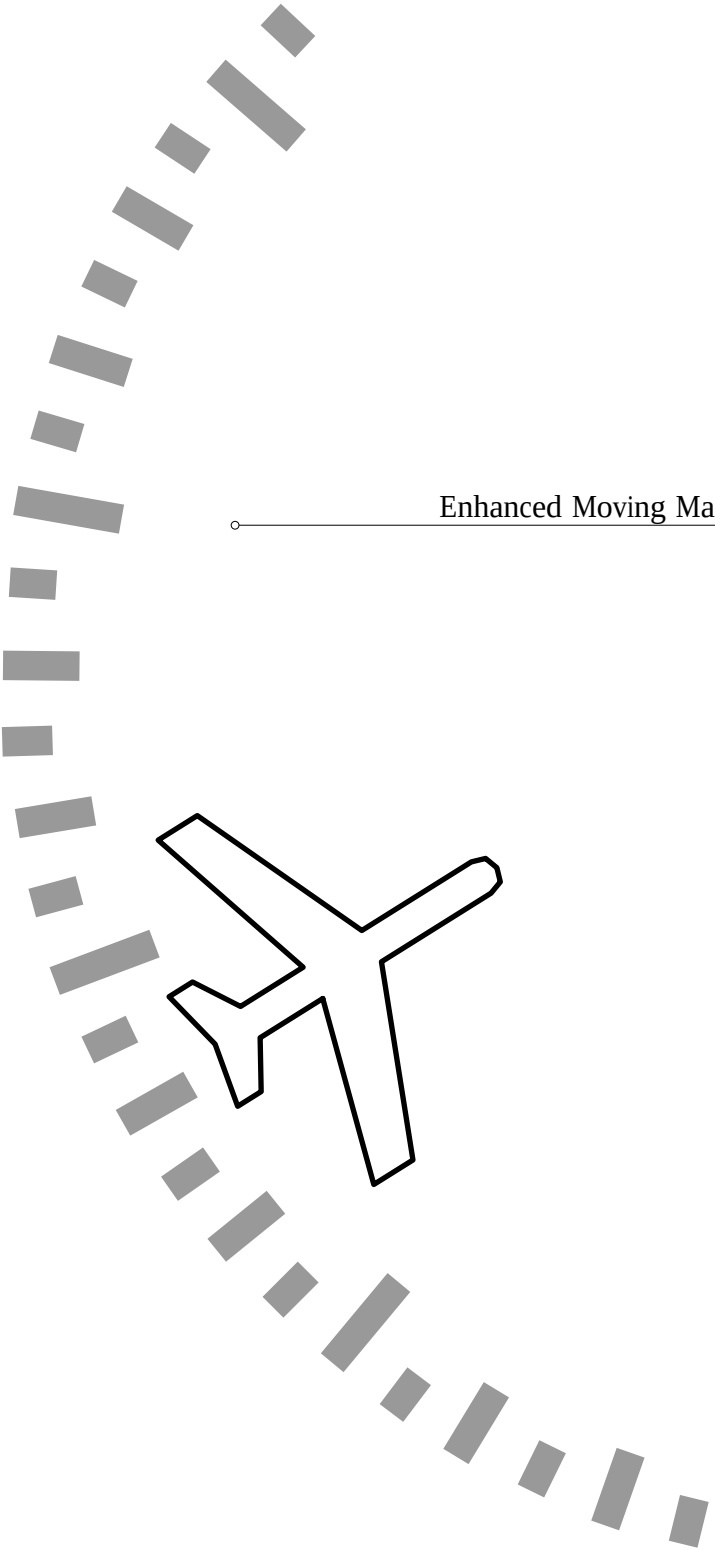
CHAPTER

5

# Enhanced Moving Map Features



## Overview

MAP operations allow you to display navigation information in the form of a "moving map" directly on the SN3308 display. You have extensive control over what kinds of navigation information are displayed on the map:

- Airports/Runways
- Controlled and Special Use Airspace
- VORs
- NDBs
- Intersections
- GPS Flight Plans (with or without course line)

Within each of these classes of map objects you may fine tune exactly which items you want displayed. For example, you may choose to exclude military or private airports, or those with unpaved runways or runways shorter than a particular length. Similarly, you may elect not to display terminal VORs or low-powered NDBs, or to display Class B airspace and Restricted Areas but exclude Class C airspace and MOAs. As you'll see, the SN3308 offers great flexibility in how you configure your moving map display.

