

TRIDEN SERIES OPERATING TECHNIQUES

In the pages that follow, we have included techniques for:

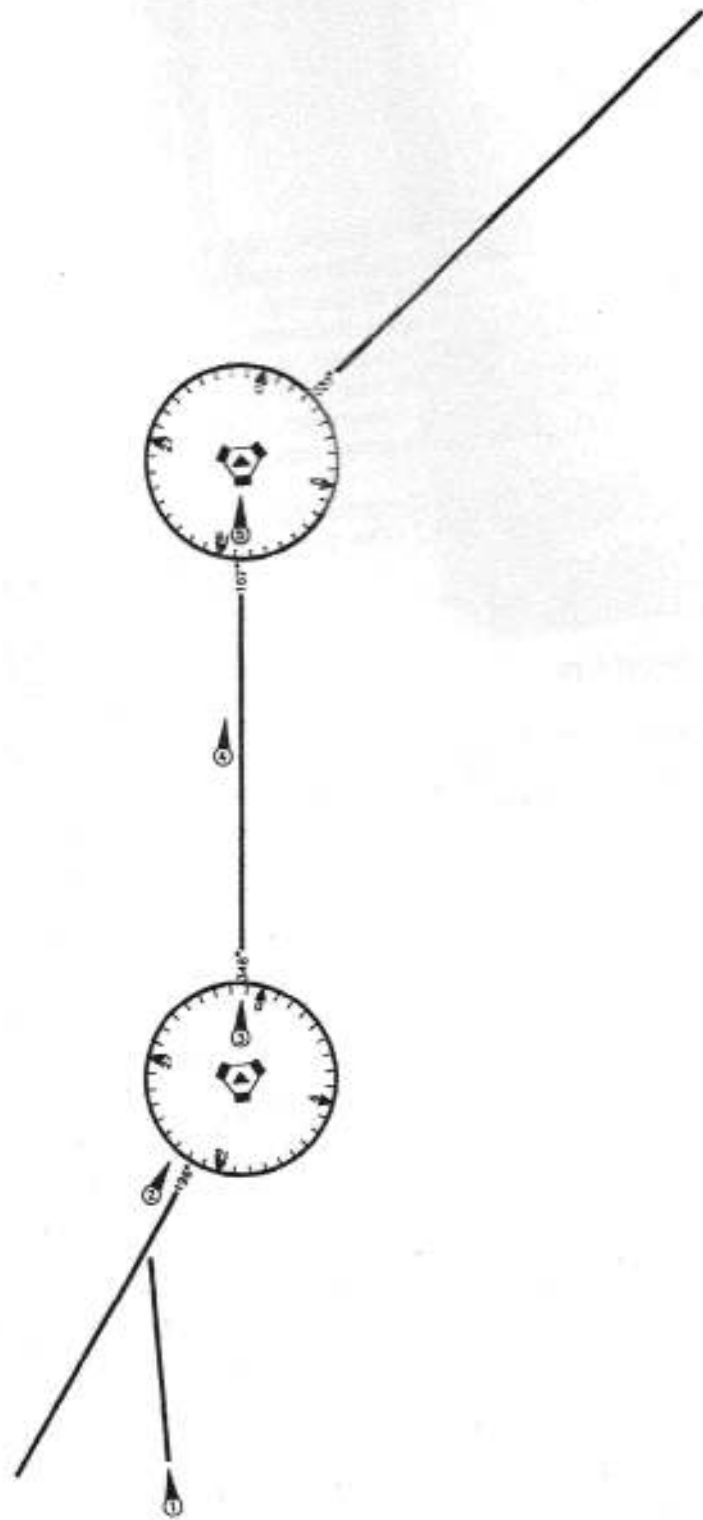
- VOR Navigation
- VOR Approaches
- Localizer Approaches
- Glideslope Arming & Coupling
- Localizer Back Course

NOTE





The TRIDEN SERIES autopilot is capable of tracking lateral information from a loran or GPS. Several factors in procedure and operation are important to remember. Adjust the course width (CDI sensitivity) of the loran or GPS to insure it is not too wide or too narrow (represented as nautical miles per dot). On most IFR Approach Certified GPS's this is done automatically. A course width too wide would cause the autopilot to S-turn back and forth along the desired track. Too narrow would cause the autopilot to be overly sensitive to CDI movement. When tracking to a desired waypoint, the bearing information will be displayed on the loran or GPS. This bearing information must be input into the autopilot through either the heading bug (when using a DG) or the course arrow (when using an HSI) in order for the autopilot to track properly.

The photographs depict the Century Flight Systems Navigational Situation Display 1000 (NSD 1000) as the HSI and the standard Directional Gyro. The techniques are equally applicable to other compass systems.

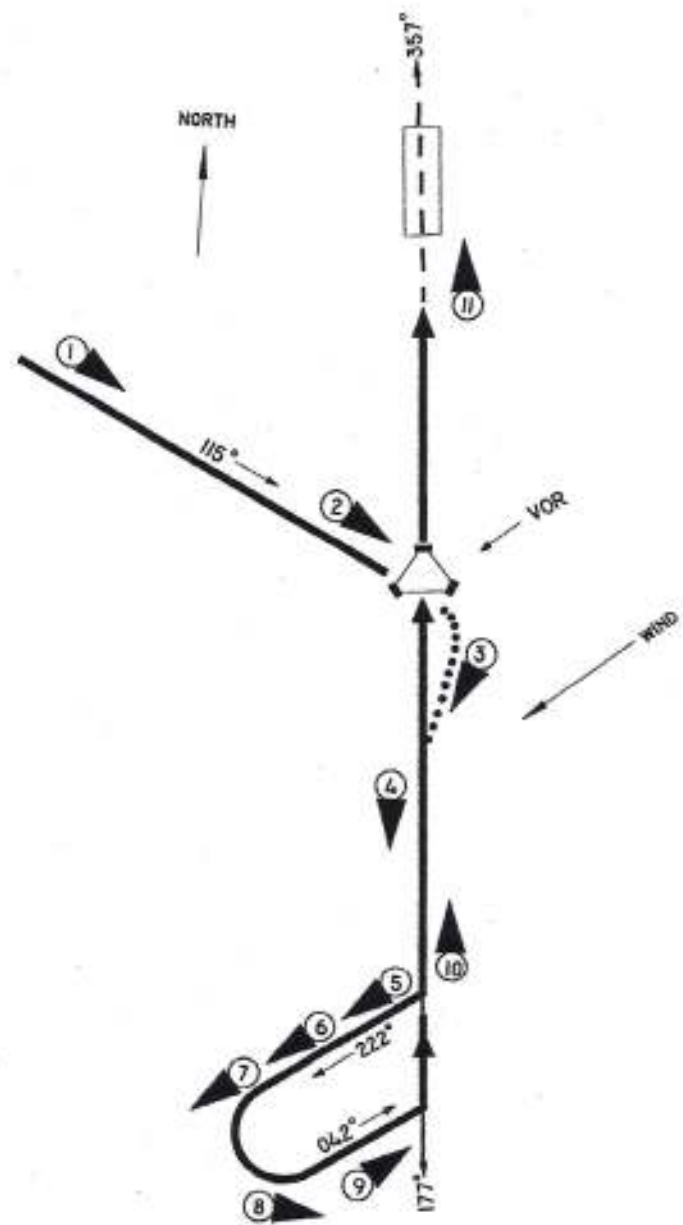
HSI VOR Navigation







HSI VOR Navigation

STEP	HSI	MODE	REMARKS
1		HDG/NAV ARM ALT	A selected angle intercept of up to 90° may be selected by setting the course arrow to the desired radial and the heading bug to the appropriate heading for the desired intercept. Momentarily press the NAV switch on the autopilot. The system will remain tracking the heading bug until the on course turn.
2		NAV CPL SOFT ALT	After intercept, the system will correct for crosswind and adjust its internal radio authority and limit bank angles.
3		NAV CPL/HDG ALT	If a course change is required at the VOR, reposition the course arrow. If deviations because of station passage is not desired, press HDG and set the heading bug on the desired course.
4		NAV CPL or ARM ALT	Station switching is accomplished by tuning the nav receiver to the desired station and setting the course with the course arrow. A course change of 45° or more will cause the system to kick out of "soft" mode and set up a 45° intercept to the new course.

