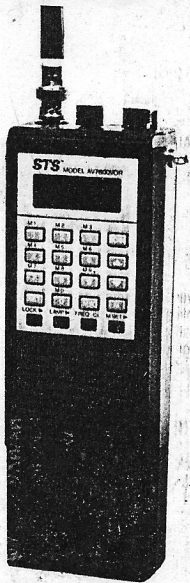


OPERATOR'S MANUAL MODEL AV7600VOR HANDHELD TRANSCEIVER

STSTM

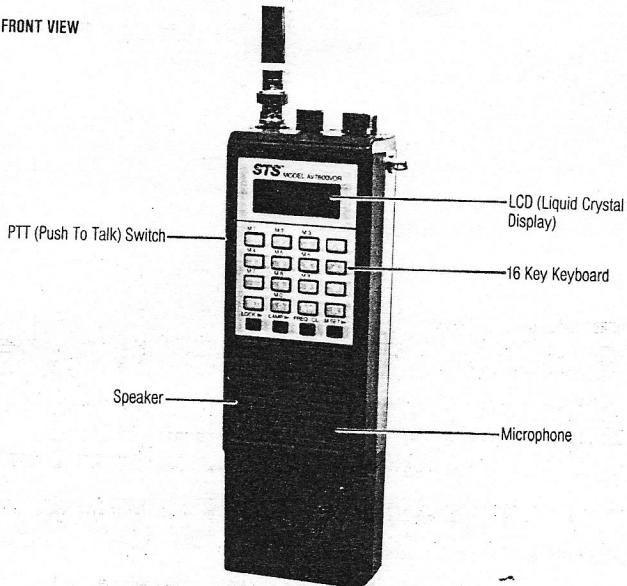


NOTE: If something's missing or broken, contact us immediately. Do not, we repeat, DO NOT attempt to repair your AV7600VOR yourself.

Satellite Technology Services, Inc.
STS Service Department
11600 Lilburn Park Road
St. Louis, Missouri 63146
(314) 567-0304

GETTING ACQUAINTED WITH YOUR AV7600VOR

FRONT VIEW



The STS AV7600VOR — High quality "flight insurance" for the safety conscious pilot.

As you'll soon find out, you've just made a very wise investment. The STS AV7600VOR is a state-of-the-art handheld transceiver. Designed specifically for sport and commercial pilots, it's light, economical, easy-to-use; and most importantly,

completely equipped for self-contained operation—regardless of aircraft.

While it's entirely possible you'll never use the AV7600VOR to save your life, it could. And doesn't that make you feel just a little bit safer in the air?

PRODUCT FEATURES

- Microprocessor-controlled circuitry.
- Communication channels: 720 (25 kHz steps) from 118.000 to 135.975 MHz.
NAV channels: 200 (25 kHz steps) from 108.000 to 117.975 MHz.
- 10 pre-programmable non-volatile memory locations.
- 4 scanning modes: MANUAL, SCAN, SEARCH, OPEN.
- Priority channel scanning in SCAN mode.
- 24 hour clock.
- 16 key keyboard.
- Large LCD display.
- Quick-change, rechargeable NiCad battery.
- BNC antenna connector.
- Separate headphone jack.
- Separate external speaker/microphone jack.
- Squelch adjustment.
- 2.0 watts RF carrier.
- Lightweight: 1 lb. 5 oz. (600 grams).
- Receiver sensitivity: 1.5 μ V for 10 dB (s+n/n).
- Off-longitude angle for navigation.

LICENCE REQUIREMENTS

For use as an aircraft transceiver, the FCC requires you to file Form 404: "Application for Aircraft Radio Station" before operation. If you plan to use your AV7600VOR as a ground

station, the FCC requires Form 406, "Application for Ground Station Authorization in the Aviation Service" prior to operation.

