# TECSUN

# TECSUN

# PL-505

**FM stereo / SW / MW / LW DSP RECEIVER**

**OPERATION MANUAL**

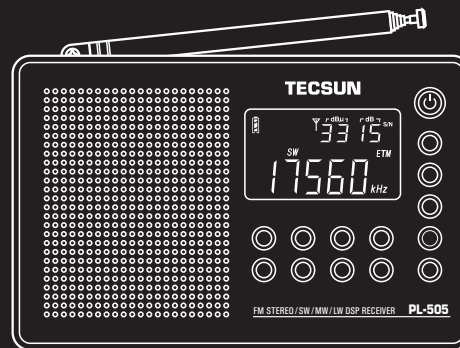FM STEREO / SW / MW / LW DSP RECEIVER **PL-505**

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2011.9 VER.1

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## PL-505 Functional Block Diagram

PL-505 is using DSP si4734 Microchips (from Silicon Labs in USA) to digitalize the analog AM/FM broadcasting signal base on the modern software technology and radio principles. It can highly improve on radio's sensitivity, selectivity, S/N ratio and anti-interference.
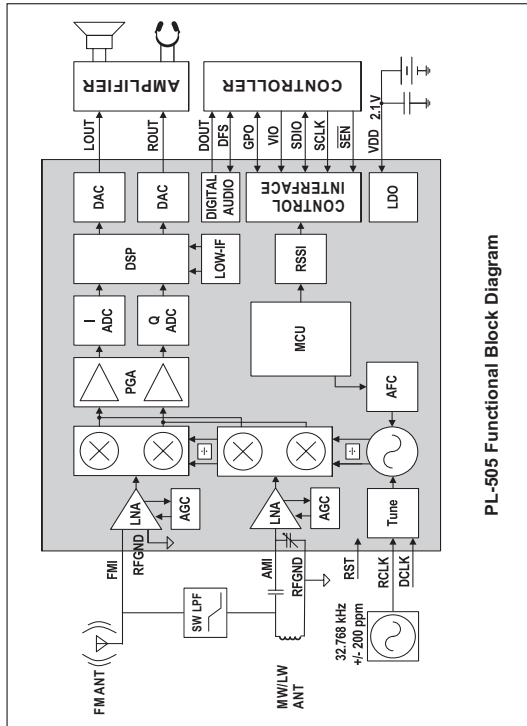


PL-505 Functional Block Diagram

## SPECIFICATIONS

1. Frequency range

| | |
|---|---|
| FM | 87~108 MHz |
| | Russia 64~108MHz |
| | Japan 76~108 MHz |
| | Eu, USA 87.5~108 MHz |
| MW | 522~1620 (USA 520~1710) kHz |
| LW | 153~513 kHz |
| SW | 2300~21950 kHz |

2. Sensitivity

| | |
|---|---|
| FM (S/N=30dB) | Less than 3μV |
| MW (S/N=26dB) | Less than 1mV/m |
| LW (S/N=26dB) | Less than 10mV/m |
| SW (S/N=26dB) | Less than 20μV |

3. Selectivity

| | |
|---|---|
| FM | $>$60 dB (±150kHz) |
| MW | $>$60 dB (BW=3kHz, ±9kHz) |
| LW | $>$60 dB (BW=3kHz, ±9kHz) |
| SW | $>$60 dB (BW=3kHz, ±5kHz) |

