SCANNING MONITOR RECEIVER

VHF Band	26-57.995 MHz
	58-88 MHz
	108-180 MHz
UHF Band	380-514 MHz

SX-200

OPERATION MANUAL

GENERAL DESCRIPTION

This scanning monitor receiver utilizes a miniature computer-micro-processor with 16 channels in over 32,000 different frequencies such as Police, Ambulance, Rescue, Fire, Paramedic, Government Services, Taxis, etc. which can be monitored, searched, scanned, to memorize without adding expensive crystals. Unknown frequencies can be searched and locked-in. Frequencies can be easily selected by the keyboard operation. An accurate digital clock which displays time is built-in. Amateur bands in VHF and UHF range, T-Band can also be received.

SPECIFICATIONS

1. Type . . . . FM & AM
2. Frequency Range . . . .
   a) 26 ~ 57.995 MHz Freq. Space . . . 5 KHz
   b) 58 ~ 88 MHz   "   "   . . . 12.5 KHz
   c) 108 ~ 180 MHz   "   "   . . . 5 KHz
   d) 380 ~ 514 MHz   "   "   . . . 12.5 KHz
3. Sensitivity . . . .
   FM . . . a) 26 ~ 180 MHz 0.4 uV S/N 12 dB
            b) 380 ~ 514 MHz 1.0 uV S/N 12 dB
   AM . . . a) 26 ~ 180 MHz 1.0 uV S/N 10 dB
            b) 380 ~ 514 MHz 2.0 uV S/N 10 dB
4. Selectivity . . . .
   FM . . . More than 60 dB at ±25 KHz
   AM . . . More than 60 dB at ±10 KHz
5. Audio Output . . . . 2 Watts
6. External Speaker Impedance . . . . . 4 ~ 8 ohms
7. Power Supply . . . . AC Adaptor (Output DC 12V) or DC 12V Power Supply
8. Antenna Impedance . . . . 50 ~ 75 ohms
   Whip or External Antenna with LO/DX Control (20 dB ATT.)
9. Frequency Stability . . . .
   26 ~ 180 MHz . . . . Within 300 Hz
   380 ~ 514 MHz . . . . Within 1 KHz
   (at normal temperature)
10. Clock Error . . . . Within 10 sec./month
11. Memory Channel . . . . 16 Channels
12. Scan Rate . . . .
    Fast . . . . 8 Channels/sec.
    Slow . . . . 4 Channels/sec.
13. Seek Rate . . . .
    Fast . . . . 10 Channels/sec.
    Slow . . . . 5 Channels/sec.
14. Scan Delay Time . . . . 0 ~ 4 sec.

GETTING ACQUAINTED WITH YOUR NEW SX-200 SCANNER

You are about to enjoy a new dimension in scanning ease, convenience and efficiency. Thousands of frequencies at your fingertips. In any of three different public service bands. Instantly available by fast keyboard selection. Up to 16 Channels. For you to program with the most listened to frequencies, change and reprogram whenever you wish with a simple keyboard operation. Seeking, scanning, and priority scan to give you easy operation any way you want. But, before you start on your new adventure in monitoring for fun and information, take a minute to get acquainted with the precision instrument that we have so carefully designed to give you, not only ease and efficiency, but years of dependable service as well.

