

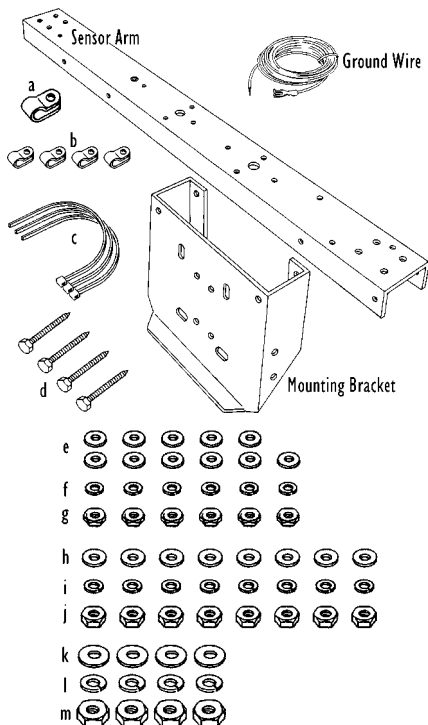
# SENSOR MOUNTING ARM

The Sensor Mounting Arm provides an ideal mounting location for all of your Davis weather station sensors. This manual is designed to take you through the process required to assemble and mount the Sensor Mounting Arm. Please take the time to read through this manual before beginning.

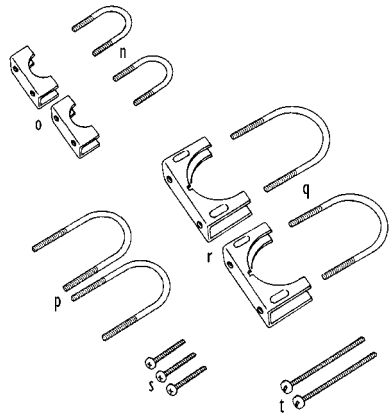
## COMPONENTS

The Sensor Mounting Arm includes the following components. Please make sure you have all listed components before continuing.

- ◆ Sensor Arm
- ◆ Mounting Bracket
- ◆ 16.5-foot (5 m) Ground Wire
- ◆ Installation Hardware Kit
  - a. One 3/8" Cable Clamp
  - b. Four 3/16" Cable Clamps
  - c. Three 3/8" Cable Ties
  - d. Four 1/4" x 1-1/2" (38 mm) Lag Screws
  - e. Eleven #8 Flat Washers
  - f. Six #8 Split Lock Washers
  - g. Six #8-32 Hex Nuts
  - h. Eight 1/4" Flat Washers
  - i. Eight 1/4" Split Lock Washers
  - j. Eight 1/4"-20 Hex Nuts
  - k. Four 5/16" Flat Washers
  - l. Four 5/16" Split Lock Washers
  - m. Four 5/16"-18 Hex Nuts



- n. Two 1/2" U-Bolts (for anemometer arm)
- o. Two 1/2" Saddles
- p. Two 1-1/2" U-Bolts (for pipe with outside diameter between 1" and 1-1/4" (25 mm and 31 mm))
- q. Two 2-1/4" U-Bolts (for pipe with outside diameter between 1-1/2" and 2-3/8" (38 mm and 60 mm))
- r. Two 2-1/4" Saddles
- s. Three #8-32 x 3/4" (19 mm) Screws
- t. Two #8-32 x 2 -1/2" (64 mm) Screws



## TOOLS AND MATERIALS NEEDED

In addition to the components listed above, you will need some of the following tools and materials. Please be sure you have everything you need before beginning the installation.

- ◆ Medium Phillips Screwdriver
- ◆ Wrench or Pliers
- ◆ 11/32" (9 mm) Nut Driver or Socket Wrench

If mounting the anemometer on the same side as the Radiation Shield.