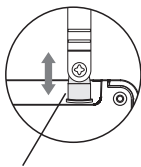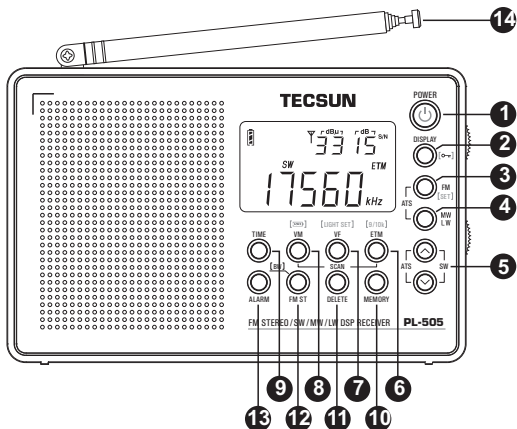| | |
|---|---|
| 4. FM Stereo crosstalk | Less than 25 dB |
| 5. Memory | 550 |
| 6. Output (Distortion 10%) | $\geq$200 mW |
| 7. Power | UM3 or AA X 2 |
| | USB 5V DC |
| 8. Speaker | φ50mm, 500mW/16 Ohm |
| 9. Earphone Jack | φ3.5mm, 32 Ohm, Stereo type |
| 10. Dimensions Approx. | 123(W) X 79(H) X 20(D) mm |
| 11. Weight | 175g (excluded batteries) |

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## CONTROL LOCATIONS



Note:
You can rotate the telescopic antenna in all direction (360 degree) by pulling up the bottom of antenna.
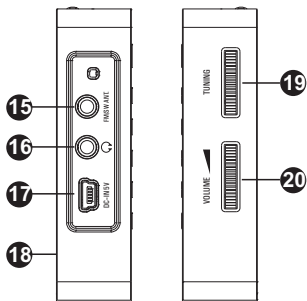
1. Power
2. Display / Lock
3. FM band & ATS
4. MW/LW band Selection & ATS
5. SW band selection & ATS
6. ETM (Easy Tuning Mode) / 9k or 10k AM tuning step selection
7. VF (Frequency scan) / Backlight set
8. VM (Memory scan)
9. Time
10. Memory
11. Delete
12. FM ST / AM BW (AM bandwidth)
13. Alarm
14. FM & SW telescopic antenna
15. FM & SW antenna jack
16. Earphone jack
17. USB 5V DC jack
18. Battery compartment
19. Multifunctional tuning knob
20. Volume knob

## LCD DISPLAY



1 Battery consumption indicator / Charging indicator

2 Sleep timer indicator

3 Alarm on/off indicator

4 Key-lock indicator

5 Temperature (Temp.)

6 Signal indicators
dBu: signal strength unit
dB : Signal to Noise Ratio (S/N) unit

7 Alarm time indicator

8 SW meter band indicator

9 ETM indicator

10 Tuning speed:
" ▶ " Slow Tuning
" ▶▶" Fast Tuning

11 kHz: frequency unit for MW, LW & SW
MHz: frequency unit for FM

12 Digital number display (4 Digits)
With radio off: world time, alarm time, temperature
With radio on: word time, signal strength / SNR, alarm time, temperature, local time, memory address, meter band.

13 Preset memory address

14 Digital number display
With radio off: local time
With radio on: frequency display, band display

15 Band indicator

16 FM stereo status indicator
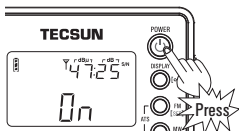
17 Rechargeable batteries indicator

## HOW TO TURN ON/OFF THE RADIO

1. Open the battery compartment located on the back of the radio, install 2 x AA alkaline batteries observing the battery polarity diagram on the back of the radio. Close the battery door.
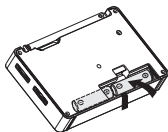
Installing batteries

2. Press the [POWER] button to turn on/off the radio.

*Note:*
If the radio is unable to be turned on, please check if the batteries were installed correctly, battery capacity is sufficient, and the lock function had been turned on.  If the radio is locked with " 🔒 " displays on screen, press & hold the [ 🔒 ] button to unlock.

## INTELLIGENT VOLUME CONTROL

**Speaker volume:**  Volume control range is 0 to 30.
**Earphone volume:** Volume control range is 0 to 15.

This device is equipped with its own intelligent volume control function. If the volume is below level 8, it will maintain the current volume when you plug in the earphone; however if the volume is above level 8, the volume will drop to level 8 automatically. You can adjust the earphone volume according to your own needs.
It is suggested to plug in the earphone first and wear it later when you want to listen to the radio by earphone.

