



**Rockwell  
International**

**Collins instruction book**

**Collins Government Telecommunications Group**

**237B-3**

**Rotatable Directional  
HF Antenna**



Rockwell  
International

Collins instruction book

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# 237B-3

## Rotatable Directional HF Antenna

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Collins Government Telecommunications Group  
Rockwell International  
Dallas, Texas 75207

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Printed in United States of America

KIRZ

6.5-40 MHz

part no. 758-5345-002-#33

AGAY - 001 #

"PART 15" CEDAR RAPIDS  
CHRISTINE  
319-345-3194

BRENDA BROOKS  
CUSTOMER SRVC  
214 705-3073

RICHARDSON TX  
BILL BELLAMY  
214-705-3128

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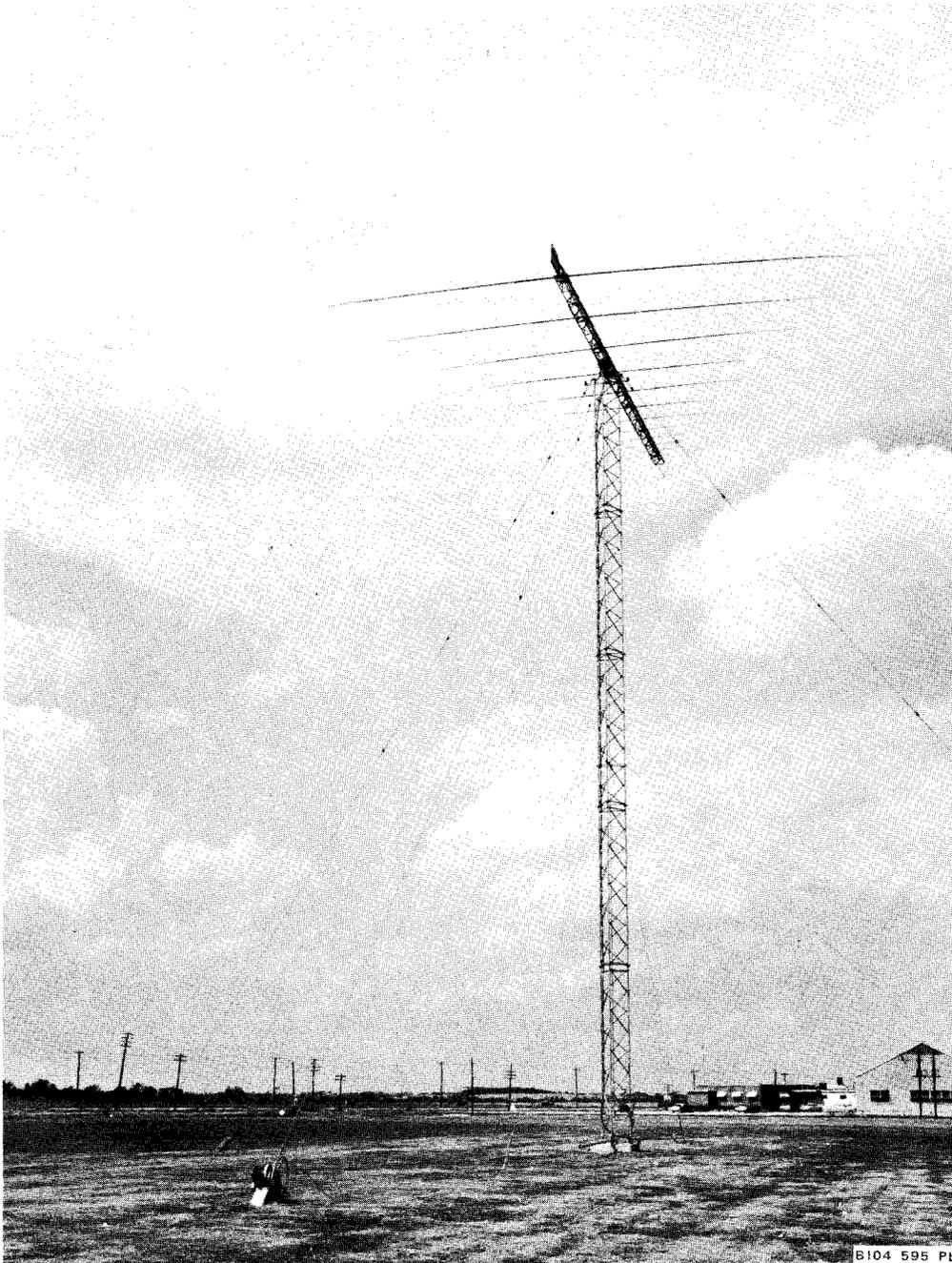
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B104 595 Pb

Figure 1-1. 237B-3 Rotatable Directional HF Antenna.

# section **1**

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## general description

### 1.1 PURPOSE OF THIS BOOK

This publication contains installation, operation, and maintenance instructions for the 237B-3 Rotatable Directional HF Antenna. The installation directions are aimed at enabling an experienced crew to erect the antenna in the safest and most efficient manner possible. Particular attention should be paid to all Warning, Caution and Note designations in these instructions.

### 1.2 PURPOSE OF EQUIPMENT

The 237B-3 Rotatable Directional HF Antenna is a wide-band aluminum array which will operate over the 6.5- to 40.0-MHz frequency range with a minimal vswr variation. This antenna meets both military and commercial requirements for a reliable broadband hf antenna which can be rapidly changed in both operating frequency and azimuth. See figure 1-1.

### 1.3 EQUIPMENT DESCRIPTION

The 237B-3 is an antenna of the log-periodic type. The 237-B configuration is a series of dipole elements (logarithmic periodic function determines size and spacing) arranged in a planar isosceles tapered array. The elements are fed with a balanced transmission line which is alternately transposed electrically between adjacent dipole elements. The array is constructed with a chromate conversion finish structural aluminum (6061 T6) and stainless steel hardware.

A sail mounted on the array equalizes wind loads and prevents windmilling. A rotator mounted on top of the antenna tower rotates the array. A rotary coaxial joint integral with the rotator provides rf feed to the antenna. The rotator provides approximately 360° per minute unidirectional rotation. The antenna can be positioned to any azimuth position from the tower base or in 30° increments from the 143A-3 Antenna Rotator Control. See figure 1-2.

The antenna supporting tower is a 100-foot tubular, high strength steel, galvanized structure mounted

on a concrete base and guyed from seven points. Three guy cables spaced at 120° intervals are attached to the top of the tower and four guy cables spaced at 90° intervals are attached to the middle of the tower.

When desired, the antenna system can be lowered and stowed within a 2-hour period by two men using only manual equipment. By using the optional power tool kit, two men can lower and stow the antenna in only 30 minutes.

The 237B-3 offers exceptional environmental resistance and easy maintainability from the ground.

### 1.4 SPECIFICATION SUMMARY

#### Array:

Frequency Range  
6.5 MHz to 40.0 MHz

Polarization  
Horizontal

Impedance  
50-ohm, unbalanced nominal

VSWR  
Less than 2:1 relative to a 50-ohm source

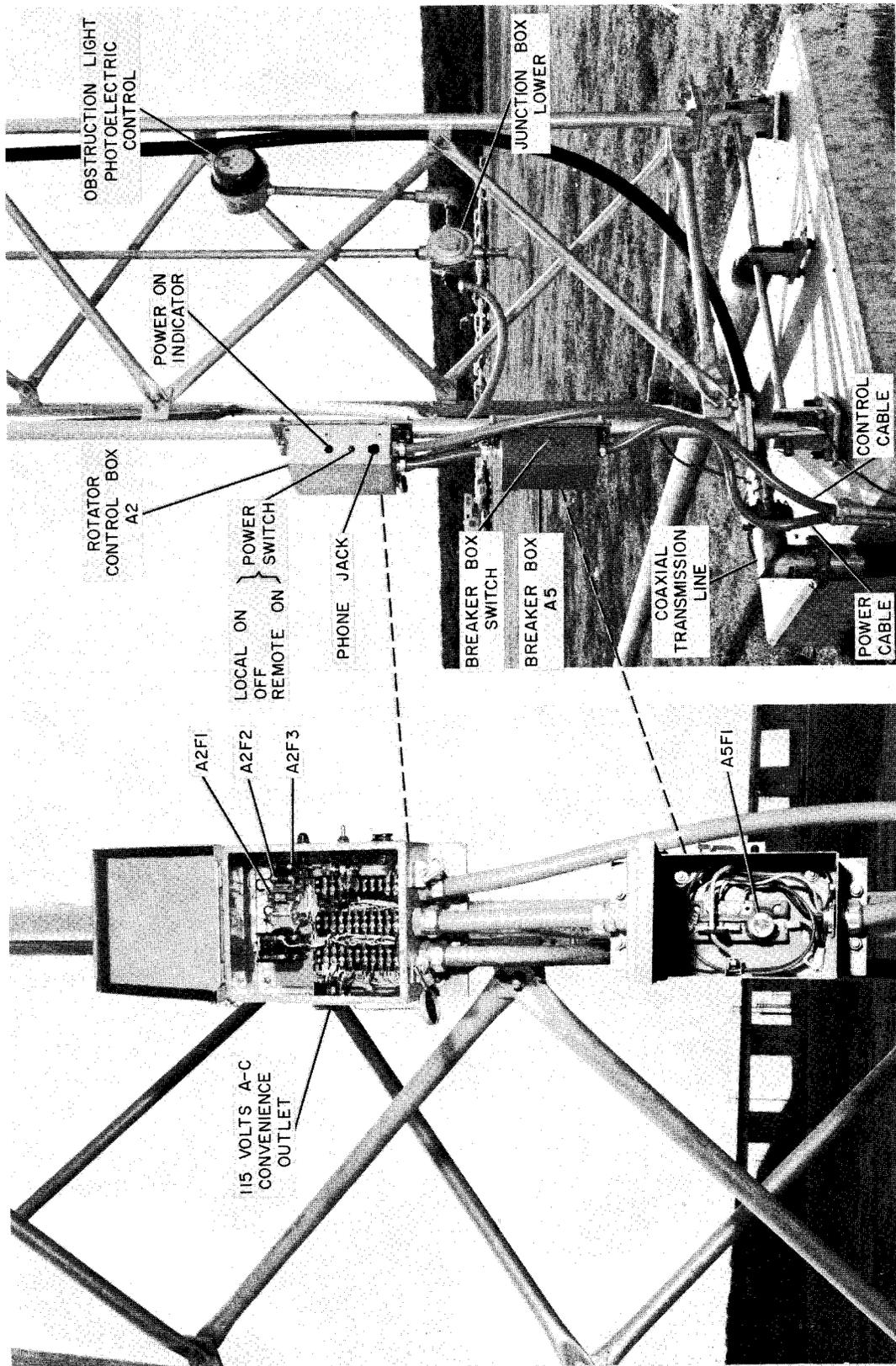
Power Handling Capability  
50-kw pep., 25-kw average

Azimuth Beam Width  
65° typical

Vertical Beam Width  
Varies with frequency

Gain  
12 db minimum at 6.5 MHz; increases monotonically to 13.5 db at 20 MHz; 13.5 db minimum 20 to 40 MHz.

Boom Length  
63 feet (19.2 meters)



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Figure 1-2. 143A-3 Antenna Rotator Control.

Longest Element Length  
80 feet (24.4 meters)

Shortest Element Length  
10 feet (3.04 meters)

Rotator, Local and Remote Control:  
Control

Local, by control unit at the tower base  
Remote, by the 143A-3 Antenna Rotator  
Control

Power Cable.

LENGTH feet	WIRE SIZE (AWG)	COLLINS PART NUMBER
50	No. 10	424-1786-000
100	No. 6	424-1794-000
1000	No. 4	424-1798-000

**Note**

To reduce power line losses and size of power cable requirements for distances over 1000 feet, the use of 4.0-kVa power transformers is recommended.

Power Requirements:

Rotator Motor and Rotator Control Unit  
115 volts, 50 to 60 Hz; 10-1/2 amperes nominal; 44 amperes with rotator motor locked; 25-35 amperes starting current.

Obstruction Light Kit

115 volts, 50 to 60 Hz, 2 amperes

Rotator Heater

115 volts, 50 to 60 Hz, 125 watts

**Note**

The rotator control units can be operated from a 28-volt-dc source; however, the motor control relay and indicator lamps must be changed accordingly. Refer to note on figure 4-9. When 28 volts dc is used, wire resistance per conductor of the control cable must not exceed 7 ohms. A 20-conductor cable is required.

Control Cable (for 115-volt-ac operation):

Nineteen number 20 AWG conductors for runs up to 2500 feet (761.9 meters), Collins P/N 424-0238-010.

Rotation:

Local, continuous clockwise rotation, approximately 360° per minute  
Remote, in 30° increments; after calibration, azimuth control on remote control unit indicates position of antenna.

Tower:

Height  
100 feet (30.4 meters)

Height of Antenna With Rotator and Array Installed

105 feet (32 meters)

Space Requirements

For initial installation and when lowering, an area 175 feet (53.4 meters) by 245 feet (74.8 meters) is required. After erection, the antenna occupies an equilateral triangular space of 175 feet (53.4 meters) per side.

Design Loads (top of tower)

Vertical load  
2564 lb (1162 kg)

Lateral load  
3648 lb (1620 kg)

Torque load  
3200 ft-lb (442.56 kgM)

Guying

From tower top, 3 guys spaced apart 120°  
From midtower, 4 guys spaced apart 90°

Lighting

Provided by optional lighting kit featuring photoelectric control

Wind Loads (wind velocity measured at array height)

Withstands  
143 mph (230 kmh, 122 knots) with no ice  
98 mph (158 kmh, 85 knots) with one-half inch of radial ice

Steerable

75 mph (121 kmh, 65 knots)

Erection

40 mph (65 kmh, 35 knots) maximum during erection or lowering

general description

**1.5 EQUIPMENT SUPPLIED**

The equipment supplied consists of the items listed in table 1-1.

**1.6 OPTIONAL EQUIPMENT**

The optional equipment available consists of the items listed in table 1-2.

**Note**

For operation of the rotator in temperatures below +10°F (-12.2°C) it is recommended that the rotator gear oil be changed to a lighter grade, such as Molub-Alloy or Artic Gear Oil. Contact Imperial Oil and Grease Co., 6505 Wilshire Blvd, Los Angeles California. The alternative would be to install the optional Rotator Heater Kit, CPN 515-8605-002.

**1.7 ITEMS REQUIRED BUT NOT FURNISHED**

- a. Site for antenna

- b. Concrete and reinforcing steel for tower base and anchor assembly encasement
- c. Coaxial rf transmission line cable between transmitter and antenna base (1-5/8-inch, Andrews Heliac recommended)
- d. Control cable, 18-conductor, between remote control unit and antenna base (20-conductor if remote control unit is modified for 28-volt-dc operation)
- e. Coaxial cable flange, 1-5/8-inch standard EIA
- f. Power cable to antenna.

**1.8 PACKING DIMENSIONS AND SHIPPING DATA**

Packing dimensions and shipping data are furnished in table 1-3.

**1.9 SERVICE INFORMATION**

Inquiries concerning the 237B-3 Antenna should be directed to: HF Antenna Product Line Program Manager, Collins Radio Group, Rockwell International, Dallas, Texas, 75207. Phone 214-690-5029.

*406 636 1407  
714-641-7536  
Peter Coggins*

Table 1-1. Equipment Supplied.

COLLINS PART NUMBER	NAME	KIT PARTS BREAKDOWN REFER TO FIGURE
758-5346-002 758-5346-001	237B-3 Antenna Antenna array kit	2-13, 2-10, 2-10A, 2-11, 2-12, 2-12A
515-8012-001	Tower, guy, and anchor kit	2-1
515-8551-001	Rotator kit	2-6
515-8576-001	Rotator control kit	2-7, 4-9
515-8600-001	Rf transmission line kit	2-9

Table 1-2. Optional Equipment.

COLLINS PART NUMBER	NAME	KIT PARTS BREAKDOWN REFER TO FIGURE
515-8453-001	Lighting kit	2-8
515-8601-001	Power tool kit	2-3, sheet 2
515-8524-001	Erection kit	2-3, sheet 1
515-8605-002	Rotator heater kit	2-5
515-8606-001	Rfi kit (to meet MIL I 26-6)	2-19

Table 1-3. Packing Dimensions and Shipping Data.

DESCRIPTION	DIMENSIONS (in.)	GROSS WEIGHT (lb)	CUBIC FEET
Array kit			
Sail	61-1/2x32x8	100	9.1
Elements and hardware	346x14-1/4x17-3/4	820	50.6
Front boom section	300x31-3/4x25-3/4	710	141.9
Center boom section	300x32-3/4x29	870	164.9
Rear boom section	190x32-1/2x25-1/2	<u>515</u>	<u>91.1</u>
		3015	457.6
Erection kit (1)	250-1/2x12x12	420	20.9
Erection kit (2)	32x32x16	<u>300</u>	<u>9.5</u>
		720	30.4
Tower and guy kit			
Crate	54x48-3/4x21-3/4	1731	33.1
Crate	242x23x19	<u>1395</u>	<u>61.2</u>
		3126	94.3
Rotator	36x18x20	228	7.5
Rotator control	22x21x22	140	5.9
Rotator Heater kit	14x14x13	24	1.5
Rf transmission line cable	68x68x11	305	29.5
Lighting kit	32-1/2x13x12	119	3.0
Power tool kit	50x20-1/2x15	130	8.9
Mounting adapter	14x14x12	64	1.4

# section 2

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## installation

### 2.1 GENERAL

This section contains installation instructions for the 237B-3 Rotatable Directional HF Antenna. Site selection and training of installation crews should be performed prior to starting antenna installation. Installation instructions are in the form of written, step-by-step procedures, drawings and pictures. The procedures, as nearly as possible, are in chronological order. Installation procedures are also listed for optional equipment. In making the installation, refer to the line drawings and emphasis notes which accompany the procedure steps. Refer to table 1-1 for kit identification, and table 1-2 for a listing of optional equipment.

### 2.2 SITE SELECTION

Site selection for the antenna depends on many factors; only those directly relating to the 237B-3 will be covered in this section.

- a. Physically, the antenna requires a clear area, 175 feet (53.4 meters) by 245 feet (74.8 meters) for initial installation and lowering operations. When erected, the antenna occupies a space in the form of an equilateral triangle 175 feet (53.4 meters) on a side. To facilitate accurate vertical placement of guy anchor loops, the ground selected should be level to within  $\pm 2$  percent. Antenna tower base and guy anchor plans in figure 2-1, sheet 1, were designed for installation in 3000-psf soil; however, alternate plans and construction details for installation in 1000 psf soil are furnished in figure 2-2. It is desirable to choose a well drained site in order to maintain this firmness. Other considerations in selecting the site are ease of access and cable routing. Siting of the antenna on or near an airfield requires compliance with civil or military regulations covering lateral airfield clearance and airfield zoning of the airfield operating agency. If possible, avoid siting the antenna in locations where wind ducting may occur.

Wind ducting can cause severe turbulence and/or multiply the wind effect on an exposed antenna structure. Typically, wind ducting occurs near cliffs, canyons, built up areas or rugged terrain.

- b. For the best site selection electrically, avoid objects in the immediate vicinity of the antenna which would tend to absorb or deflect radiated energy such as large trees or woods, other antennas and steel buildings. The balanced design of the radiating array minimizes the dependence of the antenna on good ground conductivity for control of its vertical angle of radiation. Consider ground conductivity in providing lightning protection for the antenna, its transmission line and associated receiver and/or transmitter. Failure to provide a good ground at the antenna base for lightning protection could result in the lightning stroke seeking a ground anywhere in the communication system. Adequate lightning protection can be gained by attaching one of the tower legs to a good ground, through a large conductor, as all portions of the antenna tower structure are at the same dc potential. Carefully plan length and routing of power, control, and transmission line cables to reduce ac and rf power losses and to keep cable cost at a minimum. For added convenience, install a 115-volt convenience outlet near the erecting winch foundation for power tool use. Connect far end to unswitched power cable at tower base.

### 2.3 FOUNDATION AND GUY ASSEMBLY ANCHOR POINT CONSTRUCTION

The tower foundation and guy anchors are the first items installed at the site. Installation requirements for these items are shown in figures 2-1 and 2-2. The figures provide recommended configuration and layout information for these items. (Reinforcing steel and concrete for the construction of these assemblies are not supplied with the antenna kits.)

**Caution**

It is imperative that the tower base bolt locations be in line with each other and with the guy attachment points on the guy anchors. Even a small misalignment will cause excessive strain on the guys and/or tower during antenna raising and lowering operations.

In constructing the tower foundation, make sure the foundation can support the tower weight as well as absorb horizontal loads due to the tower erection or stowage process. The recommended 28-day concrete strength is 3000-psi. Back fill around foundations should be well compacted. In acid, alkaline or salty soil installations, cover anchor rods with bituminous wrap.

The concrete in the foundation and anchor assemblies should be aged at least 14 days before erection of the tower assembly.

**Caution**

The side anchor terminating loops MUST be in the same vertical and horizontal planes as the tower pivot shaft and equidistant from the foundation center. See figure 2-1, sheet 1, detail G. The remaining five anchor points should be located at the distances and angles shown in figure 2-1, sheet 1. Failure to locate anchor terminating loops properly can cause guy cables to overtighten and buckle the tower during raising and lowering operations.

**2.4 ASSEMBLY OF THE TOWER**

In assembly of the tower, use the following torque limits:

3/8-inch bolts	25 pound-foot
1/2-inch bolts	90 pound-foot
3/4-inch bolts	320 pound-foot

- a. Install the tower pivot assembly (consisting of items 10, 11, 12, 13, 14, and 19; figure 2-1, sheet 2) on the concrete foundation. Use the nuts on the foundation anchor bolts to level the tower pivot assembly, using item 14 (figure 2-1, sheet 2) as a reference. Centerline of pivot, item 14, lines up hori-

zontally and vertically with side anchor loops to within  $\pm 1/2$  inch. See figure 2-1, sheet 1, detail G.

- b. A support for the bottom tower section should be placed about 15 feet from the tower foundation. This support should be of wood with a large surface area. The top surface of the support should be above the level of the base pivot shaft. (Wooden crossties may be stacked to form this support.)

**Note**

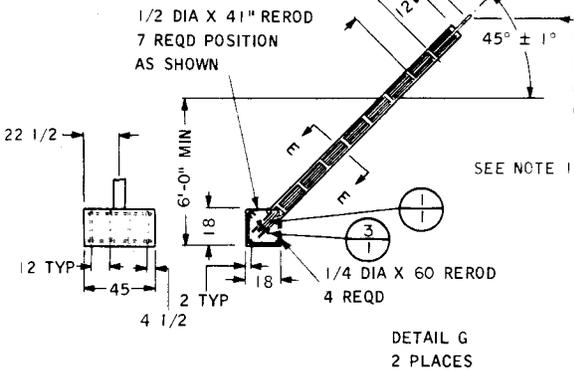
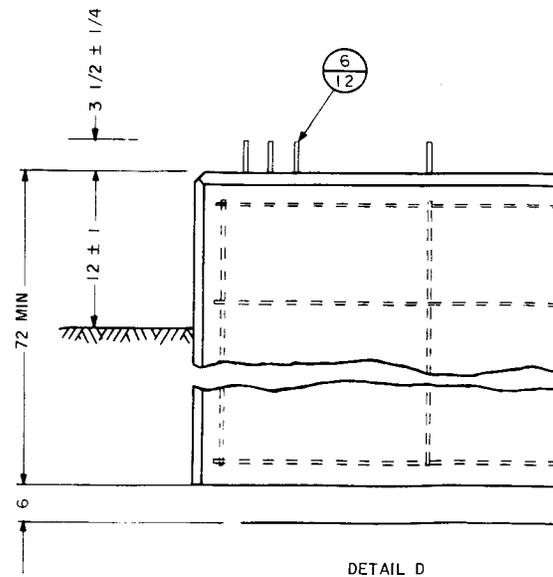
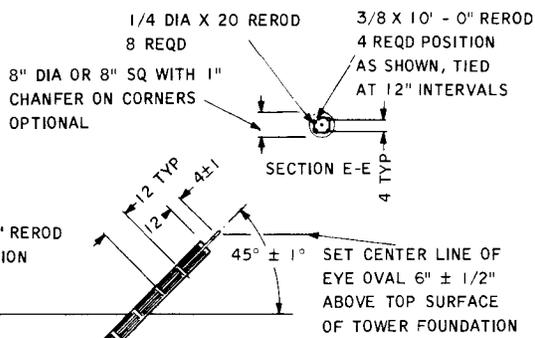
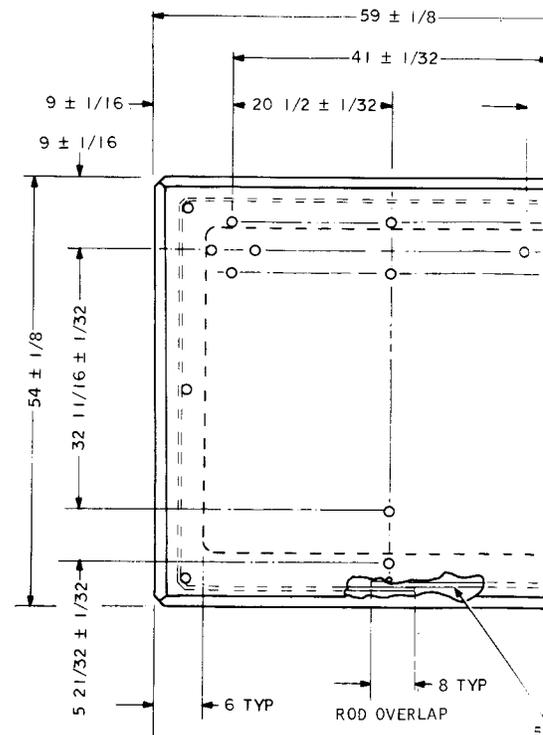
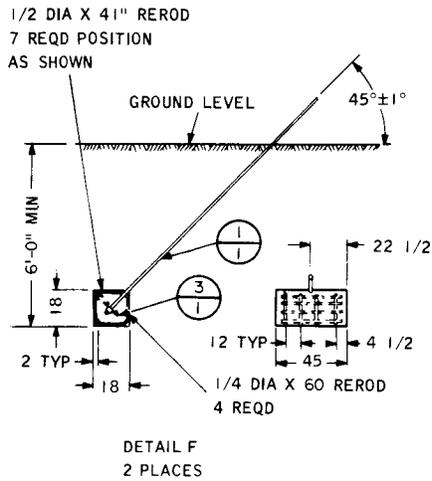
Assemble the tower in a horizontal position.

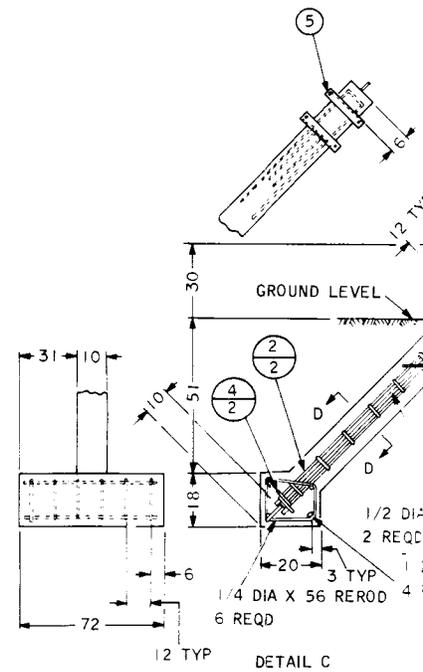
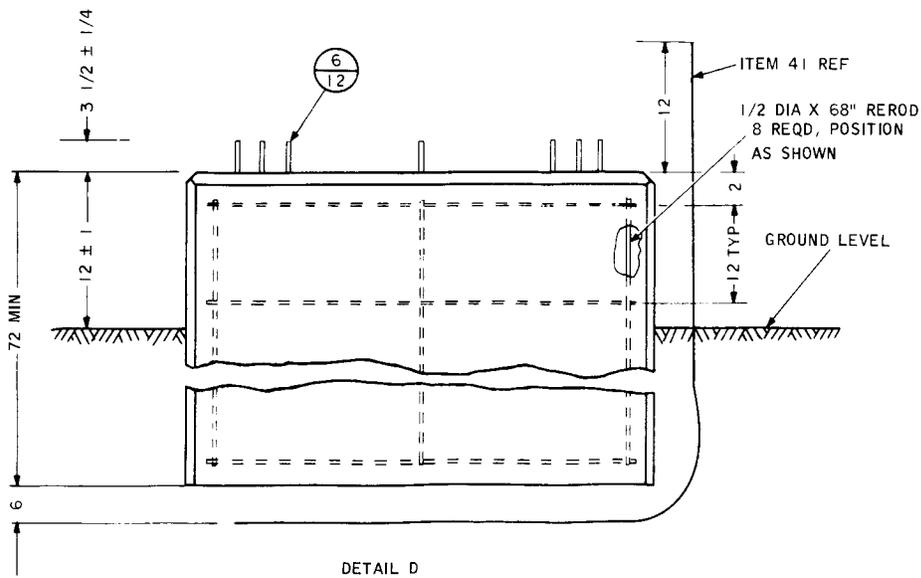
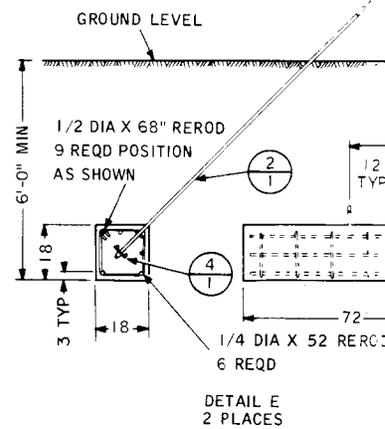
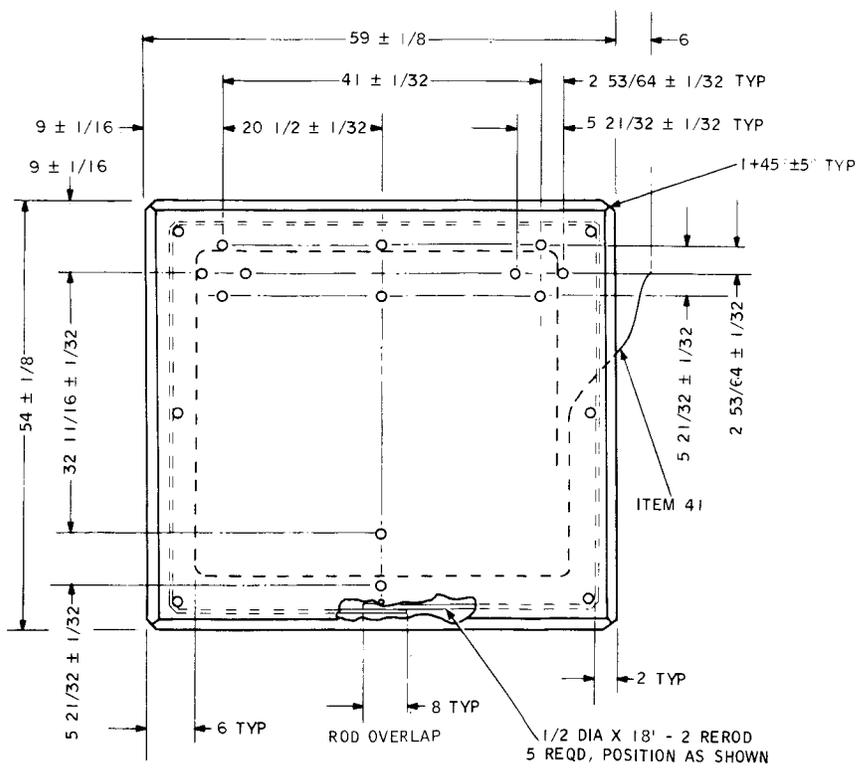
- c. Attach tower vertical members to the left and right pivot assemblies.

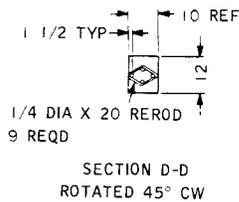
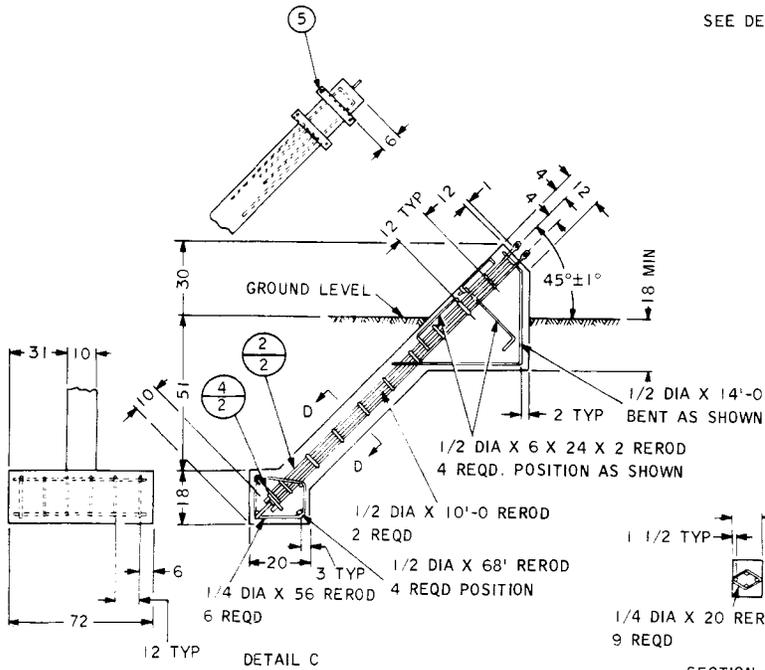
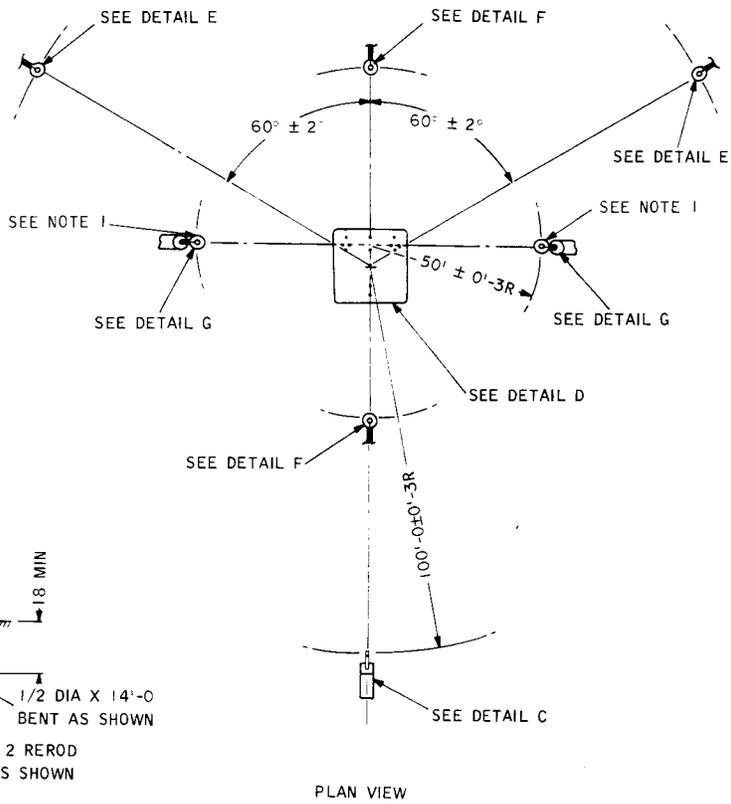
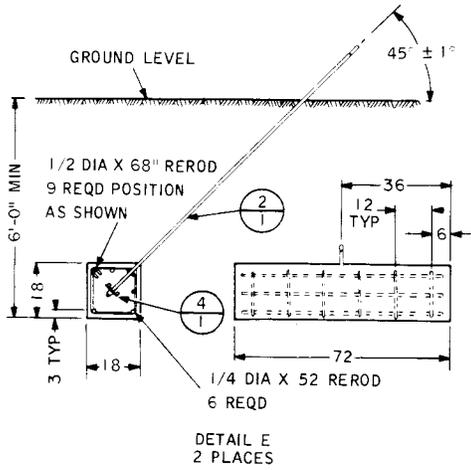
**Note**

It is necessary to install the bottom horizontal brace on the inside of the tower as shown in figure 2-1, sheet 2, view B-B.

- d. Place the tower vertical members on the support. Attach the lattice cross bracing to the two members as shown in figure 2-1, sheet 2.
- e. Place the third tower vertical member atop the completed tower side.
- f. At either end of the completed tower side, erect lattice bracing (four braces) for the third member.
- g. Lift and bolt the third vertical member into position.
- h. Attach lattice bracing to either end of tower.
- i. Lift third member into position and bolt it into place.
- j. Attach remaining lattice bracing.
- k. Attach tower leg (item 15, figure 2-1, sheet 2, view B-B,) to tower.
- l. Check that winch and tackle block is adequately greased with any of the following greases: ANG-25; CPN 005-0423-000; Texaco Unitemp; Beacon 325; Air Shell No. 7A or Super Mil 72832 (American Oil Co.).
- m. To attach hoisting cable (item 3, figure 2-3, sheet 1) to cable winch, see figure 2-3, sheet 2. Remove setscrew and its securing nut from cable dog. Insert cable dog into the center of the cable winch reel through large hole in the hollow reel core. Insert cable dog setscrew, with securing nut attached, through the hollow axle of the winch







ANCHOR AND FOUNDATION DETAILS

QTY REQD	ITEM NO.	
4	1	
4	2	
4	3	
4	4	
1	5	
12	6	
325.0	7	
3	8	
5	9	
1	10	
1	11	
2	12	
1	13	
1	14	
1	15	
1	16	
1	17	
6	18	
18	19	
6	20	
12	21	
1	22	
1	23	
2	24	
1	25	
9	26	
1	27	
1	28	
1	29	
2	30	
2	31	
1	32	
8	33	
4	34	
4	35	
8	36	
3	37	
3	38	
3	39	
3	40	
25.0	41	
1	42	
35.0	43	
1	44	
2	45	

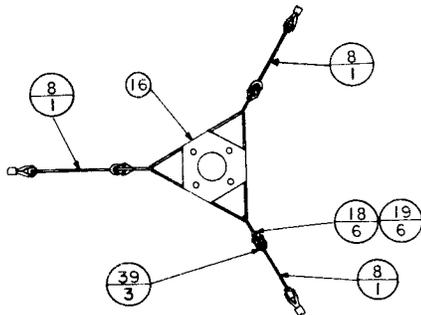
QTY REQD	ITEM NO.	COLLINS PART NUMBER	DESCRIPTION
4	1	015-0856-000	ROD, ANCHOR - 3 4 X 10 FT.
4	2	015-1064-000	ROD, ANCHOR - 1 X 10 FT.
4	3	310-0521-000	WASHER - 4 X 4 X 1/2 THK.
4	4	310-0523-000	WASHER - 6 X 6 X 3/8 THK.
1	5	766-2356-004	BRACKET, WINCH
12	6	013-1324-040	BOLT, ANCHOR
325.0	7	432-1091-000	STRAND, GUY - 3 8 (FT)
3	8	766-2364-001	GUY, UPPER
5	9	013-1891-040	SECTION, TOWER
1	10	766-2352-003	PIVOT, LEFT
1	11	766-2352-004	PIVOT, RIGHT
2	12	766-2362-003	BRACKET, BASE
1	13	766-2361-003	BRACKET, CENTER
1	14	766-2366-001	SHAFT, PIVOT
1	15	766-2365-003	LEG, TOWER
1	16	766-2367-005	PLATE, ROTATOR
1	17	766-2354-004	BRACKET, LOWER
6	18	326-1531-000	SCREW, CAP - 3 4 - 10 X 2 1/2
18	19	334-1282-000	NUT, HEX. - 3 4 - 10
6	20	766-2355-001	U-BOLT
12	21	334-1277-000	NUT, HEX. - 3 8 - 16
1	22	019-1313-000	BOX, JUNCTION
1	23	766-2377-003	ARM, CONDUIT-NIPPLE
2	24	019-0279-000	NUT, LOCK - 3 4
1	25	019-1311-000	BREATHER, CONDUIT
9	26	019-0129-000	CONDUIT - 3 4 X 10 FT.
1	27	005-1222-020	COMPOUND, SEALING (TUBE)
1	28	015-2702-000	KIT, STRAPPING
1	29	766-2369-001	CONDUIT - 3 4
2	30	332-0712-000	PLUG, PIPE - 3 4
2	31	338-0096-000	PIN, COTTER
1	32	019-1314-000	BOX, JUNCTION
8	33	015-2352-000	GUY, STRAND - DEAD END - 3 8
4	34	015-4136-000	TURNBUCKLE - 5 8 X 12
4	35	015-4197-000	SHACKLE - 1 2
8	36	015-4235-000	THIMBLE - 3 8
3	37	015-2354-000	GUY, STRAND - DEAD END - 1 2
3	38	015-4139-000	TURNBUCKLE - 3 4 X 18
3	39	015-4198-000	SHACKLE - 5 8
3	40	015-4237-000	THIMBLE - 1 2
25.0	41	421-2448-000	WIRE, ELEC (FT)
1	42	788-6275-001	STRAP, GROUNDING
35.0	43	421-1020-000	WIRE (FT)
1	44	774-6331-001	INSTRUCTION PLATE
2	45	013-0994-003	CLAMP, HOSE

NOTES:

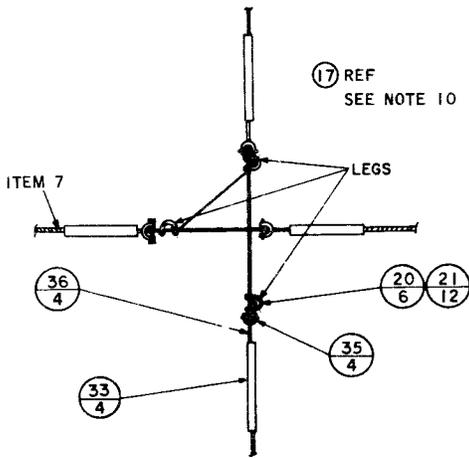
1. LOWER SIDE GUY ANCHOR LOOPS MUST BE LOCATED WITHIN 1/2 INCH OF LINE PASSING THROUGH PIVOT SHAFT HOLES IN BASE BRACKETS ITEM 12, VERTICALLY AND HORIZONTALLY
2. IN ACID, ALKALINE OR SALTY SOIL COVER EXPOSED ANCHOR RODS WITH BITUMINOUS WRAP
3. EARTH FORMED ANCHORS TO MINIMUM DIMENSIONS SHOWN ARE PREFERRED
4. IN ALL SPLIT BALLOONS TOP FIGURE IS MATERIAL LIST ITEM AND BOTTOM FIGURE IS QUANTITY
5. LEVEL ITEM 14 BEFORE RAISING TOWER
6. SAFETY WIRE ALL TURNBUCKLES AFTER PLUMBING TOWER USING ITEM 43
7. ANCHORS AND FOUNDATION DESIGNED FOR 3000 PSF SOIL
8. TOLERANCE ON FRACTIONS ± 1/4 UNLESS OTHERWISE SPECIFIED
9. OVERALL DIMENSIONS ON CONCRETE ARE MINIMUM UNLESS OTHERWISE SPECIFIED
10. LACING OF TOWER MUST BE ASSEMBLED AS SHOWN IN MAIN VIEW AND VIEW B-B TO INSURE PROPER OPERATION OF LOWER GUY BRACKET, ITEM 17. ORIENT ITEM 17 WITH TUBE SECTION AS SHOWN IN SECTION A-A
11. END OF CABLE SHOULD BE VISIBLE WITH A MINIMUM OF 1 INCH EXPOSED
12. COAT ALL CONDUIT THREADS WITH SEALER, ITEM 27
13. ITEM 41 REF, TO BE CONNECTED TO SUITABLE GROUND ROD FOR LIGHTNING AND STATIC DRAIN PROTECTION. SUITABILITY DEPENDS ON FREQUENCY OF ELECTRICAL STORMS AND GROUND CONDUCTIVITY
14. GROUT SPACE UNDER BRACKETS, ITEMS 12 AND 13 AFTER LEVELING

B104 664 6

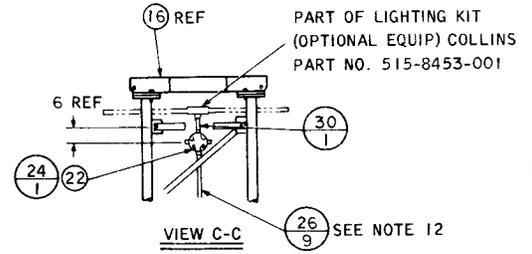
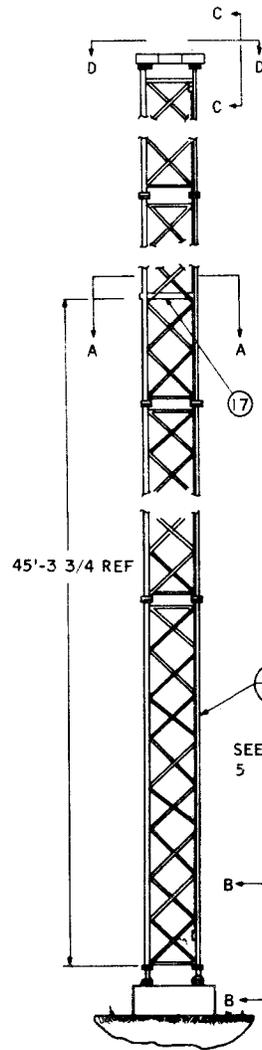
Figure 2-1. Anchor and Foundation Details (3000-PSF Soil) (Sheet 1 of 2).



