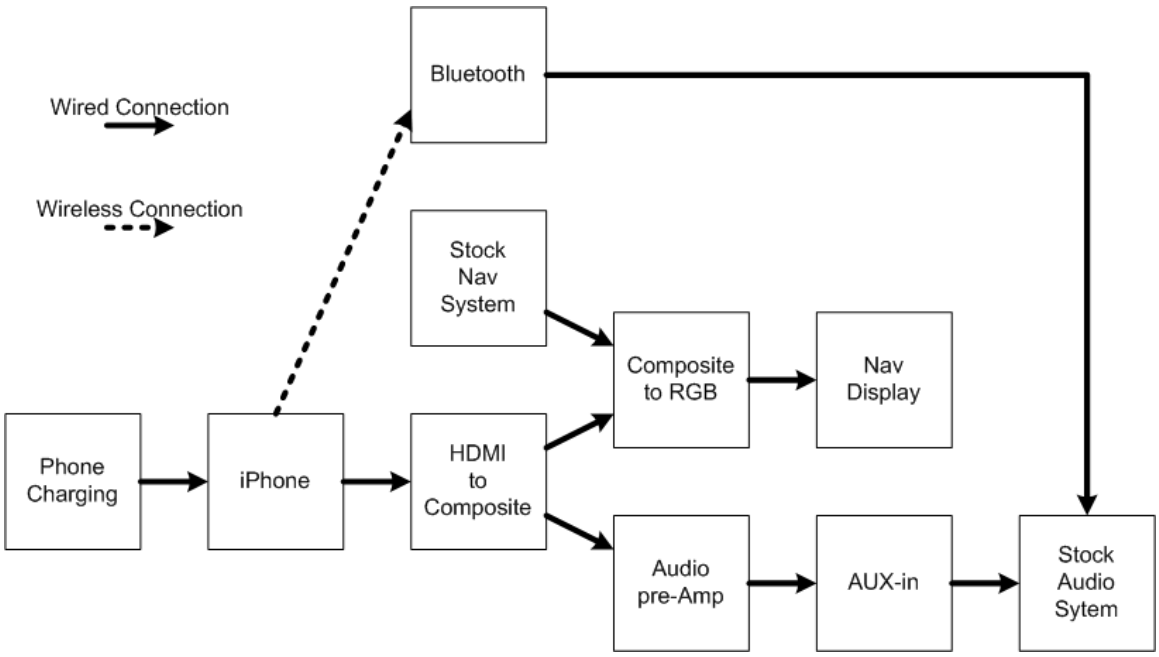
Background & Objective

I don't like talking on the phone in the car and generally try to avoid it, but it is sometimes necessary and having owned other cars with an integrated hands free phone, it is a nice feature.

There are a number of possibilities described in the forums for adding bluetooth, many with detailed write ups, but none achieved quite what I was looking for. It also happens that I installed an AV upgrade at the same time as the Bluetooth, but the two don't have much interaction so I will describe them separately.

The project began with a 2003 XKR coupe had provision for a factory phone, meaning it was wired for the connections and microphone, but never had a phone module or handset installed.

The high level architecture looks like this:



Parts List

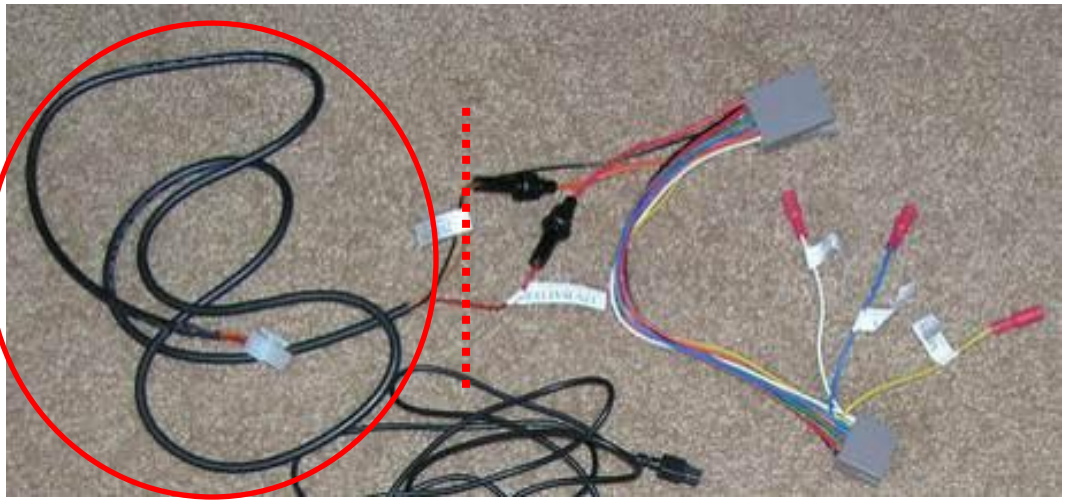
Bluetooth enabled phone
Parrot CK3000 Evolution Bluetooth
18 pin AMP 070 connector P/N 173853 (console connection)
2 pin AMP 070 connector P/N 174660 or 178602 (overhead microphone)
AMP pins for 070 connectors

