Classic Car Radio Restoration

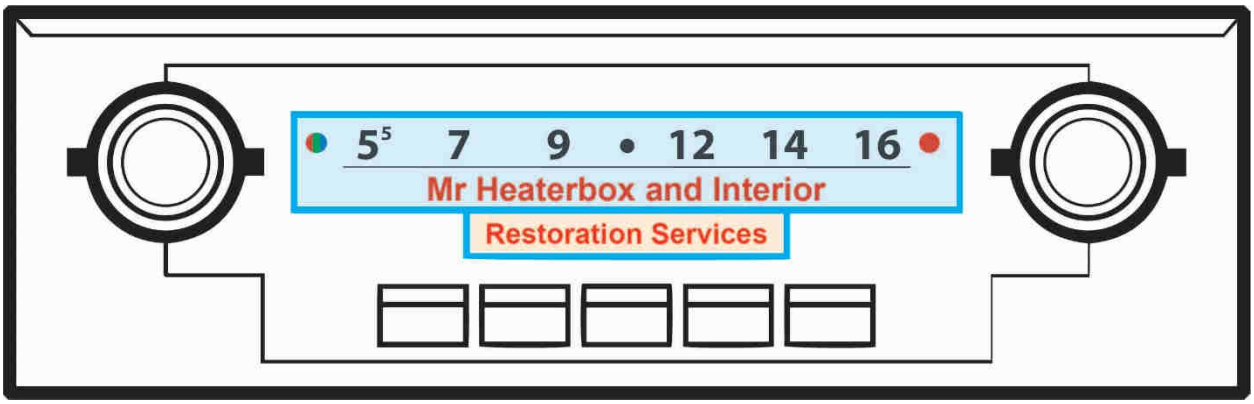
AM/FM Radio Conversion

+ Bluetooth/USB/Delay Module

USER & INSTALL GUIDE



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



Basic Radio Quick Reference Section:

Basic Radio Control Actions

TONE **Virtual Fader**

TONE **Virtual Balance**

TONE **Loudness Toggle On/Off**

VOL **AVC Toggle** On/Off**

Auto Scan Action (standard tuner)

TUN **Start Scan**

TUN **Stop Scan**

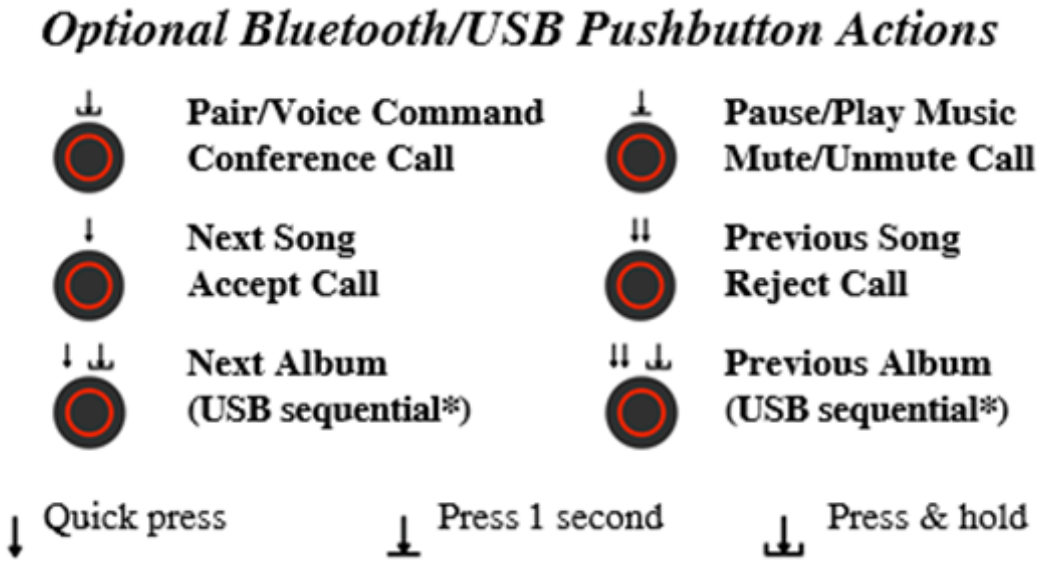
TUN **Cancel Scan**

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 turning the dial in the correct direction, the radio will mute until the station is found.