VIEW D-D



SECTION A-A



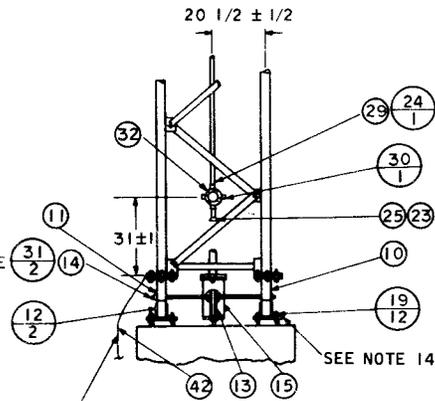
VIEW C-C

PART OF LIGHTING KIT  
(OPTIONAL EQUIP) COLLINS  
PART NO. 515-8453-001

SEE NOTE 12  
SEE DETAIL A  
(2 ANCHOR RODS)

THIS ANCHOR ROD  
1 PLACE ONLY

DETAIL A  
3 PLACES

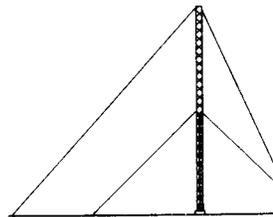


VIEW B-B  
SEE NOTE 10

ITEM 41 REF  
SEE NOTE 13

SEE NOTE 5

SEE NOTE 14



ELEVATION

SEE DETAIL E

SEE DETAIL

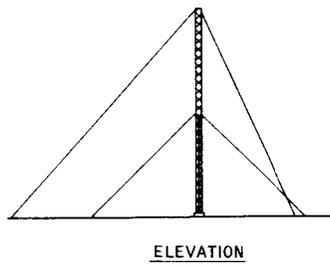
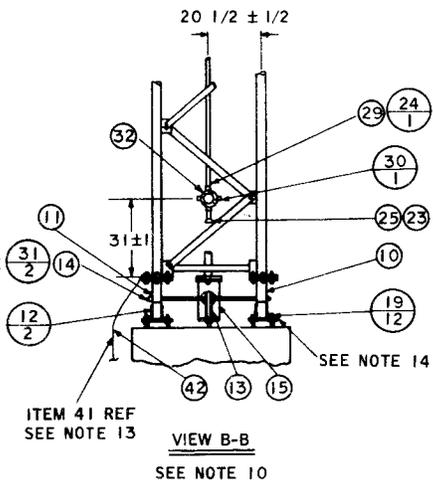
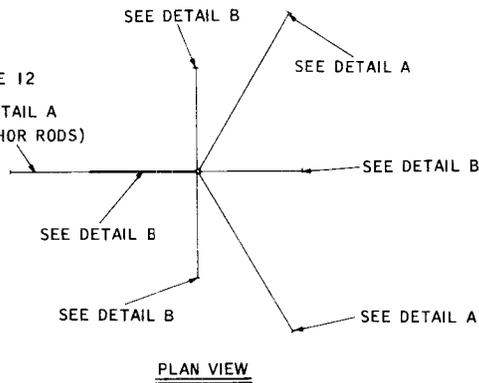
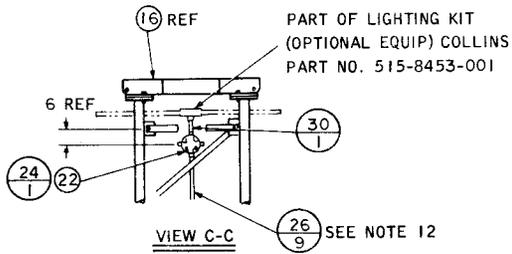
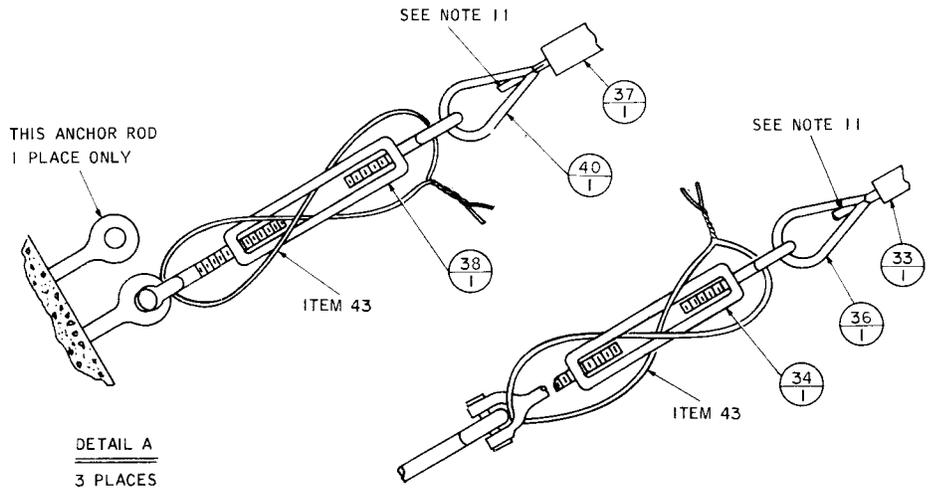
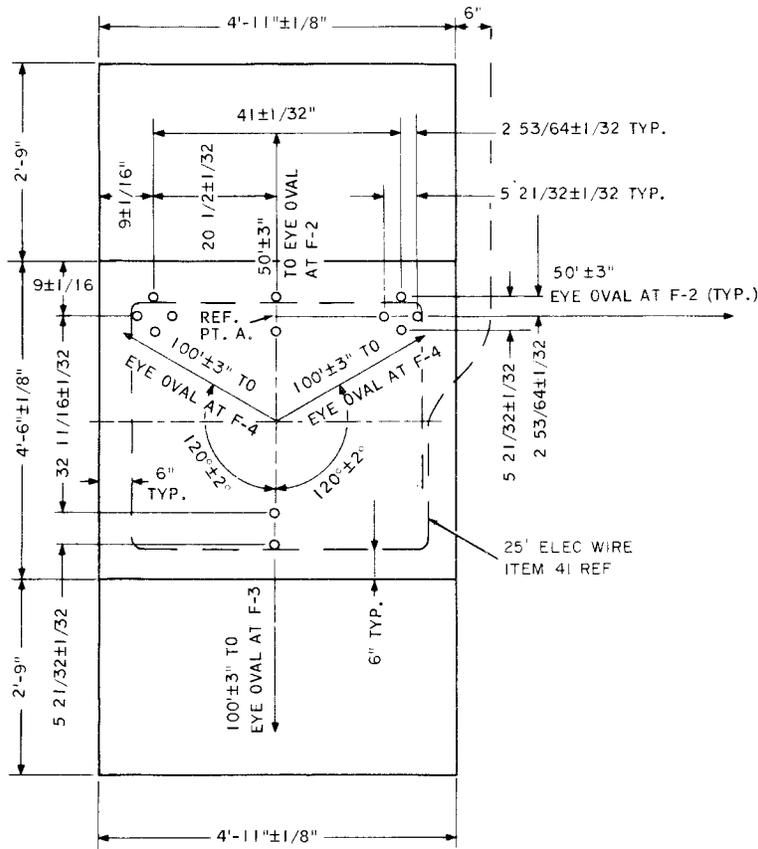


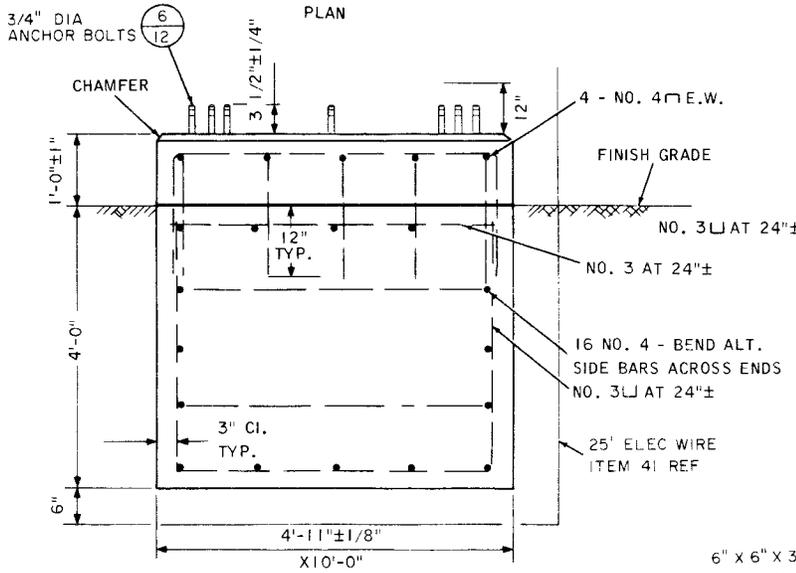
Figure 2-1. Anchor and Foundation Details (3000-PSF Soil) (Sheet 2 of 2).



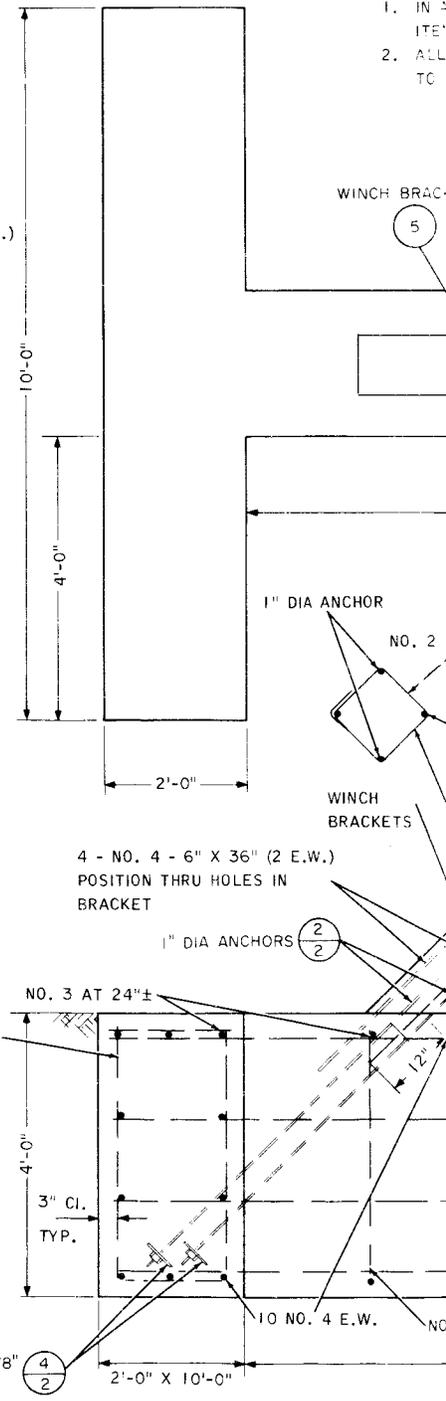
- NOTES:
1. IN A...
  2. ALL...
  - TO F...

WINCH BRACKET

5



ELEVATION FOUNDATION F-1 DETAIL D



ELEVATION FOUNDATION F-1 DETAIL C

NOTES:

1. IN ALL SPLIT BALLOONS TOP FIGURE IS MATERIAL LIST ITEM AND BOTTOM FIGURE IS QUANTITY
2. ALL ITEM NUMBERS AND DETAIL REFERENCES REFER TO FIGURE 2-1 SHEET 1 OF 2 PAGES 2-3/2-4

53/64±1/32 TYP.

21/32±1/32 TYP.

50'±3" EYE OVAL AT F-2 (TYP.)

2 53/64±1/32

25' ELEC WIRE ITEM 41 REF

4 - NO. 4 E.W.

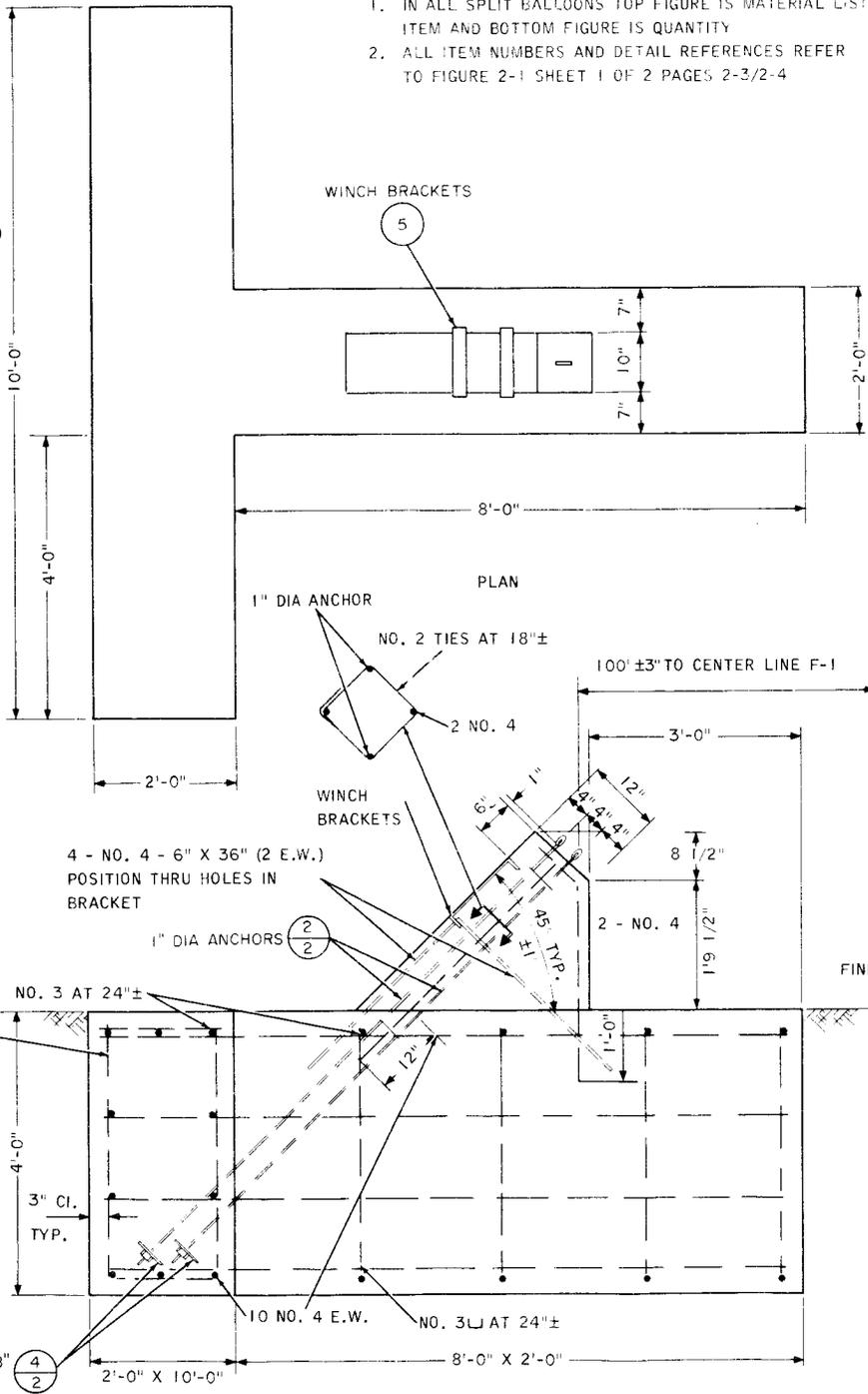
FINISH GRADE

NO. 3 AT 24"±

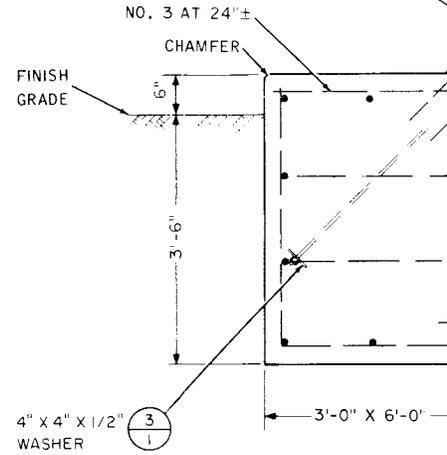
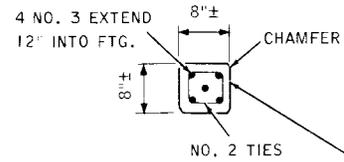
16 NO. 4 - BEND ALT. SIDE BARS ACROSS ENDS NO. 3LJ AT 24"±

25' ELEC WIRE ITEM 41 REF

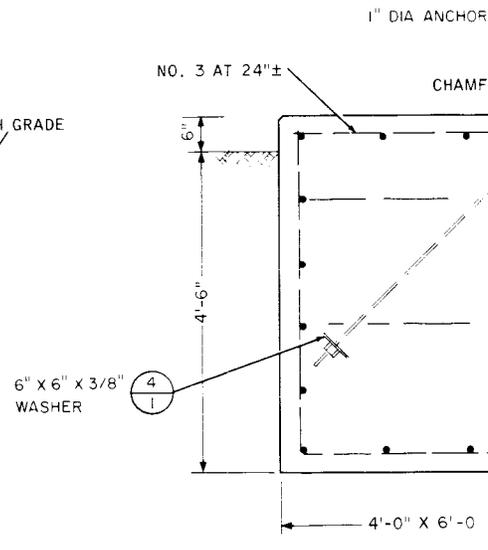
6" X 6" X 3/8" WASHERS



ELEVATION FOUNDATION F-3  
DETAIL C



ELEVATION FOUNDATION F-2  
DETAIL F - 2 PLACES  
DETAIL G - 2 PLACES

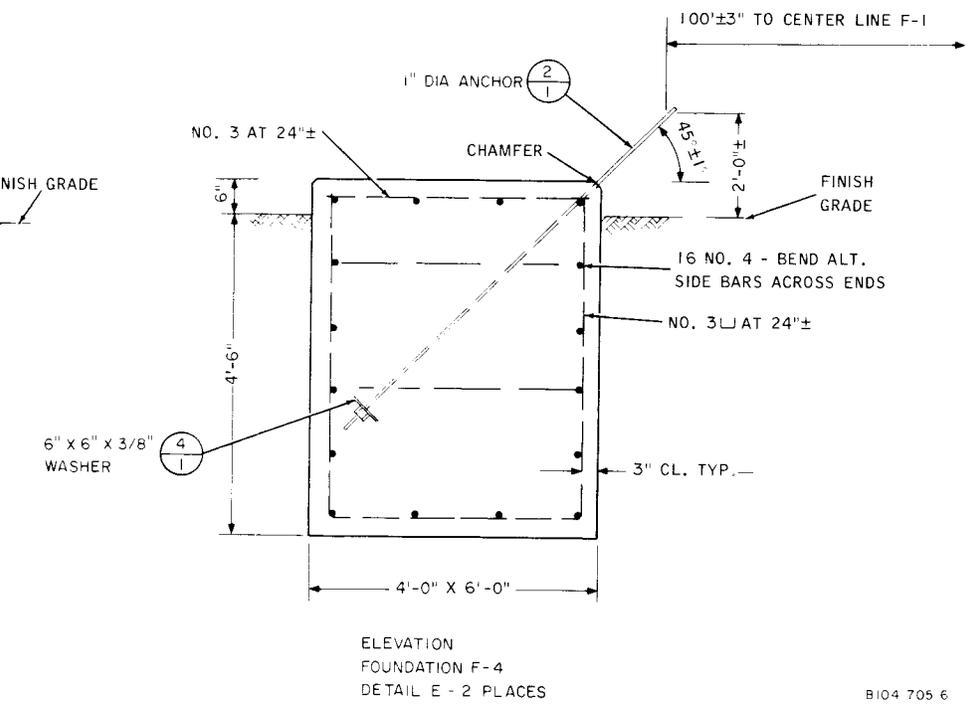
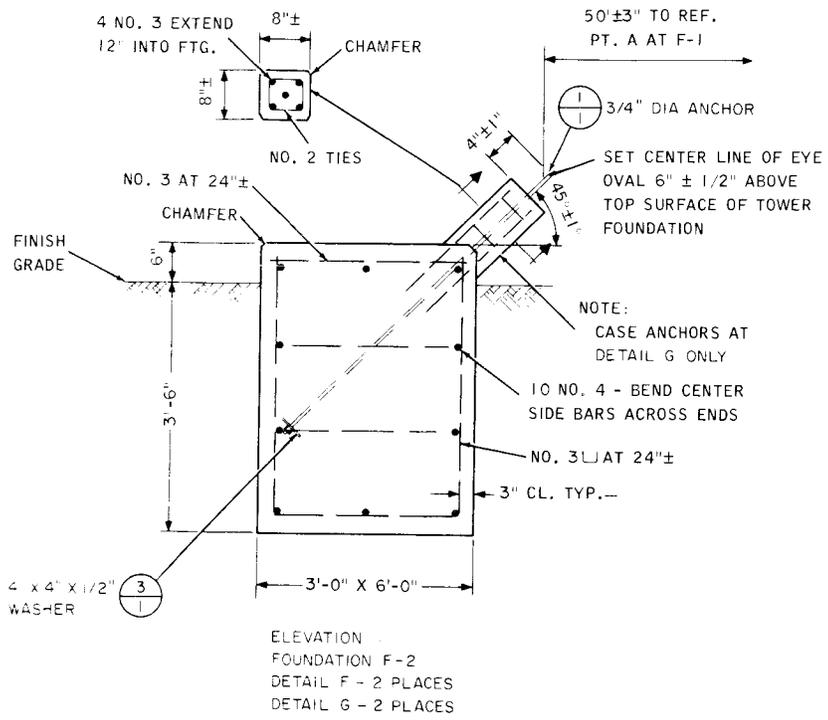


ELEVATION FOUNDATION F-4  
DETAIL E - 2 PLACES

Figure 2-2. AN  
(1)

Revised 15 July 19

ST



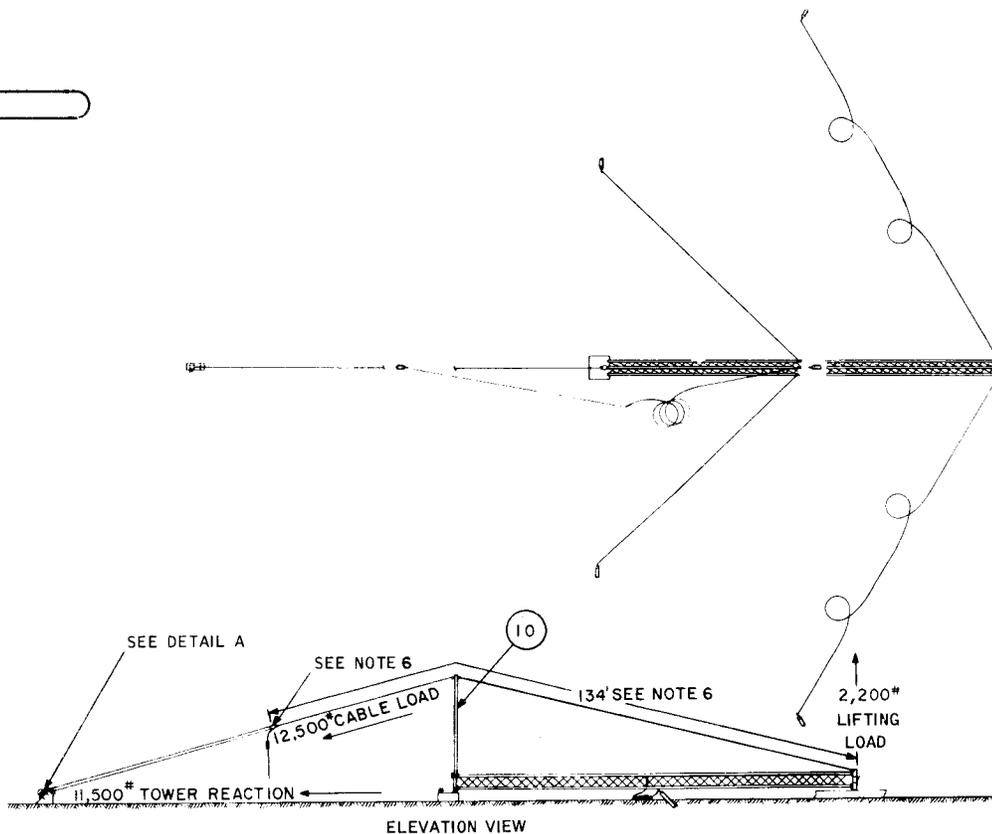
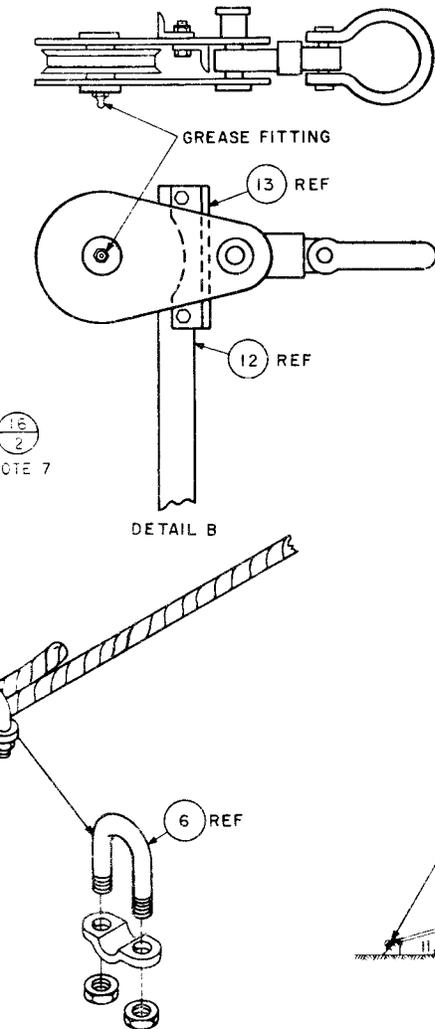
B104 705 6

Figure 2-2. Anchor and Foundation Details (1000-PSF Soil).



NOTES:

1. IN ALL SPLIT BALLOONS, TOP FIGURE IS ITEM NO. AND BOTTOM FIGURE IS QUANTITY.
  2. GREASE WINCH AND PULLEY, ITEMS 2 AND 4 USING GREASE CALLED OUT IN PARAGRAPH 5.2.2.
  3. TO ATTACH CABLE TO WINCH, SEE SHEET 2, REMOVE SCREW FROM CABLE DOG, INSERT CABLE DOG INTO THE CENTER OF THE CABLE WINCH REEL THROUGH LARGE HOLE IN THE HOLLOW REEL CORE INSERT CABLE DOG SET SCREW WITH SECURING NUT THROUGH THE HOLLOW AXLE OF THE WINCH REEL AXLE AND SCREW LOOSELY INTO CABLE DOG. INSERT THE LIFTING CABLE THROUGH THE SMALL HOLE IN THE REEL CORE AND THROUGH THE HOLE IN THE CABLE DOG, ALLOWING APPROXIMATELY SIX INCHES OF CABLE TO EXTEND THROUGH CABLE DOG. TIGHTEN SET SCREW UNTIL CABLE IS TIGHTLY SECURED IN CABLE DOG (150 TO 200 POUND FEET). TIGHTEN CABLE DOG SECURING NUT TIGHTLY (200 POUND FEET).
  4. WARNING: ONCE THE DEAD-END, ITEM 7, HAS BEEN INSTALLED IT SHALL NOT BE REUSED. REUSE OF A DEAD-END CAN RESULT IN SLIPPAGE OF THE DEAD-END CAUSING DEATH OR INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.
  5. DRIVE EXTENSION HANDLE, ITEM 14, ONTO SHORT BRAKE HANDLE OF ITEM 2.
  6. LOCATE DEAD-END, ITEM 7, SO THAT EYE IS 134 FEET FROM UPPER END OF GUY (ASSUMING LEVEL GROUND). EXTEND CABLE, ITEM 3, FROM WINCH, ROUTE THROUGH BLOCK, ITEM 4, AND PULL UP TENSION BEFORE ATTACHING TO ANCHOR WITH ROPE CLIPS, ITEM 6.
- WARNING: DO NOT ATTEMPT TO RAISE ANTENNA WITH WINCH/BLOCK AND TACKLE WITHOUT COUNTERWEIGHT.
8. CAUTION: THE WINCH BRAKE IS AN EMERGENCY BRAKE OR STATIC HOLDING DEVICE. IT SHOULD NOT BE USED IN NORMAL LOWERING OF THE ANTENNA. IF USED AS AN EMERGENCY BRAKE, APPLY FORCE SLOWLY TO PREVENT SUDDEN STOPS.



B104 668 4

Figure 2-3. Installation of Erection Kit (Sheet 1 of 2).

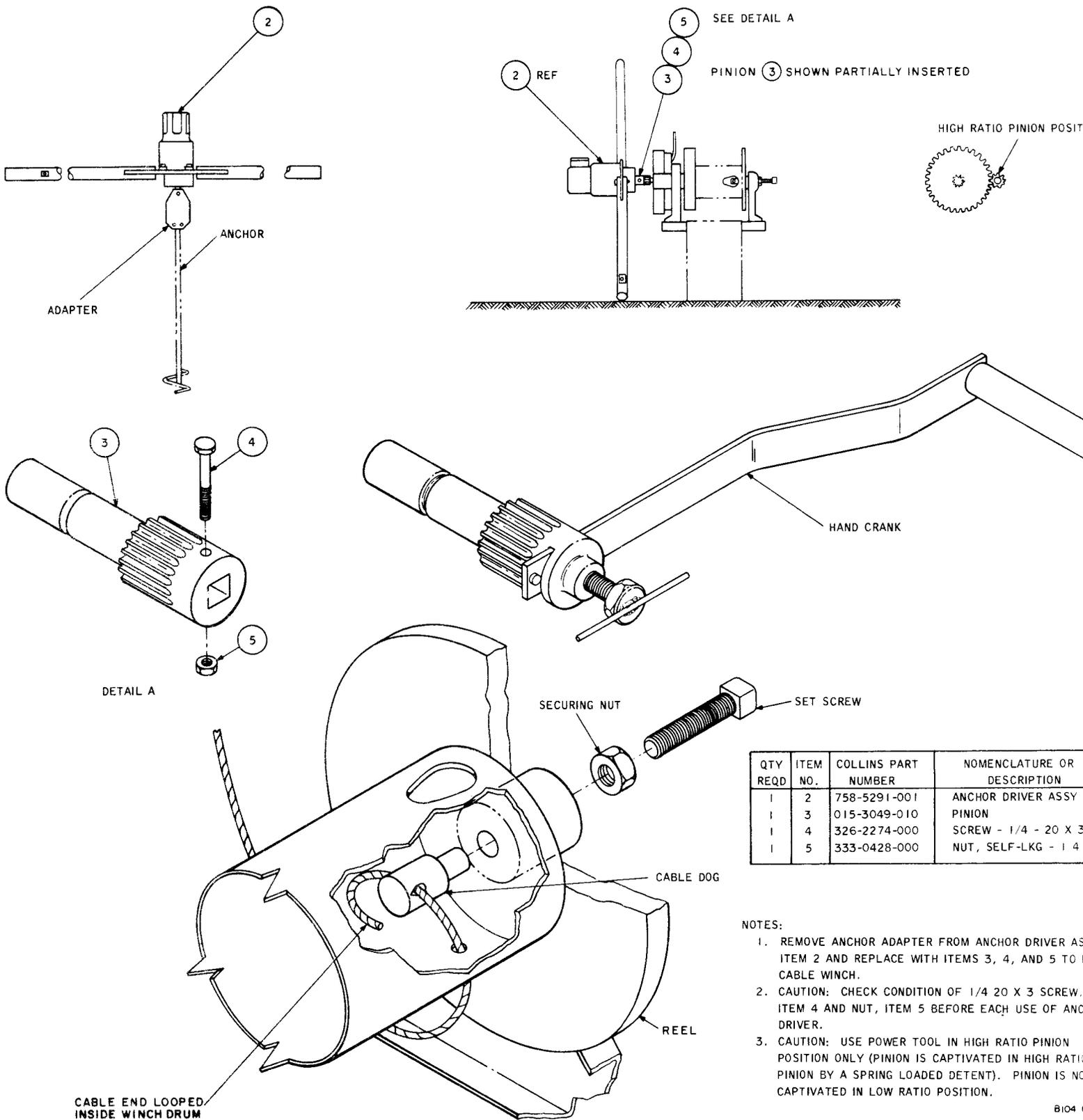
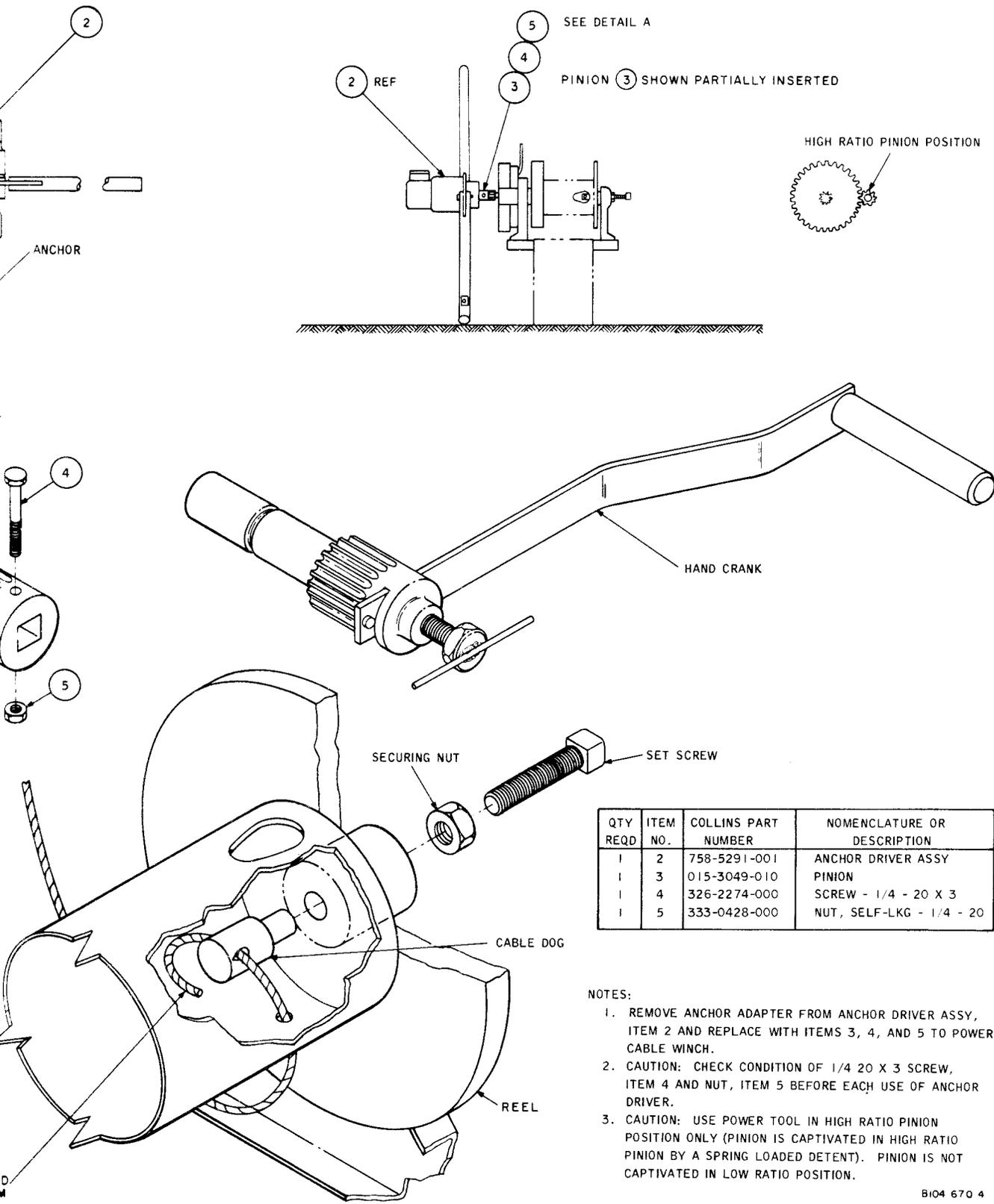


Figure 2-3. Installation of Erection Kit (Sheet 2 of 2).



QTY REQD	ITEM NO.	COLLINS PART NUMBER	NOMENCLATURE OR DESCRIPTION
1	2	758-5291-001	ANCHOR DRIVER ASSY
1	3	015-3049-010	PINION
1	4	326-2274-000	SCREW - 1/4 - 20 X 3
1	5	333-0428-000	NUT, SELF-LKG - 1/4 - 20

- NOTES:
1. REMOVE ANCHOR ADAPTER FROM ANCHOR DRIVER ASSY, ITEM 2 AND REPLACE WITH ITEMS 3, 4, AND 5 TO POWER CABLE WINCH.
  2. CAUTION: CHECK CONDITION OF 1/4 20 X 3 SCREW, ITEM 4 AND NUT, ITEM 5 BEFORE EACH USE OF ANCHOR DRIVER.
  3. CAUTION: USE POWER TOOL IN HIGH RATIO PINION POSITION ONLY (PINION IS CAPTIVATED IN HIGH RATIO PINION BY A SPRING LOADED DETENT). PINION IS NOT CAPTIVATED IN LOW RATIO POSITION.

B104 670 4

Figure 2-3. Installation of Erection Kit (Sheet 2 of 2).

reel and screw loosely into the cable dog. Insert one end of the hoisting cable through the small hole in the reel core and through the hole in the cable dog, allowing approximately six inches of cable to extend inside cable drum. Tighten cable dog setscrew until cable is tightly secured in the cable dog (tighten to a 150- to 200-pound-foot torque value). Tighten securing nut on set-screw to a torque value of 200 pound-feet.

**Warning**

Do not stand under tower when raising or lowering the tower.

**Caution**

Reel a minimum of two turns onto the reel before applying any tension to the hoisting cable. This ensures that the cable will not be damaged by the edges of the hole.

**Caution**

Attach counterweight to erecting winch block and tackle prior to its use in erecting tower. Failure to use counterweight will allow cable preform to unravel and the tower to drop.

- n. Use the tower erecting winch to pull the tower into a vertical position (attach the hoisting cable to the unpivoted end of the tower). Ensure that the first tower section is vertical. If necessary, adjustment of the tower plumb can be made by adjusting the foundation bolt nuts (item 19, figure 2-1, sheet 2).
- o. Install the erecting kit mast (mast, erection fixture, item 10, figure 2-3, sheet 1) in the tower pivot assembly.
- p. Lower the tower with hoisting guy resting in gin pole fork. Use the erection kit winch until it is horizontal. See figure 2-3, sheet 1.
- q. Extend a tower support (similar to support described in paragraph 2.4., b.), approximately 20 feet out to support the second tower section.
- r. Assemble the second tower section to the first.
- s. Place a third tower section support about 20 feet beyond the second and assemble the third section of the tower.
- t. In similar fashion, assemble the remaining tower sections. Apply proper torque to tower bolts and install Palnuts.
- u. Attach the 4-point guy anchor bracket assembly to the third tower section at a point 45 feet

3-3/4 inches from the bottom of the first section of the tower. See figure 2-1, sheet 2, view A-A.

- v. Attach the rotator plate (item 16, figure 2-1, sheet 2, view D-D) and the 3-point guy anchor assembly on the top of the fifth section of the tower. Check for correct orientation of the rotator plate.
- w. Select one of the long guy cables (item 8) as the lifting guy. Attach looped cable end and thimble to rotor plate (item 16) at the top of the tower, using shackle and pin (item 39). Place cable in gin pole fork.
- x. From the attachment point on the tower rotator plate, measure off 134 feet along the cable. At the 134-foot cable point, attach erecting kit dead-end preform (item 7, figure 2-3, sheet 1), so that its eye is located at the 134-foot point. Do not cut cable extending through the preform dead end.

**Warning**

Once the erecting kit dead-end preform has been installed, it shall not be reused. Reuse of a dead-end preform may result in slippage of the dead-end preform causing death or injury to personnel and damage to equipment.

**Note**

Do not allow lifting cable insulators to catch in the erection mast fork.

- y. Secure the marked lifting guy cable in the erecting kit mast fork (114 feet of the cable must extend from the fork on the tower side).
- z. Attach the short, four lower guy cable assemblies (item 7, figure 2-1, sheet 2) to their respective tower anchor points. Attach the two side guys and the one under the tower to their respective ground anchor points.
- aa. Adjust tension so the two lower side guys are equally taut (200 pounds, ±15 percent) and the tower centers.
- ab. Attach the two long rear guy cables to their respective tower and ground anchor points.
- ac. Extend winch cable (item 3) from erecting winch; route cable through block and counterweight assembly as shown in figure 2-3, sheet 1. Attach free end of cable to ground anchor using rope clips (item 6) and thimble (item 9).
- ad. Attach block and counterweight to dead end located at the 134-foot point on the lifting

## Installation

guy. Pull up slack in the winch and lifting guy cable.

### **Caution**

The winch must have a minimum of two wraps of cable past the cable retaining hole before tension is applied to the cable. This ensures that the cable will not be damaged by the edges of the hole.

### **Warning**

Do not stand under tower when raising or lowering the tower.

- ae. The builder should check the tower assembly and installation by erecting and lowering the tower prior to installation of the rotator, array and accessories. To erect the tower:
1. Ensure that all guys, except those attached to the upper side of the lowered tower, are attached to the correct anchor facilities.
  2. Be sure that the tension is equal on the two side guys (in line with the pivot shaft) and the tower is centered.

### **Caution**

The back guy assembly must not become taut before tower is fully erect.

3. Use the upper guy cable assembly (in the fork of the tower erecting kit mast), to pull the tower up to an erect position.
4. Check the tower to be sure that it is vertical ( $\pm 1/2$  inch). If out of tolerance, adjust the guy turnbuckles.
5. Adjust guy tension to 1300 pounds,  $\pm 15$  percent, on the upper guy assemblies, and 200 pounds,  $\pm 15$  percent, on the lower guy assemblies.
6. Lower the tower by reversing the erection procedure. Place a support 60 feet from the base of the tower in order to clear the array and support the lowered tower.

