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EQUIPMENT MANUAL
ANTENNA POSITIONING MAST
EMCO MODEL 1050/1051

399006
Revision E

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WARRANTY

The Electro-Mechanics Company (EMCO) warrants that our products are free from defects in materials and workmanship for a period of two years from the date of shipment. If you notify us of a defect within the warranty period, we will, at our option, either repair or replace those products which prove to be defective. If applicable, we will also recalibrate the product.

There will be no charge for warranty services performed at the location we designate. You must however, prepay inbound shipping costs and any duties or taxes. We will pay outbound shipping costs for a carrier of our choice, exclusive of any duties or taxes. You may request warranty services to be performed at your location, but it is our option to do so. If we determine that warranty service can only be performed at your location, you will not be charged for our travel related costs.

This warranty does not apply to:

1. Normal wear and tear of materials
2. Consumable items such as fuses, batteries, etc.
3. Products which have been improperly installed, maintained, or used.
4. Products which have been operated outside of specifications.
5. Products which have been modified without authorization.
6. Calibration of products, unless necessitated by defects.

THIS WARRANTY IS EXCLUSIVE. NO OTHER WARRANTY, WRITTEN OR ORAL, IS EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

THE REMEDIES PROVIDED BY THIS WARRANTY ARE YOUR SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT ARE WE LIABLE FOR ANY DAMAGES WHATSOEVER, INCLUDING BUT NOT LIMITED TO, DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER BASED ON CONTRACT, TORT, OR ANY OTHER LEGAL THEORY.

Please contact our Sales Department for a Return Material Authorization Number before shipping equipment to us.

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C A U T I O N

CAUTION: Prior to operation of the Model 1050/1051 Antenna Positioning Mast, the following steps must be followed:

1. Set the voltage select switch located on the rear of the CONTROLLER to the proper setting.

2. Set the voltage select switch mounted on the PC board assembly located in the MOTOR BASE to the proper setting.

NOTE: Voltage settings of Step 1 and 2 above should match.

3. Adjust upper and lower cams to limit the antenna mast carrier travel.

FAILURE TO OBSERVE THE ABOVE CAUTION CAN RESULT IN POSSIBLE DAMAGE TO THE MODEL 1050/1051 AND VOID THE WARRANTY

FOR LABORATORY USE BY QUALIFIED PERSONNEL

POUR EMPLOI PAR LE PERSONNEL DE LABORATOIRE.

WARNING: HIGH LEAKAGE CURRENT - ENSURE PROPER GROUNDING

AVERTISSEMENT: COURANT DE FUITE ELEVE - FOURNIR UNE MISE A LA TERRE EFFICACE

WARNING: DISCONNECT SUPPLY BEFORE SERVICING

AVERTISSEMENT: COUPER L'ALIMENTATION AVANT L'ENTRETIENT ET DEPONNAGE.

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DESCRIPTION AND USE OF THE ANTENNA POSITIONING MAST EMCO MODEL 1050/1051

SYSTEM DESCRIPTION

The Electro-Mechanics Company Model 1050/1051 Antenna Positioning Mast is a portable mast and platform system designed for use in compliance testing at elevations from 1 to 6 meters above ground level. The mast, carrier, boom, platform, lift rope, and guying system are non-conductive and non-magnetic. The carrier is raised and lowered by a fractional horsepower electric motor, gear reduction system, and an electric brake located on motor at the base of the system. In addition, a mechanical safety brake installed on the antenna carrier, operates automatically to prevent the carrier from falling.

The mast section of the positioner is constructed of square fiberglas tubing for strength and rigidity. The assembled mast consists of three or four sections, depending on whether a four or six meter height of the mast is desired. A four meter height is attained by using the base section, one center section, and the top section. A six meter height is attained by use of two center sections along with the base and top section. Mylar (low stretch) guy lines attach to the top section of the mast and MUST be firmly anchored to the ground to provide safe, adequate vertical stability.

Low friction skids built into the carrier assembly section allow smooth motion when carrying antenna loads of up to 75 lbs. (Model 1051 has rollers installed in the carrier assembly.) The vertical drive mechanism consists of the drive motor, a gear reduction system, and an electric brake which stops the vertical motion in less than one centimeter of vertical motion. The motor drive system winds and unwinds a rope onto a take-up cylinder (winch drum).

The upper and lower limits of operation must be set by using the dual cam mechanism in the motor enclosure, to prevent overrunning of the high and low limits of the 6 meter mast assembly. Within the mechanical limits, maximum and minimum antenna height positions can also be set into the controller, which additionally displays the antenna height.

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SPECIFICATIONS
MODEL 1050/1051

Voltage (115/230v +10V,-15V) (Switch Selectable)	100/110 VAC	220 VAC
Frequency	60 Hz	50 Hz
Max Power Input	500 VA	500 VA
Motor Horsepower	1/6 hp	1/6 hp
Max Load Rating		
Crossboom (Tip)	22.7 kg (50 lb)	22.7 kg (50 lb)
Crossboom (Center)	33.7 kg (75 lb)	33.7 kg (75 lb)
Lift Velocity	(11.9 cm/sec) 4.7 in/sec	(10.16 cm/sec) 4 in/sec
Overall Size		
Height (Model 1050)	7m (23 ft)	7m (23 ft)
Height (Model 1051)	Varies	Varies
Base Width	1.2 m (48.0 in)	1.2 m (48.0 in)
Base Depth	1.2 m (48.0 in)	1.2 m (48.0 in)
Polarization Option		
Angular Velocity	3-30 deg/sec	3-30 deg/sec
Max psi	35 psi (2.4 bar)	35 psi (2.4 bar)

Conversion 1 bar = 100 kpa = 14.5 psi

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DESCRIPTION OF OPTIONS

Option 2: Air-Actuated 90 Degree Polarization

The air-actuated 90 degree polarization option is constructed of non-reflective materials. This option, when used with the controller, allows a higher degree of automation. The action of the air cylinder is positive and reliable. It eliminates problems of slippage encountered with belt driven systems. The rate of polarization is a range of 3 to 30 degrees per second. A 1/4 inch NPT inlet is provided. Operation at 1.4 to 2.1 bar (20 to 30 psi) is recommended. Customer to provide air supply.

Option 3: Coaxial Take-Up Reel

The spring loaded coaxial take-up reel option keeps cables neatly out of the way during ascent and and descent of the cross-boom. It also helps to assure consistency of readings during testing.

Option 7: Shielded Room Kit

The shielded room kit provides bulkhead feedthrough of the Model 1050's and 1051's control cables for entry into a shielded room.

Option 8: Variable Speed Motor

The variable speed motor option offers a speed range of 1.3 to 12 inches (3.3 cm to 30 cm) per second, ascent and descent of the antenna carrier. The option is available in 110-220 VAC, 50 or 60 Hz. This option is not upgradable to existing motor assemblies.

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Option 9: Rhode & Schwarz Antenna Adapter (Model 1050/1051)

The Rhode & Schwarz antenna adapter option is a separate cross-boom that can be easily interchanged with the standard unit. It permits mounting of Rhode & Schwarz antennas.

Option 10: Cold Weather Kit (Model 1050)

Permits operation at below freezing temperatures. Includes AGMA #8 synthetic oil and Belden #8214 (RG 214/U) coaxial cable with low-temperature outer jacket.

