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Forum THE HANGAR RC TECH A high gain CP OMNI finally! Parasitic Lindenblad



Hey guys... I've upgraded the site to a more stable version of vB. Click around and if you see anything out of place or that doesn't work as before then drop me a thread in SITE SUGGESTIONS!! Thanks for supporting FPVLab.

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Thread: A high gain CP OMNI finally! Parasitic Lindenblad

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26th July 2012, 12:17 PM

#1

Kondor-FPV

Navigator



Join Date: Nov 2011
Location: Boca Raton, FL
Posts: 662

A high gain CP OMNI finally! Parasitic Lindenblad

Ok, as promised I will post pictures of this high gain Lindenblad, I will call it Lindy5.8

It is a parasitic Lindenblad built in the easiest way possible, with a vertical dipole in which part of the connector and the outer shield work as the ground plane and the inner conductor works as the active element. This will avoid problems with matching, in fact the SWR is quite good at 1.4:1 on 5705.

The design is actually LHCP as you see in the picture since the "circulator" uses parasitic, not driven elements.

I have flown this antenna for 2 days and I can honestly say it outperforms the SPW for low angles, it gets easily 6-7dbic gain, if you fly level, and at 30° you get about 3dbi, that's my estimate based on flight path, altitude and distance from base compared to video degradation.

I think this antenna would have no problems blowing away the spw for LR records and multicopter flight, but it needs a bit of modeling to understand well what the effects of the connector are, being so close to the circulator. Of course some better looks would also help, but that is for later.

If someone is willing to model it to understand the effects of the connector being so close to the circulator, I am willing to give out measurements of the g10 cnc cut circulator, and everything else.

Attached Thumbnails



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26th July 2012, 01:50 PM

#2

Flying Monkey ◦

Banana Drone



Join Date: Jan 2012
Location: Snoqualmie, WA
Posts: 5,110

Looks dangerous! Lol, cool antenna! I'd make one but I don't have 5.8ghz. Can it be made at other frequencies? 900 or 2.4?

"You can't take the sky from me"

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26th July 2012, 02:09 PM

#3

Kondor-FPV ◦

Navigator



Join Date: Nov 2011
Location: Boca Raton, FL
Posts: 662

Originally Posted by **Flying Monkey** ◦

Looks dangerous! Lol, cool antenna! I'd make one but I don't have 5.8ghz. Can it be made at other frequencies? 900 or 2.4?

yes, it can be made for all frequencies, but at this moment I don't have actual measurements, and the antenna needs to be tuned by chopping it down once the circulator is installed.. 1 week and I will have all frequencies down.

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26th July 2012, 02:20 PM

#4

Flying Monkey ◦

Banana Drone



Join Date: Jan 2012
Location: Snoqualmie, WA
Posts: 5,110

Oh okay cool!

"You can't take the sky from me"

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26th July 2012, 02:27 PM

#5

Wearyman ◦

Just dog tired.



Join Date: Mar 2011

I noticed that you have it listed as LHCP. Since pretty much ALL the other CP antennas out there are RHCP, can this be made RHCP as well so that it is compatible with existing systems?

Location: Buffalo, NY, USA
Posts: 2,101



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26th July 2012, 02:31 PM

#6

IBCrazy

Engineer for Jesus Christ



Join Date: Mar 2011
Location: Amherst, VA
Posts: 7,345

Now that's a killer! How did you come up with such a thing? I will admit I have not seen anything like that. How is the bandwidth?

I have to admit, I tried to build one of these and failed... Good to see it worked out for you. If you give me the measurements for 1.3GHz, I will see if I can model it in 4NEC-2. For some reason 4NEC-2 doesn't like frequencies up around 5.8GHz.

And another question: Can I try it? 🙄

-Alex

If it is broken, fix it. if it isn't broken, I'll soon fix that.

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26th July 2012, 02:54 PM

#7

Kondor-FPV

Navigator



Join Date: Nov 2011
Location: Boca Raton, FL
Posts: 662

Originally Posted by IBCrazy

Now that's a killer! How did you come up with such a thing? I will admit I have not seen anything like that. How is the bandwidth?

I have to admit, I tried to build one of these and failed... Good to see it worked out for you. If you give me the measurements for 1.3GHz, I will see if I can model it in 4NEC-2. For some reason 4NEC-2 doesn't like frequencies up around 5.8GHz.