## **25 INSTALLATION OF ROTATOR KIT, CONTROL KIT AND RF TRANSMISSION LINE KIT**

### **Caution**

Before installing the rotator fill the gearcase with oil up to the oil level plug (approximately seven-eighths of a gallon). See figure 2-4. Use Texaco

Meropa No. 1 or CPN 005-1269-020. Check to see that the rotator has been greased with any of the following greases: ANG-25; CPN 005-0423-000; Air Shell No. 7A; or Super Mil 72832 (American Oil Co.). See section 5 for alternate oils.

### **Note**

The rotator heater kit is recommended for operation where temperatures fall below  $+10^{\circ}\text{F}$  ( $-12.2^{\circ}\text{C}$ ). See figure 2-5.

If the rotator heater kit is not used and temperatures are expected to fall below  $+10^{\circ}\text{F}$ , drain rotator oil and replace with Molub-Alloy Artic Gear Oil (Imperial Oil and Grease Co., 6505 Wilshire Blvd., Los Angeles, California).

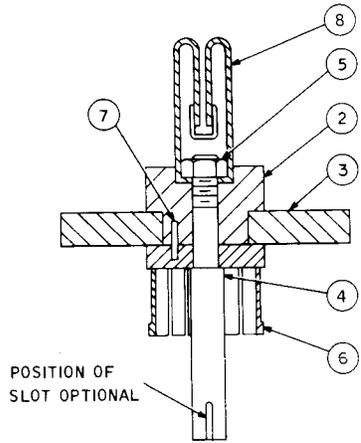
- a. Install the rotator to the rotator platform. See figures 2-4 and 2-6.
- b. Install the rotator motor and switch assembly on the gear case. See figures 2-4, 2-6, and 2-7 and read pertinent emphasis notes.

### **Caution**

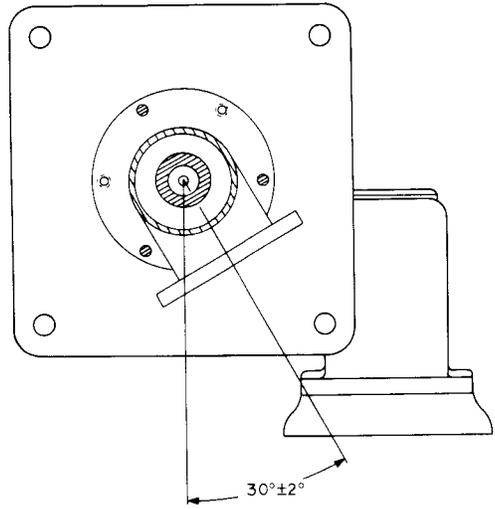
If motor drive key slides toward motor, wedging results. Motor must fit freely into rotator recess. Coat mounting bolts with thread lubricant and insert and tighten to 25-pound-foot torque value.

- c. Install the conduit on the hinged, lower side of the tower. The conduit has a clamping facility J-box at each end and is fastened in place with the steel straps (item 28, figure 2-1, sheet 2) furnished with the tower kit.
- d. Attach the breaker box (A5), item 20, and rotator control box, item 2, to the tower legs. See figure 2-7.
- e. Use a fish tape to pull the rotator control cable assembly through the conduit. Clamp it at both ends using the cable clamping J-box.
- f. Connect the electrical wires to the terminals in the J-boxes and to the rotator motor and switch assembly. See figure 2-7.
- g. If the obstruction lighting kit is to be installed, see figure 2-8.
- h. Apply power and operate the local control facility on the rotator control J-box to ensure that the rotator functions properly. Stop the rotator with the key slot located to the left of a person standing at the top end of the tower and facing the rotator.

- i. Attach the rf transmission line to the coaxial input of the rotator. Use a 3-1/8- to 1-5/8-inch reducer and a coaxial elbow (CPN 013-1506-000 and 013-1301-020) furnished with the transmission line kit. See figure 2-9, items 2 and 3. Use O-ring supplied with reducer. Strap transmission line to tower with steel straps (item 28, figure 2-1).

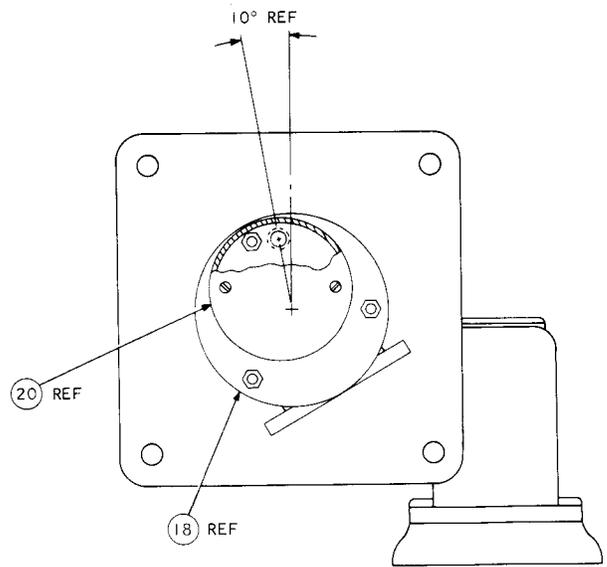


DETAIL A

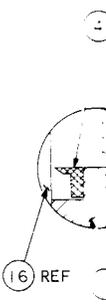


SECTION A-A

ITEM NO.	COLLINS PART NO.	QTY	DESCRIPTION
1	766-2374-001	1	CONNECTOR ASSEMBLY
2	766-2376-001	1	SOCKET, CLIP
3	762-6316-001	1	INSULATOR, TOP
4	766-2406-001	1	SCREW SPECIAL
5	334-1275-000	1	NUT, SELF LOCKING, HEX
6	766-2375-001	1	CONTACT, SPRING
7	311-0595-000	1	PIN, SPRING
8	265-1255-010	1	CLIP

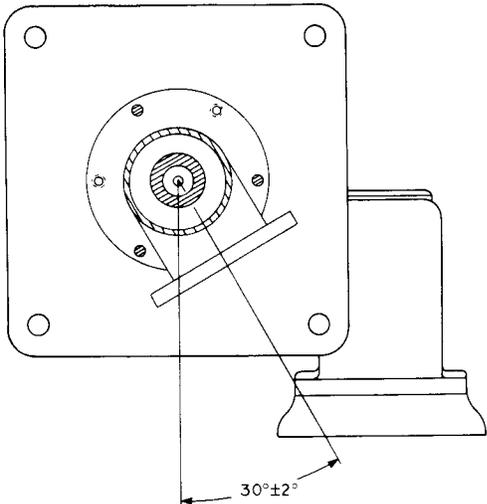


VIEW B-B

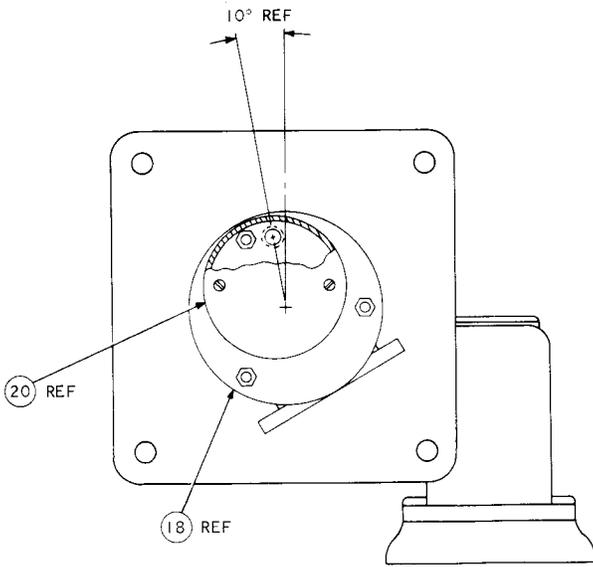


OIL DR

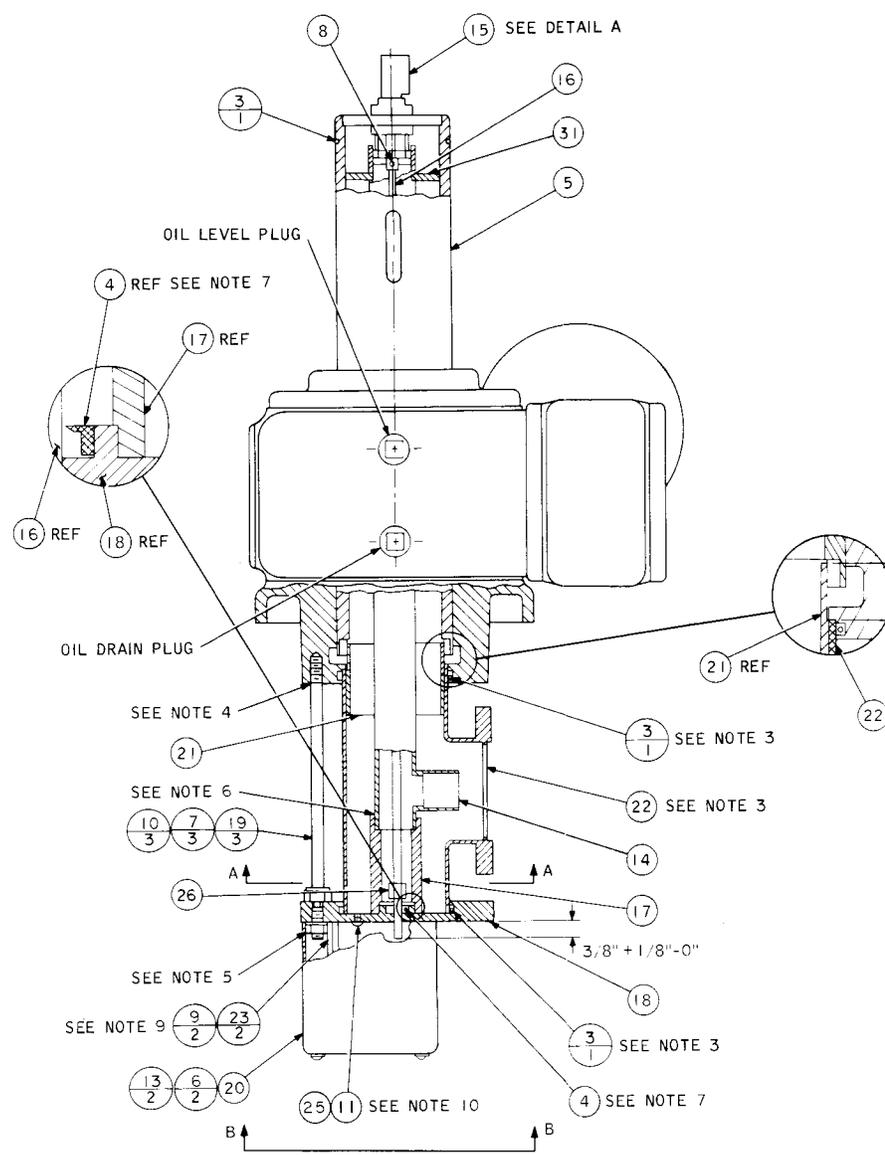
SEE V



SECTION A-A

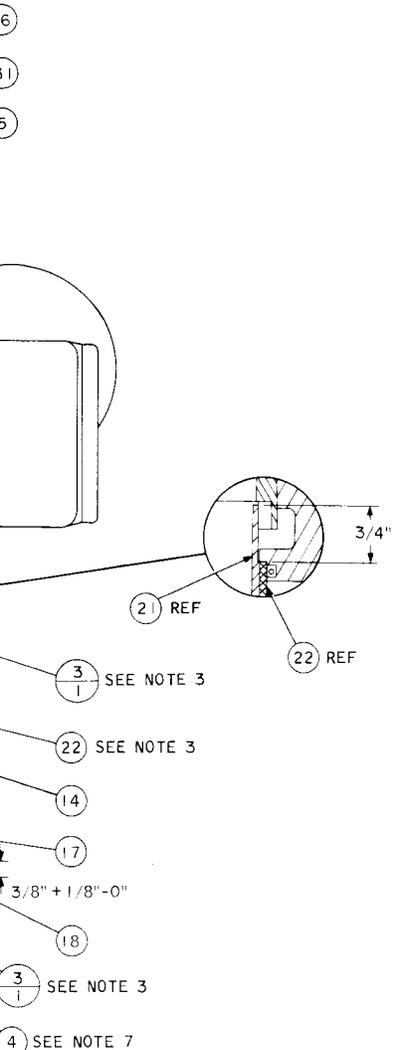


VIEW B-B



-001  
 CROSS HATCHED SECTION ROTATED 60°  
 CCW AS VIEWED FROM BELOW

TAIL A



ITEM NO.	COLLINS PART NO.	QTY	DESCRIPTION
1	766-2371-001	1	ROTATOR ASSY
2			
3	200-2338-040	3	GASKET, O RING
4	137-0083-010	1	SEAL, OIL
5	990-0927-010	1	GEAR, REDUCER
6	310-0072-000	2	WASHER, LOCK NO 8
7	310-0290-000	3	WASHER, LOCK 5/16
8	311-0419-000	1	PIN 1/16 X 3/8
9	312-0097-000	2	STUD 8-32 X 3/4
10	313-0033-000	6	NUT, HEX 5/16-18
11	330-4053-530	1	SCREW, 10-32 X 1/4
12			
13	343-0190-000	2	SCREW, 8-32 X 5/8
14	766-2370-003	1	COND, INNER
15	766-2374-001	1	CONN, ASSY
16	766-2405-001	1	ROD, DRIVE
17	766-2414-001	1	INS, CONDUCTOR
18	766-2415-001	1	PLATE, BASE
19	766-2416-001	3	ROD, TIE
20	766-2417-002	1	COVER, SWITCH
21	766-2418-001	1	CONTACT, OUTER CONDUCTOR
22	766-2419-003	1	TEE, OUTER CONDUCTOR
23	766-2422-001	2	STANDOFF, HEX
25	766-2871-001	1	TAG
26	015-0257-000	1	COUPLING
27	013-0233-000	1	GASKET, O RING
28	310-0292-000	6	WASHER, LOCK 3/8
29	313-0004-000	6	NUT, 3/8-16
30	326-2330-000	6	SCREW, HEX 3/8-16 X 3/4
31	774-6332-001	1	INSULATOR

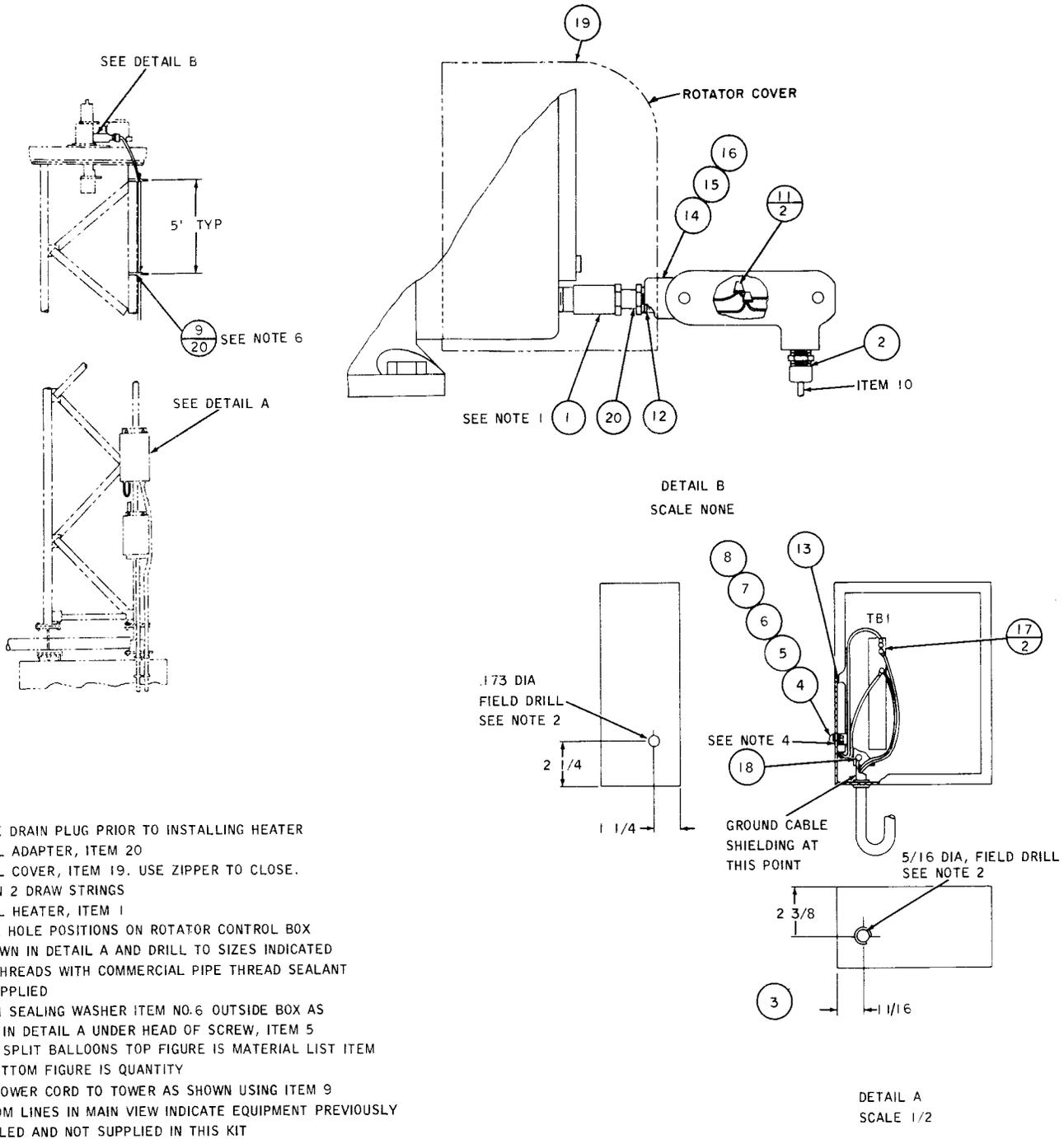
NOTES:

1. INTENTIONALLY LEFT BLANK
2. IN ALL SPLIT BALLOONS TOP FIGURE IS MATERIAL LIST ITEM AND BOTTOM FIGURE IS QUANTITY
3. COAT ENDS OF TEE, ITEM 22, O-RINGS, ITEM 3, AND O-RING GROOVES WITH SEALING COMPOUND, 005-0318-000
4. COAT THREADS OF RODS, ITEM 19, WITH SEALANT 005-0548-000 AND BOTTOM INTO ITEM 5.
5. INSTALL TIE RODS, ITEM 19, AS SHOWN, AND WITH HEX NUTS, ITEM 10, BACKED OFF TO CLEAR, TIGHTEN LOWER HEX NUTS TO 100 ±10 INCH POUNDS TORQUE. THEN TIGHTEN UPPER HEX NUTS DOWN ON BASE PLATE, ITEM 18, TO 100 INCH POUNDS TORQUE. APPLY SEALANT 005-0548-000 TO THREADS OF ALL SIX NUTS.
6. BOND ITEM 14 TO ITEM 17 USING ADHESIVE 005-0569-000
7. COAT SEAL, ITEM 4, WITH GREASE 005-0201-000 AND INSTALL WITH EXPOSED METAL SURFACE DOWN.
8. PRESS PIN, ITEM 8, INTO ROD, ITEM 16, SO THAT AN EQUAL AMOUNT IS EXPOSED ON EACH SIDE.
9. COAT STUD ITEM 9 WITH SEALER 005-0548-000 BEFORE ASSEMBLY INTO ITEM 18
10. REMOVE SCREW, ITEM 11 IF BALUN NOT PRESSURIZED
11. ON ASSEMBLY, BE CERTAIN KEY SLOT IN OUTPUT SHAFT OF ITEM 5 IS ORIENTED AS SHOWN.
12. INSERT ROD, ITEM 16, INTO INNER CONDUCTOR, ITEM 14, BEFORE ASSEMBLY OF CONDUCTOR INSIDE ROTATOR SHAFT. LOCATE AND SECURE COUPLING, ITEM 26, AS SHOWN 1-1/16 INCH FROM PLAIN END OF ROD.
13. ITEMS 27, 28, 29, AND 30 ARE SHIPPED IN A PLASTIC BAG ATTACHED TO OUTER CONDUCTOR TEE, ITEM 22, AND ARE USED TO CONNECT TOWER RF TRANSMISSION LINE.

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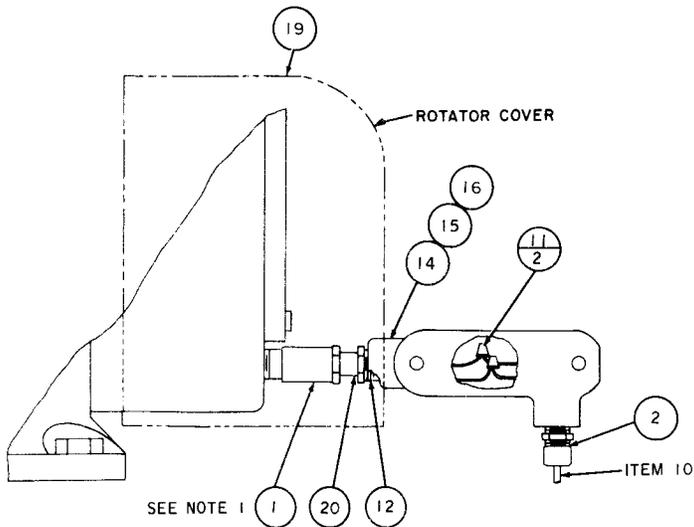
Figure 2-4. Rotator Assembly.

QTY REQD	ITEM NO	
1	1	7
1	2	0
1	3	2
1	4	1
1	5	3
1	6	3
1	7	3
1	8	3
20	9	4
105.0	10	4
2	11	3
1	12	0
1	13	2
1	14	0
1	15	0
1	16	0
2	17	3
1	18	3
1	19	6
1	20	7



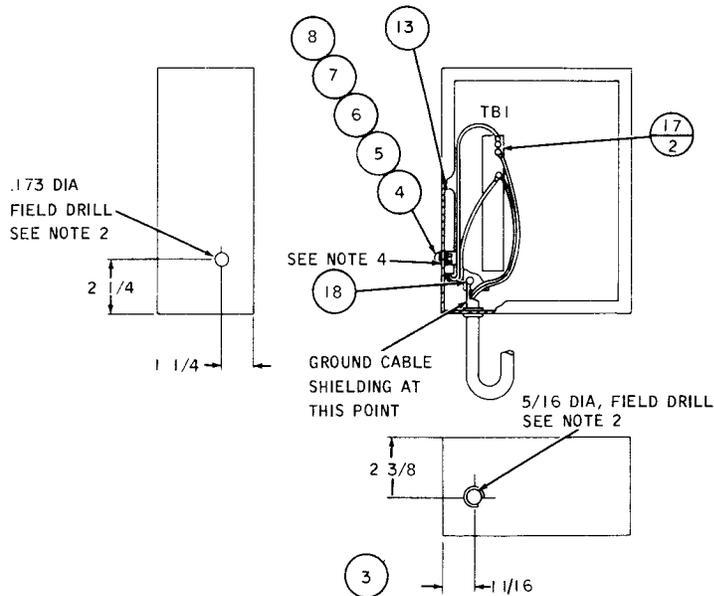
- NOTES:
1. REMOVE DRAIN PLUG PRIOR TO INSTALLING HEATER
  2. INSTALL ADAPTER, ITEM 20
  3. INSTALL COVER, ITEM 19. USE ZIPPER TO CLOSE. TIGHTEN 2 DRAW STRINGS
  4. INSTALL HEATER, ITEM 1
  5. LOCATE HOLE POSITIONS ON ROTATOR CONTROL BOX AS SHOWN IN DETAIL A AND DRILL TO SIZES INDICATED
  6. COAT THREADS WITH COMMERCIAL PIPE THREAD SEALANT NOT SUPPLIED
  7. ATTACH SEALING WASHER ITEM NO.6 OUTSIDE BOX AS SHOWN IN DETAIL A UNDER HEAD OF SCREW, ITEM 5
  8. IN ALL SPLIT BALLOONS TOP FIGURE IS MATERIAL LIST ITEM AND BOTTOM FIGURE IS QUANTITY
  9. LACE POWER CORD TO TOWER AS SHOWN USING ITEM 9
  10. PHANTOM LINES IN MAIN VIEW INDICATE EQUIPMENT PREVIOUSLY INSTALLED AND NOT SUPPLIED IN THIS KIT

Figure 2-5. Rotator  
 Revised 15 July 19



QTY REQD	ITEM NO	COLLINS PART NUMBER	DESCRIPTION
1	1	711-0166-010	HEATER
1	2	019-1087-070	CONNECTOR
1	3	201-0001-000	GROMMET
1	4	150-1546-000	CLAMP
1	5	343-0189-000	SCREW 8-32 UNC X 1/2 PPH
1	6	310-0442-000	WASHER, SEALING
1	7	310-0048-000	WASHER, FLAT-NO. 8
1	8	333-0381-000	NUT, SELF-LOCKING 8-32
20	9	435-1074-000	CLAMP, CABLE TIE
105.0	10	439-1268-000	CABLE (FT)
2	11	304-0907-000	NUT, WIRE
1	12	019-1560-060	REDUCER, THREADED
1	13	267-0258-010	SWITCH, THERMO
1	14	019-1537-020	FITTING
1	15	019-1537-030	COVER
1	16	019-1537-170	GASKET
2	17	304-0252-000	LUG, TERMINAL
1	18	304-0250-000	LUG, TERMINAL
1	19	011-0150-010	COVER, ROTATOR
1	20	774-6276-001	HEATER ADAPTER

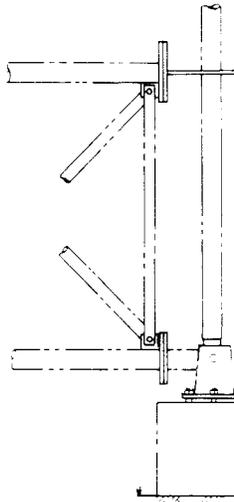
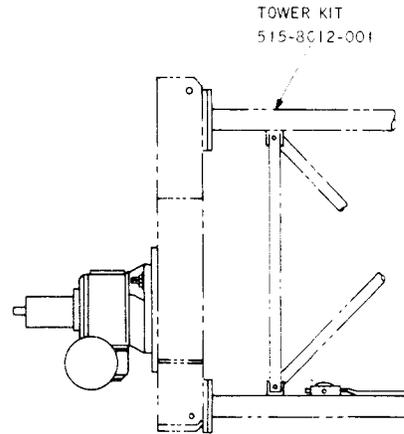
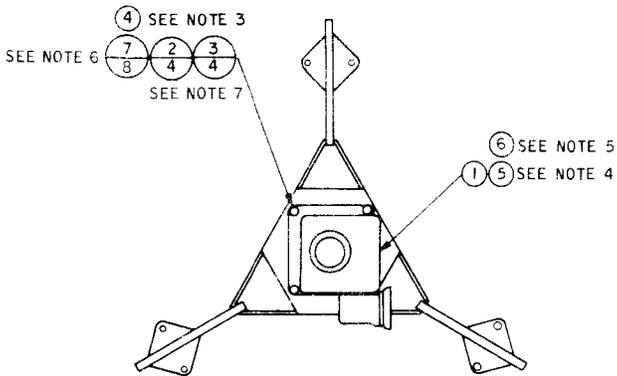
DETAIL B  
SCALE NONE



DETAIL A  
SCALE 1/2

Figure 2-5. Rotator Heater Kit Installation.

QTY REQD	ITEM NO.	COLLINS PART NUMBER	DESCRIPTION
1	1	766-2371-001	ROTATOR ASSY
4	2	326-1532-000	SCREW, HEX-3/4-10X2 3/4
4	3	334-0955-000	NUT, SELF-LOCKING-3/4-10
10	4	766-2425-001	SHIM
1	5	SEE NOTE 1	KEY
1	6	005-1269-020	OIL
8	7	310-0762-030	WASHER-FLAT



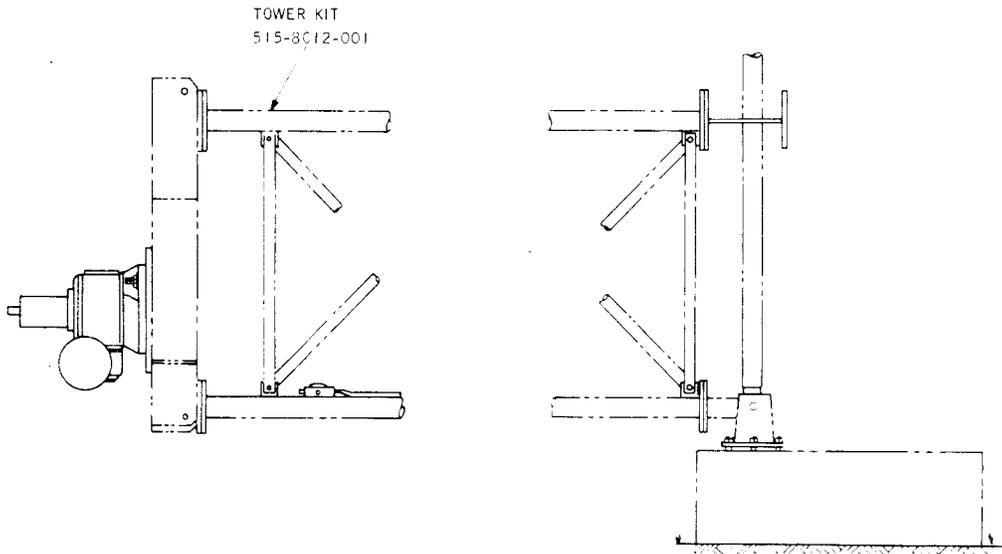
NOTES:

1. USE KEY, CPN 766-2440-001 ON ANTENNAS MFG PRIOR TO SEPT. 1966.  
USE KEY, CPN 764-7278-001 ON ANTENNAS MFG SUBSEQUENT TO SEPT. 1966.
2. IN ALL SPLIT BALLOONS TOP FIGURE IS ITEM NO. AND BOTTOM FIGURE IS QUANTITY.
3. SHIM AS REQUIRED BETWEEN TOWER AND ITEM 1, USING ITEM 4, IF ITEM DOES NOT SET FLAT ON TOWER.
4. TEMPORARILY ATTACH KEY, ITEM 5, TO SHAFT OF ROTATOR ASSEMBLY, ITEM 1, PENDING FURTHER ASSEMBLY.
5. FILL GEAR BOX TO OIL LEVEL PLUG WITH OIL, ITEM 6, WITH ASSEMBLY, ITEM 1 IN UPRIGHT POSITION BEFORE ATTACHING TO TOWER.
6. PLACE WASHER, ITEM 7, BETWEEN ROTATOR MOUNTING BASE AND NUT ITEM 3, AND UNDER HEAD OF SCREW.
7. TIGHTEN NUTS EVENLY TO 320 LB. FT. TORQUE.

Figure 2-6. Installation of F

DESCRIPTION
ROTATOR ASSY
SCREW, HEX-3/4-10X2 3/4
NUT SELF-LOCKING-3/4-10
- 1
- 1
- 1
WASHER-FLAT

⑥ SEE NOTE 5  
 ① ⑤ SEE NOTE 4



ANTENNAS MFG PRIOR TO SEPT. 1966.  
 ANTENNAS MFG SUBSEQUENT TO SEPT. 1966.  
 FIGURE IS ITEM NO. AND BOTTOM FIGURE IS QUANTITY.  
 FOR ITEM 1, USING ITEM 4, IF ITEM DOES

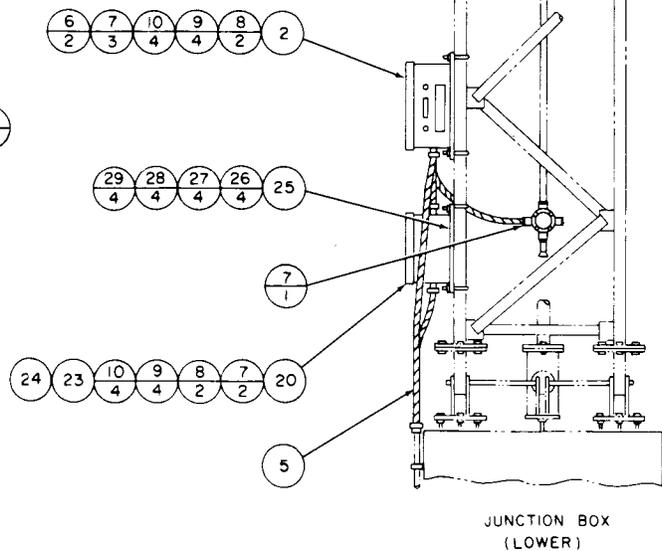
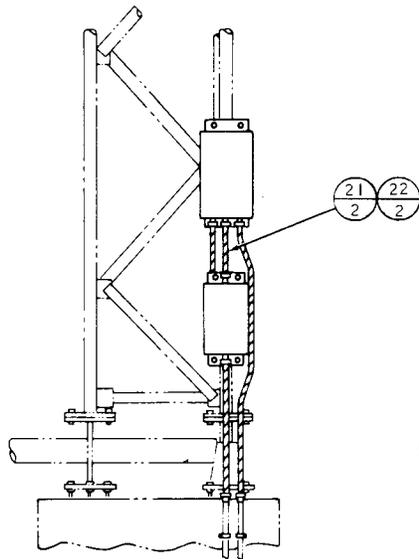
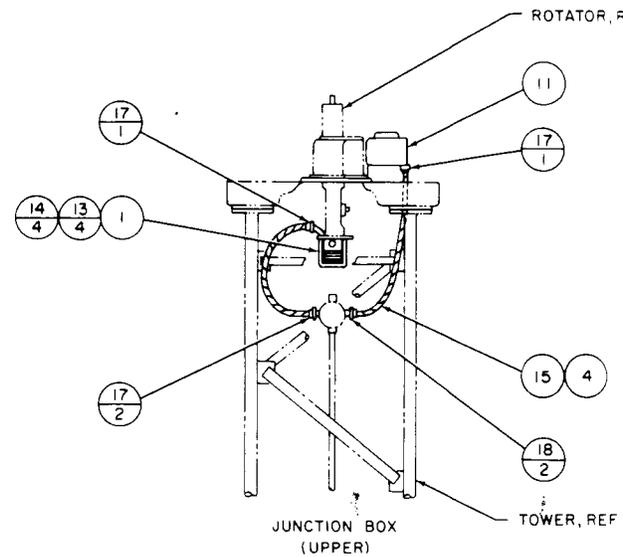
3. TO SHAFT OF ROTATOR ASSEMBLY,  
 ASSEMBLY.  
 5 WITH OIL, ITEM 6, WITH ASSEMBLY, ITEM 1  
 ATTACHING TO TOWER.  
 ROTATOR MOUNTING BASE AND NUT ITEM 3,

FT. TORQUE .

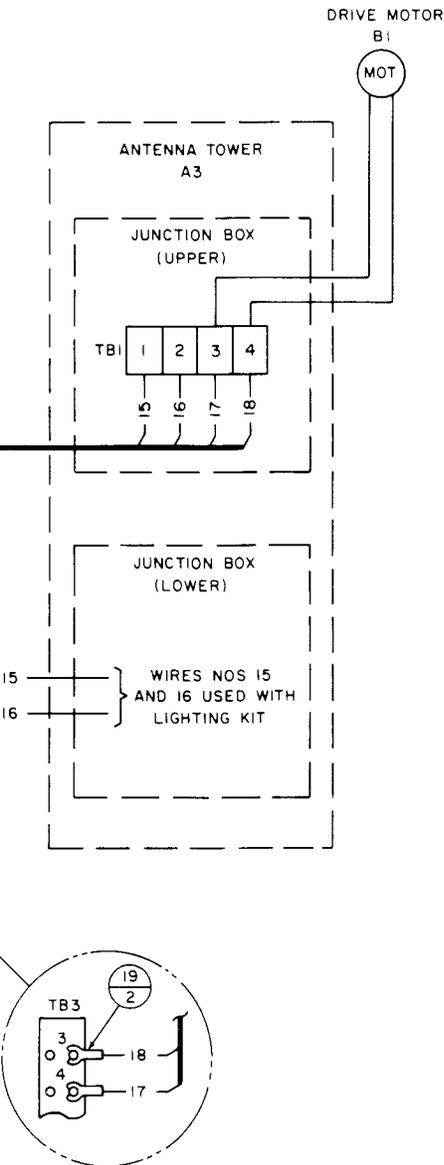
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Figure 2-6. Installation of Rotator Kit.

QUANTITY REQD	ITEM NUMBER	COLLINS PART NUMBER	DESCRIPTION
1	1	766-2379-001	SWITCH ASSY A4
1	2	766-2378-001	BOX, ROTATOR CONTROL A2
1	3	766-2389-001	PANEL, REMOTE CONTROL A1
1	4	766-2390-001	CABLE ASSY
12.0 FT	5	018-1089-000	CONDUIT, FLEXIBLE-3/4 DIA.
2	6	766-2428-001	BRACKET, MOUNTING
6	7	019-0599-000	FITTING, CONDUIT
4	8	766-2355-001	U-BOLT
8	9	334-1277-000	NUT, HEX.-3/8-16
8	10	310-0292-000	WASHER, LOCK-3/8
1	11	230-0551-010	MOTOR, ELEC
28	12	304-0252-000	LUG, TERMINAL
4	13	343-0168-000	SCREW, 6-32 X 5/16
4	14	310-0282-000	WASHER, LOCK NO. 6
8.0 FT	15	018-1088-000	CONDUIT, FLEXIBLE-1/2 DIA.
	16		
4	17	019-0598-000	FITTING, CONDUIT-1/2
2	18	019-0700-000	FITTING, REDUCER
2	19	304-0253-000	LUG, TERMINAL
1	20	266-0186-010	BOX, BREAKER A5
2.0	21	439-1564-000	WIRE, A14PC00X0XXX (FT)
2.0	22	439-1550-000	WIRE, A14PC00X9XXX (FT)
1	23	264-0170-000	FUSE, 30AMP
1	24	266-0186-020	HUB, 3/4
1	25	766-2437-001	PLATE, MOUNTING
4	26	343-0266-000	SCREW, 1/4-20 X 5/8
4	27	310-0288-000	WASHER, LOCK-1/4
4	28	313-0082-000	NUT, 1/4-20
4	29	310-0050-000	WASHER, FLAT-1/4



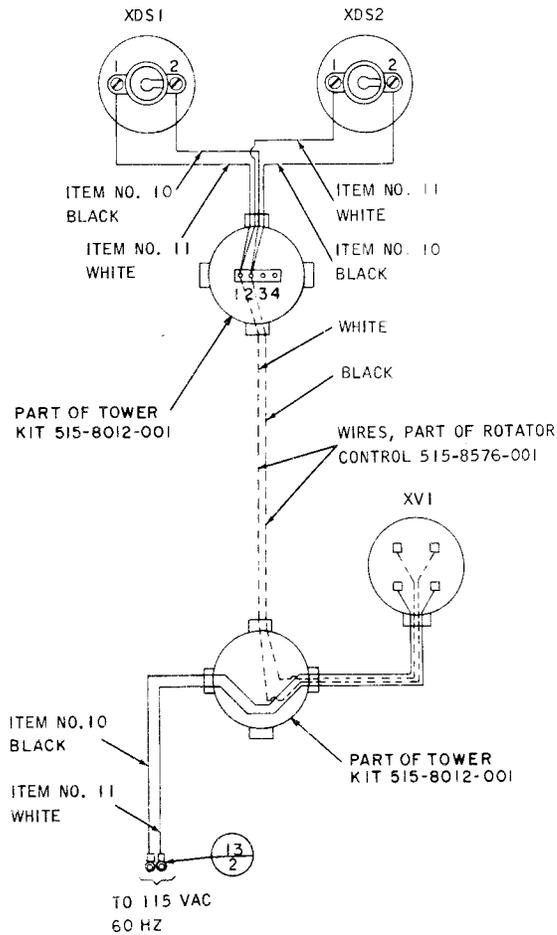
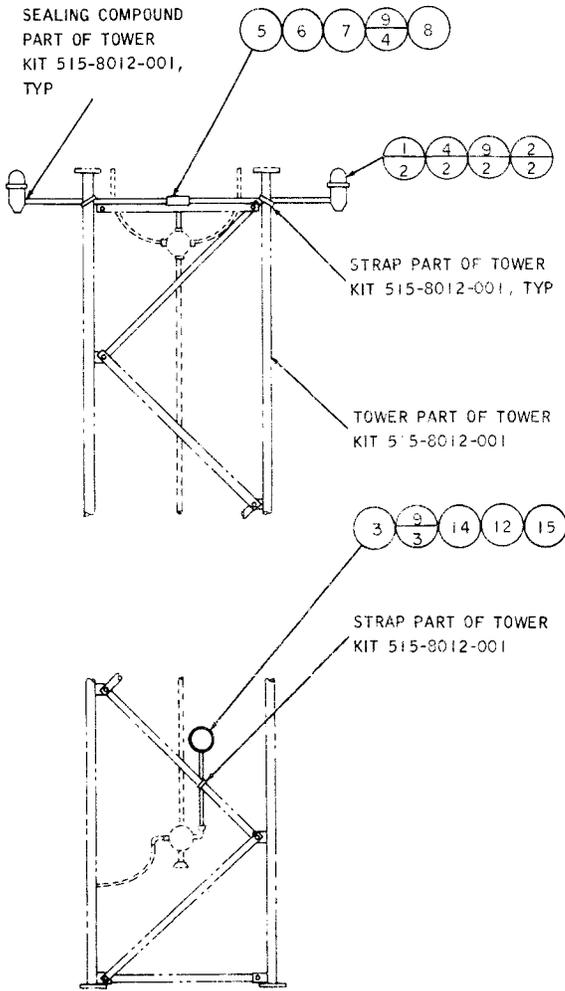




WIRING DATA			
WIRE NO.	COLOR CODE	FROM	TO
1	A20PB00X0XXX	A4TB2-7	A2TB2-4
2	A20PB00X1XXX	A4TB2-6	A2TB2-3
3	A20PB00X2XXX	A4TB2-5	A2TB2-7
4	A20PB00X3XXX	A4TB2-4	A2TB2-6
5	A20PB00X4XXX	A4TB2-3	A2TB2-5
6	A20PB00X5XXX	A4TB2-2	A2TB2-2
7	A20PB00X6XXX	A4TB2-1	A2TB1-6
8	A20PB00X7XXX	A4TB1-7	A2TB2-9
9	A20PB00X8XXX	A4TB1-6	A2TB2-8
10	A20PB00X9XXX	A4TB1-5	A2TB1-4
11	A20PB00X90XX	A4TB1-4	A2TB1-8
12	A20PB00X91XX	A4TB1-3	A2TB1-9
13	A20PB00X92XX	A4TB1-2	A2TB1-10
14	A20PB00X93XX	A4TB1-1	A2TB2-10
15	A14PC00X0XXX	A3TB1-1	FREE
16	A14PC00X9XXX	A3TB1-2	FREE
17	A14PC00X2XXX	A3TB1-3	A2TB3-4
18	A14P000X5XXX	A3TB1-4	A2TB3-3
19		A1TB1-1	A2TB2-7
20		A1TB1-2	A2TB2-6
21		A1TB1-3	A2TB2-5
22		A1TB1-4	A2TB2-9
23		A1TB1-5	A2TB3-1
24		A1TB1-6	A2TB2-8
25		A1TB1-7	A2TB1-4
26		A1TB1-8	A2TB1-8
27		A1TB1-9	A2TB1-9
28		A1TB1-10	A2TB1-6
29		A1TB1-11	A2TB3-2
30		A1TB1-12	A2TB2-2
31		A1TB2-1	A2TB3-10
32		A1TB2-2	A2TB3-9
33		A1TB2-3	A2TB1-10
34		A1TB2-4	A2TB2-10
35		A1TB2-5	A2TB2-4
36		A1TB2-6	A2TB2-3
37	A14PC00X0XXX	A2J1-1	A5-1
38	A14PC00X9XXX	A2J1-2	A5-2

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Figure 2-7. Installation of Rotator Control Kit.

