aircraft turned to the right should result in control wheel moving left.)

With the aircraft not moving there should be no creeping of the control wheel. If the control wheel is creeping to either side, adjust the Trim Control knob to stop control wheel movement.

IN FLIGHT OPERATION

The AutoFlite II is approved for full time use in flight but must be off during take-off and landing. If the AltiMatic III B-1 malfunctions, the AutoFlite II provides maximum utility for level flight cross-country operation by freeing the pilot of the necessity of constantly holding the aircraft level and on heading.

TRIM THE AIRCRAFT FOR CRUISE CONFIGURATION WITH WINGS LEVEL BEFORE ENGAGING THE AUTOFLITE II. (See Figure 6, page 19.)

The operation and trim of the AutoFlite II should be checked frequently, even if it is seldom used. The trim should be kept set for a wings-level attitude. Then if the pilot gets disoriented because of poor visibility, he can make the aircraft return to and maintain wings-level flight simply by pushing the AutoFlite II master switch ON.

TRIM ADJUSTMENT

The Trim Adjustment is used to correct or stop any tendency in the AutoFlite II system to allow the aircraft to creep off heading to either side.

Observe the Directional Gyro for several minutes of flight after the AutoFlite II has been engaged. If the aircraft has drifted slightly off heading, depress the control wheel button, return the aircraft to the original heading and release the control button. Turn the heading trim control knob, (lower left-hand knob on turn and bank instrument) a small amount to the opposite side of the drift and again observe the Directional Gyro for any heading changes.

DO NOT EXPECT TO SEE THE AIRCRAFT BANK AND TURN WHEN TURNING THE HEADING TRIM CONTROL KNOB. THE HEADING TRIM CONTROL KNOB IS NOT A BANK COMMAND FUNCTION BUT AN ADJUSTMENT TO CANCEL DRIFT TO EITHER SIDE OF THE DESIRED HEADING.

HEADING CHANGES

Heading changes of any amount may be executed by depressing the control wheel button, turning the aircraft to the desired heading and releasing the control wheel button upon completion of the turn. An alternate method would be to use the turn command knob (lower right-hand knob on turn and bank instrument) in place of the control wheel disengage button. Rotate the Turn Command Knob to give desired degree of bank until established on new heading.

OVERRIDE FEATURE

The AutoFlite II can be overridden with approximately nine to fifteen pounds exerted on the control wheel. Override settings vary with model of aircraft. The override is accomplished by the slipping of a friction disk in the servo. This is an emergency procedure and overriding the servo should not normally be practiced other than during preflight ground check. Push the control wheel disengage button rather than overriding the AutoFlite II during normal operation.

ROUGH AIR OPERATION

The AutoFlite II is designed to operate in any degree of turbulence without overworking the servo or the aircraft control system.

SECTION III

OPERATION OF OMNI/LOC RADIO COUPLER

Intercepting VOR Radials

VOR Navigation

Omni Approach

ILS Localizer Approach (Radar Surveillance Directed)

ILS Localizer Approach (Standard Front Course Approach)

ILS Back Course Approach (Radar Surveillance Directed)

Glide Slope Coupled Approach

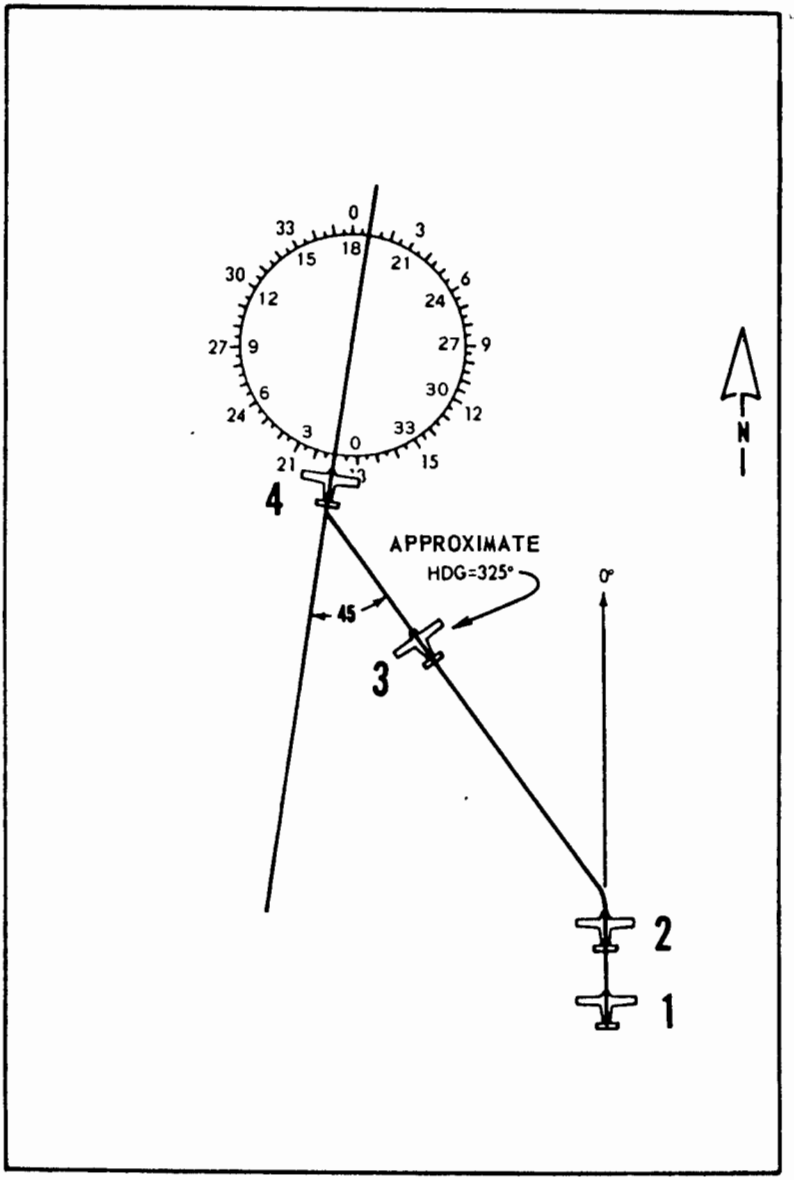
NOTE

In the following discussions it is assumed that the magnetic compass of the aircraft has been compensated and that the Directional Gyro is set to correspond with the compass.

