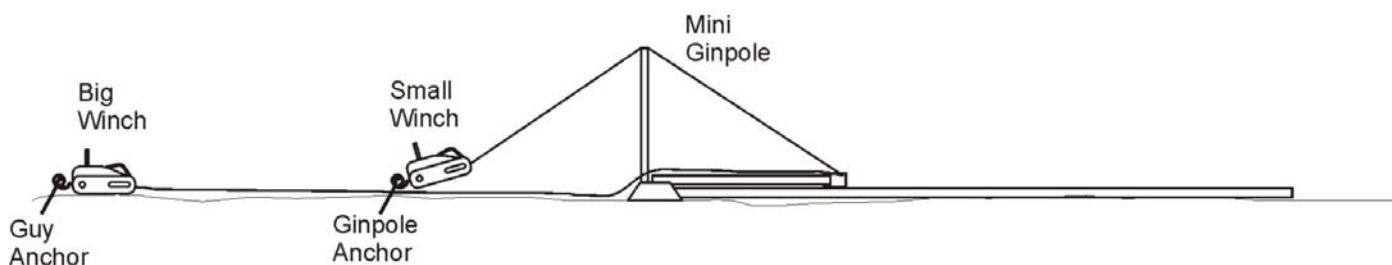


## FAQSHEET6 - HiMast Gripwinch (Tirfor) Lifting Procedure

The 60m and 70m HiMast have an initial winch load at the moment of lifting from the ground that can reach 3000kg, possibly greater if there are several booms and sensors near the top. The largest Tirfor readily available has a capacity of 3200kg and, perhaps more importantly, providing a single ground anchor for the winch with an adequate factor of safety is problematic. The preferred lifting procedure makes use of two winches, the smaller (and much quicker) 1600kg Tirfor being used at the beginning and end of the lift with the big Tirfor being used for the main work. As the Nexgen HiMast is supplied with a Ginpole retention system then the main 3000+kg load can be shared between a lifting anchor at the ginpole radius and the inner main guy anchor point by using a doubling pulley.

### STAGE 1



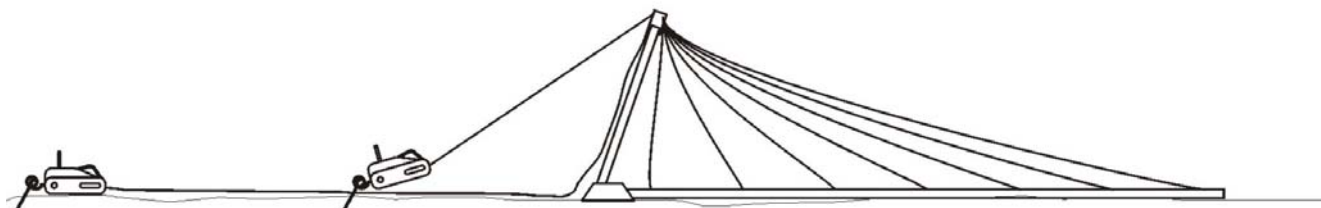
Initially the 1600kg Tirfor is used with the assistance of the mini-ginpole, to raise the main ginpole.

Note in the picture that on this site due to ground conditions the small Tirfor load is shared between two ground anchors and the big Tirfor cable (red hook) is attached to a third.

On the ground is the load cell used to proof load and check the anchors prior to starting the lift.