The Parrot Bluetooth setup can be found on eBay or Amazon. The AMP connectors and pins can be found purchased from an electronic components supplier but it is common that they have minimum orders. I chose http://www.onlinecomponents.com/ which does have a minimum order dollar amount (something around $20), but no minimum quantity of parts, because who really needs a thousand AMP connectors.

When it comes to connectors the first 6 digits are what is important and the part after the dash indicates color. I wasn't too concerned about color coordinating the connectors so went with whatever was in stock.

The CK3000 is a universal system, meaning that it comes with all of the wiring and connections to install it in a vehicle that has no provision for a phone but since our cars are wired for a phone input already, a great deal of the wiring we will end up discarding.

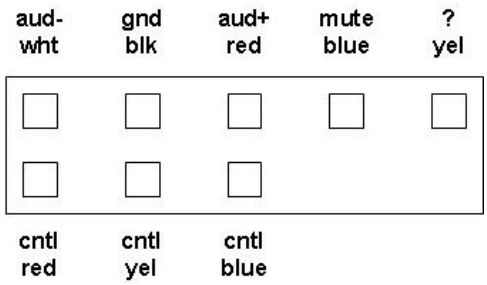
First on the chopping block is the power cable:



The power cable comes with universal connectors that are not needed in our application. The only part we need to keep is the 4pin connector that mates to the Parrot control box so cut on the dotted line. All of the circuits for the phone are fused at the vehicle panel so you can clip the wires downstream of the in line fuses. For convenience leave enough of the wire outside of the black sheath to allow stripping the ends and soldering to the new connector.

Below is the mute and audio harness which is designed to be put in line, between the head unit or amp and the speakers. The black box contains a collection of relays that switch the phone audio in place of the stereo output but none of this is needed in our application. Cut on the dotted line, keeping the circled part of the harness. The rest can be discarded.

The connection to the CK3000 control module has a pinout as follows:



The audio wires in the top row we will use to connect to the vehicle phone connector under the console, the bottom row wires go to the smaller four pin connector that is mated to the CK3000 controls and the yellow wire at far right in the top row is unused in this application. There is a separate programming harness that Parrot sells to re-flash the control module firmware and I believe that this wire is used for that purpose.

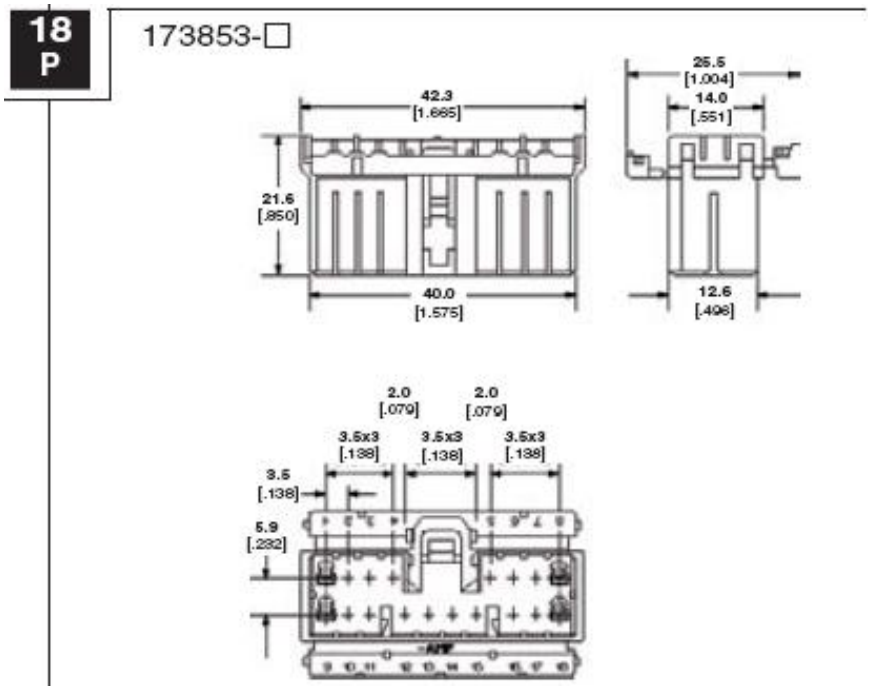
The last bit of destruction is to cut the microphone cable. If I am completely honest I was a chicken about this one and put eveything together to make sure it would work before I cut the mic cable but since I know the outcome I can pretend that I cut all of the wires with reckless abandon.

