

GENERAL DYNAMICS
SATCOM Technologies

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May 6, 2009

ASSEMBLY MANUAL

1.2 METER SERIES 1130
Rx/O ANTENNA SYSTEM

General Dynamics SATCOM Technologies
1500 Prodelin Drive
Newton NC 28658

1.2 METER SERIES 1130 ANTENNA SYSTEM

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| G | Revised Logo and Name | 5/5/09 | RAH |
| F | Revised Address | 1/10/02 | |
| E | Deleted Item #9 | 1/2/97 | PGW |
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SECTION I INTRODUCTION

1.0 GENERAL INFORMATION

This manual describes the assembly and installation of General Dynamics 1.2M small aperture mount. The General Dynamics 1.2M small aperture system is a rugged, reliable antenna system, which will operate in the Ku-band or C-band receive frequency bands with high efficiency and at the same time successfully withstand the effects of the environment.

These instructions are listed by sections that cover all areas of assembly and installation. Additional sections are included in the manual to provide information on antenna alignment to the satellite and maintenance. It is assumed the mast pipe has been properly installed. A suggested In-Ground foundation is shown in section 1.6. The antenna should be grounded to meet any applicable local laws or codes.

1.1 UNPACKING AND INSPECTION

The antenna containers should be unpacked and inspected at the earliest date to insure that all material has been received and is in good condition. A complete packing list for each major component is supplied.

1.2 FREIGHT DAMAGE

Any damage to materials while in transit should be immediately directed to the freight carrier. He will instruct you on matters regarding any freight damage claims.

1.3 MATERIAL - MISSING OR DAMAGED

Any questions regarding missing or damaged materials that is not due to the freight carrier should be directed to General Dynamics Customer Service Department at:

**General Dynamics SATCOM Technologies
1500 Prodelin Drive
Newton NC 28658
USA
(828) 464-4141**

1.4 MECHANICAL INSTALLATION TOOLS

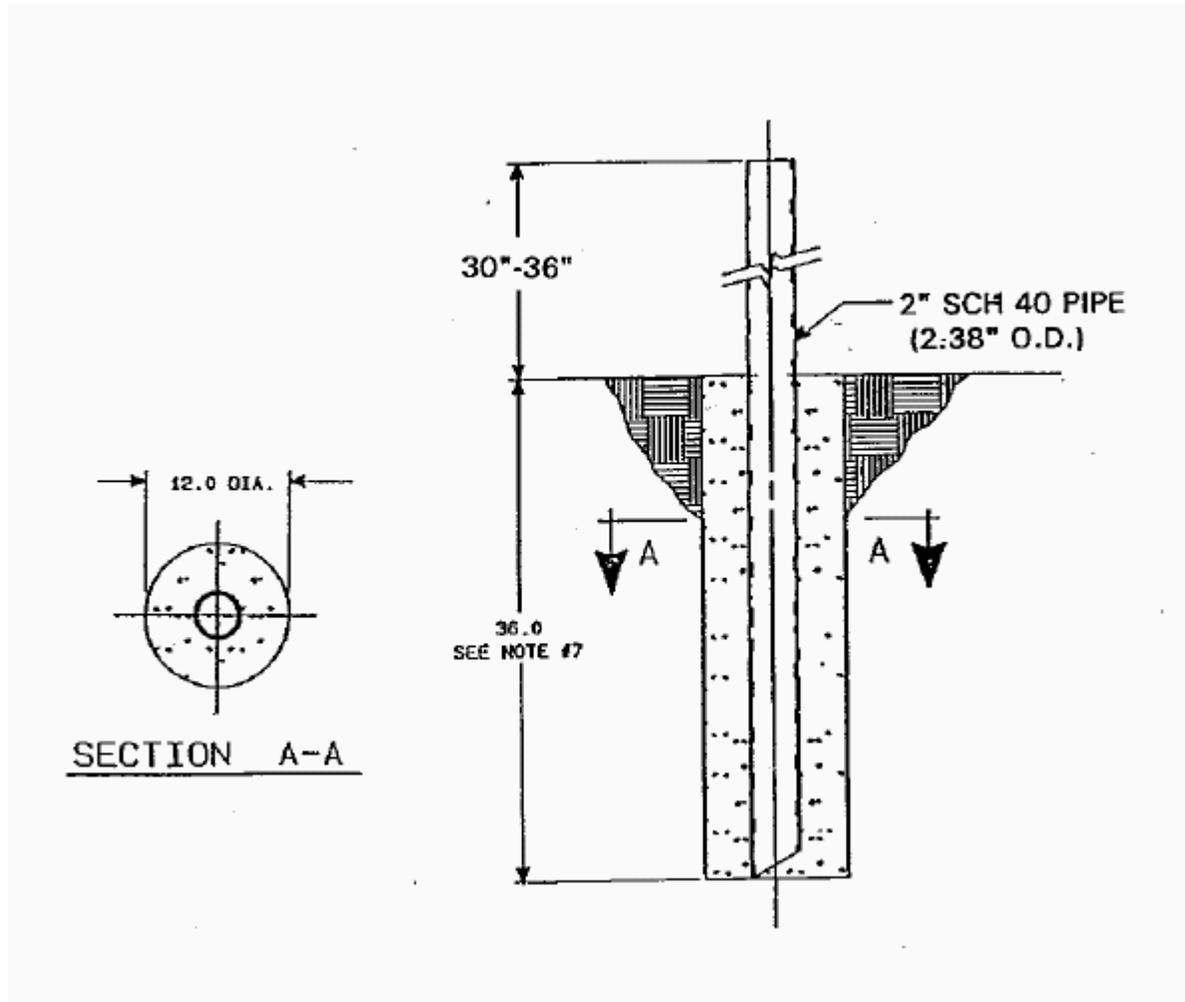
The following tools are suggested for the antenna installation.

