# Mr.Heaterbox
& Interior Restoration Services

AM/FM Radio Conversion
+ Bluetooth/USB/Delay Module
User Guide

Welcome to Your Newly Converted
AM/FM /Bluetooth/USB Radio with Delay Module
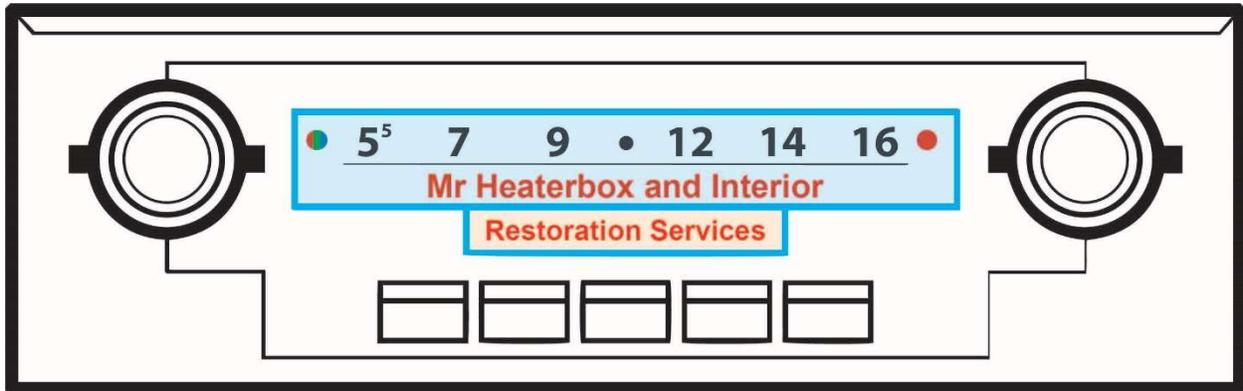
Basic Radio:

Basic Radio Control Actions

Virtual Fader	Virtual Balance
Loudness Toggle On/Off	AVC Toggle** On/Off
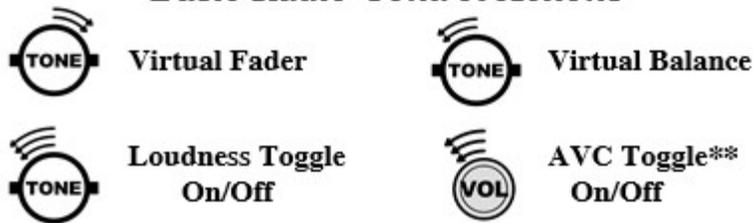
Auto Scan Action (standard tuner)

Start Scan   Stop Scan   Cancel Scan
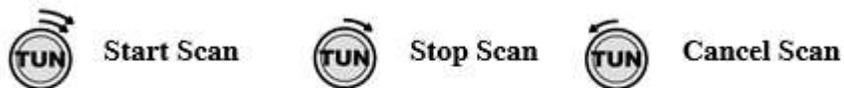
When in radio mode, double twist the tuning knob to start a scan. (The dial pointer will not move while scanning) To stop on a station, turn the tuning knob. The station will be temporarily stored. To find the actual station on the dial, turn the tuning knob within 5 seconds of stopping the scan. When turing the dial in the correct direction, the radio will mute until the station is found.

Bluetooth:

Bluetooth/USB Control Actions

(VOL)	Pair/Voice Command Conference Call	(VOL)	Pause/Play Music Mute/Unmute Call
(TUN)	Next Song Accept Call	(TUN)	Previous Song Reject Call
(TUN)	Next Album (USB sequential*)	(TUN)	Previous Album (USB sequential*)

Note: To perform an Action, <u>smoothly twist</u> the control forwards and back in a continuous motion as shown by the arrows, repeating for the number of arrows shown.

Optional Bluetooth/USB Pushbutton Actions

⊥	Pair/Voice Command Conference Call	⊥	Pause/Play Music Mute/Unmute Call
↓	Next Song Accept Call	‖	Previous Song Reject Call
↓⊥	Next Album (USB sequential*)	‖⊥	Previous Album (USB sequential*)

↓ Quick press   ⊥ Press 1 second   ⊥ Press & hold

Optional Pushbutton Support

The optional push button (if installed) can be used when music is playing.
A simple short press will advance to the next song in order and a double press will go back to the beginning of the song or two quick double presses will go back to the previous song.