When the earphone is plugged out, the volume will automatically set to level 15.

## TUNE INTO STATIONS

Press the [POWER] button to turn on your radio, then select your desired band by pressing the [FM], [MW]、 SW [ ∧ ] or [ ∨ ] button. In case of receiving FM/ SW broadcasting, fully extend the telescopic antenna for a better reception. When receiving MW(LW) broadcasting, please rotate the radio or change its location to achieve optimum reception.
Now, you can turn into your favorite stations with any of the below tuning methods:

### 1. ETM (EASY TUNING MODE)
ETM is the unique tuning method designed by Tecsun. It skillfully combines the reception circuitry & control procedure to pre-select the suspected radio station and temporarily auto stores them into the ETM memory (not the regular 550 memories). This highly enhances the efficiency when tuning into radio stations.
Please follow below steps to tune into your preferred frequencies employing ETM:

1. Press the [ETM] button followed by [ETM] appearing in the display to enter Easy Tuning Mode.
2. Press & hold the [ETM] button until the frequency start running to auto scan and store stations into ETM memory, within the present band.
3. When the frequency stop running, turn around the [TUNING] knob to select those stored stations.

flashing

Preset station number ETM

E041

ETM

107.50 MHz
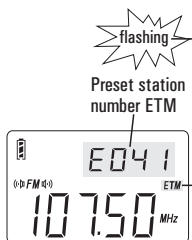
*Notes:* While operating ETM to search for stations, a few stations might be missed if there is interference in the surrounding. In this case, you can simply key-in the frequency, then press the [ETM] button to manually store it into ETM memory.

*Tips:*
**FM station:** When you are in a different city or country, you should perform the ETM function again in stead of using ATS function, because this will not delete any of the stations already stored within the memory.

**MW station:** It is recommendable to perform the ETM function during night time, because there are usually many stations starting broadcasting at night.

**SW station:** It is recommendable to perform the ETM function in the morning, afternoon as well as night time, because the transmitting signal of SW is very unstable and usually there are more stations that start broadcasting in the late afternoon.

## 2. MANUAL TUNING

Frequency searching: Press the [VF] button to switch into frequency mode, and then rotate the [TUNING] knob to select your desired station.

FAST/SLOW tuning is shown in the chart below for each band.

| step band | ▶ Slow tuning mode turning step | ▶▶ Fast tuning mode turning step |
|---|---|---|
| FM | 0.01 MHz | 0.1 MHz |
| MW | 1 kHz | 9 / 10kHz |
| LW | 1 kHz | 9 kHz |
| SW | 1 kHz | 5 kHz |

*Memory searching:* Press the [VM] button to switch into memory mode, and then rotate the [TUNING] knob to select those stored stations.

## 3. AUTO BROWSE STATIONS

1. Turn on the radio and press the [VF] button to switch into frequency mode.
2. Press & hold the [VF] button with [ ►► ] advancing to scan from one station to another, staying on each station for about 5 seconds.
3. To stop the auto browse function, simply press the [VF] button.
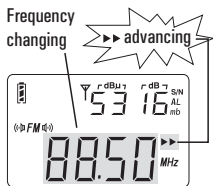
Auto browse stations

*Note:* While browsing stations automatically, you can press the [MEMORY] button at anytime to store the station into the memory, and the radio will keep on auto browsing the next available station.

# WORKING WITH STATION MEMORIES

There are in total 550 preset memories within the unit. 100 preset memories for each FM, MW, and LW band, and 250 for SW. You can use either of below methods to tune and store those stations into memories:

## 1. ATS (Auto Tuning Storage)
**FM ATS:**
1. Fully extend the telescopic antenna and press the [FM] button to select FM band.
2. Press & hold the [FM] button until "*PRESET*" flashing and the frequency advancing; now the unit starts scanning and storing all available stations into the memories. When the frequency stops advancing, it means the ATS operation has been done completely; you can rotate the [TUNING] knob to search around for those scanned and stored stations.

