



Founded in 1962 | AMA Club #154

April 2021



David's First Flight  
with Grandpa Mario Salazar

# Table Of Contents

Presidents Message	3
David Evan Hess "First flight"	5
In The Shop	7
2.4GHz: Is It All It's Cracked Up To Be?	9
2021 Club Calendar	12
Random Photos At The Field	13
Model of the Month	14
Some More Photos	15



## Gilbert Lucero

President

## Presidents Message

*Gilbert Lucero*

### APPRECIATING WHITTIER NARROWS PARK STAFF

I am writing to all the San Gabriel Valley Radio Control League members and to everyone who uses the RC flying field in area "A" of Whittier Narrows Park. I think it is important that we all acknowledge that we have a great flying site! We also have a few great San Gabriel Valley Radio Control League members who go out of their way that maintain the flying field area. People like Kenny Meade, and Glenn Branch, Larry Kaneshiro, and others. We are also one of the only RC flying fields that has electricity. Yes, we do not get any water in our area, and it looks like a desert in the summer months.

The point I am trying to make is we should all try and be grateful for the awesome flying site we have at our convenience. It is one of two RC flying fields in Los Angeles County. It is a privilege to have access to such a wonderful place to fly. I also want to encourage everyone to thank the park staff for all their support next time you see them, or send them a nice email. Our club has a great working relationship with the Whittier Narrows Park and Recreation staff.

I want to recognize, and thank Mr. David Jallo, Regional Park Superintendent III of Whittier Narrows Recreation Area for all his help and support he gives to all our concerns, and problems at our RC flying field. He recently helped us get portable restroom back in our area. He also has been very helpful in getting a cage made for our portable restrooms to minimize vandalism, and damage to the restroom facilities. The damage and vandalism are why the park staff had to remove our portable restrooms in the first place from our area. It cost the Los Angeles County, Department of Parks and recreation several thousand dollars for the damage made to the portable facilities. Not good in any case, especially now with the Corona Virus budget cuts the Los Angeles County workers and their staff have had to endure. If you have been to the field lately you will see the cage being made on the cement base where the portable restrooms were originally stationed. I want to remind all who use our flying field, that the Los Angeles County has no obligation to set these portable restrooms in our area. This is another privilege for all of us. Especially to the older people like me who's bladder does not work like it used to. Thank you, Mr. Jallo!



I would also like to recognize Mr. Louie Guerrero Superintendent of area "A" for all his help on our maintenance needs and concerns. He has always made himself available and has been a pleasure to work with. Mr. Jahal Dixon Superintendent has been very helpful, and has had some very good suggestions at our hobbyist meetings. I would also like to thank David Moronez, Oscar Ogalde for all there help with our maintenance needs.

I would also like to thank a couple people working on the cage that will help us get a portable restroom facility back in our immediate area. I met Mark Thompson, and Juan Alverado about a week and half ago when they started the cage project. They were very polite, and were open to suggestions. Also, very professional. They designed the barrier while they constructed it. The new barrier is coming along very nicely!

Please try and understand that my message is more than just about restroom problems we old men have. It is more about appreciation for who we get to work with, and for what we have at our convenience. Please, thank the park staff next time you see them.

**Gilbert Lucero, President**  
 San Gabriel Radio Control League  
 Whittier Narrows Recreational Park  
 Ken Mead Field



**Mario Salazar**  
 Flight Instructor

## David Evan Hess

*"First flight"*

I first met David the day he was born, on July 7th, 2014. From that moment on, David and I established a very strong bond that has only gotten stronger over the years. David lives in Sonora, Central California with his Dad Ben, his Mom Amber (my daughter), Sisters Ivy and Ramona and little Brother Daniel.

His Dad Ben has done a great job at keeping David interested in the mechanics of things and this has immensely contributed to David's mechanical aptitude and dexterity when handling tools. He's a good problem solver.

He's a very inquisitive, curious, methodical and great conversationalist boy, with plenty of stories and with a great imagination. He has loved paper airplanes and balsa wood gliders since he started walking, and one of his favorite things every time he comes to visit his Grandma and I with his family has been to work in Grandpa's garage, where he has his own set of tools, and his own model engines to work on...



About three years ago I acquired a Hangar 9, Alpha 60 trainer that from the beginning, was destined to train David how to fly. So right away, I officially presented David the airplane and told him that it was his!

I told David that when he turned 7, I was going to start teaching him to fly, and amazingly, he felt very ready to jump into it last month, 5 months shy of his 7th birthday. I set him up with a simulator a few days before we went to the Whittier flying field for the first time, and he excelled at it from the start.



Fast forward to Feb 3rd, we arrived at the flying field...

