

## 3 NAV/COM

### (GTN 650 NAV/COM AND GTN 635 COM ONLY)

The GTN 650 features a digitally-tuned VHF Com radio and digitally-tuned Nav/localizer and glideslope receivers. The GTN 635 has a Com radio only. The Com radio operates in the aviation voice band, from 118.000 to 136.975 MHz, in 25 kHz steps (default). For European operations, a Com radio configuration of 8.33 kHz steps is also available.



Figure 3-1 Nav/Com Controls

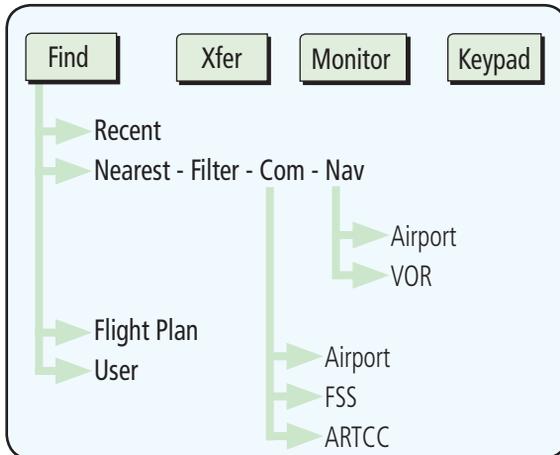


Figure 3-2 Nav/Com Functional Diagram

### 3.1 Volume

Com radio volume is adjusted using the **Volume** knob. Turn the **Volume** knob clockwise to increase volume, or counterclockwise to decrease volume. The level will be maintained until changed.



1. Turn the **Volume** knob to set the Com volume.



*Percent Of Maximum Volume    Graphic Scale Showing Volume*

**Figure 3-3 Com Volume Setting**

2. A bar graph showing the relative volume level will indicate the selected level and will disappear a few seconds after releasing the **Volume** knob.

### 3.2 Squelch

The Com radio features an automatic squelch to reject many localized noise sources. You may override the squelch function by pressing the **Volume** knob. This facilitates listening to a distant station or setting the desired volume level.

To override the automatic squelch, press the **Volume** knob momentarily. Press the **Volume** knob again to return to automatic squelch operation. A “SQ” indication appears above the active Com frequency window in the upper left corner of the display when automatic squelch is overridden.

*Com Volume and Squelch Control*

*Com Control Text*

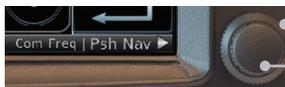
*Receive Annunciation*

*Squelch Annunciation*



*Active Com Frequency (Touch to Flip/Flop)*

*Standby Com Frequency*



*Turn To Select MHz*

*Turn To Select kHz*

**Figure 3-4 Com Controls**

While receiving a transmission, an “RX” indication appears in the Com frequency window to the immediate right of “Com.” A “TX” indication appears at this location while you are transmitting.

### 3.3 Com and Nav Frequency Window and Tuning

Communication frequencies are selected by using the **large** and **small right** knobs or by touching the value in the *standby* Com or Nav frequency field and using the displayed keypad. The standby frequency always appears below the active frequency. The active frequency is the frequency currently in use for transmit and receive operations.

Once a frequency is selected in the standby field, it may be transferred to the active frequency by touching the active frequency field.



**NOTE:** *The Com window is normally active for adjustment, unless the NAV window is made active by pressing the **small right** knob. The active state automatically returns to the Com window after 30 seconds of inactivity.*

#### To select a Com or Nav frequency using the small and large right knobs:



1. If the tuning cursor is not currently in the frequency window, press the **small right** knob momentarily. The Standby frequency will be highlighted to indicate that it is active for editing.
2. Turn the **large right** knob to select the desired megahertz (MHz) value. For example, the "118" portion of the frequency "118.30."
3. Turn the **small right** knob to select the desired kilohertz (kHz) value. For example, the ".30" portion of the frequency "118.30."