Station Storage #

flashing

*003*

PRESET

FM

*87.50* MHz
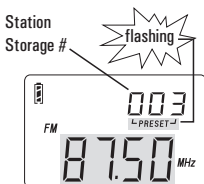
Auto Tuning storage (ATS) status

**MW/LW ATS:**
Press the [MW] button to select MW/LW band, then follow step 2 of FM ATS.

**SW ATS:**
Fully extend the telescopic antenna and press the SW[ ∧ ] or [ ∨ ] button to select SW band. There are two modes for SW ATS tuning:

**Mode A:** Press & hold the [ ∧ ] button to ATS the stations within present meter band.
**Mode B:** Press & hold the [ ∨ ] button to ATS the stations within all meter bands.

***Notes:***
1. During ATS process in FM, MW / LW or SW (mode B), pre-stored radio stations will be replaced automatically by the new searched stations.
2. With ATS in SW (mode A), those existing memories will not be replaced; all the newly found radio stations would be stored in the blank memory address.
3. If there is too many interference in you surrounding or many mirror/blank station are being stored during ATS, you should contract the telescopic antenna (FM & SW) or rotate the radio for better location (MW & LW).

## 2. STORING STATONS MANUALLY
1. Select band and tune to your desired station.
2. Press the [MEMORY] button with "*PRESET*" flashing
3. Press the [MEMORY] button again to store the station into memory.
   You can also wait for 3 seconds to auto store the station into memory.

## 3. SEMI-AUTO STORING STATION
While operating the While auto browsing the station, you can simply press the [MEMORY] button to store the station into memory to avoid storing unwanted stations and interfering signals.
1. Press the [VF] button to switch into frequency mode.
2. Press & hold the [VF] button with " ►► " advancing to auto browse from one station to another.
3. While tuning to your favor station, press the [M] button with "*PRESET*" flashing to direct store the station into the next available memory.  The unit will keep on browsing until you deactivate it by pressing on the [VF] button again.

## LISTENING TO STORED STATIONS

You can use either of below methods for listening to those stored stations:

**1. MANUAL MEMORY TUNING**
Press the [VM] button to enter the frequency mode, rotate the [TUNING] knob to tune into the stored stations one by one.



Memory address

address state
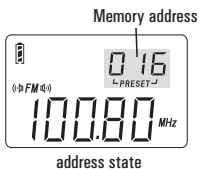
**2. AUTO BROWSE MEMORY**

1. Press the [VM] button to enter the frequency mode with "Memory Page" shows in the upper right corner of the display.
2. Press & hold the [VM] button until "*PRESET*" flashing to auto scan from one memory to another, staying on each station for about 5 seconds.
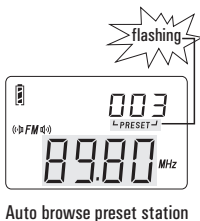
   To stop auto search memory, simply press the [VM] button.



flashing

Auto browse preset station

## DELETE MEMORY

Press the [VM] button followed by "Memory address" flashing on the upper right corner of the display to enter the [Memory] mode. You can follow either of the below methods to delete those unwanted stations:

### 1. DELETE A SINGLE MEMORY MANUALLY

Rotate the [TUNING] knob to select the memory that you want to delete, press & hold the [DELETE] button until "dEL" flashing; then immediately press the [DELETE] button to remove the unwanted memory address.
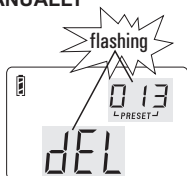
Delete a single station

### 2. SEMI-AUTO DELETE MEMORY

Press and hold the [VM] button until "PRESET" flashing to auto browse those stored stations, press the [DELETE] button at anytime to direct delete the unwanted station; the radio will keep on auto browsing the next available station until you press any other button to stop this function.

