Uni-Directional WIFI Range Extender

by tm36usa on July 20, 2006

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Intro: Uni-Directional WIFI Range Extender

Easily receive WIFI signals from far away using a standard USB WIFI adaptor and a bit of ingenuity. This Simple idea requires no modifications to a USB WIFI adaptor or your computer. A simple way to increase the signal strength and range of your WIFI. Plus it works with all USB WIFI adaptors.

Step 1: Tools and Parts Needed

You need only a few parts for this project and they all are pretty cheap except for the USB WIFI adaptor. (I got mine on sale for $10, just check the ads)

1 - Metal Strainer/Steamer
1 - USB WIFI Adaptor
1 - USB Extension Cable (I chose a 10ft long)
½" Drill Bit (I like to use stepper bits for metal)
Gorilla Glue (Epoxy works well too)
2 - Zip Ties

Image Notes
1. 1/2" Drill Bit
2. Gorilla Glue or Epoxy
3. Metal Strainer/Steamer
4. USB Extension Cable
5. Zip Ties
6. USB WIFI Adaptor
**Step 2: Drilling the Strainer/Steamer**

Remove the Center Post (if you've had one) and drill a 1/2" hole as that is perfect size to fit the USB extension.

**Image Notes**
1. Remove and Enlarge the hole to 1/2".

**Step 3: Glue and Zip-Ties**

Insert the Female end of the USB extension (the part that doesn't connect to your computer) into the hole you just drilled. Then just apply the glue/epoxy and let it sit for 24 hours. This creates a strong bond between the plastic and metal. I used some tape to help hold the connector in place while the glue cured. Be sure to apply glue to both sides of the connector. Once that's dry the next day, zip tie 2 of the metal "ears" so they won't fold in on themselves when you use it.

**Image Notes**
1. Make sure to not get any glue in the USB socket or the adaptor won't fit.

**Image Notes**
1. Apply glue to the back of the dish too.
Step 4: Finish
Just plug the USB WiFi adaptor into the socket on the dish and plug the other end into your computer. Enjoy boosted signal strength and improved distance. Fire up Netstumbler or Kismet to really see the gain in power. This works even better than I thought it would. Be sure to leave your comments on how well it worked. Works great for war driving too.

Step 5: Update: Tripod Mount
I decided to make the dish tripod mountable as its really hard to try and hold it to lock in a far away signal. The parts needed are pretty straight-forward.

Tripod
Nut for the bolt on the tripod
9/32" Drill Bit (Stepper bit works really nice for enlarging the hole)

Pick a hole near the edge of the dish and use the drill bit to enlarge it. I chose the one where one of the feet had once been secured. Then just put the bolt from the tripod through the hole and secure with the nut. Works great.
Image Notes
1. 9/32” Drill Bit
2. Nut for Tripod
3. Standard Tripod
Related Instructables

- WiFi made into old Laptop hard drive! by morganlowe
- External Bluetooth Antenna for Increased Range! by Popcornfilms
- WiFi Antenna Hack! by babblin5
- Two quicky directional wifi antennas by Computothought
- 12” Powerbook External Antenna Hack by McWhizzleteeth
- Dell Laptop Wi-Fi High Gain Antenna Mod, Increase Internal Network Cards Range and Signal !!! by xxgemi

Comments

50 comments Add Comment view all 385 comments

dwarren-1 says:
Mar 7, 2011. 8:30 AM REPLY
that is awesome, im gonna go get a strainer and try it out.......wait a sec, I already got 2 WiFi networks at home. ill try it out anyway

kazefal says:
Jan 30, 2011. 6:58 AM REPLY
does it work???

jc penny says:
Nov 2, 2010. 1:31 AM REPLY
what's war drive ?