Option NRA03: Controller Rack Mounts

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ASSEMBLY INSTRUCTIONS

ERECTING THE MAST

1. Tilt the lower mast section from horizontal to vertical and insert pin to lock it in vertical position.

2. Carefully slide carrier into position over bottom section of the mast.(now vertical)

3. If you have Option 2: With air cylinder in closed position and cable clamp pointing downward, insert the boom through the boom lever, bearing, and boom collar so that dimension A is 27.5 inches (69.9 cm). See Figure 1 for Model 1050. See Figure 5 for Model 1051.

   On a standard mast without Option 2, dimension A is set at 32 inches (81.3 cm) between clamp end of boom and the carrier side plates. See Figure 1 for Model 1050. See Figure 5 for Model 1051.

4. Tighten boom lever and boom collar set screws securely making sure that set screws on the boom collar are orientated in the same position as on the boom lever (1/8" Allen wrench supplied).

   On standard masts without Option 2, the set screws are located in the side plates on the carrier. See Figure 2 for Model 1050. See Figure 6 for Model 1051.

5. If the mast has Option 3, assemble the take up reel in the position shown with the four carriage bolts, washers, and nuts, supplied on the base of Option 3 mast. Pull the coax cable to the approximate length shown in Figure 1 and secure in the clamp block provided on the boom. The clamps which are with stand-offs are positioned on the boom lever and boom collar on masts with Option 2, but they are positioned on the carrier side plates when the mast does not have Option 2.

6. Remove the mast lockpin then return lower mast section, with carrier, back to horizontal (as it was in shipment). Insert the mast sections into each other: match the color code marks at the joints to insure the sections are installed in the proper sequence.

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7. Unwind rope from the winch drum, pull through the top pulley, and secure through the hoisting eye located on the carrier brake with the rope clamp provided. Double the rope back under the clamp, then neatly tie the rope above the clamp.

8. Attach the guy ropes to the mast using the ropes provided to insure safe operation. (Follow the guying diagram in Figure 3.)

9. Carefully lift mast into vertical position and lock. (get assistance)

10. Set cams on the limit switches inside of the motor cover to the desired upper and lower limits. (Refer to Setting Up/Down Travel Limits section, for setting the mechanical limit switches.)

11. A grounding lug (brass 1/4-20 stud) is provided for bonding the Motor Assembly to ground.

12. NOTE: NEVER OPERATE THE MAST WITHOUT HAVING IT FULLY GUYED DOWN AND AS STATIONARY AS POSSIBLE. USE EXTREME CAUTION WHEN OPERATING IN GUSTY WINDS OR QUESTIONABLE WEATHER CONDITIONS.

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SETTING THE UP/DOWN TRAVEL LIMITS

CAUTION: The mechanical limits must be properly set prior to operation of the Antenna Positioning Mast. (See Figure 4 for a pictorial description of the parts and procedure noted below).

The mechanical limit switches are located in the Motor Assembly at the base of the mast. To set them, remove the cover and loosen the brass cams on the limit switch with a 1/16" Allen wrench (supplied). Lower the antenna carrier to a position near the bottom of the mast. The rope should be feeding off the side of the drum nearest the mast. No more than two turns of rope should remain on the winch drum when the carrier is at the bottom of the mast. This prevents the rope running off the drum when the carrier is at the top of the mast.

The lower limit is set by rotating and adjusting the brass cam above the lower limit switch so that the switch just cuts off. (A detent can be felt and a small "click" heard when the switch cuts off.) Tighten the set screws on the cams with a 1/16" Allen wrench (supplied).

The upper limit is set by raising the antenna carrier to a point near the top of the mast and adjusting the brass cam above the upper limit switch as described above. Tighten the set screw on the cam with a 1/16" Allen wrench (supplied). Replace the motor cover.

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CONTROLLER OPERATION AND PROGRAMMING

GENERAL DESCRIPTION

The Controller for the EMCO Model 1050/1051 Antenna Positioning Mast includes a digital readout in centimeters and two adjustable electronic limits. The Controller is attached to the Motor Assembly using an eight conductor cable and a four conductor cable. The eight conductor cable provides power and directional control for the mast. This cable also provides polarization control when this option is furnished. The four conductor cable provides position information from the mast to the Controller.

Power to the controller is applied through the filtered three pin power inlet located on the rear panel. Mains voltage selection should be made prior to connection.

The 1050/1051 Controller is a relative position indicator. It is for this reason that it is important to properly set the mechanical limits (located in the Motor Assembly) to prevent over travel of the antenna carrier. This also means that the position of the antenna carrier must be measured and entered into the Controller as the "CURRENT POSITION" when first powered on.

USER FRONT PANEL CONTROLS

Refer to Figure 8 for Front-Panel Feature Overview and Figure 9 for Rear-Panel Feature Overview.

DISPLAY

The display in normal operation will display one of four numbers: the current carrier position, the lower limit currently set, the upper limit currently set, or a "display" value as entered from the "INCREMENT"/"DECREMENT" display set switches. The display set switches are used to present a value which can be used to set the current position, the upper limit, or the lower limit. The parameter to be displayed is set by pressing the appropriate switch (i.e. CP, LL, UL). The appropriate LED for the displayed parameter will be lit. If all three LED indicators are off, the display will follow the display set switches.

To load a present value, the LOAD switch must be pressed. The LOAD LED indicator will then light "arming" the loading action for approximately 2 seconds. During that interval one should press the desired destination (i.e. CP, LL, UL) to receive the preset value. The display mode will switch to display the parameter just loaded. If the 2 second "arm" interval elapses without a load sequence being performed or if any other switch is pressed, no loading will occur. Reference sequence below.

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1. Select desired value by using the "INCREMENT"/DECREMENT" switches.
2. Depress the "LOAD" switch.
3. Depress function desired: "CURRENT POSITION", "LOWER LIMIT", or "UPPER LIMIT".

Pressing the "INCREMENT"/ "DECREMENT" switches will cancel any existing display and allow the operator to change the display to any desired value. If the switches are pressed momentarily the display value will increment/decrement by +/-1. If the given switch is held down for more than 1 second, the display will increment/decrement continuously at a fast rate to allow the operator to move the value to the general range desired and then single-step the display to the desired value. The allowable range will be from -999 to 999.

If the situation ever occurs that the current carrier position is not within the range specified by the upper and lower limits, the display will blink.

GPIB HOST INTERFACE CONTROL

The following programming sequences list the instrument functions for the Model 1050/1051 Mast Controller.

Model 1050/1051 Mast Controller Instrument functions:

UP - Move carrier position up from current position

DN - Move carrier position down from current position

ST - Stop carrier motion

CP - Set display in instrument to show current mast position. Note that this sets up the display mode so that subsequent read commands will return the current position value to the host controller.

UL - Set display in instrument to show current mast upper limit. Note that this sets up display mode so that subsequent read commands will return the upper limit value to the host controller.

LL - Set display in instrument to show current mast lower limit. Note that this sets up display mode so that subsequent read commands will return the lower limit value to the host controller.

PV - Set antenna carrier position for vertical polarization.

PH - Set antenna carrier position for horizontal polarization.

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LD (+,-)XXX CM - Set the display to show +/-XXXcm. (+ can be omitted). This command must be followed by a "CP", "UL", or "LL" command to load the value into the proper register.

When reading the value currently being shown in the mast controller display, the meaning of this value will be whatever has been preset by a "CP", "UL", or "LL" command.

P? - Interrogates the controller to return the present polarization as a "1" or "0".

The GPIB address switch (SP1) is located on the main board and may be accessed by removing the top cover panel of the control box. Five of the eight switches are identified by the following markings: "1", "2", "4", "8", or "16". The address has been preset to 08 by setting the switch marked "8" to the "ON" position. The switches marked "1", "2", "4", and "16" remain set in the "OFF" position.