Cut the mic cable approximately in half. This is way more length than is actually needed but gives plenty of recovery room just in case something goes wrong.

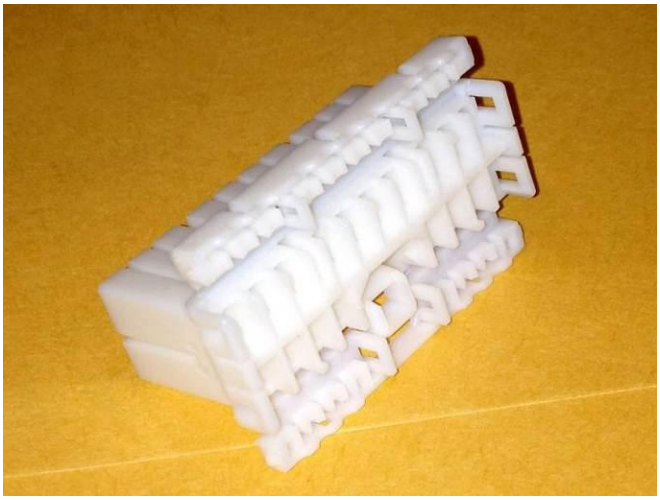
When you cut the cable you will find that it has a central conductor and a copper sheath around the outside. You need to strip the insulation back some length and twist the sheath into a “wire” such that we can mate it to the connectors we will make. Stripping the insulator without also cutting the braided sheath is a bit of a trick and this is where the extra length is useful.

The 4 pin control harness we will use as is, so that can be set aside for now.

In the 2003 MY the connector in the console is an 18pin AMP 070 style (P/N 173853).

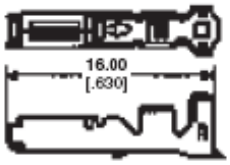


Your connector should look something like this:

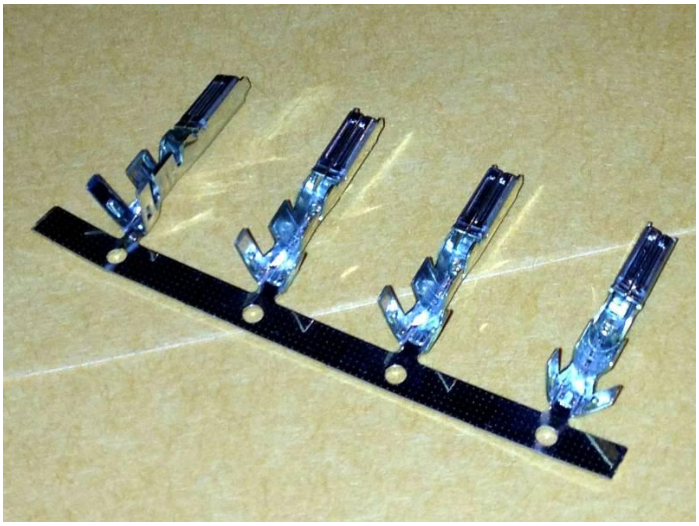


You also need the female pins to populate the positions in the connector we will need to use. For the wires we have to work with the smaller pin is ideal, although either will work. I chose to go with 173630-1, brass type, in strip form. Again, the best choice will be what is in stock and easy to get.

070 Series Receptacle Contact and Plug Housing for Wire Application (Continued)



Wire Range AWG	Wire Range mm²	Wire Ins. Diameter	Finish	Receptacle Part No. Strip Form Brass	Strip Form Phos. Bro.	Loose Piece Brass	Loose Piece Phos. Bro.	Hand Tool Part No.
24-22	0.2~0.35	1.2~2.0 .047~.079	Pre-tin.	173630-1	173630-6	175026-1	175026-6	911799-2 (408 481J)
			Sel. gold	173630-2	173630-7	175026-2	175026-7	
20-16	0.5~1.25	2.0~2.6 .079~.102	Pre-tin.	173631-1	173631-6	175027-1	175027-6	911788-2 (408 480J)
			Sel. gold	173631-2	173631-7	175027-2	175027-7	

