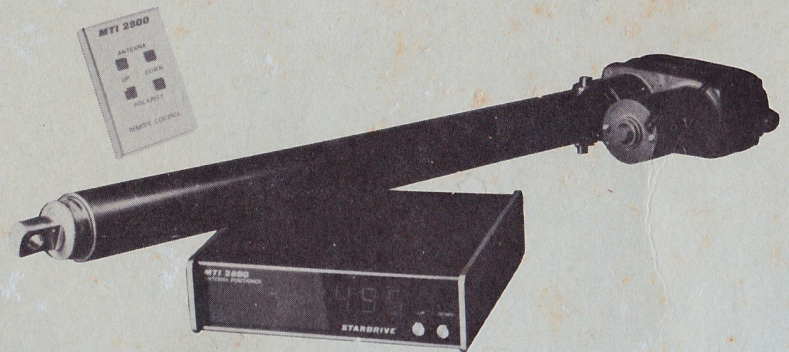


**STARDRIVE
MTI 2800A
INSTRUCTION MANUAL
SATELLITE ANTENNA
POSITIONER**



SERVICE: 1-800-521-7330

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INSTRUCTION MANUAL MTI 2800A April, 1984

PenTec
MTI SYSTEMS, INC.

2351 South 2300 West
Salt Lake City, Utah 84119

LIMITED WARRANTY

MTI Systems, Inc. warrants new equipment and component parts against defects in material or workmanship for a period of twelve (12) months from the original date of shipment. MTI Systems further warrants all components are equal to or exceed published ratings and specifications at the time of shipment.

If a defect covered by this warranty is found, MTI Systems will, at its option, repair such defect, replace any defective part, or replace defective equipment provided that the purchaser has given MTI Systems immediate written notice within the twelve (12) month period. MTI Systems shall have the option of requiring prepaid return of defective equipment or parts to the factory, or to an authorized maintenance representative, for inspection.

This warranty covers only conditions resulting from normal use of equipment. MTI Systems reserves the right to refuse to extend this warranty to any of the following conditions:

- A. Equipment or parts repaired or altered by other than MTI Systems or an authorized repair representative.
- B. Failure to follow proper installation, operation, and maintenance instructions provided in the equipment manuals.

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THE ABOVE WARRANTY IS EFFECTIVE 1/1/83
AND SUPERCEDES ALL PREVIOUS WARRANTIES.

Pentec
MTI SYSTEMS, INC.

2351 South 2300 West
Salt Lake City, Utah 84119
(801) 972-4817 or
SERVICE 1-800-521-7330

INSTALLATION PRECAUTIONS

The following are **IMPORTANT** installation precautions that **MUST** be followed to insure proper operation and not void any warranties.

ACTUATOR:

On manual antenna positioning systems, it is extremely important that the actuator be attached to the antenna mount **in such a way that full extension or full retraction** of the tube does not result in damage to the actuator or the antenna mount caused by either binding from poor linear alignment of mount pivot points or by physical contact of the actuator to the mount at any point along the actuator tube other than the two mechanical connecting points used for installation.

CONTROL UNIT:

Do not plug control unit into 115 VAC wall plug until the actuator power cable is completely connected to the actuator and control unit. Failure to do so can damage the hall sensor in the actuator.

SAFETY PRECAUTIONS

The following are general safety precautions that are not related to any specific procedure and therefore do not appear elsewhere in this publication. These are recommended precautions that personnel must understand and apply during many phases of operation and maintenance.

HIGH VOLTAGE

Operating and maintenance personnel must at all times observe all safety precautions. Care must be exercised when performing maintenance in and around the power supply and actuator.

DO NOT SERVICE OR ADJUST ALONE

Maintenance personnel should not service or adjust the equipment except in the presence of someone who is capable of rendering aid.

RESUSCITATION

Personnel working with or near high voltage should be familiar with modern methods of resuscitation. Such information may be obtained from the Bureau of Medicine and Surgery.

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SECTION I GENERAL INFORMATION

1-1 Introduction

Congratulations! You are now the proud owner of MTI's Infrared Antenna Positioner System. We are proud of the quality and reliability that is built into every unit's physical appearance and performance.

