Westinghouse

TYPES MG-4 AND MG-6 MULTI-CONTACT AUXILIARY RELAYS

INSTRUCTIONS

CAUTION

Before putting relays into service, remove all blocking which may have been inserted for the purpose of securing the parts during shipment, make sure that all moving parts operate freely, inspect the contacts to see that they are clean and close properly, and operate the relay to check the settings and electrical connections.

APPLICATION

The types MG-4 and MG-6 relays are designed for applications where several independent circuits must be energized or de-energized upon the operation of a single primary relay contact, or where the capacity of the primary relay contact is inadequate for the energy required in a control circuit. In certain applications these relays may be used directly as primary relays. Since the stationary contacts can readily be reversed so as to be suitable for either circuit opening or circuit-closing service (although readjustment may be required on the D-C MG-6 relay - see "ADJUSTMENTS AND MAINTENANCE") it is unnecessary to predetermine the arrangements of the circuits for which the relay is to be used.

In the usual application of the relay, the armature resets when the operating coil is de-energized. However, the relays may be supplied with a latching mechanism which holds the armature in the operated position until the latch is tripped, either by hand or electrically.

CONSTRUCTION AND OPERATION

The operating electromagnet is at the lower end of the relay, as shown in Fig. 1. The stationary iron circuit is built up of U-shaped punchings. These are slotted at the outer end of the lower leg to receive the copper lag loops used to obtain quiet operation on A-C. The operating coil is mounted on this leg of the punchings. In order to improve the performance of the relay on D-C, the pole face area is increased by means of an iron plate. This plate is assembled between the end of the coil and a copper lag loop which serves to hold the plate in place. The inner end of the upper leg of the punching assembly is shaped so that the lower end of the armature restraining spring can be hooked over it.

The armature is made of high-silicon steel. Projecting sections on the sides, near the center, act as knife-edge bearings and rest on suitably shaped supports which are a part of the moulded base. A stud attached to the lower leg of the electromagnet extends through a hole in the lower end of the armature, and a stop-nut on the outer end of this stud is used to limit and adjust the travel of the armature in the de-energized direction. The special stop nut used will remain at any position in which it is placed without additional locking means.

The upper end of the armature carries an adjusting screw to which one end of the armature restraining spring is attached. In the hand or electrically reset relays, a latch screw is mounted at the extreme end of the armature. In the self-reset relays this screw is replaced by a set screw which serves to separate the locking plate (see Fig. 1) slightly from the armature. Between the spring adjusting screw and the latch screw (or set screw), there is a third screw which when tightened applies pressure to the threads of the former screws and effectively locks them against turning.

The moving contact fingers are mounted on moulded insulation which is fastened to the armature by two screws. Silver contact buttons are welded on both sides of these fingers so that they can be used for either a circuit-opening or a circuit-closing contact. The fingers are assembled on guide pins, between two springs in such a way that definite spring compression and contact wipe is assured for either contact-closing or contact-opening service. Flexible leads are welded to the contact fingers. Provision is made for assembling four contact fingers at the upper end of the armature, but on MG-4 relays the two inner fingers are omitted. Since the armature assembly has contact fingers both above and below the bearing points, the armature weight is partially balanced about the bearings and there is less tendency for severe shocks to move the armature.

The stationary contacts consist of large silver buttons welded to brackets which can be assembled so that they close with the moving contacts when the armature is in either the energized or de-energized position. The stationary contact brackets are connected directly to the terminal inserts by means of long screws which pass through brass tubes. These tubes are of such length that the moulded material of the base is not under direct compression when the screws are tightened. Therefore, there is always a tight connection from contact to terminal regardless of possible shrinkage or other variation in the moulded base material. The contact bracket is held against its seat by means of a spring ring which is compressed between shoulders in the base and on the hexagonal terminal insert.

