The Wing Nut

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Jan/Feb/Mar 2008

Here's a idea for something a little different although it's my understanding that it has been done on an occasion or two before. How about a Night Fly? I think that there are at least six or so members that have lights of some type on a plane and we could get together one evening at the field for a Night Fun Fly. This would be a very low key affair and the object would be to just have fun doing something different.

I think that the second Saturday in March, March 8th. 2008 shouldn't be to bad (cold) at the field in the evening.

I have 2.5mm Glow Wire on my Easy Star Glider from Glow Hut That I got from the web for $27.00 delivered to me. It came with a 9 volt battery hookup, but I just soldered in a Deans connector In front of the ESC and they light when the battery is plugged in. Disconnect the battery and you disconnect the lights.

Here's few references if you want to join in the fun.

Glow Hut
8430 Weatherwood Street
Chino, CA 91708
Phone: (909) 569-7808
Fax: (909) 606-1821
Internet URL http://glowhut.com
Email: sales@glowhut.com

In the March issue of Backyard Flyer they have these references to lights for a plane. (which I got just before Christmas.)

Ram Radio Control Services
(847) 740-8726 http://ramrcandramtrack.com

Since March is a couple of months away, you have time to order and install lights and join in.

Frank Mattox

Email me at: fmattox@intouchmail.net if you think that you might want to join in the fun.

Current Officers—Club Contact Information

President		
Jack Knuth	(623) 878-9140	jaknuth@cox.net
Vice President		
Fred Frost	(623) 214-2254	oofred@cox.net
Treasurer		
Jeff Lambert	(623) 544-9224	jeff5403@cox.net
Secretary		
Dick Olin	(623) 214-1439	rolin2@cox.net
Field Marshall		
Frank Mattox	(623) 936-3077	fmattox@intouchmail.net
Safety Officer		
Arnold Alpert	(623) 594-2758	arnie689@cox.net
Newsletter Editor		
Frank Mattox	(623) 932-5922	fmattox@intouchmail.net

These are the new officers of the club.
Fred Frost will be acting President for the next few months while Jack has a hectic work schedule.

Scheduled Events

Club Meeting
ARCS Field
Saturday February 9th., 10:00 AM
Breakfast Available @ 9:00 AM

March Madness
ARCS Field
Saturday March 29th.
Flying Begins @ 9:00 AM

INTERFERENCE
The Invisible (and usually nonexistent) Enemy
by Sherman Knight, duworm@aol.com
Reprinted from RCSD (RC Soaring Digest) w/permission of the author

Ever notice how the same pilots seem to loose an airplane to interference? It is a truly amazing thing. The same few pilots are always claiming they were glitched. Before you know it, the local club posts notices concerning how several channels have known interference or are "glitch prone" and recommend not flying on them. You know what I mean — signs like "DANGER – DO NOT FLY ON CHANNEL 22," or "CHANNEL 22 HAS INTERFERENCE."YIKES! This stuff is scary. So, lets try to define the type of interference discussed in this article. When someone turns on their radio and you just happen to be flying on the same channel and you loose control, you have been "shot down." This is not the type of interference this article discusses. If you fly out of range or you have an antenna issue with you aircraft, that is not the type of issue this article discusses. This article discusses the mysterious type of interference that seems to strike right before a plane crashes into the ground. The type of interference that strikes a plane when the pilot claims he was "glitched.""Glitched" is a word with many, many possible meanings, but it nearly always implies something mysterious. So, in this article, getting shot down is not a "glitch." There is nothing mysterious about getting shot down. A glitch is that mysterious interference that happens at the most inopportune times. Personally, I believe that glitches are real, but never, well almost never, are they because of some mysterious radio interference. Rather, nearly all glitches are caused by interrupting the flow of electrons or by routing them to the wrong place somewhere in the wiring of the plane or in the transmitter. Some are caused by mechanical interference within the airframe. Few, very very few, are actually interference from an outside radio source. Typically, radio interference, when it happens, occurs over a rather wide portion of the radio spectrum, not just the single narrow channel you are flying on. The FCC files contain some rather interesting