Finally, you may store up to four different map configurations, and then quickly switch from one to another as appropriate to your phase of flight. For instance, when cruising at FL180 or higher, you might want to display only high-altitude VORs (but not Terminal or Low-altitude VORs), Special Use Airspace (but not Class B or Class C), and only airports with paved runways of 6,000 feet or longer. The SN3308 allows you to save such a map configuration in one of its four *map memories* and then recall it as needed.

All the airports, navaids and intersections on the moving map, except for GPS flight plan fixes, come from the *internal* database of the SN3308 and are color-coded amber. GPS flight plan fixes come from the GPS receiver and are color-coded magenta/white. Controlled and Special Use Airspace also comes from the internal database, and are color-coded according to its type (Class C and Class B in green, MOAs in purple, Restricted and Warning Areas in yellow, and Prohibited Areas in red).

Note: The SN3308 requires a connection to a GPS receiver in order to display the moving map. The map display, including the flight plan from the GPS1 receiver, will also be shown when NAV1 or NAV2 is selected as the primary Nav source.

## Internal Database

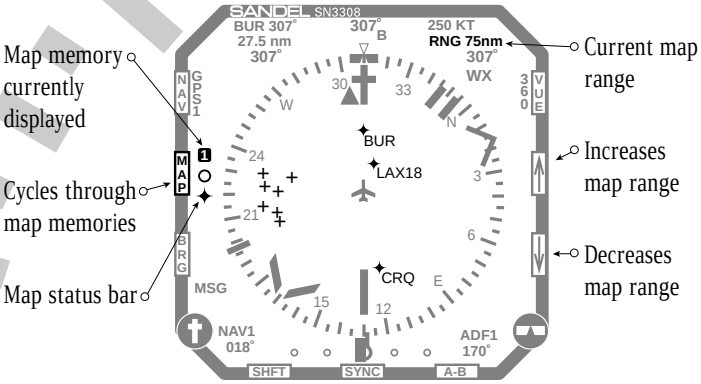
Non-flight plan data including airspace is referred to as the "internal database" and is stored in the SN3308's internal memory. The internal database can be periodically updated from a Windows-based PC or laptop. The expiration date of the internal database is shown during the power on sequence. As this database is for supplemental use only and not intended for primary navigation, it is not required to be kept up to date. Database updates are available directly from Sandel Avionics, and may be purchased online at **www.sandel.com**.

Newly manufactured units may not contain an internal database when shipped from the factory. Your avionics installer should obtain and install the most recent database prior to completion of a new installation. The SN3308 will operate normally without an internal database except that only GPS flight plan waypoint information will then be displayed.

## Map Controls and Displays

Information associated with control of the map is displayed as follows:

- The *map status bar* is shown just to the right of the MAP button and shows icons for the currently enabled map items.
- The map memory location currently being displayed is shown at the top of the map status bar as "S", "1" "2" "3" or "4".
- The map range (or "MAP OFF") is shown in the upper right of the display.




Map operations are controlled with the following buttons:

- [MAP] – Press repeatedly to cycle through the map memories including MAP OFF. Holding the [MAP] button will turn off the map without cycling through the memory locations.
- [ ↓ ] and [ ↑ ] – Press to zoom the map range in or out. Holding the [ ↓ ] button auto-ranges to the current waypoint and holding the [ ↑ ] button auto-ranges to the end of the current flight plan.
- [SHFT]>[MAP] – Accesses the map setup function and allows enabling or disabling of various map items.

## Map Memories

The [MAP] pushbutton cycles from MAP OFF through a maximum of four possible map memory locations, or *memories,* plus a scratchpad memory. The map memory you are currently displaying is shown at the top of the map status bar and will show S, 1, 2, 3 or 4.