Bluetooth:



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



Optional Push Button Support

The optional push button (if installed) can be used when music is playing on a Bluetooth connection or via the USB memory stick connection. The push button does not work on AUX-IN connections as there is no way to communicate back to the device via the AUX-IN cable which is single direction (device to radio) only.

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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 original 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 Classic Car Radio Restoration 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. Rebuilding the switch means 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, the radio module used in your conversion will pull in more FM stations than 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 an 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 your 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.

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

AM = Red, FM = Yellow, Bluetooth = Blue, USB = Magenta, AUX-IN = Green, Aqua= HD Radio

All radios 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. The default configuration to select this AUX-IN to play music from the device plugged into it, simply to 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.

PLEASE NOTE: there are other methods we sometimes have to use to select the AUX Input, so if in doubt, please check your *RADIO DELIVERY SHEET* that came with your radio as there is a section on it that tells you how the radio is configured for AUX-IN and how to select it.

Its always a good idea to program the left most push button on your radio to this point so that you can use it to instantly select and activate the AUX-IN. To deselect the AUX-IN simply tune off the end and up the radio dial.

If your radio is of the design style whereby it has no-push buttons, then we configure the radio to continually listen to the AUX-IN jack for a signal and if found, it will auto-switch to the content coming in from the auxillary device. To go back to the radio, simply turn off the device or unplug it and it will switch back to whatever it as doing before the AUX-IN device was turned on. This is called a VOX (Auto-detection) configuration.

Changing from AM to FM bands is easy. If you have a factory AM/FM unit, simply use the OEM AM/FM selector switch that is on the radio. If you have a radio that as converted from an AM-only configuration to AM-FM, no additional controls are necessary, simply rotate the power switch off and back on quickly. The radio will flip to the other band and remember it (even if turned off) until you change the band selection. For example, 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 offer some additional options for your convenience and ease of use, detailed below.

One of the options 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 your 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 lit push button that you can optionally install in your vehicle. While the push button 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 don't 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 push button can be used. Please note that the push button's presence is scanned by the radio's microprocessor chip, so it must be plugged-in 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 push button. 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 in your radio. This dongle/USB Port can be used to play music that is pre-loaded onto a memory stick, or to simply charge your cell phone. The radio supports high current charging 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.

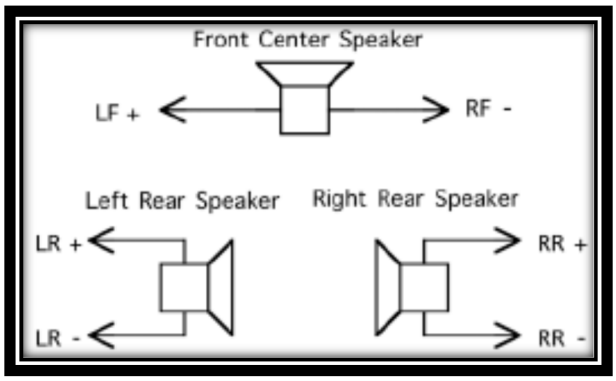
Speaker Selection & Configuration:

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 or 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 to 8-ohm impedance loudspeakers. 2-ohm speakers are supported but be aware that you can only use a maximum of TWO of these speakers due to the amount of heat their low impedance generates within the radio amplifier section. 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!

Grounded Speakers:

This radio as configured is *NOT COMPATIBLE* with one wire (ie. Grounded Speaker) configurations. The Grounded Speaker configuration was used by manufacturers as a cost and material saving reason only. In this configuration one of the speaker terminals was grounded to the vehicle body and one wire went back to the radio.
Your restored radio MUST HAVE a dedicated pair (two wires) run between the radio and speaker for each channel used. In some cases this may mean that you have to run new/additional wiring within your vehicle. Failure to do so will mean that the radio will not detect the installed speakers and thus you will get no output.

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.

Standard Wiring Harness Connections:

Red*	Continuous Battery
Blue	Remote Amp Trigger/ Power Antenna control
Orange	Dial Lamp
Black	BODY Ground
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 years down the road.

COURTESY MODULE Equipped Radio Wiring Harness Connections:

Red*	Continuous Battery
Blue	Switched +12V
Orange	Dial Lamp
Black	Door 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 **
ADDITION BLACK WIRE (not in connector) coming from Radio Case	BODY GROUND

The Car Antenna:

AM and FM reception is only as good as the antenna installed. We STRONGLY recommend when and where possible that a good quality NEW antenna be installed along with your radio.

