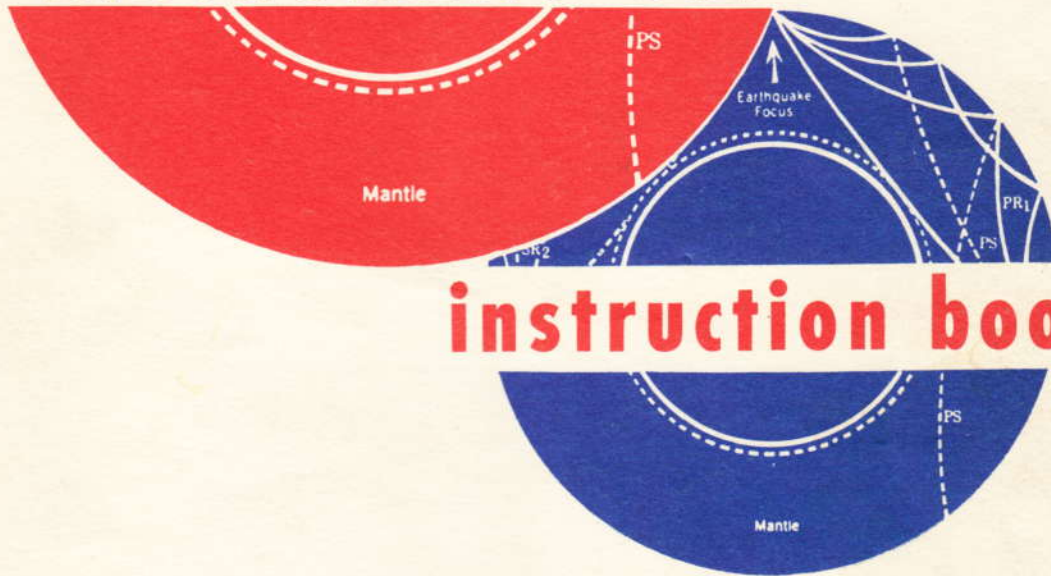




**SPRENGNETH**

**INSTRUMENT CO.**



**instruction book**

**SPRENGNETH**

JE 51682

AUTOCORDER, SERIES 6100

**MANUFACTURERS OF SEISMOLOGICAL, GEOPHYSICAL AND ENGINEERING INSTRUMENTS**

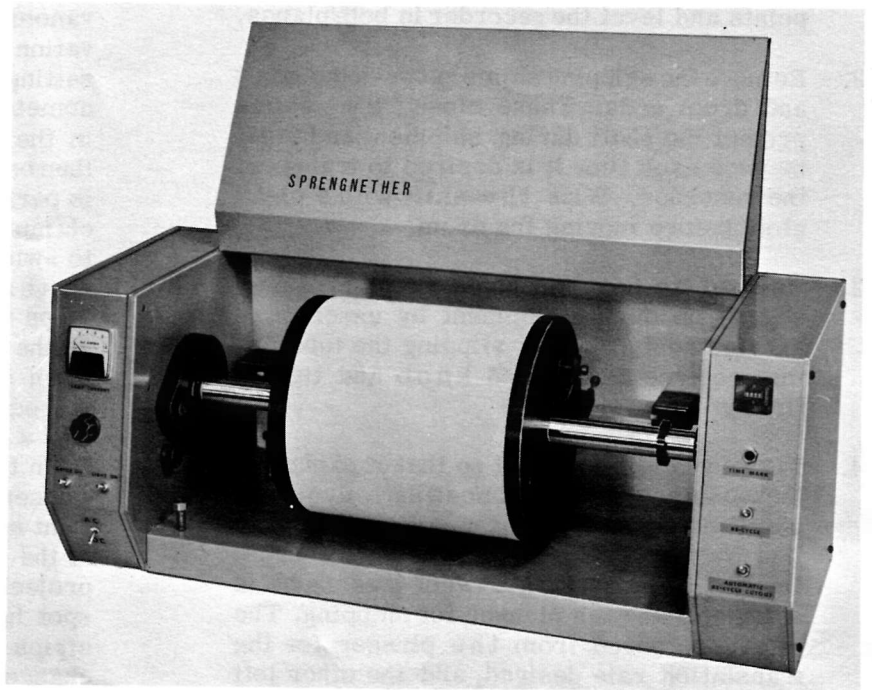
**SAINT LOUIS 10, MISSOURI, U.S.A.**

MANUFACTURERS OF

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INSTRUMENT CO., INC.

