

How to be Safe when Installing and Maintaining— Antennas, Towers and Support

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Presented to:
Antenna Forum

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FIRST some Questions

- Where is the First Aid Kit
- Does everyone have a Hard Hat
- Where is the phone to call 911
- What is the Work Plan
- Has Someone Inspected the Anchor Points

Safe Installation & Maintenance Agenda

- Introduction
- Wire Antennas
- Telescoping Masts
- Hazards
- Tools and Tasks
- Safety Equipment
- Fall Protection & Rescue
- Summary: Administering Safety



Introduction

How to live to enjoy your tower

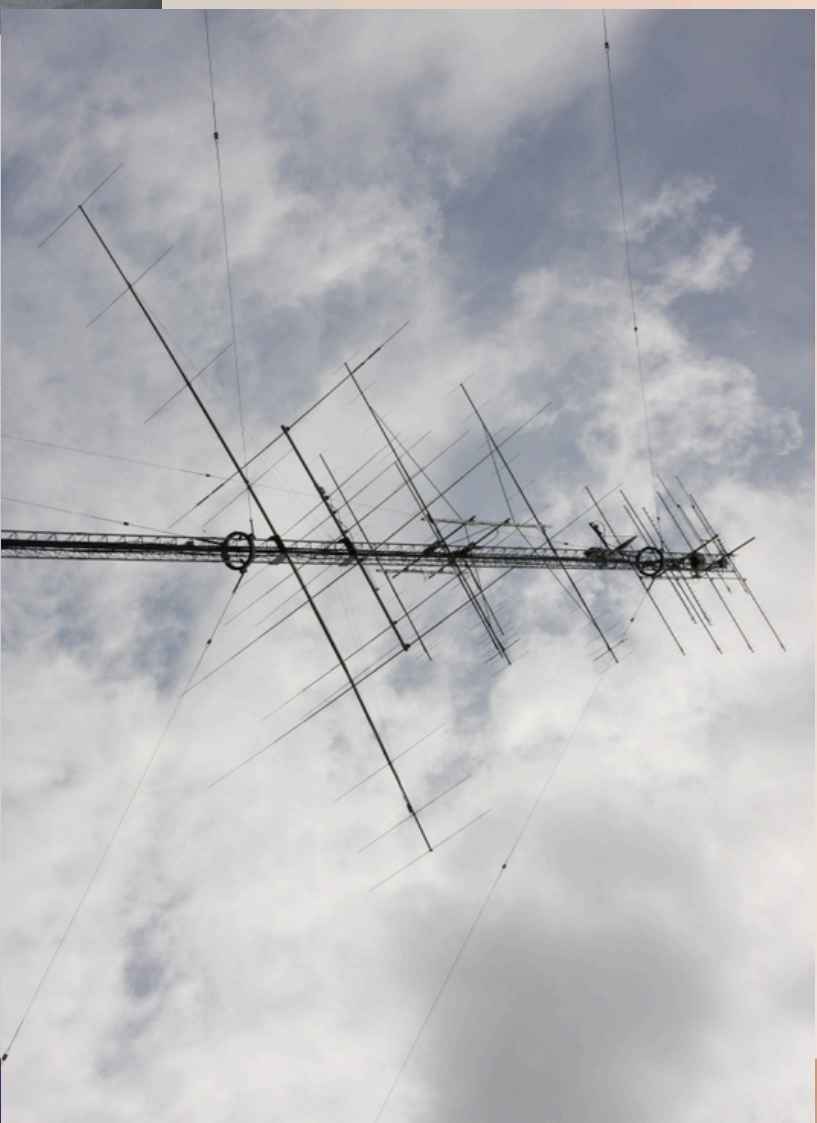
Not Tower Construction

New View of things

Something to Think about

It's all about **SAFETY**

The old is out



Wire Antennas



Wire Antennas

- **Methods**
 - **Bow and Arrow**
 - **Sling Shot**
 - **Potato Shooter (PVC Projectile)**
 - **Tennis Ball Shooter**
 - **Climbing**
 - **Bucket Truck**

Wire Antennas



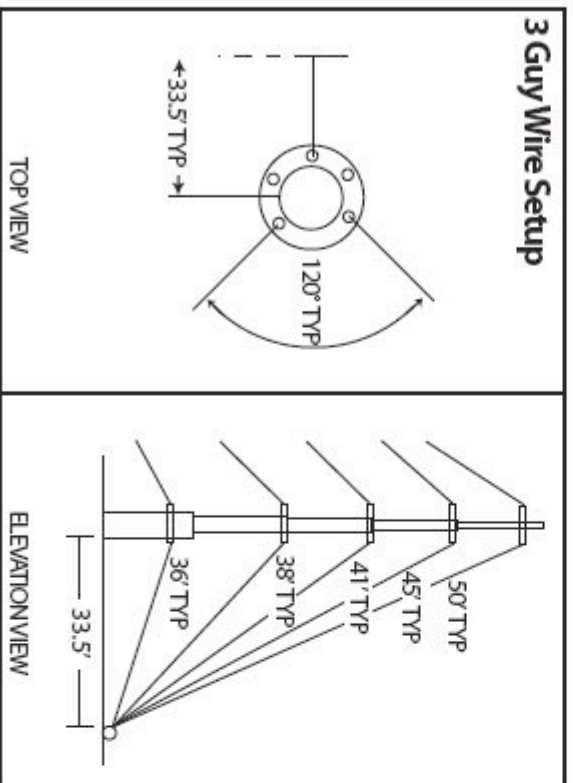
Telescoping Masts



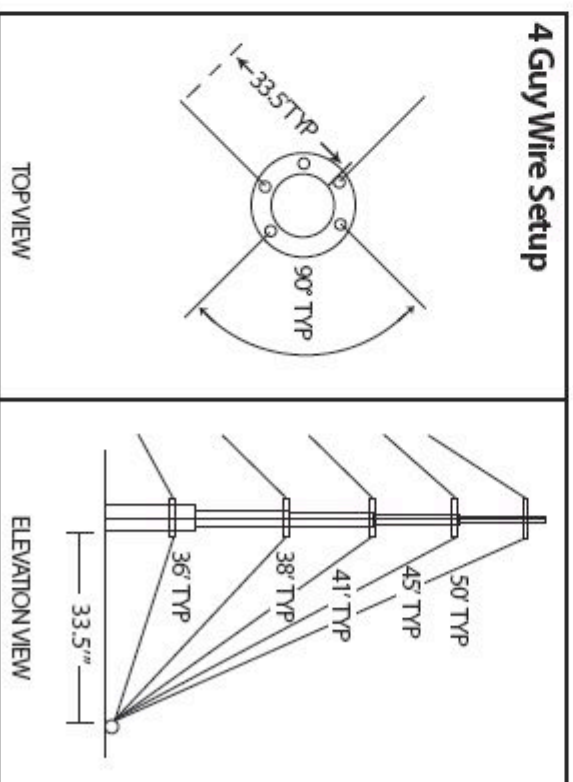
TELESCOPING MASTS

INSTALLATION GUIDELINES

All Telescoping Mast kits include guys, connection hardware, anchors and ground mount.
Mast must be ordered separately.



