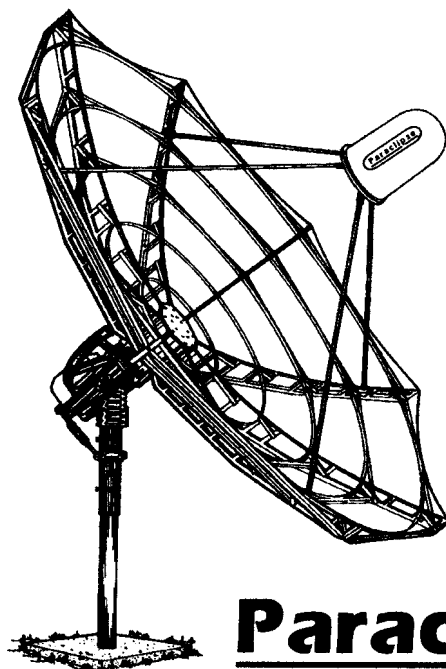


MAG DEC
Dec 9.55 E

Paraclipse®

LAT 20.9
LONG 152.29

HIGH PERFORMANCE ANTENNAS
Your Complete Reflector Source

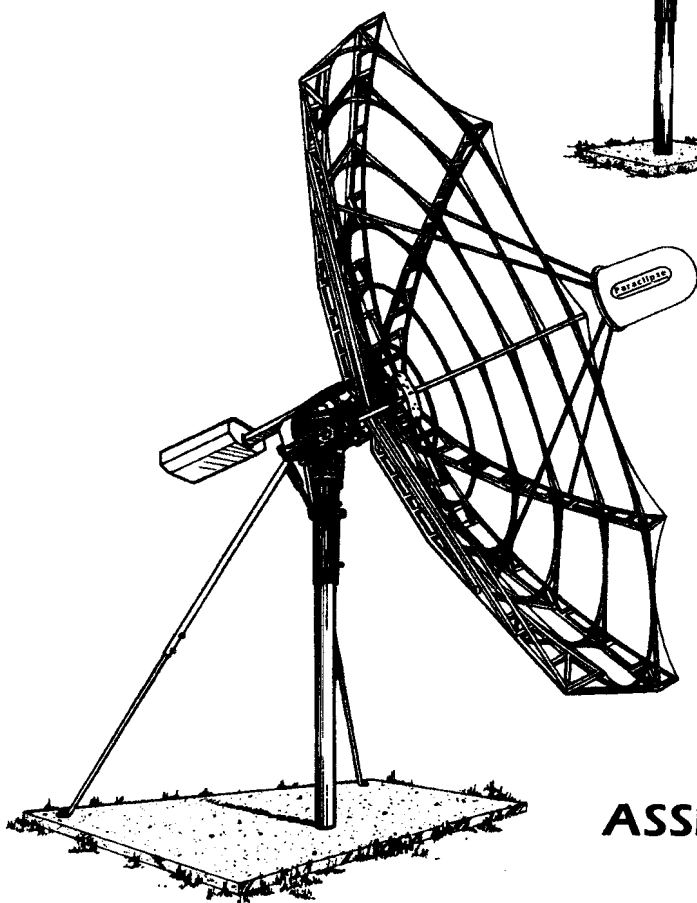


Paraclipse®
CLASSIC
12 CD

(3.8 m)

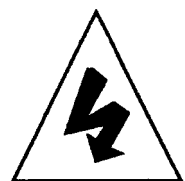
14 1/2 CD

(4.5 m)



**INSTALLATION &
ASSEMBLY INSTRUCTIONS**

FILL OUT WARRANTY CARD PROVIDED AND RETURN TO PARACLIPSE TO SECURE VALUABLE EXTENDED WARRANTY RIGHTS.



This symbol is intended to alert you of the presence of unusually dangerous voltage within the unit's enclosure that may be of sufficient magnitude to constitute a risk of electric shock.



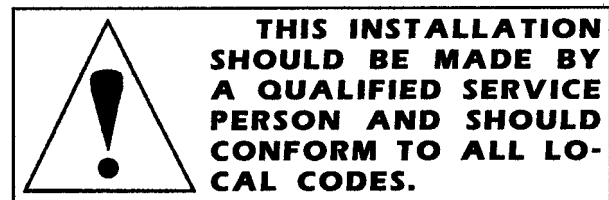
This symbol is intended to alert you of the presence of important operating and maintenance instructions in the literature accompanying the unit.

WE RECOMMEND THE FOLLOWING:

1. Site location: THIS IS EXTREMELY IMPORTANT! We recommend that the site survey be performed by qualified personnel to ensure proper antenna location and to test for microwave interference.

2. Read the instructions thoroughly prior to assembly so that you may become familiar with our method of installation.

3. Please keep this assembly instruction manual for future reference. The information below and inside this manual will help you when ordering replacement parts, and with questions you may have about your antenna.



THIS INSTALLATION SHOULD BE MADE BY A QUALIFIED SERVICE PERSON AND SHOULD CONFORM TO ALL LOCAL CODES.

4. Please fill out the warranty card provided and return to **Paraclipse**.

MAINTENANCE AND OPERATION:

The condition of your antenna should be checked at least once a year and after severe weather conditions. Replace or tighten any loose or missing hardware, watch for signs of rust on steel components and provide proper protection. Inspect weather protection for electronics and motor drive and perform any maintenance called for by motor drive manufacturer.

Chain lube will help protect the chain from adverse weather conditions. Apply regularly to help keep chain from deteriorating. Replace chain when signs of wear develop. Check site location for any obstructions to movement of antenna and clear branches, etc. as needed.

THE ANTENNA SHOULD BE PLACED IN A STOWED POSITION FOR HEAVY STORMS, SNOW, OR LONG UNATTENDED PERIODS OF TIME. THE STOWED POSITION IS WITH THE ANTENNA POINTED AT EITHER HORIZON.

Optional Equipment

12 CD	Part Number
CD Counterbalance kit	35050*
Extreme weather bolt kit	65405
Stainless steel hardware	65565
Stabilizer struts	65826 & 65828
Galvanization also available	
14 1/2 CD	
Stainless steel hardware	65579
Galvanization also available	
*Not recommended for windy areas on 12 CD	

Write the serial number of your antenna, the date of purchase, and the name, address, and phone number of your **Paraclipse** dealer. The serial number can be found on ends of packaging boxes, on the antenna mount, and on the packing list packed with the antenna.

Serial #: _____

Date purchased: _____

Dealer: _____

Telephone: _____

Manufacturer's Note

A home satellite antenna system is extremely difficult to correctly install without proper training and specialized equipment. It is therefore recommended that installation be done by an authorized dealer.

Before starting installation, check applicable local building codes and restrictions.

The antenna can be assembled other than the assembly sequence described in this manual. It can be assembled on the base pipe, but when the reflector is assembled first, assembly is faster.

TOOLS:

- 1) $\frac{7}{16}$ " open end wrench.
- 2) $\frac{1}{2}$ " open end wrench.
- 3) $\frac{9}{16}$ " open end wrench.
- 4) $\frac{3}{4}$ " open end wrench.
- 5) 1 $\frac{1}{8}$ " open end wrench.
- 6) 1 $\frac{5}{16}$ " open end wrench.
- 7) Adjustable crescent wrench.
- 8) Compass.
- 9) Lineman's pliers or similar tool.
- 10) Tape measure.
- 11) Side-cutting pliers (tin snips).
- 12) Inclinator (optional).
- 13) Wire stripper.
- 14) $\frac{1}{2}$ " torque wrench.
- 15) Phillips-head screwdriver.
- 16) Flat-head screwdriver.
- 17) $\frac{1}{8}$ " allen wrench.

MATERIALS:

- 1) **12 CD** 3.5" (88.9 mm) o. d. x 90" (2.29 m) pipe (3" schedule 40 black pipe). See page 5.
- 14 $\frac{1}{2}$ CD** 3.5" (88.9 mm) o. d. x 10' (3.05 m) pipe (3" schedule 40 black pipe). See page 6.
- 2) **12 CD** Approximately $\frac{2}{3}$ cubic yard ($\frac{1}{2}$ cubic meter) of concrete. See page 5.
- 14 $\frac{1}{2}$ CD** Approximately 2 cubic yards (1 $\frac{1}{2}$ cubic meter) of concrete. See pages 6 and 19.
- 3) **14 $\frac{1}{2}$ CD** Sixteen 7'6" (2.29 m) and sixteen 5'6" (1.68 m) #4 (10 mm) diameter reinforcing bars. See page 6.
- 4) Marine wheel-bearing grease. See page 12.

NOTE: On assembly illustrations where circled numbers rather than part names are noted, please refer to page 25 for **12 CD** and page 26 for **14 $\frac{1}{2}$ CD** for part identification. This list shows all hardware including those on preassembled parts.

Paracclipse® CLASSIC

This assembly manual is written for the **12 CD** (3.8 m) and **14 $\frac{1}{2}$ CD** (4.5 m) series antennas. Any unique assembly differences within this manual will be noted by the following bold headings:

12 CD 14 $\frac{1}{2}$ CD

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GROUNDING FOR PARACLIPSE ANTENNA



Example of antenna grounding according to National Electric Code instructions contained in Article 810 "Radio and Television Equipment."

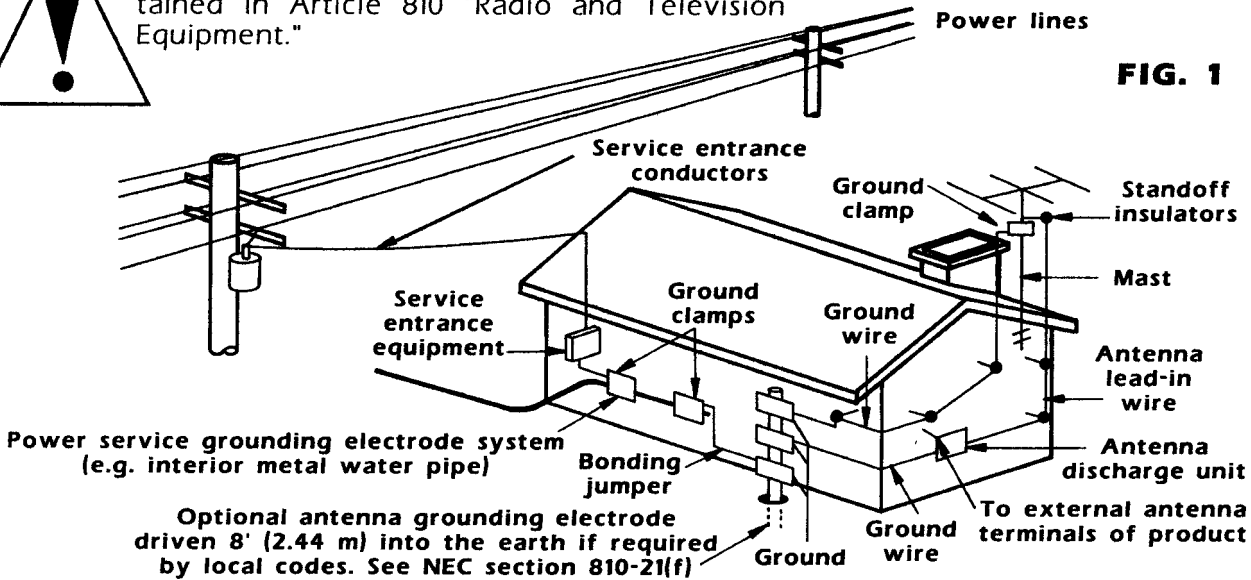


FIG. 1

1. Use #10 AWG (2.6 mm) copper, #8 AWG (3.3 mm) aluminum, #17 AWG (1.2 mm) copper-clad steel or bronze wire, or larger, as a ground wire. Use a 0.625" (16 mm) ground rod 8' (2.4 m) minimum into ground. (See Fig. 1)

2. Secure antenna lead-in and ground wires to house with stand off insulators spaced from 4'-6' (1.22-1.83 m) apart. (See Fig. 1)

3. Mount antenna discharge unit as close as possible to where lead-in enters house. (See Fig. 1)

4. Use jumper wire not smaller than #6 AWG (4.1 mm) copper, or equivalent, when a separate antenna-grounding electrode is used. See NEC section 810-21(i). (See Fig. 1)

TYPICAL GROUNDING CONFIGURATION

NOTE: This is a typical grounding configuration only. It should be noted that multiple grounding locations may be required to thoroughly ground the antenna. It is suggested that a ground wire be installed at the mount and at the back hub plate of the antenna. (See Fig. 2)

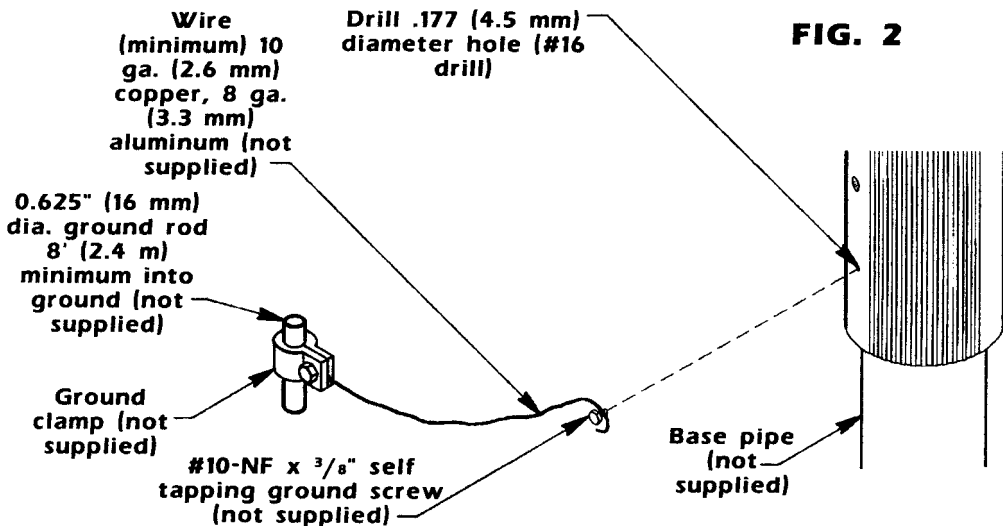
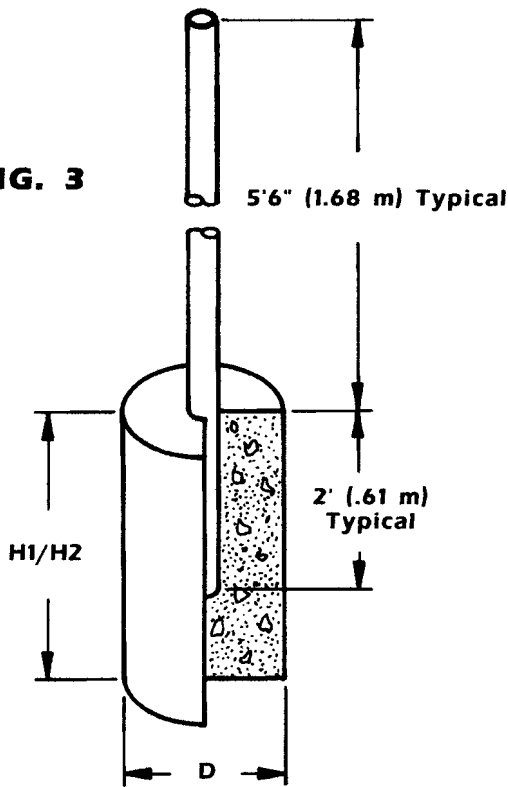


FIG. 2

FIG. 3



1. The hole for the antenna footing should be dug in accordance with the chart below in order to adequately support the antenna during violent weather, hard freeze, or muddy conditions. The base pipe must be mounted absolutely plumb in concrete. (See Fig. 3)

2. For a hole depth over 3' (.91 m) we recommend using reinforcing bar in the concrete.

3. **Above ground requirements (please see Fig. 3)** For most areas, this amount of base pipe above the ground is all that is needed. For special clearance requirements (snow, uneven terrain, etc.) add the needed clearance requirement to the standard to determine above ground requirements.