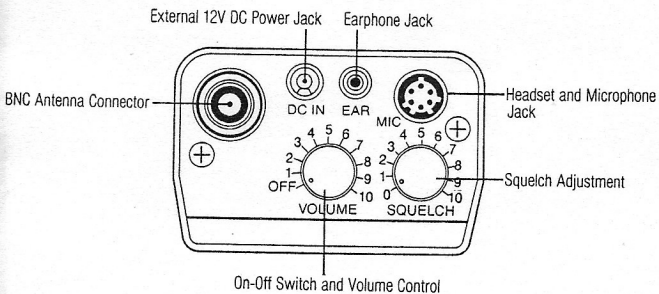
UNPACKING YOUR AV7600VOR

Before you go any further, check to make sure you have everything listed below. And while you're taking inventory, check everything for obvious damage.

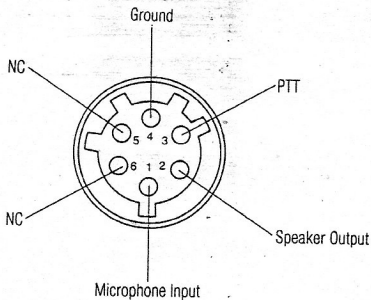
- AV7600VOR
- NiCad BATTERY PACK

- 12V DC CIGARETTE LIGHTER RECEPTACLE CHARGER
- ANTENNA WITH BNC CONNECTOR
- NYLON STRAP HANDLE
- HARD PLASTIC CARRYING CASE

TOP VIEW



MICROPHONE CONNECTOR PINS



LCD (Liquid Crystal Display)

"RX" displayed when receiving a signal.

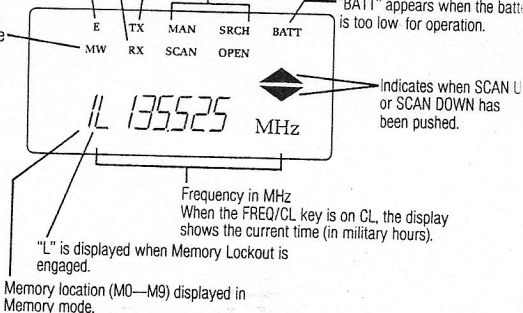
"E" appears when an illegal setting is entered or VOR signal is to weak to navigate.

"M" indicates you're in the Memory mode.
"MW" indicates you're in the Memory Write mode.

"TX" displayed when transmitting.

The four scanning modes are displayed
MAN (Manual), SCAN, SRCH (Search) & OPEN.

"BATT" appears when the batt is too low for operation.



INSTALLATION AND CARE OF YOUR NiCad BATTERY PACK

Your new AV7600VOR is powered by a rechargeable Nickel Cadmium battery pack (7.2 Vdc/700 mA). Your battery pack was charged at the factory before shipment—but was not connected to minimize discharge. However,

some discharge may have occurred during shipping or storage. This is normal.

We strongly urge you to fully charge your battery pack before you use your AV7600VOR.

NiCad CHARGING

Under normal use, a fully charged battery pack will operate your AV7600VOR:

Receive only: 12 hours

Transmit 10% duty: 6—8 hours

Transmit 30% duty: 4—6 hours

Your battery pack can be fully recharged up to 300 times. However, under or overcharging will reduce your battery's life.

CHARGING INSTRUCTIONS:

- If "BATT" appears in the LCD, battery charge is below the usable limit.
- Turn power off before removing or installing the battery pack.
- Charge the battery with the AC wall charger (this may be done while battery is still attached to the AV7600VOR).

NOTE: CHARGING TIME IS ABOUT 10—13

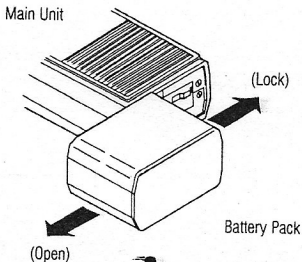
HOURS FOR A FULL CHARGE

CHARGING CURRENT: 100 mA

- *12VDC Cigarette Lighter receptacle charger will trickle charge and run this unit. It's not necessary to have the battery attached to operate the unit with the 12V charger.*

NOTE: USE ONLY IN A 12V OUTLET!