## ASSEMBLING THE SENSOR MOUNTING ARM

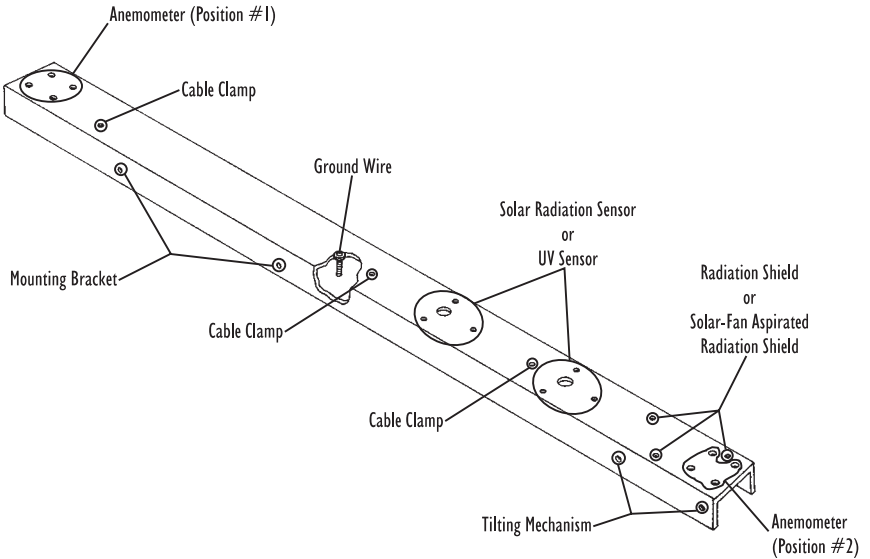
The assembly of the sensor arm involves attaching the mounting bracket and then attaching all desired sensors. Instructions for attaching sensors (other than the anemometer) to the Sensor Mounting Arm are contained in the manual for that sensor or for the accessory which allows that sensor to be attached (such as the Radiation Shield or the Rain Collector Shelf). The Sensor Mounting Arm includes provisions for attaching the following sensors:

- ◆ Anemometer
- ◆ External Temperature Sensor, External Temperature/Humidity Sensor, or Stainless Steel Temperature Probe (with Radiation Shield or Solar-Fan-Aspirated Radiation Shield)
- ◆ Rain Collector (with Rain Collector Shelf)
- ◆ UV Sensor (with or without Tilting Mechanism)
- ◆ Solar Radiation Sensor (with or without Tilting Mechanism)

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## The Sensor Arm

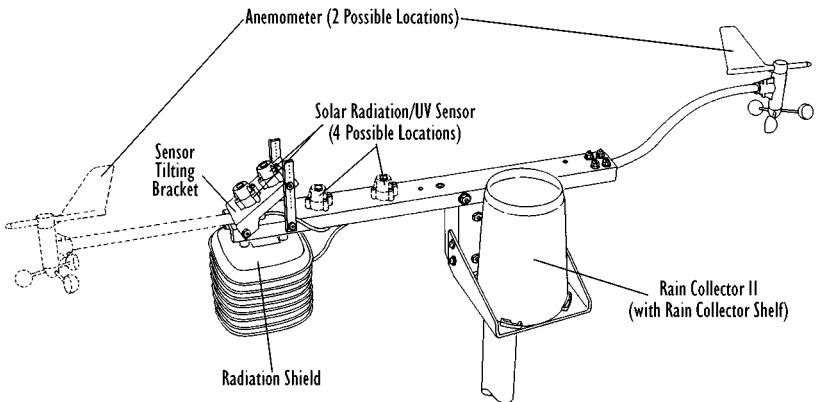
The illustration below shows the sensor arm and indicates which holes are used by the various sensors, brackets, and accessories.



*SENSOR ARM HOLE ASSIGNMENTS*

## Typical Sensor Mounting Arm Installation

The illustration below shows a typical Sensor Mounting Arm installation with all possible sensors attached to the sensor arm.



*TYPICAL SENSOR MOUNTING ARM INSTALLATION*

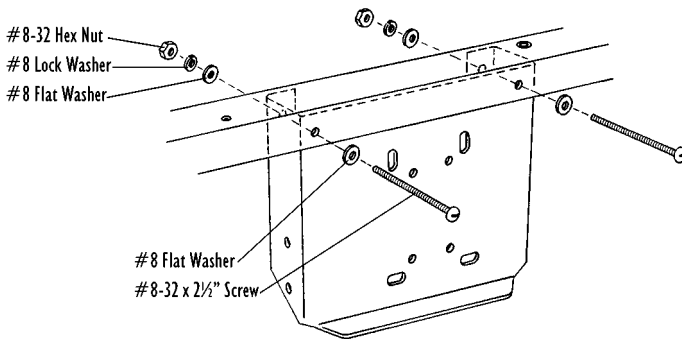
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## ATTACHING THE MOUNTING BRACKET

In order to attach the mounting bracket to the sensor arm, you will need the sensor arm, mounting bracket, two #8-32 x 2-1/2" screws, four #8 flat washers, two #8 split lock washers, and two #8-32 hex nuts.

