Ignition Systems and Interference

by Henry Zwolak & Pat Roy

The biggest challenge that all of us gas guys face is ensuring that our planes fly interference free.

The First, Foremost and BIGGEST reason is Safety. The far distant second reason is the cost of replacing that beautiful bird. Oh, did I say mention SAFETY!!

RF will be evident immediately if using a PPM receiver. Do not fly until you obtain excellent engine running range checks with a PPM receiver. Using a PCM receiver for initial range checks frequently masks some RF issues which can later push through the ability of a PCM receiver to filter them out. A crash comes almost immediately after that happens.

So the key is using a PPM receiver for those first critical system checks, *not* a PCM receiver. Engine off to establish a baseline, then engine running. You want no worse than a 10% difference between engine off and engine running range checks. Over 90 to 100' for a minimum distance, engine running. If you do everything right and have problems do not fly until EVERYTHING is working properly.

What about the 2.4 GHz frequencies that are quickly overtaking the 72 MHz market? You have probably heard that using the 2.4 GHz radios will eliminate you concerns. Right? In fact, they it is absolutely incorrect to assume that is the case.

You keep believing that and you're sure to lose a plane. You won't be alone. Others have already gone before you with the same belief. Where the receiver is mounted is not nearly as critical as assuring that you don't have RF issues at all. I've been mounting radio components in close proximity to ignition systems for many years but what has permitted that to work every time is using good

components in great condition and making all the checks to assure that any issues were eliminated prior to flight.

Using 2.4 GHz radio does not eliminate RFI, and the 2.4 GHz systems are still subject to various forms of jamming. If one has failed to achieve adequate range checks with the engine off and the engine running the loss of an aircraft is only a matter of time. Using 2.4 will not eliminate that problem, nor will PCM. Both only reduce the chance of a crash from ignition RFI, with 2.4 being better than 72 MHz PCM.

Never rule out anything when it comes to airplanes.

The batteries can get "feedback" from the ignition unit. Consider EVERYTHING associated with the ignition unit as a potential problem. Switch, battery, plug, engine, ignition module-- ALL of it can cause problems. It's a closed system that is independent of the RX--but it can belch out RF in a number of ways.

Should you have a plug arcing to the outside of the plug and down the cap due to a cracked plug insulator you *will* have interference. A poor ground and you *will* have interference. The age old advice of not flying if you have greater than a 10% difference in range checks, engine running and engine off, still hold true. If you have an interference problem at *any* rpm level, don't fly! To do so is only accepting that you will crash the plane on that flight or another very soon.

When you make the step up from a glow engine to a gasser, don't re-use your old radio flight equipment and accessories. Step up to the plate and use new products of high quality. That includes the servos and associated linkages. Your days of buying the cheapest stuff you can find should be viewed as over, and to continue doing so radically increases the opportunities for problems to occur. Resist this change and you will spend a fortune replacing airplanes. Some seem to think it's cheaper that way....

If you elect to use digital servos, also elect to use batteries of higher amperages than you did with your old NiCad driven analog servos. Receiver drop outs are nothing new. They happened in the "old days" as well, (upcoming analogy) but most of us understood that a flashlight would not work with a dead battery. But it would dim before it died. Nothing has changed with the advent of 2.4. Weak battery still equals dead airplane or flashlight if you will.

The hardest part is having to go back through everything one component at a time to find a very small problem. Unfortunately that small problem has the ability to cost you a lot of money, let alone time in rebuilding. Take the time to learn and understand how the new equipment works. An example of not understanding is well depicted with the gentleman on his third ignition. Don't feel bad, I learned it the same way, but did it the first time after researching how it could happen.

Lastly, manufacturers tell you everything you need to know to buy their products. They frequently don't tell you all you need to know to use them, and the difference between the two can be extremely important and sometimes costly.

Interference Check Sheet……a good start

1. Type of ignition? Is the cap well seated?
2. Is the plug wire in good shape?
3. Braided shielding in good shape?
4. Ground strap (if used) securely connected to a positive ground?
5. New batteries or old?
6. Wire conditions?
7. Age of connectors?
8. Clean or dirty?
9. Age of switches?
10. Number of planes they have been used in?
11. Connector conditions?
12. Conditions of switch internal solder joints?
13. Landing gear bolts secure and tight?
14. Age of servos?
15. Condition of servo wires and plugs?
16. Solder joints inside servos?
17. Have any ever been crashed?
18. Receivers ever been crashed?
19. Are the input ports clean?
20. Solder joints inside the receiver all good?
21. Are all connector plugs fully seated?

That's just a few potential candidates for RFI generation. That's why the use of better equipment in good condition is sooo important with gassers.