And another question: Can I try it? 🙄

-Alex

Sure,
you can try it...

I will give you the starting measurements but than you have to optimize it, either by trial and error or through a nec program. This 5.8 one flew so I know it works, with the 1.3 you'll be testing new grounds.

Basically make a vertical dipole with a brass tube and coax going through it, or just use the outer shield of the coax as the ground leg. Normally the ground leg has to be a bit shorter than the other pole since it's bigger diameter. Tune it for 1.2ghz, so you have room for chopping it down to get best SWR later.

At this point make a square block or something with a hole in the middle to distance the parasitic elements from the outer shield 0.15 Lambda, which is about 30.1 millimeters at 1300mhz.

At this point cut 4 pieces of 3mm thick copper 102mm long and glue them at 30° from horizontal on the edge of the standoff.

The center of the standoff should be perfectly in the middle between ground element and active element.

Let me know if you have other questions.

The impedance will get lower once the circulator is placed in the middle of the dipole, about 30 ohms give or take so you need a choke or simply make the dipole use up all the length of the coax.

As far as LHCP goes, I just thought I was making it RHCP but once I hooked up a 4 turn RHCP helix , performance was terrible, than I realized it actually reverses polarity, I switched to a LHCP helix on the RX and BOOM! cristal clear picture, and great performance.

To reverse polarity just reverse the incline on the parasitic elements.

This could turn any stock whip into a CP antenna, but with a lot of fiddling, because of impedance mismatch problems.

EDIT: I forgot to answer your question: bandwidth is VERY good, just like a dipole, depends a lot on material and thickness.

Thick copper : NICE!

Last edited by Kondor-FPV; 26th July 2012 at 03:08 PM.

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26th July 2012, 03:23 PM

#8

Kondor-FPV ◦

Navigator



Join Date: Nov 2011
Location: Boca Raton, FL
Posts: 662

for nec modeling I suggest trying to optimize the parasitic element which should be between 98 and 102mm, and also thickness, 2 or 3mm would be good.

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26th July 2012, 04:07 PM

#9

HugeOne ◦

Shedding light over FPV



Join Date: Mar 2011
Location: Canada, Quebec
Posts: 953

Good work Kondor!

This is a model I made last year, never could get gain above 2.5db with acceptable axial ratio. This one bear 0.88, not bad. Never finished it as I got caught with antennas production, sale, support...

If you don't mind, you could send it over to get gain and axial ratio measured on my analyzer.

-Hugo

Last edited by HugeOne; 26th July 2012 at 04:12 PM.

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26th July 2012, 04:12 PM

#10

bgarber ◦

RDWHAH



Join Date: Mar 2012
Location: OH, USA
Posts: 218



Originally Posted by **Kondor-FPV**

At this point make a square block or something with a hole in the middle to distance the parasitic elements from the outer shield 0.15 Lambda, which is about 30.1 millimeters at 1300mhz.

Kondor, please forgive my "noob-ness" here but I have a question about the element distance. When you calculate 0.15 lambda to get 30.1 mm, are you using a velocity factor of 0.87?

I saw an article about Parasitic Lindenblad antennas for 70cm in an AMSAT (Radio Amateur Satellite Corporation) publication... www.stalad.it/iz4bqv/antspec/2006ParaLindy.pdf

Very interesting! When can we expect to see some production models for sale???

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26th July 2012, 04:13 PM

#11

Kondor-FPV ◦

Navigator



Hello Hugo,
yes, I could do that, you can analyze 5.8 also?
That would be fantastic.

I can make you one identical to this.

Join Date: Nov 2011
Location: Boca Raton, FL
Posts: 662

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26th July 2012, 04:26 PM

#12

Kondor-FPV

Navigator



Join Date: Nov 2011
Location: Boca Raton, FL
Posts: 662

Originally Posted by **bgarber**

Kondor, please forgive my "noob-ness" here but I have a question about the element distance. When you calculate 0.15 lambda to get 30.1 mm, are you using a velocity factor of 0.87?

I saw an article about Parasitic Lindenblad antennas for 70cm in an AMSAT (Radio Amateur Satellite Corporation) publication... www.stalad.it/iz4bqv/antspec/2006ParaLindy.pdf

Very interesting! When can we expect to see some production models for sale???

