iPHONE BREAKOUT CABLE

By Bruce Pierson

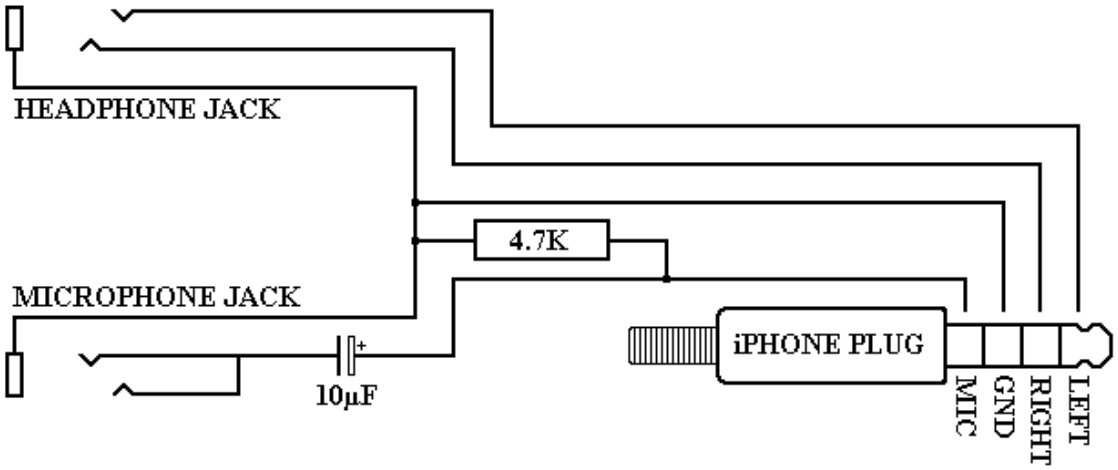
Professional quality headphones and microphone plugged into an iPhone

My oldest son does event videos and he's been working out better ways of doing things to optimise his productions. Recently, he looked into the possibility of using his iPhone to record sound, so that he could use a variety of microphones in different situations. In order to accomplish this, it was necessary to use an iPhone Breakout Cable, as the inbuilt iPhone microphone is not suitable for video productions.

He looked into the availability of cables and found that they were over $30.00 each, for a cable that included a microphone socket and a headphone socket, so we decided to have a go at making some, because he needed three cables made up and we could get all the parts for around $30.00 for the three cables, so that was a substantial saving.

He looked on line and found a schematic for the cable construction and he gave me the schematic, so I went ahead and constructed the first cable ready for testing. We tested it and it would not work. Some further research revealed that the iPhone uses an electret microphone and that 2.7V was present across the microphone terminals. This means that a standard microphone will not work in this situation. Further research indicated the need for installing a 10µF capacitor in series with the microphone cable to prevent the DC voltage from reaching the microphone.

I fitted a miniature 10µF electrolytic capacitor inside the microphone socket and we re-tested the cable. It still didn't work. Still further research indicated the need for a 4.7K resistor across the iPhone's microphone input, so I installed a miniature ¼W resistor in the socket as well. Once that resistor was fitted, the cable worked correctly.



The correct schematic for an iPhone Breakout Cable

It would seem that a lot of information on iPhone Breakout Cables on the internet is incorrect, because many of the schematics do not show the capacitor and resistor in the schematic. The persons posting these schematics either haven't constructed these cables, or they are using electret microphones, because a standard microphone simply will not work without the additional components. Some commercially available cables mention in their listing about the inclusion of the resistive and capacitive components, although they don't provide any further details about these components.

I constructed two more cables after the initial trial cable and I found that the best approach was to fit a miniature 10µF electrolytic capacitor inside the microphone socket and use a standard sized ¼W resistor in the lead where the two twin shielded cables join to the single quad shielded cable.

Construction of the cable can be tedious and time consuming and some care needs to be taken with wiring up the iPhone plug, as these are rather different to standard stereo plugs. The plug, sockets and shielded cables are available from both Altronics and Jaycar. Note that if you can't get a miniature electrolytic capacitor to fit inside the socket, you can use a Tantalum capacitor or fit the capacitor along with the resistor in the area where the cables are joined.

Each wire at the cable joining is insulated with PVC electrical tape and then the whole bundle is further taped to make the joint as smooth as possible, before applying two layers of heat shrink to protect the joint and keep the wires stable.

The completed iPhone Breakout Cable

PARTS LIST

1 3.5mm stereo + video plug
2 3.5mm stereo line sockets
1M twin shielded cable + 1M quad shielded cable (Sold in minimum 1M lengths)
1 4.7K ¼W resistor
1 10µF miniature electrolytic capacitor (or 10µF Tantalum Capacitor)
Electrical tape, 5mm Red + 5mm Green + 8mm Black or Grey Heat Shrink Tubing