

Type ES56()

5.6-Meter ESA



5.6-Meter Earth Station Antenna

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5.6-Meter Earth Station Antenna

Introduction

Like all Andrew earth station antennas, the 5.6-Meter Earth Station Antenna provides high gain and exceptional pattern characteristics. The electrical performance and exceptional versatility provides the ability to configure the antenna with your choice of linearly- or circularly-polarized 2-port or 4-port combining network. That versatility is provided at the time of initial purchase, as well as in the future, as your satellite communication requirements evolve.

The aluminum reflector is precision formed for accuracy and strength requiring minimal assembly. The reflector assembly is 18.3-feet (5.6-meters) in diameter and segmented in a sixteen piece configuration to reduce shipping volume and facilitate transport to remote sites. Reflector panels are chromate converted and painted with a highly reflective white paint.

The versatile tripod mount can be purchased with either manual or motorizable capabilities. The tripod mount features 180 degree azimuth coverage in three continuous 120 degree overlapping ranges and executes 90 degree continuous elevation adjustment. This large adjustment range provides non-critical foundation orientation and the ability to view geostationary satellites from horizon-to-horizon, from any location worldwide.

The motorizable tripod mount features self-aligning bearings for the elevation pivots, resulting in "zero" backlash. This mount can be operated manually, but has the ability to be upgraded for motorized operation, including steptracking/Smartrack™ applications. The motorizable mount type is indicated by the **ES56** or **ES56HS** letters within the antenna type number. The addition of the letter "HS" within the antenna type number indicates that the mount includes High-Speed azimuth/elevation machine jackscrews, instead of corresponding azimuth/elevation strut assemblies. The azimuth/elevation jackscrews are equipped for integration with the optional motor drive systems. A cross-axis grounding kit is supplied with each mount to ensure electrical interconnectivity of the complete structure.

The aluminum enclosure and hot-dipped galvanized steel mount maintain pointing accuracy and ensures durability and reliability. The antenna and standard manual mount with enclosure will survive 125 mph (200 km/h) wind, in any position of operation, without damage or permanent deformation in moderate coastal/industrial areas. Severe conditions require additional protection.

Andrew provides a complete line of available options, including motor drive systems (with power interfaces addressing domestic and international standards), remote micro-processor antenna control for motor drive systems, pressurization equipment, and inter-connecting HELIAX® cables and waveguide.

Proprietary Data

The technical data contained herein is proprietary to Andrew Corporation. It is intended for use in operation and maintenance of Andrew supplied equipment. This data shall not be disclosed or duplicated in whole or in part without express written consent of Andrew Corporation.

Information and Assistance

Andrew Corporation provides a world-wide technical support network. Refer to the technical assistance portion of this manual for the contact numbers appropriate to your location.

Notice

The installation, maintenance, or removal of antenna systems requires qualified, experienced personnel. Andrew installation instructions have been written for such personnel. Antenna systems should be inspected by qualified personnel to verify proper installation, maintenance and condition of equipment.

Andrew Corporation disclaims any liability or responsibility for the results of improper or unsafe installation and maintenance practices.

All designs, specifications, and availabilities of products and services presented in this manual are subject to change without notice.

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Technical Assistance

24-hour Technical Assistance

For technical assistance, call the following numbers at anytime.

Call From	Call To	Telephone	Fax
North America (toll free)	U. S. A.	1-(800)-255-1479	(800)-349-5444
Any Location (International)	U. S. A.	(708)-349-3300	(708)-349-5410

Customer Service Center

The Andrew Customer Service Center gives you direct access to the information and personnel service you need, such as the following:

- Place or change orders
- Check price and delivery information
- Request technical literature

You can call from any of the following:

Call From	Telephone	Fax
North America	1-800-255-1479 (toll free)	1-(800)-349-5444 (toll free)
United Kingdom	00-800-0-255-1479 (toll free)	00-800-0-349-5444 (toll free)
Australia	0011-800-0-255-1479 (toll free)	0011-800-0-349-5444 (toll free)
China	00-800-0-255-1479 (toll free)	00-800-0-349-5444 (toll free)
New Zealand	00-800-0-255-1479 (toll free)	00-800-0-349-5444 (toll free)
Hong Kong	001-800-0-255-1479 (toll free)	001-800-0-349-5444 (toll free)

How to Use This Manual

Overview

The scope of this manual is intended to provide station personnel with the base installation, operation, and maintenance requirements necessary for a 5.6-Meter C-, X- or Ku-Band Earth Station Antenna. This manual provides a convenient reference for authorized operator/service personnel requiring technical information on general system or specific subsystem equipment.

The tables and figures presented in this manual are used as communication aids for the installation, operation, and maintenance of the 5.6-Meter Earth Station Antenna. These tables and figures instantly convey messages, as well as make the procedures easier to understand. This manual uses tables and figures for the following references:

- **Tables** The tables allow you to locate information quickly and easily.
- **Drawings** The drawings supplement the installation instructions by using a combination of graphics and verbage to assist you in simplifying complex procedures and clarifying components.
- **Photographs** The photographs compliment the installation instructions by providing actual examples of the steps being performed, which allow you to view the installation in concrete form.

Content

The manual is divided into five distinct sections, each dealing with a specific technical topic relating to either system or component subsystem information. The sections contained in this manual are described and listed under the following technical headings:

- **How to Use This Manual** Describes the manual's purpose, content, and communication aids. Additionally, this section lists the related documentation for the 5.6-Meter Earth Station Antenna.
- **Getting Started** Provides the preliminary information needed to perform a successful installation. This section should be reviewed prior to the installation. The warnings, recommended tools, parts verification, instructions on reporting lost or damaged equipment, and installation checklist are located in this section.
- **Installation Procedures** Provides the procedures for the different phases of a 5.6-Meter Earth Station Antenna base installation. This section will help you easily find requirements for an individual task, as well as displays the sequence for each task execution.
- **Operation** Describes the controls, functions, and general operating procedures required for proper operation of the 5.6-Meter Andrew Earth Station Antenna.
- **Preventive Maintenance** Describes preventive maintenance procedures that are required to maintain proper functional operation of your new Andrew Earth Station Antenna.

Getting Started

Overview

The installation, operation, and maintenance of the 5.6-Meter Earth Station Antenna requires qualified and experienced personnel. Andrew installation, operation, and maintenance instructions are illustrated for such personnel. Additionally, the antenna should be inspected by qualified personnel to verify proper installation, maintenance, and condition of equipment as described in Preventive Maintenance. The basic equipment and accessories are either manufactured or design controlled by Andrew Corporation.

The prerequisite information necessary for the 5.6-Meter Earth Station Antenna can be found in this section. Furthermore, this section should be reviewed BEFORE performing the installation, operation, or maintenance. Warnings, recommended tools, and the antenna parts can be verified and/or determined with such a review.

Warnings

When installing the 5.6-Meter Earth Station Antenna, be conscious of the warnings presented below. For further information or clarification of this information, contact the Customer Service Center. The warnings are as follows:

1. Electrical shock from voltages used in this antenna system may cause personal injury or death. Prior to making any electrical connections or performing maintenance or repair, ensure that the power is removed. Electrical connections should be made only by qualified personnel in accordance with local regulations.
2. Installation of antennas may require persons to work at elevated work stations. Whenever persons are working at eight or more feet above the ground and not on a guarded platform, they should wear safety belts with at least one (preferably two) lanyards.
3. Never stand underneath any object while it is being lifted.
4. Always wear a hard hat, especially if someone is above you.
5. Make sure no person is in or under the reflector while it is being lifted or positioned; personal injury can result if the reflector assembly falls.
6. Personnel should never be hoisted in or out of the reflector by the crane; personal injury may result.
7. Andrew earth station antennas supplied to standard product specifications will survive 125 mph winds in any operational position in moderate coastal/industrial areas. Severe conditions require additional protection. Should it be expected that winds will exceed 125 mph, it is recommended that Andrew antennas be steered to specific azimuth and elevation orientations to minimize wind forces upon the structure and thereby increase the probability of survival.
8. It is recommended that all cross-axis waveguide and coaxial cables are secure such that high winds will not cause excessive flexing. Position the antenna to an elevation of 90 degrees. The azimuth jackscrew should be placed in the center of its travel.
9. When the antenna is transmitting, severe eye injury or injury to other parts of the body can result from exposure to radio frequency (RF) energy. The antenna must be turned off before entering the area in front of the reflector and near the feed.

NOTE: Failure to follow an installation procedure could result in damage to equipment or personal injury.

Additional warnings will be displayed throughout this manual for your awareness. These warnings can be identified in warning boxes as shown in the following sample.



Andrew disclaims any liability or responsibility for the results of improper or unsafe installation, operation, or maintenance practices.

Recommended Tools

Andrew supplies all appropriate hardware/parts required for the installation of your 5.6-Meter Earth Station Antenna. All tools necessary for the installation process should be provided by the installation crew. Andrew recommends the following tools to be used for a proper installation of the 5.6-Meter Earth Station Antenna.

Tool	Size	Quantity	
Open End or Combination Wrenches	5/16 Inch	2	
	7/16 Inch	2	
	9/16 Inch	2	
	7/8 Inch	2	
	3/4 Inch	2	
	1/2 Inch	2	
	1-1/4 Inch	1	
Crane	1 Ton Minimum Capacity, extended end	1	
Nylon Web Slings (2000 pound breaking strength)	3 Inch by 14 Foot	2	
Rope or Cord (2000 pound breaking strength)	50 Foot	1	
Shackles	5/8 Inch	2	
Ladder	10 Foot Extension	1	
Drive Sockets	1/16 Inch	1	
	9/16 Inch	1	
	7/8 Inch	1	
	3/4 Inch	1	
	1-1/4 Inch	1	
	Breaker Bar	1/2 Inch	1
	Spud Wrenches	1-1/16 Inch	1
1-1/4 Inch		1	
Screw Driver	Standard	1	
	Phillips	1	
Allen Wrench	7/64 Inch	1	
	3/16 Inch	1	
	1/4 Inch	1	
Tape Measure (or other measuring device)	Standard	1	
Felt-tip Marker (or other marking device)	Standard	1	
Hammer	Standard	1	
Rubber Mallet	Standard	1	
Pry Bar	Standard	1	
Tin Snips	Standard	1	
Safety Gloves (each installer)	Standard	1	

Table 2-1. Recommended Tools

Parts Verification

Upon receipt of your order, the shipment should be verified to ensure that all parts have reached your site. This process should occur before the installation process begins.

Andrew Corporation thoroughly inspects and carefully packs all equipment before shipment. If you find that there are missing components, please refer to page 9 for step-by-step instructions on how to properly report the equipment loss.

When you have received your order, verify that all parts contained in the shipment correspond to the parts listed on your packing list.

Reporting Equipment Loss or Damage

If you find that there was damage caused to the equipment during the shipping process, a claim should be filed with the carrier. Follow the "Reporting Visible Loss or Damage" or "Reporting Concealed Damage" procedures when filing a claim with the carrier.

Reporting Visible Loss or Damage

Make a note of any loss or evidence of external damage on the freight bill or receipt, and have it signed by the carrier's agent. Failure to adequately describe such external evidence of loss or damage may result in the carrier refusing to honor a damage claim. The form required to file such a claim will be supplied by the carrier.

Reporting Concealed Damage

Concealed damage means damage which does not become apparent until the unit has been unpacked. The contents may be damaged in transit due to rough handling, even though the carton may not show external damage. If you discover damage after unpacking the unit, make a written request for an inspection by the carrier's agent, then file a claim with the carrier since such damage is most likely the carrier's responsibility.

Inventory Equipment Received

After opening your shipment, an inventory of the parts should occur immediately. Check each item received in your shipment against the packing slip included with the shipment. If any items are missing, please notify Andrew Corporation immediately by contacting the Customer Service Center.

Returning Equipment

Andrew Corporation tries to ensure that all items arrive safe and in working order. Occasionally, despite these efforts, equipment is received which is not in working condition. When this occurs, and it is necessary to return the equipment to Andrew Corporation for either repair or replacement, return can be expedited by following the procedure listed below:

Step 1

Call the Andrew Customer Service Center and request a Return Material Authorization (RMA) number, as well as an address to forward the material to.

Step 2

Tag or identify the defective equipment, noting the defect or circumstances. Also, be sure to write the RMA number on the tag. It would be helpful to reference the sales order and purchase order, as well as the date the equipment was received.

Step 3

Pack the equipment in its original container with protective packing material. If the original container and packing material are no longer available; pack the equipment in a sturdy corrugated box, and cushion it with appropriate packing material.

Step 4

Be sure to include the following information when returning the equipment:

- Your Company Name
- Your Company Address
- City, State, and Zip Code
- Telephone Number
- RMA Number
- Problem Description
- Contact Name

NOTE: Absence of the RMA number will cause a delay in processing your equipment for repair. Be sure to include the RMA number on all correspondence.

Step 5

Ship the equipment to Andrew Corporation using UPS, U.S. Postal Service, or other appropriate carrier; freight prepaid and insured. The material should be forwarded to the address given by the Andrew contact in Step 1.



DO NOT DISCARD CONTENTS



The product in this packaging was placed in the market after August 13, 2005. Its components must not be discarded with normal municipal or household waste.

Contact your local waste disposal agency for recovery, recycling, or disposal instructions.

Installation Procedures

Overview

This section provides installation procedures for the 5.6-Meter Andrew Earth Station Antenna. The installation procedures include instructions on the following antenna components:

- Mount
- Reflector
- Enclosure
- Reflector-to-Mount Assembly
- Subreflector
- Feed System (C-, X- and Ku-band)

Foundation Preparation

Before beginning the installation process on the ground mount assembly, ensure that the foundation has been prepared. Foundation specifications are provided by Andrew and may be used as a reference by civil engineering personnel when preparing the foundation for local soil conditions. These specifications are available before the shipment arrives by contacting the Customer Service Center or your Account Manager.

- Foundation should be dimensioned as detailed in Figure 1.
- Sweep foundation clear of any dirt or debris.
- To ensure smooth surface for mount, scrape foundation pads as shown in Figure 2.
- Studs should extend 3 in. above the ground and are 7/8 in. in diameter
- Apply stick wax to stud threads to ease later connections.

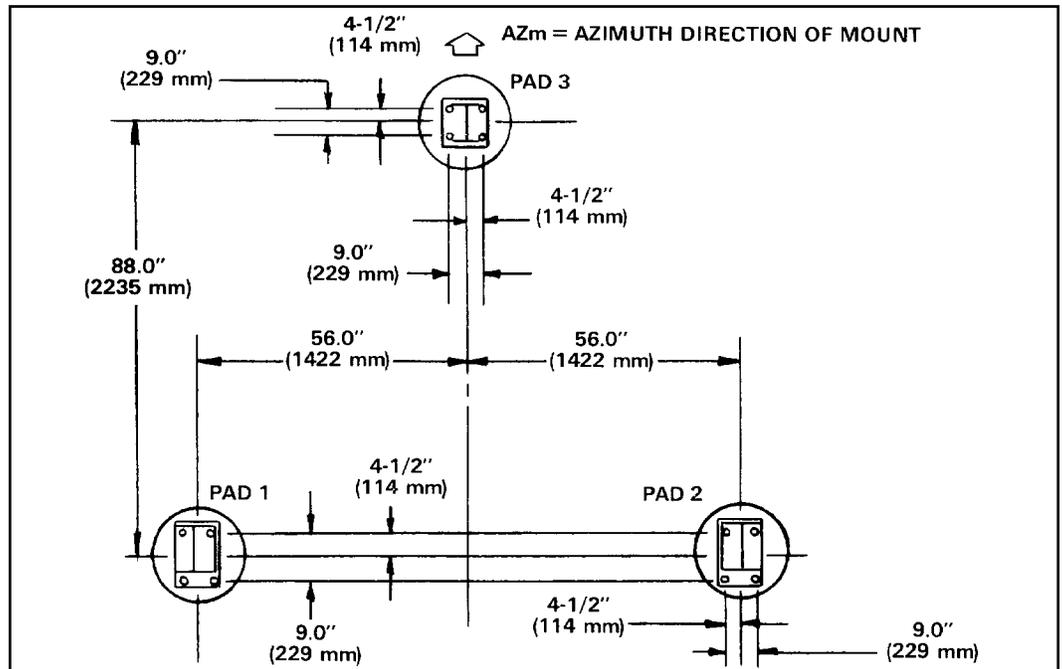


Figure 1



Figure 2

A-325 Tensioning

During the installation process, there are several references to the A-325 hardware tensioning procedure. The A-325 hardware must be properly tensioned to avoid slippage between bolted surfaces under high loads. Slippage can cause the corresponding assembly to move, causing antenna misalignment. When designated, the A-325 hardware should be tightened according to the following tensioning procedure.

NOTE: Tensioned bolts are for final connections only and should not be loosened for reuse.

Step 1

Lubricate the bolt threads with the provided stick wax to reduce friction.

Step 2

Insert the bolt, and add a flat washer—if required. **Do not** allow wax under the flat washer.

Step 3

Add the nut, and finger tighten.

Step 4

After the connections are complete, tighten the bolts until the surfaces are joined and the nuts are snug (for example, full effort of a person using an ordinary spud wrench). Do not proceed with Steps 5 and 6, unless the connection is final and is not intended to be loosened again.

Note: If the bolts are loosened after Steps 5 and 6, discard and replace with new hardware.

Step 5

Using a felt-tip marker, mark the nuts and the ends of the bolts with a straight line as shown in Figure 3-1a and Figure 3-1b.

Step 6

Tighten the nuts further with an extra long wrench until the nuts are moved 1/3 turn (120 degrees) as shown in **Figure 3-1a** for bolt lengths less than four diameters and 1/2 turn (180 degrees) as shown in **Figure 3-1b** for bolt lengths over four diameters.

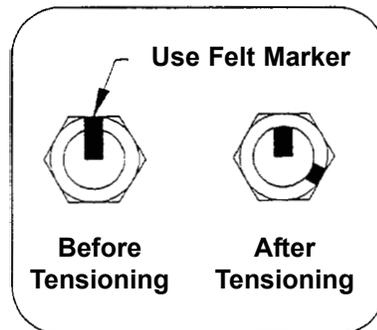


Figure 3-1a: A-325 Tensioning Procedure For bolts less than 4 diameters

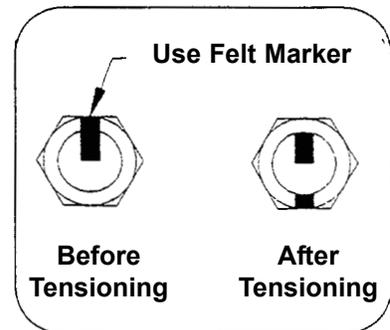


Figure 3-1b: A-325 Tensioning Procedure For bolts over four diameters

Tripod Ground Mount Assembly

Azimuth Beam Assembly

Step 1

The three-point mount is an elevation-over-azimuth mount optimized for geostationary satellite applications. The mount enables continuous elevation adjustment from 0 to 90°. Azimuth adjustment is $\pm 90^\circ$ and divided into three 120° ranges with 30° overlap. Follow the subsequent procedures for proper installation of tripod ground mount assembly.

Step 2

All ground mount hardware is type A-325. Lubricate all A325 bolt threads with supplied stick wax. **Note:** Do not tighten hardware until ground mount installation is complete unless otherwise instructed.

Attach 200056 and 200057 supports to upper portion of 201408 beam assembly as shown in Figure 3.

- Use 7/8 x 2-1/4 in (57 mm) hardware

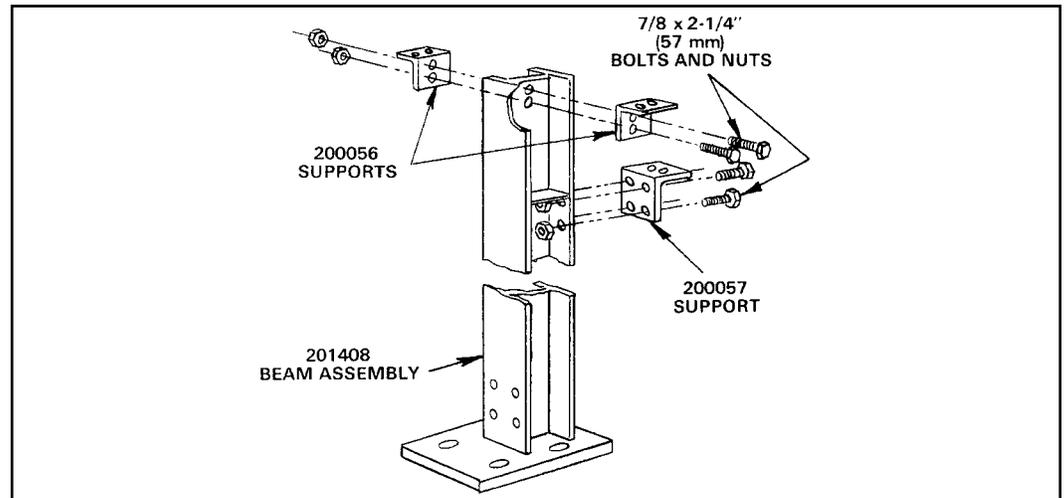


Figure 3

Step 3

Raise 201408 azimuth beam assembly and attach to front foundation pad as shown in Figure 4.

- Use 7/8 in. flatwashers and hex nuts

Note: Hex nuts and flatwashers supplied with 201630 anchor bolt kit

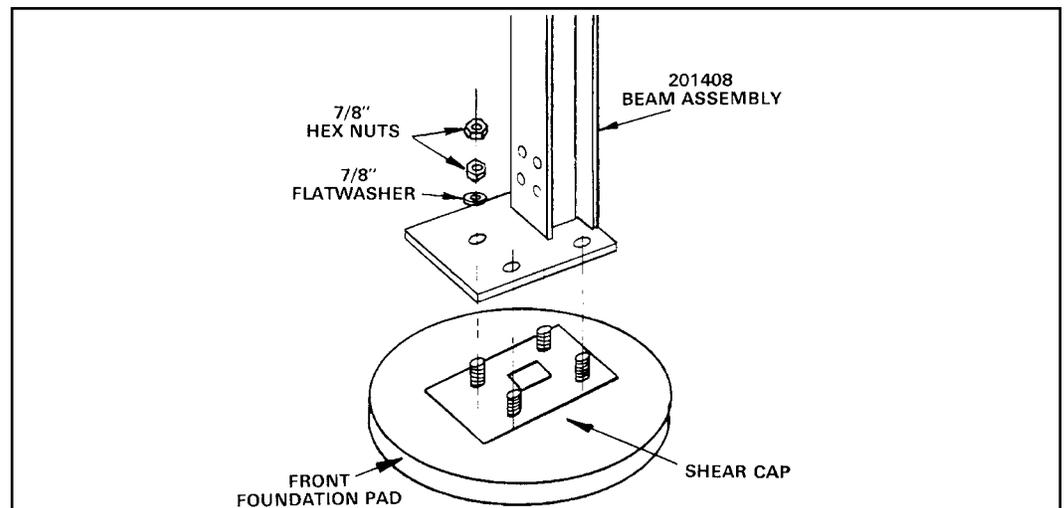


Figure 4

Support Legs Assembly

Step 1

Attach 201327 joint assembly to 201313 beam assembly as shown in Figure 5. Attach 200083 angles to 201313 beam assembly as shown in Figure 5.

- Use 7/8 x 2-1/4 in (57 mm) bolts and nuts for each connection

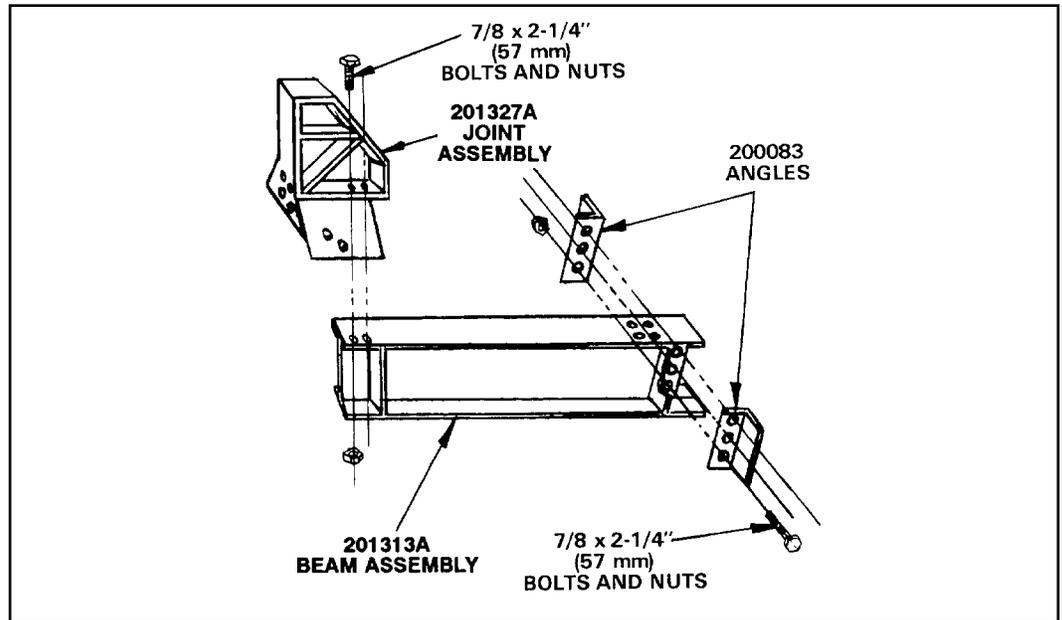


Figure 5

Step 2

Attach 200088 joint assembly to 201313 beam assembly as shown in Figure 6.

- Use 7/8 x 2-1/4 in (57 mm) bolts and nuts

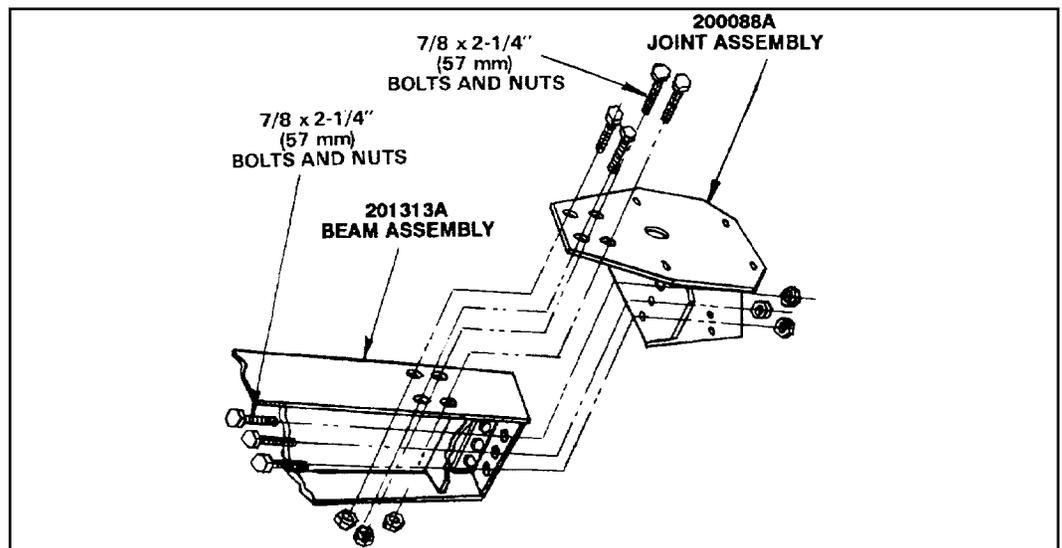


Figure 6

Step 3

Raise 201313 beam assembly to upright position and attach 201315 supports to 201327A joint assembly as shown in Figure 7.

- Use 7/8 x 2-1/4 in (57,ivm) bolts and nuts
- Insert bolts from 201327A joint assembly to supports
- Supports should be installed back-to-back with the flat of angle facing upwards
- Tighten supports until assembly can support itself



Figure 7

Step 4

Attach 201301/201302 rear pad assembly to 201315 supports as shown in Figure 8.

- Use 7/8 x 2-1/4 in (57 mm) bolts and nuts
- Insert bolt from inside of rear pad assembly to outside of support
- Supports should be installed back-to-back with the edges forward and the flats of angles facing rear



Figure 8

Step 5

Attach 201314 supports to 201301/201302 rear pad assemblies and 201273 joint assembly as shown in Figure 9.

- Use 7/8 x 2-1/4 in (57 mm) bolts and nuts
- Insert bolt from inside of joint assembly to outside of support
- Supports should be installed back-to-back with the edges forward and the flats of angles facing rear



Figure 9

Step 6

Attach 201317 supports between angle pairs as shown in Figure 10. Select corresponding mounting holes so that 201317 supports are parallel to 201313 beam assembly.

- Use 7/8 x 2-1/4 in (57 mm) hardware
- Supports attached with edges inward and flats facing up.

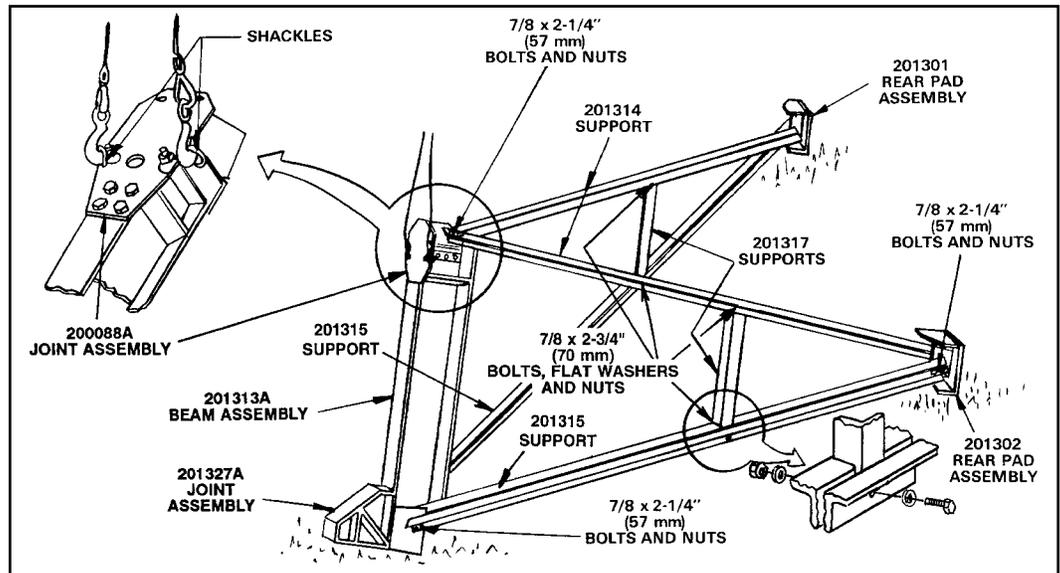


Figure 10

Panning Frame Assembly

Step 1

Attach 201487 panning frame to 201544 azimuth pivot assembly as shown in Figures 11 and 12.

- Use 7/8 x 2-1/4 in (57 mm) hardware
- Bolts should connect from panning frame to pivot assembly



Figure 11

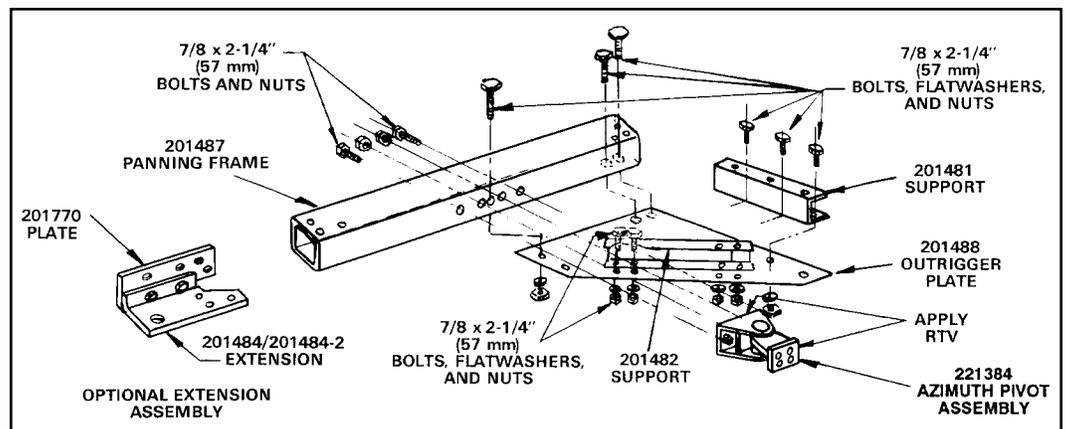


Figure 12

Step 2

Attach 201295/201296 joint assemblies to panning frame as shown in Figures 13 and 14.

- Use 7/8 x 2-1/4 in (57 mm) hardware
- Insert bolts from panning frame to joint assembly



Figure 13

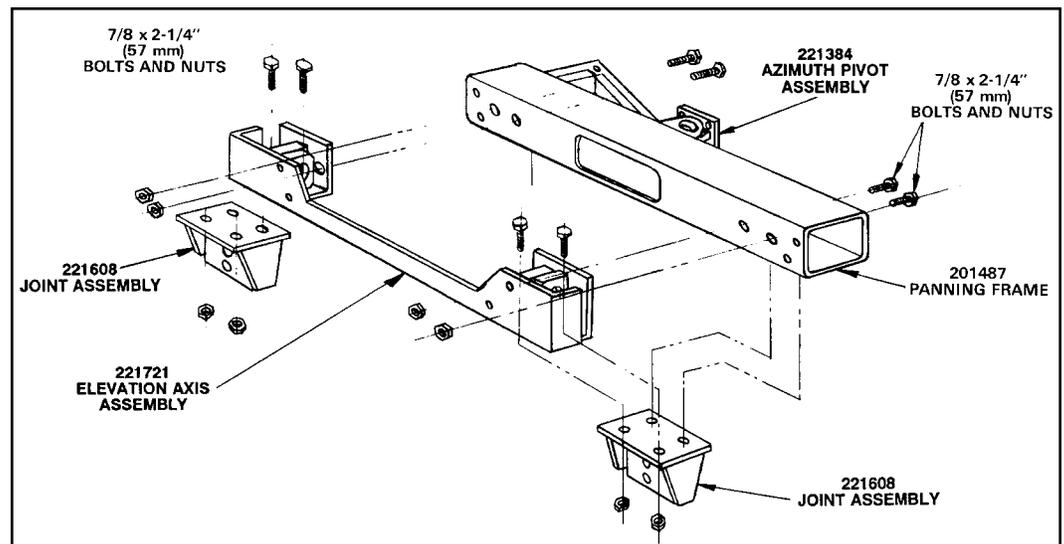


Figure 14

Step 3

Attach 201316 support pairs to 201295/201296 joint assemblies as shown in Figure 15.

- Place supports back-to-back with edges out and flat of angle inward
- Install 45967 spacer at midpoints of support pairs
- Use 7/8 x 2-1/4 in (57 mm) hardware for each connection



Figure 15

Step 4

Attach 201458 azimuth pivot assembly to 201316 support pairs. Attach 201596 mounting plates to 201458 azimuth pivot assembly tab as shown in Figure 16.

- Use 7/8 x 2-1/4 in (57 mm) hardware for each connection
- Insert bolts from rear of pivot assembly to connect supports



Figure 16

Step 5

Attach 201770 plate connecting 201484/201484-2 extension assembly to 201487 panning frame as pictured in Figure 17.

