Sporty's® SP-400 Hand-held NAV/COM

Operator's Manual

sporty's® pilot shop

Important Notice

FCC RF Exposure Compliance Requirements for Occupational Use Only

This radio has been tested and complies with the Federal Communications Commission (FCC) RF exposure limits for Occupational Use/Controlled Exposure Environment. In addition, it complies with the following Standards and Guidelines:

- FCC 96-926, Guidelines for Evaluating the Environmental Effects of Radio-Frequency Radiation.
- FCC OET Bulletin 65 Edition 97-01 (1997) Supplement C, Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields.
- ANSI/IEEE C95.1-1992, IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.
- ANSI/IEEE C95.3-1992, IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave.
- When transmitting, hold the radio in a vertical position with its microphone 1 to 2 inches (2.5 to 5 cm) away from your mouth and keep the antenna at least 1 inch (2.5 cm) away from your head and body.
- The radio must be used with a maximum operating duty cycle not exceeding 50%, in typical Push-to-Talk configurations. DO NOT transmit for more than 50% of total radio use time (50% duty cycle). Transmitting more than 50% of the time can cause FCC RF exposure compliance requirements to be exceeded. The radio is transmitting when TX is on the front panel of the radio is illuminated. You can cause the radio to transmit by pressing the P-T-T button.
- Always use Sporty's authorized accessories.

Simplified Directions

1. Install the batteries.
2. Turn the unit on (rotate volume knob clockwise).
3. Enter the desired frequency (1 2 2 9 7 5 for 122.975 MHz).
   Note: Six digits may be required to select certain frequencies.)
4. Listen and transmit.

Table of Contents

General Information

Introduction

This manual contains only operational information relative to Sporty's SP-400 Hand-held NAV/COM. This manual is not intended as a service or maintenance manual and does not contain any theory or schematic diagrams.

Features

Sporty's SP-400 is a hand-held, aircraft communication and navigation transceiver with the following features:

- 2,280 COMM frequencies (118.000 MHz to 136.975 MHz) (unit will also receive 137.000 MHz to 142.975)
- 200 NAV frequencies (108.000 MHz to 117.950 MHz)
- Duplex communications—unit transmits on the Flight Service Station (FSS) frequency, 122.100 MHz, while listening over a VOR frequency
- Course Deviation Indicator (CDI) with Omni Bearing Selector (OBS) and TO/FROM Indicator
- Localizer with CDI
- VOR with CDI
- ILS with CDI
- Auto-Lit Keypad and Screen
- 20 Visual Memory Channels
- Full Feature Scanner—Scan the 20 Memory Channels or the entire frequency range
- Key Lock
- Large 15⁄8" x 15⁄8" LCD Screen
- Low Battery Indicator
- NOAA Weather Band
- External Power and Antenna Options
- 121.5 Emergency Frequency Button
- Easiest to use hand-held transceiver available
- Last Frequency Function with visible last frequency
- 8.33 MHz spacing
- Side-tone
- Adjustable LCD Screen
- Night Mode

Warranty

Our Limited Warranty is simple. If, in its first five years, your SP-400 Transceiver fails due to defective workmanship or parts under normal use, we will replace it or repair it at our option.

The warranty does not apply to units subject to misuse, battery leakage, neglect or accidents. Nor does the warranty apply to units damaged by lightning, excess current, moisture, units repaired or altered outside the factory, units with altered or removed serial numbers, or units used with accessories other than those listed in the Accessories section of this manual.

To have your unit serviced under this warranty, return it postage paid with proof of purchase to: Sporty's Pilot Shop, 2001 Sporty's Dr, Clermont County/Sporty's Airport, Batavia, Ohio 45103-9747.

Note: If you are experencing an issue with the SP-400 while using an approved accessory, please include the accessory when you return the SP-400.

If your SP-400 is no longer under warranty, you may still have it serviced at Sporty's. Call Sporty's Customer Service at 513.735.9000 for instructions.

License Requirements

Operating the transceiver in an aircraft that has an aircraft radio station license requires no additional license. To get an aircraft radio station license fill out FCC Form 404. Operating the radio on the ground requires a ground station authorization. Fill out FCC Form 406. These forms are available from the FCC at http://wireless.fcc.gov/uls.

Antenna Requirements

Included with the SP-400 is a flexible rubber antenna (Rubber Duck), which may be used for both COMM and NAV frequencies. However, an external antenna may be needed if operating inside an aircraft (must be properly installed by an aircraft radio shop), automobile or other metal enclosure.

On top of the SP-400 is a BNC connector, which is standard for use on aircraft radios. Therefore, little difficulty should be encountered in connecting an existing aircraft radio antenna to the SP-400.

When using the flexible antenna inside an aircraft or other enclosure, the optional Remote Antenna Mount allows the antenna to be positioned in a side window or other favorable location for improved reception. The SP-400 can also be positioned in a side window or other favorable location using the optional Suction Cup Transceiver Holder. See Accessories section of this manual for these products.

Batteries

An Alkaline Battery Pack is standard equipment with the SP-400. Alkaline batteries are a good power source for a backup radio because they have excellent storage life and no maintenance is required. Energizer® are the recommended Alkaline battery for the SP-400.