The velocity factor depends on the material used for a standoff, I used that velocity factor on my 5.8 but I don't expect it to be correct for wood distancer or plastic distancer or pvc etc, which do affect a bit and cover up the dipole parasitic elements.

Actually in free air it would be about 34 mm, but I expect Alex to have to move it to 31-32mm in his modeling.

I would probably wait for Hugo to analyze the 5.8 antenna if he confirms he has the capability. I do not want to make the mistake of advertising false information. I liked the performance but I don't know how repeatable it is.

I will send a couple to hugo to see if they can be reliably replicated.

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27th July 2012, 07:13 AM

#13

Kondor-FPV

Navigator



Join Date: Nov 2011
Location: Boca Raton, FL
Posts: 662

Hello Hugo,
in 2-3 hours I am going to test out the two antennas that I will send you.
I made one with high angle of 55° , and I will make one with lower angle for the parasitic elements.

This one resonates higher, incredible how bad the stock foxtec antennas are... they are tuned WAAAY high around 6+ ghz,
After the circulator unit was put in place it came in with a decent swr at 5945... so I am going to fly it at that frequency.

Attached Thumbnails



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27th July 2012, 08:15 AM

#14

Kondor-FPV

Navigator



the 5.8 circulator is really tiny, this is the 3rd version for a lower angle incline.
You can see the tolerances... you have to have a good cnc machine for this or a laser cutter.



Join Date: Nov 2011
 Location: Boca Raton, FL
 Posts: 662



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27th July 2012, 08:34 AM

#15

msev

Navigator
 Join Date: Mar 2011
 Posts: 150

Even if it is small..everything can be made in enough tries...So I hope you will be a nice bloke and scan the circulator, make a pdf and post it on fpvlab..Since I have access to a VNA I could make them and tune them myself..Hope you will be cooperative..Will you make a tutorial? Is this both a rx and tx antenna?

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27th July 2012, 08:46 AM

#16

IBCrazy

Engineer for Jesus Christ



Join Date: Mar 2011
 Location: Amherst, VA
 Posts: 7,345

Now I see how it works! It's like a yagi. Dipole in the middle with parasitic elements to direct the signal. I didn't realize that it could actually rotate it. You learn something new every day.

One thing that might cause an issue is the dielectric right in the middle of the radiation pattern. If you can move the support up or down, it might help. Or here's another suggestion: Use two supports with the elements in between them. This will give it more support and help clear the center of the radiation pattern where reactivity is critical. If you play your cards right, you can make this a commercial product... and I'll be your first customer 😊

Here's an idea for you: Make a cap for the cheap dipoles that come with most systems that all you need to do is insert the elements.

Needless to say I am very excited for you, Kondor. Very excited!

-Alex

If it is broken, fix it. if it isn't broken, I'll soon fix that.

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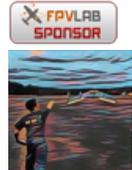
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27th July 2012, 08:51 AM

#17

IBCrazy

Engineer for Jesus Christ



Join Date: Mar 2011
 Location: Amherst, VA
 Posts: 7,345

I am getting empirical numbers for a 55 degree tilt from vertical for best axial ratio. However, the distance changes with the location and type of dielectric. Tilt stays the same. What material are you using? FR4?

-Alex

If it is broken, fix it. if it isn't broken, I'll soon fix that.

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27th July 2012, 09:04 AM

#18

Wearyman ◊

Just dog tired.



Join Date: Mar 2011
 Location: Buffalo, NY, USA
 Posts: 2,101



I have to say that although I don't understand 90% of what you guys are saying, I'm still really excited about the potential for an awesome new antenna product, particularly one that promises to turn crappy cheap rubber duck antennas into awesome and powerful CP antennas!

I wonder how having some kind of plastic cover over the antenna elements (to protect against damage) would affect the signal and geometry of this thing?

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27th July 2012, 09:32 AM

#19

SENTRY ◊

I Like Waffles...



Join Date: Feb 2011
 Location: Atlanta, GA
 Posts: 10,765



Good to see you antenna gurus geek out - I love it. I'm just a pilot - but you guys geeking out makes my life easier and brings my planes home from some of the toughest places I put them. Good job!