- Use 7/8 x 2-1/4 in (57 mm) hardware
- Insert bolts from inside panning frame assembly

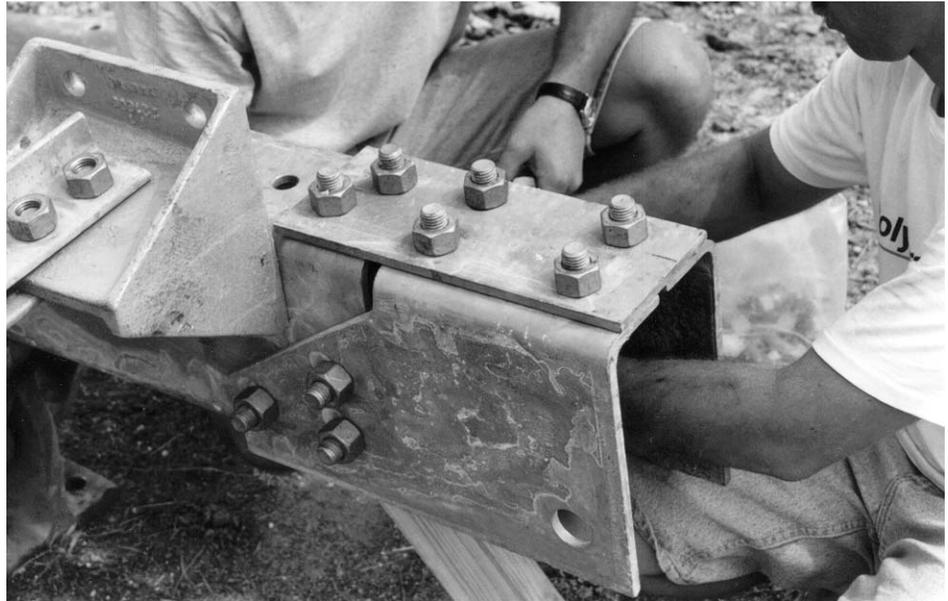


Figure 17

Step 6

Attach 201488 outrigger plate to opposite end of 201487 panning assembly. Attach 201481/201482 supports to outrigger plate as shown in Figure 18.

- Use 7/8 x 2-1/4 in (57 mm) hardware
- Insert bolts from supports to the outrigger plate



Figure 18

Step 7

Attach second 201488 outrigger plate to 201487 panning frame assembly as shown in Figure 19.

- Use 7/8 x 2-1/4 in (57 mm) hardware
- Insert bolts from inside assembly to outrigger plate



Figure 19

Step 8

Attach 201407 elevation axis assembly to 201487 panning frame assembly and 201295 joint assemblies as shown in Figures 20 and 21.

- Use 7/8 x 2-1/4 in (57 mm) hardware
- Insert bolts from elevation axis assembly to panning frame assembly and joint assembly

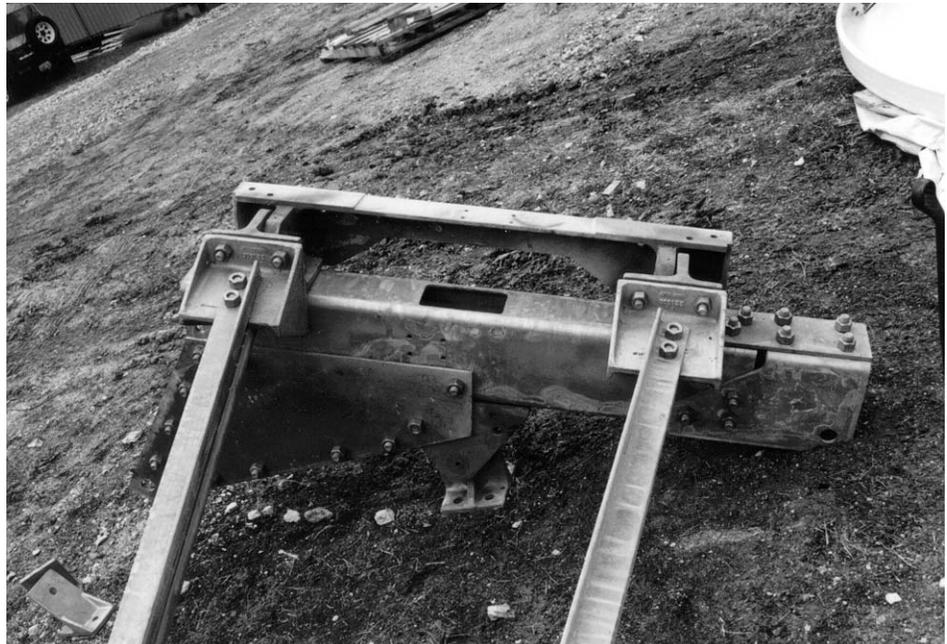


Figure 20

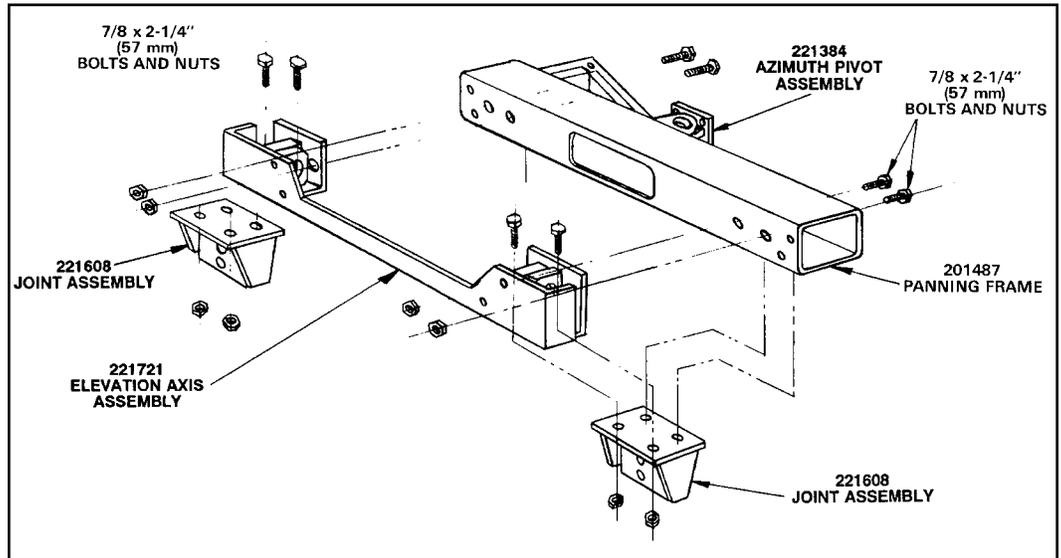


Figure 21

Step 9

Attach 300029 tripod joint bracket to 201407 elevation axis assembly as shown in Figure 22.

- Use 7/8 x 2-1/4 in (57 mm) bolt, flatwasher under bolt and under nut, and nut
- Insert bolts from elevation axis assembly to tripod joint bracket



Figure 22

Step 10

Attach 300026 tripod channel legs to 300029 tripod joint bracket as shown in Figure 23.

- Use 7/8 x 2-1/4 in (57 mm) bolt, flatwasher and nut
- Insert bolts from channel leg to joint bracket



Figure 23

Step 11

Attach 300010 tripod tube weldment to 300026 tripod channel legs as shown in Figure 24.

- Use 7/8 x 2-1/4 in (57 mm) bolt, flatwasher and nut
- Insert bolt from channel leg to tube weldment



Figure 24

**Elevation
Jackscrew
Assembly
Step 1**

Attach 301771/301736 elevation jackscrew assembly to 201596 mounting plates as shown in Figure 25. Tighten connection.

- Use 7/8 x 2-1/2 bolts and nuts



Figure 25

Step 2

Loosen rubber boot from end of jackscrew. Turn elevation drive screw to extend jack to dimension 67.7 in (1719 mm) as shown in Figure 26. Apply grease to screw shaft. Reattach rubber boot.



Figure 26

Step 3

Prop 301771/301736 elevation jackscrew up to align with 300010 tripod tube weldment as shown in Figure 27.



Figure 27

Step 4

Attach 301771/301736 elevation jackscrew to 300010 tripod tube weldment as shown in Figure 28.

- Use 7/8 x 5-1/4 (133 mm) bolt. Fasten with heavy hex nut and flatwasher according to A-325 procedure with the exception of tightening the nut 1/2 turn from snug condition. Tighten jam nut in accordance with A-325 procedure. Apply supplied Loctite to threads to act as locking nut.



Figure 28

Azimuth Jackscrew Assembly

Step 1

Insert 22193/223180 azimuth jackscrew tube into 201287 azimuth pivot assembly as shown in Figure 29. Insert jack carefully to prevent scratching jackscrew tube. **Note:** Ensure jackscrew assembly remains fully retracted at this time.

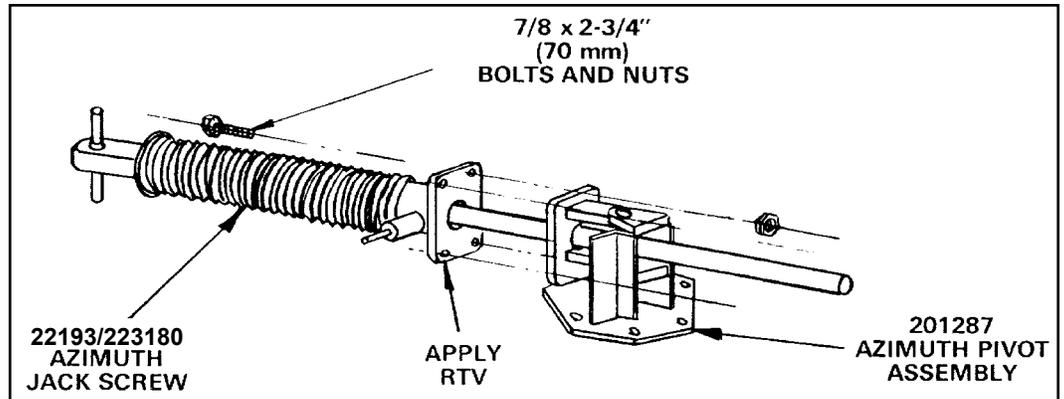


Figure 29

Step 2

Apply RTV to flange surface as shown in Figure 29. Fasten jack to pivot using 7/8 x 2-3/4 in (70 mm) bolts and nuts. Mounting hardware is included with corresponding jack assembly hardware kit.

Mount Assembly

Step 1

Attach shackles to beam assembly as shown in Figure 30.



Figure 30

Step 2

Lift support legs to azimuth beam assembly.

Step 3

Attach rear pad assemblies to rear foundation pads as pictured in Figure 31.

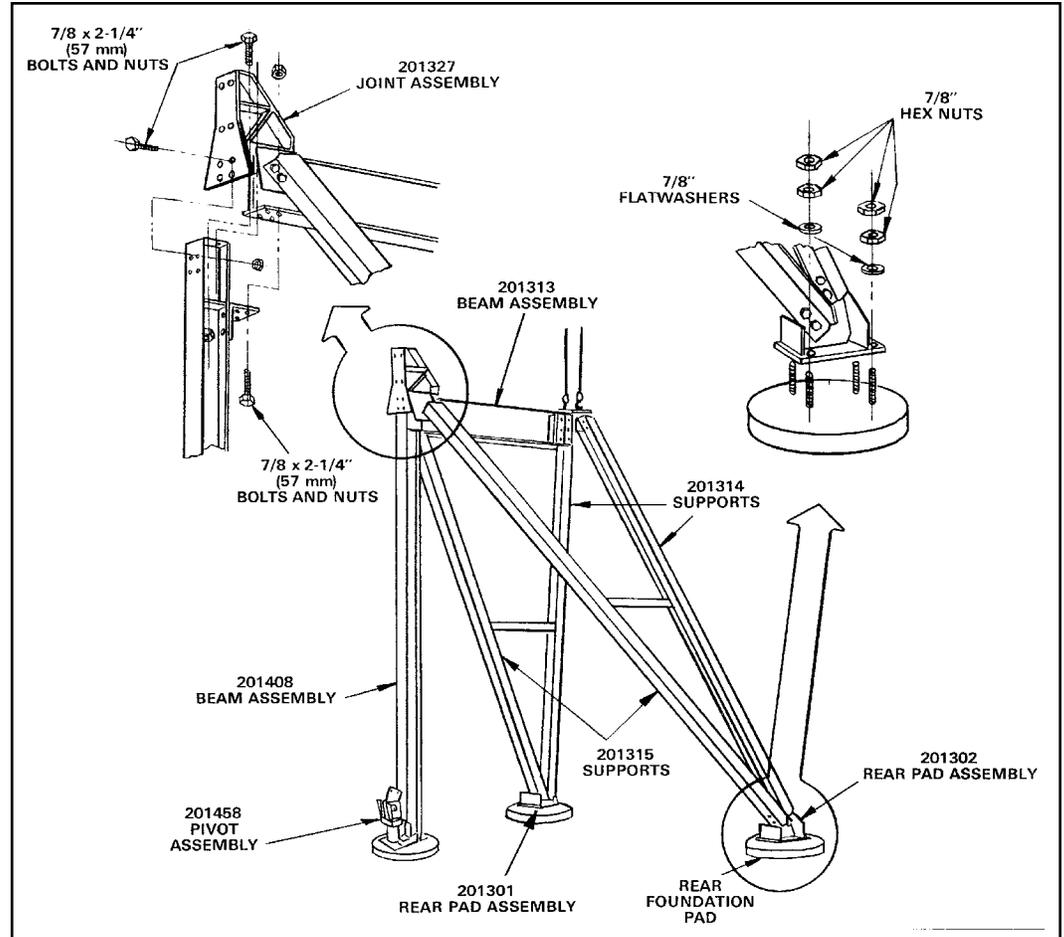


Figure 31

Step 4

Connect beam assembly using 7/8 x 2-1/4 in (57 mm) hardware. Tighten supports to beam assembly per A-325 tensing procedure.

Step 5

Hoist elevation jackscrew assembly to mount. Attach 201544 azimuth pivot assembly to 201327 joint assembly with 7/8 x 2-1/4 hardware from pivot assembly to joint assembly as shown in Figure 32.

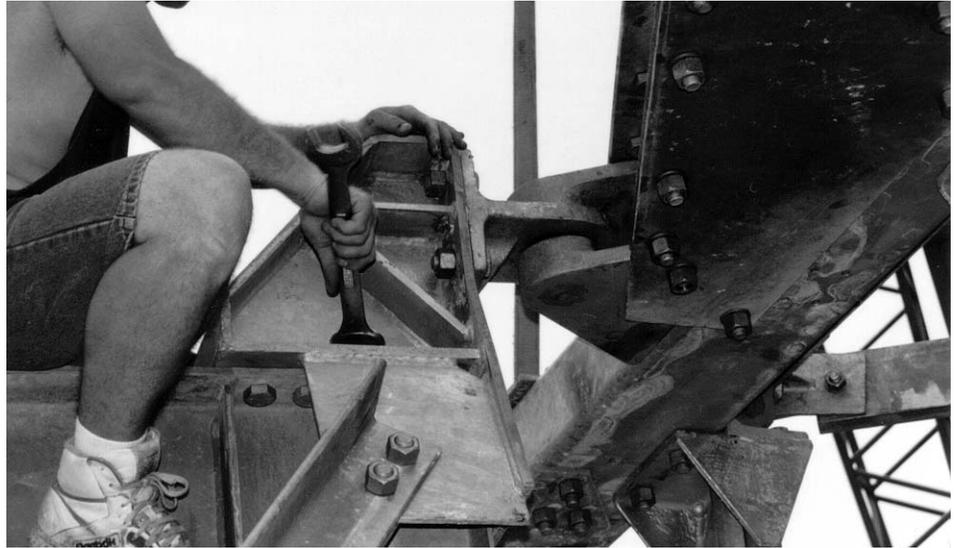


Figure 32

Step 6

Attach 201458 azimuth pivot assembly to 201408 beam assembly with a line of RTV around the plate and four 7/8 x 2-1/4 in (57 mm) bolts inserted from pivot assembly to beam assembly as shown in Figure 33.

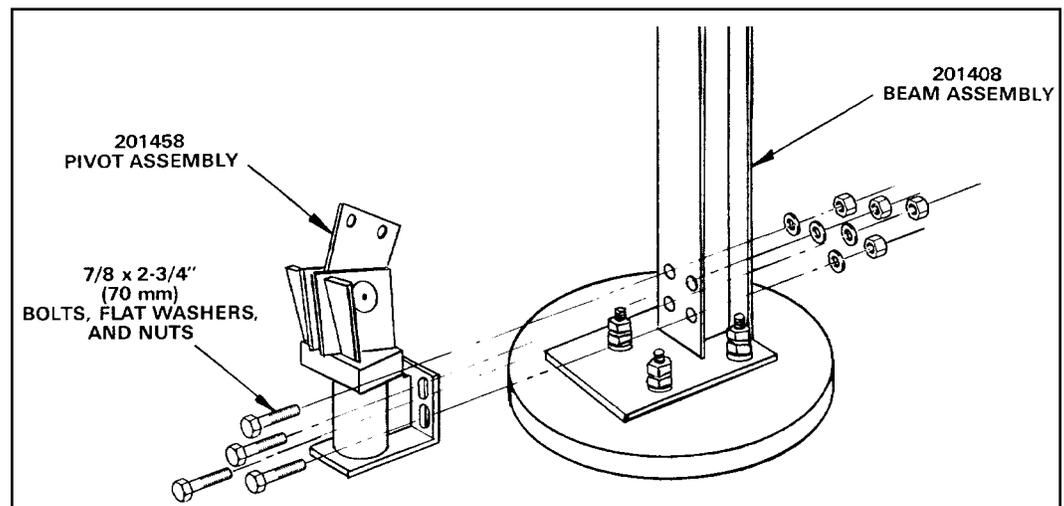


Figure 33

Note: If optional motor drive system is included, install motors at this point. Refer to installation instructions provided with motor kits.

Step 7

Refer to Figure 34. Position hoisting ropes on azimuth motor jack assembly so jack will not roll when hoisted. Attach one rope to motor frame next to gearbox to balance assembly. Tie up loose conduit before lifting jack.



Figure 34

Step 8

Refer to Figure 34. Position hoisting ropes on motor/jack assembly so jack will not roll when hoisted. Attach one rope to large motor frame next to gearbox to balance assembly; do not attach rope to small motor. Tie up loose conduit before lifting jack.

Step 9

Raise 22193/223180 azimuth jackscrew and attach 201287 pivot assembly to 201273 joint assembly with 1 x 2-1/2 in (63 mm) hardware. **Note:** Mounting position of azimuth pivot jackscrew assembly is dependent upon azimuth range requirements and corresponds with mounting position of 201488 outrigger plate or extension assembly.

Step 10

Extend jackscrew to meet outrigger assembly. Loosely re-attach outrigger plate to pin assembly in azimuth jackscrew as shown in Figure 35. **Note:** Realignment of panning frame/pivot assembly may be necessary to ensure proper alignment of azimuth jackscrew pin. Snug panning frame/pivot assembly hardware and fully extend azimuth jackscrew to ensure binding does not occur throughout entire azimuth pivot range.

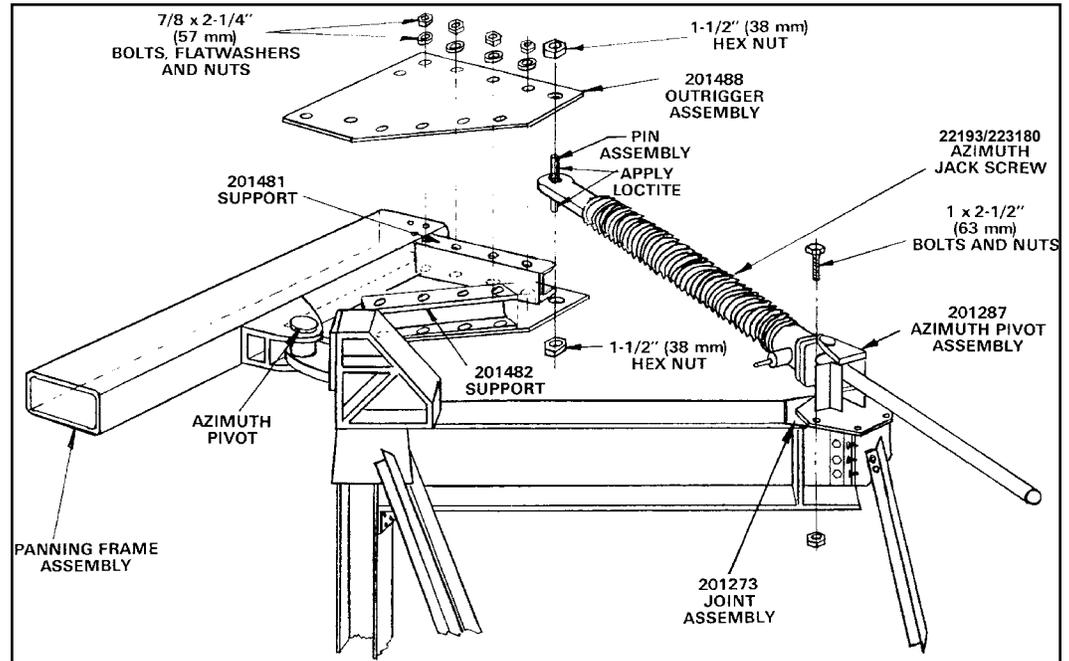


Figure 35

Step 11

Loosen both setscrews in upper and lower collars of pin assembly at end of azimuth jack. **Do not retighten these collars.** Apply supplied Loctite to pin threads and nuts. Attach 1-1/2 in (38 mm) hex nuts to top and bottom of azimuth jackscrew pin assembly and securely tighten mounting hardware using 6 foot (1.8 m) lever arm. Reattach rubber boot. Tighten an outrigger plate hardware.

The tripod ground mount assembly is now completed with the necessary operational essentials. All ground mount options have separate instructional bulletins located in the parts kit that contain the option.

The next step in the installation process is the reflector assembly. Proceed to the next page to begin installation of the reflector.

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. REMOVE ALL BURRS AND SHARP EDGES
2. DIMENSIONS APPLY BEFORE FINISH
3. UNPACKING DRAWING REF AND FIGS. 1-100

GENERAL

READ THE INSTRUCTIONS THOROUGHLY BEFORE ASSEMBLY. FOLLOW THE SEQUENCES FOR PROPER ASSEMBLY AND OPERATION.



THIS WARNING INDICATES THAT FAILURE TO FOLLOW THE PROPER PROCEDURE AT THIS POINT COULD RESULT IN DAMAGE TO THE ANTENNA AND/OR OTHER PROPERTY AND POSSIBLE INJURY TO CAUTION! PERSONNEL.

NOTICE

THIS INDICATES INFORMATION THAT SHOULD BE READ BEFORE PROCEEDING.

UNPACKING

CAREFULLY REMOVE ALL PARTS FROM SHIPPING BOXES. THE CONTENT SHOULD CORRESPOND WITH THE PARTS LIST. ANY DAMAGE OR DEFECTIVE WILL PREVENT SATISFACTORY ASSEMBLY, INSTALLATION, AND OPERATION OF THE ANTENNA.

NOTICE

THE INSTALLATION, MAINTENANCE OR REMOVAL OF AN ANTENNA REQUIRES QUALIFIED, EXPERIENCED PERSONNEL. ANDREW INSTALLATION INSTRUCTIONS HAVE BEEN WRITTEN AND ILLUSTRATED FOR SUCH INSTALLATION PERSONNEL. ANTENNA SYSTEMS SHOULD BE INSPECTED ONCE A YEAR BY QUALIFIED PERSONNEL TO VERIFY PROPER INSTALLATION, MAINTENANCE AND CONDITION OF EQUIPMENT. ANDREW DISCLAIMS ANY LIABILITY OR RESPONSIBILITY FOR THE RESULTS OF IMPROPER OR UNSAFE INSTALLATION OR MAINTENANCE PRACTICES.

TOOLS RECOMMENDED FOR PROPER INSTALLATION

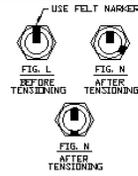
QUANTITY	DESCRIPTION
1	15 TON CRANE
1	SCREWDRIVER (SLOTTED)
1	5/32 HEX SOCKET (ALLEN) WRENCH
1	1/4 HEX SOCKET (ALLEN) WRENCH
1	7/16 SOCKET
1	9/16 SOCKET
1	1/2 SOCKET
1	3/4 SOCKET
1	7/8 SOCKET
1	1 1/16 SOCKET
1	1 1/4 SOCKET
1	1 7/16 SOCKET
1	1/2 DRIVE RATCHET
1	1/2 DRIVE EXTENSION
1	7/16 COMBINATION WRENCH
1	1/2 COMBINATION WRENCH
1	9/16 COMBINATION WRENCH
1	3/4 COMBINATION WRENCH
1	7/8 COMBINATION WRENCH
1	1 1/16 COMBINATION WRENCH
1	1 1/4 COMBINATION WRENCH
1	1 7/16 COMBINATION WRENCH
1	1 1/4 SPUD WRENCH
1	6 FT NYLON CHOKER (3/8" DIA)
1	3 FT NYLON CHOKER (3/8" DIA)
1	PULLER HOIST/1 TON
4	2x4x8 FT LUMBER (TEMPORARY SUPPORT)
4	5/8 SHACKLE
4	20 FT TAG LINE
4	16 FT CHOKER (1/2" DIA)
2	12 FT STEP LADDER
2	25 FT EXTENSION LADDER
1	8" ADJUSTABLE WRENCH
4	TEMPORARY WOOD SUPPORT BLOCKS

MFG PROCESSES	INSPECTION PROCEDURES	TEST PROCEDURES

AUSA SPECIFICATIONS

TENSIONING PROCEDURE A-300 HARDWARE

1. LUBRICATE BOLT THREADS WITH STICK WAX (ITEM 39) TO REDUCE FRICTION. DO NOT ALLOW WAX UNDER FLAT WASHER.
2. AFTER CONNECTIONS ARE COMPLETED, TIGHTEN BOLTS UNTIL SURFACES ARE FLATTENED AND NUTS ARE SINKED. USE FULL EFFORT OF PERSON USING ORDINARY SPUD WRENCH. DO NOT PROCEED WITH STEPS 3 & 4 BELOW UNLESS THE CONNECTION IS FINAL. IF BOLTS ARE LOOSENED AFTER STEPS 3 AND 4, DISCARD AND REPLACE WITH NEW HARDWARE. REPEAT ALL STEPS.
3. MARK NUTS AND END OF BOLTS WITH STRAIGHT LINE. SEE FIGURE L.
4. TIGHTEN NUTS FURTHER WITH EXTRA LONG WRENCH OR POWER WRENCH UNTIL NUTS ARE MOVED 1/3 TURN (20°±30°) FOR BOLT LENGTHS UP TO AND INCLUDING 4 DIAMETERS. SEE FIGURE M. 1/2 TURN (30°±30°) FOR BOLT LENGTHS OVER 4 DIAMETERS. SEE FIGURE N.



REV	DATE	DESCRIPTION	APPROVED
F	10/24/94	SEE REVISION FOR PREVIOUS REVISIONS. ADDED ITEM 37. REVISED SHEET 3. ITEM 39 OPT WAS 8. DON 200825A	SLJ,K,C MK
G		IT 37 WAS OPT 48. IT 35 WAS P/N 45980-71. 825 LG BOLT. REVISED SHEET 3. DON 200394C	SLJ,K,J JP
H		ADDED IT 38-40. BOLT IS 25 x 33. IT 25 WAS OPT 61. ADDED SHEET 7. DON 200608A2	29AY98 SJA BLS/SL
J		ADDED ITEM 62 AND REV. ITEMS 49,50,REV. PAGES 5 AND 6. DON 200658A	ELJUL90 SL WRS/JA
K		INCREMENT REV LEVEL. EGG 500037 CLASS C	14SEP94 PAT

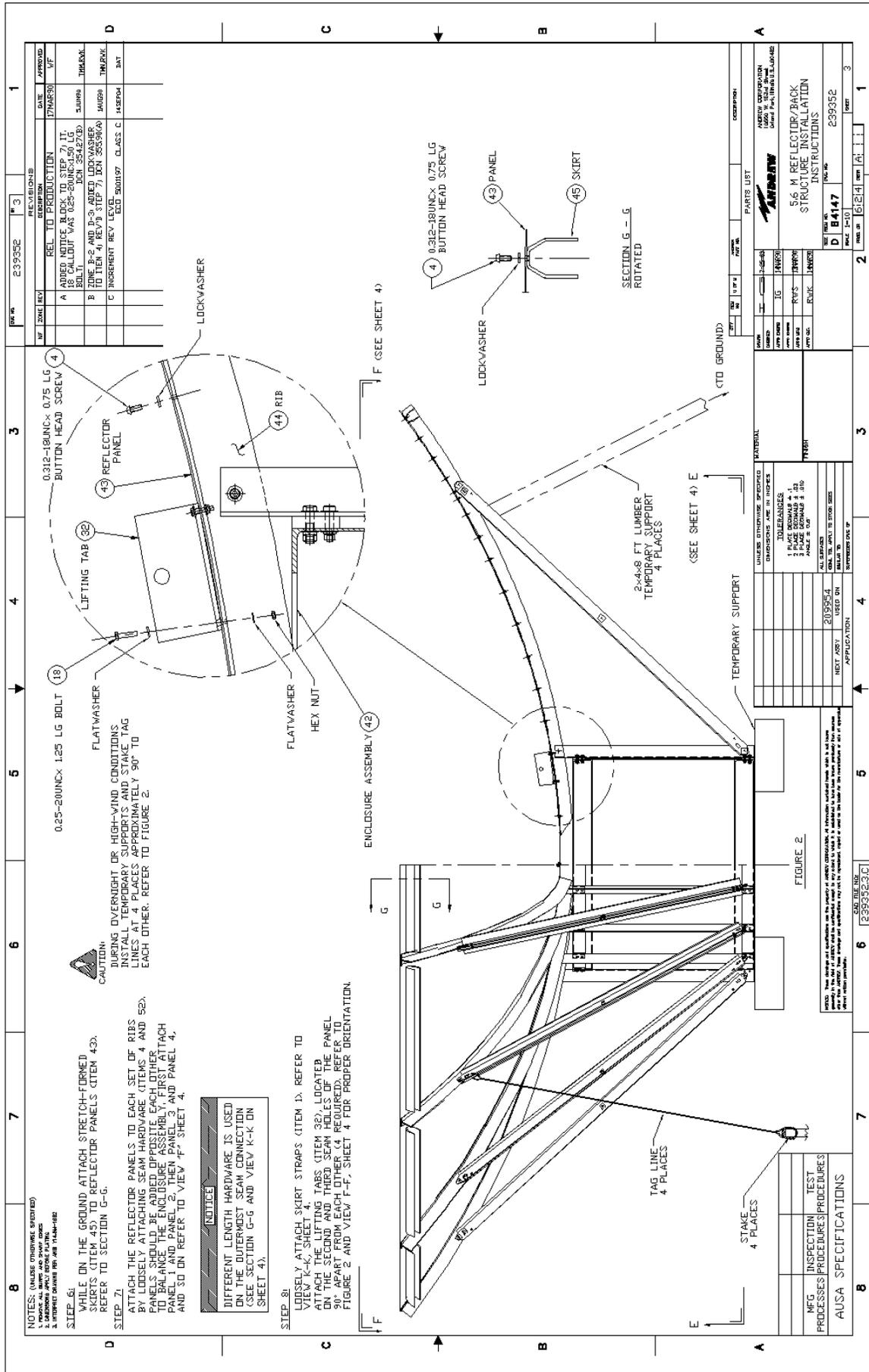
REV	DATE	DESCRIPTION	APPROVED
1	40	EA 209954	REFLECTOR HARDWARE KIT
2	39	EA 200852	209954 STICK WAX
4	38	EA 9903-10	209954 ALLEN WRENCH
77	37	EA 9997-236	209954 #0.625 FLAT WASHER (CSST)
32	36	EA 9997-228	209954 #0.50 FLAT WASHER (CSST)
16	35	EA 45980-23	209954 #0.50-11UNC X 2.00 LG BOLT/NUT ASSY
32	34	EA 9858-22	209954 #0.625-100 LG SHOULDER BOLT
4	33	EA 209957	209954 BAKING PLATE
4	32	EA 206278	209954 LIFT TAB
16	31	EA 9974-79	209954 #0.625 LOCK WASHER (CSST)
1	30	EA 9999-224	209954 #0.75-RUNC HEAVY HEX JHM NUT
1	29	EA 9997-174	209954 #0.75 FLAT WASHER (CSST)
2	28	EA 9997-202	209954 #0.75 FLAT WASHER (CSST)
60	27	EA 9997-227	209954 #0.625 FLAT WASHER (CSST)
1	26	EA 45980-35	209954 #0.75-11UNC X 2.25 LG BOLT & NUT ASSY
4	25	EA 45980-29	209954 #0.50-11UNC X 2.00 LG BOLT & NUT ASSY
2	24	EA 45980-18	209954 #0.50-11UNC X 2.00 LG BOLT & NUT ASSY
16	23	EA 45980-1	209954 #0.625-11UNC X 2.00 LG BOLT & NUT ASSY
16	21	EA 9999-72	209954 #0.625-11UNC NUT (CSST)
32	20	EA 9997-131	209954 #0.25 FLAT WASHER (CSST)
16	19	EA 9999-57	209954 #0.25-20UNC HEX NUT (CSST)
16	18	EA 9963-76	209954 #0.25-20UNC X 1.25 LG HHCS (CSST)
64	17	EA 9974-64	209954 #0.50 LOCK WASHER (CSST)
64	16	EA 9999-61	209954 #0.50-18UNC HEX NUT (CSST)
32	15	EA 9963-129	209954 #0.50-18UNC X 1.25 LG HHCS (CSST)
178	14	EA 9997-65	209954 #0.50 FLAT WASHER (CSST)
48	13	EA 9997-145	209954 #0.375 FLAT WASHER (CSST)
48	12	EA 9974-63	209954 #0.375 LDCX WASHER (CSST)
48	11	EA 9999-60	209954 #0.375-16UNC HEX NUT (CSST)
32	10	EA 9858-18	209954 #0.50-18 LG SHOULDER BOLT
16	9	EA 9858-19	209954 #0.50-18 LG SHOULDER BOLT
608	8	EA 9974-17	209954 #0.312 LOCK WASHER (CSST)
64	7	EA 9997-56	209954 #0.312 FLAT WASHER (CSST)
64	6	EA 9999-59	209954 #0.312-18UNC HEX NUT (CSST)
64	5	EA 9959-11	209954 #0.312-18UNC X 1.50 LG HHCS
544	4	EA 209236	209954 #0.250-11UNC X 2.00 LG BOLT & NUT ASSY
16	3	EA 9963-222	209954 #0.625-11UNC X 2.00 LG HHCS (CSST)
80	2	EA 209765-1	209954 #0.250 SPACER
32	1	EA 220225	209954 SKIRT STRAP

QTY	UNIT	QTY	UNIT	DESCRIPTION
1	EA	301742		LEFT TRIPOD JOINT WELDMENT
10	EA	9974-10	209954	LOCKWASHER
10	EA	9997-66	209954	WASHER - FLAT
18	EA	9999-121	209954	HEAVY HEX NUT
4	EA	203672	209954	FULLY THREADED ROD
2	EA	301611	209954	LOAD PLATE
4	EA	45980-14	209954	#0.25-11UNC X 1.75 LG BOLT & NUT ASSY
2	EA	300027	209954	CAST SPACER
4	EA	45980-22	209954	#0.25-11UNC X 2.00 LG BOLT & NUT ASSY
4	EA	45980-37	209954	#0.25-11UNC X 2.00 LG BOLT & NUT ASSY
4	EA	300031	209954	CAST BEVEL WASHER
4	EA	209140	209954	CLIPPED WASHER
1	EA	301741	209914	RIGHT TRIPOD JOINT WELDMENT
1	EA	301772	209914	TRIPOD TUBE WELDMENT
2	EA	300026	209914	TRIPOD CHANNEL LEG
16	EA	220915	209913	SHORT STRUT
32	EA	209950-2	209913	LONG STRUT
16	EA	209375-2	209912	5.6M STRETCH-FORMED SKIRT
16	EA	220916	209912	MACHINED RIB
16	EA	220917	209912	MACHINED PANEL
1	EA	220911	209914	MODULAR ENCLOSURE
1	EA	209565	209914	ENCLOSURE DOOR ASSEMBLY

QTY	UNIT	QTY	UNIT	DESCRIPTION
1	EA	209954		REFLECTOR HARDWARE KIT

REV	DATE	DESCRIPTION	APPROVED
D	8/14/97	5.6 M REFLECTOR/BACK STRUCTURE INSTALLATION INSTRUCTIONS	239352

NOTE: These drawings are specifications on the property of ANDREW CORPORATION. All information contained herein shall be set forth in accordance with the drawings and specifications and shall be maintained, revised or used in its entirety by the manufacturer of any equipment which requires them.