The Alkaline Battery Pack is NOT rechargeable. The batteries must be replaced. To replace the batteries, turn the power OFF and then remove the battery pack from the unit by pushing the Battery Pack Release Button in (see Controls section of this manual) and sliding the battery pack down. Remove the battery cover by pressing down on the tab and gently pulling it out. Eight 1.5 volt AA Alkaline batteries are required.

Replace the batteries by following the positive (+) and negative (-) terminal markings inside the case. When the batteries are replaced, replace the battery cover and attach the battery pack to the radio.

To attach the Alkaline or NiMH Battery Pack, make sure the power is OFF and then align the grooves on the SP-400 and battery pack. Slide the battery pack onto the radio until it locks in place.

The following table is a conservative estimate of the life of fresh Alkaline batteries at some common duty cycles with the audio background noise silenced by the Squelch.

Life	Transmit	Receive	Standby	Light
15.4 hrs	2%	3%	95%	Off
12.8 hrs	2%	3%	95%	On
9.5 hrs	10%	10%	80%	Off
7.9 hrs	10%	10%	80%	On
6.0 hrs	20%	20%	60%	Off
5.0 hrs	20%	20%	60%	On

The optional NiMH (nickel-metal hydride) Battery Pack is rechargeable and must be charged upon receipt before using.

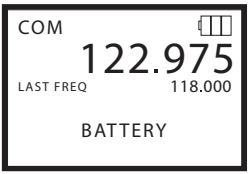
The NiMH Battery Pack is not recommended when the SP-400 will be used as a backup radio. The storage life of NiMH batteries is not as predictable as Alkaline batteries. The NiMH Battery Pack is recommend when the SP-400 will be used on a daily or frequent basis.

The following table is a conservative estimate of the life of a fully charged NiMH Battery Pack at some common duty cycles with the audio background noise silenced by the Squelch.

Life	Transmit	Receive	Standby	Light
6.0 hrs	2%	3%	95%	Off
5.0 hrs	2%	3%	95%	On
3.8 hrs	10%	10%	80%	Off
3.2 hrs	10%	10%	80%	On
2.5 hrs	20%	20%	60%	Off
2.1 hrs	20%	20%	60%	On

Use only the chargers listed in the Accessories section of this manual.

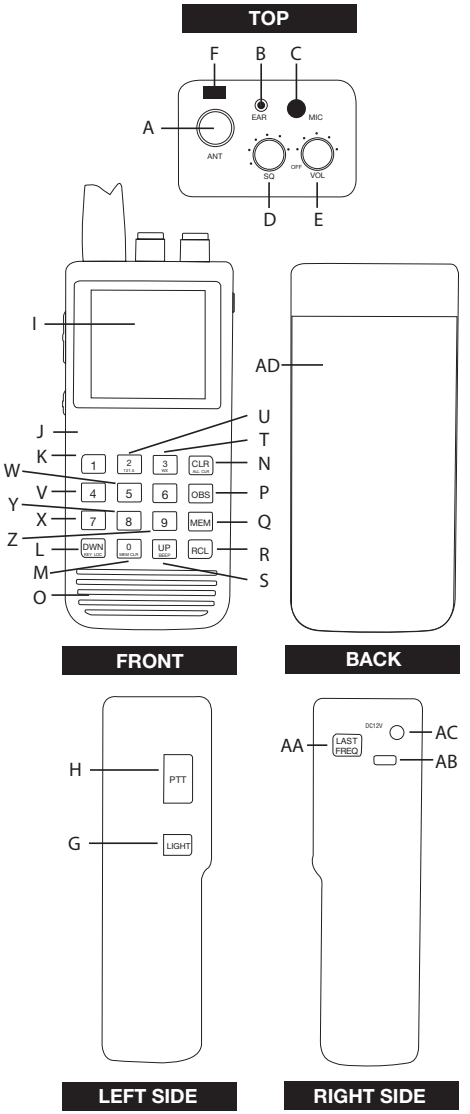
When the Alkaline batteries need replaced or the NiMH Battery Pack recharged, the screen will display the icon as shown below and the frequency will flash.



Note: The SP-400 will maintain memory for one hour with batteries removed.

Precautions:

- Changes or modifications not expressly approved by the manufacturer for compliance could void the user's authority to operate the equipment.
- Never attempt to service this unit yourself. It should be referred to qualified service personnel. Please read the Warranty section in this manual.
- If liquid spills or some solid object falls into the unit, remove the battery pack or external power adapter and have the unit checked by a qualified person before further operation.
- The optional NiMH (nickel-metal hydride) Battery Pack is recyclable. It may be unlawful in your state to dispose of NiMH batteries in a municipal landfill. Please contact your local solid waste officials for disposal and recycling options.
- Never dispose of batteries or battery packs in a fire. They may explode.
- Never leave weak or dead batteries in the Alkaline Battery Pack. They may leak and cause permanent damage.
- Never store a battery pack where it may be accidentally shorted.
- Never crush or disassemble a NiMH battery pack. NiMH batteries contain toxic chemicals.
- Never store a discharged NiMH Battery Pack. The cell polarity may reverse, making it impossible to recharge.
- Use only the approved external power adapters, NiMH battery chargers and battery packs listed in the Accessories section of this manual.
- Never touch an external antenna when the danger of lightning is present.
- Do not leave the transceiver near heat sources, such as radiators or air ducts, or place the transceiver in an environment where the radio will be subjected to moisture, excessive dust, shock or mechanical vibration.
- Abrasive cleaners or chemical solvents may mar or damage the case. Clean the transceiver with a soft cloth dampened with a mild detergent solution.
- If operating the transceiver at temperatures outside the range of -20°F to 122°F (-30°C to 50°C), the LCD (screen) may not display the selected frequency. If the SP-400 is used in temperatures lower than the recommended range, the characters being displayed may change very slowly. These irregularities will disappear, with no harm to the SP-400, when operation is resumed within the recommended temperature range.