Welcome:

Thank you for allowing us to convert your AM radio to this state-of-the-art AM/FM receiver with Bluetooth, USB music support, 2A phone charging and many more advanced functions. Great care has been taken during the conversion process to install all components, wiring and hardware in a manner that will produce a product that will give amazing radio reception and years of service.

As an extra feature all radios converted by Mr Heaterbox and Interior Restoration services have had the volume control switch fully disassembled, cleaned and rebuilt. This is a high wear and tear item and is usually something that most builders forget to attend to. Over time the lubrication grease hardens and the internal contacts can be tarnished or corroded. By rebuilding you switch you can be certain that your newly converted radio will function for many years without problems.

Should your radio be a Mopar thumbwheel radio then we have also repaired or performed a preventative maintenance on the main tuning gear which is often problematic in this style of radio.

We pay attention to the little details so that you can have a trouble-free ownership experience.

The actual radio module has excellent reception. In some cases, this radio module used in your conversion will pull in more FM stations that brand new model car radios. One thing that is important to understand is that an antenna is not just an antenna. Typically, an AM antenna and an AM/FM antenna are different items from an electrical standpoint. If you are returning this radio to a car that was originally and AM radio only car and you find that you are having reception issues, then it is almost certain that your original radio antenna on the car is not compatible with the AM/FM requirements of your newly converted radio. If this is the case, please contact your preferred restoration parts supplier and purchase a reproduction AM/FM antenna to install. Even if you radio is working fine, you might be surprised at how big a difference a specifically made AM/FM antenna will make.

(As a side note if you have an old parts book for your classic car often you will find a totally different part number for an AM/FM antenna compared to that of an AM only antenna).

Before your radio has left our shop, it has undergone a full quality control inspection and EVERY function right down to the dial lamp has been checked and tested for proper operation. Additionally, it has been run for 12-24 continuous hours at a high output level to ensure that everything is working well and stable.

The first page of this manual shows you visually some of the impressive new features that your radio now has in terms of operation.

Unless you have requested otherwise, all of our radio conversions come with an RGB coloured MODE LED on the left and a RED STEREO RECEPTION LED on the right.

Depending on your radio configuration the possible Mode Colours are as follows:

AM = Red, FM = Yellow, Bluetooth = Blue, USB = Magenta, Aux I/P = Green

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All radios (unless requested otherwise) come with a 3.5mm – 1/8" stereo mini-jack Aux Input which is compatible with all phones and most other audio devices and players. To select this AUX I/P to play so that you can hear the music from the device plugged into it, simply tune your dial tuner all the way down to the lowest (leftmost) end of the radio dial. Soon as you do this the Mode LED will turn GREEN and your music will play. Its always a good idea to program the left most pushbutton on your radio to this point so that you can use it to instantly select and activate the AUX I/P. To deselect the AUX I/P simply tune off the end and up the radio dial.

If the Radio is playing an FM station (Mode LED is YELLOW) and you wish to go to the AM Dial, simply turn the power switch off and back on quickly and the power cycle will enable the AM band and the Mode LED will display RED. To go back to FM, once gain do the power cycle. Its pretty easy and quick to get used to !!

With our AM-FM radios with Bluetooth and USB we always include two additional options for your convenience and ease of use.

The first feature is a Courtesy (Delay) Module. The Courtesy Module allows the radio to keep playing or the Bluetooth connection (ie phone call) to keep functioning even after you have parked and turned the ignition off. The maximum delay time is 15 minutes or until you open the car door or until you physically turn off the radio (whichever comes first).

The Bluetooth module is fully Bluetooth V5 compatible, so if you phone supports this level you have a ton of great features you can use. However if your phone is Bluetooth V4 or even V3.1, no worries the Bluetooth module in your phone is fully backwards compatible, the only thing you will notice is that you will have fewer advanced Bluetooth features available to you. To determine your phone/device's Bluetooth level, simply go to the manufacturer's website for the device and review the published specifications.

