



## MODEL AM2 OPERATOR'S MANUAL



The Will-Burt Company  
401 Collins Blvd  
Orrville, OH 44667, U.S.A.

Phone: +1 330 684 4000  
E-Mail: [info@willburt.com](mailto:info@willburt.com)  
Website: [www.willburt.com](http://www.willburt.com)

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Authorized Representative:  
Will-Burt Germany GmbH & Co. KG  
Fischergasse 25  
D-91344 Waischenfeld, Germany



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## Document History

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# Section 1 Safety Summary

This section describes safety instructions for the AntennaMast™ Model AM2 that personnel must understand and apply throughout all product activities such as transportation, handling, installation, deployment, disassembly, maintenance, storage, disposal and troubleshooting. Read and understand this entire document, and contact The Will-Burt Company with any questions, before performing any procedure outlined in this document. Keep this document during the entire duration of use of the device. Pass this document along to trained and qualified end users.

## 1.1 Signal Word Definitions

The following signal words and definitions are used to indicate hazardous situations:

### DANGER

**DANGER** indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.

### WARNING

**WARNING** indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.

### CAUTION

**CAUTION** indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It is also used to alert against unsafe practices.

## 1.2 Safety Instructions

### DANGER

**Electrocution Hazard!** Contact with high voltage will result in death or serious injury. Observe general safety precautions for handling equipment using high voltage. Do not locate or operate mast near electrical lines, cables or other unwanted sources of electricity. Allow sufficient clearance on all sides of mast to allow for side sway. Do not operate mast during an electrical storm. Be certain electrical cables are undamaged and properly terminated. Do not touch live wires. Follow OSHA or other national safety regulations when working near energized power lines. Personnel working with or near high voltages should be familiar with methods of resuscitation.

### DANGER

**Disconnect Power for Service!** Always disconnect all power sources following proper lock-out tag-out procedures before performing service, repair or test operations. Remove the tethered hand held control where applicable for added protection during maintenance.



**⚠ DANGER**

**Mast Tip Over Hazard!** Mast tip over could result in death or serious injury. Before operation, be certain mounting structure is capable of resisting forces generated from all loading and environmental conditions, including, but not limited to, mast size and weight, payload and cable size and weight, payload sail area, wind speed, guy line arrangement, support bracket or roof line location, and base plate assembly. Do not operate in wind speed conditions exceeding the maximum rated wind speed. Do not operate on slopes exceeding the maximum deployment angle. Do not install a payload that exceeds the maximum payload lifting capacity of mast. Do not install a payload with the center of gravity offset from mast centerline exceeding the maximum allowed offset. Stand clear of mast and mast payload during operation. Be certain mast is level and secure before and during installation, operation, and maintenance.

**⚠ DANGER**

**Falling Objects from Mast Hazard!** Wear a protective hard hat when working on mast or situated near mast operating area while mast is extending, retracting or deployed in any position above the nested position. Improperly secured payload or mast components, ice formations, etc. could be dislodged from mast and fall. Be sure the payload is properly installed and secured.

**⚠ DANGER**

**Relocation/Driving Hazard!** Do not relocate the system during operation or while mast is extended to any height above the nested position or powered up. Do not move vehicle until mast has been securely nested and isolated from power. Power-up and operate mast only if the vehicle is stationary and securely parked with the parking brake properly applied. Do not put mast in service or operate without the vehicle interlock warning circuit or magnetic warning kit installed to provide confirmation mast is nested prior to moving the vehicle. Contact The Will-Burt Company Engineering for special on-the-move situations for military only use on specialized products.

**⚠ DANGER**

**Burst Hazard!** For pneumatically operated masts, do not operate without the over-pressure safety valve installed. Keep personnel clear of safety valve exhaust direction. Do not exceed the maximum rated pressure of mast. If the mast air pressure is not fully discharged prior to removing air hoses, a rapid release of air pressure will occur requiring hearing and eye protection.

**⚠ WARNING**

**Payload Lifting Hazard - Intended Use!** The mast is intended to lift a specific payload for lighting, surveillance or communication use only. Any other use without written consent is prohibited and could cause death or serious injury. Do not use mast to lift personnel. Do not exceed specified payload capacity. Large payload wind sail areas can reduce payload capacity. Consult The Will-Burt Company engineering.

**⚠ WARNING**

**Read Operating Instructions!** Read and observe the operating instructions. Non-observance of the instructions, operation which is not in accordance with use as prescribed in the instructions, wrong installation or incorrect handling can seriously affect the safety of operators and machinery. Adhere to the safety instructions when carrying out any activity relating to the Pneumatic Mast.

**⚠ WARNING**

**Trained Personnel Only!** This product is intended for use by trained professionals only. It is not intended for general use by the public or untrained personnel. Handling, installation, operation and maintenance to be performed by trained and authorized personnel only. Only a properly trained and qualified certified electrician should perform electric installations and service.

**⚠ WARNING**

**Erratic Mast Operation Impact Hazard!** The mast should operate smoothly during extension and retraction. If erratic mast motion is observed during extension or retraction that results in impact loading between the tube and the tube collar (mechanical travel stop), cease use of the mast and contact The Will-Burt Company service department. Repeated operation with impact loading can damage tubes and lead to mast separation.

**⚠ WARNING**

**Over-current Protection!** Over-current protection or power switching by the installer on mast incoming power supply as specified in this document should be a type suitable to allow lock-out tag-out procedures for power disconnect.

**⚠ WARNING**

**Safety Instruction - Explosion!** For outdoor use only. Do not use in explosive areas or areas that have been classified as hazardous as defined in Article 500 of the National Electric Code or equivalent national standards. Do not use in the presence of flammable gases or liquids such as paint, gasoline or solvents. Do not use in areas of limited ventilation or where high ambient temperatures are present.

**⚠ WARNING**

**Safety Equipment (PPE)!** Proper personal protective equipment (PPE) like hard hats, gloves, and safety shoes shall be properly worn while working on mast or near the deployment area of mast. In addition, eye protection shall be worn during maintenance procedures. Follow national PPE guidelines in your area of operation.

**⚠ WARNING**

**Pinch Point Hazard!** Keep clear of all moving parts like mast collars nesting. Be sure to stay clear of system during operation. Moving parts can crush and cut resulting in serious injury. The mast shall be mounted out of reach of the operator during operation.

**⚠ WARNING**

**Crush Hazard - Mast Failure!** Do not stand directly beneath mast or its payload. Be certain the payload is properly installed and secured.

**⚠ WARNING**

**Entanglement Hazard!** Tangled cables can cause equipment damage. Ensure payload cables, Nycoil®, trip lines, guy lines or other cables are not tangled and are free to pay out as mast is deployed. Cables that get tangled or snagged on mast or other objects can cause mast tubes to lurch upward suddenly when the cable is freed. This can cause damage to mast and lead to mast separation if repeatedly allowed to continue.

**⚠ WARNING**

**Health and Safety Hazard while Cleaning!** Solvent used to clean parts is potentially dangerous. Avoid inhalation of fumes and prolonged contact to skin.

**⚠ WARNING**

**Fire Hazard Solvent!** Cleaning solvent, used for maintenance, is flammable and can be explosive. Do not smoke near solvent. Use cleaning solvent in a well-ventilated area. Keep cleaning solvent away from ignition sources. Always store cleaning solvent in the proper marked container and in a proper location.

**⚠ WARNING**

**Bright Light Radiation Hazard!** For systems equipped with scene lighting or look-up lights, do not look directly into lights when they are illuminated. Temporary impairment or permanent vision damage could occur.

**⚠ WARNING**

**Personnel Freezing/Burn Hazard!** If the system is equipped with lights, make sure the lights are completely cool before attempting to clean the lens, replace bulbs or perform maintenance. Wear gloves to protect from contact with exposed metal that may be at extremes of hot and cold temperatures from sun or cold outdoor exposure.

**⚠ WARNING**

**Mast Extension Hazard - Obstruction!** Extending mast into obstructions could result in death or serious injury and could render mast inoperable and partially extended. Before applying power and operating mast, be certain there is sufficient clearance above and to all sides of the expected location of the fully extended mast and payload. Keep all persons clear of mast and mast extension. Do not lean directly over mast. Locate the operator station such that the operator has a clear view of the operating space of mast and payload prior to deployment to avoid contact with overhead objects.

**⚠ WARNING**

**Manual Retraction!** For powered masts, make sure all power sources have been disconnected from the system prior to manually lowering mast to avoid unexpected start-up motion and/or damage to mast.

