

GPS Antenna and Maxstream data modem antennas modifications

10th Nov 2006 by Paw Yew Chai

The purpose of the modification is to reduce the weight of the antenna as well as custom the antenna for easier integration onto the YardStik aircraft.

1. Modification of the Maxstream data modem antenna.

The Maxstream data modem that is used onboard of the YardStik aircraft is the 9xTend OEM board that has a MMCX connector with the pigtail antenna (figure 1).

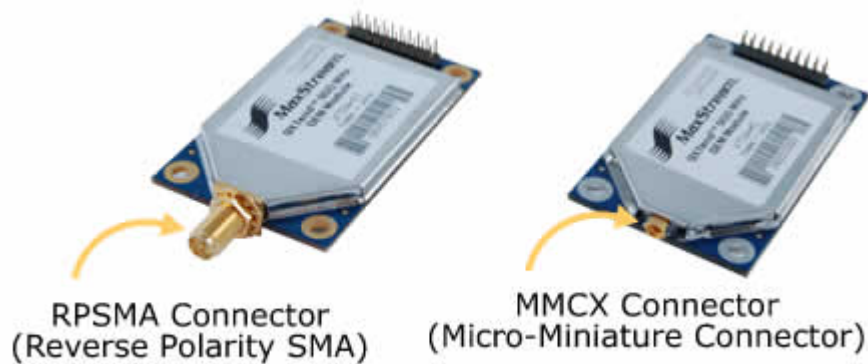


Figure 1. Maxstream OEM 9xTend data modem

(source: <http://www.maxstream.net/products/xtend/oem-rf-module.php>)

Quarter-Wave & Half-Wave Whip Antennas



Figure 2. Maxstream OEM 9xTend whip antennas

(source: <http://www.maxstream.net/products/accessories/antennas-whip.php>)

Figure 2 shows the Pigtail antenna with the MMCX connectors which we are modifying. The weight of this antenna without modification is 28g. The antenna housing is stripped and the metal mounting housing is removed as well. To do that, the MMCX connect has to be cut off to allow the metal housing base to slot out of the

antenna and a new MMCX connector is crimp to the antenna wire again. Figure 3 and 4 shows the modified antenna.