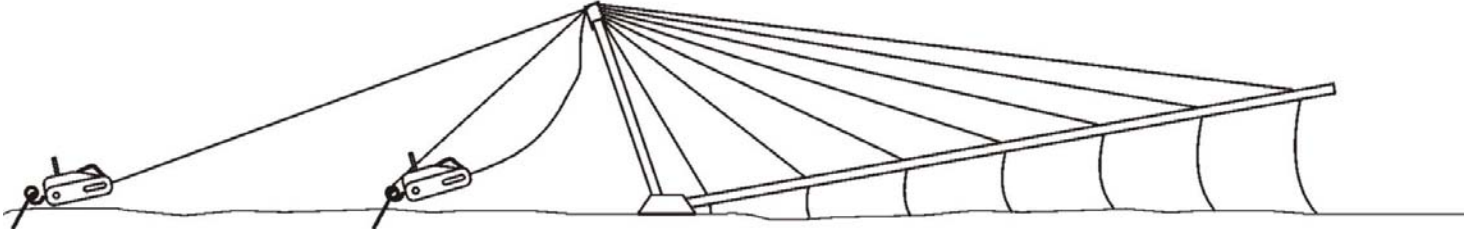
### STAGE 2

Small Winch used to raise ginpole

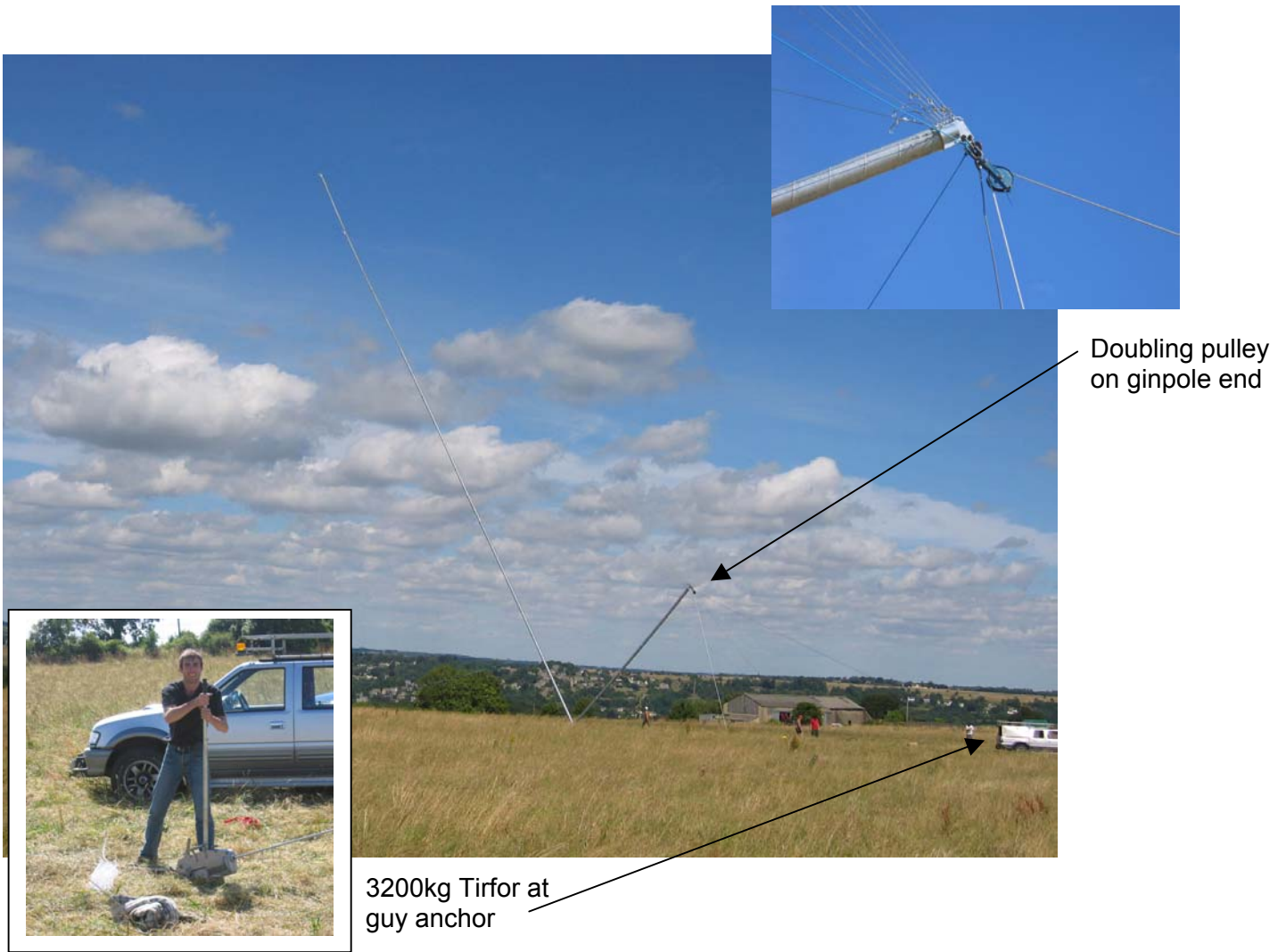


### STAGE 3

Big Winch used to raise mast with doubling pulley



The use of a doubling pulley shares the load between the anchors and makes the lifting process more controllable, the lifting rate is nice and slow.



