

Dayton Hamvention Antenna Forum

17 May 2013

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GETTING THINGS UP

Raising Antennas via
Trolley, Tram, Cranes &
Manlifts

TROLLEYING

Trolley implies a pair of support cables (the track) upon which the trolley may ride

The load may be secured either above or below the trolley

Trolley layout

For best results, the line tensions should be equal and under considerable tension—keeping them straight provides a more “direct route” to tower/mast
(this is all harder than it sounds!)

Trolley designs

Rigid metal frame

Pulleys riding under line (let gravity work with you)

Tram on top of cables (with or without pulleys) slower moving due to induced drag

Advantages/Disadvantages

PROS

Fewer ground crew needed

Antenna can ride above or below cables

Antenna is held in all three planes

Applying tension to one cable while

slacking other side allows antenna to tilt

CONS

More rigging

More stress on the tower

AB5K's upper tower trolley support

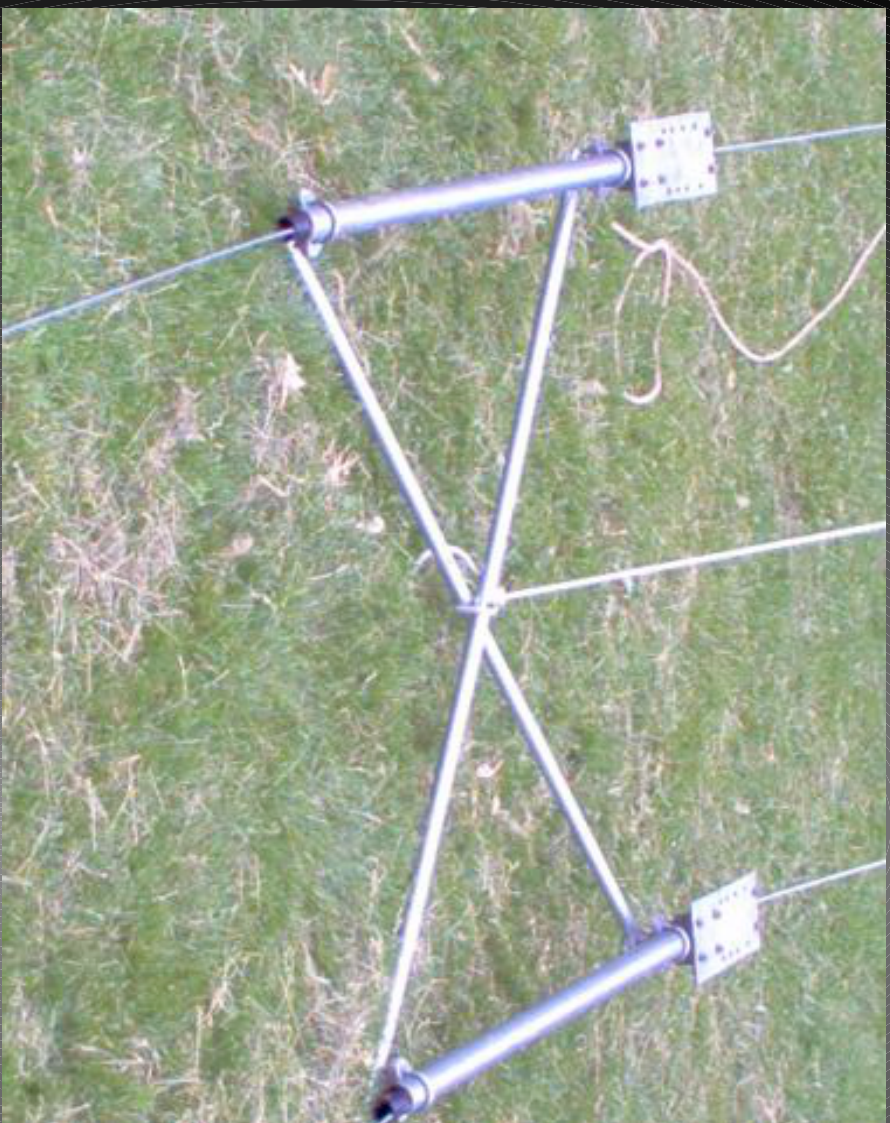




One side
of ABSK's
trolley



AB5K's EF-240 almost in place



W2EF's trolley design



W9XT trolley design

TRAMMING

Only one support line
Load always "under-slung"

