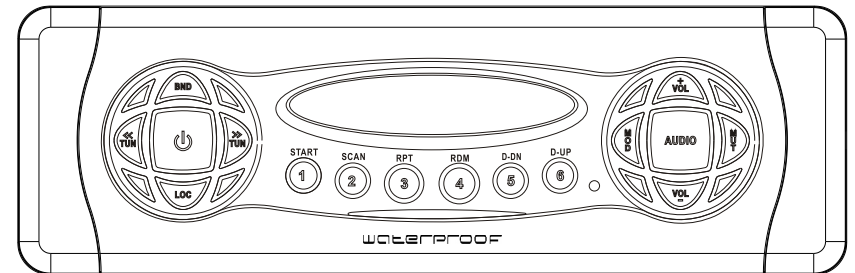


OWNER'S MANUAL

MS160

Your MS160 radio is designed to control an optional 10-Disc CD changer (Model ACC56M). If you are interested in purchasing this CD changer, please visit your local marine dealer. Professional installation of the CD changer is recommended.



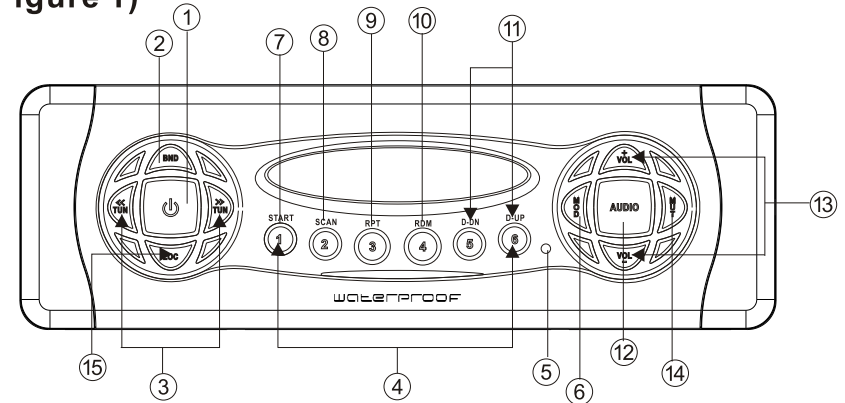
ASA
The Mobile Electronics Company
AUDIOVOX SPECIALIZED APPLICATIONS, LLC
www.asaelectronics.com

***Electronically-Tuned
AM/FM/ Radio With
CDC Control***

Made in China

FACEPLATE CONTROLS DIAGRAM

(Figure 1)



- ① **POWER ON/OFF**
Press once to turn the POWER ON/OFF..
- ② **BAND (AM/FM BAND) SELECTOR**
During radio play, each time the BND button is pressed, the radio band changes. The indications FM1, FM2 and FM3, AM1, AM2 will appear on the display panel according to your selection. During FM operation, when the station is broadcasting in stereo, the stereo icon appears on the display, together with an ST indication. During AM operation, no indications are displayed. During CD play or AUX mode, pressing this button will change to radio operation without ejecting the disc.
- ③ **MANUAL UP/DOWN TUNING, STATION SEEK AND TRACK SELECTION**
Each time the Up Tuning side of the button is pressed, the radio will tune one frequency step higher. Similarly, each press of the Down Tuning side of the button will tune one frequency step lower. To manually tune in a station, press the appropriate directional side of the button until the desired frequency is reached. Pressing and holding either side of the button for longer than 2 seconds will cause the radio to continue tuning rapidly in the selected direction until the button is released, at which point it will seek the next available station and stop. During CD play operation, momentarily pressing and releasing either side of the button will increase or decrease CD track selection in sequence. Pressing and holding either side of the button for longer than 2 seconds, will cause the elapsed time of the current track in play to increase or decrease accordingly.
- ④ **STATION PRE-SET MEMORIES**
To set any of the 6 pre-set memory buttons, use the following procedure:
 1. Turn the unit on and select the desired band.
 2. Select the first station to be pre-set using the Manual Up/Down Seek Tuning functions.
 3. Press the pre-set button to be set and continue to hold the button in. The pre-set number will appear on the display panel. The station is now set into the memory of that pre-set button and can be re-called at anytime by momentarily pressing that button. 4. Repeat the above procedure for the remaining 5 pre-sets on the band in use and for the other 4 bands of the unit.

