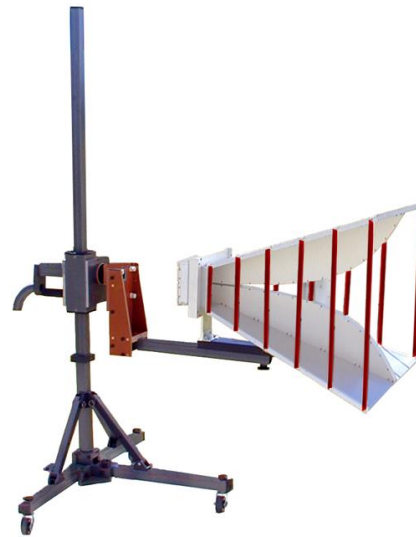


*Model 7-TR*

# Tripod Positioner

User Manual



*Model 3106B shown mounted onto 7-TR/POL-M  
with optional 108507 centerline rotation boom*

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An ESCO Technologies Company

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**Revision Record | MANUAL, 7-TR | Part #399260, Rev. L**

Revision	Description	Date
A	Initial Release	October, 2000
B C D	Edits/updates	March, 2002 April, 2003 July, 2003
E	Added optional Pneumatic Polarization Upgrade Kit information; converted to half-size format	September, 2007
F	Added <i>Boom Options</i> ; added Model 3106B boom information; rebrand	January, 2009
G	Updated part# of Pneumatic Polarization Upgrade Kit to 112413	June, 2009
H	Updated <i>Assembly Steps</i> ; updated boom information; updated drawings	September, 2010

Revision	Description	Date
J	Updated boom options	June, 2013
K	Updated <i>Replacement and Optional Parts</i> with 108507 boom information; added <i>Mounting a Model 3106 Series Antenna</i>	July, 2013
L	Updated boom options for manual and pneumatic models	July, 2014

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## Notes, Cautions, and Warnings

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	<p><b>Note:</b> Denotes helpful information intended to provide tips for better use of the product.</p>
<p><b>CAUTION</b></p>	<p><b>Caution:</b> Denotes a hazard. Failure to follow instructions could result in minor personal injury and/or property damage. Included text gives proper procedures.</p>
<p><b>WARNING</b></p>	<p><b>Warning:</b> Denotes a hazard. Failure to follow instructions could result in SEVERE personal injury and/or property damage. Included text gives proper procedures.</p>



See the ETS-Lindgren *Product Information Bulletin* for safety, regulatory, and other product marking information.

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## 1.0 Introduction

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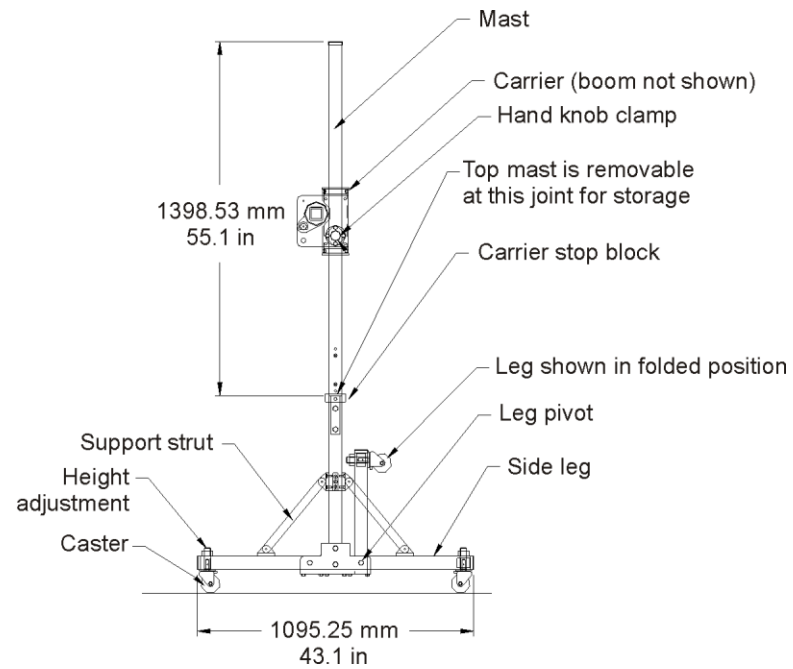
The **ETS-Lindgren Model 7-TR Tripod Positioner** is designed for EMC testing, providing increased stability for physically large, ultra-broadband antennas, such as ETS-Lindgren BiConiLog™ antennas. The 7-TR boom height can be adjusted up and down from one to two meters (3.3 to 6.6 ft), and can support antennas up to 13.6 kg (30 lb). The fiberglass and high-strength plastic construction makes it non-conductive and non-magnetic.



*7-TR/POL-M shown  
without boom*



Specify the type of boom required when ordering a 7-TR with manual or pneumatic polarization; a boom is not included. For a list of available booms, see *Boom Options* on page 11.



- The boom is attached to the carrier and is locked into position with a hand knob clamp. Standard mount knobs are included with the boom to attach antennas securely to the boom.
- Three horizontal legs extend from the base to support the mast and maximize stability. Each leg has a caster with height adjustment for leveling the mast on uneven surfaces. For convenient storage, the legs can be folded upward and the top section of the mast removed.

## **Boom Options**

---

A variety of booms for the 7-TR are available, depending on your antenna model(s) and polarization requirements. For additional information see *Replacement and Optional Parts* on page 18.

<b>Boom Type</b>	<b>Function</b>
Straight (109042)	For general antenna mounting on a 7-TR.
Offset (108983)	For general antenna mounting on a 7-TR with pneumatic or manual polarization. Can also be used to mount stinger-type antennas.
Stinger Only (118947)	For stinger mount antennas only.
Centerline Rotation (108507)	For Model 3106 Series antennas only; when changing polarization, maintains centerline rotation.  For mounting information, see <i>Mounting a Model 3106 Series Antenna</i> on page 29.

