

OPTOELECTRONICS[®]

5821 NE 14th Avenue
Ft. Lauderdale, FL 33334
Telephone: (954) 771 2050 Fax: (954) 771 2052 Email: sales@optoelectronics.com

www.optoelectronics.com

X SWEEPER

USER MANUAL

CAUTION



WARNING - Maximum input voltage is 12VDC. Automotive voltages may exceed 12V causing damage to internal circuitry. Damage resulting from excessive input voltage is readily apparent and will not be covered under warranty. Units returned for warranty service that have damage resulting from excessive supply voltages will incur service charges.

WARNING - Maximum antenna input signal is +15dBm (50mW). Under no circumstances should the X Sweeper be directly connected to an RF transmitter or be used in close proximity to a radio transmitter of more than 5 watts. Damage to the input amplifier circuitry is readily apparent and will not be covered under warranty. Units returned for warranty service that have damage to the input circuitry will incur service charges.

The Optoelectronics X Sweeper is covered under U.S. Patent Number 5,471,402.

WARRANTY
Products under warranty
and labor provided

NON-WARRANTY
Products not under warranty
will be repaired on a
case-by-case basis
of service charges

RETURN POLICY
The Optoelectronics X Sweeper

Address all correspondence to:

Note: Optoelectronics X Sweeper

If in question, please contact:

WARRANTY

Products under warranty must be returned, transportation prepaid, to Optoelectronics' Fort Lauderdale Service Center. All parts replaced and labor performed under warranty are at no charge to the customer.

NON-WARRANTY

Products not under warranty must be returned, transportation prepaid, to Optoelectronics' Fort Lauderdale Service Center. Factory service will be performed on a time and materials basis at the service rate in effect at the time of repair. A repair estimate prior to commencement of service may be requested. Return shipping will be added to the service invoice and is to be paid by the customer.

RETURN POLICY FOR REPAIRS

The Optoelectronics Service Department will provide rapid turnaround of your repair. Enclose complete information as follows:

1. Copy of sales receipt if under warranty.
2. Detailed description of problem(s).
3. Complete return address and phone number (UPS street address for USA).
4. Proper packaging (insurance recommended). Note: Carriers will not pay for damage if items are improperly packaged.
5. Proper remittance including return shipping, if applicable (Visa/MasterCard number with expiration date, Money Order, etc.).

Address all items to:

**Optoelectronics, Inc.
Service Department
5821 NE 14th Avenue
Fort Lauderdale, FL 33334**

Note: Optoelectronics is not responsible for packages lost or damaged during shipment.

If in question, contact the factory for assistance. Service Department: (954) 771-2050

ACCESSORIES

As is the case with just about any type of communications receiver, accessories play a big role in how well the instrument performs. Optoelectronics has a variety of accessories to choose from to enhance the performance of the X Sweeper. It is very important to try different antennas in varying RF environments to see what works best. Below is a list of accessories offered by Optoelectronics. There are many other after market antennas, filters, pre-amps etc. that may also provide benefit to the X Sweeper.

ANTENNAS

RD27 rubber duck antenna	26-150MHz
RD150 rubber duck antenna	145-165MHz
RD440 rubber duck antenna	440-480MHz
RD800 rubber duck antenna	500-1000MHz
DB32 stubby antenna	150-1000MHz
BB85 rubber duck antenna	100-2000MHz
RD2400 rubber duck antenna	2400-2500MHz

The BB85 and DB32 antennas are very good all band antennas. They allow the X Sweeper to lock onto many different signals. The BB85 is an excellent antenna for VHF frequencies. In addition, it has proven to work very well in the 400-900 MHz ranges. The DB32 is very convenient for its size. It has proven to work very well in the 400-800MHz ranges.

FILTERS

N100 FM notch filter	88-108MHz
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The N100 provides approximately 30 dB of attenuation in the FM broadcast band. It does a very good job of blocking out the RF from your local FM stations. Reducing the background RF from FM transmitters by 30dB allows the X Sweeper to lock onto signals from a much greater distance. Even if the X Sweeper is not locking onto FM stations, the RF from those transmitters is still present and can prevent the unit from locking onto signals in the nearfield. Since the X Sweeper locks onto signals that are 15dB above the background RF floor, reducing the RF from FM stations by 30dB will have a significant effect on the way the X Sweeper locks onto frequencies.

FCC NOTICE & LEGAL NOTICE

*In compliance with US FCC Regulations, an X Sweeper shipped in the U.S. is disabled in the following frequency bands: 824.010 - 848.970MHz and 869.010 - 893.970MHz. *Except for FCC approved users.

FCC NOTICE

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference to radio communications. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to the radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult Optoelectronics or an experienced radio/TV technician for help.

Note: Optoelectronics is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the users authority to operate the equipment.

