

Belkin Tunecast II FM Transmitter Mod

by [The Corrugator](#) on January 18, 2007

Table of Contents

- License: Attribution Non-commercial Share Alike (by-nc-sa) 2
- Intro: Belkin Tunecast II FM Transmitter Mod 2
- step 1: How to gut the TuneCast 2
- step 2: The anatomy of a Belkin TuneCast II 3
- step 3: What you would see in your brandnew TuneCast, the 'Before' 3
- step 4: How to boost the FM Transmission power 4
- step 5: Hmm... How about a longer audio cable? 4
- step 6: Now to remove the TuneCast auto-power down 5
- step 7: Modding the case to fit the switch 6
- step 8: Just to prove that everything still works and fits snugly ! 6
- step 9: Finally! The finished product! 7
- Related Instructables 7
- Advertisements 8
- Comments 8

License: Attribution Non-commercial Share Alike (by-nc-sa)   

Intro: Belkin Tunecast II FM Transmitter Mod

Belkin is a popular manufacturer of cheap and cheerful computer accessories, having singlehandedly made the USB hub sexy! One of their more popular product hitching the iPod popularity ride, is the Tunecast II FM Transmitter.

It is only earlier this year (2007) that FM transmitters like these became legal in the UK, ignoring the fact that savvy netizens have already brought theirs from eBay.

This modification improves the transmission range and remove the 'feature' of auto-power down when no audio signal is present. It certainly sets you up as resident pirate radio DJ of your block and allows you to jam the loud radio listener on a bus or train!

Please note that this is a rehash of something that was done before 'instructable' came along. No more the delay now for the good stuff!

Product link:

http://catalog.belkin.com/IWCatProductPage.process?Product_Id=263200



step 1: How to gut the TuneCast

Those ever efficient Taiwanese manufacturer manage to secure this piece of gadget with just a single screw, if you're handy with a screwdriver, that's the job done!

The first image shows the location of the screw (ignore the switch for the moment, that comes later), the second one shows where to a gentle pry will open it, note the plastic latch.



step 2: The anatomy of a Belkin TuneCast II

Here's the back of the TuneCast, the IC is a FM transmitter from Rohm, a Japanese semiconductor company.

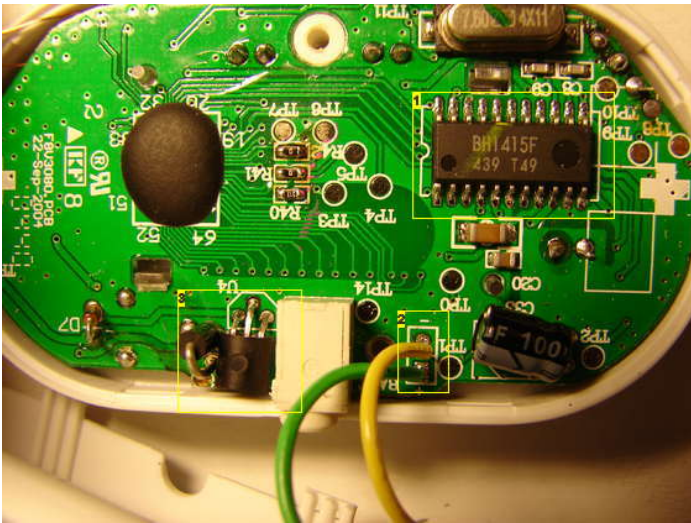


Image Notes

1. BH1415F FM Transmitter IC
2. Battery power inputs
3. 5V linear regulator and reverse voltage protectionn

step 3: What you would see in your brandnew TuneCast, the 'Before'

Here's a series of photos of the same TuneCast, thankfully with everything still attached.