PROGRAM EXAMPLE:

Programming Examples for HP-87 GPIB controller.

```
Reading the display:
     ENTER 708; X
Loading the current position:
OUTPUT 708; "LD 123 CM CP"
```

A display of "E - P" indicates a power error and suggests that the electronic limits and current position should be reset.

A display of "E L" indicates the motor continued to run in the down direction when commanded to go up.

A display of "E -" indicates the motor continued to run in the up direction when commanded to go down.

SAMPLE LISTING:

```
10  REMOTE 708
20  OUTPUT 708;  "LD 15 CM LL"
30  OUTPUT 708;  "LD 15 CM CP"
40  OUTPUT 708;  "LD 195 CM UL"
50  OUTPUT 708;  "UP"
60  WAIT 5000
70  OUTPUT 708;  "ST"
80  ENTER 708;  X
90  DISP X
100 OUTPUT 708;  "PV"
120 ENTER 708;  X
```


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ANTENNA CARRIER CONTROLS

The antenna carrier is controlled by the "UP", "DOWN", and "STOP" switches. The function control is self-explanatory with the added explanation that the LED indicators for for "UP" and "DOWN" will remain lit if the carrier activates a mechanical limit (cam). The current position display will stop changing if the carrier is mechanically stopped, also if the electronic limits are exceeded, or if "STOP" has been activated, the LED indicators will be extinguished.

The antenna carrier can be rotated into either a vertical or horizontal polarization by use of the "HORIZONTAL" and "VERTICAL" switches. The LED indicator will be lit on one or the other indicating the current orientation of the carrier.

REMOTE/LOCAL INTERFACE CONTROLS

The interface state of the instrument is indicated by the "RMT" LED indicator. When lit, the instrument is under control of the host GPIB controller; otherwise the front panel controls are active. The LOCAL switch will switch the instrument to local front panel control IF POSSIBLE (i.e. if the host controller will permit. The host may have the front panel controls locked out using the LLO Local Lock Out command).

The ADDR LED will be lit whenever the 1050/1051 controller is being addressed by the GPIB.

VERTICAL/HORIZONTAL POSITION (OPTION 2)

When the Controller's power is off, the antenna boom will be in the horizontal position. Should the polarization be vertical when the controller is turned off, the boom will rotate to the horizontal position. When power is then turned back on, the boom will rotate back to the vertical position.

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MAINTENANCE INSTRUCTIONS

1. Mylar ropes should be frequently inspected for fraying or degradation due to usage and replaced every two years as a safety precaution.

2. Mast and carrier must be kept clean to assure smooth operation. Do not use oil or grease to decrease friction between the mast and carrier.

3. Inspect bearing at top of mast every six months and keep clean to prevent excessive wear or binding.

4. RG-214 coaxial cable used with option 3 should be inspected frequently and replaced at least every two years, or sooner if wear is detected in the cable or cable connectors. The coaxial rotary joint that is supplied with option 3 should be checked frequently for noise generation.

5. Remove the motor base cover every six months and inspect upper and lower limit cams to insure tightness on shaft. Tighten the Allen set screws in the cams with the 1/16" Allen wrench (supplied), as necessary.

6. Inspect the carrier brake spring every six months to insure that it has tension and is capable of positioning the brake firmly against the mast, should the rope break.

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ELECTRIC BRAKE ADJUSTMENTS

For proper operation of the electric brake it is necessary to adjust the magnet air gap (reference A on drawing Figure 7). As this air gap increases due to wear of the friction discs, the stopping time of the brake will increase accordingly. Before air gap "A" reaches 13/32" (10.32 mm) (measured on center line of plunger), adjustment for wear is required. Misadjusting the air gap will result in a loss of torque and/or coil burnout.

To adjust the brake refer to drawing Figure 7 and proceed as follows::

1. Remove cover. (Ref #01)

2. Insert allen wrench into adjusting Set Screw #10-32 x 24 (Ref #02) and turn clockwise until solenoid air gap is approximately 11/32" (8.7 mm). Gap is measured between Operator Assembly Lever (Ref #03) and solenoid (Ref #04) "c" frame, at center line of solenoid plunger (Ref #05).

3. Replace cover.

NOTE: The 11/32" dimension for the air gap is a nominal position. On low horsepower units, the gap may have to be slightly larger. Observe motor starting characteristics after adjusting gap. Motor should start quickly. If not, increase air gap by turning adjusting Set Screw (Ref #02) 1/8 turn counter clockwise.

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REPLACEMENT PARTS LIST
Model 1050/1051

For those customers that prefer to repair the tower at the major sub-assembly level, the following list of is provided:

P/N	Description	Used on Option:
100071	CABLE ASSEMBLY, 10 METER	ALL MODELS
100088	AIR CYLINDER ASSEMBLY	2
100717	ANTENNA CARRIER	2
101938	ANTENNA ADAPTER, 3104	2
101939	ANTENNA ADAPTER, 3146	2
101937	ANTENNA MOUNT	2
890062	SELF STORING AIR HOSE	2
890112	MALE AIR HOSE CONNECTOR	2
890113	MALE AIR HOSE ELBOW	2
960001	.0625 ALLEN WRENCH	ALL MODELS
960002	.125 ALLEN WRENCH	ALL MODELS
100027	TOWER ROPE CLAMP	ALL MODELS
100713	MAST CENTER SECTION	ALL MODELS
100714	MAST TOP SECTION	ALL MODELS
W3/16	MYLAR ROPE	ALL MODELS
100712	MAST BASE SECTION	ALL MODELS
890037	3" RIGID CASTER	ALL MODELS
890039	3" SWIVEL CASTER	ALL MODELS
100645	CONTROLLER CHASSIS BOARD ASSY	1,2
480004	FUSE, 1/8A, FAST ACTING	ALL MODELS
480006	FUSE, 5A, SLOW BLOW	ALL MODELS
480007	FUSE, 1A, FAST ACTING	ALL MODELS
480009	FUSE, 1/2A	ALL MODELS
400009	BATTERY, 6V, LEAD ACID	ALL MODELS
400016	POWER SUPPLY, 5VDC	ALL MODELS
100655	CONTROLLER MAIN BOARD ASSY	1
100045	ENCODER WHEEL	ALL MODELS
100051	BRASS CAM LIMIT	ALL MODELS
625001	SCAVENGER VALVE, HUMPHREY	2
630060	ROLLER LEVER SWITCH	ALL MODELS
700004	MAGNETIC DISC BRAKE	ALL MODELS
700023	MOTOR, 100-220V/50-60HZ	ALL MODELS
880002	CHAIN, .1475 PITCH	ALL MODELS
880012	CHAIN MASTER LINK, .1475 PITCH	ALL MODELS
100794	MOTOR BOARD ASSEMBLY	ALL MODELS