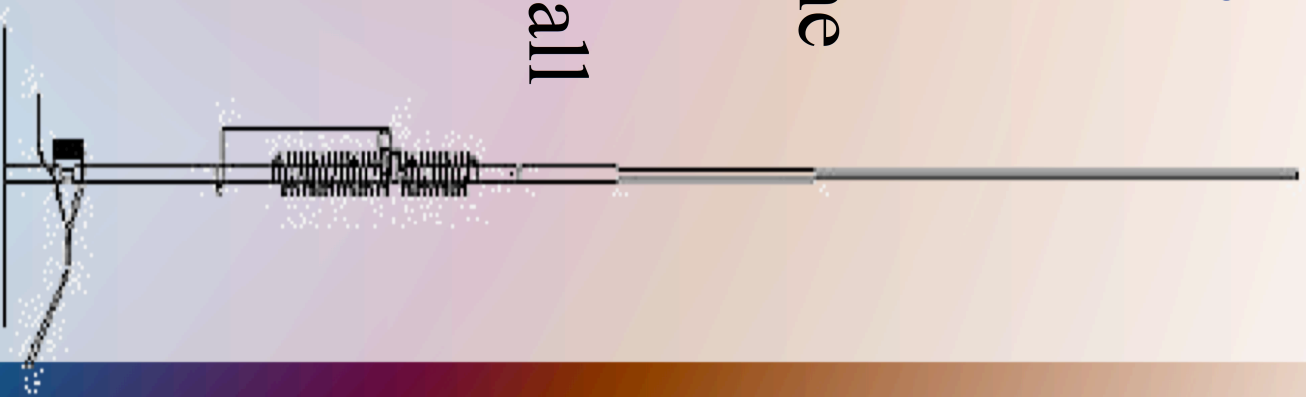
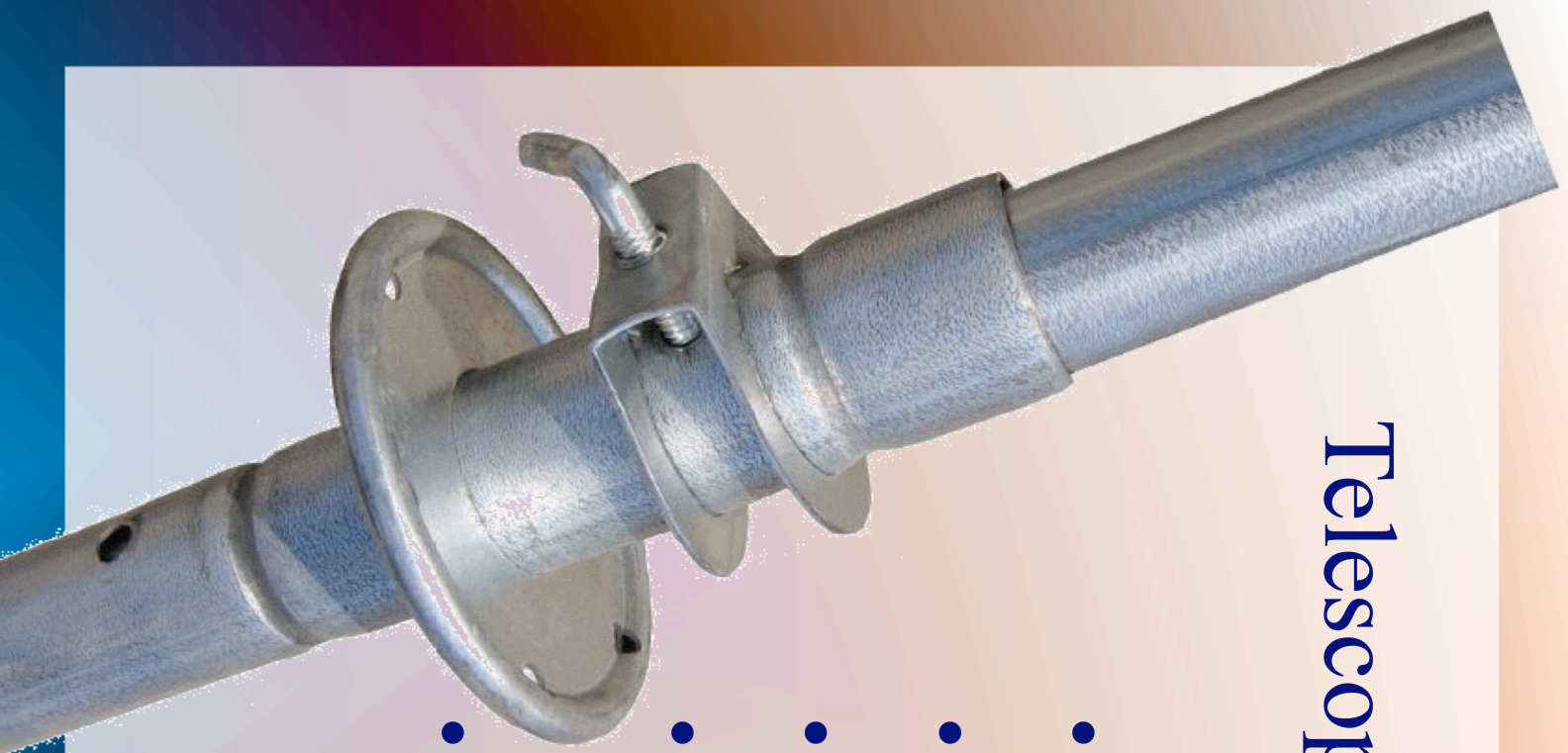
9H503WAYGUY



9H504WAYGUY

Telescoping Masts & Verticals

- Follow Guidelines
- Have Adequate Help + One
- Stay Within the Fall Zone
- Fall Zone is the Height in all directions
- No where near Electric



A Word about Temporary Antennas

- How would you like a “Temporary Injury”
- Safety should not be “Temporary”
- Follow all precautions that you would if it was Permanent
- Enjoy The Antenna

Hazards

“Are there any hazards to this kind of work?”