#### To select a Com or Nav frequency using the numeric keypad:



1. Touch the Standby window.
2. A keypad will appear with the current Standby frequency highlighted.

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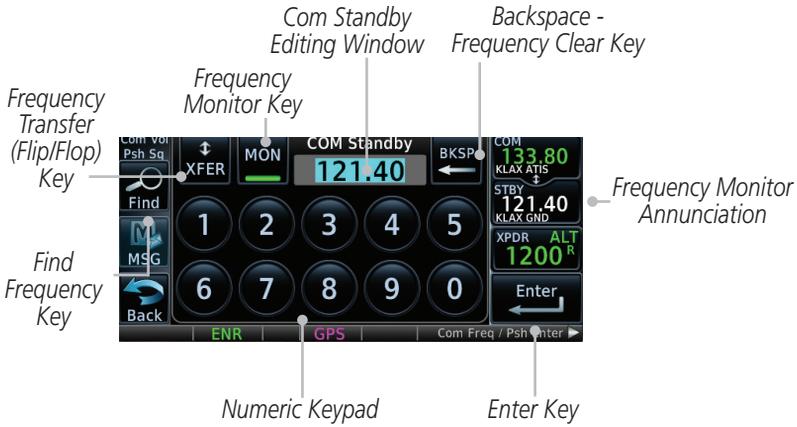
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**Figure 3-5 Com Standby Frequency Numeric Keypad**



**Figure 3-6 Nav Standby Frequency Numeric Keypad**



3. Touch the numeric keys to add the desired values and touch **Enter** to accept the displayed value and place it into the Standby frequency window.



4. Touching the **XFER** key will place the selected frequency directly into the Active frequency window.

**To make the standby frequency the active frequency:**



1. Touch the active frequency (top) window.



2. The Active (top) and Standby frequencies will flip/flop.

## 3.3.1 Com and Nav Frequency Finding

The GTN 635 (Com) and 650 (Com and Nav) frequency finding feature allows you to quickly select any displayed database Com or Nav frequency as your standby frequency. The following are some examples of selecting frequencies from some of the main GPS pages.

**To select a Com or Nav frequency for a User created frequency, Recent selected frequency, Nearest airport, or from your Flight Plan:**



1. While viewing the numeric keypad touch the **Find** key. Categories for User, Recent, Nearest, and Flight Plan are available.

Touch to Select Recent Freq List

Touch to Select Fpl Freq List



Touch to Select Nearest Freq List

Touch to Select User Freq List

Figure 3-7 Com Nearest Frequencies



2. Touch **Recent**, **Nearest**, **Flight Plan**, or **User**. A list of the selected frequency types will be displayed.

3. Touch the desired frequency to select it and place it into the Standby window.

### 3.3.1.1 Find Recent Frequencies



1. While viewing the **Find** results, touch the **Recent** key. A list of the recently selected frequencies will be displayed.

Selected Frequency Category



Touch Frequency From Recent List To Select Standby Frequency

Figure 3-8 Recent Com Frequency List

2. Touch the desired frequency to select it and place it into the Standby window.

### 3.3.1.2 Find Nearest Frequencies

1. While viewing the **Find** results, touch the **Nearest** key. A list of the nearest airport Com frequencies will be displayed.