D	Diameter of hole
H1	Depth of hole, natural soil
H2	Depth of hole, paved soil

SOIL TYPE	Soft	Medium	Hard	Rock
80-85 mph (129 to 137 kph) wind force				
D	17" (.48 m)	17" (.48 m)	12" (.36 m)	10" (.31 m)
H1	4'6" (1.37 m)	3'6" (1.07 m)	3'6" (1.07 m)	2'0" (.61 m)
H2	3'0" (.91 m)	3'0" (.91 m)	2'6" (.76 m)	2'0" (.61 m)
90-95 mph (145 to 153 kph) wind force				
D	17" (.48 m)	17" (.48 m)	12" (.36 m)	10" (.31 m)
H1	5'6" (1.68 m)	5'6" (1.68 m)	4'6" (1.37 m)	2'0" (.61 m)
H2	3'6" (1.07 m)	3'6" (1.07 m)	3'0" (.91 m)	2'0" (.61 m)

SOIL REFERENCE:

Soft	clayey silts, sandy clays, or silty clays
Medium	medium dense sand, silty sand, or clayey sand
Hard	sandy gravel or gravel
Rock	fractured or solid sandstone or better

NOTE: The soil type determination shall be made by the antenna installer.



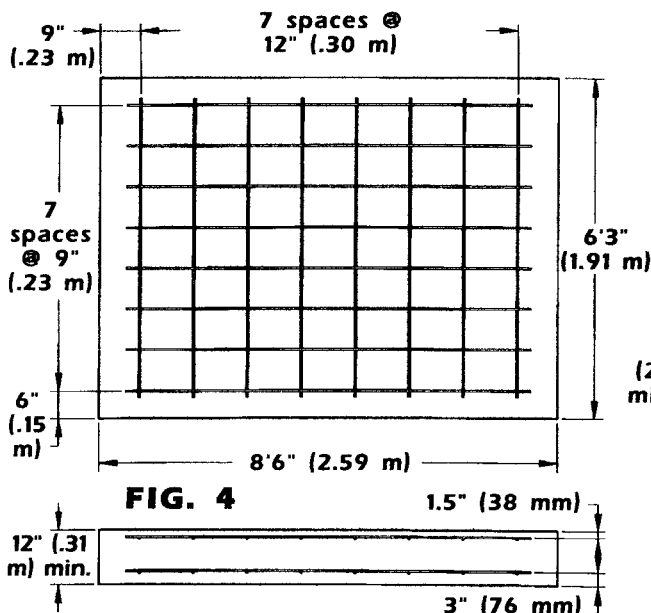
SEE PAGE 24 PRIOR TO POURING FOUNDATION. SEE PAGE 19 FOR ADDITIONAL CONCRETE REQUIREMENTS FOR 14 1/2 CD.

Construction Notes a) CONCRETE:

Five sacks minimum of Type 2 Portland Cement per cubic yard (.76 cubic meter). Slump 3" (76 mm) to 4" (102 mm). Air entrained in freezing climates. 3,000 psi (20,700 MPa) minimum compression strength. b) REINFORCING BAR: #4 ASTM A615 Grade 40 deformed bars. No splices. c) SOIL: Remove all grass and root-bound material from under the footing prior to placing the concrete. d) LOCATION: Bottom of the footing shall be 1' (.31 m) minimum below the frost line.

1. The footings should be poured as level as possible in accordance with the dimensions shown in Fig. 4 in order to adequately support the antenna during violent weather, hard freeze, or muddy conditions.

NOTE: It is recommended to use eye bolts in the corners of the footings to tie down the antenna during assembly and in areas subject to high winds. Eye bolts may be installed later with expansion sleeves, if necessary.



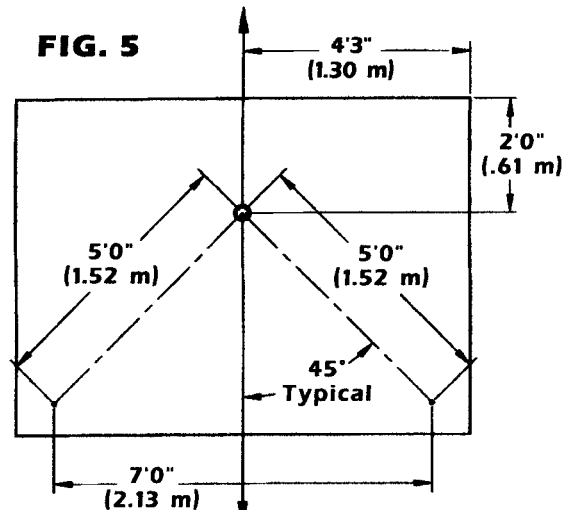
2. Place eight #4 (10 mm) diameter reinforcing bars each way as shown in Fig. 4 at 3" (76 mm) from bottom. Place eight #4 (10 mm) diameter reinforcing bars each way as shown in Fig. 4 at a depth of 1 1/2" (38 mm).

3. Mount the base pipe and two $\frac{3}{4}$ " x 12" anchor bolts as shown in Fig. 5. Make sure 7' (2.13 m) minimum of the base pipe protrudes from the concrete and 3" (76 mm) minimum of the two $\frac{3}{4}$ " x 12" anchor bolts protrudes. The base pipe must be mounted absolutely plumb.

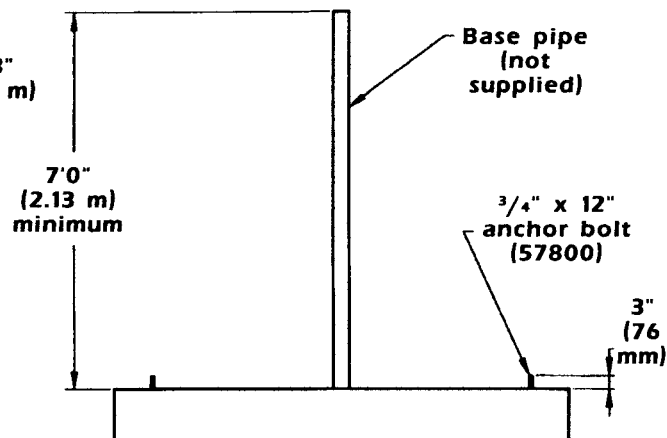
NOTE: If desired, isolated pier footings may be used in place of the slab footing shown. These must be designed by the local installer.

Towards equator if installation site is more than 30° latitude

FIG. 5



Towards equator if installation site is less than 30° latitude.

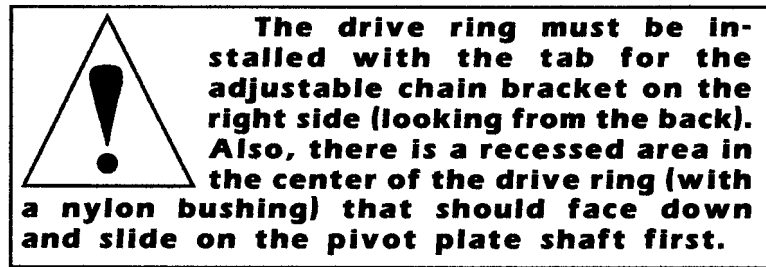


1. Slide the mount collar up the base mount assembly and secure it with one $\frac{3}{8}$ " x $1\frac{3}{4}$ " bolt, two $\frac{3}{8}$ " flatwashers, and one $\frac{3}{8}$ " nyloc nut. Do not tighten. Make sure that the mount collar flaps are underneath and on the side opposite of the set screws of the mount cap of the base mount assembly. (See Fig. 6)

2. Slide the base mount assembly over the base pipe (not supplied) and secure it using four $\frac{1}{2}$ " x $\frac{3}{4}$ " bolts. Snug these bolts. (See Fig. 6)

3. Attach the left and right elevation arm to the mount cap of the base mount assembly with the pivot plate between the left and right elevation arms. Make sure the threaded end of the pivot plate points is up and on the side of the mount cap that has the set screws. Secure the pivot plate to both elevation arms using four $\frac{1}{2}$ " x $2\frac{1}{4}$ " bolts, four $\frac{1}{2}$ " flatwashers, and four $\frac{1}{2}$ " nuts. Secure the elevation arms to the mount cap using one $\frac{3}{4}$ " x 6" bolt, two $\frac{3}{4}$ " flatwashers, and one

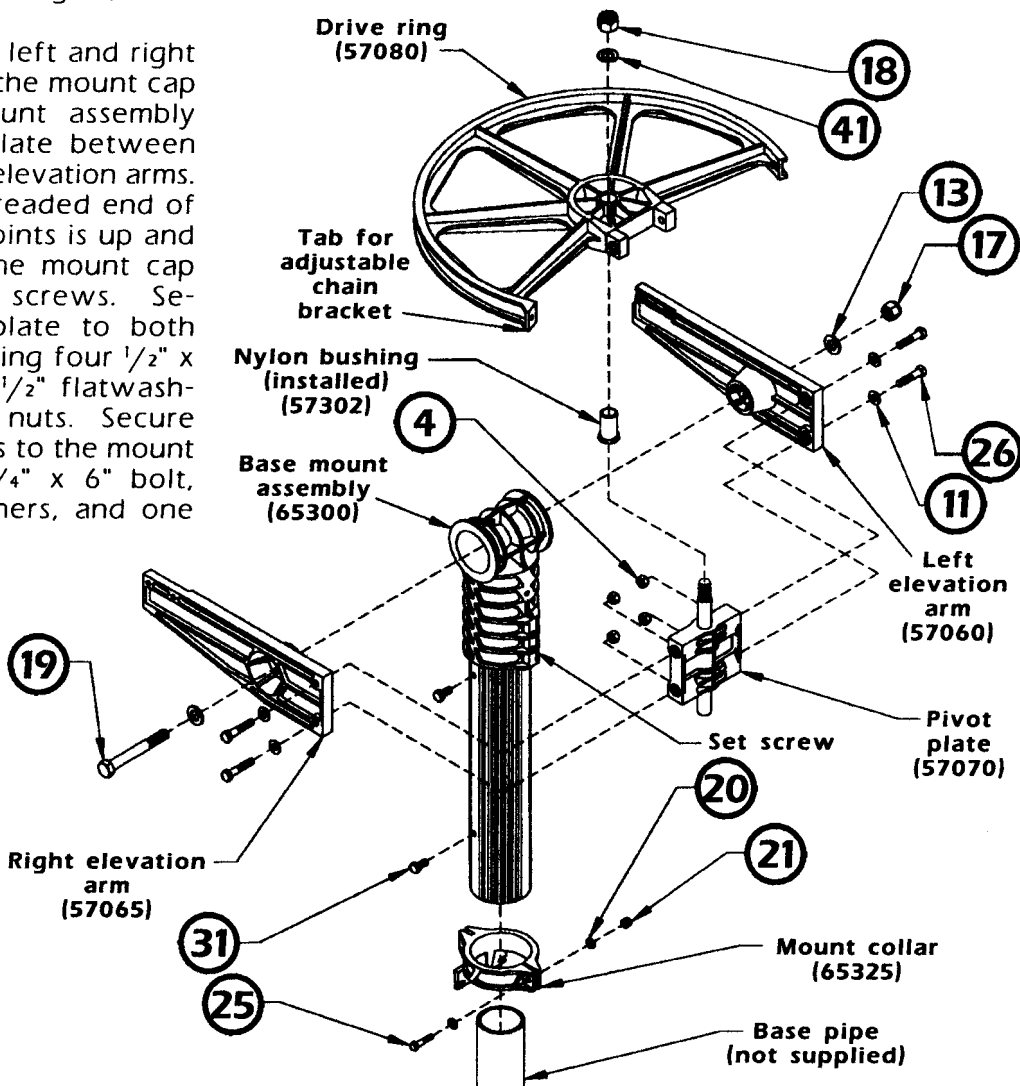
$\frac{3}{4}$ " nyloc nut. Do not tighten. The two $\frac{3}{4}$ " flatwashers must be used as shown. (See Fig. 6)



4. Attach the drive ring as noted above to the pivot plate shaft using one $\frac{7}{8}$ " bronze washer and one $\frac{7}{8}$ " nyloc nut. Tighten securely. (See Fig. 6)

FIG. 6

For a complete listing of nuts, bolts, and other hardware, please see identification table on page 25 for **12 CD** and page 26 for **14 1/2 CD**.



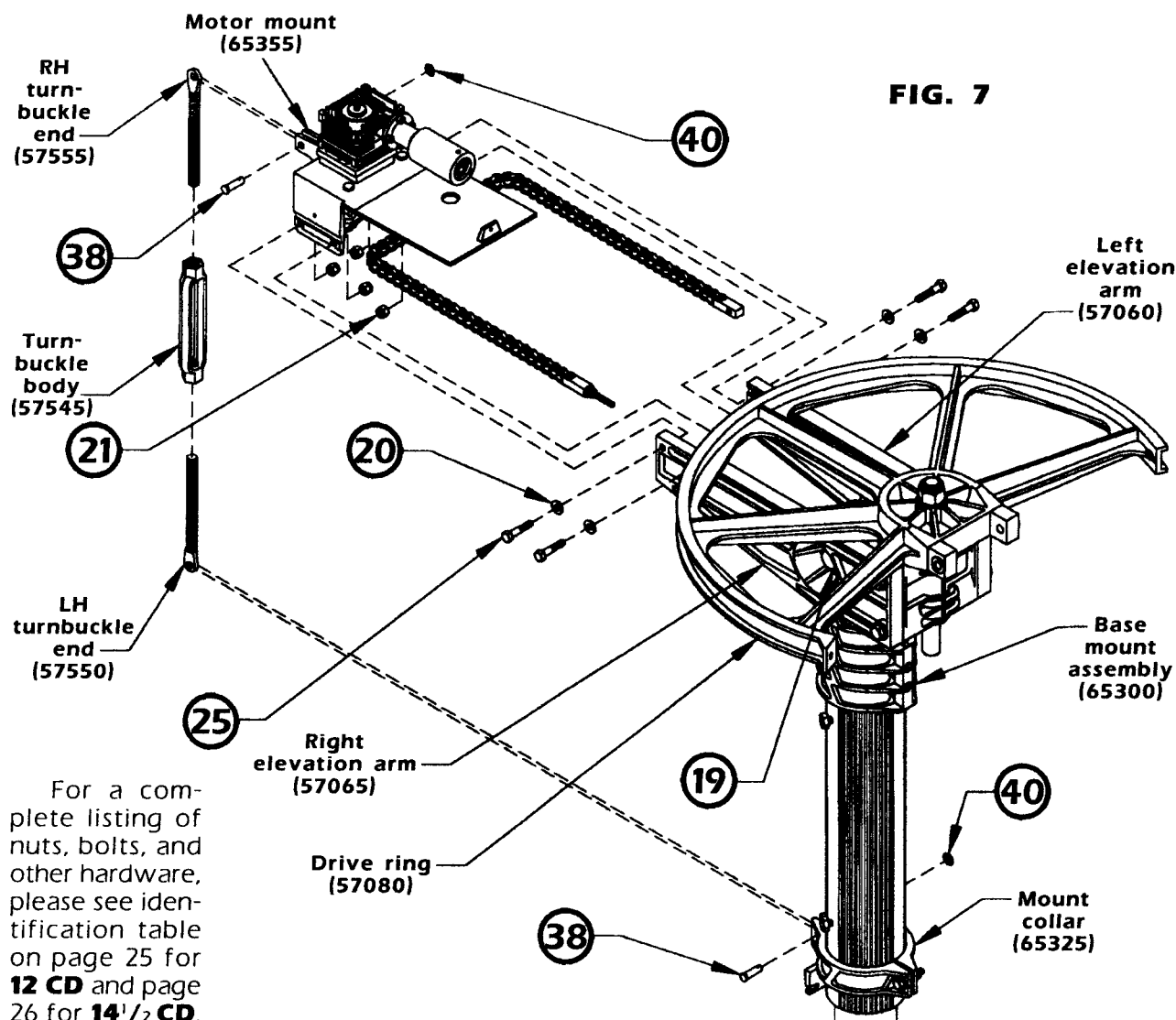
PREASSEMBLED MOTOR ASSEMBLY AND TURNBUCKLE INSTALLATION

1. Attach the motor mount of the preassembled motor assembly to the right and left elevation arms using four $\frac{3}{8}$ " x $1\frac{3}{4}$ " bolts, four $\frac{3}{8}$ " flatwashers, and four $\frac{3}{8}$ " nyloc nuts. Tighten securely. (See Fig. 7)

NOTE: Preassembled motor assembly exploded view is shown in Fig. 36 on page 27.

2. Tighten all mount hardware except the $\frac{3}{4}$ " x 6" bolt that holds the elevation arms to the mount cap of the base mount assembly. (See Fig. 7)

3. Attach the assembled turnbuckle (one turnbuckle body, one LH turnbuckle end, and one RH turnbuckle end) to the motor mount and the mount collar using two $\frac{3}{8}$ " x $1\frac{1}{4}$ " clevis pins and two $\frac{3}{8}$ " push nuts. (See Fig. 7)



For a complete listing of nuts, bolts, and other hardware, please see identification table on page 25 for **12 CD** and page 26 for **14 $\frac{1}{2}$ CD**.