INSTALLATION INSTRUCTIONS:



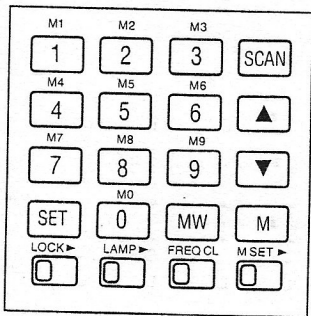
- Remove battery pack by sliding the entire pack in the open direction.

- Install the pack by aligning the grooves with those on the unit — then sliding pack to the lock position.

RULES AND CAUTIONS

- Never store the AV7600VOR with a discharged battery pack.
- Never short-circuit a NiCad battery pack. The massive discharge current will damage the pack.
- Do not turn the unit on while the Press to Talk button is pushed.
- Disconnecting the battery for extended periods of time will cause Memory locations M1 to M9 to automatically reprogram themselves to 121.5 MHz and M0 to 135.975 MHz.
- Exchange battery packs within 30 seconds to preserve stored Memory frequencies and clock time.
- NiCad batteries contain toxic materials — never crush or dissect.
- Never substitute bench power supply for the battery pack.
- Never operate transmitter without an installed antenna.
- Never leave your battery pack attached to the AC wall charger longer than prescribed charging time.

MEET YOUR KEYBOARD



THE "NUMBER" KEYS

These let you assign frequencies and clock time (described in later sections). You'll notice above each is a "M" number (example: M1, M2, etc.). In the Memory mode, these keys also define 10 memory locations for preassigned frequencies.

SET

THE "SET" KEY

This assigns frequencies or starts the clock. After you punch in a desired frequency, you must press the "SET" key to lock it in (the decimal is automatically placed). After you've set clock time, depress this button to start the 24 hour clock.

SCAN

THE "SCAN" KEY

Selects one of the four scanning modes: Manual, (MAN), Automatic Scan (SCAN), Search (SRCH), or Open SCAN (OPEN). Modes appear on the LCD screen.



THE "SCAN UP" AND "MEMORY LOCKOUT" KEY

In the Frequency Mode, pressing this key moves the scanner up to the next highest active frequency.

In the Memory Mode, pressing this key moves the scanner up to the next highest active memory channel (M0—M9) until all have been scanned.

In the Memory Lockout Mode, a location (M1—M9) can be locked out of the scanning sequence when the "M-Set" switch is on (to the right) and this key is pressed.

NOTE: M0 cannot be locked out.



THE "SCAN DOWN" KEY AND "MEMORY LOCKOUT" KEY

In the Frequency Mode, pressing this key moves the scanner automatically down to the next lower active channel.

In the Memory Mode, pressing this key automatically moves the scanner to the next lower active Memory channel. Once it reaches the lowest Memory channel, it returns to the highest Memory channel, where the cycle is repeated.

When "M-Set" switch is on (to the right) and this key is pressed. Locked out locations (M1—M9) will be unlocked and able to be scanned.



THE "MEMORY MODE" KEY "M"

Pressing this key shifts the transceiver from selecting any of the 920 frequencies to the 10 memory frequencies that you have selected (noted by a "M" in the upper left LCD screen).



THE "MEMORY WRITE" KEY "MW"

Combined with the "M-SET" key, this assigns frequencies to Memory locations M0—M9. Pressing this key illuminates a "MW" in the upper left corner of the display.

LOCK



THE "LOCK" SWITCH LOCK

In the "Lock On" position, this switch inactivates the keyboard, so the set frequency can't be accidentally changed.

LAMP



THE "LAMP" SWITCH LAMP

This switch illuminates the display for night operation.

FREQ CL



THE "FREQUENCY/CLOCK" SWITCH "FREQ CL"

In the FREQ position, the display shows the current operating frequency.

In the CL position, the display shows the time of day — in military (24 hour) mode.