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EMCO Part No.	Description	Vendor Part No.
MOTOR BASE / CABLES		
460065	PCB MOTOR BASE	
460038	PCB OPTICAL SENSOR	E1050500B
495006	TRANSZORB TRANSIENT PROTECT	J15KE300C
495002	INRUSH CURRENT LIMITER	JCL30
495005	METAL OXIDE VARISTOR	JV275LA4
675053	CABLE CLAMP 8 CONDUCTOR	P305712AWB
675004	CABLE CLAMP 4 CONDUCTOR	P30576AWB
504014	CONNECTOR 4 PIN MALE	P31061402P
504019	CONNECTOR 8 PIN MALE	P31062007P
504028	CONNECTOR 8 PIN FEMALE	P31062007S
504007	RECEPTACLE 4 PIN FEMALE	P310214S2S
504012	RECEPTACLE 8 PIN MALE	P31022007P
625008	SOLID STATE RELAY	SG290A25
101519	OPTICAL SWITCH ASSEMBLY	
630069	OPTICAL SWITCH	SHOA2001
580083	OPTOCOUPLER	U740L6000
630092	SWITCH, SLIDE	V802-12-SS-Q5-Q
630060	SWITCH ROLLER LIMIT	SV3L139D8
675004	CABLE 4 CONDUCTOR	W5164
675005	CABLE 8 CONDUCTOR	W5178
640005	TRANSFORMER, STEP-DOWN	20 VA EWC AT102
CONTROLLER		
400016	POWER SUPPLY 5V	BLVS42E5
400009	BATTERY LEAD ACID 6V	BPS612
420001	CAPACITOR .01UF 50V	C43C103M
420002	CAPACITOR .1UF 50V	C43C104M
420015	CAPACITOR .1UF 25V	UK25-104
434037	CAPACITOR 470UF 35V	ULB-IV-471M
420029	CAPACITOR 1.0UF 500V	CY30C105M
424001	CAPACITOR 18PF 500V	CD10CD180J03CDE
434018	CAPACITOR 10UF 20V	199D106X9020CA2
560036	DIODE	IN4001
565001	BRIDGE RECTIFIER	MDA100G
460051	PCB AC CHASSIS BOX	
460002	PCB FRONT PANEL	
460040	PCB MAIN BOARD	
480004	FUSE 1/8 A NORM BLOW 3AG	312.125
480009	FUSE 1/2 A NORM BLOW 3AG	312.500
480005	FUSE 1 A SLOW BLOW 3 AG	
480006	FUSE 5 A SLOW BLOW 3 AG	3130050
485002	FUSE HOLDER	345601
485006	FUSE CLIP	751.0100
890022	MNTG STUB HPIB CONNECTOR	0380-0644
532001	LED	521-9165
536006	NUMERIC DISPLAY LED	730-6001
505002	CABLE IEEE INTERCONNECT	531-3549

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EMCO Part No.	Description	Vendor Part No.
505003	HEADER ASSEMBLY 20 PIN	3428-2002
505004	HEADER ASSEMBLY 50 PIN	3433-2002
504007	RECEPTACLE 4 PIN FEMALE	MS3201A-14S-02S
504012	RECEPTACLE 8 PIN FEMALE	MS3201A-20-07S
505008	CABLE ASSEMBLY 20 PIN	5313421
505009	CABLE ASSEMBLY 50 PIN	5313425
505033	PLUG 10 PIN FLAT	CE100F22-10
506059	RECEPTACLE 10 PIN FLAT	ML SS100-10
570047	TRANSISTOR SCR	MCR68-2
570038	TRANSISTOR	MPS2222
570047	TRANSISTOR	MCR68-2
570048	TRANSISTOR POWER	TIP-30
570049	MOS SWITCH	VP0300
600001	RESISTOR PACK 4700 OHM	4116R-002-472
600002	RESISTOR PACK 200 OHM	316B201
630002	SWITCH, FRONT PANEL	
630001	SWITCH, FRONT PANEL W/LED	SEAU-OA-01-02-R
630067	SWITCH, FRONT PANEL RED	SEAU-OA-03-01
630003	SWITCH, SLIDE	1101M2AB C/K
630092	SWITCH, SLIDE	V802-12-SS-05-Q
630068	SWITCH, PC MNT PUSH-BUTTON	301 VBE
630035	SWITCH, POWER FRONT PANEL	AML35FBB4AA01
630037	SWITCH, COVER	AML55N10RK
620001	SOLID STATE RELAY	2DW202F
630040	SWITCH DIP	ALS-08
620005	RELAY PC MOUNT	HE721C05-00
640003	TRANSFORMER	LP-12-450
580001	IC IEEE INTERFACE BUFFER	MC3448AL
580002	IC TIMER	NE555P
580003	IC PERIF INTERFACE ADAPT	MC6821P
580004	IC IEEE INTERFACE	MC68488P
580005	IC EEPROM	MC68701L
580006	IC DISPLAY DRIVER	ICM7212AMIPL
580007	IC QUAD NAND GATE	SN7400N
580010	IC HEX INVERTOR	SN7404N
580022	IC HEX SCHMITT TRIGGER	SN7414N
580072	IC 3 TO 8 DECODER	74LS138N
580075	IC OCTAL BUFFER/LINE DRVR	UA74LS240PC
580083	IC OPTOCOUPLER	740L6000
590026	IC VOLTAGE DETECTOR	ICL7665ACPA
590040	IC VOLTAGE REGULATOR	LP2950ACZ5.0
580089	IC LINE INTERFACE	MID400
590041	IC OVERVOLTAGE PROTECTOR	MC34062PI
580088	IC BATT CHARGE REGULATOR	UC3906N
580087	IC TIMER	TL7705A
680001	CRYSTAL 3.579545 MHz	NDK 035A
690001	FILTER FEED-THRU	1270-009
690005	FILTER POWERLINE	6ED1

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CABLE WIRE LIST

CONTROL/POWER CABLE (8 CONDUCTOR)

POSITION	FUNCTION	WIRE COLOR
A	AC HIGH	BLACK
B	AC LOW	WHITE
C	UP/CW	ORANGE
D	DN/CCW	BROWN
E	POLARIZATION	BLUE
F*	GROUND	GREEN
G	AC HIGH (A)	RED
H	AC LOW (B)	YELLOW

* NOTE: Drain wire is connected to Pin F of the seven-pin connector on the controller end.
Shield is connected connector strain relief.

SIGNAL CABLE (FOUR CONDUCTOR)

POSITION	FUNCTION	WIRE COLOR
A	+ 5 VDC	RED
B*	COMMON	BLACK
C	SIGNAL #1	GREEN
D	SIGNAL #2	WHITE

* NOTE: Drain wire is connected to Pin B of the four-pin connector on the controller end.
Shield is connected to connector strain relief.