## **Polarization Options**

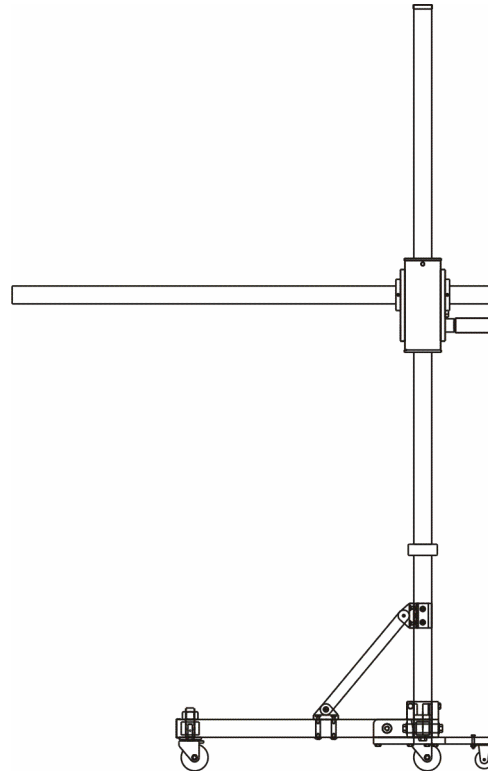
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The 7-TR is available with no polarization, with pneumatic polarization, or with manual polarization; the following sections describe each option. Additionally, a kit is available to upgrade an existing 7-TR from no polarization or manual polarization to pneumatic polarization. See *Pneumatic Polarization Upgrade Kit* on page 35 for more information.

## 7-TR WITH NO POLARIZATION

The 7-TR with no polarization option includes a standard boom assembly (109042) for general antenna mounting.

For information on assembling a 7-TR, see page 25. For information on using the 7-TR, see page 43.



## 7-TR WITH PNEUMATIC POLARIZATION



Specify the type of boom required when ordering a 7-TR with manual or pneumatic polarization; a boom is not included. For a list of available booms, see *Boom Options* on page 11.

The 7-TR with pneumatic polarization enables remote rotation of an antenna between horizontal and vertical positions while maintaining a constant rotational axis for the centerline of the antenna. A coax cable guide at one end minimizes stress on cables during use.



7-TR Tripod Positioner with Pneumatic Polarization Option  
(shown without boom installed)

The pneumatic polarization option consists of the following components:

- Air cylinder—Attaches to the carrier.  
The air cylinder is made of non-conductive material, and is connected by 6.3-mm (1/4-in) tubing to the Air Polarization Interface mounted to the base of the 7-TR. The air cylinder will polarize antennas up to 13.6 kg (30 lb).
- Twin air hose—Connects to **Air Output**.
- Air hose—Connects to **Air Input**.



The 1/4-in air hoses are UV stabilized with a 1/8-in National Pipe Thread (NPT) fitting. The customer may supply a metric fitting for a 4-mm tube.

- Air Polarization Interface—Mounts to the rear of the 7-TR mast.  
The Air Polarization Interface requires 120 VAC (230 VAC is optional), and approximately a 0.28 cubic meters/minute (1 CFM) air supply at 6 bars (90 PSI).
- Pneumatic Interface—Mounts to the rear of the 7-TR mast, above the Air Polarization Interface.
- Fiber optic cable—Using a controller such as the Model 2090 Multi-Device Controller (or next generation ETS-Lindgren controller, if applicable), enables horizontal and vertical boom rotation.

An air supply of 0.28 cubic meters per minute (1 CFM) at 6 bars (90 PSI) is required for the pneumatic polarization option. It is important to have clean, dry air; the use of a 40-micron filter in close proximity to the tripod installation is recommended (not included).

For information on assembling a 7-TR, see page 25. For information on using the 7-TR, see page 43. For information on using the polarization option, see page 46.

## 7-TR WITH MANUAL POLARIZATION



Specify the type of boom required when ordering a 7-TR with manual or pneumatic polarization; a boom is not included. For a list of available booms, see *Boom Options* on page 11.

For information on assembling a 7-TR, see page 25. For information on using the 7-TR, see page 43.

### **ETS-Lindgren Product Information Bulletin**

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See the ETS-Lindgren *Product Information Bulletin* included with your shipment for the following:

- Warranty information
- Safety, regulatory, and other product marking information
- Steps to receive your shipment
- Steps to return a component for service
- ETS-Lindgren calibration service
- ETS-Lindgren contact information

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## 2.0 Maintenance

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### CAUTION

Before performing any maintenance, follow the safety information in the ETS-Lindgren *Product Information Bulletin* included with your shipment.



Maintenance of the Model 7-TR is limited to external components such as cables or connectors.

If you have any questions concerning maintenance, contact ETS-Lindgren Customer Service.

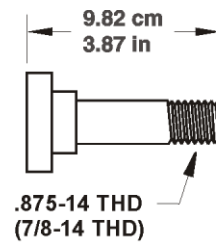
### O-Ring Lubricant

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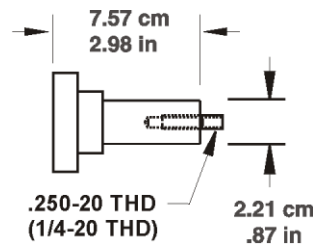
To prevent excessive wear of the O-rings, the air cylinder included with the pneumatic polarization option uses an O-ring lubricant that can be purchased from a seal or bearing store. To purchase O-ring lubricant from ETS-Lindgren, see *Replacement and Optional Parts* on page 18 for the part number.

## Boom Antenna Mount Knobs

Each boom option for the Model 7-TR Tripod Positioner includes two boom antenna mount knobs. The mount knobs can be threaded through the perforated boom and into the antenna mount to secure an antenna into place. For additional mount knobs contact ETS-Lindgren Customer Service.