M-SET



THE "MEMORY SET" SWITCH "M-SET"

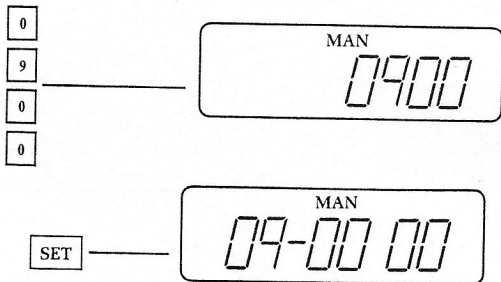
Switching the M-SET to the right enables programming of all Memory, Clock and Lock Out Functions.

HOW TO OPERATE YOU AV7600VOR

SQUELCH

By turning the control clockwise, you can eliminate undesired signals for stronger signals only.

SETTING THE CLOCK



Once you install the battery pack, your AV7600VOR's internal clock will start — beginning at 00.00 hours (that's military time!). And it will continue to run, even when the unit is switched off.

To set the clock for the proper time, follow these steps:

- Turn the AV7600VOR on.
- Set the FREQ/CL switch to CL
- *NOTE: If the LCD display shows "E", press any key to recall a previous time. You cannot set the clock when "E" is showing!*
- Set the M-SET switch to on.
- Key in the correct time (in military time).
(eg: Noon = 12-00 hrs.; 4:14 p.m.-16-14 hrs.; 11:47 p.m.-23-47 hrs.)

- Press the SET key (within 5 seconds of keying in time).
- Turn off M-SET switch.
- Return FREQ/CL switch to FREQ.

An "E" will appear after you push the SET key if you have:

- Forgotten to push the SET key within 5 sec.
- Entered an impossible 4 digit time.
- Forgotten to turn on the M-SET switch.

To check the time, simply turn the FREQ/CL key to CL.

SETTING A FREQUENCY

There are several ways you can enter a frequency into your AV7600VOR. Once you master the basic technique, there are several "shorthand" entry techniques you can use (depending, of course, of the frequency you need to enter). But frankly, the right way to enter frequencies is the way you feel most comfortable.

RULES TO REMEMBER WHEN SETTING A FREQUENCY

You must enter the frequency in 5 sec. or less. You can't enter a frequency if "E" or "M" appears in the LCD display.

The last digit in a 6 digit frequency will always be converted into a 0 or 5 (eg: 129.629 if entered just that way will become 129.625).

NOTE: Entering any frequencies between 108.00 and 117.975 MHz automatically converts your transceiver to the VOR mode. Refer to "VOR Reception For Navigation".

THE BASIC ENTRY

To enter the frequency 127.825:

- Set FREQ/CL to FREQ.
- Press in sequence 1, 2, 7, 8, 2, 5.

- Press the SET key to lock in the frequency (A DECIMAL POINT WILL AUTOMATICALLY APPEAR AFTER THE "7").

SHORTHAND ENTRY TECHNIQUES

Since all frequencies start with a 1, you can omit that leading digit and just enter the next five or four digits, as required.

For example: To set 131.650

- Set FREQ/CL to FREQ.
- Press in sequence 3, 1, 6, 5, 0.
- Press the SET key to enter the frequency (same decimal point will appear).

You can also enter certain frequencies with less than four digits. The AV7600VOR will automatically assume "0" for the last two digits.

For example, to enter 126.500:

- Set FREQ/CL to FREQ.
- Press in sequence 2, 6, 5.
- Press the SET key to enter the frequency.

All whole number MHz frequencies (118, 112, 118, . . .) can be entered by using the first, second and third digits.

For example, to enter 118.000:

- Set FREQ/CL to FREQ.
- Press in sequence 1, 8.
- Press SET key to enter frequency.

Frequencies 120 MHz and 130 MHz can be entered by using only a "2" or a "3" alone.

STORING FREQUENCIES IN MEMORY

The memory functions of your AV7600VOR can save you a great deal of time and energy. In fact, they are designed to do just that. But before you attempt to master this function, be sure

you're comfortable with all we've learned to this point. With that behind us, you now need to know . . .

