



# SANDERSON FIELD R.C. NEWS



CHARTER NO. 3079

## CLUB MEETING

*This months meeting will be held  
on Thursday June 9th at 7:00 p.m.*

*at PUD #3*

*At 3rd & Cota*

This month is the Display at  
Walmart the 11th followed by the  
public fly-in on Sunday the 12th.

## Notes from an e-flier

from the Prop Masters RC Aero Club,  
Warrenville IL  
by Mitch Gerdisch  
Dave Masters, editor

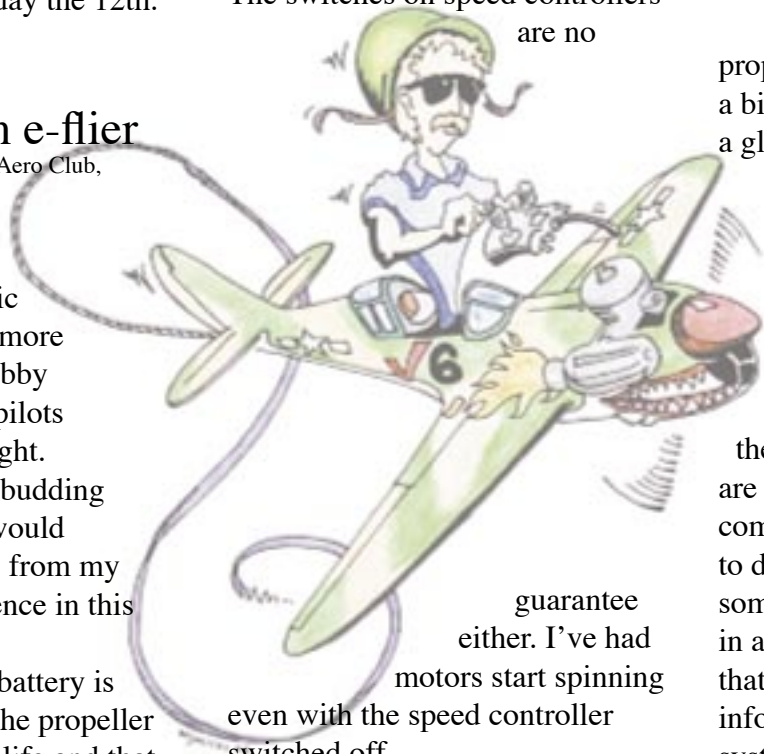
Flying electric  
airplanes is just one more  
facet of this great hobby  
and more and more pilots  
are trying electric flight.  
Therefore, for those budding  
e-fliers, I thought I would  
share a few thoughts from my  
four years of experience in this  
part of the hobby.

1. Once that battery is  
plugged in, assume the propeller  
has only one goal in life and that  
is to hurt you. Even with throttle  
locks on transmitters and switches  
on speed controllers, once you  
plug that battery in, you want to  
make sure you keep away from  
the propeller. When a gas or  
glow-motor driven propeller hits

something it will generally stall the  
motor, but not without doing some  
damage. An electric motor will not  
stall; it'll just draw more current  
in an attempt to keep going. So,  
an electric driven propeller can do  
much more damage. Thus, it must  
be given your utmost respect.

The switches on speed controllers

are no



guarantee  
either. I've had  
motors start spinning  
even with the speed controller  
switched off.

2. Use quality connectors.  
I see some folks using Tamiya  
connectors. Tamiyas are not really  
suitable for RC flight since it's  
not a matter of if they will fail,  
but rather a matter of when. For

small models, Dean's makes micro  
connectors which are well liked.  
For larger models, Sermos (AKA  
Anderson Powerpoles) or Dean's  
Ultra connectors are liked as well.  
These are just a couple of choices,  
but the bottom line is to use a  
quality connector.

3. Finding a good motor,  
propeller, and battery combo is  
a bit science and a bit art. On  
a glow model, you generally  
combine a known engine  
and a known propeller (eg.  
.40 engine with a 10 x 5  
propeller or something like  
that). In electrics, it can be a  
bit more complicated since  
you also have to account for  
the number of cells, plus there  
are a number of motor and gearbox  
combinations. The easiest thing  
to do is simply find a combination  
someone else is successfully using  
in a similarly sized model and copy  
that. One source for this sort of  
information is the electric power  
systems forum like [www.rcgroups.com](http://www.rcgroups.com).

I hope this helps those thinking  
about trying out electric flight.  
And, feel free to contact me at  
[telemitch@wowwav.com](mailto:telemitch@wowwav.com) if you  
have any follow-up questions.