1. Attach the fixed chain bracket (while connected to the chain) to the left side of the drive ring (side with no tab) using one $\frac{5}{16}$ " x $1\frac{3}{4}$ " bolt, one $\frac{1}{4}$ " USS flatwasher, and one $\frac{5}{16}$ " nyloc nut. Tighten. (See Fig. 8)

NOTE: Your chain has been preinstalled and aligned with the preset limits of your motor drive.

2. Remove the $\frac{5}{16}$ " nyloc nut, the chain spring washer, and the $\frac{5}{16}$ " USS flatwasher off of the $\frac{5}{16}$ " x 3" stud in the adjustable chain bracket. (See Fig. 9)

3. Attach the adjustable chain bracket by the $\frac{5}{16}$ " x 3" stud to the drive ring

using the $\frac{5}{16}$ " nyloc nut, the chain spring washer, and the $\frac{5}{16}$ " USS flatwasher just removed. Adjust the slop out of the chain, making it snug, but not tight. (See Fig. 9)

4. Make certain that the chain is fully engaged on the drive sprocket and the two idler sprockets. Also, be sure that the chain is aligned (centered) with the drive ring. Adjust the height of the drive sprocket and idler sprockets up or down, if necessary, for correct alignment. The drive sprocket is held on with an $\frac{1}{8}$ " allen-head set screw. (See Fig. 36 on page 27.)

5. Remove the insert that held the chain in place.

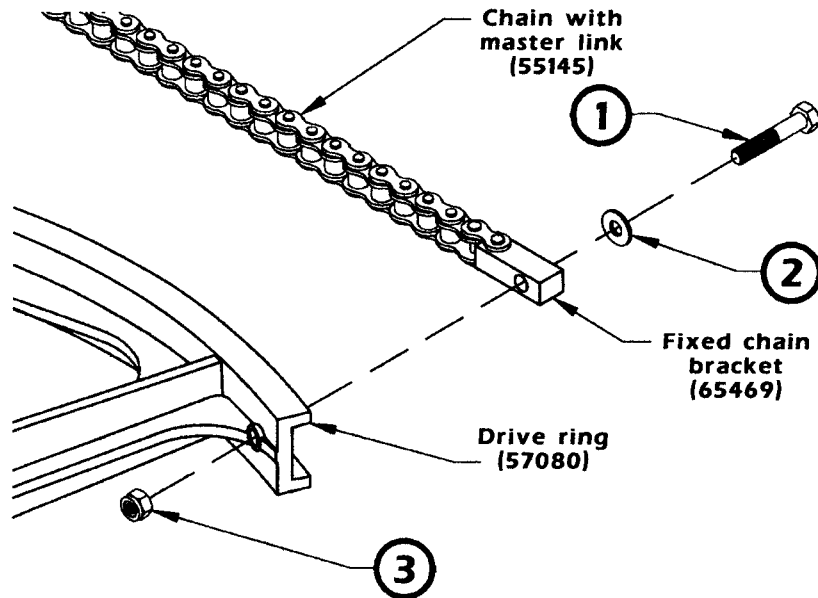


FIG. 8

For a complete listing of nuts, bolts, and other hardware, please see identification table on page 25 for **12 CD** and page 26 for **14 1/2 CD**.

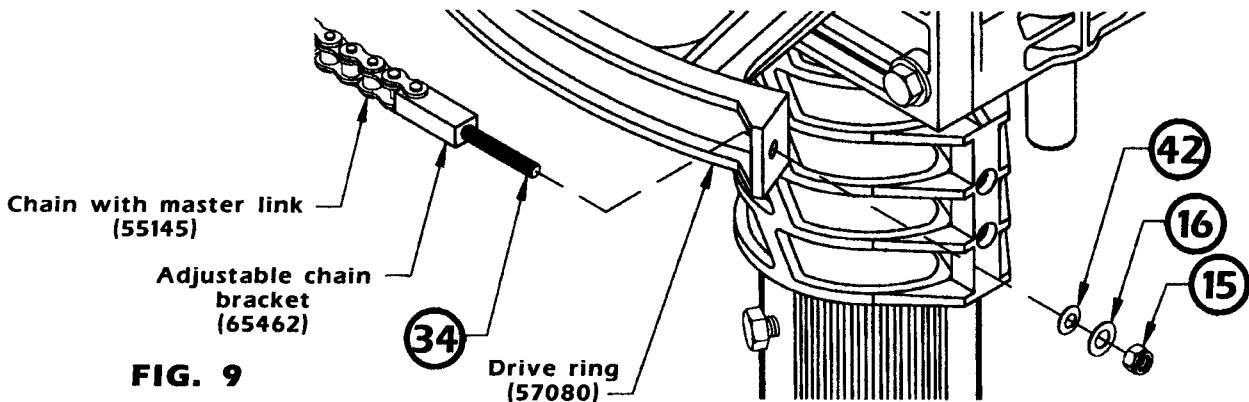


FIG. 9

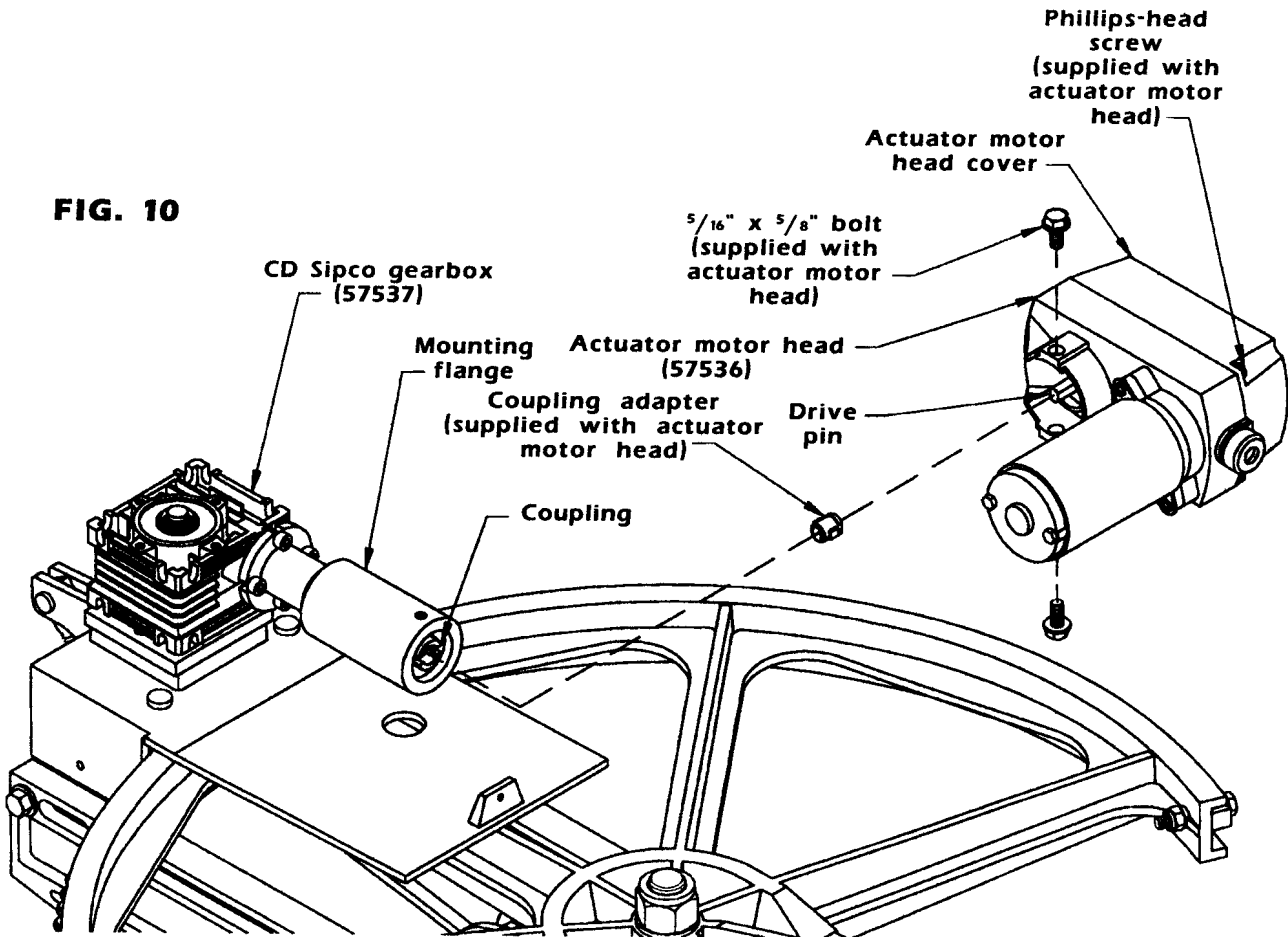
1. Take the coupling adapter (supplied with the actuator motor head) and slide it into the coupling of the CD Sipco gearbox as shown. (See Fig. 10)

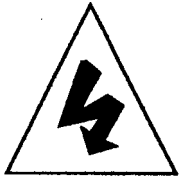
2. The actuator motor head will now have to be connected to the CD Sipco gearbox in order to move the reflector. Slide the actuator motor head over the mounting flange on the side of the CD Sipco gearbox (while noting the position of the drive pin

of the actuator motor head and the coupling adapter in the coupling of the CD Sipco gearbox so that they match). (See Fig. 10)

3. After the drive pin and the coupling adapter have been aligned, secure the actuator motor head to the CD Sipco gearbox using two $\frac{5}{16}$ " x $\frac{5}{8}$ " bolts (supplied with actuator motor head). Make sure not to overtighten these bolts. (See Fig. 10)

FIG. 10





1. Remove the strain relief from the actuator motor head and string the motor and sensor wires through it and the motor cover. Wire your two motor wires to terminals 1 and 2. Wire your two sensor wires to terminals 4 and 5. (See Fig. 11 and 12.)

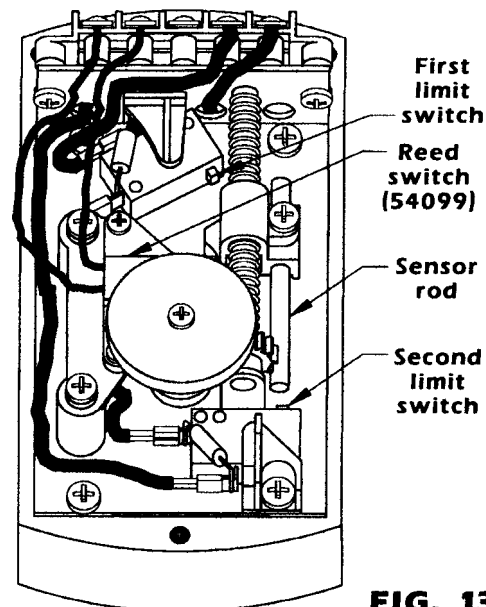
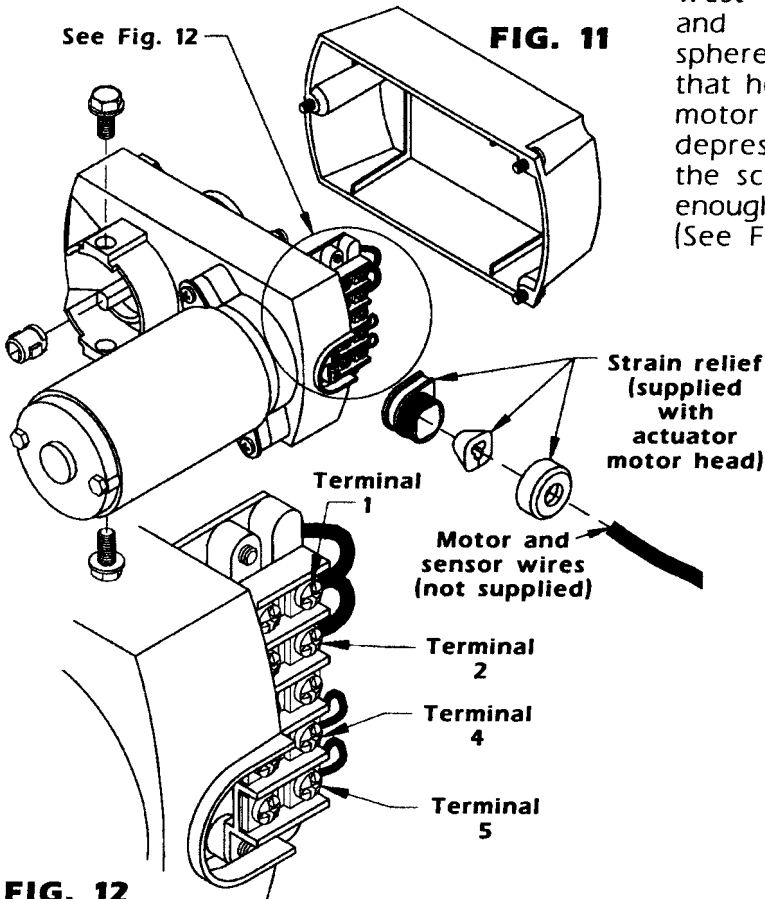
2. It is now necessary to check for proper wiring. The east-west commands from the receiver should correlate with the drive ring movement for your site. If the drive ring is moving in the wrong direction or not at all, switch the two motor wires. (See Fig. 11 and 12.)

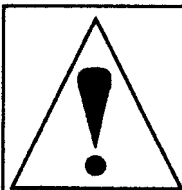
NOTE: The east and west limits are preset near the mechanical limitations of the antenna which is very close to both horizons. If these settings are improper (due to an obstacle that would interfere

with the antenna at one or both horizons), proceed with steps 3 & 4. Otherwise, turn to the next page.

3. Note the factory preset position (at the first limit switch) in the actuator motor head. Using the actuator motor head move the drive ring to approximately where your first antenna limit (the east limits in the northern hemisphere and west limits in the southern hemisphere) needs to be. Disconnect the actuator motor head from the CD Sipco gearbox by loosening the two $\frac{5}{16}$ " x $\frac{5}{8}$ " bolts. Run the actuator motor head back to the factory preset limit. Reattach the actuator motor head to the CD Sipco gearbox by tightening (without overtightening) the two $\frac{5}{16}$ " x $\frac{5}{8}$ " bolts. (See Fig. 13)

4. Now move the drive ring to where the other antenna limits are to be (the west limits in the northern hemisphere and east limits in the southern hemisphere). Loosen the Phillips-head screw that holds the sensor rod in the actuator motor head. Move the sensor rod until it depresses the second limit switch. Tighten the screw back onto the sensor rod just enough to keep the sensor rod from moving. (See Fig. 13)





After the motor has been correctly wired and the motor limits have been set, it is necessary to correctly tension the chain and check the operation of the motor limits. Failure to do so may result in serious motor or antenna damage.