With Bluetooth V5 you get the ability to use the following features:

- Phone Pairing/Calling
- ACC High Quality (Definition) music file format support
- Support for up to 8 devices with last 4 automatically selected between

- Conference Calling (in addition to answering multiple calls and hold/mute functions)
- Voice Command (if supported by phone for voice dialing, call answer etc.)
- Music streaming

As part of the radio package we also give you a lighted pushbutton that you can optionally install in your vehicle. While the lighted pushbutton is not totally necessary, it can make access to some advanced features quicker and easier to use. This is optional, so if you don't have room or want to install it you will still have access to every feature the radio comes with. On the second page of this manual you will see a visual graphic of how the pushbutton can be used. Please not that the pushbutton's presence is scanned by the radio's microprocessor chip, so it must be installed before the radio is powered on in order for it to be recognized and automatically configured for use.

Another nice part of your radio package is the pre-installed internal (hidden) microphone. Great care has been taken in the optimum placement of the hidden mic and most people will find it totally sufficient for their purposes. However, an optional use wired microphone is supplied with your radio kit that can be clipped to your sun visor or mounted to your window A-Post pillar should you wish to use it. It simply plugs into the labelled jack beside the optional pushbutton. Please make sure you plug the correct device into the correct 3.5mm jack in order for it to function. No damage will occur if you get it wrong, simply that feature won't work! When using Bluetooth features with your radio (such as pairing, calling etc) you will notice that the Mode LED on the front panel of the radio will be BLUE in colour.

If all these features weren't enough you also have a USB Dongle installed with your radio. This dongle/USB Port can be used to play music pre-loaded onto a memory stick or to simply charge your cell phone. The radio supports high current changing and will output up to 2.1A for fast charging devices. When using USB music playlist features with your radio you will notice that the Mode LED on the front panel of the radio will be MAGENTA in colour.

The following is the list of features supported by the USB port in your radio:

- Standard USB 2.0 port
- Supports all USB charging modes; SDP, CDP and DCP
- Full 2A charging current
- Charging continues even if radio is turned off
- Supports for high quality AAC, MP3, Ogg Vorbis and FLAC codecs
- Backward compatible to USB 1.0, 1.1
- Handles up to 2000 folders and 65,535 files
- USB A connector can be extended using standard USB extension cable

If the dongle cable for the USB port is too short you may add a 3ft USB extension cable (not provided in kit). A high-quality cable is suggested (they are not all made alike though they do look

similar) if you wish to take advantage of the full 2A charging capability of the radio. Cables longer than 3ft can be used but they often reduce the maximum charging rate of the phone.

Speaker Selection & Configuration:

This radio conversion (unless otherwise requested) supports up to 4 speakers simultaneously driven. The computer in the radio module AUTOMATICALLY senses speaker connections at power on and configures the radio to use them. If there is a shorted speaker connection, no damage will happen (the radio will simply shut down that channel) and the VOICE HD feature will audibly tell you which speaker is the problem.

This radio conversion supports ONE, TWO THREE and FOUR speaker configurations.

The two and four speaker configurations are pretty standard ie. a pair of speakers for the front and a pair of speakers for the rear.

Here is how to wire a one speaker and three speaker configurations. Note the polarities and which channels used:
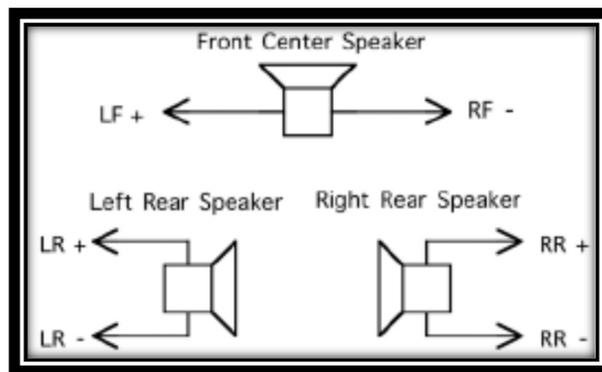
Your new radio works best with up to FOUR 4 ohm impedance loudspeakers but (up to four) 8 ohm speakers work fine too. 2 ohm speakers are supported but be aware that you can only use a maximum of TWO of these speakers. The impedance of a loudspeaker is generally written on the box (if purchased new) or the metal frame that holds the speaker cone (if using an existing speaker). Remember the better your speaker the better your radio will sounds, so now is a good time to upgrade those speakers if you have time and budget!