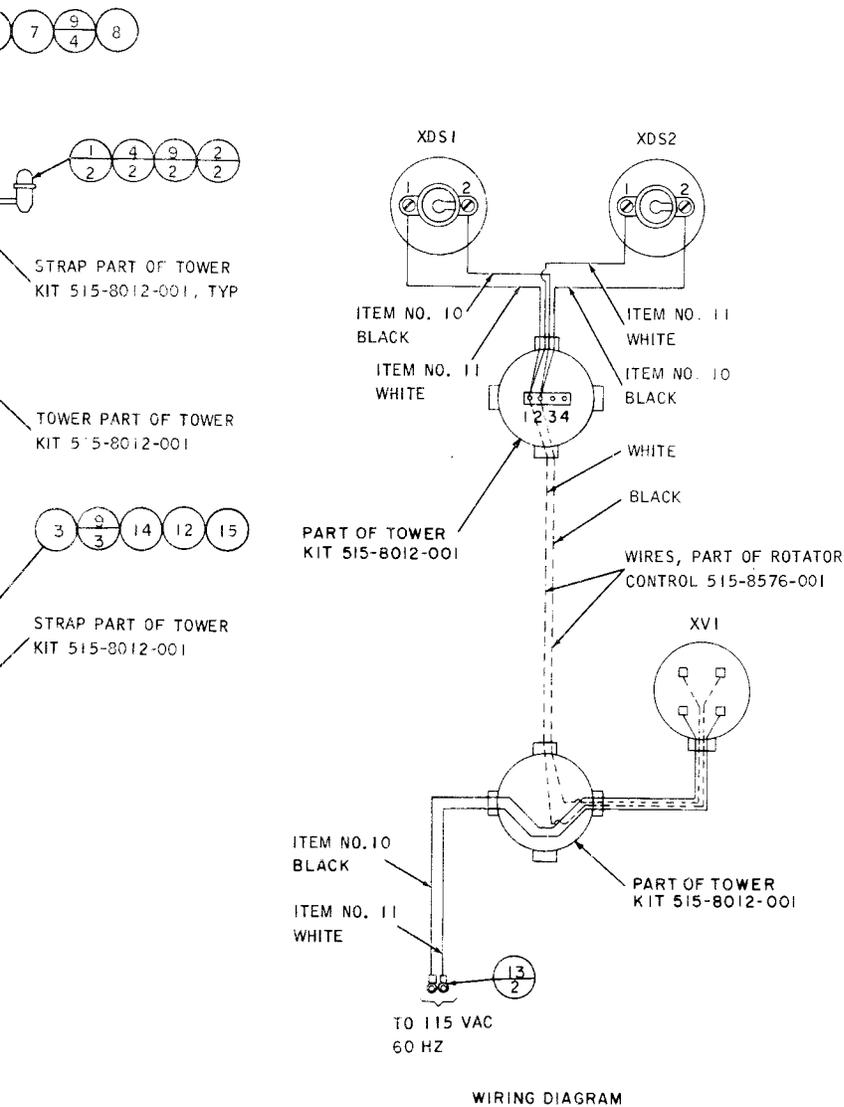


WIRING DIAGRAM

QTY	ITEM NO.	COLLINS PART NUMBER
2	1	262-2178-01
2	2	766-2377-00
1	3	013-1134-00
2	4	262-0615-00
1	5	019-1468-00
1	6	019-0160-00
1	7	019-0161-00
1	8	019-0174-00
9	9	019-0279-00
13.0	10	428-0001-00
13.0	11	428-0002-00
1	12	019-1263-00
2	13	304-0253-00
1	14	766-2377-00
1	15	019-1560-11

- NOTES:
1. INTERPRET DRAWING AS PRESCRIBED BY M.I.
  2. IN ALL SPLIT BALL JOINTS, USE ITEM AND BOTTOM

Figure 2-8. Installation of Lighting



QTY	ITEM NO.	COLLINS PART NUMBER	PART NAME
2	1	262-2178-010	LIGHT, OBSTRUCTION
2	2	766-2377-001	ARM, CONDUIT-LONG
1	3	013-1134-000	CONTROL, PHOTO ELECTRIC
2	4	262-0615-000	LAMP-111W, 115V
1	5	019-1468-000	TEE, CONDUIT-3 4
1	6	019-0160-000	COVER, CONDUIT
1	7	019-0161-000	GASKET, CONDUIT
1	8	019-0174-000	ADAPTER, CONDUIT
9	9	019-0279-000	NUT, LOCK-3 4
13.0	10	428-0001-000	WIRE, ELECTRICAL (FT)
13.0	11	428-0002-000	WIRE, ELECTRICAL (FT)
1	12	019-1263-000	ELBOW, CONDUIT-3/4
2	13	304-0253-000	TERMINAL, LUG
1	14	766-2377-002	ARM, CONDUIT-SHORT
1	15	019-1560-110	BUSHING, REDUCER

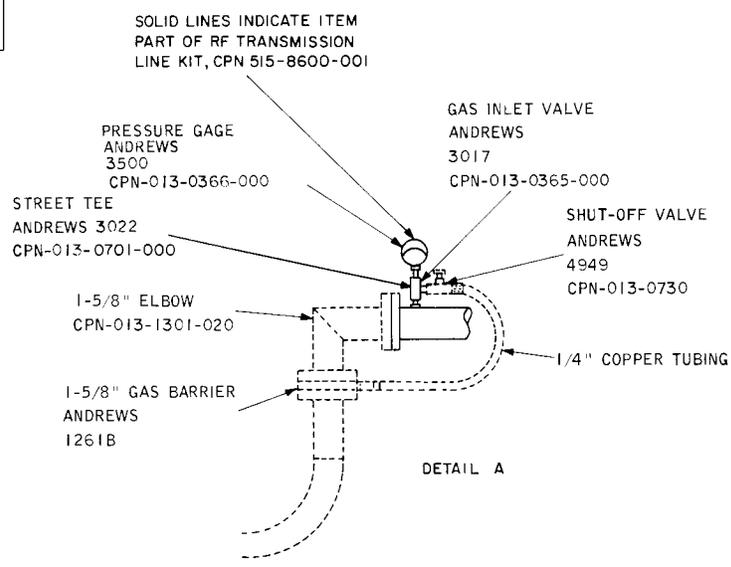
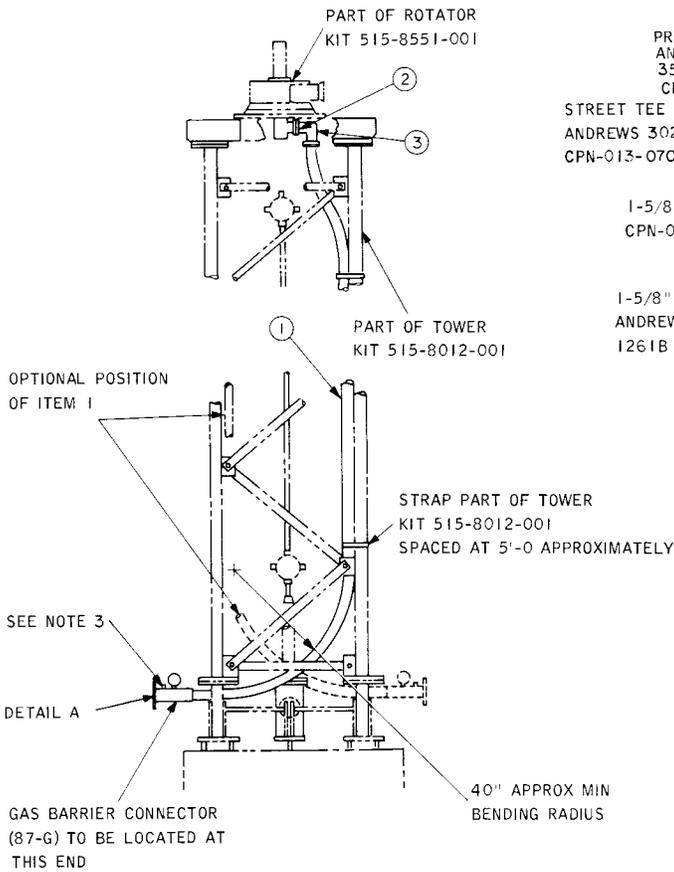
NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. IN ALL SPLIT BALLOONS TOP FIGURE IS MATERIAL LIST ITEM AND BOTTOM FIGURE IS QUANTITY

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Figure 2-8. Installation of Obstruction Lighting Kit.

QTY REQD	ITEM NO.	COLLINS PART NUMBER	DESCRIPTION
1	1	013-1878-020	LINE, RF TRANSMISSION
1	2	013-1506-000	ADAPTER, COAX
1	3	013-1301-020	ELBOW, 90°



- NOTES:
1. TYPICAL CONNECTION OF PRESSURIZED 1-5/8" COAXIAL CABLE TO ANTENNA COAXIAL FEED.
  2. DASHED LINE ITEMS NOT FURNISHED
  3. IF COAXIAL LINE IS NOT PRESSURIZED, LOOSEN 1/8 INCH PIPE PLUG AND TURN COAXIAL CABLE SO THAT HOLE IS ON BOTTOM OF CABLE (FOR MOISTURE DRAIN).

Figure 2-9. Installation of RF Transmission Line Kit.

**Note**

It is recommended that the antenna balun and rf transmission line be pressurized 5- to 7-psi. If the transmission line is not to be pressurized, loosen drain screw (item 11, figure 2-4) and 1/8-inch pipe plug on lower end fitting of lower end of the transmission line end. Rotate end fitting so that the 1/8-inch hole acts as a moisture drain.

**2.6 ANTENNA ARRAY INSTALLATION**

In assembly of the antenna array, use the following torque limits:

- |  |                  |
|--|------------------|
| 10/32-inch bolts                         | 8 pound-inches   |
| 1/4-inch bolts                           | 75 pound-inches  |
| 5/16-inch bolts                          | 132 pound-inches |
| *3/8-inch bolts                          | 25 pound-feet    |
| 3/8-inch bolts that secure plastic parts | 250 pound-inches |

a. The boom of the antenna array is shipped in three sections. The center section, with its

\*On center boom assemblies manufactured subsequent to 11 December 1970 or that have been fitted with Modification Kit A (CPN 620-1317-001), use 600 pound-inches torque on all 3/8-inch bolts except those that secure plastic parts. On the 3/8-inch bolts that secure plastic parts, use 250 pound-inches.

attached tilting platform, should be installed first. Ensure that the locking plungers on the tilting platform operate freely before securing to rotator output shaft. Secure the array tilting platform to the rotator output shaft by means of key, key slot, and key retaining plate on one side and the clamping facility provided on the other side. See figures 2-4 (notes 7 through 12), 2-10 (sheets 1 and 2) or 2-10A, and 2-13 (sheets 1 and 3; notes 5 through 12).

**Note**

The rear antenna boom section has larger dipole element support brackets. Install the rear antenna boom section on the end of the center section under the tower (nearer the tower foundation). When assembling the boom sections, be sure that the transmission line O-rings and the slotted coaxial connectors are in place before tightening the bolts.

- b. Move the antenna boom sections into place and connect each section to the center section. See figures 2-10 through 2-13.
- c. Place the dipole elements and the coupling insulator on the ground near their installation positions on the boom. See figure 2-13, sheet 1.
- d. Insert the coupling insulators into their respective saddle blocks and fasten into place with U-bolts. Be sure each end of the insulator is equidistant from the adjacent saddle blocks and that the insulator drain hole is on top (with the antenna folded under the tower).

**Caution**

Adjust clearance between the saddle, U-bolt, and element insulator and the metal strut to a minimum of one-fourth inch. See figure 2-13, note 13.

- e. After all insulator sections are mounted and adjusted, insert the dipole elements into their coupling insulators with the slotted connectors facing upwards.

**Caution**

Tighten the feed strap bolts to 8-pound-inch torque. Overtightening will strip the threads. Coat the junction of feed

straps and insulator with sealant (CPN 005-0737-000). Keep the insulator drain holes and slotted feed-line connectors pointed up during assembly to ensure drainage of the erected antenna.

- f. Connect the feed strap from the transmission line to the insulator, using bolts and spacers as shown in figure 2-13, sheet 1, view C-C. Tighten the bolts to 8-pound-inch torque.
- g. Install the array release cable as shown in sheet 2 of figure 2-10, sheet 2 of figure 2-10A, and sheet 3 (view E-E) of figure 2-13. Check locking plungers for freedom of operation.
- h. Ensure that all parts are properly torqued.
- i. Install the array sail as shown in figure 2-13, sheet 3, views E-E and F-F.
- j. Install rf coil (static drain), item 34, as shown in figure 2-12, view A-A.

**Note**

Figure 2-12A summarizes parts and mounting hardware that compose the transmission line and balun mounted on the antenna array. These components are also shown on figures 2-10, 2-10A, 2-11, 2-12, and sheets 1 and 2 of figure 2-13.

## 2.7 ERECTION OF THE TOWER

**Warning**

Do not stand under tower or antenna boom when raising or lowering antenna.

**Note**

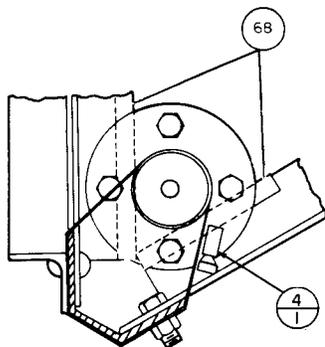
Erect the tower using either a crane or the erection kit. The power tool can be used with the erection kit.

- a. Check all mechanical and electrical connections.

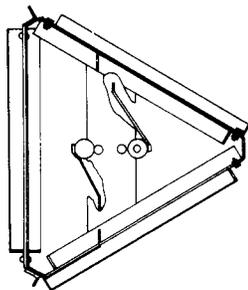
**Caution**

Align the knife switch-type spring connector (on top of the rotator assembly) in a vertical plane to assure proper mating with the knife edge mounted in the array.





SECTION B-B  
2 PLACES



VIEW A-A

COLLINS PART NO.	QTY	ITEM NO.	PART NAME	PART DESCRIPTION
764-9034-001	2	2	WASHER	
013-0994-000	4	3	CLAMP	HOSE 1, 2-9/16
013-0999-000	2	4	CLAMP	HOSE 3-1/16-4
013-1301-020	1	5	MITER	
305-1251-000	2	6	RIVET	3/8 X 7/8
305-1253-000	6	7	RIVET	3/8 X 1-1/8
305-1254-000	3	8	RIVET	3/8 X 1-1/4
305-1255-000	1	9	RIVET	3/8 X 1-3/8
310-0050-000	28	10	WASHER	FLAT - 1/4
310-0052-000	80	11	WASHER	FLAT - 3/8
139-3254-000	2	12	CLAMP	CABLE
310-0288-000	20	13	WASHER	LOCK - 1/4
310-0290-000	4	14	WASHER	LOCK - 5/16
310-0486-000	16	15	WASHER	FLAT - 1/2
310-0487-000	4	16	WASHER	FLAT - 3/4
313-0033-000	4	17	NUT	HEX 5/16-18
333-0379-000	2	18	NUT	SELF LKG 8-32
313-0082-000	12	19	NUT	HEX 1/4-20
313-0235-000	70	20	NUT	HEX 3/8-16
326-2261-000	8	21	SCREW	1/4-20 X 5/8
326-0932-000	4	22	SCREW	1/4-20 X 1-1/4
326-2293-000	4	23	SCREW	5/16-18 X 1-3/8
326-2316-000	51	24	SCREW	3/8-16 X 1
326-2318-000	17	25	SCREW	3/8-16 X 1-1/4
326-2329-000	2	26	SCREW	3/8-16 X 1-1/2
326-2367-000	2	27	SCREW	1/2-13 X 1-1/4
326-2369-000	8	28	SCREW	1/2-13 X 1-1/2
326-2370-000	4	29	SCREW	1/2-13 X 1-3/4
326-2446-000	2	30	SCREW	3/4-10 X 2-3/4
333-0428-000	4	31	NUT	SELF-LKG 1/4-20
333-0442-000	2	32	NUT	SELF LKG 3/4-10
334-0279-000	12	33	NUT	HEX 1/2-13
343-0190-000	2	34	SCREW	8-32 X 5/8
548-3269-002	2	35	BRACKET	ELEM, NO. 11
549-0783-002	4	36	BRACKET	ELEM, NO. 9, 10
549-0926-002	20	37	ANGLE	LACING
549-0928-002	4	38	BLOCK	TIGHTENING
549-2661-002	4	39	BRACE	SUPPORT
549-2708-003	4	40	BRACKET	LINE, SUPPORT
549-2798-004	1	41	SUPPORT	RF LINE NO. 1
549-2799-004	1	42	SUPPORT	RF LINE NO. 2
549-2840-005	1	43	SPREADER	SECTION-TOP
549-2881-002	1	44	SUPPORT	ELEM NO. 11
549-2882-002	2	45	SUPPORT	ELEM NO. 9, 10
549-9304-004	1	46	LINE RF	XMSN, LOWER NO. 2
013-1209-030	1	47	LINE RF	
549-9338-002	1	48	LINE RF	XMSN, NO. 2
764-8065-001	2	49	PLATE	SHIM
764-8066-001	2	50	ANGLE	MTG, COAX
764-8067-001	2	51	GUIDE	WIRE ROPE
764-8068-001	2	52	INS	
764-8070-001	1	53	GASKET	
764-8072-003	1	54	LATCH	ASSY
764-8074-001	1	55	ANGLE	SPECIAL NO. 2

764-8075-003	1	56	SPREADER	SID
764-8076-003	1	57	SPREADER	SID
764-9022-001	12	58	ANGLE	LA
764-9022-002	1	59	ANGLE	SP
764-9023-001	1	60	FITTING	CO
764-9026-001	1	61	BRACKET	SP
764-7279-010	1	62	PLATE	MT
764-8063-001	1	63	ANGLE	NO
764-8063-002	1	64	ANGLE	NO
326-2262-000	12	65	SCREW	1
326-2368-000	2	66	SCREW	1
766-2872-004	1	67	ANGLE	
200-1198-000	1.5	68	CHANNEL	RU

NOTES:

1. IN ALL SPLIT BALLOONS TOP FIGURE IS LIST OF PARTS, BOTTOM IS QUANTITY
2. LIQUID STAKE ALL SCREW THREADS WITH SEALANT WHEN NO OTHER LOCKING MEANS ARE PROVIDED
3. BOND GASKET, ITEM 53, TO PLATE, ITEM 62, WHEN APPLIED TO OUTER DIA. ONLY
4. ITEM 48 CONSISTS OF:
  - 1 549-9335-003, LINE SECTION, INNER NO. 2
  - 1 549-9310-002, LINE SECTION, OUTER NO. 2
  - 1 549-9328-003, LINE SECTION, ASSEMBLY
5. CONFIGURATION OF CENTER BOOM ASSEMBLY MANUFACTURED PRIOR TO 11 DECEMBER, 1977

Figure 2-10. Boom Assembly, Center (Sheet 1 of 2)

QTY	ITEM NO.	PART NAME	PART DESCRIPTION
2	2	WASHER	
4	3	CLAMP	HOSE 1, 2-9/16
2	4	CLAMP	HOSE 3-1/16-4
1	5	MITER	
2	6	RIVET	3/8 X 7/8
6	7	RIVET	3/8 X 1-1/8
3	8	RIVET	3/8 X 1-1/4
1	9	RIVET	3/8 X 1-3/8
28	10	WASHER	FLAT - 1/4
80	11	WASHER	FLAT - 3/8
2	12	CLAMP	CABLE
20	13	WASHER	LOCK - 1/4
4	14	WASHER	LOCK - 5/16
16	15	WASHER	FLAT - 1/2
4	16	WASHER	FLAT - 3/4
4	17	NUT	HEX 5/16-18
2	18	NUT	SELF LKG 8-32
12	19	NUT	HEX 1/4-20
70	20	NUT	HEX 3/8-16
8	21	SCREW	1/4-20 X 5/8
4	22	SCREW	1/4-20 X 1-1/4
4	23	SCREW	5/16-18 X 1-3/8
51	24	SCREW	3/8-16 X 1
17	25	SCREW	3/8-16 X 1-1/4
2	26	SCREW	3/8-16 X 1-1/2
2	27	SCREW	1/2-13 X 1-1/4
8	28	SCREW	1/2-13 X 1-1/2
4	29	SCREW	1/2-13 X 1-3/4
2	30	SCREW	3/4-10 X 2-3/4
4	31	NUT	SELF-LKG 1/4-20
2	32	NUT	SELF LKG 3/4-10
12	33	NUT	HEX 1/2-13
2	34	SCREW	8-32 X 5/8
2	35	BRACKET	ELEM, NO. 11
4	36	BRACKET	ELEM, NO. 9, 10
20	37	ANGLE	LACING
4	38	BLOCK	TIGHTENING
4	39	BRACE	SUPPORT
4	40	BRACKET	LINE, SUPPORT
1	41	SUPPORT	RF LINE NO. 1
1	42	SUPPORT	RF LINE NO. 2
1	43	SPREADER	SECTION-TOP
1	44	SUPPORT	ELEM NO. 11
2	45	SUPPORT	ELEM NO. 9, 10
1	46	LINE RF	XMSN, LOWER NO. 2
1	47	LINE RF	
1	48	LINE RF	XMSN, NO. 2
2	49	PLATE	SHIM
2	50	ANGLE	MTG, COAX
2	51	GUIDE	WIRE ROPE
2	52	INS	
1	53	GASKET	
1	54	LATCH	ASSY
1	55	ANGLE	SPECIAL NO. 2

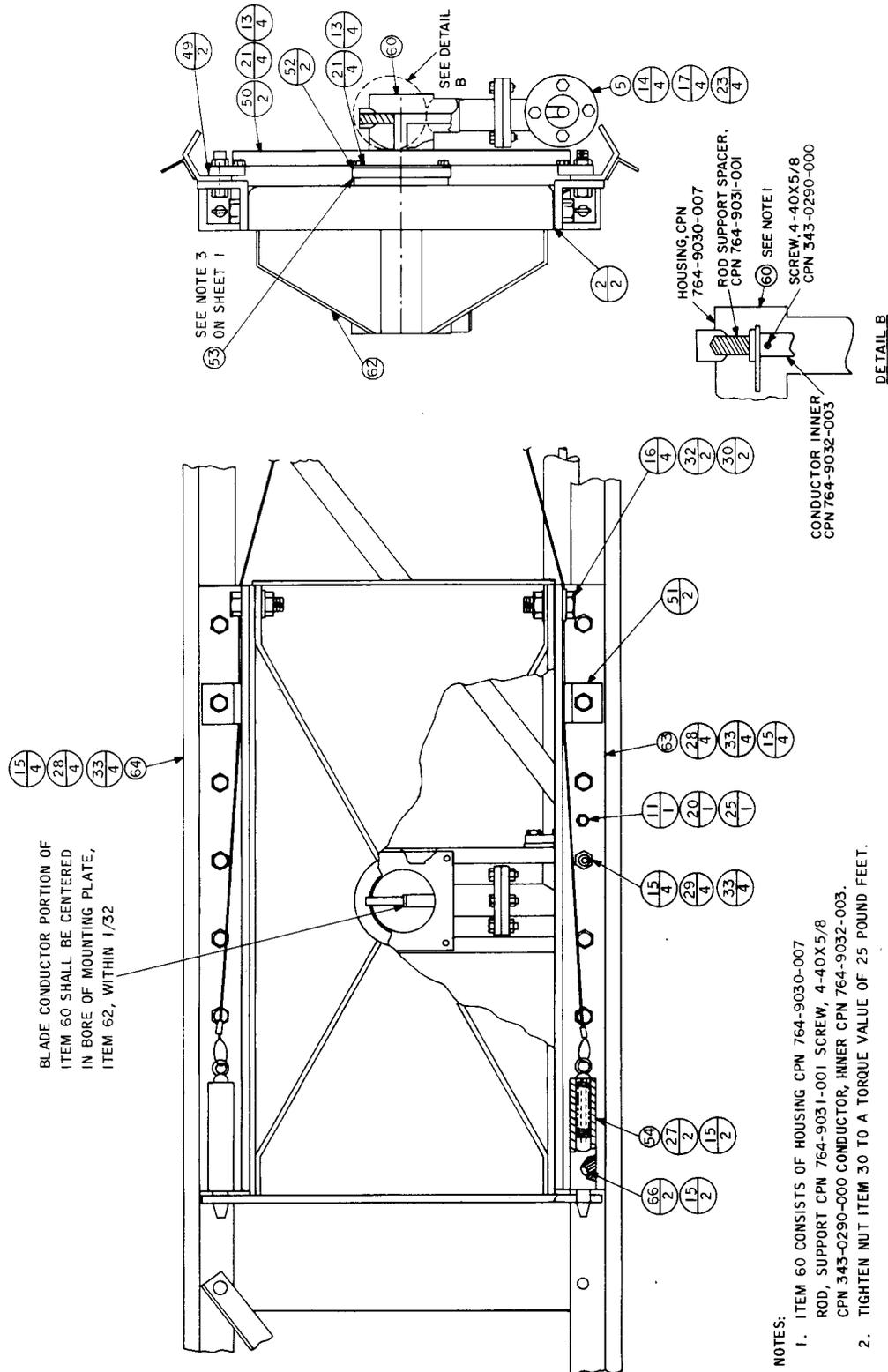
764-8075-003	1	56	SPREADER	SIDE, NO. 2
764-8076-003	1	57	SPREADER	SIDE, NO. 1
764-9022-001	12	58	ANGLE	LACING
764-9022-002	1	59	ANGLE	SPECIAL
764-9023-001	1	60	FITTING	COAX
764-9026-001	1	61	BRACKET	SPACING
764-7279-010	1	62	PLATE	MTG, ANTENNA
764-8063-001	1	63	ANGLE	NO. 1
764-8063-002	1	64	ANGLE	NO. 2
326-2262-000	12	65	SCREW	1/4-20 X 3/4
326-2368-000	2	66	SCREW	1/2-13 X 1-3/8
766-2872-004	1	67	ANGLE	
200-1198-000	1,5	68	CHANNEL	RUBBER

NOTES:

1. IN ALL SPLIT BALLOONS TOP FIGURE IS LIST OF MATERIAL ITEM AND BOTTOM IS QUANTITY
2. LIQUID STAKE ALL SCREW THREADS WITH SEALANT, CPN 005-0547-000, WHEN NO OTHER LOCKING MEANS ARE PROVIDED
3. BOND GASKET, ITEM 53, TO PLATE, ITEM 62, WITH ADHESIVE, 005-9042-000 APPLIED TO OUTER DIA. ONLY
4. ITEM 48 CONSISTS OF:
  - 1 549-9335-003, LINE SECTION, INNER NO. 2
  - 1 549-9310-002, LINE SECTION, OUTER NO. 2
  - 1 549-9328-003, LINE SECTION, ASSEMBLY
5. CONFIGURATION OF CENTER BOOM ASSEMBLIES MANUFACTURED PRIOR TO 11 DECEMBER, 1970

B104 672 6

Figure 2-10. Boom Assembly, Center (Sheet 1 of 2).



B104 666 4

Figure 2-10. Boom Assembly, Center (Sheet 2 of 2).

- b. Pull up the tower with the winch facility and erecting kit mast (figures 2-14 and 2-15). Simultaneously, one man will walk out the array from under the tower. See figure 2-16. Use care to prevent the boom, elements, and/or array sail from dragging along the ground.
- c. When the array can be moved into a position perpendicular to the tower without ground interference, it should be locked into position. The array tilting platform is kept in a perpendicular position to the tower by two spring-actuated lockpins. These pins can be retracted by pulling the lockpin release cable (at bottom of the array, under sail). Keep the pins retracted while moving the array into position and then release the cable, locking the array into position. See figure 2-17. Visually check full engagement of pins.
- d. Use the winch to pull the tower to an erect position. Check side guys to ensure that tension is equal. Ensure that the lower rear guy does not become taut before the tower is erect. When the tower is erect, fasten the lower guy cable, on the winch side of the tower, to its anchor termination. Adjust tension on the lower guy to 1500 pounds,  $\pm 15$  percent. Bolt the unhinged leg of the tower into final position. Transfer the upper guy from the winch to the anchor termination. See figures 2-3, sheet 1, and 2-14. Adjust the tension of the upper guys to 2600 pounds,  $\pm 15$  percent.

**Note**

For future antenna servicing, experienced personnel may use the check-list placard, which should be steel-strapped to the unhinged tower leg. See figure 2-18.

- e. Check the installation to be sure that the tower is vertical and that the rotator functions properly.
- f. Safety-wire all turnbuckles as shown in details A and B in figure 2-1.
- g. Grout space under brackets, items 12 and 13, figure 2-1.

### 2.8 STOWING OF ANTENNA

For procedures to use in lowering and stowing the antenna, refer to section 3, paragraph 3.5.

### 2.9 143A-3 ROTATOR CONTROL UNIT

- a. Run an 18-conductor cable from the remote facility to the antenna tower.
- b. Wire leads from the rotator control panel into the rotator control box as shown in figure 2-7.
- c. Calibrate the rotator control panel so that the pointer on the azimuth control parallels the antenna position. See section 3 for calibration details.

### 2.10 RADIO FREQUENCY INTERFERENCE KIT INSTALLATION

Install CPN 515-8606-001 Radio Frequency Kit in accordance with notes and drawings in figure 2-19 to meet the MIL I 26-6 requirements. Perform the following:

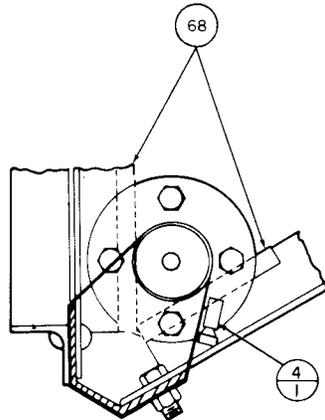
- a. Remove conduit from breaker box and remove box from leg of tower. Attach filter assembly (item 1) to top of breaker box after removing conduit fitting. Reinstall conduit fitting in top boss of filter assembly and attach breaker box to tower leg at a lower position. Shorten lower conduit to suit.
- b. Mark face of front panel as shown and drill four holes, 0.203 inch in diameter and counter-sink  $82^\circ$  to 0.390 inch in diameter. Attach enclosure panel (item 2) to back of remote control panel with screws (item 3), after rerouting control cable through conduit.
- c. The  $3/4$ -inch flexible conduit called out in d. below is required but not furnished by Collins as part of the RFI kit.
- d. A  $3/4$ -inch flexible conduit must extend from remote control panel to outside wall of remote control building and be grounded either to the wall or outside of the wall.

**Caution**

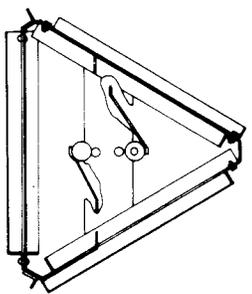
Remove power from antenna system at breaker box or prior to breaker box before disconnecting wires from remote control panel.

- e. In all split balloons (figure 2-19), top figure is material list item and bottom figure is quantity.
- f. Before assembly coat all pipe threads with sealer.





SECTION B-B  
2 PLACES



VIEW A-A

COLLINS PART NO.	QTY	ITEM NO.	PART NAME	PART DESCRIPTION
764-9034-001	2	2	WASHER	
013-0994-000	4	3	CLAMP	HOSE 1, 2-9/16
013-0999-000	2	4	CLAMP	HOSE 3-1/16-4
013-1301-020	1	5	MITER	
305-1251-000	2	6	RIVET	3/8 X 7/8
305-1253-000	6	7	RIVET	3/8 X 1-1/8
305-1254-000	3	8	RIVET	3/8 X 1-1/4
305-1255-000	1	9	RIVET	3/8 X 1-3/8
310-0050-000	28	10	WASHER	FLAT - 1/4
310-0052-000	140	11	WASHER	FLAT - 3/8
139-3254-000	2	12	CLAMP	CABLE
310-0288-000	20	13	WASHER	LOCK - 1/4
310-0290-000	4	14	WASHER	LOCK - 5/16
310-0486-000	16	15	WASHER	FLAT - 1/2
310-0487-000	4	16	WASHER	FLAT - 3/4
313-0033-000	4	17	NUT	HEX 5/16-18
333-0379-000	2	18	NUT	SELF LKG 8-32
313-0082-000	12	19	NUT	HEX 1/4-20
333-1450-030	70	20	NUT	SELF LKG 3/8-24
326-2261-000	8	21	SCREW	1/4-20 X 5/8
326-0932-000	4	22	SCREW	1/4-20 X 1-1/4
326-2293-000	4	23	SCREW	5/16-18 X 1-3/8
326-1991-000	39	24	SCREW	3/8 - 24 X 1
326-1993-000	23	25	SCREW	3/8 - 24 X 1-1/4
326-1995-000	8	26	SCREW	3/8 - 24 X 1-1/2
326-2367-000	2	27	SCREW	1/2-13 X 1-1/4
326-2369-000	8	28	SCREW	1/2-13 X 1-1/2
326-2370-000	4	29	SCREW	1/2-13 X 1-3/4
326-2446-000	2	30	SCREW	3/4-10 X 2-3/4
333-0428-000	4	31	NUT	SELF-LKG 1/4-20
333-0442-000	2	32	NUT	SELF LKG 3/4-10
334-0279-000	12	33	NUT	HEX 1/2-13
343-0190-000	2	34	SCREW	8-32 X 5/8
548-3269-002	2	35	BRACKET	ELEM, NO. 11
549-0783-002	4	36	BRACKET	ELEM, NO. 9, 10
549-0926-002	20	37	ANGLE	LACING
549-0928-002	4	38	BLOCK	TIGHTENING
549-2661-002	4	39	BRACE	SUPPORT
795-6512-001	4	40	BRACKET	LINE, SUPPORT
549-2798-004	1	41	SUPPORT	RF LINE NO. 1
549-2799-004	1	42	SUPPORT	RF LINE NO. 2
549-2840-005	1	43	SPREADER	SECTION-TOP
549-2881-002	1	44	SUPPORT	ELEM NO. 11
549-2882-002	2	45	SUPPORT	ELEM NO. 9, 10
549-9304-004	1	46	LINE RF	XMSN, LOWER NO. 2
013-1209-030	1	47	LINE RF	
549-9338-002	1	48	LINE RF	XMSN, NO. 2
764-8065-001	2	49	PLATE	SHIM
764-8066-001	2	50	ANGLE	MTG, COAX
764-8067-001	2	51	GUIDE	WIRE ROPE
764-8068-001	2	52	INS	
764-8070-001	1	53	GASKET	
764-8072-003	1	54	LATCH	ASSY
764-8074-001	1	55	ANGLE	SPECIAL NO. 2

764-8075-003	1	56	SPREADER	SIDE, 1
764-8076-003	1	57	SPREADER	SIDE, 1
764-9022-001	12	58	ANGLE	LACING
764-9022-002	1	59	ANGLE	SPECIA
764-9023-001	1	60	FITTING	COAX
764-9026-001	1	61	BRACKET	SPACIN
764-7279-010	1	62	PLATE	MTG, A
764-8063-001	1	63	ANGLE	NO. 1
764-8063-002	1	64	ANGLE	NO. 2
326-2262-000	12	65	SCREW	1/4-20
326-2368-000	2	66	SCREW	1/2-13
766-2872-004	1	67	ANGLE	
200-1198-000	1.5	68	CHANNEL	RUBBER

- NOTES:
1. IN ALL SPLIT BALLOONS TOP FIGURE IS LIST OF MA  
BOTTOM IS QUANTITY
  2. LIQUID STAKE ALL SCREW THREADS WITH SEALANT,  
WHEN NO OTHER LOCKING MEANS ARE PROVIDED
  3. BOND GASKET, ITEM 53, TO PLATE, ITEM 62, WITH  
APPLIED TO OUTER DIA. ONLY
  4. ITEM 48 CONSISTS OF:  
1 549-9335-003, LINE SECTION, INNER NO. 2  
1 549-9310-002, LINE SECTION, OUTER NO. 2  
1 549-9328-003, LINE SECTION, ASSEMBLY
  5. CONFIGURATION OF CENTER BOOM ASSEMBLY  
MANUFACTURED SUBSEQUENT TO 11 DECEMBER

Figure 2-10A. Antenna Array Center Boom Section and Late  
Installation Details (Sheet 1 of 2).



COLLINS PART NO.	QTY	ITEM NO.	PART NAME	PART DESCRIPTION
764-9034-001	2	2	WASHER	
013-0994-000	4	3	CLAMP	HOSE 1, 2-9/16
013-0999-000	2	4	CLAMP	HOSE 3-1/16-4
013-1301-020	1	5	MITER	
305-1251-000	2	6	RIVET	3/8 X 7/8
305-1253-000	6	7	RIVET	3/8 X 1-1/8
305-1254-000	3	8	RIVET	3/8 X 1-1/4
305-1255-000	1	9	RIVET	3/8 X 1-3/8
310-0050-000	28	10	WASHER	FLAT - 1/4
310-0052-000	140	11	WASHER	FLAT - 3/8
139-3254-000	2	12	CLAMP	CABLE
310-0288-000	20	13	WASHER	LOCK - 1/4
310-0290-000	4	14	WASHER	LOCK - 5/16
310-0486-000	16	15	WASHER	FLAT - 1/2
310-0487-000	4	16	WASHER	FLAT - 3/4
313-0033-000	4	17	NUT	HEX 5/16-18
333-0379-000	2	18	NUT	SELF LKG 8-32
313-0082-000	12	19	NUT	HEX 1/4-20
333-1450-030	70	20	NUT	SELF LKG 3/8-24
326-2261-000	8	21	SCREW	1/4-20 X 5/8
326-0932-000	4	22	SCREW	1/4-20 X 1-1/4
326-2293-000	4	23	SCREW	5/16-18 X 1-3/8
326-1991-000	39	24	SCREW	3/8 - 24 X 1
326-1993-000	23	25	SCREW	3/8 - 24 X 1-1/4
326-1995-000	8	26	SCREW	3/8 - 24 X 1-1/2
326-2367-000	2	27	SCREW	1/2-13 X 1-1/4
326-2369-000	8	28	SCREW	1/2-13 X 1-1/2
326-2370-000	4	29	SCREW	1/2-13 X 1-3/4
326-2446-000	2	30	SCREW	3/4-10 X 2-3/4
333-0428-000	4	31	NUT	SELF-LKG 1/4-20
333-0442-000	2	32	NUT	SELF LKG 3/4-10
334-0279-000	12	33	NUT	HEX 1/2-13
343-0190-000	2	34	SCREW	8-32 X 5/8
548-3269-002	2	35	BRACKET	ELEM. NO. 11
549-0783-002	4	36	BRACKET	ELEM. NO. 9, 10
549-0926-002	20	37	ANGLE	LACING
549-0928-002	4	38	BLOCK	TIGHTENING
549-2661-002	4	39	BRACE	SUPPORT
795-6512-001	4	40	BRACKET	LINE, SUPPORT
549-2798-004	1	41	SUPPORT	RF LINE NO. 1
549-2799-004	1	42	SUPPORT	RF LINE NO. 2
549-2840-005	1	43	SPREADER	SECTION-TOP
549-2881-002	1	44	SUPPORT	ELEM NO. 11
549-2882-002	2	45	SUPPORT	ELEM NO. 9, 10
549-9304-004	1	46	LINE RF	XMSN, LOWER NO. 2
013-1209-030	1	47	LINE RF	
549-9338-002	1	48	LINE RF	XMSN, NO. 2
764-8065-001	2	49	PLATE	SHIM
764-8066-001	2	50	ANGLE	MTG, COAX
764-8067-001	2	51	GUIDE	WIRE ROPE
764-8068-001	2	52	INS	
764-8070-001	1	53	GASKET	
764-8072-003	1	54	LATCH	ASSY
764-8074-001	1	55	ANGLE	SPECIAL NO. 2

764-8075-003	1	56	SPREADER	SIDE, NO. 2
764-8076-003	1	57	SPREADER	SIDE, NO. 1
764-9022-001	12	58	ANGLE	LACING
764-9022-002	1	59	ANGLE	SPECIAL
764-9023-001	1	60	FITTING	COAX
764-9026-001	1	61	BRACKET	SPACING
764-7279-010	1	62	PLATE	MTG, ANTENNA
764-8063-001	1	63	ANGLE	NO. 1
764-8063-002	1	64	ANGLE	NO. 2
326-2262-000	12	65	SCREW	1/4-20 X 3/4
326-2368-000	2	66	SCREW	1/2-13 X 1-3/8
766-2872-004	1	67	ANGLE	
200-1198-000	1.5	68	CHANNEL	RUBBER

## NOTES:

1. IN ALL SPLIT BALLOONS TOP FIGURE IS LIST OF MATERIAL ITEM AND BOTTOM IS QUANTITY
2. LIQUID STAKE ALL SCREW THREADS WITH SEALANT, CPN 005-0547-000, WHEN NO OTHER LOCKING MEANS ARE PROVIDED
3. BOND GASKET, ITEM 53, TO PLATE, ITEM 62, WITH ADHESIVE, CPN 005-9C4 APPLIED TO OUTER DIA. ONLY
4. ITEM 48 CONSISTS OF:
  - 1 549-9335-003, LINE SECTION, INNER NO. 2
  - 1 549-9310-002, LINE SECTION, OUTER NO. 2
  - 1 549-9328-003, LINE SECTION, ASSEMBLY
5. CONFIGURATION OF CENTER BOOM ASSEMBLIES MANUFACTURED SUBSEQUENT TO 11 DECEMBER, 1970

Figure 2-10A. Antenna Array Center Boom Section and Latching Assembly Installation Details (Sheet 1 of 2).