1. Reattach the actuator motor head cover by tightening down on the three Phillips-head screws. Attach the plastic motor cover to the motor mount using three #10 x $\frac{3}{4}$ " self-tapping screws and three #10 flatwashers. Don't overtighten. (See Fig. 14)

2. Use the motor to rotate the drive ring back and forth to each limit twice.

Be certain that both limit settings are satisfactory. Check the tension of the chain at each limit. If necessary, retorque the $\frac{5}{16}$ " nut on the adjustable chain bracket to 7 ft./lbs. (9.5 Nm). (See Fig. 15)

3. After the chain has been adjusted, grease it liberally with good quality marine wheel-bearing grease (not supplied).

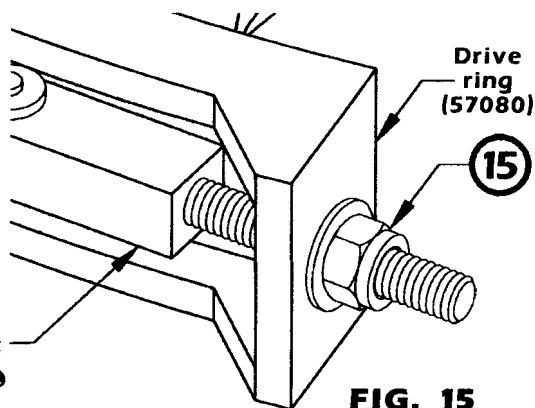


FIG. 14

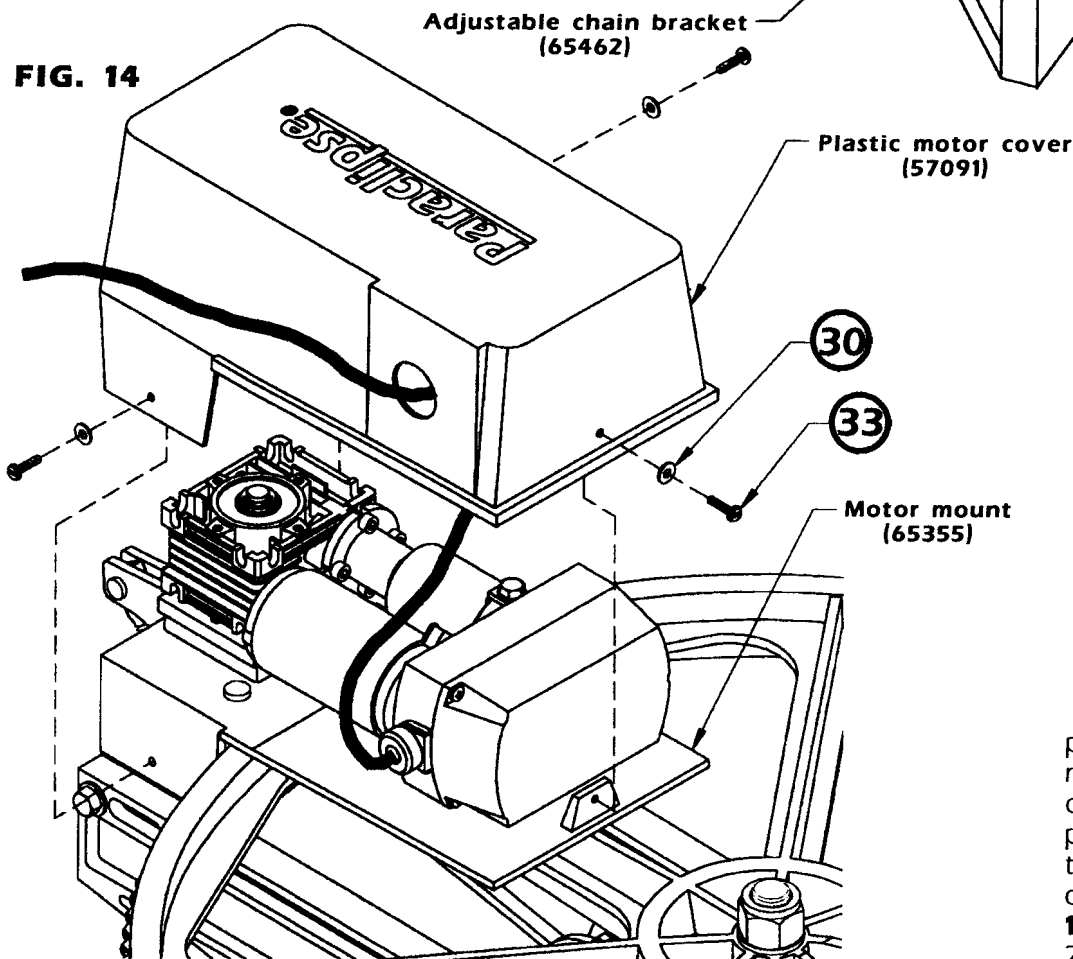


FIG. 15

For a complete listing of nuts, bolts, and other hardware, please see identification table on page 25 for **12 CD** and page 26 for **14 1/2 CD**.



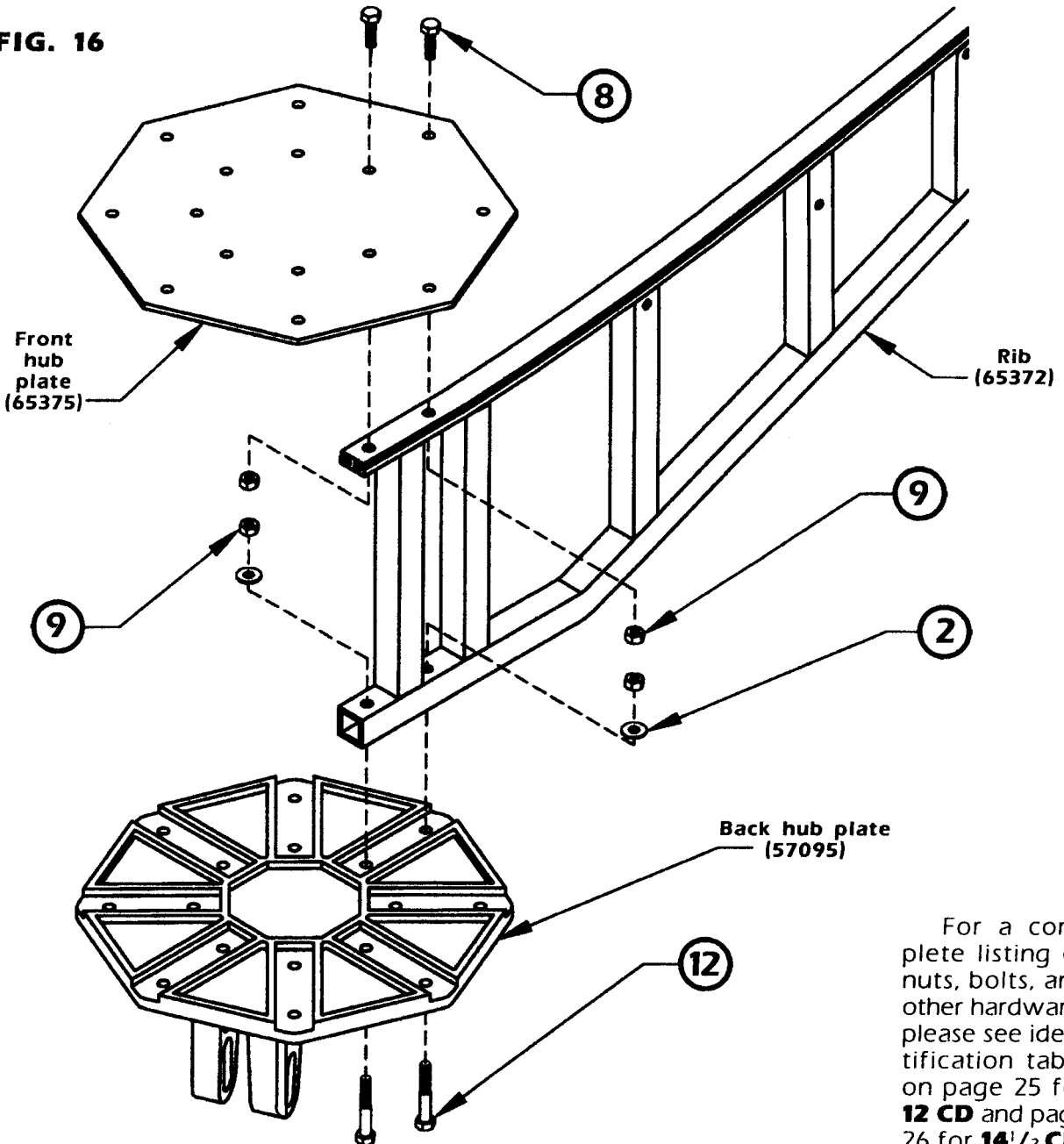
IMPORTANT

Read reflector assembly instructions carefully before starting to assemble reflector.

1. Attach the eight ribs to the back hub plate using sixteen $\frac{5}{16}$ " x 2" bolts, sixteen $\frac{5}{16}$ " nuts, and sixteen $\frac{1}{4}$ " USS flatwashers. Do not tighten. (See Fig. 16)

2. Attach the front hub plate to the eight ribs using sixteen $\frac{5}{16}$ " x 1" bolts and sixteen $\frac{5}{16}$ " nuts. Do not tighten. (See Fig. 16)

FIG. 16



For a complete listing of nuts, bolts, and other hardware, please see identification table on page 25 for **12 CD** and page 26 for **14 1/2 CD**.

IMPORTANT

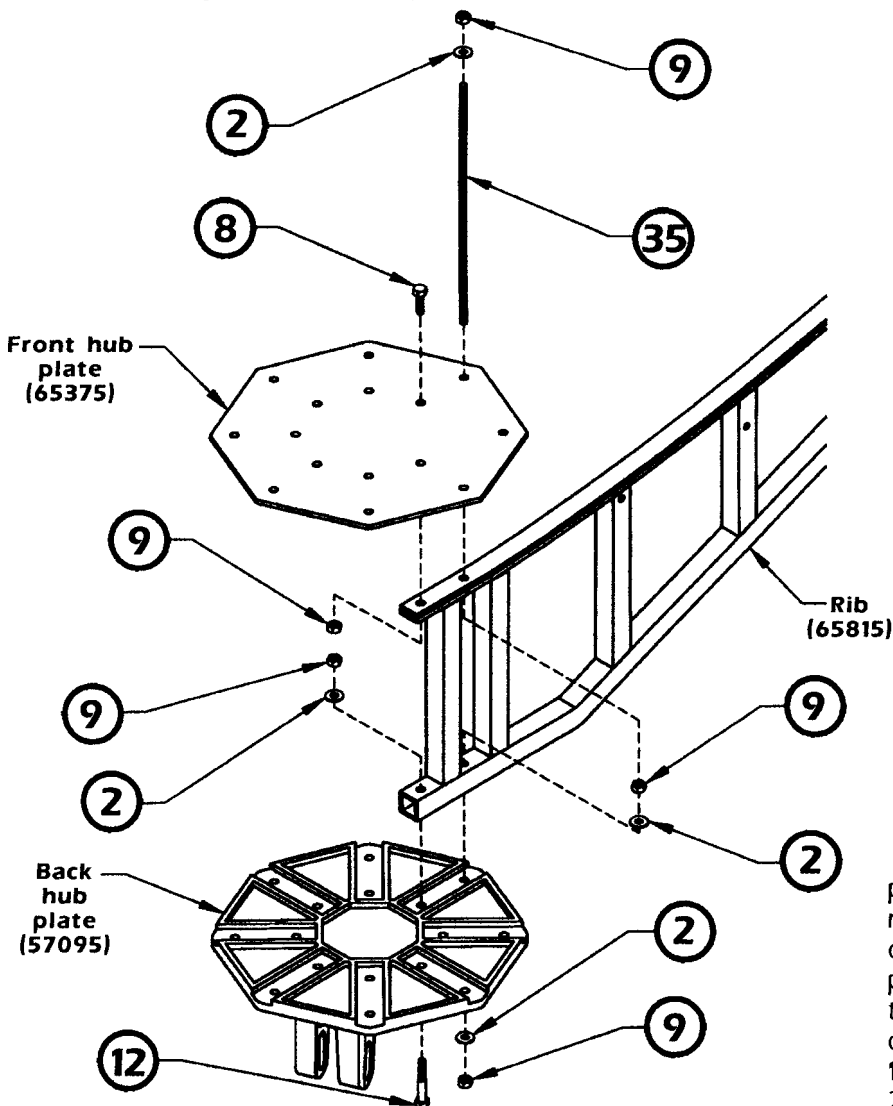
Read reflector assembly instructions carefully before starting to assemble reflector.

1. Attach the eight ribs to the back hub plate using eight $\frac{5}{16}$ " x 2" bolts, eight $\frac{5}{16}$ " nuts, and eight $\frac{1}{4}$ " USS flatwashers. Do not tighten. (See Fig. 17)

2. Attach the front hub plate to the eight ribs using eight $\frac{5}{16}$ " x 1" bolts and eight $\frac{5}{16}$ " nuts. Do not tighten. (See Fig. 17)

3. Insert one $\frac{5}{16}$ " x $11\frac{7}{8}$ " all-thread stud through the front hub plate. Run one $\frac{5}{16}$ " nut and one $\frac{1}{4}$ " USS flatwasher up the $\frac{5}{16}$ " x $11\frac{7}{8}$ " all-thread stud before inserting through the back hub plate. Attach one $\frac{5}{16}$ " nut and one $\frac{1}{4}$ " USS flatwasher on both ends of the $\frac{5}{16}$ " x $11\frac{7}{8}$ " all-thread stud and finger tighten. Then finger tighten the remaining $\frac{5}{16}$ " nut and $\frac{1}{4}$ " USS flatwasher toward the back hub plate. (See Fig. 17)

4. Repeat step #3 for the remaining seven $\frac{5}{16}$ " x $11\frac{7}{8}$ " all-thread studs, twenty-one $\frac{5}{16}$ " nuts, and twenty-one $\frac{1}{4}$ " USS flatwashers.

FIG. 17


For a complete listing of nuts, bolts, and other hardware, please see identification table on page 25 for **12 CD** and page 26 for **14¹/₂ CD**.

CAUTION



Do not overtighten ring bolts. [10 ft/lbs (13.6 Nm) maximum.]

1. Attach all eight of the outside rings (the largest rings) to the outermost holes of the ribs with the curved section facing toward the center of the antenna. Secure these rings using sixteen $\frac{1}{4}$ " x $1\frac{3}{4}$ " bolts and sixteen $\frac{1}{4}$ " nuts. Tighten these ring bolts (after all of the outermost rings have been assembled. (See Fig. 18 and 19) while being careful not to overtighten. Check that these rings are flush with the bottom of the mesh slot of the rib. Tighten all hub plate bolts.

2. Check the reflector for parabolic accuracy using tests located on the following page. If adjustments are required, loosen the ring bolts and/or rib bolts and make the necessary corrections and retighten these bolts.

3. Attach all the remaining rings, in any order, to the ribs using the remaining $\frac{1}{4}$ " x $1\frac{3}{4}$ " bolts and $\frac{1}{4}$ " nuts. **Do not tighten until all rings are attached.**

4. Tighten the remaining ring bolts while being careful not to overtighten. Using a ruler, check that the rings are flush with the bottom of the mesh slot on the rib. (See Fig. 19)

5. Recheck the reflector for parabolic accuracy. See the following page.

**FIG. 18
(12 CD
shown)**

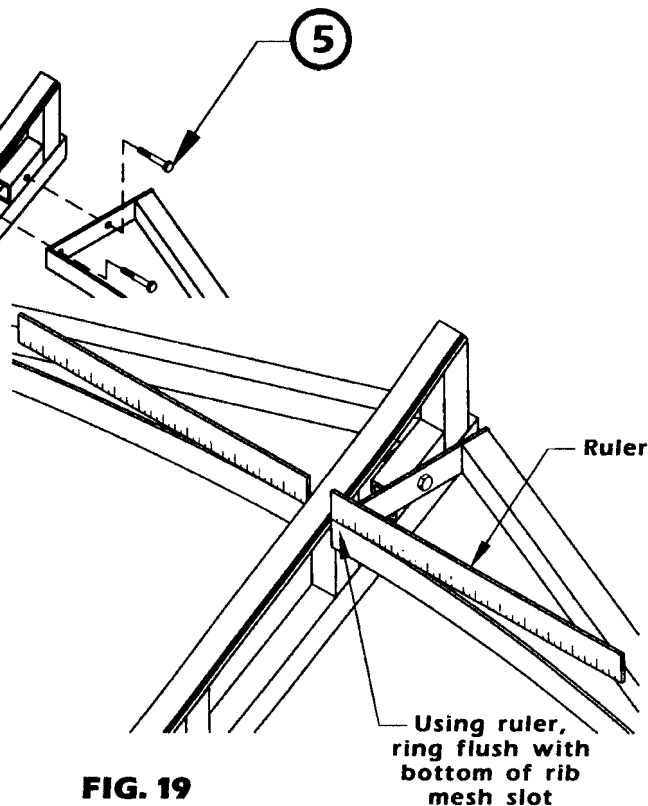
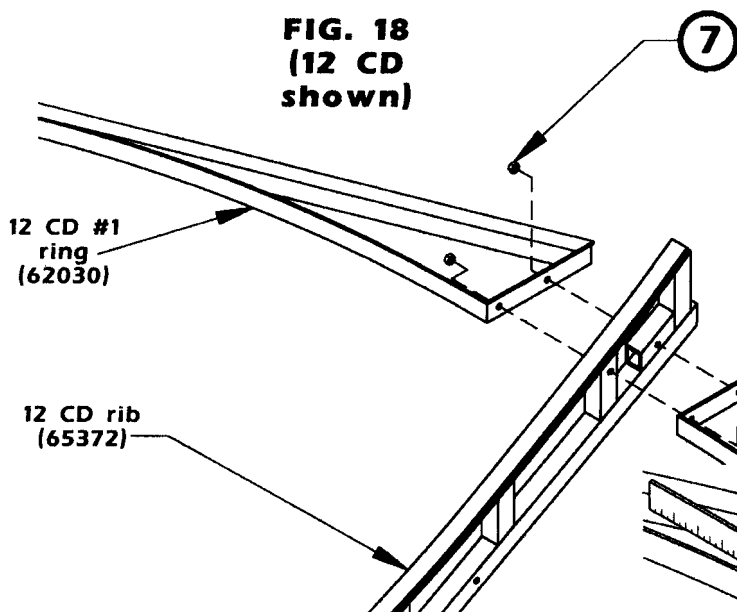


FIG. 19

For a complete listing of nuts, bolts, and other hardware, please see identification table on page 25 for **12 CD** and page 26 for **14 $\frac{1}{2}$ CD**.