TOP
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OBS
7
8
9
MEM
DWN
0
UP
RCL
FRONT
BACK
H
PTT
G
LIGHT
AA
LAST FREQ
DC12V
AC
AB
LEFT SIDE
RIGHT SIDE

Controls

This section serves only to identify and briefly describe the SP-400's external features. Please see the Operating Instructions section for detailed instructions on the use of the SP-400.

Top View

(A) Antenna Connector
The flexible rubber antenna or an external antenna may be attached to this BNC connector.

(B) Earphone Jack
Using the optional Headset Adapter (#8635A) the earphone of a standard aviation noise attenuating headset may be plugged into this jack. The internal speaker is disabled when this jack is used.

(C) Microphone Jack
Using the optional Headset Adapter (#8635A) the microphone of a standard aviation noise attenuating headset may be plugged into this jack. The internal microphone is disabled when this jack is used.

(D) Squelch
Rotate clockwise to increase squelch and counterclockwise to decrease squelch.

(E) On/Off and Volume Control
Combination on/off and volume control. Turn the knob clockwise from the OFF position to turn the unit on and to increase volume. Turn the knob counterclockwise to decrease volume and to turn the unit off.

(F) Wrist Strap Pin
The wrist strap (included as standard equipment) attaches to this location.

Left Side View

(G) Light Button
This button activates the back lighting for the screen and keypad. This key is also used in combination with the Clear Key to enable/disable the auto-light feature.

(H) Push-To-Talk Button
This button activates the internal microphone or an external microphone when using the optional headset adapter.

Front View

(I) Screen
This LCD displays the current frequency, last frequency, Course Deviation Indicator (CDI) and other information to the operator.

(J) Internal Microphone

(K) Numeric Keypad
These keys are used whenever the SP-400 requires a numeric input such as setting the frequency or Omni Bearing Selector (OBS).

(L) Down Key/Key Lock
This key is used to select the next lower frequency, select the next lower OBS setting or to initiate search and scan functions. This key is also used in combination with the Clear Key to lock out all inputs to the keyboard.

(M) Memory Clear Key
This key is used to delete a selected memory channel.

(N) Clear Key/ALL CLR
This key is used to clear erroneous key entries and to exit functions such as search, scan, and memory storage and recall. This key is used in combination with the Down Key to lock out all inputs to the keyboard. It is used in combination with the Light Button to enable/disable the backlight feature. It is used in combination with the UP Key to enable/disable the BEEP function. This Key is also used in combination with the ON/OFF Volume Control to clear all memory channels.

(O) Internal Speaker

(P) Omni Bearing Selector Key
This key is used to change the Omni Bearing Selector (OBS) function for the Course Deviation Indicator (CDI).

(Q) Memory Key
This key is used while storing frequencies in one of the 20 memory channels.

(R) Recall Key
This key is used to recall stored frequencies from the 20 memory channels.

Front View (continued)

(S) Up Key/BEEP
This key is used to select the next higher frequency, select the next higher OBS setting or to initiate search and scan functions. This key is also used in combination with the Clear Key to enable/disable the beep feature.

(T) 3 Key WX
This key is used to select the NOAA Weather Radio Band.

(U) 2 Key 121.5 Emergency
This key is used to select 121.5 emergency frequency.

(V) 4 Key Night Vision Mode
This key is used to place the SP-400 in night vision mode.

(W) 5 Key Normal Vision Mode
This key is used to place the SP-400 in normal vision mode.

(X) 7 Key Low Back Light
This key is used to select the low back light function.

(Y) 8 Key High Back Light
This key is used to select the high back light function.

(Z) 9 Key LED Contrast
This key is used to adjust the LCD contrast and night mode function.

Right Side View

(AA) Last Frequency
This switch is used to flip flop between your current and last frequency.

(AB) Battery Pack Release
Pushing this button releases the battery pack for removal.

(AC) External Power Jack
The SP-400 may be powered externally, with or without a battery pack attached by plugging the optional 12/24 Volt Cigarette Lighter Power Adapter (#7243A) or the 100 - 220 Volt Wall Power Adapter (#7343A) into this location.

Back View

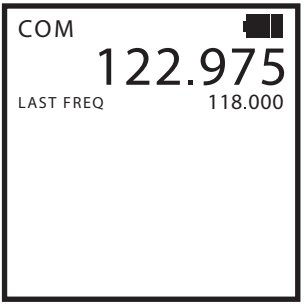
(AD) Battery Pack

Operating Instructions

To perform the following functions you must be in the basic operating mode of the SP-400. To ensure that you are in the basic operating mode, press the clear key until the last frequency that was entered manually is displayed.