CAUTION

During AutoPilot operation there is a limit to the amount of flaps which may be used, depending on the airplane. For the various Piper models these are:

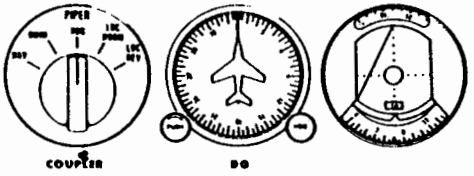
Aztec - no flaps.
Chieftain and Navajo - 15° max.
Pressurized Navajo - 15° max.
Single Comanche - No Restriction.
Twin Comanche - No Restriction.
Seneca - 25° max.



INTERCEPTING VOR RADIAL

INTERCEPTING VOR RADIALS

1. While flying with the AutoPilot engaged and operating in the HEADING MODE of the coupler, tune in an OMNI station and set the OBS to the desired VOR course (10^{o} in the illustration).



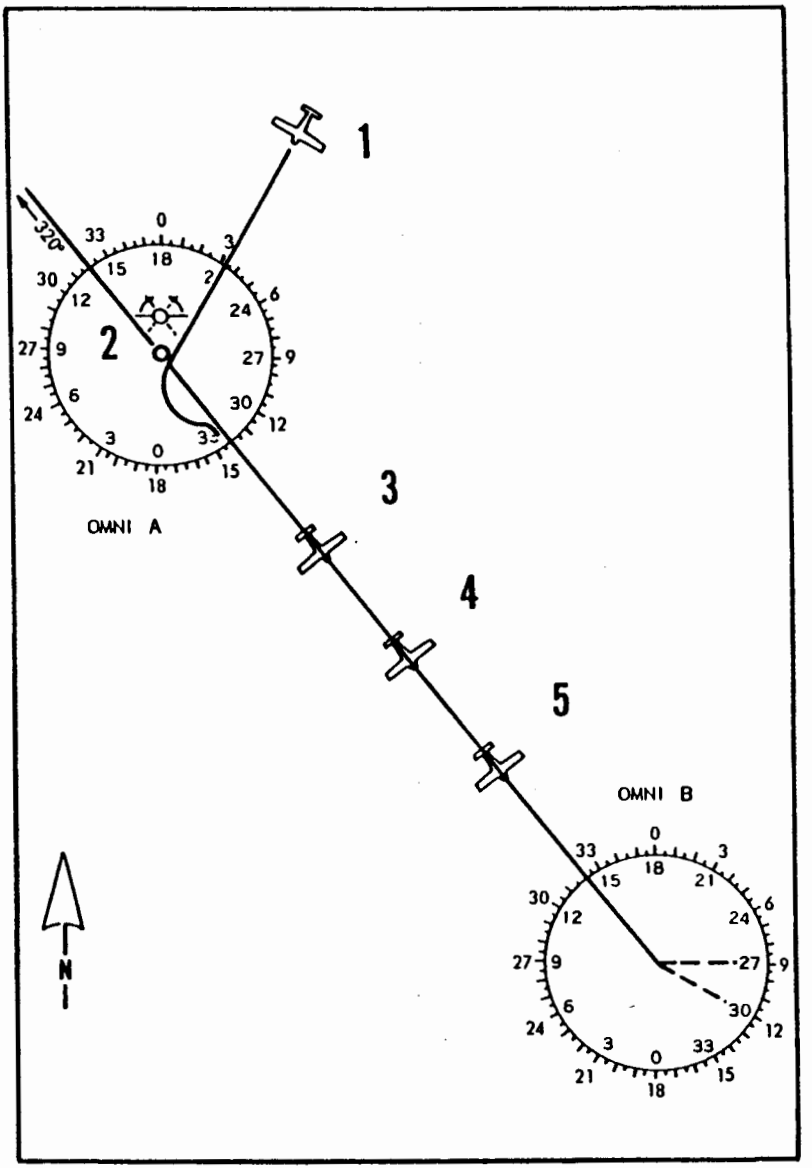
2. With OMNI setup complete, by using the Course Selector Knob, set the Course Selector of the Directional Gyro on the same course as the OBS. Switch the COUPLER from the HEADING MODE to the OMNI or NAV MODE.

3. The aircraft will turn to intercept the desired course, at an angle not exceeding 45^{o}, and the coupler will automatically compute closure rate and position.

4. The coupler will roll the aircraft onto the selected course at the proper time, and will establish the crosswind-corrected heading of the aircraft soon after rollout.

It is important to note that the Course Selector will sometimes line up off course when flying on a radial in a crosswind, this displays the wind correction angle or (crab angle).

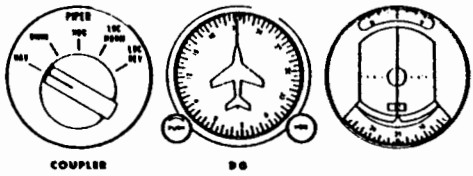
As the station is passed the TO/FROM indicator will change from a TO indication to FROM and the AutoPilot will continue to track out the same course.