REV	DATE	BY	APP'D
1	11/15/18	TRM/SB	WJ

REV	DESCRIPTION	DATE	BY	APP'D
1	BEL TO PRODUCTION	11/15/18	TRM/SB	WJ
2	ADDED NOTICE BLOCK TO STEP 7. IT IS CALLOUT WAS 0.25-20UNCX 1.50 LG BOLT. IT SHOULD BE 1.25 LG BOLT.	11/15/18	TRM/SB	WJ
3	ADDED LOCKWASHER TO STEP 7. IT SHOULD BE 0.312-18UNCX 0.75 LG BUTTON HEAD SCREW.	11/15/18	TRM/SB	WJ
4	ADDED LOCKWASHER TO STEP 7. IT SHOULD BE 0.312-18UNCX 0.75 LG BUTTON HEAD SCREW.	11/15/18	TRM/SB	WJ

REV	DATE	BY	APP'D
1	11/15/18	TRM/SB	WJ

REV	DATE	BY	APP'D
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REV	DATE	BY	APP'D
1	11/15/18	TRM/SB	WJ

REV	DATE	BY	APP'D
1	11/15/18	TRM/SB	WJ

NOTES: (UNLESS OTHERWISE SPECIFIED)
 1. DIMENSIONS ARE IN INCHES.
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STEP 6:
 WHILE ON THE GROUND ATTACH STRETCH-FORMED SKIRTS (ITEM 45) TO REFLECTOR PANELS (ITEM 43). REFER TO SECTION G-G.

STEP 7:
 ATTACH THE REFLECTOR PANELS TO EACH SET OF RIBS BY LOOSELY ATTACHING SEAM HARDWARE (ITEMS 4 AND 52). PANELS SHOULD BE ADDED OPPOSITE EACH OTHER TO BALANCE THE ENCLOSURE ASSEMBLY. FIRST, ATTACH TO BALANCE PANELS TO ENCLOSURE ASSEMBLY AND PANEL 4, AND SO ON REFER TO VIEW F-F, SHEET 4.

NOTICE:
 DIFFERENT LENGTH HARDWARE IS USED ON THE OUTERMOST SEAM CONNECTION (SEE SECTION G-G AND VIEW K-K ON SHEET 4).

STEP 8:
 LOOSELY ATTACH SKIRT STRAPS (ITEM 1). REFER TO VIEW K-K ON SHEET 4. TABS (ITEM 32), LOCATED ON THE SECOND AND THIRD SEAM HOLES OF THE PANEL 90° APART FROM EACH OTHER (4 REQUIRED). REFER TO FIGURE 2 AND VIEW F-F, SHEET 4 FOR PROPER ORIENTATION.

REV	DATE	BY	APP'D
1	11/15/18	TRM/SB	WJ

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REV	DATE	BY	APP'D
1	11/15/18	TRM/SB	WJ

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES
 1. PLACE DIMENSIONS IN 1/8"
 2. PLACE DIMENSIONS IN 1/16"
 3. PLACE DIMENSIONS IN 1/32"

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES
 1. PLACE DIMENSIONS IN 1/8"
 2. PLACE DIMENSIONS IN 1/16"
 3. PLACE DIMENSIONS IN 1/32"

REV	DATE	BY	APP'D
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REV	DATE	BY	APP'D
1	11/15/18	TRM/SB	WJ

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES
 1. PLACE DIMENSIONS IN 1/8"
 2. PLACE DIMENSIONS IN 1/16"
 3. PLACE DIMENSIONS IN 1/32"

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES
 1. PLACE DIMENSIONS IN 1/8"
 2. PLACE DIMENSIONS IN 1/16"
 3. PLACE DIMENSIONS IN 1/32"

REV. NO. 239352

DATE 12/26/90

BY SL/MS

DESCRIPTION

1 BEL TO PRODUCTION

2 REVISED TO SHOW NEW JACK TRIPPOD & JACK ASSY

3 REV STEP III DEL VIEW J-J

4 INCREMENT REV LEVEL

HEX NUT

FLAT WASHER

BEVEL WASHER

5/8" SHACKLE

CAST SPACER

LIFTING TAB

16 FT CHOKER (4 STRAPS)

TAG LINE

REFLECTOR/BACK STRUCTURE ASSEMBLY

MOUNT ASSEMBLY

ELEVATION AXIS ASSEMBLY

LONG STRUT

CLIPPED WASHER

0625-11UNCX3.00LG A-325 BOLT & NUT ASSEMBLY

VIEW H-H (ROTATED)

REVISIONS

REV. NO. 239352

DATE 12/26/90

BY SL/MS

DESCRIPTION

1 BEL TO PRODUCTION

2 REVISED TO SHOW NEW JACK TRIPPOD & JACK ASSY

3 REV STEP III DEL VIEW J-J

4 INCREMENT REV LEVEL

NOTES: (UNLESS OTHERWISE SPECIFIED)

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STEP 11:

ATTACH 5/8" SHACKLES WITH CORRESPONDING 16 FOOT CHOKERS TO FOUR LIFTING TABS ON REFLECTOR ASSEMBLY. REFER TO FIGURE 4. ATTACH 20 FOOT TAG LINES TO SUBREFLECTOR STRUT BRACKETS. RAISE REFLECTOR/BACK STRUCTURE ASSEMBLY AND ALIGN WITH CORRESPONDING ASSEMBLY ELEVATION AXIS. ATTACH 5/8" SHACKLES TO REAR OF ENCLOSURE ASSEMBLY TO PROPER GUIDANCE ATTACH ASSEMBLY. REFER TO SHEET 7. ALIGN MOUNTING HOLES AND ATTACH FORWARD LEG OF JACK TRIPPOD TO FORWARD PORTION OF ENCLOSURE ASSEMBLY. REFER TO VIEW H-H. SECURELY TIGHTEN TRIPPOD HARDWARE PER A-325 TENSIONING PROCEDURE.

STEP 12:

AFTER ASSEMBLY IS COMPLETE, REMOVE LIFTING TABS AND REPLACE HARDWARE WITH SEAM HARDWARE AS DESCRIBED IN STEP 4 AND SHOWN IN FIGURE 2.

STEP 13:

INSTALL ENCLOSURE DOOR BY ENGAGING DOOR LATCHES.

FIGURE 4

UNLESS OTHERWISE SPECIFIED: MATERIAL DIMENSIONS ARE IN INCHES

TOLERANCES

1. ± .005

2. ± .010

3. ± .015

4. ± .020

5. ± .030

6. ± .040

7. ± .050

8. ± .060

9. ± .070

10. ± .080

11. ± .090

12. ± .100

13. ± .120

14. ± .150

15. ± .200

16. ± .250

17. ± .300

18. ± .350

19. ± .400

20. ± .450

21. ± .500

22. ± .550

23. ± .600

24. ± .650

25. ± .700

26. ± .750

27. ± .800

28. ± .850

29. ± .900

30. ± .950

31. ± 1.000

32. ± 1.050

33. ± 1.100

34. ± 1.150

35. ± 1.200

36. ± 1.250

37. ± 1.300

38. ± 1.350

39. ± 1.400

40. ± 1.450

41. ± 1.500

42. ± 1.550

43. ± 1.600

44. ± 1.650

45. ± 1.700

46. ± 1.750

47. ± 1.800

48. ± 1.850

49. ± 1.900

50. ± 1.950

51. ± 2.000

52. ± 2.050

53. ± 2.100

54. ± 2.150

55. ± 2.200

56. ± 2.250

57. ± 2.300

58. ± 2.350

59. ± 2.400

60. ± 2.450

61. ± 2.500

62. ± 2.550

63. ± 2.600

64. ± 2.650

65. ± 2.700

66. ± 2.750

67. ± 2.800

68. ± 2.850

69. ± 2.900

70. ± 2.950

71. ± 3.000

72. ± 3.050

73. ± 3.100

74. ± 3.150

75. ± 3.200

76. ± 3.250

77. ± 3.300

78. ± 3.350

79. ± 3.400

80. ± 3.450

81. ± 3.500

82. ± 3.550

83. ± 3.600

84. ± 3.650

85. ± 3.700

86. ± 3.750

87. ± 3.800

88. ± 3.850

89. ± 3.900

90. ± 3.950

91. ± 4.000

92. ± 4.050

93. ± 4.100

94. ± 4.150

95. ± 4.200

96. ± 4.250

97. ± 4.300

98. ± 4.350

99. ± 4.400

100. ± 4.450

101. ± 4.500

102. ± 4.550

103. ± 4.600

104. ± 4.650

105. ± 4.700

106. ± 4.750

107. ± 4.800

108. ± 4.850

109. ± 4.900

110. ± 4.950

111. ± 5.000

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Operation

Overview

After you have completed the assembly of your antenna, you are now ready to become operational. In order to operate the earth station antenna, you will need to direct it to the desired satellite adjusting both the elevation and azimuth angles appropriately. The following procedures provide details on how to correctly position your antenna on the desired satellite.

Acquiring A Satellite

There are several procedures that may be used to properly acquire the satellite. Andrew recommends that a spectrum analyzer be used. The following procedures provide explanation as to how to use the spectrum analyzer.

While viewing the spectrum analyzer screen, a pure noise signal as shown in Figure 4-1 will probably be observed. Additionally, some transponder signals may be observed above the noise signal as shown in Figure 4-2.

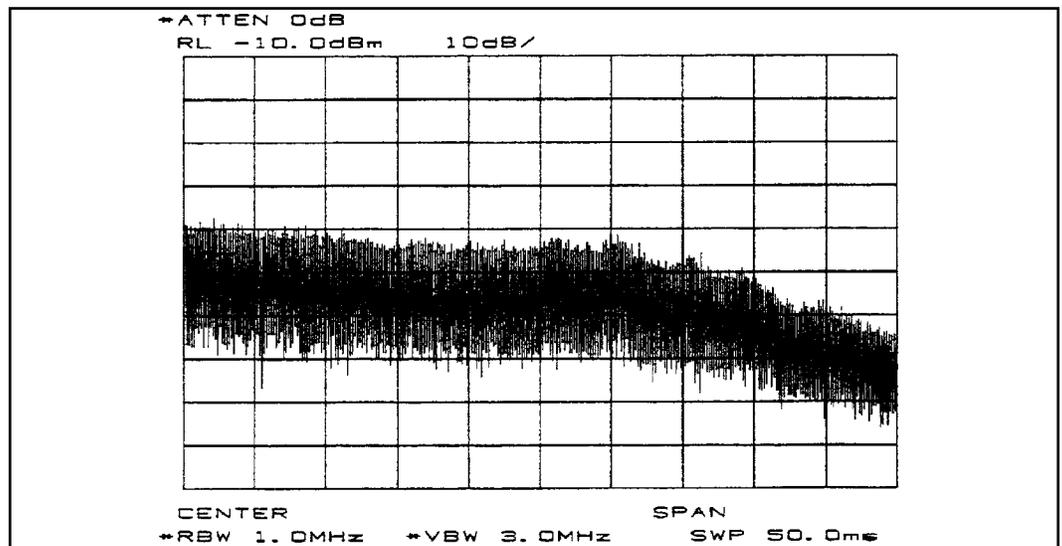


Figure 4-1: Pure Noise Signal on Spectrum Analyzer

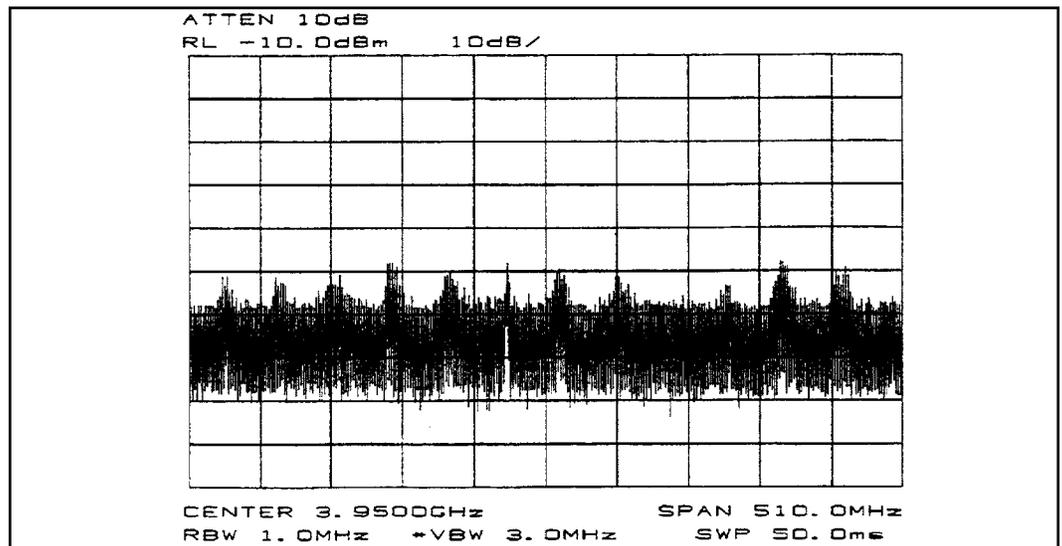


Figure 4-2: Minimum transponder Signal on Spectrum Analyzer

The following steps provide the procedure for acquiring a satellite.

Step 1

Manually move the antenna in the azimuth (scanning back-and-forth) to achieve the maximum (greatest amplitude) transponder signals.

- Scan in one direction until the amplitude continues to diminish and then scan in the opposite direction until the same condition occurs.
- Return to the position yielding the greatest amplitude.

The maximum azimuth excursion from the original setting should not exceed plus or minus 1.5 degrees or the antenna may begin to access a different satellite.

Step 2

With the antenna positioned in azimuth such that the transponder signals are maximized, follow the same procedure manually moving the antenna in elevation (scanning up-and-down) to further maximize the transponder signals.

Step 3

Repeat this procedure alternating between the azimuth and elevation excursions of the antenna to peak the transponder signal amplitude.

A transponder signal amplitude of 30 dB or greater from peak to average noise signal indicates the antenna is receiving the signal on the main beam. A transponder signal amplitude less than 30 dB or greater indicates the antenna is receiving the signal on a side lobe of the main beam.

Step 4

With the antenna peaked on a side lobe in azimuth and/or elevation, move the antenna in azimuth while observing the spectrum analyzer screen as shown in Figure 4-3.

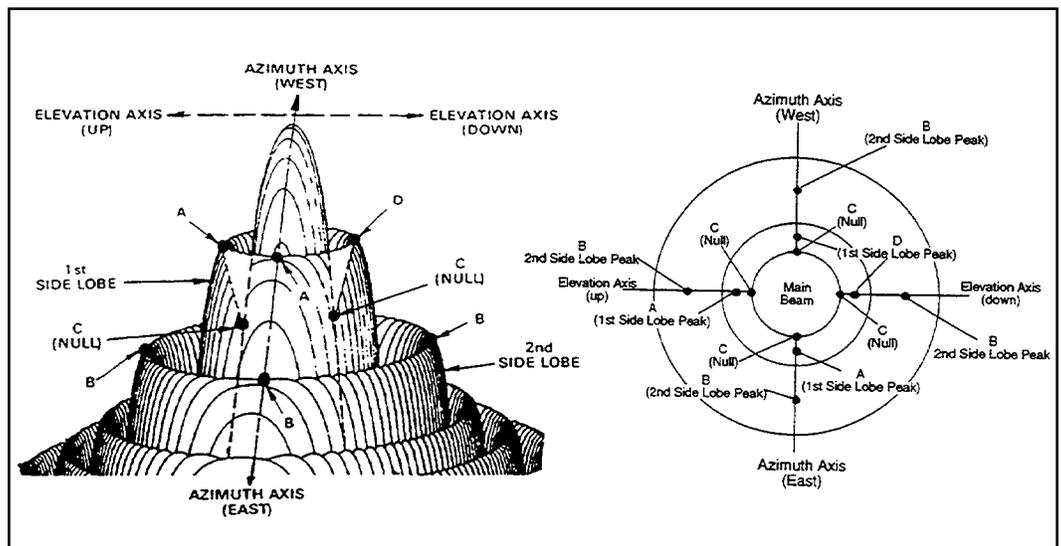


Figure 4-3: Antenna Radiation Pattern Topographical Diagram with Plan View

Step 5

If the signal amplitude diminishes and does not increase (position B) to the level noted when the antenna was peaked on the side lobe, the antenna is moving away from the main beam; reverse the direction of the antenna movement.

From the original side lobe position (position A), the signal amplitude should now diminish to a null point at position C (minimum amplitude showing only signal noise) and then symmetrically increase again to the same level at position D as noted at position A. At the null point (position C), the antenna is aligned with the alternate (elevation) axis. If the antenna was peaked on a side lobe in azimuth, it was appropriately aligned with the elevation axis; proceed with step 6. If the antenna was peaked on a side lobe in elevation, it was appropriately aligned with the azimuth axis; proceed with step 6 moving the antenna in azimuth rather than elevation.

Step 6

Move the antenna in elevation while observing the spectrum analyzer screen. If the signal amplitude increases, decreases and then increases again but to a lesser value, the antenna is moving in the wrong direction; reverse the direction of the antenna movement. From the original null point, the signal level should increase and decrease alternately, but with increasing amplitude until the transponder signal increases to a level of at least 30 dB at which time the main beam. Continue to manually peak the signal to a maximum level using the azimuth and elevation adjustments.

Step 7

If the antenna is aligned in azimuth and elevation (signal maximized) and 24 transponder signals (12 horizontal and 12 vertical) are noted, the polarization adjustment is set incorrectly and must be modified. If 12 transponder signals are noted, they may or may not be the properly polarized signals. Therefore 24 transponder signals must be visually noted in order to determine the proper polarization setting.

Step 8

Rotate the feed assembly clockwise until 24 transponder signals are noted and of approximately equal amplitude.

NOTE: It is more accurate and visually easier to minimize the alternate set of transponder signals rather than maximizing the transponder of interest.

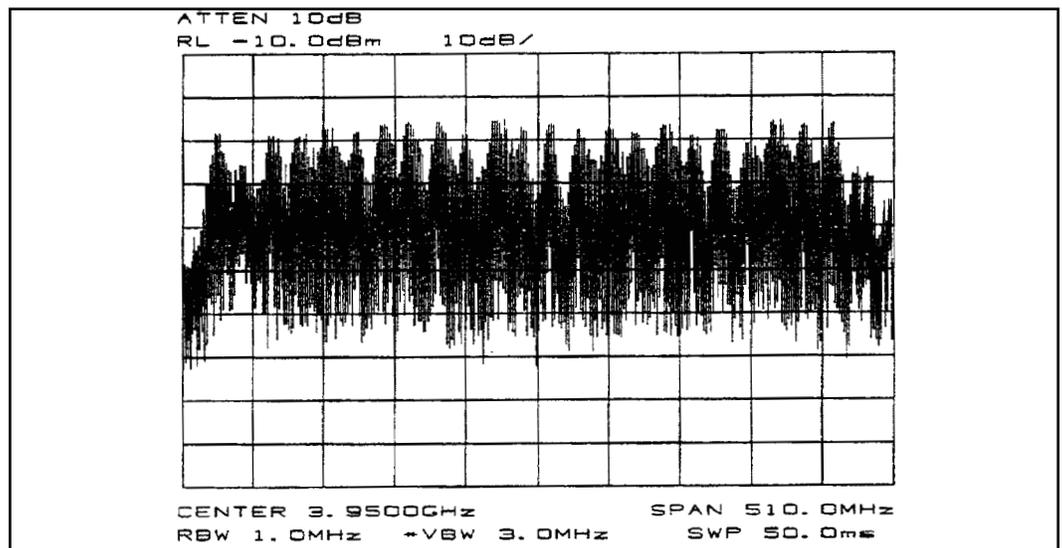


Figure 4-4: Polarization at 45 degrees from Optimum Setting

Step 9

With all 24 transponder signals of approximately equal amplitude appearing on the spectrum analyzer screen determine the specific antenna system and satellite parameters. Rotate the feed assembly as required until the appropriate (odd or even) transponder signals are maximized.

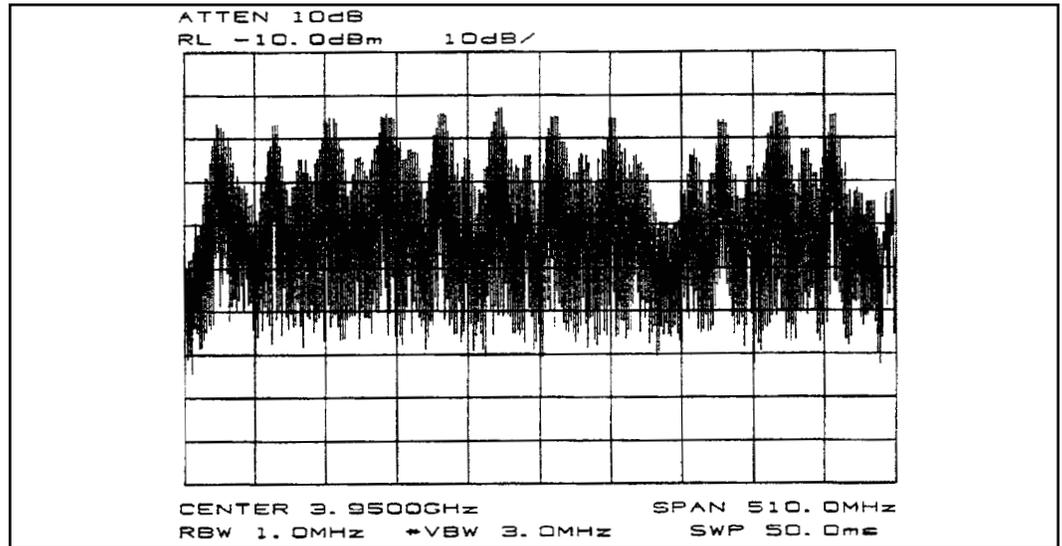


Figure 4-5: Maximizing Odd Transponders

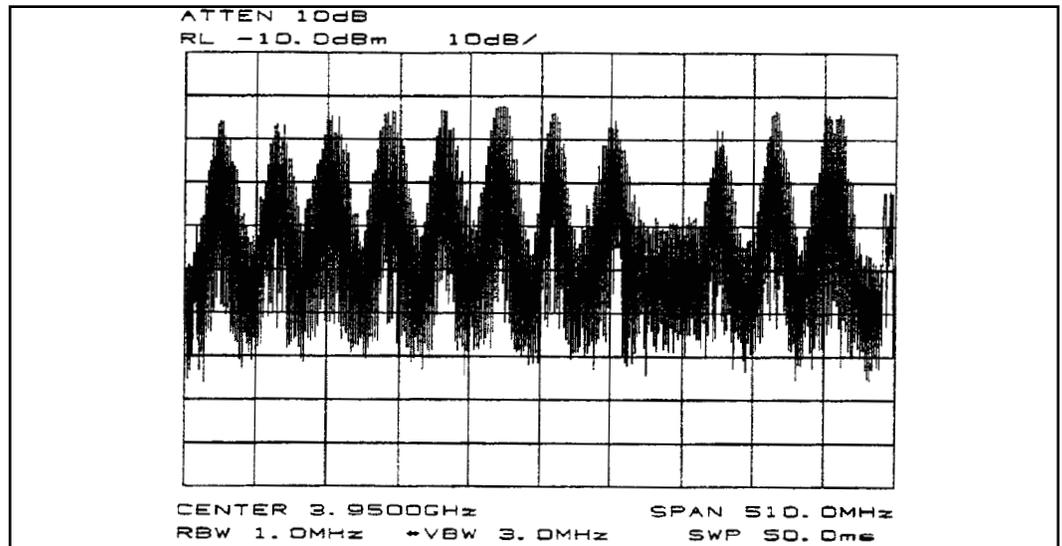


Figure 4-6: Optimum Polarization Setting

Subreflector Adjustment

After the satellite has been acquired and testing has taken place with the spectrum analyzer, the subreflector may need to be adjusted to maximize optimum performance of your antenna. The following procedures should be followed if a subreflector adjustment is required to maximize optimum performance.

NOTE: All INTELSAT Type Approved antennas do not require subreflector adjustment.

Before proceeding, azimuth and elevation patterns should be conducted to determine the adjustments that need to be made. The goal is to achieve a high peak on the main lobe and even distances between the main lobe and sidelobes as shown in Figure 4-6.

NOTE: No adjustments should be made in the receive band.

If your pattern dictates a need to adjust the azimuth angle (the left sidelobe requires adjustment), the west side of the subreflector should be adjusted outward by loosening the screws on the subreflector and adjusting the left side outward. An easy way to remember this adjustment feature is through the acronym WOLD (West Out Left Down).

If your pattern dictates a need to adjust the elevation angle (the right sidelobe requires adjustment), the bottom side of the subreflector should be adjusted downward by loosening the screws between the subreflector and the struts and adjusting the bottom side of the subreflector downward. An easy way to remember this adjustment is through the acronym BOLD (Bold Out Left Down).

Each of these adjustments should be repeated until each sidelobe is of equal distance from the peak of the mainlobe.

After the BOLD and WOLD adjustments have been made, it may be necessary to adjust the main lobe. The goal is to achieve a high null depth (distance between lower intersection of sidelobes and top of main lobe) as shown in Figure 4-6.

In order to adjust the main lobe pattern characteristics **ALL** subreflector adjustment screws should be adjusted at the same degree (Note: Because the azimuth and elevation adjustments have been set, it is very important that the null depth adjustment be carefully conducted. Be careful not to alter any previous adjustments that have been made to the subreflector. Follow the procedure listed below when adjusting the null depth of the main lobe.

C-band feeds - Adjustment screws are 3/4 X 10. Move 1 turn per 1dB of imbalance.

Ku-band feeds - Adjustment screws are 1/4 X 20. Move 1 turn per 1 dB of imbalance.

All adjustments should be continued until the desired pattern is achieved. Upon completion the antenna should be properly aligned with the satellite for maximum performance.

Preventive Maintenance

Overview

This section contains periodic preventive maintenance instructions for the 5.6-Meter Earth Station Antenna. Included in this section are inspection and preventive maintenance procedures including cleaning and lubrication, painting, and an operational voltage/current checkout procedure deemed within the capabilities of the average station technician. Refer to applicable vendor manuals for any repair procedures not included in this section yet designated as capable of being performed in the “field” rather than requiring specialized facilities, tools, and/or test equipment as well as technically trained personnel.

An operational checkout procedure provides an accurate indication of the overall earth station performance and should be performed at intervals of approximately three months. This procedure is essentially performed during the various modes of normal operation of the earth station. In addition, the operational checkout procedure should be performed after any repairs or adjustments have been made, or whenever the earth station is suspected of degraded operation. If any discrepancy in performance exists and the condition cannot be readily remedied to return the earth station to a proper operating condition, the appropriate troubleshooting procedures should be referenced to locate the fault. After the trouble is determined and the repairs affected, a final operational checkout procedure should be performed to verify that all discrepancies have been corrected.

The following paragraphs describe the inspection and preventive maintenance procedures for the earth station. These instructions include general cleaning and inspection, the preservation of metal parts and lubrication. Periodic replacement of assemblies or components as a preventive measure is not required. Malfunctions of the earth station can be traced to components, assemblies, and parts through the use of applicable troubleshooting procedures.

General Cleaning

To prevent the excessive accumulation of dust and dirt as well as the removal of such contaminants, thoroughly clean the equipment whenever visually inspecting the earth station components. No special cleaning procedures are required. However, a thorough cleaning in accordance with the following procedures is required to assure continued trouble-free operation.

Electrical Parts

Minor cleaning, such as the removal of dust and loose foreign particles can be accomplished by one of the following:

- Vacuuming
- Using a soft brush or lint-free cloth
- Blowing out the dust and dirt with low pressure (5 to 25 psi), dry compressed air

When using air to blow off the contaminants, either avoid or be careful when directing the air stream on delicate parts. To remove imbedded dirt, grease, or oil from electrical parts; use a 50 percent solution of isopropyl (rubbing) alcohol and apply with a soft bristle brush. It may be necessary to brush some parts vigorously with a stiff bristle brush to remove imbedded and hardened dirt particles. If possible, avoid excessive use of cleaning solvent on electrical insulation. After cleaning, allow the cleaned parts to dry for 10 to 15 minutes before placing the equipment into operation.

Clean mechanical parts by first removing dust, dirt, and other loose contaminants with a

Mechanical Parts

scraper, stiff brush (bristle or wire in the case of rust or other corrosion), or cloth or compressed air at 25 to 40 psi. Any accumulated imbedded dirt, corrosion, grease, or oil deposits that require further cleaning may be removed with a bristle or wire brush and a cleaning solvent such as trichlorethylene or equal. After cleaning, allow cleaned parts to dry for 10 to 15 minutes before placing the equipment into operation.

Inspection

The frequency of inspection is contingent upon the user's individual standards and the operational environment in which the earth station is located. However, a visual inspection of the earth station components should be performed at least semi-annually. Where there are no established wear limits, perform a visual inspection to locate worn or damaged parts which could cause improper functioning of the earth station. It is recommended that the mechanical and electrical inspection be performed on the assembled or partially disassembled equipment to determine the extent of disassembly required prior to completely disassembling a suspected malfunctioning component or module. In the absence of any special inspection requirements, operational tests are the most effective means in isolating parts and assemblies requiring further inspection. Any condition noted during inspection that may preclude continued proper operation of the earth station prior to the next scheduled inspection should be noted. The discrepant condition should be corrected (repaired or replaced) immediately or at the conclusion of the inspection procedure.

Local Control/Motor Drive Controller

Inspection of the local control/motor drive controller conforms generally to standard visual inspection procedures on electromechanical equipment. In addition to these standard procedures, perform the following checks and visual inspections for the specific conditions noted:

- Check the front panel for illegible and indistinct panel markings.
- Check the three position selector switches (Azimuth Off/Slow/Fast, Elevation-Off/Slow/Fast, and Polarization-CCW/Off/CW) for smooth operation, audible clicking at each actuation (left to center and return) and spring return from right to center. For each of the two position selector switches (Azimuth-East/West, Elevation-Up/Down, and Local/Remote) check for smooth operation and audible clicking at each actuation.
- Inspect all wiring and cables for discolorization and burned insulation, dirt, breaks, security of connection and other signs of deterioration. Examine connections for dirt, flux, corrosion, and mechanical defects. Check for loose or broken lacing and cut, brittle, abraided, frayed, or cracked insulation.
- Examine connectors for corrosion, broken inserts and stripped threads. Check connector shells for distortion and dents, and contact pins for bends, misalignment, or other deformities. Check connector inserts for carbon tracking indicating arc-over.
- Check all electrical components for dirt, cracks, chips, breaks, discoloration and other signs of deterioration and damage. A discolored, blistered, or burnt condition is evidence of overload. Measure actual value of suspect electrical components and compare against specified value.
- Check transformer for an excessive wax deposit on the surface, discoloration, or a

pungent odor indicative of burning varnish denoting overheating or a total breakdown.

- Check all terminal boards for broken or missing terminals and stripped threads. Check tightness of lead attaching hardware.
- Check each starter for a make-after-break provision through the release of one pushbutton as the alternate pushbutton is pressed.
- Check the relays and contactors for free operation of the armatures and contact condition. The contacts are usable even though pitted, burned, worn, or discolored. The contacts or contactor or relay assembly should be replaced only when the contact material has been completely torn away or worn off.
- Visually inspect all mechanical parts for freedom of operation without binding or interference. Check for security of all hardware and stripped or otherwise damaged threads. Check metallic parts for corrosion, dents, distortion, and other deformation.
- Check for evidence of water inside the enclosure. If any water is in evidence, check that all seals are intact and if not, use a coating of RTV-108 (silicone rubber sealant) to seal any exposed electrical fitting, bolt hole, or other possible water entry to the enclosed electrical components in order to maintain a waterproof condition.
- Check or change humidity absorber.

Antenna

Inspection of the antenna conforms generally to standard visual inspection procedures performed on electromechanical equipment. In addition to these procedures, perform the following checks and visual inspections for the specific conditions noted:

- Inspect all wiring and cables particularly the network to enclosure and enclosure to mount interfaces for discoloration and burned insulation, moisture entry, corrosion, dirt, breaks, security of connection, and other signs of deterioration. Examine connections for dirt, corrosion, and mechanical defects. Check for loose or broken lacing and cut, abraided, frayed, brittle, and cracked insulation.
- Examine connectors for corrosion, broken inserts and stripped threads. Check connector shells for distortion and dents, and contact pins for bends, misalignment or other deformities. Check connector inserts for cracks, and carbon tracking, burns or charring indicating arc-over.
- Check all electrical component for dirt, cracks, chips, breaks, discoloration, and other signs of deterioration and damage. A discolored, blistered, or burnt condition is evidence of overload.
- Operate the azimuth and elevation drives as well as the feed rotation in both the plus

and minus direction from the local control/motor drive controller at least once every three months during antenna down time. Check the mechanical limit switches provided at the end points stop antenna and feed movement, and limit travel to prevent structural interference and damage. Check the mechanical limit switches for corrosion and water entry and the arm on each feed limit switch for free movement without binding. Be certain both feed rotation limit switch arms are not distorted and ride centrally on the actuating cam to open their corresponding limit switch.