⑤ **RESET BUTTON**

A RESET button is located on the front of the chassis. The re-set circuitry is provided to protect the microprocessor circuitry and should only be activated under the following circumstance: If there is a malfunction of the switches on the unit or the CD player, pressing the RESET button may clear the system and return to normal

⑥ **MOD BUTTON**

Pressing this button to cyclically change function Radio-CD-Aux-Radio

⑦ **START BUTTON (M1)**

Pressing this button during CD play will set the unit to play from beginning of track 1.

⑧ **SCAN BUTTON (M2)**

To "Intro" each song on the disc for 10 seconds, press the "INTRO" button. INT will appear in the display area. To turn off this feature, press the "Intro" button again. The indicator in the display will be off.

⑨ **TRACK REPEAT PLAY SELECTOR (RPT) (M3)**

During disc play, press this button to repeat the play of the selected track (RPT will appear on the display panel). Play of the track will continue to repeat until the button is pressed again and the RPT indication disappears from the display panel.

⑩ **RDM BUTTON (M4)**

To play the songs on the disc in a random order (other than the original recorded order), press the "RANDOM" button. To turn off this feature, press the "RANDOM" button again. The indicator RDM in the display will be off.

⑪ **DISC UP/DOWN (M5/M6)**

This key is for search up and down the disc of magazine in the CDC mode.

⑫ **AUDIO SELECT KEY**

This key select audio mode as shown in below sequence. If no volume up/down key is pressed in bass/treble/bal/fad mode, it is returned to volume select mode (initial) 5 seconds later.



⑬ **VOLUME**

Increase or decrease the volume by pressing "+" or "-". The volume + or - keys can also be used to adjust the bass/treble/bal/fade controls in the same manner.

⑭ **MUTE KEY**

* This key is used in any mode to mute audio output. In the mute state, "MUTE" flashes in the display and all 4 channels of the audio output are muted.

* The mute function is released by pressing any of the following buttons: mute, power, volume up or down, loud, or turning the vehicle off.

⑮ **LO/DX KEY**

* This key is valid in radio mode and toggles LO/DX output and 'LOC' display.

Local : LO/DX output=High, 'LOC' on
Dx (initial) : LO/DX output=Low, 'LOC' off

APPLICATION NOTES

This note will discuss DC Power sources and how they relate to 12 volt products.

General Specifications

Our general specification for the voltage range of operation is 10 to 16 volts DC .

Voltage

The voltage of a fully charged battery (engine not running) is approximately 12.5 VDC. Once a load (items being powered represent the "load") is applied , the voltage will drop. How much the voltage is reduced will depend on the following:

1. Current draw (amount of amperage) The higher the draw the greater the voltage will drop.
2. The size and length of the conductor (wire) supplying power.

Converters

Many boats incorporate convertors as a source for 12VDC when connected to shore power (110-120 VAC).Some convertors put out a very clean DC supply where others may have a considerable amount of AC ripple noise under maximum load.

The AC ripple noise is filtered by the boat battery when connected into the circuit , but when the battery is disconnected the amount of AC ripple noise can create major problems for audio products. Noise may result and the line fuse may fail

Ignition systems

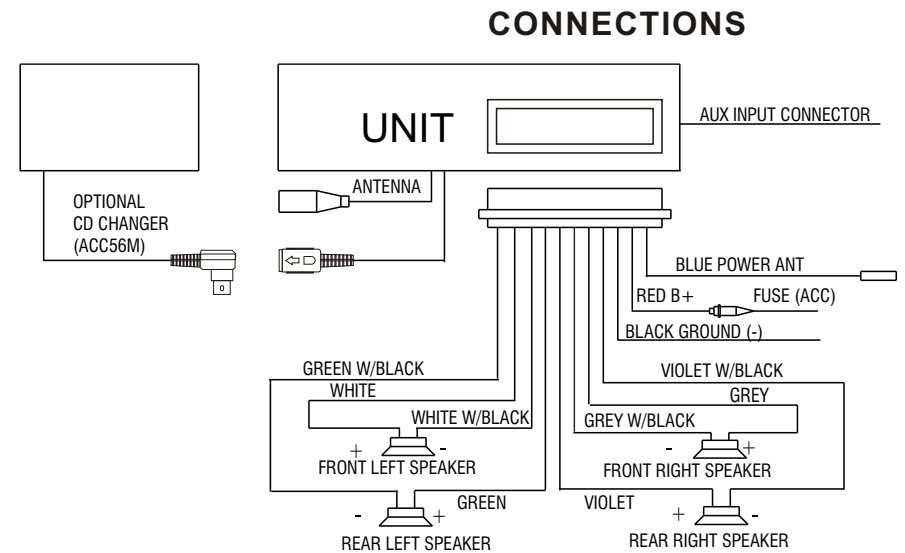
Unwanted noise generated from ignition systems used to be a big problem. However, with more sophisticated filtering circuits designed into audio/video products, these problems are not as wide spread

