Owner's Manual

PROGRAMMABLE SCANNING RECEIVER

The Scanning Radio Receiver is designed for listening to narrow-band FM channels of public service communications.

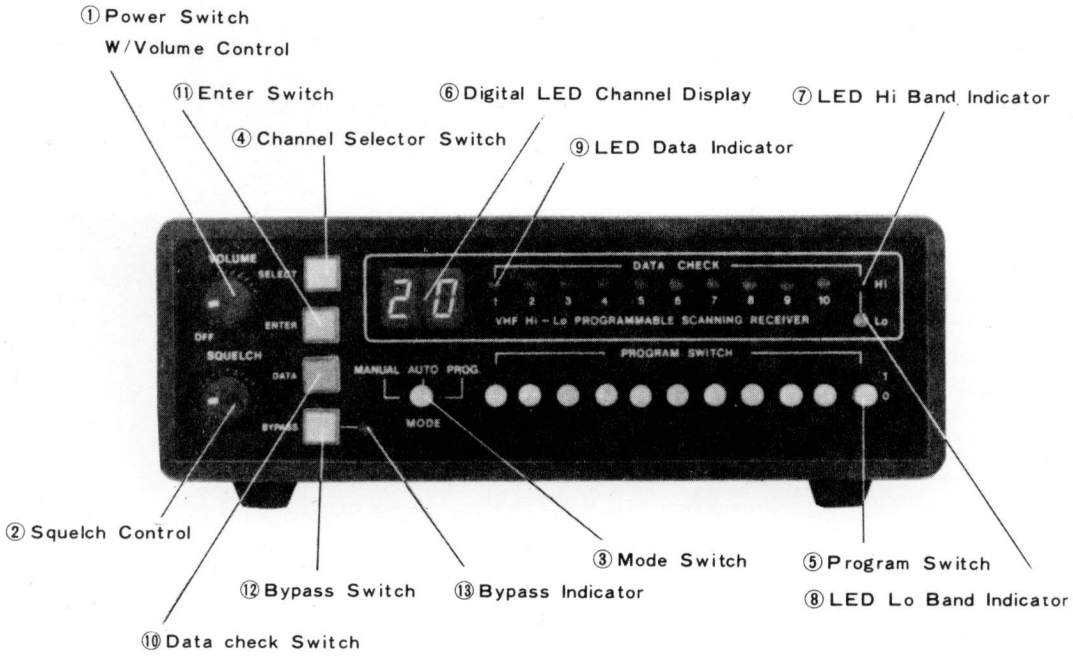
This **Scanner** is a crystal -less, dual band VHF (Low and High), 20 programable channels scanning monitor.
This **Scanner** is double conversion superheterodyne receiver. Designed for mobile use.
Can also be used as base station, but then **Scanner** has to be connected to mains via a battery eliminator.

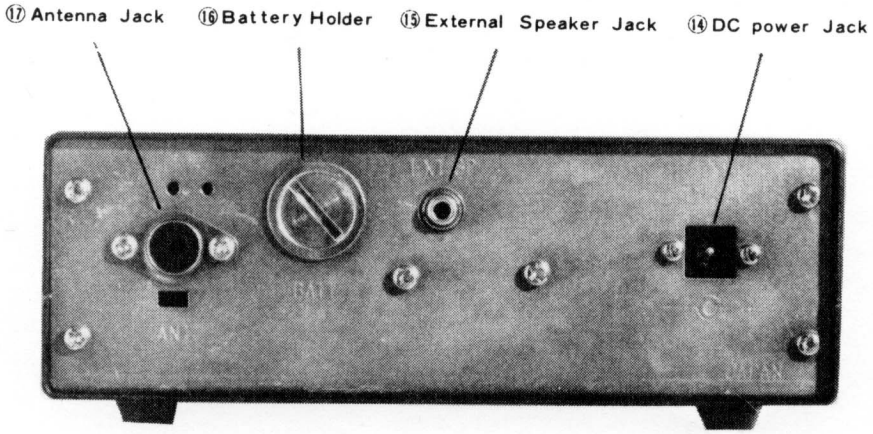
The programmed data is always keeping by IC memory and even if power cord is taken out from the power source, the batteries installed in the unit keeps the memory automatically.
The circuitry is all solid state, mounted on a rugged printed circuit board. It is skillfully constructed to provide the reliable troublefree performance you expect.

