

## tTEM 2x4 frame assembly guide



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## **INTRODUCTION**

This manual will detail the assembly of the tTEM 2x4 system. After completion, please refer to the *2. Field setup and use of the tTEM 2x4 and 3x3 systems* for further information about the field setup, field use, software setup etc.

# 1 FRAME ASSEMBLY

## 1.1 Parts list tTEM frame

- Front Tx platform with runners, tow ropes and bolts
- Rear Tx platform
- Rx platform with runners, Rx-coil brackets and Rx cable assembly
- 4 beams; fiberglass profiles 75x75x1915mm
- 4 wings; fiberglass profiles 75x75x964mm. Wings have cable guides mounted at the ends.
- 2 masts; fiberglass profiles 75x75x1000mm. Front mast with GPS holder as well as Tx-coil attached. Both masts have cable holders.
- 2 beam assemblers; plastic 63x63x450mm with 2 holes and matching bolts
- 12 support struts with black brackets (see picture below); white fiberglass tubes  $\varnothing 30 \times 600 \text{mm}$

### Nuts, bolts and brackets

Note that the countersunk bolts for the front Tx platform are installed with nuts and washers. Loose nuts and bolts are specified below:

Type	Material	Dimensions	Quantity
Bolt	POM (black thermoplastic)	M20x155mm	4
Bolt	POM (black thermoplastic)	M20x125mm	22
Bolt	POM (black thermoplastic)	M20x51mm	2
Bolt	POM (black thermoplastic)	M20x80mm	8
Nut	POM (black thermoplastic)	M20x18mm	28
Washer	Nylon or rubber	M20x3mm	28

## 1.2 Parts list - electronics and miscellaneous

- TiB
- Transmitter (Tx)
- TiB battery
- Samsung tablet and charger
- LiFePO4 battery 12V 100Ah
- 1 power cable
- 2 galv/com cables (between TiB and Tx)
- Rx-coil RC20
- Rx cable assembly (extra)

**Important:** All M20 bolts are to be tightened with a cordless drill with a maximum torque setting of 16 – see Figure 1. This ensures that bolts are not overtightened.



*Figure 1: Torque setting on cordless drill.*

### **1.3 Beam assembly**

The two beams (1915 mm in length) should be assembled first. Each completed beam consists of 2 halfbeams and an assembler with 2 bolts, washers and nuts. See Figure 2, Figure 3 and Figure 4 for instructions on how to assemble the beams.



*Figure 2: Parts needed for assembly of a beam.*



*Figure 3: Insert one end of the beam assembler into the end of the beam and insert the bolt. Tighten.*



*Figure 4: Slide the other beam on the assembler and tighten the last bolt. A finished beam should look like this.*

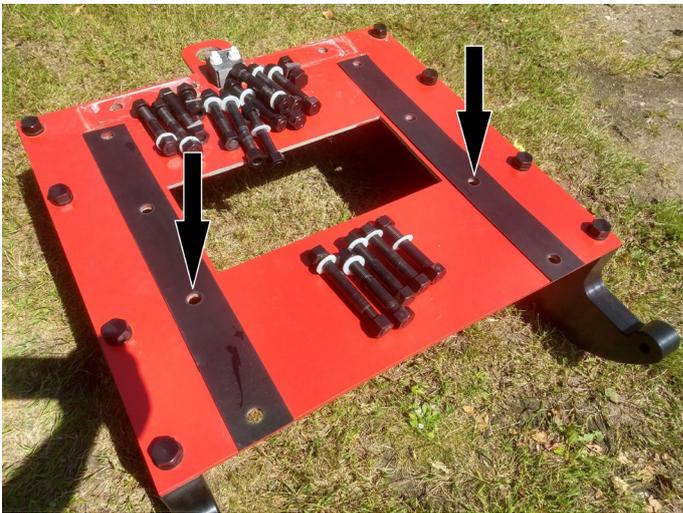
#### **1.4 Mount runners on the rear Tx platform**

The rear Tx platform is the only platform with no runners attached. The runners use M20x80mm POM bolts without washers. Be sure not to overtighten these bolts (see Figure 1). See also Figure 5.

#### **1.5 Attach beams to platforms**

The front Tx platform (with bolts attached and a swivel plate) and the back platform should be placed at a distance of 400 cm measured from the front edge of the front platform to the rear edge of the rear platform. The front platform comes with bolts already installed. The two long bolts should not be tightened with nuts and washers yet.