This is especially true if your car originally had an AM only radio installed. Up until the early/mid 70's AM/FM antennas were expensive, so you only got an AM/FM antenna with your car if you opted for the optional matching radio. That means that if you ordered an AM radio, you received an AM ONLY antenna. Later on in the 70's when antenna prices came down, most manufactures opted to simply install an AM/FM antenna for either type of radio. This meant they only had to stock/supply a single part, which is good for them.

So if your car originally had an AM only radio, and you install your 'new' FMR Radio from ClassicCarRadioRestoration.com and you don't get nearly as many FM stations as you were expecting, then you can pretty much be assured that you have an AM only antenna and it must be replaced in order to achieve proper FM reception performance. A good quality antenna is general more costly to produce, so don't buy the cheapest one available. Talk to people and get some recommendations, or you can contact us for our recommendations.

UNDER DASH ANTENNAS

These types of antennas (ie 'Hidden Antennas') while being very convenient to install, simply do not work well. We have tried many different brands and ALL OF THEM had less than desireable results and definitely even the best one pulled in significantly fewer FM stations that a normal metal mast externally mounted antenna. We cannot support any reception tech issues if one of these antennas

are installed. Even if they have the optional signal boost technology. Simply, we have not found one that works acceptably well, so save your money and simply buy a quality mast antenna, either of the fixed or power antenna variety.

ANTENNAS FOR HD RADIO INSTALLATIONS:

The antenna length is somewhat more critical for HD Radio™Technology than it is for regular analog AM/FM. Start by setting the length to 29in as measured from the base to the tip and tuning to an active station. Using the Signal Strength feature of the FMR (see below), slowly adjust the length for best signal strength, stepping away from the antenna after each adjustment so as not to interfere with the radio signal.

To enter signal strength mode:

1) Start a radio station scan



Start Scan

2) While the Voice Assist HD is speaking the station information, turn the volume control 4 twists to the Right to start a Signal Strength readout. To end, perform action again or turn radio off.



APPENDIX – A –

Installing The Courtesy Module

(If so equipped)

OVERVIEW:

At your request your radio has been equipped with the Aurora FMR Courtesy Module! The Courtesy Module is a small board that has been added inside your radio to increase the functionality and usability of your radio. The purpose of the Courtesy Module is to allow the radio to stay powered on and fully functional for up to 15 minutes after the vehicle has been turned off or until a door is opened (whichever comes first). Not only is this a handy convenience feature but is a great addition to a Bluetooth configured radio by allowing you to maintain a hands-free phone call while you pull over and shut off your vehicle so you can finish the conversation without having to call back.

As mentioned above the purpose of the Courtesy Module is to maintain power on your radio for up to 15 minutes. Once this time has been exceeded the radio will shut itself off. Please note that if this was done at a high volume level, when you restart the radio by turning on your vehicle (without touching the volume control/on-off switch) the radio will resume playing at this volume level!
If you open the vehicles door before the 15 minute time delay has fully elapsed the radio will also power down as above.

Please note that Courtesy Module functionality only works with 12V Negative Ground vehicles.

INSTALLATION:

Wiring this feature up is very easy and four wires will complete the installation. Below will outline the steps that need to be done to complete the Courtesy Module wring.

There are four wires involved in the Courtesy Module Install they are as follows:

Black Wire (Case GND)	– Connect to frame/chassis Ground (this is a separate thick black wire, separate from the main radio wiring harness, with one end already attached to radio case with ring terminal and the other end has a ring terminal and is ready to attach to a body electrical ground)
Red Wire (Constant 12V)	– Connect to battery (unswitched) +12V
Blue Wire (Switched 12V)	– Connect to SWITCHED +12V (i.e. ignition switch circuit of car or equivalent)
Black Wire (Door Switch)	– Connect this wire to your dome light circuit so that when the car door opens this wire receives 12V power.

Wiring is very straightforward as you can see above. Its very important to get the Door-Switch (Black wire) wired correctly. The important thing to understand is that this wire should only have 12V on it when the door is opened. As soon as the Courtesy Module receives a 12-Volt signal on this wire, it

will automatically turn off the radio. If this is wired wrong and its connected to a 12 Volt continuous source, the radio will not turn on as the 12V present on the black wire is telling the radio to turn off!