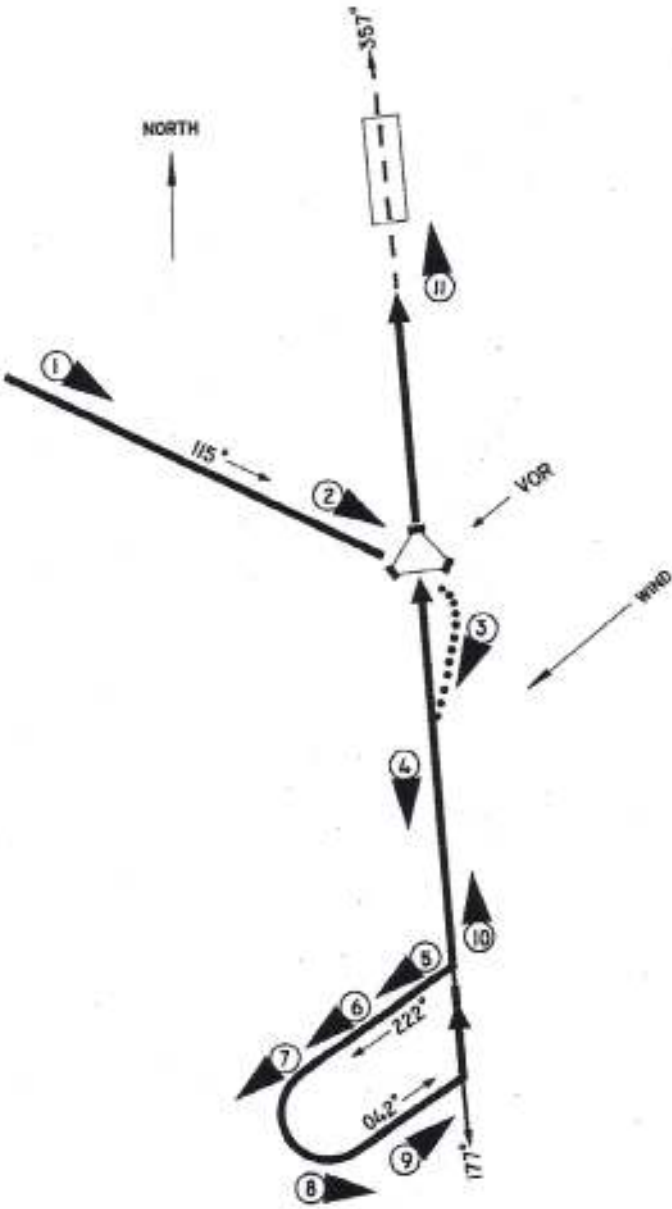
HSI VOR APPROACH







HSI VOR Approach

STEP	HSI	MODE	REMARKS
1		NAV CPL SOFT ALT or ATT	The VOR approach usually begins from an enroute situation.
2		HDG/REV ARM ALT or ATT	As the VOR is neared, match the heading bug to the course flown and momentarily press the REV switch. Set the course arrow for the inbound intermediate course segment.
3		REV CPL ALT or ATT	As the VOR is approached, REV will couple to fly the selected course outbound. Should a lower altitude be required, select VS or press ATT and use the pitch modifier to make the altitude change.
4		REV CPL SOFT VS or ATT	When the desired altitude is reached, press the ALT switch.

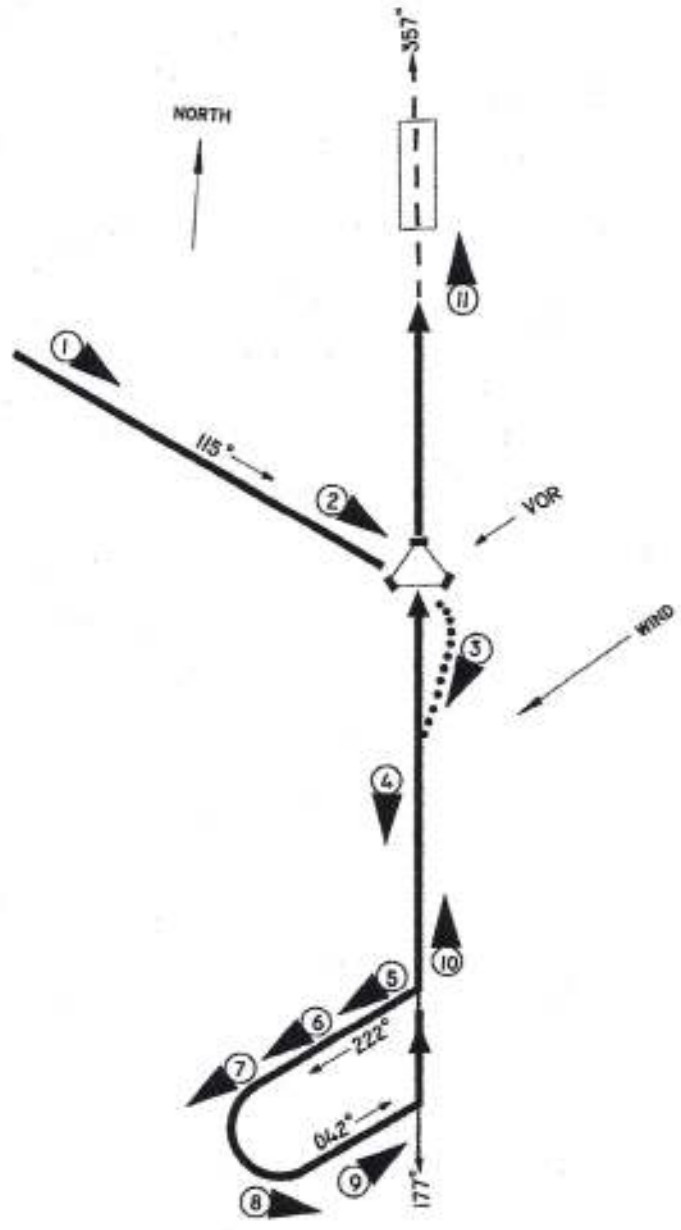
HSI VOR APPROACH






HSI VOR Approach

STEP	HSI	MODE	REMARKS
5		<p style="text-align: center;">HDG ALT or ATT</p>	<p>Turn the heading bug to the outbound procedure turn heading and press the HDG switch.</p>
6		<p style="text-align: center;">HDG ALT</p>	<p>Proceed outbound until sufficient time has elapsed to assure proper re-interception.</p>
7		<p style="text-align: center;">HDG ALT</p>	<p>Lead aircraft through the procedure turn by moving the heading bug in the direction of the procedural turn.</p>
8		<p style="text-align: center;">HDG/NAV ARM ALT</p>	<p>As the aircraft continues to turn, momentarily press the NAV switch and turn the heading bug to intercept the inbound course.</p>

HSI VOR APPROACH

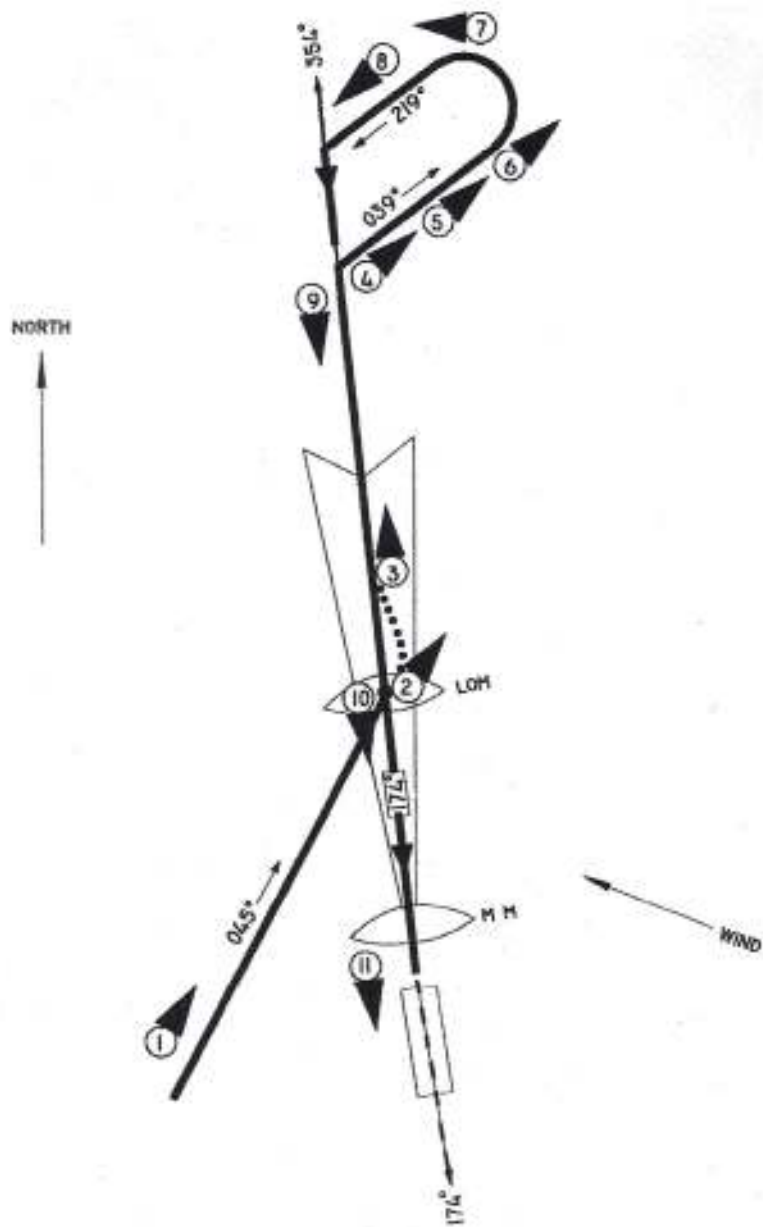


HSI VOR Approach





STEP	HSI	MODE	REMARKS
9		NAV CPL ALT	As the aircraft approaches the inbound course, the system will switch out of the dual mode and turn to the inbound course.
10		NAV CPL SOFT ATT or VS	After the on course turn, the system will correct for crosswind and enter into a "soft" mode. The aircraft's altitude and speed should be controlled as appropriate for the approach. Once the aircraft has reached minimums, disconnect the autopilot.
11		NAV CPL SOFT ATT	If a missed approach is required, disconnect the autopilot and establish desired climb attitude and airspeed. When appropriate select HDG and ATT HDG and ALT or HDG and VS and engage autopilot.