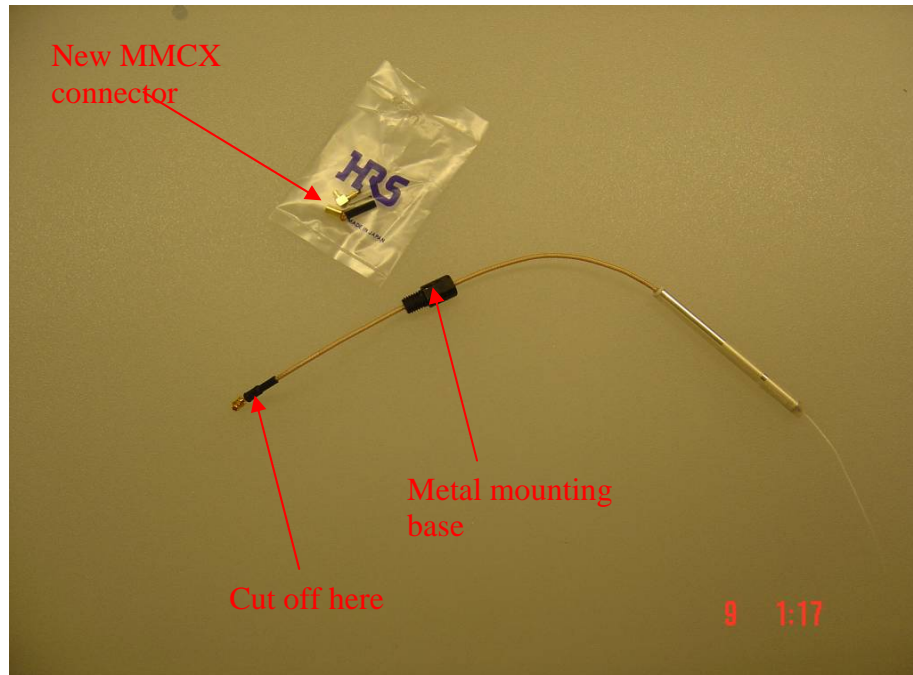


Figure 3. Antenna with housing stripped

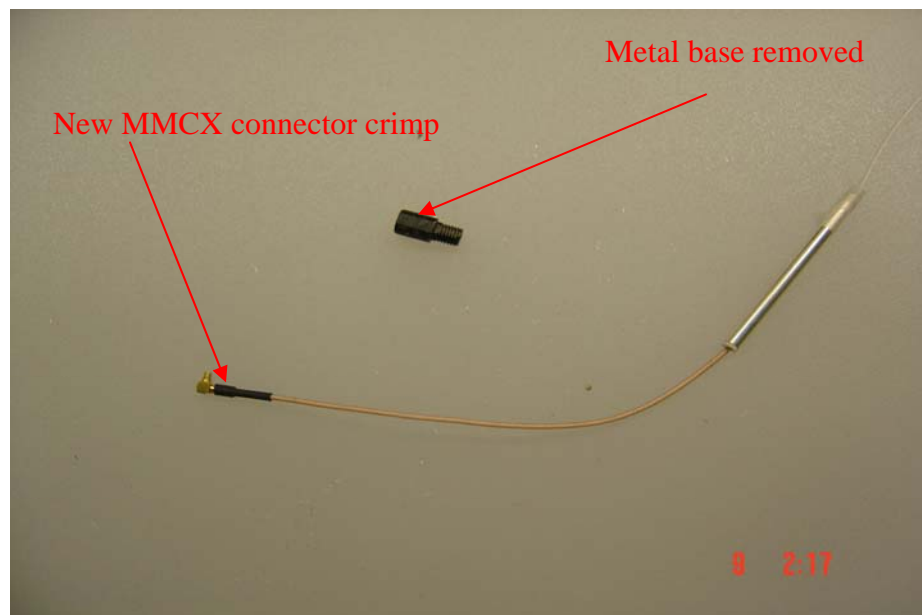


Figure 4. Fully modified antenna
The modified antenna weighs about 6 grams. (weight reduction of 22g)

2. Modification of the GPS antenna.

The GPS antenna that is used on the MNav is MK-76 active antenna. The original antenna has a length of 1m and weighs 30g. As we are going to embed the GPS antenna into the wing of the YardStik aircraft, we shortened the antenna and remove the metal mounting base which are not useful to us. However, due to removal of the metal base (which serves as a ground plane), we are going to use aluminum foil as the replacement ground plane.

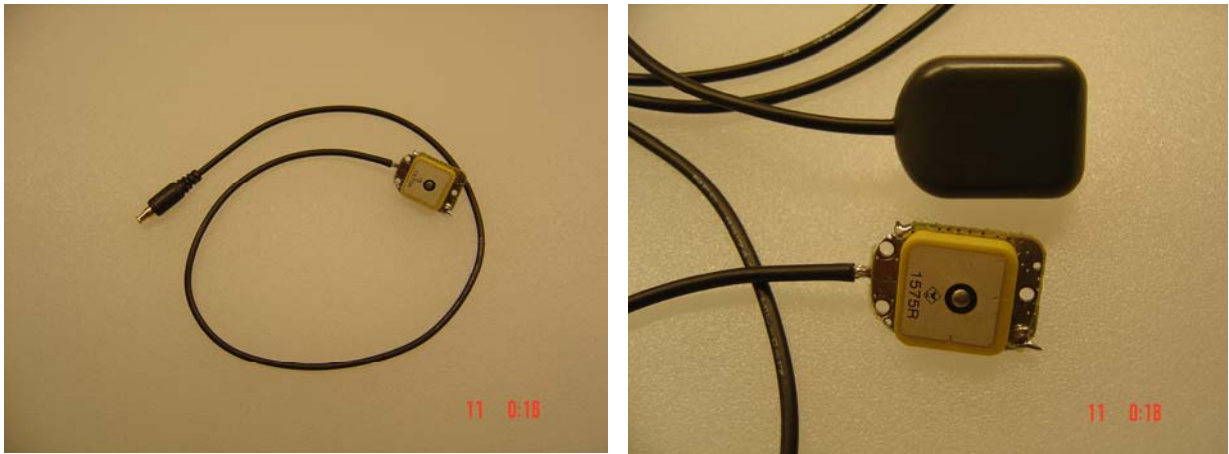


Figure 5 Modified GPS antenna

The steps to modify the GPS antenna are as follows:

- Remove the plastic housing of the GPS antenna
- Remove the 3 screws that secure to the mounting base
- De-solder the electrical contact point from the PCB to the mounting base
- Remove the mounting base. Once remove, we are able to de-solder the coaxial antenna attached to the GPS antenna.
- Cut the excess wire that you do not required and re-solder the co-axial wire back to the antenna (both the signal line and the ground shielding wires)

We modified the length of the wire to 45 cm and its weighs 15 g after the modification. (weight reduction of 15g)