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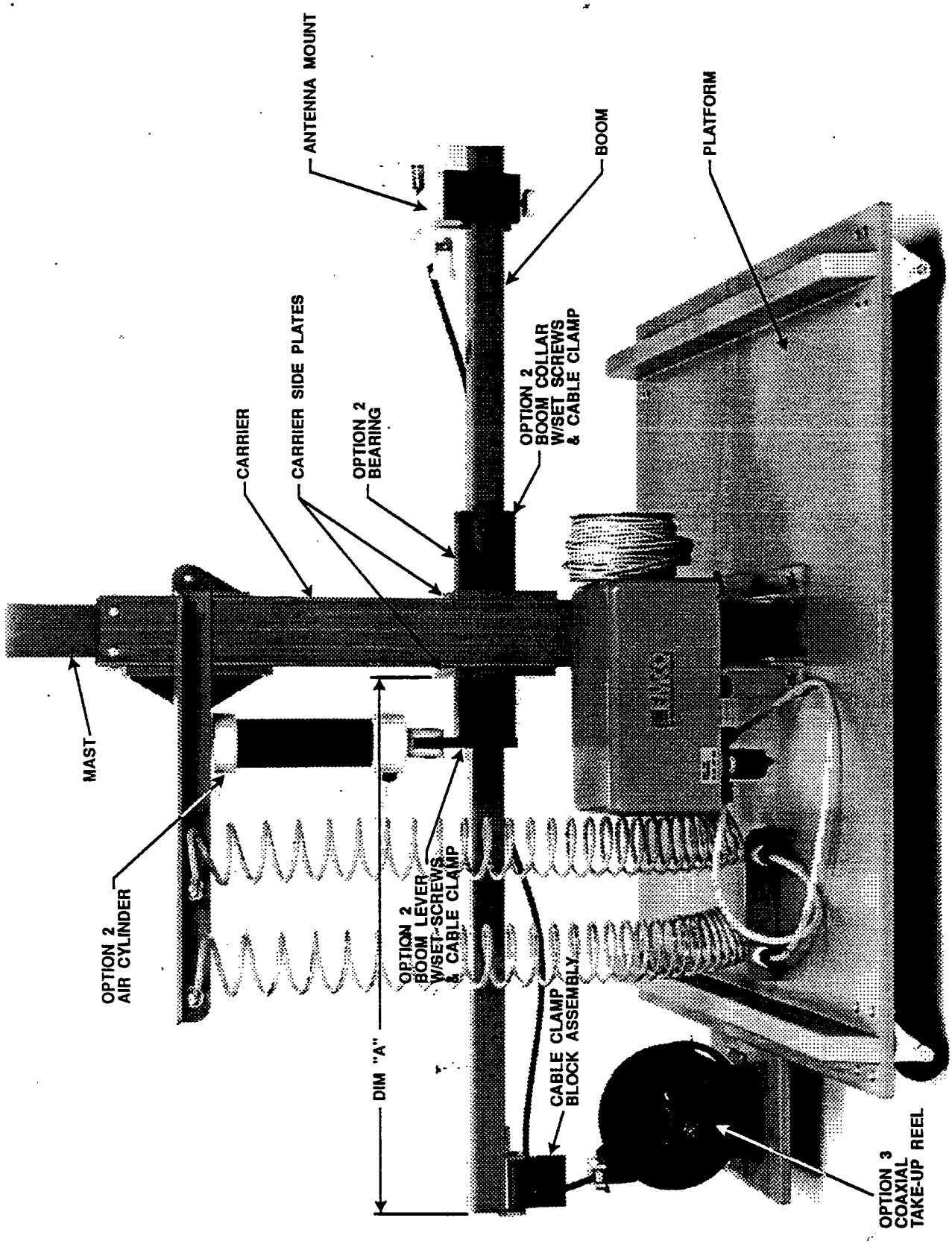
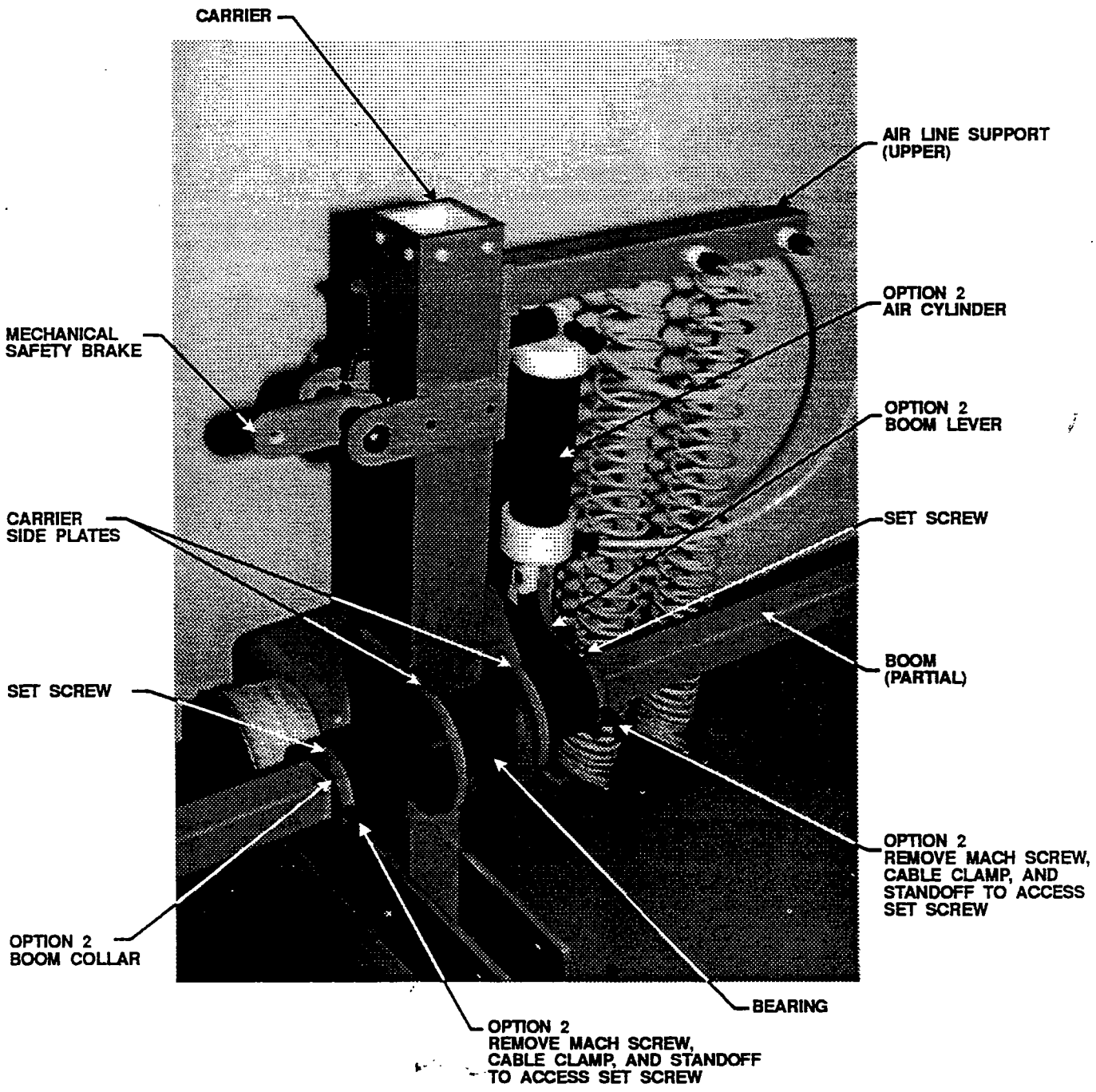


FIGURE 1 MODEL 1050 ANTENNA POSITIONING MAST

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CARRIER AND BOOM ASSEMBLY (PARTIAL)