Changes in wire harnessing also has contributed to the decline of application problems. Use the same ground point for all related products. This will greatly reduce the potential for unwanted noise.

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WIRING DIAGRAM

(Figure 2)



SPECIFICATIONS

Size:	7"(W) x 2" (H) x 6 1/8"(D) 178mm x 50mm x 166mm
Operating Voltage:	12VDC, Negative Ground
Output Power:	4x25W Max. Stereo Power
Output Impedance:	Compatible with 4 or 8 ohm speaker.
Tuning Range:	(AM) 530-1710KHz (FM) 87.5-107.9MHz
Sensitivity:	(AM) less than 25uV (FM) less than 5uV
FM Stereo Separation:	More than 23 dB
Frequency Response:	50-10000Hz

TROUBLESHOOTING CHART AM/FM RADIOS

Symptom	Cause	Possible Solution
No Power	No 12VDC	Check circuit fuse at source Check in-line fuse on power lead Power lead disconnected Ground connection disconnected
Power indicated; no audio output or very distorted sound	No 12VDC to memory lead (electronically tuned units only)	Circuit fuse at source In-line memory lead fuse
	Speaker Output shorted	Check continuity of speaker leads to ground
	Speaker out cross channeled	Check for proper speaker wiring Note: Radios have a sticker on them explaining wiring color code.
Only one channel (right or left side)	Radio Balance	Check radio function
	Speaker Disconnected	Check speaker connection at radio and/or speaker
	Speaker lead shorted or grounded	Check speaker wiring continuity to ground w/tester or meter
Popping in one or both channels	Speaker wiring shorted or positive lead grounded Speaker terminals grounded or shorted	Leads from speaker cone to terminal touching metal basket or speaker
No AM Reception	Antenna disconnected	Connect Antenna
	Antenna mast grounded or shorted	Check antenna or substitute with antenna known to be good
	Antenna center lead broken	Check antenna or substitute with antenna known to be good
	NOTE: Antenna leads can be tested with continuity or multi-tester. Some may have electronic component (capacitor) built in which not allow it to be tested.	

APPLICATION NOTES

AM/FM RECEPTION

Some boats have more than one AM/FM radio. The best way to insure good reception is to supply a separate antenna for each radio. Other options available to supply adequate AM/FM reception to these radios are listed below, along with some general information in regards to radio reception.

"Y" ADAPTORS

The "Y" adaptors used to connect one antenna to two radios will compromise both AM and FM reception.

AMPLIFIED AM/FM ANTENNA

A popular second antenna that can be used is our AB-100 amplified AM/FM antenna. It is small and has a retractable mast that can be mounted vertically or horizontally. This antenna provides good FM reception, but the AM reception will be compromised to some degree because of the length of the mast.

MAST LENGTH

AM/FM antennas compromise AM reception by design. The optimum mast length for FM is approximately 30 inches which is the standard for most automotive antennas. The optimum mast length for AM reception is over 100 inches which is not practical for mobile applications.

Special circuitry in electronic tuned radios or AM trimmers in mechanically tuned radios, make up for some of this difference in optimum mast length for AM reception.

ANTENNA CABLE

Increasing the antenna lead cable (adding extensions) will reduce sensitivity of AM with electronic tuned radios.

GROUND PLANES

Ground planes are also important when considering antenna performance. Most automotive antennas are designed to be mounted on the metal body of the vehicle.

The metal body reflects the signal interference generated by the vehicle's electrical system while it also provides the ground for the antenna lead shield. All this is necessary in order to maintain a good signal, especially AM.

FM RECEPTION

FM reception can be received with a very limited antenna and strong local FM stations can be received without an antenna, depending on the circumstances.

CONCLUSION:

AM/FM reception is subject to the choice of an antenna and its application. There can also be a variety of methods used to supply signal to both primary and secondary radios, but AM performance is the ultimate "test"