I finished installing a new head unit in my 2005 RX330. Before starting, I looked on the forum to see if anyone had posted instructions on how to do it. While I found some helpful bits and pieces, I did not find a complete set of installation instructions. I am documenting my experience here in hopes that it will help someone. This document is long but don't let the length deter you – the installation is fairly straightforward. I added a lot of details so that you can avoid the challenges and use the tips I found going through it. It might make sense to read through it once before attempting your installation.

My project was to replace the OEM head unit in my 2005 RX330 (non-Nav, non-ML) with a new unit that had features like Bluetooth, Nav, iPod interface, DVD and rear view camera. This was not my first install of this unit. I own a 2001 LS430 and installed the unit in that car about a year ago. While I was generally happy with the project, I was unhappy with the fact that I lost the use of my steering wheel controls because no one makes an interface that works with the LS430. This summer I purchased the RX330 and decided to put the OEM radio back into the LS430 and install the new unit in the RX330 because I knew I could retain the steering wheel controls. My experience with the LS430 helped with the RX330 even though they were different cars.

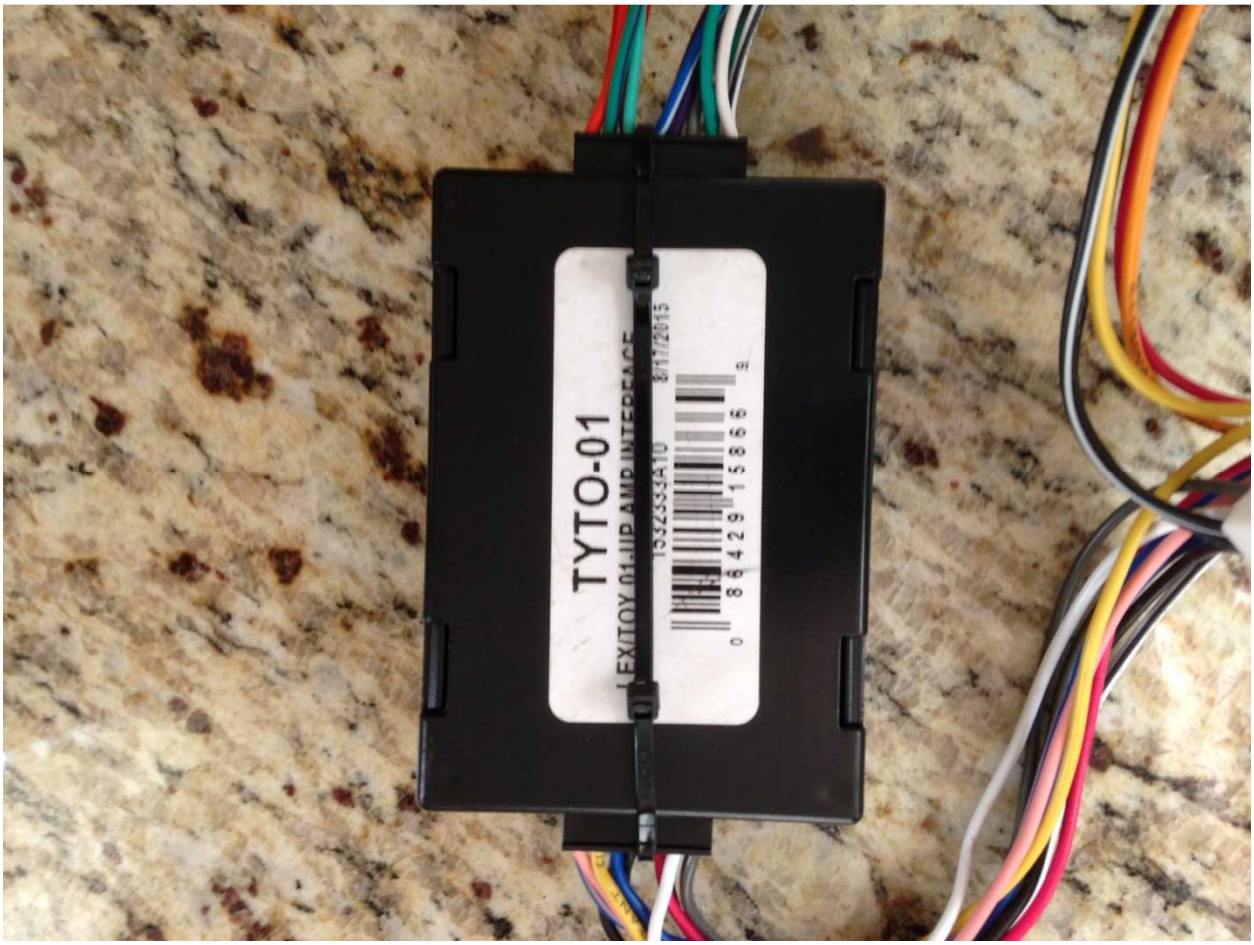
I am not a music aficionado so I was not overly concerned about sound quality; my OEM amp and speakers sounded fine for me so I retained them. This means that I needed to install an interface unit to allow my new head unit to work with my OEM amp. Here are the parts I purchased (all on eBay):