NOTES

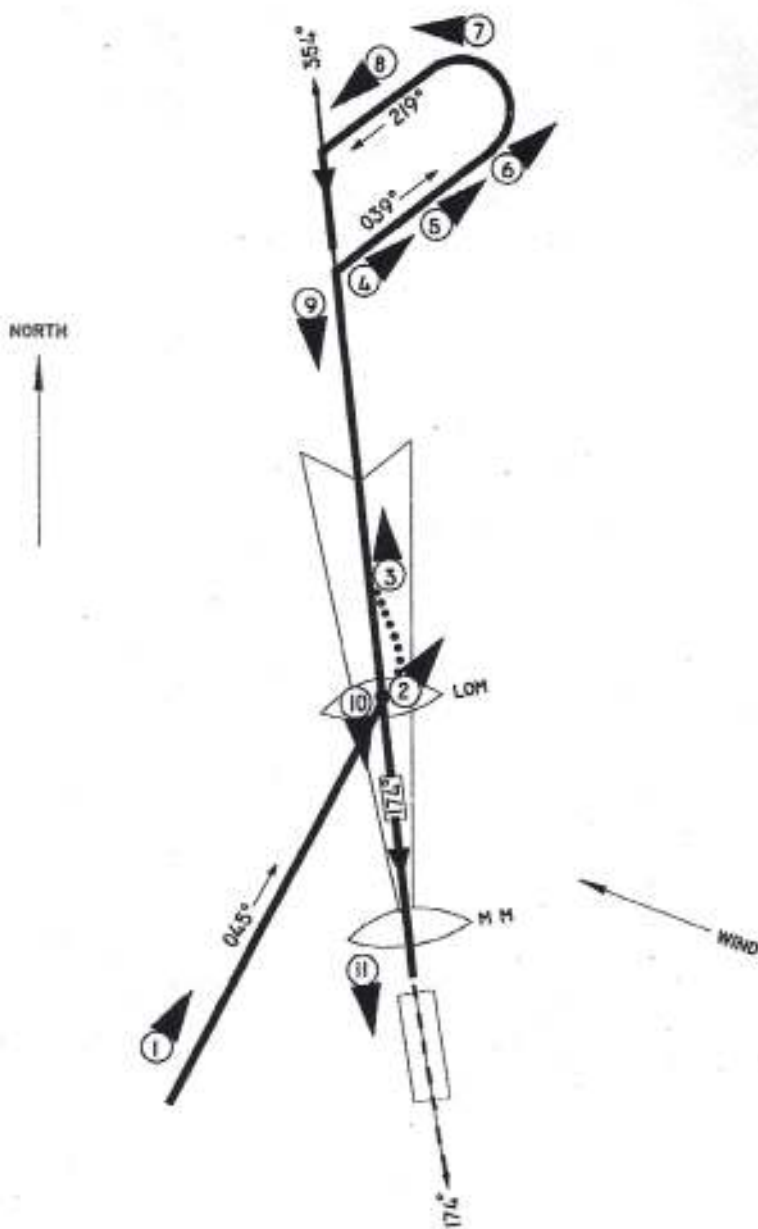
HSI LOCALIZER APPROACH







HSI LOCALIZER Approach

STEP	HSI	AP MODE	REMARKS
1		HDG REV ARM ALT, ATT or VS	The localizer or ILS approach begins with a transition from the enroute structure to the outer compass locator (LOM). Momentarily press the REV switch. The heading bug is used to select the desired heading. The aircraft's altitude may be controlled by the modifier switch or through the use of the mode. The inbound Front Course direction is selected with the course arrow.
2		REV CPL ALT	Before reaching the LOM, the autopilot will couple REV mode and track outbound.
3		REV CPL SOFT ALT	Upon tracking the localizer, the system will compensate for crosswind and enter the "soft" mode. The procedure turn outbound heading may now be selected with the heading bug.
4		HDG or ATT	At the appropriate time, press the HDG switch to begin the procedure turn. Altitude appropriate to this phase of the approach should be controlled using VS or ATT HLD as necessary.

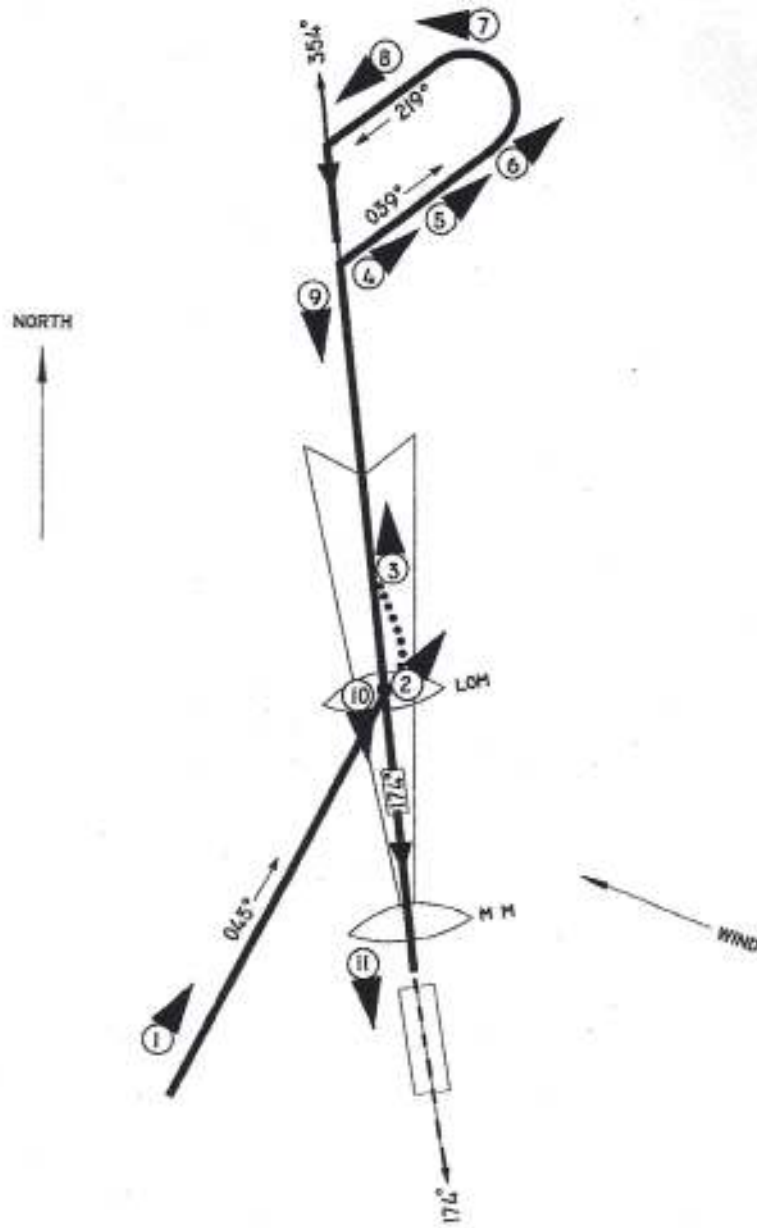
HSI LOCALIZER Approach






HSI LOCALIZER Approach

STEP	HSI	MODE	REMARKS
5		<p>HDG ALT</p>	<p>Proceed outbound in the procedure turn until sufficient time has elapsed to assure proper re-interception.</p>
6		<p>HDG ALT</p>	<p>Lead the aircraft through the procedure turn by moving the heading bug in the direction of the turn.</p>
7		<p>HDG ALT</p>	<p>Continue to lead the aircraft through the turn.</p>
8		<p>HDG/APR ARM ALT or ATT</p>	<p>Momentarily press the APR switch. The HDG and APR ARM messages should be displayed to indicate a dual mode. The aircraft will follow the heading bug until the system determines when an on course turn is required.</p>