Any memory which is empty is skipped during the MAP rotation sequence. In the default setup of the SN3308, memories 1, 2 and 3 contain factory settings, and memories S and 4 are empty.

Map memory S has been designated the *scratchpad memory* and the remaining memories 1-4 are designated as *preset memories.* All on-screen changes are made to S but can be copied to memories 1-4 as desired. The purpose of having a separate scratchpad is to allow you to quickly add or delete items from your map display to attend to a current flight situation, without changing presets you may already have made.

The map setup function, described on page 5-7, shows how to make changes to the map memories. The following table lists the 24 items that can be independently configured for each map memory:

There are a large number of selection items. However, the organization of the SN3308 is intended to make the map setup process as easy as possible. You should experiment often with the map settings until you develop the style of operation best suited to your flying.

| Status Bar Icon | Item | Softkey Label Page | Color Setup | Map |
|---|---|---|---|---|
| **Airports** ○ | Civil | CIVIL | Amber | 1 |
| | Military | MIL | Amber | |
| | Private | PRIV | Amber | |
| | Runway Length [3] | MIN LEN | - 2 | |
| | Grass Surface | GRASS SURFC | - | |
| | Other Surface | OTHER SURFC | - | |
| **Airspace** ▽ | Class B | 'B' | Green (dashed) | 3 |
| | Class C | 'C' | Green (dotted) | |
| | MOA | MOA | Purple (dotted) | 4 |
| | Restricted | RESTR | Yellow (dashed) | |
| | Warning | WARN | Yellow (dotted) | |
| | Prohibited [1] | - | Red (solid) | - |
| **Intersections** △ | Enroute | ENRT | Amber | 5 |
| | SID | SIDS | Amber | |
| | STAR | STARS | Amber | |
| **NDBs** ◎ | Outer Marker | OM | Amber | 6 |
| | Low Power | L PWR | Amber | |
| | High Power | H PWR | Amber | |
| **VORs** ▽ | High Level | HI LV | Amber | 7 |
| | Low Level | LO LV | Amber | |
| | Terminal | TERM | Amber | |
| **GPS Flight plan WPTS** ✦ | Waypoints or Waypoints and courselines | FPL ENA | Magenta: currently active leg; White: previous or next leg | 8 |
| | Waypoint symbols [2] | FPL SYM | | |
| **TACAN on/off** [4] | Adds to VORs | TACAN | Amber | |

| | |
|---|---|
| **1** | Prohibited airspace is shown in Red and cannot be turned off on the map display. |
| **2** | Flight plan waypoints can be selected to show as facility icons (such as VOR or INT icons) or to show as waypoint icons only ✦ using map setup page 8. Most RS-232 GPS receivers are limited to showing waypoint icons only. |
| **3** | Runways below a selectable minimum length may be masked from the display by pressing the MIN LEN softkey. This parameter may be set to 2000', 2500', 3000', 3500', 4500', 5500', 6500' or ALL. |
| **4** | TACAN is a single setting which will affect all of the map memories. This can be set from within any map memory and will affect all map displays. |

## Getting Started — Example

The Factory Default SN3308 map memories are set up as follows:

S: Empty

1: Flight plan only with courselines

2: Flight plan and paved civil airports over 3500' in length

3: Flight plan and HI and LO VORs

4: Empty

To get started, we recommend you try some operations on the ground. Ensure that your GPS receiver is operating, and enter a flight plan using its normal procedures. You can use the simulator mode of your GPS receiver if it has one, or if it does not, make sure the flight plan you enter is near the airport where you are located.

Press [MAP] until "1" shows at the top of the map status bar. With this setting, you should see the waypoint icon ✦ next to the [MAP] key, indicating that flight plan waypoints are enabled on the display. Use the [ ↑ ] or [ ↓ ] key to adjust the display range, which is the number of miles between the symbolic airplane and the outer compass ring.

You should see your GPS flight plan on the display. The active leg and waypoint will be shown in magenta and the other waypoints and courselines will be shown in white.