David grabbed his tools and started assembling his own airplane. After a quick review of "ground school" rules, we taxied over to the runway. David was beyond excited and he interacted with all the "old guys" at the field.

David said to me: "Grandpa, remember to be careful with the propeller!"... We started and tuned his airplane engine and proceeded to take off. David's trainer airplane uses a wireless Spektrum DX-9 trainer system, so I had the Master transmitter and David had the Trainer box transmitter.

After a couple of quick trim passes, I told David, "OK buddy, it's all yours"... He jumped right on it and felt very comfortable with the controls...



David did five very successful flights that day, and everyone at the field was impressed with the fact that this was his very first time flying... He did great!

As you can guess, I've been waiting for this day, since David was born...

To say that I'm a very proud Grandpa is a huge understatement!

Special Thanks to Robert King for all the pictures...

**Mario Salazar**



**Robert King**

Newsletter/Webmaster

## In The Shop

*Robert King*

Howdy All!

Hope you all are doing well and bringing all your planes home in one piece. If not that just means you have room for new ones right?

I've been working on my Bridi UFO kit a little bit. I'm up to the stabs now. Just trying to do a little bit when I have time. This kit requires a little thinking so as not to glue yourself into a box. Going to power with a Jett 56 engine. Hopefully all will fit! I changed my mind and won't have any retracts. Not much room up front and retracts are getting hard to get for this type model.



Since we haven't had any pylon races I've been getting into pattern competition. I had originally wanted to do this before I started flying pylon. I have my Kaos that RJ will be using for our classic pattern contest and I'll be using my Apollo 90 in novice. Will be RJ's first time competing and he's a little nervous but I know he's a good pilot and shouldn't embarrass himself too much like his old dad usually does!



I have two AMA pattern style airplanes now and hopefully will be entering some of those competitions later on this year if it all works out. Fingers crossed!

I put some random pictures at the end of the newsletter. One is of a tree the club planted. The ground there was so dry we never thought it would survive. Well it's looking pretty good now!

RJ and I bought some new fangled corsair from Hobby King. I saw it advertised EVERYWHERE and decided to buy it. Runs on 2s lipos and is pretty cool. RJ and I took turns on it. It has a gyro in it and took me a while to configure. Only has two settings intermediate and beginner on the gyro. It's a hard pass on that mode! Fighting me all the way. Anyways it seems every time we brought to the field it was super windy. I was flying it in the wind one day and lost aileron and went in to the ground. Broke a prop that came with it and of course they didn't have any for sale! 3 blade. Since most all of those types of planes are similar or the same I found some replacements from another company and

were exactly the same.

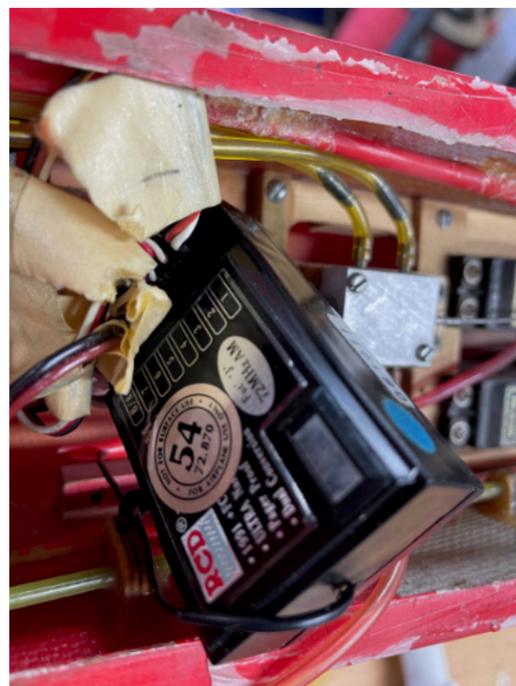
The same windy day I flew that I flew my pattern plane. You ever go flying and you sit there and think maybe I shouldn't fly? Well it was one of those days. So I flew it. Not much problems flying but landing.....was so windy I was having trouble getting it to set down. Finally got it down and of course rolled off the end of the runway and tore the gear out. Picked up some marine grade G Pox. It's an epoxy that is a little flexible and worked perfect Didn't take long and is good as new with some flights already on it.

Picked up an **old** used pattern plane called an Illusion with a Rossi .60. Will require work but it's a pretty cool plane. More next time!

Well that's about it I hope you are all doing well and if you have ANY articles or even pictures of any projects you are working on PLEASE send them to me and I will put in the newsletter or website. Email to kingconsulting@mac.com.

Until next time.....What's going on in YOUR shop?