1-2 Purpose and Capabilities

The MTI 2800A Antenna Positioner System is designed for use with "polar" type satellite antenna mounts. The unit is intended primarily for private, noncommercial earth station application and is not warranted for industrial or commercial use.

The Stardrive consists of three major parts:

- 1 - Control Unit - Figure 2-1
- 2 - Actuator - Figure 5-2
- 3 - Hand Held Remote - Figure 5-3

1-3 System Description and Orientation

1. The control unit contains the microcomputer control circuits, the power supply circuits for power to the actuator, the LED displays, and the up and down control switches. This unit is also infrared control compatible with an optional plug on board.
2. The actuator contains the motor, screw jack, Hall effect sensor or Reed sensor, and safety clutch. Your unit is supplied with either an ACME screw jack or Ball Screw jack. Check Actuator Tables I and II in SECTION II to ensure that the actuator you have will be suitable for the load of the antenna it is being used on and cable run desired is acceptable. The type of actuator you have is checked on the label on the end of the shipping box.

NOTE: Also included is 125 feet of actuator power cable. We recommend that you use this cable because of special shielding requirements. Not using this cable could result in system miscounting.

SECTION II PREPARATION FOR USE

2-1 Installation

NOTE - Before installing actuator to antenna mount, ensure that weight limits of actuator used are not exceeded when antenna mount is at extreme ends of actuator travel.

ACME Tube is Silver Finish - 750 lbs. MAX

Ball Tube is Gold or Black Finish - 1500 lbs. MAX

See Table 1 & 2 in this section.

1. The actuator should be attached to the antenna so as to allow the full satellite belt to be accessed. Your dealer can assist you in the proper installation. It is recommended that the motor be mounted in the uppermost position, if possible, to prevent moisture intrusion into the motor and gear assembly. MTI manufactures a mounting clamp for use with the Saginaw Performance Pak Actuator. These clamps are available from your distributor or from the factory for a nominal charge.

TECHNICAL BULLETIN # 1

SUBJECT: Moisture Intrusion in Saginaw Drive

Could Result In: Damage to unit due to freezing. Decreased positioning accuracy. Eventual damage due to corrosion.

Suggested Corrective Action:

To prevent moisture intrusion into the gear housing we have found that a small amount of "RTV" or clear silicon sealant placed around the saginaw tube (figure 5-2 B) (sealing the tube to the gear housing) will greatly reduce and in most cases completely eliminate any moisture from entering the gear housing.

The inner tube is sealed to the outer tube by means of an "O" ring approximately 2« down inside the outer tube. (Figure 5-2 C). To **guarantee** no moisture entrapment, drill a ¼" to ¼" hole on down side of gear housing just **slightly below bottom of outer tube for drain purposes. (Figure 5-2 A)**

TECHNICAL BULLETIN # 2

It is the responsibility of the installer of the power jack to the dish to insure there is no **Lateral** strain on the Saginaw Actuator. The installer may find it necessary to install knuckle kits (which may be obtained through Distributors or from factory at a normal charge), or modify mount by changing triangulation or both so that the actuator will obtain **FULL** extension and **FULL** retraction without lateral stress.

2. Place the control unit in a convenient location near 115 VAC grounded socket. Do not plug unit in until actuator power cable is connected.
3. Run the actuator cable from the control unit to the actuator at the antenna. The actuator end of this cable is connected through the waterproof cable grip to the terminal strip inside the actuator housing.

See wiring diagram SECTION 5-2. Do not connect the actuator cable to the control unit at this time. Links up to 1200 feet can be used. See Table 1 & 2 in this section.

2-2 SET-UP

1. Plug 115 VAC into grounded socket. At this point there should be no LED displays lit.

At this point it is extremely important to emphasize that the actuator must be mounted properly to prevent damage to either the actuator or antenna/mount. Because this is a manual antenna positioner, the user has the ability to run the actuator to both extreme limits.

2. If all safety precautions and installation instructions have been thoroughly followed, push the Down button on the control unit and check the direction of the actuator. If the actuator is retracting, then skip Step 3 and proceed to Step 4.
3. If the actuator extends when pushing the Down button, then unplug 115 VAC power cable and reverse the large red and orange wires on the back of the control unit.
4. Run actuator to complete retract position (down). At this point, you will hear a popping noise from the actuator. Push the reset button on the back of the control unit. The LED display should go blank.
5. Push the Up button. The actuator should extend and the LED displays will count in upward direction. The actuator will move at approximately 1 inch per 20 counts.