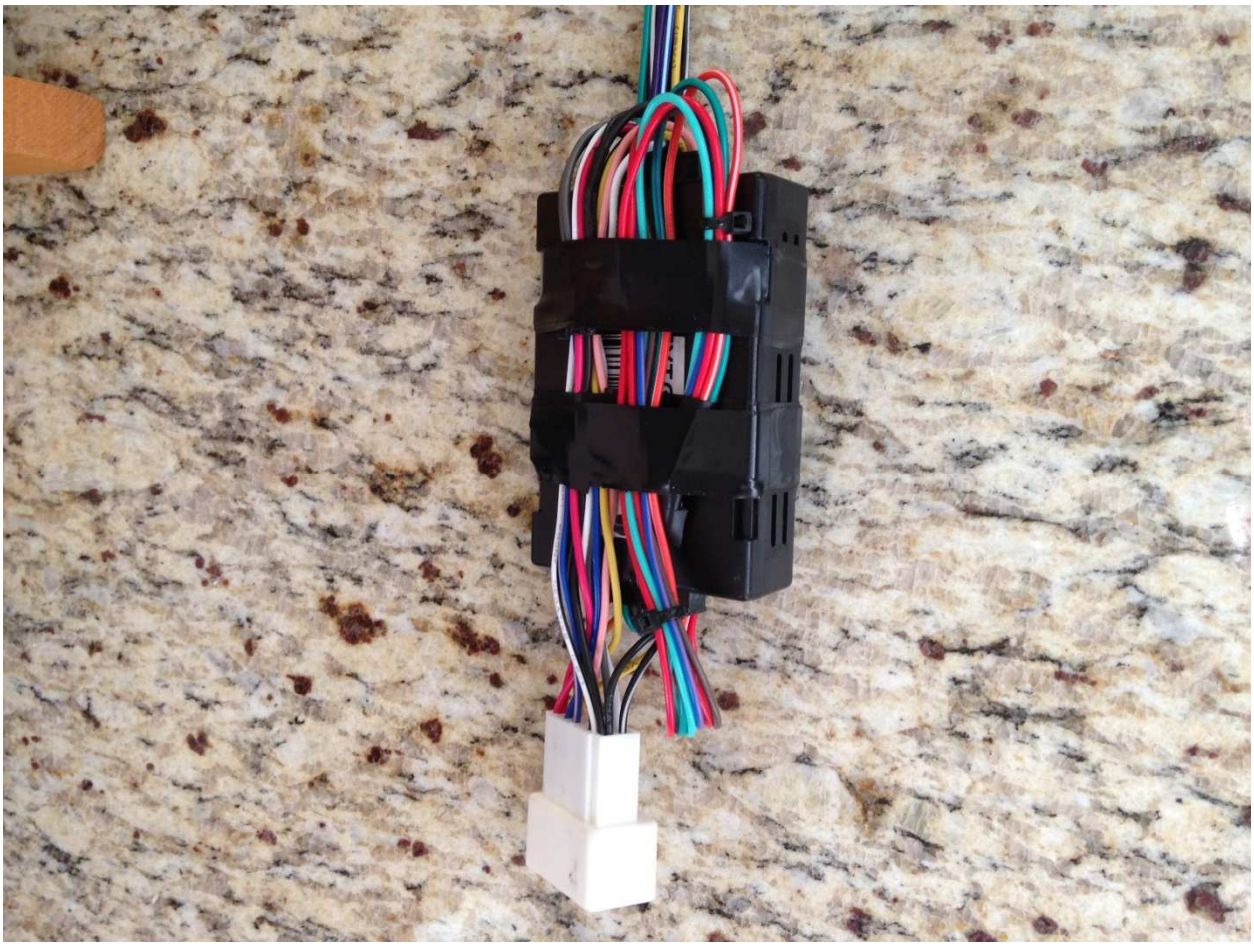
| **Item** | **Cost** |
|---|---|
| Metra 99-8159S Installation Dash Kit RX330/RX350/RX400H Double DIN | 19.74 |
| Metra Axxess TYTO-01 Toyota Turn-on Interface | 50.77 |
| Metra Axxess ASWC-1 Steering Wheel Control Interface | 46.45 |
| 3.5mm/RCA & USB Extension Cable Audio & Video | 18.23 |
| Auxiliary Input 3.5mm/RCA IS335 Jack Dash Mount Adapter | 12.45 |
| 170° Night Vision HD Waterproof Car Rear View Camera | 8.94 |
| 2.4GHz Wireless Transmitter/Receiver for Car Camera | 10.75 |
| Scosche MDAB GM Micro/Delco Antenna Adapter | 4.50 |
| Radio Male to 2 Female Universal Antenna Splitter Adapter Cable | 5.95 |
| | |
| TOTAL | 177.78 |