# Radio Interference Primer for R/C Flyers

In the several years between 1988 and 1991, radios were being sold that could handle a spacing of 40 kHz, and which were equipped mostly with single conversion receivers. Examples are the Futaba Conquest AM series, and the Futaba 5 channel PCM. Then, in preparation for 1991 and the introduction of the odd channels, these so-called “wide band” radios were phased out in favor of “narrow band” radios. The new 1991 radios being sold today need to handle 20 kHz spacing, and most have state-of-the-art dual conversion receivers. However even in the strict 1991 environment single conversion receivers are still being sold for some radios (for example the Futaba Attack AM series, and some JR receivers which have special circuitry called ABC&W - “Automatic Blocking Circuit with Window”).

So we have seen a progression of radio models, basically in three categories based on their capabilities:

- 1) Old: 80 kHz spacing, single conversion rx, wide band tx.
- 2) 1988-1991: 40 kHz spacing, single conversion rx, wide band tx.
- 3) Post-1991: 20 kHz spacing, single/dbl conversion rx, narrow band tx.

When we talk about a “narrow band” radio, we mean one that can handle 20 kHz spacing with multiple frequencies in use at

the same time. Unfortunately not all 1991 radios come with true “narrow band” receivers, just narrow band (“gold stickered”) transmitters. The idea is that the manufacturer attempts to ensure that you never shoot somebody else down. However if your receiver is not narrow band (i.e. not dual conversion or ABC&W), somebody with wide band equipment can still shoot you down. This is rather like the world of automobile insurance, where liability insurance is mandatory but collision insurance is optional.

In Canada our situation is more complicated than in the U.S. We get 99% of our radio equipment from the U.S. and follow most U.S. rules, but unlike in the U.S. we have not taken any steps toward obsoleting old equipment. There are still a fair number of radios in operation from category 1 (above), and many radios in operation from category 2. In the U.S. some of these radios may still also be in operation, but since their use is much more discouraged there is less chance of encountering one, especially at a sanctioned flying site.

Problems in today’s environment

Our goal is to make available as many R/C channels as possible while doing our best to ensure that no potential for interference exists. There will always be unanticipated factors such as radios out of tune and interference from external non-

R/C signals, but we want to at least avoid known problems. We also want to explore all possible options before making rash hard-to-enforce decisions such as banning certain types of radio equipment or disallowing certain channels.

The following five problems must be handled:

## 1) Spacing

We would like to use as narrow a spacing as possible, however two radios must not operate on frequencies closer than the spacing they are capable of handling. 20 kHz spacing (i.e one channel apart, for example one flier on channel 30 the other on 31) is only possible if both fliers have narrow band transmitters AND receivers. If one of the fliers has a wide band transmitter OR a wide band receiver, then the spacing must be wider, for example 40 kHz or 80 kHz.

## 2) Image frequency

Anybody using a single conversion receiver should ensure that no other transmitter is operating 910 kHz away. Luckily this affects only a few people since 910 kHz spans almost the whole 72 MHz band and since one transmitter would have to be on an odd half frequency. The only radios likely to be affected (in order from most likely to least likely) are those on channels 14.5 (brown/white), 58.5 (yellow/white), 60, and 13.

# Radio Interference (Continued)

## 3) 2IM

No two radios should operate on frequencies such that their difference is too close to the intermediate frequency of any single conversion receivers being used. For example, if somebody is on channel 42, and somebody else is on channel 19 the difference frequency is 460 kHz, which is very close to 455 kHz. This could affect EVERY single conversion receiver in the air. They could all crash no matter what channel they are on. Fortunately, not all single conversion receivers seem to be affected since 460 kHz is not right on 455 kHz, and since they have varying abilities to suppress unwanted distortion. Receivers from radios in categories 1 and 2 (above) will tend to be more affected. (I had one crash and one near crash due to 23 channel 2IM with my Futaba 5 channel PCM that I bought in 1988.) There is no easy way of telling which single conversion receivers are more susceptible than others. The only sure way to avoid this problem if we don't incorporate it into the frequency board is for EVERYBODY to use only dual conversion receivers, but this would obsolete at least 50% of the radios out there, at least in Canada. Note that the main reason a dual conversion receiver is not affected by 2IM is that all direct sum and difference frequencies that can be created in the 72 MHz band fall either way below or way above 10.7 MHz. Also note that this is a recent problem. Before the

introduction of the odd channels, THIS COULD NOT HAPPEN. Two even channels can never be an odd number of channels apart (23).

## 4) 3IM

While not a big problem, 3IM is still an issue, as it has always been. The best protection for this problem is to ensure that people always stand in their pilot's box when flying so that no two transmitters with their antennas up come closer than 15-20 feet to each other. This is because those intermodulation products that are created within transmitters increase in power if the two sources are close together. Another rule to keep in mind is not to walk too close to somebody else if both your antennas are up.