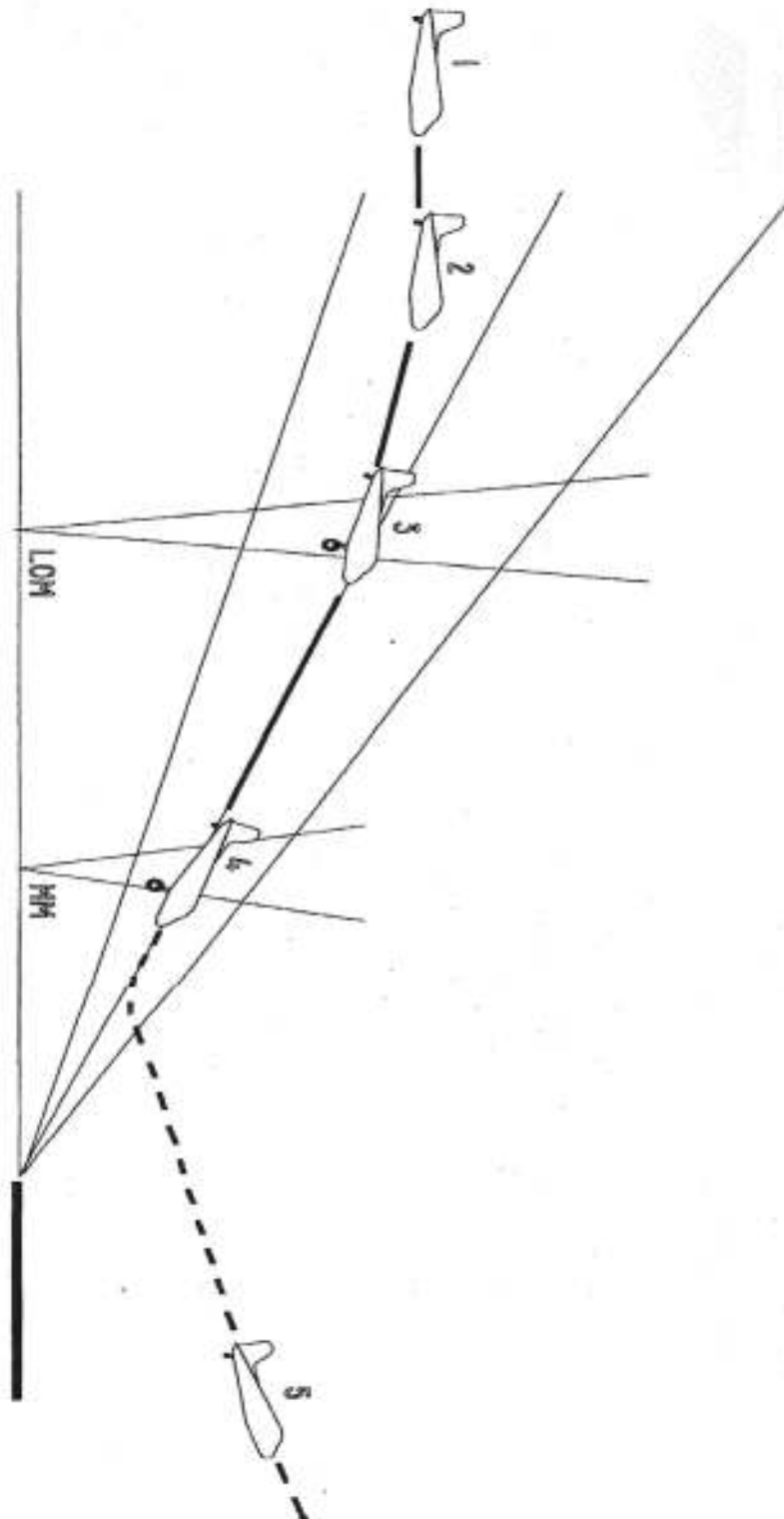
HSI LOCALIZER Approach








HSI LOCALIZER Approach

STEP	HSI	MODE	REMARKS
9		<p style="text-align: center;">APR CPL SOFT ALT/GS ARM</p>	<p>When the on course turn is initiated the HDG message will be removed and the system will track the localizer. After intercept, the system will correct for crosswind and enter into the "soft" mode. Internal radio gains and bank angles will be limited. The system will also automatically arm for glide slope.</p>
10		<p style="text-align: center;">APR CPL SOFT GS CAP</p>	<p>As the glide slope beam is captured, the ALT messages will be removed. The system will track the localizer and glide slope. Power changes should be performed in small increments as necessary to maintain correct airspeed. Once the aircraft has reached minimums, disconnect the autopilot.</p>
11		<p style="text-align: center;">HDG ATT</p>	<p>If a missed approach is required, disconnect the autopilot and establish desired climb attitude and airspeed. When appropriate press HDG and ATT and engage autopilot.</p>

HSI GS ARMING & CAPTURE

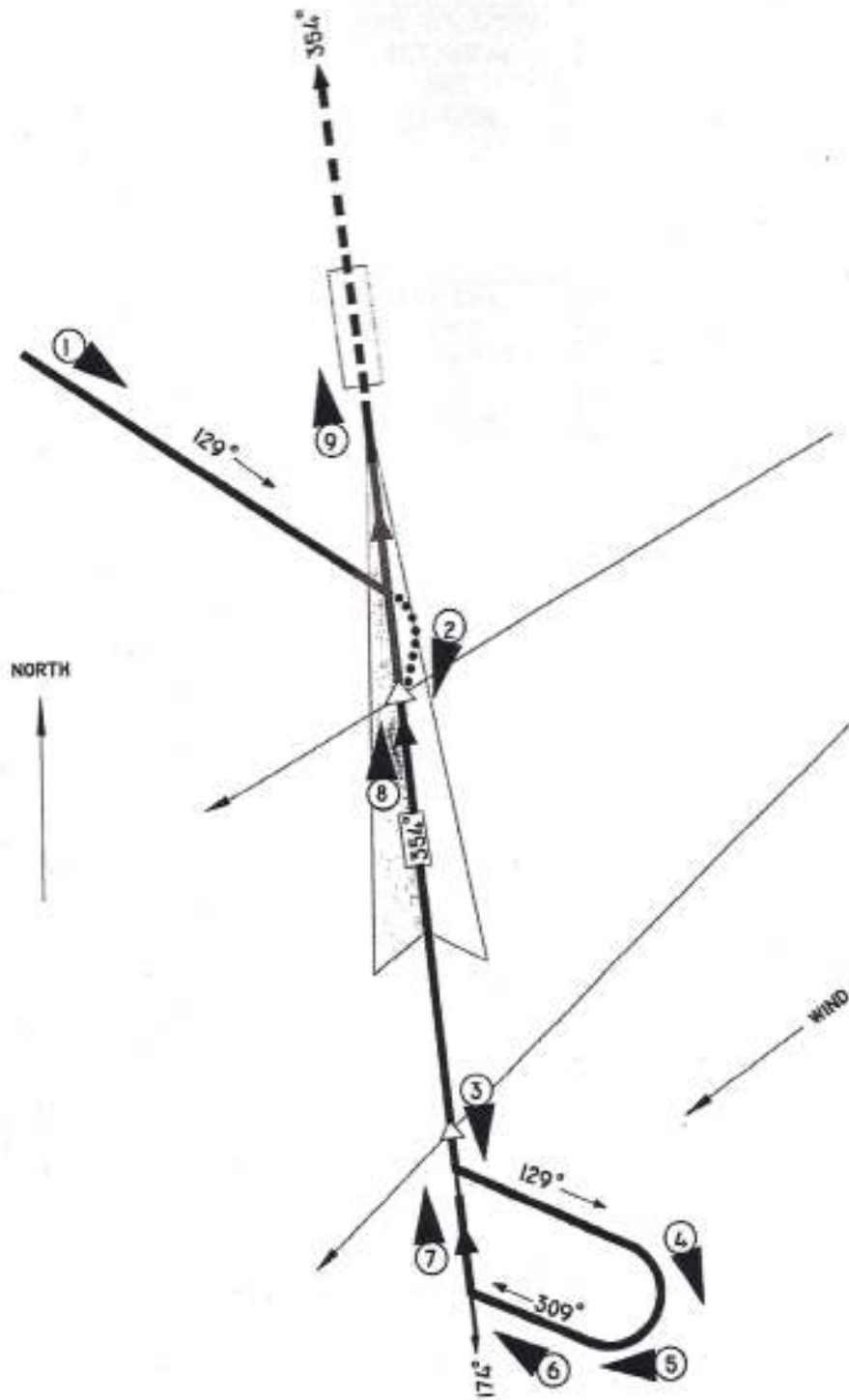


HSI GS Arming & Capture





STEP	HSI	MODE	REMARKS
1		APR CPL SOFT ALT, VS or ATT GS ARM	The typical glide slope portion of an ILS begins with the aircraft in ALT modes or in the ATT HLD mode with the aircraft on a closure to the glide slope beam.
2		APR CPL SOFT ALT or ATT HLD GS ARM	The TRIDEN SERIES autopilot system incorporates circuitry, which anticipates when capture should occur. It is important the aircraft be configured for landing before the system captures glideslope.
3		APR CPL SOFT GS CAP	When capture occurs, the ALT VS or ATT messages will be removed. The GS CAP message will be displayed indicating that the glideslope has captured.
4		APR CPL SOFT GS CAP	Upon reaching the decision height, disconnect the autopilot and complete the approach or conduct normal missed approach procedures as required.
5		HDG ATT	If a missed approach is required, disengage the autopilot and follow normal missed approach procedures. When appropriate press the HDG and ATT switches and engage autopilot. Set power appropriately.