"I Like Waffles" : [FPVLab on Facebook](#) and [FPVLab on Twitter](#)

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27th July 2012, 09:37 AM

#20

Kondor-FPV ◊

Navigator



Join Date: Nov 2011
 Location: Boca Raton, FL
 Posts: 662

Yes Alex,
 I am using Fr4, it's 1.5mm thick and I made the arms 2mm wide... that's for 5.8 of course, you are working on 1.3
 This is what my last antenna looks like, with 32° angle so not far from the original paper..
 I want to fly right now, plane is ready and charged but there are 40mph wind gusts out there, I hate it when it does that right at the moment I decide I want to fly.

P.S -you can try with a 4.4 dielectric coefficient for the fr4

Attached Thumbnails



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27th July 2012, 09:48 AM

#21

Kondor-FPV ◊

Navigator



Join Date: Nov 2011
 Location: Boca Raton, FL
 Posts: 662

Originally Posted by **msev**

Even if it is small..everything can be made in enough tries...So I hope you will be a nice bloke and scan the circulator, make a pdf and post it on fpvlab..Since I have access to a VNA I could make them and tune them myself..Hope you will be cooperative..Will you make a tutorial? Is this both a rx and tx antenna?

msev,
 if the results are repeatable and the design is non-critical I see no reason why I wouldn't put up a small tutorial for it..

I don't think this will replace the SPW/pinwheel for all around flying, unless it really comes in at only 2-3 dbi, than it might as well replace it....

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27th July 2012, 09:51 AM

#22

Kondor-FPV

Navigator



Join Date: Nov 2011
Location: Boca Raton, FL
Posts: 662

Originally Posted by **Wearyman**

I have to say that although I don't understand 90% of what you guys are saying, I'm still really excited about the potential for an awesome new antenna product, particularly one that promises to turn crappy cheap rubber duck antennas into awesome and powerful CP antennas!

I wonder how having some kind of plastic cover over the antenna elements (to protect against damage) would affect the signal and geometry of this thing?

Wearyman :

Anything you put over it will affect velocity factor so , to put it into easy terms, it's as if all the elements were cut bigger than they actually are....

To make it work they have to be reduced in size... each one of them by a certain percentage..

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27th July 2012, 10:00 AM

#23

Kondor-FPV

Navigator



Join Date: Nov 2011
Location: Boca Raton, FL
Posts: 662

Originally Posted by **IBCrazy**

Now I see how it works! It's like a yagi. Dipole in the middle with parasitic elements to direct the signal. I didn't realize that it could actually rotate it. You learn something new every day.

*One thing that might cause an issue is the dielectric right in the middle of the radiation pattern. If you can move the support up or down, it might help. Or here's another suggestion: **Use two supports with the elements in between them. This will give it more support and help clear the center of the radiation pattern where reactivity is critical.** If you play your cards right, you can make this a commercial product... and I'll be your first customer 😊*

Here's and idea for you: Make a cap for the cheap dipoles that come with most systems that all you need to do is insert the elements.

Needless to say I am very excited for you, Kondor. Very excited!

-Alex

Now, that's a very good idea, 2 supports!

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27th July 2012, 10:18 AM

#24

bgarber

RDWHAH



Join Date: Mar 2012
Location: OH, USA
Posts: 218

Originally Posted by **IBCrazy**

Here's and idea for you: Make a cap for the cheap dipoles that come with most systems that all you need to do is insert the elements.

This is a really good idea, especially if you modelling guys find a way to squeeze some decent gain out of the design. If it's good enough for satellite reception, it's good enough for me!



Cool stuff!!!!

Reply | Reply With Quote

27th July 2012, 10:22 AM

#25

Wearyman ◊

Just dog tired.



Join Date: Mar 2011
Location: Buffalo, NY, USA
Posts: 2,101



Originally Posted by **Kondor-FPV**

*Wearyman :
Anything you put over it will affect velocity factor so , to put it into easy terms, it's as if all the elements were cut bigger than they actually are...
To make it work they have to be reduced in size... each one of them by a certain percentage..*

Wouldn't that be a good thing though? I mean, within a certain scale, being able to make the elements smaller/more compact AND protect them from damage without affecting the overall range of the antenna is generally considered a plus, yes?