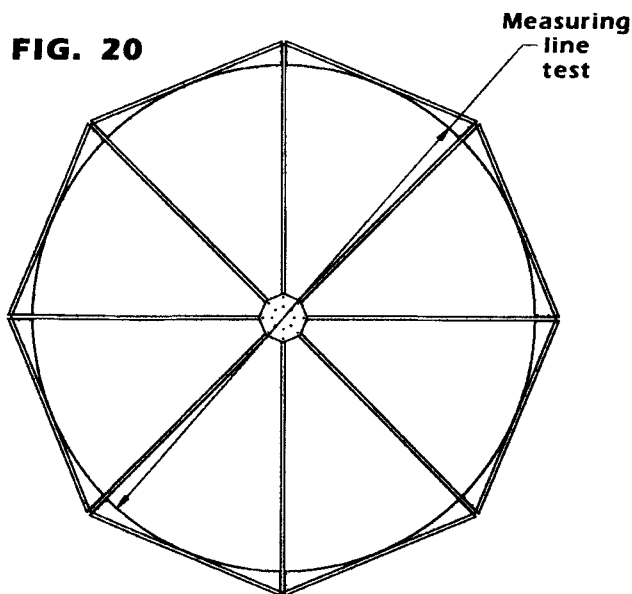
Parabolic Integrity

A precise parabolic surface that is both accurate and symmetrical is a must for good antenna performance. The design of the antenna structure must not allow for any change in the shape of the reflector. The reflector cannot elongate, warp, or sag if it is to maintain its picture quality.

Measuring Test

With an accurate tape measure, measure from the outside of the largest ring across the face of the dish to the outside of the largest ring opposite the measuring point. (See Fig. 20) Repeat this step measuring completely around the reflector and making sure that the measurements are consistent.

FIG. 20



String Test

With a ball of string and some masking tape, you can check the antenna for symmetry. Find at least four identical spots on the antenna and run lengths of string to the opposite side. Where the strings cross each other, there should be a perfect intersection. The intersection of the string should be perfectly aligned without horizontal or vertical gaps or tension.

Straight Edge Test

When you inspect the assembled antenna, lay an imaginary straight edge across the top of the outside ring, close one eye, and sight across the reflector. If you notice a deviation along this edge, you can be certain that the reflector does not have an accurate parabolic shape. (See Fig. 21)

Remember, a total variation of only $\frac{3}{8}$ " (9.5 mm) from side to side is enough to seriously compromise your picture quality. If you can flex the antenna with your hands, you can be sure that the weather and other natural elements will be flexing it every day for you.

Adjustments

If any of the above tests show that the dish was incorrectly assembled, loosen the ring bolts (and the front hub plate and back hub plate bolts if necessary) and make the necessary adjustments and retighten.

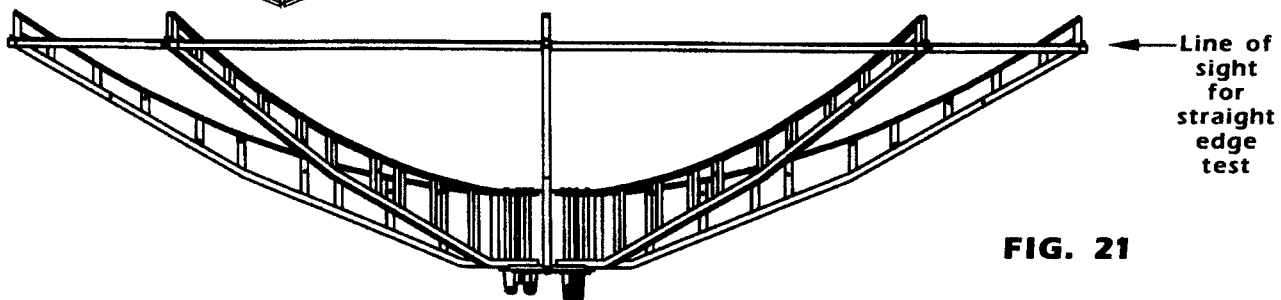


FIG. 21

IMPORTANT

Read all instructions carefully prior to beginning mesh installation.

1. INNER MESH INSTALLATION: Lay the inner mesh on the rings. Starting with one side of mesh, slide the inner mesh into the slot on top of the rib. Once one side of the inner mesh has been completely installed into the slot, slide it towards the center of the reflector until the other side of the inner mesh begins to touch the opposite rib slot. Completely work the inner mesh into the opposite slot. Then firmly slide the inner mesh towards the center of the reflector, making sure that the sides of the inner mesh stays inside the rib slot.

NOTE: The diagrams shown in Fig. 22 for the **12 CD** and Fig. 23 for the **14 1/2 CD** for J-clip installation are for reference only. The actual numbers of J-clips required will vary; one clip every 3" (76 mm) is typical. Mesh must be held firmly against the ribs and rings.

2. J-CLIP INSTALLATION: After a piece of inner mesh is in place, install J-clips using the clip installation sequence shown in Fig. 22 and 23. When installing the J-clips, firmly pull downward and around the ring while making sure the J-clip is square to the ring. (See Fig. 24)

NOTE: There will be one ring (the third largest) that will not be clipped until the outer mesh is in place.

3. OUTER MESH INSTALLATION: Install the outer mesh as per steps #1 and #2 while making sure to slide the outer mesh **under** the inner mesh where the two pieces of mesh overlap.

4. Repeat steps #1, #2, and #3 until the antenna is completely meshed.

5. TRIM INSTALLATION: When the antenna mesh installation is completed, install the trim. With the flat side up, work the trim onto the edge of the outer mesh panel. Trim the excess with side-cutting pliers.

FIG. 24

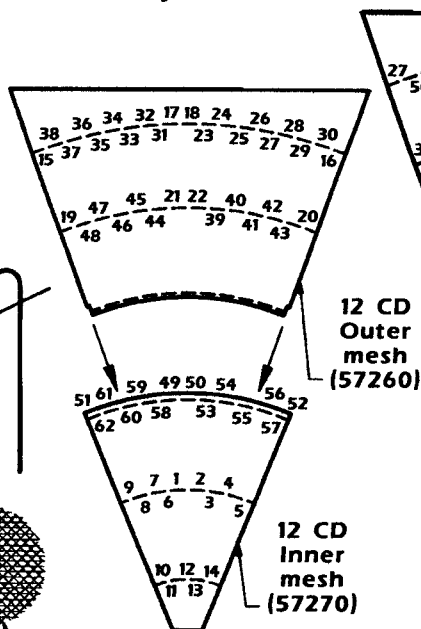
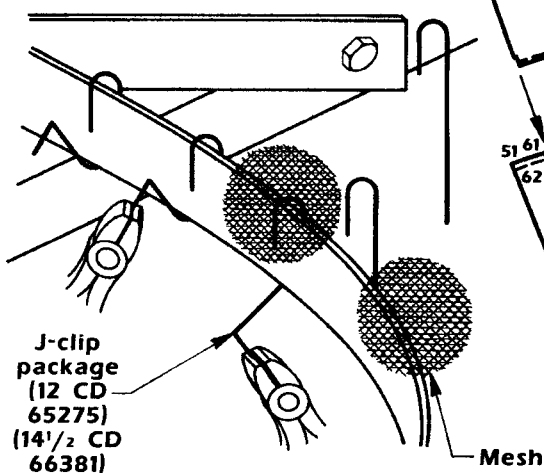


FIG. 22

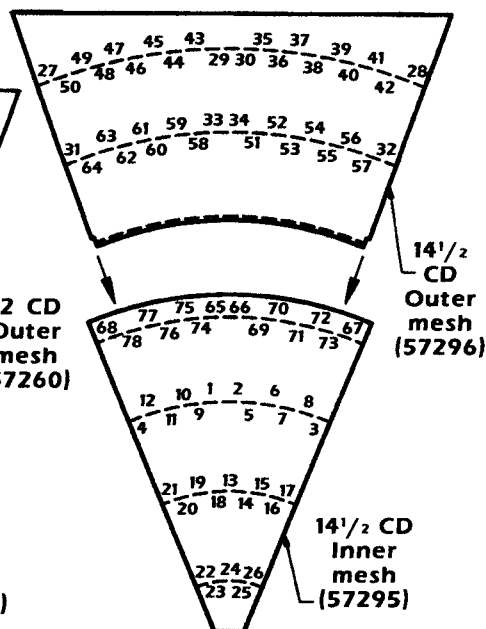


FIG. 23



Exercise caution when attaching the assembled reflector to the drive ring until the declination bracket is installed. If the weight of the reflector is left on the top two bolts or any excessive sideways torque is exerted, the tabs of the back hub plate may crack.

1. Lift the assembled reflector and attach its back hub plate to the drive ring using two $\frac{1}{2}$ " x $2\frac{3}{4}$ " bolts, two $\frac{1}{2}$ " flatwashers, and two $\frac{1}{2}$ " nyloc nuts. Do not tighten. (See Fig. 25)

NOTE: For those using the counterbalance (standard on the **14 1/2 CD** and optional on the **12 CD**), insert the two $\frac{1}{2}$ " x $2\frac{3}{4}$ " bolts, but do not use the two $\frac{1}{2}$ " flatwashers and two $\frac{1}{2}$ " nyloc nuts until the counterbalance has been installed. (See the following page.)

2. Slide the declination bracket onto the shaft on the bottom of the pivot plate, making sure that the side with the nylon bushing slides up the shaft first. (See Fig. 25)

3. Attach the back hub plate to the declination bracket using one $\frac{1}{2}$ " x $5\frac{1}{2}$ " bolt, two $\frac{1}{2}$ " star washers, and one $\frac{1}{2}$ " nyloc nut. Tighten all reflector to drive ring and declination hardware without overtightening. (See Fig. 25)

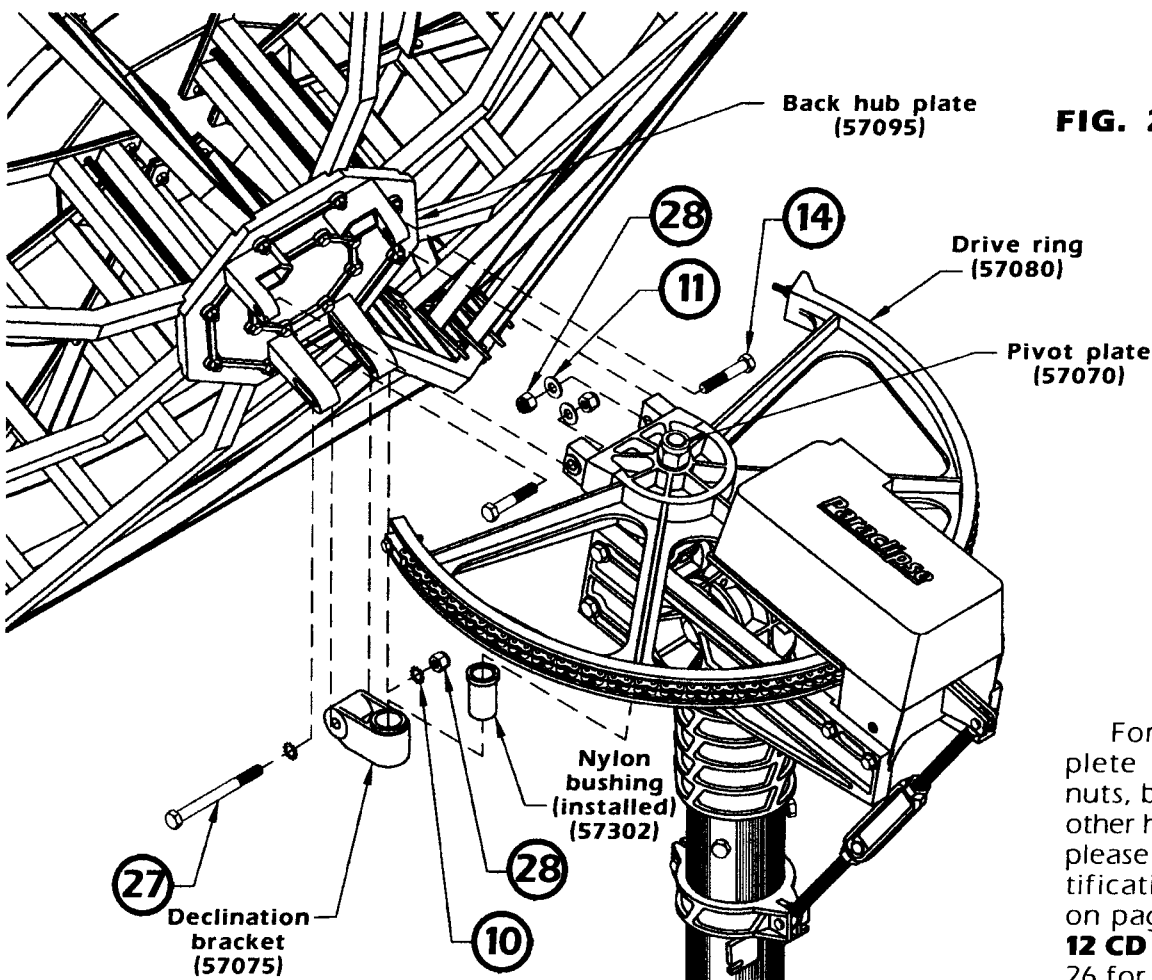


FIG. 25

For a complete listing of nuts, bolts, and other hardware, please see identification table on page 25 for **12 CD** and page 26 for **14 1/2 CD**.

IMPORTANT

Read all instructions carefully prior to beginning mesh installation.

1. INNER MESH INSTALLATION: Lay the inner mesh on the rings. Starting with one side of mesh, slide the inner mesh into the slot on top of the rib. Once one side of the inner mesh has been completely installed into the slot, slide it towards the center of the reflector until the other side of the inner mesh begins to touch the opposite rib slot. Completely work the inner mesh into the opposite slot. Then firmly slide the inner mesh towards the center of the reflector, making sure that the sides of the inner mesh stays inside the rib slot.

NOTE: The diagrams shown in Fig. 22 for the **12 CD** and Fig. 23 for the **14 1/2 CD** for J-clip installation are for reference only. The actual numbers of J-clips required will vary; one clip every 3" (76 mm) is typical. Mesh must be held firmly against the ribs and rings.

2. J-CLIP INSTALLATION: After a piece of inner mesh is in place, install J-clips using the clip installation sequence shown in Fig. 22 and 23. When installing the J-clips, firmly pull downward and around the ring while making sure the J-clip is square to the ring. (See Fig. 24)

NOTE: There will be one ring (the third largest) that will not be clipped until the outer mesh is in place.

3. OUTER MESH INSTALLATION: Install the outer mesh as per steps #1 and #2 while making sure to slide the outer mesh **under** the inner mesh where the two pieces of mesh overlap.

4. Repeat steps #1, #2, and #3 until the antenna is completely meshed.

5. TRIM INSTALLATION: When the antenna mesh installation is completed, install the trim. With the flat side up, work the trim onto the edge of the outer mesh panel. Trim the excess with side-cutting pliers.