**⚠ WARNING**

**Mast Lifting/Handling!** Use extreme caution while lifting mast System and when mast System is suspended to avoid injury and equipment damage. Be certain mast is properly secured using at least two sling points at the center of gravity label. All operators should be aware of and follow the applicable local, regional, and national standards and codes of practice for slinging and transporting equipment. Never lift Mast System over people. Ensure lifting equipment including, but not limited to, lifting straps and hoist, are capable of handling the forces generated from lifting the system. Observe manufacturer instructions on lifting equipment.

**⚠ WARNING**

**Remove Payload!** For mast systems shipped with no payload (customer installed payloads), remove payload before performing maintenance on mast system. The Will-Burt Company installed devices can remain installed.

**⚠ WARNING**

**Equipment Damage - Submerged!** Do not submerge mast in liquid or operate the vehicle in a fording situation that would result in a submerged mast.

**⚠ WARNING**

**Safety Instruction – Keep Clear!** Keep personnel clear of the system during operation.

**⚠ WARNING**

**Safety Instruction - Potential Air Contaminants!** If internally mounted in a vehicle, air from mast and any accumulated water will discharge into the vehicle. Install appropriate drainage and venting.

**⚠ WARNING**

**Fastener Vibration Hazard!** Mast system and payload mounting hardware must include proper means to resist vibration loosening such as thread-locking compound, locking hardware, or equivalent. Use specified assembly torques appropriate for the fastener size.

**⚠ CAUTION**

**Safety Instruction - Guy Anchors!** For masts using Guy Lines, verify the Guy Anchor point strength is adequate to support the Guy Line forces.

**⚠ CAUTION**

**Frozen Water Hazard!** Water freezing inside mast or air fittings may render mast inoperable and cause major equipment damage such as tube deformation. Ensure water is free to exit at the base of mast. Open drain cock when mast is not in operation. The drain cock shall be installed at the lowest position in the pneumatic system. If mounted internally in a vehicle or structure, direct the draining water to a suitable location. Cover locking masts when not in use to limit water ingress. Non-locking masts stored outdoors should be covered if possible. A cover is available from The Will-Burt Company.

**⚠ CAUTION**

**Lubrication!** Do not lubricate the exterior of mast moving tubes. The lubricant will attract dust and other environmental contaminants into mast.

**⚠ CAUTION**

**Equipment Damage - Forces!** Before unloading the system, be certain the unloading region is capable of resisting forces generated from unloading the system including but not limited to system weight. Ensure the unloading region is level and has sufficient room and strength to hold the system. If the unloading region is incapable of meeting the requirements of the system, damage to the system and/or unloading region could occur.

**⚠ CAUTION**

**Equipment Damage - Support Bracket!** For masts using an upper support bracket, do not over-tighten mast support bracket. Over-tightening may damage the Base Tube causing mast tubes to stick.

**⚠ CAUTION**

**Mast and Payload Access!** The operator must provide safe means to access mast and payload during installation, removal and maintenance.

**⚠ CAUTION**

**Tripping Hazard!** Cables, trip lines, guy lines and guy anchors can be hard to see during and after installation. Any equipment posing trip hazards should be clearly marked.

**⚠ CAUTION**

**Lifting Hazard!** Manually lifting over 55 lb. (25 kg) is prohibited. In the UK, all lifting equipment must be thoroughly examined annually by a competent person according to the Lifting Operations and Lift Equipment Regulations 1998. Equivalent regulations exist in other EU states.

**⚠ WARNING**

**Mast Extension Hazard - Obstruction!** Do not deploy the mast if power lines are less than 80 ft. (24.4 m) from the center of the deployment site.

**⚠ WARNING**

**Mast Tip Over Hazard!** Do not attempt to deploy or retrieve this mast when winds exceed 32 km/h / 20 mph.

**⚠ WARNING**

**Mast Deployment Hazard!** Do not attempt to deploy the tripod on ground that slopes more than 5 degrees. Do not attempt to deploy the mast on soft or loose soil. The base plate and guy stakes could become unstable under wind loading and cause the mast to fall. The mast must be vertical before deployment. Adjust guy lines as required until the bubble level indicates the mast is vertical.

**⚠ CAUTION**

**Safety Instruction - Guy Lines!** Use ground stakes to secure tripod and mast. Be mindful of buried cables when staking the mast. Always follow guy stake removal instructions to avoid injury and/or guy stake damage.

The following list contains reasonably foreseeable misuses of the mast system according to EN ISO 12100 5.3.2. These uses shall be avoided:

- Operating the mast with an obstruction in the functional space that prevents full extension or retraction
- Operating the mast near overhead power lines
- Operating the mast without the mast and operating space visible to the operator
- Driving the vehicle with the mast in a deployed position (any height above the nested position) or powered-up
- Operating the mast or leaving deployed in wind speeds higher than the specified maximum velocity
- Operating the mast on a non-level surface greater than the specified maximum angle
- Installing a payload greater than the maximum rated payload (weight and sail area) of the mast

## 1.3 Symbols

The following are symbols that are used with the system and their meaning. Contact The Will-Burt Company with any questions before performing any procedure outlined in this manual.



This symbol indicates an electrocution hazard or hazardous voltage hazard. There is DC voltage present inside the mast and control box. Do not operate mast near electrical lines or during lightning events. Contact with high voltage will result in death or serious injury.



This symbol indicates a pinch point hazard. Keep fingers and hands clear of moving parts.



This symbol indicates a tip-over hazard. The mast must be properly supported during transport, installation, maintenance and operation. System tip-over could result in death or serious injury.



This symbol indicates a general warning. In this unit, this symbol indicates a frozen water hazard. Do not block the mast drain port at the base of the unit. Water must be permitted to exit the mast to avoid ice damage to the mast.



This symbol is used to remind users to read and understand the operator's manual before operating the Mast System. Failure to follow operating instructions could result in death or serious injury. Read and understand operator's manual before operating or installing the mast system.



This symbol indicates a hard hat is required when working under the mast operating area. Failure to wear a hard hat could result in death or serious injury.



This symbol indicates an electrical ground connection point.



This symbol is used to indicate the center of gravity (COG) of a fully nested mast.

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## Section 2 Introduction

Thank you for selecting The Will-Burt Company for your critical payload elevation needs. These operating instructions describe transporting, handling, installing, disassembling, maintaining and storing procedures for the AntennaMast™ Model AM2. These procedures assume the use of standard mast systems. Procedures and characteristics for mast systems customized to meet customer-specific needs may vary.

These operating instructions are intended for professionals who are qualified by their appropriate training and experience to perform the procedures. Review this document in its entirety. Contact The Will-Burt Company with any questions before performing any procedure outlined in this manual.

The views depicted in this manual are provided for clarification and are subject to change without notice. Views are not to scale.

The AntennaMast™ Model AM2 is a man-portable, aluminum tripod mast designed for ease of use while delivering payload deployment flexibility and rugged reliability. The AntennaMast™ Model AM2 is well-suited for elevating up to four antennas and sensors. The following models are covered in these operating instructions:

- AntennaMast™ Model AM2
- AntennaMast™ Model AM2 with Lift Winch
- AntennaMast™ Model AM2 with EZ RAZE

This manual is not for the following portable masts:

- Hurry-Up® Push Up Mast
- Hurry-Up® Pump Up Mast
- QEAM MTS Series
- QEAM MTSV Series
- Ranger Expedition Composite Tripod Masts

See [www.willburt.com](http://www.willburt.com) for information on these and other The Will-Burt Company products.

The AntennaMast™ Model AM2 is available with many options installed by The Will-Burt Company, such different payload adaptors. By adding accessories, the mast can be configured with 2, 3, or 4 arms in 6, 12, 24, 36 or 44 in. (15, 30, 60 cm or 1 m) lengths.

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## 2.1 Intended Use

The AntennaMast™ Model AM2 is intended for use by professionals in the fire/rescue/first responder/ security/towing/broadcast/cellular industries to provide elevated and directional emergency scene lighting and surveillance or communication capabilities. It is not intended for use by nonprofessionals. Do not use the mast to lift personnel. Contact The Will-Burt Company with any questions on the intended use or available training programs for installation and operation.

## 2.2 Definitions

The following terms are used throughout this manual:

- **Mast:** refers to the telescoping AntennaMast™ Model AM2
- **Mast System:** refers to the entire mast system and other optional accessories
- **Payload:** refers to the object or equipment being extended by the mast to an operational height

## 2.3 Mast Component Descriptions

This section describes major components of a mast system assuming the use of standard catalog mast systems. Characteristics of components customized to meet customer-specific needs may vary. If necessary, contact The Will-Burt Company for additional details.

The exact configuration of the mast may vary. For detailed information on the locations of components in your system, see the drawings that shipped with the system.

**Telescoping Mast (arrives disassembled):** The telescoping mast is the structure used to raise the payload to an operational level. It consists of a base tube, a top tube, and 1m mast tubes that extend and retract.



