Computerized Programmable Automatic Scanning Receiver 70 Channels Memories

AC/DC   AC 117/220/240V
        DC 13.8V

OWNER'S MANUAL

SPECIFICATIONS

Frequency Range . . . .

VHF Lo	60 – 89 MHz
VHF	140 – 144 MHz
VHF	144 – 148 MHz
VHF	148 – 179 MHz
UHF	380 – 470 MHz
UHF "T"	470 – 519 MHz
Airband	108 – 138 MHz

Antenna . . . . Telescopic whip (supplied) connector provided for external antenna (50-70 ohms)

Clock . . . . Crystal-controlled; LED display hours, minutes, seconds, Keyboard-resetable

RF Sensitivity . . . . 0.4 microvolts 66 – 174MHz
(± 5KHz deviation, 12dB SINAD) 0.8 microvolts 420 – 512MHz

Squelch Sensitivity . . . . 0.3 microvolts 66 – 174MHz
0.6 microvolts 420 – 512MHz

IF Selectivity . . . . – 60dB at ± 25KHz

Scan/Search Speed . . . . Selectable 5 or 10 channels per second

Scan/Search Delay . . . . Selectable 0 to 2 seconds

Audio output . . . . 2 watts RMS, 8 ohm. 10% THD (max.)

Dimensions . . . . 270(W)m/m X 90(H)m/m X 230(D)m/m

Weight . . . . 3.1 kgs.

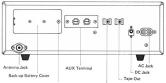Note: Improvements may result in features or specifications change without notice.

GENERAL DESCRIPTION

Your CPU SCANNER is a 70 channel, automatic VHF/UHF FM and AM AIR scanning radio receiver. Its micro-processor control makes scanning easy. The advanced search feature allows unknown signals to be captured and monitored, and their frequencies to be automatically stored in memory for later recall. The versatile keyboard will allow you to command a variety of convenient functions: digital display of frequencies and channel numbers, direct channel access, scan or manual control, lockout of unwanted channels, priority for important transmissions, automatic search with search/store storage and recall, selectable speed control for both scan and search, lockout of "birdies" or otherunwanted search frequencies and even local time ..... to the second!

An internal dual power supply allows 220V ac or 13.2V (13.8V dc operation, 100% solid-state circuitry includes seven custom-designed integrated circuits made especially for your CPU SCANNER. Additional features include external antenna jack, external speaker jacks, auxiliary connector, volume and squelch controls a large bright display panel, frequency synthesis requiring no channel crystals, and track-tuning.

LED Display

Speaker

Keyboard

Volume control

Squelch control

Antenna Jack

Back-up Battery Cover

Screw for Battery of Back-up

AUX Terminal

External Speaker Jack

AC Jack

DC Jack

Tape Out

FRONT PANEL CONTROLS

1. **ON/OFF SWITCH:** Push the switch ON & OFF.
2. **SQUELCH:** Keep the radio quiet unless a signal is being received and allows the radio to scan or search for a signal.
3. **VOLUME:** Adjusts the sound level by slide volume.
4. **DISPLAY PANEL:** Indicates Channel Number, Frequency, Delay (d), Lockout (L), Scanning action (channel number only), Programming Error (Error), Time, Priority (P), Block Lock out (') Aux, (ẋ).
5. **KEYBOARD:** Transfers fingertip commands to the UNIT Micro processor.

NUMERIC KEYS

| 0 | thru | 9 | and | ./Aux. | used to program frequencies into the scanner and program AUX. function.

| E | enters frequencies into scan channels from keyboard or from search display.

SCANNING CONTROLS

| 30 | — | 70 | Five banks (10 channel each) are each included.

NOTE: Control switches are from 30 to 70. From 1 — 20 CHs are memoried and can be passed by Lock/out sw.

| SCAN | starts SCAN of all programmed channels.

| Manual | Single-steps receiver through all 70 channels; stops search or scan; prepares the radio for any mode of operation.

| Speed | selects SCAN, SEARCH or STORE-SEARCH rates of 5 or 10 channels per second.

| Count | indicates the number of times the displayed channel has received a signal.

