

SECTION II. INSTALLATION

6.2.1 INTRODUCTION

The modular design of the ASOS visibility sensor allows for simple assembly. All elements are wired with keyed connectors and are secured to each other with bolts. The entire single-pedestal assembly is secured to the standard mounting flange with locking bolts. The sensor head is mounted to the top of the pole and is interfaced with the electronics enclosure via supplied cables. When assembled, the scatter volume (the volume of air through which the flash transfers) is approximately 10 feet high in the air. The electronics enclosure is mounted on the support structure several feet off the ground to provide easy access for the servicing technician.

6.2.2 ASSEMBLY

6.2.2.1 **Hinge Plate Assembly.** The hinge plate assembly provides easy access to the visibility sensor's receiver and transmitter assemblies by permitting the visibility sensor to be lowered to a horizontal position. The hinge plate has a locking pin to secure the sensor in an upright position and a cable lanyard to support the sensor when it is lowered.

6.2.2.2 **Enclosure Support.** The base of the enclosure support consists of a flange containing 12 holes. Each of the holes is offset 30 degrees from adjacent holes to allow proper positioning of the enclosure support on the mounting hinge. The enclosure support is mounted on top of the hinge plate assembly using four 5/8-inch hex head bolts and associated hardware (figure 6.2.1 and table 6.2.1). Alignment of the enclosure support on the hinge plate is important to the operation of the unit. The visibility sensor should be installed such that the receiver optics and the day/night assembly are pointed away from direct sunlight. In the northern hemisphere, this aligns the receiver and day/night sensor to face north. Precise alignment of the visibility sensor may not be possible and is not considered critical; however, for the best performance, the hole pattern that provides the closest receiver alignment to face north should be selected.

6.2.2.3 **Electronics Enclosure.** Figure 6.2.1 identifies and locates the components used to install the electronics enclosure on the enclosure support. Installation procedures are provided in table 6.2.2.

6.2.2.4 **Crossarm Support.** The crossarm support is mounted on top of the enclosure support such that the calibration plate mounts face to the right of the enclosure. The crossarm support is secured to the enclosure support using four e - 11 by 2-1/2-inch HHCS's as shown on figure 6.2.2.

6.2.2.5 **Crossarm.** The crossarm is mounted to the top of the crossarm support such that the transmitter and receiver hoods are to the right of the electronics enclosure (on the same side of the support pole as the calibration plate mounts). The crossarm comes prewired for the head assemblies. As such, the wires from the crossarm need to be routed through the interior of the support pole prior to securing the crossarm to the support pole. The crossarm is secured to the crossarm support pole using four 3/8 - 16 by 1-3/4-inch HHCS's as shown on figure 6.2.2.

6.2.2.6 **Day/Night Sensor.** The day/night sensor is installed by feeding the day/night heater and signal wires through the support columns, attaching the sensor ground and cable connections, and mounting the day/night sensor to the crossarm support such that the day/night sensor is pointed 6 degrees above the horizon (Figure 6.2.3). This installation procedure is described in table 6.2.3.