Part number  
104136



Part number  
104169

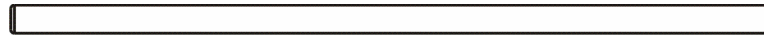
## Replacement and Optional Parts



ETS-Lindgren may substitute a similar part or new part number with the same functionality for another part/part number. Contact ETS-Lindgren for questions about part numbers and ordering parts.

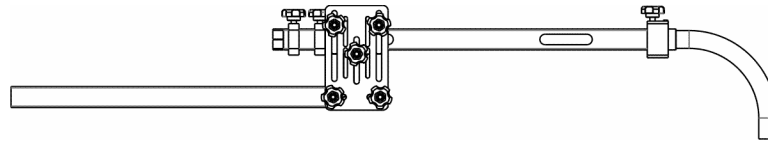
Part Description	Part Number
<b>7-TR Tripod Options</b>	
1. 7-TR Tripod, No Polarization	7-TR
2. 7-TR Tripod, Pneumatic Polarization	7-TR/POL
3. 7-TR Tripod, Manual Polarization	7-TR/POL-M
Pneumatic Polarization Upgrade Kit	112413
Boom Antenna Mount Knob, 0.875-14 THD (7/8-14)	104136
Boom Antenna Mount Knob, 0.250-20 THD (1/4-20)	104169
O-Ring Lubricant	890437

Part Description	Part Number
<b>Boom Assembly Options</b>	
1. Boom Assembly, Antenna Mounting, Straight—Standard for general antenna mounting on 7-TR	109042



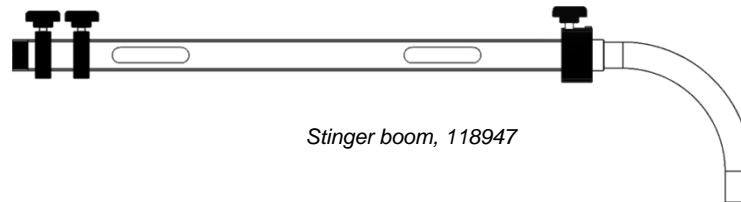
*Straight boom, 109402*

2. Boom Assembly, Antenna Mounting, Offset—Standard for general antenna mounting on 7-TR/POL and 7-TR/POL-M; can also be used to mount stinger-type antennas	108983
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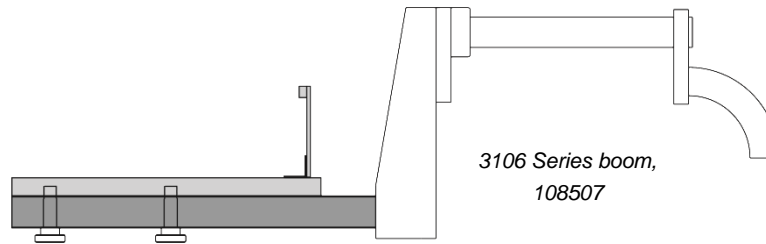
*Offset boom, 108983*

3. Boom, Stinger Only— For stinger-mount antennas only.	118947
---	--------



*Stinger boom, 118947*

Part Description	Part Number
4. Boom Assembly, Antenna Mounting, 3106—For mounting Model 3106 antennas only	108507



For mounting information, see *Mounting a Model 3106 Series Antenna* on page 29.



*Model 3106B shown mounted onto 7-TR/POL-M with optional 108507 centerline rotation boom*

## **Service Procedures**

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For the steps to return a system or system component to ETS-Lindgren for service, see the *Product Information Bulletin* included with your shipment.

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### 3.0 Specifications

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#### Physical Specifications

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<b>Height:</b>	217.9 cm (85.8 in)
<b>Width:</b>	109.5 cm (43.1 in)
<b>Depth:</b>	154.9 cm (61 in)
<b>Weight (with pneumatic polarization option):</b>	26 kg (58 lbs)
<b>Load Capacity:</b>	13.6 kg (30 lbs)

#### Electrical Specifications–Pneumatic Polarization Option

---

	110 V	220 V
<b>Power Supply:</b>	160 mA	80 mA
<b>Frequency:</b>	60 Hz	50 Hz
<b>Power Input:</b>	160 mA	80 mA
<b>Interface Device:</b>	500 mA 12 VDC	300 mA 12 VDC
<b>I/O Ports:</b>	ST Fiber Optic Input	ST Fiber Optic Input

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## 4.0 Assembling the 7-TR

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### **CAUTION**

Before assembling or connecting any components, follow the safety information in the ETS-Lindgren *Product Information Bulletin* included with your shipment.

### **Recommended Tools**

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- 15- or 20-cm (6- or 8-in) adjustable open-end wrench
- #2 Phillips screwdriver
- #3 Phillips screwdriver
- Hex key