SOME INITIAL RULES

- 1) When the battery pack is first installed, your AV7600VOR automatically preprograms Memory locations M1—M9 to 121.500 MHz. Location M0 is preprogrammed at 135.975.
- 2) To check the frequency set in each memory, press the M key, then press the location keys M0—M9.
- 3) The Scanning modes will not affect frequency assignments in memory.
- 4) Location M0 will always determine the upper scan limit when scanning the 720 frequencies.
- 5) You must understand how to set a frequency on the AV7600VOR before you can store a frequency in memory.

HOW TO PROGRAM FREQUENCIES INTO YOUR 10 MEMORY LOCATIONS.

- 1) Set FREQ/CL on FREQ.
- 2) Clear the display of "E" or "M" if necessary (Press any key to clear "E"; press M to clear "M").
- 3) Assign a frequency (See SETTING A FREQUENCY).
- 4) Turn M-SET on.
- 5) Press MW key — "MW" will appear in LCD display.
- 6) Press a memory location key (M0—M9) to store the frequency. "MW" then disappears from the LCD display — signifying frequency is now in memory.
- 7) You are now ready to assign a frequency to next memory location.
- 8) Repeat steps 5, 6 & 7 until all 10 memory locations (M0—M9) are set.
- 9) Turn M-SET off to inactivate the MW key.

RECALLING FREQUENCIES IN MEMORY

Press M key — make sure "M" is now showing in LCD display.

Press memory number you want (eg. for M0,

push 0). The frequency and memory location number will be displayed.

GETTING THE MOST OUT OF YOUR AV7600VOR — THE SCANNING FUNCTIONS.

Unless you always plan on monitoring and transmitting over a single channel (which, by the way, you can certainly do!), you'll be glad your AV7600VOR is equipped with sophisticated scanning capabilities. By repeatedly pressing the SCAN key, you'll notice the LCD display will take you through the four scanning modes: Man, Scan, Srch and Open.

THE MANUAL "MAN" MODE

The "MAN" scanning mode lets you manually move up or down in frequencies in 25 kHz steps simply by pressing the SCAN UP (Δ) or SCAN DOWN (∇) keys. (Squelch does not need to be "broken".)

To use the MAN mode:

- 1) Select a starting frequency.
- 2) Press SCAN key until "MAN" appears in the LCD display.
- 3) Each time you press the SCAN UP or SCAN DOWN keys, an arrow at the right-hand side of the LCD display will indicate if you've scanned up or down from the previous frequency.
- 4) The frequency that appears in the display is the one you can receive or transmit over. When a signal is received, the letters "RX" appear on the display. "TX" appears when you transmit over a frequency.

THE SCAN MODE

The SCAN mode automatically scans up or down in 25 kHz steps between two limits you set at the rate of six steps per second (when squelch is broken or turned clockwise).

To use the SCAN mode:

- 1) Select the SCAN mode by pressing the SCAN key until "SCAN" appears in the screen.
- 2) Set upper and lower limits, depending on direction of SCAN (SEE: "SETTING SCAN LIMITS")
- 3) When you receive a signal in SCAN, the scan will stop for 10 seconds before resuming. If the signal becomes inactive, scanning will resume in 3 seconds. When SCAN reaches its upper or lower limit, it automatically returns to the opposite limit and resumes.

THE SEARCH (SRCH) MODE

SRCH is identical to SCAN, except when it receives a signal, it freezes at that frequency until you press the SCAN UP (Δ) or SCAN DOWN (∇) keys.

THE OPEN MODE

OPEN is identical to SCAN and SRCH except it stays on a busy channel as long as that channel remains active. If 3 seconds of inactivity occurs on a "frozen" channel, OPEN assumes the signal is finished and automatically resumes it's scan between limits.

SETTING SCAN LIMITS

SCANNING UP LIMITS.

The upper limit of a SCAN UP is always the frequency stored in M0. The lower limit is always the frequency assigned on the LCD display.

The frequency in M0 must always be higher than the lower limit to SCAN UP.