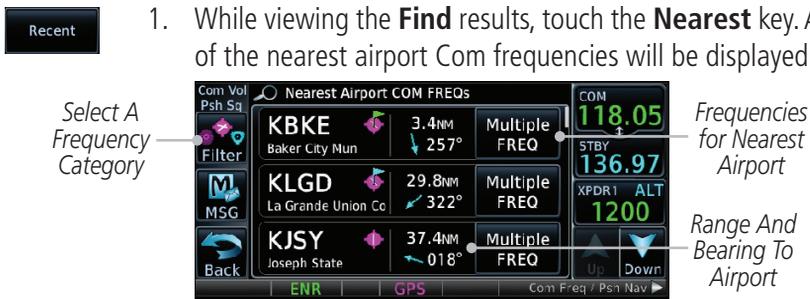


Figure 3-9 Com Nearest Airport Frequency

2. Touch the **Multiple FREQ** key to show the available frequencies.

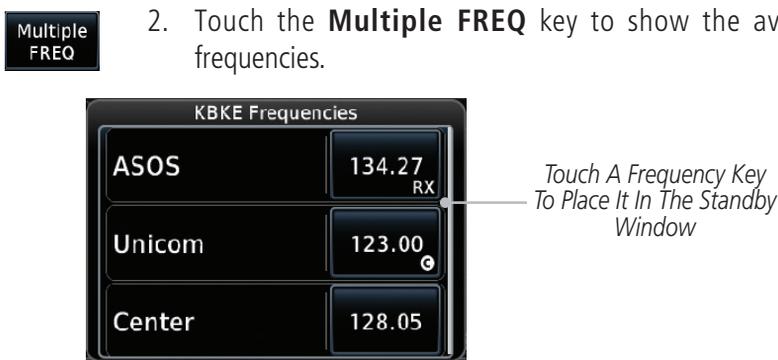


Figure 3-10 Nearest Airport Multiple Frequency List

3. Touch the **Filter** key to filter the Nearest List by Airports, FSS, or ARTCC.



Figure 3-11 Nearest Com Frequency List

4. Touch the desired Frequency List. Then, touch the desired frequency to load it into the Standby window.

- Some frequencies will have more information detail available. Touch the key that shows "More Information."

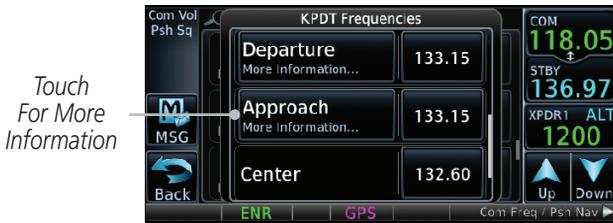


Figure 3-12 More Information Is Available For Some Frequencies

- More detailed information is shown on the display. Touch the frequency key to load it into the Standby window.



Figure 3-13 More Frequency Detail

### 3.3.1.3 Find Flight Plan Frequencies

Flight Plan

- While viewing the **Find** results, touch the **Flight Plan** key. A list of Com or Nav frequencies associated with the active flight plan will be displayed.



Figure 3-14 Flight Plan Frequency List

Multiple FREQ

- Touch the **Multiple FREQ** key to show the available frequencies, if present.
- Touch the desired frequency to select it and place it into the Standby window.

## 3.3.1.4 Find User Frequencies

User

1. While viewing the **Find** results, touch the **User** key. A list of User-created frequencies will be displayed.
2. Touch the desired frequency to load it into the Standby window.

## 3.3.2 Simple Frequency Entry

Frequencies can now be entered on the GTN without the leading one and/or trailing zero(s). As a result, the pilot can now touch “2,” “1,” and “5” for 121.50. If a number is pressed that is not valid for the cursor location, the pilot is presented with a confirmation pop-up upon selecting the typed frequency. Frequency entry can be accomplished by typing every digit in the frequency or by leaving off the leading one and/or trailing zero(s). The frequency that will be entered is always displayed in the cursor window.