VOR NAVIGATION

VOR NAVIGATION

1. Assume that the aircraft is inbound and coupled to the 032 degree radial of OMNI A (see illustration on Page 27).

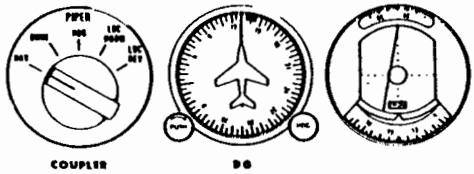


2. When flying through the "Cone of Confusion" directly over the OMNI station, the aircraft will gently roll to the right and to the left and the TO/FROM indicator will go to FROM indicating station passage. At this point the pilot should select on the OBS the desired outbound radial, (140 degrees in the illustration) and also set the Course Selector to 140 degrees.

NOTE

It is not necessary to change coupling modes and the coupler should be left in the NAV position.

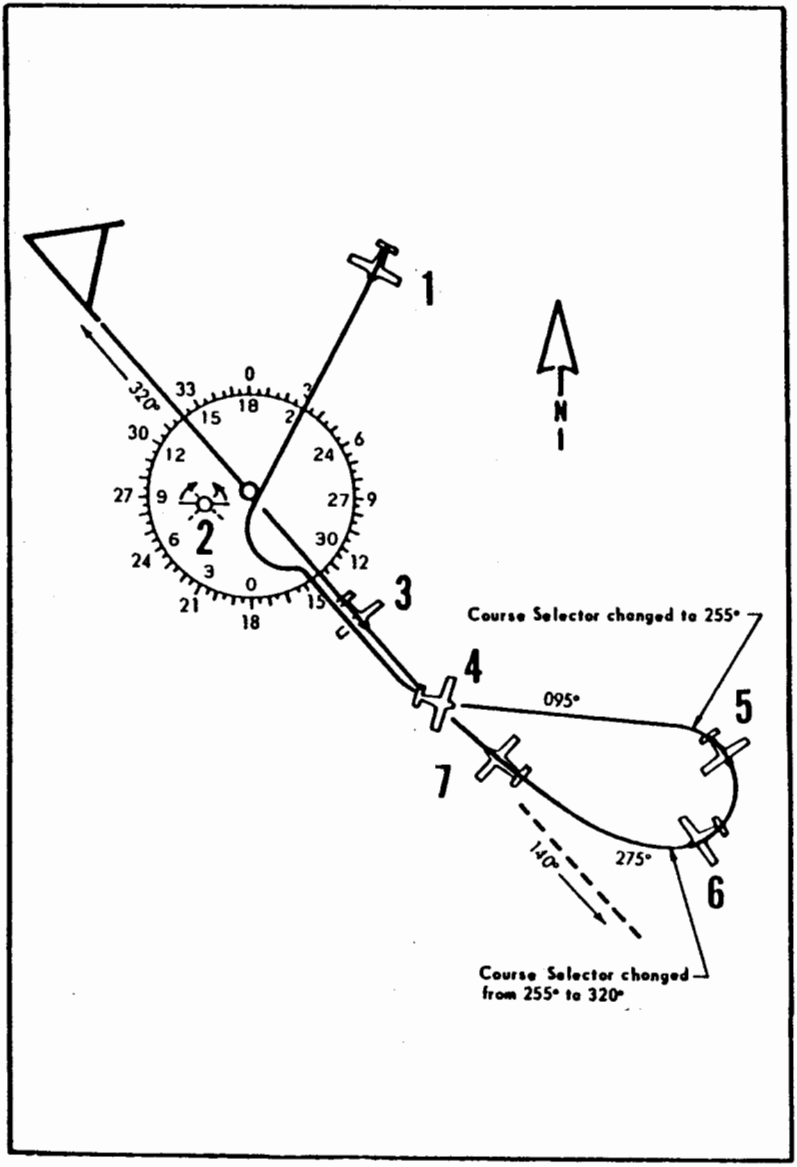
3. The aircraft will automatically turn left to intercept the 140 degree radial of OMNI A, and will compensate for any cross-wind or station overshoot.



*4. When normal OMNI sensitivity decreases on station A the pilot should go to the HDG MODE, tune in station B, set the OBS and then go back to the NAV MODE.

5. The coupling procedure is repeated as described above from station to station as the aircraft progresses along its route.

* When Omni sensitivity dictates changing from station A to station B the operator can tune in station B on his lower receiver and simply actuate his coupler radio selector switch to the Omni 2 position for ease of operation. (See Page 4.)



OMNI APPROACH

OMNI APPROACH

1. In this example the aircraft is inbound on the 032 degree radial with the compass, Directional Gyro, Course Selector, and the OBS reading 212 degrees. (No wind condition.) The coupler will track the radial leaving the pilot free to plan ahead for his OMNI approach. The coupler should be in the NAV position at this time since the approach has not yet begun.

2. As the aircraft is rolling to the right and left indicating station passage, the pilot should select the 140 degree radial in the OBS, set the Course Selector to 140 degrees in the D.G., and move the coupler mode to OMNI position.

NOTE

It is recommended that the Omni position of the Coupler be used for approach work, because it flies a more precise track.

3. The coupler will automatically intercept the 140 degree radial outbound and correct for winds and overshoot of the station and establish the aircraft on the outbound course.

4. At the time for procedure turn, the pilot should select the HDG. MODE of the coupler and rotate the Course Selector to the left to agree with the published outbound heading of the procedure turn, 095 degrees in the example.