Set the map range to 30 nm, and press [MAP] so that "2" is displayed. The display should show your flight plan as above, overlaid with local airports with runways over 3500'. Note that the airport icon shows on the map status bar indicating airports are being displayed, and that on-screen airports are shown in *amber.* The amber color indicates that the source of the airport data is coming from the internal database. The flight plan information, coming from the GPS receiver, is displayed in magenta and white.

Lower the map range to 10nm, and notice that as the display zooms in any airport shown will change from the airport icon into a runway (or multiple runways). Below 7nm the runway numbers will also be added so that as you zoom in you can plainly see the airport identifier, runways, and runway numbers. During flight, the display will rotate and update with the aircraft in real-time.

Press [MAP] to change to memory 3. Notice that airports will be removed and instead local LO and HI VORs will be shown in Amber. Note that on the map status bar the airport icon will be removed and the VOR icon will display, indicating that VORs are enabled.

Pressing [MAP] again will skip memory 4, because it is empty, and jump directly to MAP OFF. All the map information will be removed from the screen. Further presses of the [MAP] key will again cycle through map memories 1, 2 and 3 and then back to MAP OFF.

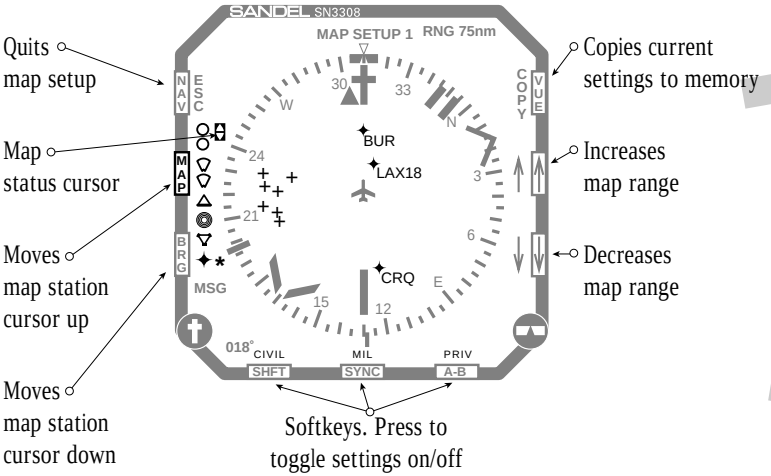
## Map Setup

We are about to change what is displayed on the map, using memory 1 as the *baseline.* Start by pressing [MAP] until "1" shows at the top of the map status bar.

Press [SHFT]>[MAP] to enter Map Setup. All settings in memory 1 are copied to S (the scratchpad memory), and you can now make non-permanent changes with the softkeys. Notice that *you are editing memory S.* If you want to save these changes back into memory 1, you can use the COPY function, described on page 5-9.

The following actions occur every time you enter [SHFT]>[MAP]:

- The currently selected display memory is copied into S.
- S becomes the active memory.
- You enter Map Setup and can make changes to the map display.
- The map status bar shows all icons, with active items shown with an *. A moveable cursor allows you to select which icon category you want to change.




Map setup allows you to change the scratchpad memory S by adding or deleting items from the map category by category. The two buttons located next to the map status are used to move the map status cursor up and down, selecting the different map setup items you want to change.

Notice that when you select each setup item, the three softkeys at the bottom of the screen change and are used to make your selections. The [ ↑ ] or [ ↓ ] keys continue to function normally so you can change the map range during setup operations to see the effect of your changes.

For example, highlight the Airspace icon on the map status bar, and then use softkeys 'B' and 'C' to enable airspace depiction and observe

the map display. Assuming you are in a location with nearby Class B or C airspace, you should see the airspace boundaries on your display. Notice that you are displaying *scratchpad memory S,* and you have *added airspace depiction.*

Note: During map setup operations the SN3308 continues to operate normally. The compass and deviation displays are still active, and the HDG and CRS knobs still operate.

### Escaping Map Setup

Note the flashing ESC softkey. Pressing this softkey will immediately exit the map setup page, and the map display will remain as you programmed it. You should see both your flight plan and airspace on the map display.