1. Place one #8 flat washer over the end of each of the #8-32 x 2-1/2" screws.
2. Position the mounting bracket so the holes in the mounting bracket line up with the appropriate holes on the sensor arm.
3. Slide each of the #8-32 x 2-1/2" screws (with washer) through the holes on the sensor arm and the mounting bracket.
4. Secure the mounting bracket to the sensor arm using a #8 flat washer, #8 split lock washer, and a #8-32 hex nut on each screw end.

Tighten until the mounting bracket is securely fastened to the sensor arm.



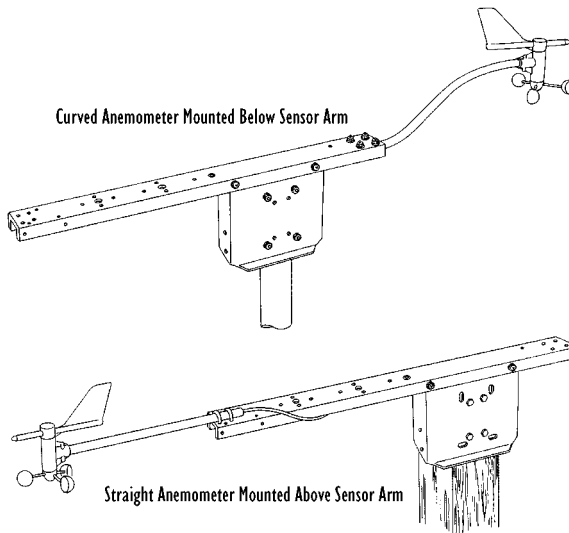
ATTACHING THE MOUNTING BRACKET

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## ATTACHING THE ANEMOMETER

You may mount the anemometer on either side of the sensor arm. The preferred mounting location for the anemometer is on the end closest to the mounting bracket. However, if you have an anemometer with a straight arm *and* a Rain Collector attached to the Sensor Mounting Arm, the Rain Collector might create obstruction problems which result in inaccurate wind speed and direction readings. In this case (and only in this case), you may want to mount the anemometer on the end farthest from the mounting bracket.

In general, you should mount the anemometer below the sensor arm, following the instructions in “Attaching the Anemometer Below the Sensor Arm (Preferred)” on page 6. If, however, you need to mount the anemometer arm on the end farthest from the mounting bracket *and* you have a radiation shield mounted on that side as well, attach the anemometer above the sensor arm, following the instructions in “Attaching the Anemometer Above the Radiation Shield” on page 9.

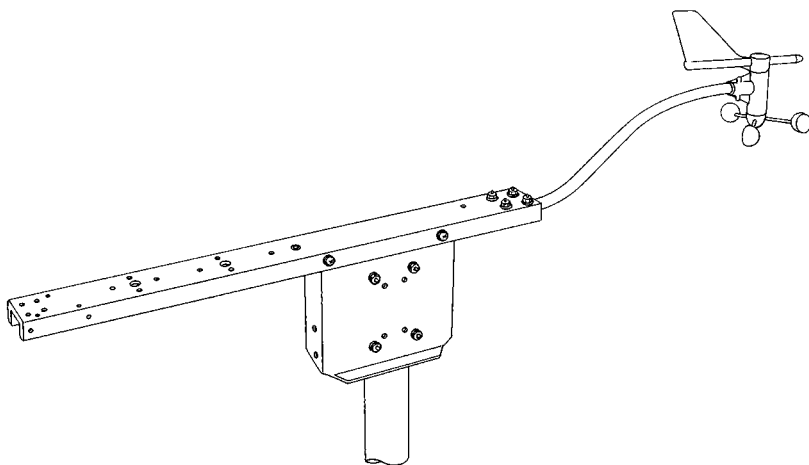


TYPICAL ANEMOMETER MOUNTS

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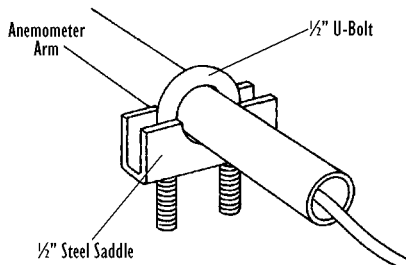
## Attaching the Anemometer Below the Sensor Arm (Preferred)

To attach the anemometer below the sensor arm, you will need the anemometer, sensor arm, two 1/2" U-bolts, two 1/2" saddles, four 1/4" flat washers, four 1/4" split lock washers, four 1/4" hex nuts, one cable clamp, one #8-32 x 3/4" screw, one #8 flat washer, and one #8-32 hex nut.



