

## Amateur Television Transmission

Parts for the system:

VM-70X transmitter  
Receiver Card  
Video Switching Circuit  
GPS OSD board  
11.1 V Battery  
Ground Plane Antenna  
Cameras  
Heat Sink

### **VM-70X transmitter**

We purchased two transmitters from hamtv.com. The transmitter labeled #1 is the flight model, while #2 was/is used for testing purposes. There is a potentiometer on the transmitter which adjusts the output power of video signal. The RF output power can be adjustable up to 5 Watts. The output frequency can be adjusted through the DIP switches located on the transmitter. Rather than me rattle off all of the information regarding the transmitter I would suggest taking a look at this website

[http://www.hamtv.com/pdf/VM-70X\\_Manual.pdf](http://www.hamtv.com/pdf/VM-70X_Manual.pdf)

What you really need to know is that the output power has already been adjusted for the flight model and the only real way to test the output power is at Bruce's house with a wattmeter. Always make sure there is an antenna attached before you apply power to the transmitter.

### **Receiver Card**

This is a rather weak point in our system and I am going to assume that future teams will look into improving this part. The tuner card that we have gets an antenna plugged into it and plugs into a computers USB port. I believe that the program for the card is installed on one of the computers, but I could be mistaken. There is a CD in the lab which contains the software for the card. If you do d/l the software you will have to make your own channel for the frequency which the TX is tuned.

### **Video Switching Circuit**

The video switching circuit is controlled through three logic inputs (ground, input1, input2). By switching the logic inputs, the circuit can switch up to four different cameras. The circuit also allows the possibility of powering the cameras through the circuit. The circuit requires a 5 V input to power the circuit. When you guys complete your powerbus, this will be a perfect application.

The circuit also allows up to 4 (or 5) outputs of the same signal. We used two of the outputs last launch, one for the transmitter and one for the DVR.

## **GPS OSD board**

The GPS overlay board is very easy to understand. There is an input for the video signal, the gps information, and the power. Everything should already be set up and ready to run. There is a manual in the lab with the information.

## **11.1 V Battery**

There is a universal battery charger in the lab in which the 11.1 V battery needs to be charged with before it is used again, the last launch depleted the power. The battery can be used for testing if necessary, but if you can avoid using it and power the system using the regulated DC power supply, that would be best.

## **Ground Plane Antenna**

The small ground plane antenna needs to be repaired. Mark would be the best person for information regarding rebuilding the antenna. The wire we used for the radials were wire hangers. I would go ahead and make some extra radials in case they break in the future.

We were getting some RF interference inside of the box. Work with Bruce and the ME team to help solve this issue if you have further launches.

## **Cameras**

The cameras used in the last launch didn't have that good of a picture. Bruce says he has a circuit in which we can use the single stack cameras which we were going to originally use. I would look into replacing the cameras we have now with the older ones.

## **Heat Sink**

There are two heat sinks in the laboratory, one of which weighs more than the other. Obviously the one which weighs less is the flight model. Look back at the temperature data gathered from previous flights and decide whether the heat sink can be smaller. Look into making the heat sink smaller/lighter.