Delete memory

### 3. DELETE ALL MEMORIES MANUALLY

Press & hold the [DELETE] button for 3 seconds and notices "ALL" appears on the upper right corner of the display, then press the [DELETE] button to delete all memory within the selected band.
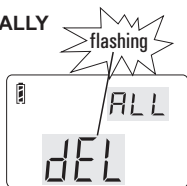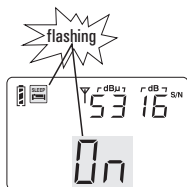
Delete all memories

Note:
1. If " $dEL$ " is flashing for more than 3 seconds without confirmation, it will exit the delete function automatically.
2. If the [DELETE] button has not been pressed within 3 seconds to confirm, it will exit the delete function automatically.

## SLEEP FUNCTION

1. Press & hold the [POWER] button until " ⬛ " and "On" or 1~120" shows on the display.
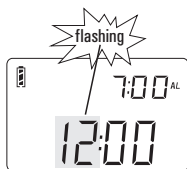
flashing

2. Rotate the [TUNING] knob immediately to select sleep timer from 1 ~ 120 minutes or select permanently " On ", then wait untill the radio auto turn on to confirm the setting.

```
┌─On ↔ 120 ↔ 90 ↔ 75 ↔ 60 ↔ 45─┐
└─01 ↔ 05 ↔ 10 ↔ 15 ↔ 30─┘
```
Sleep time range
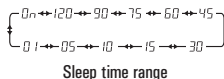
## CLOCK SETTING

1. Press & hold the [TIME] button until hour flashing, then rotate the [TUNING] knob to adjust the hour.
2. Then press the [TIME] button with minutes flashing, then rotate the [TUNING] knob to adjust the minutes while minutes is flashing.
3. Press the [TIME] button again to confirm the setting.

flashing

7:00 AL

12:00

※ If the [TIME] button has not been pressed again within 3 seconds, the unit will automatically confirm the setting.

# WORKING WITH ALARM

## 1. SETTING THE ALARM TIME

1. Press & hold the [ALARM] button with hours flashing on the display, then rotate the [TUNING] knob to adjust the hours.
2. Press the [ALARM] button with minutes flashing,   then rotate the [TUNING] knob to adjust the minutes while minutes is flashing
3. Press the [ALARM] button again, then rotate the [TUNING] knob to select from 1 ~ 90 minutes to set the "Auto Alarm Off" Timer.
4. Press the [ALARM] button to confirm the setting.
5. To turn off the alarm, press the [ALARM] button repeatedly with " 🕉 " disappears.

※ If the [ALARM] button has not been pressed again within 3 seconds, the unit will automatically confirm the alarm setting.

## 2. HOW TO SET ALARM BY RADIO

You can preset the alarm station following below steps:

1. Turn on the radio, then tune into your favorite station for the alarm by radio and adjust your desired alarm volume level.
2. Press the [MEMORY] button followed by " *PRESET* " flashing in the display, then immediately press the [ALARM] button and notices " 🕉 " appearing in the display to confirm the preset alarm station.
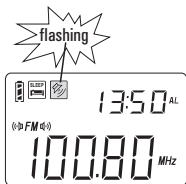
**3. HOW TO TURN OFF WHEN ALARMING**
Press the [POWER] button once to continue listen to the radio; press twice to turn it off.

*Note:* If the preset alarm is activated when you are listening to the radio, it will auto switch to the preset alarm station.  The unit will auto turn off after alarming.
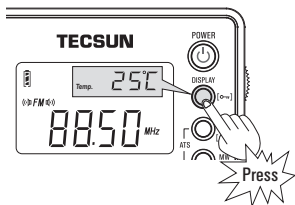
## HOW TO CHANGE THE DISPLAY MODE

**With radio OFF:**
Repeat pressing the [DISPLAY] button to view temperature or alarm time display.
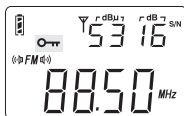
**With radio ON:**
Press the [DISPLAY] button to view local time, alarm time, temperature or signal strength/ SNR showing on the upper right corner of the display.