NOTE

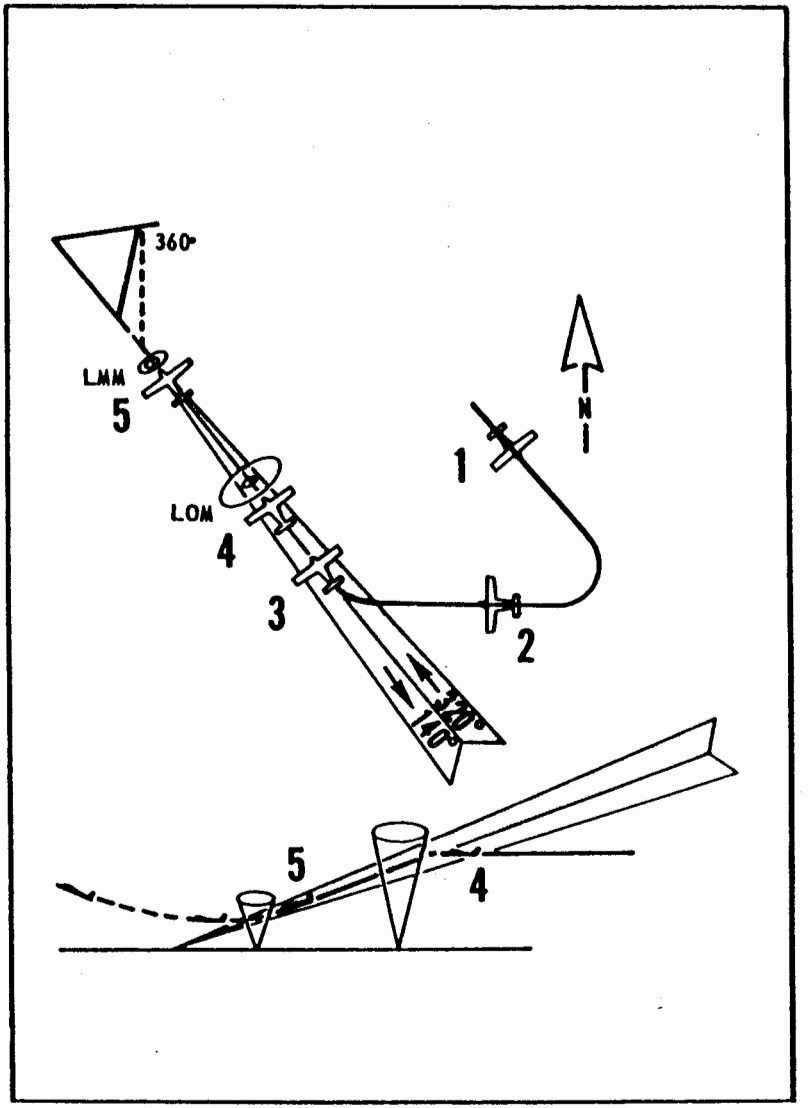
The pilot must compensate for winds while in the HDG. Mode of the coupler.

5. At the end of the first leg of the procedure turn (depending on what type of procedure turn the pilot chooses), usually one minute, the pilot should rotate the Course Selector to the right to approximately 20 degrees less than the reciprocal, 255 degrees in this illustration. It is recommended procedure that the OBS be set to the inbound course 320 degrees while flying the outbound leg of the procedure turn.

6. With the aircraft turning right, the pilot now sets the Course Selector further right to the inbound radial of 320 degrees to match his OBS. After the Course Selector and OBS are both set to 320 degrees, the coupler is switched to the OMNI Mode.

7. The coupler will now intercept the 140 degree radial inbound, and after station passage will continue to track the 320 degree radial outbound. At station passage, indicated by TO/FROM indicator "TO" changes to "FROM", the power should be reduced, time noted, OBS and Course Selector set (if necessary but not in example) for course to the field and a let down established.

During the descent from the VOR station to the M.D.A. (Minimum Descent Altitude) the unique features of the Altitude Preselect Mode can be very helpful. At the VOR station inbound (or the Final Approach Fix) set the Altitude Preselect to the M.D.A. and control the rate of descent by adjustment of the Pitch Command Disc and engine power. At the selected M.D.A. the Altitude Preselect will cause an automatic level OFF until the pilot elects either a Go-Around or a landing. During the final descent the altimeter should be constantly cross checked to assure that descent is not continued below the M.D.A. due to an inaccurate setting, and adequate power should be used.



ILS
LOCALIZER APPROACH

ILS LOCALIZER APPROACH (Radar Surveillance Directed)

It must be realized by the pilot that the localizer is only ¼ as wide and four times as sensitive as the VOR system of navigation. Therefore, to use the coupler on a localizer, the speed of the aircraft must be held to approach speeds in order for the coupler to perform as required. The coupler will not make up for lack of knowledge and understanding of the localizer system on the part of the pilot. However, the coupler will function with a high degree of reliability if standard procedures are followed. It must also be understood that while the OBS is not used on localizer approaches (because of the radio transmission principles involved) the Course Selector must be set to the inbound heading of the localizer to prevent the aircraft from orbiting.* The Piper coupler will not orbit when used correctly.

1. When receiving Airport Surveillance Radar (ASR) vectors to a localizer course, the pilot will be given headings to steer by the radar controller. When contacting the controller, make sure he is aware of the intercept angle limitations by stating "THIS WILL BE AN AUTOMATIC APPROACH." This will alert the radar operator that the intercept angle must not be 90 degrees or some large angle and he may take the aircraft out further before turning it toward the ILS course. At this point the pilot should have the coupler in the HDG MODE and should use the Course Selector to dial the headings given by the radar controller. The localizer should be tuned in and identified at this time.

*Orbiting - to travel in circles around a designated area.