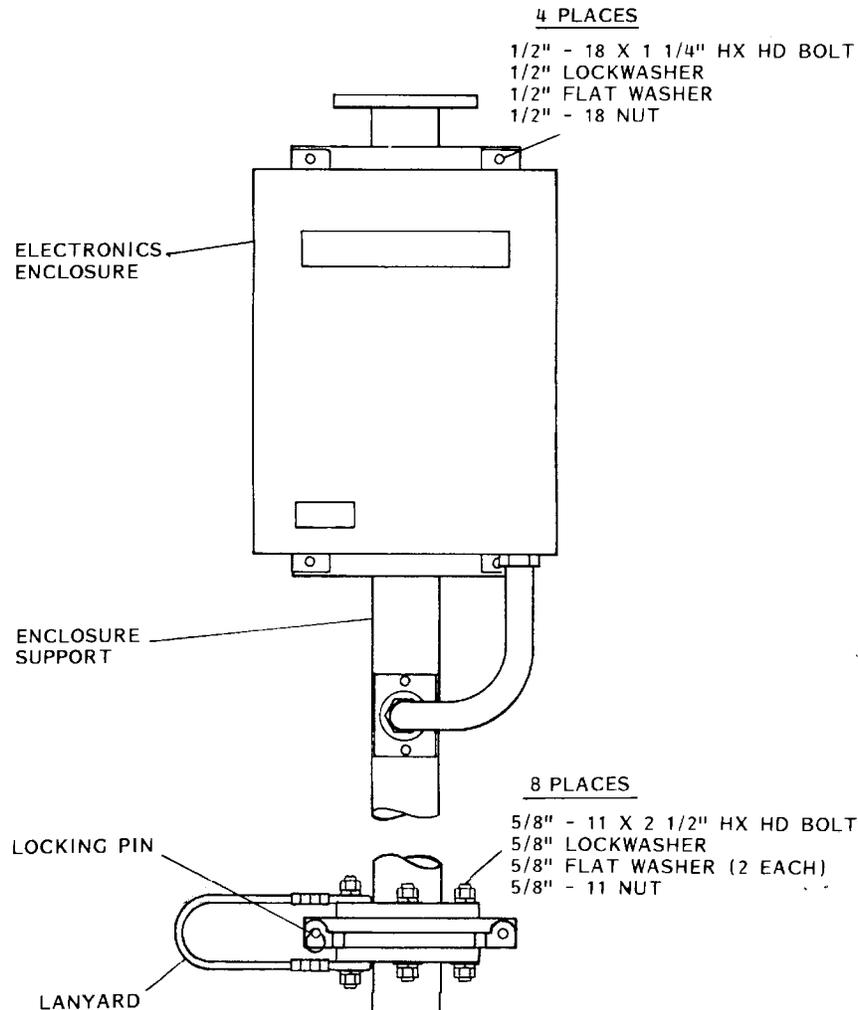


Figure 6.2.1. Electronics Enclosure Installation

Table 6.2.1. Enclosure Support Installation

Step	Procedure
1	Open hinge plate and position on mounting pedestal. For most sites, orient hinge plate so that when facing the door of enclosure, sensor tilts to right, away from other sensors (hinge side of plate is on right).
	NOTE The lanyard must be oriented so that when the hinge plate is opened, the lanyard falls in hinge plate cutouts.
2	Using one 1/2-inch bolt, one nut, one lockwasher, and three flat washers, secure opening edge of hinge plate to pedestal, attaching one end of cable lanyard. Bolt is inserted from top down through pedestal with one flat washer under bolt head. On the underside of pedestal, lanyard loop must be secured between two flat washers with lockwasher and nut on outside. Do not fully tighten hardware.
3	Install three more sets of mounting hardware (i.e., bolt, two flat washers, lockwasher, and nut) on hinge plate. Tighten all four sets of mounting hardware.

Table 6.2.1. Enclosure Support Installation -CONT

Step	Procedure
4	Install washer on each bolt and slide four mounting bolts up through top of hinge plate. Temporarily install nut on each bolt and close hinge plate. Install hinge plate locking pin to hold hinge plate in closed position.
5	Remove nuts from four enclosure support mounting holes.
6	Position enclosure support on top of four mounting bolts taking care to properly position enclosure support.
	NOTE
	The lanyard must be oriented so that when the hinge plate is opened, the lanyard falls in hinge plate cutouts.
7	Using two flat washers, one lock washer, and one nut, secure front of hinge plate to enclosure support pole, attaching other end of cable lanyard. Lanyard loop must be secured between two flat washers with lockwasher and nut on outside. Do not fully tighten hardware.
8	Install remaining sets of mounting hardware (i.e., flat washer, lockwasher, and nut) on rear, left, and right of sensor support pole.
	WARNING
	With locking pin removed from hinge plate, sensor pole is not firmly locked in upright position. Death or severe injury may result if personnel are not kept out of travel path of sensor.
9	Lower enclosure support pole on hinge plate as follows: <ol style="list-style-type: none"> a. Remove locking pin from front part of hinge plate. b. From hinge side of sensor pole, firmly grasp pole with both hands and carefully lower support pole on hinge until lanyard catches and supports weight of pole.
10	Tighten all four sets of hardware securing support pole to hinge plate.
	WARNING
	With locking pin removed from hinge plate, sensor pole is not firmly locked in upright position. Death or severe injury may result if personnel are not kept out of travel path of sensor.
11	Raise enclosure support pole on hinge plate as follows: <ol style="list-style-type: none"> a. From behind hinged side of pole, firmly grasp support pole with both hands and carefully raise pole on hinge into upright position. b. Install locking pin into front of hinge plate.