## 5) Strong signal overpowers receiver.

This problem is quite common. If two flyers are standing relatively far apart, say at opposite ends of the flight line, and the first person flies their plane too close to the second person, the second person's radio signal will be so much stronger than the intended signal that the first person's receiver may experience a short burst of interference. This is in keeping with the discussion earlier which explained that an interfering signal need not be close in frequency if it is very strong. The best solution here is the same as in problem #4: stand in your pilot's box. Pilot boxes should be far enough back from the edge of the runway so that no plane will get too close in normal circumstances. Safe flying practices, i.e. low passes only over the far side of the runway, also help here.

The frequency board & club rules: Possible solutions.

Well, I've said almost all I can.

CLUB OFFICERS		
President .....	Jody Diaz .....	(360)427-6102
Vice President .....	Dick Robb .....	(360)427-4521
Treasurer .....	Charles Kentfield .....	(360)866-9473
Secretary .....	Bob Beatty .....	(360)426-5601
Field Marshall .....	Charles Kentfield .....	(360)866-9473
Safety Officer.....	John Tupper.....	(360)426-6383
BOARD MEMBERS		
Board Member.....	Jody Diaz .....	(360)427-6102
Board Member.....	Dick Robb .....	(360)427-4521
Board Member.....	Stacy Myers.....	(360)426-9367
Board Member.....	Bob Beatty .....	(360)426-5601
Board Member.....	Herb Coslett.....	(360)275-4158
Alt Board Member .....	Gordon Osberg.....	(360)426-5172
Alt Board Member .....	Chuck Kentfield .....	(360)866-9473

# Radio Interference (Continued)

The next step is to design an improved frequency board and/or modify club rules. I will now very briefly list some of the solutions that I have heard other clubs put in effect:

- i) Ban odd channels.
- ii) Allow the use of dual conversion receivers only.
- iii) Go to a special pin system that forces you to take all necessary pins, for example the pin(s) for channel(s) that are 23 channels away. An effective system is described in the AMA handbook (see me for more information).
- iv) Go to a special computerized frequency board where the computer decides whether you can fly based on rules

similar to those listed earlier.

In conclusion, there are some basic principles involved in radio interference, and these result in about 5 main problems that a frequency board and field layout must overcome. The first and third listed above, namely spacing and 2IM, are the most pressing, especially with the introduction of the new odd channels in 1991.

I have not dealt specifically with interference from non-RC sources, for example pagers (a problem in the U.S.), 2IM from audio of TV channel 4, etc. This type of interference will follow the same basic principles as I stated in the body of the article, but will be unique to a particular flying site and will require local rules.

Additional notes by Max, Feb. 3, 1998:

- 1) I still see some of the pre-1988 radios from time to time.
- 2) My club is still using the ancient MAAC frequency board from 1987, with its non-linearity problems. Luckily we can use a 3-wide pins for newer radios.
- 3) Single conversion receivers are STILL being sold by some manufacturers, like the Futaba ATTACK-4. This is plain inexcusable. At least JR's single conversion receivers have ABC&W, which seems to do a good job of eliminating 2IM.

*IF YOU PAY BY MAIL SEND YOUR DUES, PROOF OF 2005 AMA MEMBERSHIP AND A SELF ADDRESSED STAMPED ENVELOPE TO THE TREASURER:*

**CHUCK KENTFIELD**  
**6843 Gallagher Cove Rd NW**  
**Olympia WA 98502**

BELOW ARE THE SCHEDULED EVENTS FOR 2005

## Club Scheduled Events for 2005

- January.....Annual 1st fly of the year
- February .....
- March .....
- April 23rd .....Sanderson Field RC flyers annual swap meet 9:00 to 12:00 SHS Sub
- May .....
- June 11th .....Display at Walmart
- June 12th.....Public Fly-In
- July 9th.....fly-in 9:00 a.m. to ????
- August 20th.....Scale fly-in 9:00 a.m. to ????
- September 10th.....Fly-In 9:00 a.m. to ????
- October .....
- November.....
- December .....

**It's time for 2005 dues, pay before December 31st for \$10 savings**

**Check out our web site at <http://sfrfc.quintex.com>**

MECA & LCRC

are sponsoring a

# MODEL AIRPLANE MODEL ENGINE SWAP MEET

## ADMISSION

Adults: \$1.00  
Children under 12: Free

## HOURS

10 AM TO 2:00 PM

## LOCATION

Toledo High School Cafeteria

**Saturday, June 18, 2005**

Display Tables are \$5.00 each with a first come first served.  
Vendors will be admitted at 9:00 AM.

Bring your old model airplanes, cars, boats,  
other related items and especially ENGINES.  
Engine run in parking lot – Lets hear your old & weird engine run.

**BUY... SELL... SWAP... AND HAVE FUN**