- 1 ratchet
- 1 socket, - 7/16"
- 1 socket, - 9/16"
- 1 wrench, combination - 7/16"
- 1 wrench, combination - 9/16"
- 1 wrench, combination - 3/4"
- 1 wrench, adjustable - 8"

1.5 RECOMMENDED TORQUE VALUES

The following maximum recommended torque (M.R.T) values are suggested:

| <u>HARDWARE</u> | <u>M.R.T.</u> |
|---------------------------|---------------|
| 1/4" FEED SYSTEM HARDWARE | 66 in/lb |
| 3/8" MOUNT HARDWARE | 20 ft/lb |
| BACK REFLECTOR SCREWS | 180 in/lb |
| SIDE REFLECTOR SCREWS | 120 in/lb |

1.6 RECOMMENDED FOUNDATION**NOTES:**

1. SCHEDULE 40 PIPE SHOULD CONFORM WITH ASTM A36 STRUCTURAL STEEL.
2. ALL CONCRETE SHOULD CONFORM TO BUILDING CODE STANDARDS AND HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS (PER ACI-318-77)
3. SOIL BEARING CAPACITY SHOULD BE NO LESS THAN 2000 PSF.
4. CONCRETE SHOULD BE POURED AGAINST UNDISTURBED SOIL.
5. ALLOW CONCRETE 24 HOUR SET TIME BEFORE INSTALLATION OF ANTENNA.
6. THE ANTENNA SHOULD BE PROPERLY GROUNDED TO MEET APPLICABLE LOCAL CODES.
7. MINIMUM DEPTH AS SHOWN OR EXTENDED TO LOCAL FROST LINE.

(GENERAL DYNAMICS DOES NOT REPRESENT OR WARRANT THAT ANY PARTICULAR DESIGN OR SIZE OF FOUNDATION IS APPROPRIATE FOR LOCALITY OR EARTH STATION INSTALLATION)

SECTION II

2.0 ANTENNA ASSEMBLY OVERVIEW

This small aperture Az/El mount is designed to support General Dynamics 1.2M Rx/O antenna. The mount is quick and easy to install and designed to withstand the effects of the environment. Refer to the figures and parts list and follow the instructions in the listed sequence.

2.1 MOUNT AND REFLECTOR ASSEMBLY

- STEP 1: Place the reflector (item #1) face down on a flat surface as shown in figure #1. Place the reflector support (item #3) onto the reflector with the elevation tab oriented to the top of the reflector. (Note that the top of the reflector does not have a feed support hole in the outer rim where as the bottom and each side does.)
- STEP 2: Attach the reflector support to the reflector with (4) Hi-Lo thread cutting screws (item #13). Tighten securely but do not over tighten to prevent damaging the reflector.
- STEP 3: Place the canister (item #2) onto the mast pipe as shown in figure #2. Secure by placing (4) 3/8-16 x 3/4" bolts (item #16) into the holes in the canister and tightening.
- STEP 4: Place the elevation channel (item #5) between the short ears of the canister and secure with (2) 3/8-16 x 1" bolts, lockwashers, and hex nuts. (items #17, 20, & 21).
- STEP 5: Thread a 1/2-13 hex nut (item #14) well up onto the elevation adjustment rod (item #4) and then slide the rod through the hole in the elevation channel. Next, thread the 1/2-13 coupling nut (item #15) onto the end of the elevation adjustment rod.