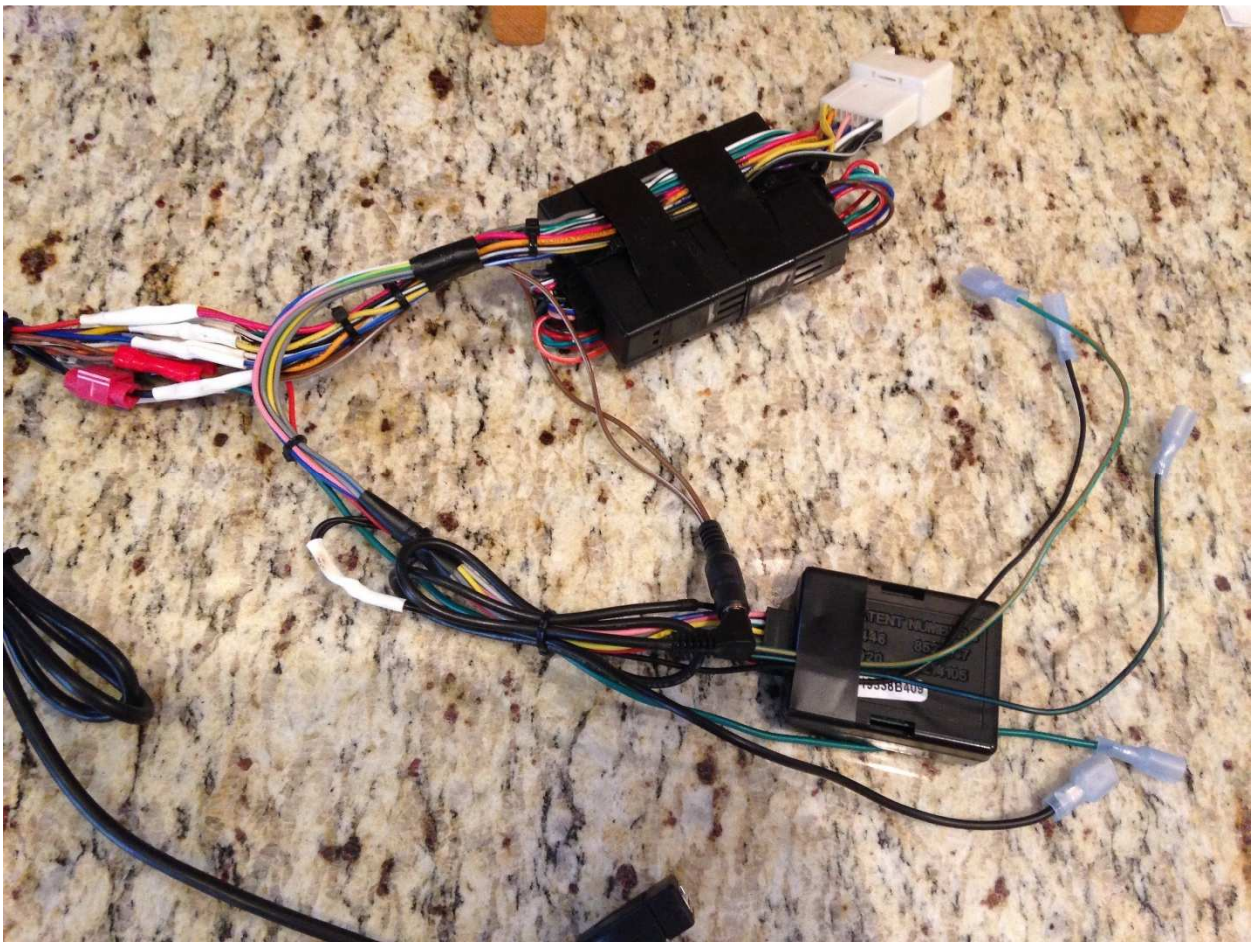
I also purchased some 16-gauge wire, splices, spade connectors and a heat shrink wrap kit for a couple of bucks. From forum posts, I was aware that Beatsonic also made an interface that works with my car. However, the Beatsonic interface costs much more than Metra and I was trying to do this inexpensively. One Beatsonic interface would have cost more than all of the parts I purchased combined!

The first thing I did was to wire the TYTO-01 interface to the new head unit. This was very simple and the instructions were straightforward – match up like wires on the head unit with the TYTO-01 harness. My head unit came with cut wires that were ready to be connected to the TYTO-01. I soldered the wires to ensure good connections; takes a little more time but it is worth it! The head unit needs to have an output to turn on the OEM amp or you will not get any sound. If your head unit does not have an "amp turn-on" output, you can use the "antenna power" output – this is what my head unit has. The TYTO-01 has a small black dial on it that controls the volume level from the interface to the OEM amp. I set the dial right in the middle and it seems to work fine; your setting may vary based on your head unit.

I did not perform this next step until I encountered an issue later in the installation but I am putting it here because this is where it belongs. It turns out that the TYTO-01 interface has an issue with its wiring connections being loose. I found this out at the end of the installation when I turned on the unit and got intermittent sound. When I wiggled the wires the unit sound would go on and off; this seemed to indicate that there was a loose wire and/or connection. I noticed that the contents of the TYTO-01 moved around when it was jiggled so I thought that maybe this was the issue. I contacted Metra support via e-mail and explained my situation; I was impressed that they responded in a couple of hours. They suggested that I secure the TYTO-01's connectors with zip ties and then tape the wires to the side of the TYTO-01 to ensure that the connections are tight and the wires cannot move (see the three pictures below). Given how quickly the response came, I am betting that this has been a problem with this adapter. Nonetheless, I followed the instructions, reinstalled the radio and tested it. So far, the issue has gone away so I assume that this fix works. Since I mentioned that the Metra unit was less expensive than Beatsonic, you might say that I got the quality that I paid for but I made it work!