Installation

PART NAME	PART DESCRIPTION
WASHER	
LAMP	HOSE 1, 2-9/16
LAMP	HOSE 3-1/16-4
WASHER	
WASHER	3/8 X 7/8
WASHER	3/8 X 1-1/8
WASHER	3/8 X 1-1/4
WASHER	3/8 X 1-3/8
WASHER	FLAT - 1/4
WASHER	FLAT - 3/8
LAMP	CABLE
WASHER	LOCK - 1/4
WASHER	LOCK - 5/16
WASHER	FLAT - 1/2
WASHER	FLAT - 3/4
	HEX 5/16-18
	SELF LKG 8-32
	HEX 1/4-20
	SELF LKG 3/8-24
SCREW	1/4-20 X 5/8
SCREW	1/4-20 X 1-1/4
SCREW	5/16-18 X 1-3/8
SCREW	3/8 - 24 X 1
SCREW	3/8 - 24 X 1-1/4
SCREW	3/8 - 24 X 1-1/2
SCREW	1/2-13 X 1-1/4
SCREW	1/2-13 X 1-1/2
SCREW	1/2-13 X 1-3/4
SCREW	3/4-10 X 2-3/4
	SELF-LKG 1/4-20
	SELF LKG 3/4-10
	HEX 1/2-13
SCREW	8-32 X 5/8
BRACKET	ELEM, NO. 11
BRACKET	ELEM, NO. 9, 10
WASHER	LACING
WASHER	TIGHTENING
WASHER	SUPPORT
BRACKET	LINE, SUPPORT
PORT	RF LINE NO. 1
PORT	RF LINE NO. 2
SPREADER	SECTION-TOP
PORT	ELEM NO. 11
PORT	ELEM NO. 9, 10
RF	XMSN, LOWER NO. 2
RF	
RF	XMSN, NO. 2
WASHER	SHIM
WASHER	MTG, COAX
WASHER	WIRE ROPE
	ASSY
	SPECIAL NO. 2

764-8075-003	1	56	SPREADER	SIDE, NO. 2
764-8076-003	1	57	SPREADER	SIDE, NO. 1
764-9022-001	12	58	ANGLE	LACING
764-9022-002	1	59	ANGLE	SPECIAL
764-9023-001	1	60	FITTING	COAX
764-9026-001	1	61	BRACKET	SPACING
764-7279-010	1	62	PLATE	MTG, ANTENNA
764-8063-001	1	63	ANGLE	NO. 1
764-8063-002	1	64	ANGLE	NO. 2
326-2262-000	12	65	SCREW	1/4-20 X 3/4
326-2368-000	2	66	SCREW	1/2-13 X 1-3/8
766-2872-004	1	67	ANGLE	
200-1198-000	1.5	68	CHANNEL	RUBBER

NOTES:

1. IN ALL SPLIT BALLOONS TOP FIGURE IS LIST OF MATERIAL ITEM AND BOTTOM IS QUANTITY
2. LIQUID STAKE ALL SCREW THREADS WITH SEALANT, CPN 005-0547-000, WHEN NO OTHER LOCKING MEANS ARE PROVIDED
3. BOND GASKET, ITEM 53, TO PLATE, ITEM 62, WITH ADHESIVE, CPN 005-9042-000 APPLIED TO OUTER DIA. ONLY
4. ITEM 48 CONSISTS OF:
  - 1 549-9335-003, LINE SECTION, INNER NO. 2
  - 1 549-9310-002, LINE SECTION, OUTER NO. 2
  - 1 549-9328-003, LINE SECTION, ASSEMBLY
5. CONFIGURATION OF CENTER BOOM ASSEMBLIES MANUFACTURED SUBSEQUENT TO 11 DECEMBER, 1970

B104 780 6

2-10A. Antenna Array Center Boom Section and Latching Assembly, Installation Details (Sheet 1 of 2).

August 1977

2-30A/2-30B

$\sqrt{T=0.837}$

REAL DIM

- 13 = 80
- 11 5/8 } 12 = 66.96 3
- 9 3/4 } 11 = 56.04 3
- 7 9/8 } 10 = 46.91 2 1/2
- 6 6 1/2 } 9 = 39.26 2 1/2

- 5 6 1/2 } 8 = 32.86 = 32
- 4 7 3/4 } 7 = 27.5 = 27.5
- 3 10 3/8 } 6 = 23.02 = 23



- 3 3 1/2 } 5 = 19.27
- 2 9 1/4 } 4 = 16.129 = 16.125 REAL KNOWN
- 2 4 } 3 = 13.50 = 6.375
- 1 10 1/2 } 2 = 11.29 = 5.8
- 1 8 20 } 1 = 9.45 = 4.725

4.8"

175-515



7"

$$3' 4\frac{3}{4}'' \left\{ 6 = 23.02 = \underline{23.1}''$$

$$3' 3\frac{1}{2}'' \left\{ 5 = 19.27$$

$$2' 9\frac{1}{4}'' \left\{ 4 = 16.129 = \underline{16.125} \text{ REAL KNOWN}$$

$$2' 4'' \left\{ 3 = 13.50 = 6. \cancel{2} 9''$$

$$\cancel{1' 10\frac{3}{4}''} \left\{ 2 = 11.29 = 5.8''$$

$$1' 8' 20'' \left\{ 1 = 9.45 = 7. \cancel{3} 9''$$

$\$ 4.8''$

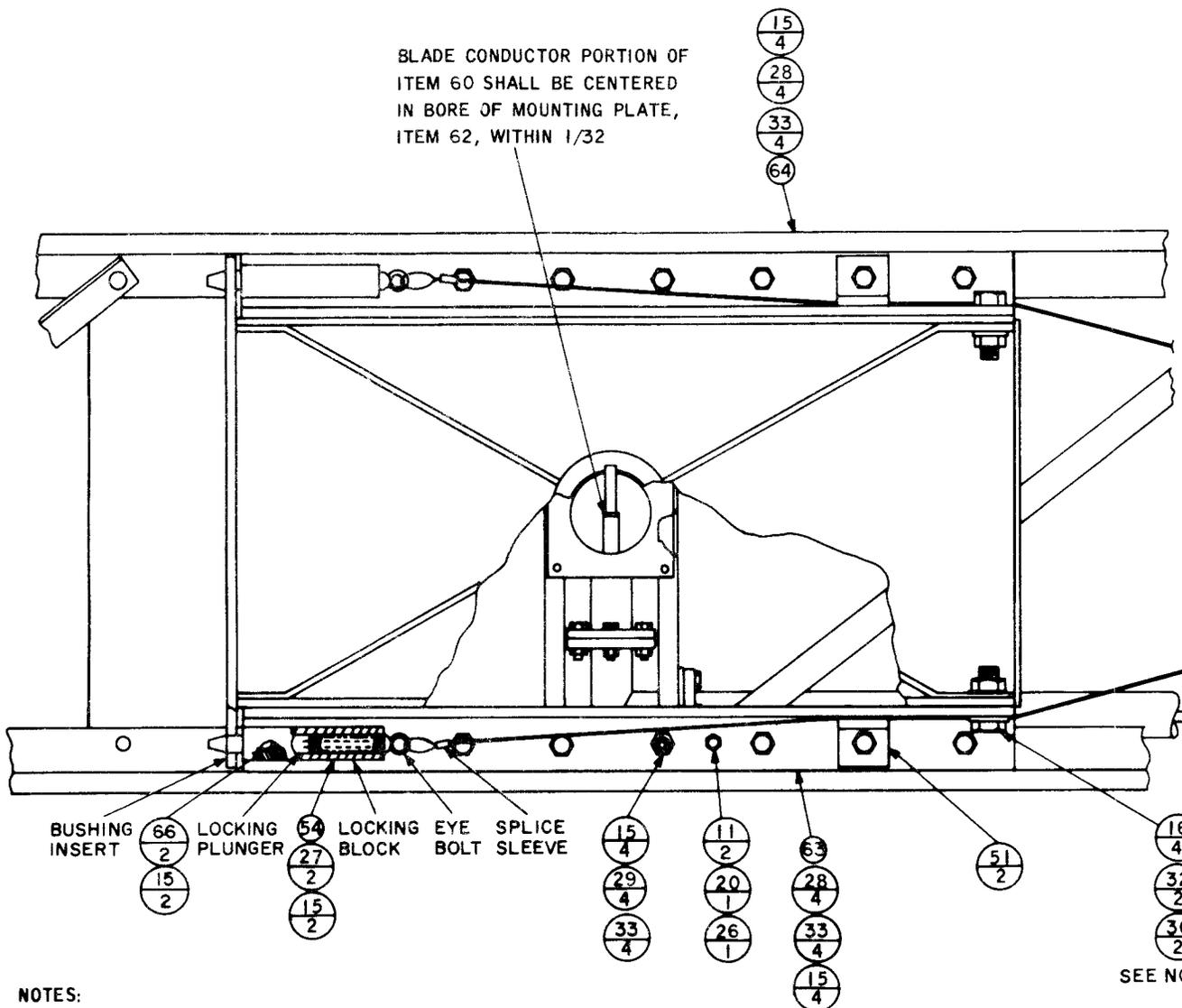
275.54



$$\begin{array}{r} 166 \\ 17 \\ \hline 33.6 \end{array}$$

$$\begin{array}{r} 3291 - 9111 \\ 203 - 9111 \\ 213 - 9111 \\ 209 - 9111 \\ 212 - 9111 \\ 250 - 9111 \end{array}$$

BLADE CONDUCTOR PORTION OF  
ITEM 60 SHALL BE CENTERED  
IN BORE OF MOUNTING PLATE,  
ITEM 62, WITHIN 1/32



BUSHING 66/2 LOCKING PLUNGER 54/2 LOCKING EYE BLOCK 11/2 SPLICE BOLT SLEEVE 20/1

NOTES:

1. ITEM 60 CONSISTS OF HOUSING CPN 764-9030-007  
ROD, SUPPORT CPN 764-9031-001 SCREW, 4-40X5/8  
CPN 343-0290-000 CONDUCTOR, INNER CPN 764-9032-003.
2. TIGHTEN NUT ITEM 30 TO A TORQUE VALUE OF 25 POUND FEET.

DETAIL A

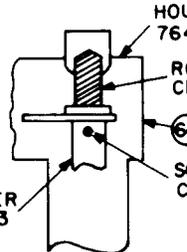
53 SEE NOT ON SHEE

62

2/2

SEE NOTE 2

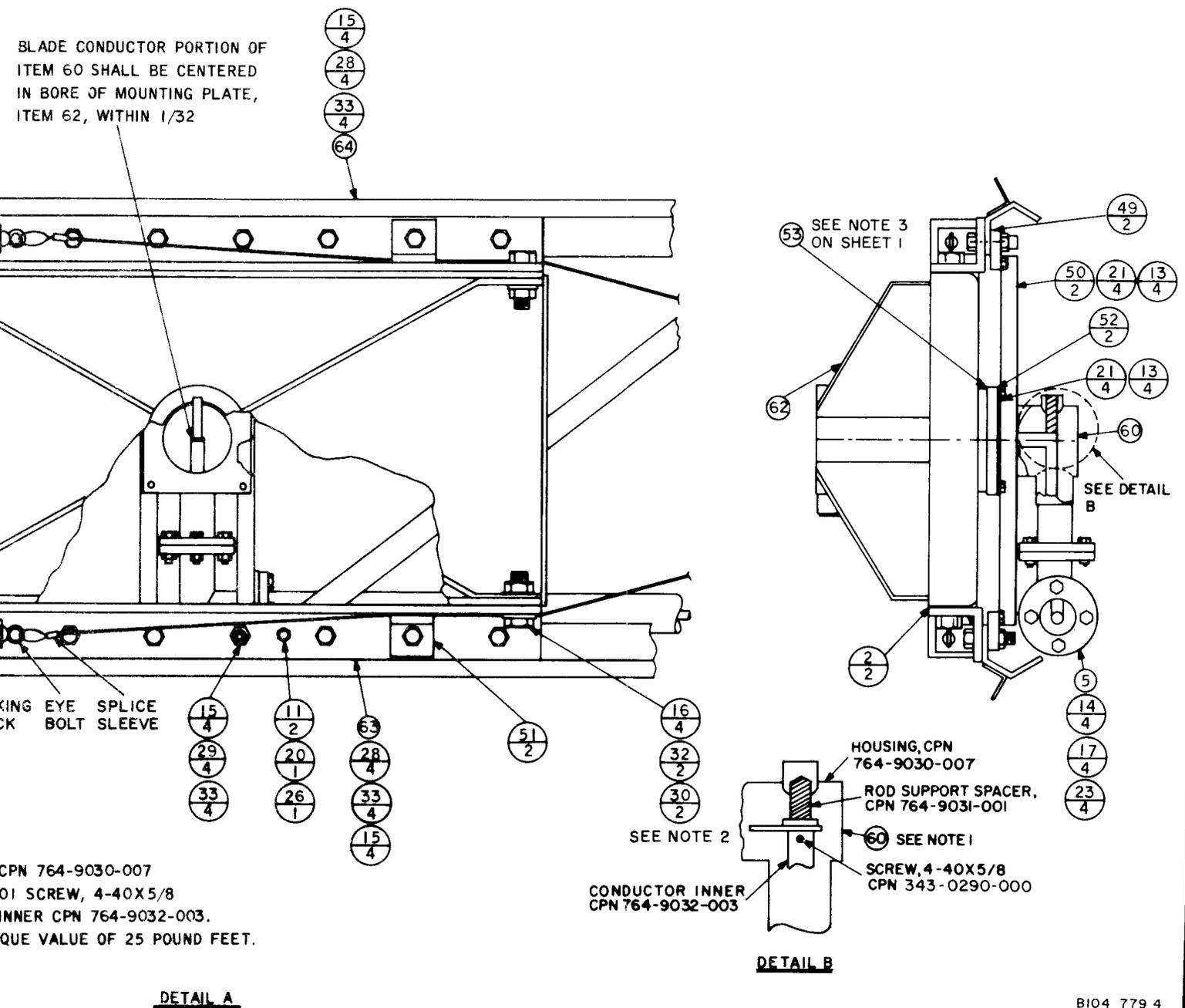
CONDUCTOR INNER  
CPN 764-9032-003



DETAIL B

Figure 2-10A. Antenna  
Section  
Installation  
(Sheet 1 of 2)

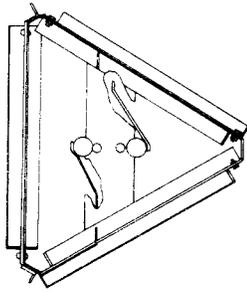
Revised 15 July 1971



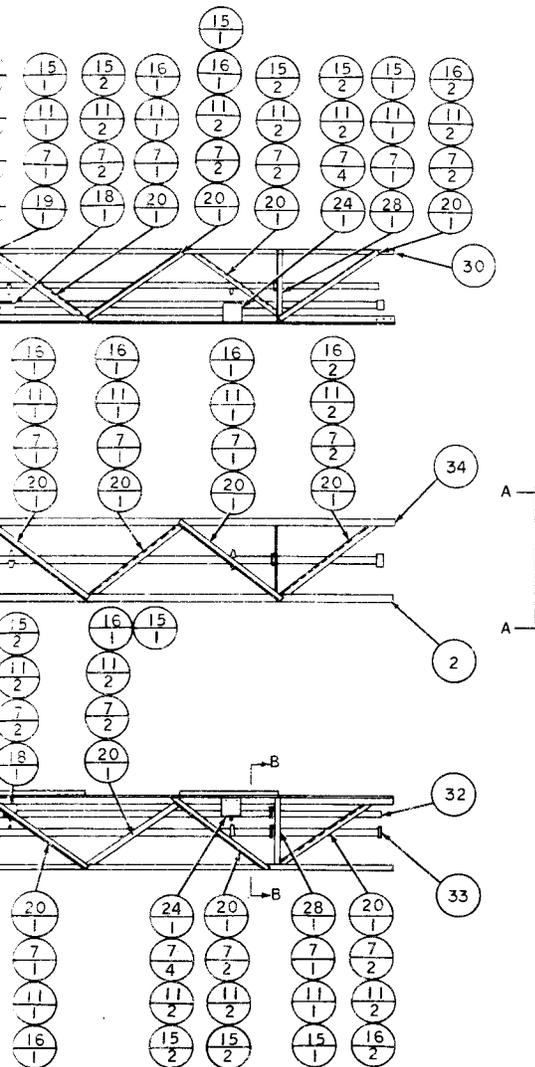
B104 779 4

Figure 2-10A. Antenna Array Center Boom Section and Latching Assembly, Installation Details (Sheet 2 of 2).





VIEW A-A



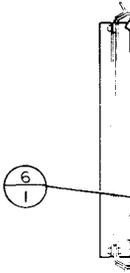
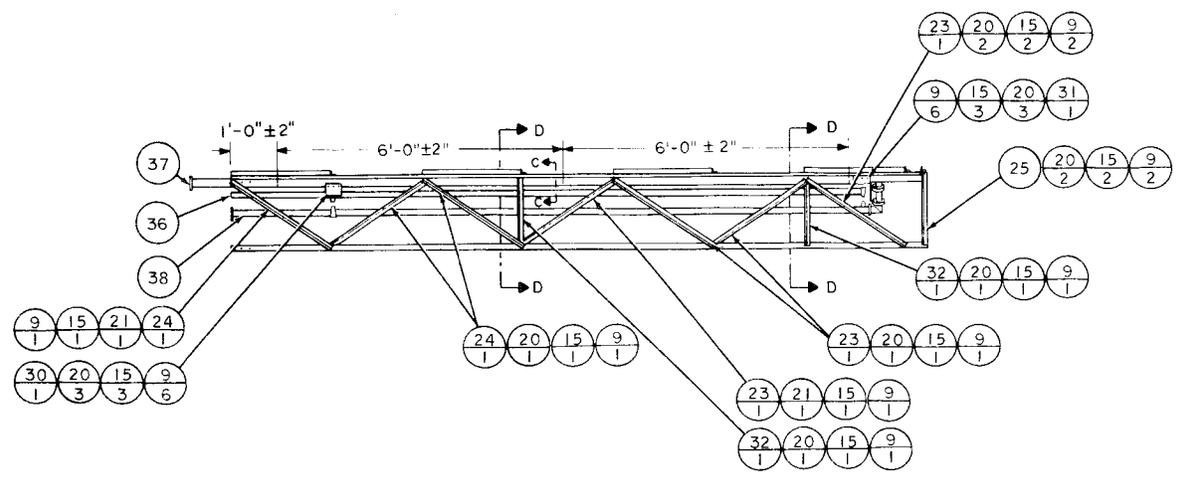
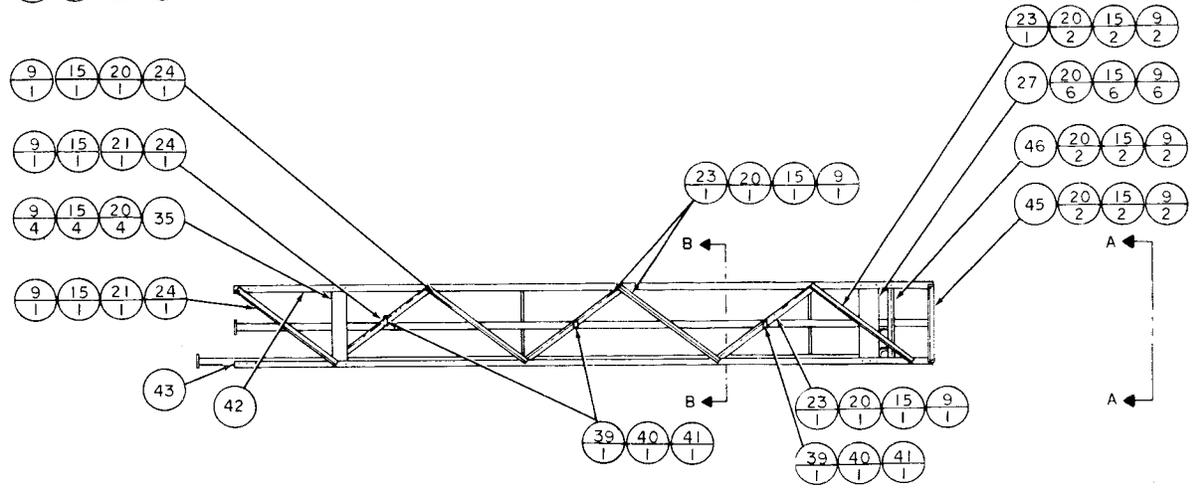
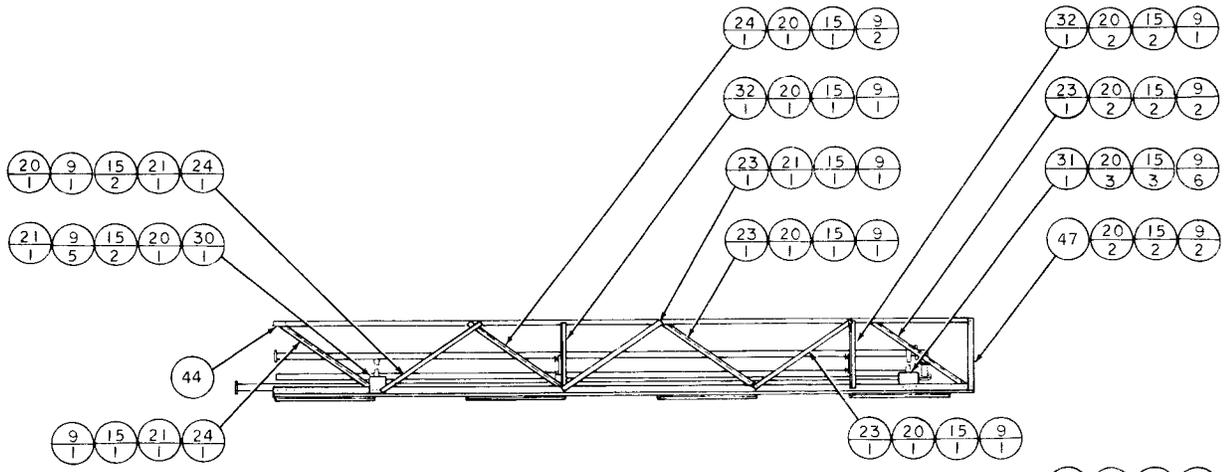
COLLINS PART NO.	QTY	ITEM NO.	PART NAME	PART DESCRIPTION
764-8077-003	1	2	SPREADER	SIDE NO. 2
013-0994-000	6	3	CLAMP	HOSE
013-1112-000	1	4	SEAL	END, COAX
310-0049-000	1	5	WASHER	FLAT NO. 10
310-0050-000	42	6	WASHER	FLAT - 1/4
310-0052-000	99	7	WASHER	FLAT - 3/8
310-0284-000	1	8	WASHER	LOCK NO. 10
310-0288-000	18	9	WASHER	LOCK - 1/4
313-0082-000	18	10	NUT	HEX 1/4-20
313-0235-000	86	11	NUT	HEX 3/8-16
325-0053-000	1	12	SCREW	10-32 X 3/4
326-2262-000	18	13	SCREW	1/4-20 X 3/4
326-0932-000	6	14	SCREW	1/4-20 X 1-1/4
326-2316-000	67	15	SCREW	3/8-16 X 1
326-2318-000	19	16	SCREW	3/8-16 X 1-1/4
333-0428-000	6	17	NUT	SELF-LKG 1/4-20
548-3267-002	9	18	BRACKET	ELEM, NO. 1-7
549-0784-002	24	19	BRACE	SPREADER
549-0926-002	12	20	ANGLE	LACING
549-0927-002	3	21	ANGLE	BRACE END
549-0928-002	6	22	BLOCK	TIGHTENING
549-2655-002	1	23	BRACKET	SPECIAL-ELEM NO. 3
549-2658-002	2	24	BRACKET	ELEM NO. 8
549-2663-002	1	25	BRACKET	LEFT NO. 2
549-2669-002	1	26	LEAD	ELEC
549-2706-003	1	27	BRACKET	RT-ELEM NO. 2
549-2708-003	6	28	BRACKET	SUPPORT, LINE
549-2798-004	3	29	SUPPORT	LINE, RF NO. 1
549-2837-005	1	30	SPREADER	TOP
549-2884-002	2	31	BRACKET	ELEM, NO. 1,6
549-9306-004	1	32	SECTION	LINE, LOWER NO. 3
549-9339-003	1	33	SECTION	LINE, UPPER NO. 3
766-2353-003	1	34	SPREADER	SIDE NO. 1

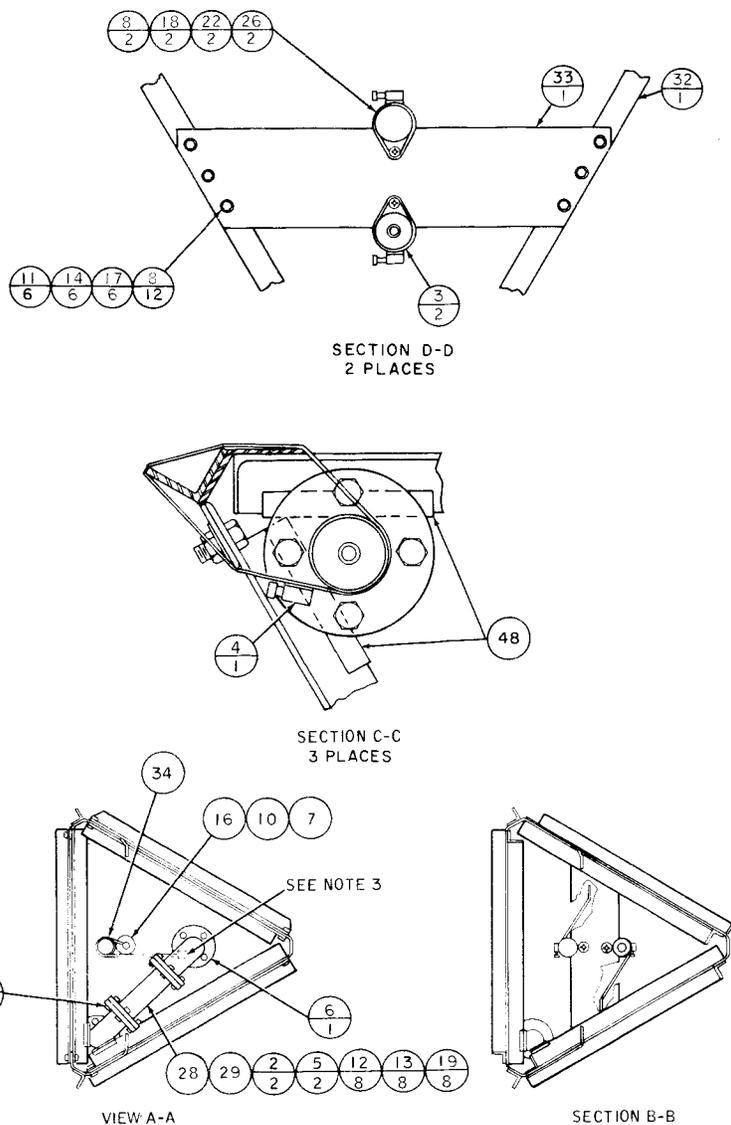
NOTES:

1. LIQUID STAKE ALL SCREW THREADS WITH SEALANT, CPN 005-0847-000 WHEN NO OTHER LOCKING MEANS ARE PROVIDED
2. IN ALL SPLIT BALLOONS TOP FIGURE IS MATERIAL LIST ITEM AND BOTTOM IS QUANTITY
3. ITEM 33 CONSISTS OF:
  - 1 549-9322-002, LINE SECTION ADAPTER
  - 1 549-9334-003, LINE SECTION INNER NO. 3
  - 1 549-9312-004, LINE SECTION OUTER NO. 3

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Figure 2-11. Boom Assembly, Front.





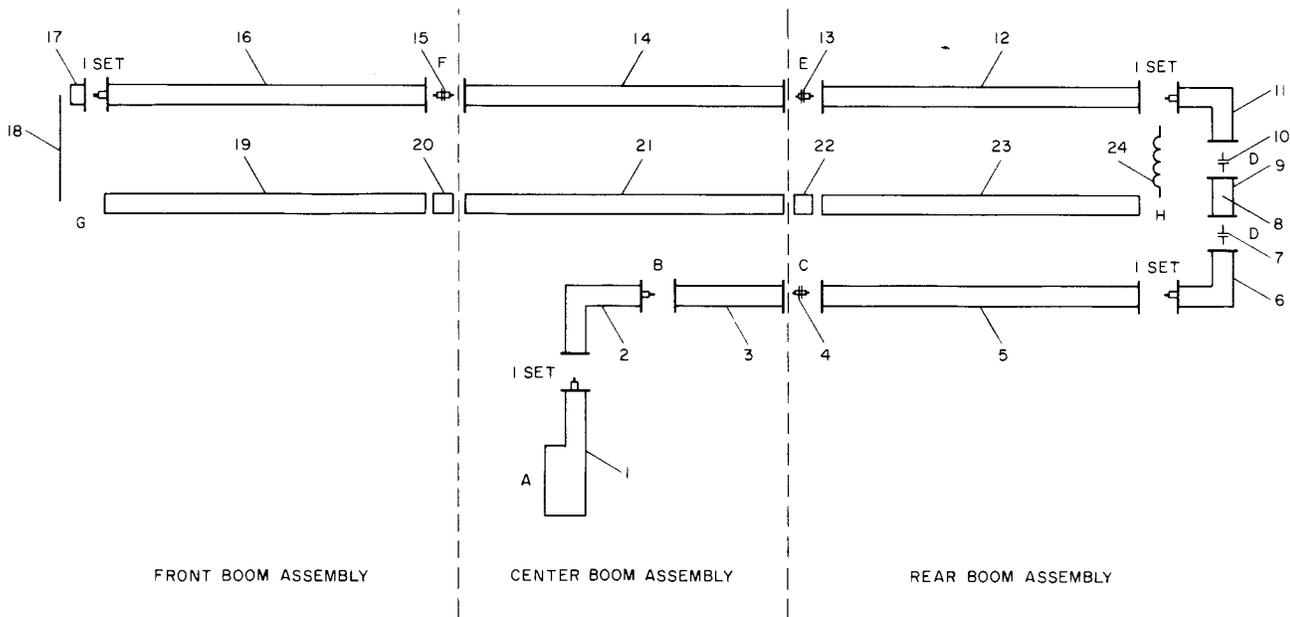
COLLINS PART NO.	QTY	ITEM NO.	PART NAME	PART DESCRIPTION
013-0232-000	2	2	GASKET	
013-0994-000	4	3	CLAMP	HOSE
013-0999-000	3	4	CLAMP	HOSE
013-1500-000	2	5	CONTACT	ELEC
013-1301-020	2	6	MITER	
310-0049-000	1	7	WASHER	FLAT-NO. 10
310-0050-000	28	8	WASHER	FLAT-1/4
310-0052-000	70	9	WASHER	FLAT-3/8
310-0284-000	1	10	WASHER	LOCK-NO. 10
310-0288-000	12	11	WASHER	LOCK-1/4
310-0290-000	8	12	WASHER	LOCK-5/16
313-0033-000	8	13	NUT	HEX 5/16-18
313-0082-000	12	14	NUT	HEX 1/4-20
313-0235-000	59	15	NUT	HEX 3/8-16
325-0053-000	1	16	SCREW	10-32 X 3/4
326-2262-000	12	17	SCREW	1/4-20 X 3/4
326-0932-000	4	18	SCREW	1/4-20 X 1-1/4
326-2293-000	8	19	SCREW	5/16-18 X 1-3/8
326-2316-000	51	20	SCREW	3/8-16 X 1
326-2318-000	8	21	SCREW	3/8-16 X 1-1/4
333-0428-000	4	22	NUT	SELF-LKG 1/4-20
549-0784-002	12	23	BRACE	SPREADER
549-0926-002	9	24	ANGLE	LACING
549-0927-002	1	25	ANGLE	BRACE END
549-0928-002	4	26	BLOCK	TIGHTENING
549-2638-002	1	27	SUPPORT	ELEM NO. 13
549-2652-002	1	28	TUBING	COPPER ALLOY
549-2654-002	1	29	LINE	XMSN REAR
549-2657-002	2	30	BRACKET	ELEM NO. 12
549-2698-003	2	31	BRACKET	ELEM NO. 13
549-2708-003	4	32	BRACKET	SUPPORT LINE
549-2800-004	2	33	SUPPORT	RF LINE NO. 3
549-2871-003	1	34	COIL	RADIO FREQ
549-2880-002	1	35	SUPPORT	ELEM NO. 12
549-9302-004	1	36	LINE	XMSN LOWER NO. 1
013-1209-020	1	37	LINE	
549-9337-002	1	38	LINE	XMSN UPPER NO. 1
139-3254-000	3	39	CLAMP	CABLE
333-0379-000	3	40	NUT	SELF-LKG 8-32
343-0190-000	3	41	SCREW	8-32 X 5/8
766-2359-003	1	42	SPREADER	REAR NO. 2
766-2358-003	1	43	SPREADER	REAR NO. 1
766-2357-001	1	44	SPREADER	REAR TOP
764-8078-001	1	45	ANGLE	BOTTOM REAR
764-8079-001	1	46	ANGLE	MTG SAIL
766-2411-001	1	47	ANGLE	BEVELED
200-1198-000	1,5	48	CHANNEL	RUBBER

NOTES:

1. IN ALL SPLIT BALLOONS TOP FIGURE IS MATERIAL LIST ITEM AND BOTTOM IS QUANTITY
2. LIQUID STAKE ALL SCREW THREADS WITH SEALANT, CPN 005-0547-000, WHEN NO OTHER LOCKING MEANS ARE PROVIDED
3. COIL, ITEM 34 CONNECTED TO MITER, ITEM 6, FLANGE BOLT BEHIND POINT INDICATED
4. ITEM 38 CONSISTS OF:
  - 1 LINE SECTION, INNER NO 1 549-9336-003
  - 1 LINE SECTION, OUTER NO 1 549-9308-004

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Figure 2-12. Boom Assembly, Rear.

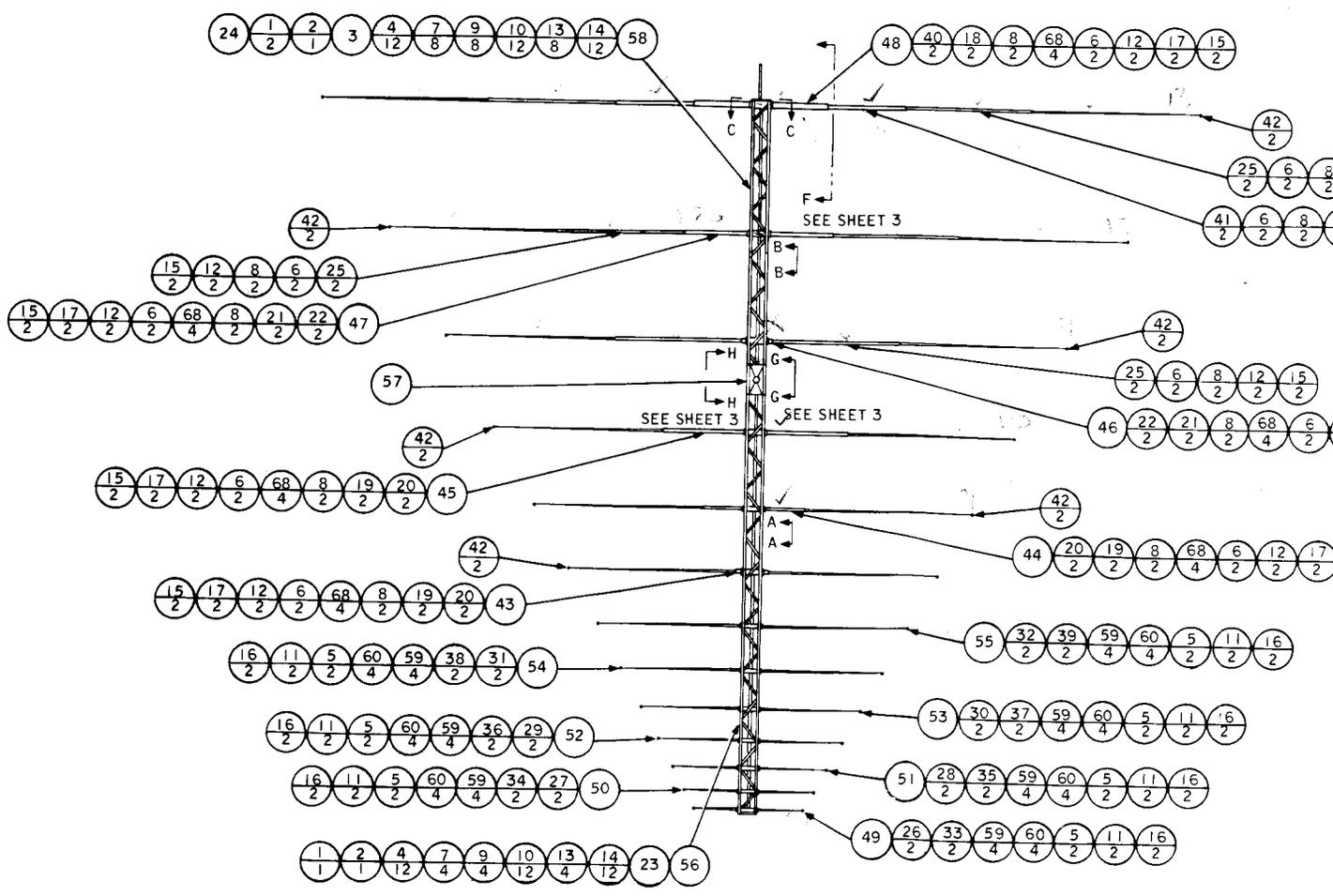
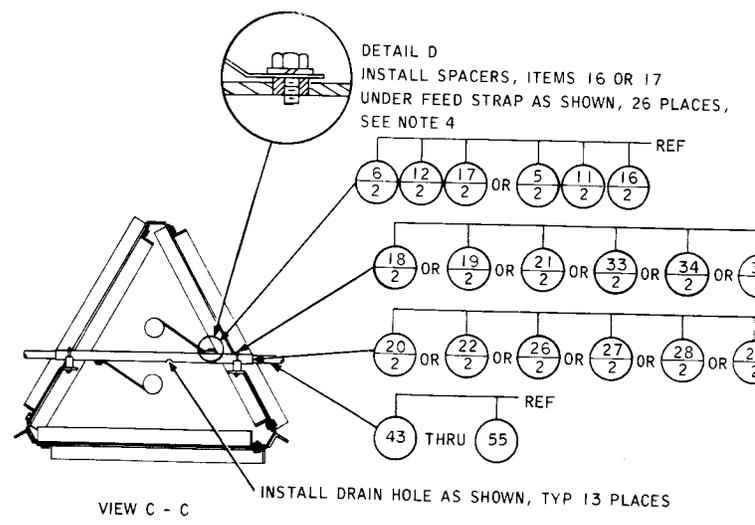


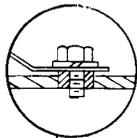
ITEM	QTY	COLLINS PART NUMBER	DESCRIPTION	INST BOOK	
				FIG	ITEM
I	1	764-9023-001	FITTING, COAX	2-10	60
A	4	310-0288-000	WASHER, LOCK - 1/4	2-10	13
A	4	326-2261-000	SCREW 1/4-20X5/8	2-10	21
2	1	013-1301-020	MITER 90°	2-10	5
B	4	310-0290-000	WASHER, LOCK - 5/16	2-10	14
B	4	313-0033-000	NUT, HEX 5/16-18	2-10	17
B	4	326-2293-000	SCREW 5/16-18X1 3/8	2-10	23
3	1	013-1209-030	LINE, RF	2-10	47
C	1	013-0232-000	GASKET	2-13	1
C	4	310-0290-000	WASHER, LOCK - 5/16	2-13	7
C	4	313-0033-000	NUT, HEX 5/16-18	2-13	9
C	4	326-2293-000	SCREW 5/16-18X1 3/8	2-13	13
4	1	013-1500-000	CONTACT, ELEC	2-13	3
5	1	013-1209-020	LINE, RF	2-12	37
6	1	013-1301-020	MITER, 90°	2-12	6
7	1	013-1500-000	CONTACT, ELEC	2-12	5
8	1	549-2652-002	TUBING, COPPER ALLOY	2-12	28
9	1	549-2654-002	LINE, XMSN, REAR	2-12	29
D	2	013-0232-000	GASKET	2-12	2
D	8	310-0290-000	WASHER, LOCK - 5/16	2-12	12
D	8	313-0033-000	NUT, HEX 5/16-18	2-12	13
D	8	326-2293-000	SCREW 5/16-18X1 3/8	2-12	19
10	1	013-1500-000	CONTACT, ELEC	2-12	5
11	1	013-1301-020	MITER 90°	2-12	6
12	1	549-9337-002	LINE, XMSN, UPPER NO 1	2-12	38
E	1	013-0232-000	GASKET	2-13	1

ITEM	QTY	COLLINS PART NUMBER	DESCRIPTION	INST BOOK	
				FIG	ITEM
E	4	310-0290-000	WASHER, LOCK - 5/16	2-13	7
E	4	313-0033-000	NUT HEX 5/16-18	2-13	9
E	4	326-2293-000	SCREW 5/16-18X1 3/8	2-13	13
13	1	549-2672-002	BULLET, CONNECTOR NO 3	2-13	24
14	1	549-9338-002	LINE, XMSN, UPPER NO 2	2-10	48
F	1	013-0232-000	GASKET	2-13	1
F	4	310-0290-000	WASHER, LOCK 5/16	2-13	7
F	4	313-0033-000	NUT, HEX 5/16-18	2-13	9
F	4	326-2293-000	SCREW 5/16-18X1 3/8	2-13	13
15	1	549-2671-002	BULLET, CONNECTOR NO 2	2-13	23
16	1	549-9339-003	LINE, XMSN, UPPER NO 3	2-11	33
17	1	013-1112-000	END SEAL, COAX	2-11	4
18	1	549-2669-002	LEAD, ELEC	2-11	26
G	1	310-0049-000	WASHER, FLAT NO 10	2-11	5
G	1	310-0284-000	WASHER, LOCK NO 10	2-11	8
G	1	325-0053-000	SCREW 10-32X3/4	2-11	12
19	1	549-9306-004	LINE, XMSN, LOWER NO 3	2-11	32
20	1	013-0706-000	COUPLING	2-13	2
21	1	549-9304-004	LINE, XMSN, LOWER NO 2	2-10	46
22	1	013-0706-000	COUPLING	2-13	2
23	1	549-9302-004	LINE, XMSN, LOWER NO 1	2-12	36
24	1	549-2871-003	COIL, RF	2-12	34
H	1	310-0049-000	WASHER, FLAT NO 10	2-12	7
H	1	310-0284-000	WASHER, LOCK NO 10	2-12	10
H	1	325-0053-000	SCREW 10-32X3/4	2-12	16

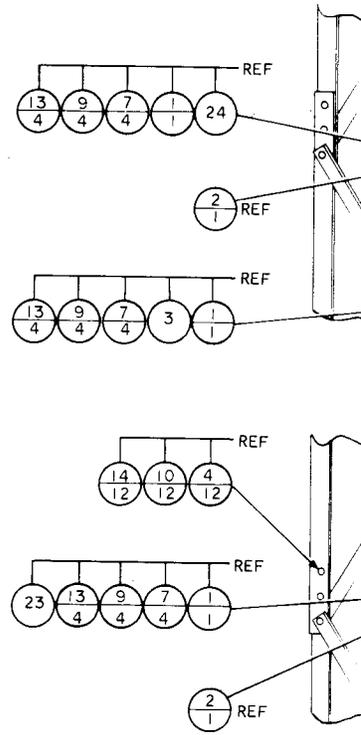
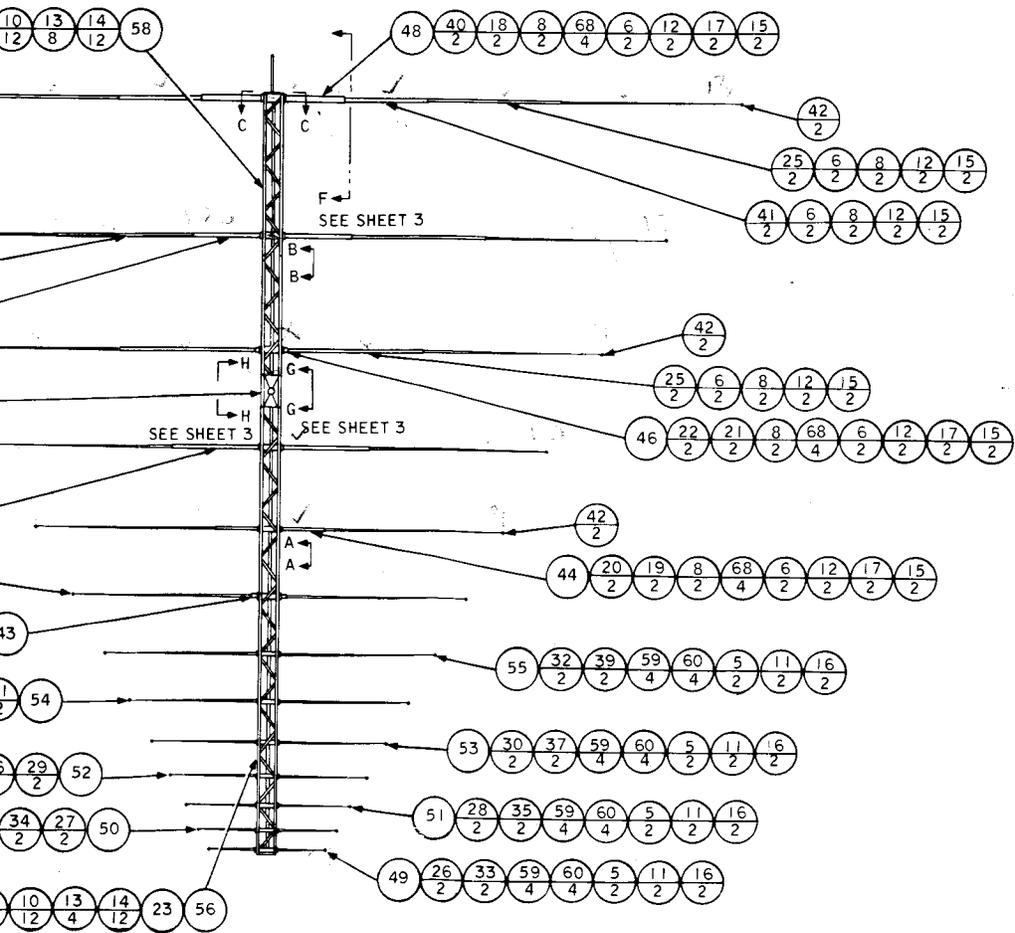
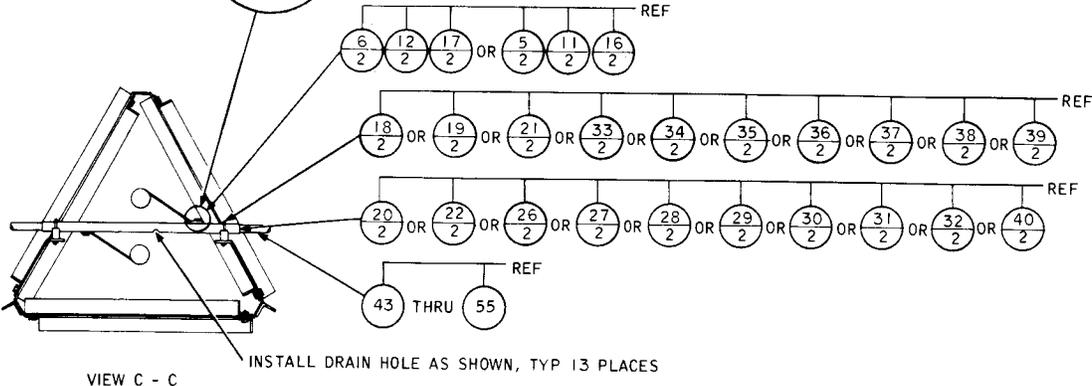
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Figure 2-12A. Antenna Array, Transmission and Balun Components.