examples of things that have caused radio interference.An oxidized ground wire (intermittent short) in a commercial 50,000 watt FM antenna and, believe it or not, the worn-down-to-metal brake pads grinding on a metal brake drum on a public bus both wiped out wide portions of the local radio spectrum.These situations occur, but are very rare. These events also covered a wide part of the spectrum, not just the narrow portion of the spectrum you are flying on. The radio spectrum covers a very wide range of frequencies. If you were to spread the RC channels across the full radio spectrum, there would be room for over 55,000 RC channels.If you are flying on channel 41 and are glitched, and the pilots flying on channel 40 and 42 at the same time were not glitched, the likelihood of interference from a mysterious outside radio source, just on your narrow radio frequency band, is extremely low. Your odds are better at Vegas. So, when there are multiple planes in the air at one time and only one is glitched, it is the first indication that it is not caused by general radio interference. (Remember, a shoot down is not a glitch.) General interference should typically take down more than one plane. Every single glitching problem I have investigated could be traced to an electrical failure in the aircraft or transmitter, or was simply a case of dumb thumbs. So here are some things to think about the next time you think you were glitched. I hope they help: • Look inside yourself. Were you just 10 to 12 feet off the ground? Did you look away and when you looked back the plane was diving into the ground like a lawn dart? You probably performed a deep stall (and have a forward CG) and maybe did not see it. Ten or twelve feet is just not enough altitude to recover, but is plenty of time for the lawn dart to bury itself up to the wing root. If you crash hard, throw away the receiver. It is as simple as that. • You guys that use the battery plug as a switch are simply asking for trouble. There is no excuse for not using a switch. Excessive wire movement will break the wires at the plug! • You guys that are actually using a switch are simply asking for trouble. Because it is a mechanical connection, it is prone to wearing out and failing. But, at least the flimsy wires connected to the switch are not going to fail. • The switch should be hard mounted. Excessive wire movement will break those thin little servo wires. • If you have a power glitch in which the entire

plane looses power, re-solder all the joints between the battery and the switch and the switch and the receiver. If still no go, replace the switch. • There are only two ways to make an electrical connection — physical crimping or solder. Using CA or epoxy to make an electrical connection is an invitation for disaster.Several years ago, a post-flight was performed after a crash. The electrical splicing was protected in heat shrink tubing. I pulled the heat shrink off and the wires were beautifully twisted around each other. Wait a minute, I could see the individual wires! CA was applied to the joint after the wires were twisted together. No solder to be seen! A continuity check of the connection showed an open circuit. The CA had wicked in between the wires and acted like a little insulator around each individual wire strand. The beautiful looking splice was a complete failure. • If you glitch for no apparent reason on the ground, change the crystal or don't fly.This does not apply if you are using JR341's or 351's or any other "high impedance" servo. Long servo leads, like the one to the aileron, will pick up enough stray RF to cause servo jitter. If you move the radio more than 15 feet from the plane and the jitter goes away, it is probably a long servo lead problem. This can be solved by placing a 150 pf to 0.001 uf capacitor between the negative and signal wire right at the servo. (Radio Shack P/N 272-125, 470pf, or P/N 272-126, 0.001uf. • Here is an example of an interfered plane. One day while shooting a competition landing, the plane suddenly rolled hard left. I successfully landed the plane, but my heart nearly jumped out of my chest. Full opposite aileron and opposite rudder barely got it wings level before it landed, hard. As we approached the plane, people around me started saying things like "You must have been hit."What really happened was an intermittent solder joint on the wiring for the left aileron servo. During the roll out onto final, the left servo was in nearly the full up position when the solder joint opened, power to the servo was interrupted, and the servo simply stayed in that position. So when I let the aileron stick return to neutral the plane kept rolling. Opposite aileron and full opposite rudder barely leveled out the wings. The landing caused the bad connection to re-connect and the servo returned to neutral. By the time we got to the plane, everything looked good and worked fine.It took me days to find the problem.