STEP 6: Place the Reflector/Reflector Support Assembly from Step #2 between the long ears of the canister as shown in figure #3 and secure with the 3/8-16 x 3" bolt, lockwasher, and hex nut (items #19, 20, & 21). Attach the elevation adjustment rod to the elevation tab on the reflector support with a 3/8-16 x 1.25" bolt, lockwasher, and hex nut (items #18, 20, 21).

STEP 7: **DO NOT TIGHTEN HARDWARE UNTIL AFTER ALIGNMENT TO SATELLITE.**

2.2 **FEED ASSEMBLY**

Refer to the parts list and figure #4 for feed and feed support assembly.

STEP 1: Attach the feed rods (items #6 & 7) to the reflector with the Hi-Lo self threading screws (item #12) as shown. Note that the two long rods attach to the sides of the reflector and the shorter rod attaches to the bottom. The bent end of each rod attaches to the reflector. Do not over tighten these screws, tighten just until snug.

STEP 2: Assemble the feed bracket (item #10) to the ends of the feed rods as shown, using the 1/4" bolts, lockwashers and nuts (items #22, 23, & 24). Note that the bolts should be inserted from inside the bracket, then through the rod ends. tighten all feed support hardware now.

STEP 3: Assemble the feed horn and LNB as shown. Place the o-ring into its groove in the LNB. Cover with the teflon gasket (if provided) noting the hole line-up. Attach the feed assembly to the LNB with the hardware provided with the LNB, using the four holes indicated.

STEP 4: Place the feed assembly into the saddle of the feed bracket as shown, making sure that the shoulder of the feed horn is back against the face of the bracket. Secure with the feed clamp (item #11) and 1/4" hardware (items #22, 23, & 24) as shown. Tighten this hardware fully to seat the feed in the bracket.

| FEED AND FEED SUPPORT ASSEMBLY PARTS LIST | | | |
|--|-----------------------------|------------|-----------------|
| ITEM | DESCRIPTION | QTY | PART NO. |
| 1 | REFLECTOR | 1 | 0179-231 |
| 2 | CANISTER | 1 | 0490-186 |
| 3 | REFLECTOR SUPPORT | 1 | 0490-185 |
| 4 | ELEVATION ADJ ROD | 1 | 0180-191 |
| 5 | ELEVATION CHANNEL | 1 | 0247-135 |
| 6 | FEED ROD - SIDE | 2 | 0176-147 |
| 7 | FEED ROD - BOTTOM | 1 | 0176-148 |
| 8 | FEED HORN | 1 | VARIES |
| 9 | DELETED | | |
| 10 | FEED MOUNTING BRACKET | 1 | 4080-059 |
| 11 | FEED MOUNTING BRACKET - TOP | 1 | 4080-060 |
| 12 | Hi-Lo SCREW - 11/32 - 14 | 3 | 8319-004 |
| 13 | Hi-Lo SCREW - 27/64 - 13 | 4 | 8319-006 |
| 14 | 1/2 - 13 HEX NUT | 1 | 8104-007 |
| 15 | 1/2 - 13 COUPLING NUT | 1 | 8115-003 |
| 16 | 3/8 - 16 x 3/4" BOLT | 4 | 8032-006 |
| 17 | 3/8 - 16 x 1" BOLT | 2 | 8032-008 |
| 18 | 3/8 - 16 x 1 1/4" BOLT | 1 | 8032-010 |
| 19 | 3/8 - 16 x 3" BOLT | 1 | 8032-024 |
| 20 | 3/8" LOCKWASHER | 4 | 8202-042 |
| 21 | 3/8 - 16 HEX NUT | 4 | 8102-007 |
| 22 | 1/4 - 20 x 3/4" BOLT | 5 | 8030-006 |
| 23 | 1/4" LOCKWASHER | 5 | 8202-040 |
| 24 | 1/4" - 20 HEX NUT | 5 | 8100-007 |