The construction of the latch and electrical reset is shown in Fig. 2, in which the lower portion is a partial front view and the upper portion a top view. In the latter view, the latch screw (in the main armature) is in the energized position, and the reset armature is free to be moved to the right by the tension spring until the hardened latch plate on the reset armature rests against the tip of the

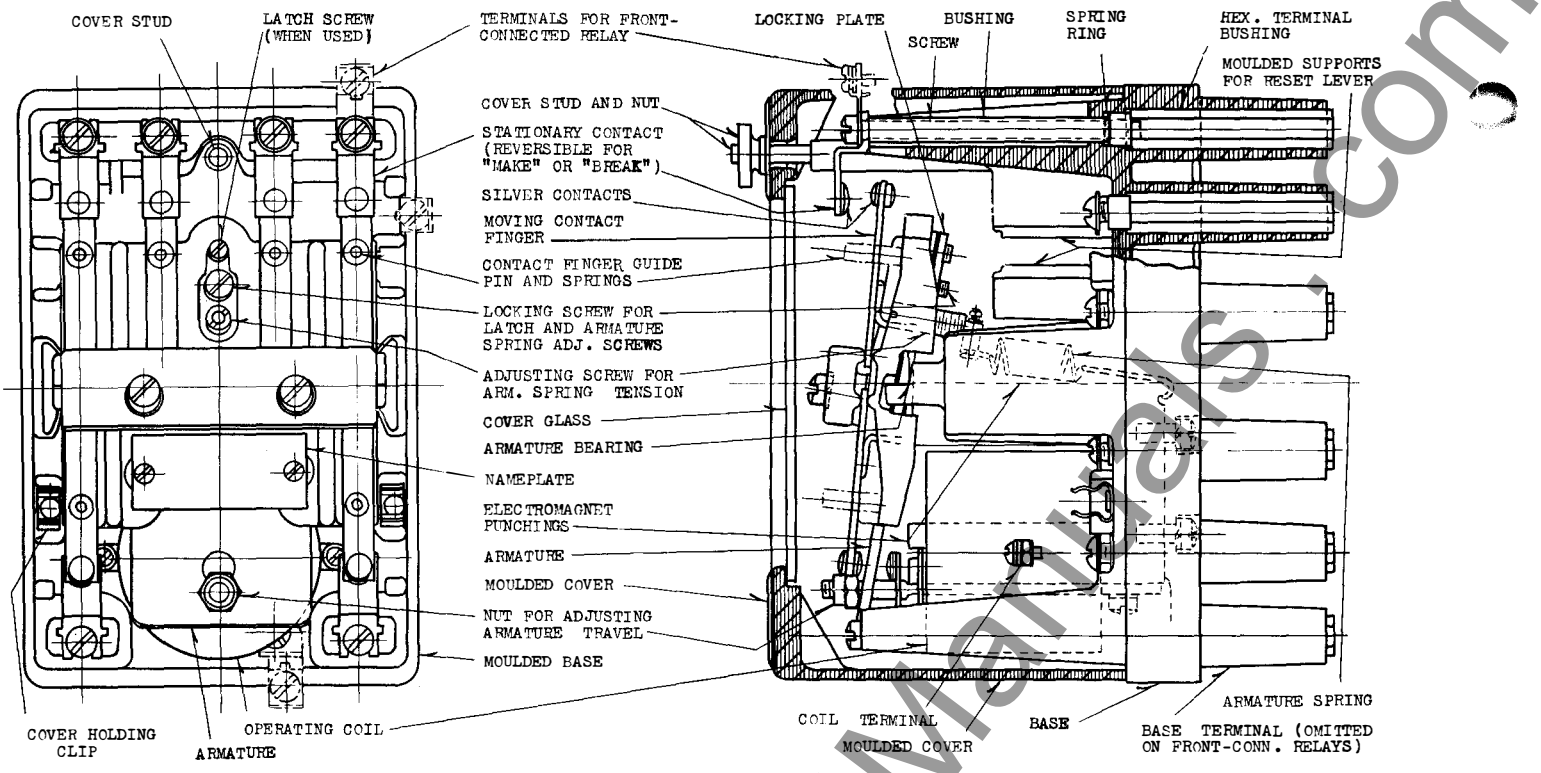

Figure 1
Front View (Cover Omitted) And Side View of The Type MG-6 Relay In The Moulded Case, Without Latch Or Reset.

latch screw. When the operating coil is de-energized, the latch screw will move slightly so that its shoulder rests on the edge of the latch plate. When the reset coil is energized, its armature moves to the left, thus permitting the main armature to return to its open position. Pressing the reset push rod, which extends through the cover stud, will also release the latch through the medium of the reset lever shown in the figure.