*ANEMOMETER ATTACHED BELOW SENSOR ARM*

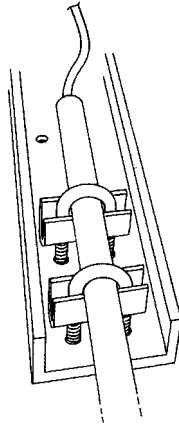
1. If necessary, disconnect the anemometer from your weather station.  
Your weather station manual contains instructions for connecting the two. Simply reverse the directions to disconnect them.
2. If necessary, disconnect the anemometer arm from the anemometer base.  
Your weather station manual contains instructions for connecting the two. Simply reverse the directions to disconnect them.
3. Place one of the 1/2" U-bolts over the anemometer arm.
4. Slide one of the saddles over the end of the U-bolt so the anemometer arm is contained in the circle created by the U-bolt and the saddle.



*PLACE U-BOLT AND SADDLE ON ANEMOMETER ARM*

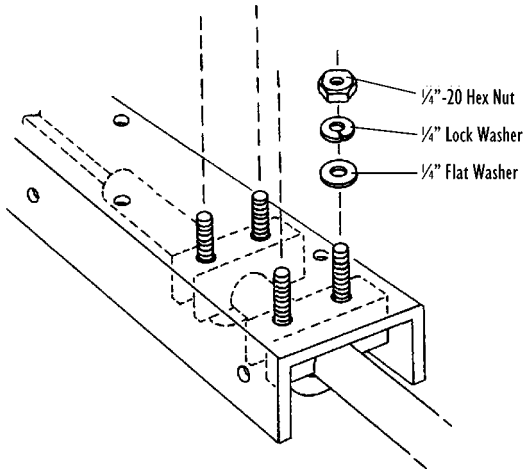
5. Repeat this process for the other 1/2" U-bolt and saddle.

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6. Slide the ends of the U-bolts into the appropriate holes at the end of the sensor arm nearest the mounting bracket.



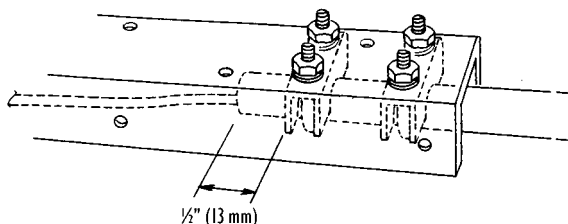
*SLIDE U-BOLTS INTO HOLES*

7. Secure the U-bolts and anemometer arm in place using a 1/4" flat washer, 1/4" split lock washer and 1/4" hex nut on each of the U-bolt ends.  
Tighten the hex nuts with your hand so the arm is gently held in place. Do not tighten fully until instructed to do so later on.



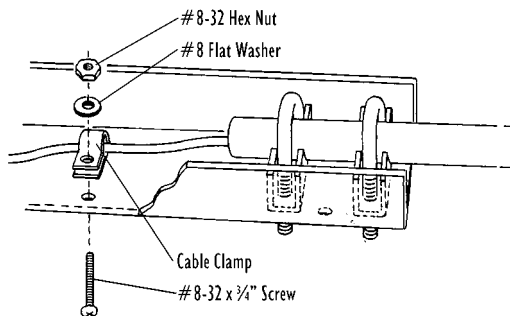
*ATTACH THE U-BOLTS AND ANEMOMETER ARM*

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- Slide the anemometer arm backwards/forwards until the end of the anemometer arm extends just 1/2" (13 mm) past the second U-bolt/saddle.



*POSITION ANEMOMETER ARM*

- Once the anemometer arm is correctly positioned, tighten the hex nuts. In order to keep the anemometer arm steady in high winds, tighten the hex nuts until you notice the anemometer arm just begin to buckle underneath the U-Bolt.
- Place a cable clamp around the anemometer cable.
- Slide a #8-32 x 3/4" screw down through the indicated hole on the sensor arm.