FIG. 24

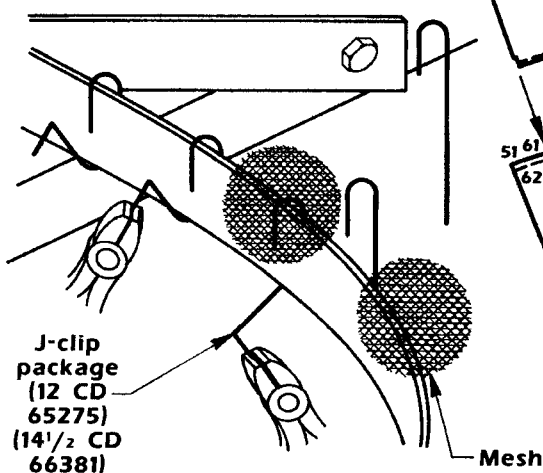


FIG. 22

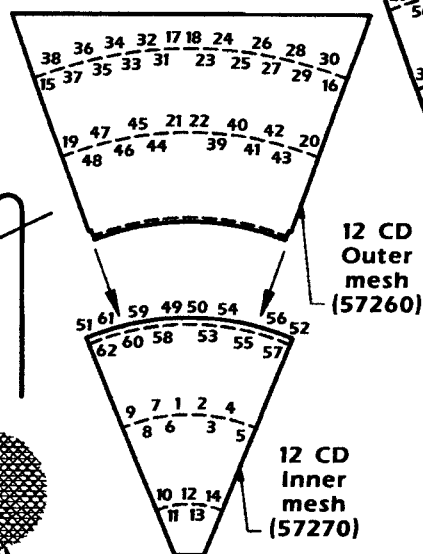
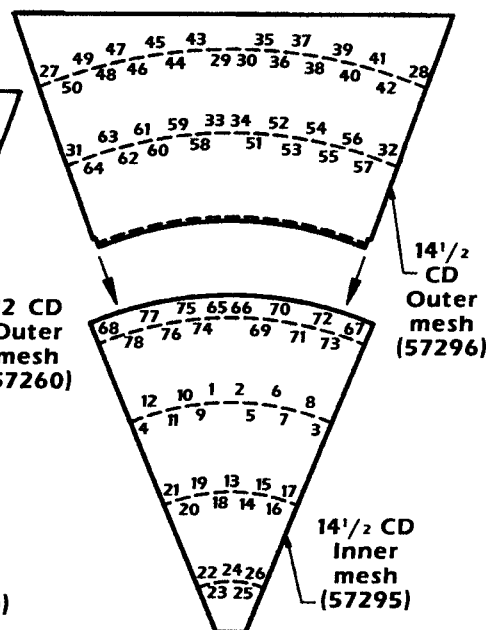
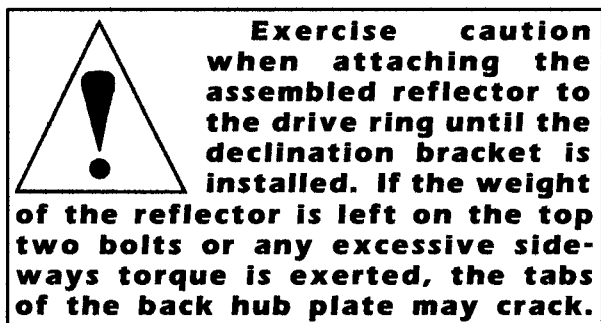


FIG. 23





1. Lift the assembled reflector and attach its back hub plate to the drive ring using two $\frac{1}{2}$ " x $2\frac{3}{4}$ " bolts, two $\frac{1}{2}$ " flatwashers, and two $\frac{1}{2}$ " nyloc nuts. Do not tighten. (See Fig. 25)

NOTE: For those using the counterbalance (standard on the **14 $\frac{1}{2}$ CD** and optional on the **12 CD**), insert the two $\frac{1}{2}$ " x $2\frac{3}{4}$ " bolts, but do not use the two $\frac{1}{2}$ " flatwashers and two $\frac{1}{2}$ " nyloc nuts until the counterbalance has been installed. (See the following page.)

2. Slide the declination bracket onto the shaft on the bottom of the pivot plate, making sure that the side with the nylon bushing slides up the shaft first. (See Fig. 25)

3. Attach the back hub plate to the declination bracket using one $\frac{1}{2}$ " x $5\frac{1}{2}$ " bolt, two $\frac{1}{2}$ " star washers, and one $\frac{1}{2}$ " nyloc nut. Tighten all reflector to drive ring and declination hardware without overtightening. (See Fig. 25)

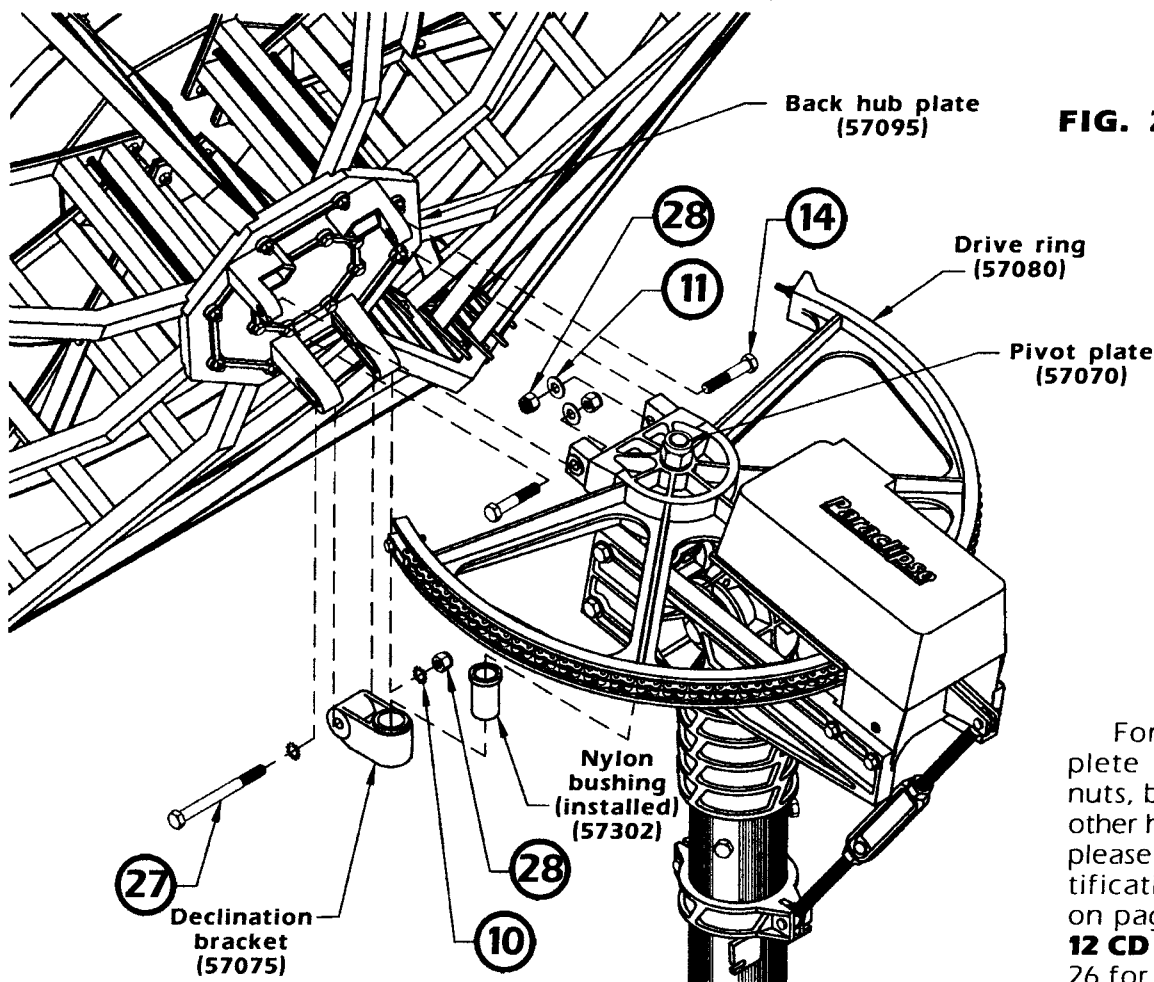


FIG. 25

For a complete listing of nuts, bolts, and other hardware, please see identification table on page 25 for **12 CD** and page 26 for **14 $\frac{1}{2}$ CD**.

COUNTERBALANCE INSTALLATION (14 $\frac{1}{2}$ CD)

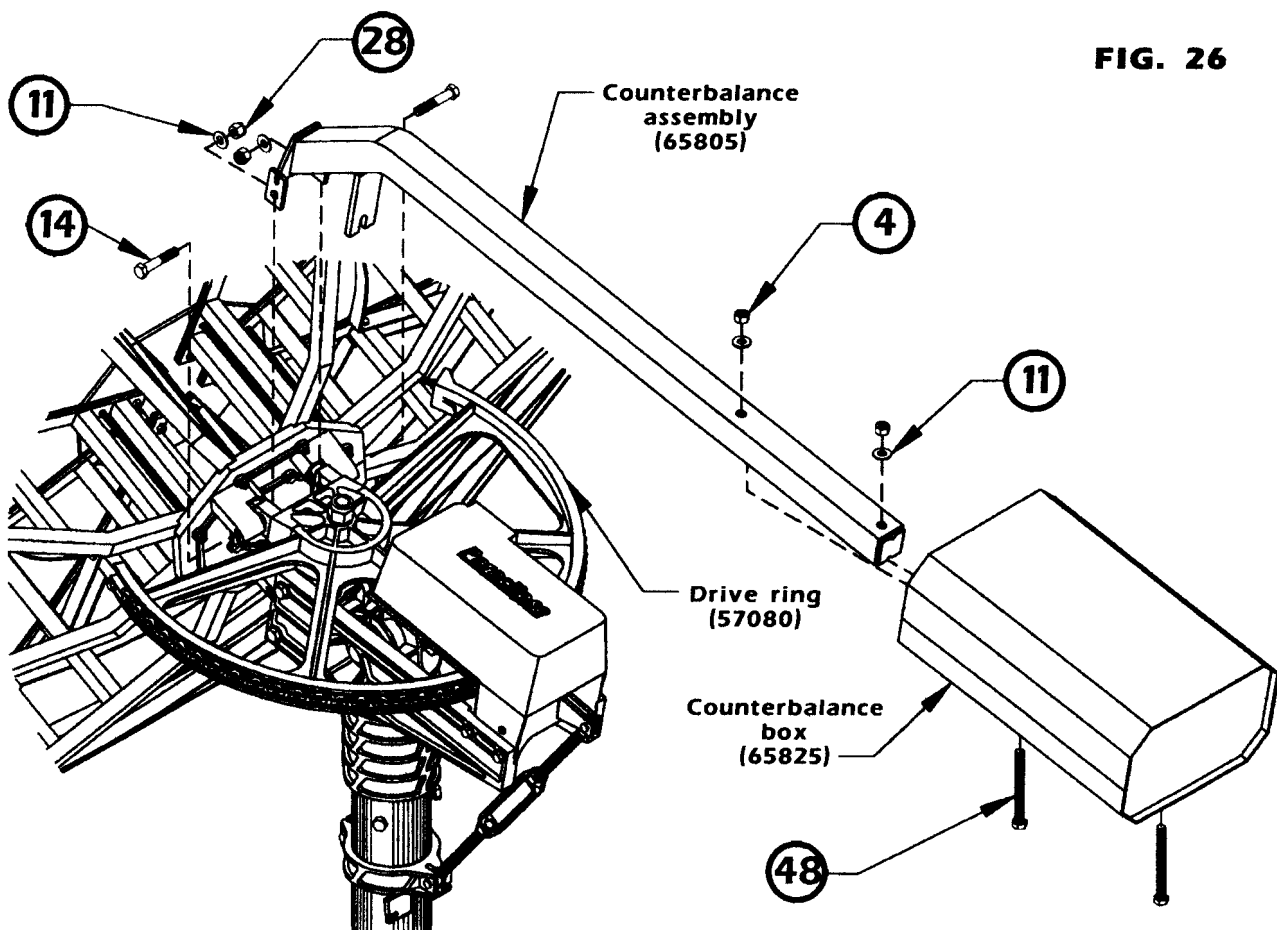
1. Attach the counterbalance box to the counterbalance assembly using two $\frac{1}{2}$ " x 5" tap bolts, two $\frac{1}{2}$ " flatwashers, and two $\frac{1}{2}$ " nuts. Tighten. (See Fig. 26)

2. Fill the counterbalance box (to the top) with standard ready-mix concrete so that the concrete is flush with the rim of the counterbalance box. Let set.

NOTE: If it is desired to add concrete later, the concrete must be added so that it is flush with the rim of the counterbalance box.

3. Attach the completed counterbalance to the drive ring using two $\frac{1}{2}$ " x 2 $\frac{3}{4}$ " bolts, two $\frac{1}{2}$ " flatwashers, and two $\frac{1}{2}$ " nyloc nuts. Do not overtighten. (See Fig. 26)

FIG. 26



For a complete listing of nuts, bolts, and other hardware, please see identification table on page 25 for **12 CD** and page 26 for **14 $\frac{1}{2}$ CD**.

FEED POLE AND FEED PLATE INSTALLATION

1. Assemble the feed horn according to manufacturer's instructions.

NOTE: The feed pole to rib assembly mounting locations will vary from feed to feed depending on the feed offset angle with respect to the polar axis. Mount the feed poles and the feed plate on the ribs which suitably accommodate the individual

feed offset angle. Fig. 27 below will suffice in most cases.

2. Attach the feed poles to the ribs using four $\frac{1}{4}$ " x 1" bolts, eight $\frac{1}{4}$ " flat washers, and four $\frac{1}{4}$ " nuts. Do not tighten. (See Fig. 28)

3. Attach the feed plate to the feed poles using four $\frac{1}{4}$ " x 1" bolts, eight $\frac{1}{4}$ " flat washers, and four $\frac{1}{4}$ " nuts. Do not tighten. (See Fig. 29)

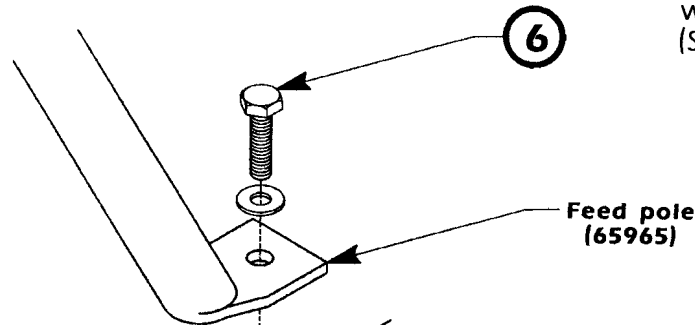


FIG. 28

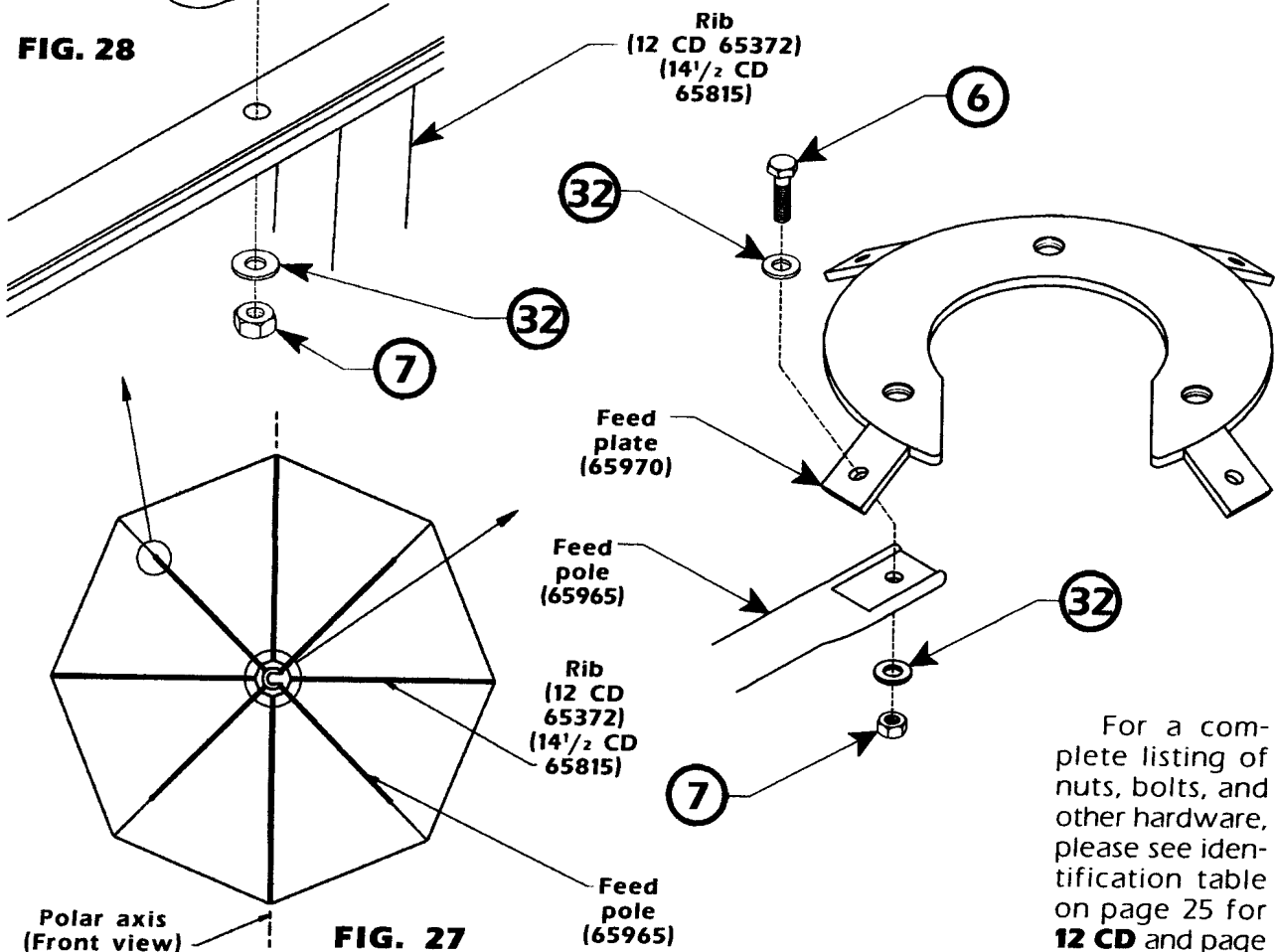


FIG. 27

FIG. 29

For a complete listing of nuts, bolts, and other hardware, please see identification table on page 25 for **12 CD** and page 26 for **14 1/2 CD**.