If actuator is mounted properly, continue to hold Up button until you reach full extension of actuator tube. Note, Count when you hear the clutching action. This is the count that you should never exceed to prevent satellite mislocation once set-up is complete.

6. Now run actuator down to full retract position. LED's should count in downward direction. Once you have retracted the tube, stop and reset the control unit. (It is a good idea to never go to your maximum and minimum count once you have located and documented all satellite locations.)
7. Now that you have reset to zero, you may now start locating satellites.
8. If you have found any discrepancies in your set-up procedures, refer to Trouble Shooting Section IV.
9. In locating satellites, refer to a Satellite T.V. Guide. Once you have verified the name of the satellite, write down the number and name on a card.

Example:

F5 - 27

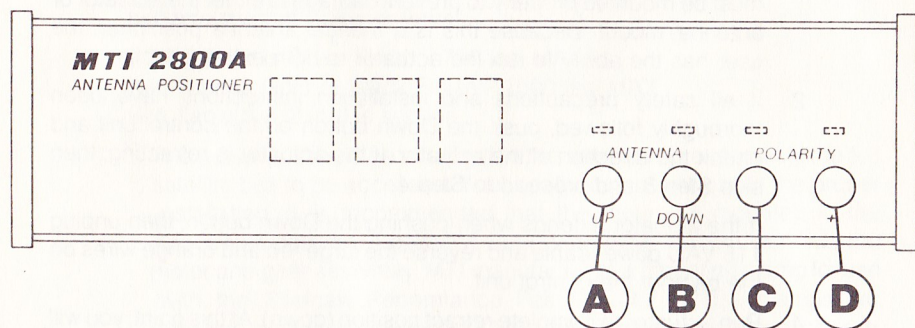
F1 - 42

G1 - 60

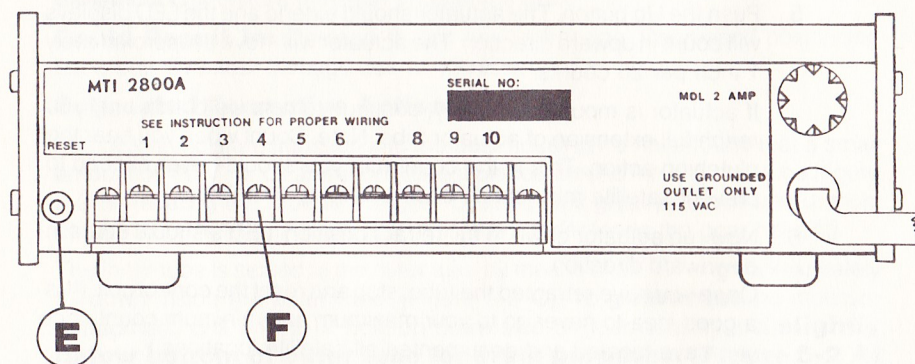
F3 - 88

Locate and document all satellites in this manner.