It looked like interference, the people around me were convinced it was interference, but it was not. • Servo connecters and battery connectors should not get warm, much less hot. If they do, cut out the entire connection and throw it away. Bad connections are typically invisible and only short intermittently. Looks like glitching, but it's not. • Check all the connections on the battery. If any cells appear to have "leaked" or oxidized (white coating) throw away the battery pack. If any of the solders are not "shiny" you might have a cold solder joint that will only get worse over time. • Lightly flex the battery pack while it is plugged into the plane. If the model glitches, throw away the battery. • Cycle your battery pack on a charger that will tell you the capacity of the battery during each discharge cycle. If the discharge is 30 percent less than rating of the battery, throw the battery away. • If you have a glitch, never assume that you are being interfered with. The Seattle Area Soaring Society field (60 Acres South) has been tested with some rather expensive gear. No interference was found. You are much, much more likely to have an electrical problem in your model. • Over the years I have checked out a lot of planes that people claim were interfered with. Except for a well known receiver that was recalled, I have never seen a case of random interference. We always traced it back to a crystal or wiring problem. • I fly a lot of expensive stuff. When I have something that seems like a glitch and I cannot find the problem, I replace the entire wiring harness. The glitch has disappeared every time. • If you are getting "hit" while flying, START YELLING OUT YOUR FREQUENCY, AS LOUD AS YOU CAN. Someone using your frequency may have turned on their transmitter. • If you are getting "hit" while flying, assume your battery in the plane is dead or dying. Start running at the plane. Take your thumbs off the sticks. Closing the distance will result in a louder signal at the plane and maybe some control. It is my understanding that there is enough power to move the servos long after sufficient power to control the receiver is gone, but that may be changing in some of the newer receivers. A louder signal in an almost dead receiver might be enough to provide some control for a short period of time.By taking your thumbs off the sticks and the load off the battery, the battery may rebound to a higher voltage. Once closer, try moving the sticks again. Hope

you get lucky. • If you get "hit" while flying assume the battery in your radio is dead or dying. While running at the plane, turn your radio off for as long as you can. When you turn it back on, the battery will momentarily rebound to a higher voltage than it had before. If you regain control, it will only be for a brief moment. Make the best of it. • If you get "hit" while flying use as few servos as possible. Fly with rudder and elevator only. Reduce the load on the battery. Land quickly. • If you switch out the receiver in a jittery plane and the jitters go away, don't assume that the problem was in the receiver. You may have simply created a better connection in that bad wire than you had before. • I was talking with a young man the other day who was complaining about a very specific receiver and that it was having a rather interesting glitching problem. The gitching was occurring with the sailplane on the ground and the radio just a few feet away. He even went so far as to point out that when replaced with a different but same model receiver, the glitching continued, exactly as before. The typical response is to blame it on the receiver. (It must be a bad batch or poor design.) Lets face it, there have been a couple of cases where a bad receiver design was released to the public, but this situation is VERY rare. Putting a new receiver in a glitching plane is not the proper method of trouble shooting. • The proper method of trouble shooting is to take the receiver out of the jittery plane and put it in a different plane. If the jitters are now in the different plane, you can now assume the receiver is bad and throw it away.How many people do this? None that I know of. (Come on, pulling a receiver from a perfectly good plane and substituting the suspect receiver and then putting the original receiver back in is a real pain in the...) Most do what is in previous paragraph and blame it on the receiver. Could be a big mistake. • Check your mechanics.Here is an example. I forget who it was, but during a check out flight the test pilot tried a loop. The loop was so successful, the plane just kept on looping. No matter what we did, it just looped and looped and looped. Amazingly enough, it landed itself successfully.How often after a frozen control ("I've been glitched!") do you get to perform a post-flight check on an undamaged plane? We had a heck of a time trying to recreate the problem on the ground because the elevator was working again. ("I've been glitched, it must be radio