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27th July 2012, 10:30 AM

#26

Kondor-FPV ◊

Navigator



Join Date: Nov 2011
Location: Boca Raton, FL
Posts: 662

Originally Posted by **bgarber**

This is a really good idea, especially if you modelling guys find a way to squeeze some decent gain out of the design. If it's good enough for satellite reception, it's good enough for me!

Cool stuff!!!!

Actually that was the original idea behind it all, to be able to turn whips into cp omnis of high gain.

The problem I see with that is that the stock vertical dipoles aren't consistent, you really don't know where the middle of it is, so it's a hit and miss, not good for customer confidence. I really believe the antenna has to be tuned.

If you start with a bad antenna to begin with, you aren't going to make it better by making it CP... Often with 900mhz -1.2ghz systems I see whips that are tuned way off, or even shorted.... and people just screw them on and go flying...

I have found a 1500mhz one for 1200 and a 1160 one for 900....
Not the best thing if people don't know what they are starting with.

I believe the antenna has to be sent out with a KNOWN good swr, and positioning of the elements, otherwise you'll have lots of enemies very fast!
The problem of the stock antennas becomes your problem! No thanks!

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27th July 2012, 10:31 AM

#27

Kondor-FPV ◊

Navigator



Join Date: Nov 2011
Location: Boca Raton, FL
Posts: 662

to wearyman: Absolutely, of course you can't overdo it otherwise efficiency gets lower, but it's possible to reduce 5-10% the size of the antenna with a plastic radome, and most of all protect it.

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27th July 2012, 10:54 AM

#28

Kondor-FPV ◊

If this works as I hope, there are possibilities to make a commercial product with it, and I am thinking even with vertical parasitic elements to increase gain of the wi-fi products that use linear

Navigator



Join Date: Nov 2011
Location: Boca Raton, FL
Posts: 662

polarization.

All I'd have to do is put a patent in for the CP "converter" or something like that...

People want to increase gain of their router, they put these over the stock whips and they are set.

FOR FPV people know what you are selling them and I don't want to get a bad rap if people start with a off-tune whip, all at once it's your circulator cap that sux not the antenna itself, so I guess I could offer a complete antenna with the circulator professionally installed and the antenna tuned, and also I could offer the circulator element by itself with a disclaimer...

But we are thinking too far ahead, there is some optimization to be done.



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27th July 2012, 01:20 PM

#29

IBCrazy ◊

Engineer for Jesus Christ



Join Date: Mar 2011
Location: Amherst, VA
Posts: 7,345

@kondor - I think you should look at my home Wifi system. I feed the neighbor's too 🙄

The problem is I believe routers are part 15, so modification of them would be illegal and there are already USB wifi cards with an SMA jack in them that cost ~\$12. On the other hand for FPV, you do have a great product if you can get it refined. I am happy to help you. Besides, I think you live 3 hours from me.

-Alex

If it is broken, fix it. if it isn't broken, I'll soon fix that.

videoaerialsystems.com - Performance video piloting

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27th July 2012, 01:23 PM

#30

Flying Monkey ◊

Banana Drone



Join Date: Jan 2012
Location: Snoqualmie, WA
Posts: 5,110

Originally Posted by **IBCrazy**

The problem is I believe routers are part 15, so modification of them would be illegal

Really? Oh, oops.....

"You can't take the sky from me"

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27th July 2012, 02:09 PM

#31

Kondor-FPV ◊

Navigator



Join Date: Nov 2011
Location: Boca Raton, FL
Posts: 662

Hello guys, I am back from flying and news aren't really good, I could only manage 2.2km on the foxtec 200mw 5.8ghz system, using a 4 turn on the rx side, not good!
That means I was not able to replicate the performance of the first prototype.

I did change a few things, like the thickness of the parasitic elements, and the distance by 0.25mm only, but I think the problem might be the different shape of the standoff, with all the fr4 where the holes are located, that must have ruined it...

It's back to the drawing board for me, and I won't send Hugo one until I get the same performance as the prototype...

stay tuned!

Last edited by Kondor-FPV; 27th July 2012 at 02:14 PM.