MODEL 1050

FIGURE 2

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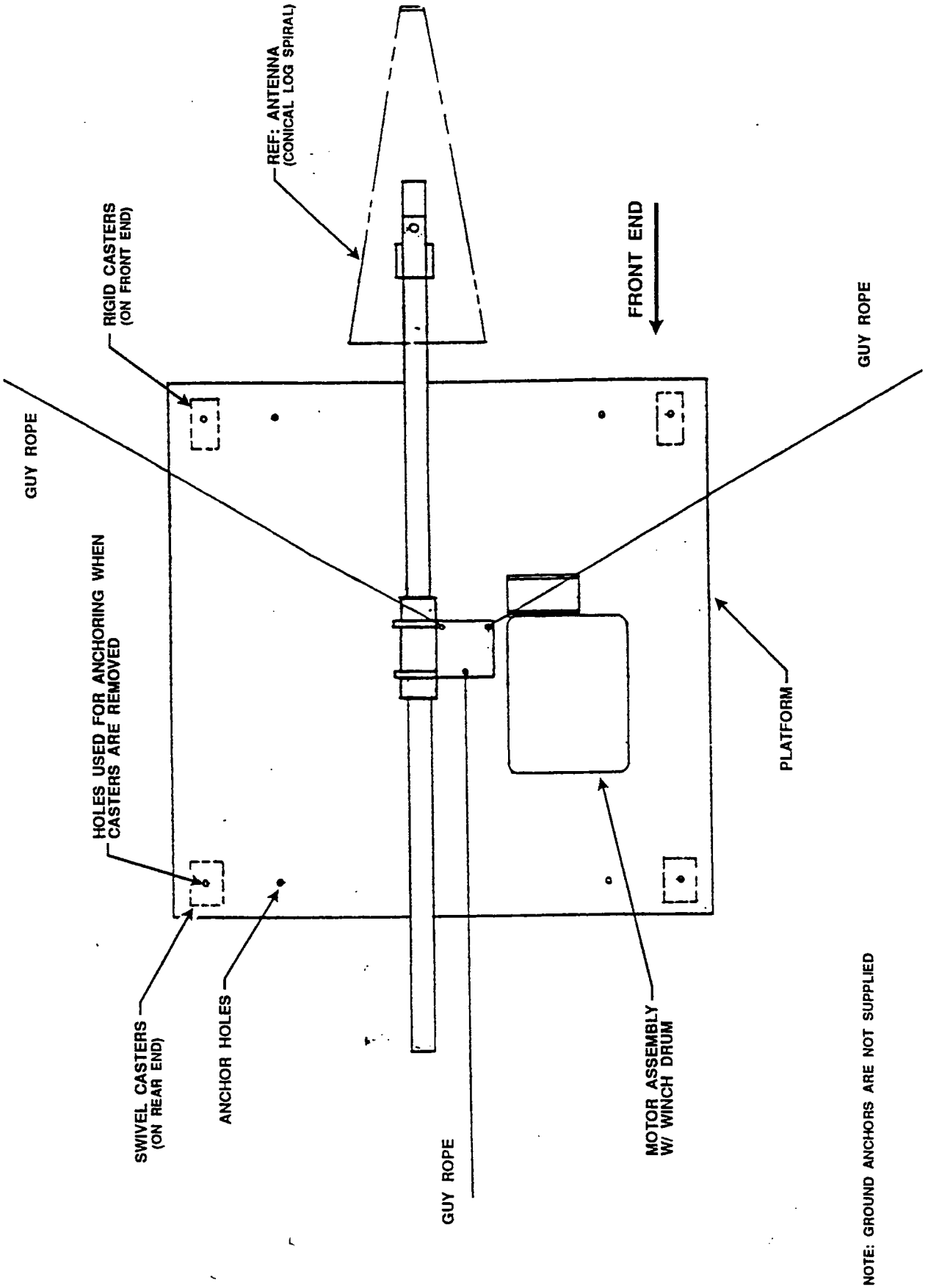
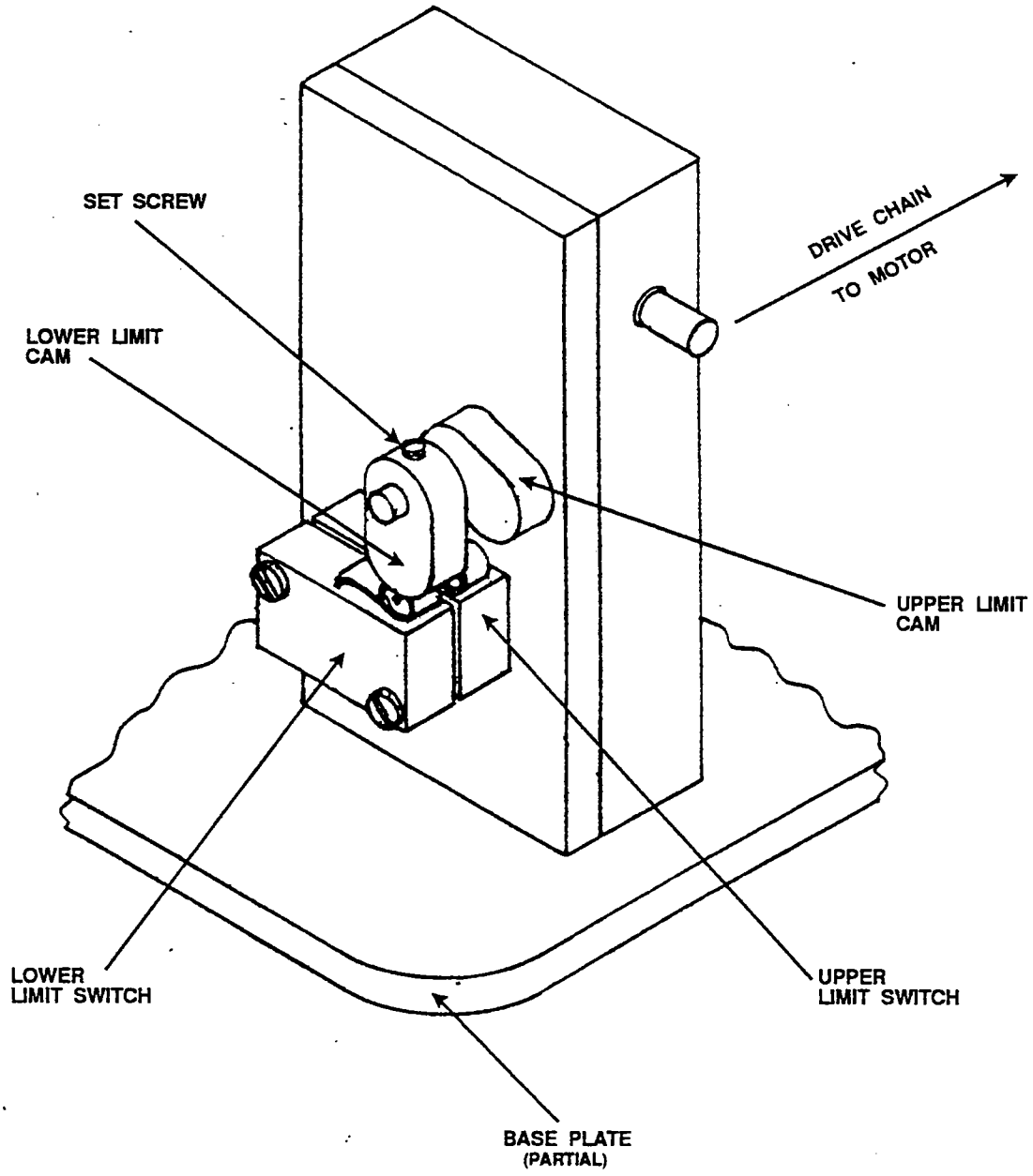