DETAIL D  
 INSTALL SPACERS, ITEMS 16 OR 17  
 UNDER FEED STRAP AS SHOWN, 26 PLACES,  
 SEE NOTE 4

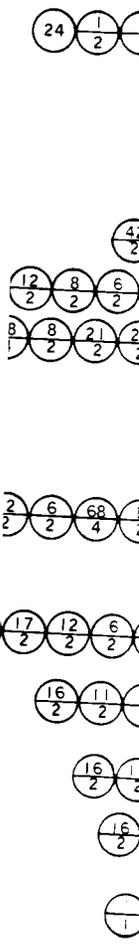


QTY	ITEM NO.	CULLINS PART NUMBER	PART NAME	QTY	ITEM NO.	CULLINS PART NUMBER	PART NAME
3	1	013-0232-000	GASKET	2	62	330-3862-000	SET SCREW 5/16 - 18 X 3/8
2	2	013-0706-000	COUPLING	2	63	313-0082-000	NUT, HEX. - 1/4 - 20
1	3	0 3-1500-000	CONTACT, ELECTRICAL	2	64	326-2261-000	SCREW - 1/4 - 20 X 5/8
29	4	310-0052-000	WASHER, FLAT - 3/8	2	65	005-0547-000	SEALANT (10 CC BTL)
14	5	310-0284-000	WASHER, LOCK - NO. 10	1	66	005-0737-000	SEALANT (2 OZ TUBE)
22	6	310-0288-000	WASHER, LOCK - 1/4	1	67	005-0318-000	THREAD LUBRICANT (8 OZ JAR)
12	7	310-0290-000	WASHER, LOCK - 5/16	24	68	333-1351-000	NUT, HEX., SELF LOCKING 3/8 - 16
22	8	310-0292-000	WASHER, LOCK - 3/8	2	69	326-2332-000	SCREW - 3/8 - 16 X 2 1/4
12	9	313-0033-000	NUT, HEX. - 5/16 - 18	4	70	343-0187-000	SCREW - 8 - 32 X 3/8
31	10	313-0235-000	NUT, HEX. - 3/8 - 16	4	71	310-0072-000	WASHER, LOCK - NO. 8
14	11	325-0053-000	SCREW - 10 - 32 X 3/4	1	72	005-1366-010	PRIMER
20	12	326-2262-000	SCREW - 1/4 - 20 X 3/4	1	73	005-1365-010	SEALANT
12	13	326-2293-000	SCREW - 5/16 - 18 X 1 3/8				
29	14	326-2316-000	SCREW - 3/8 - 16 X 1				
20	15	324-0615-000	SCREW - 3/8 - 16 X 1 1/4				
14	16	541-6123-002	SLEEVE, SPACER				
12	17	541-6167-002	SLEEVE, SPACER				
2	18	548-3265-002	U-BOLT, ELEMENT - NO. 13				
6	19	548-3266-002	U-BOLT, ELEMENT - NO. 8, 9, 10				
6	20	548-3268-002	BLOCK, SADDLE - NO. 8, 9, 10				
4	21	548-3270-002	U-BOLT, ELEMENT - NO. 11, 12				
4	22	549-0785-002	BLOCK, SADDLE - NO. 11, 12				
1	23	549-2671-002	BULLET, CONNECTOR - NO. 2				
1	24	549-2672-002	BULLET, CONNECTOR - NO. 3				
6	25	549-2687-003	SECTION, ELEMENT				
2	26	549-2691-003	BLOCK, SADDLE - NO. 1				
2	27	549-2692-003	BLOCK, SADDLE - NO. 2				
2	28	549-2693-003	BLOCK, SADDLE - NO. 3				
2	29	549-2694-003	BLOCK, SADDLE - NO. 4				
2	30	549-2695-003	BLOCK, SADDLE - NO. 5				
2	31	549-2696-003	BLOCK, SADDLE - NO. 6				
2	32	549-2697-003	BLOCK, SADDLE - NO. 7				
2	33	549-2699-003	U-BOLT NO. 1				
2	34	549-2700-003	U-BOLT NO. 2				
2	35	549-2701-003	U-BOLT NO. 3				
2	36	549-2702-003	U-BOLT NO. 4				
2	37	549-2703-003	U-BOLT NO. 5				
2	38	549-2704-003	U-BOLT NO. 6				
2	39	549-2705-003	U-BOLT NO. 7				
2	40	549-2707-003	BLOCK, SADDLE - NO. 13				
2	41	549-2784-004	SECTION, ELEMENT				
12	42	549-2794-004	SECTION, ELEMENT - NO. 8 - 13				
1	43	549-2850-005	ELEMENT, ANTENNA GLUED - NO. 8				
1	44	549-2851-005	ELEMENT, ANTENNA GLUED - NO. 9				
1	45	549-2852-005	ELEMENT, ANTENNA GLUED - NO. 10				
1	46	549-2853-005	ELEMENT, ANTENNA GLUED - NO. 11				
1	47	549-2854-005	ELEMENT, ANTENNA GLUED - NO. 12				
1	48	549-2855-005	ELEMENT, ANTENNA GLUED - NO. 13				
1	49	549-2856-005	ELEMENT, ANTENNA RIVETED - NO. 1				
1	50	549-2857-005	ELEMENT, ANTENNA RIVETED - NO. 2				
1	51	549-2858-005	ELEMENT, ANTENNA RIVETED - NO. 3				
1	52	549-2859-005	ELEMENT, ANTENNA RIVETED - NO. 4				
1	53	549-2860-005	ELEMENT, ANTENNA RIVETED - NO. 5				
1	54	549-2861-005	ELEMENT, ANTENNA RIVETED - NO. 6				
1	55	549-2862-005	ELEMENT, ANTENNA RIVETED - NO. 7				
1	56	764-9027-001	BOOM ASSEMBLY - FRONT				
1	57	764-9028-001	BOOM ASSEMBLY - CENTER				
1	58	764-9029-001	BOOM ASSEMBLY - REAR				
28	59	310-0050-000	WASHER, FLAT - 1/4				
28	60	333-0428-000	NUT, HEX., SELF-LOCKING - 1/4 - 20				
1	61	766-2409-005	SAIL				

NOTES:

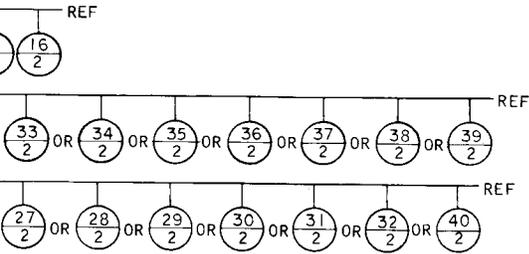
- THIS FIGURE APPLIES TO ANTENNAS MANUFACTURED PRIOR TO SEPT 1966
  - IN ALL SPLIT BALLOONS TOP FIGURE IS ITEM NUMBER AND BOTTOM FIGURE IS QUANTITY
  - LIQUID STAKE ALL SCREW THREADS USING SEALANT, ITEM 65, WHEN NO OTHER LOCKING MEANS ARE PROVIDED
  - COAT ENTIRE AREA AROUND ENDS OF FEED STRAPS AND THEIR MOUNTING HARDWARE WITH SEALER, ITEM 66, 26 PLACES, SEE DETAIL D
  - MOUNT LATCH CABLE BRACKET (PART OF ITEM 57) TO ITEM 58 PER VIEW E-E PASS CABLE THRU ALL CLAMPS AND UNDER 4 ANGLES AS SHOWN IN VIEW F-F
  - COAT THREADS OF BOLTS, ITEMS 12 AND 15, THAT ARE USED ON ELEMENT ASSEMBLIES WITH THREAD LUBRICANT, ITEM 67
- CAUTION
- DO NOT OVER TIGHTEN BOLTS, ITEM 69, VIEW GG, FIGURE 2-13. OVER TIGHTENING COULD RESULT IN SERIOUS DAMAGE TO ARRAY.
- TIGHTEN NUTS INDICATED IN VIEW G-G TO 25 LB. FT.
  - ON ASSEMBLY OF ANTENNA ARRAY WITH ROTATOR KIT, CPN 515-8551-000, CLEAN ROTATOR SHAFT AND BORE OF ANTENNA TILTING PLATFORM AND LUBRICATE WITH ITEM 67
  - SPRAY LIGHT COAT OF PRIMER, ITEM 72, ON ROTATOR OUTPUT SHAFT AND BORE OF ANTENNA TILTING PLATFORM, ALLOW TO DRY.
  - COAT THE LOWER 6 INCHES OF ROTATOR OUTPUT SHAFT WITH SEALANT, ITEM 73
  - INSTALL TILTING PLATFORM AND ROTATE THE SHAFT ADDING ADDITIONAL SEALANT, ITEM 73, THROUGH KEY SLOT
  - COAT KEY SUPPLIED WITH ROTATOR WITH SEALANT, ITEM 73, AND INSTALL WITH COVER
  - WHEN ASSEMBLING ELEMENTS ONTO BOOM BRACKETS, TAKE CARE TO ADJUST THE ELEMENTS SO THAT THE SADDLE, U-BOLT, AND ELEMENT INSULATOR DO NOT COME WITHIN 1/4 INCH OF THE METAL STRUT SECTION
  - THE ANTENNA ARRAY TILTING PLATFORM MAY BE REMOVED FROM THE ROTATOR OUTPUT SHAFT BY THE FOLLOWING: REMOVE THE LOCKING KEY RETAINER. WEDGE THE SLOT IN THE ANTENNA TILTING PLATFORM BORE OPEN. HEAT THE ANTENNA TILTING PLATFORM BORE TO 450° ± 50°. APPLY AN AXIAL FORCE BETWEEN THE ANTENNA ROTATOR OUTPUT SHAFT AND THE ANTENNA TILTING PLATFORM BORE.

Figure 2-13. Installation of Antenna Array (Sheet 1 of 3).

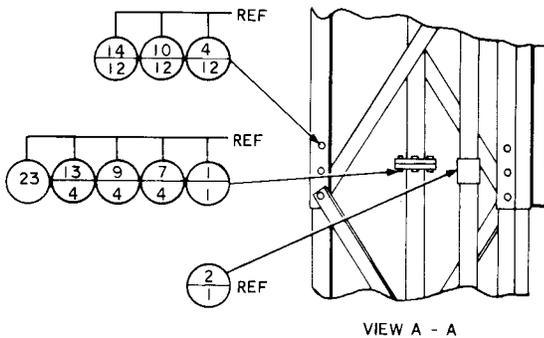
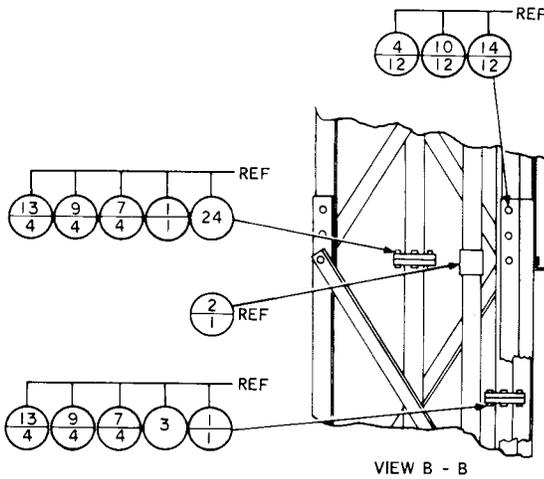
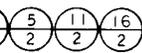
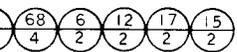
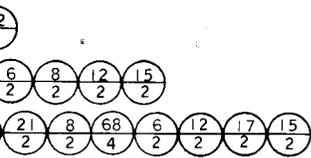
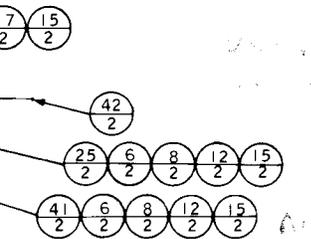




6 OR 17  
 W, 26 PLACES,



3 PLACES



QTY	ITEM NO	COLLINS PART NUMBER	PART NAME
3	1	013-0232-000	GASKET
2	2	013-0706-000	COUPLING
1	3	013-1500-000	CONTACT, E
29	4	310-0052-000	WASHER, FL
14	5	310-0284-000	WASHER, LO
22	6	310-0288-000	WASHER, LO
12	7	310-0290-000	WASHER, LO
22	8	310-0292-000	WASHER, LO
12	9	313-0033-000	NUT, HEX
31	10	313-0235-000	NUT, HEX
14	11	325-0053-000	SCREW - 10
20	12	326-2262-000	SCREW - 1
12	13	326-2293-000	SCREW - 5
29	14	326-2316-000	SCREW - 3
20	15	324-0615-000	SCREW - 3
14	16	541-6123-002	SLEEVE, SP
12	17	541-6167-002	SLEEVE, SP
2	18	548-3265-002	U-BOLT, EL
6	19	548-3266-002	U-BOLT, EL
6	20	548-3268-002	BLOCK, SAD
4	21	548-3270-002	U-BOLT, EL
4	22	549-0785-002	BLOCK, SAD
1	23	549-2671-002	BULLET, CC
1	24	549-2672-002	BULLET, CC
6	25	549-2687-003	SECTION, EL
2	26	549-2691-003	BLOCK, SAD
2	27	549-2692-003	BLOCK, SAD
2	28	549-2693-003	BLOCK, SAD
2	29	549-2694-003	BLOCK, SAD
2	30	549-2695-003	BLOCK, SAD
2	31	549-2696-003	BLOCK, SAD
2	32	549-2697-003	BLOCK, SAD
2	33	549-2699-003	U-BOLT NO.
2	34	549-2700-003	U-BOLT NO.
2	35	549-2701-003	U-BOLT NO.
2	36	549-2702-003	U-BOLT NO.
2	37	549-2703-003	U-BOLT NO.
2	38	549-2704-003	U-BOLT NO.
2	39	549-2705-003	U-BOLT NO.
2	40	549-2707-003	BLOCK, SAD
2	41	549-2784-004	SECTION, EL
12	42	549-2794-004	SECTION, EL
1	43	549-2850-005	ELEMENT, A
1	44	549-2851-005	ELEMENT, A
1	45	549-2852-005	ELEMENT, A
1	46	549-2853-005	ELEMENT, A
1	47	549-2854-005	ELEMENT, A
1	48	549-2855-005	ELEMENT, A
1	49	549-2856-005	ELEMENT, A
1	50	549-2857-005	ELEMENT, A
1	51	549-2858-005	ELEMENT, A
1	52	549-2859-005	ELEMENT, A
1	53	549-2860-005	ELEMENT, A
1	54	549-2861-005	ELEMENT, A
1	55	549-2862-005	ELEMENT, A
1	56	764-9027-001	BOOM ASSEM
1	57	764-9028-001	BOOM ASSEM
1	58	764-9029-001	BOOM ASSEM
28	59	310-0050-000	WASHER, FL
28	60	333-0428-000	NUT, HEX.
1	61	766-2409-005	SAIL

Figure 2-3

QTY	ITEM NO	COLLINS PART NUMBER	PART NAME	QTY	ITEM NO	COLLINS PART NUMBER	PART NAME
3	1	013-0232-000	GASKET	2	62	330-3862-000	SET SCREW 5/16 - 18 X 3/8
2	2	013-0706-000	COUPLING	2	63	313-0082-000	NUT, HEX. - 1/4 - 20
1	3	013-1500-000	CONTACT, ELECTRICAL	2	64	326-2261-000	SCREW - 1/4 - 20 X 5/8
29	4	310-0052-000	WASHER, FLAT - 3/8	2	65	005-0547-000	SEALANT (10 CC BTL)
14	5	310-0284-000	WASHER, LOCK - NO. 10	1	66	005-0737-000	SEALANT (2 OZ TUBE)
22	6	310-0288-000	WASHER, LOCK - 1/4	1	67	005-0318-000	THREAD LUBRICANT (8 OZ JAR)
12	7	310-0290-000	WASHER, LOCK - 5/16	24	68	333-1351-000	NUT, HEX., SELF LOCKING 3/8 - 16
22	8	310-0292-000	WASHER, LOCK - 3/8	2	69	326-2332-000	SCREW - 3/8 - 16 X 2 1/4
12	9	313-0033-000	NUT, HEX. - 5/16 - 18				
31	10	313-0235-000	NUT, HEX. - 3/8 - 16				
14	11	325-0053-000	SCREW - 10 - 32 X 3/4				
20	12	326-2262-000	SCREW - 1/4 - 20 X 3/4				
12	13	326-2293-000	SCREW - 5/16 - 18 X 1 3/8				
29	14	326-2316-000	SCREW - 3/8 - 16 X 1				
20	15	324-0615-000	SCREW - 3/8 - 16 X 1 1/4				
14	16	541-6123-002	SLEEVE, SPACER				
12	17	541-6167-002	SLEEVE, SPACER				
2	18	548-3265-002	U-BOLT, ELEMENT - NO. 13				
6	19	548-3266-002	U-BOLT, ELEMENT - NO. 8,9,10				
6	20	548-3268-002	BLOCK, SADDLE - NO. 8,9,10				
4	21	548-3270-002	U-BOLT, ELEMENT - NO. 11,12				
4	22	549-0785-002	BLOCK, SADDLE - NO. 11,12				
1	23	549-2671-002	BULLET, CONNECTOR - NO. 2				
1	24	549-2672-002	BULLET, CONNECTOR - NO. 3				
6	25	549-2687-003	SECTION, ELEMENT				
2	26	549-2691-003	BLOCK, SADDLE - NO. 1				
2	27	549-2692-003	BLOCK, SADDLE - NO. 2				
2	28	549-2693-003	BLOCK, SADDLE - NO. 3				
2	29	549-2694-003	BLOCK, SADDLE - NO. 4				
2	30	549-2695-003	BLOCK, SADDLE - NO. 5				
2	31	549-2696-003	BLOCK, SADDLE - NO. 6				
2	32	549-2697-003	BLOCK, SADDLE - NO. 7				
2	33	549-2699-003	U-BOLT NO. 1				
2	34	549-2700-003	U-BOLT NO. 2				
2	35	549-2701-003	U-BOLT NO. 3				
2	36	549-2702-003	U-BOLT NO. 4				
2	37	549-2703-003	U-BOLT NO. 5				
2	38	549-2704-003	U-BOLT NO. 6				
2	39	549-2705-003	U-BOLT NO. 7				
2	40	549-2707-003	BLOCK, SADDLE - NO. 13				
2	41	549-2784-004	SECTION, ELEMENT				
12	42	549-2794-004	SECTION, ELEMENT - NO. 8-13				
1	43	549-2850-005	ELEMENT, ANTENNA GLUED - NO. 8				
1	44	549-2851-005	ELEMENT, ANTENNA GLUED - NO. 9				
1	45	549-2852-005	ELEMENT, ANTENNA GLUED - NO. 10				
1	46	549-2853-005	ELEMENT, ANTENNA GLUED - NO. 11				
1	47	549-2854-005	ELEMENT, ANTENNA GLUED - NO. 12				
1	48	549-2855-005	ELEMENT, ANTENNA GLUED - NO. 13				
1	49	549-2856-005	ELEMENT, ANTENNA RIVETED - NO. 1				
1	50	549-2857-005	ELEMENT, ANTENNA RIVETED - NO. 2				
1	51	549-2858-005	ELEMENT, ANTENNA RIVETED - NO. 3				
1	52	549-2859-005	ELEMENT, ANTENNA RIVETED - NO. 4				
1	53	549-2860-005	ELEMENT, ANTENNA RIVETED - NO. 5				
1	54	549-2861-005	ELEMENT, ANTENNA RIVETED - NO. 6				
1	55	549-2862-005	ELEMENT, ANTENNA RIVETED - NO. 7				
1	56	764-9027-001	BOOM ASSEMBLY - FRONT				
1	57	764-9028-001	BOOM ASSEMBLY - CENTER				
1	58	764-9029-001	BOOM ASSEMBLY - REAR				
28	59	310-0050-000	WASHER, FLAT - 1/4				
28	60	333-0428-000	NUT, HEX., SELF-LOCKING - 1/4 - 20				
1	61	766-2409-005	SAIL				

NOTES:

1. THIS FIGURE APPLIES TO ANTENNAS MANUFACTURED SUBSEQUENT TO SEPT. 1966.
2. IN ALL SPLIT BALLOONS TOP FIGURE IS ITEM NUMBER AND BOTTOM FIGURE IS QUANTITY.
3. LIQUID STAKE ALL SCREW THREADS USING SEALANT, ITEM 65, WHEN NO OTHER LOCKING MEANS ARE PROVIDED.
4. COAT ENTIRE AREA AROUND ENDS OF FEED STRAPS AND THEIR MOUNTING HARDWARE WITH SEALER, ITEM 66, 26 PLACES, SEE DETAIL D.
5. MOUNT LATCH CABLE BRACKET (PART OF ITEM 57) TO ITEM 58 PER VIEW E-E PASS CABLE THRU ALL CLAMPS AND UNDER 4 ANGLES AS SHOWN IN VIEW F-F.
6. COAT THREADS OF BOLTS, ITEM 12 AND 15, THAT ARE USED ON ELEMENT ASSEMBLIES WITH THREAD LUBRICANT, ITEM 67.

CAUTION

- DO NOT OVER TIGHTEN BOLTS, ITEM 6, VIEW G-G, FIGURE 2-13. OVER TIGHTENING COULD RESULT IN SERIOUS DAMAGE TO ARRAY.
7. TIGHTEN NUTS INDICATED IN VIEW G-G TO 25 LB. FT
  8. BEFORE ASSEMBLY OF ANTENNA ARRAY WITH ROTATOR KIT CPN 515-8551-001, CLEAN ROTATOR SHAFT AND BORE OF ANTENNA TILTING PLATFORM AND LUBRICATE WITH ITEM 67.
  9. POSITION KEY IN ROTATOR OUTPUT SHAFT KEY SLOT AND INSTALL THE TILTING PLATFORM UNTIL IT BOTTOMS OUT.
  10. COAT SET SCREWS, ITEM 62, WITH SEALANT, ITEM 65, AND TIGHTEN AGAINST KEY AFTER ASSEMBLY.
  11. WHEN ASSEMBLING ELEMENTS ONTO BOOM BRACKETS, TAKE CARE TO ADJUST THE ELEMENTS SO THAT THE SADDLE, U-BOLT, AND ELEMENT INSULATOR DO NOT COME WITHIN LESS THAN 1/4 INCH OF THE METAL TRUSS SECTION.

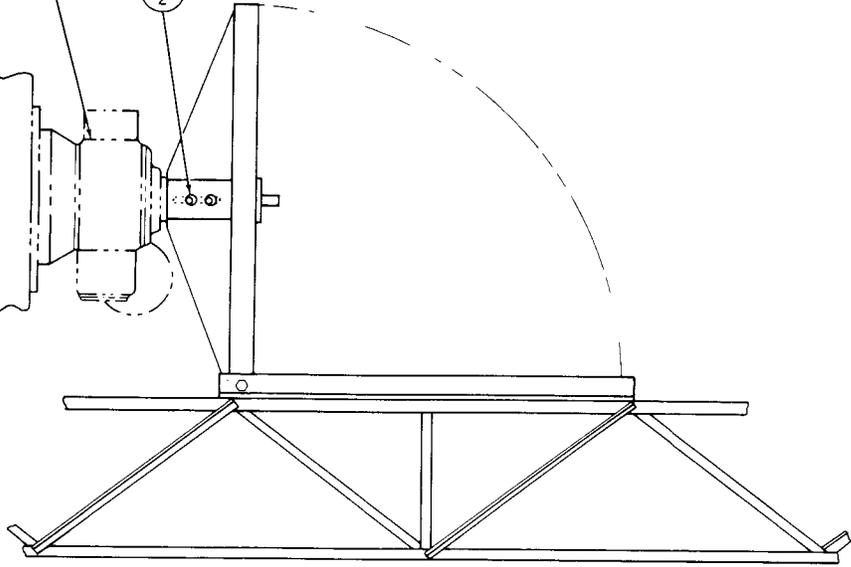
Figure 2-13. Installation of Antenna Array (Sheet 2 of 3).

ROTATOR KIT  
CPN 515-8551-001

62  
2

GUY, ANCHOR AND TOWER KIT  
CPN 515-8012-001

VIEW H-H  
ROTATED 90° CCW  
ANTENNAS MFG  
SUBSEQUENT TO  
SEPT 1966



SEE NOTES  
7 THROUGH 12  
CAUTION:  
DO NOT OVER  
TIGHTEN

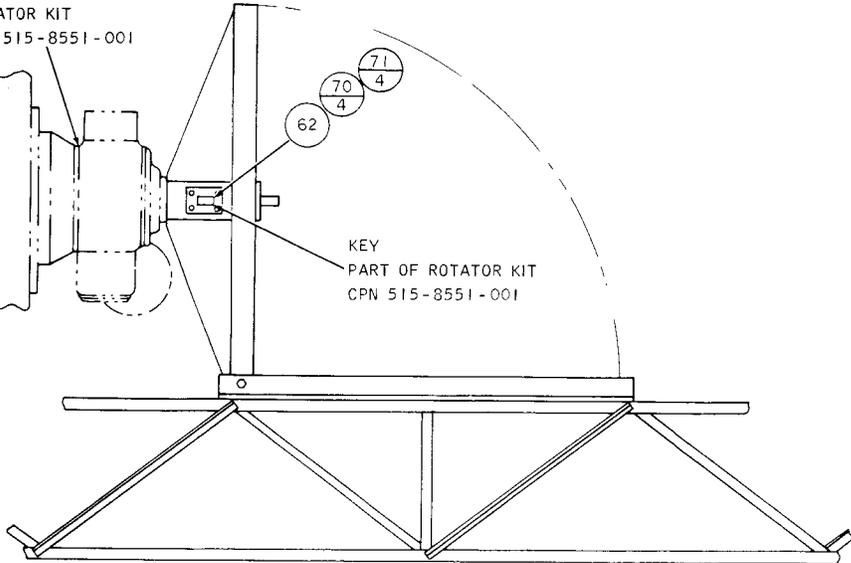
ROTATOR KIT  
CPN 515-8551-001

71  
4  
70  
4  
62

GUY, ANCHOR AND TOWER KIT  
CPN 515-8012-001

KEY  
PART OF ROTATOR KIT  
CPN 515-8551-001

VIEW H-H  
ROTATED 90° CCW  
ANTENNAS MFG  
PRIOR TO SEPT. 1966



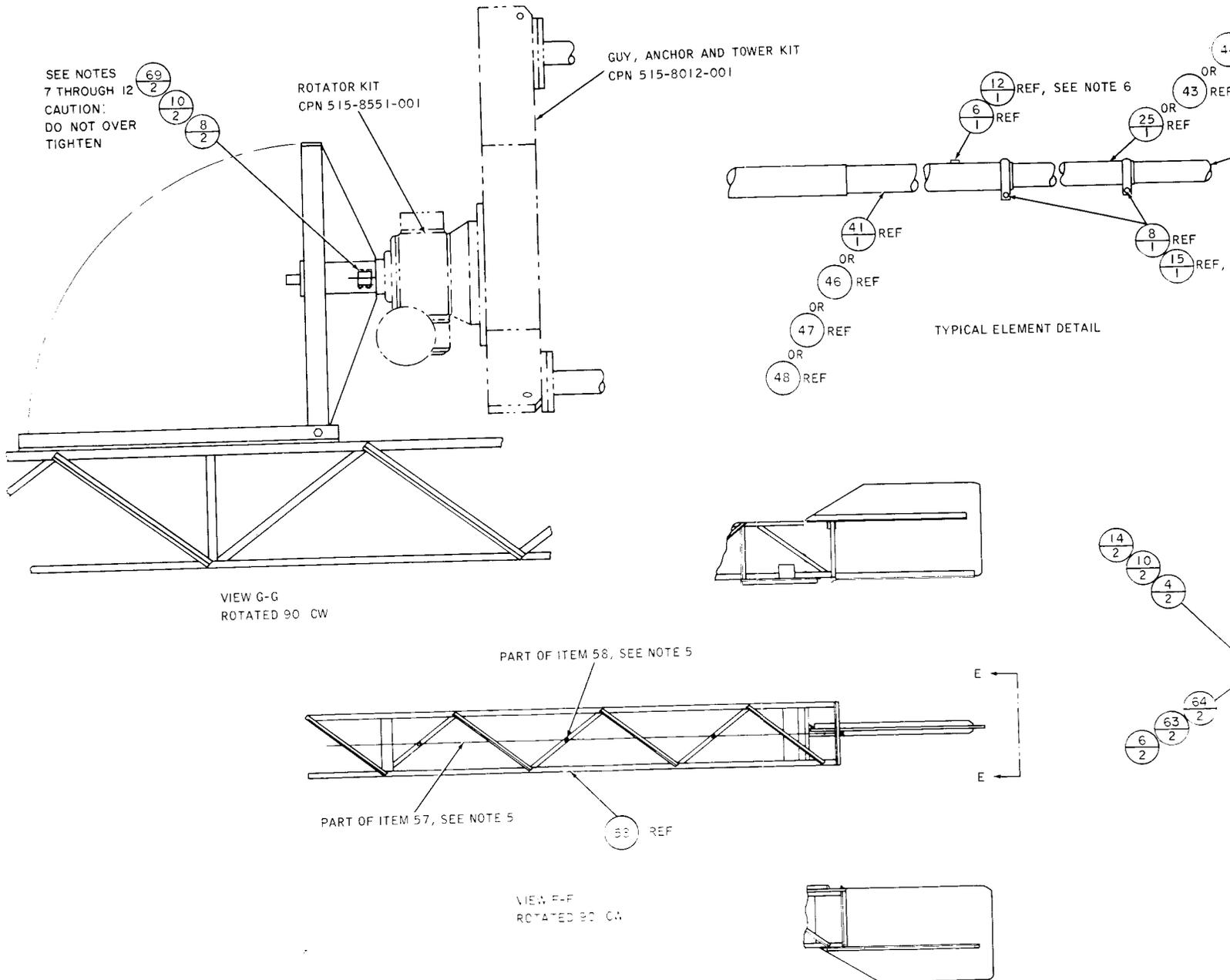
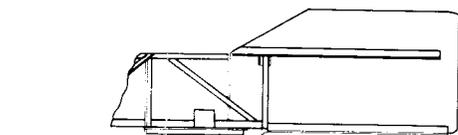
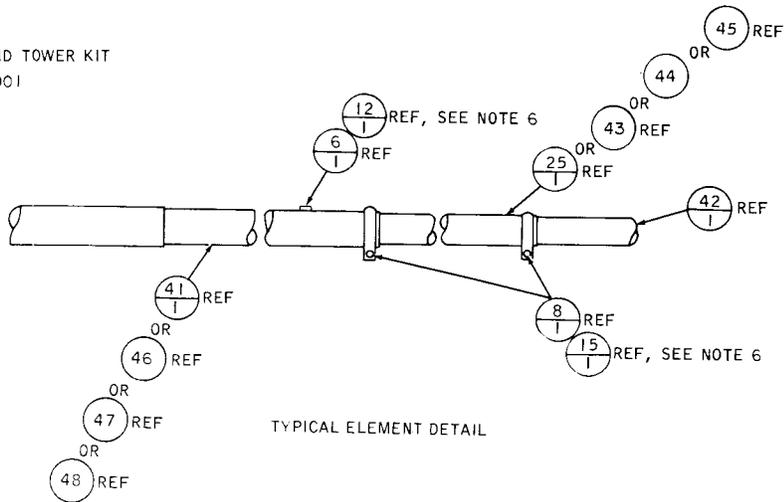
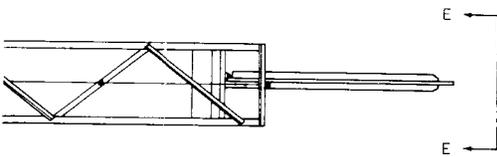


Figure 2-13. Installation of

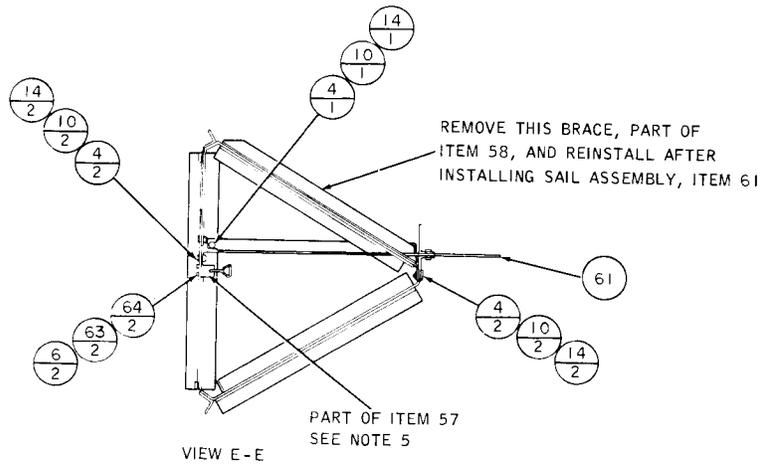
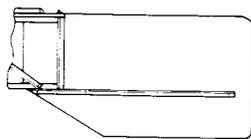
UY, ANCHOR AND TOWER KIT  
PN 515-8012-001



E NOTE 5



REF

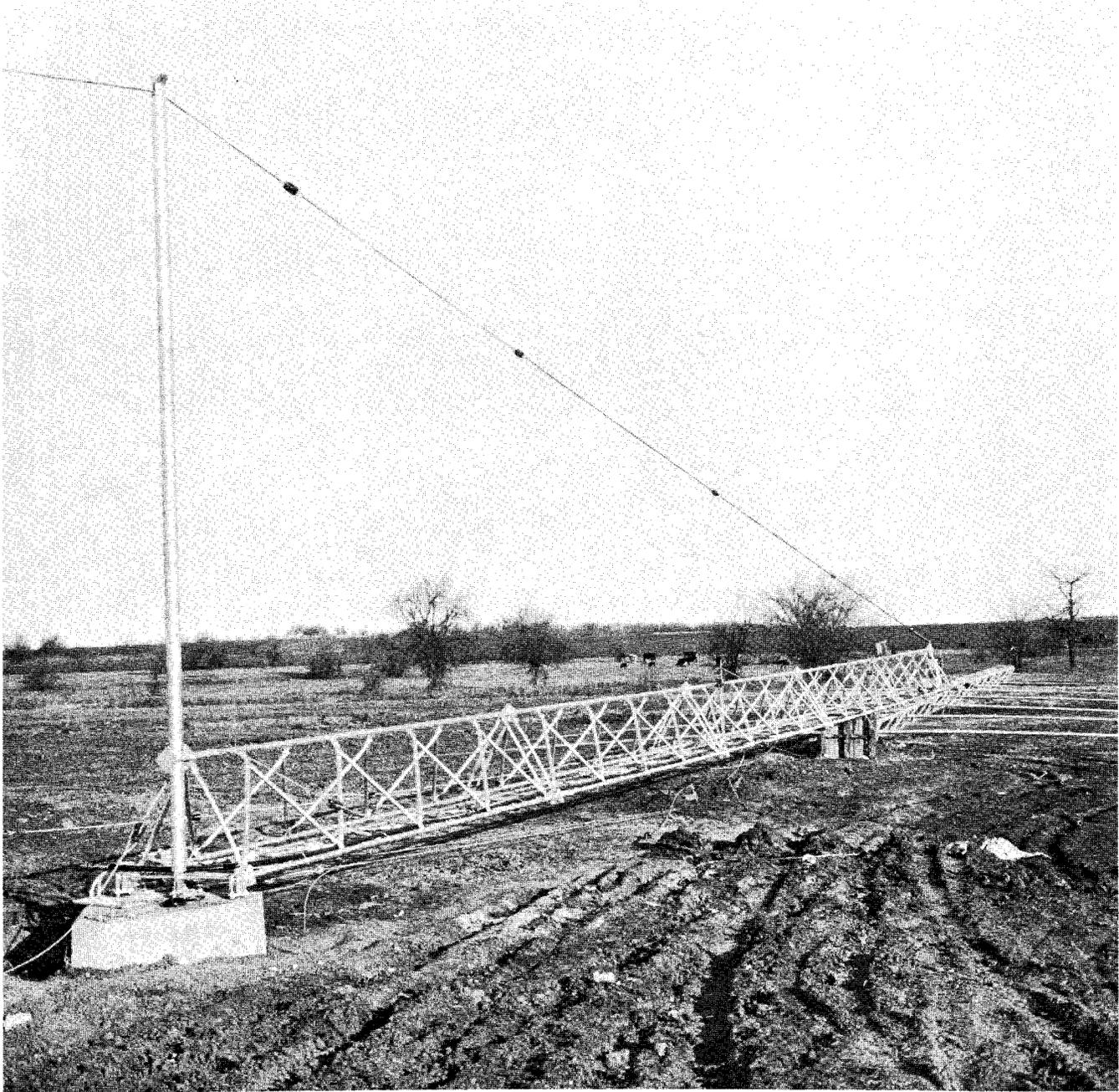


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Figure 2-13. Installation of Antenna Array (Sheet 3 of 3).



Figure 2-14. Winch and Block Assembly in Use.



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Figure 2-15. Antenna in Lowered Position With Erecting Mast Installed.

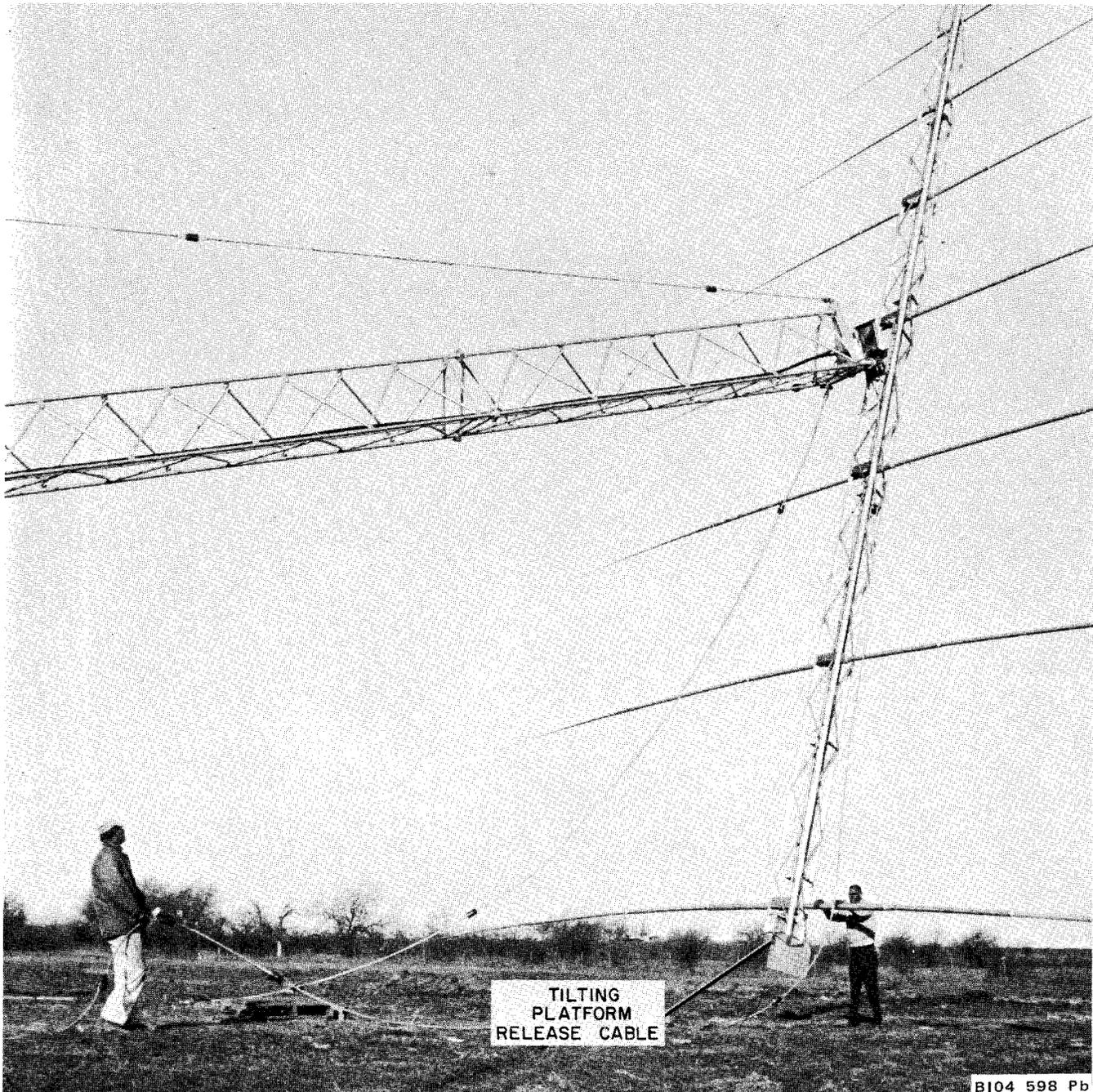


Figure 2-16. Antenna During Erection With Array Hinging Detail.