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The X Sweeper is covered under U.S. Patent No.5,471,402

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GPS

SPECIFICATIONS

Frequency Range:	30MHz - 3GHz (Cellular Frequencies Blocked except for FCC Approved Users)
Modulation:	FM, Deviation < 100KHz
Frequency Response:	50-3000MHz
Auto Sweep Time:	<1 Second
Input Impedance:	50 Ohm
Connector:	Female BNC
Sensitivity (typical):	20uV 30MHz-700MHz 50uV 800MHz 150uV 1GHz 40mV 2.4-3GHz
Display:	64 X 128 Graphical Display with white LED backlight
Inputs/Outputs:	3.5mm mono headphone jack, 2.5mm mono Reaction Tune jack, 3.5mm stereo RS232 jack
Power:	Battery: 8 AA Alkaline, NiCad or NiMH
A C A dapter:	9-12VDC / 500mA / center positive
Frequency Display:	7 digit with 1 kHz resolution
Signal Strength:	50 segment bargraph, relative reading, uncalibrated.
Real Time Clock:	Internal Calibration Adjustment
GPS Receiver (optional):	L1 (1575.42MHz) frequency, C/A code, 8 channel, continuous tracking receiver, 32 correlators
GPS Antenna (optional):	Gain 20dBic typical, Beamwidth >120 degrees, VSWR 2.3:1

PC INTERFACE

DOWNLOAD

The X Sweeper can be interfaced to the PC for the purpose of downloading information saved to memory, as well as downloading the log memory file. The data is downloaded as a text file and may then be imported into other programs.

The X Sweeper is supplied with a PC interface cable (3.5mm stereo plug to DB9F) and download software. The software is a DOS program that is compatible with most PC operating systems.

1. Connect the cable between the X Sweeper and an available com port on your PC.
2. Install the 3.5 floppy disk to your hard drive.
3. Run the xsweeper.exe file and follow the instructions in the program.

SERIAL INTERFACE SPECIFICATION

The serial interface specification is available to anyone who would like to write software for the X Sweeper. Check our website at www.optoelectronics.com

The X Sweeper is a completely unique nearfield test receiver. It is not a single frequency radio receiver in the conventional sense, or a high speed scanner. It is actually a frequency sweeper using multiple swept harmonic LO frequencies that enable the X Sweeper to lock on to virtually any two-way FM signal in less than one second. Its unique frequency conversion system allows it to search for and acquire new frequencies much more quickly than a conventional receiver.

Nearfield refers to the relative strength of a transmitter as compared with the background RF floor. The nearfield refers to an approximate distance where the signal strength radiating from an antenna is relatively strong. As you approach an antenna, the observed signal strength increases to a point where its amplitude becomes greater than any other signal sources. At this point you are in the nearfield of the transmitter. The X Sweeper will pick up signals in the nearfield of a transmitter.

Because of its high rate of sweeping, the X Sweeper is essentially a self tuning receiver. The primary reason for a nearfield receiver is to trade distance for speed. A conventional scanning receiver will receive signals from greater distances than the X Sweeper but suffers from being able to scan only 25 to 100 frequencies per second. It could take several minutes to several hours to tune an unknown frequency using a scanner. (An FCC data base search shows over 5,000 licensed transmitters within 5 miles of the Optoelectronics facility.)

The self tuning feature makes the X Sweeper valuable for testing two-way radios, commercial FM wireless microphones and other low power transmitters. In addition, the X Sweeper is able to locate strong RF signals located nearby in order to evaluate interference. Coupled with the GPS module/antenna option and the X Sweeper becomes very useful in determining the exact location of signals detected.

The 64x128 graphical display of the X Sweeper allows for a "snapshot" of the nearfield RF. This is useful in quickly determining all signals in the area, not just a single frequency at a time.

KEYPAD FUNCTIONS

SWEEP

Press to initiate sweep mode. SWP is indicated to the right of the display. Press again to initiate scan mode. SCN is indicated to the right of the display.

MODE

Press to access MEMORY, VFO, GPS and LOG MEMORY modes.

SETUP

Press to access the configuration menu.

SKIP

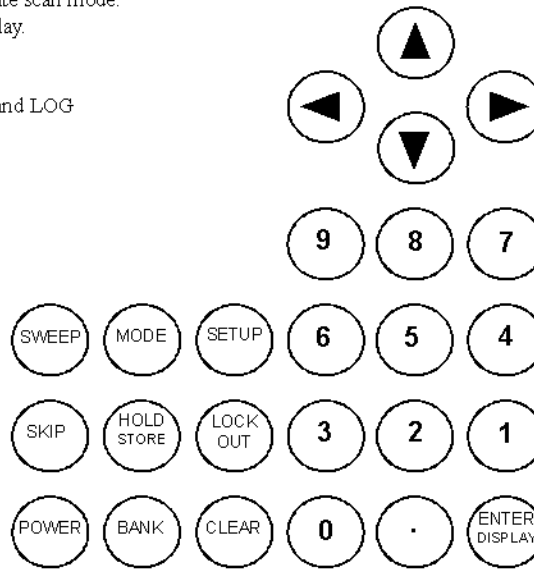
Press to resume sweep or scan.