FIGURE 3 TOP VIEW - ANTENNA POSITIONING MAST

NOTE: GROUND ANCHORS ARE NOT SUPPLIED

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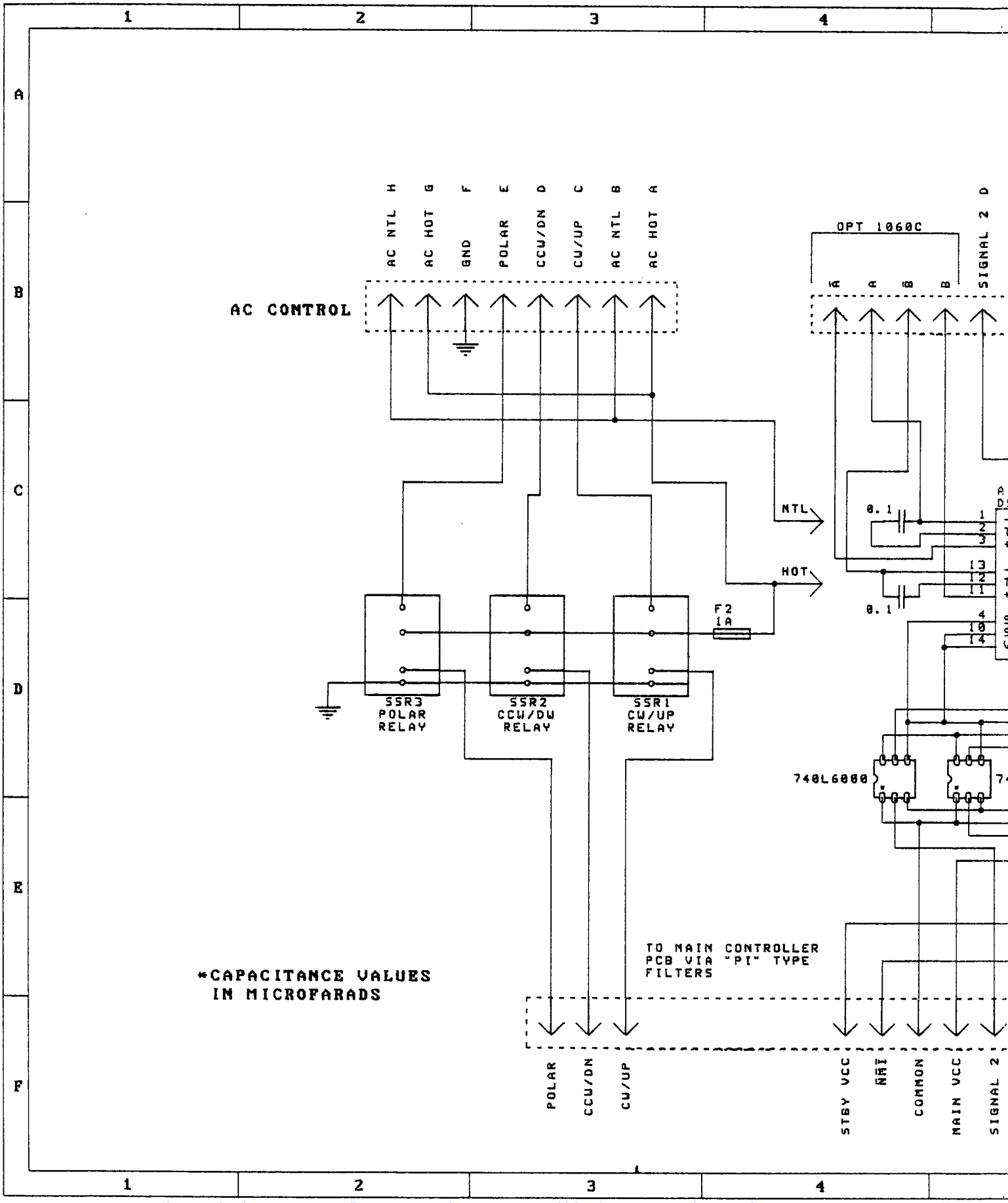


LOCATION OF MECHANICAL LIMITS
(INSIDE OF MOTOR ASSEMBLY)

FIGURE 4

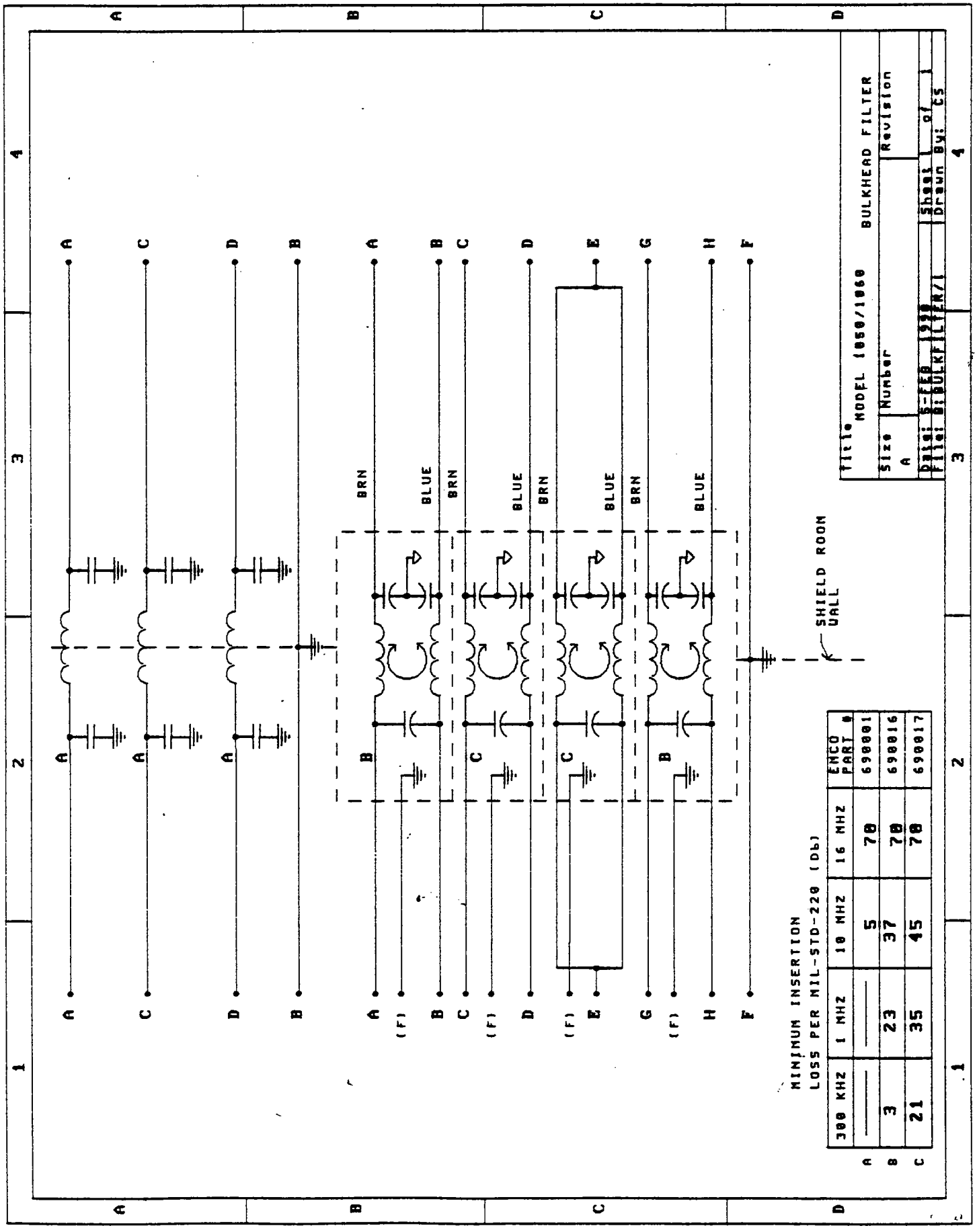
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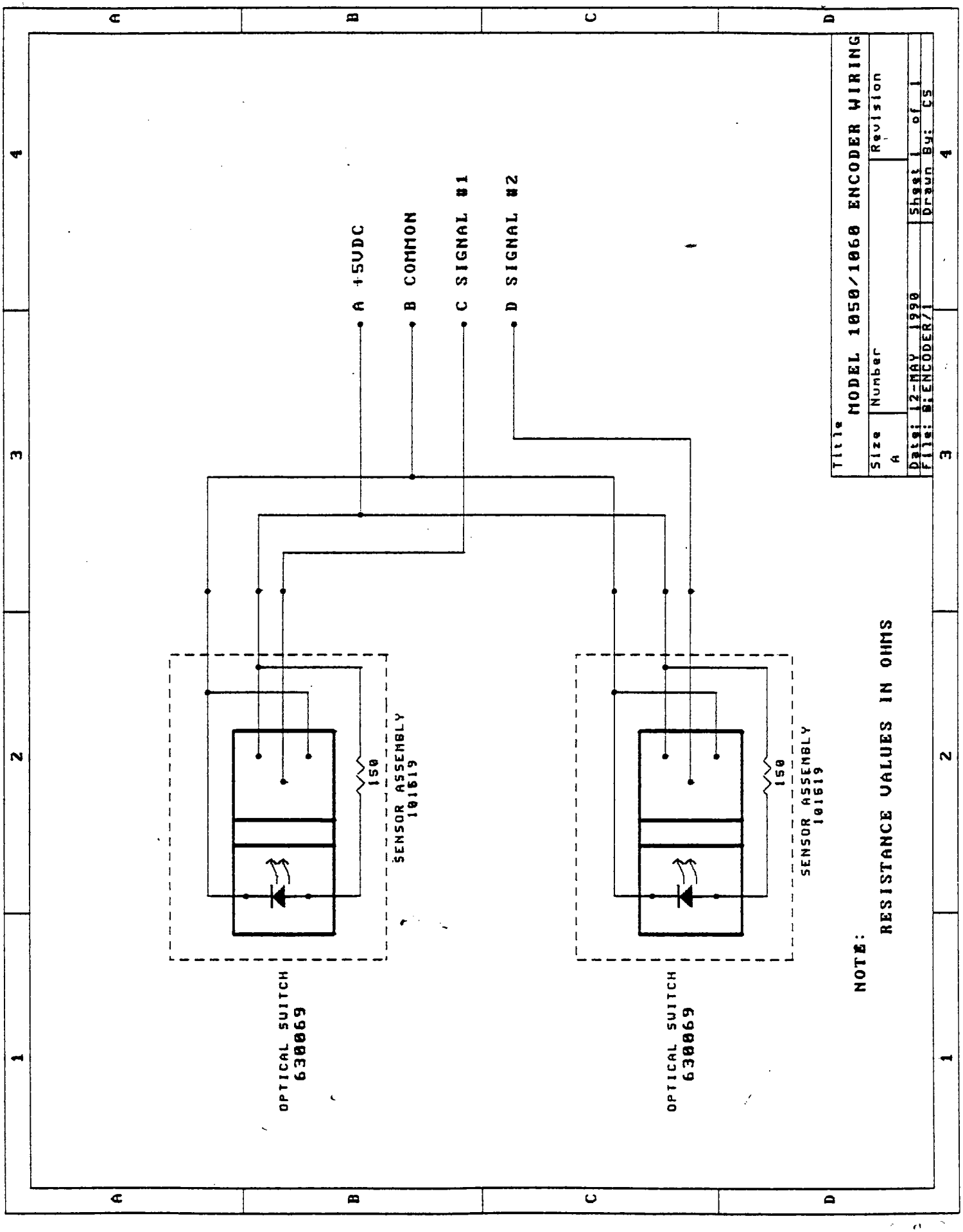
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	300 KHZ	1 MHZ	10 MHZ	16 MHZ	ENCO PART #
A	———	———	5	70	690001
B	3	23	37	70	690016
C	21	35	45	70	690017