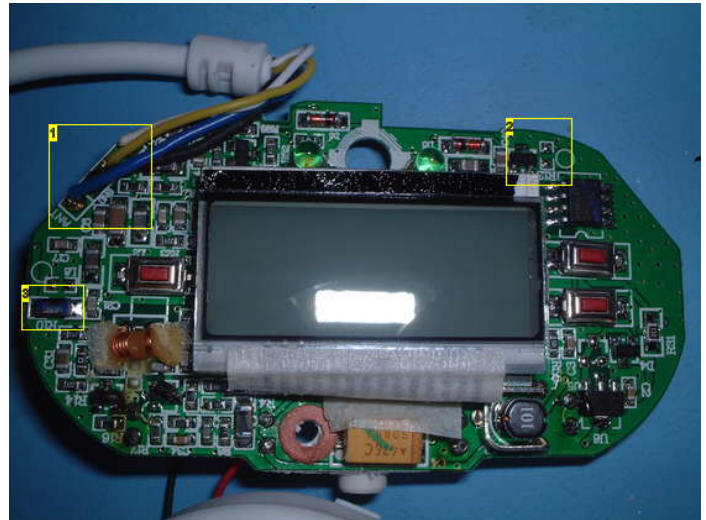
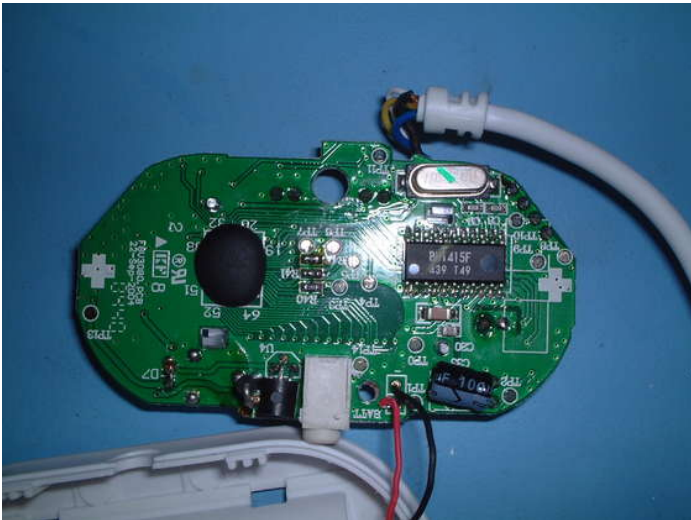


Image Notes

1. Wire Identification Blue: Antenna White: Audio Left Channel, 'Tip' Yellow: Audio Right Channel, 'Ring' Black: Ground, 'Sleeve'
2. Here's where the transistor to keep the TuneCast on without the presence of a audio signal
3. The pesky inductor that attenuates the transmission power output

step 4: How to boost the FM Transmission power

Well... Not to boost the power, more like removing the attenuation.

This step involves a bit of handy soldering which may be a bit tricky.

Should you dare proceed, the procedure is easy enough, simply bypass the tiny inductor. If you refer to the previous step, you would have notice a blue wire soldered to the PCB via hole, conveniently labeled 'ANT', remove this and stick it directly to where the black wire is on the photo below, the inductor can be left connected to one end, just in case you wish to revert the changes.

An adequate length of this black wire for the antenna can be a quarter of the transmission wavelength, in this case, a minimum of $3e8/108e6 * 4$ ($c = f * \lambda$), about 70cm.

Now if you wish to take it further, get a telescopic antenna! I have devised a neat way of attaching the antenna, see second photo.

If you live in the UK, Maplin Electronics (www.maplin.co.uk) has a selection of antenna for CB radio