2

1. Touch the Standby frequency field and then touch the **2** key.



Figure 3-15 Simplified Frequency Entry Without Leading Number

2. Touch the **7** key.



Figure 3-16 Second Frequency Number

3. Touch the **2** key.



Figure 3-17 Final Frequency Without Trailing Number

4. Touch **Enter**.



Figure 3-18 Completed Frequency Entry

2

Enter

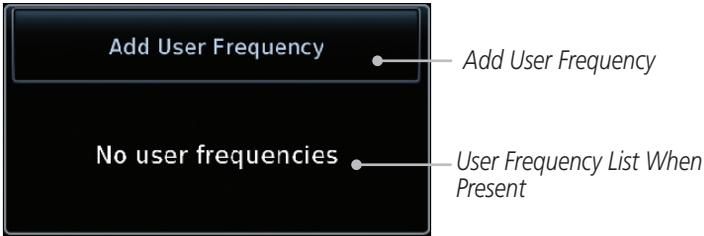
### 3.3.3 Adding a New User Frequency



1. While viewing the numeric keypad touch the **Find** key on the left side of the display.



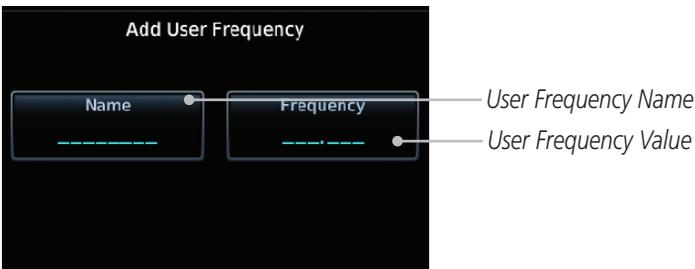
2. Touch the **User** key.  
3. Touch the **Add User Frequency** key.



**Figure 3-19 Add New User Frequency**



4. The Add New User Frequency information window will now be displayed. Touch the **Name** key to select a name for the User frequency.



**Figure 3-20 Add New User Frequency Detail Window**

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5. Touch the lower part of the display to select the desired range of characters. Select the characters from the selected alphanumeric range for the desired name. Touch the **Enter** key to accept the displayed Name.



**Figure 3-21** Select a Name for the New User Frequency



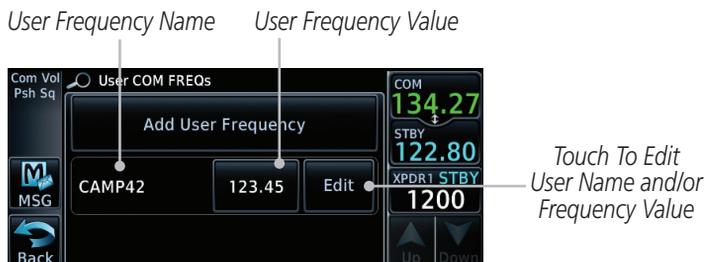
6. Touch the **Frequency** key and select the characters from the keypad for the desired frequency. Touch the **Enter** key to accept the displayed frequency.



**Figure 3-22** Select a Frequency Value for the New User Frequency



7. Touch the **Enter** key to accept the displayed name and frequency. The new User Frequency will be added to the list. The list can store up to 15 user frequencies.



**Figure 3-23** Completed New User Frequency

8. Touch the **Name** or **Frequency** keys to edit the displayed name or frequency, if desired.

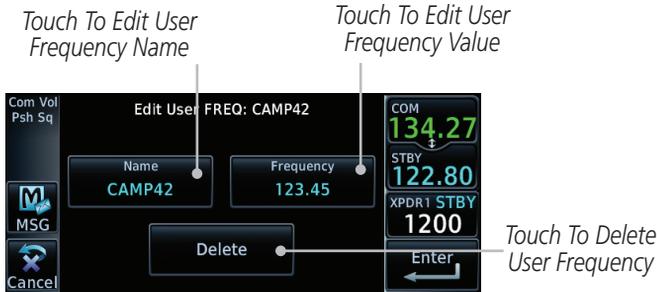


Figure 3-24 Edit The User Frequency

## 3.3.4 Emergency Frequency

The GTN 635 or 650 emergency frequency select provides a quick method of selecting 121.50 MHz as the active frequency in the event of an in-flight emergency. The emergency frequency select is available whenever the unit is on, regardless of GPS or cursor status, or loss of the display.