Advantages/Disadvantages

PROS

Simple—master the basics & you'll likely never use anything else

CONS

Requires dynamically balanced antenna(s)

Only way to “master the basics” is to *practice*, a definite *Catch-22* situation

What's needed to tram?

Room to tram—45 degree angle ideal

Rope, EHS, aircraft cable for TRAM LINE & backstay

Comealongs to adjust tension of TRAM & backstay (Sag is not necessarily bad; reducing TRAM LINE tension lessens load on tower by a huge margin)

Lifting rope with suitable pulleys (top of tower and at tower base)

Suitable pulley for TRAM LINE



Tramming works very well with
lightweight beams...



*...and the heavyweights too, like this 2L
80M Yagi at 200 feet*



First "secret" to successful tramming
— the "tiller"



Another "secret" to successful rope tranning—the tandem pulley



Even another "secret" to successful
tranning—dynamic balancing of the load,
here is a Hy-Gain 105CA ... weight added



... pipe weight in a 40M 4L OWA

CRANES

Treat crane & access area just like a tower
1st rule: watch for power lines overhead

Consider weight of the crane on driveways or lawns

Ask for a site survey, which will resolve most questions concerning access, safety issues, & general applicability to your job

Advantages/Disadvantages

PROS

Often faster than doing the work the "old fashioned" way...and usually safer

CONS

Items that must be considered - minimum charge (hours), operator occasionally costs extra, highway use tax charges, the hourly rate is almost always portal-to-portal

Access restrictions—size & weight limitations



















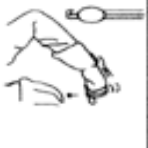






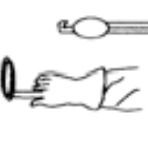
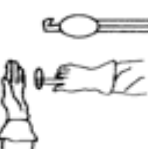





















 Main Hoist	 Auxiliary Hoist	 Hoist Load	 Hoist Load Slowly	 Stop
 Raise Boom	 Raise Boom & Lower Load	 Lower Load	 Lower Load Slowly	 Emergency Stop
 Lower Boom	 Lower Boom & Raise Load	 Swing Boom	 Swing Boom Slowly	 Travel (mobile eqpt)
 Retract Boom 2 hands	 Retract Boom 1 hand	 Extend Boom 2 hands	 Extend Boom 1 hand	 Dog Everything

Universal (world-wide) crane operation hand signals

Simple crane safety rules

Always stay within rated load capacity (usually NOT a problem with ham tower/antenna installations)

Be aware of the load radius

Tailgate meeting before a lift is vital---most crane operators will not be familiar with ham radio terminology

Know the weather—discuss wind precautions before climbing

Climbers always direct the workflow

Aerial Lifts

(commonly called manlifts)

Manlift Facts:

Available in various sizes & configurations

Lesser lifting height & power than a crane,
but user-friendly, & affordable

Much safer than ladders or scaffolding

And more important, they're maneuverable

Wide-spread construction usage means
they're available for rent almost
everywhere today, at reasonable prices



Genie S-40 with straight boom
aerial work platform



Genie 50-ft towable manlift with articulating boom arm



My personal favorite: the all terrain, articulating boom arm





Simple manlift safety RULES

Pay attention to what's overhead

Watch the terrain—never work on sloping ground or wet ground

Always use out-riggers if supplied

Resources



And the best bargain in ham radio:
www.k1ttt.com

Thanks for your attention!

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