- Inspect the azimuth and elevation jackscrew boots for security of attachment at both ends, for abrasion, tears, cuts, brittleness and other damage that may expose the jackscrew to the environment (water, dust, etc.). Minor repairs can be made with RTV-108 silicone rubber sealant.
- Visually inspect the feed window for dirt and the feed, feed supports, feed window, and reflector for distortion, foreign object damage and environmental deterioration due to ice and snow, dust, rain, hail, and high winds, etc. which may cause electrical component and/or structural deformation.
- Check the cable attachment to the resolvers and to the LNA or LNB's and enclosure mount interface for security, the cable routing for secure hanger attachment and the cable insulation for cuts, cracking, abrasion, and other deterioration. Check the LNA or LNB's and the resolvers for a secure mechanical attachment. Ensure proper torquing of polarization drive gear box setscrews and appropriate tensioning of corresponding drive chain assembly, if applicable.
- Check (if applicable) that the drain holes in the bottom of the enclosure are not obstructed and there is no evidence of water accumulation. Check the enclosure doors for proper closure and that the door seals are intact, not torn, abraded or otherwise damaged. Check that all other seals are intact and if not, use a coating of RTV-108 (silicone rubber sealant) to seal any exposed electrical fitting, bolt hold, or other possible water entry to electrical components in order to maintain a weatherproof condition. If the enclosure is provided with a vent fan, check for free operation of the fan blade. The fan bearings are permanently lubricated; any binding, abnormal noise or vibration necessitates replacement of the fan assembly. Check and replace the fan filter element if it appears dirty or obstructed with dust.
- Check for the appearance of surface lubricants that will cause the accumulation of dirt and grime. Clean off all excess surface lubricants with a cloth and if required, a cloth dampened not wetted with trichlorethylene, or equal.
- Visually inspect all mechanical parts for freedom of operation with no misalignment, binding or interference. Check all cabling for sufficient slack to prevent cable strain as well as adequate restraint to prevent abrasion or chaffing during antenna and feed movement.
- Check security of antenna mounting and interconnecting assembly hardware. Be cer-

Drive System Voltage and Current Checks

tain all electrical grounding connections (including cross-axis grounding straps) are intact and secure, not corroded or broken. Thoroughly clean any noticeable corroded portions of grounding cables, unplated portion of universal terminals and corresponding mounting surfaces using a wire brush. Replace rather than tighten any loose A-325 structural hardware. The hardware distorts at initial installation and once loosened will not maintain the required high strength friction connection. All other assembly and installation hardware should be tightened to its original torqued condition. When installing new structural hardware, do not use a wrench with a lever arm longer than two feet.

- Examine painted aluminum and galvanized surfaces and touch-up where required.

At the conclusion of the installation procedure prior to turning the system over to the station facility, an installation acceptance check off sheet was prepared and duly signed off if installed by Andrew crew. Part of this check off included voltage readings retaken to determine if proper voltage was available. Current readings were also taken as a reference for future comparison to serve as a troubleshooting aid in determining possible equipment degradation and shortened life. Any current reading taken during the following procedure that varies by more than five percent from the pre-established reference values necessitates troubleshooting the particular system involved to determine the cause and required corrective action.

Step 1

Approximately every three months and during a period of down time, disconnect as applicable the RF transmitter and all power supplies. The main disconnect switch in the main load center box at the antenna site must be in the ON position and the LOCAL/REMOTE switch in the local control motor drive controller must be in the LOCAL position.

Step 2

Open the outer local control/motor drive controller door at the antenna site to gain access to the conductors supplying power to the azimuth, elevation, and polarization drive motors.

NOTE: During the following procedures, the antenna drives (azimuth, elevation, and polarization) will be powered to rotate the antenna and feed in both directions of travel. Check that this condition can be tolerated from a safety as well as an operational standpoint, and that the electrical limits are not reached before the testing is concluded. Reaching an electrical limit before concluding a test necessitates rotating the antenna or feed in the opposite direction a sufficient distance to permit retesting in the desired direction.

Step 3

Turn the FEED CCW/OFF/CW switch to either the CW or CCW position and while the feed is rotating, carefully use a clamp on ammeter in accordance with the ammeter manufacturer's instructions to take current readings off each of the three conductors (phases) connected to the load side of the polarization motor circuit breaker. Record the current draw in the equipment log and compare the readings to the reference values entered in the installation/acceptance check off. If the readings differ by more than five percent, refer to appropriate troubleshooting information and perform applicable corrective action. Then take voltage readings off each of the three conductors; the readings should agree with each other within two percent. Turn the FEED CCW/OFF/CW switch to OFF. Repeat preceding step (3) with the FEED CCW/OFF/CW switch in the alternate operating position.

Step 4

Turn the AZIMUTH EAST/WEST switch to either position and while the antenna is rotating, carefully use a clamp on ammeter in accordance with the ammeter manufacturer's instructions to take current readings off each of the three conductors (phases) connected to the load side of the azimuth drive motor circuit breaker. Record the current draw in the equipment log and compare the readings to the reference values entered in the installation/acceptance check off. If the readings differ by more than five percent, refer to appropriate troubleshooting information and perform applicable corrective action. Then take voltage readings off each of the three conductors; the readings should agree with each other—within two percent. Turn the AZIMUTH switch to OFF.

Step 5

Repeat steps (5) with the AZIMUTH EAST/WEST switch in the alternate operating position.

Step 6

Turn the ELEVATION DOWN/UP switch to either position and while the antenna is rotating, carefully use a clamp on ammeter in accordance with the ammeter manufacturer's instructions to take current readings off each of the three conductors (phases) connected to the load side of the elevation drive motor circuit breaker. Record the current draw in the equipment log and compare the readings to the reference values entered in the installation/acceptance check off. If the readings differ by more than five percent, refer to appropriate troubleshooting information and perform applicable corrective action. Then take voltage readings off each of the three conductors; the readings should agree with each other within two percent. Turn the ELEVATION switch to OFF.

Step 7

Repeat steps (7) with the ELEVATION DOWN/UP switch in the alternate operating position.

Step 8

If all voltage and current readings are within tolerance, close the local control/motor drive controller inner door and place the LOCAL/REMOTE switch in the REMOTE position to return antenna control to the studio. Then close and lock the outer local control/motor drive controller door.

Step 9

When preserving the component parts, refer to the following paragraphs in this section.

Preservation of Component Parts

Aluminum Parts

Remove all loose paint and corrosion by scraping, wire brushing, or using steel wool. If using steel wool near the feed window, make sure that none remains on the feed horn window. Edges of existing paint can be blended with the metal surface by using a fine grit sandpaper. Wipe the surface to be painted with a soft rag dampened in trichlorethylene, lacquer thinner or equal. Be certain to remove all loose paint, corrosion, imbedded dirt, grease, and oil deposits or the paint will not adhere to the surface. Lacquer thinner will dissolve paint if applied heavily and rubbed vigorously. The reflector may be washed with plain water if necessary. Do not use bleach, soap solutions, or kerosene as it is difficult to remove the residue. Allow the cleaned surface to dry thoroughly before priming.

Prime the cleaned surface by applying zinc chromate primer. The primer can be applied with a brush, roller, or pressurized spray. If necessary, thin the primer with lacquer thinner to the proper consistency. Feather primer onto adjacent painted surfaces;. Allow primer to thoroughly dry before applying the finish paint coat.

Paint all RF surfaces, such as the inside of the main reflector and subreflector with a high-reflectance white paint. This type of paint disperses light rays, reducing the focusing effect of the sun's radiation, thereby reducing heat build-up caused by the focused sun's rays on the feed system. Rear surfaces of the reflector and subreflector may be painted with a flat white enamel paint. The paint can be applied with a brush, roller, or pressurized spray. If necessary, thin the paint with the appropriate thinner to the proper consistency. Thoroughly paint over the primed surfaces and blend with the existing painted surface.

Galvanized Surfaces

Remove all loose paint and corrosion by scraping, wire brushing, or using steel wool. Edges of existing paint can be blended with the metal surface by using a fine grit sandpaper. Wipe the surface to be painted with a soft rag dampened in trichlorethylene, lacquer thinner, or equal. Be certain to remove all loose paint, corrosion, imbedded dirt, grease, and oil deposits or the paint will not adhere to the surface. Lacquer thinner will dissolve paint if applied heavily and rubbed vigorously. Do not use bleach, soap solutions, or kerosene as it is difficult to remove the residue. Allow the clean surface to dry thoroughly before painting.

Paint the cleaned surface with a zing-rich paint. The paint can be applied with a brush, roller, or pressurized spray. If necessary, thin the paint with the appropriate thinner to the proper consistency. Thoroughly paint over the cleaned surface and blend with the existing painted surface.

Lubrication

For long life and trouble-free operation be certain not to extend the lubrication schedule beyond the frequency recommended in the Lubrication Chart. The frequency should be shortened if the antenna is subjected to an adverse environment (e.g., high temperature, extended periods of rainfall, high humidity, dust storms, etc). Any component or part should be immediately be lubricated if during inspection or operation, rough, jarring, or intermittent motion is noted, or if squeaky or other unusual noises are heard.

Lubrication is required on all metal-to-metal rolling or sliding parts. Use the lubricants recommended. Do not over lubricate. Over lubrication can often be as damaging as under lubrication. Prior to the application of lubricant to any parts, use a clean cloth and/or bristle brush and remove any old lubricant to prevent an excessive build-up. Remove indicated access plugs from square tube weldment and apply lubricant to panning frame

tube assembly and corresponding thrust pads. Securely replace access plugs in square tube weldment. Be certain to remove any protective caps and clean off each lubrication fitting prior to injecting fresh grease. The elevation and azimuth jackscrew assemblies are equipped with a grease fitting and corresponding pipe plug on opposite sides of the jack housing. Remove the appropriate pipe plug and fill with with grease until lubricant seeps from the pipe plug opening. Replace and securely tighten pipe plug.

The following is a list of the lubricant characteristics:

- Mobil Temp SHC32 A non-soap hydrocarbon fluid type grease. Operating temperature range is -65 degrees to 350+ degrees Fahrenheit (-54 degrees to 177+ degrees Celsius).
- Mobil SHC624 A low temperature synthetic oil for worm gear reducers. Operating temperature range is -40 degrees to 125+ degrees Fahrenheit (-40 degrees to 52+ degrees Celsius).
- Moly Grease A grease lubricant containing molybdenum disulfide. Operating temperature range is -85 degrees to 300+ degrees Fahrenheit (-29 degrees to 149+ degrees Celsius).

Periodically inspect lifting screws on jackscrew assemblies to ensure adequate lubrication. Loosen Jackscrew boot clamps to expose the lifting screw assembly. Fully extend jackscrew assembly being careful not to exceed preset mechanical limits. Brush thin coating of Mobil SHC32 grease on exposed lifting screw. Replace boot and attach corresponding boot clamps. If lifting screw is rusty, remove existing lubricant with solvent and wire brush rusted area. Rinse with solvent and apply fresh grease.

Periodically inspect and remove dust or dirt deposits from the motor housings to avoid hindering the heat exchange with the ambient air. Slight dirt accumulation on the air vent screw through splash oil cannot be avoided; however, keep vent screw clean to ensure proper pressure compensation.

Lube points 2, 3, 7 and 8, shown in the Lubrication Chart, require removal of the indicated drain plugs and collecting/measuring the amount of SHC624 drain oil using measuring cup. The specified amount of oil must be added to the gear motor/housing (after installing the drain plug) via the fill/vent plug opening using supplied funnel. Addition of the oil requires use of an appropriate filling utensil. Use of a modified level stick will not correctly gauge the appropriate amount of oil in the gear housings.

Lube Point	Parts to be Lubricated	Action	Frequency	Service Type	Lube Type	Quantity /Points	Andrew Number
------------	------------------------	--------	-----------	--------------	-----------	------------------	---------------

Jackscrews/Motors

**Gear
Motor/Housing Fill
Drain
Requirements**

Lubrication Chart

Lube Point No.	Components to be Lubricated	Frequency (Months)				Type of Service	Type of Lube	No. of Lube Points or Quantity
		1	3	6	12			
1.	Elevation Jackscrew Housing		X			Pressure Fitting	SHC32	1
2. ¹	Elevation Jackscrew Gear Housing Fill and Drain			I*	C**	Pipe Plugs	SHC624	10 Oz
3. ²	Elevation Drive Intermediate Gearbox Fill and Drain	I*	C**			Pipe Plugs	SHC624	34 Oz.
4.	Elevation Jackscrew Pivot Pin, upper		X			Pressure Fitting	SHC32	1
5.	Azimuth Jackscrew Pivot Pin, front		X			Pressure Fitting	SHC32	1
6.	Azimuth Jackscrew Housing		X			Pressure Fitting	SHC32	2
7. ¹	Azimuth Jackscrew Gear Housing Fill and Drain	I*	C**			Pipe Plugs	SHC624	4 Oz.
8. ²	Azimuth Drive Intermediate Gearbox Fill and Drain			I*	C**	Pipe Plugs	SHC624	34 Oz.
9.	Polarization Drive Gear			X		Brush	SHC32	Minimum Surface Coverage
10.	Feed Rotation Worm Gear Pillow Blocks			X		Pressure Fitting	SHC32	2

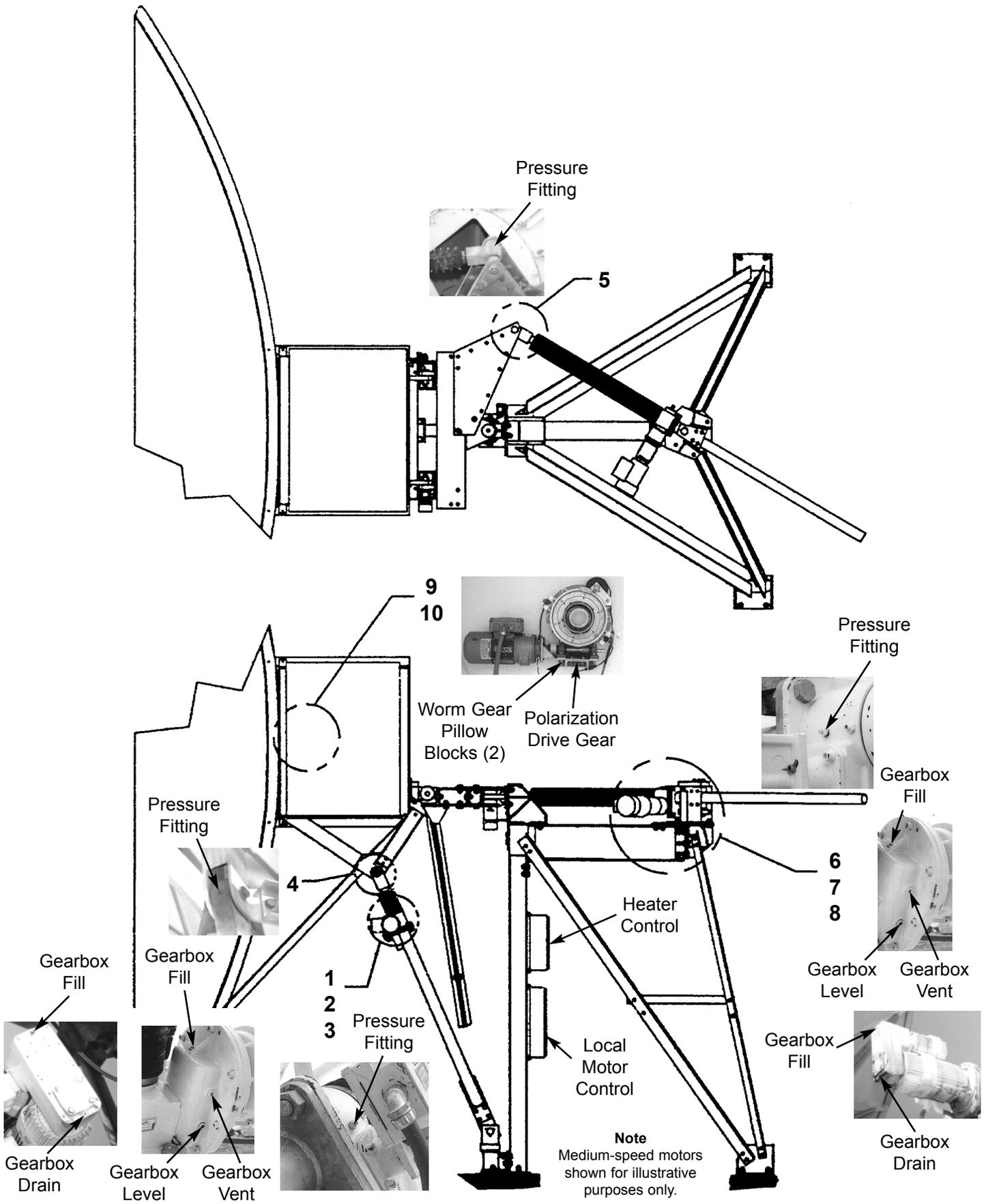
X = Lubricate I = Inspect C = Change

* Inspection requires checking for visible signs of oil leakage, draining replacing and adding oil to ensure appropriate oil level requirements. Excessively dirty oil will require fresh oil replacement. If oil leakage is found to be excessive, refer to appropriate troubleshooting information and perform applicable corrective action. Periodic inspection procedures can be less frequent after first or second scheduled inspections.

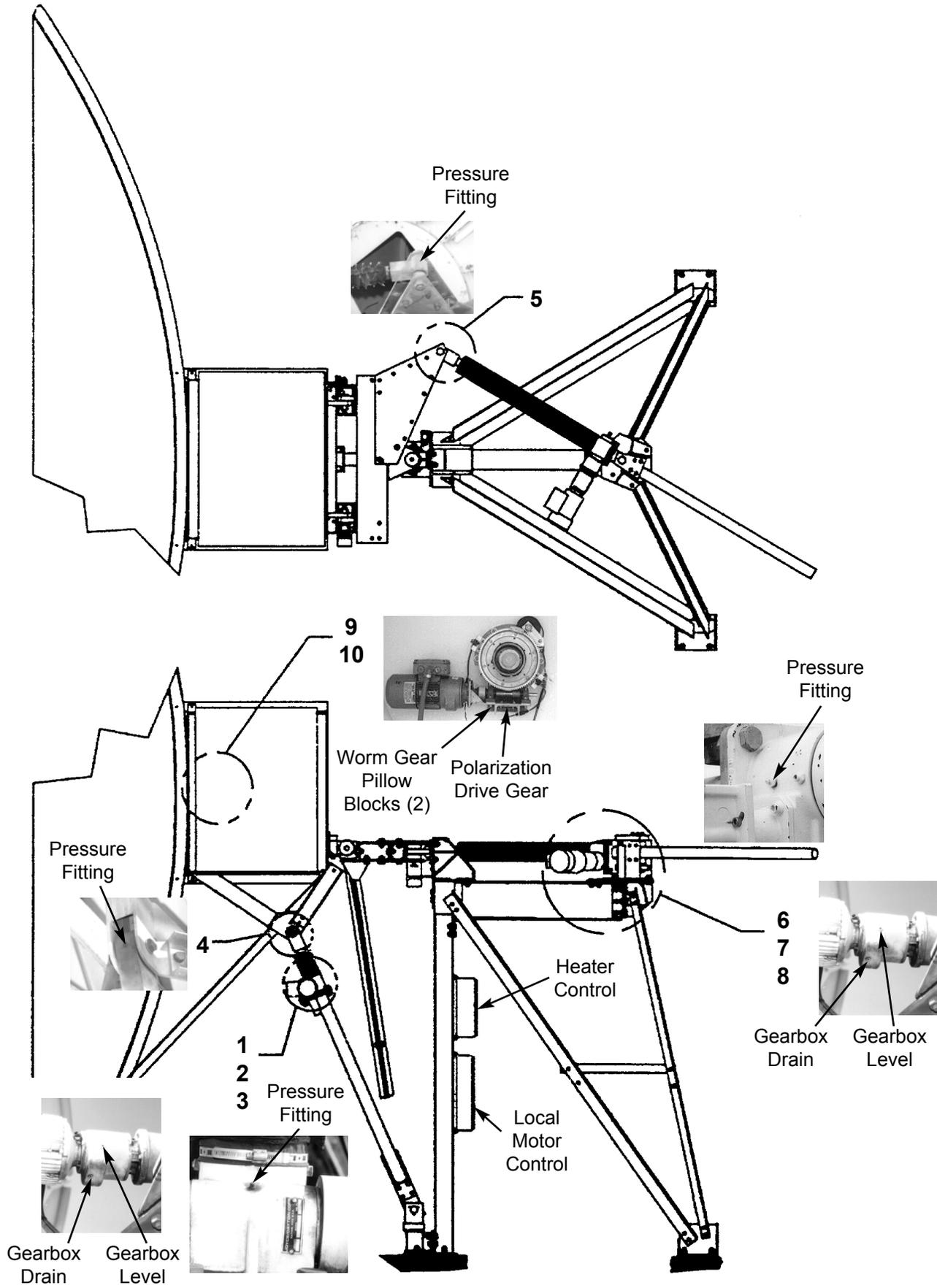
** Initial oil change requirements include flushing gear boxes with a standard cleaning agent.

1 Type 'HS' and 'STHS' drives only. 10 oz. required for gearbox on Type 'MS' drives.

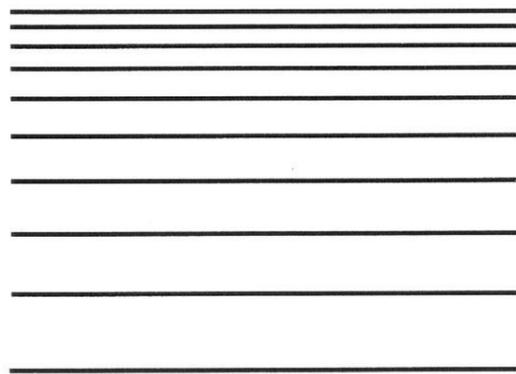
2 Type 'HS' and 'STHS' drives only.



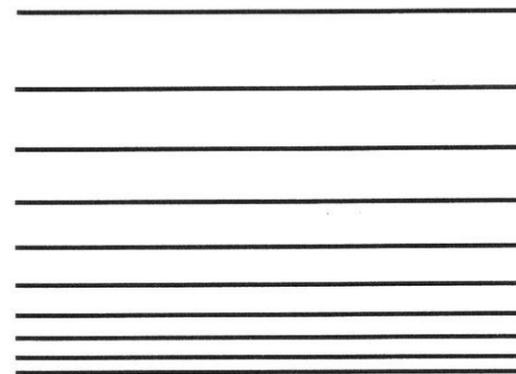
High-Speed Antenna Lubrication Points



Medium-Speed Antenna Lubrication Points



**OPERATIONS AND
MAINTENANCE MANUAL**



**237232
5.6M Antenna**

SH 1

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DWG NO. 239306

APPLICATION		REVISIONS				
NEXT ASSY	USED ON	MF	REV	DESCRIPTION	DATE	APPROVED
				REL TO PRODUCTION	28APR89	FFR
			A	REVISED SHTS 6-9. DCN D015.74(B)	29APR98	SJA JTP,SLI
			B	REVISED SHT 4. DCN D016.74(B)	11AUG98	SJA SLI BLA

209906-2
LUBRICATION KIT
MAINTENANCE
INSTRUCTIONS

REVISION STATUS OF SHEET

REVISION	B	-	-	A	-	A	A	A	A
SHEET NO.	1	2	3	4	5	6	7	8	9

MATERIAL	FINISH
----------	--------

UNLESS OTHERWISE SPECIFIED	DRAWN	RWB	1FEB89
DIMENSIONS ARE IN INCHES	CHECKED	KGJ	27APR89
TOLERANCES PLACE DECIMALS ± .1 PLACE DECIMALS ± .03 PLACE DECIMALS ± .010 ANGLE ± 0.5°	APPD ENGRG	RWS	27APR89
	APPD ENGRG	RWK	27APR89
	APPD MFG	----	----
ALL SURFACES	APPD Q.C.		
COMMERCIAL TOL APPLY TO STOCK SIZES	SIMILAR TO		
	SUPERSEDES DWG OF		



ANDREW CORPORATION
2701 Mayhill Road
Denton, Texas U.S.A. 76208

5.6/7.3/9.3M LUBRICATION MAINTENANCE INSTRUCTIONS

SIZE	FSCM NO.	DWG. NO.
A	84147	239306
SCALE	CAD FILE NO.	SHEET
X	ES05KX1A	1 of 9

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GENERAL

READ THE INSTRUCTIONS THOROUGHLY BEFORE ASSEMBLY. FOLLOW THE SEQUENCES FOR PROPER ASSEMBLY AND OPERATION.



CAUTION: PERSONNEL.

THIS WARNING INDICATES THAT FAILURE TO FOLLOW THE PROPER PROCEDURE AT THIS POINT COULD RESULT IN DAMAGE TO THE ANTENNA AND/OR OTHER PROPERTY AND POSSIBLE INJURY TO

NOTICE

THIS INDICATES INFORMATION THAT SHOULD BE READ BEFORE PROCEEDING.

UNPACKING

CAREFULLY REMOVE ALL PARTS FROM SHIPPING BOXES. THE MATERIAL COMPLEMENT SHOULD CORRESPOND WITH THE PARTS LIST. ANY DAMAGE OR SHORTAGE WILL PREVENT SATISFACTORY ASSEMBLY, INSTALLATION, AND OPERATION OF THE ANTENNA.

NOTICE

'THE INSTALLATION, MAINTENANCE OR REMOVAL OF AN ANTENNA REQUIRES QUALIFIED, EXPERIENCED PERSONNEL. ANDREW INSTALLATION INSTRUCTIONS HAVE BEEN WRITTEN AND ILLUSTRATED FOR SUCH INSTALLATION PERSONNEL. ANTENNA SYSTEMS SHOULD BE INSPECTED ONCE A YEAR BY QUALIFIED PERSONNEL TO VERIFY PROPER INSTALLATION, MAINTENANCE AND CONDITION OF EQUIPMENT. ANDREW DISCLAIMS ANY LIABILITY OR RESPONSIBILITY FOR THE RESULTS OF IMPROPER OR UNSAFE INSTALLATION OR MAINTENANCE PRACTICES.'

SIZE	FSCM NO.	239306
A	84147	
SCALE	<i>W</i>	SHEET 2

CAD FILE NO. **ES05KX2** ↑

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TOOLS RECOMMENDED FOR PROPER INSTALLATION

<u>QTY</u>	<u>DESCRIPTION</u>
1	CARTRIDGE GREASE GUN
1	FUNNEL
1	MEASURING CUP (FILLING UTENSIL)
1	SLOTTED SCREWDRIVER $\phi 1/4"$ BLADE
1	ADJUSTABLE WRENCH 8"
1	WIRE BRUSH
1	ALLEN WRENCH SET

PARTS LIST

209906-2 LUBRICATION KIT

<u>QTY</u>	<u>IT. NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
3	1	47497	LUBRICANT
2	2	49208	GREASE
4	3	44799	GREASE FITTING



CAUTION:

WHEN THE ANTENNA IS TRANSMITTING, SEVERE EYE INJURY OR INJURY TO OTHER PARTS OF THE BODY CAN RESULT FROM EXPOSURE TO RADIO FREQUENCY ENERGY. THE ANTENNA MUST BE TURNED OFF BEFORE ENTERING THE AREA IN FRONT OF THE REFLECTOR AND NEAR FEED.

SIZE	FSCM NO.	239306
A	84147	
SCALE	<i>X</i>	SHEET 3

CAD FILE NO. **ES05KX3**



1.1 LUBRICATION

FOR LONG LIFE AND TROUBLE-FREE OPERATION, BE CERTAIN NOT TO EXTEND THE LUBRICATION SCHEDULE BEYOND THE FREQUENCY RECOMMENDED IN TABLE 1 AND TABLE 2, LUBRICATION CHART. THE FREQUENCY SHOULD BE SHORTENED IF THE ANTENNA IS SUBJECTED TO EXTENSIVE USE OR AN ADVERSE ENVIRONMENT (e.g. HIGH TEMPERATURE, EXTENDED PERIODS OF RAINFALL, HIGH HUMIDITY, DUST STORMS, ETC.). ANY COMPONENT OR PART SHOULD IMMEDIATELY BE LUBRICATED IF DURING INSPECTION OR OPERATION, ROUGH, JARRING, OR INTERMITTENT MOTION IS NOTED, OR IF SQUEAKY OR OTHER UNUSUAL NOISES ARE HEARD. LUBRICATION IS REQUIRED ON ALL METAL-TO-METAL ROLLING OR SLIDING PARTS. USE THE LUBRICANTS RECOMMENDED IN PARAGRAPH 1.3. DO NOT OVER-LUBRICATE. OVER-LUBRICATION CAN OFTEN BE AS DAMAGING AS UNDER-LUBRICATION. PRIOR TO THE APPLICATION OF LUBRICANT TO ANY PARTS, USE A CLEAN CLOTH AND/OR BRISTLE BRUSH AND REMOVE ANY OLD LUBRICANT TO PREVENT AN EXCESSIVE BUILDUP. BE CERTAIN TO REMOVE ANY PROTECTIVE CAPS AND CLEAN OFF EACH LUBRICATION FITTING PRIOR TO INJECTING FRESH GREASE. WHEN USING A GREASE GUN ON LUBRICATION FITTINGS, INJECT GREASE UNTIL IT EXTRUDES FROM BOTH SIDES OF THE JOINT. EACH JACKSCREW ASSEMBLY IS EQUIPPED WITH A GREASE FITTING. DEPENDING ON MAKE & MODEL, EACH JACKSCREW ASSEMBLY MAY ALSO HAVE A CORRESPONDING PIPE PLUG OPPOSITE THE GREASE FITTING. IF A CORRESPONDING PIPE PLUG IS PRESENT, REMOVE THE APPROPRIATE PIPE PLUG AND FILL UNIT WITH GREASE UNTIL LUBRICANT SEEPS FROM THE PIPE PLUG OPENING. REPLACE AND SECURELY TIGHTEN PIPE PLUG. IF NO CORRESPONDING PIPE PLUG IS PRESENT, ADD 1/4 DUNCE OF GREASE (ABOUT 8 PUMPS WITH A HAND GREASE GUN) EACH LUBRICATION INTERVAL.

1.2 JACKSCREWS/MOTORS

A: PERIODICALLY INSPECT LIFTING SCREWS ON JACKSCREW ASSEMBLIES TO ENSURE ADEQUATE LUBRICATION. LOOSEN JACKSCREW BOOT CLAMPS TO EXPOSE THE LIFTING SCREW ASSEMBLY. FULLY EXTEND JACKSCREW ASSEMBLY BEING CAREFUL NOT TO EXCEED PRESET MECHANICAL LIMITS. BRUSH THIN COATING OF MOBIL SHC32 GREASE ON EXPOSED LIFTING SCREW. REPLACE BOOT AND ATTACH CORRESPONDING BOOT CLAMPS. IF LIFTING SCREW IS RUSTY, REMOVE EXISTING LUBRICANT WITH SOLVENT AND WIRE BRUSH RUSTED AREA. RINSE WITH SOLVENT AND APPLY FRESH GREASE.

B: PERIODICALLY INSPECT AND REMOVE DUST OR DIRT DEPOSITS FROM THE MOTOR HOUSINGS TO AVOID HINDERING THE HEAT EXCHANGE WITH THE AMBIENT AIR. ON PRIMARY ANTENNAS WITH DUAL-MOTORS ON EACH AXIS, SLIGHT DIRT ACCUMULATION ON THE AIR VENT SCREW THROUGH SPLASH OIL CANNOT BE AVOIDED; HOWEVER, KEEP VENT SCREW CLEAN TO ENSURE PROPER PRESSURE COMPENSATION.

SIZE	FSCM NO.	239306
A	84147	
SCALE	<i>X</i>	SHEET 4

CAD FILE NO. ES05KX4



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1.3 LUBRICANT CHARACTERISTICS

- A: MOBIL TEMP SHC32 NON-SOAP HYDROCARBON FLUID TYPE GREASE. OPERATING TEMPERATURE RANGE IS -65 TO +350°F (-54 TO+177°C).
- B: MOBIL SHC624 LOW TEMPERATURE SYNTHETIC OIL FOR WORM GEAR REDUCERS. OPERATING TEMPERATURE RANGE IS -40 TO +125°F (-40 TO +52°C).

1.4 MOTOR GEARBOX/HOUSING FILL AND DRAIN REQUIREMENTS

- A: LUBE POINTS 4, 5, 12 AND 13 (TABLE 2) AND LUBE POINTS 4, 11, 15 AND 16 (TABLE 1) REQUIRE REMOVAL OF THE INDICATED DRAIN PLUGS AND COLLECTING/MEASURING THE AMOUNT OF SHC624 DRAIN OIL USING A MEASURING CUP. THE SPECIFIED AMOUNT OF OIL MUST BE ADDED TO THE GEARBOX/HOUSING (AFTER INSTALLING THE DRAIN PLUG) VIA THE FILL/VENT PLUG OPENING USING A FUNNEL. ADDITION OF THE OIL REQUIRES USE OF AN APPROPRIATE FILLING UTENSIL. USE OF A MODIFIED LEVEL STICK WILL NOT CORRECTLY GAUGE THE APPROPRIATE AMOUNT OF OIL IN THE GEARBOX/HOUSINGS.

SIZE	FSCM NO.	239306
A	84147	
SCALE	<i>X</i>	SHEET 5

CAD FILE NO. ES05KX5 ↑

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5.6/7.3/7.6 METRE PRIMARY ANTENNA LUBRICATION CHART

(SEE FIGURE 1)

LUBE POINT LUBE NO.	PARTS TO BE LUBRICATED	(MONTHS) FREQUENCY				TYPE OF SERVICE	LUBE TYPE	NO. OF LUBE POINTS OR QUANTITY
		1	3	6	12			
1	ELEVATION JACKSCREW HOUSING		X			PRESSURE FITTING	SHC32	1
2	ELEVATION JACKSCREW GEAR HOUSING FILL AND DRAIN	I*	C**			PIPE PLUGS	SHC624	10 OUNCES
3	ELEVATION JACKSCREW PIVOT PIN, UPPER		X			PRESSURE FITTING	SHC32	1
4	AZIMUTH JACKSCREW PIVOT PIN, FRONT		X			PRESSURE FITTING	SHC32	1
5	AZIMUTH JACKSCREW HOUSING		X			PRESSURE FITTING	SHC32	2
6	AZIMUTH JACKSCREW GEAR HOUSING FILL AND DRAIN	I*	C**			PIPE PLUGS	SHC624	*
7	POLARIZATION DRIVE GEAR			X		BRUSH	SHC32	MINIMUM SUR- FACE COVERAGE
8	FEED ROTATION WORM GEAR PILLOW BLOCKS			X		PRESSURE FITTING	SHC32	2
9 ***	ELEVATION DRIVE INTERMEDIATE GEARBOX FILL AND DRAIN			I*	C**	PIPE PLUGS	SHC624	34 OUNCES
10 ***	AZIMUTH DRIVE INTERMEDIATE GEARBOX FILL AND DRAIN			I*	C**	PIPE PLUGS	SHC624	34 OUNCES

TABLE 1

X=LUBRICATE I=INSPECT C=CHANGE

- * INSPECTION REQUIRES CHECKING FOR VISIBLE SIGNS OF OIL LEAKAGE, DRAINING, REPLACING AND ADDING OIL TO ENSURE APPROPRIATE OIL LEVEL REQUIREMENTS. ANTENNAS WITH DUAL-MOTORS ON EACH AXIS REQUIRE 4 OUNCES OF LUBRICANT IN THE AZIMUTH JACKSCREW GEAR HOUSING. ON ANTENNAS WITH DUAL-WOUND MOTORS, THE AZIMUTH JACKSCREW GEAR HOUSING REQUIRES 10 OUNCES OF LUBRICANT. EXCESSIVELY DIRTY OIL WILL REQUIRE FRESH OIL REPLACEMENT. IF OIL LEAKAGE IS FOUND TO BE EXCESSIVE, REFER TO APPROPRIATE TROUBLESHOOTING INFORMATION AND PERFORM APPLICABLE CORRECTIVE ACTION. PERIODIC INSPECTION PROCEDURES CAN BE LESS FREQUENT AFTER FIRST OR SECOND SCHEDULED INSPECTIONS.
- ** INITIAL OIL CHANGE REQUIREMENTS INCLUDE FLUSHING GEAR BOXES WITH A STANDARD CLEANING AGENT.
- *** NOT REQUIRED ON DUAL-WOUND MOTORS.