Wiring Connector:

Your radio comes with a 12 pin molex style (brand) connector for speakers and power connections. You will have one connector wired directly to your radio and the other one intended to be integrated into your car's under-dash wiring connected to it. Wire assignments are as follows.

Please note that a radio specific wiring diagram has been attached to the top case of your radio. If there are any discrepancies between the information below and that which is printed on the radio case label, the radio case label takes precedence.

Wiring Harness Connections:

Red*	Continuous Battery
Blue	Switched 12V (ignition switch)
Orange	Dial Lamp
Black	Door Open Switch
Green	Left Rear +
Green/Black	Left Rear -
Violet	Right Rear +
Violet/Black	Right Rear -
White	Left Front +
White/Black	Left Front -
Grey	Right Front +
Grey/Black	Right Front –
Radio Case/Chassis	GROUND **

* For circuit protection there is a 10 Amp 12V blade type ATO automotive fuse installed in the rubber holder in the RED main power wire

** The Radio metal radio case/chassis must be connected to a solid metal vehicle ground connection. If unsure, please use a multimeter to ensure good ground continuity or attach a ground strap from the radio mounting bolt to a solid known ground connection!

We suggest using soldered connections with heat shrinkable insulation tubing/sleeving installed over top. Crimp connectors will work but are often a source of problem in the long term. The extra few minutes it takes to make good solder connections can save hassle and irritation in years down the road.

APPENDIX – A –

Radio Functions Explained in More Detail:

Virtual Balance:

Virtual balance/fader controls will be enabled when physical controls are not present. By quickly twisting the tone control back and forth twice to the LEFT the tone control temporarily becomes the balance control. This will be confirmed by the FMR-radio by speaking "balance adjust" signifying a virtual balance setting is in progress. The user can then turn the tone control to adjust the balance. As long as the tone control is moving, the FMR-radio will continue to adjust the balance. Once the desired balance setting is obtained, the FMR-radio waits a few seconds and then confirms the setting by playing a confirmation beep tone. The tone control then reverts back to its normal operation.

Virtual Fader:

The virtual fader control is entered by quickly twisting the tone control back and forth twice to the RIGHT, the tone control temporarily becomes the fader control. This will be confirmed by the FMR-radio by speaking "fader adjust" signifying a virtual fader setting is in progress. The user can then turn the tone control to adjust the fader. As long as the tone control is moving, the FMR-radio will continue to adjust the fader. Once the desired fader setting is obtained, the FMR-radio waits a few seconds and then confirms the setting by playing a confirmation beep tone. The tone control then reverts back to its normal operation.

Loudness Mode:

Loudness Contouring can be enabled and disabled in a similar manner. Quickly twist the tone control back and forth three times to the LEFT to toggle the Loudness ON and OFF. *Voice Assist HD* will announce the change

Automatic Volume Control:

The optional Automatic Volume Control that is sensitive to engine rpm can be enabled and disabled similarly. This feature will automatically increase radio volume slightly as engine RPM increases. Quickly twist the volume control back and forth three times to the LEFT to toggle Automatic Volume Control on and off. *Voice Assist HD* will announce the change. Note: the engine must be running for this change to take effect.

Digital Scan for Channels:

On manually tuned radios, to start a scan, double twist the tuning control to the RIGHT. (the front panel status LED will slowly pulsate) The radio will seek to the next station, pause for 8 seconds, and then seek to the next station continuously. (the dial pointer will not move during this scan). To stop on a station, simply turn the tuning control to the RIGHT. The front panel LED will then pulsate faster. If you do nothing in the next 5 seconds, the radio will hold the station until you press one of the tuner presets, turn the tuning control, or turn the radio off. If you want to find the actual position of the station on the dial, turn the tuning control to the right within the 5 second period. You can then start to tune toward where the station is on the dial, if you are going in the wrong direction the station will just continue playing. If you are going in the correct direction, the radio will mute and then unmute once the station position is found. The scan can be canceled by pressing one of the tuner preset buttons on the radio or turning the tuning control to the LEFT.