- Environmental
- Structural
- Tools and Techniques

Hazards: Environmental

- Weather Related Hazards
 - ☒ Wind; Moisture; Lightning; Sun
- Live Hazards
 - ☒ Insects
 - ☒ Birds
 - ☒ Snakes
 - ☒ Rodents
 - ☒ Humans
- Assessment: Find out what will get you and Figure out what to do about it



Hazards: Structural

- Anchors
 - ▣ Shafts
 - ▣ Point of Daylight
 - ▣ Turnbuckles
- Guy Tension
- Tower Coating
- Plumb and Torque



Hazards: Tools and Techniques

- Condition of Personal Protective Equipment
 - ☒ PPE
- Condition of Hand Tools
- Review your Plan for work on the Tower
 - ☒ Take everything you will need
 - ☒ Be sure everyone is aware of the tasks
 - ☒ Mentally review the entire scope of tasks

Tools and Tasks

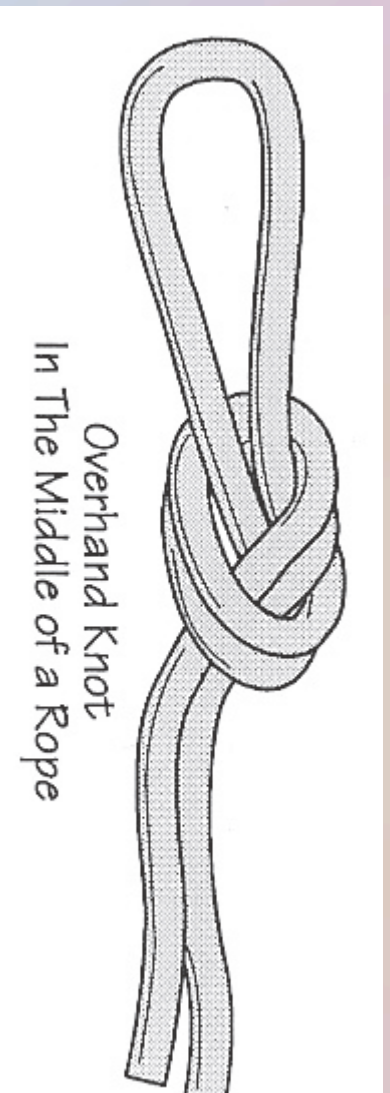
- Rigging
- Gin (Jin) Pole
- Winches
- Hand Tools
- Tool Belts / Bags
- Pre-Climb Inspection
- The Climb
- The Work

Tools & Tasks: Rigging

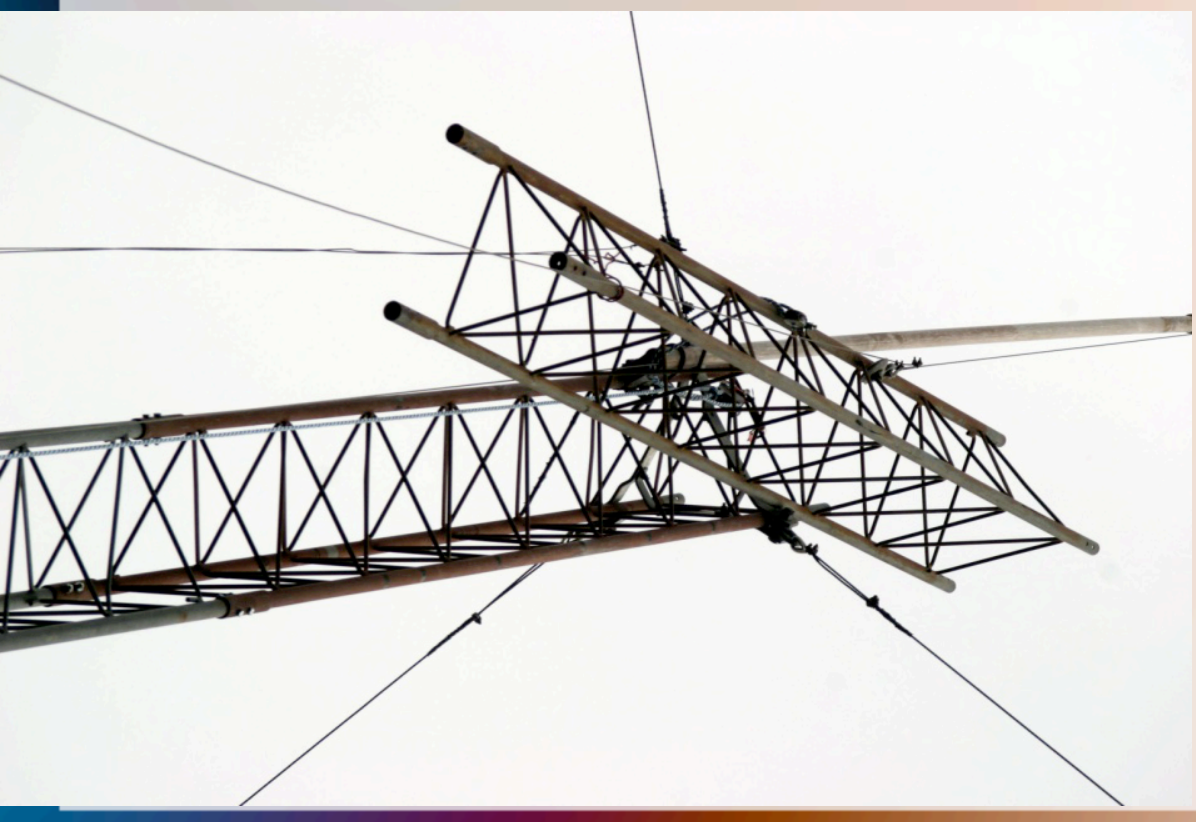
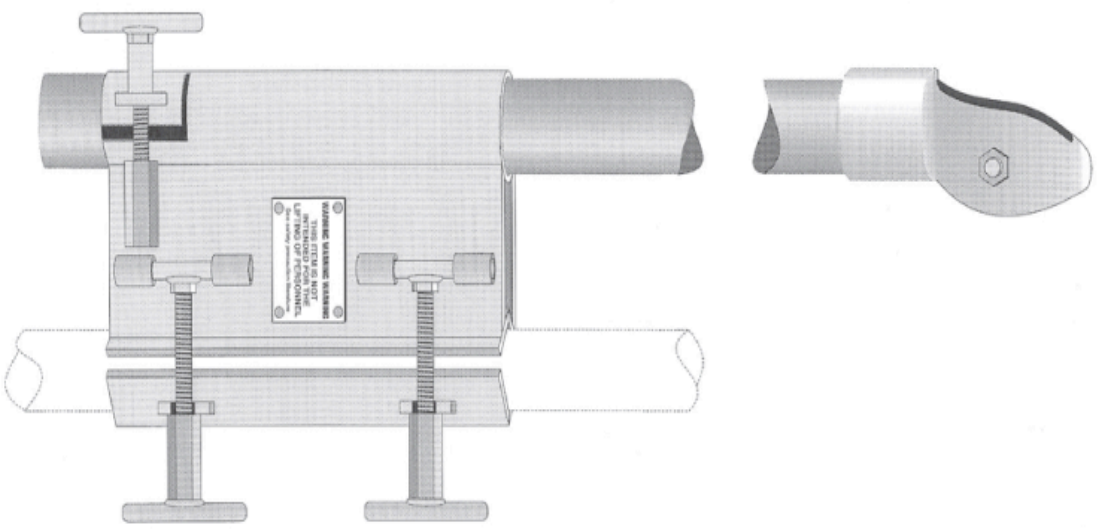
- A block and tackle is an arrangement of rope and pulleys that allows you to trade force for distance