interference!") Of course everyone that witnessed the event said it must be interference.It took an hour to find the problem. When you moved the stick to full up elevator the end of the servo arm jammed against the inside of the fuselage, but only when the antenna wire got in the way. We fixed the antenna to the bottom of the fuselage and out of the way of the servo arm and the glitch never reoccurred. • Fly PCM or one of its digital versions. PCM may use an FM carrier wave, but the signal is digitally encoded. This means that when the digital signal path is corrupted, the servo simply stops moving. That's right, loss of signal means no servo movement. This also means that to get a servo to actually move differently than your stick movement requires a digital data stream that the receiver can understand. In other words, stray RF will not cause the servo to move. It requires a digital data stream that the receiver can understand to cause the servo to move differently than your stick input. How often is that going to happen? • If you are flying a digital receiver, pay attention to your failsafe settings. Failsafe sends the servo to a specified position upon loss of signal. There may be options. Many radios default the failsafe to "HOLD." This means that the servo stops moving a the last position of the servo when the receiver lost signal.You may also set the failsafe so the servos move to any position upon loss of signal you desire. Few failsafe's move the servo to a failsafe position, or back to servo center. So if you simply turn failsafe on with out setting the failsafe position, upon signal loss, all the servos move to their center position.Sounds good in practice.In reality, a 10 year old boy was killed in England at a very large fun fly because of the default setting. The power plane took off and went into failsafe at a couple of hundred feet. Failsafe moved the throttle to default position. Fifty percent power rather than off. The Plane kept flying under power and slowly rolled into the spectators. The post-flight found that the antenna was still bundled with a wire tie. Range was limited to around 400 feet when failsafe kicked in. There is a lot of discussion of what is the best failsafe position for a plane. I won't go into that discussion here. However, if your failsafe is on you really need to check something. Turn on the model and radio. Then turn the radio off. If the elevator jumps to a different location, you need to reset your elevator in the failsafe mode.

Otherwise, even a short interruption in signal will result in a pitch change in the aircraft. One way to check if the signal is occasionally lost to your plane is to set the flaps and elevator to a failsafe position. Set the flaps to 40 percent or so and the elevator to provide the correct compensation. If you are flying along and all of the sudden the flaps come down and then back up, the aircraft is telling you that there was a momentary loss of signal. And now for some additional thoughts.As I mentioned before, if you crash hard, throw away the receiver. It is as simple as that. Next time you have a problem, seek out the help of the older guys in the club. It is possible that one of them has had the exact problem you are experiencing and can help you find your gremlin in your aircraft. So with all of these examples, why do most of us with a momentary loss of control always assume it was a glitch caused by phantom interference and that all the electronics are perfect? Or if two pilots have mysterious crashes and are flying the same receiver, that it must be a design flaw in the receiver?Are our egos so big that we go into automatic denial that maybe our soldering technique is not the best?Why are we so unwilling to spend the time to investigate the electrical system in the aircraft and make sure that it is not the real problem? I think I know the answer, or at least part of it. I had a physics professor state, "Someday your kids are going to ask you, 'How does a light bulb work?' and there is a simple answer. It's magic. You see, no one has ever actually seen an electron. Therefore, it must be magic." Amazingly enough, most people treat all things electronic just like the professor. It's magic! It is this belief in magic and that the interference is from a mysterious source that causes pilots to do strange things.Like the pilot who just piled-in a new molded plane from 400 feet and simply brushed off that piled-in receiver and put it in his next $1500 plane. When the second plane went in, the pilot was heard to say, "Well, it (the receiver) looked good to me! I mean it wasn't crushed or anything!"So, just remember, an electron is a really really small thing. Way too small for us to see with a magnifying glass at the field. That means that to interrupt the flow of electrons only takes a gap that is also way too small for us to see. This brings us to the real reason we blame glitching on interference. We cannot see the gap that is causing the glitching. The professor was right. For most of

us, if we cannot see it, it does not exist. So remember this formula when you experience a glitch. One gap, so small it cannot be seen, in the wrong place, plus the wrong time, equals a dead aircraft. All of us need to pay more attention to the ENTIRE electrical system of the aircraft. In the future, when you experience a glitch, your first assumption should always be an electrical problem in the aircraft. Only after every other possibility, and then all the possibilities you did not think of yet, have been tested and discarded, should you look to interference as a problem.

Here's a couple of shots that was the basis for a little excitement at the field in early November. This is the UCD3D of Bob Lange after a minor midair with Terry Dziukt.