FIGURE 2-1



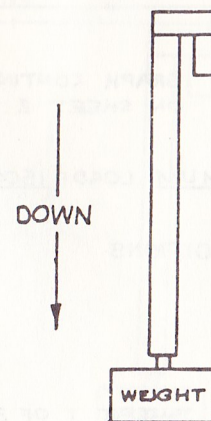
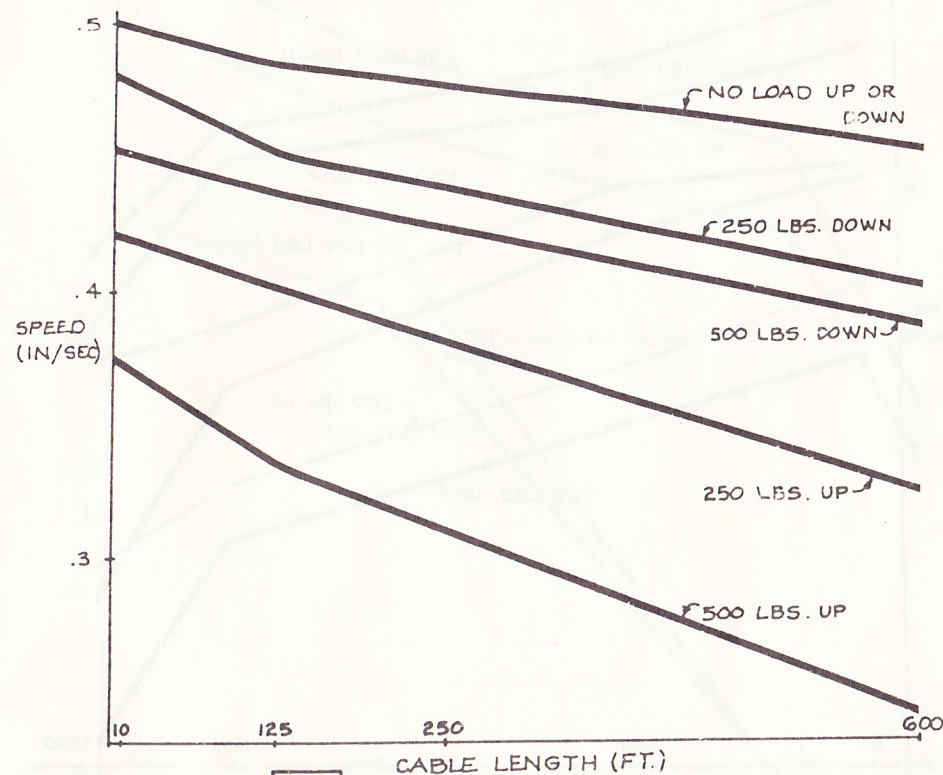
BACK VIEW:



- A** Actuator Extends and Count Increases
- B** Actuator Retracts and Count Decreases
- C** Rotates Polarotor II Clockwise
- D** Rotates Polarotor II Counter Clockwise
- E** When Pushed this will Blank Display and Reset to Zero
- F** Power Cable Connection, See Fig. 5-1 for Wiring

SPEED AND LOAD CONDITIONS FOR:

**SAGINAW ACME
SCREWJACK ACTUATOR**

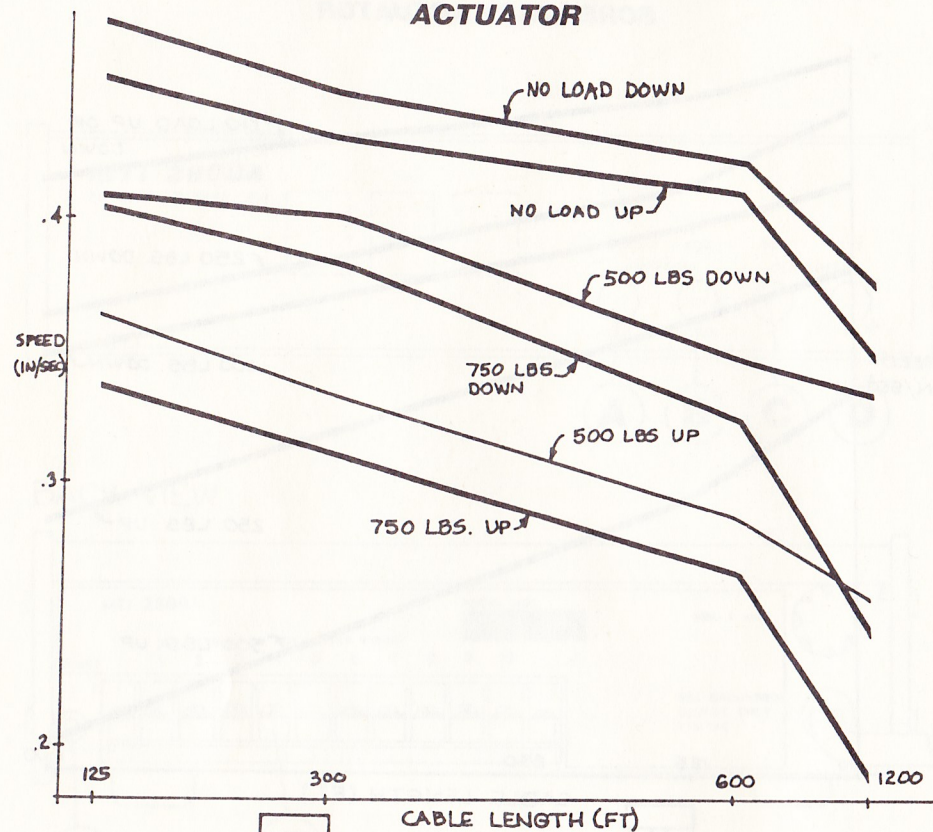


ACME MAXIMUM LOAD: 750 LBS.