FEATURE CONTROLS

| Lockout | locks out displayed channel during SCAN only. |

| Delay | Selectively activates a 2-second delay to receive a reply transmission |

| Priority | Samples channel 1 every two seconds and automatically switches to any signal on channel 1 regardless of any other signals. |

| Time | displays TIME when radio is ON or OFF. |

| D/N | "N" position is no frequencies displayed, but receive signals. |

| Clear | When wrong frequencies are pushed, it clear that wrong numbers. |

SEARCH CONTROLS

| Limit | enters two selected frequencies as upper and lower limits. |

| ▲ | starts searching upwards. |

| ▼ | starts searching downwards. |

| Store | automatically samples all active signals between SEARCH limits and silently STORES up to 70 frequencies. |

DISPLAY FEATURES

CPU SCANNER display consists of 11 digit spaces or "windows" in which lighted characters indicate the programming commands of the keyboard. The display of features selected or de-selected is shown below:

In this example, from left to right, the following information is shown:

All CHANNEL BANKS are selected as indicated by dots at upper left of spaces 1–5.

PRIORITY is ON (P in 1st space)
Channel 70 is selected (2nd and 3rd spaces)
DELAY is selected (d in 4th space)
LOCKOUT is selected (L in 5th space)

The FREQUENCY 466.950MHz (6th thru 11th spaces) is programmed into channel 70.

AUX. is slected as indicated by the dot in upper-right of 11th space.

WHAT DOES IT ALL MEAN?

Scanners electronically sample through your choics of frequencies looking for a signal. When a signal is detected, the scanning function stops and the squelch is activated allowing the listener to hear the transmissions. When the signal goes off the air, the squelch turns off the audio (so we don't hear annoying background noise) and the circuitry resumes its scanning of the channels looking for another signal.

It all sounds very simple. In fact, a good scanner like the CPU-SCAN is very sophisticated, using the latest microprocessor techniques from the computer industry. These integrated circuits, or IC "chips" allow this very complex radio to be simple and easy to use.

PROGRAMMING YOUR RECEIVER

PROGRAMMING FREQUENCIES

Read this section thoroughly before attempting frequency programming.

Now that you are aware of some of the flexibility of your CPU SCAN, you are ready to enter local frequencies.

You can program your receiver to scan 70 different frequencies, one for each of the 70 channels, arranged in 1 group of 20 channels and 5 groups of 10 channels each.

EXAMPLES (Push frequency as correctly)

To program 162.550MHz in desired channel in channel 1

PRESS: | 1 | MANUAL | step to that channel

PRESS: | 1 | 6 | 2 | . | 5 | 5 | 0 | E |

READ: (channel 1) 162.550

PRESS: | MANUAL | (step to next channel)

To program 471.1375MHz in next channel (Example: 2)

PRESS: | MANUAL | 4 | 7 | 1 | . | 1 | 3 | 7 | 5 | E |

READ: 471.137 (Rounded off to 6 places)

This manual selection of channels may continue through all SEVENTY channels, even without all channel banks having been pressed.

If you attempt to program a frequency that is outside the tuning range of the receiver, "Error" appears on the display, and you simply enter a new frequency.

DIRECT (MANUAL) CHANNEL ACCESS

To display any channel (Example: 70) manually when: Scanning is stopped; in manual mode; in count.

PRESS: 7 0 MANUAL

READ: 70 in 2nd and 3rd spaces along with frequency and status information.

The "Manual Mode" may be selected at any time by pressing Manual . All of the 70 channels may be displayed in sequence by repeated pressing of the Manual key.

BANKS AND PASS OF CHANNELS

The first bank of channels was automatically selected upon "First Power-on" and was indicated by the dot in upper-left of 1st space. After programming the first 10 channels, continue programming by:

PRESS: 30 Bank Key. A dot appears in the 1st space.
         Programming channels 21 thru 30 are passed.

PRESS: 30 a dot disappears and CH21 to 30 are scanned again.

SCANNING

To put your reciever in the "Scanning Mode" adjust the squelch properly.

PRESS: Scan

READ: CH numbers will be being gone up to from CH1 – 70.