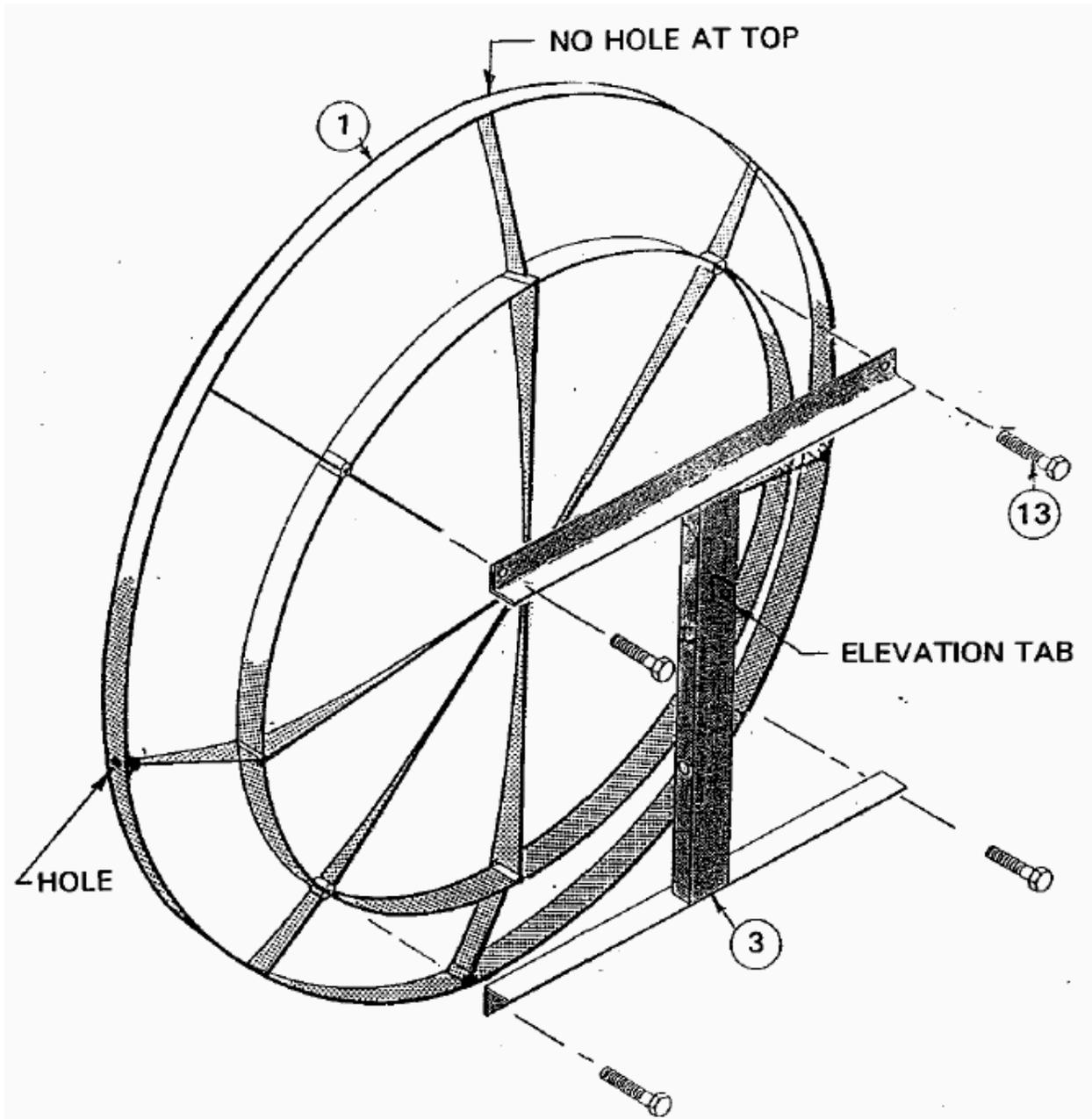


Figure 1

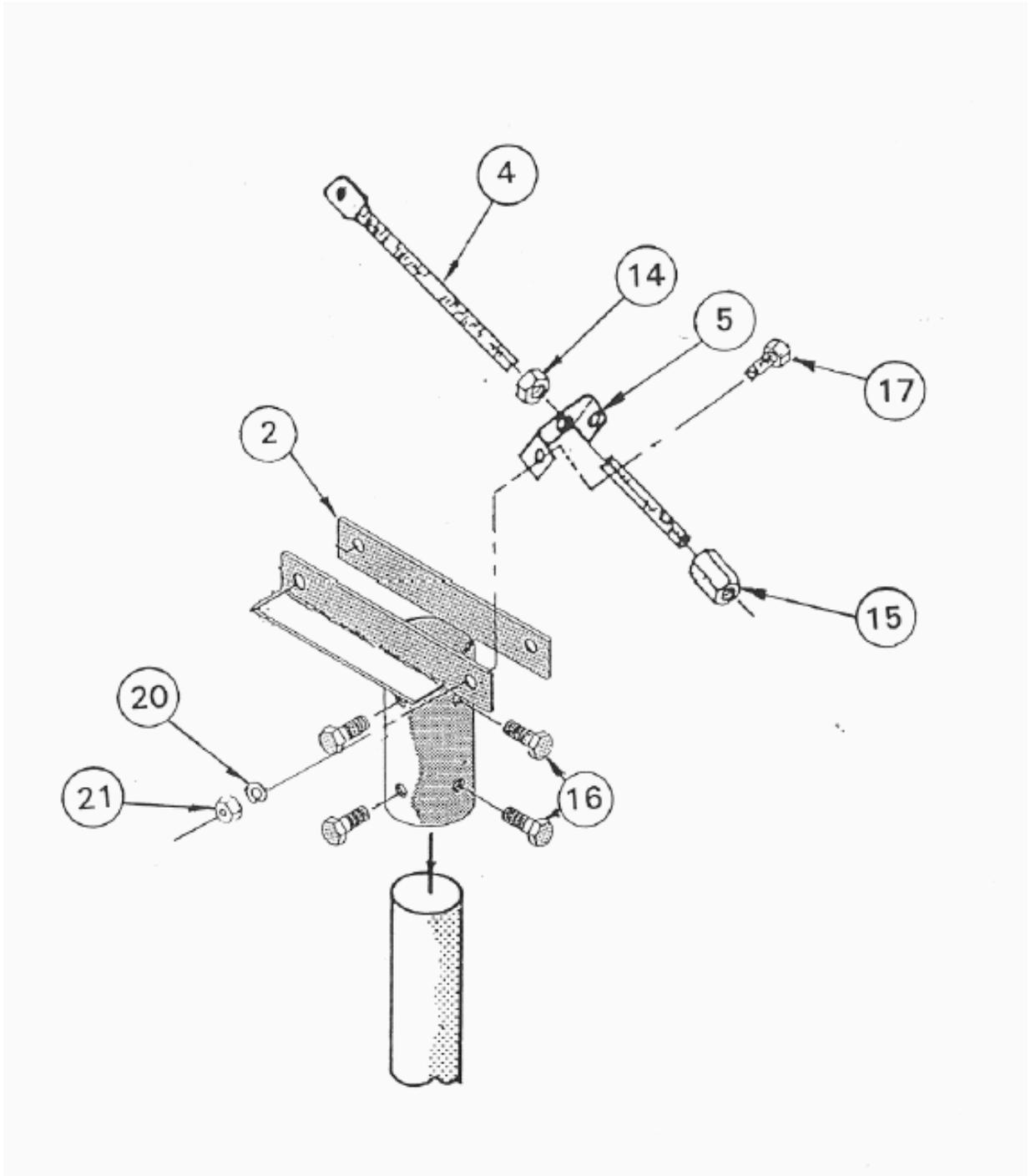


Figure 2

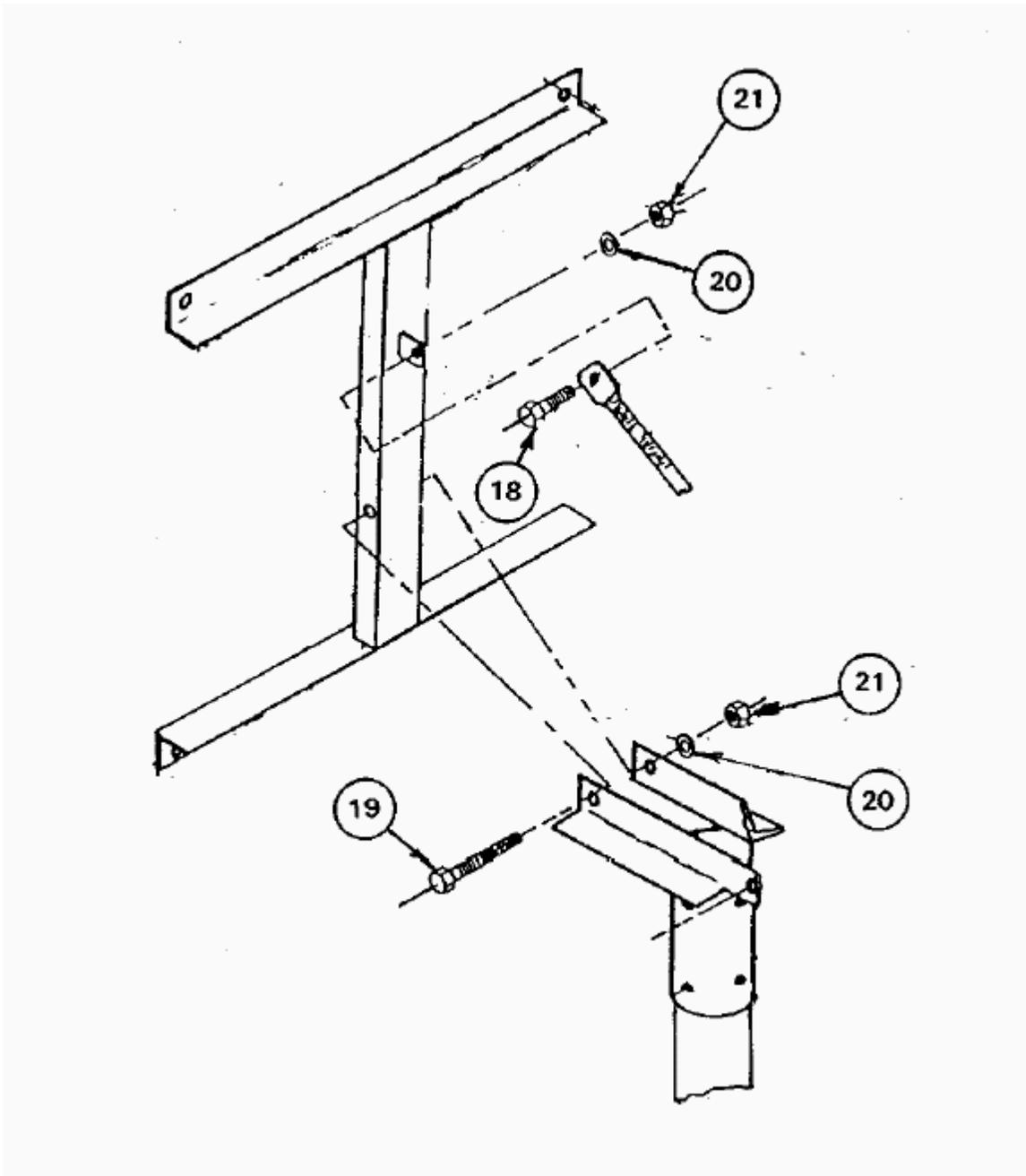


Figure 3

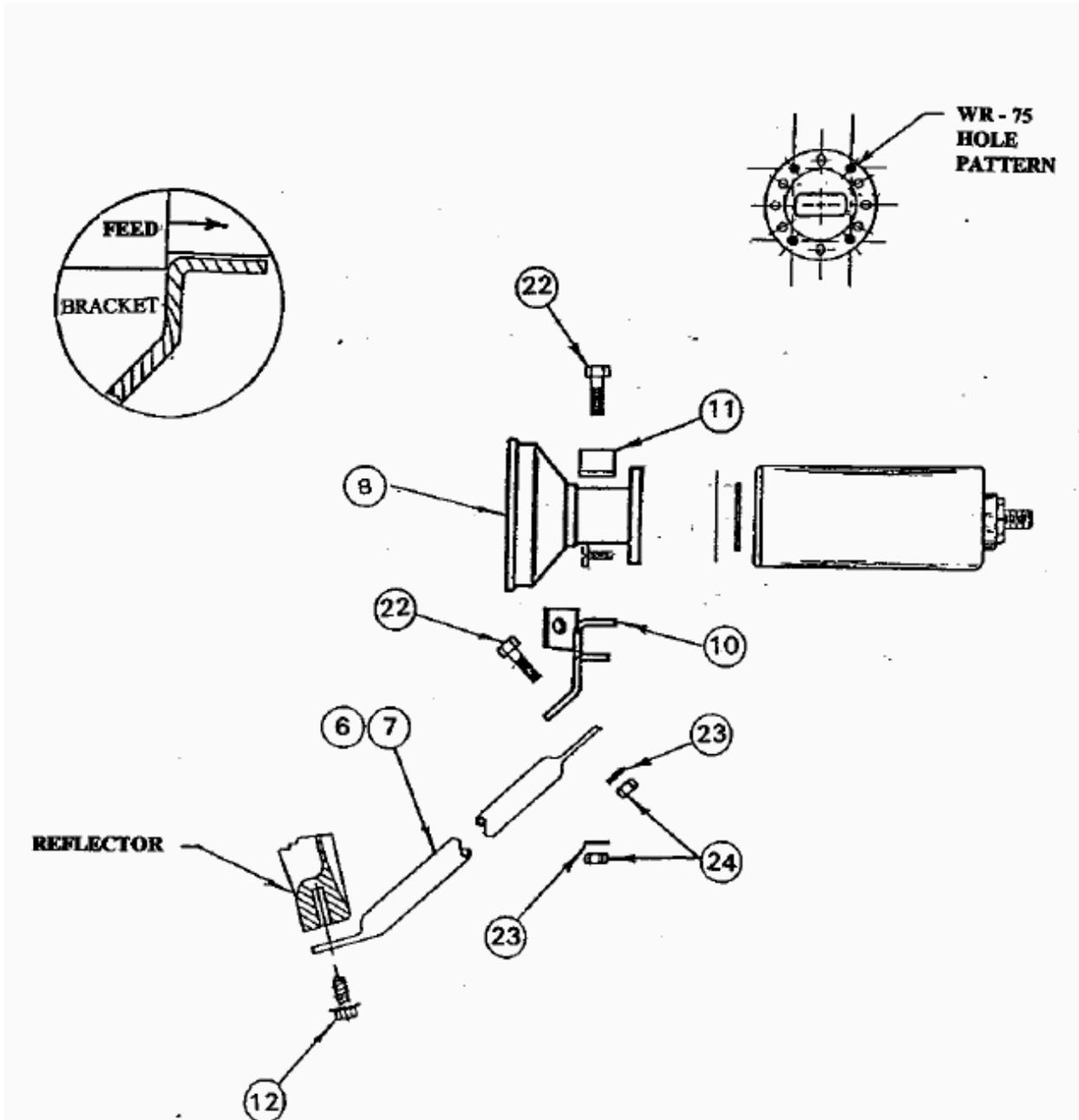


Figure 4

SECTION III ANTENNA ALIGNMENT

3.0 SATELLITE ALIGNMENT

The antenna is now ready to be aligned to the selected satellite. First the rough elevation is set to the expected angle with an inclinometer. The rough azimuth is set by sweeping until the desired satellite is acquired. Fine adjustments in elevation, azimuth and polarity are made until the optimum signal is reached. Then all hardware is tightened fully, and the antenna installation is complete.