SparkyGage says:
Dec 4, 2010. 8:17 PM REPLY
"driving" or walking around looking for open wifi connections.

pvanheck says:
Nov 4, 2010. 5:55 PM REPLY
I built one myself and have it suspended from a ceiling light fixture, it just about triples my signal and data rate from a home wifi router and I am 300 foot and several wall thickness between the line of sight.

fivefingers says:
Feb 2, 2009. 10:54 AM REPLY
this is amazing. but i was just wondering if this would work with a home wireless router setup. also, i want to know if you need to put the satellite with the wireless USB adapter near the window to increase reception.

anibioman says:
Oct 27, 2010. 10:39 PM REPLY
if your router has a removable antenna then yes you can (in theory), if you can find a matching cable for the attachment for your antenna, you can use it instead of the usb extender and have the original antenna where the usb thing plugged in on the other side of the dish. i might not be making any sense so ill try a makeshift diagram

```
| router | ---cable--- | {--- antena
|       |           | |
|       |..................dish
```

[flag][delete]

GFriday says:
Oct 15, 2009. 5:04 PM REPLY
Hi! I hate to appear stupid, but there's no way around it thistime...can this setup be used with a wireless router? I'd really appreciate some help with getting things right the first time! Thanx!

anibioman says:
Oct 27, 2010. 10:34 PM REPLY
if your router has a removable antenna then yes you can (in theory), if you can find a matching cable for the attachment for your antenna, you can use it instead of the usb extender and have the original antenna where the usb thing plugged in on the other side of the dish. i might not be making any sense so ill try a makeshift diagram

```
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|       |           | |
|       |..................dish
```

[flag][delete]
This would be a lot harder to be able to attach the antenna to the little dish, making it impractical. I do not think it would work very well, but you can try it!

: But there's no way around it this time* LOL! nice

This is my all time most favorite instructable! It's amazingly simple in design but oh so extremely effective! I built one from your plans a year ago and it works amazingly! Thanks so much for sharing this on the site!

Wow.. I am surprised to see this thread still er...steaming along. This is my all time most favorite instructable! It's amazingly simple in design but oh so extremely effective! I built one from your plans a year ago and it works amazingly! Thanks so much for sharing this on the site!

It is a good place to start on a wi-fi extender project, with many more different examples shown at http://www.instructables.com/id/usb-wifi-antenna/?&sort=NEWEST&limit=50&offset=100. It is a good place to start on a wi-fi extender project, with many more different examples shown at http://www.instructables.com/id/usb-wifi-antenna/?&sort=NEWEST&limit=50&offset=100.

I found the five foot cable attached to the base of the USB adapter, could not only be removed from the base, but it was made at a 90 degree angle to the cable which meant that drilling out the steamer was unnecessary. As luck would have it, that found the tip of the USB adapter was perfectly matched to the hot-spot. (beginners luck) All I needed to do was zip-tie the USB adapter and cable to the steamer and it was good to go, and totally portable. I even fashioned a spring tension coat-hanger base which held it open and allowed it to sit-up straight. (If I hung the steamer with a hook from its top, the petals stayed open by gravity)

When hung from the raingutter outside of my window, depending on which direction it faced the setup worked well enough to receive 17 to 20 wi-fi networks in my neighborhood, several of which were not password protected. I suppose that if it were mounted to a pole extending above the roof which could be rotated, I would receive many many more networks.

I had similar results in Bangkok, and elsewhere on the road. Just remember that your reception is always based on line of site.

The problem I found with this particular setup is the hard mounting of the USB cable, which is not only unnecessary, but also may be placing the USB adapter out of the parabolic "hot-spot".

A quick and easy way to find the hot-spot is to cut a piece of paper to the curve of the dish, then take it outside and point it at the sun. The focused sunlight will show the parabolic hot-spot of that dish. (there is also a mathematical method to calculate the hot-spot at the orcon.net.nz site above)

I think it may have been more advantageous for this project to have hard mounted a piece of plastic tubing of the appropriate diameter to allow the USB adapter and cable to snuggly slide in or out to adjust reception.

Some photos and directions for the making of my variation of the (portable) wi-fi steamer can be seen in the comments at http://home-and-garden.webshots.com/gallery/578207030mo%7EJRC. This technique also would allow for further experiments with the same cable and adapter using other types of dishes.