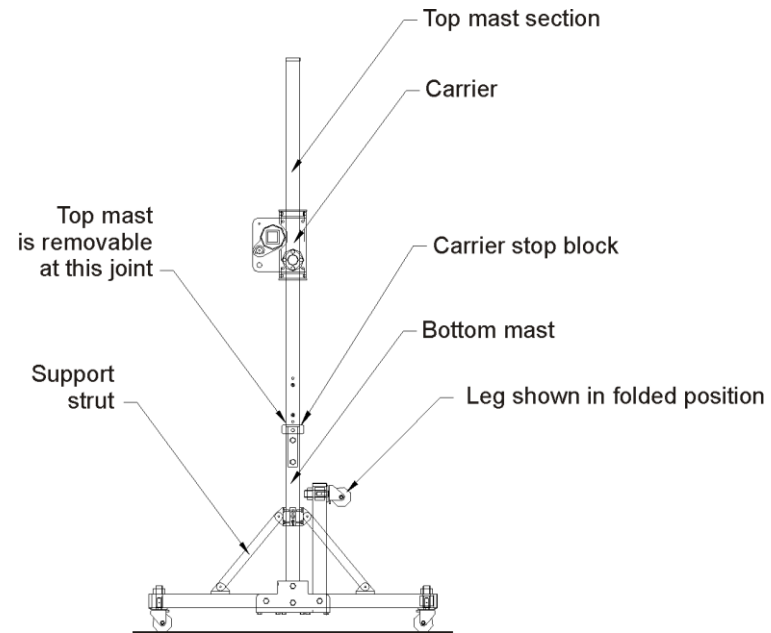
### **Assembly Components**

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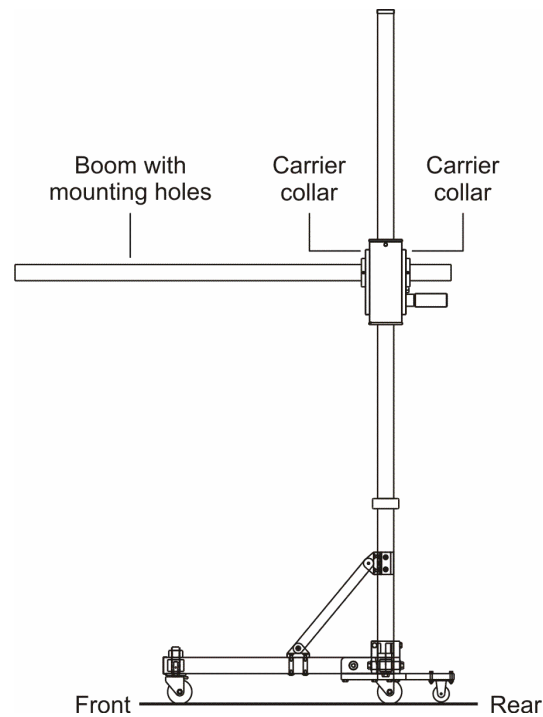
- Mast assembly with carrier and folded legs
- Top mast section
- Boom antenna mount knob, 0.250-20 (1/4-20)
- Boom antenna mount knob, 0.875-14 (7/8-14)
- Boom assembly
- Mounting hardware

## Assembly Steps

---



1. Remove the three lock pins that hold the three legs against the mast. You will re-use the lock pins in the next step.
2. Lower the three legs and secure the support struts to the mast with the lock pins.
3. Place the base of the Model 7-TR Tripod Positioner on the floor and install the top mast section onto the bottom mast.



4. Install the boom:
  - Orient the boom so the mounting holes are to the front of the 7-TR. If the boom has a cable guide (not shown), orient the cable guide to the rear of the 7-TR.
  - If the boom has a cable guide, remove the cable guide from the end of the boom.
  - Insert the end of the boom through the front and rear carrier collars, leaving five inches of boom on the hand knob clamp side of the carrier.
  - Secure the boom with the 1/4-20 set screws located in the carrier collars.
5. If the boom has a cable guide, reinstall the cable guide.



See *Operation* on page 42 for information on adjusting boom height, leg height, and mounting an antenna.

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## 5.0 Mounting a Model 3106 Series Antenna

### CAUTION

Before connecting any components or operating the Model 7-TR, follow the safety information in the ETS-Lindgren *Product Information Bulletin* included with your shipment.

### CAUTION

You will need assistance from two team members to mount a Model 3106 Series antenna to the 7-TR.



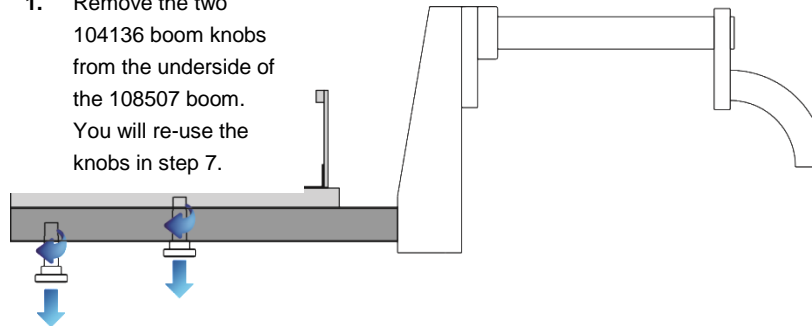
You must install the 108507 boom onto the 7-TR before performing these steps. For clarity, the following illustrations do not show the 7-TR.



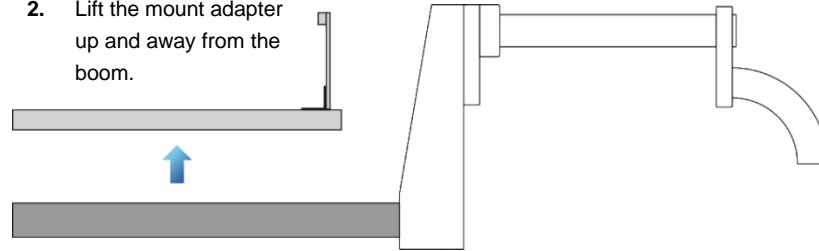
ETS-Lindgren may substitute a similar part with the same functionality for another part (for example, a wingnut for a hex nut).

The following steps to mount a Model 3106B Double-Ridged Waveguide Horn Antenna onto a 108507 boom apply to all Model 3106 Series antennas.

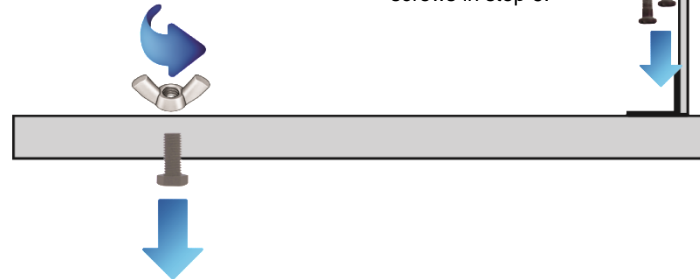
1. Remove the two 104136 boom knobs from the underside of the 108507 boom. You will re-use the knobs in step 7.



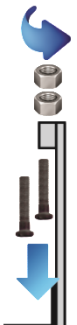
2. Lift the mount adapter up and away from the boom.