HOW TO SET UP A SCAN UP SRCH BETWEEN 128.250 and 133.175:

- 1) Set FREQ/CL to FREQ.
- 2) Clear display of "E" or "M" if necessary.
- 3) Press in sequence 3, 3, 1, 7, 5 to establish the upper limit.
- 4) Press the SET key.
- 5) Turn M-SET on.
- 6) Press MW key.
- 7) Press M0 key to set upper limit in M0.
- 8) Turn M-SET off.
- 9) Press SCAN key until SRCH appears in display.
- 10) Press in sequence 2, 8, 2, 5 to establish lower limit.
- 11) Press SET key.
- 12) Press SCAN UP key to start radio scanning up between limits in the SRCH mode.

SCAN DOWN LIMITS

The upper limit for a SCAN DOWN is **not** the frequency set in M0! Because the lower limit is fixed at 118.000 MHz, *the upper limit is the frequency you set on the LCD display.*

The upper limit you set must be higher than 118.000!

HOW TO SET UP A SCAN DOWN OPEN SCAN from 121.700:

- 1) Set FREQ/CL on FREQ.
- 2) Clear the display of "M" or "E" if necessary.
- 3) Press SCAN key until OPEN appears on the LCD display.
- 4) Press in sequence 2, 1, 7 to establish upper limit.
- 5) Press the SET key.
- 6) Press SCAN DOWN key to start the OPEN scanning mode between 118.000—121.700 MHz.

CHANGING THE SCAN DIRECTION

Change the direction for a Memory Scan by pressing either the SCAN UP (Δ) or SCAN DOWN (∇) key twice in succession. To stop a scan in this mode, press either key once. To stop on a particular memory location, press the appropriate key M0—M9.

LOCKING OUT CERTAIN MEMORY LOCATIONS

Let's say that you only want to scan a few channels. Or perhaps traffic is especially bad on a couple of frequencies — and you don't want that to hold up your scan. MEMORY LOCKOUT can save the day and make your life a lot easier.

- This feature allows you to "lock out" a memory location or locations when scanning in the memory mode.
- Locations M1—M9 can be locked out — M0 cannot, since it determines the upper limit of a SCAN UP.
- As you would guess, if a memory location is "locked out", that location is passed up in SCAN UP or SCAN DOWN sequentially. (eg: locking out M3, the sequence goes M0, M1, M2, M4—M9; locking out M2, M4, the sequence would go M0, M1, M3, M5—M9.)

HOW TO LOCKOUT A MEMORY LOCATION OR LOCATIONS:

- 1) Set FREQ/CL on FREQ.
- 2) Press M key for Memory mode.
- 3) Turn M-SET on.
- 4) Press the memory location (M1—M9) you want to lockout one at a time.
- 5) Press SCAN UP key to lock out. Confirm by the "L" next to the memory location number on the display.

- 6) To lock out other locations, press each location key separately, followed by the SCAN UP key, until all desired are locked out.
- 7) Turn off M-SET.

TO RESTORE A MEMORY LOCATION IN THE SCAN

- 1) Press M key for memory mode.
- 2) Turn M-SET on.
- 3) Press the appropriate memory location key (M1—M9) to recall channel.
- 4) Press SCAN DOWN key to unlock. Confirm by the removal of the "L" next to the memory location number on the display.
- 5) Turn M-SET off.

THE FREQUENCY MODE

When you're in this mode, you can transmit and receive over any of the 720 Com channels and receive over any of the 200 Nav channels available on your AV7600VOR. You can also scan the 720 Com channels in any of the four scanning modes — assuming you set the upper and lower limits and direction of scan as necessary.

TO GET INTO THE FREQUENCY MODE:

- Turn the FREQ/CL switch to FREQ.
- Clear "M" from the screen if necessary (by pressing the M key.)

THE MEMORY MODE

If you're only interested in receiving and transmitting over ten frequencies or less, this is the mode for you.

Here, you can operate over the ten stored frequencies in your memories (M0—M9). And if you choose, you can lock out memory frequencies. You also have no upper and lower limits to set in the scan modes (SCAN UP travels from M0—M9; SCAN DOWN travels from M9—M0).