As they were flying around those of us on the ground heard a slight tick as they passed by each other. After Bob landed and had a chance to look at his plane this was the result. The top surface doesn't look too bad, just some minor damage to the control surface. But the bottom had the back edge completely sheared in half, probably by Terrys propeller.

It's been fixed by now of course. I think that Terry damaged a prop in the incident.

Frank

Photos by Chuck Watson

Safety is No Accident

The winter flying season is in full swing and it's a good time to review a couple safety procedures.

The first thing you need to do before flying, starts at home. Per AMA guidelines you must attach either your name and address or your AMA number somewhere on your aircraft. A simple way to do this is to stick a return address sticker inside or on the outside of the fuselage. You can also add your phone number in case the model should fly away and be found later.

When you get to the field and have assembled your plane you then need to grab the proper frequency pin, clip it on your antenna and perform a range check per the manufacturer's guidelines. It's important to leave the pin on your radio as they were designed to meet the requirement of identifying what channel the radio is transmitting on.

Ideally we never fly alone. Have a helper hold your plane during start up or use one of the devices on the tables to restrain your aircraft. Be sure to check that the throttle setting is at idle or close to it. In this day of computer radios with multiple model memories it is quite easy to find the throttle servo reversed. Take a moment to check it is the right model.

Once the engine has started move behind the prop arc before making any needed needle adjustments. Once ready to fly, the smaller planes can be carried and placed on the edge of the field facing away from the pits. Larger planes can be walked or pushed along the taxiway. At no time should we be taxiing through the pits.

At this time a series of clear, concise call-outs will help other flyers remain aware of activity on the field while they are busy flying or working on their aircraft.

On the field – when you are placing a plane on the field for take off or retrieving a stalled aircraft.

All clear – lets other pilots know when you have exited the field.

Heading out/Heading in – when you are taxiing out onto the field and back

Taking off – when you are ready to start your take off roll

Low pass – lets others know your intention and raises awareness

Coming in – when you are attempting to land. Give notice before your turn on final approach

Dead stick – When a powered plane's engine quits. Dead stick aircraft have priority over gliders and other powered planes. Immediately clear the field for landing attempt.

I don't have it (I ain't got it) – this lets everyone know you have trouble and that a potentially dangerous event is unfolding. Those not flying should offer assistance to the pilot in trouble and take note of where an aircraft goes down to help in recovering it.

Of course most of this is just common courtesy but keeping others apprised of what is going on will help them enjoy their flying time as well as make for a safer flying experience.

Arnold Alpert

Minutes
ARCS Business Meeting, November 7, 2007
Peoria Community Center

Meeting called to order at 6:40 PM by President Jack Knuth, 10 members present.

Motion to approve September Meeting Minutes as published in the Wing Nut, carried.

The third quarter 2007 budget summation was presented. The saving account has been closed and funds moved to the checking account to reduce banking fees. Motion to accept the treasurers report carried.

Bob Holdorf reported that an annual audit of Club finances has been satisfactorily completed.

Nominations for Board positions were opened. Nominated were; Fred Frost, Arnie Alpert, and Frank Mattox. All were elected unanimously. Board members for next year will be:

Arnie Alpert	**Jeff Lambert**
Fred Frost	**Frank Mattox**
Jack Knuth	**Dick Olin**

Meeting schedules and locations were discussed. To eliminate the need for night driving and find a location suitable to more members, it was decided to conduct the next meeting at the Field on Saturday, February 9th at 10:00am. Breakfast will be available at 9:00.

March Madness will be held on March 29, 2008. Flying will start at 9:00am. Any suggestions for contests or event format should be given to any Board member.

It was noted that the grill purchased for the F.E.A.R. event is available at the field if members are interested in planning activities with food. Contact Jack for access.