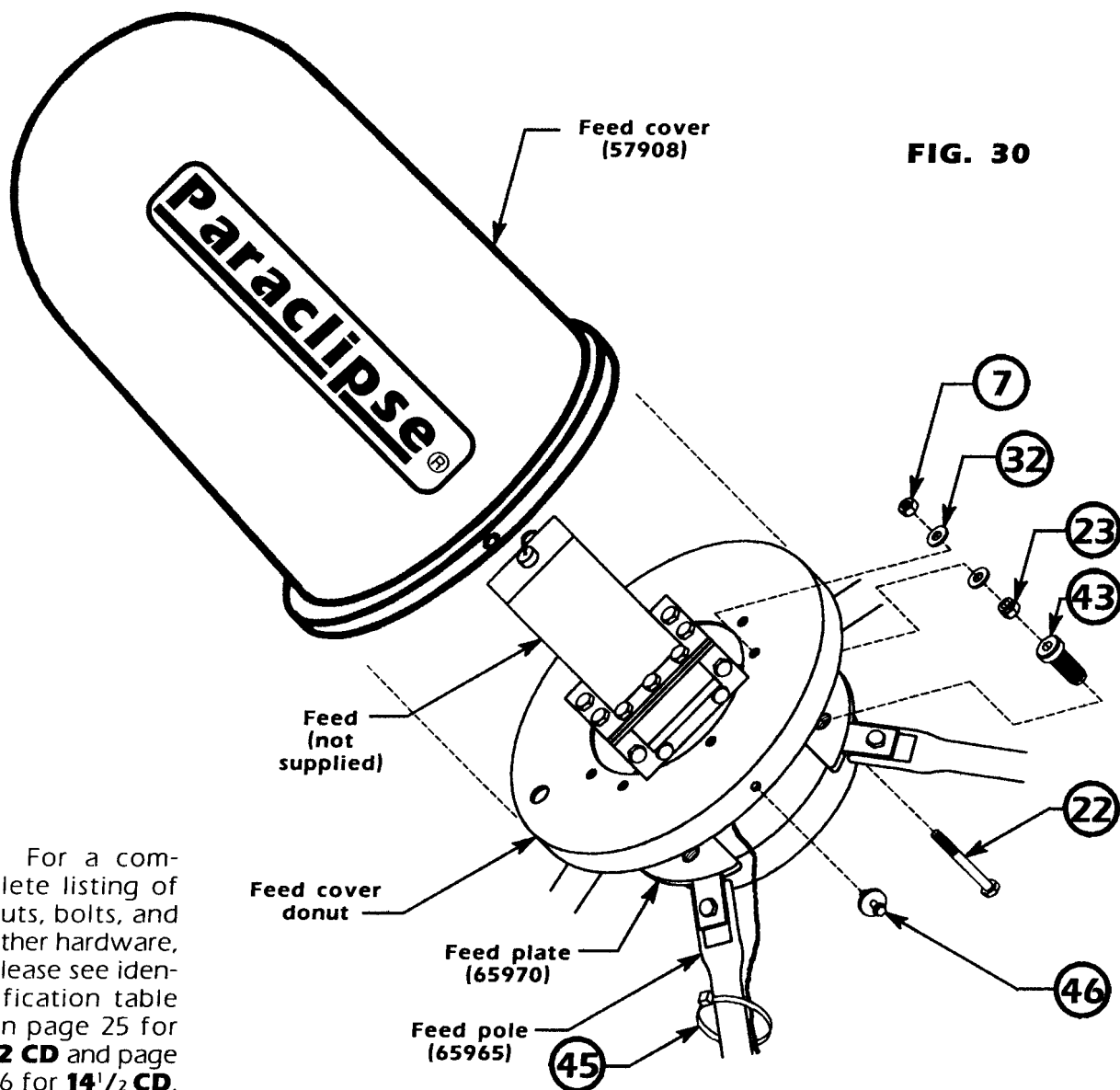
FEED AND FEED COVER INSTALLATION

1. Attach the feed (not supplied) and feed cover donut to the feed plate using three $\frac{1}{4}$ " x 2 $\frac{1}{2}$ " bolts, three nylon thumb screws (which thread into the feed plate), three $\frac{1}{4}$ " nyloc nuts, six $\frac{1}{4}$ " flat washers, and three $\frac{1}{4}$ " nuts. Do not tighten. (See Fig. 30)

2. Attach the feed cables to a feed pole and the back of a rib using seven cable tie wraps. (See Fig. 30)

3. Center the feed horn in the antenna. Equal measurements to all ribs is a must. Adjust the focal length (see specifications on page 27). The focal length is measured from the top of the front hub plate to the throat of the feed. Tighten all reflector hardware.

4. Attach the feed cover to the feed cover donut using four cover push nuts (insert and thread in). (See Fig. 30)



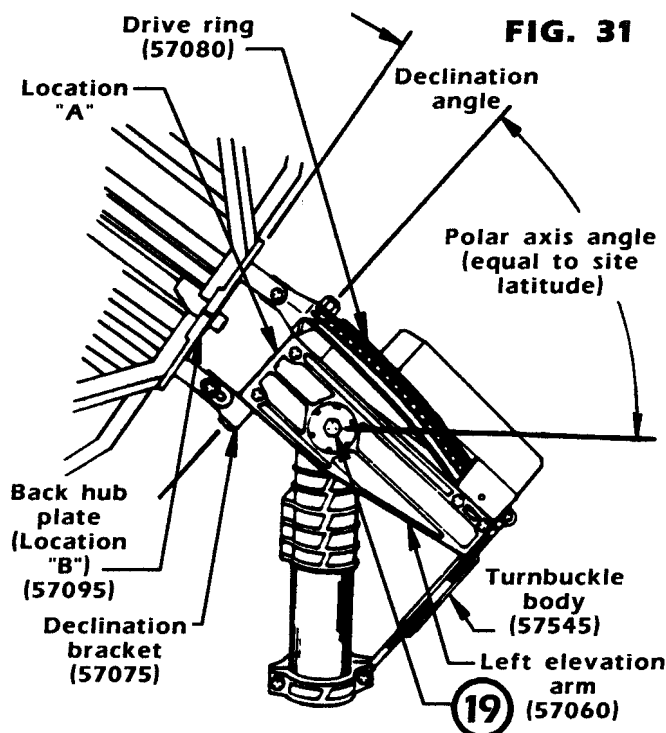
For a complete listing of nuts, bolts, and other hardware, please see identification table on page 25 for **12 CD** and page 26 for **14 1/2 CD**.

1. To adjust the elevation, loosen the $\frac{3}{4}$ " x 6" bolt that goes through the right and left elevation arms and the mount cap. (See Fig. 31)

2. Using an inclinometer at location "A", adjust the elevation so that it is equal to the site latitude. To adjust, rotate the turnbuckle body. Retighten the $\frac{3}{4}$ " x 6" bolt. (See Fig. 31)

3. To adjust the declination, loosen the three $\frac{1}{2}$ " nyloc nuts that attach the back hub plate to the drive ring and the declination bracket. (See Fig. 31)

4. Using an inclinometer to measure the angle at locations "A" and "B", adjust the declination according to the chart below. The declination angle is the difference between locations "A" and "B". Retighten all declination hardware. (See Fig. 31)



For a complete listing of nuts, bolts, and other hardware, please see identification table on page 25 for **12 CD** and page 26 for **14 1/2 CD**.

Declination & Elevation Chart

Polar axis angle (equal to site latitude)	Decli- nation	Polar axis angle (equal to site latitude)	Decli- nation	Polar axis angle (equal to site latitude)	Decli- nation
0°	.00°	24°	3.54°	48°	6.41°
2°	.30°	26°	3.81°	50°	6.61°
4°	.61°	28°	4.08°	52°	6.79°
6°	.91°	30°	4.34°	54°	6.97°
8°	1.21°	32°	4.60°	56°	7.14°
10°	1.51°	34°	4.85°	58°	7.30°
12°	1.81°	36°	5.09°	60°	7.45°
14°	2.11°	38°	5.33°	62°	7.59°
16°	2.40°	40°	5.56°	64°	7.72°
18°	2.69°	42°	5.79°	66°	7.84°
20°	2.98°	44°	6.00°	68°	7.95°
22°	3.26°	46°	6.21°	70°	8.06°

1. It is necessary to search for the most southerly satellite (for antenna location sites in northern hemisphere) or northerly satellite (for sites in southern hemisphere) from your location. Refer to a "Satellite Guide" or consult your nearest dealer.

Begin with the antenna pointed in a southerly direction (for antenna location sites in northern hemisphere) or northerly direction (for antenna sites in southern hemisphere). To begin searching, turn your receiver on to scan-tune (if your receiver is not so equipped, have someone slowly tune the receiver through the transponders). Next, turn the antenna slightly in the direction of the satellite.

2. Systematically search for the satellite by making one-turn-at-a-time adjustments of the turnbuckle. With each adjustment of elevation, slowly swing the antenna using the motor drive from east to west, while looking for a signal on your television.

NOTE: If no signal can be found, recheck the antenna elevation/declination, north-south alignment and plumb of mount. If no problem is found with the mechanical alignment, consult the owner's manual for your receiver or call your local dealer.

3. When you find your first satellite, turn off the scan-tune and adjust to an active transponder (channel).

4. Carefully adjust elevation and azimuth to maximum signal strength using the signal strength meter on your receiver; or, if available, use a digital or analog volt-ohm meter (VOM). You may also adjust visually by observing your television for the best picture.

5. Turn on scan-tune once again and swing antenna, using the motor drive while looking for other satellites. If no other satellites are "visible," or you can not receive all the satellites (and your signal path is not blocked), the mount is not aligned to true north/south.

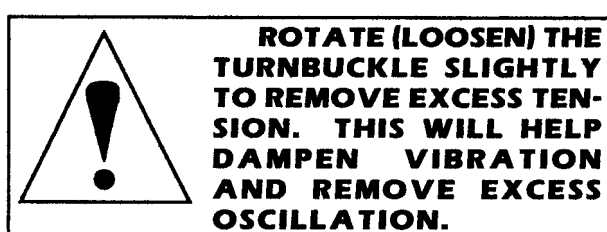
6. North/south alignment: While facing the equator, determine whether the lowest (closest to the horizon) viewable satellite is to the right or left of you. If it is to your left, continue with the following instructions. If it is to your right, reverse all "right/left" and "raise/lower" references.

a) Swing your antenna to the satellite farthest to your right and adjust your azimuth and elevation for the absolute maximum signal. Swing your antenna to the satellite farthest to your left and do the same. If any azimuth and elevation adjustments are required to peak the signal on this satellite, your north/south alignment will still need minor correction.

b) If you raise the antenna to improve the picture with the turnbuckle assembly, rotate the mount slightly (a fraction of an inch or a few millimeters) counter-clockwise. If you lower the antenna to improve the picture, rotate the mount slightly clockwise.

c) Repeat steps "a" and "b" until there is no adjustment needed from the satellite farthest to your right to the satellite farthest to your left.

7. While observing a signal strength meter or watching the television picture, retighten all nuts and bolts on the mount firmly to ensure that the signal remains at maximum. Recheck antenna tracking from west to east to make sure the mount has not moved.



Your **PARACLIPSE** antenna is now aligned to track the Clarke orbit belt. Therefore, complete your wiring to the television viewing location per instructions provided with your receiver.



The adjustment strut pipes and the long strut pipes are used to help keep the mount stable in high wind areas. When the strut pipes are attached, the north/south alignment is limited. The adjustment strut pipes and the long strut pipes are optional on the 12 CD.

1. Attach the adjustment strut pipes to the long strut pipes using four $\frac{3}{8}$ " x $1\frac{1}{2}$ " bolts. Do not tighten. (See Fig. 32)

2. Attach the adjustment strut pipes to the ends of the right and left elevation arms using the two existing $\frac{3}{8}$ " x $1\frac{3}{4}$ " bolts, $\frac{3}{8}$ " flatwashers, and $\frac{3}{8}$ " nyloc nuts. Do not tighten. (See Fig. 32)

3. Attach the long strut pipes to the two $\frac{3}{4}$ " x 12' anchor bolts using two $\frac{3}{4}$ " flatwashers and two $\frac{3}{4}$ " nyloc nuts. Do not tighten. (See Fig. 33)

4. Correctly align the adjustment strut pipes and the long strut pipes so that binding will not take place and tighten all hardware. **Take caution so as not to pull on the aligned mount!**

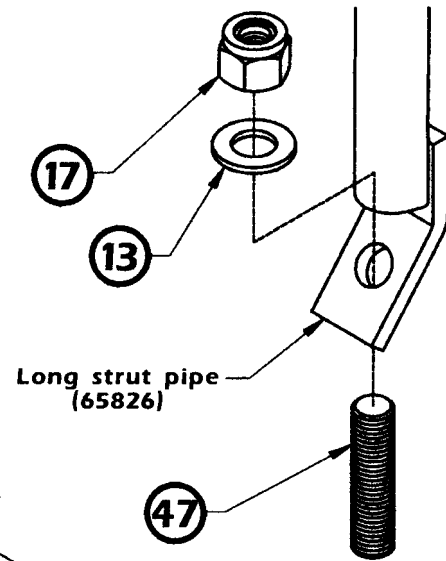
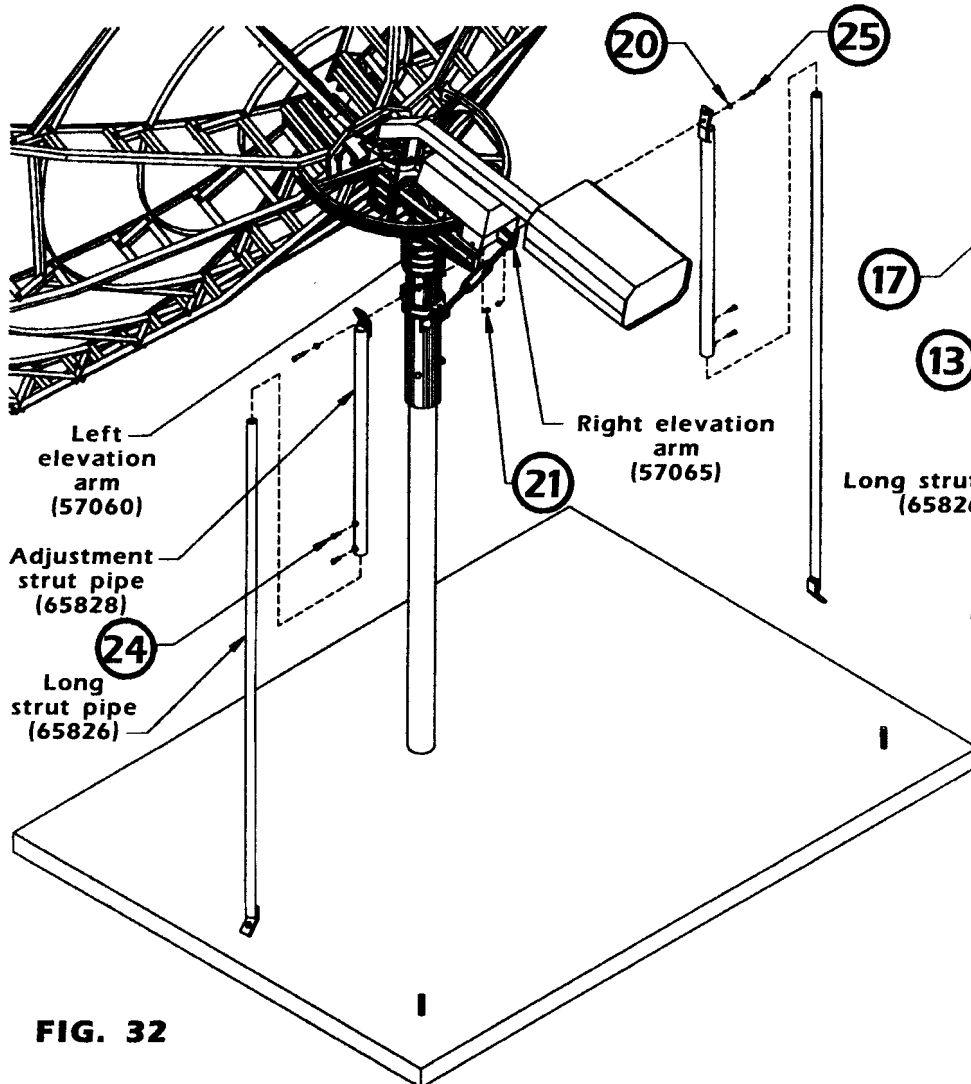


FIG. 33

For a complete listing of nuts, bolts, and other hardware, please see identification table on page 25 for **12 CD** and page 26 for **14' 1/2 CD**.