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27th July 2012, 02:37 PM

#32

IBCrazy ◦

Engineer for Jesus Christ



Join Date: Mar 2011
Location: Amherst, VA
Posts: 7,345

No!!! Anaomalies are how we learn! Build a couple of different units and we'll analyze them and see what parameters work best.

-Alex

If it is broken, fix it. if it isn't broken, I'll soon fix that.

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27th July 2012, 02:46 PM

#33

Kondor-FPV ◦

Navigator



Join Date: Nov 2011
Location: Boca Raton, FL
Posts: 662

Ok, I will do as you suggest, I will make one more with 2 supports at the edges and free space calculated distance from the radating element...

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2nd August 2012, 11:17 AM

#34

Kondor-FPV ◦

Navigator



Join Date: Nov 2011
Location: Boca Raton, FL
Posts: 662

Just came back from testing out the prototype again, and that one works... I am getting 10km with a 8 turn helix and the lindenblad on the tx side....

This is LHCP. To check polarization I installed a 12 turn RHCP and couldn't see anything at all...

The other 2 tries at RHCP lindenblad are still fail with 2.2km-2.5km...

Looking at the parameters used for the first lucky attempt, and trying to replicate that.

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26th August 2012, 03:55 PM

#35

msev ◦

Navigator

Join Date: Mar 2011
Posts: 150

Did you manage to replicate it?

26th August 2012, 04:14 PM

#36

Kondor-FPV

Navigator



Join Date: Nov 2011
Location: Boca Raton, FL
Posts: 662

Yes, but only built on top of the connector, that's because it works as a monopole, but I am close to a solution... I am getting encouraging results with thick 4mm vertical dipole.

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21st September 2012, 03:49 PM

#37

Nakelp86

Navigator



Join Date: Feb 2011
Location: Union, NJ USA
Posts: 423

Im in :-)

25th September 2012, 02:53 PM

#38

GLEvideo

KC8UD



Join Date: Jul 2011
Location: Laurel, MD between Washington D.C. / Baltimore
Posts: 383

I'm not real knowledgeable with microwave antennas and waveguides (mostly work with lower frequencies) but I've been thinking that a small cylindrical slot antenna would work well. If the tuned slots were angled and wrapped around the cavity it would create the circular pattern and the antenna would be physically strong and aerodynamic. For 5.8 Ghz it would be not much larger than a pill bottle lid with tiny angled slots cut in it all the way around. What do you think?

Airplanes LIKE to fly : Helicopters WANT to kill you.

25th September 2012, 04:02 PM

#39

Kondor-FPV

Navigator



Join Date: Nov 2011
Location: Boca Raton, FL
Posts: 662

Originally Posted by **GLEvideo**
I'm not real knowledgeable with microwave antennas and waveguides (mostly work with lower frequencies) but I've been thinking that a small cylindrical slot antenna would work well. If the tuned slots were angled and wrapped around the cavity it would create the circular pattern and the antenna would be physically strong and aerodynamic. For 5.8 Ghz it would be not much larger than a pill bottle lid with tiny angled slots cut in it all the way around. What do you think?

I think it's a good idea... haven't had time to work on it much lately, because production is sucking all my time, but I added more parasitic elements, bringing them up to 6 and I have better circularity. I don't see why we can't use 8 slots.
so yes, a small cap with 50° angled slots as a starting point would probably work .

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SecretSpy711 ◦

Sky Pirate & FPV Outlaw



Join Date: Dec 2011
Location: Denver, CO
Posts: 4,936

what ever happened with this antenna? did it work? It would be nice to have an antenna that wasn't quite as time-consuming to make as most circular omni's are.

youtube.com/secretspy711
COFPV.com

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Thread: A high gain CP OMNI finally! Parasitic Lindenblad

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25th September 2014, 06:25 PM

#41

IBCrazy 

Engineer for Jesus Christ



Join Date: Mar 2011
Location: Amherst, VA
Posts: 7,345

Originally Posted by **SecretSpy711**
what ever happened with this antenna? did it work? It would be nice to have an antenna that wasn't quite as time-consuming to make as most circular omni's are.

Be very quiet 



The parasitic Lindenblad doesn't work at microwave frequencies but a microstrip driven Lindenblad does. I have been doing some testing with them. I also had two of these at the Colorado meet in my box. Had I known you were interested, I'd have let you try them out.