When a signal is received on a channel (not locked out) the scanning will stop and the display will show:

            – – – –   the selected banks
            – – – –   the channel number being received
            – – – –   the frequency being received

To stop scanning

PRESS: MANUAL

LOCKOUT

You may wish to lock out certain frequencies in any bank skip over them when scanning. To program Lockout on a channel (Example: 20) first select that channel manually.

PRESS: [2][0][MANUAL]

PRESS: [Lockout]

READ: 20 (L) (lockout symbol appears on this channel)

To remove Lockout

PRESS: [Lockout] The symbol (L) will disappear from this channel.

SPEED

To scan slowly (5 channels per second)

PRESS: [Speed]

To resume fast scan (15 channels per second)

PRESS: [Speed]

PROGRAMMING SPECIAL FEATURES

Your CPU SCAN offers many special features which, when properly understood and used, will increase its usefulness greatly.

AUTOMATIC SEARCH

To search for signals continuously between two frequencies in the same band (example: 160.000MHz to 161.000MHz), go to any desired channel manually. Then:

PRESS [1][6][0][.][Limit]

READ: 71   160.000 (one limit is entered)

PRESS: [1][6][1][.][Limit]

READ: 71   161.000 (other limit is entered)

PRESS: [▲]   (search starts up and repeats) OR

PRESS: [▼]   (search starts down and repeats)

To reverse direction of search at anytime

PRESS: [▼] or [▲]

To stop search

PRESS: | Manual | The "Scan" frequency in that channel will be displayed.

To enter a frequency, found while searching, into the channel on which you are searching.

PRESS: CH Number | 10 | E |

PRIORITY

This selectable feature will permit you to hear channel 1 any time it is active, regardless of any other signals being received at that time. Put your favorite frequency in channel 1. Then:

PRESS: | Priority | "P" is displayed

To de-select Priority

PRESS: | Priority | again. "P" disappears.

DELAY

To selectively delay restart of scanning on a "Simplex" signal long enough to receive a replay on the same channel, manually go to the channel to be delayed.

Then:

PRESS: Delay   The "d" will be displayed. The channel will hold for 2 seconds after the signal ends.

To de-selected delay

PRESS: Delay   The "d" disappears. Scanning will begin immediately at the end of the signal.

Delay will also hold for 2 seconds in Search or Store if such a delay is desired.

COUNT

To count the number of times a channel has received a signal (up to 99) go to that channel manualy, for example, 70:

PRESS: [7] [0] Manual Channel 70 is displayed

PRESS: Count The count number will show at the right end of the display.

To erase count from memory while it is displayed:

PRESS: [Count] 00 will be displayed.

AUXILIARY

To selectively control accessories attached to the Auxiliary terminal on the rear panel, go to the desired channel manually. Then:

PRESS: ./Aux Dot appears at upper-right of display.

To de-select Auxiliary

PRESS: ./Aux Dot disappears.

SEARCH/STORE

To get a stored "List" of up to 70 frequencies in a separate memory, found while searching between two limit frequencies, select a channel and enter both limits as in Automatic Search.

In case of searching and want to store frequencies.

PRESS: [1] [4] [4] [.] [0] [0] [0] [LIMIT] [1] [4] [8] [.] [0] [0] [0] [LIMIT]

Then

1 STORE (want to searching upper ward).
To reverse the direction of search

PRESS: (▼)

RECALL

To see the stored frequencies on the display

PRESS: [1] Manual Read the first stored frequency in the special memory. You may wish to copy it on paper.

To see the next and other stored frequencies in sequence.

PRESS: Manual For each one. The end of the store list is indicated by a blank screen. The next press of [Manual] starts at the first frequency again

TRANSFER

To transfer the memoried frequencies to other channels.

EXAMPLE: To transfer 144.000MHz in CH10 to CH1.

PRESS: | 1 | 0 | MANUAL | STORE |

PRESS: | 1 | E |

TIME

To display time from the 24 hour clock, go to the Manual Mode first.
To set the clock to 9:02:03 when in the TIME mode.

PRESS: | TIME |

PRESS: | 0 | 9 | 0 | 2 | 0 | 3 | E | and Read: 9.02.03

Time WILL be displayed when the time switch is turned "ON".
You may also scan or search with the time channel number being displayed.