LOADING CONDITIONS

TABLE 1

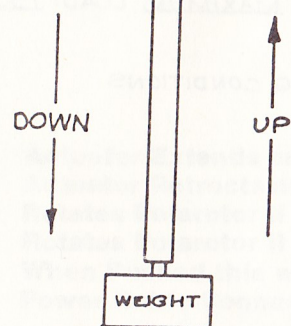
SPEED AND LOAD CONDITIONS FOR: **SAGINAW BALL THREAD OR WARNER** **ACTUATOR**



GRAPH CONTINUES
ON SHEET 2.

BALL MAXIMUM LOAD: 1500 LBS.

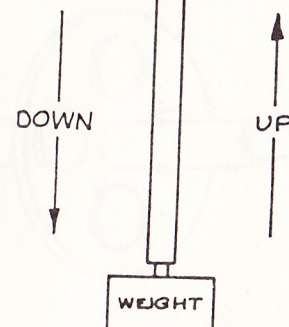
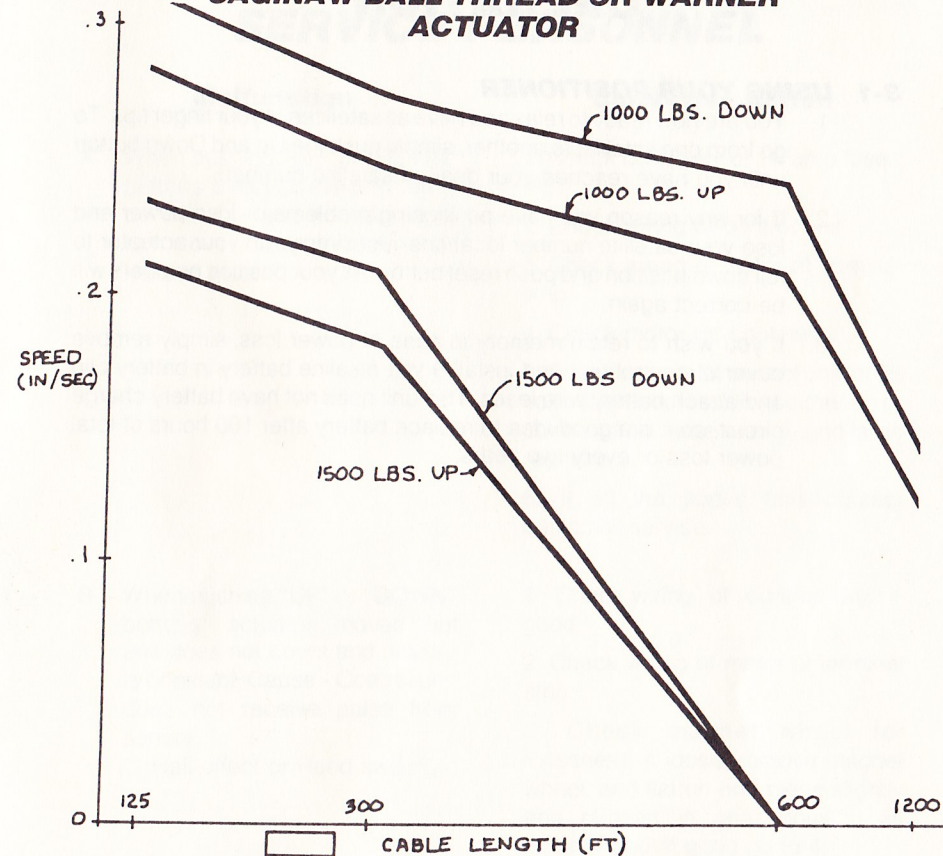
LOADING CONDITIONS