HOLD/STORE

Press to hold on a frequency. Press HOLD/STORE button and ENTER/DISPLAY button at same time to store a frequency in VFO mode

LOCKOUT

Press to lockout current frequency. Press while in MEMORY mode to lockout current frequency displayed.



POWER

Press to power unit ON/OFF.

BANK

Press to change from banks 0-9.

ARROW BUTTONS

Press UP/DOWN arrows to change display span width. Press RIGHT/LEFT arrows to change center frequency. Use all arrows to navigate through the MEMORY mode and change setting in SETUP mode.

NUMBERS

Press to change center frequency or enter in new frequency while in VFO mode.

ENTER/DISPLAY

Press to enter new center frequency. Press to change display from SIG to HITS.

CLEAR

Press to clear the current bank/log memory bank displayed and all data saved for that bank.

GPS (Internal)

The GPS option allows the latitude and longitude coordinates to be logged to memory with each frequency captured. The GPS option consists of the GPS module and antenna. **The GPS option is a factory installation only.**

1. Press the SETUP button until INTERFACE TYPE is displayed. Press the UP/DOWN arrow button to select NMEA 0183 (GPS)
2. Press the SETUP button until GPS SELECT is displayed. Press the UP/DOWN arrow button to select INTERNAL.
3. Press the MODE button until GPS MODE is displayed. When using the GPS for the first time it may take anywhere from a 1-2 minutes up to 20 minutes to acquire the proper number of satellites. When the GPS has acquired the proper number of satellites GPS ACTIVE will flash at the bottom of the display.
4. After the unit is turned off and the turned on again, this process should take less than 1 minute, assuming you have a clear path to the sky. The GPS may not work in buildings or areas where the GPS antenna does not have a clear path to lock on the satellites.
5. Press SWEEP to go to sweep mode. A flashing "C" will appear in the bottom right hand portion of the display to indicate that the unit is currently locked on the satellites. As a frequency is captured the coordinates are automatically logged to memory with that frequency as well as signal strength and time/date stamp.
6. If the flashing "C" at the bottom of the display goes away reposition the unit so that the antenna has a better path.

GPS (External)

The X Sweeper can also accept an external GPS. This is interfaced through the RS232 jack on top of the unit.

1. Be sure that the GPS you intend to interface to the X Sweeper is using NMEA 0183 language.
2. Take the serial cable that was supplied with the X Sweeper (3.5mm stereo - DB9F) and plug the 3.5mm stereo end into the RS232 jack on top of the X Sweeper.
3. Locate the serial cable for your GPS. Interface a Null Modem adapter between the DB9 of the X Sweeper cable and the DB9 of the GPS cable. You may need a gender changer for the two to interface properly as well.
4. Turn the GPS on and wait until it acquires the proper number of satellites.
5. Press the MODE button until GPS MODE is displayed. Wait until GPS ACTIVE is flashing.
6. Press the SWEEP button to go to sweep mode and look for the flashing "C" to indicate it is currently locked.

REACTION TUNE & PCR1000 VOLUME/SQUELCH

Cables Required For Reaction Tune

ICOM(excluding PCR1000), Radio Shack and Optoelectronics Optocom	CBCI5
Optoelectronics R11	CBRT
AOR AR8000	RT8000
AOR AR8200	RT8200
Uniden BC245 and 780	SmartLink
ICOM PCR1000	CBPCR

1. Press the SETUP button until INTERFACE TYPE is displayed.
2. Press the UP/DOWN arrow buttons to select REACTION TUNE.
3. Press the SETUP button until RECEIVER TYPE is displayed. Press the UP/DOWN arrow buttons to select either CI-5, AR8000 or PCR1000.
4. Select CI-5 for tuning all ICOM (excluding PCR1000), Radio Shack, Optoelectronics and Uniden receivers.
5. Select AR8000 for tuning the AR8000 or AR8200.
6. Select PCR1000 for tuning the ICOM PCR1000.

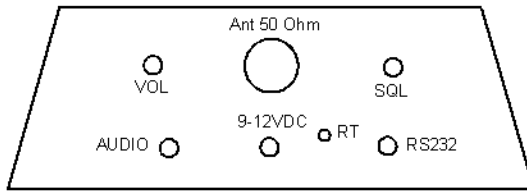
When Reaction tuning the ICOM PCR1000 the RS232 jack on top of the X Sweeper will be used. The RT (Reaction Tune) jack will be used to interface to all other receivers.

IMPORTANT: The X Sweeper sends an initialization command to the receiver when powered on. Once the proper modes have been selected and the two units are connected by the appropriate cable, the receiver that you wish to Reaction Tune must be turned on first, then the X Sweeper.