Manual Frequency Selection

The SP-400 will receive 200 NAV frequencies (108.000 MHz to 117.950 MHz) and 3,000 COMM frequencies (118.000 MHz to 142.975 MHz). The SP-400 will transmit on 2,280 COMM frequencies (118.000 MHz to 136.975 MHz). The frequency currently selected is always displayed at the top of the SP-400's screen and the last frequency is always underneath the current frequency.



From the example above, the SP-400 is receiving 122.975 MHz with the last frequency being 118.000 MHz. To manually enter a desired frequency such as 118.700 MHz, enter 1 1 8 7 0 0 using the numeric keypad. As each digit is entered, the flashing cursor moves to the next digit. Six digits may be required to select a frequency.

The SP-400 will return to the previous frequency if there is a pause of five seconds between key entries while entering a new frequency. The Clear Key may be pressed any time prior to entering the sixth digit to clear the digits entered and return to the previous frequency.

Any frequency outside of the range listed above will not be accepted. The SP-400 will beep when such a digit is entered. For example, starting any frequency selection with a number other than 1 or attempting to place a 5, 6, 7, 8 or 9 in the second digit will result in a beep.

Frequency Search

To manually search through the frequency range (COMM and NAV), the Up Key or Down Key may be pressed at any time to select the next higher or lower frequency. This uses 8.33 KHz steps in the COMM frequency range. The Up and Down Keys may be pressed repeatedly to continue changing the selected frequency.

To automatically search the entire COMM frequency range for a broadcasting signal, the Up Key or Down Key may be pressed and held for one second. The Screen will display SEARCH as seen below.

The frequencies will either scroll up or down in 8.33 KHz steps depending upon whether the Up or Down Key was used to initiate the Search.

When a broadcasting signal is found, the word SEARCH will flash and the SP-400 will stop temporarily on that frequency. If the broadcasting signal is cut off for more than two seconds, the Search will resume until another signal is found. When 142.975 MHz is reached during an upward Search, the Search automatically continues at 118.000 MHz. Likewise, when 118.000 MHz is reached during a downward Search, the Search automatically continues at 142.975 MHz.

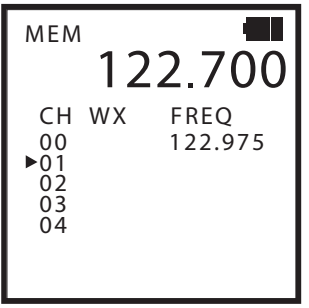
The Search may be canceled at any time by pressing the Clear Key. The direction of the Search may also be reversed at any time by pressing and holding the Up and Down Key (whichever is appropriate) for one second.

It is very important that the Squelch be properly adjusted prior to initiating a Search. The background static received with the squelch off may be strong enough to disrupt a Search. If a Search gets "stuck" on a frequency with too much background noise, increase the Squelch or press and hold the Up or Down Key for one second to skip that frequency and resume Searching.

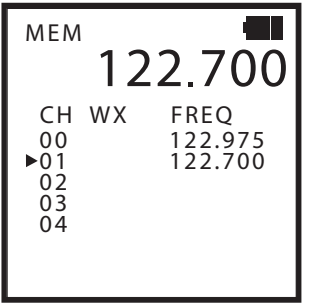
Frequency Memory

The SP-400 has 20 visual memory channels numbered 00 to 19 to store those frequencies used most often. These channels are stored in groups of five on four separate pages. These memory channels may be used to store COMM, NAV and WX frequencies.

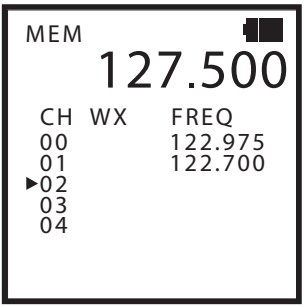
Select a desired frequency, such as 122.700, to be stored by using either manual frequency selection or frequency search. To store this frequency, press the Memory Key. The following screen will appear.



The first available memory channel will be displayed with an arrow on the screen. In this example, memory channel 01 is the first available location. To store the frequency, press the Memory Key a second time. The screen will now display the following for one second to verify 122.700 has been stored in memory channel 01.



You may also overwrite an existing memory channel or select an available memory channel other than the first one displayed. Once again, select the desired frequency and then press the Memory Key.



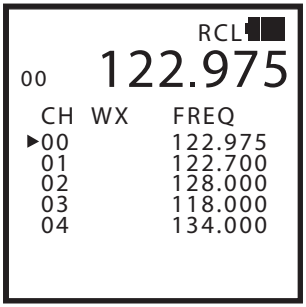
The first available memory channel will be displayed with an arrow on the screen. Now press either the Up or Down Key to scroll through the 20 memory channels. If a memory channel is already storing a frequency, the stored frequency will be displayed next to the memory channel number on the screen while your selected frequency remains on the top line.

Once the desired memory channel is selected, press the Memory Key and the frequency will be stored. Remember, if a channel was selected that was already storing a frequency, the old frequency will be erased when your selected frequency is stored.

You may exit the memory function by pressing the Clear Key any time prior to storing the frequency (pressing the Memory Key the second time).