*Figure 2-1 Telescoping Masts (Not to Scale)*

**Wheeled Bag:** The wheeled bag is a carrier for the mast, tripod, guy bag, accessory bag, and other components.

**Tripod:** The tripod stabilizes and connects the mast to the mounting location. The tripod is vital to keeping the mast stable during deployment.

**Guy Accessory Kit:** The guy accessory kit includes the components used to guy the mast. The guy accessory kit includes ground stakes, guy lines, a hammer and a stake puller.

**Lift Winch (Optional):** The lift winch kit raises the tubes and payload during deployment to make deployment easier on the installer.

**EZ RAZE Payload Elevation Kit (Optional):** The EZ RAZE Payload Elevation Kit allows the payload to be raised up to the top of the mast while the mast is already extended.

**Payload Accessories (as ordered):** The payload accessories allow a specific payload to be attached to the mast.

**Payload Adaptors (Optional):** Payload adaptors attach to the top of the mast and are used to secure and support the payload during operation. Payload adaptors come in varying sizes and configurations. It is possible to guy directly to some payload adaptors. Optional payload adaptors offered are:

- Bolster plate
- Cup holder
- NATO plate
- Blank plate

## Section 3 Technical Data

The model numbers listed in this section are for catalog masts with a black anodized finish only. Masts with other heights, capacities, and finishes are available. For more information on additional mast sizes, capabilities, and finishes, see [www.willburt.com](http://www.willburt.com).

This section describes specifications for mast system as follows:

- AntennaMast™ Model AM2
- AntennaMast™ Model AM2 with Lift Winch Specifications
- AntennaMast™ Model AM2 with EZ RAZE Payload Elevation Systems Specifications

### 3.1 Payload Capacity and Wind Effects

The payload weight should be evenly distributed around or divided per arms on the mast. For example, if you have 4 arms and a total payload of 22.6 kg / 50 lb., place 5.65 kg / 12.5 lb. on each arm. The cable and platform bracket weight must be considered in the maximum payload weight. If the cable weight is significant, it may be possible to route the cable opposite the payload weight or to loosely wrap the cable around the tubes.

Note: Do not deploy the mast in winds greater than 32 km/h / 20 mph. For payload weights and wind sail areas outside website specified limits, contact The Will-Burt Company.

### 3.2 Mast System Specifications

If the mast model is not listed, contact The Will-Burt Company. If payload extends beyond the boundaries defined for the wind analysis, contact The Will-Burt Company.

Mast Storage Temperature: -40°C to +70°C (-40°F to 158°F)

Maximum Altitude Above Sea Level: Not restricted

Table 3-1 AntennaMast™ Model AM2 Specifications

	Payload Capacity	Extended Height	Deployment Time	Approx. Mast Weight	Wind Survival Speed	Guying (Primary / Secondary)
<b>6.6' / 2 m</b>	100 lb.	6.6 ft	5-10 (1-2 persons)	61.3 lb.	70 mph @ 6 sq. ft	Top
	45.4 kg	2 m		27.8 kg	113 km/h @ 6 sq. ft	
<b>9.8' / 3 m</b>	85 lb.	9.8 ft	5-10 (1-2 persons)	64.6 lb.	70 mph @ 6 sq. ft	Top
	38.6 kg	3 m		29.3 kg	113 km/h @ 6 sq. ft	
<b>13.1' / 4 m</b>	75 lb.	13.1 ft	5-10 (1-2 persons)	67.8 lb.	70 mph @ 6 sq. ft	Top
	34 kg	4 m		30.8 kg	113 km/h @ 6 sq. ft	
<b>16.4' / 5 m</b>	65 lb.	16.4 ft	5-10 (1-2 persons)	71 lb.	70 mph @ 6 sq. ft	Top
	29.5 kg	5 m		32.2 kg	113 km/h @ 6 sq. ft	
<b>19.7' / 6 m</b>	60 lb.	19.7 ft	10-18 (1-2 persons)	74.3 lb.	70 mph @ 6 sq. ft	Top
	27.2 kg	6 m		33.7 kg	113 km/h @ 6 sq. ft	
<b>23' / 7 m</b>	60 lb.	23 ft	10-18 (1-2 persons)	77.6 lb.	70 mph @ 6 sq. ft	Top
	27.2 kg	7 m		35.2 kg	113 km/h @ 6 sq. ft	
<b>26.2' / 8 m</b>	55 lb.	26.2 ft	15-18 (1-3 persons)	80.8 lb.	70 mph @ 6 sq. ft	Top
	24.9 kg	8 m		36.7 kg	113 km/h @ 6 sq. ft	
<b>29.5' / 9m</b>	55 lb.	29.5 ft	15-18 (1-3 persons)	84 lb.	70 mph @ 6 sq. ft	Top
	24.9 kg	9 m		38.1 kg	113 km/h @ 6 sq. ft	
<b>32.8' / 10 m</b>	50 lb.	32.8 ft	15-18 (1-3 persons)	87.3 lb.	70 mph @ 6 sq. ft	Top / Mid Guying Optional
	22.7 kg	10 m		39.6 kg	113 km/h @ 6 sq. ft	
<b>36.1' / 11 m</b>	40 lb.	36.1 ft	15-20 (2-3 persons)	90.5 lb.	70 mph @ 4 sq. ft	Top / Mid Guying Optional
	18.1 kg	11 m		41.1 kg	113 km/h @ 4 sq. ft	
<b>39.4' / 12 m</b>	35 lb.	39.4 ft	15-20 (2-3 persons)	93.8 lb.	70 mph @ 4 sq. ft	Top / Mid Guying Optional
	15.9 kg	12 m		42.5 kg	113 km/h @ 4 sq. ft	
<b>42.7' / 13 m</b>	30 lb.	42.7 ft	15-20 (2-3 persons)	97 lb.	70 mph @ 4 sq. ft	Top / Mid Guying Optional
	13.6 kg	13 m		44 kg	113 km/h @ 4 sq. ft	
<b>45.9' / 14 m</b>	25 lb.	45.9 ft	15-20 (2-3 persons)	100.5 lb.	70 mph @ 4 sq. ft	Top / Mid Guying Optional
	11.3 kg	14 m		45.6 kg	113 km/h @ 4 sq. ft	
<b>49.2' / 15 m</b>	20 lb.	49.2 ft	20-30 (2-4 persons)	103.6 lb.	70 mph @ 4 sq. ft	Top / Mid Guying Optional
	9.1 kg	15 m		47 kg	113 km/h @ 4 sq. ft	

Note:

- Deployment method is manual.
- Payload Capacity assumes a 12 Inch Maximum Offset Payload and a Mast Deployment Angle 0° to 5°.
- Payload Capacity will be affected by wind sail area; consult factory. Payload Capacity includes cable weight.
- Dimensions and specifications provided are for reference only, and are not intended for vehicle design purposes.
- Specifications may be subject to change without notice.