TESTING:

Testing is very simple and takes less than 30 seconds to confirm the correct configuration.
With the ignition key off, attempt to power on the radio using the vol/on-off switch, it should not work.

Next start the vehicle and turn on the radio, it should work as normal.
Next turn the car off and remove the ignition key, the radio should still function (15 countdown minute timer is now active). If you had waited 15 mins you would have seen that once the Courtesy Module times out the radio will shut off on its own).

Finally open the vehicle door with the radio operating and vehicle switched off and you will notice that the radio turns itself off.

Turn the ignition switch back on and start the vehicle and radio will resume playing.

TROUBLESHOOTING:

If the Courtesy Module/Radio does not perform as above then some troubleshooting will be required. It is pretty straight forward and is best done with a test light probe (or a voltmeter).
Turn the radio on and probe each of the wires with the test light, they should be as follows:

With the vehicle off and the doors CLOSED:
Black Ground wire – test light OFF
Red Wire – test light ON
Blue Wire – test light OFF
Black Wire –test light OFF
Radio = NOT PLAYING

With Vehicle Running and doors CLOSED:
Black Ground wire – test light OFF
Red Wire – test light ON
Blue Wire – test light ON
Black Wire –test light OFF
Radio = PLAYING

With Vehicle Off and a door OPEN:
Black Ground wire – test light off
Red Wire – test light ON
Blue Wire – test light OFF
Black Wire –test light ON
Radio = NOT PLAYING

APPENDIX – B –

Installing an External Power Amp or Powered Subwoofer or Power Antenna:

(optional features, if purchased)

OVERVIEW:

If you radio has been equipped with external output connections for an external amplifier and/or subwoofer, or if you have purchased our optional Power Antenna, then this section will explain how you connect them to your FMR Radio system.

When configured properly, your radio will now function as a Radio Head Unit, which means that when you power on the radio, all ancillary powered devices (amp/sub/antenna) will also power on in unison. Same with power off. Not only is this convenient but it allows the FMR radio to implement a proprietary 'anti-thump' functionality, that helps the amp or sub power on without the usual power-on transient thump sound that most systems make.

Connectors:

You will see these connections on the back or side of your radio as one, two or three RCA jack connectors.

The RCA Jacks are colour-coded as follows:

YELLOW - COMPOSITE Subwoofer Output Connection (Line level output)
RED (R) AND WHITE (L) (always installed as a pair) – External Power Amp Connection (Line level output)

Wiring:

There is an additional wire that has also been placed in your main wiring harness. This is a BLUE wire and had been supplied with a pair of crimp terminals (one has been preinstalled for you)

This BLUE wire is the REMOTE AMP TURN ON TRIGGER / POWER ANTENNA CONTROL Wire

When the radio is turned on the Blue Trigger wire receives a +12V DC signal. If this wire is connected to a power antenna, the antenna will go up when it receives this power signal and will goes down when the power signal is removed – i.e. radio turned off. This wire can also be run to the REMOTE/REMOTE TURN-ON wiring terminal on an external power amplifier or powered subwoofer.

This is the DESIRED configuration if using external amps or a power antenna and allows all the supporting external amplifiers to power up when the main radio knob is turned on. In this mode your classic radio is now acting like a 'Head Amplifier' controlling everything to do with your sound

system!! No additional fusing is required. This wire can be wired to several REMOTE terminals if there is more than one external amplifier installed in the vehicle.

Once the blue wire has been connected to the REMOTE terminal of your amplifier(s) it is merely a matter of running a Quality RCA Patch cable of the appropriate length between the radio and the external amplifier (not included). A typical power amp requires both a Left (White) and Right (Red) cable.

Powered subwoofers tend to vary with many power amps needing on a single patch cable. If your sub amp requires both a left a right input then you will need to supply an RCA Y Cable to take the single subwoofer line and turn it into a pair to go in the left and right inputs. Please read the manual for your powered subwoofer carefully, some sub amps, while having a Left and Right input jack present will work fine with only the single patch cable as long as it goes to the specific channel on the amp required (the manual will tell you). Again if not, a simple Y cable to provide a signal to both inputs will suffice.