Speaker Selection/Configuration:

The radio through the use of a digitally controlled power amplifier, detects at turn-on which speaker outputs are connected. No settings during configuration are required, and the user can change the attached speakers at anytime and the radio will make the appropriate adjustments to mono/stereo operation and whether a Operation and whether a balance and/or fader control is required.

- The radio supports up to four 4 ohm speakers or two 2 ohm speakers. DO NOT connect four 2 ohm speakers!
- For a single speaker installation, the speaker can be connected to any one of the 4 speaker outputs. The radio will automatically enter the mono mode and no balance or fader control will be enabled.
- If a speaker is detected on at least one of the left channel outputs and one of the right channel outputs, stereo mode will be enabled.
- If a speaker is detected on both the left and right front pair or left and right rear pair the balance control, physical or virtual, will be enabled.
- If a speaker is detected on either front channel and either rear channel the fader control, physical or virtual, will be enabled.
- If three or four speakers are detected, both the balance and fader controls will be enabled.

With the flexibility of this system, original balance and or fader controls can be made to operate as desired just by connecting speakers to the appropriate outputs. The radio's internal software configuration program takes care of the rest!

Overheat Situation:

During normal operation, if the radio detects that it is becoming to hot, the Voice Assist HD will announce it. No damage will occur to the radio and

operation will be unaffected unless this condition continues to get worse at which time the radio will start to limit the output power to the speakers. It will continue to lower the output power until the temperature is brought back under control.

APPENDIX – B –

Bluetooth Functions Explained in More Detail:

Overview:

- Bluetooth version 5.0 certified
- Backwards compatible with Bluetooth version 3.0/2.1+EDR, 1.2 and 1.1
- Supports high quality AAC and standard Bluetooth SBC codecs If the music is stored as high quality AAC files (like those used by iTunes®) it will be played back without conversion to the lower quality SBC format
- Has Bluetooth Voice Command feature to allow the user to control their compatible Bluetooth device through voice commands. The Voice Command feature is accessible in all radio modes. It is designed to work with Apple Siri®, Google Voice®and Microsoft Cortana® and other compatible Bluetooth voice interfaces.
- Automatically reconnects to any of the last 4 connected devices
- Up to 8 devices can be paired with the BT-2.5
- Supports multiple phone calls and conference calling
- Automatically continues on last song when turned on
- Optional pushbutton for Pairing, Voice Command, next/previous, play/pause, call accept/reject, mute with illuminated in pushbutton which gives user feedback to operational status
- Built in internal microphone, with optional use external microphone

Pairing:

- To pair a new device, twist the volume control back and forth twice towards the direction of higher volume. (this is the same action that is used with the tone control to access the virtual fader function) or push and hold the optional pushbutton
- The front panel status LED will turn BLUE or optional pushbutton LED will illuminate to signify the start of pairing activity
- it will then go into pairing mode for approximately 90 seconds or until a device is paired
- your device will display AuroraDesign BT-x.x (x.x represents the version number)

Connecting:

- The radio will automatically attempt to reconnect to the last connected Bluetooth device and if this device is not within range, it will then attempt to reconnect to any of the last four connected devices.
- The front panel status LED will turn BLUE or optional pushbutton LED will illuminate to signify a Bluetooth device

Voice Command:

- To initiate a Voice Command, twist the volume control back and forth twice towards the direction of higher volume or push and hold the optional pushbutton. (this is the same motion that was used to open up pairing)

- Wait for the confirmation tone from the Bluetooth device and then speak the commands

- For example you can say things like "call home" or "play Bruce Springsteen". Check with the manual for your Bluetooth device for further information on its support for voice commands.

Audio Levels:

- The radio sends commands to the connected Bluetooth device to adjust the playback audio levels, but many devices require that the user make these settings manually.

- Usually the playback levels for audio streaming, phone calls and Voice Command are all stored separately so must be adjusted separately.