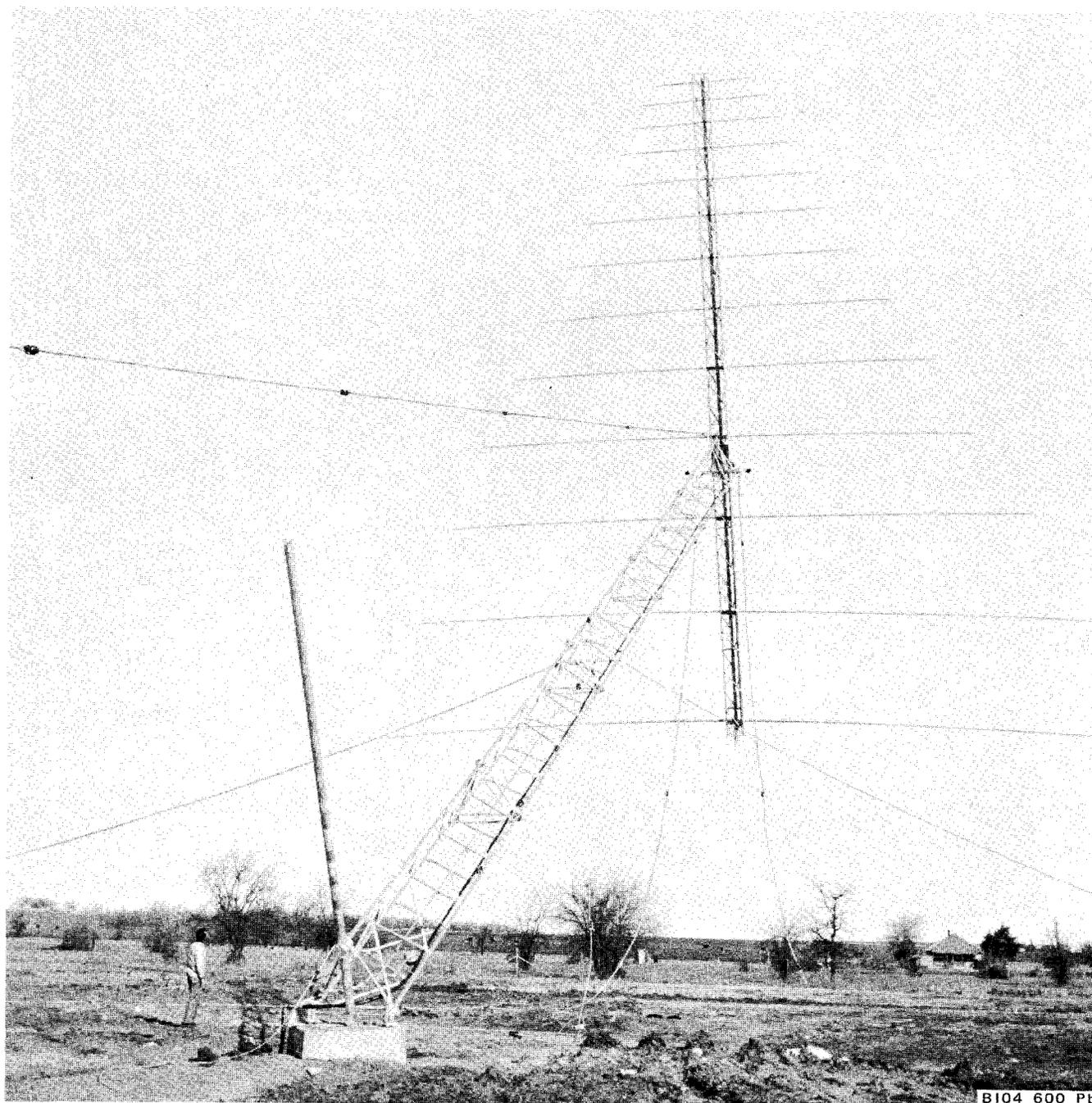


Figure 2-17. Antenna During Erection With Array Locked.



**COLLINS RADIO COMPANY ROTATABLE LOG PERIODIC ANTENNA 237B-3**  
**PROCEDURE FOR LOWERING OR RAISING WITH**  
**ERECTION KIT, CPN 515-8524-001**

**CAUTION - THE FOLLOWING PROCEDURES MUST BE OBSERVED.**

1. DO NOT RAISE OR LOWER ANTENNA IN WINDS ABOVE 40 MPH.
2. CHECK CONDITION OF WINCH, CABLE, COUNTERWEIGHT, PREFORMED GRIP, AND PULLEY. ALL MUST BE USED.
3. CHECK ALL ERECTING KIT BOLTS FOR TIGHTNESS.
4. GREASE WINCH AND PULLEY AT ALL FITTINGS.

IF PREFORMED GRIP HAS BEEN REMOVED, DO NOT RE-APPLY. USE NEW GRIP CPN 015-2354-00.

**TO LOWER:**

1. ROTATE ARRAY SO THAT FRONT OF BOOM IS IN LINE WITH TOP GUY TO WINCH.
2. DISCONNECT COAX AT BASE OF TOWER. TURN OFF A.C. POWER TO ROTATOR.
3. REDUCE MIDDLE SIDE-GUY TENSION TO APPROXIMATELY 200 LBS. SHAKE GUY TO OBTAIN "FEEL" FOR THIS TENSION. SEE NOTE.
4. DISCONNECT MIDDLE GUY TOWARDS WINCH.
5. REMOVE 2 TOWER BASE NUTS BELOW LEG EXTENSION.
6. INCREASE TENSION ON WINCH CABLE AND REMOVE SHACKLE PIN FROM TURNBUCKLE.
7. LOWER ARRAY USING HAND CRANK OR POWER TOOL KIT. CPN 515-8601-001.
8. MAKE SURE CABLE ENTERS GIN-POLE SLOT.

CHECK MIDDLE SIDE-GUY TENSION CONTINUALLY DURING RAISING OR LOWERING. IF THE GUY ANCHOR LOOPS ARE NOT IN LINE WITH THE TOWER HINGE WITHIN 1/2 INCH THE GUYS CAN OVER-TIGHTEN CAUSING A TOWER LEG TO BUCKLE. PROPER TENSION MUST ALSO BE MAINTAINED TO BRACE TOWER AGAINST A STRONG CROSS-WIND. UP-WIND GUY MAY DEVELOP 600 LBS. MAX. @ 40 MPH WIND.

9. DO NOT STAND UNDER TOWER WHEN RELEASING ARRAY LATCHES.

**TO RAISE:**

1. INCREASE TENSION ON WINCH CABLE SO THAT WEIGHT OF ANTENNA IS ON TOWER. TENSION IN LIFTING GUY CABLE IS 12,000 LBS. MAXIMUM AT THIS POINT.
2. ADJUST MIDDLE SIDE GUY TENSION TO 200 LBS.
3. RAISE TOWER MAKING SURE MIDDLE SIDE GUY TENSIONS DO NOT BECOME TOO TIGHT OR LOOSE.
4. SWING ARRAY INTO POSITION. PULL LATCH CABLE TO RETRACT LATCHES AND SWING ARRAY INTO FINAL POSITION. RELEASE LATCH CABLE AND CHECK THAT BOTH LATCH PLUNGERS ARE FULLY ENGAGED IN TILT PLATFORM EAR.
5. RAISE TOWER TO VERTICAL POSITION. PLUMB TOWER WITHIN 1/2 INCH WITH TRANSIT. RECONNECT TURNBUCKLES AND RELIEVE TENSION ON WINCH.
6. TENSION TOP GUYS TO 2600 LBS. MIDDLE GUYS 1500. RE-CHECK PLUMB OF TOWER.
7. REPLACE BASE NUTS AND COAX. RE-PRESSURIZE COAX.
8. SAFETY-WIRE ALL TURNBUCKLES.

**RECOMMENDED MAINTENANCE: THREE MONTH INTERVALS**

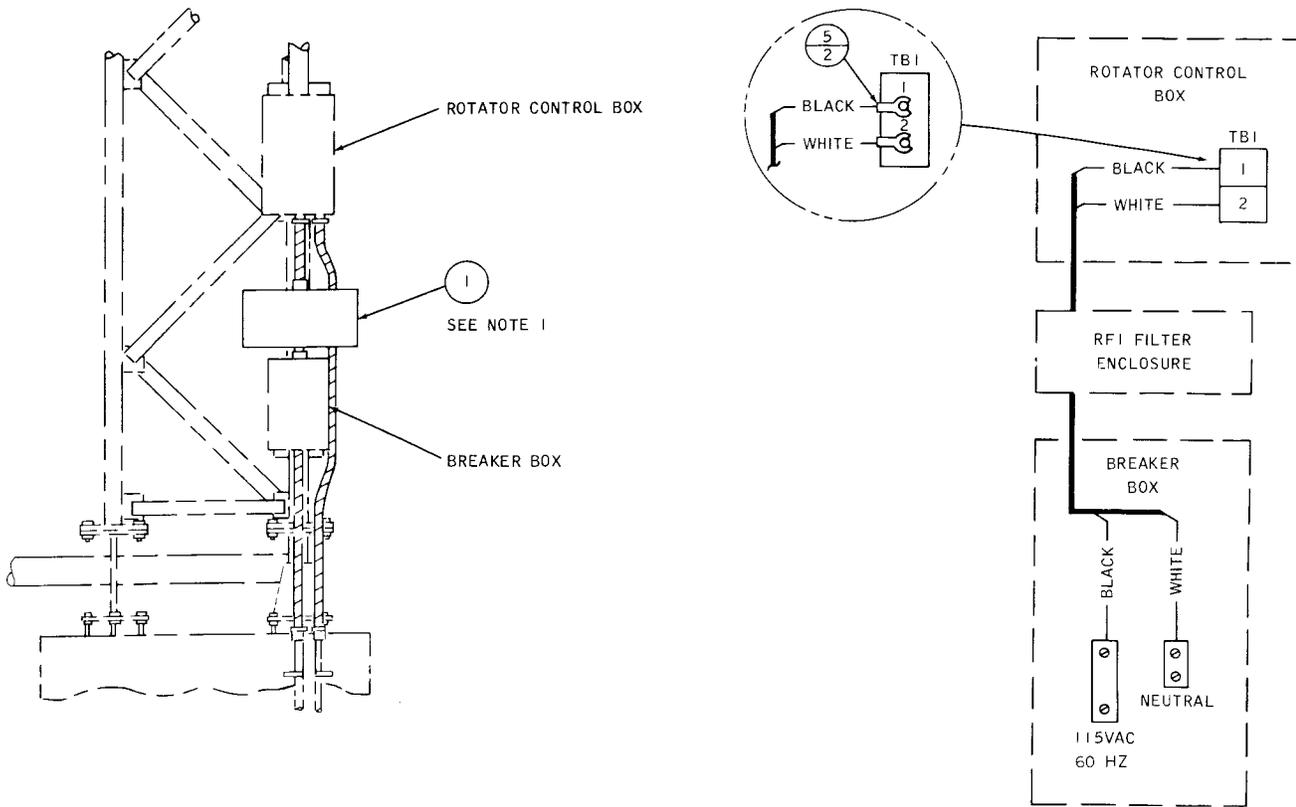
CHECK TOWER, ROTATOR, AND ARRAY FOR FOLLOWING TORQUE VALUES ON BOLTS:

3/4 DIAMETER	-	320 LB-FT
1/2 DIAMETER	-	90 LB-FT, (GALV. BOLTS), 45 LB-FT (STAINLESS STEEL BOLTS)
3/8 DIAMETER	-	25 LB-FT
5/16 DIAMETER	-	132 LB-IN
1/4 DIAMETER	-	75 LB-IN
10-32 BOLTS	-	8 LB-IN

**NOTE:** USE IN-LINE DYNAMOMETER OR CLAMP-ON DYNAMOMETER NO. AT-6896 CALIBRATED FOR 25M CABLE. (OBTAINABLE FROM GRAYBAR ELECT. CO.). USE 10M SCALE FOR 3/8 GUY, 25M FOR 1/2 GUY, (OR A SUITABLE SUBSTITUTE).

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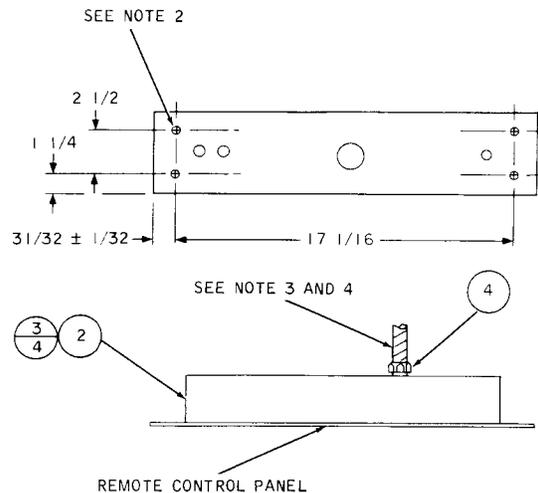
Figure 2-18. Antenna Raising and Lowering Checklist Placard.



QTY REQD	ITEM NO.	COLLINS PART NUMBER	DESCRIPTION
1	1	764-7287-001	ENCLOSURE ASSY, RFI FILTER
1	2	764-7283-002	ENCLOSURE, PANEL
4	3	342-0224-000	SCREW, 10-32 UNC X 1/2 PFH SS
1	4	019-0330-000	FITTING, CONDUIT
2	5	304-0253-000	LUG, WIRE

NOTES:

1. REMOVE CONDUIT FROM BREAKER BOX AND REMOVE BOX FROM LEG OF TOWER: ATTACH FILTER ASSY, ITEM 1, TO TOP OF BREAKER BOX AFTER REMOVING CONDUIT FITTING. REINSTALL CONDUIT FITTING IN TOP BOSS OF FILTER ASSY AND ATTACH BREAKER BOX TO TOWER LEG AT A LOWER POSITION. SHORTEN LOWER CONDUIT TO SUIT
2. MARK FACE OF FRONT PANEL AS SHOWN AND DRILL 4 HOLES, .203 DIA, AND COUNTERSINK 82° TO .390 DIA ATTACH ENCL ITEM 2, TO BACK OF REMOTE CONTROL PANEL WITH SCREWS, ITEMS 3, AFTER REROUTING CONTROL CABLE THRU CONDUIT
3. 3/4 INCH FLEXIBLE CONDUIT NOT SUPPLIED BY COLLINS RADIO
4. 3/4 INCH FLEXIBLE CONDUIT MUST EXTEND FROM CONTROL PANEL TO OUTSIDE WALL OF CONTROL BUILDING AND BE GROUNDED EITHER TO THE WALL OR OUTSIDE THE WALL
5. CAUTION - REMOVE POWER FROM ANTENNA SYSTEM AT BREAKER BOX OR PRIOR TO BREAKER BOX BEFORE DISCONNECTING WIRES FROM REMOTE CONTROL PANEL
6. IN ALL SPLIT BALLOONS TOP FIGURE IS MATERIAL LIST ITEM AND BOTTOM FIGURE IS QUANTITY
7. COAT ALL PIPE THREADS WITH SEALER BEFORE ASSEMBLY



B104 678 6

Figure 2-19. Radio Frequency Interference Kit Installation.

# section **3**

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## operating instructions

### 3.1 GENERAL

**Caution**

Point the antenna into the wind when wind velocity exceeds 65 mph. Stow the antenna when winds of 143 mph (no ice), or winds of 98 mph (with one-half inch of radial ice) are expected.

**Note**

Above caution refers only to antennas manufactured prior to January 1967. Antennas manufactured after that date are equipped with Type CT-1410 rotators, which contain a load-relieving slip clutch.

The 237B-3 Rotatable Directional HF Antenna presents a 50-ohm load at any frequency in the 6.5- to 40.0-MHz range. The antenna azimuth can be controlled locally or from a remote facility. The antenna is designed for a maximum input power of 50-kw-pep., or 25-kw average.

### 3.2 LOCAL OPERATION

Perform the following procedures for local (tower base) operation of the antennas. Refer to figure 3-1 and table 3-1 for control identification. Phone jacks are provided for communication between the local (tower) and remote operating positions.

- a. Position the power switch to OFF.
- b. Position the breaker box switch to ON.
- c. Hold the power switch in the LOCAL ON position (spring-loaded switch). The antenna will begin to rotate. The POWER ON indicator and the IN MOTION indicator (on 143A-3 Antenna Rotator Control) will light when the antenna is in motion.
- d. Release the power switch when the antenna is in the desired position. The switch will return to the OFF position.

**Note**

The power switch must be in the REMOTE ON position and the breaker box switch must be in the ON position for remote operation from the 143A-3 Antenna Rotator Control. When the power switch is returned to the REMOTE ON position, the antenna will return to the position indicated on the 143A-3 Antenna Rotator Control.

### 3.3 REMOTE OPERATION FROM THE 143A-3 ANTENNA ROTATOR CONTROL

Perform the following procedures for operation of the antenna from the 143A-3 Antenna Rotator Control. See figure 3-2 for identification of controls and indicators.

- a. Refer to note following step d. of paragraph 3.2.
- b. Position the antenna azimuth control to the desired antenna direction. The IN MOTION indicator will light when the antenna is being positioned to the selected direction.
- c. The antenna is now ready for operation.

### 3.4 143A-3 ANTENNA ROTATOR CONTROL CALIBRATION

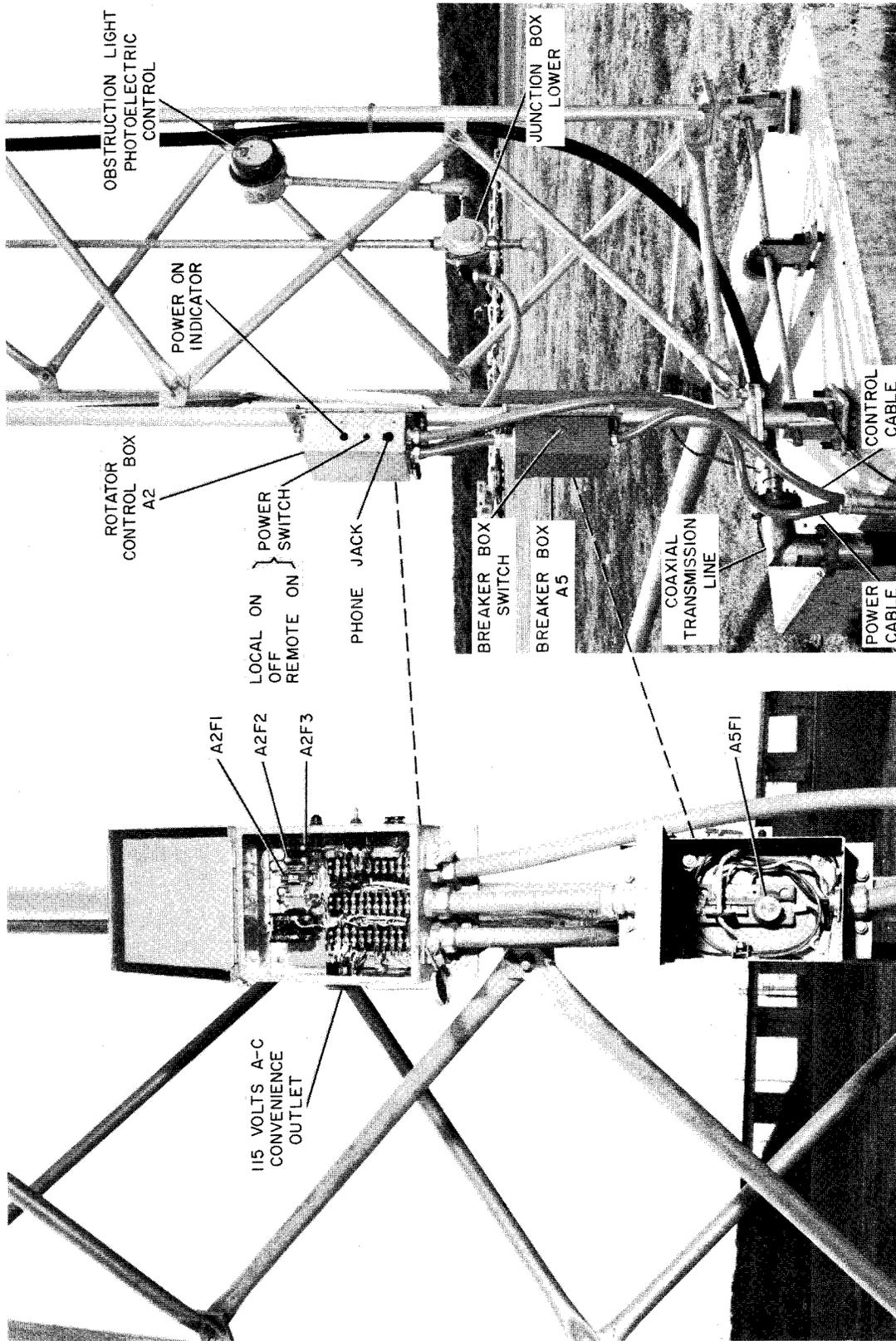
Calibrate the 143A-3 Antenna Rotator Control using the following procedures:

- a. Position one man at the antenna tower.
- b. Position one man at the remote control position.
- c. Check to see that phone jacks are operational between the two positions.
- d. Ensure that the power switch is in the REMOTE ON position and the breaker box switch is in the ON position. The POWER ON indicator should light.

**Note**

The antenna sail is on the rear of the antenna.

- e. Use a compass (or other acceptable means) to determine true north (correct magnetic compass for local magnetic variation).



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Figure 3-1. Local Control Unit, Controls and Indicators.

Table 3-1. Local (Tower Base) Controls, Fuses, and Indicators (See Figure 3-1).

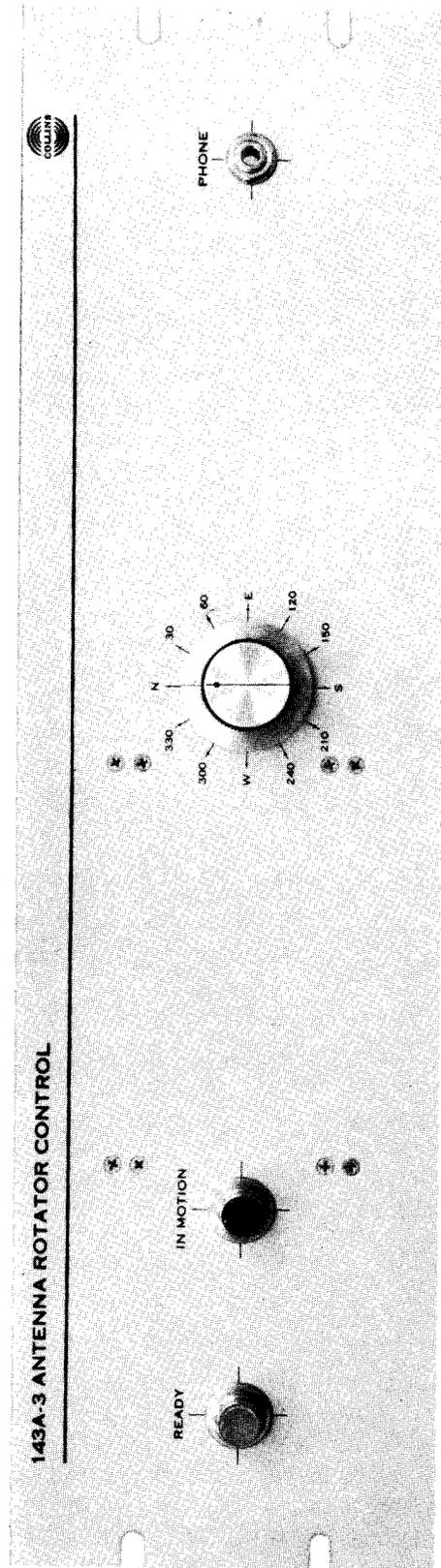
CONTROL	INDICATOR	FUNCTION
Power switch  PHONE  Breaker box switch Fuse A5F1  Fuse A2F1  Fuse A2F2  Fuse A2F3	POWER ON	LOCAL ON - Local control of antenna azimuth. Permits positioning of antenna azimuth to any direction. Not restricted to 30° increments. OFF - Prevents control of antenna from remote position. REMOTE ON - Permits control of antenna from remote position. Indicates when power is applied to the local or remote control units. Used for communication between remote location and antenna tower. Applies power to antenna system. Protects motor, tower lights, and control circuits. 30-amperes, CPN 264-0170-001. Protects motor and control circuits 12 amperes, CPN 264-0656-000. Protects control circuits. 2 amperes, CPN 264-4070-000. Protects photocell and tower lights. 5 amperes, CPN 264-4090-000.

Table 3-2. 143A-3 Antenna Rotator Control, Controls and Indicators (See Figure 3-2).

CONTROL	INDICATOR	FUNCTION
Antenna azimuth control  PHONE	IN MOTION  READY	Selects antenna azimuth in 30° increments.  Indicates when antenna is rotating. This control indicates rotation when the antenna is operated locally or remotely. Indicates that antenna is positioned to selected azimuth. Used for communication between remote location and antenna tower.

- f. Use local control to rotate antenna to true north.
- g. Set knob on remote control to N (north).
- h. Position switch on local control unit to REMOTE. Antenna will either remain in position or rotate to a new position and stop.
  1. If the antenna remains in position, rotate knob to E (east) position. Antenna should

- rotate 90° clockwise and stop, indicating that the antenna rotator control is calibrated and requires no further action.
- 2. If the antenna rotates to a new position and stops, remove switch cover from switch at base of rotator. Loosen set screws in switch assembly coupling (item number 1, figure 2-7).



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Figure 3-2. 143A-3 Antenna Rotator Control, Controls and Indicators.

3. Use the local control switch to rotate the antenna to true north.
4. After antenna has stopped at true north, retighten set screws in switch coupling and replace switch cover.

### 3.5 STOWING OF ANTENNA

**Note**

Check middle side guy tension continually during raising or lowering. If the guy anchor loops are not in line with the tower hinge within one-half inch, the guys can overtighten and buckle a tower leg. Proper tension must also be maintained to brace tower against a strong crosswind. Up-wind guy may develop 600 pounds maximum tension in a 40-mph wind.

**Warning**

Do not stand under tower when releasing array latches or lowering tower and antenna array.

To stow the antenna, perform the following procedures:

- a. Rotate array so that boom front is in line with top guy to winch.
- b. Disconnect coax at base of tower. Turn off ac power to rotator.
- c. Reduce middle side guy tension to approximately 200 pounds. Shake guy to obtain "feel" for this tension.
- d. Disconnect middle guy toward winch.
- e. Remove the two tower base nuts below leg extension.
- f. Increase tension on winch cable and remove shackle pin from turnbuckle.
- g. Lower array using hand crank or power tool kit. CPN 515-8601-001. Use winch in high gear ratio at all times.
- h. Make sure cable enters erecting mast slot.
- i. Slowly lower the tower until the back (sail) of the antenna can be reached.
- j. Release the antenna array latches by pulling on the cable release. See figure 2-16.
- k. Continue lowering the tower while simultaneously folding the antenna array under the tower.
- l. Support the antenna in the horizontal position as shown in figure 2-15.

# section 4

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## theory of operation

### 4.1 GENERAL

Antennas, in general, operate satisfactorily over a relatively narrow frequency range. This results from the requirement that the length of the radiating element has a particular relationship to the frequency of operation. The performance of the antenna will deteriorate rapidly as the element length or the frequency deviates from that required for proper operation. It follows, therefore, that if an antenna is to be truly broadband, or frequency independent, its geometry must be such that no length is specified. If the antenna is described entirely by angles and ratios and is infinitely large, this condition is met. Fortunately, there are several structures which will provide frequency independent operation with a finite sized structure. Log-periodic antennas are an example of such a structure. These antennas need not be infinitely large because they exhibit no end effect. That is, currents are carried along the antenna on its feed lines until they reach a region where the elements are approximately one-half wavelength long. In this area, all the energy present on the transmission line is radiated. Therefore, no currents are carried to the rear (larger) end, and the performance of the antenna is not altered by removing that part of the structure which contains elements longer than one-half wavelength. The forward end of the structure simply matches the antenna to its transmission line. Therefore, using the log-periodic principles, an antenna may be built to cover an extremely large frequency range. Antennas having a bandwidth in excess of 30:1 have been built.

237B-3 Rotatable Directional HF Antenna has a bandwidth ratio of 6:1 in the 6.5- to 40.0-MHz frequency range. The antenna consists of a series of dipole elements, the length and spacing of which are determined in accordance with the log-periodic principle. Excitation of the dipoles is accomplished by a balanced transmission line supported in dielectric fittings extended the full length of the antenna boom. The dipoles are alternately strapped to the two sides of the balanced transmission line, giving the effect of transposing the balanced line between the dipoles.

In figure 4-1, parameter  $\alpha$  is the dipole length description angle and is  $60^\circ$ .  $R_n$  is the distance from the antenna apex (tip) to the center of an element.  $R_{(n+1)}$  is the distance from the antenna apex to the next smaller dipole element. The ratio of  $R_{(n+1)}$  over  $R_n$  defines parameter  $\tau$ . A period of frequency ( $f$ ) is defined in terms of design parameter  $\tau$ , by range  $f$  to  $\tau f$ . The geometry of the log-periodic structure is such that the input impedance and radiation pattern repeat periodically with the logarithm of frequency. Since the input impedance and radiation pattern characteristics of the structure repeat periodically with the logarithm of frequency, any variation in those characteristics also repeats at each interval where the frequency is changed by the ratio  $\tau$ . If the shape of the structure and design parameter  $\tau$  are such that the variations of the impedance and radiation characteristics in any one period are small, then they will be small for all periods and the antenna will be essentially frequency-independent. Since the antenna end-effect is negligible, the antenna produces a unidirectional beam in the direction of the centerline radiating in the direction of the taper plane. The low frequency limit of the antenna is determined by the longest element, which is approximately one-half wavelength long at 6.5 MHz. The upper frequency limit is obtained at the shortest dipole, which is approximately  $3/8$ -wavelength long at 40 MHz. The impedance of the 237B-3 is approximately 80 ohms. A wideband, tapered-line transformer converts the impedance to 50 ohms to match a 50-ohm unbalanced transmission line. Figures 4-2 through 4-7 illustrate radiation patterns taken over the entire range of the antenna assuming perfect ground. Figure 4-8 illustrates the vertical angle versus frequency characteristics of the 237B-3 Rotatable Directional HF Antenna.

### 4.2 LOCAL ROTATOR CONTROL CIRCUIT (TOWER BASE)

#### 4.2.1 General

The local control unit permits control of the antenna azimuth from the tower base. The antenna

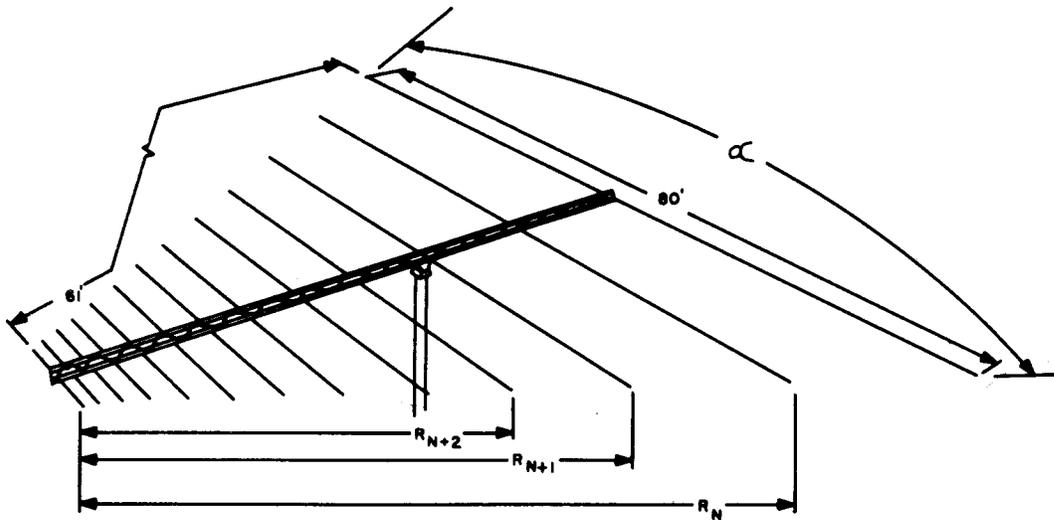


Figure 4-1. 237B-3 Directional HF Antenna, Design Parameters.

can be positioned to any azimuth by holding the power switch in the LOCAL ON (momentary on) position. The spring-loaded switch will return to OFF when released. The REMOTE ON position of the switch permits remote control of the antenna from the 143A-3 Antenna Rotator Control.

#### 4.2.2 Operation

Power (115 volts, 50 to 60 cps) is applied through a 30-ampere fused breaker box to terminals 1 and 2 of A2TB1. Refer to figure 4-9. Power (115-volt ac) is routed from terminal board A2TB1 to power switch A2S1. With A2S1 in the LOCAL ON position, a control signal is applied to motor control relay A2K1. (Simultaneously, the control signal is applied to the 143A-3 Antenna Rotator Control IN MOTION indicator A1DS2.) Power is applied through the contacts of energized relay A2K1 to the rotator motor. The power switch will automatically return to the OFF position when released. With the power switch in the REMOTE ON position, the antenna azimuth can be controlled from the remote control unit. POWER ON indicator A2DS1 will light when power is applied to the remote control unit.

### 4.3 REMOTE CONTROL CIRCUIT

#### 4.3.1 General

The 237B-3 Rotatable Directional HF Antenna can be controlled remotely using 143A-3 Antenna

Rotator Control. Power for 143A-3 Antenna Rotator Control is supplied through the local (tower base) rotator control box. The power switch must be in the REMOTE ON position and the breaker box switch in the ON position for operation from the 143A-3 Antenna Rotator Control.

The 143A-3 Antenna Rotator Control provides antenna azimuth selection in 30° increments. Monitor circuits are provided to indicate when the antenna is in motion and when antenna is positioned to the selected azimuth.

#### 4.3.2 Operation

Refer to figure 4-9. Control power is routed through terminal 1 of A2TB3 and terminal 5 of A1TB1 to contact 10 (common contact) of A1S1. When the antenna azimuth control is positioned to a selected azimuth, the control signal is routed to switch A4S1B (READY indication control) and switch A4S1A (motor control relay A2K1 and IN MOTION indicator control). The control signal is routed through switch A4S1A to the IN MOTION indicator and to motor control relay A2K1. Power is applied through the contacts of the energized motor control relay to the rotator motor. Switches A4S1A and A4S1B rotate simultaneously with the antenna. When the antenna reaches the selected position, the control signal is removed from the IN MOTION indicator and motor control relay. Simultaneously, the control signal is applied through A4S1B to the READY indicator.

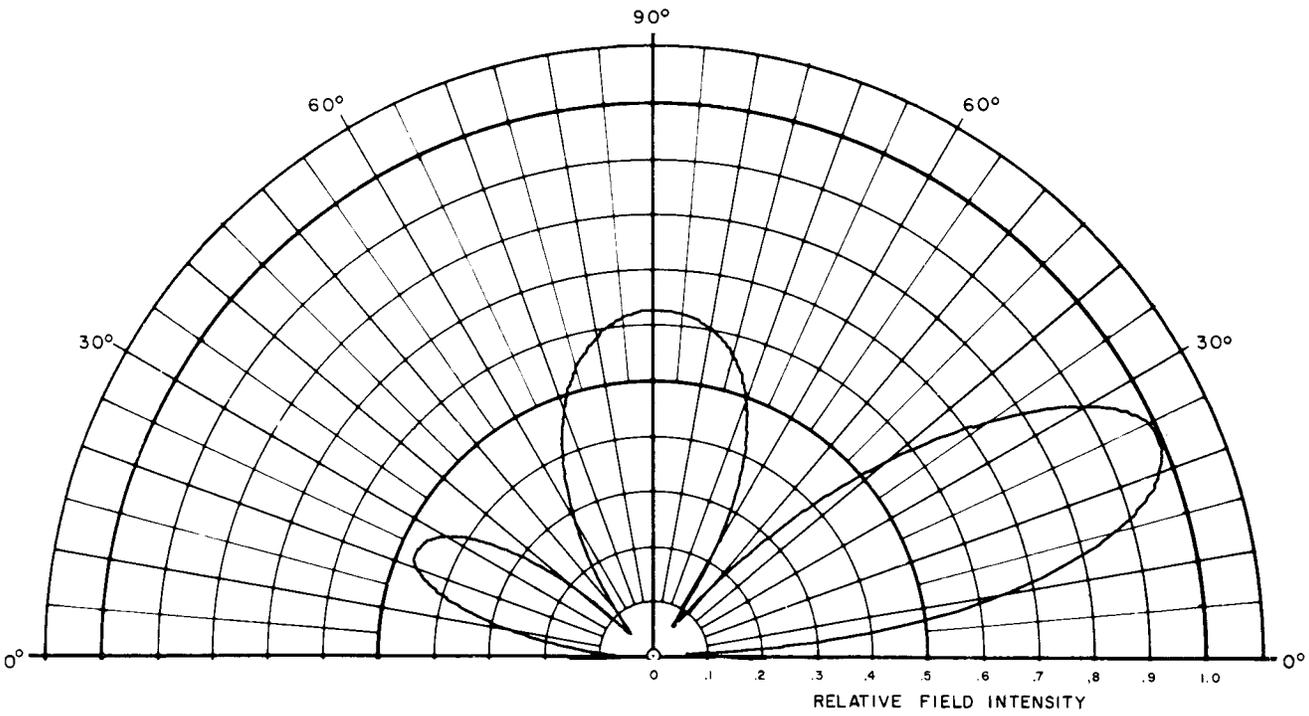


Figure 4-2. 6.5-MHz Elevation Plane Patterns 237B-3 Antenna.

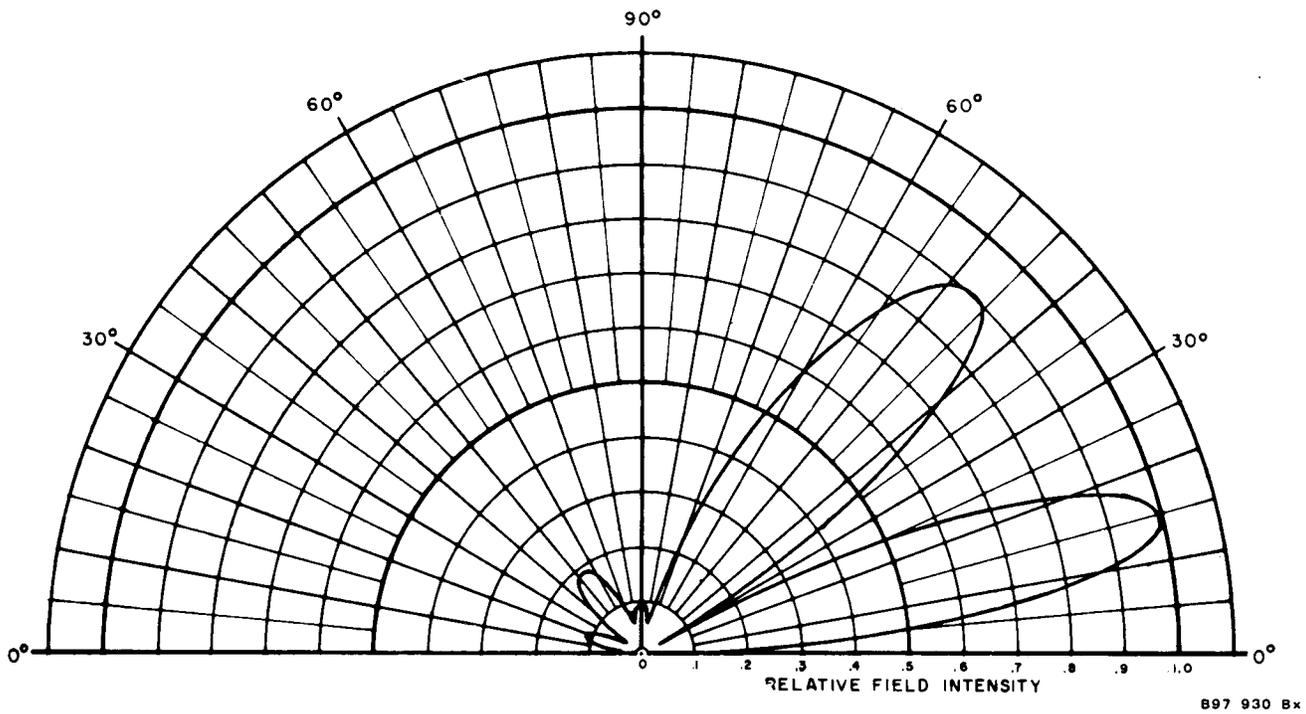
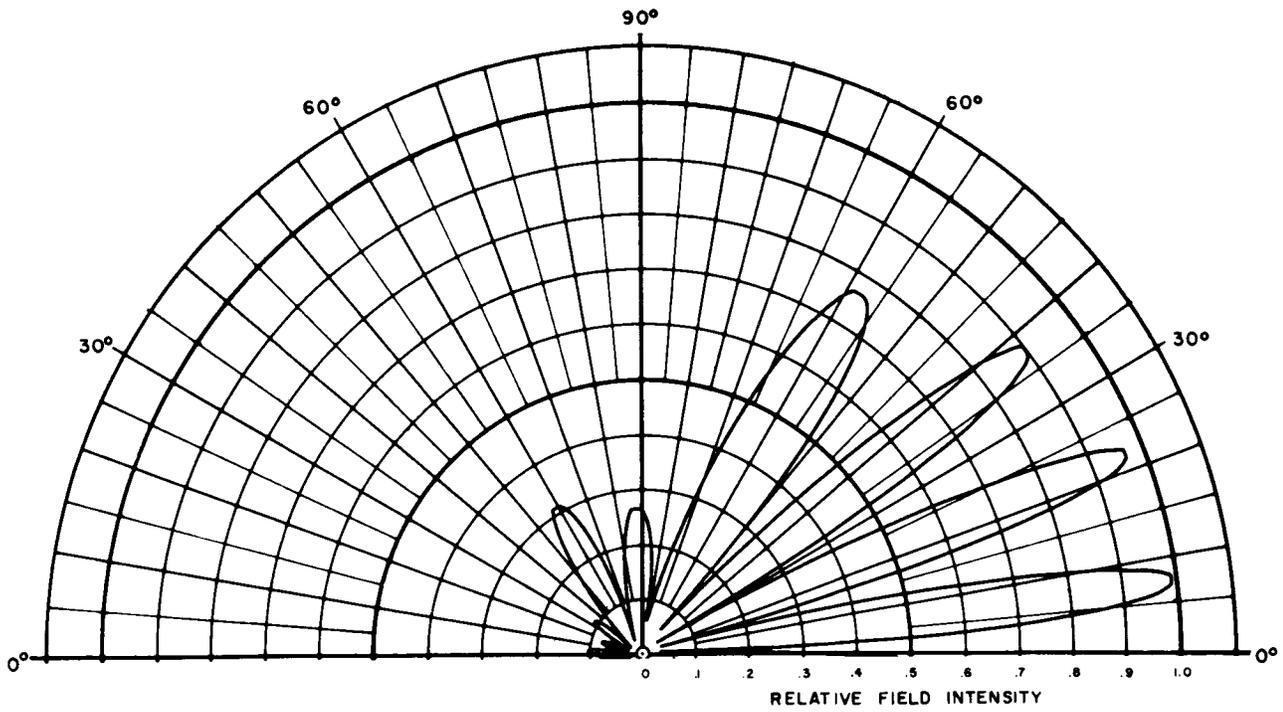


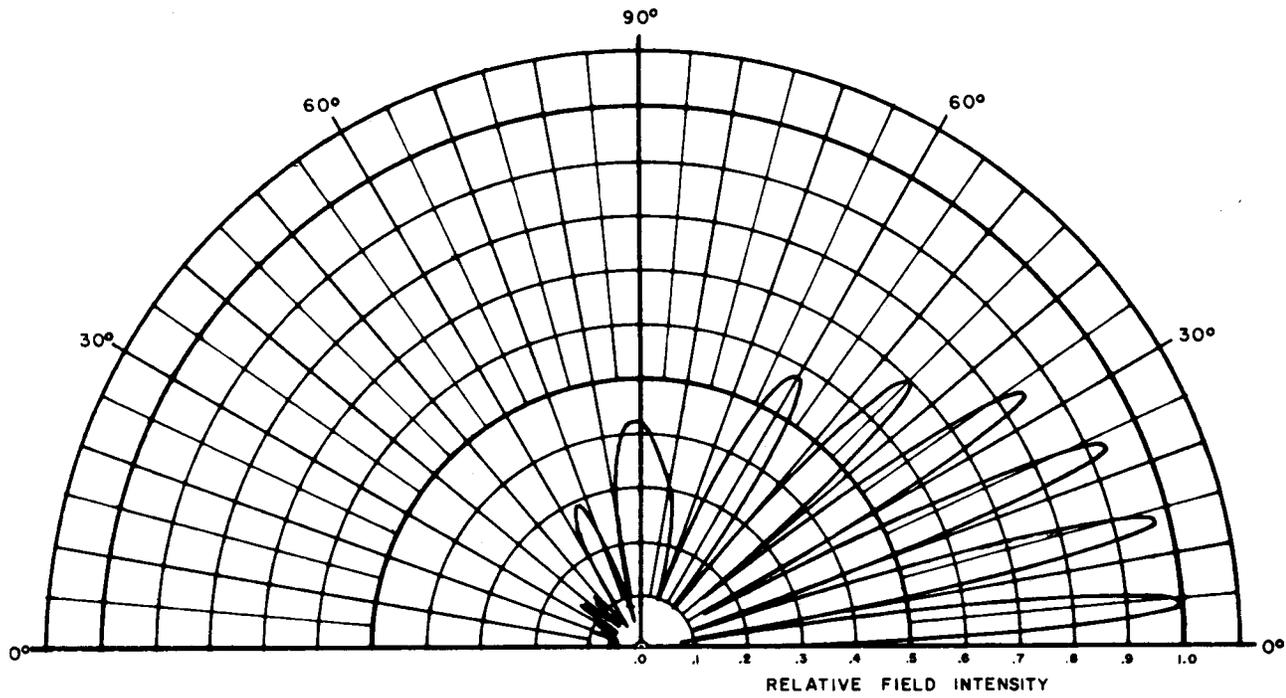
Figure 4-3. 10-MHz Elevation Plane Patterns, 237B-3 Antenna.