*Table 3-2 AntennaMast™ Model AM2 with Lift Winch Specifications*

	Payload Capacity	Extended Height	Deployment Time	Approx. Mast Weight	Wind Survival Speed	Guying (Primary / Secondary)
<b>6.6' / 2 m</b>	100 lb.	6.6 ft	5-10 (1-2 persons)	68.3 lb.	70 mph @ 6 sq. ft	Top
	45.4 kg	2 m		31 kg	113 km/h @ 6 sq. ft	
<b>9.8' / 3 m</b>	85 lb.	9.8 ft	5-10 (1-2 persons)	71.6 lb.	70 mph @ 6 sq. ft	Top
	38.6 kg	3 m		32.5 kg	113 km/h @ 6 sq. ft	
<b>13.1' / 4 m</b>	75 lb.	13.1 ft	5-10 (1-2 persons)	74.8 lb.	70 mph @ 6 sq. ft	Top
	34 kg	4 m		33.9 kg	113 km/h @ 6 sq. ft	
<b>16.4' / 5 m</b>	65 lb.	16.4 ft	5-10 (1-2 persons)	78 lb.	70 mph @ 6 sq. ft	Top
	29.5 kg	5 m		35.4 kg	113 km/h @ 6 sq. ft	
<b>19.7' / 6 m</b>	60 lb.	19.7 ft	10-18 (1-2 persons)	81.3 lb.	70 mph @ 6 sq. ft	Top
	27.2 kg	6 m		36.9 kg	113 km/h @ 6 sq. ft	
<b>23' / 7 m</b>	60 lb.	23 ft	10-18 (1-2 persons)	84.6 lb.	70 mph @ 6 sq. ft	Top
	27.2 kg	7 m		38.4 kg	113 km/h @ 6 sq. ft	
<b>26.2' / 8 m</b>	55 lb.	26.2 ft	15-18 (1-3 persons)	87.8 lb.	70 mph @ 6 sq. ft	Top
	24.9 kg	8 m		39.8 kg	113 km/h @ 6 sq. ft	
<b>29.5' / 9m</b>	55 lb.	29.5 ft	15-18 (1-3 persons)	91 lb.	70 mph @ 6 sq. ft	Top
	24.9 kg	9 m		41.3 kg	113 km/h @ 6 sq. ft	
<b>32.8' / 10 m</b>	50 lb.	32.8 ft	15-18 (1-3 persons)	94.3 lb.	70 mph @ 6 sq. ft	Top / Mid Guying Optional
	22.7 kg	10 m		42.8 kg	113 km/h @ 6 sq. ft	
<b>36.1' / 11 m</b>	40 lb.	36.1 ft	15-20 (2-3 persons)	97.5 lb.	70 mph @ 4 sq. ft	Top / Mid Guying Optional
	18.1 kg	11 m		44.2 kg	113 km/h @ 4 sq. ft	
<b>39.4' / 12 m</b>	35 lb.	39.4 ft	15-20 (2-3 persons)	100.8 lb.	70 mph @ 4 sq. ft	Top / Mid Guying Optional
	15.9 kg	12 m		45.7 kg	113 km/h @ 4 sq. ft	
<b>42.7' / 13 m</b>	30 lb.	42.7 ft	15-20 (2-3 persons)	104.5 lb.	70 mph @ 4 sq. ft	Top / Mid Guying Optional
	13.6 kg	13 m		47.4 kg	113 km/h @ 4 sq. ft	
<b>45.9' / 14 m</b>	25 lb.	45.9 ft	15-20 (2-3 persons)	107.5 lb.	70 mph @ 4 sq. ft	Top / Mid Guying Optional
	11.3 kg	14 m		48.8 kg	113 km/h @ 4 sq. ft	
<b>49.2' / 15 m</b>	20 lb.	49.2 ft	20-30 (2-4 persons)	110.6 lb.	70 mph @ 4 sq. ft	Top / Mid Guying Optional
	9.1 kg	15 m		50.2 kg	113 km/h @ 4 sq. ft	

Note:

- Deployment method is with a lift winch.
- Payload Capacity assumes a 12 Inch Maximum Offset Payload and a Mast Deployment Angle 0° to 5°.
- Payload Capacity will be affected by wind sail area; consult factory. Payload Capacity includes cable weight.
- Dimensions and specifications provided are for reference only, and are not intended for vehicle design purposes.
- Specifications may be subject to change without notice.

Table 3-3 AntennaMast™ Model AM2 with EZ RAZE Payload Elevation Systems Specifications

	Payload Capacity	Extended Height	Deployment Time	Approx. Mast Weight	Wind Survival Speed	Guying (Primary / Secondary)
<b>9.8' / 3 m</b>	75 lb.	9.8 ft	5-10 (1-2 persons)	76.6 lb.	70 mph @ 6 sq. ft	Top
	34 kg	3 m		34.7 kg	113 km/h @ 6 sq. ft	
<b>13.1' / 4 m</b>	75 lb.	13.1 ft	5-10 (1-2 persons)	79.9 lb.	70 mph @ 6 sq. ft	Top
	34 kg	4 m		36.2 kg	113 km/h @ 6 sq. ft	
<b>16.4' / 5 m</b>	75 lb.	16.4 ft	5-10 (1-2 persons)	83.1 lb.	70 mph @ 6 sq. ft	Top
	34 kg	5 m		37.7 kg	113 km/h @ 6 sq. ft	
<b>19.7' / 6 m</b>	75 lb.	19.7 ft	10-18 (1-2 persons)	86.4 lb.	70 mph @ 6 sq. ft	Top
	34 kg	6 m		39.2 kg	113 km/h @ 6 sq. ft	
<b>23' / 7 m</b>	75 lb.	23 ft	10-18 (1-2 persons)	89.6 lb.	70 mph @ 6 sq. ft	Top
	34 kg	7 m		40.6 kg	113 km/h @ 6 sq. ft	
<b>26.2' / 8 m</b>	75 lb.	26.2 ft	15-18 (1-3 persons)	92.9 lb.	70 mph @ 6 sq. ft	Top
	34 kg	8 m		42.1 kg	113 km/h @ 6 sq. ft	
<b>29.5' / 9m</b>	75 lb.	29.5 ft	15-18 (1-3 persons)	96.1 lb.	70 mph @ 6 sq. ft	Top
	34 kg	9 m		43.6 kg	113 km/h @ 6 sq. ft	
<b>32.8' / 10 m</b>	75 lb.	32.8 ft	15-18 (1-3 persons)	99.4 lb.	70 mph @ 6 sq. ft	Top
	34 kg	10 m		45.1 kg	113 km/h @ 6 sq. ft	
<b>36.1' / 11 m</b>	70 lb.	36.1 ft	15-20 (2-3 persons)	102.6 lb.	70 mph @ 4 sq. ft	Top
	31.8 kg	11 m		46.5 kg	113 km/h @ 4 sq. ft	
<b>39.4' / 12 m</b>	65 lb.	39.4 ft	15-20 (2-3 persons)	105.9 lb.	70 mph @ 4 sq. ft	Top
	29.5 kg	12 m		48 kg	113 km/h @ 4 sq. ft	
<b>42.7' / 13 m</b>	60 lb.	42.7 ft	15-20 (2-3 persons)	109.1 lb.	70 mph @ 3 sq. ft	Top
	27.2 kg	13 m		49.5 kg	113 km/h @ 3 sq. ft	
<b>45.9' / 14 m</b>	55 lb.	45.9 ft	15-20 (2-3 persons)	112.5 lb.	70 mph @ 2 sq. ft	Top
	24.9 kg	14 m		51 kg	113 km/h @ 2 sq. ft	
<b>49.2' / 15 m</b>	50 lb.	49.2 ft	20-30 (2-4 persons)	115.6 lb.	70 mph @ 1 sq. ft	Top
	22.7 kg	15 m		52.4 kg	113 km/h @ 1 sq. ft	
<p>Note:</p> <ul style="list-style-type: none"> <li>• Deployment method is with a carriage.</li> <li>• Payload Capacity assumes a 12 Inch Maximum Offset Payload and a Mast Deployment Angle 0° to 5°.</li> <li>• Payload Capacity will be affected by wind sail area; consult factory. Payload Capacity includes cable weight.</li> <li>• Dimensions and specifications provided are for reference only, and are not intended for vehicle design purposes.</li> <li>• Specifications may be subject to change without notice.</li> </ul>						



## Section 4 Installation and Disassembly

This section provides instructions for installing the mast system and provides the general procedures that must be followed to ensure a successful installation. Be sure to read and understand the entire installation procedure and the Safety Summary (Section 1) before beginning installation.

### 4.1 Pre-Installation Check

Before installing the mast system, ensure:

- All installers read and understand the entire installation procedure and are properly trained.
- Only a properly trained and qualified certified electrician performs electric installations and maintenance.
- The mounting structure is level and has sufficient room and strength to mount the mast system.
- All purchased components are included (Section 2.3).
- All required equipment is readily available (Section 4.3).

Check with The Will-Burt Company's Engineering for additional wind information for customer-specific loading scenarios.

### 4.2 Select a Suitable Mounting Location

To select a suitable mounting location, consider the following:

- Select a flat, level site to deploy the system that has no more than a 5° slope. The ground should be level and firm.
- Ensure that the center of the site is approximately 2.1m / 7 sq. ft. and is level and smooth. The center of the site is where the tripod will be located in the installation.
- Select an area free of power lines or other overhead obstructions. The mast should be located no closer than a horizontal distance equal to the extended height of the mast away from any power lines.
- The ground clearance must be a radius equal to the height of the mast. For example, for a 4m / 13.1 ft. mast, ensure that the site has an overhead clearance of 4m / 13.1 ft. and a clear radius of 4m / 13.1 ft. from the center of the site.

## 4.3 Recommended Installation Tools

Table 4-1 lists recommended tools and materials for installation.

*Table 4-1 Tools and Materials Required for Installation*

Tools and Materials		
Safety Glasses	Safety Shoes	Nitrile or Vinyl Gloves
Hearing Protection	Hard Hat or Helmet	Safety Gloves / Work Gloves
Wrenches	Screwdrivers	Thread Tape
Measuring Tape	Sling / Strap	Level
Sockets	String or Thin Wire	Plumb Bob
Hammer	Torque Wrench	Drill
Note: Depending on the national and local standards and codes of practice, and the environment, additional personal protective equipment may be necessary.		