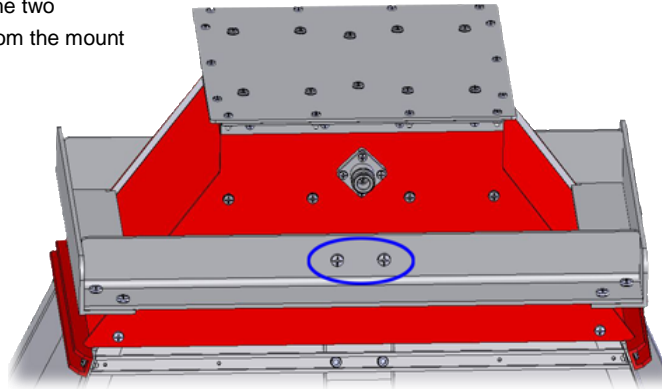
3. Remove the wingnut to free the 1/4-20 screw from the mount adapter. You will re-use the screw in step 6.



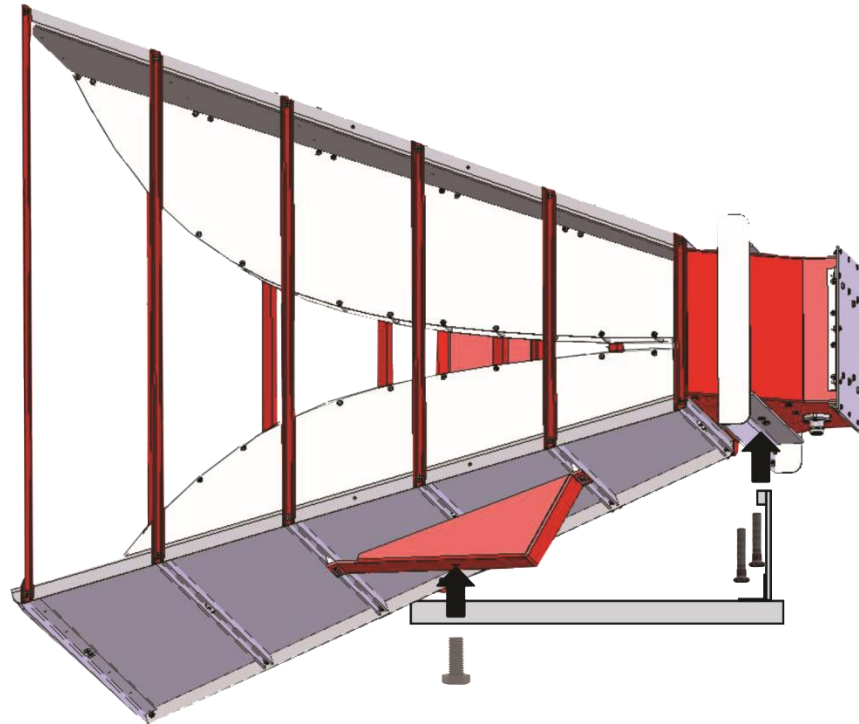
4. Remove the nuts to free the two screws from the vertical plate on the mount adapter. You will re-use the screws in step 6.



5. On the side of the Model 3106B with the antenna connector, remove the two screws from the mount plate.



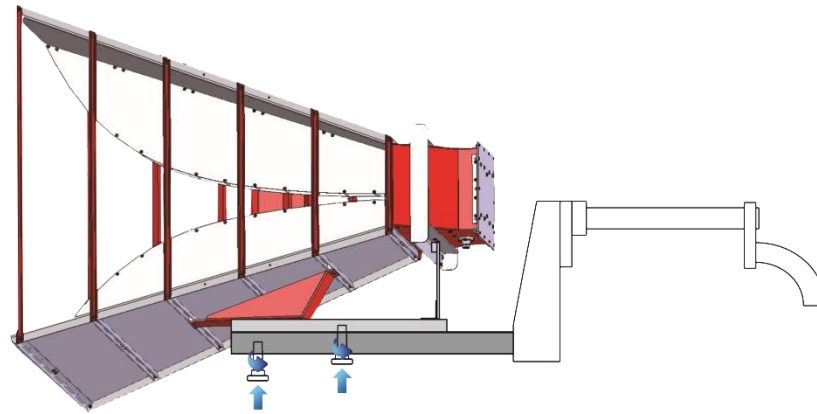
Retain these two screws for future use; if you remove the Model 3106B from the 7-TR, you will need to replace these screws to provide support for the inner ridge of the antenna.



**6. Attach mount adapter to the Model 3106B:**

- Using the two screws removed in step 4, insert the screws through the lip on the vertical part of the mount adapter and into the two holes on the antenna. Tighten to secure.
- Using the screw removed in step 3, insert the screw through the horizontal part of the mount adapter and into the mount block on the antenna. Tighten to secure.





- 7. Attach the mounted assembly to the boom:** Use the two 104136 knobs removed in step 1 to attach the antenna and mount adapter assembly to the boom. Tighten to secure.

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## 6.0 Pneumatic Polarization Upgrade Kit

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### **CAUTION**

Before assembling or connecting any components, follow the safety information in the ETS-Lindgren *Product Information Bulletin* included with your shipment.