NOTES

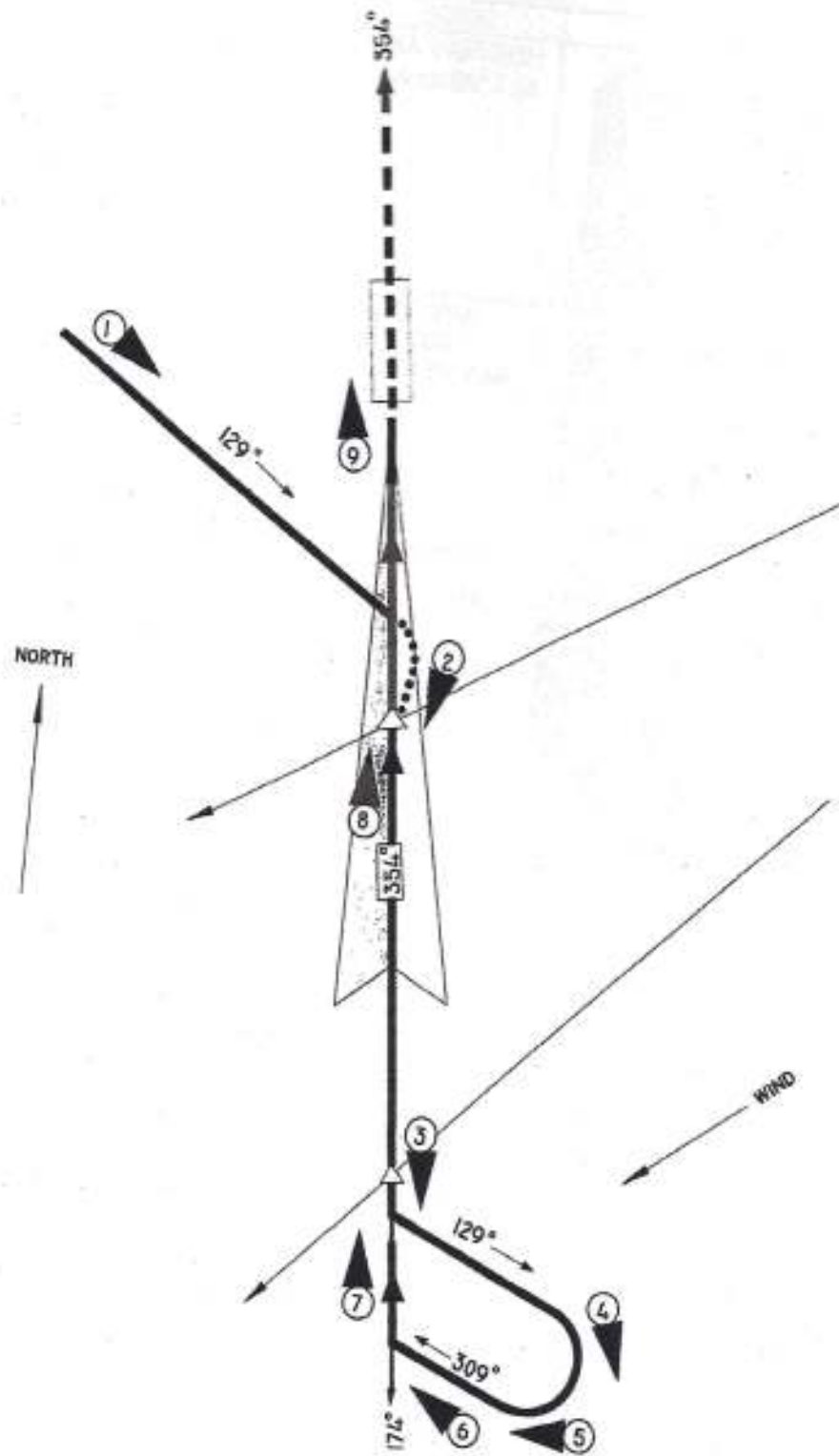
HSI Localizer Back Course



HSI Localizer Back Course






STEP	HSI	MODE	REMARKS
1		HDG/NAV ARM ALT VS or ATT	The localizer back course approach begins with a transition from the enroute structure to an intercept with the back course outbound. The <u>inbound front course</u> is set on the course arrow. Momentarily press the NAV switch. The system will follow the heading bug until an on course turn is made.
2		NAV CPL SOFT ALT VS or ATT	As the outbound course is tracked, select the outbound procedure turn heading with the heading bug. Altitude should be controlled as appropriate for the procedure.
3		HDG ALT VS or ATT HLD	When the outbound procedure turn is desired, press the HDG switch and fly outbound for sufficient time to permit re-interception.
4		HDG ALT VS or ATT HLD	Lead the aircraft through the procedure turn by moving the heading bug in the direction of the turn.

HSI Localizer Back Course



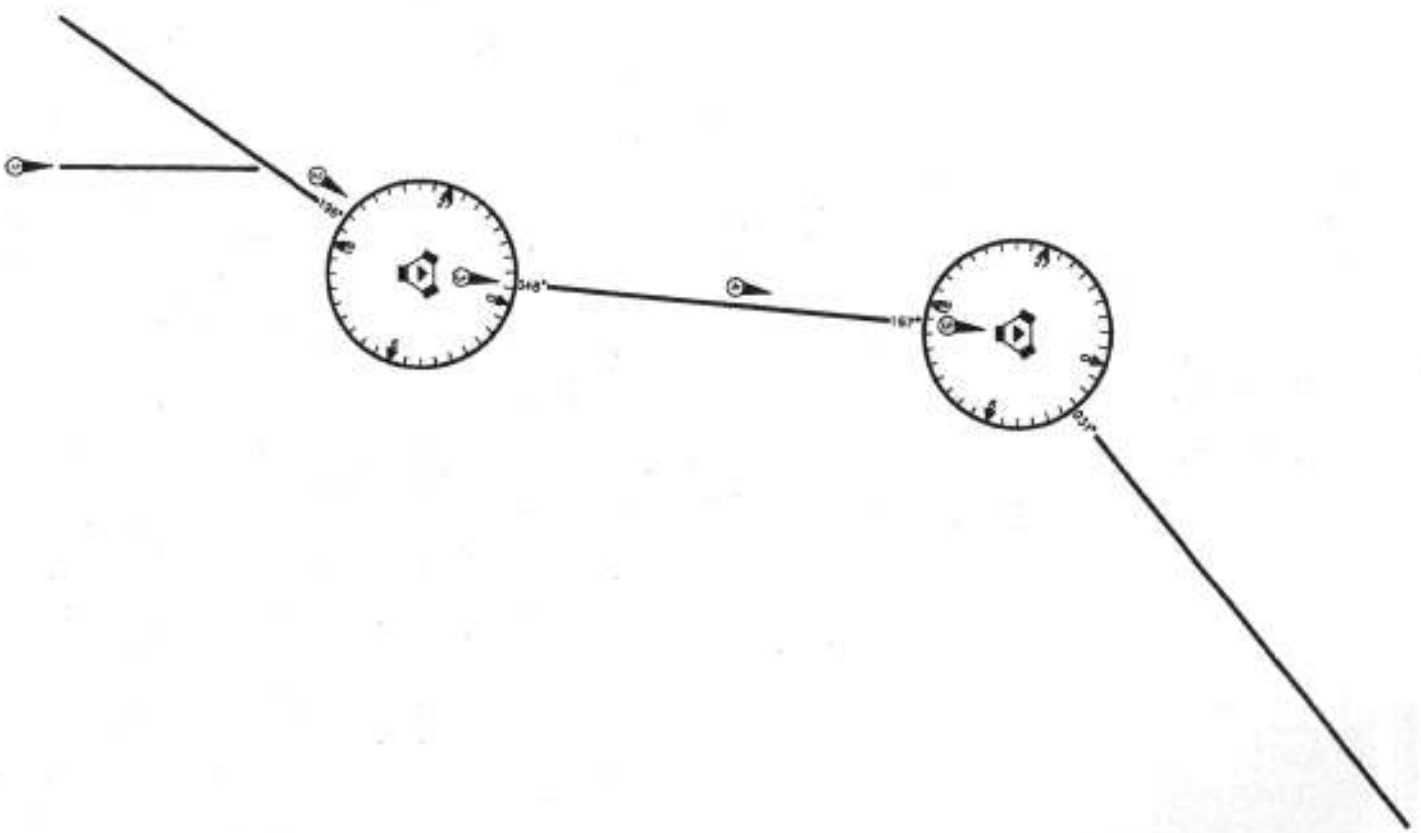
Rev B 02-05-03

HSI Localizer Back Course











STEP	HSI	MODE	REMARKS
5		HDG ALT VS or ATT	As the aircraft continues to turn, set the heading bug to the inbound procedure turn heading.
6		HDG/REV ARM ALT VS or ATT	Momentarily press the REV switch. The HDG and REV messages should be displayed to indicate the system is in a dual mode. The system will follow the heading bug until the on course turn is initiated then the HDG messages will be removed.
7		REV CPL SOFT ALT VS or ATT	After the on course turn is completed, the system will enter the "soft" mode to limit radio authority and bank angles and to correct for crosswind.
8		REV CPL SOFT ATT or VS	Control altitude and airspeed as appropriate for the approach.
9		HDG ATT	Once the aircraft has reached minimums, disconnect the autopilot. If a missed approach is required, disconnect the autopilot and establish desired climb altitude and airspeed. When appropriate press HDG and ATT and engage autopilot.