Next, I prepared to connect the head unit to the car's Reverse signal. I will be installing a rear view camera; this signal will tell the head unit when the car is in reverse so it can display the camera on the screen. I will discuss how to find and connect to the Reverse signal after I remove the OEM unit later in these instructions. For now, I connected the head unit's Reverse input line to a dark Green wire and attached a male spade crimp connector to it. This will be used to attach them to the Reverse signal once it is available.

After this, I connected the steering wheel controls interface (small black box in above picture):

- It connects to the same accessory power as the radio so I connected its power wire to the accessory power wire on the TYTO-01 harness.
- Metra recommends attaching the interface's ground wire to the car chassis instead of the radio ground. I brought a chassis ground wire into the radio cavity after removing the OEM unit; this is explained later as it was done at the same time I brought the Reverse signal to the radio cavity. In preparation, for this, I attached a male spade connector to the interface's ground wire (Black wire) which will be used to attach it to the chassis ground once it is available.
- The interface connects to the radio's steering wheel control wires. The way it connects will depend upon the type of radio you have. Through a little guesswork, I figured out that my generic radio worked like what Metra called an "Eclipse" model. It has two wires which I connected to a 3.5mm female connector provided in the Metra kit; this plugged into the male connector on the steering wheel interface.
- Finally, the interface has two wires that need to be connected to the RX330's steering wheel control wires. These are located on a 20-pin connector plugged into the OEM unit. I tapped into these wires once I removed the OEM unit (described later). In preparation for this, I attached male spade connectors on the ends of the interface's two wires. They will be used to attach them to the corresponding steering wheel control wires on the RX330. Also, one of the pins on the OEM unit needs to be grounded so I connected a wire to the interface's ground wire and put a male spade connector on it. The three wires are taped on top of the interface.

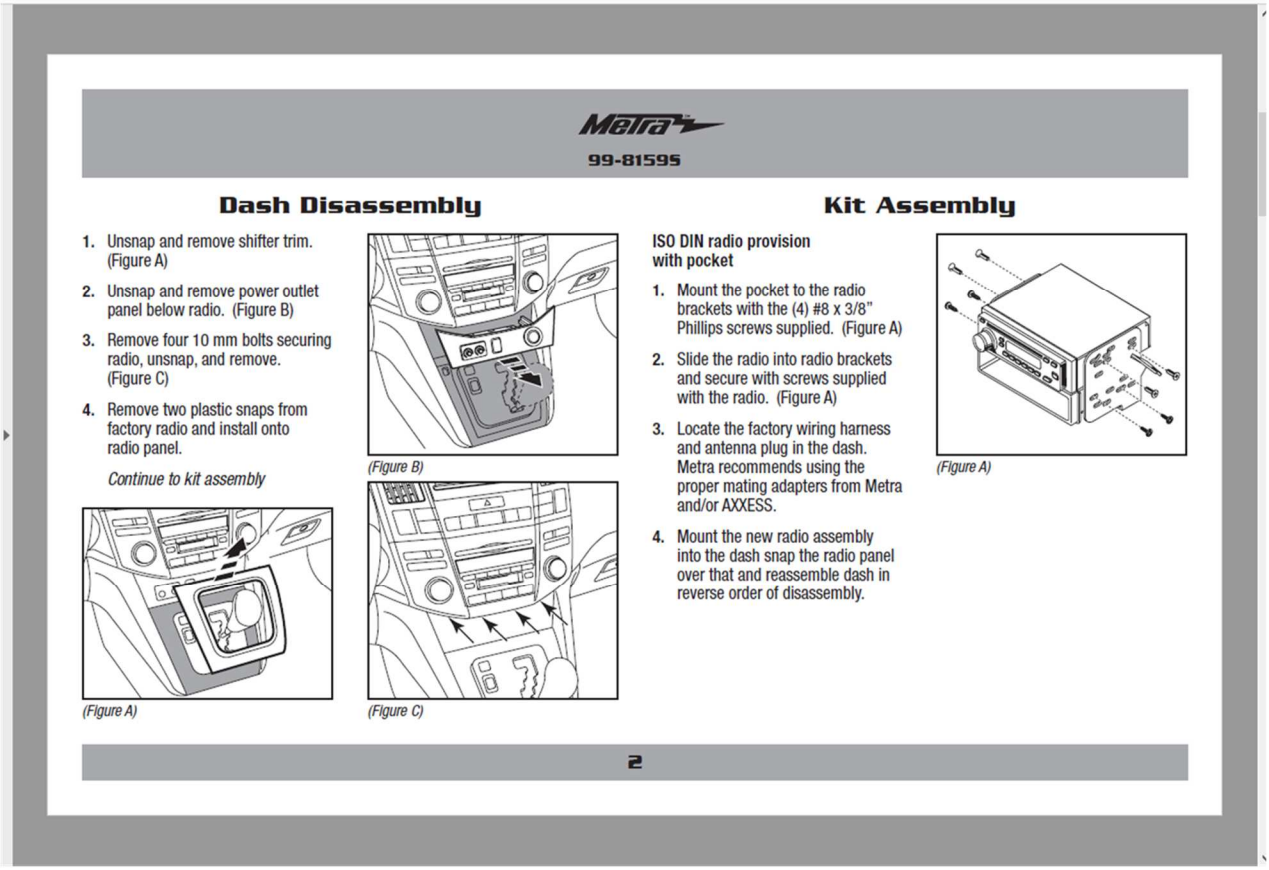
Next, I fit the unit into the dash kit. I encountered a challenge with this when I installed it in the LS430 so I was ready for it. My head unit is 178mm wide and 102mm tall; the Metra dash kit opening is 173mm wide and 98mm tall! This meant that I had to make the opening bigger so that my unit would fit. I used a metal file to shave away the sides, took my time and it came out OK. I am sure that this happened because I purchased an inexpensive, generic brand unit so the size was not standard. If you purchase a brand-name unit it will probably fit perfectly.