PCR1000 VOLUME/SQUELCH

The X Sweeper will not only Reaction Tune the ICOM PCR1000, it will control the volume and squelch of the receiver once it has been tuned.

1. To adjust the volume of the PCR1000 press the SETUP button until PCR1000 VOLUME is displayed. Press the UP/DOWN arrow buttons to adjust the volume.
2. To adjust the squelch of the PCR1000 press the SETUP button until PCR1000 SQUELCH is displayed. Press the UP/DOWN arrow buttons to adjust the squelch.



VOL	Controls the volume level.
SQL	Controls the squelch level.
Ant 50 Ohm	50 Ohm antenna input / connector type: BNC
AUDIO	3.5mm mono headphone audio jack
9-12VDC	Power input of 9-12VDC / 500mA current / 2.1mm barrel connector / center positive
RT	2.5mm Reaction Tune jack
RS232	3.5mm stereo RS232 jack for memory download and PC interface

POWER REQUIREMENTS

The X Sweeper comes supplied with an AC90 AC power adapter as well as 8 AA alkaline batteries.

EXTERNAL POWER

Plug the supplied AC90 power adapter into the jack labeled 9-12VDC on the top panel. This will only power the unit and will not charge any batteries that may be installed internally. The X Sweeper external power requirements are 9-12VDC / 500mA current / center positive 2.1mm barrel connector.

INTERNAL BATTERY POWER

The X Sweeper comes with 8 AA alkaline batteries installed. The unit may operate using any AA battery including NiCad and NiMH. As long as there is no external power supply connected the unit will operate using the internal batteries. If an external power source is connected then the unit will stop running off battery power and start running from the external power source. In addition, the external power source will not charge the internal batteries. The charging of batteries such as NiCad and NiMH must be done in a separate battery charger. It is recommended that an external power source not be plugged in while running from battery power.

BATTERY LIFE

The amount of time the batteries last is influenced by a number of different factors including the battery rating, backlight use and speaker use. For standard alkalines, NiCad and NiMH batteries the run time should be 6-10 hours.

BATTERY INSTALLATION

The battery compartment is located on the back side of the X Sweeper. Lift up the rubber tilt stand, remove the two screws and then remove the plastic cover. This will allow access to the battery compartment where you may install your new batteries, making sure to note the location of the positive and negative terminals.

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The X Sw
1.

2.
3.

REACTION TUNE

The X Sweeper has the ability to Reaction Tune many different receivers to the frequency it has captured. While the X Sweeper does demodulate the audio itself, there are times when it would be beneficial to have a conventional receiver interfaced to the unit. For instance, if you locked onto a signal with the X Sweeper and were in a mobile situation, it is possible that the transmitter will move out of range very quickly. In this case the receive sensitivity of a conventional receiver allows you to stay locked onto the signal longer, therefore allowing you to monitor the audio for a longer period of time.

The X Sweeper has three different Reaction Tune settings depending upon the receiver that is being interfaced.

1. **CI5:** Following are the current CI-5 compatible receivers that the X Sweeper is capable of Reaction Tuning.
ICOM R10, R7000, R7100, R8500 and R9000.
Radio Shack PRO 2005/2006 (with OS456/Lite installed), Radio Shack PRO 2035/2042 (with OS535 installed).
Optoelectronics R11 and Optocom.
Uniden BC245XLT and BC780 using the SmartLink adapter.
The ICOM R10 and R7100 require special default settings for Reaction Tuning with the X Sweeper.
ICOM R10: Baud Rate = 9600, TRN = ON, CI-V ADDRESS = 52
ICOM R7100: Baud Rate = 9600, Transceive Mode = ON
2. **AOR:** The X Sweeper will Reaction Tune the AOR AR8000 and AR8200.
3. **PCR1000** The X Sweeper will Reaction Tune the ICOM PCR1000. In addition, it has the ability to control the volume and squelch of the PCR1000 after it has been tuned.

BANK, CLEAR, ENTER/DISPLAY

BANK BUTTON

There are 10 separate banks with a possible 100 memories for each bank for a total of 1000 unique memories.

1. While in SWEEP or SCAN mode press the BANK button to advance to the next bank. The current bank is indicated on the bottom right portion of the display with a numerical value of 0-9.