NOTE REGARDING SUBWOOFER SIGNAL:

The subwoofer output on your radio is a COMPOSITE, FILTERED subwoofer output. What composite means is that this output has the combined Left and Right audio information formatted into the single output. The filtered part means that only bass frequencies are passed down this connection to the subwoofer for amplification.

As a result, there is no need to enable low-pass filtering on the sub amplifier as its already been done in the FMR end. There is also one other nice feature built in. This is a time delay/anti-pop feature that allows the subwoofer to power up quietly when the radio is turned on. In some lesser designs, the subwoofer amp will receive a power on voltage transient and make a large thud noise when first turned on. This will not happen with the FMR due to the time delay/anti-pop circuitry that has been added inside the radio module!

TESTING:

Testing is very straightforward. There is no substitute for quality patch cords!! Don't assume that if they are new they are good, check each cable for continuity before installing and flex the cable at the end during this quick test to make sure there is nothing intermittent. Bad RCA cables are unfortunately not that uncommon! A quick test during install can save a batch of troubleshooting and frustrations later!

Once the Remote Trigger wire and RCA patch cables are all connected, your system should be fully functional. There are no options to enable or disable these jacks, so all sound levels and quality issues will be the responsibility of the external amplifiers and speakers chosen.

Some external amplifiers have additional controls to help balance the sound levels (gain) so take some time to experiment with the controls your external amplifiers afford you in order to setup the best quality sound you can achieve.

CONFIGURING:

To adjust and custom-tailor the sound of your sub/amp system, you can adjust up to three sets of parameters. The TONE control is used (see below) to make the necessary changes.

The Loudness/EQ settings allow the user to tailor the sound of the radio to their particular speakers/vehicle. The EQ feature contains a 3 band equalizer with adjustable loudness and subwoofer control.

LOUDNESS: boosts the bass slightly at lower listening levels to make it more balanced
EQ: the FMR has a 3 band sound equalizer built into it. As a result, you can separately configure the BASS or MIDRANGE or TREBLE frequencies no matter what controls you have on your radio. This allows you to further customize the sound for the best overall presentation.
CROSSOVER: allows you to change what range of frequencies are sent to the subwoofer. Typically, smaller subwoofers have a higher number and larger subs which can reproduce lower bass notes better use a lower number.



By performing the triple twist action of the TONE control, as shown above, the radio will rotate through the following modes: → Loudness/EQ Off → Loudness On → EQ On →

The radio will announce each mode as it is selected. Note, the radio normally defaults to Loudness On mode which is all that is required for most installations. In this mode the Loudness and EQ settings are automatically handled by the radio.

To make adjustments to these settings, set the radio to the EQ On mode. Immediately use the single Tone control action shown above to enter the EQ Adjust mode. Each time the Previous/Next action is performed while the radio is still announcing the current setting, the radio will move to the previous or next setting.

The settings are as follows: ↔ Treble ↔ Mid ↔ Bass ↔ Loudness ↔ Subwoofer ↔ Crossover ↔

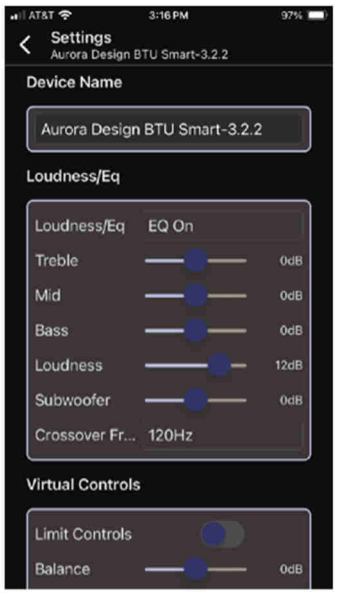
Once the desired setting has been selected and the radio has finished announcing the setting, rotating the Tone Control will adjust the setting in real time. When making an adjustment, a “plink” sound will be heard each time the setting crosses the center point. The Treble/Mid/Bass/Subwoofer can be adjusted up to +/-10dB. The Loudness can be adjusted from 0-15dB. The Subwoofer Crossover can be adjusted to 55Hz/85Hz/120Hz/160Hz.

The radio will stay in this mode as long as the setting is being adjusted (similar to the virtual Balance/Fader). After 3 seconds of inactivity the radio will announce the setting being saved and the actual dB level of the setting.