Place an inclinometer on the reflector support structure rib as shown in figure 5, so that the elevation angle can be read. (When the reflector is vertical, the RF axis is at 22.6° above horizon. Therefore, 22.6° must be added to the reading to find the true elevation angle.) Set the antenna to the correct elevation angle by raising or lowering with the elevation adjustment rod nuts.

Connect the LNB to the device used for fine tuning (receiver, signal strength meter, etc.). Sweep the antenna in azimuth until a signal is found. The use of a compass will help find the approximate azimuth location in which to confine your search. It may be necessary to rotate the feed in 45° increments in order to find the desired signal. When the desired signal is found and identified, rotate the antenna in azimuth slowly until loss of signal is observed. Rotate the antenna in the opposite direction until the signal strengthens, and then weakens again. Set the azimuth between these two points and snug a couple of the canister bolts.

If the desired signal is not found, it may be necessary to alter the elevation angle slightly, plus or minus, and repeat the above procedure.

After setting the azimuth, return to the elevation adjustment and fine tune in the same way, splitting the difference between the two points where loss of signal is first observed. Check the azimuth adjustment once more, then tighten all canister and elevation rod hardware.

Fine tune the polarity by loosening the six socket head screws that hold the LNB/Adaptor assembly to the feed horn body, and rotate the LNB until maximum signal is achieved. Tighten these screws fully, using the hex key provided.

The coaxial cable may be run down the lower feed support rods and secured with cable ties, then to the reflector's edge and around the rear, up the rube, and down the pipe.