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You can probably do this with almost any parabolic dish (it is a matter of finding a piece of tubing of the appropriate diameter). When hung from the raingutter outside of my window, depending on which direction it faced the setup worked well enough to receive 17 to 20 wi-fi networks in my neighborhood, several of which were not password protected.

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As I said, this project by tm36usa is a good starter, and from there you will find other useful dishes/strainers/steamers/reflectors etc to play with.

I found a clamp-on work light with an aluminum reflector which works awesome for extending the reception of my home wi-fi network from three bars (very good), to five bars (excellent). This is through several walls and a distance of about 60 feet from the network router.

The veggie steamer has moved-on to its next job, as base station for my cell phone. My cell phone reception inside my home has always been terrible, one to two bars at best.

I mounted a piece of a coat hanger with a loop at its end to the center post of the steamer, and hung the steamer on the wall facing my window. Then, I hung the phone by its antenna from the wire loop and presto, four out of four bars reception! If I get a call, as long as I am in front of the dish the phone works.

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The nice thing is that if I take a trip, I can re-ig the steamer for wi-fi duty in about five minutes.

So again, if you want to do this project, think about hard mounting a piece of plastic tubing to the steamer instead of the female USB cable end, and you will likely find you can use the same tube/cable/USB adapter combination with other types of parabolic dishes too.

Have fun experimenting!

Thanks again tm36usa for this instructable, and thanks again Manuka for the great ideas at the orcon.net.nz site.

Cheers

GM
yer uncle. Should take all of 20 minutes maximum to assemble. Not quite as portable as the veggie strainer, but should work very nicely nonetheless.

Cheers GmanM

jb0579 says:
I am dumb. Not in the literal sense, as my auditory and vocal capabilities are abundantly adequate (even too adequate at times). I have a problem which I have enumerated to hundreds of people who haven't been able to help, so I am going to try to posthere in hopes one of you kind folks'll help me. I will laud the person who can help!! I bought my mother DSL so the hotspot is at her house with a wifi capability, and we live about 200 ft apart. But my Sony Vaio VGN-NW310F only gets 1 bar - if that. So the first thing I bought was a Hawking HWUN3 high gain antenna that just unput into my USB. Didn't work - if anything it was worse, plus - their customer service at Hawking Technology is absolutely intolerably, insanely, inadequately, pitiful. So I returned it. It took them 5 minutes to charge my credit card when I bought it, and a month and a half to refund it - but I digress...... The Westell 327w router from the phone company had a puny antenna on it so I upgraded the antenna to a beefier Lynksys 7dBi high gain antenna hoping that I could improve from 1 wifi bar to at least 3. Didn't happen. I get 2 sometimes now, but rarely. The antenna was like $40 which is fine if further modifications suggested here will work in conjunction with it to solve the issue. Actually, the new Lynksys antenna (model HGA7S) seems to be a good unit! Question is this...what can I buy, make, install, change, or whatever on a decent budget that will get me a better signal. I am willing to mount something outside, drill a hole in the house and run a USB cable inside if I have to - whatever is necessary. I did look at this: http://www.instructables.com/id/Uni-Directional-WIFI-Range-Extender/ But it just doesn't seem adequate - unless there are people out there who will testify that it works well... As far as line of sight goes - nope. There's a garage 'tween us, however, remember, I still get 2 bars (sometimes) with the new, beefy antenna on the router/modem thingy, AND, when the laptop was out of the box and with the old puny antenna on the router I STILL got 1 or sometimes 2 bars - even with no "clear" line of sight. If someone could please help I'd love you forever. Preferably, I'd love you to email me as it is easier for me to retrieve responses that way... it's jb0579@yahoo.com (and that's a ZERO after the 'b', not the letter o). Any and all help would be greatly appreciated. I am a disabled vet and this laptop is one of the only things I have left - plus it's supposed to run my equipment - IF I CAN GET A DAMN SIGNAL! Someone, please....help? Jim 218-256-1135 cell 218-566-1135 home

YukonM says:
Jim, You have an interesting problem but you should be able to handle it. Have you tried sitting on the roof of the garage with your laptop? If that works then try mounting the Lynksys antenna on the roof of the garage and running some coaxial cable to it. Do it temporarily with duct tape and whatever else you need to see if both you and your mother can connect to it. If you have only 200 ft between your computer and the router then it seems to me that you should be able to connect to it without expensive modifications.