YOUR SX-200 CONTROL PANEL (FRONT VIEW)
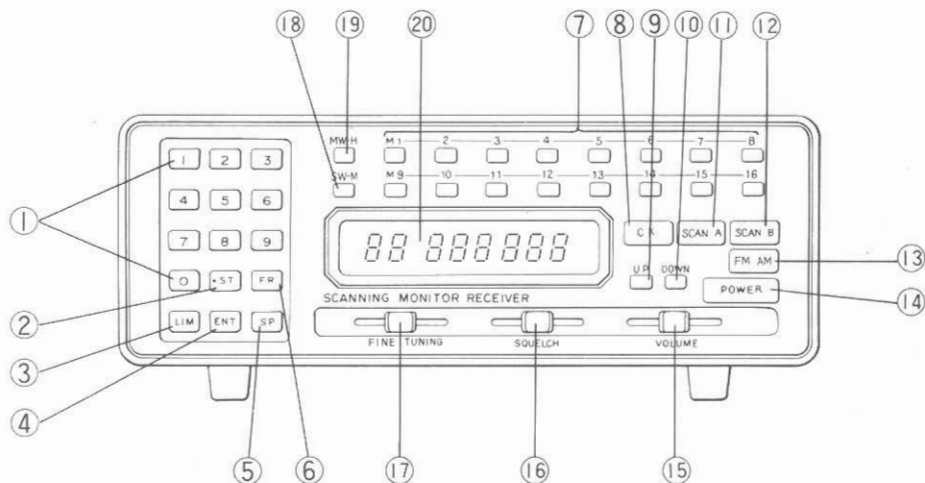
1. **Keyboard Frequency Selector Buttons (1 – 0)**
   Select any frequency in any of three bands – VHF Low, VHF High, or UHF (including the T-Band).

2. **Stop Button & Dot (·) · ST**
   Stops UP or DOWN Seek or Scan A or B function. Places decimal point in selected frequency.

3. **Limit Write Button LIM**
   Sets upper and lower frequencies of search range.

4. **Frequency Entry Button ENT**
   Is finally pushed to enter frequency.

5. **Speed Change Button SP**
   Controls speed variation for UP or DOWN Seek Function.

6. **Frequency Display Button FR**
   Interrupts constant time display to show frequency being received.

7. **Memory Read/Display Keys   M1 — M16**

   Programs your own most-listened to frequencies in any of the three bands. Retrieve any frequency desired when corresponding button is depressed.

8. **Clock Display and Adjustment Button   CK**

   Brilliant digital LED clock—accurate to the second. Retrieve and adjust time.

9. **Up Button   UP**

   Starts seeking upwards, moving through frequencies in increments of 5 KHz or 12.5 KHz and stopping on a transmitting channel.

10. **DOWN Button   DOWN**

    Starts seeking downwards, moving through frequencies in decrements of 5 KHz or 12.5 KHz and stopping on a transmitting channel.

11. **SCAN-A Button**

    Scans the 16 memory channels (M1—M16) stopping on a transmitting channel.

12. **SCAN-B Button**

    Scans selected priority channels within the 16 memory channels, stopping on a transmitting channel.

13. **FM-AM Switch**

    Selects modulation of frequency to receive, i.e., Amplitude (AM) or Frequency (FM). If desired AM typed modulation for receiving, push this button. If FM typed required, unlock it.

14. **Power ON/OFF Switch**

15. **Volume Control**

    Adjusts sound level as desired.

16. **Squelch Control**

    Adjusts to block out unwanted noise.

17. **Fine Tuning**

    Small frequency adjustment such kind of figures as 5 KHz is made.

18. **Scan Write and Minute Adjustment Button   SW·M**

    Programs priority memory channels for SCAN-B function and minute.

19. **Memory Write and Hour Adjustment Button   MW·H**

    Programs desired frequencies into memory channels for SCAN-A function and hour.