In some applications of the relay with latch and electrical reset, it may be desirable to have the operating and reset coils deenergized automatically as soon as they have performed their functions. In the case of the reset coil this can be accomplished by connecting the coil through one of the relay "make" contacts. An auxiliary contact is required to open the operating coil circuit. This contact, when provided, is assembled on the lower right-hand side of the relay, and is held in position by the terminal screw to which the right-hand coil lead ordinarily connects. The coil lead is connected to the stationary contact stud of the auxiliary contact, and the end of the moving contact spring is in contact with the head of the terminal screw. The auxiliary contact is closed when the main armature is open. When the armature approaches the closed position, the moulded insulation block strikes the end of the auxiliary contact spring and causes the contacts to part with a gap which is appreciably greater than the travel of the armature block at the point where it strikes the spring. When this auxiliary contact is used, a weight is screwed to the lower end of the armature to increase its mass and stabilize contact action.

The types MG-4 or MG-6 relays may be provided without cover, for front connection, or in a variety of completely closed cases, for rear connection. The moulded base for rear connection is shown in Fig. 1. The base for front connection is similar except that there are no terminals projecting in the rear. This same base is also used as a sub-base when the relays are supplied in standard relay cases for projection or semi-flush mountings.

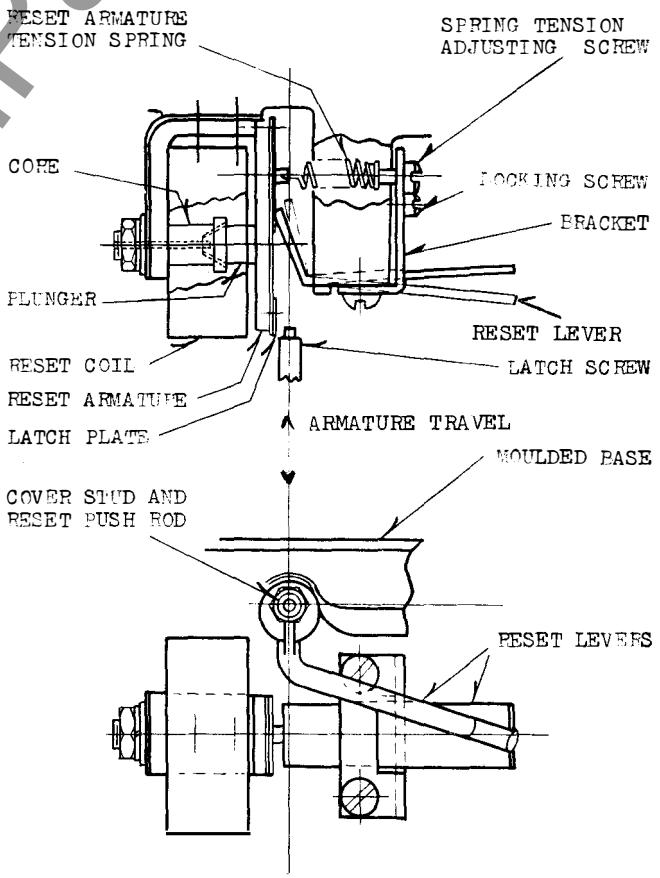

Figure 2
Front & Top Detail Views of The Latch & Electrical Reset For Types MG-4 and MG-6 Relays.

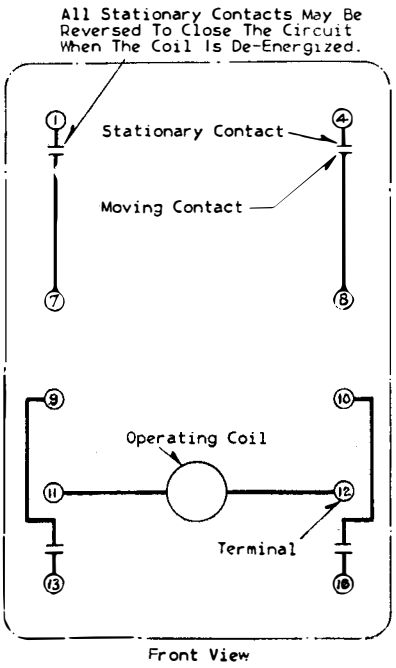

Figure 3
Internal Schematic of the Type MG-4 Relay Without Electrical Reset In The Moulded Cases of Figures 9 and 10.

