

INFORMATION BULLETIN -- 2.4GHz

This is an updated safety-related advice about 2.4GHz use at Garawarra
The temporary prohibition on 2.4GHz use at Gara. is lifted effective Saturday June 28, 2008 -- **BUT WITH SPECIFIC AND STRICT CONDITIONS.**

Please read this entire Bulletin.

Background

As mentioned previously, there have been an unacceptable number of incidents on 2.4GHz at Gara. It's possible that some of these incidents were caused by equipment set-up; some may have been caused by inadequate or fluctuating Rx power supply; some may have been caused by the less generally robust 2.4GHz in-aircraft Rx environment itself, some may have been pilot error and some are genuinely inexplicable & therefore worrying. Only Spektrum JR gear is involved (but it is by far the most commonly used at present). Various brands of 2.4GHz Tx equipment work in different ways and, if all of that's not enough variables to consider –it is proving impossible to get the specialised spectrum monitoring equipment, competent and interested people, monitor in a meaningful fashion (some transmission beams are quite focussed and may not be evident at ground level) and then wait for the 2.4GHz manufacturer to assess the data and report. Also, we are assured in writing that “...there has never been a field in the U.S. that was 2.4 ‘unfriendly’ and the U.S is likely to be a much tougher environment than in Australia”.

It is in this environment that your Committee has been trying to get to the bottom of things and to ensure that ALL members' interests are protected. (Should any member be interested, all of the emails etc supporting the work done thus far are available for members' perusal).

The Decision

The temporary prohibition on 2.4GHz use at Garawarra is lifted forthwith

HOWEVER it is required that:

- All 2.4GHz users exercise great care
 - All 2.4GHz users take note of the especially “fiddly” nature that is 2.4GHz set-up, note and action the main areas of potential problems (see below) and thoroughly acquaint themselves with the more detailed set-up and potential problem area information available from manufacturers and others
 - All users (i.e. all frequencies) thoroughly, promptly and comprehensively report any incidents/crashes at Garawarra to a Committee member
- Your Committee will continue to review the situation and, if the protection of Members' interests so dictate, the prohibition will be again implemented.

Some of the areas of potential problems – useful hints:

1. A good, strong & well-charged Rx battery is essential. Use higher capacity batteries and learn how to charge them correctly
2. The JR Instruction Manual apparently has a supplement with various tips – FAQs that should be understood
3. Power leads generally (& especially from battery to Rx) need be capable of carrying full servo power – even when there is multiple, simultaneous servo power demand
4. Switches need be good quality. Ditto with connectors. They must all fit tightly.
5. A failure in any of the above will obviously be catastrophic. It might not be known that a momentary failure in 1, 2, or 3, above can cause “brownout” – where the Rx shuts down for a few seconds while it seeks to re-acquire the Tx signal. That’s often all it takes!!
6. Turn on your Tx at home and note how long it takes for the green LED in the bind button to go solid (i.e. while it’s looking for clear channels). Note the time taken. Now go to Garawarra and repeat the procedure at various points on the field. If it takes longer to go solid then there is a higher level of 2.4GHz activity in the area. This could indicate an even more serious problem in the event of “brownout”. (If it doesn’t light up then, obviously there are no ‘free’ channels and you can’t fly)
7. The importer recommends bending the Tx antenna at 45° in the middle to ensure that the Tx antenna is less likely to be pointing at the model
8. Read fully and understand the MAAA’s policy relating to 2.4GHz (www.maaa.asn.au/mop/policy/MOP058).
9. Read all the materials about 2.4GHz and about batteries including :-
 - <http://www.rcmodelreviews.com/spectrumanalyzoffer.shtml>
 - www.rcmodelreviews.com;
 - <http://www.spektrumrc.com/Articles/Article.aspx?ArticleID=1756>;
<http://www.spektrumrc.com/Articles/Article.aspx?ArticleID=1683>
 - Carbon fibre in the fuselage, servo leads and even metal pushrods are said to be potential shielding factors that influence 2.4GHz reception

The C Tick

Equipment displaying a C Tick indicates the importer – manufacturer declares compliance with relevant Australian Standards. Without this compliance mark, the Radiocommunications Act places responsibility on the user to ensure that the equipment complies with the applicable Australian Standards.