- Rope

- Knots

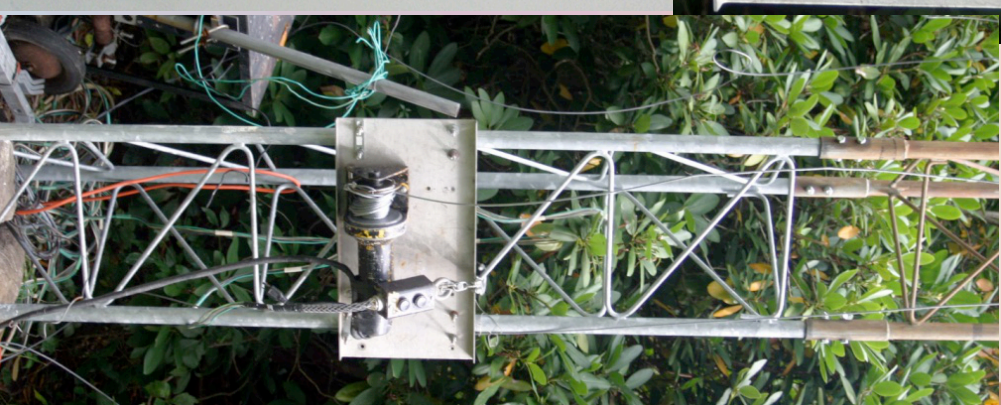
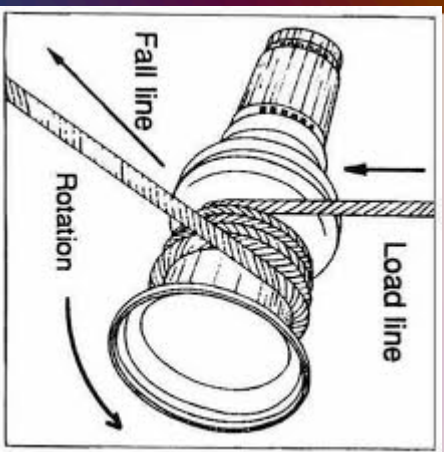