CLEAR BUTTON

1. When entering a frequency directly from the front keypad in SWEEP, SCAN or VFO modes press the CLEAR button at any time to erase the frequency currently being entered.
2. To CLEAR the current bank in SWEEP or SCAN mode, and clear the LOG MEMORY mode, press the CLEAR button.
3. The display will show the following:

Memory Bank 4
Will Be Cleared

Press "ENTER"
To Continue

Abort After 5 Seconds

ENTER/DISPLAY BUTTON

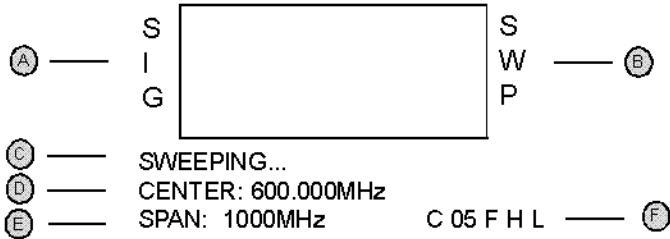
1. Press the ENTER/DISPLAY button to enter a frequency directly from the front panel keypad while in SWEEP, SCAN or VFO mode.
2. Press the ENTER/DISPLAY button to change the screen to display HIT or SIG while in SWEEP or SCAN mode. SIG displays the signal strength of the frequency and HIT displays the number of times a frequency was hit.

POWER ON

- 1. Press the red POWER button to turn the X Sweeper ON/OFF. The initialization screen will display the following.

Optoelectronics
 X Sweeper
 Test Receiver

- 2. The X Sweeper will default to the SWEEP display screen.



- A. SIG indicates the detected frequency in peaks. Pressing the ENTER/DISPLAY button changes this to HIT. HIT displays the number of times the signals displayed have been detected.
- B. SWP indicates the unit is currently in SWEEP mode and actively looking to detect RF. Pressing the SWEEP button changes this to SCN. SCN indicates the unit is in SCAN mode and is scanning all frequencies logged to memory in the current bank.
- C. SWEEPING indicates the unit is currently sweeping and attempting to detect nearfield RF. Once a signal is detected this changes to display the frequency detected. In SCAN mode this changes to SCANNING...
- D. CENTER indicates the current center frequency. Change the center frequency from the front keypad and press ENTER/DISPLAY.
- E. SPAN indicates the sweep span width. In the example above the SPAN width is 1000MHz. The center frequency is 600MHz. This indicates that the unit is sweeping from 100MHz-1100MHz. Change the SPAN by pressing the UP/DOWN arrow button.
- F. The "C" will flash to indicate that the GPS (optional) is active. The number to the right indicates the current bank. The "F" indicates the current bank is full. The "H" indicates that the current frequency is on HOLD. The "L" indicates the current frequency is locked.

GETTING STARTED

SWEEP SPAN

There are ten different sweep span widths that can be adjusted with the UP/DOWN arrow buttons. The ten sweep span widths are 100kHz, 300kHz, 1MHz, 3MHz, 10MHz, 30MHz, 100MHz, 300MHz, 1000MHz and 3000MHz.

CENTER FREQUENCY

The center frequency may be changed by entering the frequency directly from the front panel keypad and then pressing the ENTER/DISPLAY key. Be sure to press the decimal key where you wish to input it in the frequency.

The maximum frequency resolution that can be entered is 1kHz, an example being 454.125. If you attempt to enter a frequency with more resolution such as 454.1255 the display will flash ERROR.

The center frequency may also be changed by pressing the RIGHT/LEFT arrow buttons. The 64x128 graphical display of the X Sweeper is 100 pixels wide. Each time the RIGHT/LEFT arrow button is pressed the display will move one pixel to the left when pressing the LEFT arrow button and one pixel to the right when pressing the RIGHT arrow button. The center frequency will adjust 1/100th relative to the current SPAN WIDTH. For instance, if the span width is set for 3000MHz then the center frequency will move by 30MHz when either the RIGHT/LEFT arrow buttons are pressed. If the span width is set for 100MHz then the center frequency will move 1MHz at a time, and if the span width is set for 100kHz then the center frequency will move 1kHz each time the RIGHT/LEFT arrow button is pressed.

A combination of both the span width and center frequency determine the sweep range. If the center frequency is set for 450MHz and the sweep span width is set for 300MHz then the entire sweep range is 300MHz-600MHz.

*** The X Sweeper will only lock and display the frequency of signals in the specified sweep range. The X Sweeper may detect signals outside the sweep range but they will not be displayed. In the above example the X Sweeper will only lock and display signals from 300-600MHz. ***

SKIP

1.
2.

HOLD

1.
2.

3.

LOCK

1.
2.
3.
4.
5.

SKIP BUTTON

1. Press the SKIP button to resume sweeping when locked on a frequency in SWEEP mode.
2. Press the SKIP button to resume scanning when locked on a frequency in SCAN mode.

HOLD/STORE BUTTON

1. In SWEEP mode press the HOLD/STORE button to hold on a frequency after the unit has locked on a frequency. The hold symbol H will appear in the bottom right portion of the display. Press SKIP to resume sweeping.
2. In SCAN mode press the HOLD/STORE button to stop the unit on a frequency. Then press the SKIP button so the unit skips from one frequency to another. Each time a new frequency is displayed the unit will re-tune to that frequency and enable the audio if that frequency is active at that moment.
3. When in VFO mode press the HOLD/STORE and ENTER/DISPLAY buttons at the same time to manually store the frequency on the display to the current memory bank.