## 4.4 Unpack the Mast System

Unpack and handle the mast as follows:

1. Carefully open shipping container.
2. Remove all loose parts.
3. Ensure all components are included (Section 2.3) and that the required tools (Section 4.3) are readily available.
4. Carefully lift the wheeled bag and other components free from the shipping container.
5. Inspect for any shipping damage. If damage has occurred, notify the carrier.

The Will-Burt Company recommends keeping the shipping crate for transporting the mast, for example if shipping the mast back to the factory for refurbishment.

## 4.5 Install the Tripod

Set up the tripod as follows:

1. Unzip the wheeled bag. Remove the tripod, guy bag and accessories (Figure 4-1).
2. With all three base plates of the tripod on the ground, loosen each leg clamp by turning the knob to the left (Figure 4-2).
3. Step on the base plates and lift the tripod up until the legs are fully extended. Lock each clamp by turning the knob to the right until tightened (Figure 4-3).



Figure 4-1 Open Wheeled Bag



Figure 4-2 Loosen Each Leg Clamp



Figure 4-3 Extend Tripod Legs

4. Pull the spring-loaded pin outwards before pulling on the leg to deploy tripod. This unlocks the tripod (Figure 4-4).
5. Open the tripod by pushing down on the central collar until the pin snaps into the next groove and the base plates are flat on the ground. Keep fingers away from the pinch points (Figure 4-5).
6. Make sure the tripod is fully deployed before adding any tubes and payload(s). Check the front level. If the tripod is not level, loosen one of the adjacent leg clamps and adjust leg length to level the tripod. Tighten the leg clamp. Check the side level. If the tripod is not level, loosen one of the adjacent leg clamps and adjust the length. Tighten the leg clamp. Make sure all leg clamps on the tripod are tight (Figure 4-6).



Figure 4-4 Pull Pins Outward



Figure 4-5 Push Down on Central Collar



Figure 4-6 Fully Deployed Tripod

7. To stake the tripod, remove the ground stakes and hammer from the guy bag.

Stake the base plates of each leg by driving the stake(s) in the two stake holes aligned with the pivot point of the base plate using the hammer. Stakes should be driven at an angle with the eyelet toward the tripod leg (Figure 4-7). Be careful of buried cables and utilities when staking the mast.

- **For masts 2m / 6.5 ft. to 12m / 39.3 ft. tall and smaller payloads:** One stake per tripod leg plate may be sufficient.
- **For masts taller than 12m / 39.3 ft.:** Two stakes are required on each tripod leg plate.



Figure 4-7 Stake the Tripod Legs

## 4.6 Deploy the Mast

This section describes how to deploy the mast system. The exact deployment procedures will vary based on the configuration of your mast system. Follow the appropriate deployment procedures for your mast system.

Ensure the proper personnel are available to deploy the mast:

- **2m / 8 ft. to 12m / 39.4 ft. mast:** Depending on the payload weight and the current wind speeds at deployment, one to three people are required to raise the mast. One person is typically required to load the mast tubes while one to two people manage the guy lines.
- **13m / 42.6 ft. to 15m / 49.2 ft. mast:** Depending on the payload weight and the current wind speeds at deployment, two to four people are required to raise the mast. One to two people are required to load the mast tubes while two to three people manage the guy lines. For taller masts, binoculars may be required.

Ensure the mast is only being operated in safe wind speeds. Deployment and retraction wind speeds are payload dependent, however, the mast can typically be deployed and retracted in winds speeds up to 20 mph (32 km/h) assuming deployment angle is 5° of vertical.

### 4.6.1 Manual Deployment

To deploy the mast:

1. Locate the base tube and keep separate from the other mast tubes. The mast has three different tubes (Figure 4-8):

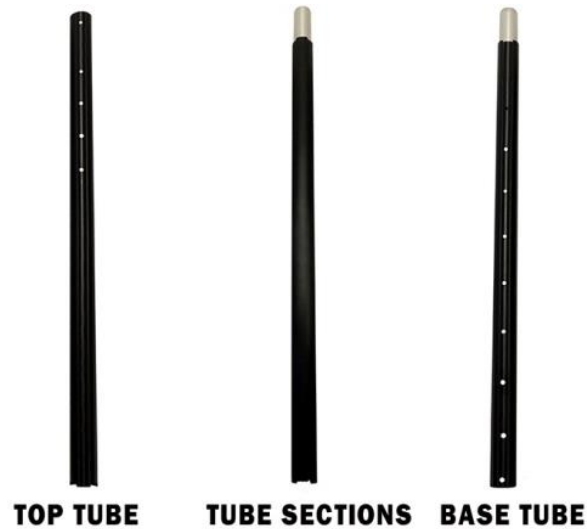


Figure 4-8 Different Tubes

2. Retrieve the top tube (not the base tube). Insert the top tube from the bottom of the tripod with the locating notches toward the ground (Figure 4-9). Take note of the small dimple in one of the locating notches on the bottom of the top tube. Orient this dimple toward you.
3. Lift the tube until there is one hand width from the bottom of the tube and tighten the knob on the clamp (Figure 4-10).
4. For the required guying, loosen the pin of the 4-way guy collar and place the guy collar onto the top of the top tube (Figure 4-11). For guy line instructions, see Section 4.7.



Figure 4-9 Insert the Top Tube



Figure 4-10 One Hand Width from Bottom



Figure 4-11 Loosen the Pin of the 4-Way Guy Collar



- Align the guy stakes to coincide with the four holes on the guy collar on the top of the mast (not required to align for the swivel collar since it automatically adjusts to the stakes) and place 90° apart (Figure 4-12). See guy line instructions in Section 4.7.

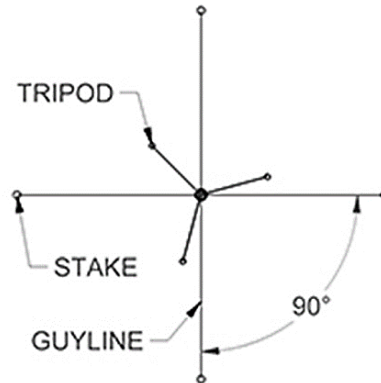


Figure 4-12 Align Guy Stakes with the Four Holes on the Guy Collar

- Install the payload accessories (Section 4.8). Connect the payload to the top of the payload stub (Section 4.9) and attach the guy line snap hooks to the 4-way guy collar (Figure 4-11). After this is done, it is now time to deploy the mast (Figure 4-13). For payload weights and wind sail areas outside website specified limits, contact The Will-Burt Company.
- To manually load the tubes, place a tube section into the bottom of the installed top tube, matching the notches on the top tube with the notches on the top of the next tube in the tripod. Match dimple profiles if payload alignment is required (Figure 4-14).
- While holding onto the tube that was just loaded, loosen the knob on the lower clamp by turning it to the left. Push the tube up until only a hand's length is visible, then tighten the knob on the clamp by turning it to the right (Figure 4-15). The manual lifter can also be used to push the tubes up. Repeat this step until all tubes are loaded.



Figure 4-13 Mast is Ready for Deployment



Figure 4-14 Manually Load Tubes



Figure 4-15 Tighten Clamps

9. Insert the base tube (tube with the base plate attached) into the bottom tube, matching the locating notches and aligning the dimples. Raise the base tube until the locating notches are fully engaged. While holding onto the base tube, loosen the clamp and slowly allow the mast tubes to be lowered to rest on the ground. Tighten the clamp (Figure 4-16).
10. Stake the base plate of the base tube by driving the stake, with the hammer provided, at a point aligned with pivot point of the base plate (Figure 4-17 and Figure 4-18):
  - **For masts 2m / 8 ft. to 12m / 40 ft. tall and smaller payloads:** One stake may be sufficient.
  - **For masts taller than 12m / 40 ft.:** Two stakes might be required, depending on the soil type.