To quickly tune and activate 121.50, press and hold volume knob or the external remote Com flip-flop key for approximately two seconds.



**NOTE:** Pressing and holding the remote Com FLIP/FLOP key for approximately two seconds, on units so configured, will lock the COM board, preventing further changes in Com frequency until the Com board is unlocked, by pressing the remote Com FLIP/FLOP key again for two seconds. The following message will notify the pilot that the Com board has been locked: "COM LOCKED TO 121.5 MHZ. HOLD REMOTE COM TRANSFER KEY TO EXIT."



**NOTE:** Under some circumstances if the Com system loses communication with the main system, the radio will automatically tune to 121.50 MHz for transmit and receive regardless of the displayed frequency.

### 3.3.5 Stuck Microphone

Whenever the GTN 635 or 650 is transmitting, a “TX” indication appears in the Com window. If the push-to-talk key on the microphone is stuck or accidentally left in the keyed position, or continues to transmit after the key is released, the Com transmitter automatically times out (or ceases to transmit) after 30 seconds of continuous broadcasting. You will also receive a “Com push-to-talk key stuck” message as long as the stuck condition exists.

### 3.3.6 Remote Frequency Selection Control

On units configured for remote Com frequency Recall, pressing the remote recall switch will load the next preset Com frequency into the unit’s Standby frequency box. The remote recall switch can be pressed multiple times to scroll the entire preset frequency list through the Standby frequency box (the list will “wrap” from the bottom of the list back up to the top, skipping any empty preset positions).

The standby frequency isn’t activated until a Com flip-flop switch (either remote- or bezel-mounted) is pressed. Remote Frequency Selection only functions on units configured for a remote Com Frequency recall switch.



**NOTE:** For software prior to v5.00, frequencies must be stored in the User Frequency List prior to utilizing the remote channel select switch.

### 3.3.7 Reverse Frequency Look-Up

When the Reverse Frequency Look-Up feature is enabled in System-Setup, the identifier and frequency type will be shown for the selected Com and Nav frequencies for the nearest stations that are in the aviation database when the unit is receiving a valid position input. Station Identifiers with a “+” sign will have more stations associated with this frequency than just the type displayed.

Identifier and Type Shown for the Selected Frequency

The “+” Sign Indicates More Stations Associated With This Frequency



Figure 3-25 Reverse Frequency Look-Up



**NOTE:** It can take up to 2 minutes for the RFL frequency to change after crossing the half way point when flying from one airport to another that both use the same frequency.

## 3.4 Com Frequency Monitoring

The Frequency Monitoring function allows you to listen to the Standby frequency in the Com radio, while monitoring the Active frequency for activity.



1. Touch the **MON** key to listen to the standby frequency. A small "MON" annunciation is displayed to the right of the Standby frequency. A green bar will show on the **MON** key. When the Active frequency receives a signal, the unit will switch automatically to the Active frequency and then switch back to the standby frequency when activity ceases.



Figure 3-26 Com Frequency Monitoring



2. The Monitor function is deactivated when you touch the **MON** key again and the green bar is extinguished.



**NOTE:** The Com radio Monitoring function is different than the Monitor function of the Audio Panel.

## 3.5 Nav (VOR/Localizer/Glideslope) Receiver Operations

The GTN 650 includes digitally-tuned Nav/localizer and glideslope receivers with the desired frequency selected on the *Nav window*, along the top right-hand side of the display. Frequency selection is performed by pressing the **small right** knob to activate Nav Standby frequency editing and then turning the **small** and **large right** knobs or keypad to select the desired frequency.