FEATURES

- Automatic scanning over High band and Low band 20 channels.
- Each channel can be programmed by the program switch on the front panel out of Low band 960 channels and High band 960 channels.
- The programmed data is being kept by the IC memory.
- The programmed data can be checked at any time.
- Batteries are installed in the unit to maintain the programmed data, even if the power supply is cutted off.
- Two functions are provided, Scan/Manual.
- High sensitivity and selectivity, double conversion superhet with High grade ceramic and one crystal filters.
- Squelch control, to eliminate background noise.
- External speaker jack allows you to use external speaker.

CONTROLS AND THEIR FUNCTIONS





1. OFF-VOLUME is the power switch and volume control. When not in use, rotate this control fully counter-clockwise to turn it off.

2. SQUELCH CONTROL is to eliminate annoying background noise between signal transmissions. When properly set, squelch will keep the **Scanner** silent until a signal comes in on the channels you are listening to – then the squelch circuit will "open" and you hear the signal.

3. MODE SWITCH (AUTO/MANUAL/PROGRAM)
   When this switch is setted to "AUTO" position (left side), each channel will be scanned automatically. While it is setted to the "MANUAL" position (center), the scanner will not scan, but will remain turned to the channel indicated by the LED. However, when it is setted to the "PROGRAM" position (right side) the **Scanner** is ready for programming.

4. CHANNEL SELECTOR SWITCH
   To advance the receiver to the next channel in sequence, press the SELECTOR SWITCH momentarily, each time you do so, the receiver will advance one channel.
   When Mode Switch is setted to "Manual" position, those channels which have been programmed to bypass are skipped off.
   However, when Mode Switch is setted to the program position can select each channel.

5. PROGRAM SWITCH
   This switch can program N1, N2, . . . N10, N11 (Hi/Lo) from left side to right side.
   The upper positions are "1" and the lower positions are "0".
   Pickup the code which correspond to the wanted frequency from the code book and set the program switches.

6. DIGITAL LED CHANNEL DISPLAY
   The light emitting diode show which channel is active.
   During scanning a digital LED light up in sequence.
   When the receiver is operative on one of the channels the number for that channel will go on.

7. LED HI BAND INDICATOR
   While the channel is receiving Hi band the light (Hi) keeps on.

8. LED LO BAND INDICATOR
   While the channel is receiving Lo band the light (Lo) keeps on.

9. LED DATA INDICATOR
   These LEDs are indicate the data when switch (10) is pushed on to check the memorized program data or switch (11) is pushed on to memory the program.
   Where it light is "1" and where it is not is "0".

10. DATA CHECK SWITCH
    Push this switch when needed to check the memorized data.

11. ENTER SWITCH
    Push this switch when needed to memorize the program data.

12. BYPASS SWITCH
    When you have channel, which you do not want to receive (whether etc.), push this switch to program to skip them with scan mode and manual select mode.

13. BYPASS INDICATOR
    When checking the memorized data and that channel is programmed to bypass, it turn on.

14. DC POWER JACK connect to 12V negative ground source.

15. EXTERNAL SPEAKER JACK is for plugging in a 3.2 – 16 ohms speaker. Use it for private listening or in areas where background noise is excessive. (in a vehicle, etc.)

16. BATTERY HOLDER install 2 batteries. Use Silver Oxide type G-13 or Alkali type LR-44.

17. ANT JACK is for connection of an external antenna.

OPERATION

1. After batteries and antenna have been connected your **Scanner** is ready to use.

2. Turn VOLUME "on" by rotating clockwise. Rotate SQUELCH to the minimum position by rotating counter-clockwise. You should hear a rushing sound from the speaker. Now adjust SQUELCH clockwise until you reach the point where the rushing background noise abruptly stops.