### Robert King



Dave Horvath

## 2.4GHz: Is It All It's Cracked Up To Be?

A substantial number of unexplained crashes of radio control model airplanes on 2.4GHz frequency prompted me to write this article on the so-called "interference free" radio control systems on the 2.4GHz band.

*The electromagnetic wave spectrum is subject to the immutable laws of physics.*

The propagation characteristics of the 2.4GHz wavelength and the environmental effects of this frequency are more complex than on the 72MHz band. To better understand this, we have to look at the electromagnetic wave spectrum where 72MHz band is in the broadcasting region and the 2.4GHz band is in the microwave region. It is easier to see the huge difference between 72MHz and 2.4GHz frequencies when we convert 2.4 gigahertz to megahertz. Now it is 2400MHz versus 72MHz. When frequency increases, wavelength decreases. Therefore, the 2.4GHz wavelength is shorter and closer to visible light on the electromagnetic wave spectrum. Since visible light is also an electromagnetic wave, 2.4GHz wavelength behaves more like visible light and travels in straight lines until it is reflected, deflected, diffracted or absorbed. Reflection and diffraction will create *interference*.

When parallel rays of light are reflected by a concave mirror, it greatly increases the intensity of light at the focal point. A parabolic dish antenna works the same way for a 2.4GHz electromagnetic wave. Since we can not focus a high gain directional parabolic dish antenna between our constantly moving model airplane and our transmitter, we have to use an omnidirectional vertical antenna system which has *much lower signal intensity*.

### Interference

The FHSS (frequency-hopping-spread-spectrum) and the DSSS (direct-sequence-spread-spectrum) techniques can share the same band. However, they interfere with each other causing a degradation of performance. Range decreases as the number of clear channels decreases. Bandwidth drops each time FHSS encounters a blocked channel on a crowded spectrum.

The crowded spectrum on the 2.4GHz band reduces the bandwidth, increases the ever present background noise, increases the adjacent channel leakage ratio, *reduces the range*, and causes overlapping. Overlapping is a direct *interference*.

Unlike the 72MHz wavelength which penetrates most objects, the 2.4GHz wavelength behaves more like visible light. Signal absorption from objects on a model airplane like the engines, electric motors, batteries, servos, pushrods, landing gears, switches, wires, etc., may cause path *interference*.

Signal reflection from objects in the terrain, like fences, walls, buildings, trees, hills, power lines cause line of sight *interference*. High speed data transfer reduces the receiver's sensitivity on 2.4GHz band. There is a trade-off between speed versus range.

The signal strength decreases quadratically as distance increases at constant radiation levels. This is called path loss. When frequency increases, path loss also increases. This is one of the reasons why 72MHz radios have a better range than the 2.4GHz radios. We can see this clearly when we look at the Wireless Range Calculator:

Frequency	Distance	Loss
100MHz	0.2 mile	62 decibel
2400MHz	0.2 mile	90 decibel

These calculations are under non-existing ideal conditions, less Fresnel (pronounced Frehnel) effect.

When we fly our model airplane on 2.4GHz, the area around us is known as the Fresnel zone. Since we have to use an omnidirectional antenna system, the electromagnetic waves will scatter and diffract from objects and from the terrain around us. When the diffracted wave reaches the receiver antenna, it is slightly lags behind the signal which traveled to the receiver antenna in a straight line that creates *interference* due to the phase canceling effect.

The Fresnel effect also deals with the behavior of electromagnetic waves over a water surface. As mentioned before, the 2.4GHz radiation behaves more like visible light, so we have to think of reflections and shadows. Flying a 2.4GHz radio control model over a reflective surface like water, snow, ice or wet terrain negatively effects the radio link. Occasionally a 3D aerobatic model plunges into water while hovering. When the rudder is near the water surface, the prop wash creates a chaotic wave pattern which generates a myriad of false-signals.

The Fresnel effect and the described interference on the 2.4GHz band work pretty well. We successfully tested this at different locations. Unfortunately, the "unbreakable Tx-Rx link" broke when our model was over 0.2 miles away at 45 degree angle. Despite the fact that a 90 decibel signal loss over a thousand feet (0.2 miles) is rather significant, we should have had control at this distance. There are too many factors that can determine the overall range on 2.4GHz.

2.4GHz receivers are not immune to ignition and electrical noise as advertised. Corona discharge from high tension insulators could break the bind.

### Satellite Receivers

Satellite receivers with remote antennas are placed in our models at different locations for better exposure to the transmitter signal. The problem with this arrangement is that the signal from the transmitter is not reaching the antennas at exact same time. This creates a multi-path interference.

