

## FAQSHEET4: Winching

Every installation crew develops their own methodology for mast lifting. There is no clear-cut winner for every situation. The objective is the need for smooth control coupled with quick response.

### Winch Types

#### Manual Wire Pullers (Tirfor, Griphoist)

The mainstay of mast erection. Prone to creating a "bounce" in the mast if used too enthusiastically, someone else in the crew needs to be aware of this – the winch operator is not in the best location to judge. Hard work and slow but safe and controllable. URL <http://www.tractel.com>

#### Electric/ Hydraulic Drum Winches

Assessing the balance point is more difficult with a powered winch and the pull can be excessive and unnoticed if something tangles. ALWAYS have a Tirfor connected even if doing the work with a powered winch. If the winch gearbox or motor fails and the mast is halfway up (or down) you need to be able to save the situation. Smooth and easy to use, but control is difficult and things happen quicker as the drum grows, which tends to be at the critical balance point towards the end of the lift. Be careful that the winch specified is capable of lowering the rated load (many are not intended for this duty) otherwise the motor, clutch or brake will burn out. URL <http://www.superwinch.com/home.html>

#### Pulling up with a Vehicle

Using a towing vehicle is possible but fraught with difficulty. It is imperative that the driver has a clear line of communication, he will not hear shouting. Drive out the "route" first, it's sometimes further than you think. We do NOT recommend lowering masts with towing vehicles and ALWAYS have a Tirfor connected, use it for the final stages of the lift. We hear horror stories of tractor drivers pulling the mast over on top of themselves.

### Winch Anchoring

For safest and easiest erection it is necessary that a winching anchor be installed at the ginpole radius, but achieving the maximum winch anchor capacity from a single anchor can be difficult in many ground conditions. It is possible to utilise the inner guy anchor as a winching point, which saves the need for an additional anchor point. However controlling the mast in the very final stages becomes difficult as the winch is trying to stretch the ginpole rather than lift the mast.

The use of a doubling pulley on the ginpole end shares the load between the ginpole radius anchor and the guy anchor and provides an adequate angle of load application. This enables the use of a 1600kg Tirfor on 30m to 50m WindMasts which have a maximum lifting load of 2100kg. The ginpole is retained by a wire retention system, so it can safely be tensioned a limited amount. As the balance point approaches the lifting loads are becoming small, as the ginpole weight is balancing the mast weight. (see also **FAQsheet6**)

Winch Cable Lengths (using doubling pulley) metres with different anchor and winch points

	Ginpole Anchor	Guy Anchor	GP+Guy anchor
30m WindMast	32	66	50
40m WindMast	44	72	58
50m WindMast	56	68	62

Winch Cable Lengths (straight pull) metres with different anchor points

	Ginpole Anchor	Guy Anchor
30m WindMast	16	33
40m WindMast	22	36
50m WindMast	28	34

A 1600kg Tirfor with 70m cable and 3Ton doubling pulley will cater for all possibilities.