Memory Recall

To recall a frequency stored in a memory channel, press the Recall Key. The first five memory channel numbers and their corresponding frequencies will be displayed. The first stored memory channel immediately becomes the active frequency and is received by the SP-400.



In this example, memory channel 00 is listed first.

At this point you may select any stored memory channel by either pressing the Up or Down Key to scroll through the stored frequencies. Memory channels stored on other pages may also be accessed directly by using the Numeric Keypad. For example, to receive memory channel 08 you may either:

1. Press the Recall Key followed by the Up or Down Key to scroll to 08

Or

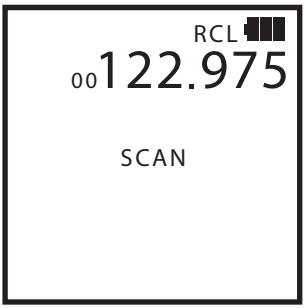
2. Press the Recall Key followed by 0 8

Once in the Recall function, the SP-400 stays in Recall until the Clear Key is pressed. This allows you to sequence your frequencies in the order you may wish to use them. For example, you may wish to store your airport's ATIS in memory channel 00, Clearance Delivery in channel 01, Ground in channel 02, Tower in channel 03 and Departure Control in channel 04. For this example you would press the Recall Key once followed by the Down Key for every frequency change instead of having to enter each frequency manually.

While in the Recall function the only entries accepted are Numeric Keypad entries between 00 and 19, the Up or Down Key or the Clear Key. All other inputs cause the SP-400 to beep. Remember, you may press the Clear Key at any time to exit the Recall function. Once you have left the Recall function, the SP-400 will remain on the last frequency that was being received.

Memory Scan

The Memory Scan function is very similar to the Search function, except it only scans those COMM frequencies stored in the memory channels. To Scan the memory channels, press the Recall Key to enter the Recall function. Then press and hold the Up or Down Key for one second to initiate either an upward or downward Scan. The word SCAN will appear on the screen and the memory channel number and frequency will be displayed on the top line of the screen.



When a broadcasting signal is found, the word SCAN will flash and the SP-400 will stop temporarily on that frequency. If the broadcasting signal is cut off for more than two seconds, the Scan will resume until another signal is found.

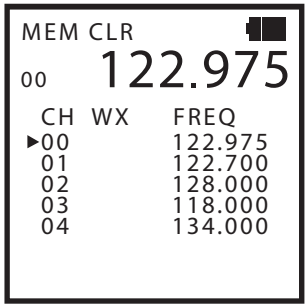
The Scan may be canceled at any time by pressing the Clear Key. The direction of the Scan may also be reversed at any time by pressing and holding the Up or Down Key (whichever is appropriate) for one second.

Once you have pressed the Clear Key to exit a Scan, you are still in the Recall function. Press the Clear Key again to exit the Recall function. The SP-400 will remain on the last frequency received.

It is very important that the Squelch be properly adjusted prior to initiating a Scan. The background static received with the squelch off may be strong enough to disrupt a Scan. If a Scan gets "stuck" on a frequency with too much background noise, increase the Squelch or press and hold the Up or Down Key for one second to skip that frequency and resume Scanning. Please note, since ATIS broadcasts continually, a Scan will always stop on an ATIS frequency if it is included in the Scan.

Memory Clear

To clear or erase a memory channel, press and hold the Clear Key followed by the Memory Key. Release the keys when MEM CLR is displayed on the top line of the screen.



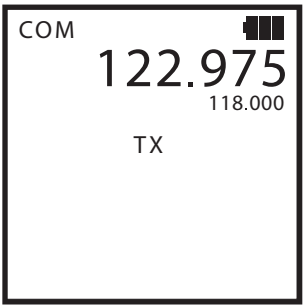
The first five memory channels with stored frequencies will be displayed on the screen. Press the Up or Down Key to scroll through the memory channels to select the memory channel to clear. Once the desired memory channel is displayed, press the Memory Clear Key (also the 0 Key on the Numeric Keypad) to clear the selected channel. Additional channels may be cleared by once again pressing the Up or Down Key to make another selection and then pressing the Memory Clear Key.

Press the Clear Key at any time to exit the Memory Clear function.

To clear every memory channel, hold down the Clear Key while turning on the power. Please note, there is no way to reverse this process. The screen will display the following to verify all of the memory channels have been cleared.

Transmittin

Press the Push-To-Talk Button (PTT) at any time while tuned to a COMM frequency to broadcast over the selected frequency. While the PTT is pressed the screen will display TX beneath the frequency to verify the SP-400 is broadcasting.



Release the PTT to end the transmission and the SP-400 will once again receive the selected COMM frequency. If the optional Headset Adapter is being used, the SP-400's internal microphone will be deactivated and the microphone on the headset may be activated by either pressing the SP-400's PTT or pressing an inline, remote PTT.

Duplex Communications

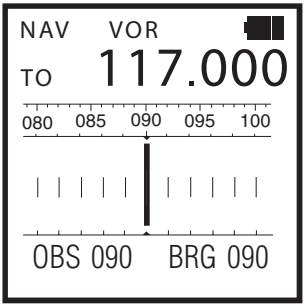
Anytime the PTT is pressed while receiving a NAV frequency, the Duplex Communications feature will be activated. Duplex Communication enables the SP-400 to broadcast over 122.100 MHz (Flight Service Station frequency) while listening over the NAV frequency. For example, if the selected frequency is 117.000 MHz (a NAV frequency) and the PTT is pressed, the SP-400 will broadcast over 122.100 MHz. When the PTT is released the SP-400 will once again receive 117.000 MHz.