### Latency

Latency is the time between stimulation and the beginning of response caused by propagation delays. There is a huge time difference in latency claims by different radio manufacturers. Some latency claims are in milliseconds, others are in microseconds! This is confusing since one millisecond is one thousandth of a second and one microsecond is one millionth of a second.

Velocity of electromagnetic waves is 186,283 miles per second. The velocity of the electric signal through conductors is nearly at the speed of light. With an adequate power output, our radio signal will travel one microsecond which is one millionth of a second to reach our model airplane one thousand feet away. This applies to all brands of radios on 72MHz or on 2.4GHz. As we know, nothing travels faster than the electromagnetic waves. Therefore, I don't see how latency could be improved "50 %" over the leading competitors regardless of different processing.

A seven millisecond latency or a fourteen millisecond latency claim is irrelevant since the human being, the RC pilot, has a painfully slow 200 millisecond latency and can not differentiate between seven or fourteen milliseconds.

### Conclusion

At huge events, like Nationals, the 2.4GHz pin-free radio system makes life easier for competitors and organizers. However, there is a huge difference between flying on 2.4GHz band in the beautiful country side near Muncie where chances are good that there won't be any noticeable interference and flying on 2.4GHz band in the middle of one of the largest concentration of population and industries in Los Angeles or other urban areas.

2.4GHz radios under harsh conditions work most of the time, however most of the time is unacceptable. Illegal signal boosting, ham radio, and rolling hills further aggravate the situation. 2.4GHz wavelength has much higher incurred losses than 72MHz wavelength. Therefore, when it comes to range, the 100mW RF output on 2.4GHz radio is no match to a 750mW RF output on 72MHz radio. When out of range, error correction, unique GUID code, and the "robust" pseudo-random control sequence will do no good. In any case, we should hold on to our *assigned* frequencies on 27MHz, 50MHz, and 72MHz bands.

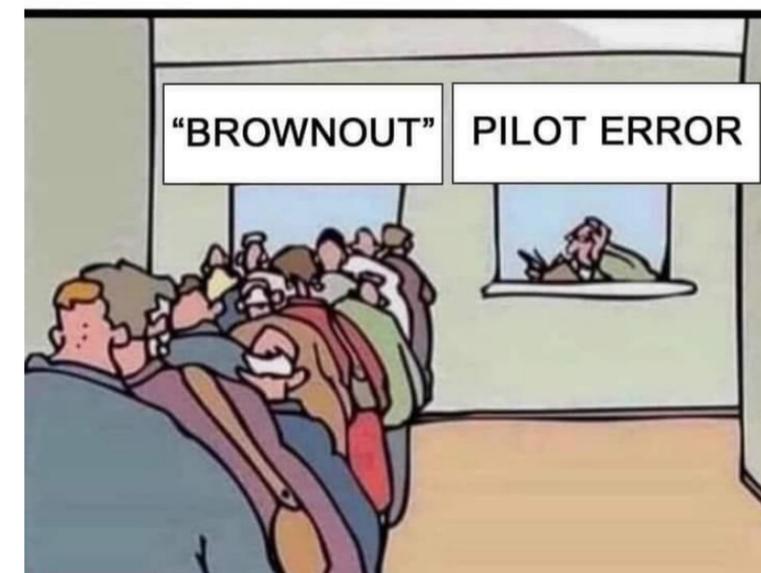
Despite glowing reviews, the so-called "bulletproof 2.4GHz technology" has range and reliability problems since day one. A bench test inside a building in a controlled environment where the receiver is a few inches away from the transmitter is meaningless.

2.4GHz wavelength is not the best choice to control model airplanes. Furthermore, we have ended up with complex radio systems on an overcrowded band on the electromagnetic wave spectrum.

The bottom line is that glitch-free software, error-free computers, and an interference-free radio link is only an *illusion*.

**Dave Horvath**

## CRASH EXPLANATIONS



# 2021 Club Calendar



## SAN GABRIEL VALLEY RADIO CONTROL LEAGUE CALENDAR - 2021



Date	Time	Event	Location	Contact/CD
<b>April</b>				
27th	6pm	<b>SGVRCL General Meeting</b>	Zoom Meeting	Gilbert Lucero
Zoom link will be sent to all club members a few days prior to meeting				
We are hoping to actually have some good news regarding future schedule soon!				
<b>Schedule May Change.</b> Any updates are online at <a href="http://www.sgvrc.org">www.sgvrc.org</a> Questions? Email: <a href="mailto:webmaster@sgvrcl.org">webmaster@sgvrcl.org</a>				



# Random Photos At The Field



# MODEL OF THE MONTH

Show off your model you are working on at the next Zoom Club Meeting!



## Some More Photos