*ATTACH THE CABLE CLAMP*

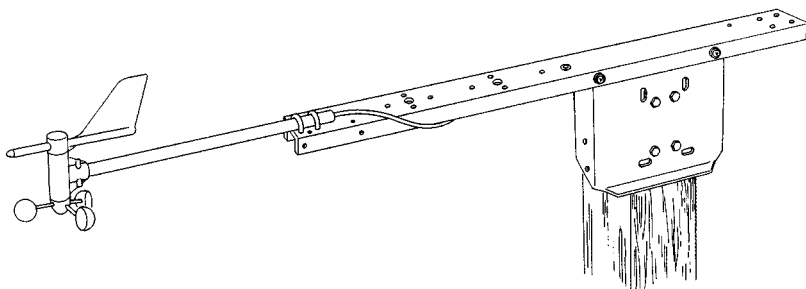
- Slide the hole in the cable clamp over the end of the #8-32 x 3/4" screw.
- Secure the cable clamp and cable in place using an #8 flat washer and an #8-32 hex nut. Tighten the hex nut until the cable is held snugly within the cable clamp.



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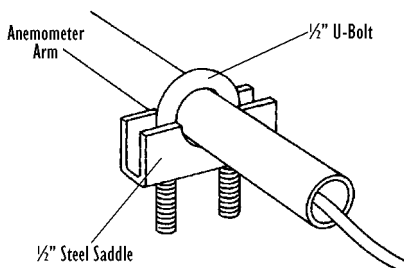
## Attaching the Anemometer Above the Radiation Shield

To attach the anemometer above the sensor arm, you will need the anemometer, sensor arm, two 1/2" U-bolts, two 1/2" saddles, four 1/4" flat washers, four 1/4" split lock washers, four 1/4" hex nuts, one cable clamp, one #8-32 x 3/4" screw, one #8 flat washer, and one #8-32 hex nut.



*ANEMOMETER ATTACHED ABOVE SENSOR ARM*

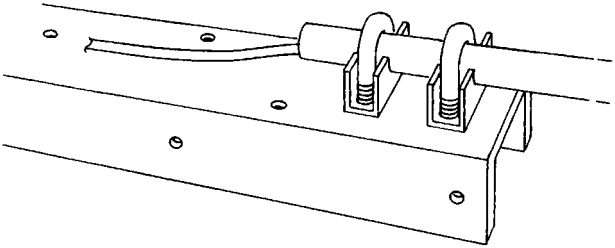
1. If necessary, remove the Radiation Shield from the sensor arm.  
You cannot mount the anemometer above the Radiation Shield if the radiation shield has already been attached to the sensor arm.
2. If necessary, disconnect the anemometer from your weather station.  
Your weather station manual contains instructions for connecting the two. Simply reverse the directions to disconnect them.
3. If necessary, disconnect the anemometer arm from the anemometer base.  
Your weather station manual contains instructions for connecting the two. Simply reverse the directions to disconnect them.
4. Place one of the 1/2" U-bolts over the anemometer arm.
5. Slide one of the saddles over the end of the U-bolt so the anemometer arm is contained in the circle created by the U-bolt and the saddle.



*PLACE U-BOLT AND SADDLE ON ANEMOMETER ARM*

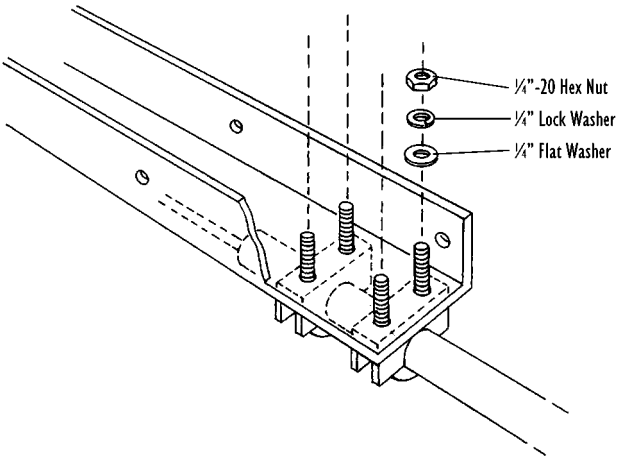
6. Repeat this process for the other 1/2" (13 mm) U-bolt and saddle.

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7. Position the U-bolts/saddles on top of the sensor arm on the side farthest from the mounting bracket so the ends of the U-bolts drop into the appropriate holes.