3. PROGRAMMING
   a) Set the Mode Switch to program position.
   b) Select Channel 1 with Selector Switch.
   c) Pick up the code which correspond to the wanted frequency from the code book and set the program switches.
   d) Push the ENTER SWITCH
      The channel LED and Hi/Lo LED turn on and off as shown in code.
      They shows memory is completed.
   e) Program 2-20 channel and memory, same process as a) – d).

4. If you want the **Scanner** to continuously scan channels, you must adjust SQUELCH as previously instructed, then set the MODE Switch to the SCAN position. The **Scanner** will constantly scan each channel in sequence; when a signal appears on one of the channels the receiver will lock onto that channel and you will hear the signal.

5. If you want to stay tuned to one channel only, set the MODE Switch to the MANUAL position (stop scanning) and then press the Selector Switch to advance to the channel you want to listen to (as indicated by the LED). For MANUAL scanning, the receiver can be either "SQUELCHED" (Adjusted as previously indicated) or "UNSQUELCHED" (SQUELCH control set to maximum counter-clockwise).

6. To eliminate the annoying background noise, rotate SQUELCH clockwise until the background noise abruptly stops. You can't adjust SQUELCH properly while listening to a station, so wait until signals ceases, the squelch circuit "closes" and cuts out all sound until the next signal comes in.

7. BYPASS PROGRAM
   At the scan or manual select mode if you had a channel with which you do not want to receive any, operate the unit as follows: You can skip that channel off.

   A) PROGRAM TO BYPASS
      a) Set the Mode Switch to program position.
      b) Select with the Selector Switch the channel you wish to bypass.
      c) Push Bypass Switch on. Bypass LED turns on.
      d) Set the Mode Switch to AUTO or MANUAL position.

   B) RELEASE THE BYPASS
      a) Set the Mode Switch to program position.
      b) Select with the Selector Switch the channel with which you want to release bypass. Bypass LED turns and keeps light on.
      c) Push Bypass Switch on. The light of bypass LED turns off. Bypass program went away from the memory.

   Note: 1. When Mode Switch is at program position only can select bypass channel with selector switch.
   2. Can operate bypass with 19 channels. It may not needed to operate bypass with 20 channels, but if you programmed bypass full 20 channels all LED lights turn faint.

8. TO CHECK MEMORIZED PROGRAM DATA
   You can check the data when Mode Switch is at manual position or program position. Please note that when it is at manual position unable to check bypass channels.
   a) Set the Mode Switch to manual or program position.
   b) Select the wanted channel to check with Selector Switch.
   c) Push on the Data Check Switch.
      DATA turns on and off and indicate the data.
      When selected channel is programmed to bypass, Bypass LED turns on.
   d) From the code book you can picks up the frequency which correspond to data. When check with the code book it is easy to see from N11 is "1" or "0" . . . ., N1 is "1" or "0"

9. In order to maintain the memorized data batteries are installed in the unit. While power cord is connected to the power source, even if power switch turns off the batteries operate the memory IC and keep the memorized data. However, when powercord is taken out of the power source memorized data went away in a minutes. Preventing from this matter, batteries are installed. They are setted in the battery holder on the rear panel of the unit. The used battery is Silver Oxide type G-13 or Alkali type LR-44 and need two batteries. The batteries keep operate the memory IC on about three months without power supply. Please note that once in three months it is requested to change the batteries with the new. When change the batteries with the new do it while connecting the power cord of the unit to the power source.