*Figure 4-16 Lower Mast Tubes to Ground*



*Figure 4-17 Stake the Base Plate*



*Figure 4-18 Use Hammer to Drive in Stake*

## 4.6.2 Deployment with Lift Winch

To deploy the mast with the lift winch:

1. Locate the base tube and keep separate from the other mast tubes. The mast has three different tubes (Figure 4-19):

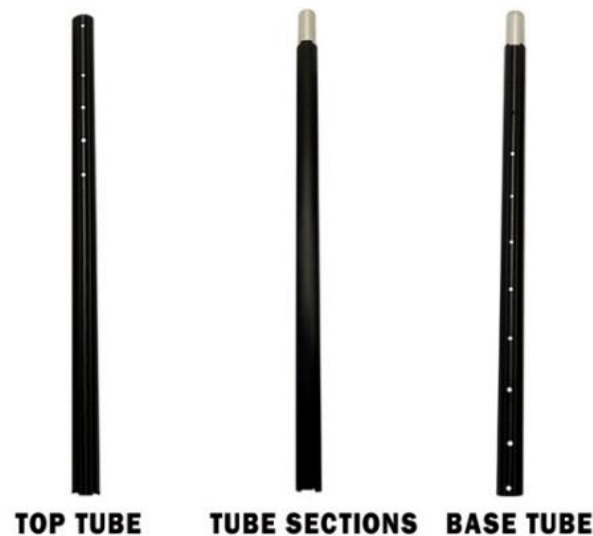


Figure 4-19 Different Tubes

2. Retrieve the top tube (not the base tube). Insert the top tube from the bottom of the tripod with the locating notches toward the ground (Figure 4-20). Take note of small dimple in one of the locating notches on the bottom of the top tube. Orient this dimple toward you.
3. Lift the tube until there is one hand width from the bottom of the tube and tighten the clamp (Figure 4-21).
4. For the required guying, loosen the pin of the 4-way guy collar and place the guy collar onto the top of the top tube (Figure 4-22). For guy line instructions, see Section 4.7.



Figure 4-20 Insert the Top Tube



Figure 4-21 One Hand Width from Bottom



Figure 4-22 Loosen the Pin of the 4-Way Guy Collar



- Align the guy stakes to coincide with the four holes on the guy collar on the top of the mast (not required to align for the swivel collar since it automatically adjusts to the stakes) and place 90° apart (Figure 4-23). See guy line instructions in Section 4.7.

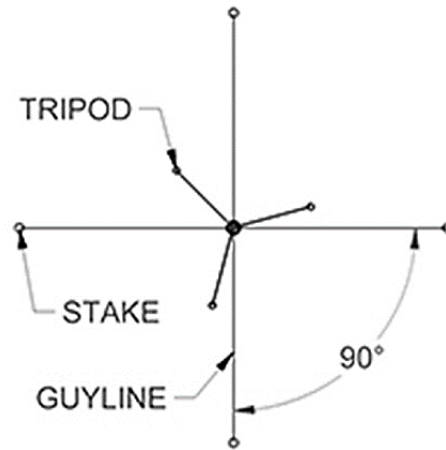


Figure 4-23 Align Guy Stakes with the Four Holes on the Guy Collar

- Install the payload accessories (Section 4.8). Connect the payload to the top of the payload stub (Section 4.9) and attach the guy line snap hooks to the 4-way guy collar (Figure 4-22). After this is done, it is now time to install the lift winch. For payload weights and wind sail areas outside website specified limits, contact The Will-Burt Company.
- To install the lift winch, insert the orange barrel of the orange winch into the tripod receiver below the orange hold down clamp (Figure 4-24).



Figure 4-24 Insert Orange Barrel of the Orange Winch into the Tripod Receiver

8. Once the winch is centered in the receiver, lift up and toggle the hold down clamp to the winch plate. Then, tighten the black knob by turning to the right (Figure 4-25).
9. Reel out enough cable from the winch to weave through the orange lift plate on the ground and back up to tripod center collar. The cable routing should not ride against the winch standoffs (Figure 4-26).
10. Feed the cable under the rollers and through the plug of the orange base plate (Figure 4-27).



Figure 4-25 Tighten the Black Knob



Figure 4-26 Reel Out Enough Cable



Figure 4-27 Feed Cable Through Base Plate

11. Attach the ball end of the cable to the black lift key. To do this:
  - a. Put the ball end of the cable through the bottom hole in the lift key from the side without the central slot (Figure 4-28).
  - b. Thread the cable end back through the top hole in the lift key from the same side with the central slot between the two holes (Figure 4-29).
  - c. Hold the ball end of the cable up and then pull the slack out from the bottom of the key to seat the ball end of the cable into the recess in the top face of the lift key (Figure 4-30).



Figure 4-28 Put Ball End of Cable Through the Bottom Hole



Figure 4-29 Thread the Cable End Back Through the Top Hole



Figure 4-30 Pull the Slack Out From the Bottom of the Key

12. Place the key between the leg braces opposite of the orange winch so the tee profile of the key is resting on the top of the leg braces (Figure 4-31).
13. To load the tubes with the lift plate, first make sure the orange lift plate is securely placed on the ground and the winch cable is threaded through the pulleys and the key is attached to the leg supports. Then, set the next tube onto the raised plug of the lifting plate (Figure 4-32).



Figure 4-31 Place the Key Between the Leg Braces Opposite of the Orange Winch



Figure 4-32 After Ensuring Lift Winch is Properly Set Up, Set Next Tube Onto the Raised Plug of the Lifting Plate

14. Crank the winch clockwise to raise and seat the tube into the bottom of the above tube in the tripod. Make sure the locking tabs fully engage (Figure 4-33).
15. Loosen the clamp on the tripod and crank the winch to raise the tube until one hand width is below the clamp (Figure 4-34). Tighten the clamp.
16. Crank the winch counterclockwise to lower the lifting plate to the ground. Make sure to keep tension on the cable to ensure it reels out correctly (Figure 4-35). Repeat this process until all tubes are loaded.



Figure 4-33 Ensure Locking Tabs Fully Engage



Figure 4-34 One Hand Width Below the Clamp



Figure 4-35 Lower Lifting Plate to the Ground



17. Insert the base tube (tube with the base plate attached) into the bottom tube, matching the locating notches and aligning the dimples. Raise the base tube until the locating notches are fully engaged. While holding onto the base tube, loosen the clamp and slowly allow mast tubes to be lowered to rest on the ground. Tighten the clamp (Figure 4-59).
18. Stake the base plate of the base tube by driving the stake, with the hammer provided, at a point aligned with pivot point of the base plate (Figure 4-60 and Figure 4-61):
  - **For masts 2m / 8 ft. to 12m / 40 ft. tall and smaller payloads:** One stake may be sufficient.
  - **For masts taller than 12m / 40 ft.:** Two stakes are required, depending on the soil type.



Figure 4-36 Lower Mast Tubes to the Ground



Figure 4-37 Stake the Base Plate



Figure 4-38 Use Hammer to Drive in Stake

### 4.6.3 Deployment with EZ RAZE

To deploy the mast with EZ RAZE:

1. Locate the base tube and keep separate from the other mast tubes. The mast has three different tubes (Figure 4-39):



*Figure 4-39 Different Tubes*

2. Retrieve the EZ RAZE top tube (not the base tube) and insert the tube from the bottom of the tripod with the locating notches toward the ground (Figure 4-40). Take note of small dimple in one of the locating notches on the bottom of the mast tube. Orient this dimple toward you.
3. Lift the tube until there is one hand width from the bottom of the tube and tighten the clamp (Figure 4-41).
4. To install the EZ RAZE system, open up the restrain mechanism by engaging the kick stand lever to the lower bar. Then, slide the EZ RAZE carriage over the top of the tube until resting on the top of the tripod (Figure 4-42).



*Figure 4-40 Insert the EZ RAZE Top Tube*



*Figure 4-41 One Hand Width from Bottom*



*Figure 4-42 Engage the Kick Stand Lever*

5. Slide the EZ RAZE top tube down through the carriage and rotate it until the locating notches fully engage with the tube. Make sure to align dimples for proper orientation. Ensure the restrain mechanism is opposite the operator ( $180^\circ$  from operator) (Figure 4-43).
6. For the required guying, attach guy lines to the top guy collar. Preferred method of attaching the hook is to hook up through the guy plate on the EZ RAZE top tube as shown (Figure 4-44).
7. Align the guy stakes to coincide with the four holes on the guy collar on the top of the mast (not required to align for the swivel collar since it automatically adjusts to the stakes) and place  $90^\circ$  apart (Figure 4-45). See guy line instructions in Section 4.7.



Figure 4-43 Slide EZ RAZE Top Tube Down the Carriage



Figure 4-44 Attach Guy Lines to Top Guy Collar

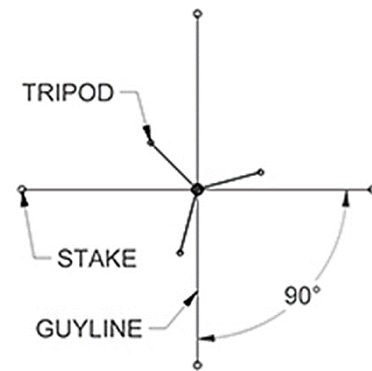


Figure 4-45 Align Guy Stakes with the Four Holes on the Guy Collar

8. Install the payload accessories (Section 4.8). Connect the payload to the top of the payload stub (Section 4.9) and attach the guy line snap hooks to the 4-way guy collar (Figure 4-44). After this is done, it is now time to install the lift winch. For payload weights and wind sail areas outside website specified limits, contact The Will-Burt Company.
9. To install the lift winch, insert the round key of the blue winch into the tripod receiver below the blue hold down clamp (Figure 4-46).