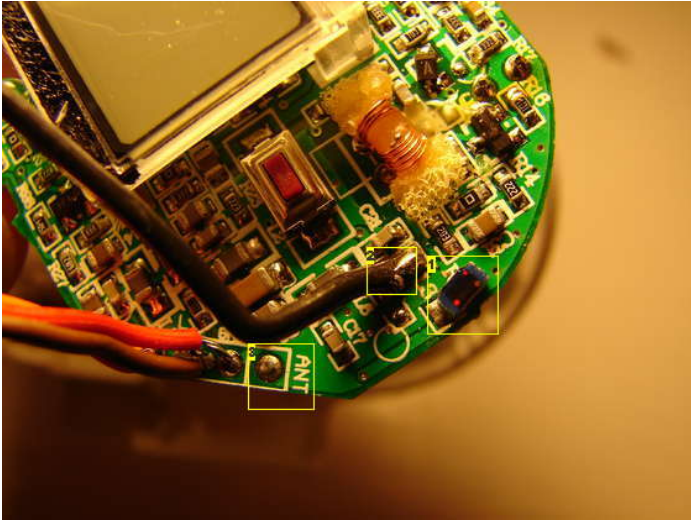


Image Notes

1. Inductor to bypass
2. Reattached antenna wire here
3. Unsolder blue wire from here

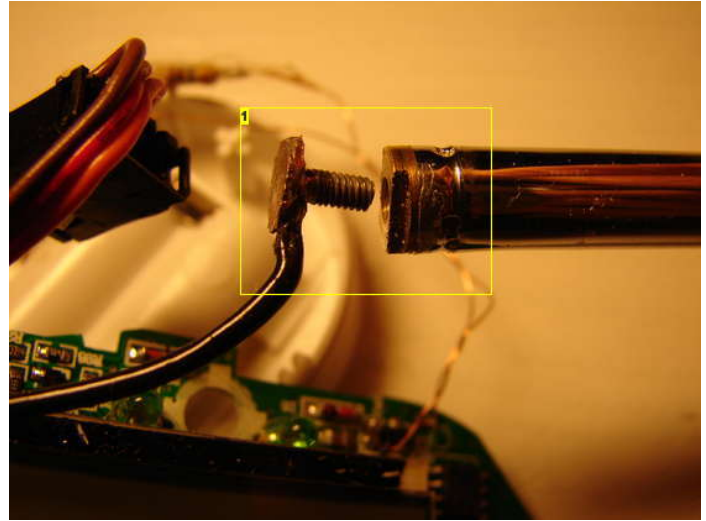


Image Notes

1. A screw-on fitting for telescopic antenna

step 5: Hmm... How about a longer audio cable?

Yup, the TuneCast has a really weedy short audio cable, not very nice if you decide to place the FM transmitter by the window, so your neighbor 4 floors down can listen to your collection of the latest break-beats!

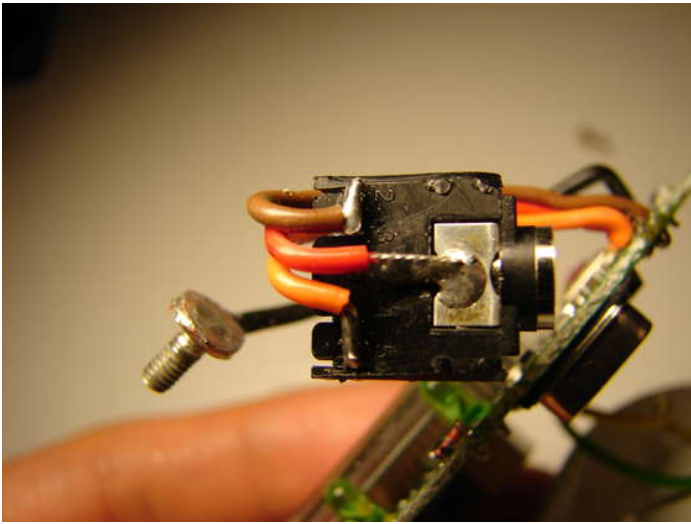
The solution is to replace the stereo plug with a plug that is small enough to still fit the TuneCast package.

The photo below shows the new stereo plug add-on feature, if you're doing the modification, do note the correct channel, refer to the photo in step 3 for the correct connections.

A brief description:

The white wire is the 'tip' of the plug, which is the left channel, the yellow wire connects to the 'ring' or middle bit of the plug, which is the right channel, the black wire is the ground.

Suitable stereo socket can also be found in Maplin Electronics.



step 6: Now to remove the TuneCast auto-power down

Basically the TuneCast automatically power down when there's no audio signal for about a minute, this is great since the number of transmission channel is limited, not so great when you are flipping through your 60GB of music selection looking for right song and then a blast of static comes on! Ouch!

This step is a bit trickier, it involve adding a switch, a resistor and some wiring.

The idea works by biasing up the bit that turns on the TuneCast when a audio signal is present. Although the transmitter is battery powered, many of the ICs on the device requires a higher operating supply voltage, this is done with a boost converter, boosting its internal supply to around 5V, where it is kept permanently 'on', which partly explain why your TuneCast is dead after a few days even if you're not using it, pretty dismal, but great for this modification!

Note on the photo below, the two point in which the wires are attached is where you need to modify (incidentally, this is at the top right end of the PCB, on the LCD side) . I choose to use enamel wire, which has a coat of thin insulating enamel/plastic, simply scrape the ends to allow soldering.