NOTES

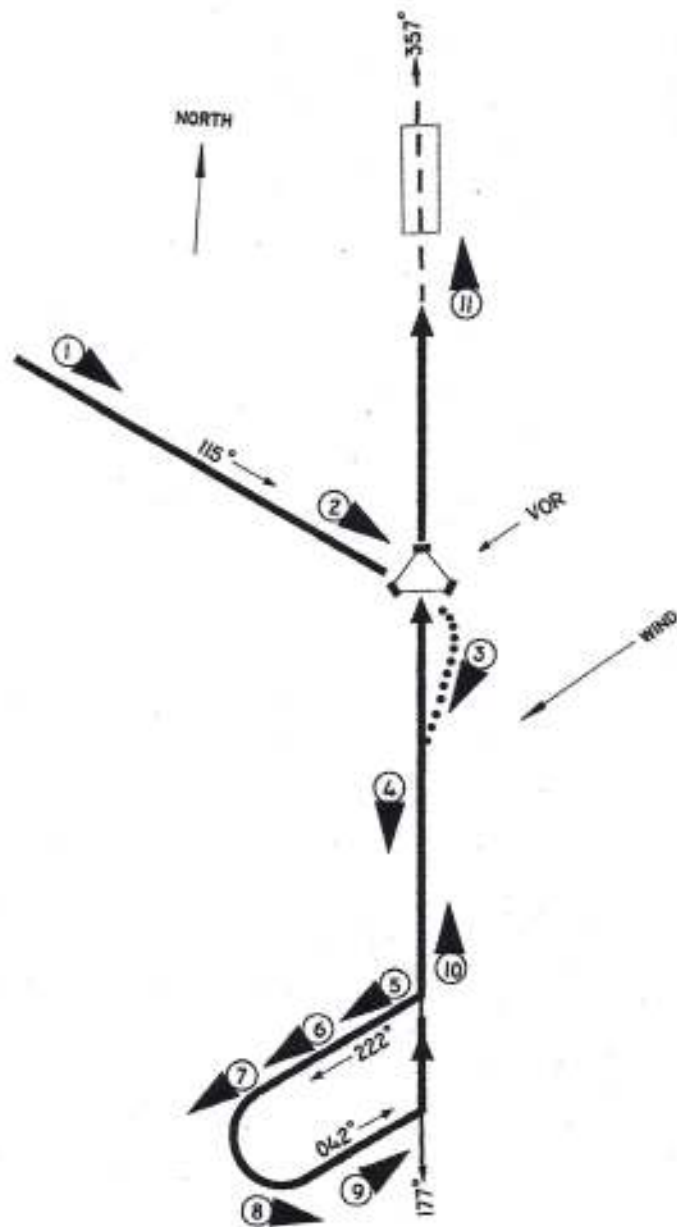
1. [Illegible text]













DG VOR Navigation

Directional Gyro	OBS	Remarks
		<p>Step 1 NAV ARM/ATT or ALT. A 45° intercept to a selected radial is accomplished by setting the OBS to the desired radial and turning the heading bug to that same degree and then pressing the NAV switch on the autopilot.</p>
		<p>Step 2 NAV CPL/ATT or ALT. After intercept, the autopilot will correct for crosswind and adjust its internal radio authority and limit bank angles.</p>
		<p>Step 3 NAV CPL/ATT or ALT. After station passage, the OBS indicates a FROM flag. If a course change is required at the VOR, turn the OBS and heading bug to new course. If a course change of more than 45° is required, the autopilot will re-cycle for a standard intercept.</p>
		<p>Step 4 NAV CPL/ATT or ALT. Station switching is accomplished by tuning the receiver to the new station.</p>
		<p>Step 5 HDG/ATT or ALT. For smooth station passage, it might be desirable to cycle the autopilot to the HDG mode before passage. Then after passage occurs turn the OBS and heading bug to the new radial and press NAV on the autopilot.</p>

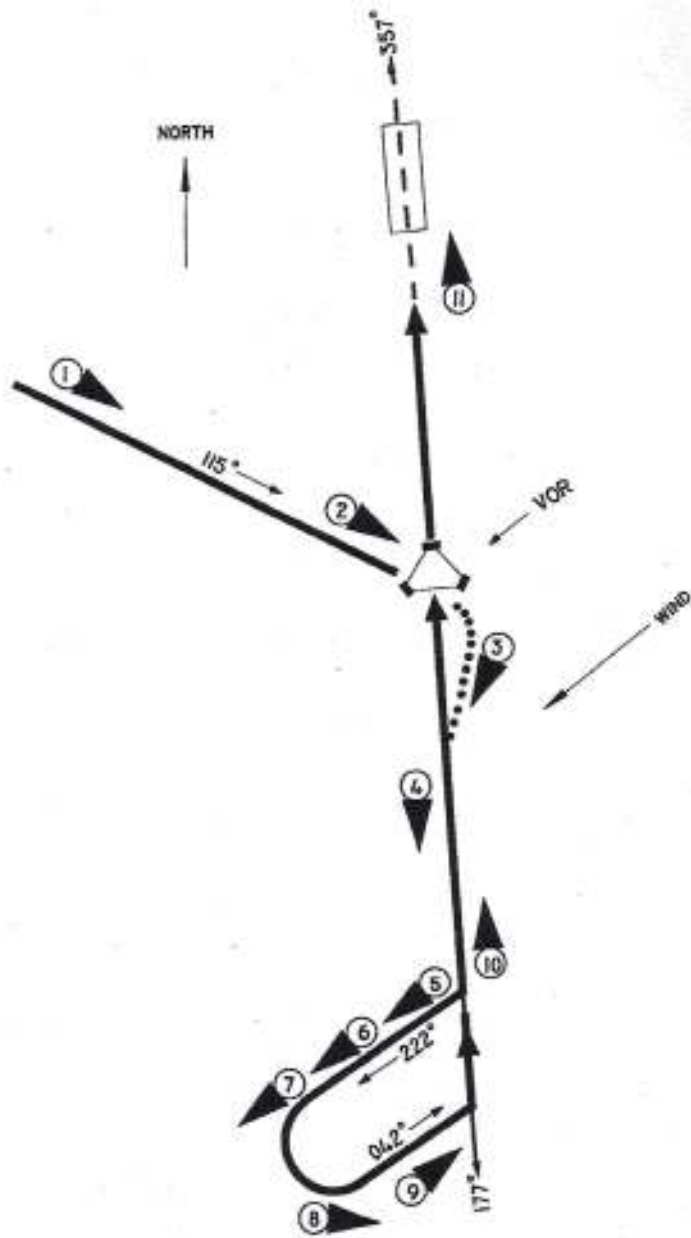
DG VOR APPROACH















DG VOR Approach

		<p>Step 1 NAV CPL/ATT or ALT. The VOR approach usually begins from an enroute situation. The heading bug and the OBS are set to the same degree radial. The autopilot is providing crosswind correction to track the desired radial.</p>
		<p>Step 2 HDG/ATT or ALT. As the VOR is neared, match the heading bug to either the course or the lubber line and press HDG on the autopilot. Set the OBS to the inbound course. Control altitude as necessary for the procedure.</p>
		<p>Step 3 REV ARM/ATT or ALT. As the VOR is crossed, turn the heading bug to the outbound course and press the REV button.</p>
		<p>Step 4. REV CPL/ATT or ALT. The autopilot will track outbound and correct for wind. Control altitude with the modifier switches. When the desired altitude is reached press ALT.</p>
		<p>Step 5 HDG/ALT. To start the procedure turn, press HDG and turn the heading bug to the outbound procedure turn heading.</p>