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**SPRENGNETH**

# **AUTOCORDER... SERIES 6100**

## **OPERATING INSTRUCTIONS**

## OPERATING INSTRUCTIONS SPRENGNETHER AUTOCORDER...SERIES 6100

1. After the recorder has been set up on the pier with leveling screws (A39) installed, place the leveling cups under the screw points and level the recorder in both planes.
2. Remove the shipping shims between the shaft and drum ends. These close fitting shims protect the shaft during shipment and must be used each time it is desired to transport the recorder. Wipe the shaft with a clean cloth before moving the drum.
3. Remove the tube that holds the plunger (D4, Fig. 2) up during shipment by unscrewing knurled knob (D3) and slipping the tube off, then replace the knurled knob and tighten firmly.
4. The plunger is designed so that it cannot be locked into a disengaged position to avoid the possibility of the operator failing to engage it and thereby losing a series of records. On dual translation rate recorders a tube is supplied with each plunger for shipping. The tube is removed from the plunger for the translation rate desired, and the other left in place. If it is desired to change translation rate remove the tube and place on the other plunger. The left screw is always the faster rate. At no time should both plungers be engaged or serious damage may result.
5. Connect the recorder to the desired power source, i.e. 110 volt 60 cycle or 12 volt DC. If DC operation is used, polarity must be observed or the protecting diodes used in the relay systems will be permanently damaged.

After connecting to the desired power source move the AC — DC switch on the lower left hand panel to the type of operation desired. Connect the clock or timing system to the terminals marked "time mark". This system only requires a circuit closing switch in the clock timing system to actuate the deflector prism. The internal power system incorporates a contact protecting diode to eliminate arcing at the clock contacts. An auxiliary push button switch is provided on the right hand panel so manual time or code marks can be applied to the record.

6. Place the light source on the mounting rod (B2, Fig. 1) with the aperture under the center of the recorder aperture strips (A16) and tighten the set screw (B30). Plug in the connecting leads (A73) to the lamp housing. Turn the light source on and set voltage at 12 volts.
7. Place the galvanometer approximately 1 meter (standard galvanometer focal length) behind the recorder and preferably on a galvanometer stand to allow adjustment in elevation of the light spot. Initially a rough setting can be made by setting the galvanometer mirror 1 inch below the aperture in the recorder. The galvanometer should then be leveled and rotated until the lens face is parallel to the back of the recorder. Unclamp the suspension and allow the mirror to swing freely. Adjust galvanometer level so that the mirror swings freely between stops without sticking. Shunt the terminals so the light spot will not move excessively when small centering adjustments are required.
8. Open the aperture on the light source, (B27). Loosen the clamp screw (B31) and rotate the light source until the light falls on the lens of the galvanometer, and a spot image is projected on the recorder panel. Center the spot horizontally on recorder aperture strips (A16). Elevation of the spot can be changed by raising and lowering the light source. If this adjustment will not place the spot in the aperture slot, the height of the galvanometer will have to be adjusted. Be sure the galvanometer suspension is clamped before these adjustments are attempted, then repeat step 7 and continue through 8 until the spot is centered on the recording aperture.

Loosen the clamp screw (B8) on the lamp adjusting rod (B7) and rotate the adjusting shaft until a good vertical image is obtained. Move the rod inward or outward to sharpen the vertical image. For proper focus on the drum, the image can be focused near the edge of the aperture strip.

Tape a piece of thin paper on the drum at the left side extending out past the drum an inch or more. This will be used to obtain the final focus of the light spot at the drum surface.

9. Move the drum to right hand limit of its travel, engage the plunger (D4, Fig. 2) and rotate the drum so the piece of paper attached at its edge is in line with the aperture and rotate the galvanometer centering knob until the spot is visible on the paper. Move the lamp adjusting rod (B7) inward or outward and rotate for sharpest vertical focus and clamp. If sharp focus cannot be obtained in about mid-range, move the galvanometer

closer or farther away as required. After the sharpest vertical focus is accomplished, place the cylindrical lens (A41, Fig. 3) in the holder (A34) flat side toward the drum and gently press downward until it is against the stops.

10. Focus the cylindrical lens with knob (A37) observing the light spot on the paper until the light spot has the shortest height or sharpest focus.
11. Return the light spot to its center position (on the red strip) and check to be sure the light image is centered over the slit.
12. Return the drum to the center of its translation range, engage the plunger, rotate drum until plastic strips are on top and tighten clutch screw (E24) to prevent drum from rotating while loading the drum. (Be sure drum drive motor is off.) Open the drum using lever (C20, Fig. 4) to raise the door and open door completely.
13. The takeup spool and supply spool are identical having a square drive key on one end and a flange on the other. Facing the drum the drive key is to the left side to engage the socket on the drive flange in the drum.

Darken the recording room using only a ruby red bulb or safety lamp at least 4 feet from the recording paper.

14. A spool is inserted in the roll of photographic paper with the roll placed on the spool so the paper will unwind from the lower edge of the spool when it is in place (Fig. 4, step 1). Push the spool completely through the roll, rotating while inserting so the eccentric sleeve will align and slip through freely. Hold the paper roll firmly and rotate the supply spool flange (C32) counter clockwise until it locks firmly in the roll.

Pull out the plunger (C79) and place the supply spool in position depressing spring loaded counter wheel, being sure the plunger and square drive key are properly engaged and paper is unwinding as shown in Fig. 4.

15. Slip a cardboard core on the takeup spool and rotate the flanges in a clockwise direction while holding the tube firmly until the spool is locked to the core.
16. Place the takeup spool in the drum while pulling out on plunger (C79a), release plunger and check that both drive key and plunger are properly engaged.
17. Thread the paper around the drum as shown in Fig. 4. Place the paper on the takeup spool

being sure the paper is spaced evenly from each end of the plastic guide strips.