LOCKOUT BUTTON

The X Sweeper allows you to lockout up to 1000 unique frequencies from either SWEEP, SCAN or MEMORY mode.

1. To lockout a frequency in SWEEP mode press the LOCKOUT button once a frequency is captured. The unit will then begin sweeping again.
2. To lockout a frequency in SCAN mode press the LOCKOUT button once a frequency is captured. The unit will then begin scanning again.
3. To lockout a frequency that has been previously logged to memory press the MODE button once to enter the MEMORY mode. The bank from which you just left will be displayed.
4. Press the UP/DOWN arrow buttons to find the frequency you wish to lockout then press the LOCKOUT button. The lockout symbol L will appear to the far right of the signal strength line to indicate that it is locked out. To disable the lockout press the LOCKOUT button again and the lockout symbol L will disappear.
5. To review your lockouts press the MODE button once to enter MEMORY mode. Press the RIGHT/LEFT buttons to scroll the 10 different banks and press the UP/DOWN arrow buttons to scroll the 100 different frequencies in each bank.

SETUP

SETUP BUTTON (cont.)

INTERFACE TYPE

Press the UP/DOWN arrow buttons to change the Interface Type from Remote Control, NMEA 0183 (GPS), and Reaction Tune. Remote Control applies to computer control for downloading memory. NMEA 0183 (GPS) applies to using the GPS option. Reaction Tune applies to reaction tuning an external receiver.

RECEIVER TYPE

The X Sweeper can Reaction Tune another receiver to the frequency it captures. This menu allows you to put the X Sweeper in the proper setting for each receiver. Press the UP/DOWN arrow buttons to change from CI-5, AR8000 and PCR1000.

PCR1000 VOLUME

When reaction tuning the ICOM PCR1000 you will need the ability to control the volume and squelch of the receiver. Press the UP/DOWN arrow buttons to increase or decrease the volume of the PCR1000.

PCR1000 SQUELCH

Press the UP/DOWN arrow buttons to increase or decrease the squelch of the PCR1000.

GPS SELECT

The X Sweeper GPS option installs inside the unit and logs the latitude and longitude coordinates with the frequency captured. You may also interface an external GPS to the unit. Press the UP/DOWN arrow buttons for INTERNAL/EXTERNAL GPS.

LOG MODE

Log Mode runs in parallel with Sweep, Scan and VFO modes. The Log Mode has over 1900 memories and will log every frequency it captures with a signal strength reading, time/date and latitude/longitude (GPS optional). For more information see the LOG MEMORY MODE page. Press the UP/DOWN arrow buttons to enable or disable the Log Mode.

LOG TYPE

When all 1919 memories in LOG MODE are full you have the option to KEEP FIRST so that no new frequencies are logged and only those first 1919 are displayed. Selecting KEEP LAST allows the unit to continue logging frequencies once all 1919 are reached, over writing the first frequency with any new frequency. Press the UP/DOWN arrow buttons to select KEEP FIRST/KEEP LAST.

SQUELCH IMPORTANT INFORMATION, PLEASE READ

The X Sweeper is a very sensitive nearfield receiver and squelch levels play a big role in what the unit detects and displays.

Once you have determined the span width and center frequency press the SWEEP button so that SWP is displayed on the right hand side of the display. The unit will begin sweeping which is indicated by the small icon moving back and forth on the bottom of the display. The display will also show SWEEPING... to indicate that the unit is actively sweeping.

The X Sweeper locks on signals that are 15dB above the background RF level. A quiet background RF environment allows the unit to lock onto signals that it would not ordinarily lock onto, or it may lock on signals from a greater distance than what it would in a noise rich environment. Adjusting the squelch allows you to control how much RF the X Sweeper sees. Opening the squelch (turn counterclockwise) introduces more background RF. Closing squelch (turn clockwise) reduces background RF levels that the unit detects. The SQL knob on the top of the display can be moved so that the knob pointer goes from a one o'clock position all the way to an eleven o'clock position. The one o'clock position represents squelch being fully open and the eleven o'clock position represents the squelch being fully closed.

When the squelch is set to its optimum level the sweep icon will move without any hesitation. If the sweep icon begins to hesitate while sweeping this indicates the unit is detecting a lot of background RF. It may lock onto many of those signals, much of which could be strong signals such as FM stations, TV stations, paging towers etc... Having the squelch set wide open will introduce high background RF levels. While it may be that you wish to open the squelch so that the unit sees everything possible, it does inhibit the unit from sweeping quickly, which may prevent it from locking onto other signals that you wish to detect.