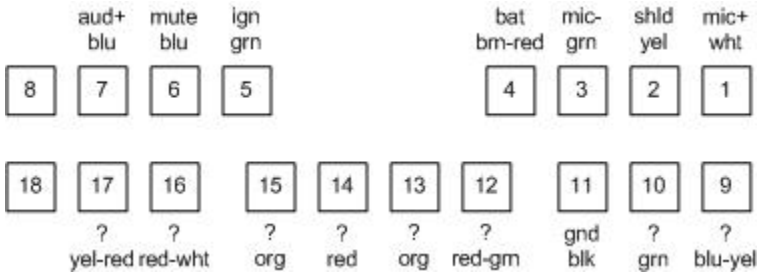


Strip the wires from the audio harness, the power harness and the half of the mic cable with the headphone like connector. Once this is done we need to affix one of the female pins to the end of each one.

The AMP pins are meant to be installed with a special crimping tool. I don't have one of these and am too cheap to buy one, but it is possible to use a pair of needle nose pliers to fold over the tabs of the pin to approximate the crimp. The middle tab is intended to make contact with the wire itself and the rear, taller tab is meant to bite into the wire insulation to hold it in place. After crimping them, I also soldered the wires into the connector by placing the tip of the iron at the front of the middle tab and wicking in some solder.

Once you have all the pins connected to the wires now it's time to insert them into the 18pin connector. Below is the pinout and wire colors from that connector in the vehicle. Pin numbers follow the AMP convention and the Jaguar wiring schematics.

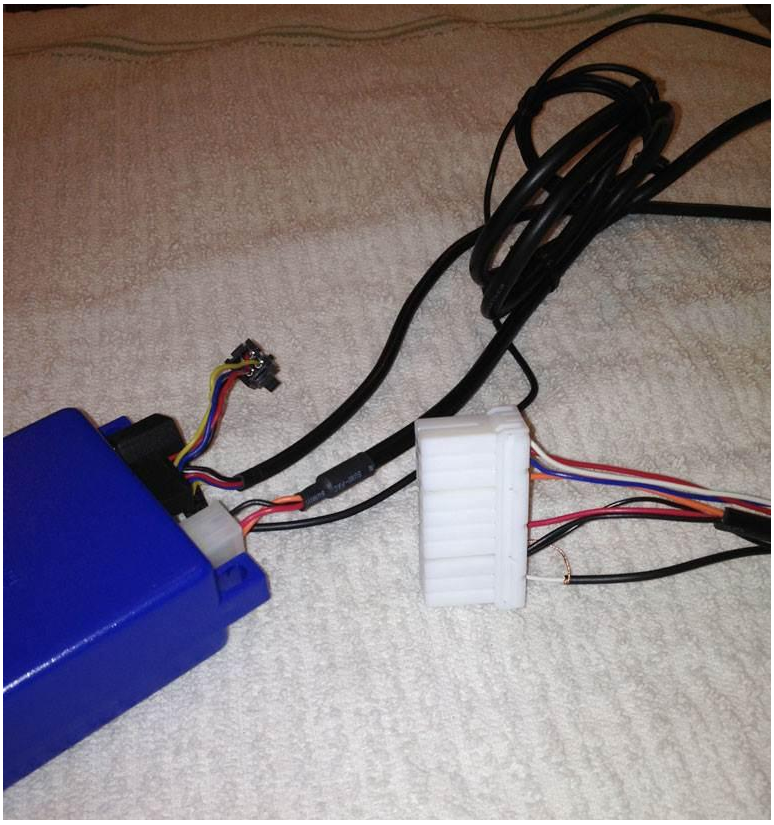
The view is looking into the end of the male connector or from the back (wire) side of the female connector that we are about to assemble.



There are many more wires on the vehicle side than are necessary for our purpose here, mostly to do with the communication to the Jaguar phone module. The one's of importance are labeled with their purpose.

Insert the appropriate pins into the locations in the connector and close the latches. The mic sheath from the cable should be inserted into the *mic-* location. The pins should slide in easily and click into place and it will not be necessary to force them if they are the right shape. If it is difficult to insert then it is likely that in folding the tabs or soldering that there is some small protrusion. Flattening these to the edges of the pin should make it easier to insert them.

You should now have a connector that looks similar to the one pictured below.



Once assembled, place a wrap of electrical tape over the *mic*- wire to prevent any accidental contact (not shown in the picture).