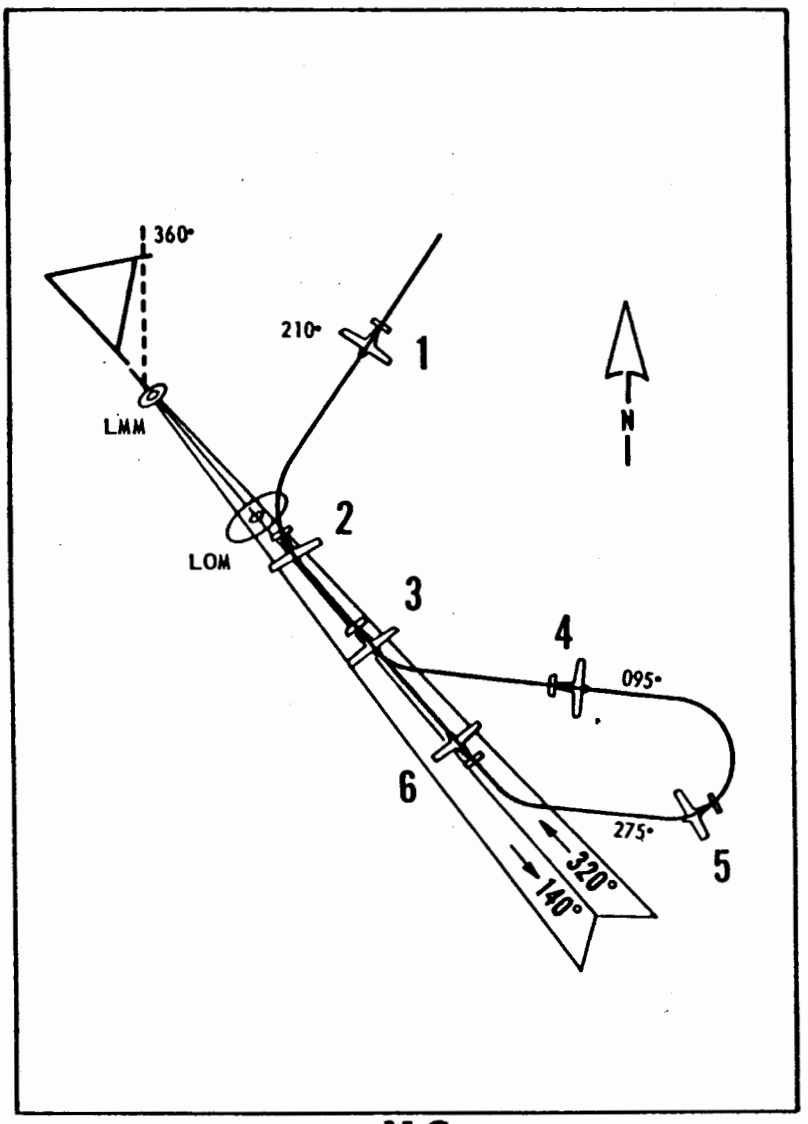
2. When the radar controller has the aircraft in position for the localizer intercept, the pilot should set the INBOUND HEADING OF THE LOCALIZER on the Directional Gyro. Then the pilot should select the LOC/NORM MODE of the coupler.

3. The coupler will intercept the localizer and correct for any crosswind up to 15°.

4. The pilot should establish the rate of descent when over the designated fix as in any approach. It must be noted that the coupler is only controlling the heading of the aircraft and not the rate of descent.

5. When over the Middle Marker the pilot should disengage the Automatic Pilot and take over control of the aircraft manually. With the AutoPilot disengaged, the coupler is no longer operating, and the Mode on the coupler is of no importance. However, the coupler should be set to the Hdg. Mode in case of a "go-around" and re-engagement of the AutoPilot.

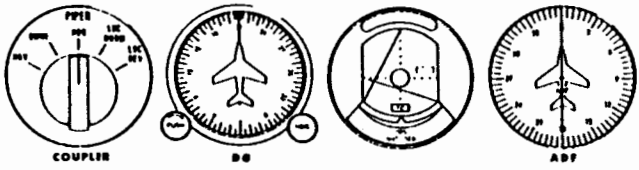
Refer to Page 37 for information on the Glide Slope Coupler if it is installed.



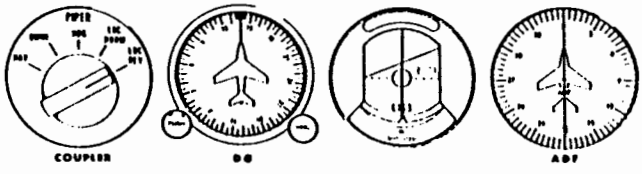
ILS
LOCALIZER APPROACH

ILS LOCALIZER APPROACH (Standard Front Course Approach)

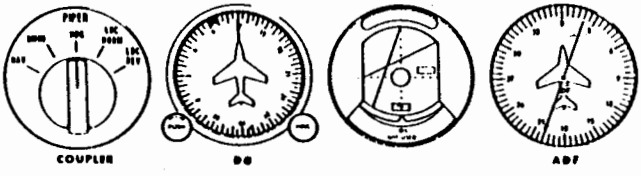
1. In this example of an ILS approach the aircraft is homing on the Outer Compass Locator (which is the Outer Marker) by use of ADF. The coupler will be selected to the HDG MODE and the pilot will be using the COURSE SELECTOR to control the aircraft heading. The ILS station should be tuned in and identified prior to reaching the Outer Marker.



2. Upon intercepting the localizer at Outer Marker, the pilot should set the COURSE SELECTOR to the OUTBOUND HEADING OF THE LOCALIZER, (140 degrees in this case) and will then move the COUPLER to the LOC REV (localizer reverse) MODE. The coupler will track the localizer outbound, (correcting away from the needle) and make corrections for any crosswind up to 15° of correction.

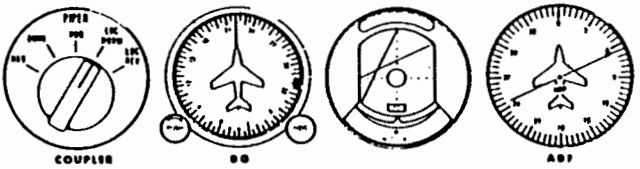


3. At the time of procedure turn, the pilot will select the HDG MODE of the Coupler, and rotate the Course Selector to the left to agree with the published outbound heading of the procedure turn, 095 degrees.