Planet_Jeroen says:
I have seen a lot of antennas that are supposed to be easy to build etc. etc.
This is still the ultimate winner for both simplicity and gain: www.freeantennas.com/projects/template2/index.html

Asmodeous says:
This did nothing for my network.

Planet_Jeroen says:
It enables me to use internet through 4 concrete walls and boosts the 5Mbps connection to across the street to 54Mbps here. I did make it on A3 sized paper tho (twice the original size) and used quite a few layers of foil.

Kryptonite says:
This looks similar... www.usbwifi.orconhosting.net.nz/

guineapig101 says:
anyone know if this works for traveling with a notebook?

WIFIENGINEER says:
The vege strainer might make a good hollywood prop for agent 007, but like most attempts at a dish antenna, this one also does not have the adapter positioned at the focal point

You can easily calculate the focal point of any parabolic as follows

Focal point = the square of the diameter divided by the depth of the dish.

thedorment says:
I made one and it works great i used a gps suction mount to put it on my window instead of the roof just modified the plastic a little and used zip ties

http://www.instructables.com/id/Uni-Directional-WIFI-Range-Extender/
sn00ze says:
this site has a focal point calculator. its important to get the USB adapter close to the dishes (cookware) focal point.
UrbanWireless.info

nea says:
Yep. You must get the focal point right. Using 2 Chinese woks about 400 mm diameter extends the range, to 9 km to an island just off shore.
Works great, except rain & fog effect it. Some times the signal drops out in these conditions though not always.
cheers kiwi john.

sn00ze says:
9km !
nice work.

pljm says:
This seems as if it works pretty well. I was wondering whether or not you could use the usb adapter on a ps3? My ps3 has very low internet connection and could easily use a bit of boosting

Lance Mt. says:
I'm going to say no.

ourmoneypit says:
This is a great 'ible. If I had only seen this a year ago, I wouldn't have sent that old satellite dish to the scrapyard...
We regularly spend time at our cottage where we are internet-less. As the crow flies, we are probably only about 1 km from an unsecured wifi network, but it is 10 minutes over rough roads, and it would be kinda obvious if we just parked outside. We also have an antenna tower on that side of the house doing nothing, since we have satellite.

Since I have a USB wifi adapter that's been sitting in a drawer doing nothing, I am definitely going to give this a try. I would be willing to climb partway up the tower with my laptop to connect to the 'net occasionally to be able to download weather forecasts and download/upload e-mail when we're there for longer spells. If it works, I'll post back with firmer data! Wish me luck!

akonichi says:
how can i use this if i am using a laptop with a built-in wifi adapter (i.e., i do not need a usb wi-fi adapter)? the signal I get from my room is only one or two bars (maximum is five bars), please help me. thanks in advance.

genio8 says:
Where would i buy the strainer/steamer, like the one the photo????

capt.tagon says:
Any kitchen supply or department store with a large kitchen section will have these.

ninjadizzle says:
Hey, i already have a wifi adapter IN my laptop. If i attached this via usb, would it bypass it?
ferny_dx says:
Mar 22, 2010, 1:05 AM
all you would have to do is disable the one in your laptop, its either a manual switch in front of the laptop or go to
Start>Connect To>Network connections, then find the one that your laptop is currently using, right click and click disable disable
Win XP:
Start>RIGHT CLICK Computer>Manage
Computer manager should come up on the list on the left, choose device manager, then go to the list on the right, and click on the + sign on network adapters, RIGHT click on the WiFi adapter and click disable,
and thats it!

ninjadizzle says:
Mar 22, 2010, 7:20 AM
cool. i have the switch on the front... yet another of those 'why didn't i think of that' moments.
thanks

ferny_dx says:
Mar 22, 2010, 11:33 PM
you're welcome!