### **Assembly Components**

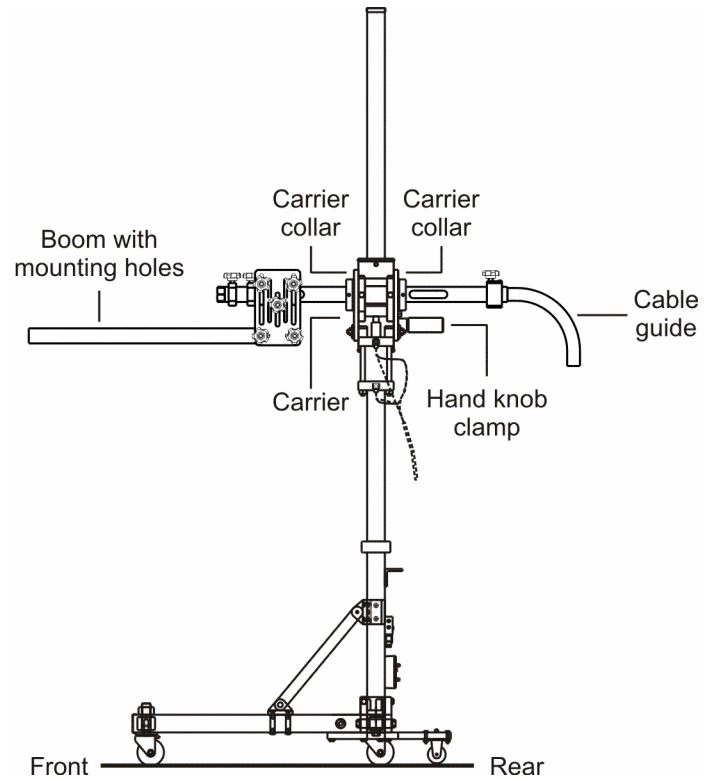
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The Pneumatic Polarization Upgrade Kit for the Model 7-TR Tripod Positioner upgrades a 7-TR with no polarization or manual polarization to pneumatic polarization. The kit includes these major components:

- Carrier
- Air cylinder
- Air Polarization Interface
- Pneumatic Interface
- Power supply
- Air hoses
- Mounting hardware

## Assembly Steps

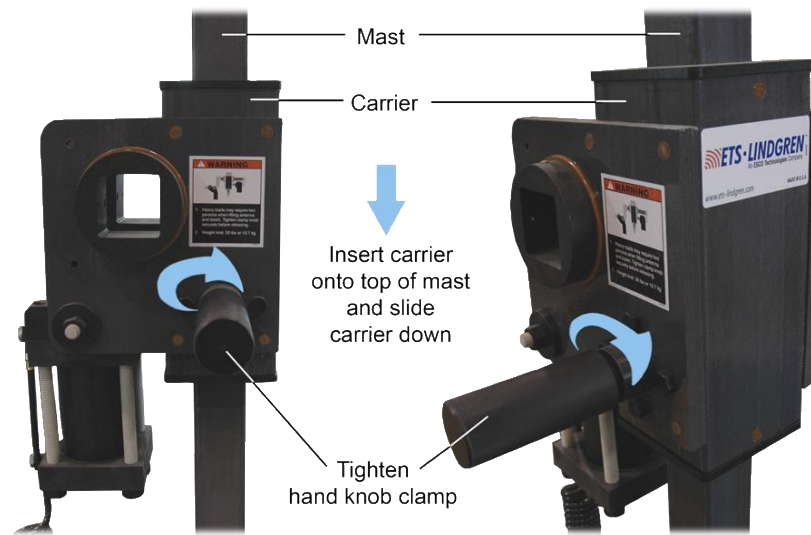
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1. Remove the boom from the carrier on the 7-TR:
  - Remove the 1/4-20 set screws located in the carrier collars that secure the boom.
  - If the boom has a cable guide, remove the cable guide from the end of the boom.
  - Completely remove the boom from the carrier by withdrawing it towards the front of the 7-TR.

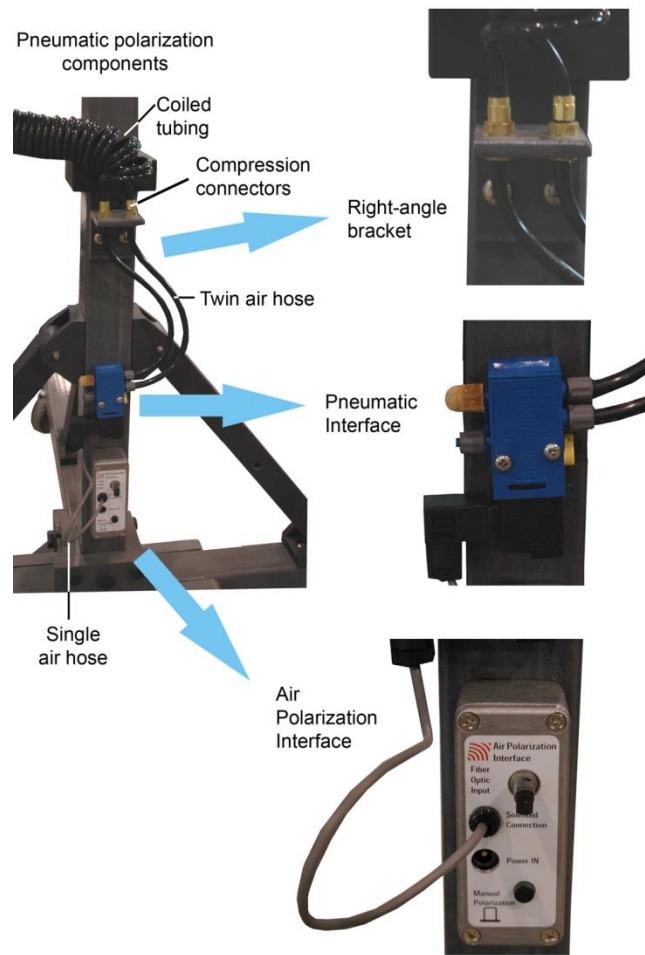
2. Remove the carrier from the mast on the 7-TR:

- Remove protective cap from top of mast.
- Unscrew the hand knob clamp.
- Lift to completely remove the carrier from mast.