**Tripod Receiver**



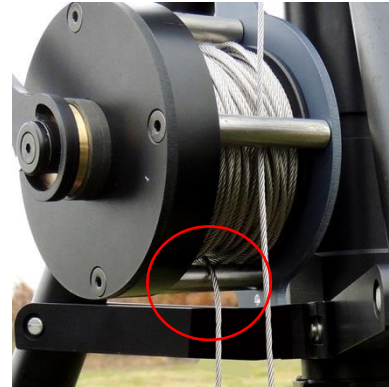
**Hold Down Clamp**

Figure 4-46 Insert the Round Key of the Blue Winch into the Tripod Receiver

10. With the winch in place, rotate the carriage so the corner with 2 eyelets is aligned above the blue winch. Also, make sure the pulley in the top of the EZ RAZE tip is in line with the winch. Take the end of the cable and feed it up through the 2 eyelets on the EZ RAZE carriage (Figure 4-47).
11. Winch cable routing is always between the spool and standoffs. Never route the cable over standoffs next to the contact point (Figure 4-48).



*Figure 4-47 Rotate the Carriage*



*Figure 4-48 Route the Cable Between the Spool and Standoffs*

12. Take the end of the cable and feed it up through the 2 eyelets on the EZ RAZE carriage (Figure 4-49).
13. Feed the cable through the top of the top pulley and back down the other side of the carriage. Make sure the cable passes back down through the backside (180°) to single eyelet (Figure 4-50).



*Figure 4-49 Feed Cable Through the 2 Eyelets on the EZ RAZE Carriage*



*Figure 4-50 Feed the Cable Through the Top of the Top Pulley and Back Down the Other Side of the Carriage*



14. Attach the end of the cable to the carriage safety restraint. To do this, feed the ball end of the cable through the top hole in the receiver plate from the side with the slot cutout at the top (Figure 4-51).
15. Hold the ball end of the cable down and take up the slack in the cable from the top, seating the ball into the recess in the bottom of the receiver plate (Figure 4-52).
16. Take the end of the cable and feed it through the bottom hole in the receiver plate from the side with the slot cutout between the two holes (Figure 4-53).



*Figure 4-51 Attach the End of the Cable to the Carriage Safety Restraint*



*Figure 4-52 Seat Ball End of the Cable into the Recess in the Bottom of the Receiver Plate*



*Figure 4-53 Feed End of Cable Through the Bottom Hole in the Receiver Plate*

17. Figure 4-54 shows the correct installation of the cable end to the receiver plate.
18. Reset the kick stand lever to open if accidentally tripped when raising the mast (Figure 4-55).



*Figure 4-54 Correct Installation*



*Figure 4-55 Reset the Kick Stand Lever*



19. Leave cable loose while deploying the mast by unwinding several feet of cable from the winch with every tube section deployed (Figure 4-56).
20. To manually load the tubes, place a tube section into the bottom of the installed top tube, matching the notches on the top tube with the notches on the top of the next tube in the tripod. Match dimple profiles if payload alignment is required (Figure 4-57).
21. While holding onto the tube that was just loaded, loosen the knob on the lower clamp by turning it to the left. Push the tube up until only a hand's length is visible, then tighten the knob on the clamp by turning it to the right (Figure 4-58). The manual lifter can also be used to push the tubes up. Repeat this step until all tubes are loaded. Tighten tripod clamp to maintain azimuth direction.



Figure 4-56 Leave Cable Loose While Deploying the Mast

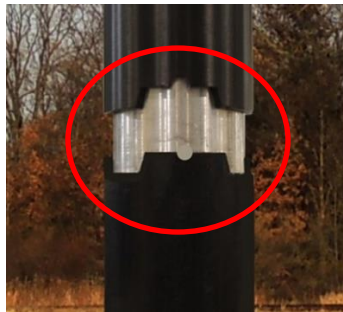


Figure 4-57 Manually Load Tubes



Figure 4-58 Tighten Clamps

22. Insert the base tube (tube with the base plate attached) into the bottom tube, matching the locating notches and aligning the dimples. Raise the base tube until the locating notches are fully engaged. While holding onto the base tube, loosen the clamp and slowly allow mast tubes to be lowered to rest on the ground. Tighten clamp (Figure 4-59).
23. Stake the base plate of the base tube by driving the stake, with the hammer provided, at a point aligned with pivot point of the base plate (Figure 4-60 and Figure 4-61):
  - **For masts 2m / 8 ft. to 12m / 40 ft. tall and smaller payloads:** One stake may be sufficient.
  - **For masts taller than 12m / 40 ft.:** Two stakes are required, depending on the soil type.



Figure 4-59 Lower Mast Tubes to the Ground



Figure 4-60 Stake the Base Plate



Figure 4-61 Use Hammer to Drive in Stake

## 4.7 Guy the Mast

This section describes the procedure to guy the mast.

Note: At least one person must observe the mast to ensure it is standing straight and not leaning in any direction. For taller masts, binoculars may be required.

To set up the guy lines:

1. Align the guy stakes to coincide with the four holes on the guy collar on the top of the mast (not required to align for the swivel collar since it automatically adjusts to the stakes) and place 90° apart (Figure 4-62).

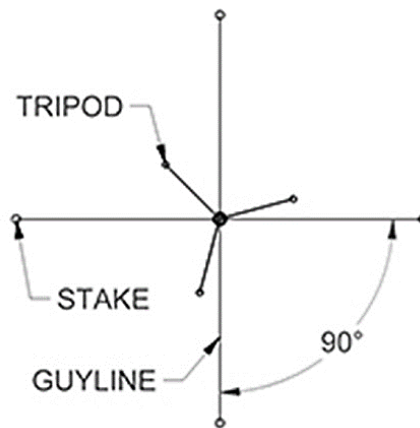


Figure 4-62 Align Guy Stakes with the Four Holes on the Guy Collar

2. Drive each stake, with the hammer provided, into the ground at a 45° angle away from the tripod (Figure 4-63). Ensure that the stake is driven into the ground up to the eyelet of the stake and that the eyelet is pointing towards the tripod. If possible, drive the stakes a distance equal to the mast height from the center of the mast. Consult The Will-Burt Company for modified distance.



Figure 4-63 Drive Guy Stakes Into the Ground at a 45° Angle Away from the Tripod

3. Clip the snap hook to the swiveling guy collar. Note: This is done before raising the mast (Figure 4-64).
4. Clip the snap hook of each of the tensioners to the ring of the guy stake (Figure 4-65).



Figure 4-64 Clip Snap Hooks to Guy Collar



Figure 4-65 Clip Snap Hooks to the Guy Stakes

5. **For masts near maximum payloads and for masts 13m / 44 ft. to 18m / 60 ft. tall:** Prepare the guy lines by loosening a maximum of 1.5m / 5 ft. of guy line from each tensioner.
6. Tension the guy lines by sliding the tension toward the mast (Figure 4-66). Do not overtighten the guy lines. Tighten the lines to the point that the mast is stabilized, sway is minimized, and the mast is stable during winds. Overtightening the guy lines causes an additional or unlevel load on the mast and reduces the overall load capacity of the mast. Ensure that the guy lines are not crossed and that the guy line attached to the guy stake coincides with the aligned hole in the guy collar on top of the mast.
7. Lock the tensioner into position by sliding the tensioner toward the mast and placing the tensioner hook over the double guy line (Figure 4-67). Check to make sure the center mast tube remains straight and perpendicular. Check guy lines to ensure no interfering with raising payload has occurred. To adjust the guy line, move the ground stake related to the guy line by a couple of degrees.



Figure 4-66 Tighten the Guy Lines



Figure 4-67 Lock the Tensioner Into Position

8. Inspect the guy lines to ensure they are properly tensioned several times throughout the day. Adjust as necessary to keep the mast plumb vertically. After initial install, inspect the guy lines at least once a week to ensure that the guy lines remain properly tensioned.



## 4.8 Install the Accessories

This section describes how to install the accessories onto the mast system. The exact accessory installation procedures will vary based on the configuration of your mast system. Follow the appropriate accessory installation procedures for your mast system.

### 4.8.1 Payload Platform Installation

Physically attach the payload platform as follows:

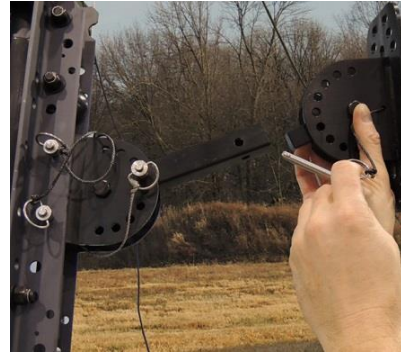
1. Attach payload platform to the carriage by inserting the ¼" quick release pins through carriage and platform. Shown is an extension arm carriage attachment (Figure 4-68).
2. Pick a preferred angle for the arm, line up the arm hole with the arm collar hole, and pin the arm in place by pressing the pin button (Figure 4-69).
3. Match a corresponding angle for the payload adaptor, line up the arm hole with adapter hole, and pin the arm in place by pressing the pin button (Figure 4-70).