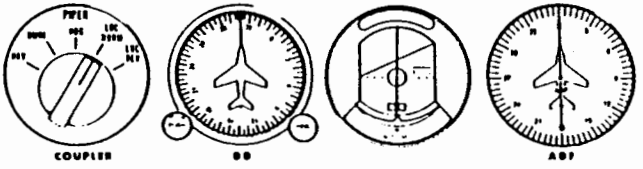


4. At the end of the first leg of the procedure turn (depending on what type of procedure turn the pilot chooses), usually one minute, the pilot will rotate the COURSE SELECTOR TO THE RIGHT to approximately 20 degrees less than the reciprocal or 255 degrees.

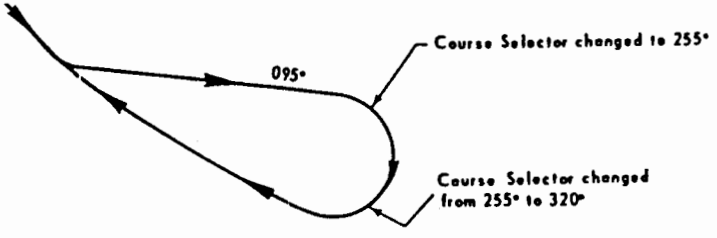
5. With the aircraft now turning right, the pilot sets the COURSE SELECTOR FURTHER RIGHT to the INBOUND HEADING OF THE LOCALIZER, 320 degrees, and then SWITCHES THE COUPLER TO THE LOC NORM MODE. *



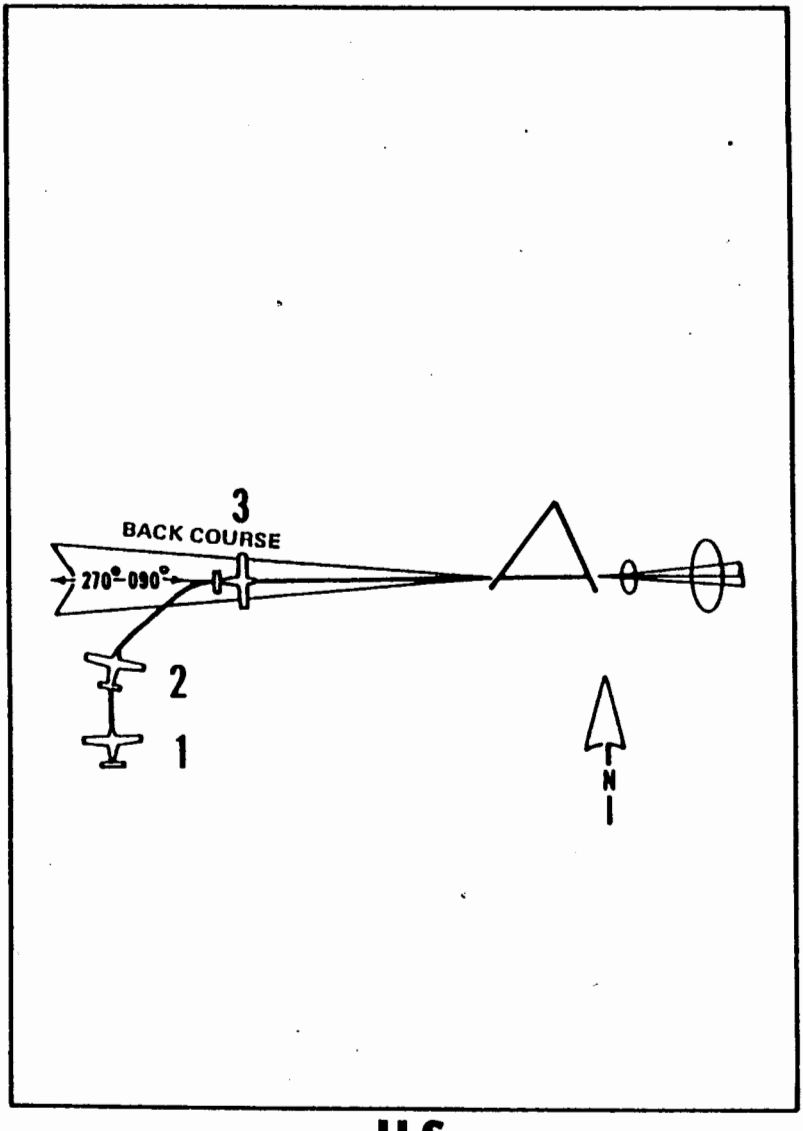
6. The coupler will now cause the aircraft to intercept the INBOUND LOCALIZER COURSE, correcting for any crosswind. The remainder of the approach should be executed as previously explained in the preceding illustration on previous page.



* This will result in a flight path similar to that below.



Refer to Page 37 for information on the Glide Slope Coupler if it is installed.



ILS
BACK COURSE APPROACH

ILS BACK COURSE APPROACH (Radar Surveillance Directed)

At times it may be necessary to make a back course approach on the ILS. There is misunderstanding among many pilots as to when the needle is directional* and when the needle is non-directional when using the ILS system. THE NEEDLE DOES NOT REVERSE WHEN FLYING OVER THE FIELD FROM THE BACK COURSE TO THE APPROACH OR FRONT COURSE OR VICE VERSA. THE NEEDLE IS DIRECTIONAL WHEN FLYING INBOUND ALONG THE FRONT COURSE (over the markers inbound) AND OUTBOUND ALONG THE BACK COURSE. THE NEEDLE IS NON-DIRECTIONAL WHEN FLYING INBOUND ON THE BACK COURSE AND OUTBOUND ON THE FRONT COURSE. To use the coupler when flying the ILS the operator must thoroughly understand the principles of the Instrument Landing and Approach System.

Inbound on the Front Course or Outbound on the Back Course, corrections are toward the needle. The Coupler Mode should be in LOC NORM.

Outbound on the Front Course or Inbound on the Back Course, corrections are away from the needle. The Coupler Mode should be in the LOC REV.

1. In this example the aircraft is receiving radar vectors to the Back Course of the localizer with the Coupler set to the HDG MODE. The pilot uses the Course Selector to control the aircraft heading. At this time or before the pilot also tunes in the localizer and identifies the station.