Tools & Tasks: Gin Pole



Tools & Tasks: Winches

- Drum Winch
- Capstan Winch



Tools & Tasks: Hand Tools



- Take Water always
- Snacks for a long tower session

Tools & Tasks: Tool Belts & Bags

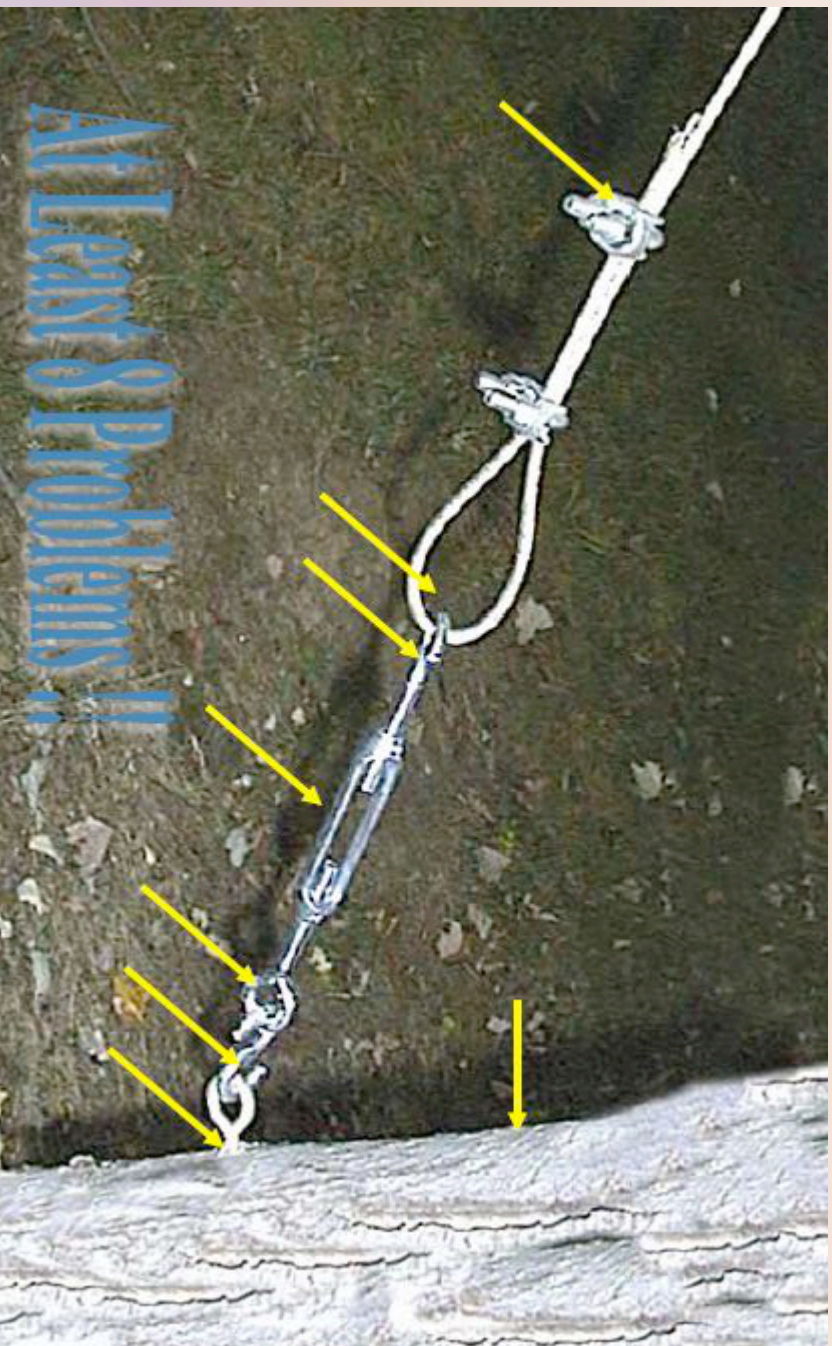


Tools & Tasks: Pre-Climb Inspection

- Why Inspect
- Inspect What?
 - All Hazards
- Guy Anchors
- Tower



This is why we Inspect



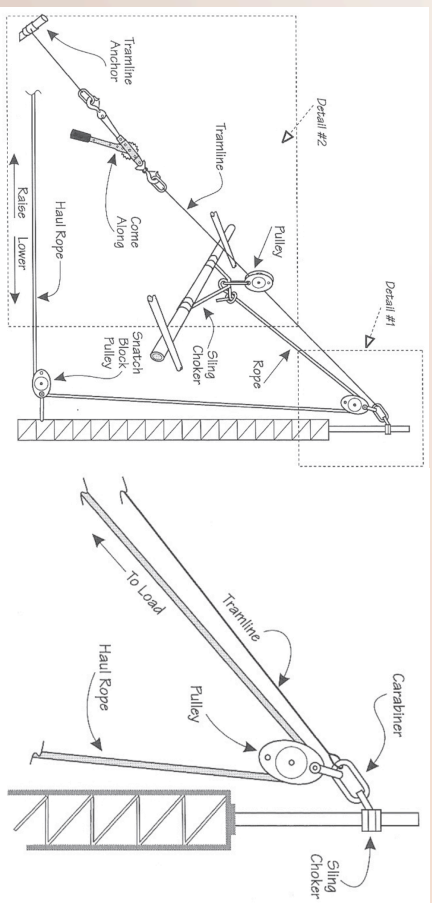
Courtesy W3RJW

Tools & Tasks: The Climb

- Preparation: **Get in shape**
- Stretch First
- Climb with Legs not Arms
- Pause and Rest Frequently
- Breath deep
- Always wear ALL PPE
- Always Connected: **ALWAYS**
- No Exception



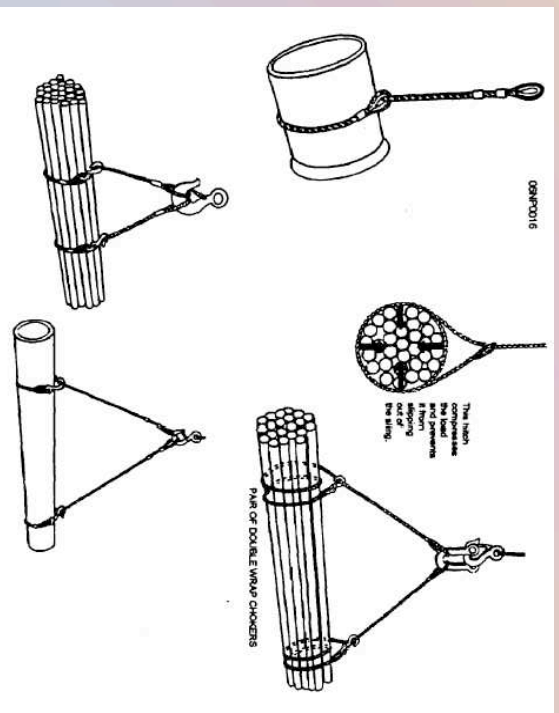
Tools & Tasks: The Work



- Use every possible method to make the work Easier

- Carry Slings for Load Management

- Slings are clips with a loop of Rope



Tools & Tasks: The Work



Safety Equipment

- First Aid Kit
- Head Protection
- Foot Protection
- Hand Protection
- Eye, Ear, Skin Protection
- Equipment
- Clothing
- Communications


Safety Equipment: First Aid Kit



- Priceless when an accident happens
- Required by Fed Reg
- Consider including training on use and CPR

Safety Equipment: PPE: Personal Protection Equipment

- Hard Hat

-  Ground and Tower

-  Within the “Drop Zone”

- One half the height

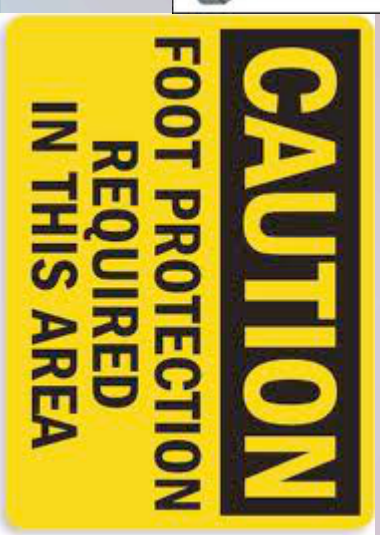
-  Should meet OSHA



- Foot Protection

-  Reinforced Shank

-  Ground Crew in “Drop Zone”