On the rear platform, use 6 M20x125mm bolts to attach the beams to the platform. Leave the 3<sup>rd</sup> hole from the rear empty for now. For these, M20x151mm bolts should be used. See Figure 5.



*Figure 5: Rear platform. Arrows indicate placement of M20x151mm bolts. The remaining bolts for the beams are M20x125mm.*



*Figure 6: Front and rear platforms with beams attached. Each bolt holding the beams have a nut and washer on top. Notice that the two bolts in the third hole from the front have not been tightened with nuts and washers. The same applies to the two bolts in the third hole from the rear.*

### **1.6 Mount masts**

Masts (75x75x1000mm) should be mounted on the front- and rear Tx platforms. The front mast comes with the Tx coil already attached. Masts are mounted by sliding them over the mast bracket on the platforms and tightening the M20x125mm bolt. The masts should be aligned as seen in Figure 7 and Figure 8.



*Figure 7: Front mast mounted.*



*Figure 8: Rear mast mounted.*

### 1.7 Mount wings

Wings are mounted at the front- and rear platform using one M20x51mm and one M20x125mm bolt per wing. Bolts for the wings have a wedge-shaped washer as seen in Figure 9. Bolts on the front platform are already in place.

Wings are mounted, so the cable guides on the end of the wings can hold the Tx coil – see Figure 10 and Figure 11



*Figure 9: Wing mounted with bolts and wedge-shaped washers.*





Figure 11: Rear platform with wings mounted. Note the cable guides on the end of the wings.

### 1.8 Bolt on the support struts

The white support struts come with black, numbered brackets. The brackets are numbered on top, where the M20 bolts attach. Once assembled, they should look like Figure 12.



Figure 12: Support struts for both front and rear platforms. Numbers in white correspond to the numbers on the brackets.

After assembly of the support struts, they are ready to be bolted on the system.

The rear platform should look as in Figure 13.



Figure 13: Rear platform with supports in place. Numbers in white correspond with the numbers on the brackets.

The front platform should look as seen in Figure 14

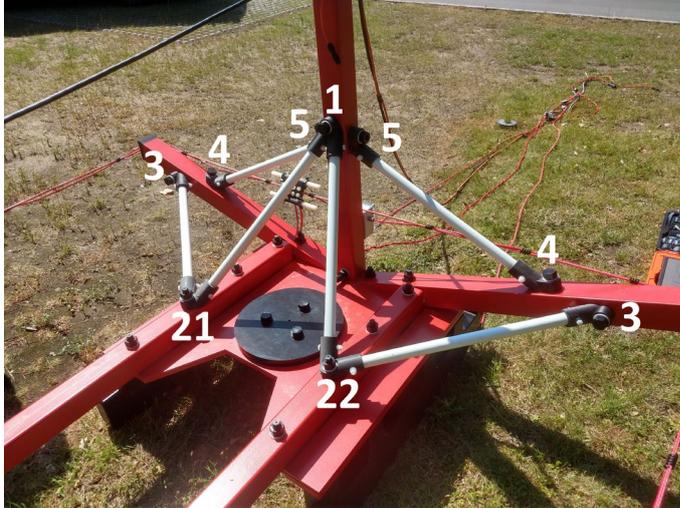


Figure 14: Front platform with supports in place. Numbers in white correspond with the numbers on the brackets.

### **1.9 Attach Tx-coil, rope and cables**

Firstly, uncurl the Tx-coil and put it on the cable guides at the ends of the wings – see

Figure 15. After that, the cable tightener should be tensioned – see Figure 17.

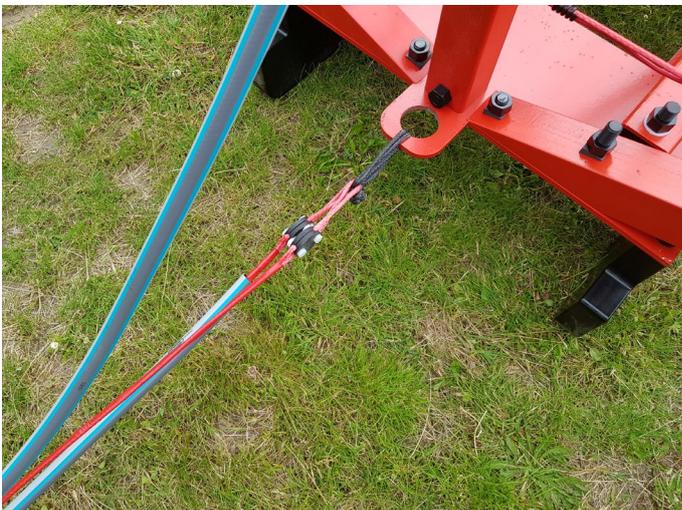


*Figure 15: The frame with the Tx-coil mounted.*



*Figure 16: The cable tensioner. When tightening the wing nuts on the threaded rods, tension will be put on the cable.*