MAAA manages national insurance for all licensed model flyers and MAAA is quite clear (see section 3.4 of MOP058) that operation of equipment that does not conform to applicable Australian Standards may result in the flyer having a liability in the event of a claim on the MAAA insurance policies.

In other words, MAAA is saying that you can use equipment that doesn’t have a C Tick but don’t expect to have insurance cover!

So, if you have privately imported equipment then you are strongly encouraged to do whatever it takes to get a C Tick. The risk is yours if you don't. You have been advised!

Best wishes to all The Committee

[Further good information on 2.4GHz from one of our Members](#)

More 2.4Ghz Info

From: Bruce Beresford [mailto:contactus@engadineweb.com.au]

Sent: Sunday, 17 August 2008 3:02 PM

To: info@sssfa.net

Subject: Another problem with Spectrum equipment

Hi, just a report on another Spectrum equipment problem.

My Son was flying in a scale comp yesterday at Temora and had loss of control on two occasions, luckily he landed safely.

The problem was in the receiver, the AR7000 dual receiver. The main receiver has two small antenna wires out each side of the plastic receiver box, one of the wires broke off possibly due to the way the receiver was mounted and the vibration of the plane. The small aux receiver took over and the plane was landed successfully, if the plane had been any further distance away it would have been lost.

I have not had this problem, but I checked the antenna wires on my AR7000 receivers and all were ok. My mounting method is to cut out the shape of the receiver and antenna wires in two pieces of foam plastic and insert the receiver into the void and clamp together using Velcro. By doing this the whole package will vibrate rather than the receiver box and antenna wires vibrating at different rates.

I checked the net and found a record of a similar problem with an AR7100 receiver in a helicopter.

I think what can be learnt from this is:

1. Make sure the whole main receiver package including antennas are subject to the same vibration effect.
2. Always check the integrity of the antenna wires on the AR7000.

Hope this helps someone in the future...

Regards, Bruce...

Bruce Beresford, Engadine Web Services

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cc : Committee June 27, 2008

Hi Bruce,

If only we had a few more members that would bother to research the facts and present them in a concise manner as you have and spend less time letting advertising and latest and greatest syndrome govern their thoughts on matters like this.

Alas, I can but dream!!!!

Thank you,
Howard.

-----Original Message-----

From: Bruce Beresford [mailto:contactus@engadineweb.com.au]

Sent: Sunday, 29 June 2008 3:42 PM

To: jcobb@ezylink.net.au

Subject: Technical Issues - Spektrum DX7

Hi Jim, I have been carrying out research on the Spektrum DX7 and associated technical issues.

I have found several articles on the Spektrum Transmitter & Receiver and also issues with the latest NiMH batteries now on the market. I thought it may be a good idea to include some of the is information and site links on the "Articles for Interest" page of our website.

Re battery voltage and the Spektrum system:

Specs for Spektrum AR7000 Receiver

Type: AR7000 7 ch DSM2 Full Range Receiver

of Channels: 7

Modulation: DSM2

Band: 2.4GHz

Dimensions (WxLxH): 25.3 x 47 x 15.8mm

Weight: 14 g

Voltage Range: 3.5V-9.6V

Antenna Length: Main RX: 30mm (2) Remote RX: 30mm (2)

NOTE the voltage range: 3.5V-9.6V

From a post that I read John Adams (Technical Director Spektrum

Horizon Hobby) has stated when a battery reaches 4.8 volts, it is NOT safe to fly...

The Spektrum box new comes with Transmitter, AR7000 receiver, 4 servos and a 4 cell 800mAH NiCad battery. From my experience (Bruce Beresford) this battery is inadequate both in voltage and capacity I have had two occasions where the receiver lost signal for about 2 to 4 seconds, luckily the planes were recovered ok and landed ok, one by me and the other by Noel while I was in training.