12 CD HARDWARE TABLE (Includes all hardware, see note below.)

FIG. PART NO.	NO.	DESCRIPTION	PIECES REQ'D	FIG. PART NO.	NO.	DESCRIPTION	PIECES REQ'D
1	52018	5/16" x 1 3/4" BOLT	1	23	55190	1/4" NYLOC NUT	3
2	52019	1/4" USS FLATWASHER	17	25	55250	3/8" x 1 3/4" BOLT	5
3	52020	5/16" NYLOC NUT	1	26	55252	1/2" x 2 1/4" BOLT	4
4	52089	1/2" NUT	4	27	55253	1/2" x 5 1/2" BOLT	1
5	52175	1/4" x 1 3/4" BOLT	80	28	55255	1/2" NYLOC NUT	3
6	52176	1/4" x 1" BOLT	8	29	55260	#10 x 1/2" ALLEN SCREW- STAINLESS STEEL	3
7	52177	1/4" NUT	91	30	55262	#10 FLATWASHER	3
8	52181	5/16" x 1" BOLT	16	31	55264	1/2" x 3/4" BOLT	4
9	52183	5/16" NUT	32	32	55270	1/4" FLATWASHER	22
10	52212	1/2" STAR WASHER	2	33	55274	#10 x 3/4" SELF- TAPPING SCREW	3
11	52213	1/2" FLATWASHER	6	34	55324	5/16" x 3" STUD- STAINLESS STEEL	1
12	55061	5/16" x 2" BOLT	16	36	56924	M6 x 12 ALLEN SCREW- STAINLESS STEEL	4
13	55079	3/4" FLATWASHER	2	37	57401	1/2" x 2 3/4" CLEVIS PIN	2
14	55110	1/2" x 2 3/4" BOLT	2	38	57402	3/8" x 1 1/4" CLEVIS PIN	2
15	55114	5/16" NYLOC NUT- STAINLESS STEEL	1	39	57420	1/2" PUSH NUT	2
16	55115	5/16" USS FLATWASHER- STAINLESS STEEL	1	40	57422	3/8" PUSH NUT	2
17	55125	3/4" NYLOC NUT	1	41	57450	7/8" I. D. x 1/8" BRONZE WASHER	1
18	55130	7/8" NYLOC NUT	1	42	57505	CHAIN SPRING WASHER	1
19	55135	3/4" x 6" BOLT	1	43	57530	NYLON THUMB SCREW	3
20	55162	3/8" FLATWASHER	6	44	57541	1/8" x 1/8" x 1 1/2" KEY	1
21	55163	3/8" NYLOC NUT	5	45	57560	CABLE TIE WRAP	7
22	55186	1/4" x 2 1/2" BOLT	3	46	57567	COVER PUSH NUT	4

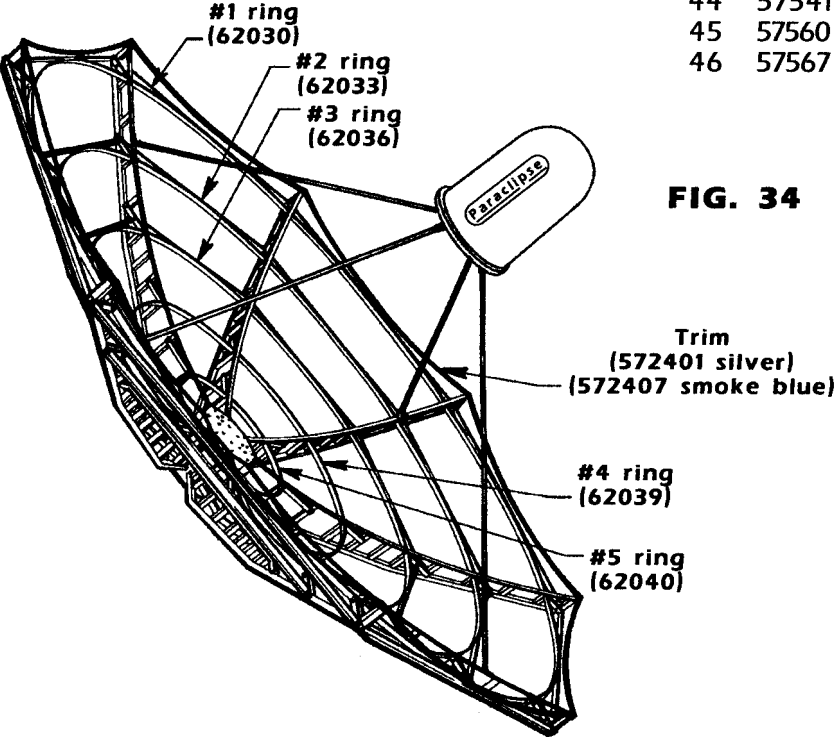


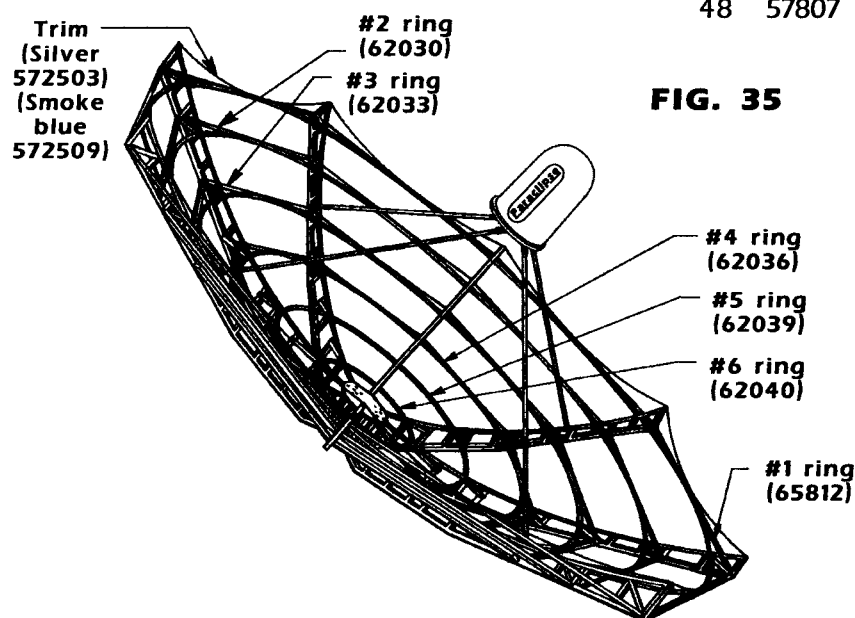
FIG. 34

IMPORTANT!

When comparing the hardware list on this page against your antenna, please remember that some hardware has already been preassembled and is therefore not in the prebagged hardware. Otherwise, it may seem that some hardware is missing when in reality it is not.

14¹/₂ CD HARDWARE TABLE (Includes all hardware, see note below.)

FIG. NO.	PART NO.	DESCRIPTION	PIECES REQ'D	FIG. NO.	PART NO.	DESCRIPTION	PIECES REQ'D
1	52018	5/16" x 1 3/4" BOLT	1	26	55252	1/2" x 2 1/4" BOLT	4
2	52019	1/4" USS FLATWASHER	25	27	55253	1/2" x 5 1/2" BOLT	1
3	52020	5/16" NYLOC NUT	1	28	55255	1/2" NYLOC NUT	3
4	52089	1/2" NUT	6	29	55260	#10 x 1/2" ALLEN SCREW- STAINLESS STEEL	3
5	52175	1/4" x 1 3/4" BOLT	96	30	55262	#10 FLATWASHER	3
6	52176	1/4" x 1" BOLT	8	31	55264	1/2" x 3/4" BOLT	4
7	52177	1/4" NUT	107	32	55270	1/4" FLATWASHER	22
8	52181	5/16" x 1" BOLT	8	33	55274	#10 x 3/4" SELF- TAPPING SCREW	3
9	52183	5/16" NUT	24	34	55324	5/16" x 3" STUD- STAINLESS STEEL	1
10	52212	1/2" STAR WASHER	2	35	55325	5/16" x 11 7/8" STUD	8
11	52213	1/2" FLATWASHER	8	36	56924	M6 x 12 ALLEN SCREW- STAINLESS STEEL	4
12	55061	5/16" x 2" BOLT	8	37	57401	1/2" x 2 3/4" CLEVIS PIN	2
13	55079	3/4" FLATWASHER	4	38	57402	3/8" x 1 1/4" CLEVIS PIN	2
14	55110	1/2" x 2 3/4" BOLT	2	39	57420	1/2" PUSH NUT	2
15	55114	5/16" NYLOC NUT- STAINLESS STEEL	1	40	57422	3/8" PUSH NUT	2
16	55115	5/16" USS FLATWASHER- STAINLESS STEEL	1	41	57450	7/8" I. D. x 1/8" BRONZE WASHER	1
17	55125	3/4" NYLOC NUT	3	42	57505	CHAIN SPRING WASHER	1
18	55130	7/8" NYLOC NUT	1	43	57530	NYLON THUMB SCREW	3
19	55135	3/4" x 6" BOLT	1	44	57541	1/8" x 1/8" x 1 1/2" KEY	1
20	55162	3/8" FLATWASHER	6	45	57560	CABLE TIE WRAP	7
21	55163	3/8" NYLOC NUT	5	46	57567	COVER PUSH NUT	4
22	55186	1/4" x 2 1/2" BOLT	3	47	57800	3/4" x 12" ANCHOR BOLT	2
23	55190	1/4" NYLOC NUT	3	48	57807	1/2" x 5" TAP BOLT	2
24	55222	3/8" x 1 1/2" BOLT	4				
25	55250	3/8" x 1 3/4" BOLT	5				

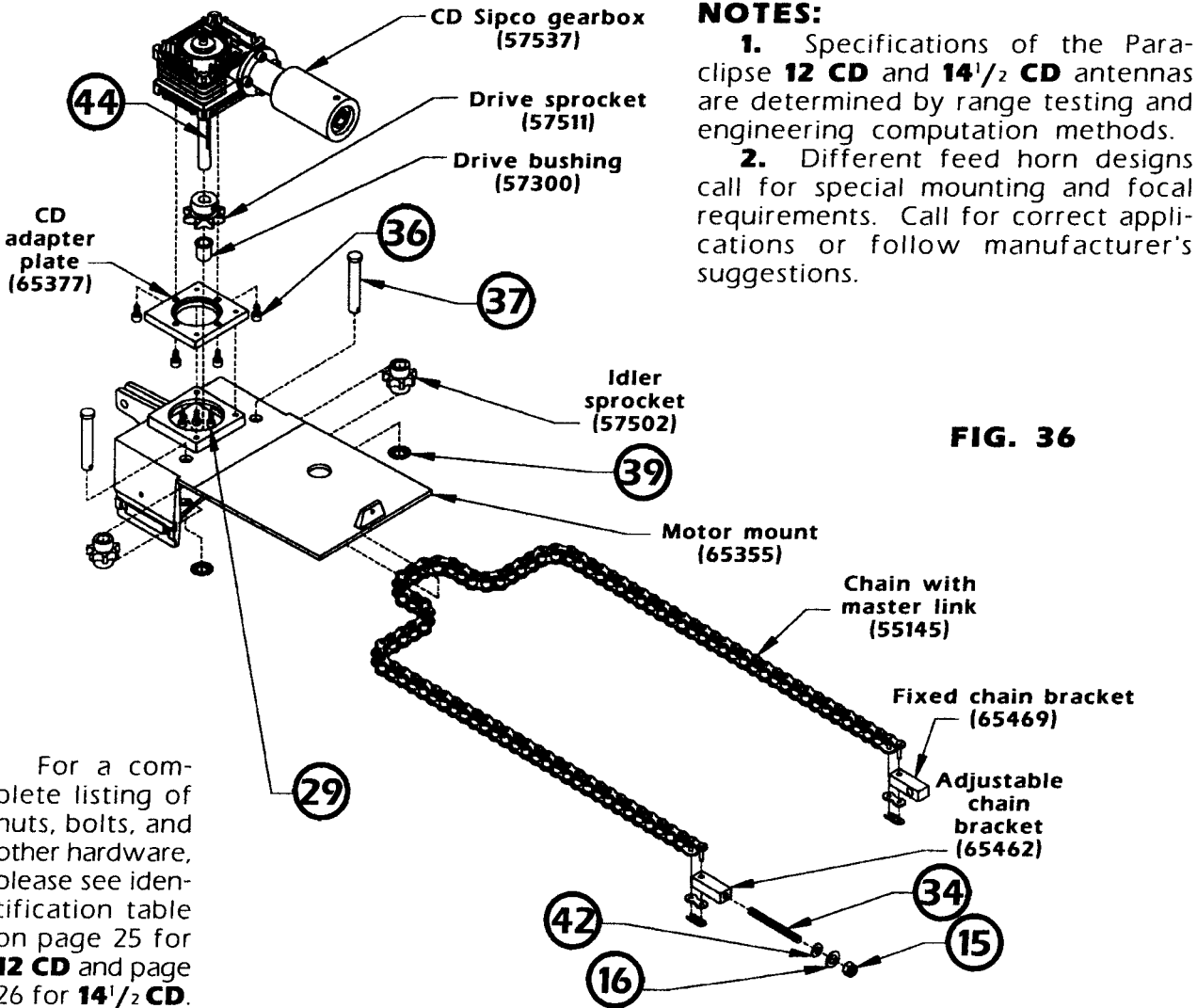
**FIG. 35**

IMPORTANT!

When comparing the hardware list on this page against your antenna, please remember that some hardware has already been preassembled and is therefore not in the prebagged hardware. Otherwise, it may seem that some hardware is missing when in reality it is not.

MOTOR ASSEMBLY PARTS ILLUSTRATION AND SPECIFICATIONS

SPECIFICATION	12 CD	14.5 CD
C Band Gain	42.3 dB	43.6 dB
Ku Band Gain	50.0 dB	51.5 dB
C Band Efficiency	70%	65%
2° Spacing Approved	Yes	Yes
C Band 3dB Beam Width	1.3°	1.2°
C Band First Side Lobe	-20.4 dB	-20.0 dB
C Band Antenna Noise Temperature	24° K @ 45° Elevation	23° K @ 45° Elevation
F/D	0.375	0.31
Focal Point (see notes)	53.375" (1.356 m)	53.375" (1.356 m)



NOTES:

1. Specifications of the Paracclipse 12 CD and 14 1/2 CD antennas are determined by range testing and engineering computation methods.
2. Different feed horn designs call for special mounting and focal requirements. Call for correct applications or follow manufacturer's suggestions.

FIG. 36

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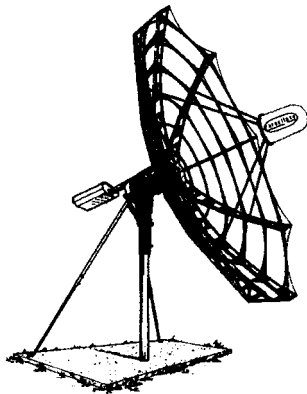
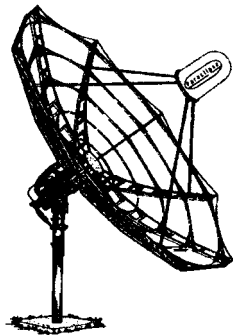
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