## KEY-LOCK FUNCTION

Press & hold the [ 🔒 ] button until " 🔒 " symbol appears on the display to activate the key lock function.
Press & hold it again until the " 🔒 " symbol disappears to deactivate the locking function.

## FM ST  (FM STEREO)

While listening to FM stereo stations, press the [FM ST] button followed by " (《🔊》 " appearing in the display to activate the
" *STEREO* " listening. If the received FM broadcast signal is too weak, it is recommendable to turn off the stereo function by pressing the [FM ST] button again with " (《🔊》 " disappears.

*Note:* The stereo function will not be activated if the FM station is not stereo broadcasting.

## AM BW (BANDWIDTH)

Repeat pressing the [AM BW] button to select your desired 6,  3, 2, 1 kHz bandwidth.

**Wide band:** It has better audio fidelity when receiving strong signals or local stations.

**Narrow band:** It is suitable to receive weak & long distant stations as narrow band is able to limit the interference from adjacent strong signal and reduce background noise.

## SYSTEM SETTING

**1. SETTING FM FREQUENCY RANGE:**
In radio off mode, press & hold the [FM] button until 87.5-108MHz, 64-108MHz, 76-108MHz, or 87-108MHz appears in the display. Quickly keep pressing on the [FM] button to select a suitable frequency range for your local FM.

**2. TURN ON/OFF THE LW:**
With radio off, press & hold the [MW/LW] button until "LW ON" or "LW OFF" appears on the display to turn ON or OFF the LW respectively.

**3. HOW TO TURN ON/OFF THE INTELLIGENT LIGHTING:**
This radio has an intelligent lighting function with which the back light will be on for 3 seconds when operating any keys or knobs.
Press and hold the [LIGHT SET] button until the light flashing and follow with "OFF/ON" shows on display.

**4. SETTING MW (AM) TUNING STEP:**
With radio off, press & hold [9/10 kHz] button until "9kHz" or "10kHz" appears on the display to select your desired AM tuning step

**5. TEMPERATUE:**
When the AM tuning step is 10 kHz, the temperature display will auto switch to Fahrenheit (℉).
When the AM tuning step is 9 kHz, the temperature display will auto switch to Centigrade (℃).

## 6. TURN ON/OFF THE CHARGING FUNCTION & EXCHANGE THE BATTERY CONSUMPTION DISPLAY:

With radio off, press & hold the [▭] key until " $CHR\ On$ " & " $Ni\text{-}MH\atop Battery$ " show on the display to activate the consumption display of rechargeable batteries and the built-in charging system. Press & hold the [▭] key until " $Ni\text{-}MH\atop Battery$ " showing and " " disappears to activate the consumption display of regular batteries and turn off the built-in charging function.

## INTELLIGENT CHARGING FUNCTION

With radio off, install 2 x UM3 (AA) rechargeable batteries
& then press & hold the [ ▭ ] key until " $CHR\ On$ " and
" $_{Battery}^{Ni-MH}$ " displaying to activate the built-in charging function.
Use the 5V external adaptor with USB plug to connect with
the radio. The symbol " ▯ " will advance from the bottom
to top during power charging. It stops when all batteries are
fully charged.



Connect 5V external adaptor with USB plug
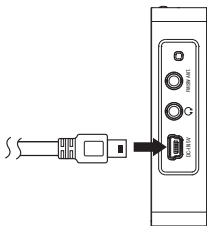
### Notes:
1. Insist to use up all power of the rechargeable batteries
   before charging again. This could extend the life time of
   the battery and keep it in good conditions.
2. Two batteries should be used as a group and do not
   apply them for other usage. Also do not mix the batteries
   with different power capacity.
3. Do not charge any non-rechargeable batteries in the
   radio, this will cause a hazard or damage to your radio.