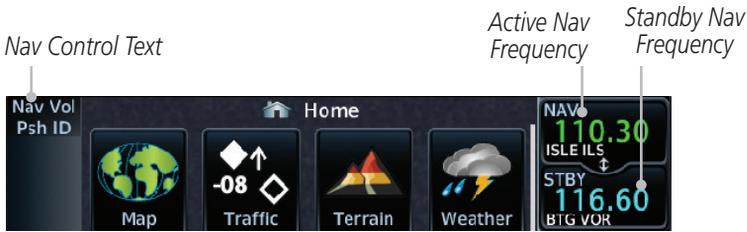


Figure 3-27 Nav Frequency Window

### 3.5.1 Ident Audio and Volume

Nav ident is enabled by pressing the **Volume** knob when the Nav window is active. When Nav ident is enabled, the ID annunciation will appear in the active Nav window and Morse code tones will be heard. When the Nav function is enabled, the Nav Standby channel window will highlight briefly and then turn to blue text. The Nav Standby frequency will be active for editing for about 30 seconds before the Com Standby frequency becomes active for editing.



Figure 3-28 Nav Standby Frequency Window is Active

Nav audio volume is adjusted using the **Volume** knob. Turn the **Volume** knob clockwise to increase volume, or counterclockwise to decrease volume.

## 3.5.2 Nav Tuning Window

Nav frequencies are selected with the tuning cursor in the standby Nav frequency field, and using the small and large right knobs to dial in the desired frequency. The keypad may also be used for frequency entry after touching the Standby window. The standby frequency always appears below the active frequency. The active frequency is the frequency currently in use. The GTN will automatically decode Morse code and display the Ident for the active frequency above it. The RFL (reverse frequency lookup) Identifier is displayed below the frequency and is only dependent on GPS position and database information.



**NOTE:** *Tuning is normally active in the Com window, unless placed in the Nav window by pressing the **small right knob**. When the tuning cursor is in the Nav window, it automatically returns to the Com window after 30 seconds of inactivity. The active frequency in either window cannot be accessed directly — only the standby frequency is active for editing.*

### To select a VOR/localizer/ILS frequency:



1. Touch the **small right knob** momentarily to make the Nav Standby frequency value active for editing. The window will be highlighted momentarily.
2. Turn the **large right knob** to select the desired megaHertz (MHz) value. For example, the "117" portion of the frequency "117.80."
3. Turn the **small right knob** to select the desired kiloHertz (kHz) value. For example, the ".80" portion of the frequency "117.80."
4. Touch the Nav active (top) frequency to make the standby frequency.
5. The Active (top) and Standby frequencies will switch.



Nav Frequencies In The Database Will Display The Ident Based on GPS Position



Nav Frequencies Will Automatically Decode Morse Code And Display The Ident

Figure 3-29 Automatic Nav Frequency Ident Decoding

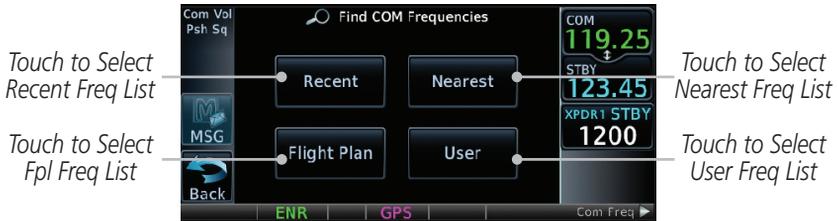
### 3.5.3 Nav Frequency Finding

The GTN 650's frequency finding feature allows you to quickly select any displayed database Nav frequency as your standby frequency.

**To select a Nav frequency for a User created frequency, Recent selected frequency, Nearest airport, or from your Flight Plan:**



1. While viewing the numeric keypad touch the **Find** key at the bottom of the display. Categories for User, Recent, Nearest, and Flight Plan are available.
2. Touch the **User, Recent, Nearest, or Flight Plan** key.



**Figure 3-30 Find Nav Frequency Group**

3. Touch the desired Nav frequency to select it and place it into the Nav Standby window.



**Figure 3-31 Nearest Airport Nav Frequency List**

OR



4. Touch the **Filter** key to narrow the list by category, such as Airport and VOR, and then select a given frequency.



Figure 3-32 Nearest Nav Frequency List

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