Next is to construct the microphone harness.

I have read that using the overhead mic location can be noisy, but it seems to work well enough in my coupe and lets me utilize the factory wiring in the car, so that's what I will describe here.

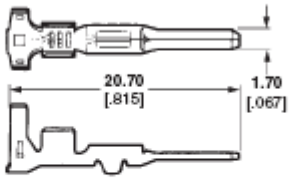
The vehicle side of the mic harness is located behind the overhead console which can be removed by pulling strait down. There is a single clip at the rear and two at the left and right sides just ahead of the ahead of the lights, near the windshield. There are two connectors that must be unhooked, one approaching from the left and right sides.

With the console out, you should find a 2 pin connector tucked above the headliner and taped to part of the wiring harness. In a LHD car this is on the right (passenger side), but the opposite may be true for a RHD vehicle. Un-tape the connector and extend the wiring so that it is accessible.

If the screen cover for your airbag ultrasonic sensor is deformed, now is the time to fix it. It is easily accessible from the back side of the overhead console and even the most flattened one can be worked back into (mostly) the right shape.

Now to build the mic harness by attaching the male style pins to the microphone half of the cable. You will also need the male version of the pins we used earlier for the console connector. The 22-24 AWG version is sufficient.

070 Series — Tab Contact and Cap Housing for Wire Application

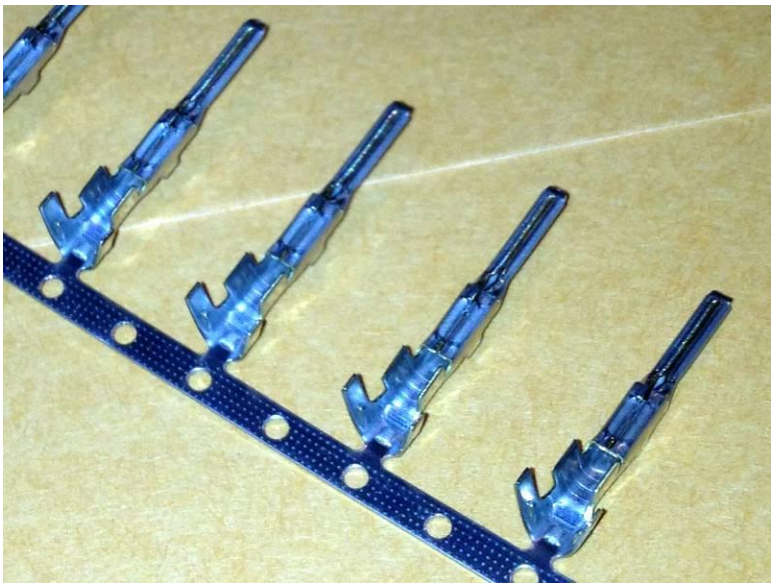


Wire Range AWG	Wire Range mm²	Wire Ins. Diameter	Finish	Receptacle Part No. Strip Form Brass	Strip Form Phos. Bro.	Loose Piece Brass	Loose Piece Phos. Bro.	Hand Tool Part No.
24-22	0.2~0.35	1.2~2.0 .047~.079	Pre-tin.	173633-1	173633-2	175029-1	175029-2	911799-2 (408-481J)
			Sel. gold	—	173633-3	—	175029-3	
20-16	0.5~1.25	2.0~2.6 .079~.102	Pre-tin.	173645-1	173645-2	175030-1	175030-2	911788-2 (408-480J)
			Sel. gold	—	173645-3	—	175030-3	

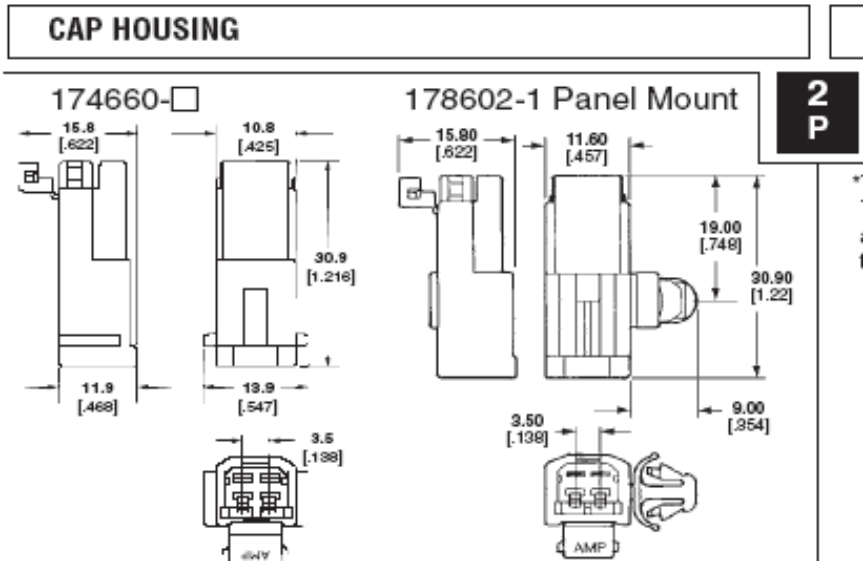
Like the others, these pins come in strip and loose forms. Attaching them is the same, use the crimper if you have it, or needle nose pliers to roll the tabs over to hold the wire. Like before I used a bit of solder to make sure the attachment was solid.