DG VOR Approach

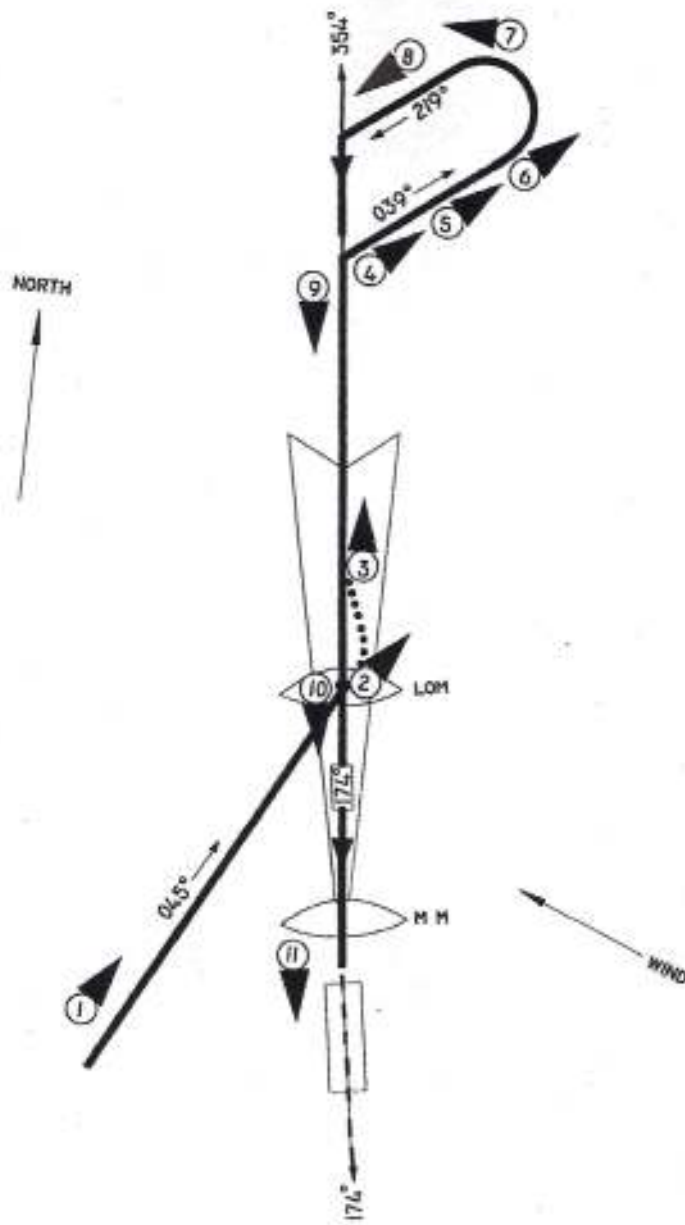


DG VOR Approach

		<p>Step 6 HDG/ATT VS or ALT. Proceed outbound until sufficient time has elapsed before starting the turn inbound.</p>
		<p>Step 7 HDG/ALT. Lead the aircraft through the procedure turn by moving the heading bug.</p>
		<p>Step 8 HDG/ALT. As the aircraft turns, move the heading bug to the desired heading to intercept the inbound course.</p>
		<p>Step 9 NAV ARM/ALT. Press the NAV button and turn the heading bug to the inbound course (same as the OBS). The autopilot will set up a 45° intercept angle.</p>
		<p>Step 10 NAV CPL/ATT VS or ALT. The autopilot will anticipate the on course turn. After intercept it will correct for crosswind, limit bank angles and adjust its radio gain. Control pitch as necessary for the approach.</p>
		<p>Step 11 HDG/ATT. Once the aircraft has reached the decision height, disconnect the autopilot and continue the approach or conduct the missed approach. For the missed approach, establish the aircraft's attitude and airspeed then turn the heading bug to the missed approach heading. Re-engage the autopilot and monitor aircraft's environment.</p>











NOTES

DG Localizer Approach

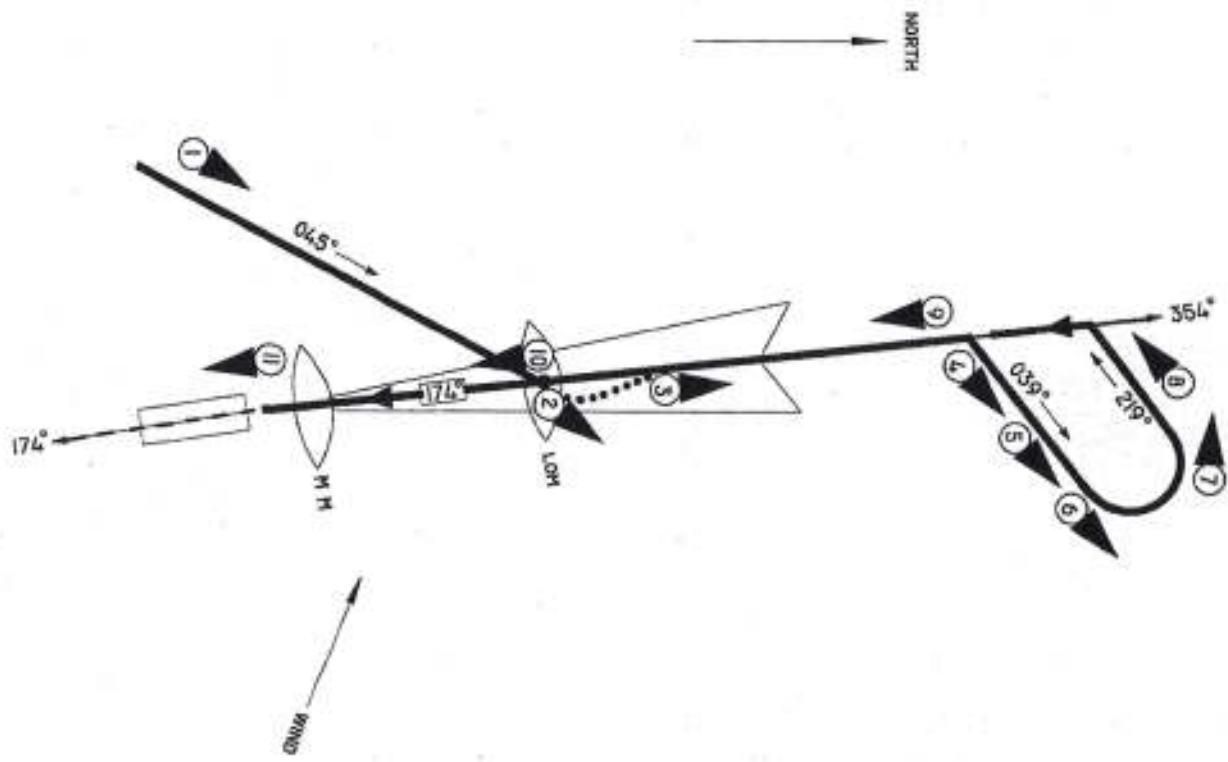


Rev B 02-05-03













DG Localizer Approach

		<p>Step 1 HDG/ALT. The localizer or ILS approach begins with a transition from the enroute structure to the outer compass locator (LOM). The heading bug is used to select the desired heading. The aircraft's altitude may be controlled by the modifier switch or through the use of the altitude mode.</p>
		<p>Step 2 REV/ARM ALT. Upon reaching the LOM, turn the heading bug to the outbound course of the ILS and press the REV switch. The autopilot will intercept and track outbound.</p>
		<p>Step 3 REV/CPL ALT. Upon tracking the localizer, the system will compensate for crosswind and enter the "soft" mode.</p>
		<p>Step 4 HDG/ATT or ALT. At the appropriate time, press the HDG switch to begin the procedure turn. Altitude appropriate to this phase of the approach should be controlled using ALT ATT or VS as necessary.</p>
		<p>Step 5 HDG/ALT. Proceed outbound in the procedure turn until sufficient time has elapsed to assure proper re-interception.</p>