Once I completed modifying the opening in the dash kit, I incorporated another learning from my previous LS430 installation. The new radio has inputs/outputs for iPod/iPhone (USB), AV-IN (RCA) and AV-OUT (RCA). In the LS430 installation I simply allowed the input/output cables to hang loose so I could plug into them when needed. Reading through forum posts, I saw that some folks attached their cables to connector jacks to make them look more professionally installed. I purchased two connectors and mounted them on each side of the dash kit and then I connected the head unit's USB and RCA cables to them to give the installation a cleaner look (see pictures below). In hindsight, I would mount both connectors on the same side of the dash kit.


GPS
GPS
MIC
DVD
RADIO
BT
MENU


TF
RES
MODE
AMS

I was now ready to remove the OEM head unit. This was very simple; there was some trim and 4 bolts that needed to be removed. The Metra dash kit included the instructions for removing the unit (below). I got a tip from a Youtube video regarding the removal – use a magnetic pick-up tool along with the socket to remove the bolts so that they do not accidentally drop into the radio cavity after they are loosened. The leftmost bolt is in an odd position and it is hard to get your hand in place to remove the bolt. If you use a magnet along with the socket you can prevent the bolt from falling into the cavity.



Metra

99-81595

**Dash Disassembly**

1. Unsnap and remove shifter trim. (Figure A)
2. Unsnap and remove power outlet panel below radio. (Figure B)
3. Remove four 10 mm bolts securing radio, unsnap, and remove. (Figure C)
4. Remove two plastic snaps from factory radio and install onto radio panel.

*Continue to kit assembly*

(Figure A)

(Figure B)

(Figure C)

**Kit Assembly**

**ISO DIN radio provision with pocket**

1. Mount the pocket to the radio brackets with the (4) #8 x 3/8" Phillips screws supplied. (Figure A)
2. Slide the radio into radio brackets and secure with screws supplied with the radio. (Figure A)
3. Locate the factory wiring harness and antenna plug in the dash. Metra recommends using the proper mating adapters from Metra and/or AXXESS.
4. Mount the new radio assembly into the dash snap the radio panel over that and reassemble dash in reverse order of disassembly.

(Figure A)

2

Once the OEM unit was out I needed to undo four connections: a 20-pin connector, a 12-pin connector and two antenna connectors (large and small).

After removing the OEM unit, I needed to make a couple of connections in the radio cavity to prepare for connecting the new unit. First, as mentioned earlier, I needed to connect to the car's Reverse signal and chassis ground. I used the forum post below to find the Reverse signal which is located in a kick panel on the driver's side of the car. Don't let the post title "Brake light wire location" fool you. It starts out talking about the brake light but ultimately reveals the location of the Reverse signal.

http://www.clublexus.com/forums/rx-2nd-gen-2004-2009/735516-brake-light-wire-location-in-driver-kick-panel.html

I spliced wires into the Reverse signal wire and a chassis ground wire that was nearby, routed them underneath the carpet and behind the console to the radio cavity. I used a straightened clothes hanger covered with electrical tape to fish the wires from behind the console to the radio cavity (another tip I found on the forum). There is plenty of space behind the console to work with. I put the clothes hanger

through the radio cavity until it stuck out the back of the console, taped the Reverse and ground wires to it and then pulled it out. I terminated both wires with female spade connectors to mate with the corresponding male spade connectors I installed on the new unit.

At this point I installed the rear camera wireless receiver. I used wireless to avoid having to run a video wire from the back of the car to the front dash. The receiver needs 12V power and ground; I spliced into the Reverse signal and chassis ground I just pulled into the cavity. This means that the receiver will only be powered when the car is put into reverse which is perfect. I mounted the receiver on a metal brace inside the cavity on the left using a Velcro strip and pulled out the receiver's RCA cable output that will connect to the head unit's rear camera input. Unfortunately, I did not take pictures of this.

The next connection to be made is to the RX330's steering wheel controls. As mentioned earlier, the controls are located on the 12-pin connector that was plugged into the back of the OEM radio. The steering wheel control instructions will direct you to three wires on the connector. I spliced into these wires and terminated the splices with female spade connectors. They will connect to the 3 male spade connectors I prepared earlier when I wired up the steering wheel control interface.