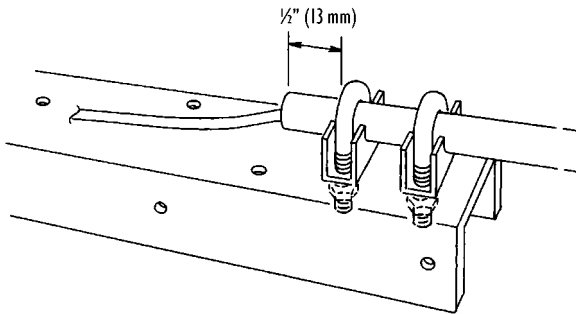
*SLIDE U-BOLTS INTO HOLES*

8. While holding the U-bolts in place, turn the sensor arm over so the protruding ends of the U-bolts are visible.
9. Secure the U-bolts and anemometer arm in place using a 1/4" flat washer, 1/4" split lock washer and 1/4" hex nut on each of the ends of the U-bolts.
- Tighten the hex nuts with your hand so the arm is gently held in place. Do not tighten fully until instructed to later on.



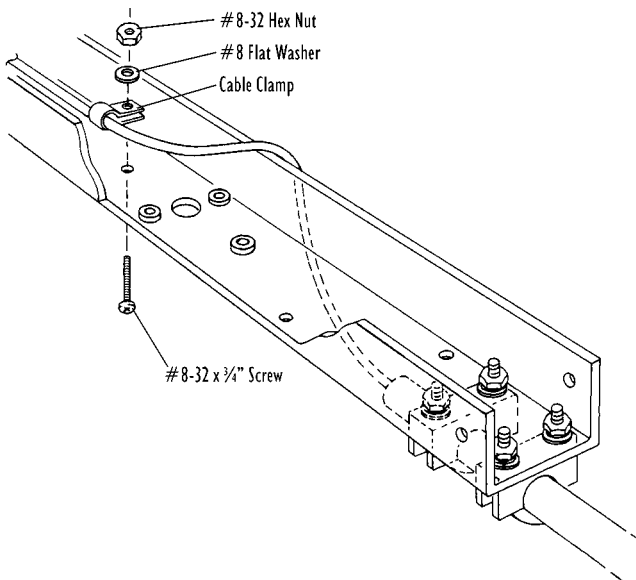
*ATTACH THE U-BOLTS AND ANEMOMETER ARM*

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10. Slide the anemometer arm backwards/forwards until the end of the anemometer arm extends just 1/2" past the second U-bolt/saddle.



*POSITION ANEMOMETER ARM*

11. Once the anemometer arm is correctly positioned, tighten the hex nuts.  
In order to keep the anemometer arm steady in high winds, tighten the hex nuts until you notice the anemometer arm just begin to buckle underneath the U-Bolt.
12. Place a cable clamp around the anemometer cable.
13. Slide a #8-32 x 3/4" screw down through the indicated hole on the sensor arm.



*ATTACH THE CABLE CLAMP*

14. Run the anemometer cable underneath the sensor arm and slide the hole in the cable clamp over the end of the #8-32 x 3/4" screw.

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15. Secure the cable clamp and cable in place using an #8 flat washer and an #8-32 hex nut.

Tighten the hex nut until the cable is held snugly within the cable clamp.

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**Note:** When you attach (or reattach) the Radiation Shield beneath the anemometer, you will find that one of the Radiation Shield's mounting screws is between the U-bolts/saddle, and will be difficult to access. You will need a nut driver or socket wrench in order to tighten this nut.

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## MOUNTING THE SENSOR MOUNTING ARM

You may mount the sensor arm on a wooden post, onto a small pipe with an outside diameter between 1" and 1-1/4" (25 mm and 31 mm), or onto a large pipe with an outside diameter between 1-1/2" and 2-3/8" (38 mm and 60 mm).

### Mounting the Sensor Mounting Arm on a Wooden Post

To attach the Sensor Mounting Arm to a wooden post, you will need the sensor arm assembly (with mounting bracket and sensors attached), four 1/4" x 1-1/2" lag screws, and four 1/4" flat washers.