20. **Digital Display Panel**

    Shows 5-second readout of selected frequencies. Registers passing frequencies during SCAN or UP/DOWN SEEK modes. Shows constant time display (except during SCAN or SEEK modes). Shows time readout when CK button is depressed.
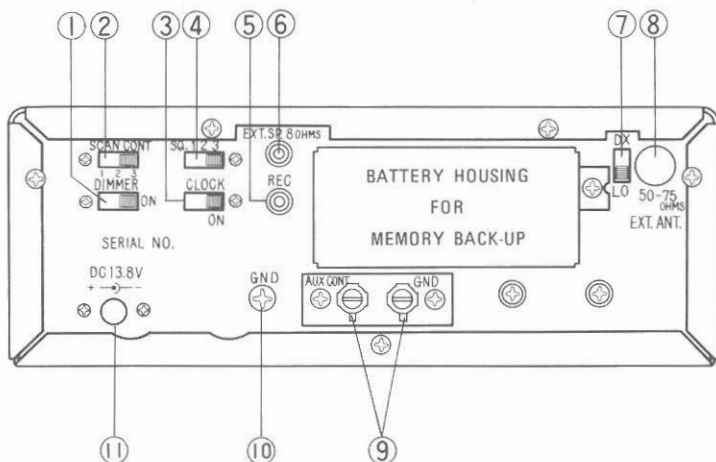
REAR VIEW OF SX-200 SCANNER

1. Dimmer Control Switch

Changes light and darkness (ON) of display.

2. Scan Delay Control

Delays resumption of scanning during a pause in transmission. Moving the slide switch to the positions 1, 2 and 3 varies the holding time on a frequency for zero second (Position 1), 2 seconds (Position 2) and 4 seconds (Position 3) respectively.

3. Clock Swtich

For only CLOCK (Time) display desired, slide this switch to ON. Under this condition that the POWER switch is off, time always displays. If this operation required, CLOCK switch shall be set to ON position before installation of this unit in a car.

4. Squelch Operation

The SX-200 uses some very unique squelch circuitry which allows THREE DIFFERENT MODES OF SQUELCH operation. These modes are selectable using the rear mounted slide switch marked "SQ".

> POSITION 1. Allows for standard "CARRIER" operated squelch ie. Scanning is stopped and Audio is opened by the carrier of the signal received.

> POSITION 2. Scanning is stopped by the received signals carrier but the AUDIO is SILENCED until modulation (voice) is put on the carrier (for monitoring telephone channels etc.)

> POSITION 3. Scanning will not stop until a carrier with modulation signal (signal with voice) is received. (used when set is in the SEARCH mode.)

Notes: 1. For SQ 1. 2. & 3., in case that squelch volume control in the front panel is positioned at the rightside (FM noise comes out.), frequency will not move in seek or scan modes as far as noise is not blocked out.

2. The condition of AUX Control output will be changed by SQ switch's positions. For SQ 1. or 2., when received wave, AUX terminal will become open electrically. For SQ 3. position, AUX terminal will not become open without sound even though a wave received.

In the event FM noise coming out, AUX control terminal will become open for all the position, SQ 1. 2. 3.

5. **Recording Output   REC**

Connect the input of open reel type or cassette tape deck to record.

6. **Output for External Speaker (Optional).**

7. **Local/Distance Switch**

This switch allows for optimum reception in both strong and weak signal areas. It is normally set in the DISTANCE (DX) position for maximum sensitivity. In strong signal areas, stations may interfere with each other. To minimize these interferences, move this switch to LO for LOCAL position.