DG Localizer Approach



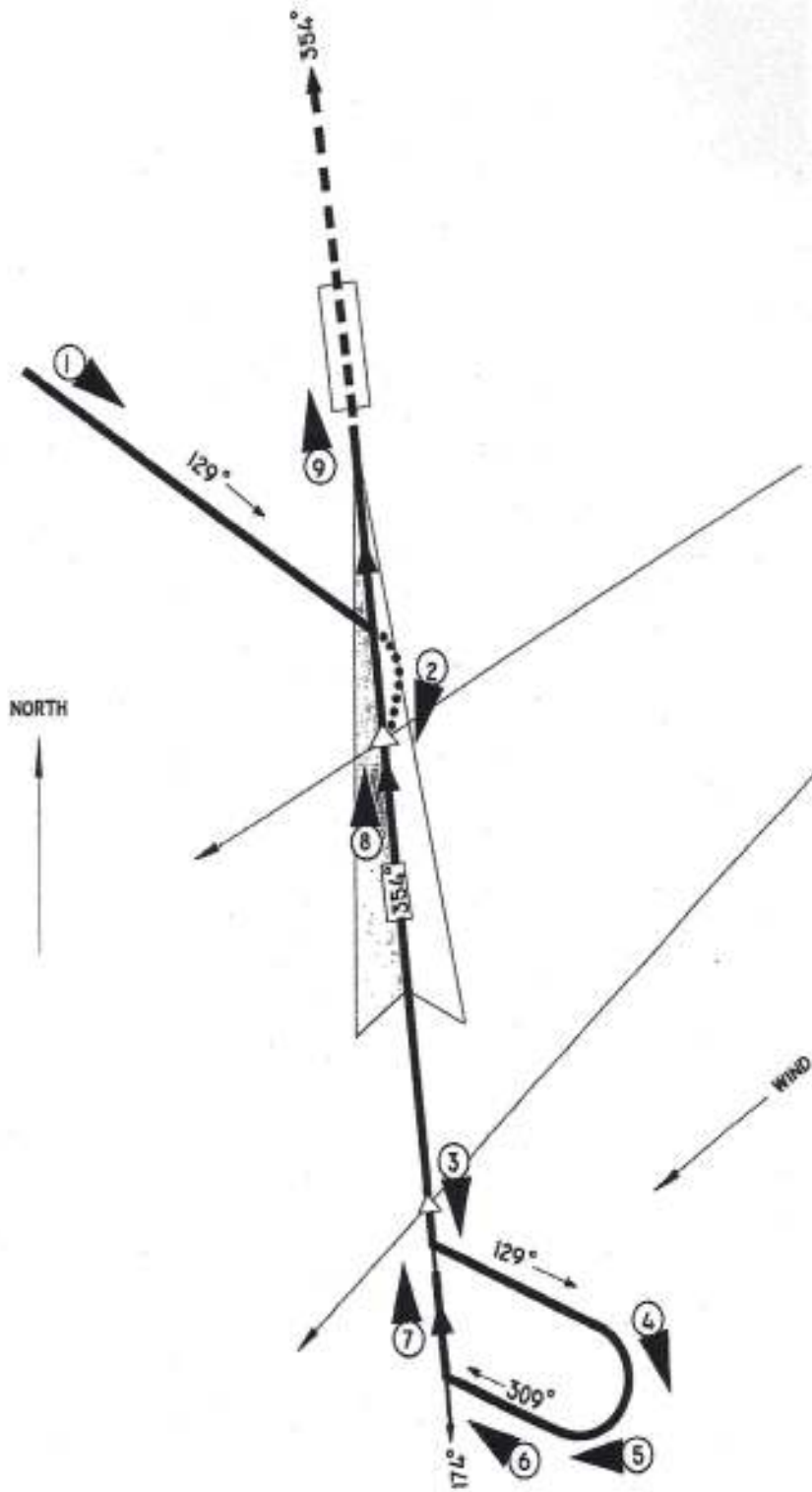
DG Localizer Approach

		<p>Step 6 HDG/ALT Lead the aircraft through the procedure turn by moving the heading bug in the direction of the turn.</p>
		<p>Step 7 HDG/ALT Continue to lead the aircraft through the turn.</p>
		<p>Step 8 APR ARM/ALT Turn the heading bug to the inbound front course of the ILS and press the APR switch. The autopilot will establish a 45° intercept to the localizer. When the localizer is less than 98% of full scale, GS ARM will be displayed to indicate the autopilot is armed for glideslope.</p>
		<p>Step 9 APR CPL/ALT/GS ARM After intercept, the system will correct for crosswind and enter into the "soft" mode. Internal radio gains and bank angles will be limited.</p>
		<p>Step 10 APR CPL/GS CAP As the glide slope beam is captured, ALT will be removed. The system will track the localizer and glide slope. Power changes should be made in small increments as necessary to maintain correct airspeed.</p>
		<p>Step 11 HDG/ATT Once the aircraft reaches minimum, disconnect the autopilot. If a missed approach is required, disconnect the autopilot and establish desired climb attitude and airspeed. When appropriate press HDG and ATT and engage autopilot.</p>











NOTES

Rev B 02-05-03

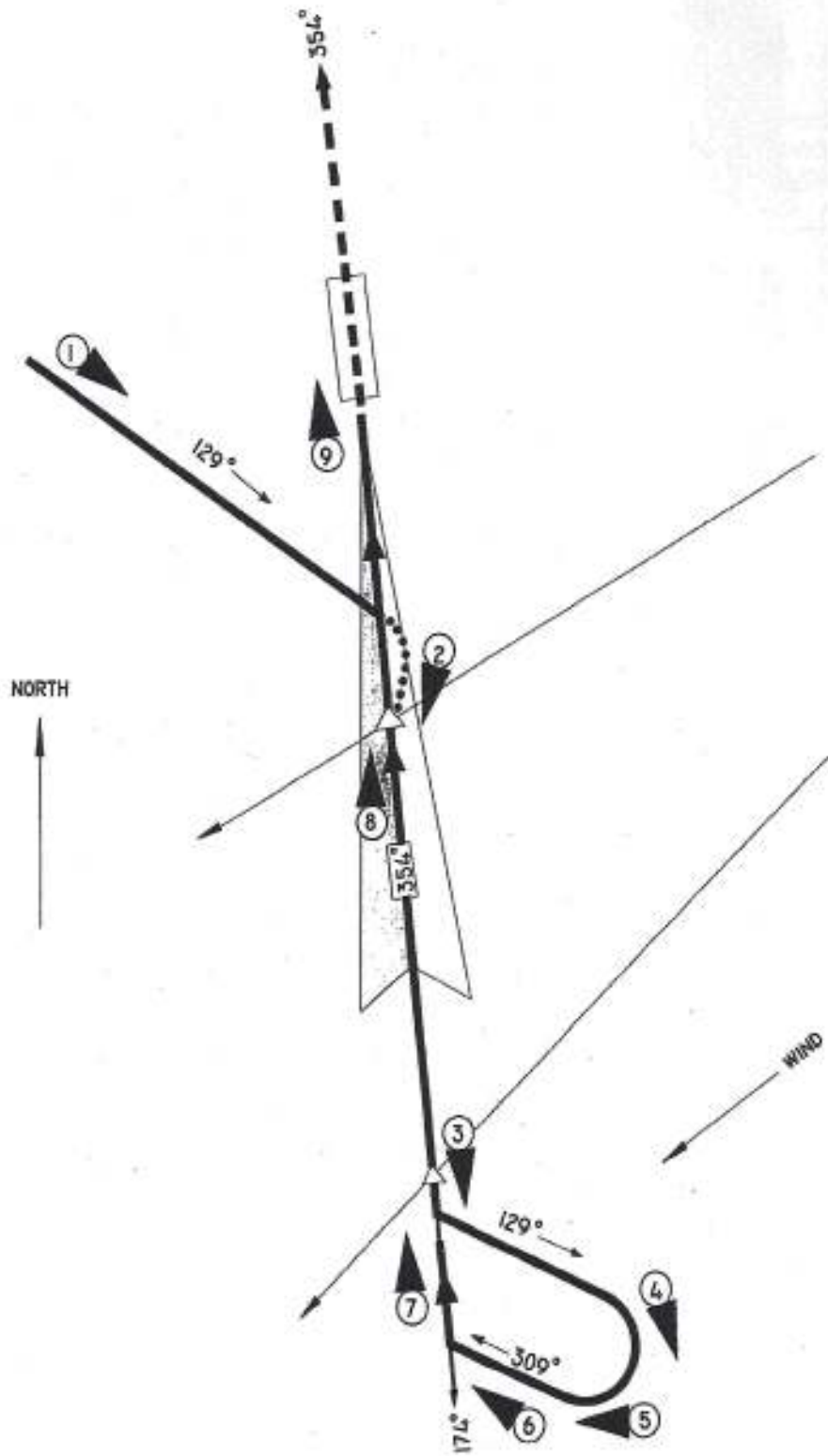
DG Localizer Back Course









DG Localizer Back Course

		<p>Step 1 HDG/ALT The localizer back course approach begins with a transition from an enroute structure to intercept the back course outbound. An alternate method would be to set the inbound front course with the heading bug and press the APR switch to set up a 45° intercept to the back course.</p>
		<p>Step 2 APR CPL/ALT After the intercept, autopilot will track the outbound course & compensate for any crosswind and begin "soft" mode.</p>
		<p>Step 3 HDG/ATT VS or ALT At the appropriate time, press the HDG switch to begin the procedure turn. Altitude appropriate to this phase of the approach should be controlled using ALT, VS or ATT as necessary.</p>
		<p>Step 4 HDG/ALT Proceed outbound in the procedure turn until sufficient time has elapsed to assure proper re-interception.</p>
		<p>Step 5 HDG/ALT Lead the aircraft through the procedure turn by moving the heading bug in the direction of the turn.</p>

DG Localizer Back Course



DG Localizer Back Course

		<p>Step 6 REV ARM/ALT As the aircraft continues to turn, set the heading bug to the inbound procedure turn heading. Press the REV switch. The autopilot will set up a 45° intercept.</p>
		<p>Step 7 REV CPL/ATT or VS After the on course turn is completed, the system will enter the "soft" mode to limit radio authority and bank angles and to correct for crosswind. Control altitude and airspeed as appropriate for the approach.</p>
		<p>Step 8 HDG/ATT Once the aircraft reaches minimums, disconnect the autopilot. If a missed approach is required, disconnect the autopilot and establish desired climb attitude and airspeed. When appropriate press HDG and ATT and engage autopilot.</p>