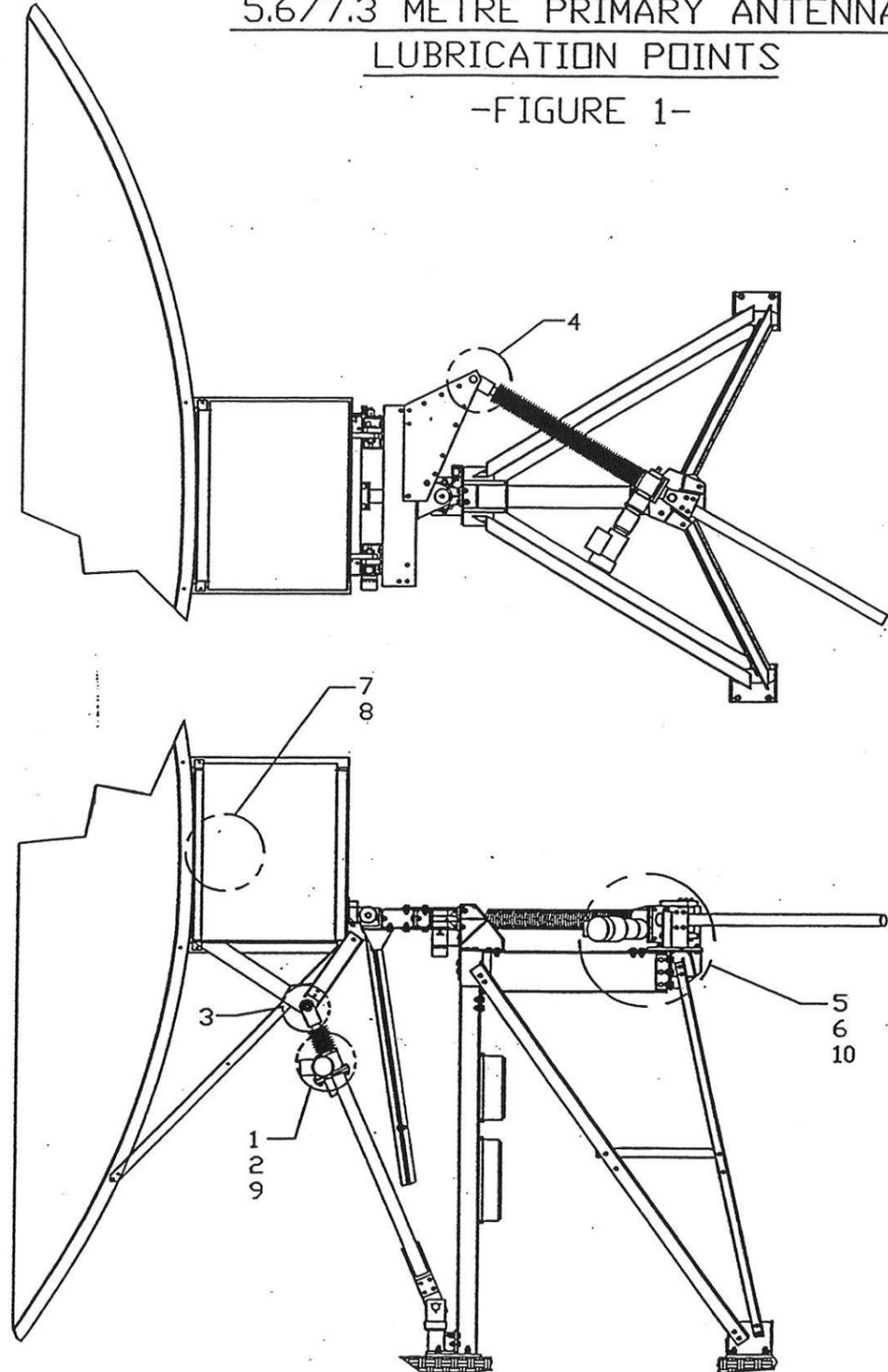
SIZE	FSCM NO.	
A	84147	239306
SCALE	<i>X</i>	SHEET 6

CAD FILE NO. **ES05KX6A** ↑

5.6/7.3 METRE PRIMARY ANTENNA

LUBRICATION POINTS

-FIGURE 1-



SIZE	FSCM NO.	239306
A	84147	
SCALE	<i>1/2</i>	SHEET 7

CAD FILE NO. ES05KX7A ↑

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9.3 METRE PRIMARY ANTENNA LUBRICATION CHART

(SEE FIGURE 2)

LUBE POINT LUBE NO.	PARTS TO BE LUBRICATED	(MONTHS) FREQUENCY				TYPE OF SERVICE	LUBE TYPE	NO. OF LUBE POINTS OR QUANTITY
		1	3	6	12			
1	AZIMUTH PIVOT PIN, LOWER		X			PRESSURE FITTING	SHC32	2
2	ELEVATION JACKSCREW PIVOT PIN, LOWER		X			PRESSURE FITTING	SHC32	1
3	ELEVATION JACKSCREW HOUSING		X			PRESSURE FITTING	SHC32	1
4	ELEVATION JACKSCREW GEAR HOUSING FILL AND DRAIN	I*	C**			PIPE PLUGS	SHC624	10 OUNCES
5	ELEVATION DRIVE INTERMEDIATE GEARBOX FILL AND DRAIN			I*	C**	PIPE PLUGS	SHC624	34 OUNCES
6	ELEVATION JACKSCREW PIVOT PIN, UPPER		X			PRESSURE FITTING	SHC32	2
7	ELEVATION PIVOT PIN, UPPER RIGHT		X			PRESSURE FITTING	SHC32	2
8	ELEVATION PIVOT PIN, UPPER LEFT		X			PRESSURE FITTING	SHC32	2
9	AZIMUTH PIVOT PIN, UPPER		X			PRESSURE FITTING	SHC32	2
10	AZIMUTH JACKSCREW PIVOT PIN, FRONT		X			PRESSURE FITTING	SHC32	2
11	AZIMUTH JACKSCREW HOUSING		X			PRESSURE FITTING	SHC32	2
12	AZIMUTH JACKSCREW GEAR HOUSING FILL AND DRAIN	I*	C**			PIPE PLUGS	SHC624	4 OUNCES
13	AZIMUTH DRIVE INTERMEDIATE GEARBOX FILL AND DRAIN			I*	C**	PIPE PLUGS	SHC624	34 OUNCES
14	AZIMUTH JACKSCREW PIVOT PIN, REAR		X			PRESSURE FITTING	SHC32	2
15	POLARIZATION DRIVE GEAR			X		BRUSH	SHC32	MINIMUM SURFACE COVERAGE
16	FEED ROTATION WORM GEAR PILLOW BLOCKS			X		PRESSURE FITTING	SHC32	2

TABLE 2

X=LUBRICATE I=INSPECT C=CHANGE

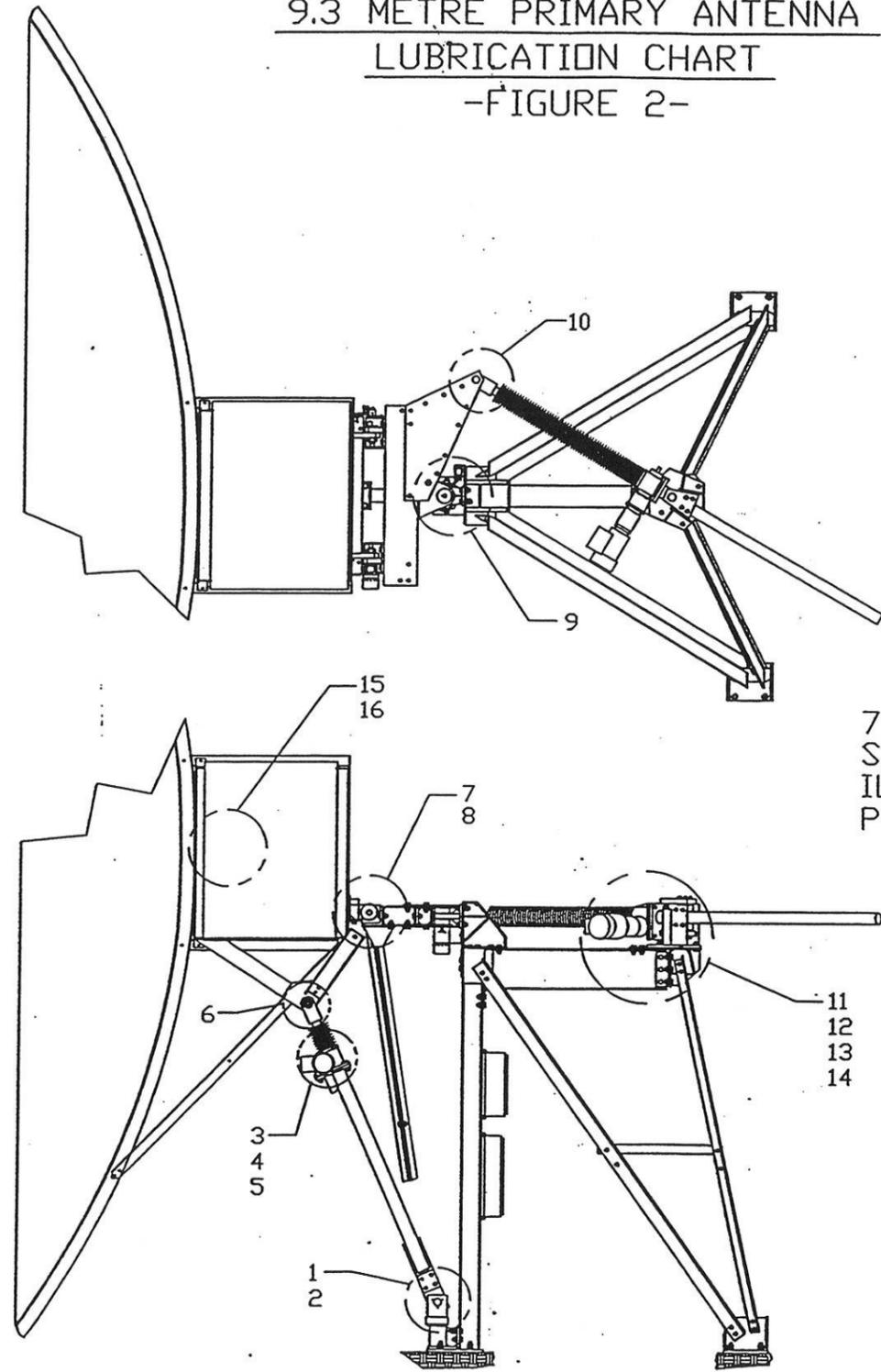
* INSPECTION REQUIRES CHECKING FOR VISIBLE SIGNS OF OIL LEAKAGE, DRAINING, REPLACING AND ADDING OIL TO ENSURE APPROPRIATE OIL LEVEL REQUIREMENTS. EXCESSIVELY DIRTY OIL WILL REQUIRE FRESH OIL REPLACEMENT. IF OIL LEAKAGE IS FOUND TO BE EXCESSIVE, REFER TO APPROPRIATE TROUBLESHOOTING INFORMATION AND PERFORM APPLICABLE CORRECTIVE ACTION. PERIODIC INSPECTION PROCEDURES CAN BE LESS FREQUENT AFTER FIRST OR SECOND SCHEDULED INSPECTIONS.

** INITIAL OIL CHANGE REQUIREMENTS INCLUDE FLUSHING GEAR BOXES WITH A STANDARD CLEANING AGENT.

SIZE	FSCM NO.	239306
A	84147	
SCALE	<i>X</i>	SHEET 8

CAD FILE NO. ES05KX8A ↑

9.3 METRE PRIMARY ANTENNA
LUBRICATION CHART
-FIGURE 2-



7.3M MOUNT
SHOWN FOR
ILLUSTRATION
PURPOSE ONLY

SIZE	FSCM NO.	239306
A	84147	
SCALE	$\times 1$	SHEET 9

CAD FILE NO: ES05KX9A

REVISIONS					
MF	ZONE	REV.	DESCRIPTION	DATE	APPROVED
		-	RELEASE TO PRODUCTION	5/28/93	PTF
		A	SEE DCN D009.72(A2)	11/21/95	SLI
		B	SEE DCN D011.96(A2)	1/29/97	PAB
		C	PER ECN-000295	6/16/98	JPM

NOTES: (UNLESS OTHERWISE SPECIFIED)

- REMOVE ALL BURRS AND SHARP EDGES.
- DIMENSIONS APPLY BEFORE PLATING.
- INTERPRET DRAWING PER ANSI Y14.5M-1982.

4. GENERAL

READ THE INSTRUCTIONS THOROUGHLY BEFORE ASSEMBLY. FOLLOW SPECIFIED SEQUENCES FOR PROPER ASSEMBLY AND OPERATION.



THIS WARNING INDICATES THAT FAILURE TO FOLLOW THE PROPER PROCEDURE AT THIS POINT COULD RESULT IN DAMAGE TO THE EQUIPMENT AND/OR OTHER PROPERTY AND POSSIBLE INJURY TO PERSONNEL.



THIS WARNING INDICATES THAT FAILURE TO FOLLOW THE PROPER PROCEDURE AT THIS POINT COULD RESULT IN DAMAGE TO THE EQUIPMENT AND/OR OTHER PROPERTY AND RISK OF ELECTRICAL SHOCK, INJURY OR DEATH.

NOTICE

THIS REPRESENTS INFORMATION THAT SHOULD BE READ BEFORE PROCEEDING.

UNPACKING

CAREFULLY REMOVE ALL PARTS FROM SHIPPING BOXES. THE CONTENTS SHOULD CORRESPOND WITH THE PARTS LIST. ANY DAMAGE OR SHORTAGE WILL PREVENT SATISFACTORY ASSEMBLY, INSTALLATION AND OPERATION OF THE EQUIPMENT.

NOTICE

THE INSTALLATION, MAINTENANCE OR REMOVAL OF AN ANTENNA REQUIRES QUALIFIED, EXPERIENCED PERSONNEL. ANDREW INSTALLATION INSTRUCTIONS HAVE BEEN WRITTEN AND ILLUSTRATED FOR SUCH INSTALLATION PERSONNEL. ANTENNA SYSTEMS SHOULD BE INSPECTED ONCE A YEAR BY QUALIFIED PERSONNEL TO VERIFY PROPER INSTALLATION, MAINTENANCE AND CONDITION OF EQUIPMENT. ANDREW DISCLAIMS ANY LIABILITY OR RESPONSIBILITY FOR THE RESULTS OF IMPROPER OR UNSAFE INSTALLATION OR MAINTENANCE PRACTICES.

5. TOOLS RECOMMENDED FOR PROPER INSTALLATION

QTY	DESCRIPTION
1	3/8" OPEN END OR COMBINATION WRENCH
2	9/16" OPEN END OR COMBINATION WRENCH
2	FLAT BLADE SCREWDRIVERS, SMALL AND MEDIUM
1	PHILLIPS SCREWDRIVER, MEDIUM
1	DIAGONAL CUTTERS OR EQUIVALENT

- THE ADDITION OF MOTORIZATION REQUIRES SPECIAL SAFETY CONSIDERATIONS IN CE COUNTRIES. ACCESS TO THIS EQUIPMENT MUST BE LIMITED TO SERVICE ENGINEERS AND TECHNICIANS ONLY, THEREFORE ACCESS CONTROL AND WARNING SIGNS ARE REQUIRED IN CE COUNTRIES. THIS EQUIPMENT MUST BE PROTECTED TO THE RELEVANT CE DIRECTIVES AT TIME OF INSTALLATION.



14. FLEXIBLE TRIM (IT. 12) MUST BE INSTALLED IN CE COUNTRIES TO COMPLY WITH MACHINERY DIRECTIVE ESSENTIAL HEALTH & SAFETY REQUIREMENTS.



15. ITEM QUANTITY SHOWN IS SPECIFIC FOR THE 3.6-9.3M LOCAL MOTOR CONTROLLER MOUNTING AND CABLE ROUTING INSTALLATION. THE INSTALLATION KIT, 300501, INCLUDES SPARES OF VARIOUS HARDWARE ITEMS.

3.6 - 4.6M ANTENNA CABLE SUMMARY

CABLE FUNCTION	ESTIMATED LENGTH (FT)	QTY REQ'D
AZ MOTOR	20	2
AZ LIMIT SWITCH	8	1
AZ RESOLVER	8	1
EL MOTOR	20	2
EL LIMIT SWITCH	10	1
EL RESOLVER	15	1
POL MOTOR/LIM SW	8	1
POL RESOLVER	8	1



5.6 - 9.3M ANTENNA CABLE SUMMARY

CABLE FUNCTION	ESTIMATED LENGTH (FT)	QTY REQ'D
AZ MOTOR	25	2
AZ LIMIT SWITCH	20	1
AZ RESOLVER	20	1
EL MOTOR	20	2
EL LIMIT SWITCH	25	1
EL RESOLVER	20	1
POL MOTOR/LIM SW	8	1
POL RESOLVER	8	1



- ALL CABLES, UNLESS OTHERWISE SPECIFIED, ARE PART OF LMC CABLE KIT P/N 300500. REFERENCE INSTALLATION DRAWINGS PROVIDED WITH KIT FOR CABLE IDENTIFICATION AND SPECIFIC TERMINATION INFORMATION.
- POLARIZATION RESOLVER CABLE IS SUPPLIED WITH OPTIONAL POLARIZATION DRIVE ASSEMBLY. AZ/EL RESOLVER CABLES ARE SUPPLIED WITH OPTIONAL ANTENNA RESOLVER KITS.
- REQUIRED CABLE LENGTH FOR POLARIZATION RESOLVER AND MOTOR/LIMIT SWITCH CABLE WILL VARY DEPENDING UPON SIZE/TYPE OF ANTENNA REFLECTOR. LENGTH TO BE DETERMINED AT INSTALLATION.
- INSTALL CABLE TIES (ITEM 11) AS REQUIRED. CABLE TIES CAN BE CONNECTED END TO END TO MAKE LONGER LENGTHS AS REQUIRED.
- REQUIRED CABLE ATTACHMENTS FOR ROUTING OPTIONAL REMOTE CONTROL CABLE [CCK-()].

11. ALLOW SUFFICIENT SLACK WHEN ROUTING CABLES TO COMPENSATE FOR ANTENNA AZIMUTH AND ELEVATION RANGE ADJUSTMENTS.

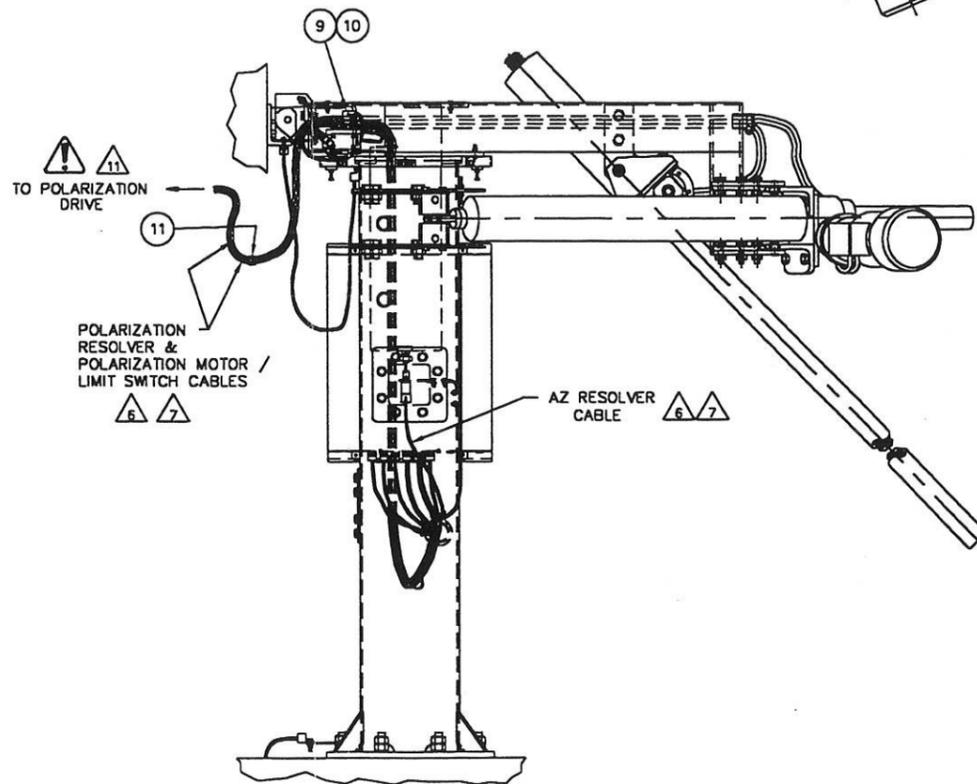
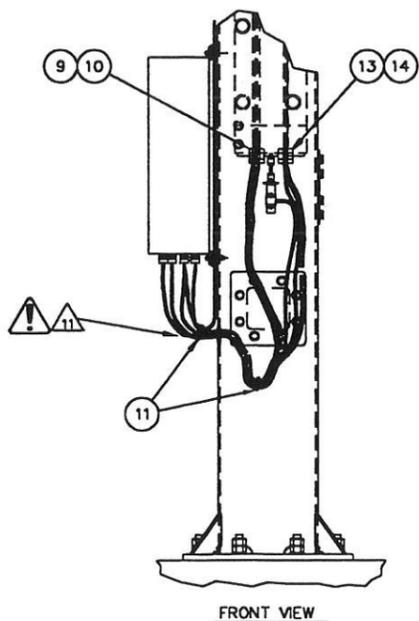
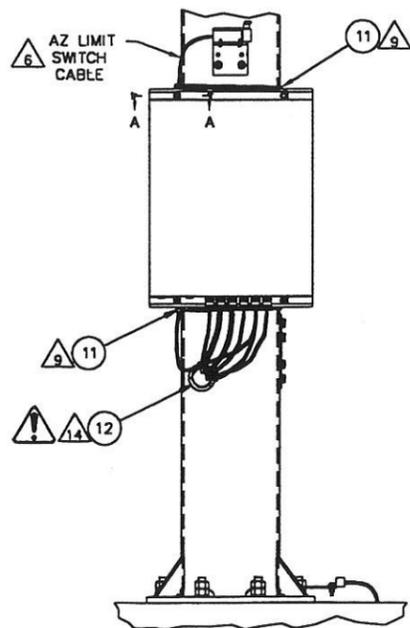
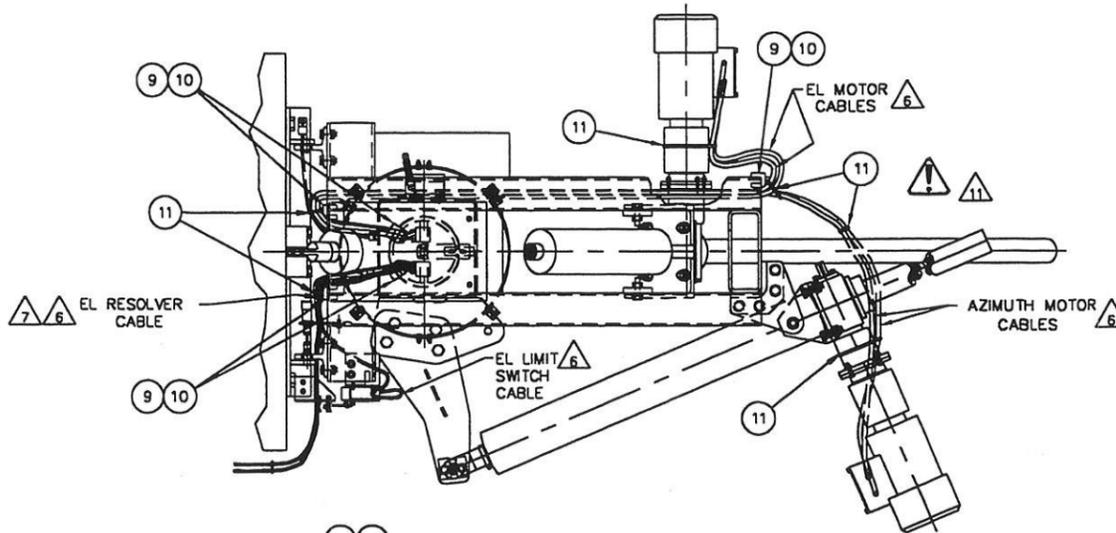
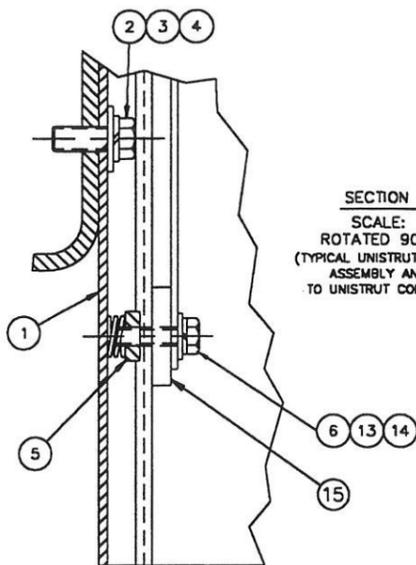
12. LOCAL MOTOR CONTROLLER IS NOT TO BE ENERGIZED AT TIME OF CABLE ROUTING; REFER TO INSTALLATION INSTRUCTIONS 239979.

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FOR REFERENCE ONLY

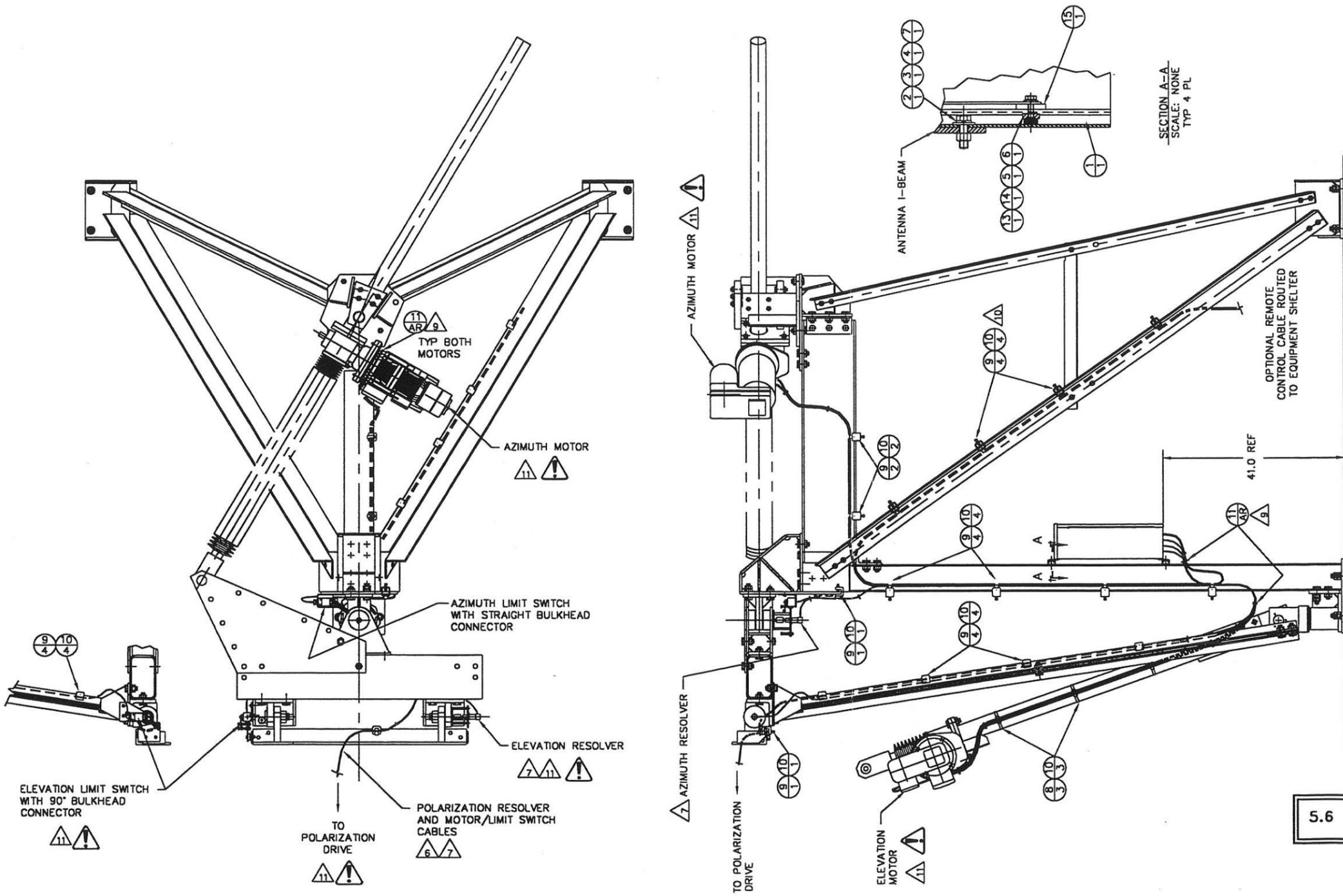
QTY	ITEM NO.	U OF M	ANDREW PART NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	REF. DESIGNATOR	NOTES
4	15	EA	300938	300501	1.625 SQUARE WASHER		
4	14	EA	9997-131	300501	.25 FLAT WASHER,SST		
4	13	EA	EWSHL-11060	300501	WASHER, LOCK,1/4,SST		
1	12	EA	206049	300501	FLEXIBLE TRIM		
20	11	EA	ECLAT-12137	300501	CABLE TIE, 120 LBS		
3	10	EA	36719	300501	INSULATED HANGER KIT		
2	9	EA	31768A-2	300501	ANGLE ADAPTOR KIT		
5	8	EA	ECLMP-18164	300501	CLMP,WORM DR,4.1-7.0 DIA		
4	7	EA	ENUTS-11090	300501	NUT,HEX,3/8-16UNC SST		
4	6	EA	9963-416	300501	SCR,HEX CAP,1/4-20X.75 LG,SST		
4	5	EA	204905-2	300501	.250-20UNC SLIDING NUT		
4	4	EA	EWSHL-11080	300501	WSHR,LOCK,3/8 SST		
4	3	EA	EWSHF-20806	300501	WSHR,FLAT,3/8 X 1.0 SST		
4	2	EA	ESCRS-73818	300501	SCR,HEX CAP,3/8-16X1.25 LG SST		
2	1	EA	AEO1M-C0151	300501	CHANNEL,MOD-LMC MTG		

MATERIAL		UNLESS OTHERWISE SPECIFIED, DIMENSIONS DIMS ARE IN INCHES (MILLIMETERS). SINGLE DIMENSIONED DIMS ARE IN INCHES.		ANDREW CORPORATION Electronic Technology Center Richardson, TX U.S.A.	
METRIC []		US CUSTOMARY		ANDREW 3.6-9.3M LMC MOUNTING AND CABLE ROUTING INSTALL	
TOL. ON [METRIC] DIM: ±.005, .005-±0.2		TOL. ON [INCH] DIM: ±.005, .005-±.002		DRAWN: FORRISTAL 09/13/93 CHECKED: TFN 5/27/93 APPL. PAB: PTF 5/27/93 APPL. ENGR: GC 5/27/93 APPL. DC: SLI 5/27/93 APPL. MFG: SJA 5/27/93	
HOLE DIA: 6.350 ±.013-0.13		HOLE DIA: .250 ±.005-.005		SIZE: FROM NO. 84147 SCALE: 1/1 DSN: DS00K81 SHEET: 1 OF 4	
HOLE DIA: 6.35 TO 12.70 ±.015-0.13		HOLE DIA: .25 TO .5000 ±.005-.005		THIRD ANGLE PROJECTION	
HOLE DIA: 12.70 ±.020-0.13		HOLE DIA: .5000 ±.005-.005		ANDREW CORPORATION Electronic Technology Center Richardson, TX U.S.A.	
HOLE DIA: 12.70 ±.020-0.13		HOLE DIA: .5000 ±.005-.005		239971 C	
HOLE DIA: 12.70 ±.020-0.13		HOLE DIA: .5000 ±.005-.005		PROD. OR. 050 DIST. P	
HOLE DIA: 12.70 ±.020-0.13		HOLE DIA: .5000 ±.005-.005		1	



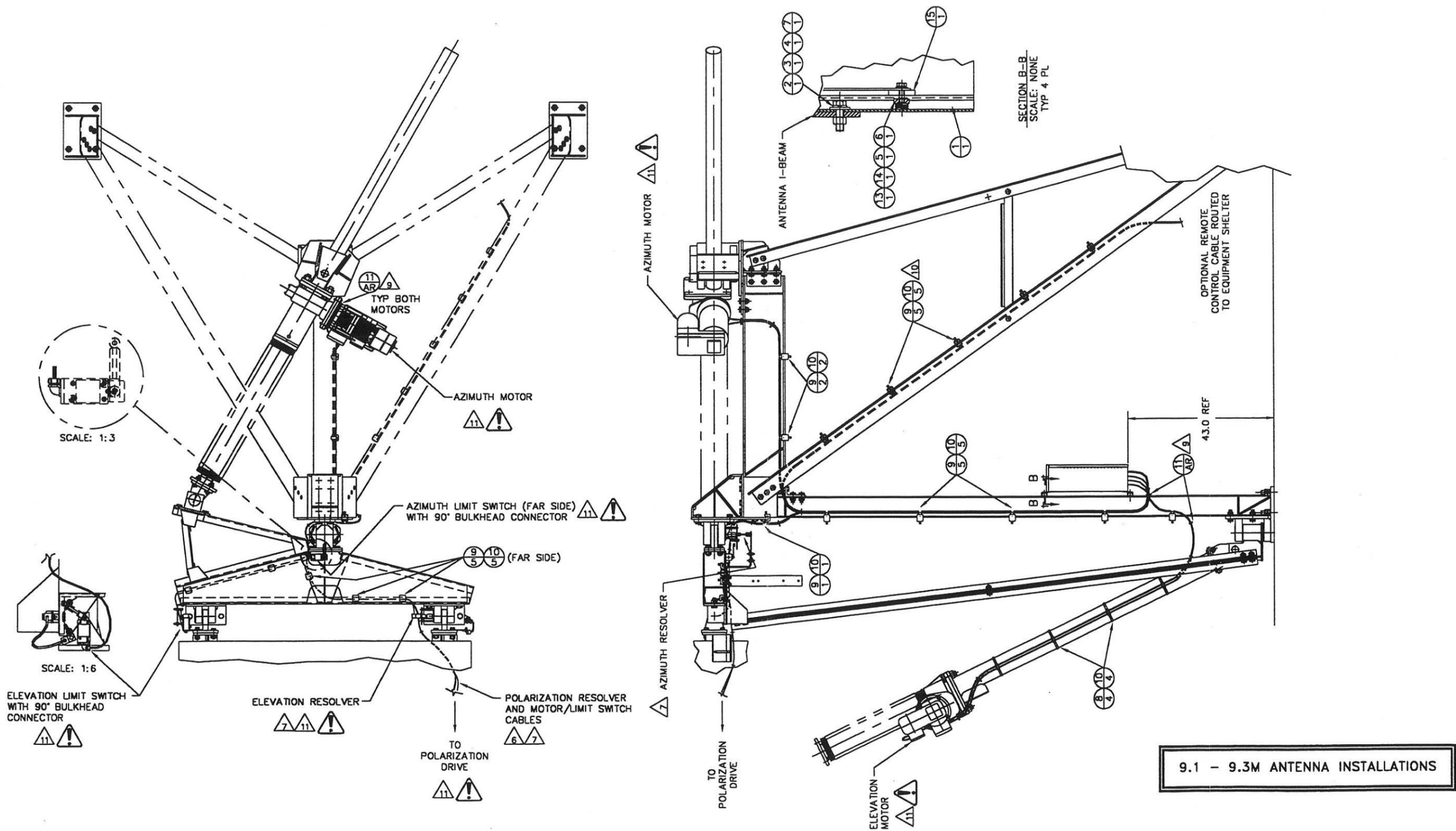
3.6 - 4.6M ANTENNA INSTALLATIONS

PREP. FORRISTA.	05/13/93	SIZE	D	FICM NO.	84147	ORIG. NO.	239971	REV.
ORIG.		SCALE	1/10	DS00KB2		SHEET 2 OF 4		



5.6 - 7.6M ANTENNA INSTALLATIONS

PREP. FORRISTAL 05/13/93	SIZE D	FORM NO. 84147	DRG. NO. 239971	REV.
DRG.	SCALE 1/12	DS00KB3	SHEET 3 OF 4	



9.1 - 9.3M ANTENNA INSTALLATIONS

PREP. FORRISTAL	05/13/93	SIZE D	FISH NO. 84147	DOC. NO. 239971	REV.
CHK.		SCALE 1/14		DS00KB4	SHEET 4 OF 4

NOTES: (UNLESS OTHERWISE SPECIFIED)
 1. REMOVE ALL BURRS AND SHARP EDGES
 2. DIMENSIONS APPLY BEFORE PLATING
 3. INTERPRET DRAWING PER AMS Y14.5M-1982

4. **GENERAL**
 READ THE INSTRUCTIONS THOROUGHLY BEFORE ASSEMBLY. FOLLOW THE SEQUENCES FOR PROPER ASSEMBLY AND OPERATION.