8. **Connection for External Antenna**

9. **AUX Control Output   AUX**

On/Off Control of auxiliary equipment (Tape Recorder) using relay. RATING of AUX Cont. terminal: Max. 15V, Max. 200 mA. The relay satisfying the above rating should be used.
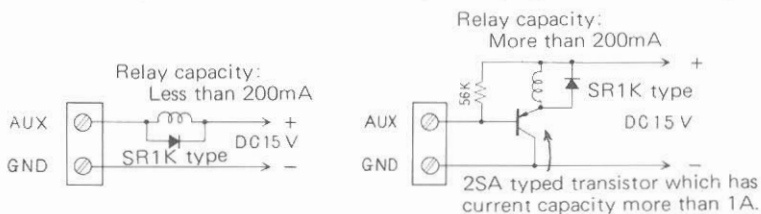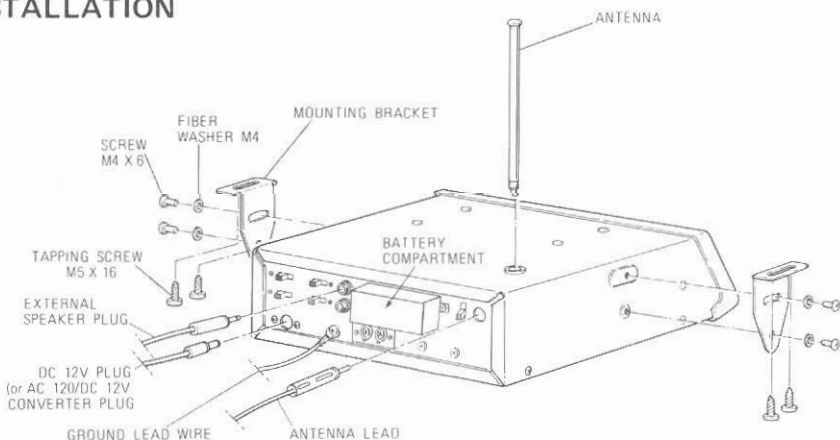

Relay will operate when scanning stops.

10. **Ground Connection   GND**
11. **Connection for Power Cord.**

INSTALLATION

NOTES: BATTERY INSTALLATION: Before turning your SX-200 on make certain that you install the two SIZE AA BATTERIES supplied in the battery housing on the rear panel being careful to put them in with the correct polarity (Polarity is marked on base of plastic holder.) The batteries are used for memory backup.

SETTING UP YOUR UNIT

1. Connect the power supply, using either AC cord, if the unit is to be used as a base station, or the DC connector for mobile operation. The AC cord includes a DC/AC power adaptor.
2. Turn on Power Switch (#14) by push button in. TIME readout A 0-00 will appear in the Display Panel (#20).
3. Install whip antenna by screwing in clockwise into the connecting hole on top of the unit. The 3-section telescoping antenna supplied with your unit extends from approximately 4 inches to approximately 22 inches for best reception in every band. (The lower the band, the longer the antenna should be extended, and vice versa.)
4. When the power switch (POWER) turns off once and then it turns on again, Time or frequency readout will appear. But if receiving is desired, be certain to push FR button.

OPERATION OF SCANNER

1. To select desired frequency . . . . .
   Depress button in the following sequence on the key board.
   Examples: 7 → 8 → ·ST → 8 → 8 → 7 → ENT
   Display shows 78.887 (Programmed)
   4 → 7 → 0 → ·ST → 3 → 1 → 2 → 5 → ENT
   Display shows 470.312 (Programmed)

   Note: 4 digits after the point is available for display only. But when entry key ENT is pushed (actually MUST be pushed to enter the frequency), fourth digit after the point does not display as the above. This means frequency always comes to a very close one that you want to catch. In other words, CUT-OFF or RAISE of FRACTIONS has automatically and suitably been made by our peculiar computer design according to the frequency space, 12.5 KHz or 5 KHz. For 5 KHz space, third digit after the point displays always 5 when pushed ENT button. Therefore, further small adjustment required is made by FINE TUNING in the front panel for either 12.5 KHz or 5 KHz.

2. To search or seek (Up or Down) a station . . . . .
   After frequency is entered, depress UP or DOWN seek button to start search. Squelch control must be adjusted to just above noise level to activate search. Channels M1 through M16 can be searched by depressing individual channel buttons and then the UP or DOWN seek button accordingly. Frequencies will be searched in increments or decrements of 5 KHz or 12.5 KHz according to bands.
   If exact frequency desired is unknown, enter a frequency a few KHz lower to begin search. For example, if the frequency desired is approximately 470.015, start the search frequency at 469.000 or lower.
   To increase seek speed, depress SP key. To decrease speed, depress SP key again.
   To stop seek or scan, depress ·ST key.