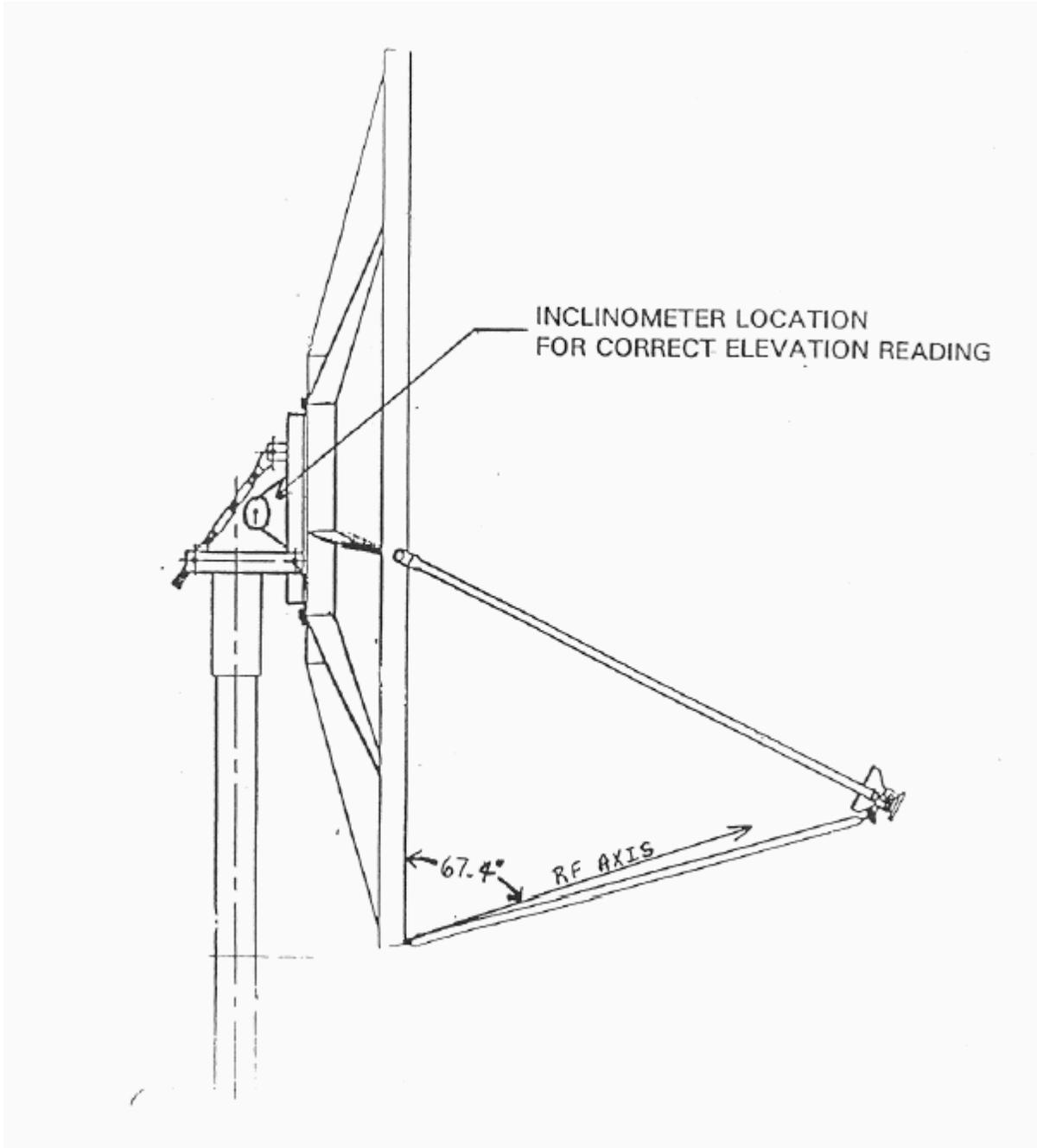


Figure 5

SECTION IV MAINTENANCE

4.0 MAINTENANCE OVERVIEW

After installation, the antenna requires only periodic inspection. It is anticipated that maintenance, if required, will be minimal and easily handled by a local or in-house maintenance staff. The materials used in the construction of this Antenna System virtually eliminate any maintenance repairs.

4.1 PERIODIC INSPECTION

It is suggested that a periodic inspection be performed at least every six months.

NOTE: After any severe weather conditions, inspection of the antenna should be performed to determine if foreign objects have caused damage or if survival specifications have been exceeded.

This inspection should include the following:

STEP 1: Check all bolting locations - all bolts should be tight.

STEP 2: Check all structural members - repair or replace if damaged.

STEP 3: Check the foundation anchor bolts - they must be secure and no failure signs in foundation.

STEP 4: Check for corrosion - on the reflector structure and the mount.

4.2 REFLECTOR

General Dynamics' reflector does not require any maintenance. The composite construction of the reflector is virtually impervious to any damages that could be caused by weather or atmospheric conditions. It is only necessary to inspect for any physical damage done by vandalism or very severe weather conditions.

Should any damage be detected to a portion of the reflector, contact the Customer Service Department at General Dynamics or recommendations involving reflector repair.

4.3 **MOUNT AND REFLECTOR SUPPORT STRUCTURE**

The mount and reflector support structure supplied with this antenna is of steel construction and has a galvanized finish.

If inspection shows any signs of structural failure, the mount members that are damaged should be repaired or replaced.

CORROSION: Any corrosion on steel members may be repaired with a cold, zinc-rich galvanizing paint.

4.4 **FEED AND FEED SUPPORT**

The feed support should be inspected to insure that all hardware is secure. The feed/radio mounting bolts should be tight.

The feed horn window should be inspected to insure that it is intact. Replace if damaged.