-Alex

Attached Thumbnails



If it is broken, fix it. if it isn't broken, I'll soon fix that.

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26th September 2014, 07:49 AM

#42

DesignGeek ◦

KD8YYX.



Join Date: May 2014
Location: Wixom MI USA
Posts: 107

Looks very promising. Alex, I like your comparison shot of the two monitors 😊

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26th September 2014, 08:47 AM

#43

IBCrazy ◦

Engineer for Jesus Christ



Join Date: Mar 2011
Location: Amherst, VA
Posts: 7,345

That was a test flight I made for a friend of mine to compare the Lindenblad to the SpiroNet. I was using a 25mW TBS Greenhorn transmitter to bring out the differences without having to fly half-way across the county.

My findings were that the gain is about 1.4db and the axial ratio was about .55-.6. This is nowhere near the gains expected for the Parasitic Lindenblad, but certainly makes a good CP antenna. HugeOne and I actually worked on this one together. He wrote up the original model in 4NEC-2 and I refined it to match what building materials were available. Strangely, we had it up to a .99 Axial ratio, but for some reason I could never realize that in practice even after making 30 of these in different styles. The gains, however, were pretty much spot-on.

-Alex

If it is broken, fix it. if it isn't broken, I'll soon fix that.

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27th September 2014, 10:39 PM

#44

HugeOne ◦

Shedding light over FPV



Join Date: Mar 2011
Location: Canada, Quebec
Posts: 953

So you finally used a choke balun on them... told ya 😊

-Hugo

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28th September 2014, 10:51 PM

#45

IBCrazy ◦

Engineer for Jesus Christ



Join Date: Mar 2011
Location: Amherst, VA
Posts: 7,345

^I've been studying the choke balun. The one on this is straight from Walter Maxwell (W2DU). I've done a lot of research into balancing antennas lately as the high axial ratio antenna gains are often lost by poor balance. The strange thing about this is that the microstrip actually balances it. What I have found (through much experimentation), is that the main contribution to balancing issues is the length of wire in line with the feed (I often call this the feed gap). This is one of the main reasons I never bothered with higher gain "optimizations" of the cloverleaf and skew wheel.

-Alex

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29th September 2014, 12:04 AM

#46

HugeOne ◦

Shedding light over FPV



Join Date: Mar 2011
Location: Canada, Quebec
Posts: 953

Yes, the microstrips network will do that job, just like my horizon stacked fan antenna is perfectly balanced.

How about naming it the "Lindy"?

-Hugo

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29th September 2014, 12:48 AM

#47

chatch ◦

Sr. Keyboard Cowboy



Join Date: Nov 2011
Location: USA
Posts: 6,029

you guys ever think about PCB antennas? I want a flat antenna(aero design + durability) and i see several options that have enough bandwidth for omni cp

if i could figure out how to draw stuff in 4nec i'd have some produced.

Originally Posted by [jimmaplesong](#)

When you're outraged at chatch, please don't quote his bullshit.

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29th September 2014, 08:14 AM

#48

HugeOne ◦

Shedding light over FPV



Join Date: Mar 2011
Location: Canada, Quebec
Posts: 953

CP is about splitting RF radiation onto two physical planes. Therefore, a single plane or "flat" CP omni cannot be.

Hugo

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29th September 2014, 11:28 AM

#49

IBCrazy ◦

Engineer for Jesus Christ



I'm very wary of PCB based antennas due to dielectric conditions. Much care needs to be taken into consideration of the PCB type and thickness. When the velocity drops due to a dielectric, the antenna gets smaller. This often results in reduced efficiency. I've been testing some different PCB substrates and thus far I've found only one I really like. Hugo has it in his hands to test 🙄

-Alex



Join Date: Mar 2011
 Location: Amherst, VA
 Posts: 7,345

If it is broken, fix it. if it isn't broken, I'll soon fix that.

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29th September 2014, 11:37 PM

#50

WitnessOnly ◦

Navigator



Join Date: Feb 2012
 Posts: 150

Originally Posted by **SENTRY** ◻

Good to see you antenna gurus geek out - I love it. I'm just a pilot - but you guys geeking out makes my life easier and brings my planes home from some of the toughest places I put them. Good job!