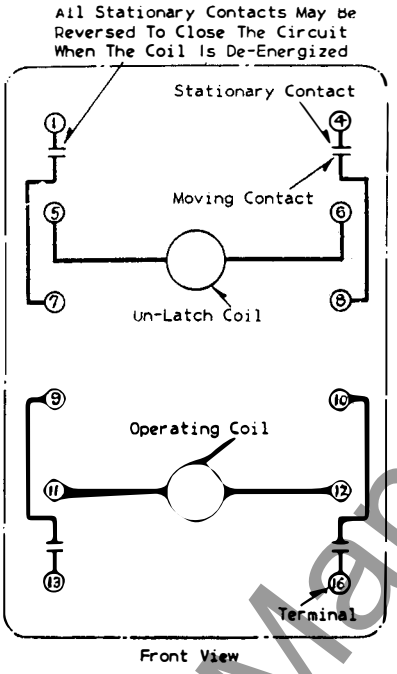

Figure 4
Internal Schematic of the Type MG-4 Relay With Electrical Reset In The Moulded Cases of Figures 9 and 10.

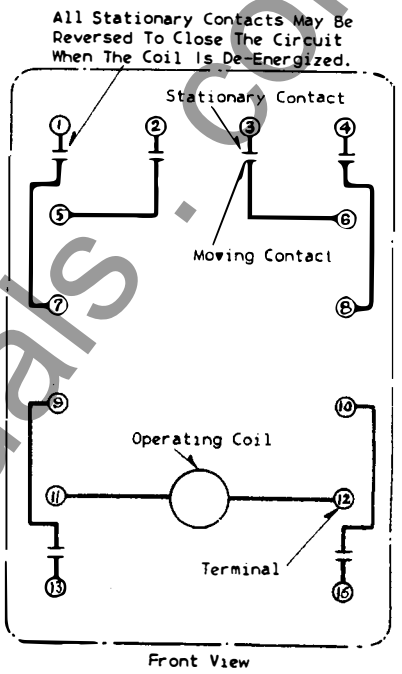

Figure 5
Internal Schematic of The Type MG-6 Relay Without Electrical Reset In The Moulded Cases of Figures 9 and 10.

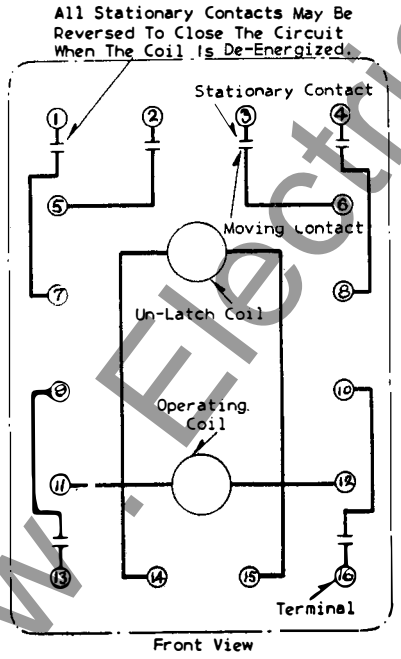

Figure 6
Internal Schematic of The Type MG-6 Relay With Electrical Reset In The Moulded Cases of Figures 9 and 10.