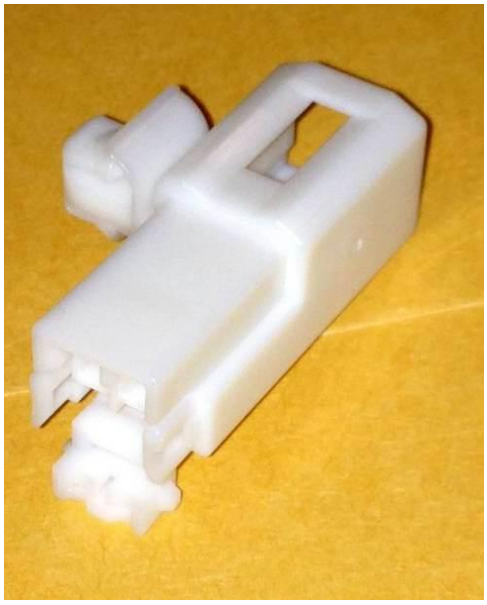
There was one minor hitch in building up this connector. When I tried to connect them in the car I found that the width of the pins made for a very tight fit and was not able to get the connector to latch. Ultimately I had to sand the edges down to make them just a little bit narrower.

Once the pins are attached but before putting them in the connector it is a good idea to check the fit of the pins to the connector in the car, so as to save having to disassemble the connector later.

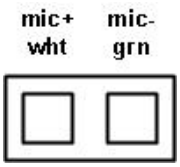


There are two styles of 2 pin connector, one that is strait and one that has a panel mount clip molded into it. The connection and pins are the same, so either will work. At the time, the panel mount version was in stock so that's what I ordered and it t should look something like:





The pinout for the vehicle connector is as below:

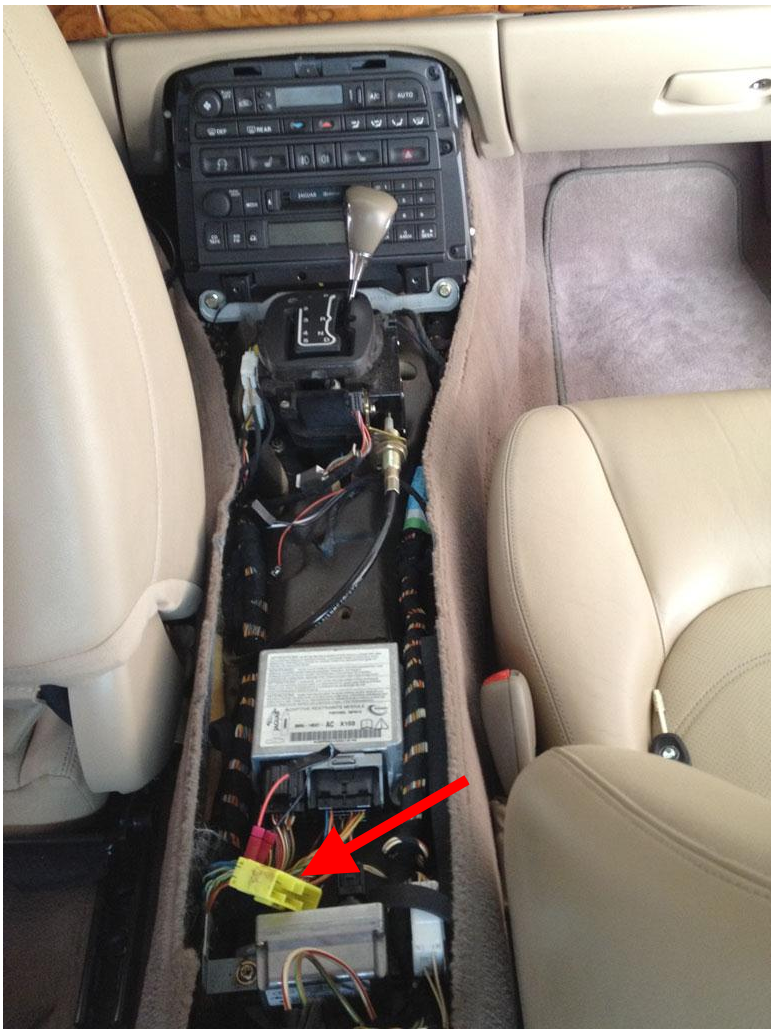


The white central conductor from the microphone connects to the white in the car and the braided sheath connects to the green in the car. Like before, place a wrap of electrical tape across the two microphone wires to protect the un-insulated *mic-* from making accidental contact (not shown in picture).

Now it's time to start installing the components. While it probably isn't necessary to remove the console completely to install this, it definitely makes getting the connector routed into the back of the console easier to do. My advice is save the frustration and to at least take the console loose at the rear, if not remove it entirely.

Reverend Sam has a very good description of how the console comes out:
http://www.youtube.com/watch?v=gU8QeZWoWr0&list=UUAgIVTq-C4gqcsWPF9JyaYg&index=9&feature=plcp

Once out, everything is very easy to get to. The phone connection in the console is mounted near the rear to a metal tab. Unclipping the connector allows much easier viewing of the wire color to confirm that the Bluetooth connection is assembled correctly.



We will mount the Bluetooth box in the same location that the Jaguar phone module would mount, and to do that we need to remove the rear seat. The bottom cushion is held in place by two nuts under the front lip at the far left and right sides. When the nuts are removed the seat can be lifted up, exposing a single philips screw on each side that holds the seat back in place. The rear seat back has a hook near the top behind the headrest part. When the screw is removed the seat back and be pushed upward to unhook and release it.

With the seat back out and the bottom loose the cable can be routed out the back of the console, under the carpet and through the wire tray that runs between the rear seats. Once the wire is fished under the padding then it can be connected to the Bluetooth electronics box.

In the picture there are also other wires routed across the rear bulkhead and these are related to an AV upgrade that I described in a separate write up.

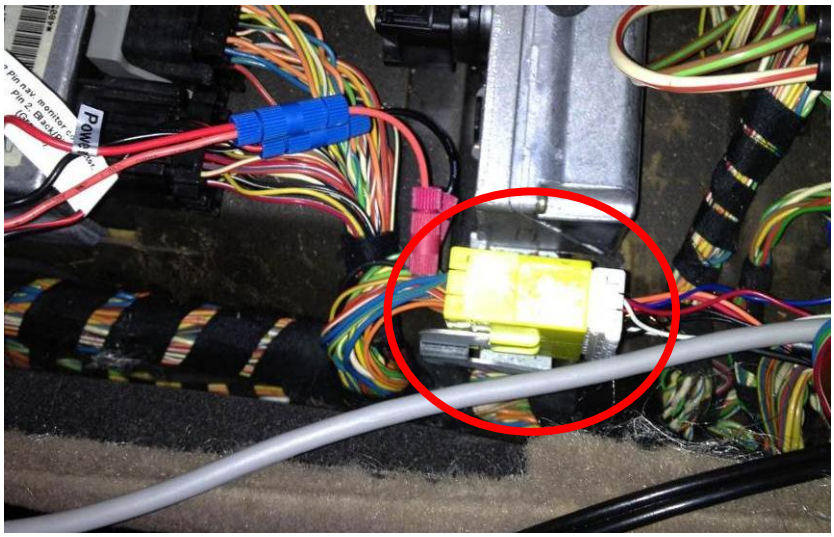
With the seat out, you can see 3 threaded studs in a triangle formation that would be used to mount the Jaguar phone module. These are pained and aren't easily visible in the picture. Looking at the back of the upper seat cushion there is a cut out in the center that the phone module would fit into. We can mount the Parrot box in this same location so that it fits into the existing seat cut out. The Parrot module is somewhat smaller than the Jaguar one so location isn't too critical.

The Parrot module is plastic and doesn't weigh very much so I used several strips of double sided molding tape to attach it to the rear bulkhead.