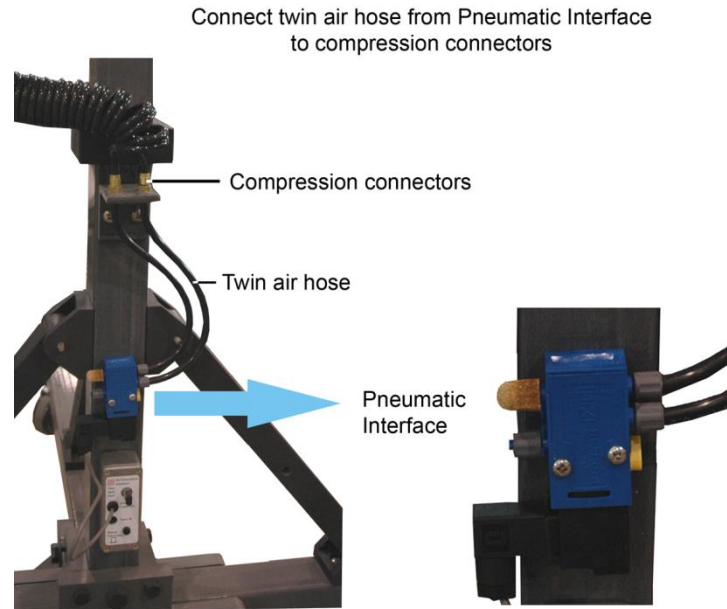
3. Install the new carrier:

- Insert the new carrier onto the top of the mast.
- Slide the carrier down the mast to the desired height.
- Tighten the hand knob clamp to secure the carrier into place.

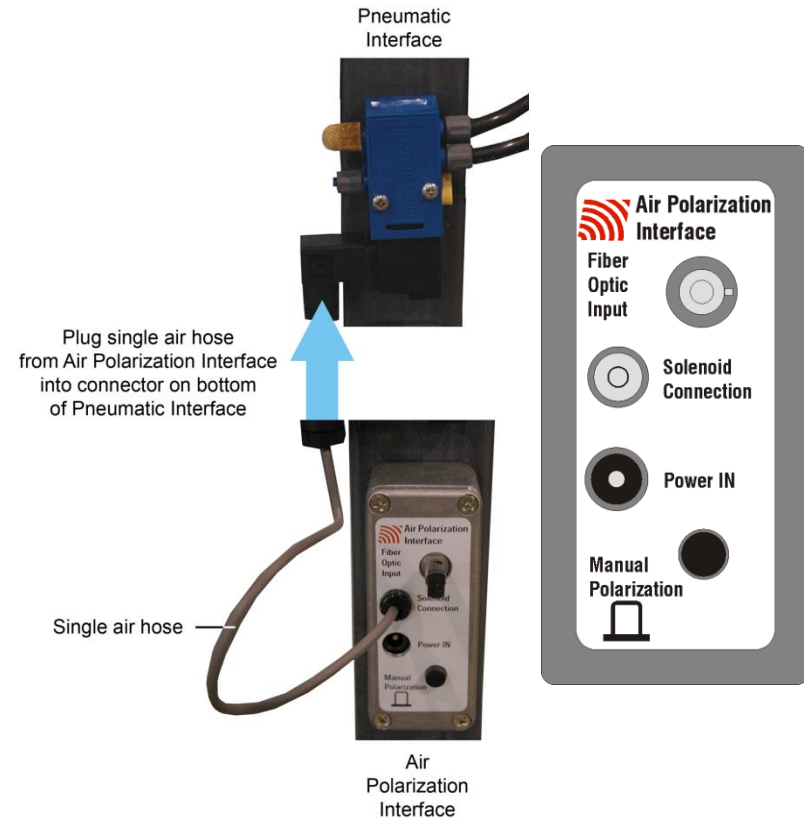


4. Install pneumatic polarization components:

- The mast includes mounting holes for the pneumatic polarization components. Place components into position as indicated in the previous illustration.
- Secure components into place with appropriate mounting hardware.

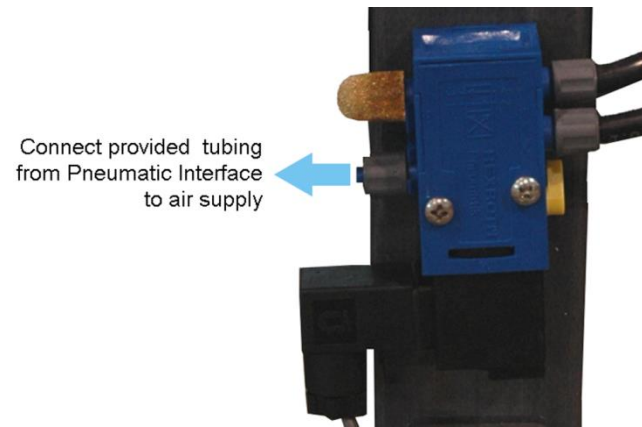


5. Connect coiled tubing from air cylinder to compression connectors on right-angle bracket.
6. Connect twin air hose:
  - Plug ends of the twin air hose into the connectors on the side of the Pneumatic Interface.
  - Plug the other ends of the twin air hose into the compression connectors on the right-angle bracket.
  - Tighten both sides of the compression connectors.



7. Plug one end of the single air hose into the **Solenoid Connection** on the Air Polarization Interface.
8. Plug the other end of the single air hose into the connector on the bottom of the Pneumatic Interface.





9. Connect tubing (provided) from Pneumatic Interface to the air supply.
10. Plug one end of the fiber optic cable into the **Fiber Optic Input** on the Air Polarization Interface.
11. Plug the other end of the fiber optic cable into the Model 2090 Multi-Device Controller (or next generation ETS-Lindgren controller, if applicable), or other controller.
12. Install the boom:
  - Orient the boom so the mounting holes are to the front of the 7-TR. If the boom has a cable guide, orient the cable guide to the rear of the 7-TR.
  - If the boom has a cable guide, remove the cable guide from the end of the boom.
  - Insert the end of the boom through the front and rear carrier collars, leaving five inches of boom on the hand knob clamp side of the carrier.
  - Secure the boom with the 1/4-20 set screws located in the carrier collars.
13. If the boom has a cable guide, reinstall the cable guide.
14. Replace the protective cap removed in step 2 onto the top of the mast.