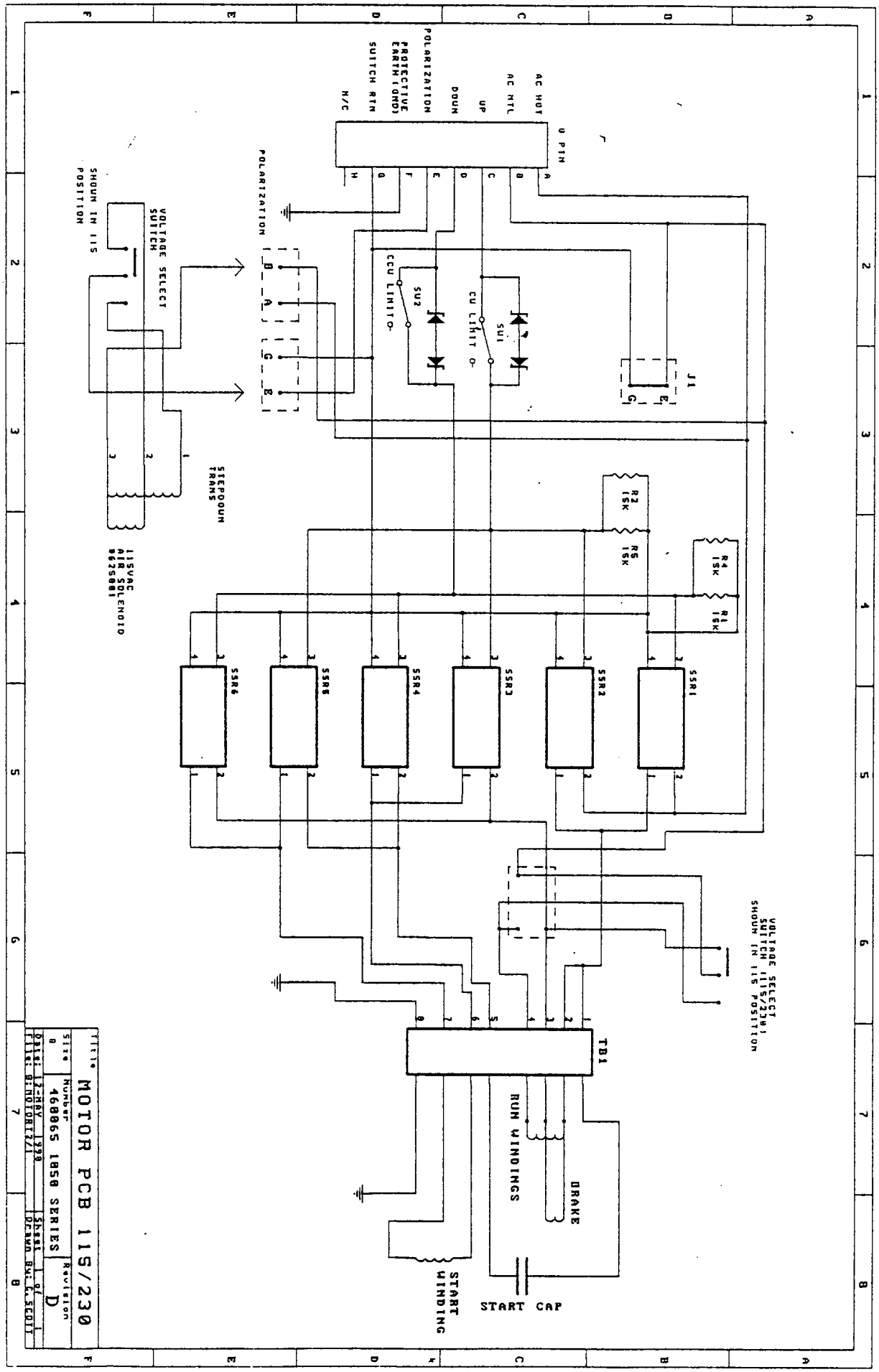
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