LiquidExplosion says:
Oct 18, 2009, 9:35 AM
If you have aluminum blinds or blinds made out of metal, just put your wireless USB antenna behind it and make sure they are closed. Find out where the strongest signal comes from and use that Blind. I have this set up downstairs using a laptop as a Bridge going to a PS3. Works awesome with internet and gaming. Upstairs I have the setup you see here with 3 USB chords together going all the way to my Master Bath. Signal isnt as strong because of the length of wire but, it does what its supposed to do, get internet. Oh and I have another PS3 upstairs in that bedroom so, my Girl and I can play online against each other. Hopefully I save some of you a few dollars.

pedla says:
Mar 22, 2010, 8:55 AM
Your girlfriend is upstairs in the bedroom and you are in a seperate room playing Inet games with her? Does that mean this age of geeks will be the last? or is there a world of virtual children about to descend upon us?

randy82k says:
Mar 22, 2010, 7:19 AM
You could use a stick of two part epoxy puddy which is sold in hardware stores for plumbing and other repairs. Just cut off as much as you need and apply around cable and strainer. gets hard quite fast 30 min or so.

static says:
Mar 21, 2010, 11:14 PM
Sometime back the crew at ww.amateutlogic.tv constructed a "cantenna" in a similar fashion. The principal is the same place the donfle's antenns where the antenna would be placed in a con conventional wave guide or a reflector.

covrt1 says:
Mar 21, 2010, 12:58 PM
I made one of these today and went from 43% to 96%... What a great idea. Thanks!

james.mcglashan says:
Nov 27, 2009, 5:33 PM
flashback - this was the first instructable i had ever seen and i have been on this site ever since hehe gr 3 now im in gr 6 and going to highschool soon yay cant wait..

XOII says:
Jan 11, 2010, 8:09 PM
You aren't very close to being in high school if you are in grade 6. Wait until you are in grade 8 to say that.
Questor says:
out here 7th grade is your first year of "High School", not back in my day, bit it is noe!

Mar 21, 2010. 10:25 AM REPLY

james.mcglashan says:
hehe in the year this was published

Nov 27, 2009. 5:34 PM REPLY

marmara34 says:
The idea is great. I also think that you will get rid of radiation a little bit more if you place it far from your PC.
I am going to try to make similar one.
All the best

Mar 21, 2010. 9:58 AM REPLY

gemtree says:
Ok, don't laugh at me please. I am not a tech at all. But I am mechanically inclined. So, I have a very long house I am living in. My electric outlets in the middle of the house are ungrounded and I lost two computers before I figured it out that they were killing my equipment from being ungrounded. So I have my puter on one (grounded) end of the house and a guest (grounded) bedroom allll the way on the other end of the house.

I can't get wireless signal way over at the other end of the house from my wireless router when I am now safely grounded. Will this antenna pick my wireless signal up thru the walls of the house? I get little to no signal at the opposite end of the house from my router now. I can't plug into any closer plugs to get a better signal due to open grounds on electric plugs and lack of privacy/space.

Mar 21, 2010. 9:36 AM REPLY

degrove says:
Does anyone know how to make this for an xbox 360 connection and having Comcast as your cable company.. i wouldnt have a good signal just using the ethernet cable and my laptop..Thanks in advance

Mar 21, 2010. 7:52 AM REPLY

purplemutant says:
I tried this a while back. It's not that good. The veggie steamer isn't parabolic. A wok or a spider (Chinese cookware to lift stuff out of hot oil), work well since those are both parabolic. Google USB wifi antenna and look for a site from New Zealand. That has TONS of info.

Wave guide antennas (cantennas) also work great. Jefa tech sells the N connector with the small length of copper wire already soldered to it. So you can save your self the hassle of soldering. All you need to do is find a cantenna calculator so you know where to drill the hole in the can. Then mount the N connector to the can. You then hook up a pig tail (the shorter the better) to the N connector and the antenna connector on your will device. If you goggle cantenna you can find tons of info.

Mar 5, 2010. 2:27 PM REPLY

view all 385 comments