15. Connect power:

- Plug the power cable into the **Power IN** on the Air Polarization Interface.
- Connect the power supply to the power source.



Prior to mounting an antenna or using the 7-TR, see *Operation* on page 42.

## 7.0 Operation

---

### CAUTION

Before connecting any components or operating the Model 7-TR, follow the safety information in the ETS-Lindgren *Product Information Bulletin* included with your shipment.

### General Antenna Mounting Information

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If using a Model 7-TR with pneumatic polarization, test the air polarization speed prior to mounting an antenna. For the steps to adjust air polarization speed, see page 46.



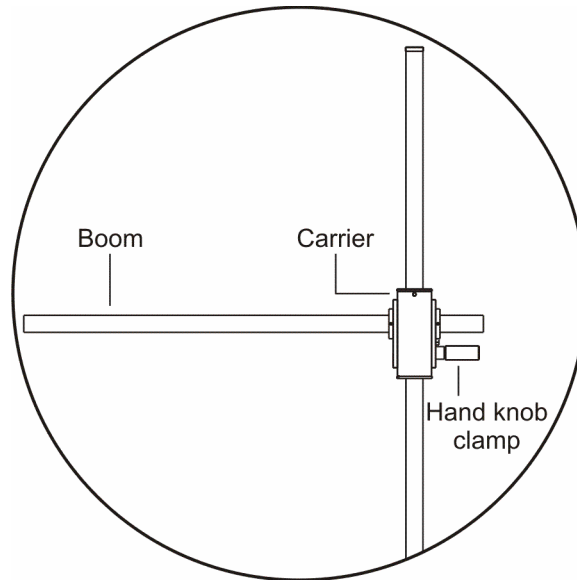
ETS-Lindgren antennas can be attached to the boom on the Model 7-TR Tripod Positioner using either the 104136 or 104169 boom antenna mount knob. The boom includes mounting holes for attaching antennas.



To reduce stress and deflection, attach the antenna as close to the carrier as possible.

## Adjusting the 7-TR Boom Height

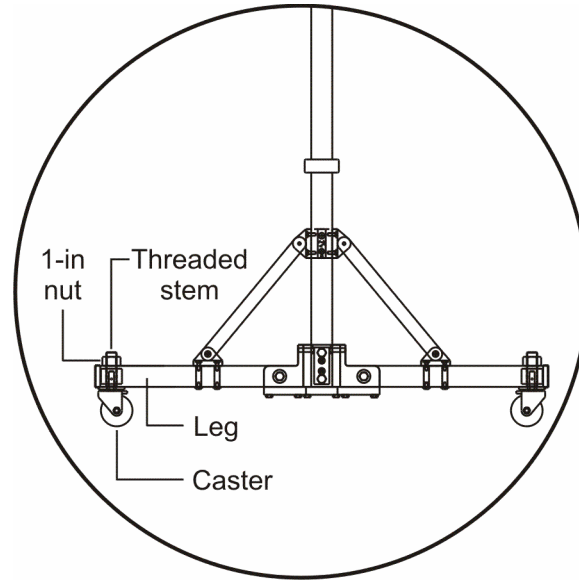
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1. Grasp the hand knob clamp with one hand while supporting the boom with the other.
2. Loosen the hand knob clamp, and then lower or raise the carrier to the desired height.
3. Tighten the hand knob clamp to secure the carrier and boom into place.

## Adjusting the 7-TR Leg Height

---



The casters include a threaded stem that can be rotated to raise or lower the extension leg. To adjust the height:

1. Loosen the 1-in plastic hexagonal nut on the top of the stem.
2. Rotate the base of the stem just below the leg.
3. Repeat for the remaining leg.

## Using the Pneumatic Polarization Option

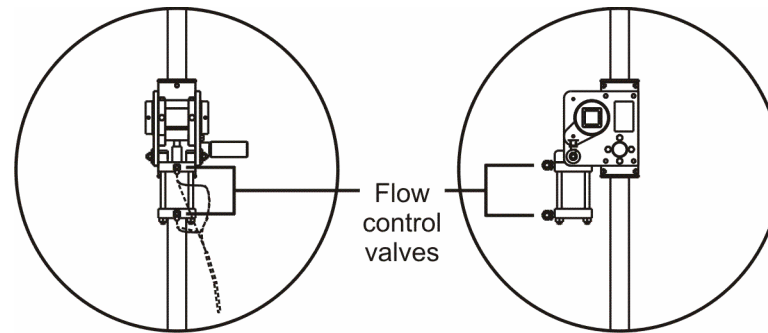
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### ADJUSTING AIR POLARIZATION SPEED

**CAUTION**

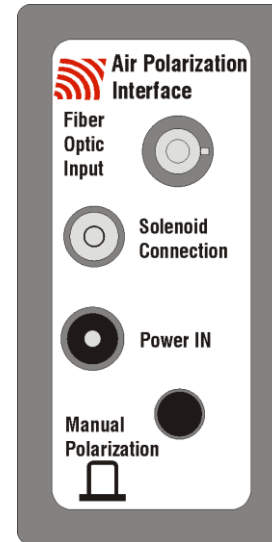
Damage to the antenna may occur if the air polarization speed is set too high. Adjust the flow control valves to prevent damage.

Flow control valves attached to the air cylinder allow variable speed on polarization cycling. Use a small screwdriver to adjust the air flow through the two 90-degree fittings.



## USING PNEUMATIC POLARIZATION

1. Turn on the air supply and power.
2. Press the **Manual Polarization** button on the Air Polarization Interface.
3. Adjust polarization speed as necessary.



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## Appendix A: Warranty

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See the *Product Information Bulletin* included with your shipment for the complete ETS-Lindgren warranty for your Model 7-TR.

### DURATION OF WARRANTIES FOR MODEL 7-TR

All product warranties, except the warranty of title, and all remedies for warranty failures are limited to two years.

Product Warranted	Duration of Warranty Period
Model 7-TR Tripod Positioner	2 Years