## HOW TO IMPROVE FM / SW RECEPTION

**METHOD 1:**
Connecting the External Telescopic Antenna to extend the length of the built-in FM/SW antenna to further enhance the FM/SW reception.  See below:

External Telescopic

Connecting the External
Telescopic Antenna
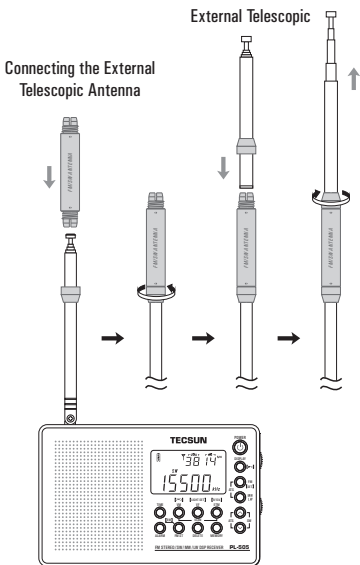
**METHOD 2:**
Plug in the External Wire Antenna to the [FM & SW] antenna jack of this radio, and then hang its end outside the window for better reception of FM and SW.



Wire antenna

Window

External wall
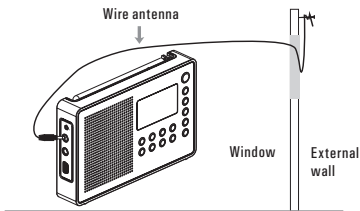
⚠ Caution: Do not install any external antenna at the area with thunder & lighting!

## IMPORTANT MATTERS FOR USING BATTERIES

1. If no battery has been installed for a long time, the clock of the radio will stop working. However, those pre-stored frequencies are still kept. The clock will work again after new batteries are installed.
2. When the battery power is low, the " ⬚ " symbol on the display will flash to alert you to exchange to new batteries. It will turn off automatically when the power is gone.
3. Mixing the used & new batteries may cause damage to the radio and also display the power capacity incorrectly.
4. In case the radio will not be used for a long period, take out the batteries to prevent liquid leakage that may damage the radio.

# TROUBLE SHOOTING

| QUESTIONS | ANSWERS | SOLUTIONS |
|-----------|---------|-----------|
| Can not turn on the radio. | -No power from the batteries. <br>-Didn't install the batteries properly. <br>-Power button is locked. | -Replace to new batteries. <br>-According to "+" or "-" sign to install the batteries again. <br>-Press the [ 🔒 ] button to unlocked. |
| Radio turns off when you are listening. | -No power from the batteries. <br>-Sleep timer is activated. | -Replace the batteries. <br>-Turn on the radio again. |
| Can not store some stations using ATS <br>Some stations store with noise using ATS. | -Frequency of stations are too weak. <br>-There is interference nearby. | -Search the stations manually. <br>-Low down the antenna or move to another location and try again. |
| Only limited FM stations can be received in Japan. | -FM frequency is 76~90MHz for Japan. | -Turn the radio off and press & hold the [FM] button, press [FM] button again to select 76~108MHz. |
| Receiving very poor AM in USA. | -USA uses 10kHz step for AM. | -Turn off the radio press the [9/10kHz] button to select 10kHz. |

| QUESTIONS | ANSWERS | SOLUTIONS |
|---|---|---|
| When the alarm is activated (alarm by radio), there is only noise with the broadcast. | -Did not set the proper radio station for the alarm.<br>-Or there is no broadcasting at that radio station.<br>-Or you are in an area where there is no radio station for your preset frequency. | -Preset your alarm station properly (see the above setting).<br>-Make sure there is a radio broadcast in your location. |
| Radio malfunction. | This may be caused by interference, and the computer microchip does not function properly. | Remove the battery, then re-install them. If it is still not able to work, please contact your nearest dealer for customer service. |

www.tecsunradio.com                    hch@cantonmade.com