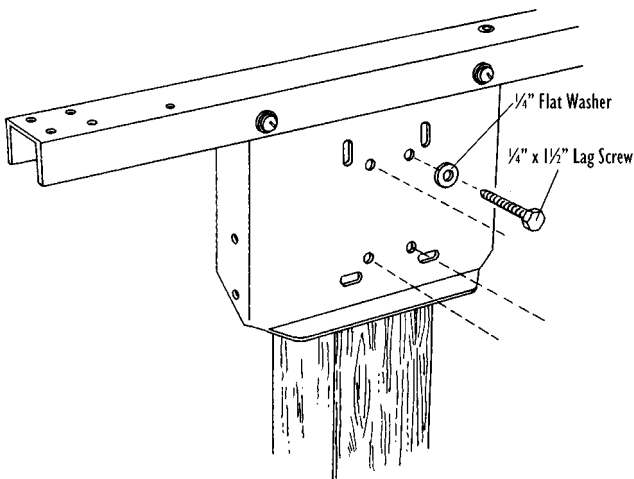
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**Note:** The Sensor Mounting Arm must be mounted at the top of the post.

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1. Position the back of the mounting bracket against the post.
2. Secure the mounting bracket to the post using the four 1/4" x 1-1/2" lag screws and the four 1/4" flat washers.

Tighten until the mounting bracket and sensor arm are held securely in place.



MOUNTING ON A WOODEN POST

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## Mounting the Sensor Mounting Arm on a Small Pipe

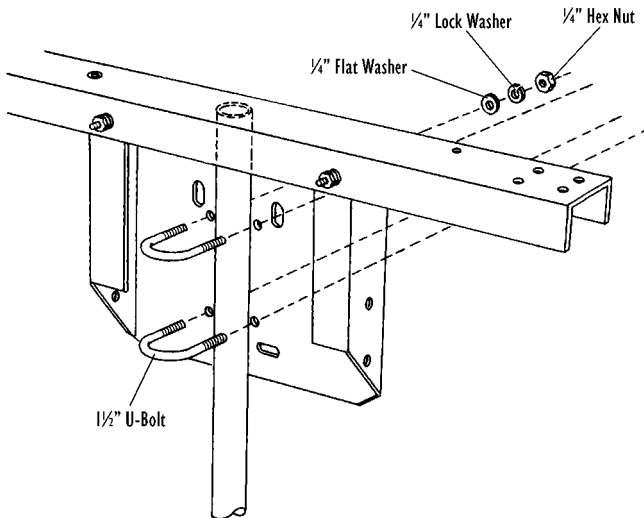
Follow the instructions below to mount the Sensor Mounting Arm on a pipe with an outside diameter between 1" and 1-1/4" (25 mm and 31 mm). To attach the sensor arm to a small pipe, you will need the sensor arm assembly (with mounting bracket and sensors attached), two 1-1/2" U-bolts, four 1/4" flat washers, four 1/4" lock washers, and four 1/4" hex nuts.

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**Note:** When mounting on a small pipe, the Sensor Mounting Arm must be mounted at the top of the pipe.

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1. Position the mounting bracket (with sensor arm) against the pipe.
2. Slide the ends of one of the 1-1/2" U-bolts (so that the U-bolt wraps around the pipe) into the holes on the mounting bracket.
3. Secure the U-bolts in place using a 1/4" flat washer, 1/4" lock washer, and a 1/4" hex nut.  
Tighten the hex nuts securely.
4. Repeat the procedure above for the other U-bolt.



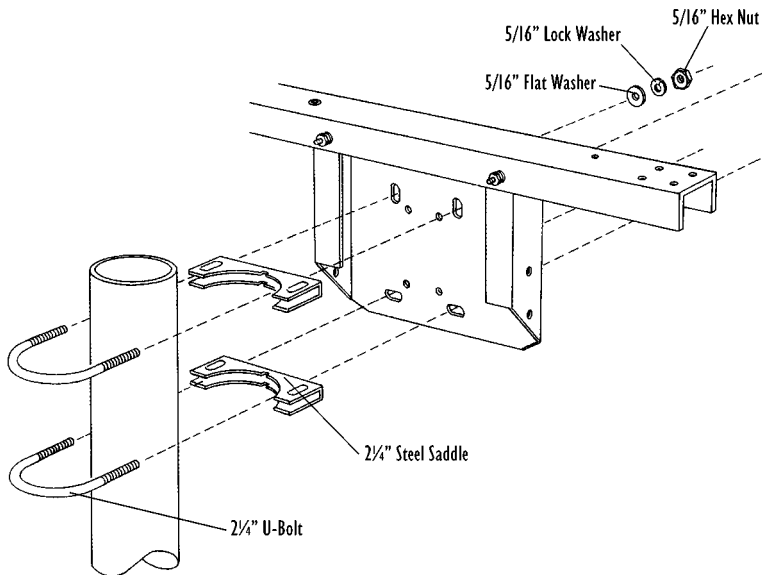
MOUNTING ON A SMALL PIPE

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## Mounting the Sensor Mounting Arm on a Large Pipe