*** When the X Sweeper is close to strong transmitters, or if you are keying a transmitter next to the unit, it is possible that it will lock and display the harmonic of those signals. For example, if you transmit 454.000MHz next to the unit it may display 908.000MHz. Correct this by closing the squelch or moving away from the transmitter until the fundamental frequency is displayed. ***

VOLUME

The volume can be adjusted from the top panel VOLUME knob. Turn the knob clockwise to increase the volume level and turn the knob counterclockwise to decrease the volume level. Audio may also be accessed through the 3.5mm mono headphone jack located on the top panel. While headphones are being used the audio from the speaker is disabled.

SWEEP & SCAN

SWEEP

By pressing the SWEEP button the X Sweeper automatically starts sweeping the range indicated on the display. SWP will be displayed on the right hand side of the display to indicate that it is in SWEEP mode. When the unit is actively sweeping a small icon will move back and forth on the bottom of the display. The display will also show SWEEPING... to indicate that it is sweeping.

When the X Sweeper detects a signal the small arrow icon stops and a vertical line is displayed indicating where that frequency is displayed. The display will now change to FREQ: followed by the frequency of the signal captured. This frequency is automatically stored into memory with a time/date stamp as well as signal strength.

The letter L will also be displayed in the far bottom right hand corner of the display to indicate that it is currently LOCKED onto a frequency. When the X Sweeper no longer detects that signal or the carrier drops the L disappears and the unit begins to sweep again.

You may press the SKIP button to restart sweeping when locked on a frequency.

SCAN

Press the SWEEP button to change the mode from sweep to scan. The display will show SCN on the right side of the display. The display will also show SCANNING... to indicate the unit is in SCAN mode.

The X Sweeper has 10 memory banks with the ability to store 100 frequencies in each bank. When in SCAN mode the X Sweeper will scan all the frequencies that are currently stored in the memory bank indicated at the bottom of the display, it does not sweep for new frequencies, it only scans and looks for activity on frequencies that are logged in memory.

Scan mode is a convenient way of determining if there is new activity on previously captured signals. It may be that you would like to take the X Sweeper back to a site where you previously logged frequencies to determine if those frequencies are still active in that area.

SETUP BUTTON

There are 14 different menus within the SETUP mode. Press the SETUP button to access and change the parameters of each menu.

DISPLAY CONTRAST

The display contrast may be changed by pressing the UP/DOWN arrow buttons, 00 being the darkest to 63 being the lightest.

DISPLAY POLARITY

The polarity of the display may be changed by pressing the UP/DOWN arrow buttons. NORMAL polarity has a white background with blue writing and REVERSE polarity has a blue background with white writing.

DISPLAY BACKLIGHT

To enable or disable the backlight press the UP/DOWN arrow buttons.

TIME/DATE

Press the UP/DOWN arrow buttons to change each value. Press the RIGHT/LEFT arrow buttons to move to the next value.

FREQUENCY DISPLAY

The X Sweeper has a unique ability to display the actual frequency measured by the unit or the channel frequency of the transmitter. Example: In CHANNEL display the X Sweeper may display the actual channel the frequency is on such as 454.155000. In MEASURED display the X Sweeper may detect that frequency as 454.157000. Press the UP/DOWN arrow buttons to change the frequency display from CHANNEL to MEASURED.

SWEEP AUTO-SKIP

The Sweep Auto Skip mode allows the unit to display the frequencies it detects while continuing to sweep and look for the next signal, never stopping to enable the audio. This is convenient when signal ID is more important than monitoring the audio. This may be best utilized in an unattended operation. Press the UP/DOWN arrow buttons to enable or disable Auto Skip.

SWEEP AUTO-HOLD

The X Sweeper may be setup to automatically stop and hold on a frequency after it has been detected. When Auto-Hold is enabled the unit will not resume sweeping, even if no signal is present, until the SKIP button is pressed. The Hold symbol H will be displayed when the unit is currently locked on a frequency. When Auto-Hold is disabled the unit will resume sweeping automatically when the carrier is no longer present. Press the UP/DOWN arrow buttons to enable or disable Auto-Hold.

MODES

LOG MEMORY MODE

The LOG MEMORY mode keeps a separate logging list of all frequencies captured and attaches a new signal strength reading, time/date stamp and latitude/longitude coordinates (GPS optional) to every frequency captured. The LOG MEMORY file will log up to 1919 frequencies (0000-1918). If you choose to keep the first 1919 frequencies it logs it will stop logging frequencies once the 1919 memory locations are full. An "F" will be displayed in the lower right hand corner to indicate the LOG MEMORY is full. You may also choose to keep the last 1919 frequencies it captures so that it continues logging frequencies without stopping, over writing the oldest frequency captured. KEEP FIRST and KEEP LAST are selected from the SETUP button under LOG TYPE.

The LOG MEMORY mode differs from the regular MEMORY mode in that it is a single file of 1919 frequencies captured, including duplicate frequencies. The regular MEMORY mode has 10 separate banks that allow 100 unique frequencies to be logged to each bank.