The second image is a drawing of the circuit connection.

As promised, with this feature allows you to 'swamp-out' a typical commercial FM station within 2 to 3 meters of the transmitter and enjoy the peace and quiet. Not dramatic but enough to convulse the listener into fiddling with the radio tuner. :)

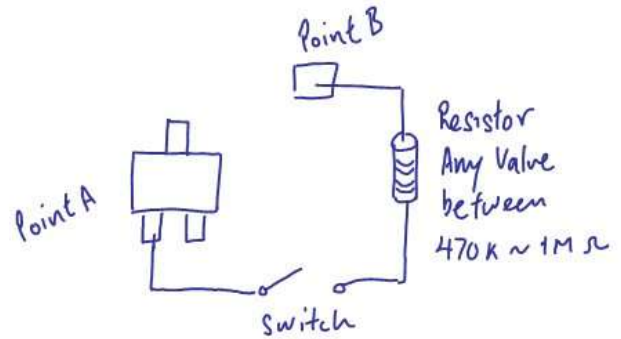
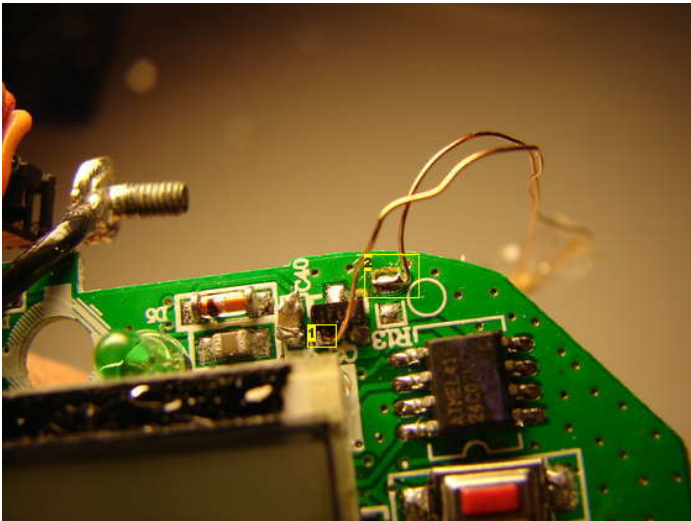