To remove time from the display: PRESS: Time

MOBILE INSTALLATION

In some areas, unauthorized mobile police receivers are unlawful: be sure to
check with local authorities before installing your unit.
Your CPU SCAN may be installed in any vehicle or boat which has a 12-volt,
negative ground electrical system (13.8V dc)
A mounting bracket has been provided for your convenience.
1. Using the mobile mounting bracket, select a location under the dash to
hold the scanner in the desired position.
2. Mark and drill two mounting holes using a 7/64 dril bit; secure the bracket
with two #6 self-tapping screws (provided).
3. Insert the two plastic T-washers (provided) into the bracket holes, flanges
inward, and secure the scanner in place with the two mouning bolts and
washers (provided).
4. Connect the dc power cable to the insulated terminal on the rear panel of
the receiver; attach the other end of the cable to the "accessory" or
"radio" terminal on the vehicle fuse block.
Because the scanner continues to drain battery current (about 1/4 amp)
even after being turned off, the power lead should be attached to one of
the fuse circuits which is disconnected by the car ignition switch, for
example, an "Accessory" terminal.
Be sure the radio cabinet is well-ground to the car metal through the
mounting frame; otherwise, connect a piece of wire from the ground screw
on the rear panel of the radio to the metal body of the vehicle.

Because power to the scanner is interrupted by turning off the vehicle ignition switch, your clock will have to be re-set each time you restors power, it will "power up" scanning, fast, no priority and bank 10 selected.

5. Connect a mobile monitor antenna to the scanner, if necessary, the automotive antenna, extended about 18 inches, can be used with fair results.

EXTERNAL ANTENNA

The telescopic antenna provided with your CPU SCAN is recommended for most monitoring. For weak-signal reception, or for electrically-noisy locations, an external antenna is readily available. Always use coaxial cable for lead-in. RG-58U is recommended for lengths of up to 100 feet.

Your CPU SCAN is equipped with an automotive type of external antenna jack, and a mating plug (supplied) must be used.

An outside antenna need only be high enough to clear surrounding obstructions. Above all, STAY AWAY FROM POWER LINES! You may be killed upon contact of the antenna with a power line.

EXTERNAL SPEAKER

Although the internal speaker of the scanner will provide ample room volume, in some applications an external speaker may be desired. The external speaker should be plugged into the rear-panel jack which will cut off the internal scanner speaker.

AUXILIARY FUNCTION

When the auxiliary function is activated selectively on a channel, (PRESS: ./Aux. a red dot will appear at the upper-right corner. Each time the scanner detects a signal on this channel, the AUX. terminal on the rear panel of your UPC SCAN will provide a closed circuit of up to 500 milliamperes of current. This will turn on many remote controlled battery-operated cassette recorders without additional accessories. NOTE: Some recorders may require additional interface equipment for control or audio. This should be installed by a qualified technician.

Audio for the recorder input is provided by: The External Speaker jack which will disconnect the internal speaker for silent recording; or the Tape jack which allows the speaker to remain on for audible monitoring while recording.

One connection of the tape recorder is made in the following manner:

1. Turn the radio off and unplug it from the wall receptacle.
2. Connect the control wires from the cassette recorder "Remote" jack to the AUX. and GND. terminals as shown in Fig. 1. If the recorder, set to "play", starts with the receiver OFF, the wires should be reversed. NOTE: Recorder should not be grounded to radio or other device in any manner.
3. Plug in radio, turn it ON. With the recorder set to operate, step to the channel programmed for aux. control (PRESS: ./Aux). Receive a signal for (or open the squelch) and the recorder should be activated.

4. Connect the Tape output of the CPU SCAN to the "mic" input of the recorder as shown in Fig. 1, to isolate the recorder ground from the scanner, coupling capacitors should be used in the ground and center conductors as show.

   Alternate: Sound may be recorded by placing the microphone near the receiver speaker if preferred.

5. Adjust the volume control to proper recording level.

To de-activate the Aux. function

PRESS: ./Aux.   again.

The aux. control terminal will source 9 ma. and sink 500 ma. It is protected against reverse voltages. The internal circuitry is shown in Fig. 2.