- The first time you stream audio, take a phone call, or use the Voice Command feature, use the volume buttons or volume slider menu on the device to adjust the audio level. This only needs to be performed once on the device as these settings are permanently saved in the device.

Streaming Audio:

- To start playing music, twist the volume control back and forth twice towards the direction of lower volume or push and hold the optional push button. (you can also use the menus on your Bluetooth device to control the audio)
- To toggle between pause and play, repeat the instructions above. When the audio is paused, the radio status LED will blink slowly.

- To skip to the next song, twist the tuning control towards the high frequency end of the dial or quickly press the optional pushbutton/seek-button once.
- To skip to the previous song, twist the tuning control towards the low frequency end of the dial or quickly press the optional pushbutton/seek-button twice.

Handling Phone Calls:

- When a phone call comes in, the radio will mute the program/music and ring through.
- To accept the call, twist the tuning control towards the high frequency end of the dial or quickly press the optional pushbutton/seek-button once.
- To reject or end a call, twist the tuning control towards the low frequency end of the dial or quickly press the optional pushbutton/seek-button twice. (A Voice Assist message to this effect will be heard)
- If a second call comes in, a tone will be heard. The call can be accepted or rejected in the same way as above. If the second call is accepted, the first will be placed on hold.
- You can toggle between the calls by twisting the tuning control towards the high frequency end of the dial or quickly pressing the optional pushbutton/seek-button once.
- To end the active call, twist the tuning control towards the low frequency end of the dial or quickly press the optional pushbutton/seek-button twice.
- To join the calls together into a conference call, twist the volume control back and forth twice towards the direction of higher volume or push and hold the optional pushbutton/seek-button.
- To place a call on hold (muted), twist the volume control back and forth twice towards the direction of lower volume or push and hold the optional pushbutton/seek-button for about 1 second. (you can also use the menus on your Bluetooth device to control the audio) A repeating confirmation tone will be heard on the radio while the call is muted.
- To toggle between mute and unmuted, repeat the instructions above.
- When the audio is muted, the FMR-radio status LED will blink slowly.
- The front panel status LED or the LED on the optional pushbutton will blink once each time one of the above actions is performed to signify it has been accepted.

Optional Pushbutton Support

The optional push button (if installed) can be used when music is playing. A simple short press will advance to the next song in order and a double press will go back to the beginning of the song or two quick double presses will go back to the previous song. SEE PAGE 2 FOR REFERENCE

APPENDIX – C –

USB Functions Explained in More Detail:

File System

The USB drive must be formatted in FAT12, FAT16 or FAT32 format using a MBR Primary partition. The name of the drive can be anything, so you may want to name them after the type of audio on them, i.e. Rock and Roll, Easy listening, Audio Books, etc.

File Layout

The BTU-2.5 will parse through two layers of hierarchy looking for aac/m4a/mp3/ogg/flac audio files. Music files loaded more than two folders deep will not be found. This does not mean you can only have two music folders; it just means you can have folders inside folders (which contain music) but you cannot have a folder in a folder that is in yet another folder (ie 3 deep).

Each folder, including the root, can contain up to 250 music files and an unlimited number of folders. (2250 folders and 65534 files maximum) In this manner the root folders could use the artist names with the subfolders named for each album, or the root folders could be name for music genres