CAUTION: THIS WARNING INDICATES THAT FAILURE TO FOLLOW THE PROPER PROCEDURE AT THIS POINT COULD RESULT IN DAMAGE TO THE ANTENNA AND/OR OTHER PROPERTY AND POSSIBLE INJURY TO PERSONNEL.

NOTICE: THIS INDICATES INFORMATION THAT SHOULD BE READ BEFORE PROCEEDING.

UNPACKING
 CAREFULLY REMOVE ALL PARTS FROM SHIPPING BOXES. THE CONTENTS SHOULD CORRESPOND WITH THE PARTS LIST. ANY DAMAGE OR SHORTAGE WILL PREVENT SATISFACTORY ASSEMBLY, INSTALLATION, AND OPERATION OF THE ANTENNA.

NOTICE: THE INSTALLATION, MAINTENANCE OR REMOVAL OF AN ANTENNA REQUIRES QUALIFIED, EXPERIENCED PERSONNEL. ANDREW INSTALLATION INSTRUCTIONS HAVE BEEN WRITTEN AND ILLUSTRATED FOR SUCH INSTALLATION PERSONNEL. ANTENNA SYSTEMS SHOULD BE INSPECTED ONCE A YEAR BY QUALIFIED PERSONNEL TO VERIFY PROPER INSTALLATION, MAINTENANCE AND CONDITION OF EQUIPMENT. ANDREW DISCLAIMS ANY LIABILITY OR RESPONSIBILITY FOR THE RESULTS OF IMPROPER OR UNSAFE INSTALLATION OR MAINTENANCE PRACTICES.

TOOLS RECOMMENDED FOR PROPER INSTALLATION	
QUANTITY	DESCRIPTION
2	7/16 SOCKET
2	9/16 SOCKET
2	5/16 SOCKET
2	3/8 DRIVE RATCHET
2	3/8 DRIVE EXTENSION
2	7/16 COMBINATION WRENCH
2	9/16 COMBINATION WRENCH
2	5/16 COMBINATION WRENCH
1	WIRE CUTTERS/STRIPPERS
1	FLAT BLADE SCREWDRIVER, MEDIUM
1	TONGUE AND GROOVE OR "ADJUSTABLE" PLIERS
1	Ø0.875 HOLE SAW (Ø22mm ALTERNATE)
1	ELECTRIC DRILL
1	5mm ALLEN WRENCH
1	ROLL ELECTRICAL TAPE

- 5. ALIGN THE CCW LIMIT SWITCH ASSEMBLY (ITEM 1) SUCH THAT THE HOLE MARKED '9' LINES UP WITH THE EXISTING HARDWARE LOCATED AT THE '9 O'CLOCK' POSITION.
- 6. ALIGN THE RESOLVER LIMIT SWITCH ASSEMBLY (ITEM 2) SUCH THAT THE HOLE MARKED '3' LINES UP WITH THE EXISTING HARDWARE LOCATED AT THE '3 O'CLOCK' POSITION.
- 7. ADJUST THE LIMIT SWITCHES AS REQUIRED TO ENSURE PROPER CONTACT WITH ACTUATORS (ITEM 3).
- 8. POSITION ACTUATORS (ITEM 3) ON LARGE WORM GEAR, AT APPROXIMATE MID-POINT OF THE ALLOWABLE FEED ROTATION RANGE.

- 9. ADJUST RESOLVER ASSEMBLY (PART OF ITEM 2) TO ENSURE PROPER ALIGNMENT BETWEEN SPUR GEARS.
 - 10. REFERENCE DRAWINGS SUPPLIED WITH LOCAL MOTOR CONTROLLER KIT FOR WIRING/ROUTING OF POLARIZATION MOTOR/LIMIT SWITCH AND RESOLVER CABLES ON ANTENNA MOUNT.
- NOTE!** IF LOCAL MOTOR CONTROLLER KIT IS NOT ORDERED AS PART OF ANTENNA SYSTEM, REFERENCE DIAGRAMS ON SHEET 5 FOR WIRING OF POLARIZATION MOTOR/LIMIT SWITCHES AND RESOLVER.

- 11. INSTALL MOTOR ASSEMBLY (ITEM 1) AS FOLLOWS:
 STEP 1: INSTALL KEY (ITEM 5) AND APPROPRIATE COUPLING HALF ONTO THE WORM DRIVE SHAFT. DO NOT TIGHTEN SET SCREW.
 STEP 2: INSTALL COUPLING HALF, OUTER COLLAR AND KEY (SUPPLIED WITH MOTOR) ONTO GEAR MOTOR OUTPUT SHAFT, SLIDE COUPLING FLUSH AGAINST MOTOR.
 STEP 3: MOUNT THE MOTOR ASSEMBLY TO THE WORM DRIVE PLATE USING SPECIFIED HARDWARE AND SNUG TIGHTEN.
 STEP 4: SLIDE MOTOR COUPLING/COLLAR FORWARD TO CHECK ALIGNMENT. IF NOT ALIGNED PROPERLY, LOOSEN MOUNTING HARDWARE FROM STEP 3 (HORIZONTAL ADJUSTMENT) AND/OR LOOSEN MOTOR MOUNTING HARDWARE (VERTICAL ADJUSTMENT) AND ALIGN AS REQUIRED.
- NOTE!** NYLON OUTER COLLAR SHOULD SLIDE FREELY BETWEEN COUPLING HALVES. TIGHTEN ALL MOUNTING HARDWARE AT THIS TIME.
- STEP 5: ALIGN COUPLING HALVES ON SHAFTS TO PERMIT EQUAL SHAFT ENGAGEMENT. FINALLY, TIGHTEN COUPLING SET SCREWS USING ALLEN WRENCH (ITEM 9).

- 12. POSITION CAUTION LABEL (ITEM 4) ON OUTSIDE COVER OF GEAR MOTOR JUNCTION BOX.
 - 13. IF THERE ARE NO HOLES PROVIDED TO ROUTE THE CABLES THRU THE ENCLOSURE WALL THEN USE THE Ø0.875 HOLE SAW TO CUT HOLES AT THE APPROXIMATE LOCATION SHOWN.
 - 14. REPLACE EXISTING POLARIZATION MOTOR STARTER (S1) IN TYPE 'LMKDS' LOCAL MOTOR CONTROLLER WITH ITEM 12. SET FLA ADJUSTMENT DIAL TO 1.0 AMP.
- ELECTRICAL HAZARD!**
CAUTION: MAKE SURE THE PRIMARY POWER HAS BEEN TURNED OFF BEFORE ATTEMPTING TO CHANGE OUT STARTER.
- 15. SPARE CONDUCTOR. FOLD BACK AND SECURE WITH ELECTRICAL TAPE.
 - 16. INSTALL GREEN TAPE (ITEM 30) ON DRN LEAD WIRE TO DENOTE GROUNDING CONDUCTOR - TYPICAL FOR CONNECTIONS AT BOTH ENDS OF CABLE.
 - 17. ITEMS 3 AND 18 ARE PART OF ACTUATOR LIMIT KIT AE01K-B0255.
 - 18. ADDITIONAL CABLE CONNECTORS AND MOUNTING HARDWARE PROVIDED FOR ROUTING CABLES INTO LOCAL MOTOR CONTROLLER.
 - 19. **NOTE:** IT MAY BE REQUIRED TO REVERSE HANDWHEEL AND DRIVE MOTOR ON 5.6M'S WITH C-Ku FEEDS AND REFLECTOR HEATERS.
 - 20. BRAKE MOTOR WIRE COLORS MAY BE DIFFERENT AS FOLLOWS FOR MOTOR P/N'S SRK40GN-AM AND SRK40GN-AMUL:
 MOTOR CCW = GRY
 MOTOR BRAKE = YEL
 MOTOR BRAKE = YEL

REVISIONS					
MF	ZONE	REV	DESCRIPTION	DATE	APPROVED
			REL TO PRODUCTION	8JUN93	PTF
	A		MODIFIED SHT. 5.	11NOV94	SJA SLI KLP PTF
	B		ADDED NOTE 19.	12AUG97	SJA JTP,SLI
	C		REVISED TITLE.	20JAN98	SJA JTP,SLI
	D		DCN D017.33(B)	14OCT98	SJA BLA,SLI
	E		DCN D018.05(A2)	05FEB99	SJA,VH JEK

QTY	ITEM NO	U OF M	ANDREW PART NO.	DESCRIPTION
1	31	EA	ETERF-12230	TERM, FORK, 22-18 AWG, #8
1	30	EA	ETAPE-51085	1/2 TAPE, GREEN
4	29	EA	9961-4	1/2 BOND NUT
6	28	EA	47893-4	1/2 SEALING RING
3	27	EA	ECNCC-40105	1/2 CORD CONN. .37-.50
5	26	EA	9997-79	0.375 FLATWASHER
8	25	EA	EWIRN-55100	WIRE CONN, 14 AWG SET SCR
3	24	EA	ECNCC-40103	1/2 CORD CONN. .25-.37
2	23	EA	9989-33	0.25-20UNC-2Ax 0.75 LG RHMS
2	22	EA	ECLAT-92480	MOUNT, CA TIE, 1/4" SCREW
2	21	EA	9991-66	0.25 SHAKEPROOF WASHER
2	20	EA	9953-23	0.375-16UNC-2Ax 1.75 LG SQ HD SET SCR
2	19	EA	45840-3	HANGER CLAMP
4	18	EA	9978-148	Ø190-32xØ56 LG CUP PT SET SCR
6	17	EA	9999-60	0.375-16UNC-2B HEX NUT
6	16	EA	9974-63	0.375 LOCKWASHER
4	15	EA	200425	Ø1.12 SPACER
1	14	EA	300452	COUPLING, SET SCREW
1	13	EA	300450	MOTOR ASSEMBLY
1	12	EA	300461-5	MTR STARTER, 1.0-1.6A
30	11	EA	301876	10 COND, 18 AWG SDN CABLE
2	10	EA	9963-165	0.375-16UNC-2Bx 1.25 LG RHMS
1	9	EA	9903-7	ALLEN WRENCH, 1/8 HEX
5	8	EA	200931-3	ADHESIVE BACKED MOUNT
10	7	EA	ECLAT-22050	CABLE TIE, 18 LB
1	6	EA	209767	CABLE ASSY, POL LIM SW
1	5	EA	9875-62	0.187 SQ x 0.62 LG KEY
1	4	EA	48146	LABEL, CAUTION
2	3	EA	200668	ACTUATOR, MACHINED
1	2	EA	AE01A-D0576	ASSY, RES/CW LIMIT SW
1	1	EA	AE01A-D0575	ASSY, CCW LIMIT SWITCH

MFG PROCESSES	INSPECTION PROCEDURES	TEST PROCEDURES
AUSA SPECIFICATIONS		

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UNLESS OTHERWISE SPECIFIED	MATERIAL
DIMENSIONS ARE IN INCHES	
TOLERANCES	
1 PLACE DECIMALS ± .1	
2 PLACE DECIMALS ± .03	
3 PLACE DECIMALS ± .010	
ANGLE ± 0.5°	
ALL SURFACES	
COM. TOL. APPLY TO STOCK SIZES	
SIMILAR TO	
SUPERSIZES DIM OF	

DRAWN	T.NOLAN	10MAR93
CHECKED	PTF	3JUN93
APPRO CHNG	PTF	3JUN93
APPRO CHNG	SLI	4JUN93
APPRO WFC	SJA	3JUN93
APPRO G.C.	SLI	4JUN93

ANDREW CORPORATION
 2701 Mayhill Road
 Denton, Texas U.S.A. 76208

ANDREW

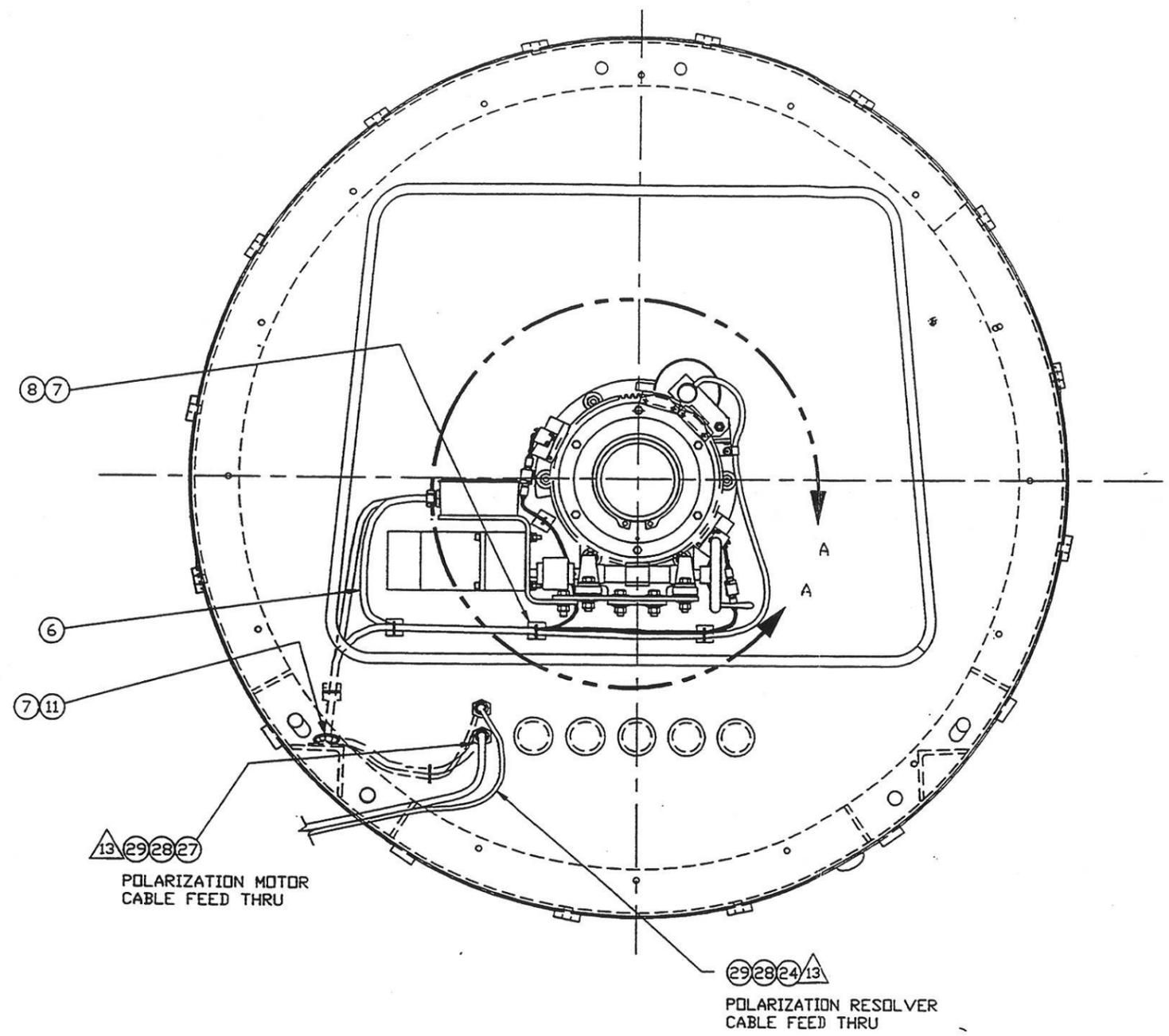
CPS.6M/7.3M/7.6M/9.3M POLARIZATION DRIVE INSTALLATION INSTRUCTIONS

SIZE FROM NO. **D 84147** DWG. NO. 239956
 SCALE 1=1 SHEET 1 of 6

8 7 6 5 4 3

NOTES: (UNLESS OTHERWISE SPECIFIED)
 1. REMOVE ALL BURRS AND SHARP EDGES
 2. DIMENSIONS APPLY BEFORE PLATING
 3. INTERPRET DRAWING PER ANSI Y14.5M-1982

REVISIONS					
MF	ZONE	REV	DESCRIPTION	DATE	APPROVED
			REL TO PRODUCTION	8JUN93	PTF
	A		REVISED BLOCK IN ZONE A2. DCN D015.17(B)	20 JUN 93 48	S.L. JTP



CP5.6M/7.6M POLARIZATION DRIVE
 INSTALLATION/CABLE ROUTING

MFG PROCESSES	INSPECTION PROCEDURES	TEST PROCEDURES
AUSA SPECIFICATIONS		

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CAD FILE NO:
 DS00J42A

UNLESS OTHERWISE SPECIFIED	MATERIAL
DIMENSIONS ARE IN INCHES	
TOLERANCES	
1 PLACE DECIMALS ± .1	
2 PLACE DECIMALS ± .03	
3 PLACE DECIMALS ± .010	
ANGLE ± 0.5°	
ALL SURFACES	FINISH
UNLESS NOTED OTHERWISE	
USE TO APPLY TO STOCK SIZES	
SIMILAR TO	
SUPPLEMENTARY DIM OF	
NEXT ASSY	USED ON
APPLICATION	

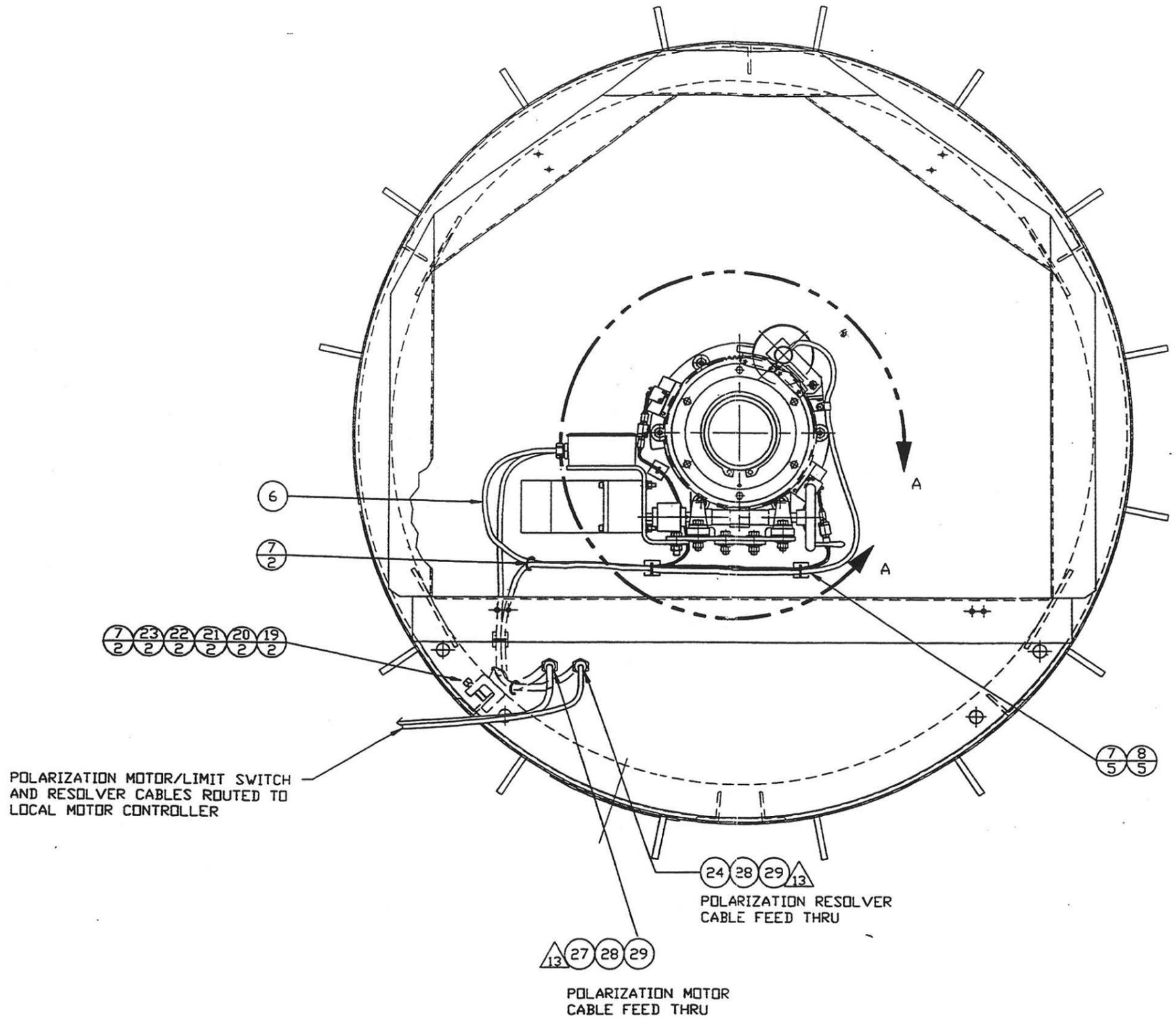
QTY	FIG. NO.	U OF #	ANDREW PART NO.	DESCRIPTION
PARTS LIST				
DRWN	T.NOLAN	4APR93		
CHECKED	PTF	3JUN93		
APPRO. ENGR.	PTF	3JUN93		
APPRO. ENGR.	SLI	4JUN93		
APPRO. MFG.	S.JA	3JUN93		
APPRO. Q.C.	SLI	4JUN93		
ANDREW CORPORATION 2701 Mayhill Road Denton, Texas U.S.A. 76208				
POLARIZATION DRIVE INSTALLATION INSTRUCTIONS				
SIZE / FIG. NO.	D 84147		DRW. NO.	239956
SCALE	1=4		SHEET	2
FILE NO.	61114	REV.	A	

8 7 6 5 4 3 2 1

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. REMOVE ALL BURRS AND SHARP EDGES
2. DIMENSIONS APPLY BEFORE PLATING
3. INTERPRET DRAWING PER ANSI Y14.5M-1982

REVISIONS				
DATE	ZONE	REV	DESCRIPTION	APPROVED
8 JUN 93			REL TO PRODUCTION	PTF



7.3M POLARIZATION DRIVE INSTALLATION/CABLE ROUTING

MFG PROCESSES	INSPECTION PROCEDURES	TEST PROCEDURES
AUSA SPECIFICATIONS		

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UNLESS OTHERWISE SPECIFIED	MATERIAL
DIMENSIONS ARE IN INCHES	
TOLERANCES	FINISH
1 PLACE DECIMALS ± .1	
2 PLACE DECIMALS ± .03	
3 PLACE DECIMALS ± .010	
ANGLE ± 0.5°	
ALL SURFACES	
CONC. TOL. APPLY TO STOCK SIZES	
SIMILAR TO	
SUPPLIES DRG. OF	

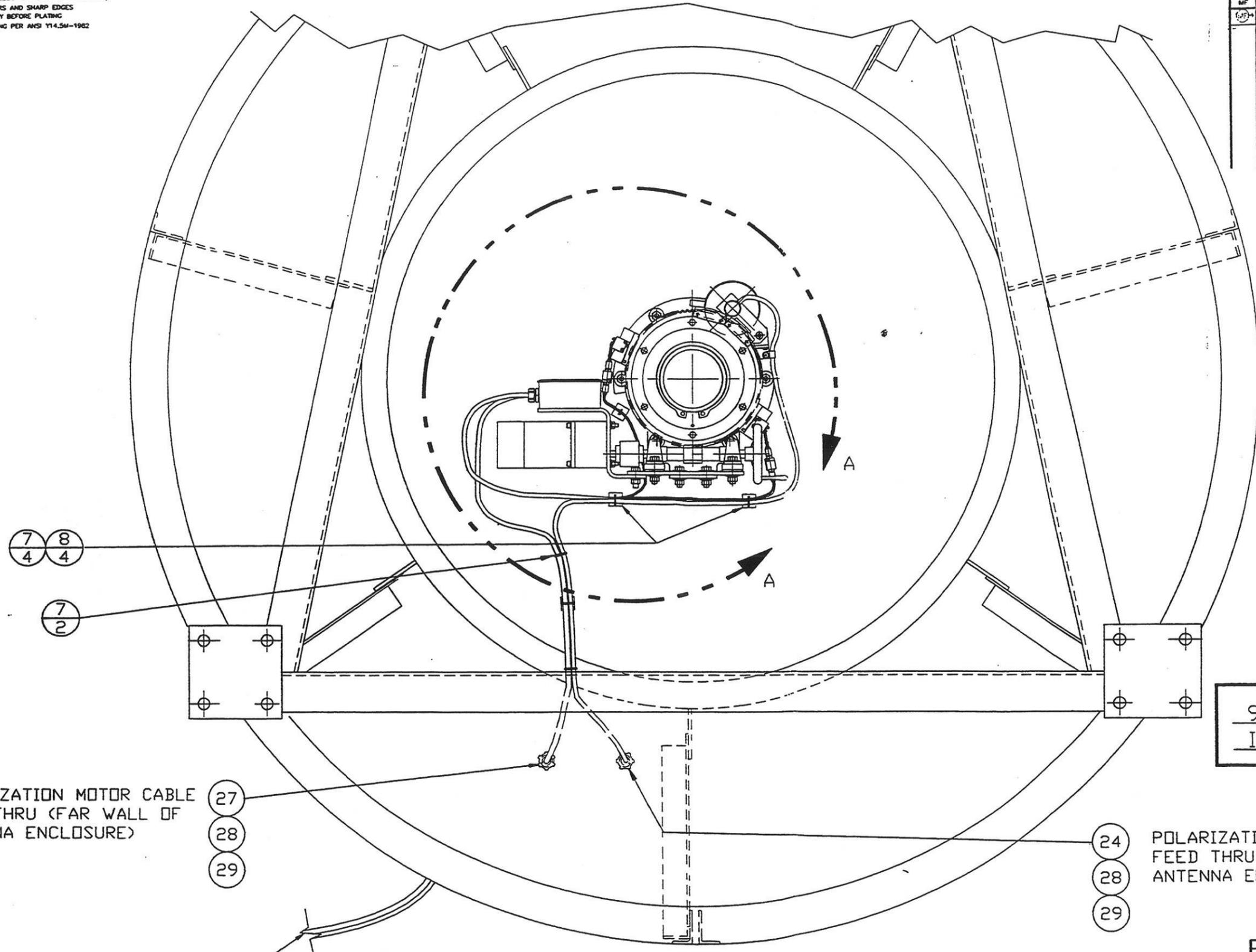
QTY	REV	U OF M	ANDREW PART NO.	DESCRIPTION			
PARTS LIST							
DESIGN	T. NOLAN	APPD	3/2/93				
DRAWN	PTF	3/2/93					
APPD. ENGR.	L.S.	3/2/93					
APPD. ENGR.	S.J.	3/2/93					
APPD. MTC	S.J.A.	3/2/93					
APPD. E.C.	S.J.	3/2/93					
<table border="1"> <tr> <td>ANDREW CORPORATION</td> <td>10500 W. 153rd Street</td> <td>Orland Park, Illinois U.S.A. 60462</td> </tr> </table>					ANDREW CORPORATION	10500 W. 153rd Street	Orland Park, Illinois U.S.A. 60462
ANDREW CORPORATION	10500 W. 153rd Street	Orland Park, Illinois U.S.A. 60462					
POLARIZATION DRIVE INSTALLATION INSTRUCTIONS							
SIZE	FRM NO.	DRG. NO.					
D	84147	239956					
SCALE	1=4	SHEET	3				
PROD. OR	6114	DATE	A: 1: 1				

239956

NOTES: (UNLESS OTHERWISE SPECIFIED)

1. REMOVE ALL BURRS AND SHARP EDGES
2. DIMENSIONS APPLY BEFORE PLATING
3. INTERPRET DRAWING PER ANSI Y14.5M-1982

REVISIONS					
REV	ZONE	REV	DESCRIPTION	DATE	APPROVED
1			REL TO PRODUCTION	8 JUN 93	PTF



9.1/9.3M POLARIZATION DRIVE
INSTALLATION/CABLE ROUTING

POLARIZATION MOTOR CABLE
FEED THRU (FAR WALL OF
ANTENNA ENCLOSURE)

24 POLARIZATION RESOLVER CABLE
FEED THRU (FAR WALL OF
ANTENNA ENCLOSURE)

POLARIZATION MOTOR/LIMIT
SWITCH AND RESOLVER CABLES
ROUTED TO LOCAL MOTOR
CONTROLLER

MFG PROCESSES	INSPECTION PROCEDURES	TEST PROCEDURES
AUSA SPECIFICATIONS		

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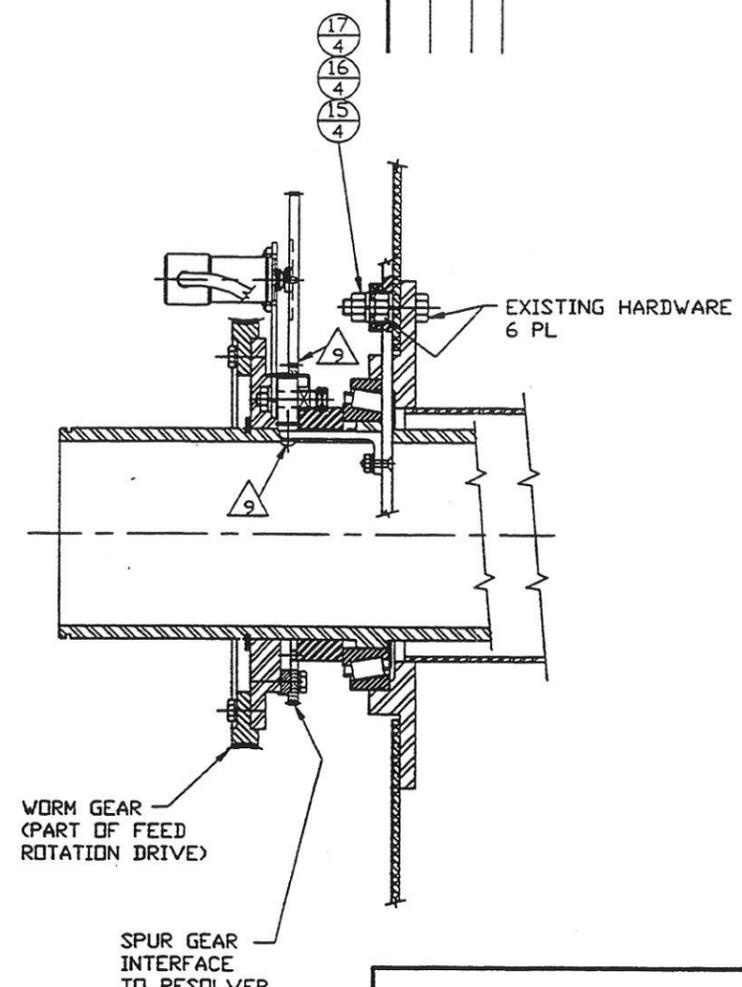
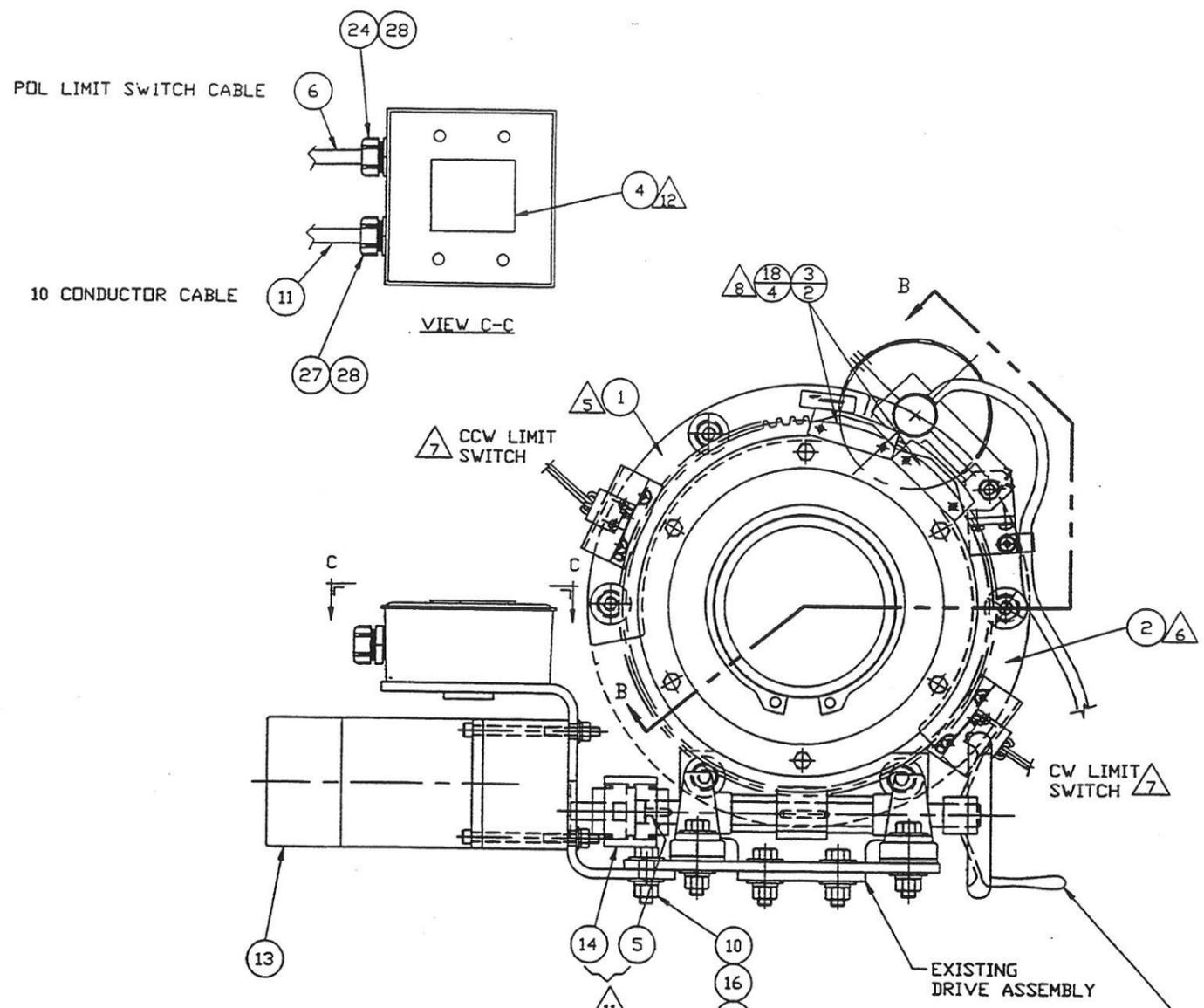
UNLESS OTHERWISE SPECIFIED	
DIMENSIONS ARE IN INCHES	
TOLERANCES	
1 PLACE DECIMALS ± .1	
2 PLACE DECIMALS ± .03	
3 PLACE DECIMALS ± .010	
ANGLE ± 0.5°	
ALL SURFACES	
COMM. TO APPLY TO STOCK SIZES	
SIMILAR TO	
SUPERSEDES DWG OF	
NEXT ASSY	USED ON
APPLICATION	

CITY	FROM NO.	U OF M	ANDREW PART NO.	DESCRIPTION
PARTS LIST				
DRAWN	T.NOLAN	14APR93	ANDREW CORPORATION 10500 W. 153rd Street Orland Park, Illinois U.S.A. 60462	
CHECKED	PTF	8JUN93	POLARIZATION DRIVE INSTALLATION INSTRUCTION	
APPROVED	SJZ	8JUN93	SIZE FROM NO. D 84147 DWG NO. 239956	
APPROVED	SJA	8JUN93	SCALE 1=4 SHEET 4	
APPROVED	SJZ	8JUN93	PROD. OR 6114 DESK A: 1: 1	

D
C
B
A

NOTES: (UNLESS OTHERWISE SPECIFIED)
 1. REMOVE ALL BURRS AND SHARP EDGES
 2. DIMENSIONS APPLY BEFORE PLATING
 3. INTERPRET DRAWING PER ANSI Y14.5M-1982

REVISIONS				
REV	ZONE	DESCRIPTION	DATE	APPROVED
REL TO PRODUCTION				
A		MODIFIED PICTORIAL VIEW OF FEED ROTATION DRIVE TO CURRENT CONFIGURATION. DCN D007.81(B)	11NOV94	PTF,SLI KLE,SJA
B		REVISED BLOCK IN ZONE B2. DCN D015.17(B)	20JAN95	SLI SJA JTP



DETAIL A-A
(CABLES NOT SHOWN FOR CLARITY)

NOTICE

IN THE EVENT OF A LOSS OF PRIMARY POWER, THE HAND WHEEL CAN BE USED TO ADJUST POLARIZATION AS FOLLOWS:

1. LOOSEN SET SCREW ON COUPLING HALVES.
2. SLIDE COUPLING HALVES APART TO PERMIT DISENGAGEMENT OF OUTER NYLON COLLAR.
3. USE HANDWHEEL TO MAKE POLARIZATION ADJUSTMENT AS NECESSARY.
2. WHEN PRIMARY POWER IS RESTORED, RECONNECT COUPLING TO ORIGINAL CONFIGURATION.

