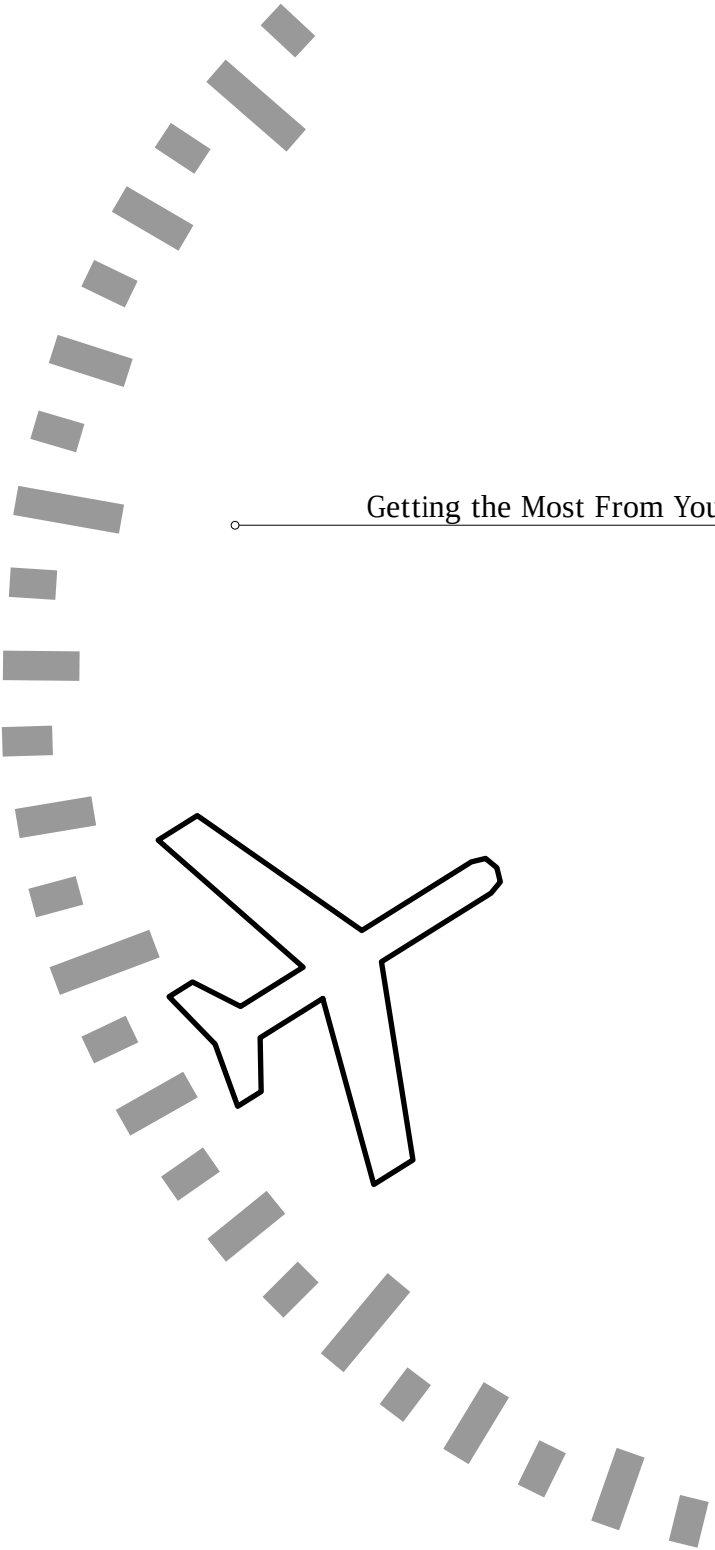
CHAPTER 6

Getting the Most From Your SN3308



If you have never flown with an HSI, you'll find that the combination of heading information and selected nav course is a powerful tool. If you have never flown with an RMI, you'll find that a simple bearing pointer can greatly improve your situational awareness. And if you have never flown with an SN3308, with its combination of HSI, RMI and moving map in a single display, you're about to discover how the whole can be greater than the sum of its parts. Please refer to the color fold-out pages of this manual while reviewing the following.

Using the HSI

A horizontal situation indicator (HSI) is basically a VOR needle superimposed over a directional gyro (DG) ring, or heading indicator. On a conventional VOR display, a course deviation indicator (CDI) indicates left or right deviation, and an Omni-Bearing Select (OBS) knob allows selection of the desired course. On an HSI, the OBS knob turns a course pointer which rotates until it is pointing to the desired course on the DG ring. The center section of the course pointer swings left and right to perform the CDI function. A glideslope (vertical deviation) scale is displayed on the right side of the course pointer, and the TO/FROM flag is a white triangle displayed next to the course pointer, either above or below the CDI.

By using the heading indicator as a background for the entire course pointer/CDI combination, an HSI gives you an immediate visual indication of the location of the desired radial. You can see at a glance your intercept angle to the desired radial, whether or not you have flown through the radial, and whether you are tracking inbound or outbound.

In normal operations, you should connect the HSI course pointer to your primary navigation source. Do this by pressing the [NAV] button until the desired source is annunciated.