Table 6.2.2. Electronics Enclosure Installation

Step	Procedure
	NOTE
	Do not tighten screws in next step. Box flanges must be allowed to slip onto bolts.
1	Install two sets of ½ - 18 by 1-¼-inch HHCS hardware into holes on lower bracket of enclosure support.
2	Position enclosure such that lower mounting flanges slip onto bolts and enclosure is resting on bolts.
3	Position box such that upper mounting flanges align with holes in upper mounting bracket.
4	Install hardware as shown on figure 6.2.1. Firmly tighten all four sets of bolts.

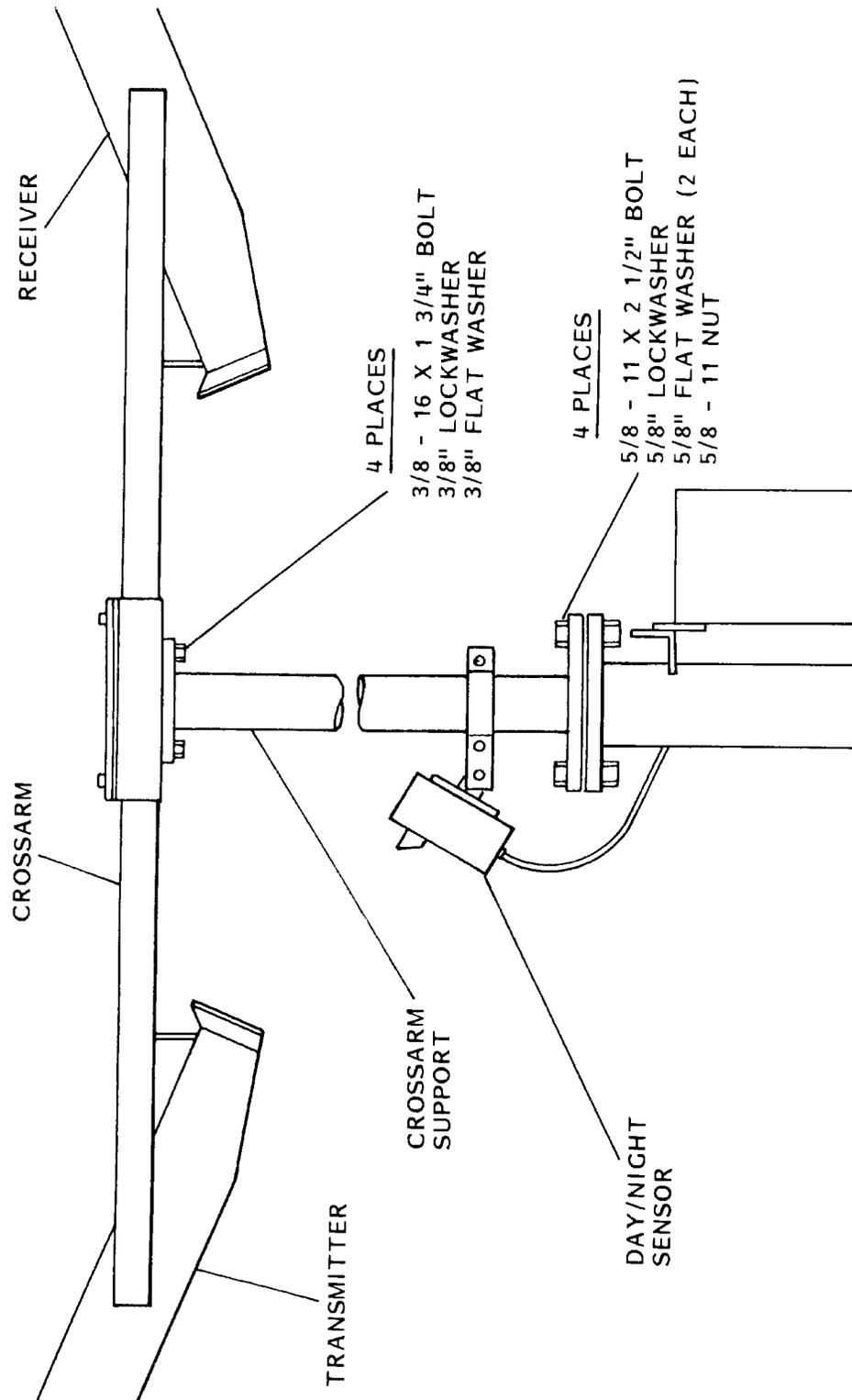


Figure 6.2.2. Crossarm/Support and Day/Night Sensor Installation

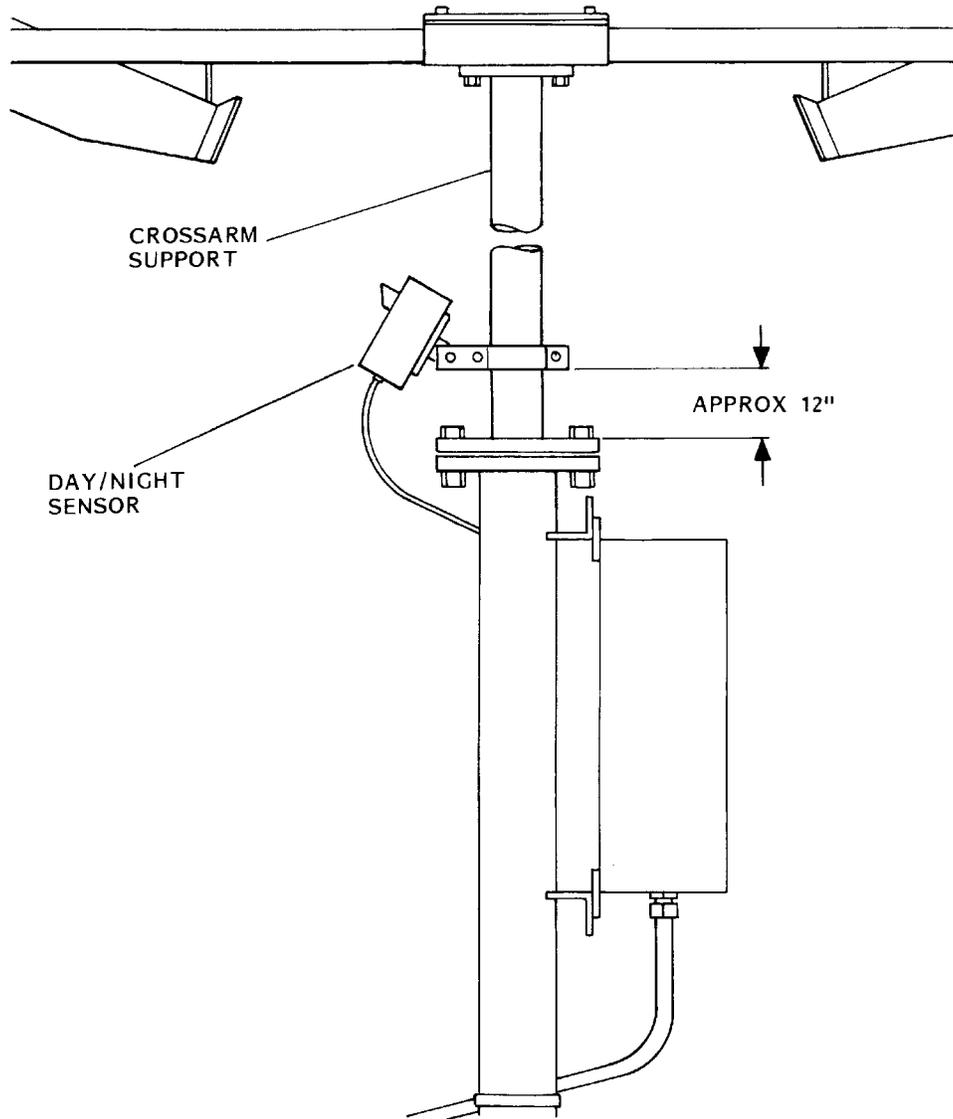


Figure 6.2.3. Day/Night Sensor Installation

Table 6.2.3. Day/Night Sensor Installation

Step	Procedure
Tools required: 7/16-inch wrench	
1	Using ¼-inch bolts and mounting hardware provided, mount day/night sensor on crossarm support pole approximately 12 inches above flange and sensor window facing same direction as receiver hood. Position sensor so that it points approximately 15 degrees above the horizon.
2	Connect day/night sensor signal and power cable A5W1-P1 to lower cable W2-P1 and route lower cable through support column and out access hole below electronics enclosure.
3	Using two ¼-inch bolts and flat washers, secure day/night sensor conduit connector to enclosure support pole.
4	Pass day/night sensor lower cable (W2) through lower conduit and into electronics enclosure.