Safety Equipment: PPE: Personal Protection Equipment

- Gloves are a must in all weather

 Protect your Tools


- Safety Goggles





- Ear Plugs

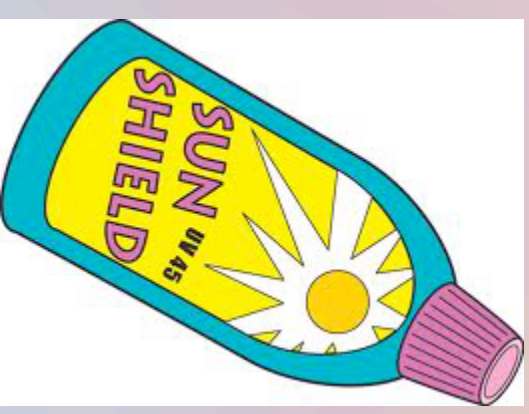


- Skin Protection

 Long Sleeves

 Long Pants

 Sun Screen



Safety Equipment: Equipment

- Power Tools: Ground Fault Protection
- Tethers for hand tools
- Use of Knives
- Secure tools and bolts when climbing
 - Professional Climbers say their goal is to Never drop anything from aloft

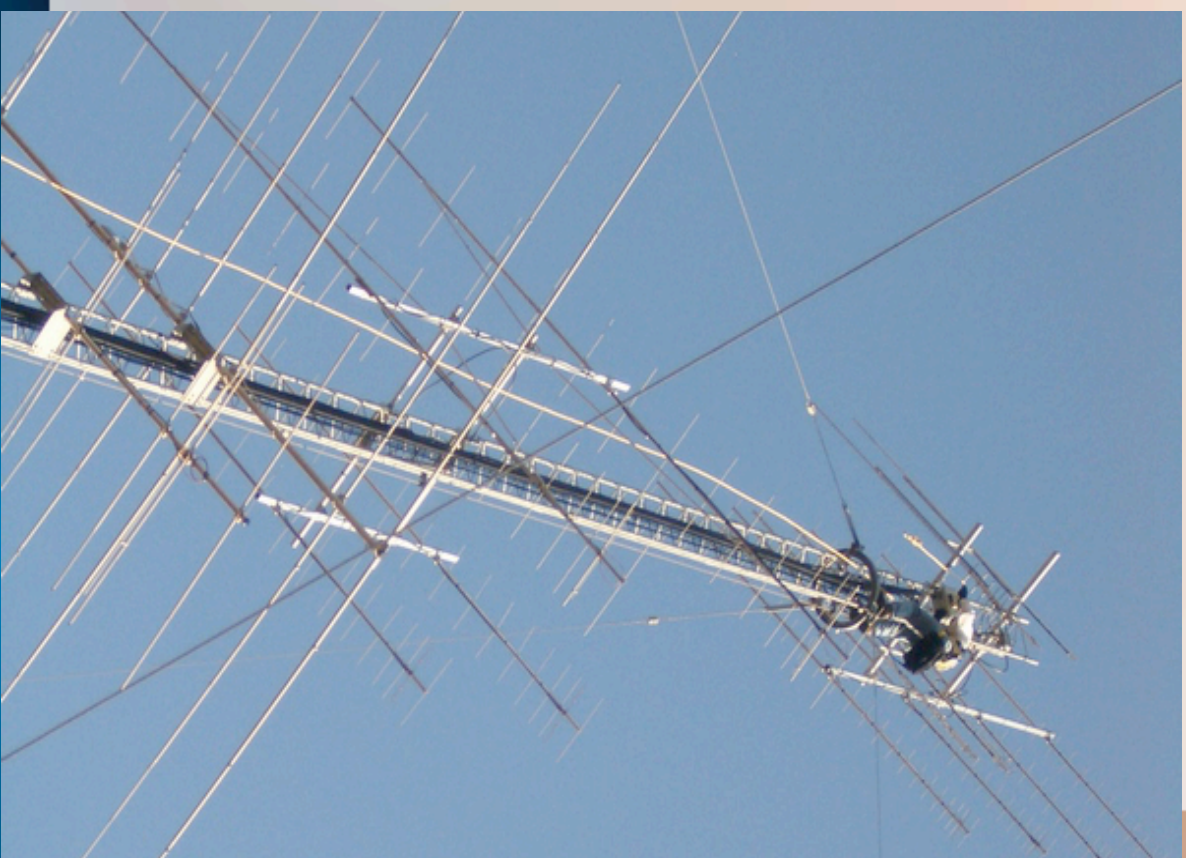
Safety Equipment: Clothing

- Appropriate to the Weather Conditions
- Balaclava
- Cold weather can be desirable



Safety Equipment: Communications

- Radio: HT or FRS
- Hand Signals
- Yelling :-)
 - Explain the difficulty of hearing from aloft to your Ground Crew