Lay the square cut end of the paper on the takeup spool and tape the paper to the core tube. It is very important that the paper is started straight around the drum to assure even takeup.

18. Lift the translation plunger and move the drum to the left until the contact pins (68, Fig. 3) are felt to lightly engage, release the plunger (D3) before the microswitch lever (A30) is actuated.
19. Turn the "recycle cutout" switch to "on" position (up) then move the spring return "recycle" switch up to begin the recycle operation.
20. The drum will translate to the left until the microswitch is actuated, at which time the drum translation will stop and the paper takeup cycle will begin. The paper takeup will then pull the drum door closed. When the door reaches its closed position press downward on the outer edges until the door is felt to snap closed. (The opening cam lever (C20) must be turned downward against its pin to allow the door to close completely.) The paper takeup will continue to run until the measuring wheel meters out approximately 37 inches of paper (approx. 20 seconds running time). The drum is now ready for recording.
21. Turn the drum motor on. The drum motor switch has two "on" positions and a center "off" position. In the up or "motor AC" position the drum motor is connected to the 110 volt 60 cycle AC line, in the down position the drum motor is connected to the "inverter" (A54, Fig. 2) receptacle on the back panel. The output of a well regulated 110 volt 60 cycle 4 watt converter can be connected to these terminals when operating the recorder on a 12 volt DC system. If it is desired to use an inverter with an AC receptacle rather than the "inverter" receptacle on the back panel for the drum-drive motor, plug the AC line cord directly into the inverter and place the drum motor switch in the "motor AC" position. The AC - DC switch remains in the DC position.
22. Drum speeds can be changed by rotating the knob (E41, Fig. 3) which is marked with a S-F indicating slow or fast drum speed, the letter position on top indicating which gearing is engaged. Standard drum speeds are 30 and 60 mm/minute.
23. The drum can be recycled anytime during

its operation, when it is desired to change records, as follows:

- a. Switch the recycle switch up momentarily.
  - b. Let the entire recycle operation complete including paper takeup.
  - c. Switch the "recycle cutout" switch to the down position so the recycle operation will not occur because of drum motion during the record changing operation.
  - d. Turn the drum motor switch to the "off" or center position.
  - e. Raise the drum plunger (D3) and move the drum midway in its translation and release plunger.
  - f. Loosen drive clutch (E24) so drum can be rotated until plastic strips are on top and retighten so drum will not rotate while removing exposed roll.
  - g. Cut the paper at the drum access door plastic strip, i.e. the lower strip.
  - h. Pull out plunger (C79a) and remove exposed roll. Rotate the knurled flange (C32) counter clockwise to loosen and remove the paper roll placing it in a light tight container.
  - i. Place a new core on the takeup spool and follow steps 13 - 21.
24. The counter on the right hand panel records each record change so that the number of records used from each load can be monitored. A reset button is provided so the count can begin at zero with each new loading. A 100 foot roll of paper will provide 30 recordings at 60 mm/minute and 2.5 mm/translation, thus if it is desired to remove records within this time the number of records remaining will be the difference between that shown on the counter and 30.
25. A friction system is provided to preload the drum gearing and prevent free rotation due to unbalance as paper is transferred from supply to takeup roll. This friction can be adjusted by loosening locking screw (E48, Fig. 2) in ring (E6) and turning the ring clockwise. Retighten locking screw (E48) when desired friction is obtained. The proper friction is obtained when the drum will not rotate freely with a new spool of paper in the drum. Excess friction will overload the motor and cause excessive wear in the gearing system.

26. An alternate counterweight is available when it is desired to use a 200 foot roll of paper. This weight should be installed in place of the standard weight so excessive friction will not be required (para. 25).
27. Adjusting the recording interval of the recorder can be accomplished by moving switch arm (A30) on the right side until the proper interval between the recycle and recycle stop is obtained. This can be checked as follows:
- a. Remove recording paper from the drum and loosen clutch knob (E24).
  - b. Recycle the drum using the recycle switch and allow the drum to translate until it stops.
  - c. Observe the rotational position of the drum using the plastic strips or plunger as a reference point.
  - d. Pull up on plunger (D3) and move drum to the right exactly 9 inches and release the knob.
  - e. Rotate the drum by hand (top away from the operator) until it has moved to 9.6 inches from its original starting position and is in the same rotational position as it started (c.). The microswitch should actuate at this point. If the microswitch operates before the drum reaches this position, the arm (A30) must be moved to the right slightly. If the microswitch operates after the drum reaches this position, bend the arm to the left. Make only small adjustments. To recheck position do not disengage plunger but rotate drum backwards (top toward operator) 2 turns and repeat step e.

For larger adjustments the plastic cover (A17) can be removed exposing the microswitch and associated mounting plate. Loosen the two mounting screws and move the switch in the direction required. Tighten mounting screws firmly when adjustments are complete.

An alternate method of measurement if a ruler is not available is to count rotations of the drum from its original starting position as it is rotated by hand. A 2.5 mm/rev. screw will require exactly 96 turns, a 5 mm/rev. 48 turns, etc.