Table 6.2.3. Day/Night Sensor Installation -CONT

Step	Procedure
5	Connect day/night sensor signal and power cable to connector J6 on backplane within electronics enclosure.
6	Secure lower conduit to support pole and electronics enclosure.

6.2.3 CABLES

All cables between the enclosure and the transmitter, receiver, and day/night sensor run through the interior of the support poles. All cables enter or exit the enclosure at the bottom of the enclosure. All cables to the transmitter or receiver connect directly to the modules within their respective hoods. Cable installation is easy and quick. After all of the cables are attached to their appropriate connectors, cable ties are installed as necessary. Table 6.2.4 provides details on installing the visibility sensor cables.

Table 6.2.4. Cable Installation

Step	Procedure
Receiver and Transmitter Cable Installation	
Tools required: 7/16-inch wrench Large pliers Flat-tipped screwdriver No. 1 Phillips screwdriver	
1	Remove large nut from end of flexible conduit and install conduit in right bottom side hole in main electrical enclosure. Install large nut securing conduit to main electrical enclosure. Do not tighten nut at this time.
2	Route receiver cable through support column and lower conduit into main electrical enclosure.
3	Connect receiver cable to connector J5 on motherboard located within main electrical enclosure.
4	Route transmitter cable through support column and lower conduit into main electrical enclosure.
5	Connect transmitter cable to connector J4 on motherboard located within main electrical enclosure.
6	Route ground wire through support column and lower conduit into main electrical enclosure.
7	Using 7/16-inch wrench, connect ground wire to wire lug E3 (located on top of power input box).
8	Remove mounting hardware from mounting bracket attached to flexible conduit. Discard nuts.
CAUTION Exercise care not to crimp wires when installing gasket.	
9	Locate EMI gasket and position gasket on rear of mounting bracket. Using 7/16-inch wrench, install two bolts, flat washers, and lockwashers securing mounting plate to column.
10	Using large pliers, tighten large nut securing conduit to main electrical enclosure.
Connecting System Cables to Enclosure	
WARNING	
Ensure that all power is disconnected from visibility sensor (turned off at DCP) before connecting cables.	
1	Using No. 1 Phillips screwdriver, open power input box within electronics enclosure by removing six Phillips screws that secure access cover.

Table 6.2.4. Cable Installation -CONT

Step	Procedure														
2	Route ac power wires and fiberoptic cables from flexible conduit through opening in bottom of power input box.														
3	Secure flexible conduit to bottom of electronics enclosure.														
4	<p>Using flat-tipped screwdriver, connect ac power wires to terminal board TB1 within power input box according to following chart:</p> <table> <thead> <tr> <th><u>Wire</u></th> <th><u>Connection</u></th> </tr> </thead> <tbody> <tr> <td>Black (ac hot)</td> <td>TB1-1</td> </tr> <tr> <td>White (ac neut)</td> <td>TB1-2</td> </tr> <tr> <td>Green (ground)</td> <td>TB1-3</td> </tr> </tbody> </table> <p>If power input box has two filters and surge suppressors, ensure that following jumpers are also in place:</p> <table> <thead> <tr> <th><u>From</u></th> <th><u>To</u></th> </tr> </thead> <tbody> <tr> <td>TB1-1 (ac hot)</td> <td>TB1-4</td> </tr> <tr> <td>TB1-2 (ac neut)</td> <td>TB1-5</td> </tr> </tbody> </table>	<u>Wire</u>	<u>Connection</u>	Black (ac hot)	TB1-1	White (ac neut)	TB1-2	Green (ground)	TB1-3	<u>From</u>	<u>To</u>	TB1-1 (ac hot)	TB1-4	TB1-2 (ac neut)	TB1-5
<u>Wire</u>	<u>Connection</u>														
Black (ac hot)	TB1-1														
White (ac neut)	TB1-2														
Green (ground)	TB1-3														
<u>From</u>	<u>To</u>														
TB1-1 (ac hot)	TB1-4														
TB1-2 (ac neut)	TB1-5														
5	Connect transmit (TX) fiberoptic cable to TX connector on fiberoptic module.														
6	Connect receive (RX) fiberoptic cable to RX connector on fiberoptic module.														
7	Install access cover on power input box and secure using six Phillips screws.														
8	Secure pedestal ground wire to ground stud located at bottom of electronics enclosure.														
9	Close and secure sensor's electronics enclosure.														