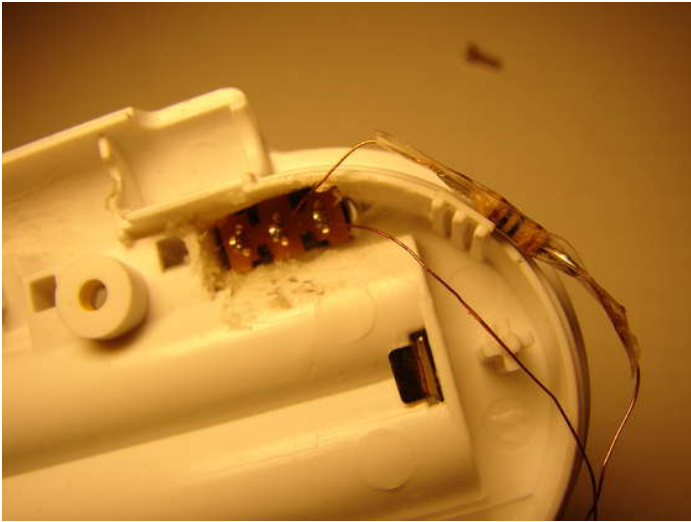
Image Notes

1. Point A, top left 'leg' of SMD transistor
2. Point B, boosted supply voltage

step 7: Modding the case to fit the switch

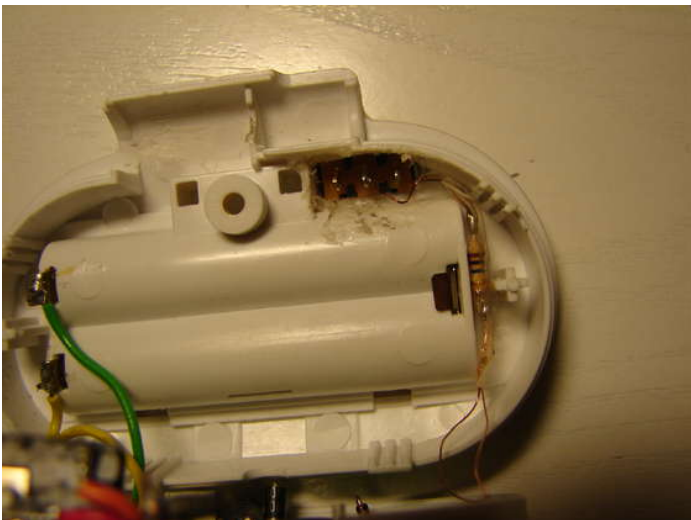
Now that you have done the tricky bit, here's the horrible bit! Wedging a tiny switch into the TuneCast casing. Any kind of on/off bistable switch is suitable, except for momentary monostable push switch, of course the smaller the better, the one I use is massive, but you do with what you have.

With a fair bit of filing and drilling, the end result is show in the photos below.



step 8: Just to prove that everything still works and fits snugly !

What you would have done if you had dare ventured! It's alive!



step 9: Finally! The finished product!

To take it further, you can make a plastic clip mount with a mini-camera tripod and you have your own FM base station!



Related Instructables



Belkin TuneCast 3 Antenna mod... by twocvbloke



Convert Belkin FM Transmitter from Battery Power to Car Power by darc



Ghetto In-Ear Monitor System by WillTheRescue



FM Transmitter Telescoping Antenna by socketeer



Simple TV headphones! by PainTrane



how to record wav. from the tv by slimguy379



Cheap lo-fi wireless audio performance system by Aimless J. Lackluster



How to hide your Cassette Adapter wire by beantown53

Comments

50 comments [Add Comment](#)

[view all 134 comments](#)



Joby1664 says:

Nov 7, 2009. 3:38 PM [REPLY](#)

My Tunecast was different to the one in the example when I opened it. I couldn't find the inductor so I soldered the antenna to one of the legs of the transmitter chip which seemed to be producing the signal. Will this produce the same result or have I made a mistake?

I can't see the equivalent components to bypass the auto shut down either.



gprix1 says:

Nov 6, 2009. 3:03 PM [REPLY](#)

What did you use for the plastic piece on top of the tripod? How is it holding the transmitter?



MairseyDotes says:

Mar 9, 2009. 10:56 AM [REPLY](#)

Replacing the cable seems like a lot of unnecessary work; just use a 3.5mm stereo headphone extension cord.



thx0138 says:

Mar 13, 2009. 7:35 AM [REPLY](#)

Agreed. The antenna mod is great, but it's not much more money and a lot less work to just use a headphone extension cord for this part.



wquoye says:

Sep 16, 2009. 5:12 AM [REPLY](#)

Trouble is the audio cable/plug is awful quality, I've had to solder on a new plug three times so far on my Tunecast due to the cable wearing and shorting out. Dumping the cable and installing a socket is the best mod you can do.



elantrix says:

Aug 30, 2009. 6:14 AM [REPLY](#)

Can you also add a way to solder a DC plug into it.

Other than that, it's a pretty nice mod.



Last_Liberal says:

Jul 18, 2009. 5:51 AM [REPLY](#)

(I apologize for the repeated posts, but I'm not getting any feedback.)

I was able to complete the mod and it did dramatically improve the output of my Tunecast (great), but for some reason, I'm only getting the Left channel (no sound from my Right speaker) even though the "stereo" light is lit on my receiver noting it detects a stereo signal. And yes, the speaker plays fine when switched to regular radio.

I'm also getting enough "hiss" to be annoying (no matter what station I choose).

Anyone have any ideas?



italodisco71 says:

Jul 17, 2009. 3:11 PM [REPLY](#)

See this video my friend.

http://www.youtube.com/watch?v=LsZw_youJAo



Last_Liberal says:

Jul 11, 2009. 8:15 PM [REPLY](#)

I am seriously confused here. You are connecting BOTH the blue antenna wire AND a separate external antenna to the transistor (?) in the middle of the photo (does it matter what end you solder the wire to? Both ends? And how is the inductor "bypassed"? Do you cut one of the leads or run a wire around it? (or both?)

Please help.