One last connection needs to be made inside the radio cavity – the GPS antenna. The base of the antenna is magnetic so it just needs to be mounted to a solid piece of the chassis. By doing this it uses the entire car as an extension of the antenna (I saw this explained on a Youtube video). Inside the radio cavity to the left (toward the driver's side) there is a piece of metal that I used to mount the antenna. The antenna cable was plenty long enough to reach back to the connection on the head unit.

The Metra dash kit comes with a 68Ω resistor and the instructions state that it needs to be installed on a couple of wires in the 12-pin connector in order for the climate controls to work. I saw some discussion of this in the forum so I was expecting to do this. However, my climate controls worked without installing the resistor. My guess is that this installation is for cars with OEM navigation (my car did not have OEM navigation). The Metra instructions should be a little clearer about this so you do not install this resistor unnecessarily.

Now I was ready to connect the unit to the connections inside of the radio cavity:

- TYTO-01 20-pin harness connects to the 20-pin connector;
- The three wires on the ASWC-1 interface (male spade connectors) connect to the three wires on the 20-pin connector (female spade connectors);
- Reverse signal wire (female spade connector) connects to the head unit Reverse signal (male spade connector);
- Chassis ground wire (female spade connector) connects to the ground wire on the ASWC-1 interface (male spade connector);
- GPS antenna cable connects to the head unit;
- Rear camera wireless receiver output (RCA cable) to the head unit's rear camera input.
- Radio antenna cables connects to the head unit. There are two antenna cables (large and small). The RX330 has antennas on top of the roof and in the rear window. In order to connect to both cables, I purchased a Y-cable and an adapter for the smaller connection (see picture below). This combined the cables into one connection which goes into the head unit.

Before mounting the dash kit into the console, I wanted to test the unit to make sure that everything was connected correctly. I put the key into the ignition and started the car. The unit booted up and worked, confirming that all of the connections were properly made. The only issue I had was the intermittent sound I got because the TYTO-01 internal connections were loose, but once I applied the fix discussed earlier in this document it worked fine. The steering wheel control interface has the ability to automatically recognize several brands of units (i.e. JVC, Kenwood, etc.). As mentioned previously, I figured out that my generic unit acted like an Eclipse unit; the interface recognized it automatically so I did not need to do any manual programming. The head unit recognized the steering wheel controls, making me a very happy camper!! Finally, the GPS signal was extremely strong so the navigation worked great. I was a little concerned that the signal would be compromised since the antenna was inside the console but the concept of making the whole car a part of the GPS antenna really works.

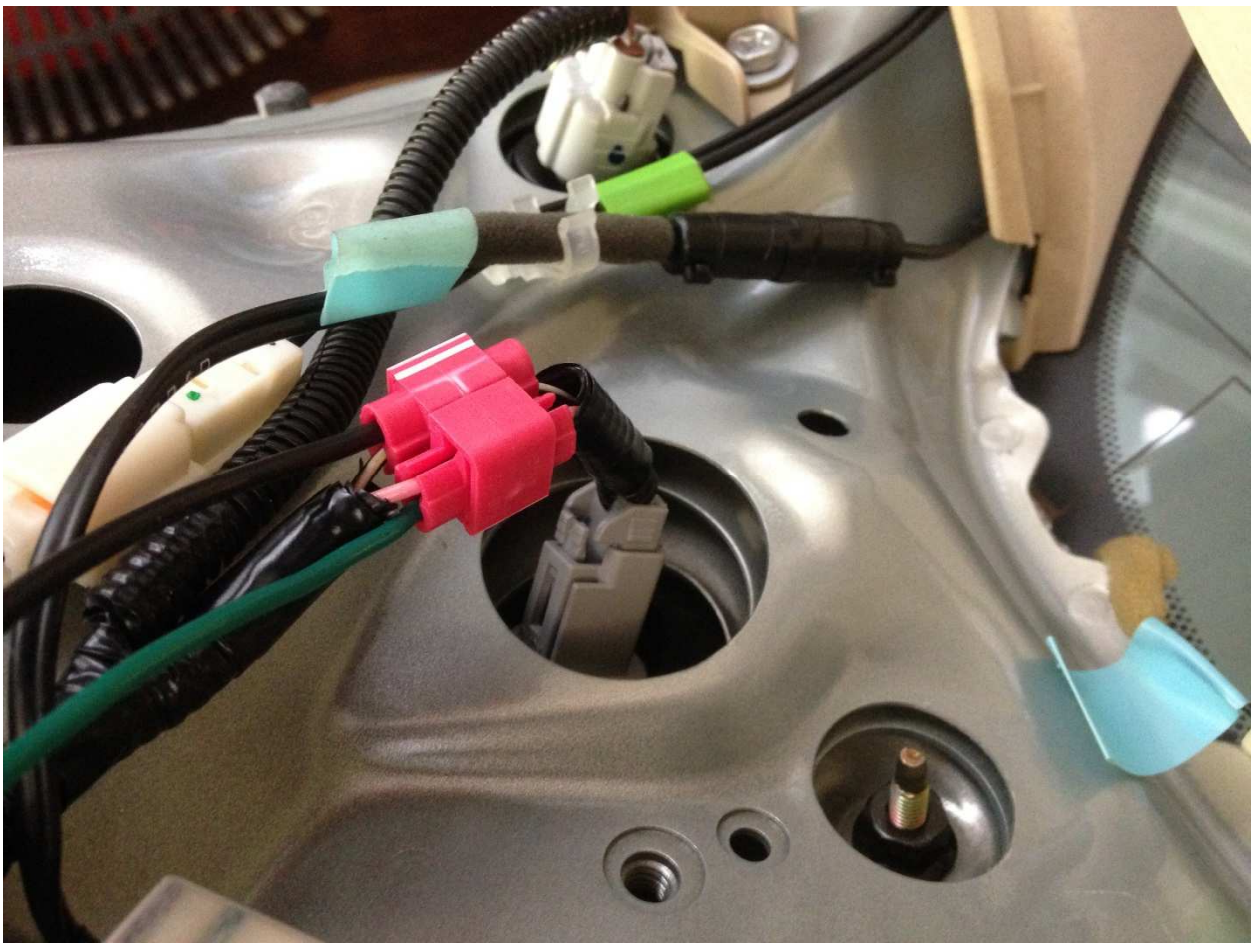
Before mounting the radio, I had to find homes for the two interface units and associated wiring inside the radio cavity. There was plenty of space to stash the interfaces and wiring while leaving enough space for the head unit. Mounting the dash kit was a snap – literally. The kit fit perfectly into the console and snapped into place. I did have to make a couple of adjustments to the angle that the kit was mounted to the head unit to get it to fit properly. There are a number of mounting holes on the dash kit and the radio so the trick was finding the correct hole combination to provide the right angle. Here are some pictures of the unit mounted in place:


BRIGHTNESS
H
M
:00
INFO
SECURITY
PASSENGER
TEMP
AUTO
OFF
A/C
MODE
DUAL
FRONT
PASSENGER
TEMP
GPS
MIC
DVD
RADIO
BT
MENU
TF
RES
MODE
AMS
SEEK


SECURITY
PASSENGER
AUTO
OFF
A/C
MODE
DUAL
FRONT
PASSENGER
TEMP
GPS
MIC
DVD
RADIO
BT
MENU
TF
RES
MODE
AMS
SEEK
12:07
Navi
Radio
87.50
DVD
USB1
USB2
SD
BT
Setup
AV_IN


Now that the head unit was mounted and working correctly, I needed to finish the rear camera installation. Recall that I already installed the wireless video receiver when I installed the head unit. Now I needed to mount the camera and install the wireless transmitter to send the video to the head unit when the car is shifted into reverse.

Similar to the wireless receiver installation, I needed to connect the wireless transmitter's power to the car's reverse signal so that it transmitted video when the car goes into reverse. To do this, I tapped into the power and ground of one of the reverse lights on the rear hatch. To access the reverse lights, the trim on the back of the hatch door needs to be removed. You need to apply a bit of force to remove the trim; it is held on by a number of plastic rivets; you can see the rivets in the next picture. I broke two of the rivets, but I found them on eBay and bought 20 of them for less than $5. Note also that there are two pieces of trim (one is plastic, the other is covered with carpet). The plastic trim piece contains the hatch light so be careful not to pull that trim too hard and damage the cable that powers the hatch light. To access the reverse lights, you only need to remove the plastic trim piece. However, the carpet trim piece needs to be removed to mount the camera so I removed both.