After about 30 seconds of inactivity, or performing the On/Off action again, the radio will end the EQ Adjust mode (an announcement will be heard) where no further changes can be made without first re-entering the EQ Adjust mode. Note you can turn the Loudness or EQ off and back on without losing any of the settings. Turning the radio off at anytime will abort the current operation.

Using the FMR Connect App

IF you have purchased the ULTIMATE Package, the radio will support the use of the FMR CONNECT (Android/Apple) application. You can also configure the EQ , Loudness and Crossover settings right from your phone within the app. This screen shot is pretty self-explanatory. *NOTE YOU MUST HAVE THE ULTIMATE PACKAGE INSTALLED FOR THIS TO WORK.*



APPENDIX – C –

Radio Functions Explained in More Detail:

HD Radio: (if equipped)

One of the least understood and arguably most import options for the future is the HD Radio™ option. Basically HD Radio™ is Digital Radio. Just like Cell phone and TV which have changed over from analog signal broadcasting to digital signal broadcasting, AM and FM is slated to do the same. Already in Canada, the traditional analog AM radio band is gone. It was sold off to private industry by the Government as a source of revenue. In its place is DIGITAL AM. So if you are trying to find AM radio stations in Canada using a normal car radio, there is nothing, and now you know why. Europe is much more advanced than North America and many countries have gone digital for AM and FM already. The European version of HD Radio™ is called DAB (Digital Audio Broadcast) and is basically the same as HD Radio™ with a few tweaks (but not interoperable).

So basically, by adding the HD Radio option you 'Future Proof' your radio conversion so that when the full changeover occurs your radio is ready and you can just keep on listening, like you are used to doing. There are many HD stations available now (mostly around larger cities).

OPERATION:
If your radio has the HD Radio™ option installed, it will still work like a normal radio, picking up analog AM and FM stations. But if it finds a digital station at the same point in the dial it will automatically select the digital transmission as its much higher quality. It all happens seamlessly, without you having to do anything. There is no loss of performance if you are in a non-digital region and the radio will work as it normally would. Due to the improved quality and audio features, the digital radio station signal will always take priority over an analog radio station signal for a given dial setting!

When an HD Radio™signal is first detected, the optional front panel Status LED will flash aqua signifying the signal is being acquired. Once the signal is locked, it will go solid aqua and the radio will seamlessly blend over to the digital signal.

Some of the larger FM HD Radio™ stations may also be broadcasting sub-channels (HD2-8) along with the main digital channel (HD1). This allows the same main radio station at the same dial position to offer multiple music formats (e.g. one subchannel is all Country, another is Classic Rock and yet another is Opera) or to support multiple languages (e.g. a sports play by play coverage in English on one subchannel, French on the next and Spanish on the third etc).

To access these sub-channels, there are a couple of different ways. The most common is to simply quickly twist the tone control Three times to the Right.



If you have a CONVENIENCE PUSH BUTTON attached to your radio, you can also quickly TAP 2 TIMES on the Convenience Push Button when listening to an HD Radio station to change to the next subchannel.



Note: For those that ALSO have the ULTIMATE FMR package which includes the ability to use the FMR Connect Application (Android/Apple), you can also select the subchannel on your phone from within the App!

Each time the Tone knob twist action is performed, the radio will select the next sub-channel and announce it. When the last sub-channel is reached the radio will wrap around to the first channel (HD1).

If a sub-channel is selected for a particular station, each time the radio is tuned to that station, the radio will automatically switch back to this sub-channel once the digital signal is locked.
Note: the number of sub-channels will vary depending on what the specific radio station is broadcasting.

CONFIGURATION:
By default, HD Radio™ (if installed) is active for both the AM and FM Bands. If for some reason you wish to disable the HD Radio™ receiver functionality on a particular band, you can easily do so. Please note that HD Radio™ can be enabled/disabled independently for either AM and/or FM bands. When the radio is not locked to a digital signal (i.e. Listening to a regular analog radio station), perform Tone Control twist action, shown above and the radio will toggle between various enabled/disabled options and announce the change each time. Simply stop when you have the desired configuration set.

SUMMARY:
For some people that intend to keep their collector cars or hand them down to family members in the future, HD Radio™is a great feature to include as it ensures your radio will work great both now and in the future. Hope this helps.

Here is a link for more information:

https://hdradio.com/canada/ (Canada)
https://hdradio.com/why-hd-radio/ (USA)

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. There is SPECIAL ADDITIONAL WIRING and parts required for this feature to work, so please contact us if this option is of interest and we will provide you the necessary information and parts list to install this feature.