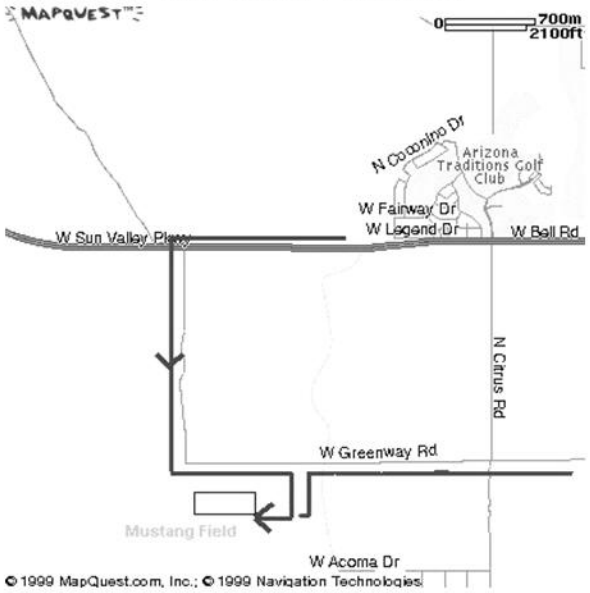
We will meet with the Knight Flyers to plan another F.E.A.R. event in October of 2008.

Jeff Lambert and John Cyr will explore the possibilities for launching gliders at the field.

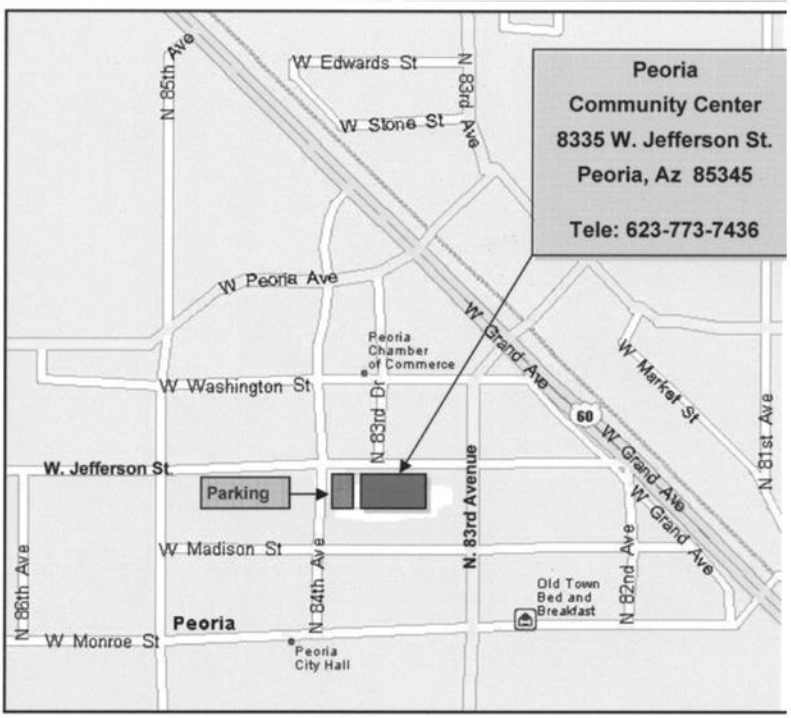
Motion to Adjourn, seconded, carried.

Submitted by: Dick Olin - Secretary

ARCS Field Location



Staff/Business & Club Meeting Location



ARCS
Activity Calendar

February 2008

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4	5	6	7	8	9 Member Meeting
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	

DATE/TIME	ACTIVITY	MEETING PLACE
February 9th. 10:00 AM	Member Meeting 10:00 AM Breakfast served @ 9:00 AM	Arcs Field

Call any officer listed on page 3 for details on any of these events.

ARCS
Activity Calendar

March 2008

Sun	*Mon*	*Tue*	*Wed*	*Thu*	*Fri*	*Sat*
						1
2	3	4	5	6	7	8 Night Fly
9	10	11	12	13	14	15
16	17	18	19	20	21	22
~~23~~ 30	~~24~~ 31	25	26	27	28	29 March Madness

DATE/TIME	ACTIVITY	MEETING PLACE
Saturday March 8th. @ Dusk	Night Fly	ARCS Field
March 29th. 9:00 AM	March Madness	ARCS Field

Call any officer listed on page 3 for details on any of these events.