ANTENNA SYSTEM

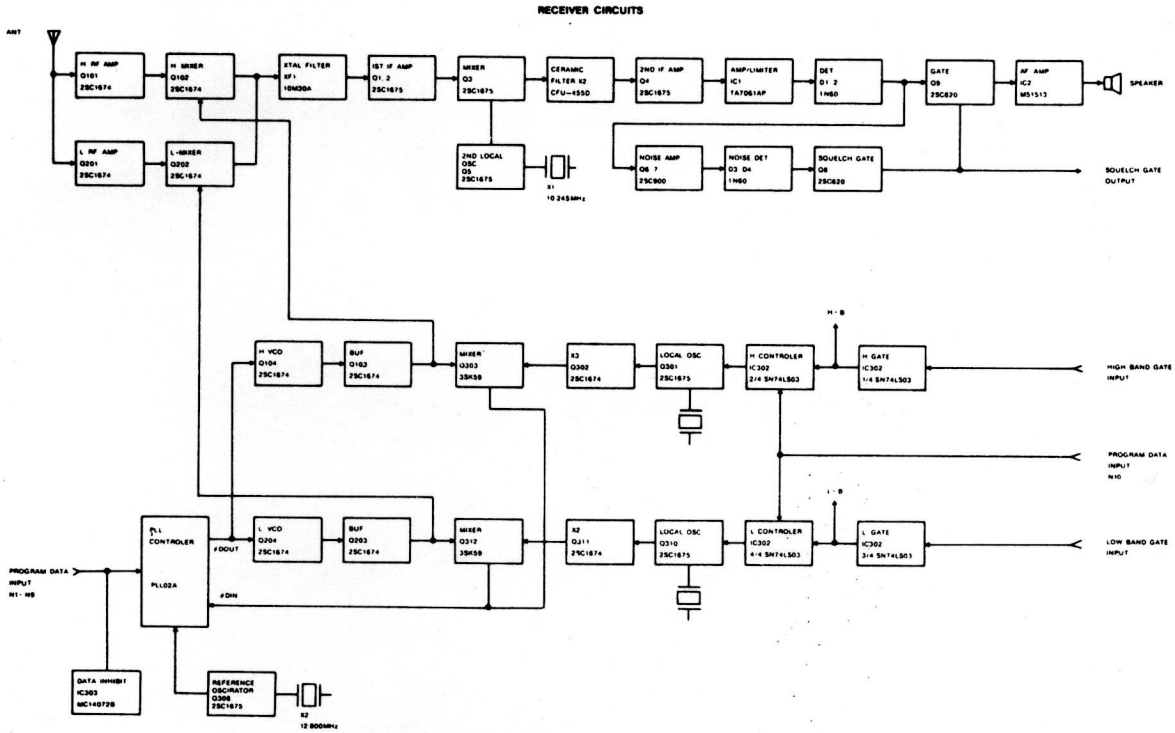
Your Receiver is designed to receive most efficiently at 50 ohm antenna impedance. Use coaxial cable with impedance of 50 ohms.

SPECIFICATION

GENERAL

Semiconductors	25 ICs, 47 transistors, 15 LED and 48 diodes
Antenna Impedance	50 ohms, motorola type receptacle
Speaker	Built-in, 50 x 75 mm dynamic type, 8 ohms
Audio Output	0.35 watt for inside speaker
Power Requirement	12-15V DC, negative ground only
Power Consumption	10 watt maximum
Dimension	166W x 54H x 193D mm
Accessories	Mobile mounting bracket with four screws
Receiving System	PLL system double conversion superheterodyne
Frequency Coverage	VHF Lo: 12.5 KHz separation, 960 channels
	VHF Hi: 12.5 KHz separation, 960 channels
Intermediate Frequency	1st: 10.7MHz, 2nd: 455KHz
Filter	Crystal type filter to 10.7MHz IF
	Ceramic type filter for 455KHz IF
Sensitivity	1.0μV at center frequency ±4MHz
	2.0μV within coverage
Selectivity	−6dB ±13.5KHz, −50dB ±20KHz
Image Ratio	VHF Lo: 30dB at center frequency
	VHF Hi: 30dB at center frequency
Signal to Noise Ratio	40dB (100μV, 5KHz div. at 1KHz)
Squelch Sensitivity	Less than 1.0μV, Threshold
Scanning Channels	20 channels, with LED digital channel read out
Scanning Rate	9 channel/sec.
Squelch Delay Time	2 seconds

BLOCK DIAGRAM (1)



BLOCK DIAGRAM (2)