Next up is attaching the Rx platform to the frame, as well as attaching cables. Attach the ropes coming from the Rx platform to the frame as seen in



*Figure 17. Once attached, the Rx leadin cable should be attached to the cable bracket on the mast located on the rear platform. (Figure 19)*

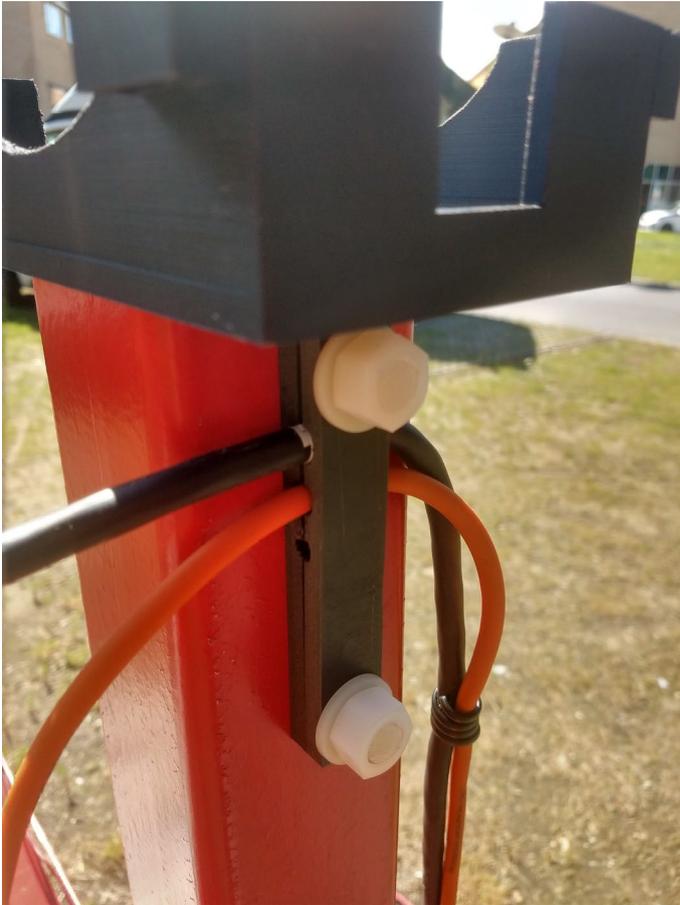
*Figure 17: The ropes from the Rx platform attached to the frame.*



*Figure 18: Cable in the cable bracket on the rear mast.*

When using an external GPS with your tTEM system, read on. If you are using the internal GPS in the Tx unit, skip to Page 15. On the mast on the front platform, mount the GPS in the GPS holder.

Use the strips of velcro to secure the GPS -Figure 20. Attach the Rx leadin cable as well as the GPS cable in the cable bracket on the mast. It should look like Figure 20.



*Figure 19: Rx leadin cable as well as GPS cable mounted in the cable bracket on the front platform.*



*Figure 20: GPS mounted in the GPS holder. Strips of velcro hold the GPS in place.*

The three cables, GPS, Rx leadin as well as the Tx leadin need to be secured to the ATV. The cables are prepared for use with an ATV with the mast on the same vertical axis as the tow hitch. In that case, the cables should be attached as seen in Figure 22.



*Figure 21: The three cables attached to the mast on the ATV.*

### **1.10 Mount the Rx coil on the Rx platform**

The Rx coil is easily mounted on the Rx platform using the three white M12 nylon bolts. Between the platform and the Rx coil, place the three rubber washers and insert the bolts through both platform, rubber washer and Rx coil. On top of the Rx coil, each bolt should have a nylon washer and two nylon nuts. Finally, connect the Rx cable from the Rx coil to the Rx leadin.