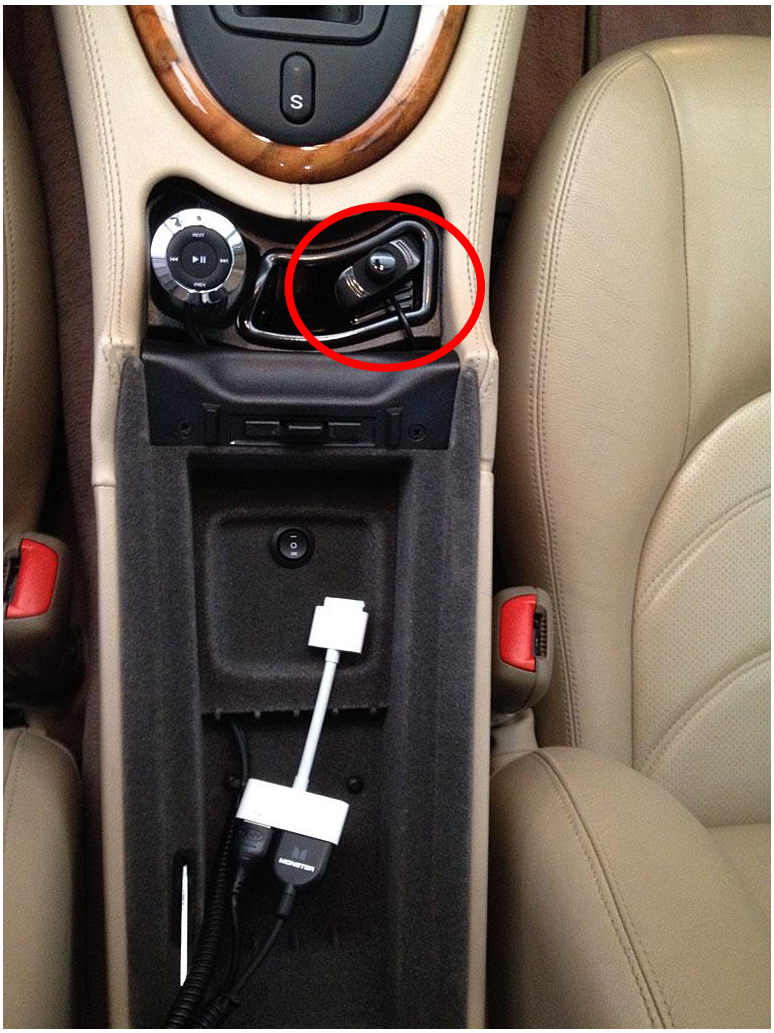
Route the cable from the controls through the console and up to the 4-pin connecter near the Parrot module. There is enough length to mount the controls around the console or ash tray areas.

Wires connect easily to the module. The power connecter clips into place, in fact it is nearly impossible to get it back out once it is attached. The 10 pin control and audio connector, on the other hand, doesn't clip and is held in place by friction alone. I have not had any problems with this but during installation just take care not to accidentally pull them out when installing the seat. I used a strip of duct tape below the module to hold the wires in place and ensure that there was always a little slack near the connection to prevent pulling.

On the console end, just clip the connector we built into the vehicle harness.



One of the main reasons for choosing the CK3000 in the first place was the small size of the controls which allows them to be mounted in a place that is not intrusive to the interior of the car. In order to show the final control location I'll skip ahead a bit to where the console has been re-installed. I chose to attach the Parrot control to the flat pat in the ash tray. While the console was out I also removed the ash tray lid since it can never be closed with the controls in place and to give a little more room for wire routing. Again, I used a piece of double sided molding tape which attaches the control firmly but not permanently should there ever be a need to remove it.



Overhead, connect the other half of the mic harness to the vehicle connector. If you didn't shorten the wire then there will be quite a bit more length than is necessary. I simply rolled this up with a cable tie and tucked it over the headliner, just in case I needed to make the microphone to a different location. Make sure you have all your clips The mic comes with an adhesive mount, but I found that just tucking it between the overhead console and the headliner is enough to hold it in place.

Follow the instructions in the manual for joining your phone to the Bluetooth and when it connects you should see a message on the radio display.

The phone connects to the head unit directly and will mute the radio or CD when Bluetooth is in use, but, if you are using an AUX input to the radio such as the AI-AUX then you will find that there is an interaction. Because the AI-AUX connects between the radio and the amp you won't hear the phone audio when music is playing. If you happen to be are using the phone as the audio source, then the music will stop when a call comes in, and there is a clear indication. If not, the only indicator will be the PHONE display on the radio. I don't really use the phone in the car that often and when I do most often it's for outgoing calls, so it isn't that much of an inconvenience, but is something to be aware of.