Last_Liberal says:

Jul 13, 2009. 9:48 AM [REPLY](#)

Okay, I think I have it now. After blowing up the photos, it appears you soldered a bridge between where the inductor was connected to the left 'L6' contact (the two L6 contacts do not appear to have been bridged), where you also connected the external antenna (the internal antenna does not appear to have been reattached).

If I'm mistaken, someone please let me know. Thx.



italodisco71 says:

Jul 13, 2009. 7:07 AM [REPLY](#)

This belkin fm transmitter has 2 chips. One, Amtel Eprom and one Toshiba with programm and up down 88 - 108. See the youtube video how to convert this transmitter! http://www.youtube.com/watch?v=LsZw_youJAo
dj Kostas <http://myitalodisco.blogspot.com>



graveyardskank says:

Jun 9, 2009. 3:51 PM [REPLY](#)

really good plans, simple and effective. took me about 10 minutes to do this and the audio quality is perfect over 5 meters, have yet to take the radio further away to asses the range but i am very impressed.

transmitter broadcast is strangely directional from the telescopic rod and needs to be angled straight up, gonna be looking for a better shape for omni-directional transmission but its awesome just as you described.



Last_Liberal says:

Jul 11, 2009. 9:49 AM [REPLY](#)

10 minutes? Yeesh!

I'm having a little difficulty seeing *exactly* where the new antenna wire is being attached or how the inductor was bypassed. Can anyone clarify? Thx.



robot+more says:

Jun 29, 2009. 10:51 AM [REPLY](#)

i don't want to mess with the signal so can i put a power antina from a car on the antena of the radio



Biotele says:

Jun 12, 2009. 4:58 AM [REPLY](#)

What is the farthest you can transmit with this mod?



pigmeat says:

Apr 18, 2008. 7:01 AM [REPLY](#)

I have a Belkin copy, by a company called Sansai (see image) and it works great, but I'd like to modify it with guidance from your instructable post. My only problem so far is getting the damn thing open. Unlike the Belkin this thing has no screw and I had a hell of a time trying to pry it open (without success). Has anyone here managed to open one of these? If so, how did you go about it?



mdphoenix says:

May 26, 2009. 2:31 PM [REPLY](#)

I know this is a year old but:

I have a similar unit. Mine is made by iWave though. The gray bezel around the front comes off and the screws are under there. My board was different but I could still locate the attenuating inductor just above the antenna solder joint.

Good luck.



richms says:

May 28, 2008. 4:10 AM [REPLY](#)

I don't know if you have got anywhere with this, but the one pictured is a hugetide c-007B - the black cover with the < O and > buttons will come off (held on with tape) and there's 3 screws under it. I am still playing with defeating the auto power off on mine, when I have some luck I will post an instructable here.



pigmeat says:

Thanks for this. I have since got another model with a screw and have opened it up. Yet to do any mods as other projects are more urgent.

May 30, 2008. 1:23 AM [REPLY](#)



mdphoenix says:

Out of curiosity, what DO the < o > buttons do on yours? I don't have them, but the spaces for them are under my bezel.

May 27, 2009. 6:51 AM [REPLY](#)



danielSpeet says:

Can you also make the signal better, by making the blue wire longer?

May 5, 2009. 6:10 AM [REPLY](#)



emherrma says:

Great mod!. I see a 29dB improvement

Apr 28, 2009. 10:26 AM [REPLY](#)



ferralll says:

I did this on my wife's Tunecast, and now it works great. (or atleast part of it)

Apr 8, 2009. 4:37 PM [REPLY](#)

Before, if you were around a city, you would need a lot of luck to find a good station. Now, I can beat out most of the non major (local) stations! Thatsk.

What I did (if any one wants to know) I used a good soldering iron, and some VERY thin gold wire (did at work under a microscope) and just made a shunt around the Inductor that you ripped out (ripped up).

It works great, and turned it from almost useless, to very effective.

I am now trying to do it to my brother in-laws Belkin TuneFM.

(this one is much more difficult to open, and the components are much smaller and closer space. If I get the chance, I will post pictures.



thatsmyfox says:

I have a diferent version again!

The unit really does need this hack though because the range is pants.(UK)

Wish I had smaller fingers - I would do this one....