897 930 Bx



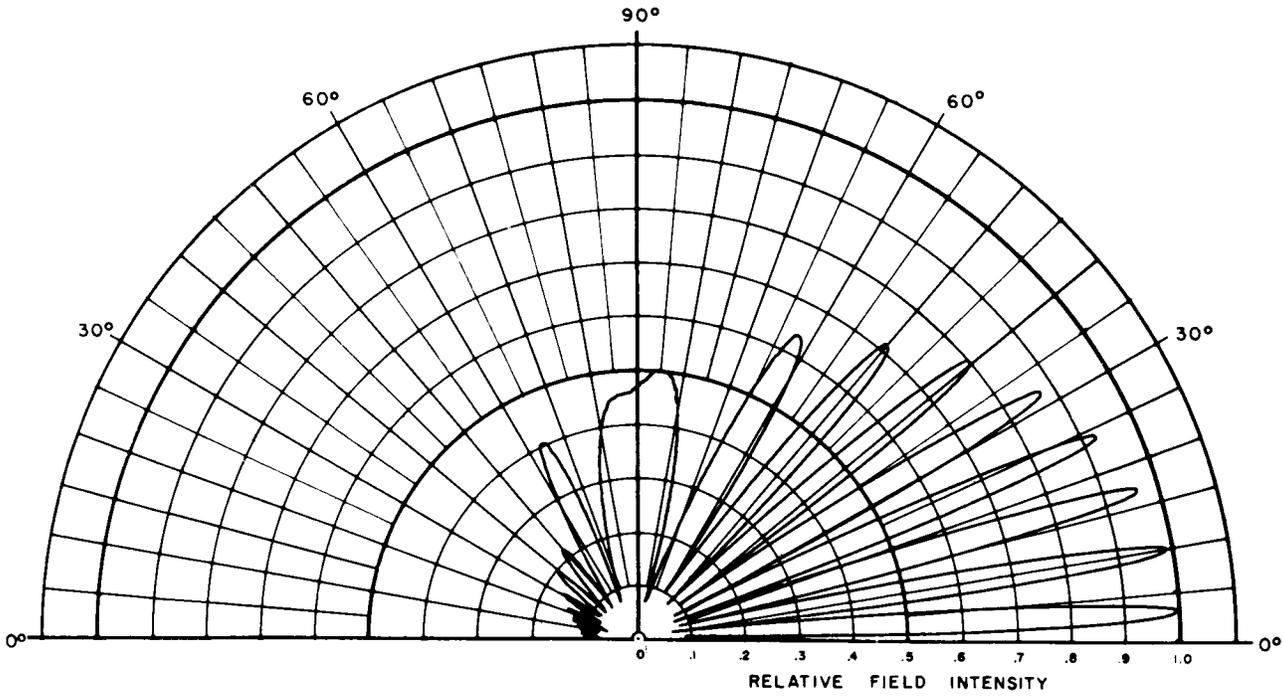
897 931 Bx

Figure 4-4. 20-MHz Elevation Plane Patterns, 237B-3 Antenna.



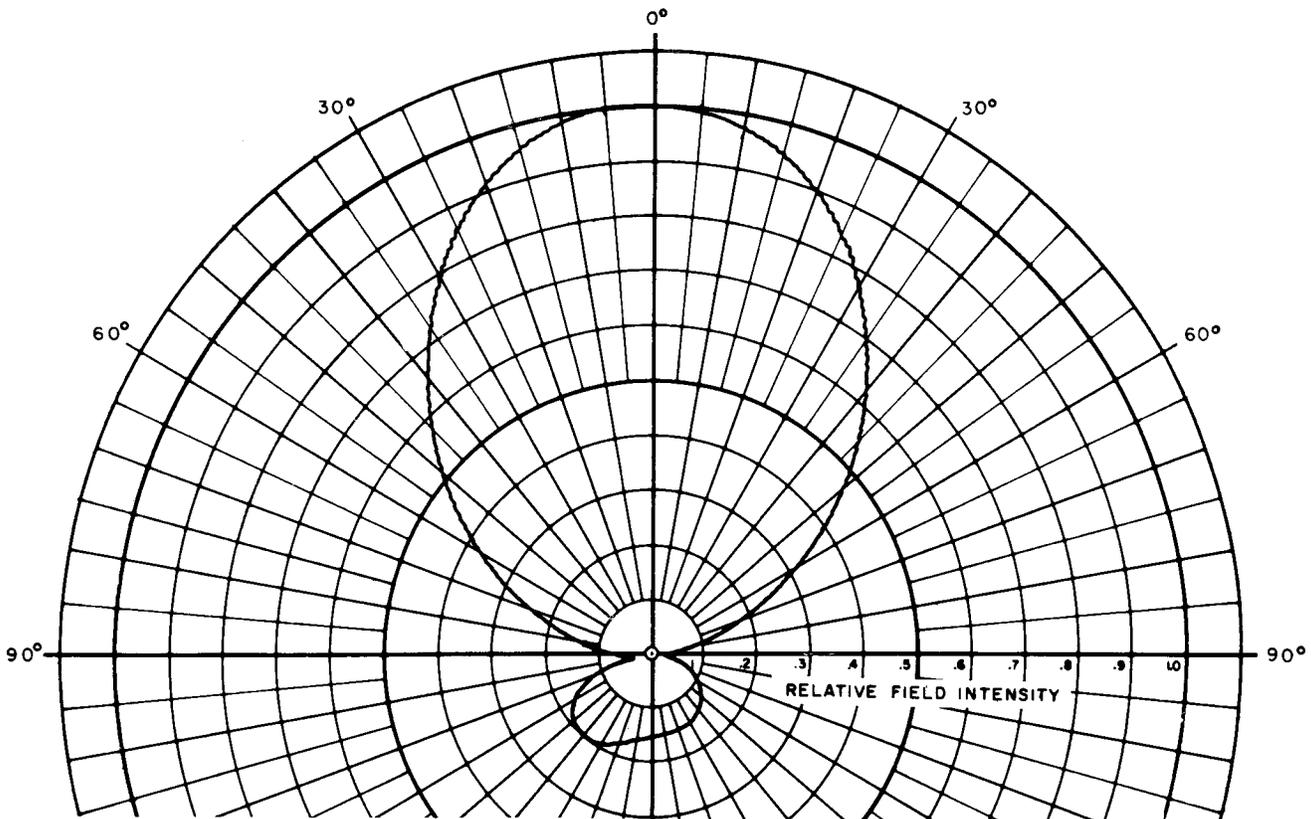
897 932 Bx

Figure 4-5. 30-MHz Elevation Plane Patterns, 237B-3 Antenna.



B97 933 Bx

Figure 4-6. 40-MHz Elevation Plane Patterns, 237B-3 Antenna.



B97 934 Bx

Figure 4-7. Azimuth Plane Patterns, 237B-3 Antenna.

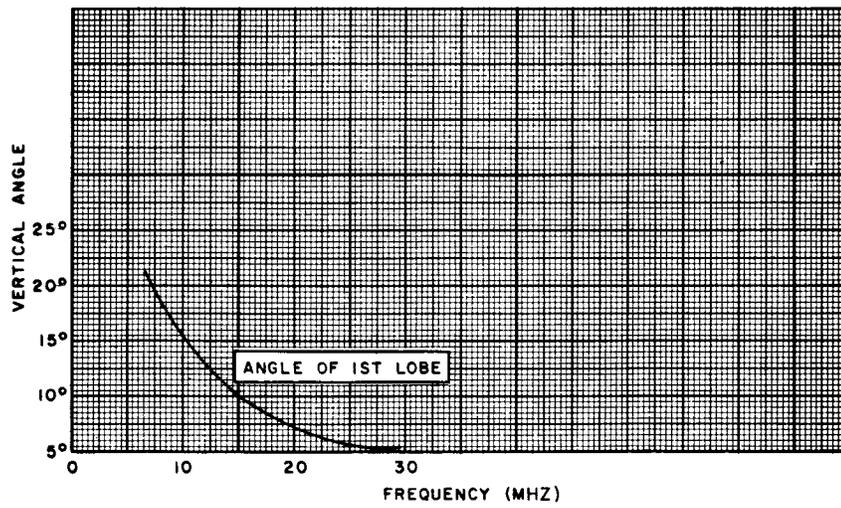
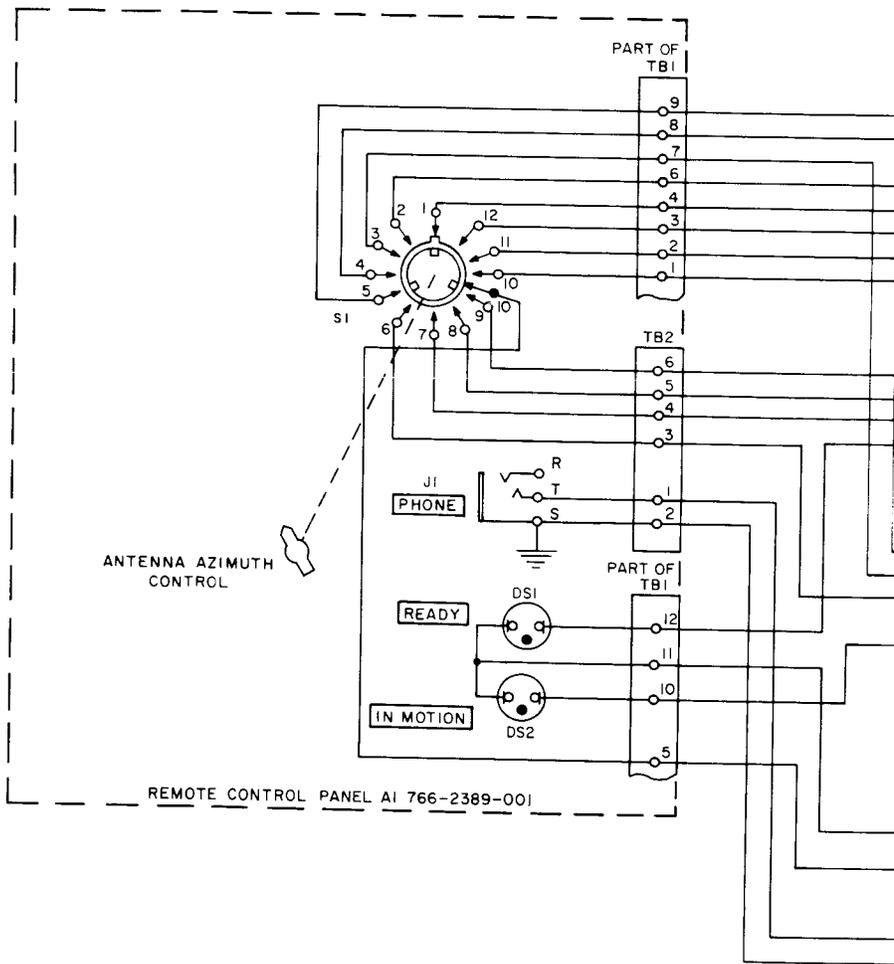
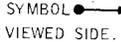


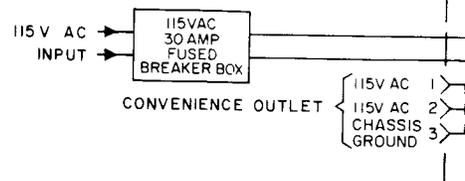
Figure 4-8. Plot of Vertical Angle Versus Frequency.

COLLINS PART NO.	QTY	ITEM NO.	PART NAME	PART DESCRIPTION
766-2389-001	1	A1	PANEL	REMOTE CONTROL
259-2327-160	1	S1	SWITCH	
262-0680-000	2	DS1, 2	LAMP	
262-2182-010	2	XDS1, 2	HOLDER	LAMP, XDS1, 2
262-2182-020	1		LENS	WHITE
262-2182-030	1		LENS	AMBER
358-1050-000	1	J1	JACK	PHONE
367-0124-000	2	TB1, 2	BOARD	TERMINAL TB1, 2
766-2378-001	1	A2	BOX	LOCAL CONTROL
262-0021-000	1	DS1	LAMP	NEON
262-0701-000	1	XDS1	HOLDER	LAMP, XDS1
262-0719-000	1		LENS	CLEAR
264-0656-000	1	F1	FUSE	12A, F1
264-4070-000	1	F2	FUSE	2A, F2
264-4090-000	1	F3	FUSE	5A, F3
265-1115-000	1	XF2, 3	HOLDER	FUSE XF2, 3
265-1184-000	1	XF1	HOLDER	FUSE XF1
266-0123-000	1		BOOT	WATER REPELLANT
266-3094-000	1	S1	SWITCH	S1
358-1050-000	1	J2	JACK	PHONE J2
367-4100-000	3	TB1, 2, 3	BOARD	TERMINAL TB1, 2, 3
368-0295-010	1	J1	CONNECTOR	RECP. ELEC. J1
401-1692-010	1	K1	RELAY	K1



NOTES:

1. REMOVE JUMPERS BETWEEN TERMINALS 5 AND 8, 6 AND 7 FOR 28V DC OPERATION OF CONTROL UNITS. REPLACE RELAY A2K1 AND CONTROL INDICATORS AIDS1, AIDS2, AND A2DS1 ACCORDINGLY. CONNECT 28V DC SOURCE TO TERMINAL 6(+) AND 5(-).
2. ALL WAFER SWITCHES VIEWED FROM SIDE OPPOSITE KNOB OR DRIVEN END.
3. SYMBOL  INDICATES WIPER ON SIDE OPPOSITE VIEWED SIDE.
4. ON ROTATOR MOTOR AND SWITCH ASSEMBLIES MANUFACTURED SUBSEQUENT TO FEBRUARY 1977, SWITCH S1 MAY BE A SINGLE WAFER SWITCH WITH WIPERS ON FRONT AND BACK. S1A IS THE BACK SIDE; S1B IS THE FRONT SIDE.



1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

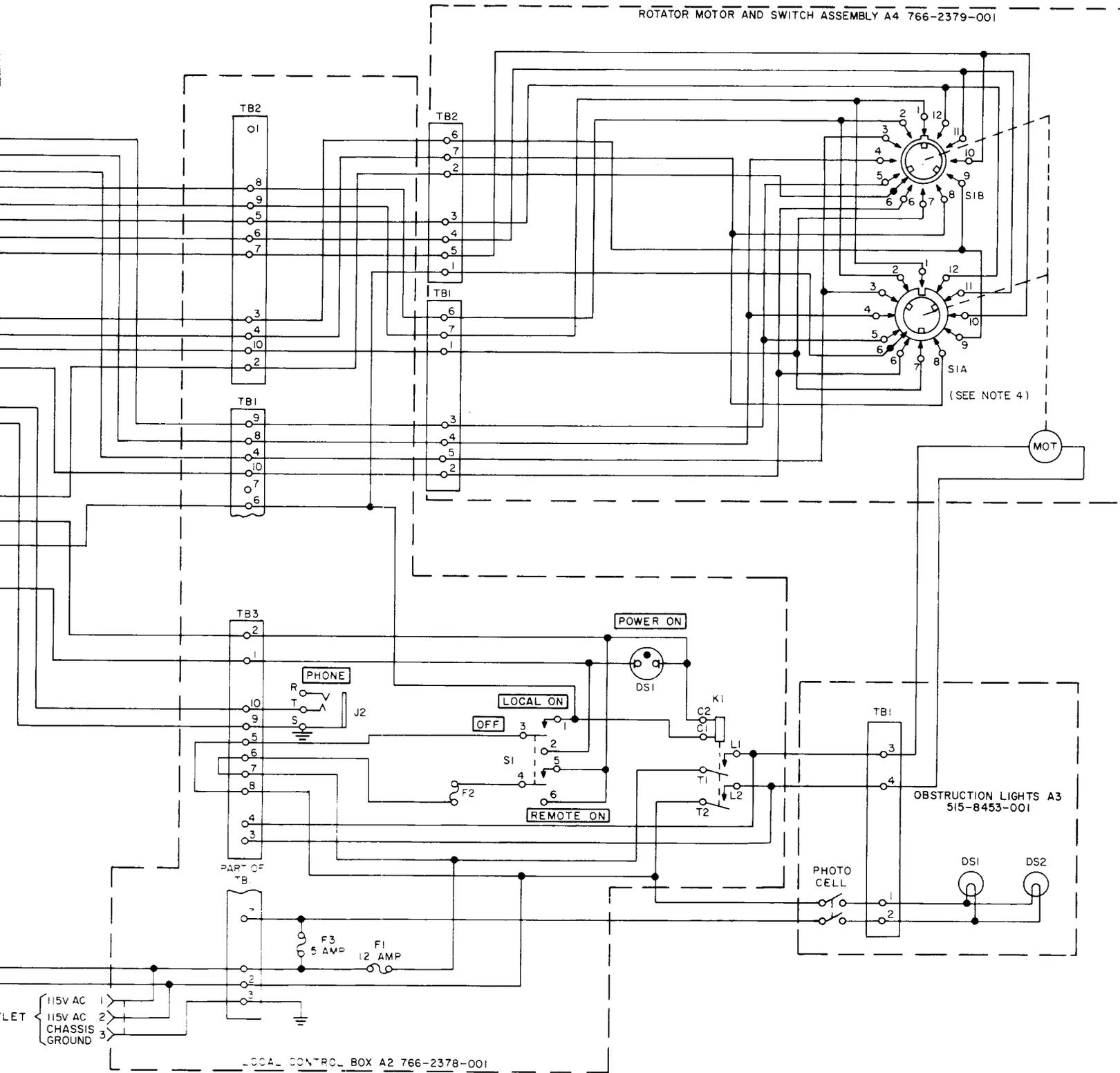
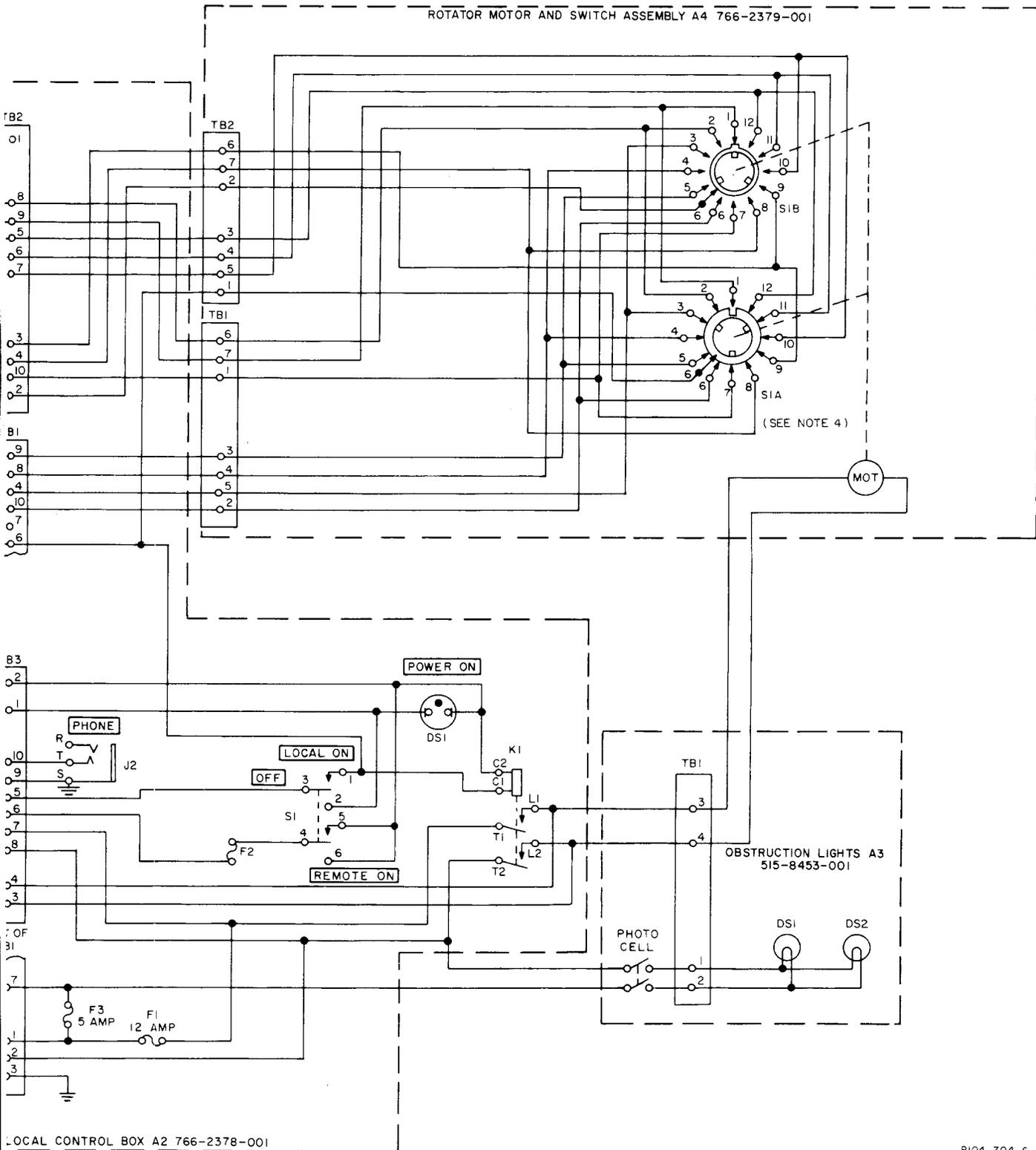


Figure 4-9. 143A-3 Antenna Rotator Control, Schematic Diagram.

Revised 1 August 1977



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Figure 4-9. 143A-3 Antenna Rotator Control, Schematic Diagram.

Revised 1 August 1977

4-7/4-8

# section 5

## maintenance

### 5.1 GENERAL

The 237B-3 Rotatable Directional HF Antenna requires a minimum of maintenance; however, the service life of the antenna can be extended greatly by a systematic inspection and preventive maintenance program.

### 5.2 LUBRICATION

#### 5.2.1 Rotator

The rotator is lubricated during initial installation and should not require attention for at least 5 years in locations where temperatures remain above +10°F (-12.22°C). In locations where seasonal temperatures regularly drop below +10°F, the rotator oil should be changed with the season to a low-temperature grade such as Molub-Alloy, Arctic Gear Oil, (Imperial Oil and Grease Co., Los Angeles Calif.) and at the completion of the cold season to any of the following oils. Use CPN 005-1269-020 (Texaco Meropa No. 1) or any of the following substitutes: Amogear Compound No. 1 (American Oil Co.); Pen-O-Led No. 1 (Humble Oil Co.); Pennant EP No. 1 (Sinclair Oil Co.); Mobil Compound AA (Mobil Oil Co.); EP Lubricant 55 (Gulf Oil Co.); or Macoma 33 (Shell Oil Co.). Lubricate grease fittings with any of the following greases: ANG 25 CPN 005-0423-000; Texaco Unitemp; Beacon 325; Air Shell No. 7A; or Super Mil 72832 (American Oil Co.).

#### 5.2.2 Erecting Winch and Pulley Block

Inspect the erecting winch and pulley block prior to use to determine if either needs lubrication. Lubricate grease fittings and exposed gear teeth with any of the following greases: ANG 25 CPN 005-0423-000, Texaco Unitemp, Beacon 325, Air Shell No. 7A, or Super Mil 72832 (American Oil Co.).

### 5.3 INSPECTION

#### Warning

Do not stand under tower or antenna boom when raising or lowering antenna.

It is recommended that the antenna be lowered for a complete inspection at least once every 90 days. Special inspections should be made as soon as possible after a major wind or ice storm.

#### Note

For antennas with pressurized coaxial transmission lines, check the line pressure before disconnecting the line fitting in preparation for lowering tower. Line pressure should be between 5- and 10-psig. Low line pressure could indicate a leak in the transmission line.

Lower the tower using procedures outlined in section 3, paragraph 3.5.

#### 5.3.1 Antenna Tower and Guy Cables

- a. Check the tower for loose or missing bolts. All 1/2-inch bolts should be tightened to 90-pound-foot torque; all 3/8-inch bolts should be tightened to 25-pound-foot torque; 3/4-inch bolts should be tightened to 320-pound-foot torque.

#### Note

It is recommended that all towers manufactured before March 1967 be retrofitted with an additional locking nut (Palnut or equivalent) on each of the 1/2-inch-lacing bolts after they have been tightened.

- b. Check straps used to secure and support coaxial transmission line and electrical control and power conduits.
- c. Check the tower structure for bent or fractured members.
- d. Inspect tower for signs of rust, corrosion or flaking of galvanized coating.
- e. If the tower is painted, check for cracks, peeling or fading.
- f. Check tower guy cable attachment points.
- g. Check guy cables for proper installation of preformed dead ends, broken cable strands, broken or chipped insulators, worn or bent turnbuckles and proper safety wire installation on turnbuckles.

- h. Check obstruction light fixture for cracked lens, clogged drain holes, burned out bulbs or bulbs that have not been replaced at the recommended 6-month interval.
- i. Check grounding connection at tower leg and at ground electrode, (ground strap or conductor should be number 4 AWG or larger).

**Note**

The following inspection procedures pertain to the antenna tower and guy assemblies but can only be performed after erecting the antenna and after inspection of the rotator and antenna array.

- j. After the antenna has been erected and the front guys connected to their ground anchors, use the turnbuckles to hand tighten the guys until all slack is removed.

**Caution**

When tightening guys, continuously watch the tower for any out-of-plumb tendency. If tower is out of plumb, alternately tighten opposing guys to maintain equal tension and verticality.

- k. Place a strand dynamometer on the upper guy and adjust front guy tension to 2000 pounds,  $\pm 15$  percent. Move dynamometer to lower front guy and adjust tension to 1500 pounds,  $\pm 15$  percent. Move dynamometer back to front upper guy and increase tension to 2600 pounds,  $\pm 15$  percent. Move dynamometer to lower side guys. Alternating between the opposing guys, increase the tension until it reaches 1500 pounds,  $\pm 15$  percent. Recheck all guys to ensure that their tension is within tolerance.

### 5.3.2 Rotator

Perform the following rotator inspections with the tower in the lowered position:

- a. Check the tightness of the four 3/4-inch-rotator mounting bolts. Torque on these bolts should be 320 pound-feet.
- b. Check the tightness of the eight 3/8-inch-rotator gear box mounting bolts. Torque on these bolts should be 25-pound-feet.
- c. Check the tightness of 5/16-18 nuts on the tie rods. Torque on these nuts should be 100  $\pm 10$  pound-inches.

- d. Remove switch cover and check that 10/32 by 9/16 screw is installed for antenna with pressurized coaxial transmission lines or removed if the transmission line is unpressurized. Replace switch cover.
- e. Disconnect the transmission line from adapter (item 2, figure 2-9) by removing the four 5/16-inch by 18 nuts holding the 90° elbow to the adapter. See figure 2-9. Position the transmission line to one side to provide access to the adapter. Inspect adapter for presence of an air hole in the Teflon to permit passage of dry air (or gas) between transmission line and boom assembly. If no hole exists, drill a 1/8-inch hole through the Teflon insulator for air or gas passage before reconnecting the transmission line to the adapter.
- f. Carefully inspect entire rotator body for signs of oil leakage. If evidence of severe oil leakage is discovered, contact HF Antenna Product Line Program Manager, Collins Radio Group, Rockwell International, Dallas, Texas 75207, Phone 214-690-5029.
- g. Check the power and control cables for fraying and loose fitting.
- h. Check the rotating coaxial cable joint for signs of wear or binding.
- i. After antenna is erected, guyed and plumbed, check rotator operation using the local rotator control box and the 143A-3 Antenna Rotator Control (remote). Coordinate operations between local and remote positions with plug-in, sound-powered or other suitable telephone instruments.

### 5.3.3 Antenna Array

With the antenna lowered, perform the following inspection of the antenna array:

- a. Inspect the boom and element insulators for signs of arcing, and for loose, broken or cracked components.
- b. Check that each element and its associated hardware clears the boom lacing by a minimum of one-fourth-inch. Repositioning of insulator mounting bolts and element U-bolts will permit this clearance with one exception. Element number 9 may require that a curved notch be filed in its adjacent lacing strap.
- c. Check all feedline-to-element jumper strap mounting bolts for tightness. These bolts should be tightened to 8 pound-inch torque. Do not overtighten.

- d. Check continuity between feedline and each element. Resistance should be less than 0.1 ohm.
- e. Check the tilting platform assembly rf disconnect contact spring for tightness. If the contact is loose, it may be retightened by removing the contact assembly and tightening the shaft on the side opposite the spring. See item 15, figure 2-4.
- f. Check the interior of the balun for moisture by removing the 90° elbows at the rear of the balun. Raise the forward end of the boom assembly slightly to assist drainage. If any moisture is present in the balun, it should be drained and purged with dry air or nitrogen prior to reconnection of the 90° elbow assembly. If the transmission line system and balun are not to be pressurized (for receive or low power operation only) a 1/8-inch-condensation drain hole should be drilled in the bottom of the lower 90° elbow.

**Note**

The boom and balun are inverted when the tower is in the lowered position. The hole should be drilled in the bottom of the 90° elbow which will be lowest when the antenna is erected.

- g. Prior to erecting the antenna, be sure the outer mating surface of the tilting platform conducting gasket is liberally coated with DC-4 silicone grease (to prevent pressure leakage).
- h. Erect the antenna using procedures outlined in paragraph 2.7 of section 2.

**Caution**

When raising the antenna, maintain a middle side guy tension of approximately 200 pounds. If side anchor loops are not in line with the base hinge pivot, the middle side guy tensions may become unequal and increase to such a point as to cause buckling of the tower.

### **5.3.4 The 143A-3 Antenna Rotator Control**

After erecting the antenna, check calibration accuracy of the rotator control by positioning the 143A-3 Antenna Rotator Control to N (north). Observe that the antenna rotates to or points to the north. Rotate azimuth control clockwise, stopping long enough at each of the 12 positions

for the antenna to rotate to and stop at each position. Check the actual antenna direction to see that it corresponds to the azimuth control position. Observe that with each 30° rotation change of the azimuth control, the IN MOTION indicator lights for approximately 5 seconds; goes off, and the READY indicator lights. If the control needs recalibration, refer to paragraph 3.4.

### **5.3.5 Obstruction Light Control**

Inspect the photoelectric control for broken or dirty glass cover. Make a daylight check of the photocell operation by covering the photocell sensing unit with a dark cloth or other cover. The obstruction lights should go on. Remove the cover and observe that the obstruction lights go off. To make a more accurate check of the photoelectric control, observe the time and light level at which lights come on at dusk and go off at dawn. Optimum light level for light turn-on is 35 ±5 candle power; for turn-off, 58 ±5 candle power. The control sensitivity adjustment is located in the rear of the control. See figure 5-1.

## **5.4 ANTENNA TOWER COATING/PAINING**

Antenna towers such as that of the 237B-3 antenna often require coating/painting, either to give added protection against environmental conditions or to comply with civil or military aircraft warning and/or clearance criteria. Four steps are involved: surface preparation, pre-primer application, primer application, and top coat application. The following procedures describe recommended methods of applying these coatings to new or in-service towers.

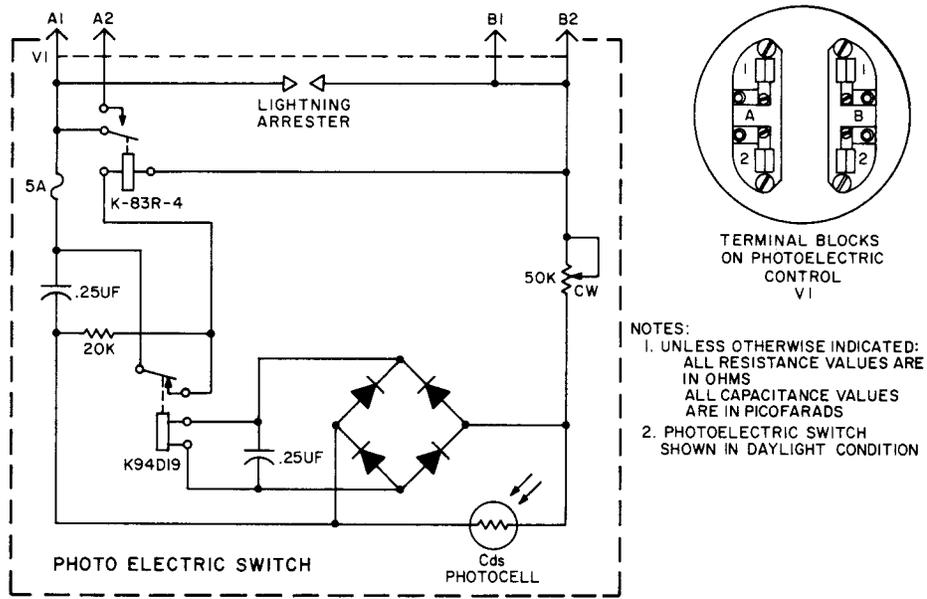
### **5.4.1 Surface Preparation**

#### **5.4.1.1 New Towers**

Any rusty surface should be wire-brushed clean. The entire surface should be washed with clear water to remove dirt and other contaminants.

#### **5.4.1.2 In-Service Towers**

Old paint surfaces should be completely stripped using solvents or light sand blasting. Any rusty surfaces should be taken to bare steel by wire brushing or power sanding. The entire surface should be washed with clear water to remove dirt or other contaminants.



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Figure 5-1. Photoelectric Obstruction Light Switch, Schematic Diagram.

**Note**

See table 5-1 for suitable materials for coating tower.

**5.4.2 Pre-Primer Coat**

The pre-primer coat (Carboline 1037 WP) is a general purpose primer that is especially effective in preparing galvanized steel structures for application of a primer and top coat.

**Note**

Pre-primer base (labeled A) is packed in a separate container from its catalyst (labeled B). Pot life of the pre-primer after mixture is 24 hours at 75°F. Mix only the amount to be used in that period.

**5.4.2.1 Mixing**

Mix thoroughly by volume, four parts of base (labeled A) to one part of catalyst (labeled B). Thin as required for spray or brush application using up to one-half gallon of Carboline Thinner # 21, CPN 005-1494-040, per gallon of pre-primer.

**5.4.2.2 Coverage**

The pre-primer coat will cover approximately 180 square feet per gallon for a dry film thickness of 2 mils. Wet application should be 8 mils thick. The 237B-3 tower has a surface area of approximately 410 square feet. Approximately 3 gallons of pre-primer is required.

**5.4.2.3 Application**

Temperature during application of pre-primer coat should be between 40° and 110°F (4.44° and 40.56°C).

a. Spraying

1. Thin, as required, for conventional spray application, using Polyclad Thinner #21, CPN 005-1494-040.
2. For best results use the recommended spray equipment listed in table 5-2.
3. Use adequate air volume supply for correct operation of spray gun.
4. Hold the spray gun 8 to 10 inches from, and at a right angle to, the surface.
5. Use a 50 percent overlap with each pass of the gun.

6. Allow to dry for 1 hour at 75°F before applying other coats.
- b. Brushing
1. Thin, as required, for brush application, using Polyclad Thinner #21, CPN 005-1494-040.
  2. Use natural bristle brushes and apply with full strokes. Avoid rebrushing the material. If necessary in hot weather, thin material slightly to obtain proper workability.

**5.4.3 Primer Coat (CPN 005-1494-010)**

The primer coat (Rustbond Primer #6C) is a rust-inhibiting, universal primer for steel, concrete, and inorganic zinc-primed surfaces in corrosive areas.

**5.4.3.1 Mixing**

Stir or mechanically shake until primer achieves a uniform consistency. Thinning may be required for conventional spray or brush application. Thinning is not normally required for airless spray application. If thinning is required, use Polyclad Thinner #8, CPN 005-1494-050 (for hot or windy conditions), or Carboline Thinner #25, CPN 005-1494-060 (for application over previously applied solvent-sensitive paints). Use thinner up to 1 quart per gallon of primer.

**5.4.3.2 Coverage**

The primer coat will cover approximately 200 square feet per gallon for a dry film thickness of 2 mils. Wet application should be 8 mils thick. Approximately 3 gallons of primer coat are required.

**5.4.3.3 Application**

Do not apply primer coat when temperatures are below +40°F (+4.44°C). For cool weather application (below +60°F, +4.44°C) the quantity of thinner used may be increased.

- a. Spraying. Spray application of the primer coat may be performed using either the conventional or airless method of application.
1. For best results use the recommended spray equipment listed in table 5-3.
  2. Use adequate air volume supply for correct operation of spray gun.
  3. Hold the gun 8 to 10 inches from the surface (conventional spray), or 12 to 15 inches

Table 5-1. Recommended Tower Coatings.

COLLINS PART NUMBER	DESCRIPTION	CARBOLINE TYPE	UNIT OF MEASURE	WT (lb)
005-1494-010	Primer	Rustbond primer #6C	Gal (06)	10.5
005-1494-020	Paint (international white)	Carboline 1294	Gal (06)	11
005-1494-030	Paint (international orange)	Carboline 1294	Gal (06)	11
005-1494-040	Thinner	Polyclad thinner #21	Gal (06)	10.5
005-1494-050	Thinner	Polyclad thinner #8	Gal (06)	10.0
005-1494-060	Thinner	Carboline thinner #25	Gal (06)	10.0
005-1494-070	Wash primer	Carboline 1037 WP	Gal (06)	10.5
005-1494-080	Paint (medium gray)	Carboline 1294 (gray 724)	Gal (06)	11
005-1494-090	*Paint kit: Consists of the following materials in the indicated ratio by volume. -070 Wash primer -010 Primer -020 Paint (int white) -030 Paint (int orange) -040 Thinner -060 Thinner	N/A	Pieces (07)  3 4 3 3 1 2-1/2	N/A
005-1494-100	*Paint kit: Consists of the following materials in the indicated ratio by volume. -070 Wash primer -010 Primer -080 Paint (gray) -040 Thinner -060 Thinner		3 4 6 1 2-1/2	

\*Specify container size in addition to vendor part number.

(airless spray), and at a right angle to the surface.

4. Use a 50 percent overlap with each pass of the gun.
  5. Coat the edges of beams and irregular surfaces first, making another pass later.
- b. Brushing. Use natural bristle brushes and apply with full strokes. Avoid rebrushing the material. If necessary in hot weather, thin material slightly to obtain proper workability.

**5.4.3.4 Drying Time**

Allow a 1 hour minimum drying time at 75°F (23.89°C) before top coating.

**5.4.4 Top Coat (CPN 005-1494-XXX)**

**Note**

See table 5-1 for desired color, quantity, and complete Collins Part Number.

The top coat (Carboline 1294) is a general purpose coat for protection of surfaces in corrosive areas. It is resistant to dirt pickup and has excellent color and gloss retention. For maximum protection, two coats are required.

**5.4.4.1 Mixing**

Stir or mechanically shake until top coating achieves a uniform consistency. Top coat may be

Table 5-2. Spraying Equipment, Carboline 1037 WP Wash Primer and Carboline 1294 Top Coat.

TYPE OF SPRAY	GUNS	FLUID TIP	AIR CAP	AIR HOSE ID (in.)	MATL HOSE ID (in.)
Conventional	Binks #18 or #19	63B	63PB	5/16	3/8
	DeVilbiss P-MBC or JGA	FX	704	5/16	3/8

Table 5-3. Spraying Equipment, Rustbond Primer 6C.

TYPE OF SPRAY	GUNS	FLUID TIP	AIR CAP	AIR HOSE ID (in.)	MATL HOSE ID (in.)
Conventional	Binks #18 or #19	63B	63PB	5/16	3/8
	DeVilbiss P-MBC or JGA	FX	704	5/16	3/8
Airless	DeVilbiss JGA 5026 Graco 205-162	Use a 0.013 orifice and 2000 psi.		3/8	1/4

thinned with up to 1 quart per gallon using Polyclad Thinner #21, CPN 005-1494-040, for either brush or spray application.

**5.4.4.2 Coverage**

The top coat will cover approximately 165 square feet per gallon for 3-mil dry-film thickness. Wet application should be 8 mils thick. Approximately 6 gallons are required for the two coats.

**5.4.4.3 Application**

Temperature during application of top coat should be between 40° and 110°F (4.44° and 43.34°C).

a. Spraying:

1. Thin as required for conventional spray

application using Polyclad Thinner #21, CPN 005-1494-040.

2. For best results use the recommended spray equipment listed in table 5-2.
  3. Use adequate air volume supply for correct operation of the spray gun.
  4. Hold the spray gun 8 to 10 inches from, and at a right angle to, the surface.
  5. Use a 50 percent overlap with each pass of the gun.
  6. Allow to dry for 4 hours at 70°F (21.11°C) before applying second coat.
- b. Brushing
1. Thin as required for brush application, using Polyclad Thinner #21, CPN 005-1494-040.
  2. Use a natural bristle brush. Apply with a full brush using short strokes and avoid rebrushing.

RM900 - prep SOLV.

16.5 x 5



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