VOR Operations

Enter a NAV frequency (108.000 MHz to 117.950 MHz) by using either manual frequency selection or frequency search. The frequency is selected is done in the same manner used to select a COMM frequency. As usual, the selected frequency will appear in the top of the screen. The top line of the screen displays NAV VOR to identify the selected frequency as a VOR.

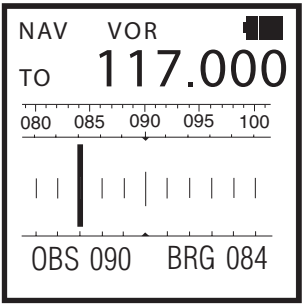
VOR Operations (continued)

If a VOR signal is not received on the selected frequency, the screen will display the selected frequency only and nothing else. This is similar to the flag on a panel-mounted NAV display. When a VOR signal is received, a screen similar to the following will be displayed.



The Course Deviation Indicator (CDI) is on the screen. The CDI will always be initially centered when a VOR signal is first acquired.

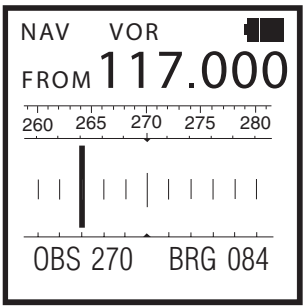
When receiving a VOR signal, each division on the CDI represents a two degree deviation. Therefore, the CDI on the SP-400 has the ability to display up to a 10 degree deviation to the right or left in VOR mode. The following example shows a 6 degree deviation to the right if your desired course is flying to the station on the 90 degree radial (fly left towards the needle to be on course).



The three digits in the lower left-hand side of the screen are the Omni Bearing Selector (OBS) setting. Whenever the CDI needle is centered, such as when a VOR signal is first received, the OBS setting represents your bearing to or radial from the selected VOR station. The TO or FROM next to the frequency specifies whether the OBS setting is a bearing to or a radial from the VOR.

VOR Operations (continued)

The Clear Key may be pressed to toggle the OBS between To and From indications. By pressing the Clear Key, the following OBS setting of 270F is obtained.



The OBS setting will remain set to the initial bearing or radial until otherwise changed. The CDI needle will continuously update to show the deviation from the selected radial as the aircraft moves.

To enter a desired radial, press the OBS Key. The OBS setting will begin to flash. Enter the desired three digit radial using the Numeric Keypad. For example, OBS 0 3 0 will enter 30 degrees as the OBS setting. The CDI will automatically display the deviation from the selected radial. This process may be exited any time prior to entering the third digit by pressing the Clear Key. As long as the OBS setting is flashing, the SP-400 will accept numeric inputs between 0 and 360. Once three digits have been entered, or five seconds pass without an entry being completed, the SP-400 will not accept additional input until the OBS Key is pressed again.

Another method of selecting an OBS setting is using the Up and Down Keys. Once the OBS Key is pressed and the OBS setting is flashing, the Up or Down Key may be used to scroll through all 360 degrees until the desired radial or bearing is selected. Input from the Up or Down Key is accepted as long as the OBS setting is flashing. Once the desired bearing or radial is selected, the flashing will "time out" after five seconds.

The CDI needle may be centered and the actual bearing to or radial from the selected VOR station may be displayed at any time by pressing the OBS Key followed by the Clear Key. Pressing the Clear Key any time the OBS setting is flashing will center the CDI.

Remember, any time the OBS Key is pressed, the OBS setting will flash. During this time the SP-400 will accept three digits, the UP or Down Key or the Clear Key to change the OBS setting.

VOR Operations (continued)

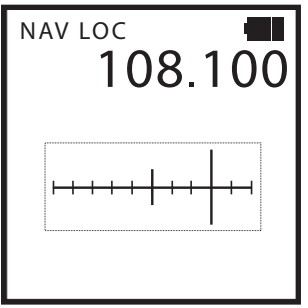
There is also an automatic bearing-to-station feature, indicated by BRG in the lower right hand corner of the display. This indicates the bearing to the VOR station, and is continually updated as you fly. This number is not user-selectable.

To exit the navigation function, enter a COMM frequency. As long as the OBS setting is not flashing, any inputs, such as manual frequency selection or recalling a frequency stored in a memory channel, will change the active frequency being received. If the NAV frequency was selected using the Recall Function, the Clear Key must be pressed to exit the Recall Function before using manual frequency selection.

Localizer Operations

Enter a Localizer frequency by using either manual frequency selection or frequency search. The selected frequency will appear on the screen.

If a Localizer signal is not received on the selected frequency, the screen will display the selected frequency only and nothing else. This is similar to the flag on a panel-mounted display. When a Localizer signal is received, a screen similar to the following will be displayed.