NOTE: Priority channel scanning is only available in the Memory Mode — and then only in the SCAN mode. For example, your AV7600VOR will lock in on an active channel for 10 sec. As soon as the scan resumes, it will begin at the priority channel — M1. If M1 is inactive, the scan jumps back into sequence. If it's busy, it will lock onto it until free, then continue in sequence.

TO ENTER THE MEMORY MODE:

- Press the M key until "M" appears in the LCD.

OPERATING THE TRANSMITTER

- Press the Push To Talk Switch
When you transmit: The keyboard is locked out.

Automatic scanning is frozen.

The automatic scanning does not automatically start after you finish transmitting. You must restart it yourself.

ONE FINAL, VERY HELPFUL TIP: Once you've programmed your AV7600VOR — slide the LOCK switch to on.

This locks out all 16 keys and inactivates the keyboard — preventing any slip of the finger from altering your program.

VOR RECEPTION FOR NAVIGATION

VOR is the abbreviation for "VHF Omnidirectional Range" navigation system. The AV7600 detects the VOR transmitters operating (near an airport) at VHF and indicates the angle between the VOR Station and True North.

TO ENTER THE VOR MODE:

The transceiver is automatically engaged in the VOR mode when any frequency within the range of 108.000 to 117.975 is entered.

- 1) Set FREQ/CL to FREQ.
- 2) Press (in sequence) the desired VOR frequency.
- 3) Press the PTT (Push To Talk) switch. Display shows the angle of the direction of the airplane etc. toward the VOR transmitter relative to the North. (The transceiver doesn't actually transmit on the VOR channels). Display reverts to the frequency mode by pressing the PTT again.

NOTE: "E" appears when VOR signals are too weak (distant). In the VOR mode, scan is made slow. VOR reception is possible on the ground, however, a slight error reading may result due to reflected VOR signals from nearby buildings or other surfaces.

IMPORTANT NOTE: *Reflected signals will cause inaccuracies in VOR reception.* These signals are generated by the moving parts of the engine as well as the metal structure around the cockpit.

For best performance, always use an external antenna while using the AV7600VOR for navigation.

If this is not possible, best results are obtained by holding the flexible antenna to the side windows or structure of the airplane.

MAINTENANCE AND SPECS ON YOUR NEW AV7600VOR

GENERAL

- Communication channels: 720 (25 kHz steps) from 118.00 — 135.975 MHz.
- NAV channels: 200 (25 kHz steps) from 108.000 to 117.975 MHz.
- Memory channels: 10
- Weight: 1 lb. 5 oz. (600g)
- Dimensions: Width — 2-5/8" (67mm); Height — 7-1/2" (191mm); Depth — 1-5/8" (41mm)

TRANSMITTER

- Power: 2.0 watts RF carrier
- Frequency stability: $\pm 0.002\%$
- Modulation: 6A3, 70% minimum
- Frequency range: 118.000 — 135.975 MHz
- Spurious radiation: 46 dB below carrier
- Antenna impedance: 50 ohms

RECEIVER

- Frequency range: 108.000 — 135.975 MHz
- Audio output: 0.3 watts into 8 ohm (speaker) available at speaker/microphone connector or earphone jack. 10 mV into 600 ohms (headphone) available at earphone jack.
- Receiver sensitivity: $1.5\mu\text{V}$ max for 10 dB $s+n/n$
- Image rejection: 60 dB or greater
- Receiver selectivity: $6\text{ dB} \pm 7.5\text{ kHz}$, $60\text{ dB} \pm 30\text{ kHz}$
- Squelch sensitivity: Adjustable carrier, AGC type, $1.5\mu\text{V}$.

POWER REQUIREMENTS

- Power source: 7.2 Vdc, 700 mA, NiCad battery
- Battery full charge time: 100 mA maximum @ 13 hours (using supplied wall charger)
- Battery life (approximate):
 - Receive only: 12 hours
 - Transmit 10% duty: 6—8 hours
 - Transmit 30% duty: 4—6 hours

TEMPERATURE

- Operating range:
 - 30 to +50 degrees centigrade
 - 22 to +122 degrees Fahrenheit