Follow the instructions below to mount the Sensor Mounting Arm on a pipe with an outside diameter between 1-1/2" and 2-3/8" (38 mm and 60 mm). To attach to a large pipe, you will need the sensor arm assembly (with mounting bracket and sensors attached), two 2-1/4" U-bolts, two 2-1/4" saddles, four 5/16" flat washers, four 5/16" lock washers, and four 5/16" hex nuts.

1. Wrap one of the 2-1/4" U-bolts around the pipe and hold it in place.
2. Slide one of the 2-1/4" saddles over the ends of the U-bolt so that it wraps around the pipe as well.



*U-BOLTS AND SADDLES ON PIPE*

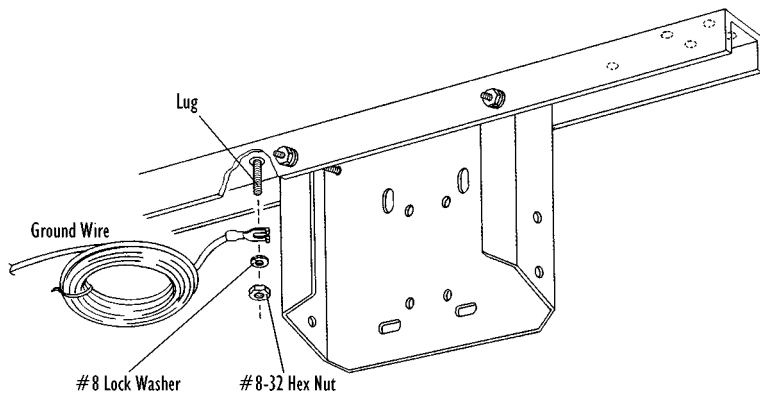
3. Repeat the steps above for the other U-bolt and saddle.
4. Slide the ends of the U-bolts into the holes on the mounting bracket.
5. Secure the U-bolt in place using a 5/16" flat washer, 5/16" lock washer, and a 5/16" hex nut.  
Tighten the hex nuts securely.

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## GROUNDING THE SENSOR MOUNTING ARM

We strongly recommend that you ground the sensor arm. You will need the 16.5' (5 m) ground wire, one #8 split lock washer, and one #8-32 hex nut.

1. Slip the ring at the end of the 16.5' (5 m) ground wire over the lug on the underside of the sensor arm.
2. Secure the ground wire to the lug using a #8 split lock washer and a #8-32 hex nut.



SECURE GROUND WIRE TO SENSOR ARM

3. Connect the other end of the ground wire to a suitable earth ground (grounded metal cold water pipe or ground rod driven into the earth).

## SAFETY AND BUILDING CODES

When installing the Sensor Mounting Arm, a 2" (5 cm) pipe should be adequate for general homeowner's backyard or open-field agricultural locations for a mounting height of 6 to 8 feet (2 to 2.5 m) provided that low wind-loading conditions apply and the pipe is anchored to a suitable foundation. (If you are unsure, consult a qualified professional for national and local codes.)

Regardless of the mounting location, local building codes must be followed. If you want to mount onto a taller mast, a building, or any location where high wind or seismic loads might be encountered, seek professional help from a structural engineer or local contractor. Remember always to use common sense.

When installing the Sensor Mounting Arm and sensors, always watch for overhead power lines. ***Electric shock, death, or damage to the sensitive electronics could result if you or the sensors come in contact with electric power lines.***

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## MAINTAINING THE SENSOR MOUNTING ARM

You should check the tightness of the various screws and U-bolts periodically. Pay particular attention to the U-bolts holding the anemometer arm in place.

## TECHNICAL SUPPORT

Before calling Technical Support (1-510-732-7814), carefully check this instruction manual for the answer to your question.

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Product Number: 7702

Davis Instruments Part Number: 7395-091  
Sensor Mounting Arm  
Rev. C Manual (7/7/99)  
DI:Weather:Accessories:Sensor Mounting Arm

This product complies with the essential protection requirements of the EC EMC Directive 89/336/EC.

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**Davis Instruments**

3465 Diablo Avenue, Hayward, CA 94545 U.S.A.