### Setting Other Items

Using [SHFT]>[MAP] again, try changing other items on different map setup pages and observe their effects. Note that you are not changing memories 1-4 by these actions. In fact, if during normal operation you are displaying any memory 1-4, you can press [SHFT]>[MAP] to create a new *baseline* for the scratchpad memory.

## Copying Settings into Preset Memories 1–4

Map settings can be retained for future use by storing them into one of the four memory presets. This is done by copying the scratchpad memory into one of the presets using the COPY function.

- Press [SHFT]>[MAP] to access the map setup function and adjust the settings as desired.
- Press the COPY softkey.
- Press one of the memory softkeys (1-4) to copy the scratchpad into that memory. (To exit without saving, press the QUIT COPY softkey.)
- Press the ESC softkey to exit the map setup function.

The changes made during map setup are now stored in the memory preset you chose and can be recalled during the map rotation.

## Eliminating a Map Memory from the Rotation Sequence

You may choose to have fewer than 4 map presets to reduce the number of memories in the MAP key rotation sequence. You can eliminate a preset memory by deleting all items in that memory.

- Press [SHFT]>[MAP] to access the map setup function.
- Press the COPY softkey.
- Clear the scratchpad memory by pressing the CLEAR softkey. The message 'SCRATCHPAD CLEARED' will be shown briefly at the top of the display.
- Press the softkey of the preset memory you desire to skip.
- Press the ESC softkey to exit the map setup function.

Both the scratchpad memory and the memory preset you cleared will now be skipped in the map rotation.

## Adding a Map Memory to the Rotation Sequence

You may bring an empty preset memory back into the MAP key rotation sequence by copying the scratchpad memory into it.

- Press [SHFT]>[MAP] to access the map setup function and adjust the settings as desired.
- Press the COPY softkey.
- Press one of the memory softkeys (1-4) to copy the scratchpad into that memory.
- Press the ESC softkey to exit the map setup function.

The memory preset you chose is now added to the map rotation.

## Restoring the Factory Default Map Presets

The factory default map presets may be restored at any time. Note that this will *permanently erase* any information you have entered into the preset memories.

- Press [SHFT]>[MAP] to access the map setup function.
- Press the COPY softkey.

- Press and hold the CLEAR (HOLD DFLT) softkey at least four seconds. The message 'DEFAULT MEMORIES 1 TO 4' will be shown at the top of the display.

Factory defaults will be loaded into presets 1-4 as follows:

S: Empty (skipped)

1: Flight plan only with courselines

2: Flight plan and paved civil airports over 3500' in length

3: Flight plan and HI and LO VORs

4: Empty (skipped)

## Automatic Decluttering

It is possible for the SN3308 map display to become too cluttered to read, such as by turning on all possible map items. This also has the undesirable side effect of slowing down the display update rate.

The SN3308 will automatically remove items from the display if the total number of items is too great to display. When this occurs, it is indicated by a color change in the associated icon in the map status bar. Normally these icons are amber, but any item which is not showing all possible occurrences because of an automatic decluttering will change the icon color to yellow.

Normally the SN3308 will allow up to approximately 50 icons before this action occurs, but this number may be smaller if complex airspace is simultaneously being displayed. When auto-decluttering occurs, it occurs first to the objects *closest* to the aircraft. When the display is zoomed-in, these objects will reappear and the associated status bar icon will turn back to amber.

## Maximum Range of Internal Map Data

During normal operation, the SN3308 only displays items from its internal database which are within 150 nm of the current aircraft position (300nm for VORs), even when the selected range is larger.

## Quick Map Off

During normal operation press and hold the [MAP] key. After 1.5 seconds the map display will jump to MAP OFF from any memory. You can use this feature to quickly remove all map data from the screen at any time. Note that this feature will also turn off the WX-500 Stormscope display, if enabled.

## Map Auto-Range

The SN3308 provides a one-touch automatic ranging function. Pressing and holding the [ ↓ ] key for 1.5 seconds will cause the SN3308 to zoom to the lowest map range at which the current waypoint is still visible. Conversely, pressing and holding the [ ↑ ] key will zoom to the highest setting needed to display the full flight plan.