When LOG MODE is enabled from the SETUP button the LOG MEMORY mode runs in parallel with SWEEP, SCAN and VFO modes. You must have the unit in one of these three modes for the LOG MEMORY to be active. In SWEEP mode as frequencies are being logged to the regular memory file they are also being logged into the log memory file. In SCAN mode as a frequency is detected from the memory file it is logged to the log memory file. In VFO mode when a specific frequency is displayed it will be logged to a separate memory in the log memory each time that signal is detected. The LOG MEMORY mode could be beneficial in an unattended sweep or when performing a site survey where it may be important to know the signal strength, time/date, and location (GPS coordinates) of each frequency as it was detected.

While in the LOG MEMORY mode you may scroll through all the frequencies that are currently in memory by pressing the UP/DOWN arrow buttons. The LOG MEMORY will wrap at the last frequency captured. For instance, if there are only 15 frequencies in the log memory the unit will not scroll all the empty locations up to 1918. The scroll will stop at the last frequency in memory, in this instance 15, and go back to the first memory. If a particular frequency is active and the squelch opens then an "L" will be displayed in the bottom right hand corner to indicate that the unit is currently locked on that frequency.

To clear the LOG MEMORY press the CLEAR button. The screen will now display: Log Memory Will Be Cleared, Press "Enter" To Continue, Abort After 5 Seconds.

The LOG MEMORY file may be downloaded to a PC using the supplied program and interface cable. See the PC DOWNLOADING section for more information.

SCAN

BUILD S

1.

2.

3.

4.

5.

6.

MANUA

1.

2.

SCAN (cont.)

BUILD SCAN LIST

1. Press the BANK button to go to your desired bank.
2. Press the MODE button twice to access VFO mode.
3. Enter the frequency from the keypad and press the ENTER/DISPLAY button. That frequency will be displayed in the VFO screen.
4. Press the HOLD/STORE and ENTER/DISPLAY buttons at the same time. That frequency will be logged to the memory of that particular bank.
5. Repeat steps 3 & 4 until you are finished building your list.
6. Press the SWEEP button twice to go back to SCAN mode to begin scanning frequencies in memory.

MANUAL TUNING IN SCAN MODE

1. Press the HOLD/STORE button to stop the unit from scanning. The Hold symbol H will appear in the bottom right hand corner of the display.
2. Press the SKIP button repeatedly and the cursor will skip from one frequency to the next in the order in which they fall in memory and tune the receiver to the frequency displayed. If there is current activity on the frequency the audio will be enabled and allow you to monitor that signal.

MODES

MODE BUTTON

The MODE button allows access to MEMORY MODE, VFO MODE, GPS MODE and LOG MEMORY MODE.

MEMORY MODE

1. Press the MODE button to access the MEMORY banks.

```
BANK: 05      MEMORY: 00
FREQ: 454.125000 MHZ
HITS: 10
SIG: ██████████ 20  [L]
TIME: 16:45:35
DATE: THUR 26 AUG 2003
LAT: 00:00.00 S
LON: 000:00.00 E
```

2. The frequency, number of hits per frequency, signal strength and time/date are all logged automatically to memory as each frequency is captured.
3. Press the UP/DOWN arrow buttons to scroll the memories for that bank. There are 100 possible memories for each bank and they are numbered 00-99.
4. Press the RIGHT/LEFT arrow buttons to scroll the memory banks. There are 10 memory banks and they are numbered 0-9.
5. If you would like to LOCKOUT a frequency in memory you may do so by first accessing the frequency you would like to lock out.
6. Press the LOCKOUT button and the lockout symbol "L" will appear to the right of the signal strength line. When you enter sweep mode again that frequency will be ignored if detected by the unit.
7. If you would like to disable that lockout press the lockout button again and the lockout symbol will disappear.

VFO MODE

1. Press the MODE button until VFO MODE is displayed.
2. Enter the desired frequency directly from the numeric keypad and press the ENTER/DISPLAY button. The unit will now be tuned to that frequency.
3. You may also program the current frequency displayed into the current bank displayed at the bottom of the display by pressing the HOLD/STORE button. If you make an error while entering the frequency press the CLEAR button to start over.
4. If the frequency entered is outside the specified frequency range of 30MHz-3GHz the display will flash ERROR and default back to the previous frequency.

```

VFO MODE
FREQ: 454.125000 MHZ
SIG: ██████████ 35
    
```

GPS MODE

1. Press the MODE button until GPS MODE is displayed.
2. If the GPS is activated as instructed in the SETUP mode, and if the GPS module has acquired the proper number of satellites the screen will flash GPS ACTIVE. It is not necessary to be in this screen for the GPS to work. This screen should only be used to confirm that the GPS satellites have been attained and the module is functioning.

```

GPS MODE
LAT: 00:00.00 S
LON: 000:00.00 E
    
```