28. Both AC and DC inputs are fused, 1 amp (A77) and 5 amps (A78), respectively. Lamp replacement - GE 67 12V 3CP.

## MULTI-COMPONENT OPERATION

Modifications to the standard Autocorder for multi-component recording consist of:

1. Additional light sources and time mark deflectors with individual intensity controls.
2. Adjustment of the positions of the drum translation limit switches and contact pin bracket to provide the appropriate range of drum motion.

Modification 1 is accomplished by positioning the additional light sources to either side and in front of the fixed light housing. Connect the main lamp and deflector leads to the appropriate terminals on the distribution box. Then connect the individual pairs from the box to the lamp housings. Individual light intensity adjustments can be made at the distribution box, the main control on the recorder panel controls all lamps simultaneously.

Modification 2 is normally a factory adjustment if the Autocorder is specifically ordered for multi-component operation. If the modification kit is ordered separately, installation instructions are furnished.

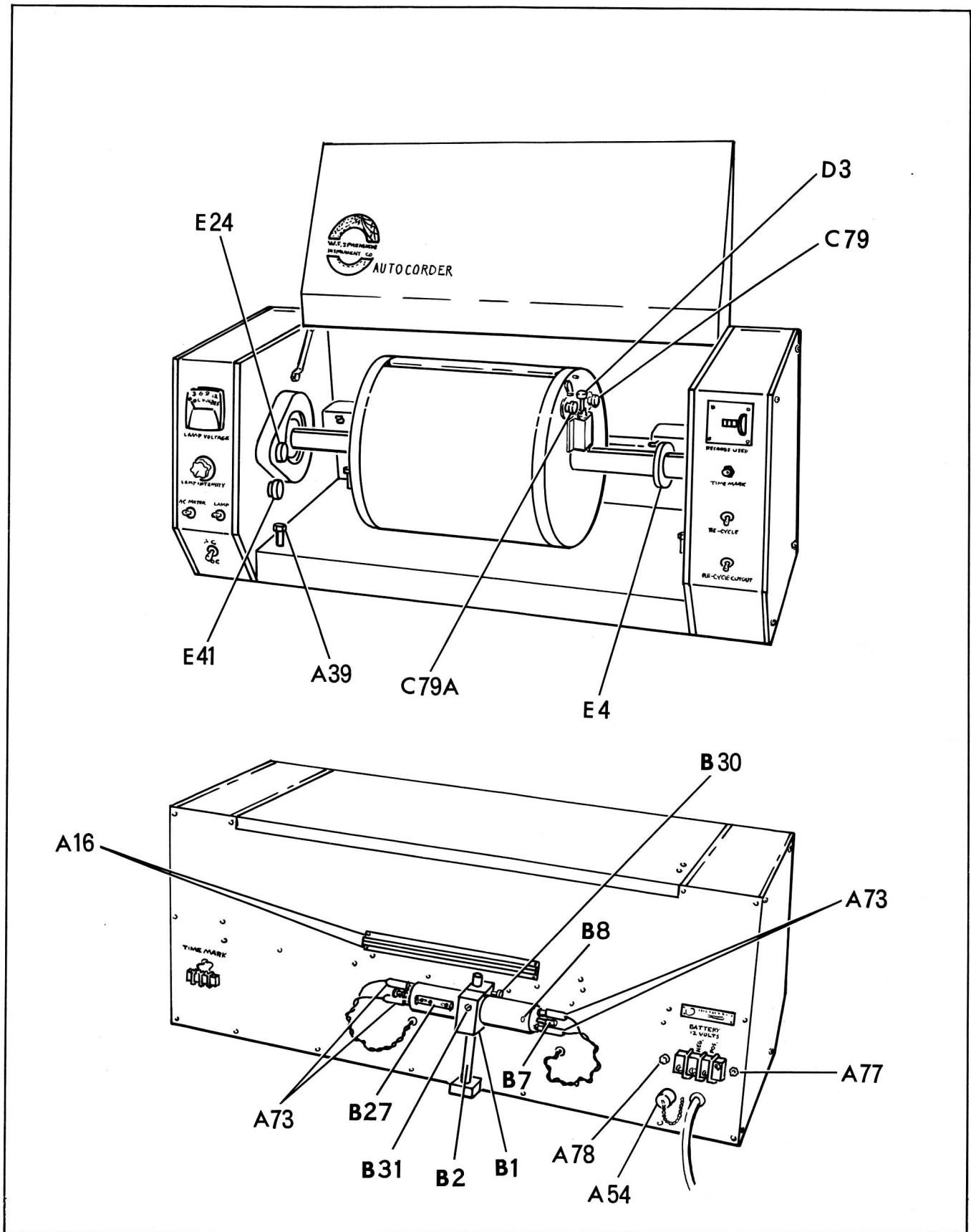


FIGURE 1

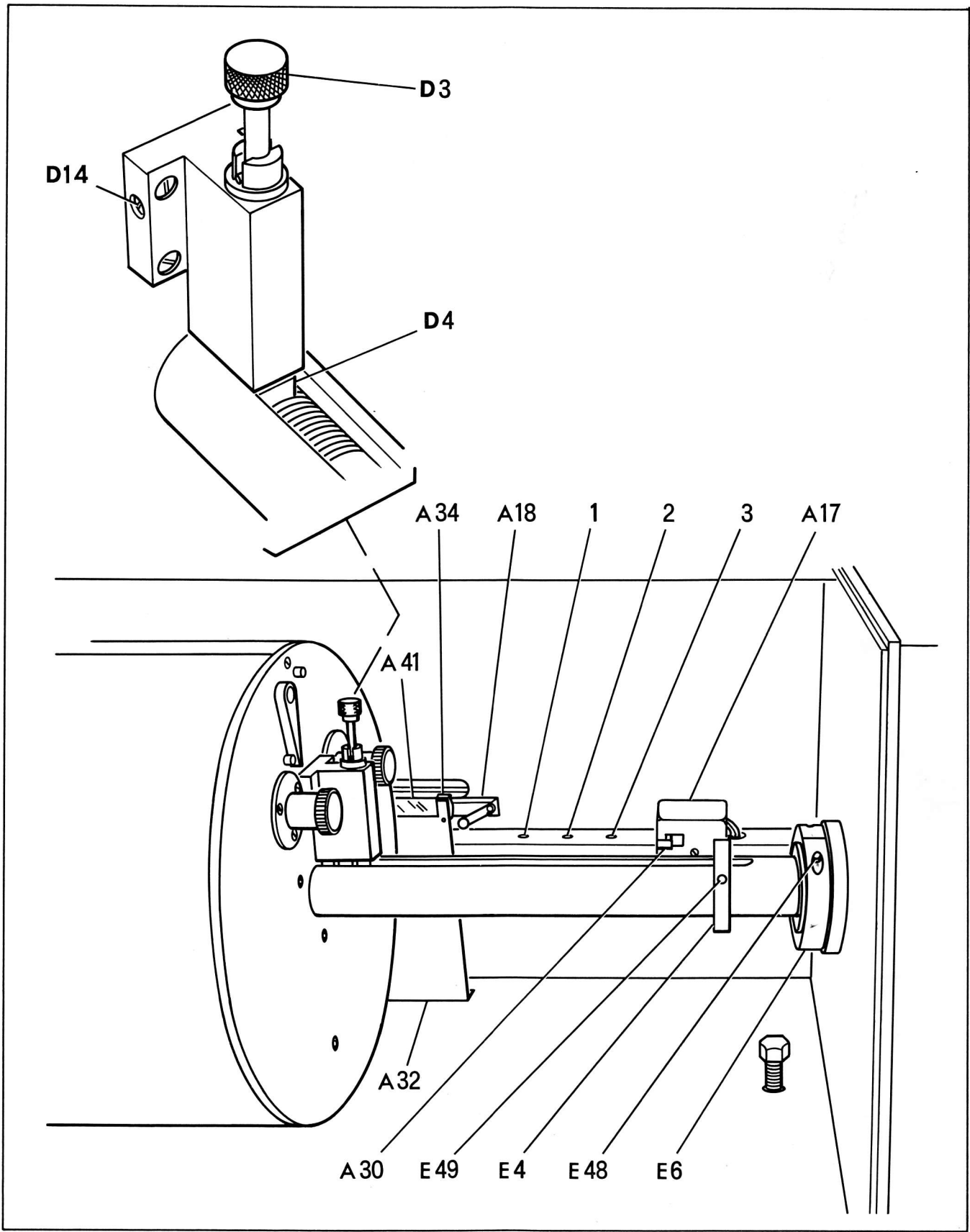


FIGURE 2



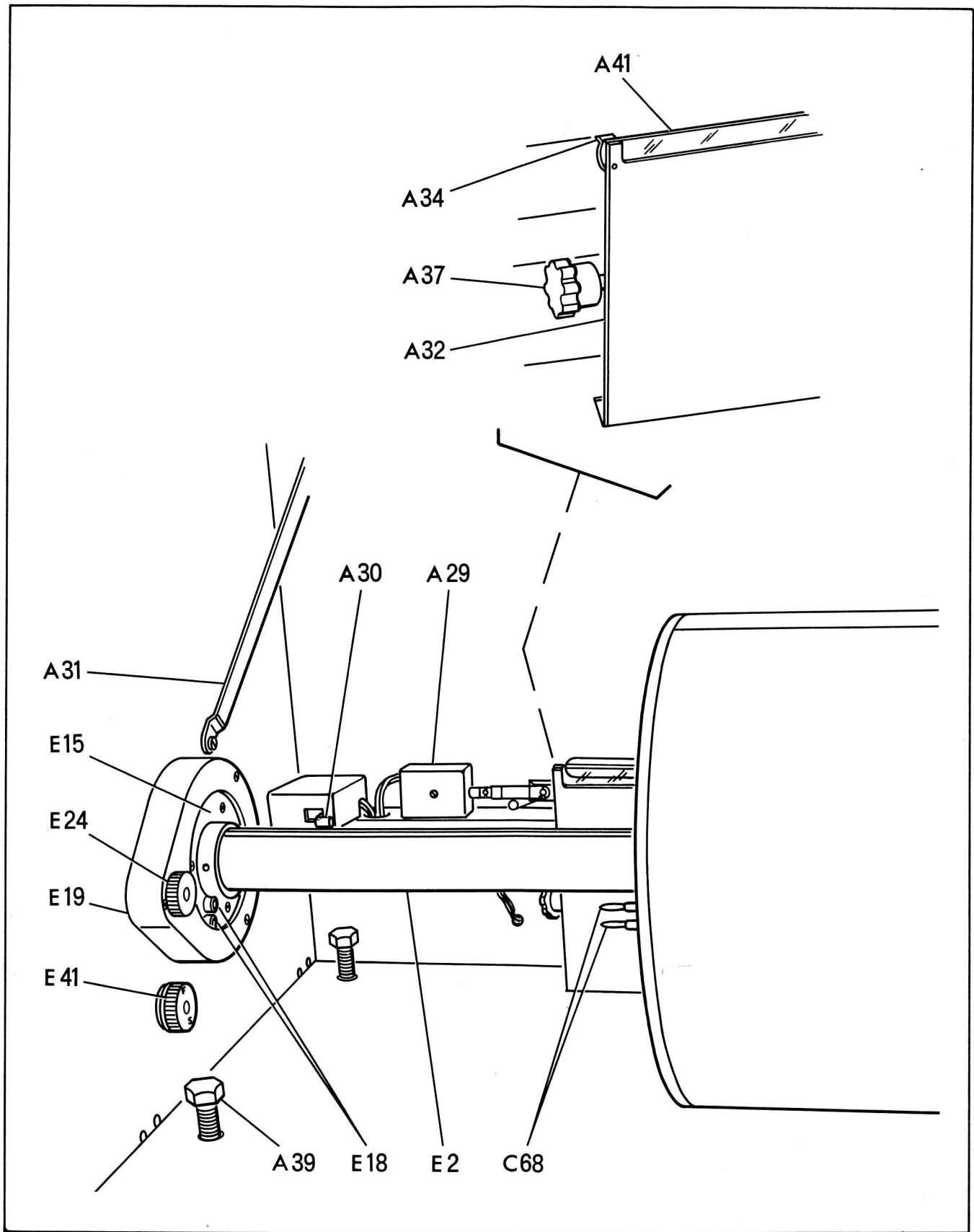


FIGURE 3

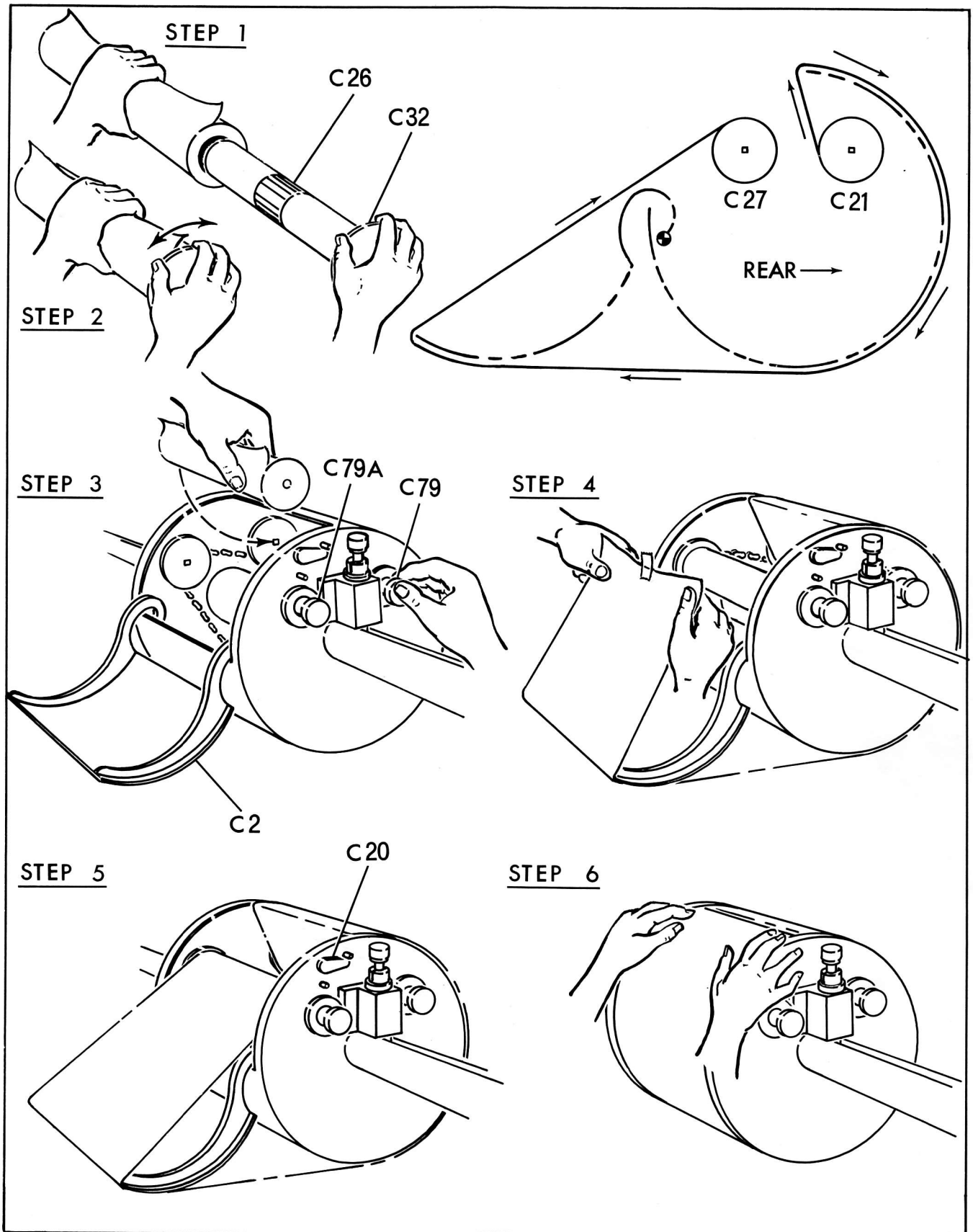
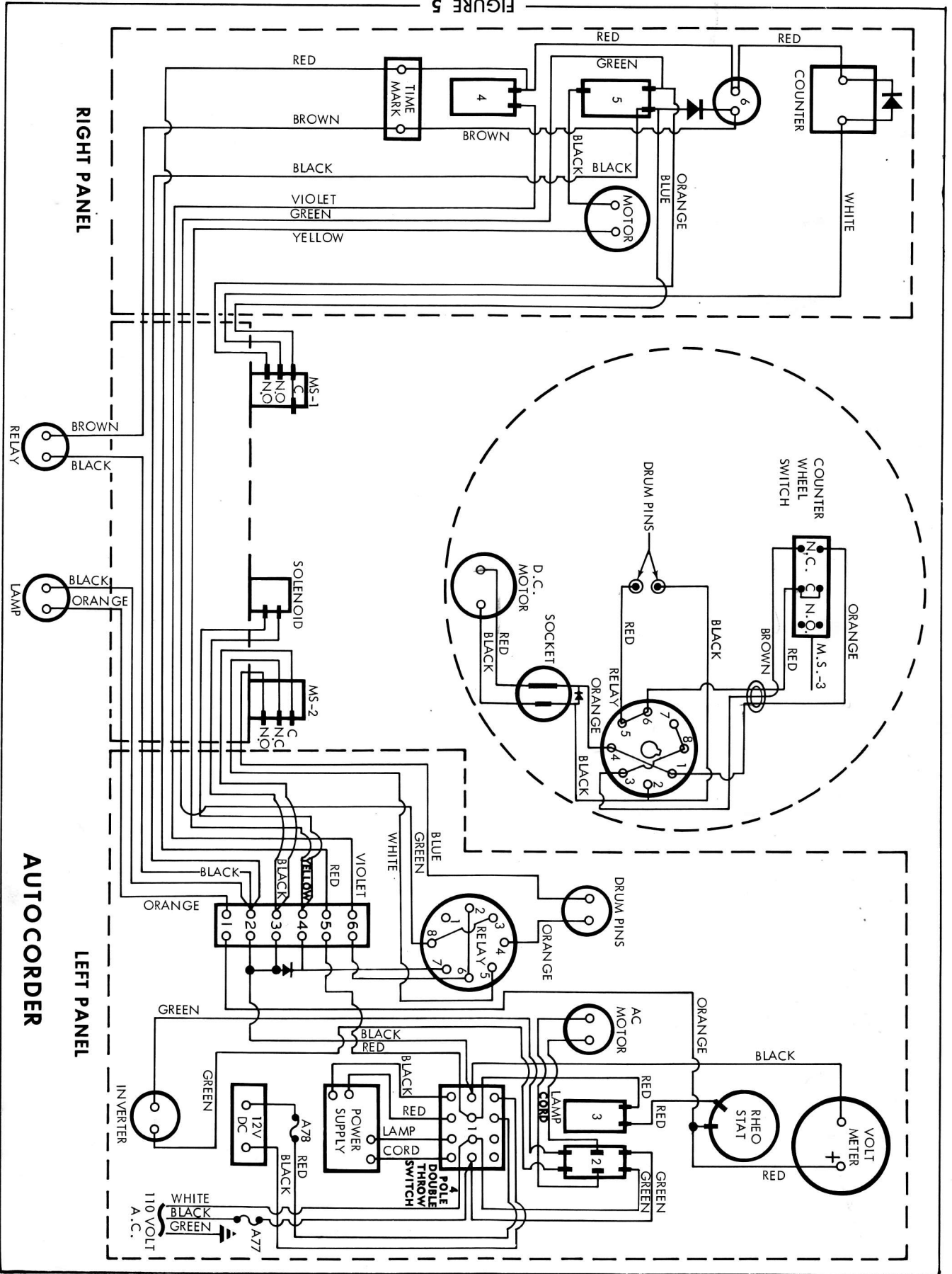