2. At this point the pilot sets the INBOUND HEADING of the BACK COURSE on the DG by placing the Course Selector

* "Directional" means that if the localizer ℄ is to the left of the aircraft the OMNI needle will point to the left.

on 090 degrees (in this illustration), and switches to the LOC REV MODE on the coupler. As in any ILS work, the OBS has no function. Also there is no glide slope for a back course approach.

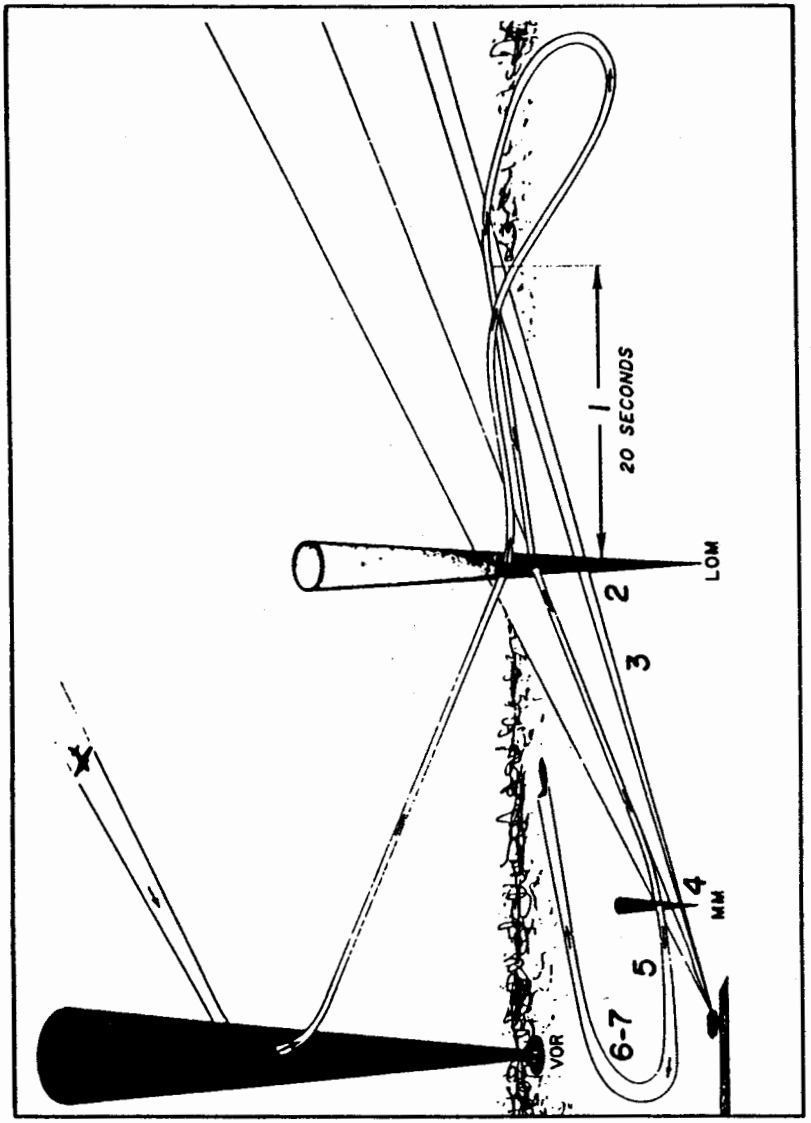
IMPORTANT NOTE

The aircraft must be flown at approach speed when using the ILS because of the increased sensitivity that accompanies the system. Also, the aircraft must be at least five miles from the end of the runway if the coupler is to function properly. Since the AutoPilot is restricted to standard rate turns, if coupling is attempted too close to the runway the aircraft will overshoot the localizer.

3. The coupler will intercept the Back Course and track inbound on the Localizer, correcting for any crosswind that may be present up to 15°.

NOTE

Since there is no Glide Path transmitted on the Back Course, the Horizontal needle will be inactive and the "OFF" flag will be visible. Also, the AutoPilot should be disengaged (or the HDG MODE should be selected) when approximately one mile from the end of the runway on a Back Course approach, since the Localizer transmitter is now at the approach end of runway.

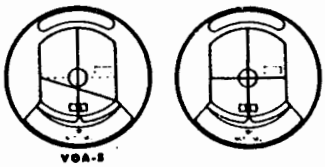


GLIDE SLOPE COUPLER
ILS APPROACH

COUPLED ILS APPROACH

1. In order for the Glide Slope Coupler to arm, all three of the following conditions must exist for at least 20 seconds:
   A. AutoPilot in the Altitude Mode
   B. Radio Coupler in Loc. Norm Mode
   C. Aircraft under the Glide Path

2. Upon interception of the glide path, a green annunciator light (located on the instrument panel) will indicate that the AutoPilot has coupled to the Glide Path. The Glide Slope Needle must drop through the center of the instrument momentarily for the AutoPilot to couple.



If the landing gear is lowered at this time, when the glide slope is intercepted in level flight, little if any power is needed for airspeed control. (The airspeed is controlled with the throttle while the Glide Slope Coupler controls the angle of descent.) If the flaps are to be used, they should be lowered by increments of about 5° to a maximum of 15°. (See CAUTION note on Page 24.)

3. After the AutoPilot couples to the Glide Path, the Altitude Preselect Drum may be set for the altitude published in the missed approach procedure of the approach plate. The altimeter should be monitored throughout the approach.

4. The AutoPilot must be disengaged at or before the Middle Marker.

5. If the Roll Engage Switch is pushed to the OFF position, the entire AutoPilot will be disengaged and the aircraft must be flown

manually. (The Roll Switch is in the lower left corner of the console.)

