Dianmu OSD and FPV System Connections

Quite some time ago I purchased a Dianmu OSD (on-screen display) from HobbyKing. The Dianmu OSD also includes a flight controller with auto-leveling and return-to-home functions. It sat in a box for quite some time before I decided to mount it on my large(ish) electric Fox Glider. At the time I used a philosophy of "Lets add in extra connectors just in case I want to connect in something else." This produced a rather messy system with connectors in various places that didn't connect to anything (but might in the future.) It also had a number of *ground loops* which I discovered upon tracing out the circuits as I had installed them. Despite all of these bad practices the video system and OSD worked reasonably well.... except for the Video Transmitter getting a bit hot, but I'll go into that shortly.

The weird thing was that while gliding with the motor off the OSD was nicely displayed, but when the motor ran, the OSD broke up and disappeared until the motor was stopped again. Hindsight and advice from others suggested that this effect was interference caused by the ground loops and the various aerials I had inadvertently added into the system through having the dead-end connector sections. So I would need to tidy up my glider's electrical system. A task I had been dreading. But the glider was not going into the air with the dodgy video transmitter, and replacing it would need a bit of rewiring so I decided to use a windy weekend to fix the wiring and install a good reliable ImmersionRC video transmitter.

Fun with TS832 Video Transmitters

As I said, I observed that the video transmitter had been too hot at one stage. I found this out when I had reason to take the transmitter off and found a neat melted hole in the plastic sheath around the device. It still works so I removed the sheath to try to get as much airflow around it as possible. The video transmitter is a 600mW TS832 from FoxtechFPV. I bought it a couple of years ago along with a receiver and two other TS832s. One of the TS832s failed very early and FoxtechFPV replaced it with a new one. Now that I am finally putting them into use I have been very disappointed to find just how crappy they are.

I have a friend who is developing some kit to go on one of his fixed wing planes. He had purchased a TS832 video transmitter and was having problems getting a signal from it. I set up my video receiving station and agreed that there was nothing there to receive. We pulled out the video transmitter and it had a cooked patch on it. Seeing as I had several of the same video transmitters ready to go, I grabbed one from home and we installed it. Based on my growing distrust of the TS832s I suspected this was going to be a sacrifice to the gods of smoke and mishap. I was not wrong. We had a good signal and got the plane into the air. After about half a minute of flying the signal suddenly stopped. When we looked at the video transmitter we found that it had failed spectacularly (as shown below). It was well and truly toasted, and had had a go a charring the plywood mounting on the plane.

So my advice on the TS832 video transmitters in all their guises and different brands is avoid them like the plague. They are rubbish. There is a diode (or something resembling a diode) that is inadequately sized for the voltages and currents it carries. Two out of three transmitters that are completely fried and one that could go at any moment is pretty poor. All of them were operated with good airflow around them and good aerials. It is possible the only reason the one from the Fox glider has not failed is



Illustration 1: Know your enemy.



Illustration 2: Toasted!

because it was not suppling electricity to the camera. There are plenty of reviews on the web that suggest these things are pretty crappy and badly under-perform, it's just a shame there were none of these reviews around at the time I bought mine.

Because I don't trust my remaining TS832, I have replaced it with a 600mW ImmersionRC video transmitter. I have used one of these on another of my planes for quite a few years and not had any problems with it.

Installing the Dianmu OSD System

What follows is a brief description of the arrangement I have used in my powered glider. The diagram below will hopefully make it clear how the various components connect. As much as possible I have tried to capture the wire colours to make it very clear where the ground is running. Please be aware that there is a change in the wire colours where the wires from the Dianmu OSD connect to the wires to the Video Transmitter.

You will see that the Dianmu OSD flight control system only controls the ailerons and elevator. The pilot still retains the ability to use the rudder and throttle even when the flight controller is flying in return-to-home mode. I have yet to see whether I need to set some sort of failsafe throttle level (say 30%) to help it get home if the plane loses the controller signal.

The Dianmu OSD main board includes a connection for an RSSI (Received Signal Strength Indicator). I don't have one of these and so that connection is left bare.

The camera includes a regulator in its connectors which allowed me to supply it directly from the main battery. The alternative would be to supply it from either the Dianmu OSD main board using one of the voltage out ports there or from the video transmitter which can supply 5V. My preference is to keep it clean, by supplying it from the main battery, thereby reducing the load on any of the other components that could be used to supply it.

Channels 6 and 7 on the transmitter are used to control the Dianmu OSD's mode and navigate the menu system at startup. On the Turnigy 9XR transmitter I am using, the Autopilot mode is selected by a three position switch, and the OSD view mode is selected using one of the pots.

The system works. Now I just need a non-windy day to get it into the air and see if I have eliminated the OSD view breakup problem.

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