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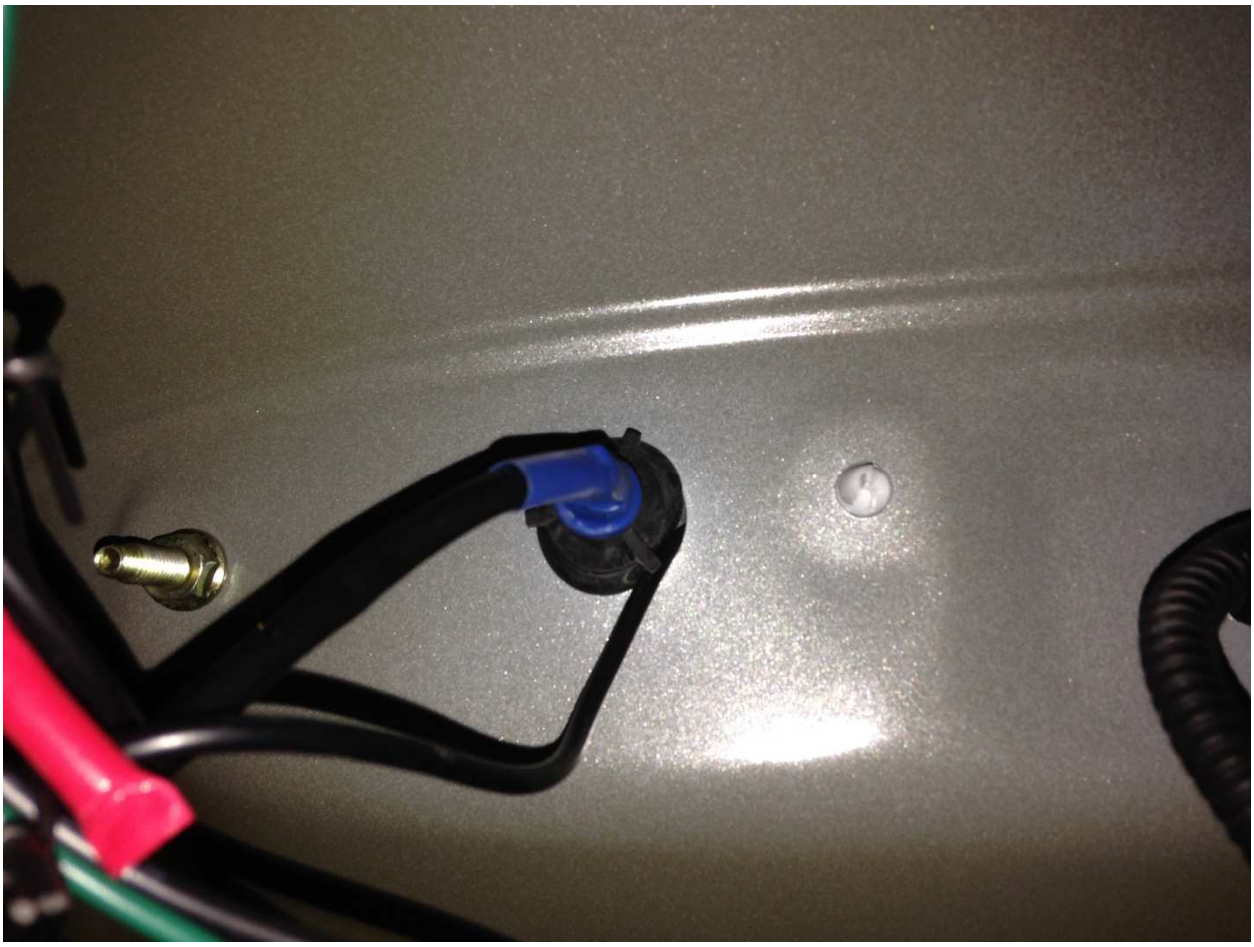
Once the trim was removed, I spliced into the power and ground of the passenger-side reverse light and connected them to the wireless transmitter. The Pink wire is the power (I spliced into it with a Green wire) and the Brown wire is the ground (I spliced into it with a Black wire). The splices are shown in the picture above (red plastic splices).

After powering and mounting the wireless transmitter, I installed the rear camera on the outside of the hatch above the license plate. There is a plastic piece above the license plate that contains the license plate lights lens covers; this piece needs to be removed so the camera can be mounted to it and the camera wire can be run inside of the car and connected to the wireless video transmitter. The camera cannot be mounted in the center because the hatch handle is located there so I mounted it just to the right of the handle. I positioned it so that it did not block the license plate lens covers. The plastic piece is held on by five nuts that secure it to the hatch. The nuts are exposed after the carpeted hatch door trim is removed. The picture below shows two of the nuts. I had to use a wrench to remove the nuts because I could not get a socket on them:

Once the plastic piece is removed, you can see a rubber grommet on the right side of the opening. The camera wire needs to be funneled through it so it can connect to the wireless video transmitter. The grommet already has a cable going through it but there is enough room on the side of the grommet to push the camera wire through. The picture below is looking at the grommet from inside of the car but you will be able to see it from the other side after the plastic piece is removed:



While the plastic piece is off, I used a small file to make a notch in it to allow the camera wire to be routed inside the hatch door. The notch is behind the camera so it cannot be seen. Next, I reinstalled the plastic piece before I mounted the camera because I wanted to make sure I was mounting it in the right place. The camera mounted to the plastic piece with two small screws, one on each side of the camera. I used a drill to make small pilot holes to assist with installing the screws. In the picture below you can see the notch I made for the wire and the screws holding the camera in place.

Before replacing the door trim inside the hatch, I tested the camera to make sure it was installed properly. I started the car, put it in reverse and was able to see the output of the camera. The picture below shows what appeared on the screen – a great picture of my driveway:


TBALL LEAGUE
NFL
HEART OF IT ALL
AVIATION
LIGHT & FLIGH


A/C
MODE
DUAL
GPS
MIC
DVD
RADIO
BT
MENU
TF
RES
MODE

Overall, I am very pleased with my installation as I was able to get the modern updates I wanted. Some final thoughts:

- As I mentioned earlier, I would mount both of the external connectors on the same side if I did it over again. I think it would look better, but that is a minor thing.
- I would check to make sure the radio fit into the trim kit before I purchased it. I almost got burned by the trim kit opening being too small but I made it work.
- I like the fact that I made the connections between the radio interfaces and the car with spade connectors. This allows me to easily remove the radio and reinstall the OEM unit if I ever want to do it. If I had hardwired the connections, I would have to cut them if I wanted to remove the new radio. You may never plan on reinstalling the OEM unit, but you never know. When I originally installed the new radio in my LS430, I did not own the RX330 so I had no intention of removing it but ended up doing it. It's a good thing that I never got rid of the LS430's OEM unit! I am going to hang on to the RX330's unit for a while.

Good luck!