Suggested Music File/Folder Structure:
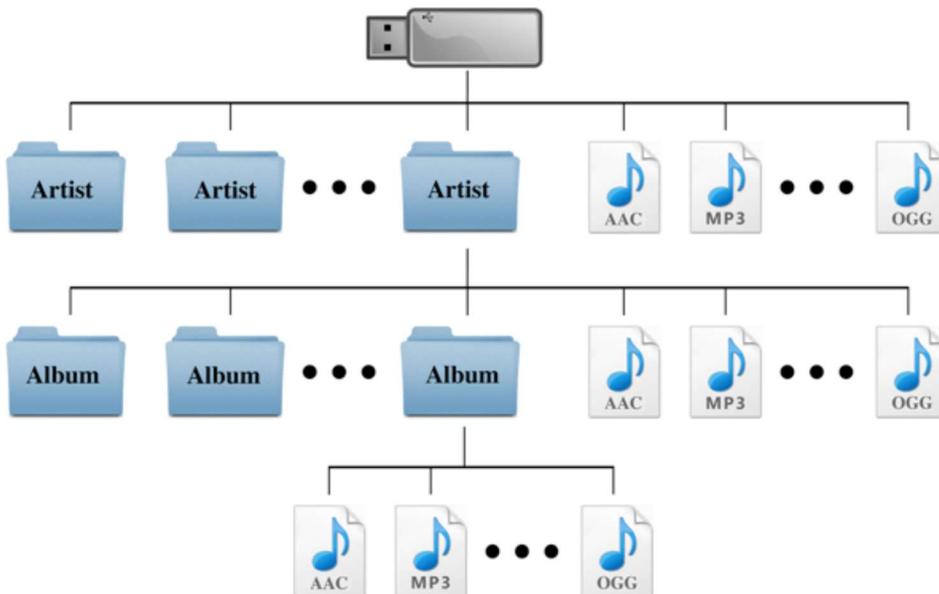
Playing Music Files:

When a USB drive is inserted, the radio has to index the drive looking for all playable audio files. If no playable files are found, the radio will simply ignore the USB drive. Since indexing takes a bit of time, the radio will start playing the first file and then continue indexing the rest of the drive.

Non-Music Files:

While non-audio files can be stored on the same USB drive, it is best to keep these to a minimum in-order to not slow down the indexing process. If the drive contains many non-music files, you can put the audio files in a folder named MUSIC. This way the radio will only look in this folder, speeding up the indexing process.

Supported File Codecs:

The radio fully supports the high quality AAC, MP3, Ogg Vorbis and FLAC codecs

Supported File Types:

Handles .aac/.m4a files up to 48kHz and 384kb/s
Handles .mp3 files up to 48kHz and 320kb/s
Handles .ogg files up to 48kHz and 500kb/s
Handles .flac files up to 48kHz and 1000kb/s

USB Charging:

The radio supports up to 2A charging and will continue to charge a USB device even if the radio is turned off as long as power is still supplied to the radio

Optional Pushbutton Support

The optional push button (if installed) can be used when music is playing. A simple short press will advance to the next song in order and a double press will go back to the beginning of the song or two quick double presses will go back to the previous song. SEE PAGE 2 FOR REFERENCE

Basic Radio Specifications

- Designed to meet automotive OEM and SAE specifications
- Protected against reverse battery, double battery jump start, load dump and mutual coupling transients
- 40℃ to +65℃ operating range
- Fully protected speaker outputs:
- Speakers protected against line shorts, shorts to ground and shorts to battery
- Digitally controlled power amplifier automatically senses which speakers are attached and takes appropriate action. (i.e. disables/enables balance/fader controls)
- 4 X 45W maximum output into 4 ohms @ 14.4V (EIAJ)
- 2 X 75W maximum output into 2 ohms @ 14.4V (EIAJ)
- High Efficiency Class SB power amplifier
- Noise blankers to suppress ignition/generator/alternator noise
- Automatic bandwidth control for optimum performance in all situations
- Wiring harness uses high temperature automotive grade GXL wire
- Powerful on-board microprocessor handles all control functions
- User settings are saved in onboard non-volatile memory so no continuous battery lead required
- Full World Wide Analog Radio support (Americas, Europe/Asia, Japan)
- Standard Voice Assist HD, Radio speaks all operations in clear English, no obtuse beep tones
- Automatic Volume Control option raises and lowers radio volume with engine speed
- Dedicated Auxiliary input for use with MP3 players, satellite radio, etc.

Troubleshooting / Questions:

If you have any questions about your radio from either an installation or operation standpoint please do not hesitate to contact us. We are here to support you and ensure that your new radio conversion meets or exceeds your expectations. Contact us if needed as follows:

Mr Heaterbox and Interior Restoration Services

613-532-2587

MrHeaterbox@kos.net

More Than Just Radio

Check out our Mopar Interior Restoration Parts on
https://premiumdashdecals.com

More Than Just Radio

We also offer Restoration Services for your classic Mopar!
https://mrheaterbox.com

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