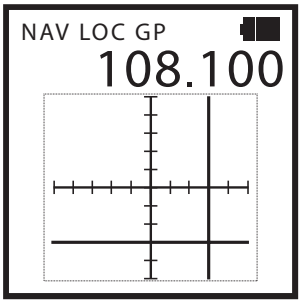
The Course Deviation Indicator (CDI) is displayed on the screen. When receiving a Localizer signal, each division on the CDI represents a one degree deviation. Therefore, the CDI on the SP-400 has the ability to display up to a 5 degree deviation to the right or left in Localizer mode. The above example shows a 3 degree deviation to the left (fly right towards the needle to be on course). OBS and BRG are disabled in LOC mode.

The top line of the screen displays NAV LOC to identify the selected frequency as a Localizer. To exit the Localizer function, enter a COMM or NAV frequency. If the Localizer frequency was selected using the Recall Function, the Clear Key must be pressed to exit the Recall Function before using manual frequency selection.

ILS Operation

Enter an ILS frequency by using either manual frequency selection or frequency search. The selected frequency will appear on the screen.

If an ILS signal is not received on the selected frequency, the screen will display the selected frequency only and nothing else. This is similar to the flag on a panel-mounted display. When an ILS signal is received, a screen similar to the following will be displayed.

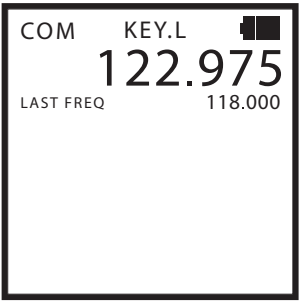


The Course Deviation Indicator (CDI) is displayed on the screen. When receiving an ILS signal, each division on the CDI represents a one degree deviation. Therefore, the CDI on the SP-400 has the ability to display up to a 5 degree deviation to the right, left, up or down in ILS mode. The above example shows a 3 degree deviation to the left (fly right towards the needle to be on course) and a 3 degree deviation up (fly down towards the needle to be on course). OBS and BRG are disabled in LOC mode.

The top line of the screen displays NAV LOC GP to identify the selected frequency as an ILS. To exit the ILS function, enter a COMM or NAV frequency. If the ILS frequency was selected using the Recall Function, the Clear Key must be pressed to exit the Recall Function before using manual frequency selection.

Key Lock

Inputs from the keypad may be locked out at any time by holding the Clear Key and pressing the Down Key. When Key Lock is active, KEY.L is displayed at the top of the screen as shown below.



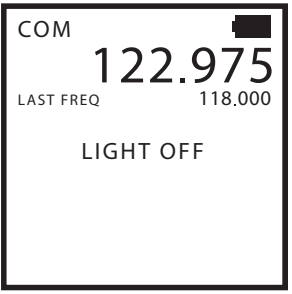
Key Lock is deactivated by holding the Clear Key and pressing the Down Key a second time. Key Lock only locks out the SP-400's keypad. The PTT and Light functions are not affected.

Screen and Keypad Lighting

Press and release any button to activate the SP-400's screen and keypad lighting for five seconds. Screen and keypad lighting will also activate anytime a frequency becomes active.

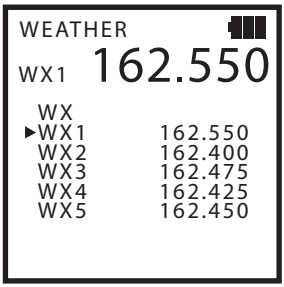
To activate the screen and keypad lighting indefinitely, press and hold the Light Button for one second until a beep is heard. When this is done, the Light Button must be pressed a second time to turn the lighting off.

To turn off automatic screen and keypad lighting, press and hold the clear button, followed by the light button. The screen will display LIGHT OFF. To reactive automatic lighting, repeat these steps.



NOAA Weather Band

Press the WX Key (also the 3 Key on the Numeric Keypad) to recall the ten stored NOAA Weather frequencies. The first five channel numbers and their corresponding frequencies will be displayed. The first stored frequency immediately becomes the active frequency and is received by the SP-400.



At this point you may select any stored weather channel by pressing the Up or Down Key to scroll through the stored frequencies. Weather channels may also be accessed directly by using the Numeric Keypad. For example, to receive weather channel 08 you may either:

1. Press the Recall Key followed by the Up or Down Key to scroll to 08

Or

2. Press the Recall Key followed by 8

Once in the Weather Band function, the SP-400 stays in Weather Band until the Clear Key is pressed.

While in the Weather Band function the only entries accepted are Numeric Keypad entries between 0 and 9, the Up or Down Key or the Clear Key. All other inputs cause the SP-400 to beep. Remember, you may press the Clear Key at any time to exit the Weather Band function. Once you have left the Weather Band function, the SP-400 will remain on the last frequency that was being received.

Emergency Frequency (121.5)

To make 121.5 the active frequency, press and hold the 121.5 Button (2 Key) for 2 seconds. The screen will display EMERGENCY. This feature works in any mode.

Low Back Light Mode
To set the back light mode of the SP-400 to low, press the clear key and the 7 key.

Once in the low back light mode, the back light can be further adjusted from level 0 to level 10 by pressing the up or down keys.

Press the clear key to save the setting.

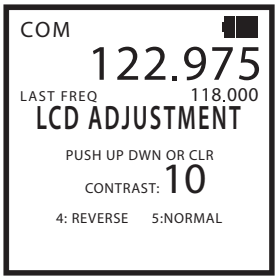
High Back Light Mode
To set the back light mode of the SP-400 to high, press the clear key and the 8 key.