6. If the AutoPilot is engaged and a missed approach is elected prior to reaching the Middle Marker, the Radio Coupler Knob should be turned to the HEADING MODE. Pitch control reverts to the Altitude Selector. With the missed approach altitude set on the Preselect Drum, the need for climb power should be anticipated and applied when Radio Coupler Knob is turned to the HDG MODE.

7. The Pitch Attitude may be controlled during a missed approach by using the Pitch Command Disk (#5).

NOTE

The Pitch Command Indicator (#6) should be centered for level flight attitude before control is transferred to the Pitch Command Disk.

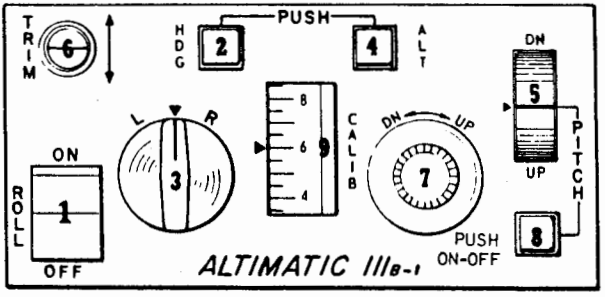
To transfer control to the Pitch Command Disk, the Altitude Preselect Button (#4) must be pressed to the OFF position. The AutoPilot will be uncoupled from the Glide Slope when the Altitude Selector is OFF.

NOTE

Before using the AutoPilot for an approach, read the airplane Flight Manual to note possible altitude in case of an AutoPilot malfunction. Be familiar with the ways to disengage the AutoPilot and electric trim, and be ready to disengage if a malfunction should occur.

SECTION IV

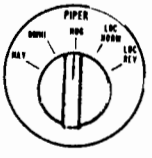
CHECK LIST



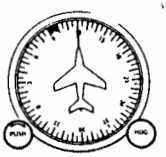
1. Roll Engage/Disengage
2. Heading Preselect Switch
3. Roll Command Knob
4. Altitude Preselect Switch
5. Pitch Command Disk
6. Trim Indicator
7. Altitude Selector Knob
8. Pitch Engage/Disengage
9. Altitude Dial (incorporates barometric pressure calibration)

Pilot's Operating Instructions For Piper AltiMatic III B-1

Engaging Roll Command Function:



1. All AltiMatic console switches - off.
2. D. G. and aircraft compass - aligned.
3. Mode selector - heading position.
4. Roll command switch (#1) - engaged.
5. Turns left and right with up to 30° bank are now possible by rotating Roll Command Knob (#3).



Engaging Heading Preselect Function:

1. Course Selector (located in D.G. and controlled by HDG knob to right of D.G.) aligned with aircraft heading.
2. Heading Preselect Button (#2) - engaged.
3. Preselected headings may now be made by rotating the course selector knob to set the course selector in the D.G. to any desired heading.

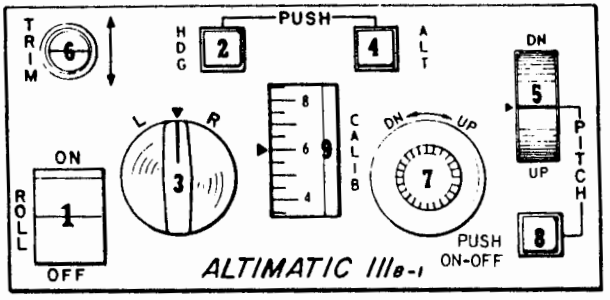
Engaging Pitch Command Function:

1. Altitude Preselect Button (#4) - off.
2. Pitch Command Disk (#5) - rotate to center Trim Indicator (#6).
3. Pitch Button (#8) - engage.
4. Aircraft attitude may now be controlled by the Pitch Command Disk (#5) through climb, level flight and descent.

Engaging Radio Coupling:

1. Choose an OMNI station that is within reception range and suitable for navigation on either Nav #1 or Nav #2.
2. Roll Command Knob (#3) - center.
3. Heading Preselect Button (#2) - disengage.
4. Place Coupler Radio Selector Switch to proper position in accordance with desired VOR receiver.
5. Omni bearing selector - center.
6. Set course selector on D. G. to correspond with setting of O.B.S.
7. Place mode selector in Nav position. (Use OMNI mode for OMNI approach only.)
8. Heading Preselect Button - engage: AutoPilot is now coupled to OMNI station.

If interception with a certain radial is necessary, set the desired course on the OBS, then set the course selector to the same heading. The aircraft will approach the desired radial at a 45° angle with full needle deflection on the OBS and then track along the radial.



Engaging Preselect Function During Climb:

To employ the Preselect function during a climb the roll and heading of the AutoPilot should be engaged.

1. Disengage the Altitude Preselect Button (#4).
2. Rotate Pitch Command Disk (#5) - to center Trim Indicator (#6).
3. Engage the Pitch Button (#8).
4. Select altitude desired on the altitude dial (higher than present altitude) by use of the Altitude Selector Knob (#7).
5. Pitch Command Disk (#5) - adjust pitch attitude and power for desired climbing speed.
6. Engage Altitude Preselect Button (#4).
7. Calibrate Altitude Dial (#9) after the aircraft is in level flight. Preselect the proper altitude if necessary.

Engaging Preselect Function From Level Flight:

1. Pitch Engage Button (#8) - off.
2. Altitude Preselect Button (#4) - engage.
3. Altitude Preselect Knob (#7) - rotate to center Trim Indicator (#6).
4. With Trim Indicator (#6) in trim, engage Pitch Button (#8).
5. Calibrate Altitude Dial (#9) by rotating it to agree with accurate altimeter setting.

To avoid a reduction in the chosen rate of descent, reduce power when preselecting a lower altitude.

The AltiMatic III B-1 may be disengaged at any time by:

a. Pressing the AutoPilot disengage button.
b. Turning roll engage switch OFF.
c. Pulling the AutoPilot circuit breaker.