SECTION B-B
(CABLES AND ACTUATORS NOT SHOWN FOR CLARITY)

POLARIZATION DRIVE ASSEMBLY
 CP5.6/7.3/7.6/9.1/9.3M ANTENNAS

MFG PROCESSES	INSPECTION PROCEDURES	TEST PROCEDURES
AUSA SPECIFICATIONS		

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UNLESS OTHERWISE SPECIFIED	MATERIAL
DIMENSIONS ARE IN INCHES	
TOLERANCES	
1 PLACE DECIMALS ± .1	
2 PLACE DECIMALS ± .05	
3 PLACE DECIMALS ± .010	
ANGLE ± 0.5°	
ALL SURFACES	
COND. VOL. APPLY TO SPOK SIZES	
SIMILAR TO	
SUPERSEDES DWG OF	
NEXT ASSY	USED ON
APPLICATION	

QTY	ITEM NO	# OF IN	ANDREW PART NO.	DESCRIPTION
PARTS LIST				
			T.NOLAN	14APR93
			PTF	3JUN93
			PTF	3JUN93
			SLI	4JUN93
			SJA	3JUN93
			SLI	4JUN93

ANDREW CORPORATION
 2701 Mayhill Road
 Denton, Texas U.S.A. 76208

POLARIZATION DRIVE
 INSTALLATION INSTRUCTIONS

SCALE 1=2

DWG. NO. 239956

84147

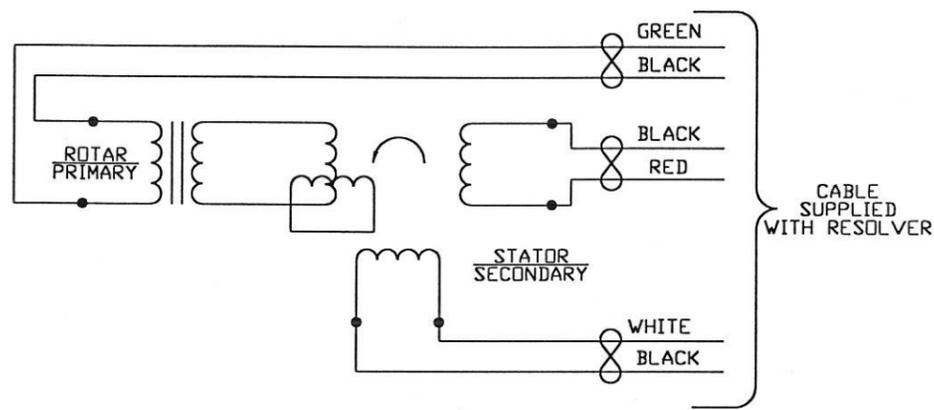
6114

CAD FILE NO:
DS00J45B

NOTES: (UNLESS OTHERWISE SPECIFIED)
 1. REMOVE ALL BURRS AND SHARP EDGES
 2. DIMENSIONS APPLY BEFORE PLATING
 3. INTERPRET DRAWING PER ANSI Y14.5M-1982

REVISONS					
MF	ZONE	REV	DESCRIPTION	DATE	APPROVED
		A	REL TO PRODUCTION	8JUN93	PTF
			DCN D018.05(A2)	05FEB99	SJA,WH JEK

POLARIZATION RESOLVER



TYPICAL RESOLVER SCHEMATIC DIAGRAM

POLARIZATION LIMIT SWITCHES			POLARIZATION MOTOR			CABLE ROUTED TO LOCAL MOTOR CONTROLLER				
		TERM ITEM NO.								
POL LIMIT SWITCH	CW	RED	2 PAIR CALE, 16 AWG CONDUCTORS	RED	25	YEL	PK9DR-100 10 CONDUCTOR, 18 AWG, SDN CABLE	YEL	18 AWG	CW LIMIT SWITCH
	COM	ORN		ORN	25	RED/BLK		RED/BLK	18 AWG	COM LIMIT SWITCH
	COM	BLK		BLU	25	BRN		BRN	18 AWG	CCW LIMIT SWITCH
	CCW	BLU						RED	18 AWG	CW MOTOR
POL MOTOR	MOTOR CW	WHT		25	RED			BLK	18 AWG	CCW MOTOR
	MOTOR CAP	BLK		25	BLK			BLU	18 AWG	COM MOTOR/BRAKE
	MOTOR CCW	RED		25	BLK			ORN/BLK	18 AWG	BRAKE
	MOTOR CAP	BLK		25	BLK			ORN	18 AWG	FRAME GROUND
	MOTOR COM	BLK		25	BLU			YEL/BLK	18 AWG	SPARE
	MOTOR BRAKE	ORN		25	ORN/BLK					
	MOTOR BRAKE	ORN		25	BLU/BLK					
MOTOR GND	FRM	31	ORN							
SPARE	N/A	15	YEL/BLK							

MFG PROCESSES	INSPECTION PROCEDURES	TEST PROCEDURES
AUSA SPECIFICATIONS		

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DIMENSIONS ARE IN INCHES	FINISH
TOLERANCES	
1 PLACE DECIMALS ± .1	
2 PLACE DECIMALS ± .03	
3 PLACE DECIMALS ± .010	
ANGLE ± 0.5°	
ALL SURFACES	
COM. TOL. APPLY TO STOCK SIZES	
SIMILAR TO	
SUPERSEDES DWG OF	
NEXT ASSY	USED ON
APPLICATION	

QTY	ITEM NO.	U OF M	ANDREW PART NO.	DESCRIPTION
PARTS LIST				
DRWN	T.NOLAN	14APR93	ANDREW CORPORATION 2701 Weyhill Road Denton, Texas U.S.A. 76208	
CHECKED	PTF	3JUN93		
APPRO ENGR	PTF	3JUN93		
APPRO ENGR	SLI	4JUN93		
APPRO MFG	SJA	3JUN93		
APPRO I.C.	SLI	4JUN93	POLARIZATION DRIVE INSTALLATION INSTRUCTIONS	
SIZE	FISCH NO.	DWG. NO.		
D	B4147	239956		
SCALE	1=1	SHEET	6	
PROJ. OR	61114	DISTR	A: i i i	

CAD FILE NO:
DS00J46A

NOTES: (UNLESS OTHERWISE SPECIFIED)
 1. REMOVE ALL BURRS AND SHARP EDGES
 2. DIMENSIONS APPLY BEFORE PLATING
 3. INTERPRET DRAWING PER ANSI Y14.5M-1982

GENERAL

READ THE INSTRUCTIONS THOROUGHLY BEFORE ASSEMBLY. FOLLOW THE SEQUENCES FOR PROPER ASSEMBLY AND OPERATION.



THIS WARNING INDICATES THAT FAILURE TO FOLLOW THE PROPER PROCEDURE AT THIS POINT COULD RESULT IN DAMAGE TO THE ANTENNA AND/OR OTHER PROPERTY AND POSSIBLE INJURY TO PERSONNEL.

NOTICE

THIS INDICATES INFORMATION THAT SHOULD BE READ BEFORE PROCEEDING.

UNPACKING

CAREFULLY REMOVE ALL PARTS FROM SHIPPING BOXES. THE CONTENT SHOULD CORRESPOND WITH THE PARTS LIST. ANY DAMAGE OR SHORTAGE WILL PREVENT SATISFACTORY ASSEMBLY, INSTALLATION, AND OPERATION OF THE ANTENNA.

NOTICE

'THE INSTALLATION, MAINTENANCE OR REMOVAL OF AN ANTENNA REQUIRES QUALIFIED, EXPERIENCED PERSONNEL. ANDREW INSTALLATION INSTRUCTIONS HAVE BEEN WRITTEN AND ILLUSTRATED FOR SUCH INSTALLATION PERSONNEL. ANTENNA SYSTEMS SHOULD BE INSPECTED ONCE A YEAR BY QUALIFIED PERSONNEL TO VERIFY PROPER INSTALLATION, MAINTENANCE AND CONDITION OF EQUIPMENT. ANDREW DISCLAIMS ANY LIABILITY OR RESPONSIBILITY FOR THE RESULTS OF IMPROPER OR UNSAFE INSTALLATION OR MAINTENANCE PRACTICES.'

TOOLS RECOMMENDED FOR PROPER INSTALLATION

QUANTITY	DESCRIPTION
1	SCREWDRIVER (SLOTTED)
2	9/16 SOCKET
2	9/16 COMBINATION WRENCH
1	12 FT. TAPE MEASURE
2	10 FT. (EYE AND EYE TYPE) NYLON SLING REQUIRED IF CRANE IS AVAILABLE
1	25 FT EXTENSION LADDER

NOTICE

THE FOLLOWING INSTRUCTIONS HAVE BEEN WRITTEN SUCH THAT THE SUBREFLECTOR AND SUPPORT STRUTS ARE PREASSEMBLED ON THE GROUND AND LIFTED INTO REFLECTOR BY USE OF A CRANE. IF A CRANE IS NOT AVAILABLE PREASSEMBLE SUBREFLECTOR SUPPORT IN REFLECTOR THEN INSTALL SUBREFLECTOR.

STEP 1:
PLACE REFLECTOR IN ZENITH ($\epsilon_L=90^\circ$) POSITION.

STEP 2:
REFER TO FIGURE 1. LOOSELY ASSEMBLE STRUT WELDMENTS (ITEM 1) AS SHOWN USING SUPPLIED STRUT ANGLES (ITEM 3) AND CORRESPONDING MOUNTING HARDWARE.

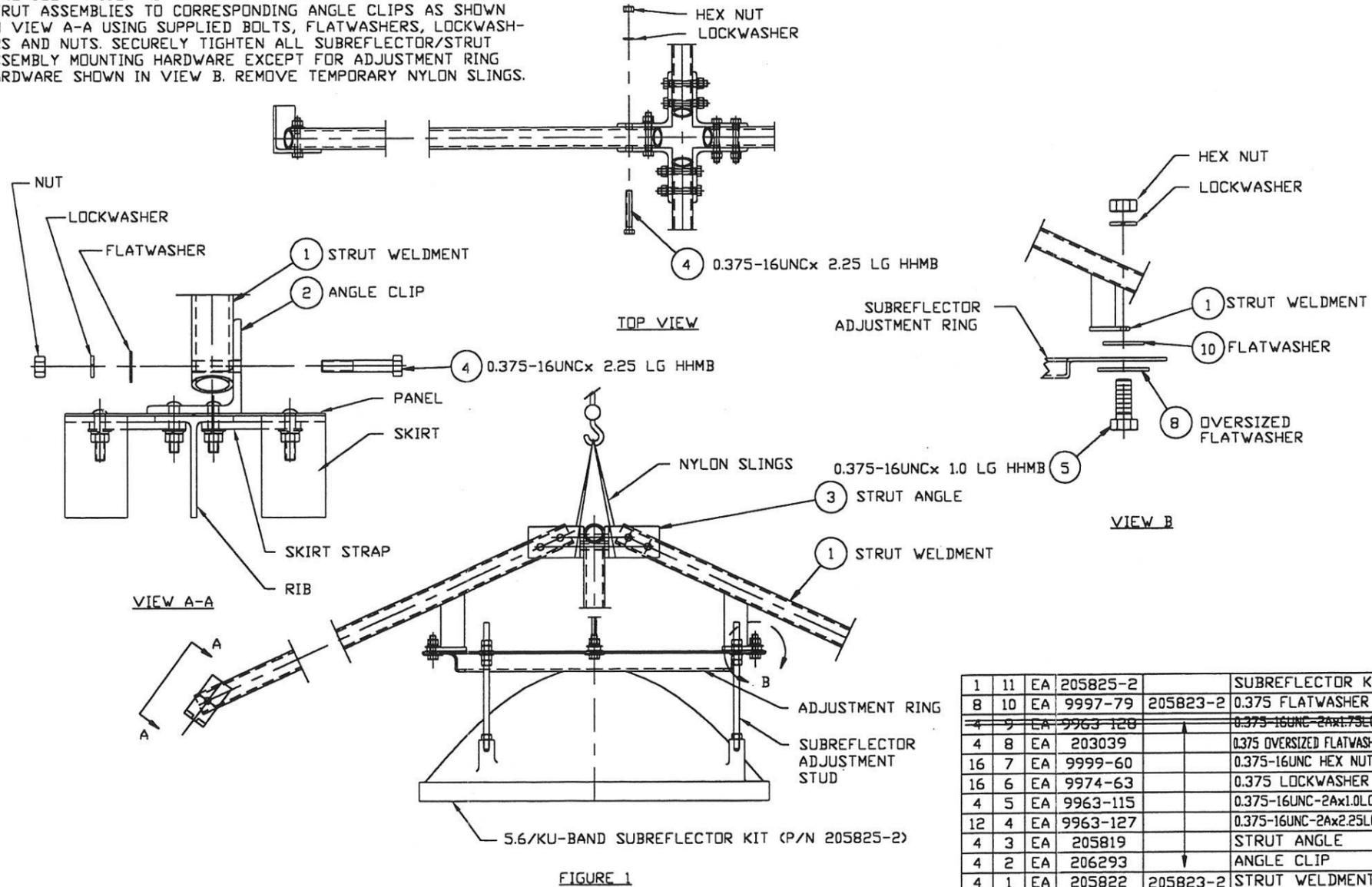
STEP 3:
REFER TO FIGURE 1. LOOSELY ATTACH ANGLE CLIPS (ITEM 2) TO PANEL SEGMENTS 8-16, 3-11, 7-15 AND 4-12 AS SHOWN IN FIGURE 2, USING SCREWS, WASHERS, LOCKWASHERS AND NUTS PREVIOUSLY INSTALLED DURING REFLECTOR ASSEMBLY.

STEP 4:
LOOSELY ATTACH PREASSEMBLED SUBREFLECTOR/ADJUSTMENT RING P/N 205825-2 (ITEM 11) TO STRUT WELDMENTS USING CORRESPONDING MOUNTING HARDWARE AS SHOWN IN FIGURE 1 AND VIEW B. ATTACH TEMPORARY NYLON SLINGS BEING CAREFUL NOT TO DAMAGE SUBREFLECTOR ASSEMBLY.

NOTICE

POSITION SUBREFLECTOR ASSEMBLY SO THAT 'TOP' STENCILED ON THE ADJUSTMENT RING IS TOWARD TOP OF THE ANTENNA.

STEP 5:
CAREFULLY RAISE AND ATTACH PREASSEMBLED SUBREFLECTOR/STRUT ASSEMBLIES TO CORRESPONDING ANGLE CLIPS AS SHOWN ON VIEW A-A USING SUPPLIED BOLTS, FLATWASHERS, LOCKWASHERS AND NUTS. SECURELY TIGHTEN ALL SUBREFLECTOR/STRUT ASSEMBLY MOUNTING HARDWARE EXCEPT FOR ADJUSTMENT RING HARDWARE SHOWN IN VIEW B. REMOVE TEMPORARY NYLON SLINGS.



REV. NO.		REV. 1		REV. 1	
MF	ZONE	REV	DESCRIPTION	DATE	APPROVED
			REL TO PRODUCTION	20APR90	WF
		A	REVISED SHEET 2. DCN 354.88(B)	10DEC90	TSK, MK
		B	ITEM 4 QTY WAS 8. DELETED ITEM 9. REVISED ITEM CALLOUT TO REFLECT BOM CHANGE. DCN 0003.15(B)	20MAR92	MK

QTY	ITEM NO	U OF U	ANDREW PART NO.	PART OF	DESCRIPTION
1	11	EA	205825-2		SUBREFLECTOR KIT
8	10	EA	9997-79	205823-2	0.375 FLATWASHER (CSST)
4	9	EA	9963-128		0.375-16UNC-2Ax1.75LG HHMB
4	8	EA	203039		0.375 OVERSIZED FLATWASHER (CSST)
16	7	EA	9999-60		0.375-16UNC HEX NUT (CSST)
16	6	EA	9974-63		0.375 LOCKWASHER (CSST)
4	5	EA	9963-115		0.375-16UNC-2Ax1.0LG HHMB
12	4	EA	9963-127		0.375-16UNC-2Ax2.25LG HHMB
4	3	EA	205819		STRUT ANGLE
4	2	EA	206293		ANGLE CLIP
4	1	EA	205822	205823-2	STRUT WELDMENT

MFG PROCESSES	INSPECTION PROCEDURES	TEST PROCEDURES
AUSA SPECIFICATIONS		

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UNLESS OTHERWISE SPECIFIED	MATERIAL
DIMENSIONS ARE IN INCHES	
TOLERANCES	
1 PLACE DECIMALS ± .1	
2 PLACE DECIMALS ± .03	
3 PLACE DECIMALS ± .010	
ANGLE ± 0.5°	
ALL SURFACES	FINISH
ES56-1	
NEXT ASSY	USED ON
APPLICATION	SUPERSEDES DWG OF

DRAWN	I G	4-11-90	<p>ANDREW CORPORATION 2701 Moughlin Road Denton, Texas U.S.A. 76208</p>
CHECKED	RVS	18APR90	
APPRO ENGR	RVK	18APR90	
APPRO MFG			
APPRO D.C.			
5.6M KU-BAND SUBREFLECTOR & SUBREFLECTOR STRUTS INSTALLATION INSTRUCTIONS			
SIZE	FICR NO.	DWG NO.	
D	84147	239438	
SCALE	1=4	SHEET	1 of 2
PROJ. OR	61214	DISTR	A: ! !

CAD FILE NO: ES06T51B

NOTES: (UNLESS OTHERWISE SPECIFIED)
 1. REMOVE ALL BURRS AND SHARP EDGES
 2. DIMENSIONS APPLY BEFORE PLATING
 3. INTERPRET DRAWING PER ANSI Y14.5M-1982

STEP 6:
 MEASURE AND NOTE THE DISTANCE BETWEEN OUTERMOST ANGLE CLIP BOLT HEAD AND THE SUBREFLECTOR RIM AS SHOWN IN SECTION D-D. OBTAIN CORRESPONDING MEASUREMENTS FROM REMAINING SUBREFLECTOR STRUTS AND ADJUST SUBREFLECTOR ADJUSTMENT RING HARDWARE (REFER TO FIGURE 1, VIEW B) AT ALL FOUR LOCATIONS TO ACHIEVE A MAXIMUM DIFFERENTIAL OF 0.06 INCH. SECURELY TIGHTEN ADJUSTMENT HARDWARE.

STEP 7:
 REFER TO SECTION D-D. USE MEASURING TAPE TO SET INDICATED DIMENSION BETWEEN FIRST PANEL SEAM BOLT HEAD (REFER TO 11.97 DIMENSION) AND SUBREFLECTOR APERTURE RIM AT THE THREE SUBREFLECTOR ADJUSTMENT STUD POSITIONS. USE SUBREFLECTOR ADJUSTMENT STUD HARDWARE (REFER TO FIGURE 1) TO ACHIEVE EQUAL AXIAL DIMENSION OF 72.99 AT ALL THREE LOCATIONS. SECURELY TIGHTEN ADJUSTMENT HARDWARE.

STEP 8:
 REPEAT PROCEDURE DESCRIBED IN STEP 6. IF ANY DIMENSIONAL VARIATION IS NOTED, REPEAT ADJUSTMENT PROCEDURE DESCRIBED IN STEP 6 THEN REPEAT PROCEDURE IN STEP 7 IF REQUIRED.

NOTICE
 DOUBLE CHECK TO SEE THAT ALL HARDWARE HAS BEEN SECURELY TIGHTENED

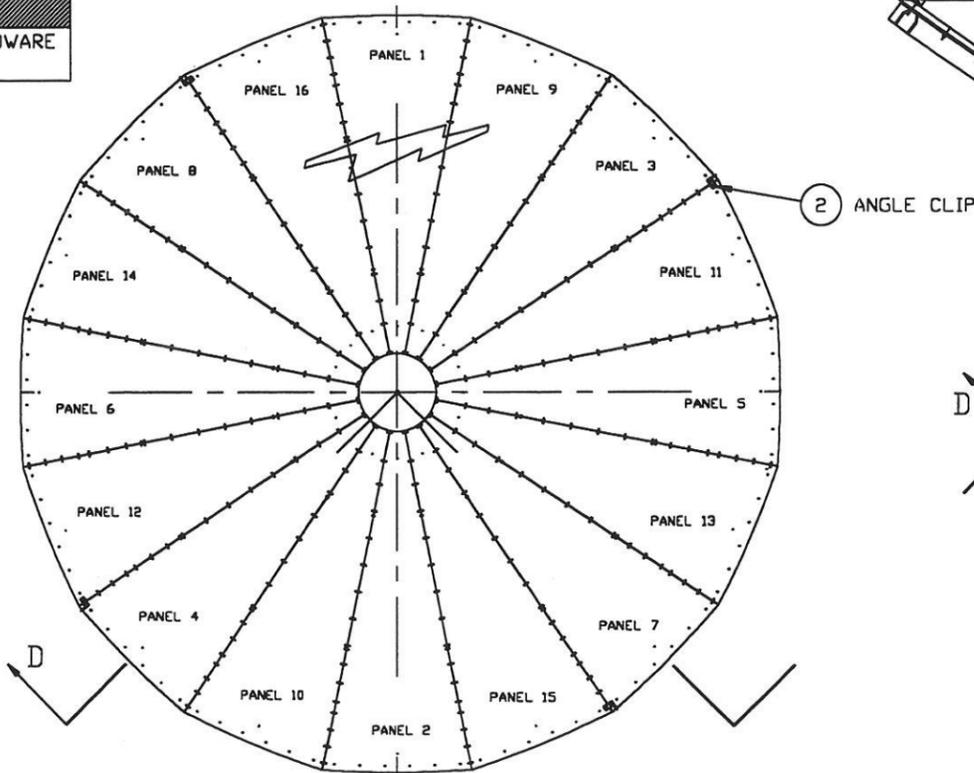
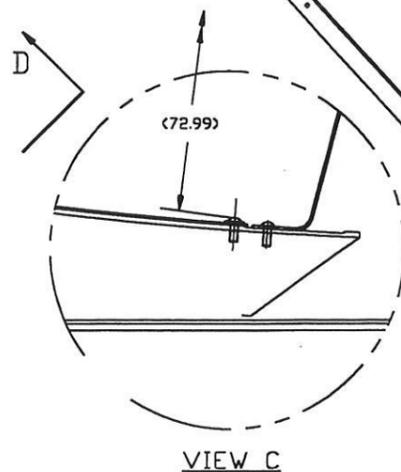
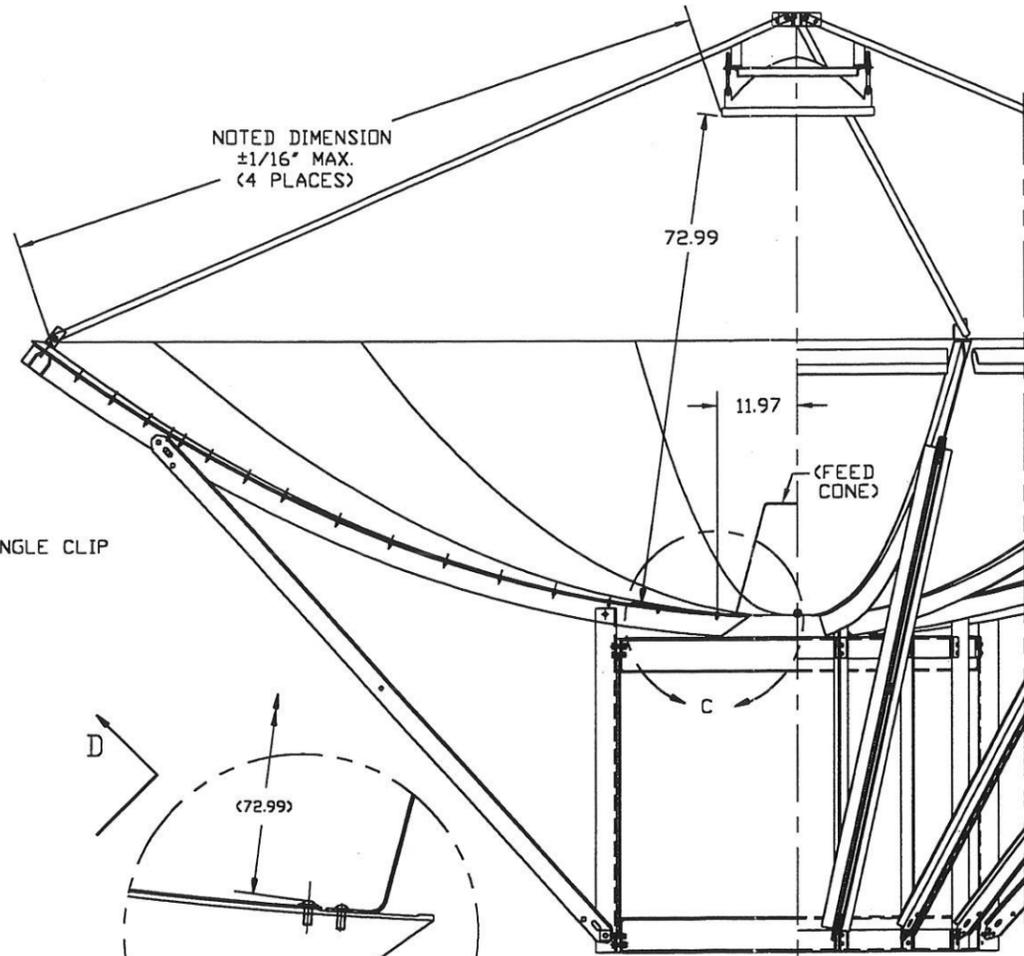


FIGURE 2
 (FRONT VIEW OF REFLECTOR)



REV		DESCRIPTION	DATE	APPROVED
REL TO PRODUCTION			20APR90	WF
A		72.99 DIM WAS 72.97, 11.97 DIM WAS 15.97, REVISED VIEW C & STEP 7, ADDED VIEW OF FEED CONE IN SECTION D-D.	10DEC90	JHD, MK

QTY	ITEM NO	U OF M	ANDREW PART NO.	DESCRIPTION
PARTS LIST				
DRWN	IG	4-11-90	ANDREW CORPORATION 10500 W. 153rd Street Orland Park, Illinois U.S.A. 60462	
CHECKED	RWS	18APR90		
APPRO ENG	RWK	18APR90		
APPRO MFG				
5.6M KU-BAND SUBREFLECTOR & SUBREFLECTOR STRUTS INSTALLATION INSTRUCTIONS				SIZE: FRENCH NO. 84147 Dwg. No. 239438
SCALE 1=6				SHEET 2
PROJ. OR 61214				DES. A

MFG PROCESSES	INSPECTION PROCEDURES	TEST PROCEDURES
AUSA SPECIFICATIONS		

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CAD FILE NO.: ES06T52A

UNLESS OTHERWISE SPECIFIED	MATERIAL
DIMENSIONS ARE IN INCHES	
TOLERANCES	
1 PLACE DECIMALS ± .1	
2 PLACE DECIMALS ± .03	
3 PLACE DECIMALS ± .010	
ANGLE ± 0.5°	
ALL SURFACES	FINISH
CON. TOL. APPLY TO STOCK SIZES	
SIMILAR TO	
SUPERSEDES Dwg OF	
ES56-1	
NEXT ASSY	USED ON
APPLICATION	

NOTES: (UNLESS OTHERWISE SPECIFIED) -
 1. REMOVE ALL BURRS AND SHARP EDGES
 2. DIMENSIONS APPLY BEFORE PLATING
 3. INTERPRET DRAWING PER ANSI Y14.5M-1982

GENERAL

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NOTICE

THIS INDICATES INFORMATION THAT SHOULD BE READ BEFORE PROCEEDING.

UNPACKING

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NOTICE

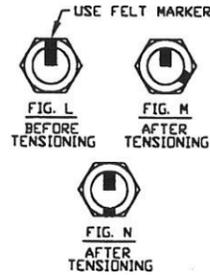
"THE INSTALLATION, MAINTENANCE OR REMOVAL OF AN ANTENNA REQUIRES QUALIFIED, EXPERIENCED PERSONNEL. ANDREW INSTALLATION INSTRUCTIONS HAVE BEEN WRITTEN AND ILLUSTRATED FOR SUCH INSTALLATION PERSONNEL. ANTENNA SYSTEMS SHOULD BE INSPECTED ONCE A YEAR BY QUALIFIED PERSONNEL TO VERIFY PROPER INSTALLATION, MAINTENANCE AND CONDITION OF EQUIPMENT. ANDREW DISCLAIMS ANY LIABILITY OR RESPONSIBILITY FOR THE RESULTS OF IMPROPER OR UNSAFE INSTALLATION OR MAINTENANCE PRACTICES."

TOOLS RECOMMENDED FOR PROPER INSTALLATION

QUANTITY	DESCRIPTION
1	15 TON CRANE
2	SCREWDRIVER (SLOTTED)
2	5/32 HEX SOCKET (ALLEN) WRENCH
2	1/4 HEX SOCKET (ALLEN) WRENCH
2	7/16 SOCKET
2	9/16 SOCKET
2	1/2 SOCKET
2	3/4 SOCKET
2	7/8 SOCKET
2	1 1/16 SOCKET
2	1 1/4 SOCKET
2	1 7/16 SOCKET
2	1/2 DRIVE RATCHET
2	1/2 DRIVE EXTENSION
2	7/16 COMBINATION WRENCH
2	1/2 COMBINATION WRENCH
2	9/16 COMBINATION WRENCH
2	3/4 COMBINATION WRENCH
2	7/8 COMBINATION WRENCH
2	1 1/16 COMBINATION WRENCH
2	1 1/4 COMBINATION WRENCH
2	1 7/16 COMBINATION WRENCH
1	1 1/4 SPUD WRENCH
1	6 FT NYLON CHOKER (3/8" DIA)
1	3 FT NYLON CHOKER (3/8" DIA)
1	PULLER HOIST/1 TON
4	2x4x8 FT LUMBER (TEMPORARY SUPPORT)
4	5/8 SHACKLES
4	20 FT TAG LINE
4	16 FT CHOCKER (1/2" DIA)
2	12 FT STEP LADDER
2	25 FT EXTENSION LADDER
1	8" ADJUSTABLE WRENCH
4	TEMPORARY WOOD SUPPORT BLOCKS

TENSIONING PROCEDURES A-325 HARDWARE

- LUBRICATE BOLT THREADS WITH STICK WAX (ITEM 39) TO REDUCE FRICTION. DO NOT ALLOW WAX UNDER FLAT WASHER.
- AFTER CONNECTIONS ARE COMPLETED, TIGHTEN BOLTS UNTIL SURFACES ARE JOINED AND NUTS ARE SNUG, I.E. FULL EFFORT OF PERSON USING ORDINARY SPUD WRENCH. DO NOT PROCEED WITH STEPS 3 & 4 BELOW UNLESS THE CONNECTION IS FINAL. IF BOLTS ARE LOOSENED AFTER STEPS 3 AND 4, DISCARD AND REPLACE WITH NEW HARDWARE. REPEAT ALL STEPS.
- MARK NUTS AND END OF BOLTS WITH STRAIGHT LINE. SEE FIGURE L.
- TIGHTEN NUTS FURTHER WITH EXTRA LONG WRENCH OR POWER WRENCH UNTIL NUTS ARE MOVED 1/3 TURN (120°±30°) FOR BOLT LENGTHS UP TO AND INCLUDING 4 DIAMETERS. SEE FIGURE M; 1/2 TURN (180°±30°) FOR BOLT LENGTHS OVER 4 DIAMETERS. SEE FIGURE N.