*Figure 4-68 Attach Payload Platform to the Carriage*



*Figure 4-69 Pin the Arm in Place*



*Figure 4-70 Pin the Payload Adaptor in Place*

### 4.8.2 Guy Collar Installation

Physically attach the accessory guy collar as follows:

1. Place the guy collar onto the top of the top tube.
2. If a second guy collar and guy lines are wanted for additional support, place both collars onto the top tube. The second guy collar, if used, can be tightened onto another tube as it is loaded.
3. The payload can be attached above the guy collar. For payload weights and wind sail areas outside website specified limits, contact The Will-Burt Company.

## 4.9 Install the Payload

The exact installation procedures for payload will vary based on the customer-specific payload. For optimal performance, center the payload as best as possible. If the payload must be offset, offset the payload in-line with the keys. Contact The Will-Burt Company with any questions before performing any installation procedures.

In general, to install the payload:

1. Carefully move the payload into position.
2. Properly secure the payload to the mast. The mounting hardware must include proper means to resist vibration loosening, such as thread-locking compound or locking hardware. Torque all hardware as appropriate for its size and grade.

Note: If securing a payload part-way along a mast tube, be sure not to overtighten the tube, or damage to the mast could occur. See [www.willburt.com](http://www.willburt.com) for additional information.

## 4.10 Disassemble the Mast

To disassemble the mast, proceed as follows:

1. If NOT using the EZ RAZE, proceed to Step 2.

If using the EZ RAZE, lower payload back down to tripod level. It is optional to dismantle the payload at this time.

2. Loosen the cable and guy lines to relieve any tension or binding on the mast.
3. Loosen the lower mast clamp and lift up on the base tube enough to allow it to be removed (if using winch, crank clockwise to raise). Tighten the lower mast clamp of the tripod onto the next tube of the mast. Remove the base tube.
4. While holding the exposed portion of the tube (held by the lower mast clamp), loosen the lower mast clamp and ease the tube down to where the tube is free from the lower clamp. Allow the next tube to slowly lower until it enters the lower clamp and a hands width of tube is exposed. Tighten the lower clamp and remove the free tube from under the tripod.

If using the EZ RAZE winch, rotate handle counterclockwise to lower. Crank the cable onto the winch while lowering the mast sections.

5. If accessories are installed on the tube, disassemble the accessories and place in the bags.
6. Repeat Steps 4 and 5 for the remaining tubes until all the tubes have been removed (except for the top tube). Place the tubes in the wheeled bag.
7. Remove the ground stakes from the tripod base plate and place them in the guy bag.
8. (Optional) Loosen the clamps on the tripod legs and allow the legs to retract within themselves, bringing the mast to a comfortable working height.
9. Detach the guy line hooks from the guy collar on the top tube.
10. Detach the guy line hooks from the stakes. Wind the guy line around the tensioner. Remove the stakes. Place the guy lines and stakes in the guy bag. Place guy bag in the wheeled bag.
11. Remove the 4-way guy collar or the accessory guy collar from the top tube and place the guy collar and top tube in the wheeled bag.
12. Pull the spring-loaded pin on the tripod and fold up the tripod for transport.
13. Place the tripod and base plates in the wheeled bag.

## Section 5 Transportation

Before transporting the mast system, the mast system needs to be secured. The exact procedures for transportation will vary based on the mast system configuration. The process described in this manual represents a possible method of transporting the mast. Depending on the environment and equipment available, other methods may work better. Use the best and safest method for your circumstances.

### 5.1 General Transportation

To prepare the mast system for transportation:

1. Ensure the mast and components are fully and properly disassembled and placed into the appropriate storage bags such as the wheeled bag and accessories bag (Section 4.10). Do not transport the mast system with the mast and payload extended. Always visually confirm the mast is fully disassembled before moving the mast.
2. If possible, secure the payload.
3. If necessary, secure the optional lift winch or EZ RAZE.
4. If necessary, secure any additional components in the mast system.

Note: The operator should always visually confirm the mast is entirely disassembled and properly stored before moving the mast for transport.

### 5.2 Shipping

When shipping the mast system, The Will-Burt Company recommends shipping the mast in the original shipping container shrink-wrapped to a pallet. If the original shipping container is not available, contact The Will-Burt Company to order a replacement.

When shipping:

1. Prepare the mast system for transportation (Section 5.1).
2. Secure the mast system in the shipping container and shrink-wrap the shipping container to the pallet:
  - a. Carefully position the mast and additional components in the shipping container.
  - b. Secure the lid on the shipping container.
  - c. Shrink-wrap the shipping container to the pallet.



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## Section 6 Maintenance and Disposal

This section describes maintenance procedures required to keep the mast system operational. Use care to understand and follow all precautions while performing these procedures. If the system does not perform as required, contact The Will-Burt Company.

Disconnect power to any devices mounted to the mast with lock-out tagout procedures as appropriate before performing mast maintenance.

### 6.1 Pre-Maintenance Check

Before performing maintenance procedures, ensure:

- All operators read and understand the entire maintenance procedure and are properly trained.
- The payload is removed prior to performing maintenance on the system.
- The system is level and secure.

### 6.2 Maintenance Equipment

Table 6-1 lists recommended equipment for maintenance.

Table 6-1 Equipment Recommended for Maintenance

Tools and Materials*			
<b>Personal Protective</b>			
Safety Glasses	Safety Gloves	Safety Shoes	Nitrile or Vinyl Gloves
Hard Hat or Helmet	Hearing Protection		
<b>Hand Tools</b>			
Hammer	Hex Wrenches	Plumb Bob	Measuring Tape
Level	Screwdrivers	Sockets	Wrenches
Torque Wrench	Utility Knife		
<b>Expendables</b>			
Acetone, Alcohol, or other solvent	Non-Abrasive Cleaners (Soap and Water)	Rags (Clean and Dry)	
* Note:			
<ul style="list-style-type: none"> <li>• Depending on the local, regional, and national standards and codes of practice, and the environment, additional personal protective equipment may be necessary.</li> <li>• When disposing of any disposables or components, do so according to any applicable local, regional, and national standards and codes of practice.</li> </ul>			

## 6.3 Spare Parts

To order spare or replacement parts, always refer to the mast model number and serial number. This information is included in the operator's manual supplied with each mast. The mast serial number is stamped at the bottom of the base tube. Model number, serial number and additional information is also engraved on the mast identification plate(s). The plate(s) are fixed to the base tube's collar.

## 6.4 Periodic Maintenance

This section describes the systematic care and inspection of equipment to keep it in safe operating condition and to prevent breakdowns. If the system does not perform as required or if anything looks wrong and cannot be diagnosed and/or fixed, contact The Will-Burt Company. Table 6-1 provides a schedule of periodic inspections and procedures required to keep the mast system in safe operating condition.

*Figure 6-1 Periodic Inspections*

Frequency	Inspection	Action
As Needed; In salt water or sandy environments clean the mast every 3 months.	Inspect to ensure the mast system is kept clean and free from foreign material. Dirt, grease, oil, sand and debris may cover up a serious problem.	Wipe down all parts using a non-abrasive cleaner or non-acid solvent and a cloth.
During Operation	Inspect for damage during operation.	If damage is apparent, do not use the mast, and have it serviced prior to use.
Monthly	Inspect all hardware to ensure nuts, bolts, and other fasteners are not damaged, loosening, backing out or missing. Take special note of hardware keeping the payload mounted and hardware used to mount the mast to the support structure.	Tighten or replace any loose, damaged or missing nuts, bolts, and other fasteners.
Monthly	Inspect all clamps to ensure clamps are not damaged, cracked, have uneven wear or are missing.	Replace any cracked, unevenly worn, damaged or missing clamps.
Monthly	Inspect the tripod for uneven wear.	Replace unevenly worn-out component or tripod. Contact The Will-Burt Company.
As every use	Inspect guy lines for frayed, damaged or cut lines.	Stop use and replace frayed, damaged, or cut guy lines.

## 6.5 Long-Term Storage

When putting the system into long-term storage, ensure the:

- Mast and components are fully disassembled and are placed into the appropriate bags.
- Mast and components are stored in a clean and dry environment.

## 6.6 System Disposal

Dispose of the mast in accordance with the national environmental regulations.

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