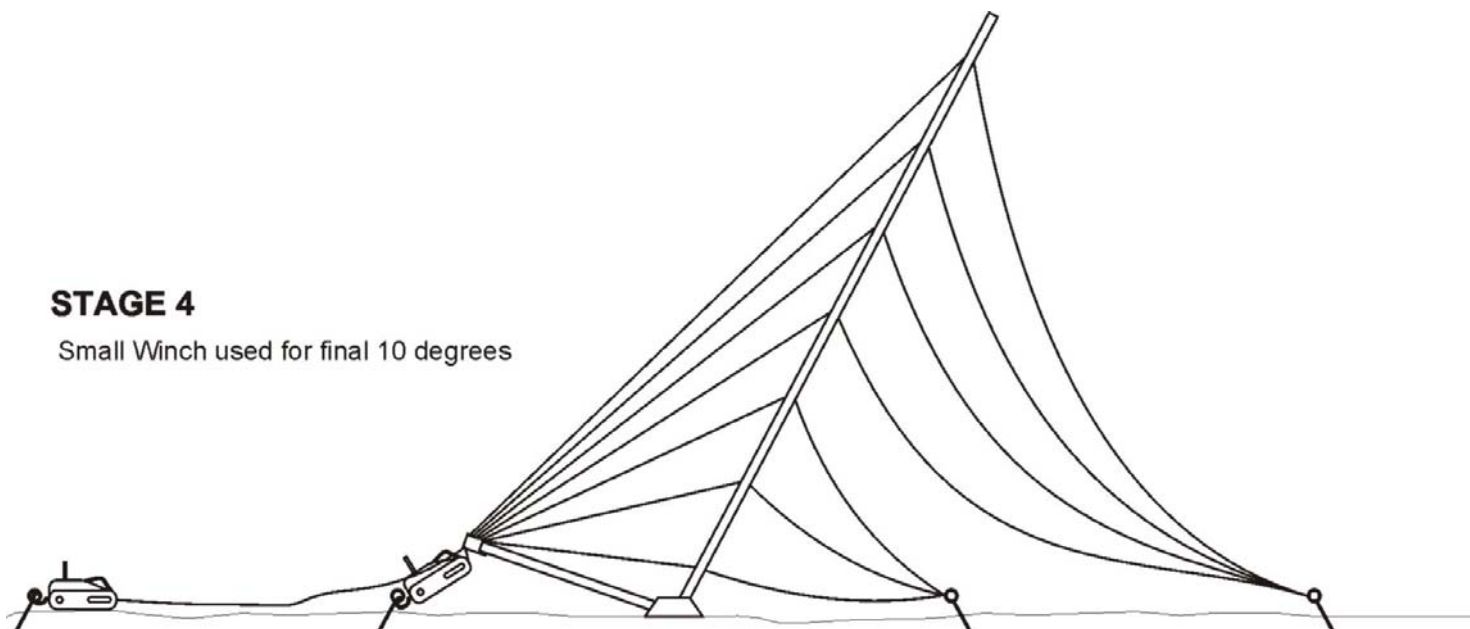


In the final phase the 1600kg Tirfor is used again. By the end of the lift the angle of the big winch is too slight, it is attempting to pull the ginpole apart rather than lift the mast.

The small Tirfor can now easily provide the necessary pull and the lifting process is again more controllable. It is easier to sense the mast balance and the restraining load being applied by the crew on the rear guys

## STAGE 4

Small Winch used for final 10 degrees



## Tirfor Winch Wire Rope Length Requirements

The use of a doubling pulley and utilising a guy anchor for winching carries the penalty of needing a long Tirfor cable.

Assuming a 70m HiMast, using the inner side guy anchor (radius 38m) with a doubling pulley back to the ginpole anchor, the 3200kg Tirfor will need a minimum cable length of 65m. The 1600kg Tirfor used to lift the main ginpole without a doubling pulley and fastened to the ginpole anchor at a radius of 15m will need a wire rope length of 35m minimum.

If the big Tirfor is doubled back to the guy anchor point then the cable needed increases to 85m, being connected to the anchor when the ginpole is up.

If no small Tirfor is used and the big Tirfor has to raise the ginpole and still doubles back to the inner guy anchor then the cable it needs increases to a length of 110m.