Apr 1, 2009. 5:15 AM [REPLY](#)



JakeFrost says:

Just finished my upgrade of the Tunecast original, and I am amazed. Where I live there is a station on all four of the presets, now I can use it on any of them. I get about five to ten feet around the transmitter. This is my first upgrade using instructables, but not my last. Thanks

Mar 25, 2009. 7:31 AM [REPLY](#)



marcward86 says:

your efforts are appreciated!

i had a tunecast original, and it used to suck, but now it's awesome!!!

Mar 23, 2009. 7:35 AM [REPLY](#)



testoffer says:

Nice instructable. Your one limitation now would be battery life. You can solve this by getting one of those cheap AC converters that outputs 3 volts DC. Cut the plug off at the end of the output line, strip the end of the wires, and hook up the + and - to the appropriate terminals of the battery connectors of the transmitter.

Mar 8, 2009. 10:58 AM [REPLY](#)



brian2012 says:

actually modding that part would be pointless, i have one of these and even notice on the first picture on the bottom that little hole, its for an AC adapter. But good idea tho.

Mar 8, 2009. 8:31 PM [REPLY](#)



remork says:

Hey, I have the same Belkin as the first commentator on this page (called Lappy). I have included a picture of it.

Aug 20, 2008. 6:34 AM [REPLY](#)

But as my German is superrusty, I don't really understand where to solder the antenna. Is the black element with R18 on it the inductor? On what side of it should I solder de antenna? thanks :-)





h4d3z says:
Having the same problem
The board has a R18 thing
How do i mod it ??

Feb 19, 2009. 6:25 AM [REPLY](#)



acer5050 says:
I did a similar mod to the same unit... I live in a small trailer and its range is about half the length.. its not good for a pirate radio station lol but it'll get music to ur radio...

Feb 2, 2009. 2:14 PM [REPLY](#)



acer5050 says:
I had the black tunecast 2 and the stereo wouldn't pick it up at all/very little. I had to put it on the antenna and still got tons of static..
I soldered a 1ft wire onto the black thing described in your instructable and now I can use it clear acrossed the house! thanks man :)

Feb 1, 2009. 11:22 AM [REPLY](#)



turbomod says:
have a completely cheap and nasty virgin megastores version worth £8. have bypassed the attenuation with some 50 ohm coax got about 15feet of it stripped about 2 foot back and pulled the screen down over the insulation. hung this in my attic and was capable of receiving my signal quite clearly up to 1km away whilst stationary, this is down hill from the antenna, up hill there were too many houses blocking the signal, if i could get it higher i think I'm on to a winner, when it finally went out of signal there was another station their so i was very shocked

Dec 27, 2007. 8:00 AM [REPLY](#)



sevy says:
Is the tunecast's power still the same,even when transmitting for a kilometre with a decent antenna? as turbomod.
Would I be legally able to do this in the uk?

Jan 4, 2009. 5:09 PM [REPLY](#)



ReCreate says:
of course you can do it in the uk

Jan 27, 2009. 8:40 PM [REPLY](#)



sevy says:
Im not sure you can do it in the uk.From what Ive read,bypassing the attenuator would take its transmit power over the legal limit.
Am I wrong??

Jan 29, 2009. 5:10 PM [REPLY](#)



ReCreate says:
i dint think so

Jan 29, 2009. 8:09 PM [REPLY](#)



sevy says:
The legal power limit in the uk is 50nanowatts.
Can anyone tell me for sure whether bypassing the attenuator will increase its power past 50nw??:)

Jan 30, 2009. 11:50 AM [REPLY](#)



ReCreate says:
probably such a tiny thing is not capable of broadcasting more than that
you could however modify a signal booster or a rf booster to to increase the nanowatts
who knows?

Jan 30, 2009. 1:30 PM [REPLY](#)



sevy says:
Eggs act lee,who knows.
I have http://www.amazon.co.uk/LUPO-Portable-Transmitter-Modulator-Channels/dp/B000S0XBE4/ref=sr_1_3?ie=UTF8&s=electronics&qid=1233354512&sr=8-3
I can attach an external aerial anywhere on the circuitboard and I get about 300metres distance.Im looking to get around 1 kilometer (so my friend can tune to my internet station,he doesnt have internet).
My objective is to copy what turbomod did but to keep within 50nw,if possible;)
I dont want to increase the nanowatts but get the most out of 50

Jan 30, 2009. 2:41 PM [REPLY](#)



krunal800 says:
hey awesome instructable.....i opened up my psp fm transmitter and connected an rc remote antenna as the aerial and the range has increased to about 5 times the original range.....once again awesome instructable dude!!!!