What he said... 😊

Man must rise above the Earth—to the top of the atmosphere and beyond—for only thus will he fully understand the world in which he lives.

— Socrates

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26th February 2016, 02:20 PM

#51

Johnnymeg ◦

Navigator

Join Date: Oct 2012
 Posts: 25

Interesting this same as the triumph

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29th February 2016, 11:49 PM

#52

33db ◦

Navigator



Join Date: Nov 2014
 Posts: 873

I was wondering about that, did I just witness the birth of the Triumph in this thread?

You guys are amazing.

Locals Only Brah.

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1st March 2016, 05:47 AM

#53

PeteDee ◦

MrTakeNoPrisoners



Join Date: Apr 2013
 Location: Canberra, Australia

WOW, time travelling and they bought something back to the future and we are all happy. 😊

Posts: 3,100

similis vobis fugere eam furatus!

- **Edith Sitwell** "I am patient with stupidity but not with those who are proud of it."

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1st March 2016, 10:06 AM

#54

IBCrazy ◊

Engineer for Jesus Christ



Join Date: Mar 2011
Location: Amherst, VA
Posts: 7,345

Originally Posted by **33db**

I was wondering about that, did I just witness the birth of the Triumph in this thread?

You guys are amazing.

Sort of. The truth is that the Triumph was started before this thread was started. However, you do see the early development of it. Note the dates in the posts. Now look at today's date. It took years to get this one working. However, since it is now working, we are indeed all very happy.

That said, apparently HugeOne has a few more tricks up his sleeve and we are looking into some new stuff. I just got a Skype message this morning from him with some prototype designs based on some simulations I was running. Looks like we're back at it again 🙄

-Alex

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1st March 2016, 10:15 AM

#55

IBCrazy ◊

Engineer for Jesus Christ



Join Date: Mar 2011
Location: Amherst, VA
Posts: 7,345

Originally Posted by **Johnnymeg**

Interesting this same as the triumph

Not really. The Triumph is driven directly with a microstip feed. This is a parasitic array on a dipole. Note that the parasitic version, the pole direction is opposite of the Triumph.

I admit I am sad to see the parasitic Lindenblad never become available. I would have very much enjoyed seeing it. However, I think Kondor realized the amount of work it would take to do such a thing and probably decided it was not worth it. While it is unfortunate, I can't say I blame him for stopping the development. Unlike the Triumph which we made deliberately difficult to copy, a parasitic Lindenblad would not be nearly as difficult and there would be clones in 3 weeks at most.

-Alex

If it is broken, fix it. if it isn't broken, I'll soon fix that.

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1st March 2016, 01:41 PM

#56

33db ◊

Navigator



Join Date: Nov 2014

Well I own a few of your antennas IBCrazy, and thanks, because they make flying much more enjoyable. I'm amazed at your guys every time I try to understand the science behind radio and antennas I get bogged.

Posts: 873

Locals Only Brah.

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20th May 2016, 03:02 AM

#57

melsailsnorth 

Preserve Our Right to FPV



Join Date: Jan 2012
Location: Chico, CA
Posts: 160

I remember reading this post 4 years ago and came back and found it tonight after getting a glimpse inside your Triumph! low n behold, I guess Johnnie beat me to it, lol... I'm always blown away by the incredible amount of time and effort that you guys put into so many of these developments and I'm relieved to hear it's a tuff one to duplicate cause that's always shame to see (at least comercially). Can't wait to see what you and Hugo are cooking up! The last masterpiece I got from him took me farther on 5.8 then I ever thought possible! Unfortunately the long range flights are winding-down around here and it's great to see these incredible Omni's rolling out now that we've been tethered 😊 Thanks for all the years/creations Alex!!

 Originally Posted by **IBCrazy** 

Not really. The Triumph is driven directly with a microstip feed. This is a parasitic array on a dipole. Note that the parasitic version, the pole direction is opposite of the Triumph.

I admit I am sad to see the parsitic Lindenblad never become available. I would have very much enjoyed seeing it. However, I think Kondor realized the amount of work it would take to do such a thing and probably decided it was not worth it. While it is unfortunate, I can't say I blame him for stopping the development. Unlike the Triumph which we made deliberately difficult to copy, a parasitic Lindenblad would not be nearly as difficult and there would be clones in 3 weeks at most.

-Alex

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