Once the additional wiring is installed, 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.

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 any time, and the radio will make the appropriate adjustments to mono/stereo operation and whether a balance and/or fader control is required.

- The radio supports up to four 4-ohm to 8-ohm speakers or two 2-ohm speakers. DO NOT connect four 2 ohm speakers!
- For a single speaker MONO 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. Please not that if the single speaker is part of a three-speaker configuration, the wiring is different and you should consult the wiring diagram in the *SPEAKER SELECTION AND CONFIGURATION* section of this document.
- 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 too 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 – D –

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 your Bluetooth radio
- Supports multiple phone calls and conference calling
- Automatically continues on last song when turned on
- Optional push button for Pairing, Voice Command, next/previous, play/pause, call accept/reject, mute with illuminated in push button which gives user feedback to operational status
- Built in internal microphone, with optional use external microphone

Pairing:

- Firstly, put your phone into pairing mode
- Then on the radio, 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 Convenience Push Button
- The front panel status LED will turn BLUE or optional Convenience Push Button 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 push button 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 push button. (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 push button/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 push button/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 push button/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 push button/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 push button/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 push button/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 push button/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 push button/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 push button will blink once each time one of the above actions is performed to signify it has been accepted.

Optional Push Button 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 – E –

USB Functions Explained in More Detail:

File System

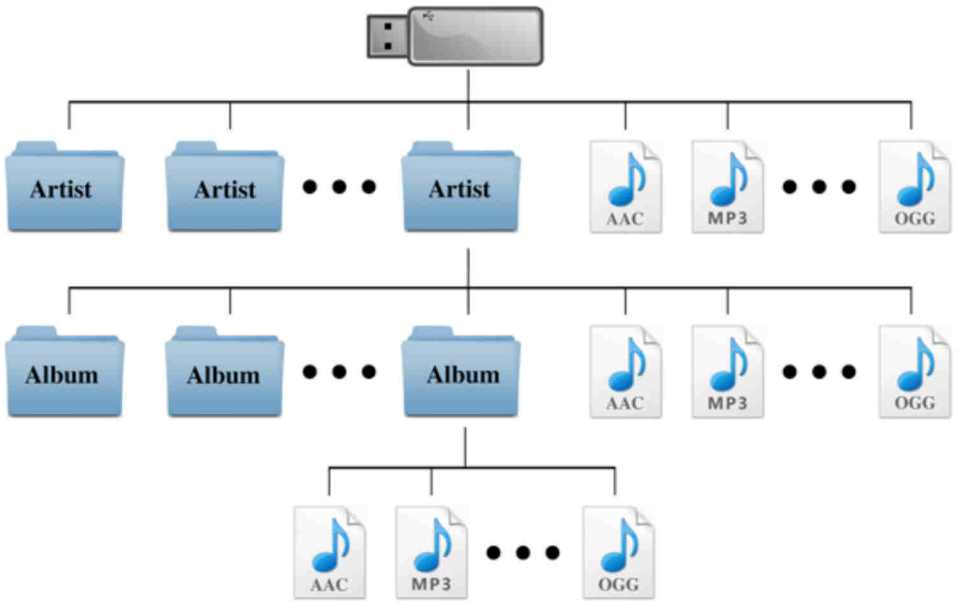
The USB drive must be formatted in FAT16 or FAT32 format using a MBR Primary partition. The name of the drive can be anything, so you may want to name them after the type of audio on them, i.e. Rock and Roll, Easy listening, Audio Books, etc.

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:

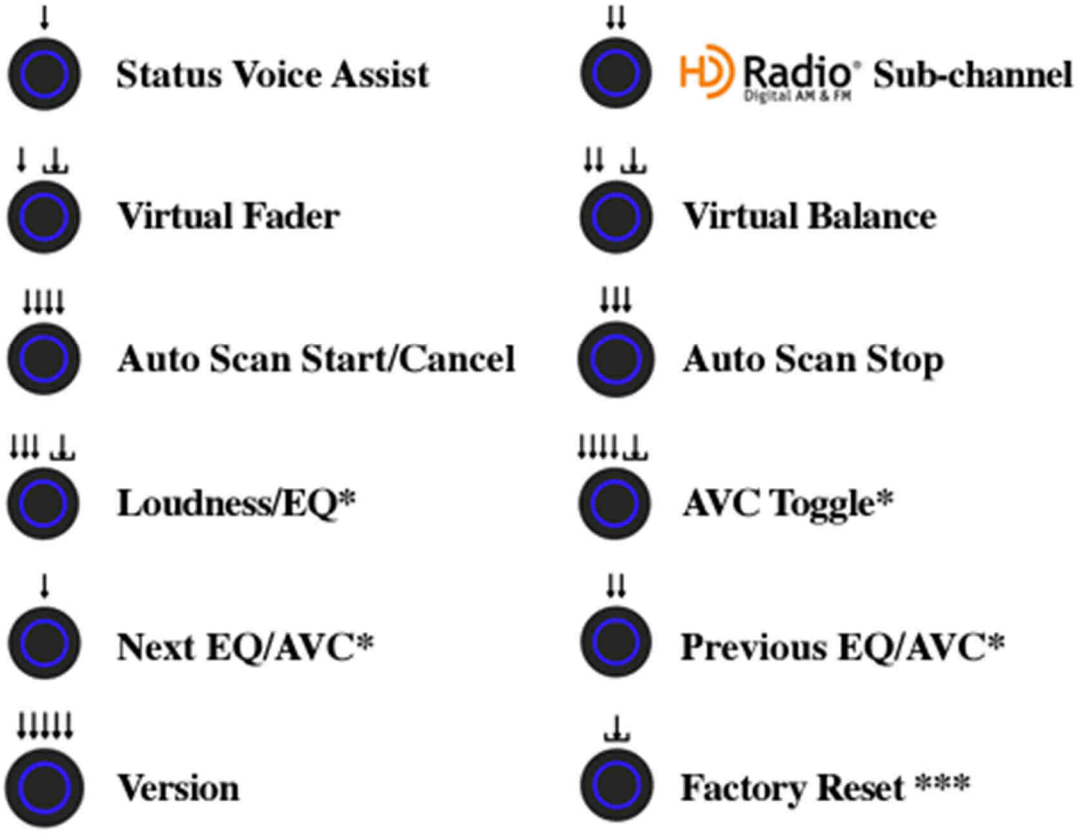
The radio supports up to 2A charging and will continue to charge a USB device even if the radio is turned off as long as power is still supplied to the radio

Optional Push Button Support

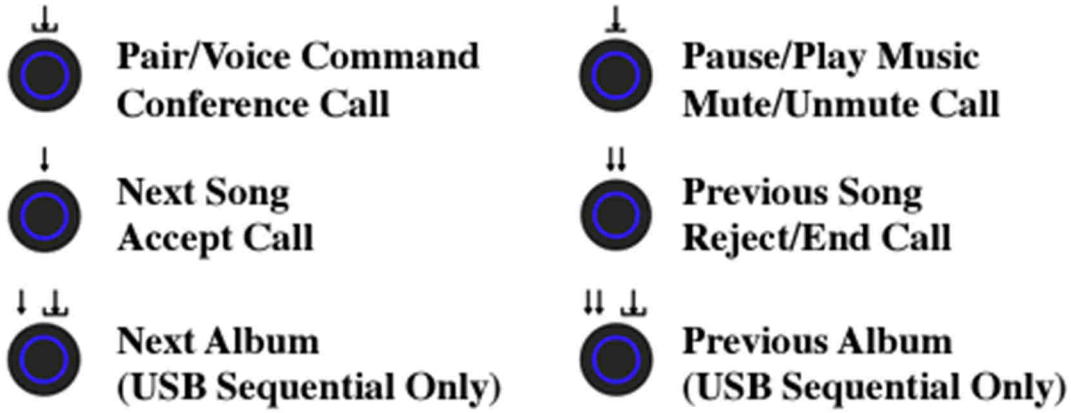
The optional push button (if installed) can be used when music is playing. A simple short press will advance to the next song in order and a double press will go back to the beginning of the song or two quick double presses will go back to the previous song. SEE PAGE 2 FOR REFERENCE

APPENDIX – F –

Convenience Push Button Actions Summary:



Bluetooth/USB Pushbutton Actions



APPENDIX – G –

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:

Classic Car Radio Restoration

613-532-2587

ClassicCarRadioRestoration@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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Thank you for supporting North American workmanship!