Mar 26, 2008. 6:46 AM [REPLY](#)

here r some pics:



ReCreate says:
hey where did you get that transmitter?
btw i have a psp except its the silver one

Jan 27, 2009. 8:50 PM [REPLY](#)



krunal800 says:
i cant remember exactly but i think it was from argos in uk

Jan 28, 2009. 12:09 AM [REPLY](#)



jb23rdmc says:
Hi what do i do with the blue wire? do i need to connect it any where plz answer my question!@!@!@!

Jul 17, 2007. 3:04 PM [REPLY](#)



Strikah says:
My thoughts are that the blue wire is removed and the black wire is now being used as the wire to the antenna. This is just my speculation.

Nov 7, 2007. 1:28 PM [REPLY](#)



Strikah says:
Sorry for double post, but if you look closely at the inductor and compare it to step 3, it has been taken out on one side

Nov 7, 2007. 1:35 PM [REPLY](#)



amzzzziohi says:
Soz but I'm still confused. Could you plz explain in a lil more detail what exactly you do with the black and blue wires? Thx I'm trying to figure it out but I'm not sure and I wanna be before I do this.

Dec 25, 2007. 8:59 PM [REPLY](#)



Strikah says:
It's not like I have done this, but when I look at the pic. The blue wire has been removed and is thus no more used. The black wire, is now connected to an external antenna and is therefore connected back to the FM transmitter. If I look even closer, you see that the Inductor has been removed on one side. On that side you'll have to solder the Antenna. BUT then again, I haven't tested it yet. So if you want to do it, it's at your own risk!

Dec 26, 2007. 3:33 AM [REPLY](#)



amzzzziohi says:
Ok thank you. I started to study all the pics closely and I came to that conclusion. I hope urs works lol if you did it. I'm gunna try it on my Belkin Tunebase (the one that plugs into the base instead of the earphone jack). I have a basic understanding of circuits, I made a circuit for a flashing LED for a school project lol. I'll get some help from the 'techno' guy at school. He once made these awesome speakers and bought 'em to a carnival.

Dec 26, 2007. 4:37 AM [REPLY](#)



shaunp says:
Cheers Buddy, OK well I bought two of the Belkin Tuncast II, and performed the Above on one of them. Now What I found is that on mine above the inductor (which is black and more cube shaped) is a small resistor were the black antenna is soldered in the above pic. So for testing i just used a small 10cm piece of braided wire and by hand put it on the (LCD Bottom Down Side) leg...and it improved the signal to quite a bit. Now After trying this is decided to get the solder iron out and after try to attach the new Ant to the spot basically the same as above but on the left leg of the resistor. In the end i basic shorted the resistor. So imagine the above picture were the new (black) ANT goes is actual covering up the Resistor...Now the Inductor is still in the same place and has not been moved at all and the main (blue ant) is still intact and attached. Now this works better than the other unit.(Non Mode) But still can't get than 3 meters away without signal Degradation. Should I remove the old ANT? (Was going to anyway). when you say remove the inductor do you mean just lift one leg off the board a slight. And in your above picture did you have a small Resistor under the Solder of the Black Wire(ANT)? If not what exactly are you soldering on two is there a Silk on the board at all list say R16??.

Jan 13, 2009. 12:39 AM [REPLY](#)

the above steps that i took seem to work to my Satisfaction as i just wanted it to be in the backseat of the car or Glovebox...But on the other belkin that i have not even opened yet. I wish to perform the same mod but hopefully would be better Transmitting Distance...hence this time i will run the wire out of the device to see how much improvement it will make...Any help would be great...Basically just need to know whether i was suppose to solder the new ANT over the resistor above the inductor(Can't bee seen well enough in PIC above...but were the Black wire is attached I have a small resistor(I think it's a resistor)..Will take Pic's when have CAM Handy...

[view all 134 comments](#)

<http://www.instructables.com/id/Belkin-Tunecast-II-FM-Transmitter-Mod/>