FIGURE 4

FIGURE 5

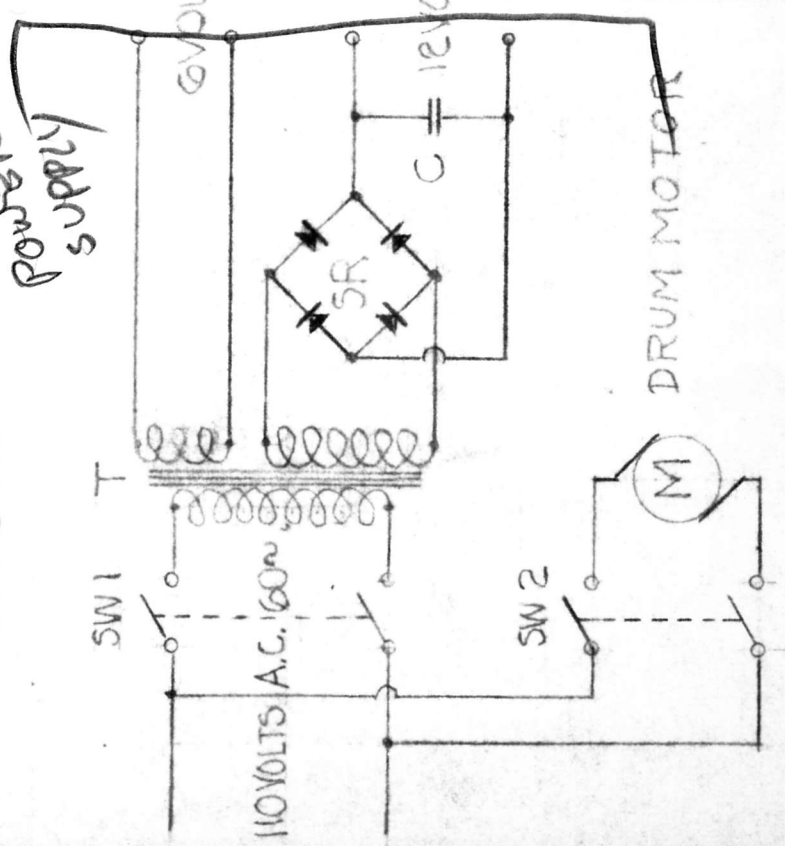


RIGHT PANEL

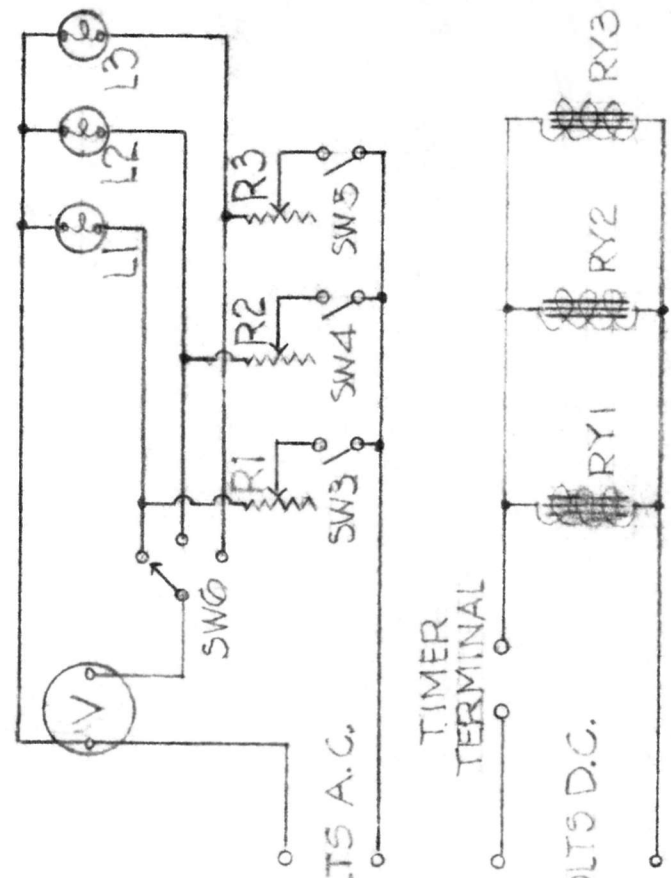
AUTOCORDER

LEFT PANEL

- LEGEND
- C 1000 mfd CAPACITOR
  - L1-2-3 GE #03 LAMP
  - LM DRUM DRIVE MOTOR 110V. A.C. 60~
  - R1-2-3 25 ohm RHEOSTAT
  - RY1-2-3 DEFLECTION SOLENOID
  - SR FULL-WAVE SELENIUM RECTIFIER
  - SW1-2 D.P.S.T. SWITCH
  - SW3-4-5 S.P.S.T. SWITCH
  - SW6 3 POSITION ROTARY SWITCH
  - T POWER TRANSFORMER-6V. 12V. SEC. VOLT METER
  - V



DATE	SYM	REVISION RECORD	AUTH.	DR.	CK.



TOLERANCES (EXCEPT AS NOTED)	WIRING DIAGRAM		DRAWN BY PRW
DECIMAL	SCALE	APPROVED BY R.F.H.	
±		TITLE	
FRACTIONAL		3 COMPONENT SERIES DH	
±		DATE	
ANGULAR		22 July '60	
±		DRAWING NUMBER	