SHEET 1 OF 2

TABLE 2

SPEED AND LOAD CONDITIONS FOR: **SAGINAW BALL THREAD OR WARNER** **ACTUATOR**



LOADING CONDITIONS

SHEET 2 OF 2

TABLE 2 (Continued)

SECTION III OPERATION

3-1 USING YOUR POSITIONER

1. You are now ready to relax and have all satellites at your finger tips. To go from one satellite to another, simply push the Up and Down button until you have reached your desired satellite number.
2. If for any reason you have positioning problems or lose power and lose your satellite number locations, just simply run your actuator to full down position and push reset button. All your position numbers will be correct again.
3. If you wish to retain memory in case of power loss, simply remove cover of control unit and install 9 volt alkaline battery in battery clip and attach battery wire leads. This unit does not have battery charge circuit, so it is a good idea to replace battery after 100 hours of total power loss or every two years.

SECTION IV TROUBLE SHOOTING SERVICE PERSONNEL

Malfunction

Corrective Action

- A. When pushing "UP" or "DOWN" buttons, direction indicator lights do not light and actuator does not move. Cause - lack of 36 volts to motor.

1. Check continuity of 10 amp fuse - (F2).
2. Check wiring of control unit.
3. Check wiring of motor at terminal strip.
4. Check motor for continuity.
5. Check voltage at control unit for 36 volts upon depression of either up or down button, large orange and large red wire.
6. If all the above fails contact customer service.

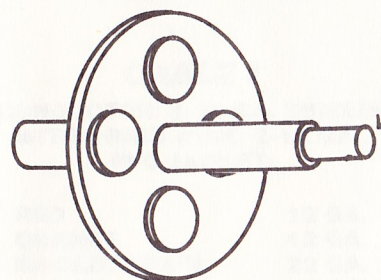
- B. When pushing "UP" or "DOWN" buttons, actuator moves but unit does not count and display is constant. Cause - Control unit does not receive pulse from sensor.

(Hall effect or Reed switch)

1. Check wiring of control unit if good.
2. Check wiring of motor at terminal strip.
3. Check magnet wheel for looseness, if loose, remove magnet wheel, and flatten end piece slightly and reinsert in gear housing as before hand. If good go to 4.

Crimp slightly with pliers or vice.

4. With voltmeter check for 5 volts at (TBI). Voltage should be measured at the small red and the small black wire. If 5 dc volts are not present repair or replace unit. If good go to 5.
5. With voltmeter check for 5 volt pulses at actuator by measuring voltage at the small blue wire and small black wire, and while doing so



actuating the "UP" or "DOWN" buttons so magnet wheel rotates. Every time magnet passes beneath sensor, a 5 volt pulse should be read. If no voltage is read, replace Hall sensor.

5a. For Reed Switch Application: Check continuity of Reed switch while magnet is below sensor. If no continuity is found, replace sensor.

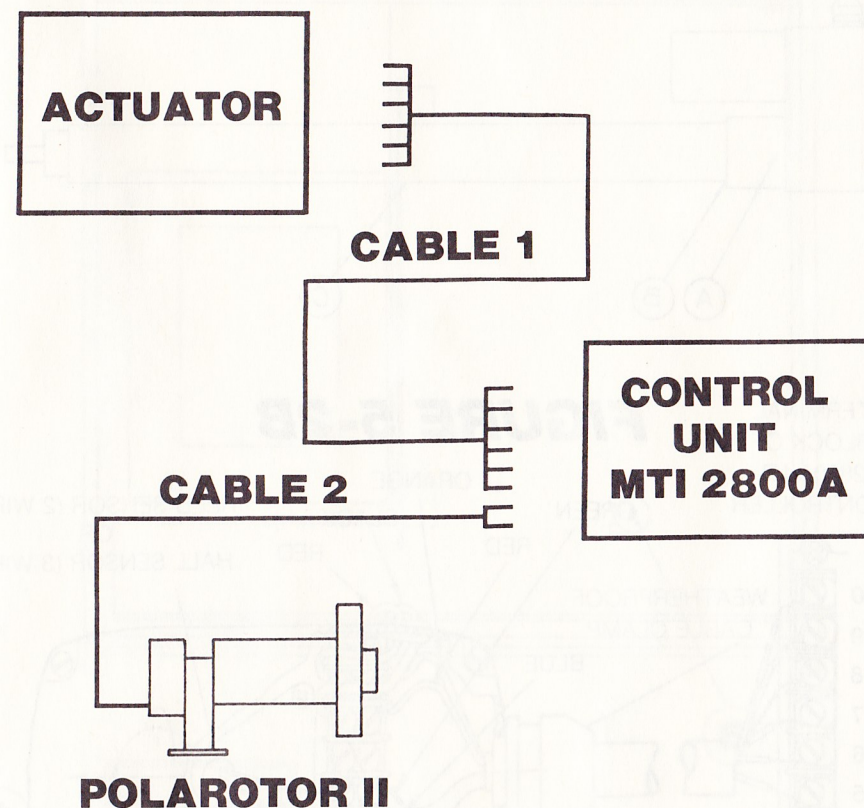
C. Control unit is dead.