3. To select or enter a frequency into memory bank . . . . .
   A) To enter a frequency being received while seeking, depress the each button according to the order of ·ST → ENT → MWH → M .

B) If you want to enter a frequency which you have already known, depress button in the following sequence; For example,

$$\boxed{4} \rightarrow \boxed{7} \rightarrow \boxed{0} \rightarrow \boxed{\cdot ST} \rightarrow \boxed{0} \rightarrow \boxed{2} \rightarrow \boxed{5} \rightarrow \boxed{ENT} \rightarrow \boxed{MW} \rightarrow \boxed{M}$$

470.025 (Programmed into memory bank)

If there is more than a 5-second delay in entering the frequency, time will be automatically displayed and you must re-program. If the frequency that was selected is not desired, to reprogram, simply enter new frequency as outlined above.

4. Recall . . . . .
Once frequency has been programmed, for example, 156.175 is entered into channel M3, by depressing M3, the frequency will be recalled.

5. Scanning . . . . . "SCAN-A"
To use "SCAN-A" mode, when this button is depressed, all channels from M1 through M16 will be scanned repeatedly until a signal is received. To stop scan, depress $\boxed{\cdot ST}$ key. The Scan Delay control located in the rear plate of the unit is used to delay resumption of scanning during a pause in transmission. Moving the slide switch to the positions 1, 2 and 3 varies the holding time on a frequency for zero second (Position 1), 2 seconds (Position 2) and 4 seconds (Position 3) respectively.

6. Scanning . . . . . "SCAN-B"
"SCAN-B" is a programmable scan mode. It allows the SX-200 to scan any combination of its 16 memory channels. (ie. you may scan e.g. ch. 3 and 5 or 2, 5 and 10 etc.) Programming of "SCAN-B" is quite simple, for example we wish to scan only channels 1, 2, 15 and 16. The following operation is performed:-

PUSH $\boxed{\cdot ST}$ TWICE $\rightarrow$ $\boxed{SW\ M}$ $\rightarrow$ $\boxed{1}$ $\rightarrow$ $\boxed{2}$ $\rightarrow$ $\boxed{15}$ $\rightarrow$ $\boxed{16}$ $\rightarrow$ $\boxed{SCAN\ B}$
Be certain to push $\boxed{\cdot ST}$ twice and all other buttons once otherwise scan memory may not write correctly.

7. "FR" key . . . . .
When TIME is being displayed and you want to see what frequency is being received, press $\boxed{FR}$ key to activate display.

8. "CK", "H" & "M" keys . . . . .
To enter time, for example: for 10.30 AM, the following keys must be depressed in sequence. If the display is showing A 6—15 (A: a.m. & P: p.m.), push $\boxed{CK}$ key first, push $\boxed{H}$ key 4 times and push $\boxed{CK}$ key and push $\boxed{M}$ key 15 times. For 10:30 PM, push also $\boxed{CK}$ key, push $\boxed{H}$ key 16 times (P and 10 will appear.) and push $\boxed{CK}$ key, and push $\boxed{M}$ key 15 times.
The display will always show time when not in the Up/Down seek or scan mode.

9. Limit Write Key, "LIM" . . . . .
To enter upper and lower frequency of search range, the following keys must be depressed in sequence:
Upper frequency desired, for example: $\boxed{470.000}$ $\rightarrow$ $\boxed{ENT}$ $\rightarrow$ $\boxed{LIM}$ $\rightarrow$
$\rightarrow$ Lower frequency desired, for example: $\boxed{450.000}$ $\rightarrow$ $\boxed{ENT}$.
Now, the search between 450.000 and 470.00 is limitedly made by depressing UP or DOWN key.
To retrieve this limitter, the following operation shall be made.
$\boxed{26.000}$ $\rightarrow$ $\boxed{ENT}$ $\rightarrow$ $\boxed{LIM}$ $\rightarrow$ $\boxed{514.000}$ $\rightarrow$ $\boxed{ENT}$