When the nav source is a VOR receiver, turn the OBS knob until the course pointer is set to the desired radial. To immediately center the needle and proceed DIRECTLY TO the VOR station, press [SHFT]>[SYNC]. If the receiver is tuned to a localizer frequency, set the course pointer to the published inbound course. Even though the OBS setting doesn't affect the CDI when a localizer is tuned, it is very

important to maintain the correct visual orientation on the HSI. In addition, the autopilot will be using the OBS to obtain a course reference. Pressing [SHFT]>[SYNC] when a localizer frequency is tuned rotates the course pointer to align with the present heading.

When the nav source is a long-range nav receiver such as GPS or loran, the SN3308's course pointer can *auto-slew,* or automatically point to the correct course. The auto-slew function can be enabled or disabled by pressing [SHFT]>[NAV] and toggling the AUTO SLEW softkey. If enabled, when the nav receiver sequences to subsequent waypoints on a flight plan or an approach, the course pointer will auto-slew to each course in turn. Simply use standard intercept and tracking techniques to keep the needle centered.

Bearing Pointers (RMI)

Conceptually, a Radio Magnetic Indicator (RMI) is even simpler than an HSI. A traditional RMI provides one or two independent pointers which point to the navigation station, much like an ADF display. But instead of using a fixed compass card like many ADF displays, an RMI automatically rotates the compass card so that the current heading is always at the top of the display. Thus, each pointer indicates the actual bearing **TO** the station (reading the head of the pointer) or **FROM** the station (reading the tail of the pointer).

The two bearing pointers on the SN3308 are especially useful because they can be connected to a VOR receiver, an ADF receiver, or a GPS/loran receiver. Since all three types of navigation signals are converted to a common display format in this case, the SN3308's bearing pointers make excellent cross-checks against your primary nav source.

To make the best use of the Bearing Pointers we recommend that you select "AUTO" as the source for bearing pointer 1, and that it be displayed at all times.

The bearing pointers are useful in the following situations:

Cross-check	Bearing pointer uses a different nav source to track the same waypoint as the HSI. Bearing pointer aligns with course pointer if both receivers agree.
Expanding CDI scale	Bearing pointer is set to the same nav source as HSI. If CDI needle is pegged, the bearing pointer will give a visual indication of how soon until intercept. Especially useful when intercepting a localizer or close-in to a VOR station when the CDI is most sensitive.
Crossing radial	Bearing pointer is connected to a VOR or NDB abeam the desired track. Use to cross-check DME fixes and identify step-down fixes or changeover points.
ADF tracking	Bearing pointer is connected to the ADF and used for primary navigation. The HSI course pointer cannot be connected to an ADF.

Example: Flying an ILS

In this example, we'll fly a full ILS approach with a standard configuration. We'll see how the SN3308 can be set up to provide course guidance both outbound and inbound, as well as cross-checking of navigation data. The fictional approach is depicted below:

Assume that we are approaching the airport from the northwest, heading 140 degrees. We are told to proceed direct to the locator outer marker (LOM), and are cleared for the ILS to runway 36. The procedure is to navigate to the marker using the ADF, track outbound on the localizer, perform a procedure turn, and then reintercept the localizer inbound.

To configure the SN3308 for the approach, we will select the following nav sources: NAV1 for the HSI course pointer, ADF for bearing pointer #1, and GPS for bearing pointer #2. The NAV 1 receiver should then be tuned to the localizer, the ADF should be

tuned to the locator outer marker, and the GPS should be given the airport as the “direct-to” destination. Rotate the OBS knob until the head of the course pointer is aligned with the inbound course of 360˚.

In this configuration, the HSI course pointer will track the localizer, bearing pointer #1 will point to the outer marker, and bearing pointer #2 will point to the airport just as a general reference and final cross-check.

To begin the approach, keep bearing pointer #1 at the top of the display. Assuming zero wind, this will track you directly to the LOM (in the presence of a crosswind, use standard ADF tracking techniques). As you near the localizer course, the CDI needle will start to swing inward. Because you are flying the localizer outbound, the tail of the course pointer is near the top of the display and the left-right sense of the needle is correct. As the needle centers, the OM light will start flashing and a few seconds later, the #1 bearing pointer should swing around to the bottom of the display. These are all confirmations that you have passed the outer marker and are established on the localizer outbound.

As you keep the CDI centered on the outbound leg, both bearing pointers should line up with the head of the course pointer at the bottom of the display. You are now using VHF nav, ADF and GPS simultaneously to verify the proper outbound course. In addition the LOC-DME distance from the threshold (if available) is displayed in the upper left corner, and this can be cross-checked by the GPS distance from the airport in the lower left corner.

Perform the procedure turn by simply turning to a heading that puts the course pointer at the desired angle, usually 45˚. After holding this heading for the desired time or distance and then turning a full 180˚, the aircraft will be inbound on a 45˚ intercept to the localizer. Now the course pointer and both bearing pointers will be in the upper half of the display. If the CDI needle is pegged to the left, bearing pointer #1 will give a visual indication of how soon to expect an intercept. Again, as the CDI begins to move inward, bearing pointer #1 will be approaching the head of the course pointer.

Tracking the localizer inbound, keep the CDI centered using standard techniques. Outer marker passage will be marked by the flashing OM display and bearing pointer #1 will swing to the bottom of the display. LOC-DME and GPS distance can be used as a cross-check.

If the procedure terminates in a missed approach, especially one in which ATC issues multiple vectors, bearing pointer #2 becomes especially useful. It simply points at the airport, which can greatly improve your situational awareness.