1. Check to make sure unit is plugged in.
2. Check one Amp fuse inside of unit.
3. Replace control unit.

D. Control unit won't hold memory (optional)

1. Check battery voltage. Voltage should be at least 6 volts. If not, replace battery.
2. Call Customer Service
1-800-521-7330

FIGURE 5-1 MTI 2800A BLOCK DIAGRAM



CABLE 1
5 CONDUCTOR: 3-22 GA. SHIELDED
WITH DRAIN WIRE, 2-12 GA.,
PVC JACKET:

RED	12 GA.
ORANGE	12 GA.
SHIELD/DRAIN	22 GA.
GREEN	22 GA.
BLUE	22 GA.
PURPLE	22 GA.

CABLE 2
2 CONDUCTOR: 2-22 GA WIRES
(NOT INCLUDED WITH UNIT)

A technical drawing of a shaft-hub assembly. A horizontal shaft is shown with a hub on its left end. The hub has a central bore through which the shaft passes. A screw is shown at the top of the hub. Three labels with arrows point to specific features: 'A' points to the inner surface of the hub bore, 'B' points to the outer surface of the shaft, and 'C' points to the outer surface of the hub bore.

FIGURE 5-2B

TERMINAL BLOCK OF 2800A I.R. CONTROLLER

10
9
8
7
6
5
4
3
2
1

WEATHERPROOF CABLE CLAMP

SHIELD DRAIN WIRE

GREEN
RED
BLUE
VIOLET

ORANGE
BLACK
RED

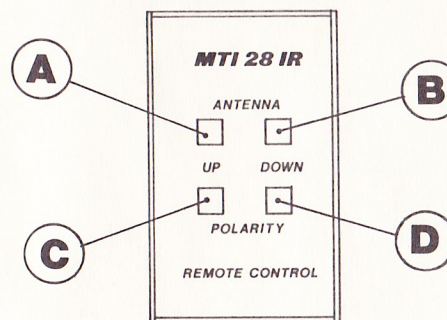
REED SENSOR (2 WIRES) OR HALL SENSOR (3 WIRES)

BLUE
BLACK

RED (This wire not included on Reed Sensor)

Detailed description: This is a technical wiring diagram. On the left, a vertical terminal block is labeled 'TERMINAL BLOCK OF 2800A I.R. CONTROLLER' and has terminals numbered 1 through 10. A 'WEATHERPROOF CABLE CLAMP' is shown connecting a cable to terminals 5, 6, 7, 8, and 9. A 'SHIELD DRAIN WIRE' is connected to terminal 1. The cable has several colored wires: GREEN, RED, BLUE, VIOLET, ORANGE, BLACK, and RED. These wires are connected to a device on the right. The device has a terminal block with wires labeled GREEN, RED, BLUE, and VIOLET. It also has a 'REED SENSOR (2 WIRES) OR HALL SENSOR (3 WIRES)' and a 'RED (This wire not included on Reed Sensor)' wire. The device has a circular component on the right side.

1 - NO WIRE	6 - BLUE
2 - NO WIRE	7 - GREEN
3 - TO POLAROTOR II (not included)	8 - SHIELD DRAIN WIRE
4 - TO POLAROTOR II (not included)	9 - ORANGE
5 - VIOLET	10 - RED



- A** Moves actuator up
- B** Moves actuator down
- C** Rotates Polarotor II clockwise
- D** Rotates Polarotor II c'lockwise
- E** Infrared sensitivity adjustment