Fall Protection

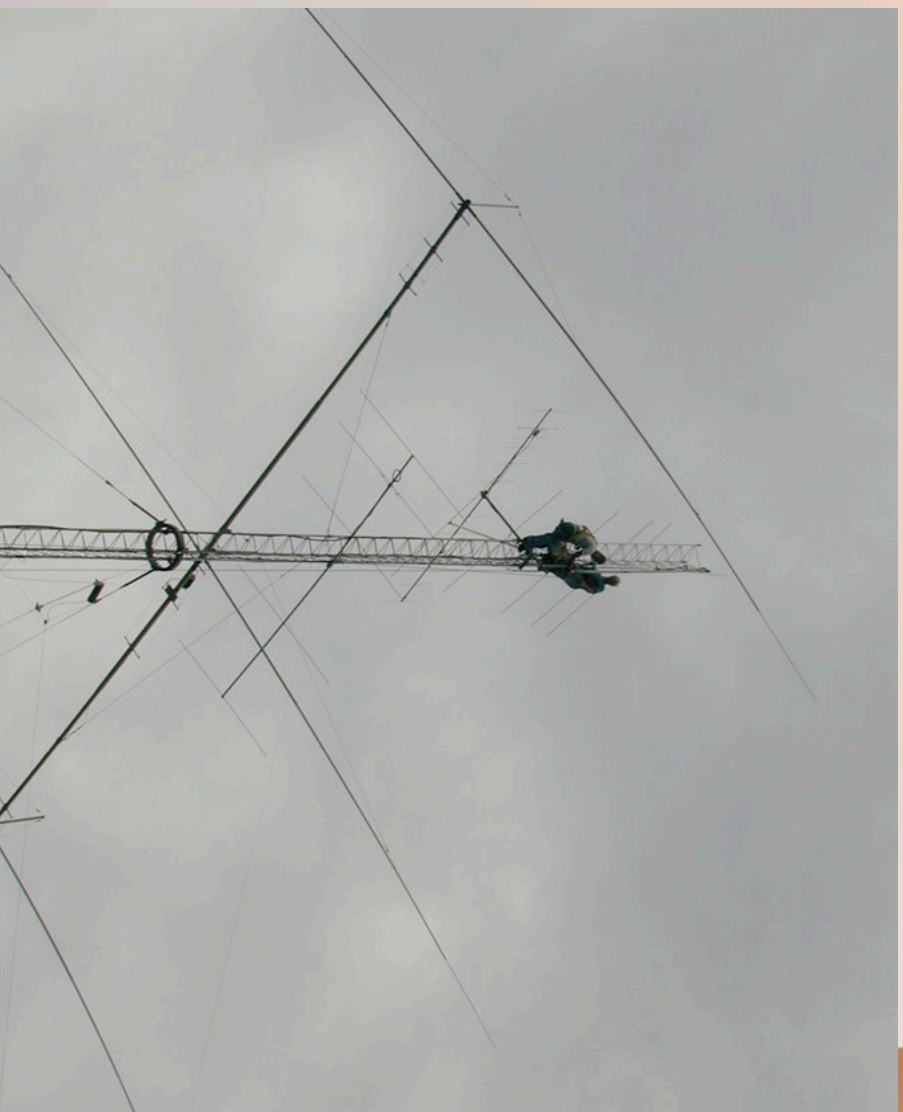
- Fall Restraint: prevents from being able to Fall
- Fall Arrest: controls a Fall that has occurred
- PFAS: Personal Fall Arrest System
 - ☒ Anchor Point
 - ☒ Body Harness (or Body Support)
 - ☒ Connecting Device(s)
 - ☒ Deceleration Device

Fall Protection: **Anchor Point**

- The Tower is the Anchor Point

5000 lbs Breaking Strength

- Lanyards and Hooks
- Safety Cable



Fall Protection: Anchor Point: Tower

Must be connected at **ALL** times



NEW

100% TIE-OFF STRETCH DECELERATOR LANYARD
Includes two (2) elasticized energy absorbing polyester web lanyards without packs.

Popular Models:
D11E1Y6 - # 3155 locking snaphook each end, 6 ft. length
D11E1YZ6 - # 3155 snaphook one end, # 3100 other two (2) ends, 6 ft. length

D11E1Y SERIES

AVAILABLE CONNECTORS

To order a connector other than a # 3155 snaphook on the anchorage end of a lanyard, put the ordering code (letter at bottom of each connector shown below) of the desired connector at the end of the lan-

yard's base Model #, i.e. D11E1L6 with # 3100 snaphook becomes D11E1LZ6. See page 20 for more detailed information on these connectors. Base Model # = Model # up to and including "L" on single leg lanyards, up to and including "Y" on 100% tie-off models.



Two Step Automatic Locking



Fall Protection: **Anchor Point: Lanyards**



- Use **TWO** Lanyards to stay connected at all times
- You will develop a rhythm as you go up and down the tower

Fall Protection: **Anchor Point: Lanyards**

- Positioning Lanyards are NOT Anchor Points
- Use Anchor Point when performing work
- Set Anchor Point high while working
- Helpful to use rear D ring for the working AP

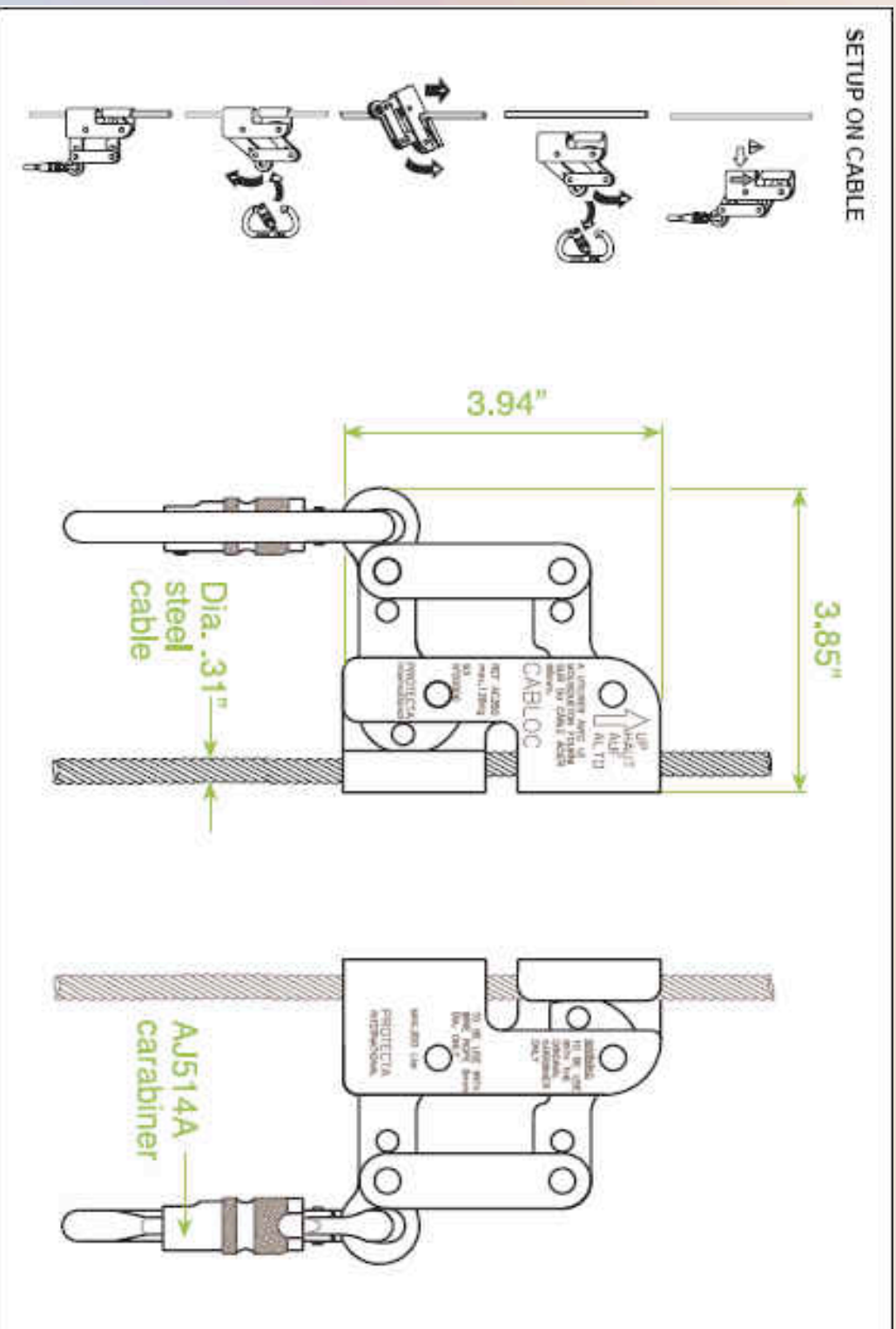
Fall Protection:

Anchor Point: Safety Cable System

- Always connected
- Tower Standard 2006



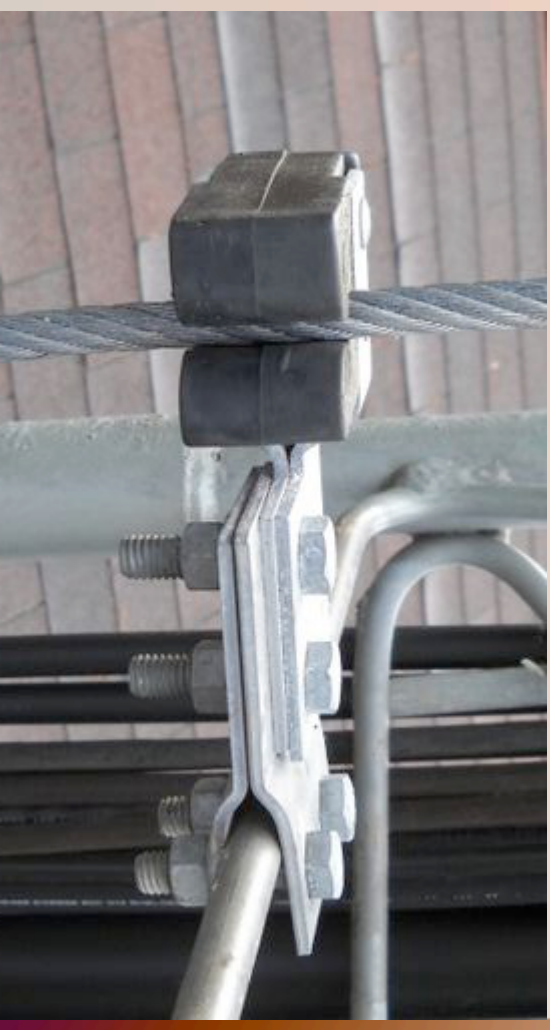
The Magic is in the Slider



Fall Protection: Anchor Point: Safety Cable System



Secure at top and Adjustable at bottom



Two part numbers required:
R-TT115303
R-TT115323
Catalog Sales Rohn Products LLC

Fall Protection

Anchor Point: Temporary Safety Rope

- When repeated climbs are anticipated
- Tie a Safety Rope to Top
- Dedicate a “Man Rope”
- Use Rope Grab as Fall Arrest



Fall Protection: **B**ody **H**arness

6 D rings is best

- 1 Front
- 1 Back
- 2 Side
- 2 Seat



Fall Protection: Connecting Devices

- At least Two Connecting Points
- 2 Step Safety Lock
 - Keepers and Automatic Locks



100% TIE-OFF STRETCH DECELERATOR LANYARD
Includes two (2) elasticized energy absorbing polyester web lanyards without packs.

Popular Models:
D11ELY6 – # 3155 locking snaphook each end, 6 ft. length
D11ELYZ6 – # 3155 snaphook one end, # 3100 other two (2) ends, 6 ft. length

D11ELY SERIES

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3155



3100



3129

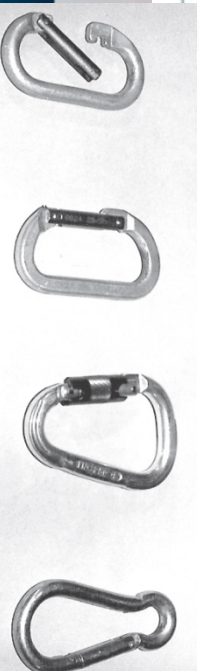


3131



3154

Load ONLY



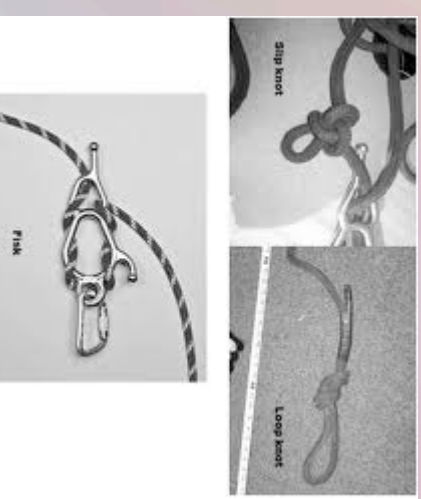
Fall Protection: **D**eceleration Device



- No Free Fall greater than 6 feet
- Not needed with Safety Cable System

Rescue

- Man Riding
- Controlled Descent
- Lines (Ropes)
 - ❑ Suspension and Safety
 - ❑ Load
- Use Rope Grab



Rescue: Man Riding



Administering Safety

- Safety Meeting
 - ▣ Doesn't need to take long
- Pre Climb Inspection
 - ▣ Guy Anchors (often overlooked)
 - ▣ Whole System
- Post Climb Recap
 - ▣ What can you improve for your next climb?
- Insist on safe climbing even if you hire someone else to do it.



Tower Climbing Safety & Rescue

By ComTrain

- Thank you

Phil Theis K3TUF

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Text books for this certification are being sold by
ARRL at the booth here in Dayton



- Safety Belts by onvsafetybelt.com (W2JUQ)
 - Ask for “Quick Connects”