REV	DATE	APPROVED
F	18MAR94	SLI,KJC MK
G	26AUG97	SLI,SJA JTP
H	SHAY98	SJA BLA,SLI
J	21JUL98	SLI JAB,SJA

QTY	ITEM NO	U OF U	ANDREW PART NO.	PART OF:	DESCRIPTION
1	40	EA	209954		REFLECTOR HARDWARE KIT
2	39	EA	200852	209954	STICK WAX
4	38	EA	9903-10	209954	ALLEN WRENCH
77	37	EA	9997-236	209954	Ø0.625 FLAT WASHER (CSST)
32	36	EA	9997-228	209954	Ø0.50 FLAT WASHER (A325)
16	35	EA	45980-23	209954	Ø0.50-13UNCx 2.00 LG BOLT/NUT ASSY
32	34	EA	9858-22	209954	Ø0.625x 1.00 LG SHOULDER BOLT
4	33	EA	209957	209954	BACKING PLATE
4	32	EA	206278	209954	LIFT TAB
16	31	EA	9974-79	209954	0.625 LOCK WASHER (CSST)
1	30	EA	9999-224	209954	0.875-9UNC HEAVY HEX JAM NUT
1	29	EA	9997-174	209954	0.875 FLAT WASHER (A325)
2	28	EA	9997-202	209954	0.75 FLAT WASHER (A325)
60	27	EA	9997-227	209954	0.625 FLAT WASHER (A325)
1	26	EA	45980-35	209954	0.875-9UNCx 5.25 LG BOLT & NUT ASSY
2	24	EA	45980-18	209954	0.750-10UNCx 2.00 LG BOLT & NUT ASSY
16	23	EA	45980-1	209954	0.625-11UNCx 2.00 LG BOLT & NUT ASSY
16	21	EA	9999-72	209954	0.625-11UNC NUT (CSST)
32	20	EA	9997-131	209954	0.25 FLAT WASHER (CSST)
16	19	EA	9999-57	209954	0.25-20UNC HEX NUT (CSST)
16	18	EA	9963-76	209954	0.25-20UNCx 1.25 LG HHCS (CSST)
64	17	EA	9974-64	209954	0.50 LOCK WASHER (CSST)
64	16	EA	9999-61	209954	0.50-13UNC HEX NUT (CSST)
32	15	EA	9963-129	209954	0.50-13UNCx 1.75 LG HHCS (CSST)
178	14	EA	9997-65	209954	0.50 FLAT WASHER (CSST)
48	13	EA	9997-145	209954	0.375 FLAT WASHER (CSST)
48	12	EA	9974-63	209954	0.375 LOCK WASHER (CSST)
48	11	EA	9999-60	209954	0.375-16UNC HEX NUT (CSST)
32	10	EA	9858-18	209954	Ø0.50x 1.00 LG SHOULDER BOLT
16	9	EA	9858-19	209954	Ø0.50x 0.50 LG SHOULDER BOLT
608	8	EA	9974-17	209954	0.312 LOCK WASHER (CSST)
64	7	EA	9997-56	209954	0.312 FLAT WASHER (CSST)
64	6	EA	9999-59	209954	0.312-18UNC HEX NUT (CSST)
64	5	EA	9959-11	209954	0.312-18UNC ROUND HEAD SCREW, 1.50 LG (CSST)
544	4	EA	209236	209954	0.312-18UNC BUTTON HEAD SCREW, 0.75 LG (CSST)
16	3	EA	9963-222	209954	0.625-11UNCx 2.00 LG HHCS (CSST)
80	2	EA	209765-1	209954	0.250 SPACER
32	1	EA	220025	209954	SKIRT STRAP

QTY	ITEM NO	U OF U	ANDREW PART NO.	PART OF:	DESCRIPTION
1	63	EA	301742		LEFT TRIPOD JOINT WELDMENT
10	62	EA	9974-10	209954	LOCKWASHER
10	61	EA	9997-66	209954	WASHER - FLAT
18	60	EA	9999-121	209954	HEAVY HEX NUT
4	59	EA	203672	209954	FULLY THREADED ROD
2	58	EA	301611	209954	LOAD PLATE
4	57	EA	45980-14	209954	Ø0.625-11UNCx 1.75 LG BOLT & NUT ASSY
2	56	EA	300027	209954	CAST SPACER
4	55	EA	45980-22	209954	Ø0.625-11UNCx 2.50 LG BOLT & NUT ASSY
4	54	EA	45980-37	209954	Ø0.625-11UNCx 3.00 LG BOLT & NUT ASSY
4	53	EA	300031	209954	CAST BEVEL WASHER
4	52	EA	209140	209954	CLIPPED WASHER
1	50	EA	301741	220914	RIGHT TRIPOD JOINT WELDMENT
1	49	EA	301772	220914	TRIPOD TUBE WELDMENT
2	48	EA	300026	220914	TRIPOD CHANNEL LEG
16	47	EA	220915	220913	SHORT STRUT
32	46	EA	209950-2	220913	LONG STRUT
16	45	EA	209375-2	220912	5.6M STRETCH-FORMED SKIRT
16	44	EA	220916	220912	MACHINED RIB
16	43	EA	220917	220912	MACHINED PANEL
1	42	EA	220911	220914	MODULAR ENCLOSURE
1	41	EA	209565	220914	ENCLOSURE DOOR ASSEMBLY

QTY	ITEM NO	U OF U	ANDREW PART NO.	PART OF:	DESCRIPTION
1	209954				

DATE	DESIGNED	APP'D ENGR	APP'D MFG	APP'D QC
7-20-89	IG	IG	RWS	RWK

ANDREW CORPORATION
 10500 W. 153rd Street
 Orland Park, Illinois U.S.A. 60462

5.6 M REFLECTOR/BACK STRUCTURE INSTALLATION INSTRUCTIONS

SIZE: 84147
 SHEET: 1 OF 7

MFG PROCESSES	INSPECTION PROCEDURES	TEST PROCEDURES

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CAD FILE NO: ES06541J

NOTES: (UNLESS OTHERWISE SPECIFIED)
 1. REMOVE ALL BURRS AND SHARP EDGES
 2. DIMENSIONS APPLY BEFORE PLATING
 3. INTERPRET DRAWING PER ANSI Y14.5M-1982

CAUTION: INSTALL REFLECTOR/BACK STRUCTURE ASSEMBLY ONLY WHEN WINDS ARE LESS THAN 15 MPH TO PREVENT DAMAGE TO REFLECTOR PANELS AND EASE ASSEMBLY.

STEP 1:
 PLACE MODULAR ENCLOSURE (ITEM 42) ON FOUR TEMPORARY WOOD SUPPORT BLOCKS. BE CAREFUL NOT TO DAMAGE MACHINED SURFACES. BOLT ON SHORT STRUTS (ITEM 47) TO ENCLOSURE REFER TO FIGURE 1. FULLY TIGHTEN ALL HARDWARE.

NOTICE:
 FOR STEPS 1 THRU 4: LUBRICATE BOLT THREADS OF BOTH STAINLESS STEEL AND A325 HARDWARE WITH STICK WAX (ITEM 39) TO REDUCE FRICTION. DO NOT ALLOW WAX UNDER FLATWASHER.

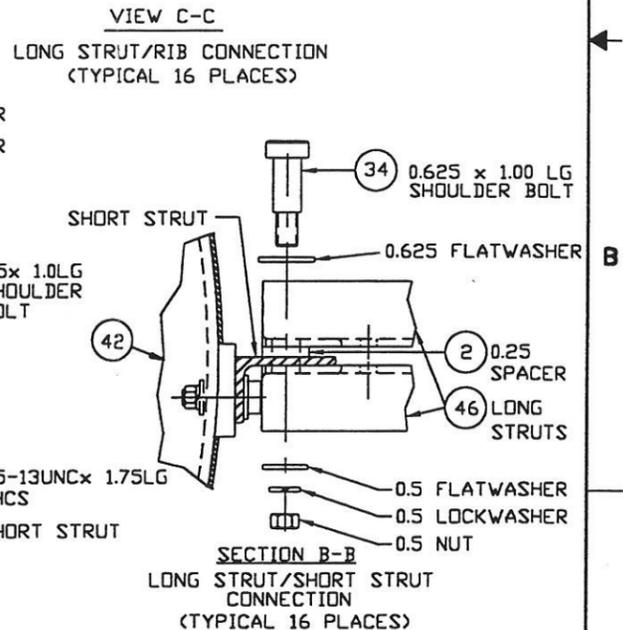
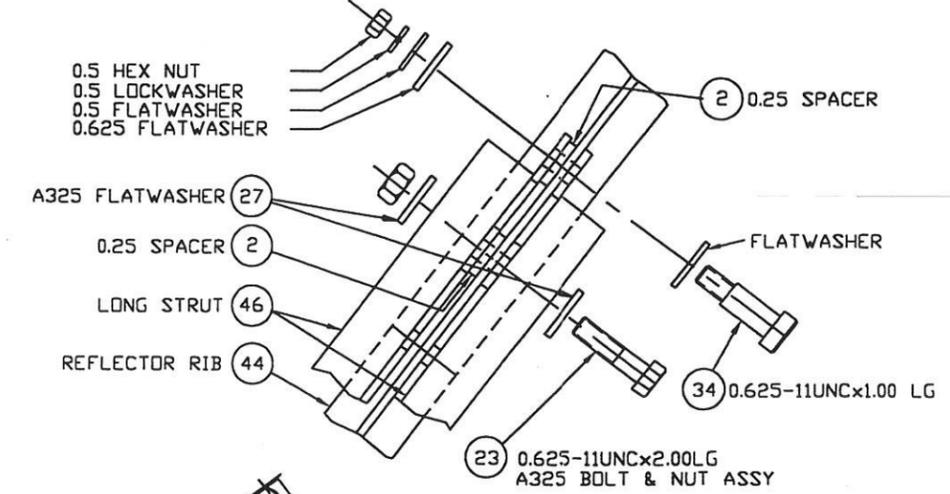
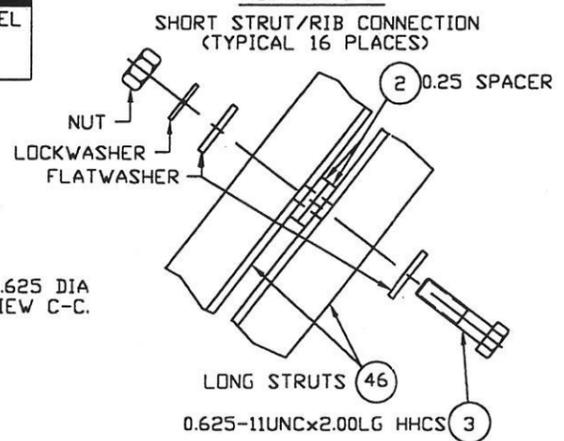
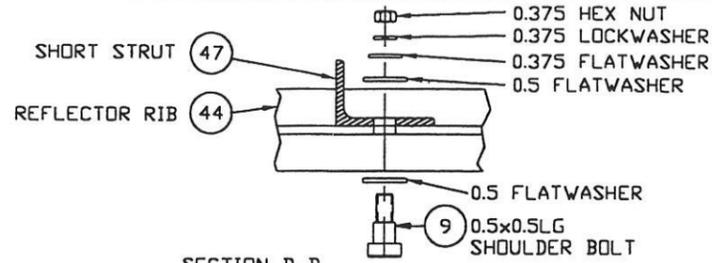
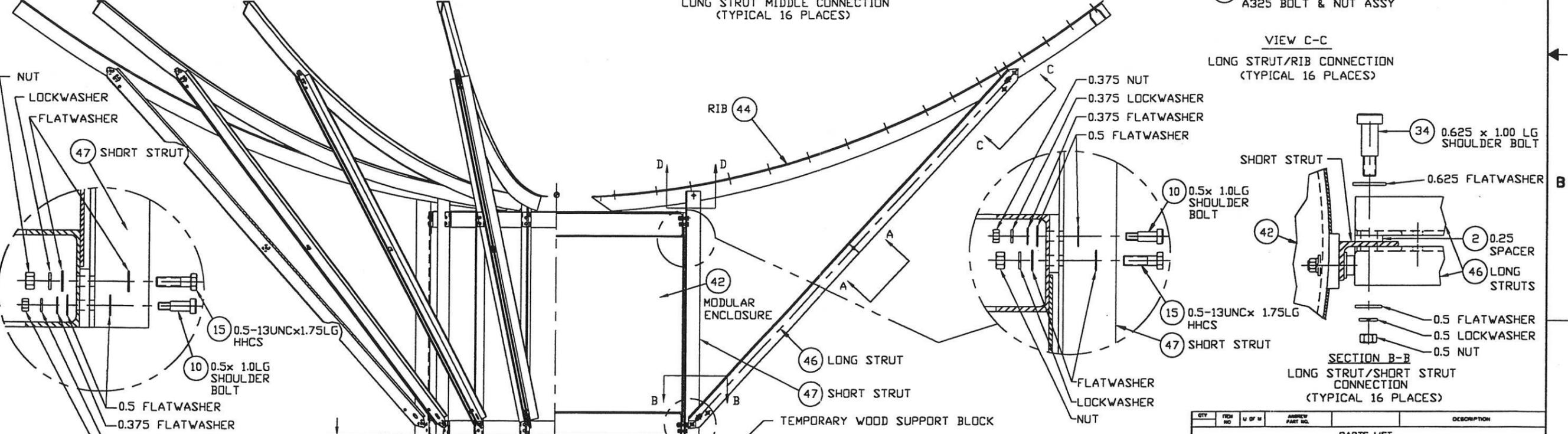
STEP 2:
 ATTACH TWO LONG STRUTS (ITEM 46) LOOSELY TOGETHER PER VIEW A-A IN FIGURE 1 TO MAKE 16 PAIRS OF STRUTS. ATTACH EACH PAIR OF LONG STRUTS TO SHORT STRUTS USE 0.25 SPACERS (ITEM 2) REFER TO SECTION B-B FIGURE 1.

STEP 3:
 ATTACH RIBS (ITEM 44) TO SHORT STRUTS (ITEM 47) REFER TO SECTION D-D FIGURE 1. HANDLE RIBS CAREFULLY TO KEEP FROM DISTORTING SHAPE.

STEP 4:
 RAISE LONG STRUTS (ITEM 46) AND RIB (ITEM 44). ATTACH LONG STRUT TO RIB WITH 0.625 DIA SHOULDER BOLT (ITEM 34) AND 0.625 DIA A325 BOLT (ITEM 23) REFER TO FIGURE 1 VIEW C-C.

NOTICE:
 MAKE SURE THAT ALL 0.25 SPACERS (ITEM 2) ARE PROPERLY PLACED AND SHOULDER BOLTS ARE PROPERLY SEATED THROUGH ALL CONNECTIONS.

STEP 5:
 SECURELY TIGHTEN ALL STAINLESS STEEL HARDWARE. NEXT, TIGHTEN ALL A325 HARDWARE FOLLOWING TENSIONING PROCEDURES, SHOWN ON SHEET 1.



MFG PROCESSES	INSPECTION PROCEDURES	TEST PROCEDURES
AUSA SPECIFICATIONS		

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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	MATERIAL
TOLERANCES 1 PLACE DECIMALS ± .1 2 PLACE DECIMALS ± .03 3 PLACE DECIMALS ± .010 ANGLE ± 0.5°	FINISH
ALL SURFACES CONC. TOL. APPLY TO STOCK SIZES SIMILAR TO SUPERSEDES DWG OF	
209954	
NEXT ASSY USED ON	
APPLICATION	

QTY	TRN NO	U OF M	ANDREW PART NO.	DESCRIPTION
PARTS LIST				
ANDREW CORPORATION 10500 W. 153rd Street Orland Park, Illinois U.S.A. 60462				
5.6 M REFLECTOR/BACK STRUCTURE INSTALLATION INSTRUCTIONS				
REV	TRN NO.	QTY	ANDREW PART NO.	DESCRIPTION
D	84147		239352	
SCALE 1=10				
PROJ. OR	61214	OSTR	A	1

DWG NO.	239352	REV	2		
REVISIONS					
MF	ZONE	REV	DESCRIPTION	DATE	APPROVED
			REL TO PRODUCTION	17MAR90	WF
		A	ADDED NOTICE BLOCK TO STEP 1; REV'D STEP 5;	5JUN90	TMM,RVK
		B	ZONE A-7: REV'D NOTE CALLOUT 15; DCN 355.90(A)	1AUG90	TMM,RVK

CAD FILE NO: ES06542B

NOTES: (UNLESS OTHERWISE SPECIFIED)
 1. REMOVE ALL BURRS AND SHARP EDGES
 2. DIMENSIONS APPLY BEFORE PLATING
 3. INTERPRET DRAWING PER ANSI Y14.5M-1982

STEP 6:
 WHILE ON THE GROUND ATTACH STRETCH-FORMED SKIRTS (ITEM 45) TO REFLECTOR PANELS (ITEM 43). REFER TO SECTION G-G.

STEP 7:
 ATTACH THE REFLECTOR PANELS TO EACH SET OF RIBS BY LOOSELY ATTACHING SEAM HARDWARE (ITEMS 4 AND 52). PANELS SHOULD BE ADDED OPPOSITE EACH OTHER TO BALANCE THE ENCLOSURE ASSEMBLY. FIRST ATTACH PANEL 1 AND PANEL 2, THEN PANEL 3 AND PANEL 4, AND SO ON REFER TO VIEW 'F' SHEET 4.

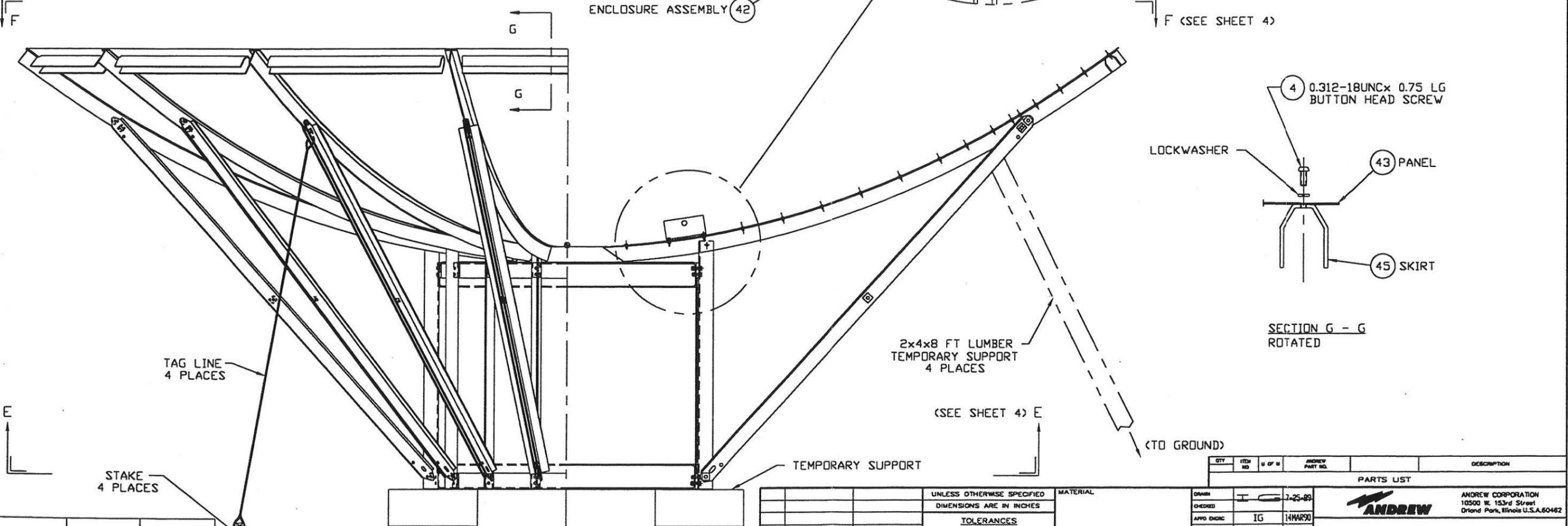


CAUTION:
 DURING OVERNIGHT OR HIGH-WIND CONDITIONS INSTALL TEMPORARY SUPPORTS AND STAKE TAG LINES AT 4 PLACES APPROXIMATELY 90° TO EACH OTHER. REFER TO FIGURE 2.

NOTICE
 DIFFERENT LENGTH HARDWARE IS USED ON THE OUTERMOST SEAM CONNECTION (SEE SECTION G-G AND VIEW K-K ON SHEET 4).

STEP 8:
 LOOSELY ATTACH SKIRT STRAPS (ITEM 1). REFER TO VIEW K-K, SHEET 4.
 ATTACH THE LIFTING TABS (ITEM 32), LOCATED ON THE SECOND AND THIRD SEAM HOLES OF THE PANEL 90° APART FROM EACH OTHER (4 REQUIRED). REFER TO FIGURE 2 AND VIEW F-F, SHEET 4 FOR PROPER ORIENTATION.

REVISIONS					
MF	ZONE	REV	DESCRIPTION	DATE	APPROVED
			REL TO PRODUCTION	17MAR90	WF
	A		ADDED NOTICE BLOCK TO STEP 7; IT. 18 CALLOUT WAS 0.25-20UNCx1.50 LG BOLT; DCN 354.27(B)	5JUN90	TMM,RVK
	B		ZONE B-2 AND D-3: ADDED LOCKWASHER TO ITEM 4; REV'D STEP 7; DCN 355.90(A)	1AUG90	TMM,RVK



MFG PROCESSES	INSPECTION PROCEDURES	TEST PROCEDURES

AUSA SPECIFICATIONS

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UNLESS OTHERWISE SPECIFIED	MATERIAL
DIMENSIONS ARE IN INCHES	
TOLERANCES	
1 PLACE DECIMALS ± .1	
2 PLACE DECIMALS ± .03	
3 PLACE DECIMALS ± .010	
ANGLE ± 0.5°	
ALL SURFACES	
CONM. TO APPLY TO STOCK SIZE	
SIMILAR TO	
SUPERSEDES ONE OF	

QTY	ITEM NO	U OF M	ANDREW PART NO.	DESCRIPTION

ANDREW CORPORATION
 10500 W. 153rd Street
 Orland Park, Illinois U.S.A. 60462

5.6 M REFLECTOR/BACK STRUCTURE INSTALLATION INSTRUCTIONS

SCALE: 1=10

PROJ. OR: 6i2i4 DATE: A/1/1

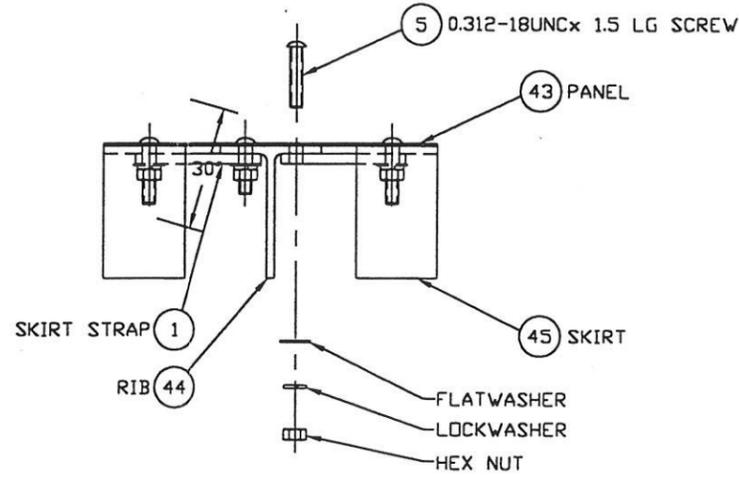
NOTES: (UNLESS OTHERWISE SPECIFIED)
 1. REMOVE ALL BURRS AND SHARP EDGES
 2. DIMENSIONS APPLY BEFORE PLATING
 3. INTERPRET DRAWING FOR AMS Y14.5M-1982

STEP 9:
 CHECK REFLECTOR PANEL FITS. INSURE THAT SEAM WIDTHS ARE UNIFORM AND PANELS ARE NOT OVERLAPING. PROCEED TIGHTENING REFLECTOR PANEL SEAM HARDWARE CLOCKWISE FROM INNER MOST HOLES TO OUTER MOST HOLES. TIGHTEN SKIRT STRAP HARDWARE.

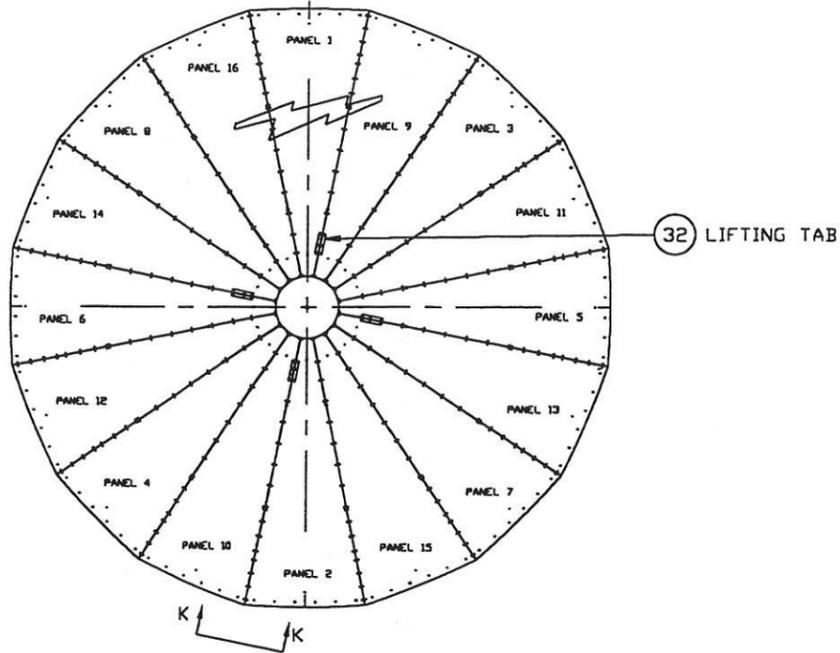
NOTICE

CHECK TO SEE THAT ALL REFLECTOR HARDWARE IS NOW SECURELY TIGHTENED.

REV. NO.		REV. NO.		REV. NO.		REV. NO.		REV. NO.	
MF	ZONE	REV	DESCRIPTION	DATE	APPROVED	MF	ZONE	REV	DESCRIPTION
			REL TO PRODUCTION	17MAR90	WF				

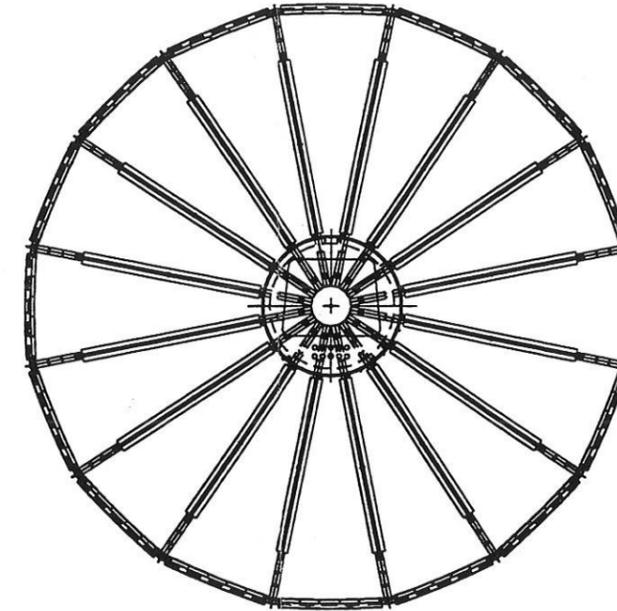
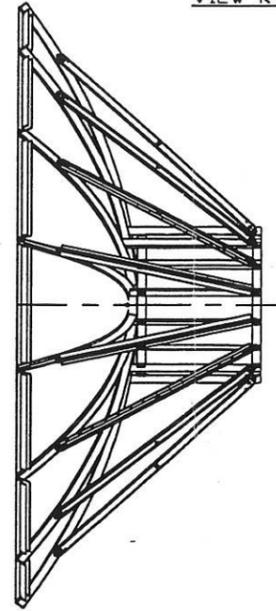


VIEW K-K



VIEW F-F

(FRONT VIEW OF REFLECTOR/BACK STRUCTURE ASSEMBLY)



VIEW E-E

(REAR VIEW OF REFLECTOR/BACK STRUCTURE ASSEMBLY)

QTY	ITEM NO	U OF M	ANDREW PART NO.	DESCRIPTION
PARTS LIST				
DRAWN	IG	7-25-89		
CHECKED	IG	14MAR90		
APPRO CHRG	RWS	13MAR90		
APPRO CHRG	RWK	14MAR90		
APPRO MFC				
APPRO ELC				
ANDREW CORPORATION 2701 Mayhill Road Denton, Texas U.S.A. 75208				
5.6 M REFLECTOR/BACK STRUCTURE INSTALLATION INSTRUCTIONS				
SIZE	PAPER NO.	REV. NO.		
D	B4147	239352		
SCALE	NONE			
PROJ. OR	61214	DETR	A: ! ! !	SHEET 4

UNLESS OTHERWISE SPECIFIED		MATERIAL
DIMENSIONS ARE IN INCHES		
TOLERANCES		
1 PLACE DECIMALS ± .1		
2 PLACE DECIMALS ± .03		
3 PLACE DECIMALS ± .010		
ANGLE ± 0.5°		
ALL SURFACES		FINISH
CON. TOL. APPLY TO STOCK SIZES		
SIMILAR TO		
SUPERSEDES DWG OF		
209954		
NEXT ASSY USED ON		
APPLICATION		

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CAD FILE NO:
 ES06544

MFG PROCESSES	INSPECTION PROCEDURES	TEST PROCEDURES
AUSA SPECIFICATIONS		

NOTES: (UNLESS OTHERWISE SPECIFIED)
 1. REMOVE ALL BURRS AND SHARP EDGES
 2. DIMENSIONS APPLY BEFORE PLATING
 3. INTERPRET DRAWING PER AMS Y14.5M-1982

STEP 11:
 ATTACH 5/8" SHACKLES WITH CORRESPONDING 16 FOOT CHOKERS TO FOUR LIFTING TABS ON REFLECTOR ASSEMBLY. REFER TO FIGURE 4. ATTACH 20 FOOT TAG LINES TO SUBREFLECTOR STRUT BRACKETS. RAISE REFLECTOR/BACK STRUCTURE ASSEMBLY AND ALIGN WITH CORRESPONDING HOLES IN ENCLOSURE ASSEMBLY AND ELEVATION AXIS ASSEMBLY USING TAG LINES FOR PROPER GUIDANCE. ATTACH REAR OF ENCLOSURE ASSEMBLY TO ELEVATION AXIS ASSEMBLY. REFER TO VIEW J-J. ALIGN MOUNTING HOLES AND ATTACH FORWARD LEG OF JACK TRIPOD TO FORWARD PORTION OF ENCLOSURE ASSEMBLY. REFER TO VIEW H-H. SECURELY TIGHTEN TRIPOD AND ELEVATION MOUNTING HARDWARE PER A-325 TENSIONING PROCEDURE.

STEP 12:
 AFTER ASSEMBLY IS COMPLETE, REMOVE LIFTING TABS AND REPLACE HARDWARE WITH SEAM HARDWARE AS DESCRIBED IN STEP 4 AND SHOWN IN FIGURE 2.

STEP 13:
 INSTALL ENCLOSURE DOOR BY ENGAGING DOOR LATCHES.

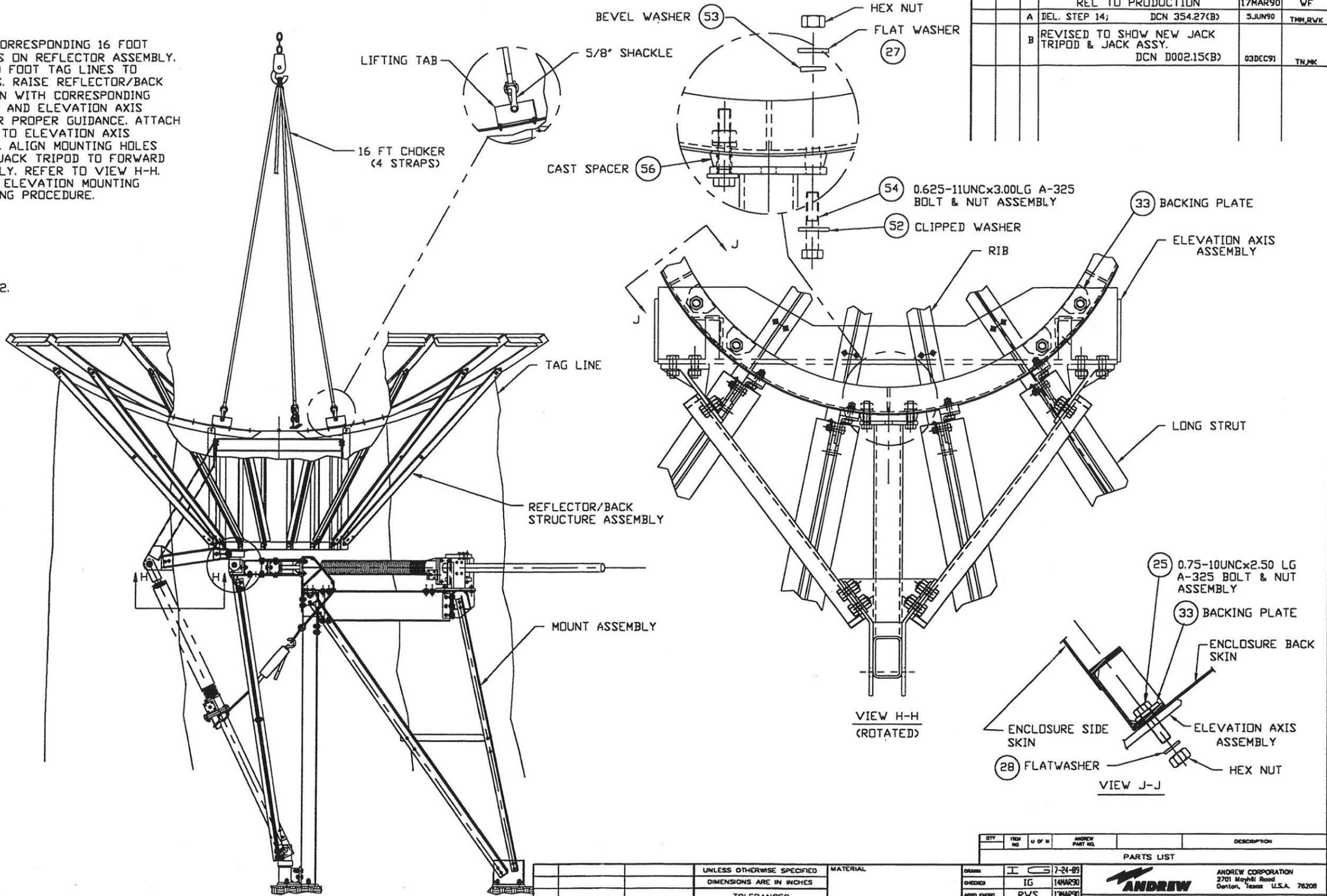


FIGURE 4

REVISIONS					
MF	ZONE	REV	DESCRIPTION	DATE	APPROVED
			REL TO PRODUCTION	17MAR90	WF
	A		DEL. STEP 14; DCN 354.27(B)	5JUN90	TMM,RWK
	B		REVISED TO SHOW NEW JACK TRIPOD & JACK ASSY. DCN D002.15(B)	03DEC91	TN,PK

QTY	ITEM NO	U OF M	ANDREW PART NO.	DESCRIPTION
				25 0.75-10UNCx2.50 LG A-325 BOLT & NUT ASSEMBLY
				33 BACKING PLATE
				28 FLATWASHER
				HEX NUT

MFG PROCESSES	INSPECTION PROCEDURES	TEST PROCEDURES
AUSA SPECIFICATIONS		

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UNLESS OTHERWISE SPECIFIED	MATERIAL
DIMENSIONS ARE IN INCHES	
TOLERANCES	
1 PLACE DECIMALS ± .1	
2 PLACE DECIMALS ± .03	
3 PLACE DECIMALS ± .010	
ANGLE ± 0.5°	
ALL SURFACES	FINISH
CONC. TOL. APPLY TO STOCK SIZES	
SIMILAR TO	
SUPERSEDES DWG OF	

DRAWN	IG	7-21-89
CHECKED	IG	14MAR90
APPRO. ENG'G	RWS	13MAR90
APPRO. ENG'G	RWK	14MAR90
APPRO. MFG		
APPRO. Q.C.		