From Spektrum:

Receiver Power System Requirements

<<http://www.spektrumrc.com/Articles/Article.aspx?ArticleID=1683>>

With all radio installations it is vital the onboard power system provides adequate power of 4.5 volts or more without interruption to the receiver even when the system is fully loaded (servos at maximum flight loads). This becomes especially critical with giant scale models that utilize multiple high torque high current servos. Inadequate power systems that are unable to provide the necessary minimum voltage to the receiver during flight loads have become the number one cause of in flight failures. Some of the power system components that affect the ability to properly deliver adequate power include: the selected receiver battery pack (number of cells, capacity, cell type, state of charge), switch harness, battery leads, regulator (if used), power bus (if used).

While Spektrum's receivers' minimum operational voltage is 3.5 volts, it is highly recommended the system be tested per the guidelines below to a minimum acceptable voltage of 4.8 volts during ground testing. This will provide head room to compensate for battery discharging or if the actual flight loads are greater than the ground test loads.

Recommended power system guidelines:

1. When setting up large or complex aircraft with multiple high torque servos, it's highly recommend a current and volt meter (Hangar 9 HAN172) be used. Plug the volt meter in an open channel port in the receiver and with the system on, load the control surfaces (apply pressure with your hand) while monitoring the voltage at the receiver. The voltage should remain above 4.5 volts even when all servos are heavily loaded.
2. With the current meter inline with the receiver battery lead, load the control surfaces (apply pressure with your hand) while monitoring the current. The maximum continuous recommended current for a single heavy duty servo battery lead is three amps while short duration current spikes of up to five amps is acceptable. Consequently if your system draws more than three amps continuous or five amps for short durations, a single battery pack with a single switch harness plugged into the receiver for power will be inadequate. It will be necessary to use multiple packs with multiple switches and multiple leads plugged into the receiver.
3. If using a regulator it's important the above tests be done for an extended period of 5 minutes. When current passes through a regulator heat is generated and this heat causes the regulator to increase resistance which in turn causes even more heat to build up (thermal runaway). While a regulator may provide adequate power for a short duration it's important to test its ability over time as the regulator may not be able to maintain voltage at significant power levels.
4. For really large aircraft or complex models (35% and larger or jets) multiple battery packs with multiple switch harnesses are necessary or in many cases one of the commercially available power boxes busses is recommended. No matter what power systems you choose always carry out test #1 above making sure that the receiver is constantly provided with 4 volts or more under all conditions.

5. The latest generation of Nickel Metal Hydride batteries incorporate a new chemistry mandated to be more environmentally friendly. These batteries when charged with peak detection fast chargers have tendencies to false peak (not fully charge) repeatedly. These include all brands of NiMh batteries. If using NiMh packs be especially cautious when charging making absolutely sure that the battery is fully charged. It is recommended to use a charger that can display total charge current. Note the number of mAh put into a discharged pack to verify it has been charged to capacity.

I am no expert as you know Jim, but my advice to Spektrum users, existing and new, is the following:

1. At the very least use a 6V 2000mAh NiMH battery for the plane and ensure the battery has been adequately charged.
 2. Consider dual batteries especially if there is heavy servo usage, large plane and/or acrobatics.
 3. Redundant Power Configurations <<http://www.tech-aero.net/documents/Tech-Tip%200601.pdf>> , Servo Power Boards <http://www.servocity.com/html/servo_power_boards.html>
 4. It is also recognised that the Transmitter antenna should be placed at the 45 degree position as a straight antenna could place the plane in a signal null.
 5. It is suggested that a bind should also be performed at setup on the day of flying.
 6. Ensure that you understand programming techniques and requirements of the DX7 - Spektrum DX7 Programming Notes <<http://www.rc-soar.com/spektrum/index.htm>>
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I hope this information will be of assistance Jim. I am new to the hobby and the Spektrum is all that I have used, from my experience the Spektrum Manual is really not adequate for new users and additional reading is recommended. There is a lot of information on the net and it is worth the time to read it.

Regards,
Bruce...

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