Once in high back light mode, the back light can be further adjusted from level 10 to level 99 by pressing the up or down keys.

Press the clear key to save the setting.

LCD Contrast Adjustment

To adjust the LCD contrast of the SP-400, press the clear key and the 9 key.



The contrast can be adjusted by pressing the up or down keys. Press the clear key to save the setting.

Night Mode

To put the SP-400 in night mode, press the clear key and the 9 key to bring up the LCD contrast adjustment screen. Once on the LCD contrast adjustment screen press the 4 key to place the SP-400 in night mode.

Press the clear key to save the setting.

To put the SP-400 in normal mode, press the clear key and the 9 key to bring up the LCD contrast adjustment screen. Once on the LCD contrast adjustment screen press the 5 key to place the SP-400 in normal mode.

Press the clear key to save the setting.

Accessories

Call Sporty's Pilot Shop at 1-800-SPORTYS (776.7897) or visit sportys.com to order any of the following optional accessories.

Spare Alkaline Battery Pack (#1613A)

Spare Alkaline Battery Pack holds eight AA batteries, allowing for a quick change of batteries while in-flight. An ideal way to ensure fresh batteries are on board if the SP-400 is to be used as a backup radio.

NiMH Battery Pack (#1639A)

The NiMH Battery Pack should be used if the SP-400 will be used on a daily or frequent basis. Requires at least one of the two available Power Adapters/Chargers (#1640A, #8633A). Charges in 12 hours. Due to the unpredictable shelf life of NiMH batteries, the NiMH Battery Pack is not recommended when the SP-400 will be used as a backup radio.

Desktop NiMH Battery Charger (#1640A)

A desktop drop-in charger for the NiMH Battery Pack. This two-piece charger includes the molded desktop base and Wall Power Adapter/NiMH Battery Charger (#8633A). For desktop use, the Wall Power Adapter/NiMH Battery Charger is plugged into the desktop base. The included Wall Power Adapter/NiMH Battery Charger may also be plugged directly into the SP-400 as described below. The SP-400 will not transmit while sitting in the Desktop NiMH Battery Charger.

100 - 200 Volt Wall Power Adapter/NiMH Battery Charger (#7343A)

Allows the SP-400 to be powered externally from a 115 Volt wall outlet. Plugs into the side of the SP-400, which allows the unit to be powered with or without a battery pack attached. Also charges the optional NiMH Battery Pack (#1639A). Included with the 115 Volt Desktop NiMH Battery Charger (#1640A). Safe for use with the Alkaline Battery Pack. Power cord measures 6 ft. long.

Cigarette Lighter Power Adapter (#7243A)

Allows the SP-400 to be powered externally from a cigarette lighter in aircraft with 12, 24 or 28 Volt electrical systems (accepts input voltage of 10 to 30 Volts DC). Plugs into the side of the SP-400, which allows the unit to be powered with or without a battery pack attached. Safe for use with the Alkaline Battery Pack. Power cord measures 6 ft. long.

Headset Adapter (#8635A)

Allows the use of a standard aviation noise attenuating headset. The SP-400's internal speaker and microphone are disabled only when the Headset Adapter is attached with the microphone plugged in the SP-400.

Metal Belt Clip (#3920A)

Attaches to the back of the SP-400 with screws installed in the unit as standard equipment.

Specifications

General

Communication Frequencies:

2,280 Frequencies from 118.000 MHz to 136.975 MHz (8.33 KHz steps)

Receive Only Frequencies

720 Frequencies from 137.000 MHz to 142.975 MHz (8.33 KHz steps)

Navigation Frequencies

200 Frequencies from 108.000 MHz to 117.950 MHz (50 KHz steps)

Memory Channels

20 channels numbered 00 to 19

NOAA Weather Band

10 channels numbered 0 to 9

Weight with Alkaline Battery Pack (including antenna)

1.83 lb. (469 grams)

Weight with NiMH Battery Pack (including antenna)

1.14 lb. (517 grams)

Weight without battery pack (including antenna)

.53 lb. (239 grams)

Dimensions with either battery pack

Height	5.68 in. (144.2 mm)
Width	2.5 in. (63.5 mm)
Depth	1.625 in. (41 mm)

Operating Temperature Range

-22°F to 122°F (-30°C to 50°C)

Frequency Stability
± 10 PPM (0.001%) at 25C

Battery Pack Power

NiMH Battery Pack	9.6 VDC / 2,200 mAH
Alkaline Battery Pack	12.0 VDC (8 AA batteries x 1.5 VDC each)

Receiver

Audio Output
350 mW into 8 Ohms, 10%

Adjacent Channel Rejection
-60 dB

Sensitivity
AM 6 dB (S+N)/N at 1 µV soft

Selectivity
-6 dB ± 7 KHz

Band Width
± 25 KHz at 60 dB down

Power Consumption
68 mA (on; no reception, no noise)
380 mA (max at voice output)

Transmitter

Transmitter Power
1.5 Watts ± 20%, 5 Watt (PEP) at 85% modulation

Antenna Impedance
50 Ohms

Spurious Radiation
-60 dB below carrier

Unnecessary Emissions
-60 dB or less

Power Consumption
1 A (max)