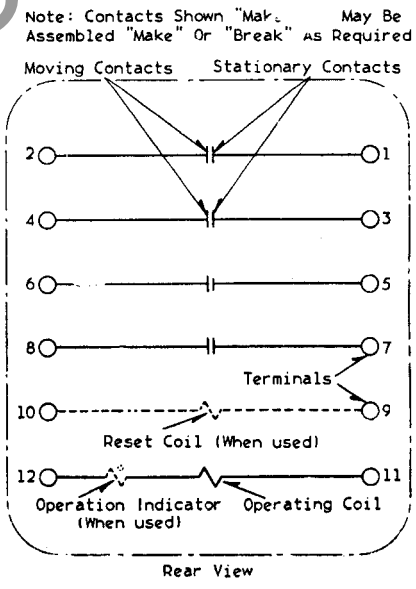

Figure 7
Internal Schematic of The Type MG-4 Relay in the Standard Cases of Figures 11 and 12.

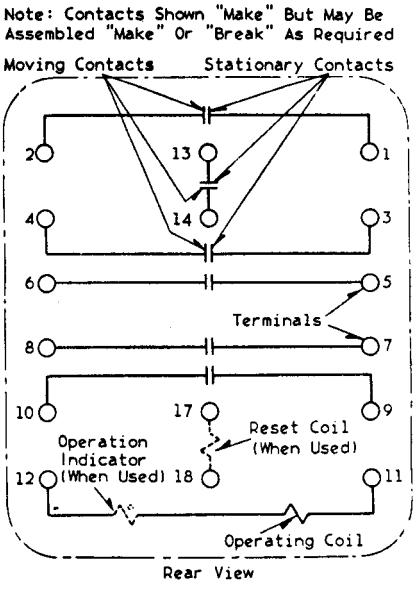

Figure 8
Internal Schematic of The Type MG-6 Relay in The Standard Cases of Figures 11 and 12.

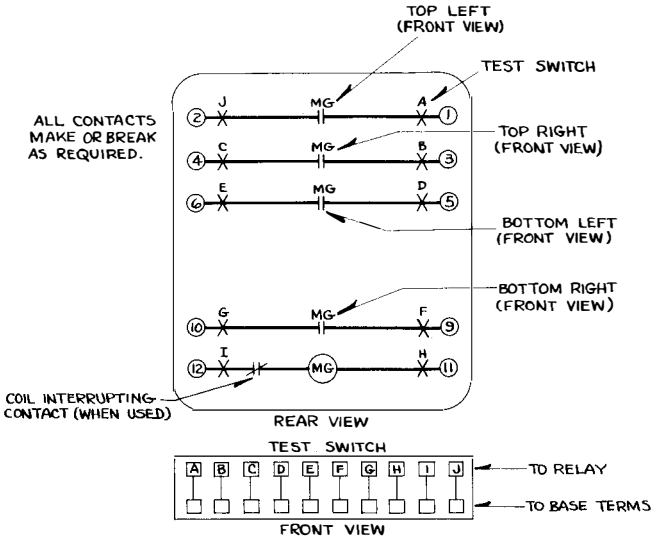

Figure 9
Internal Schematic of the Type MG-4 Relay in the Type FT Case.

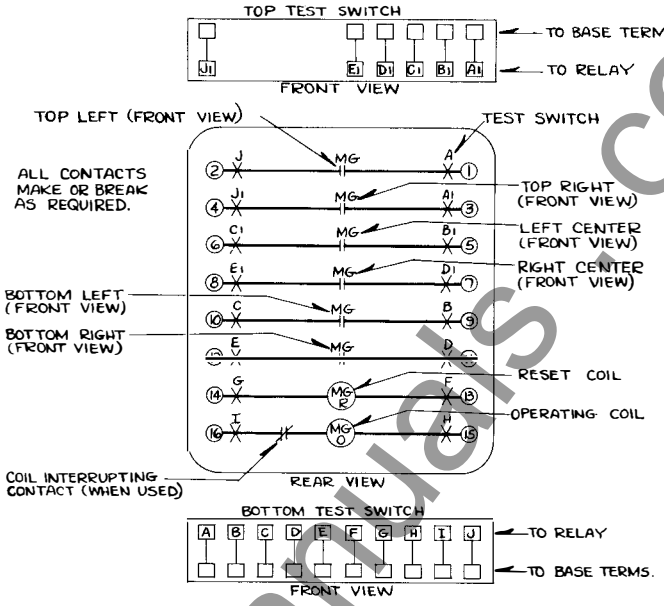

Figure 10
Internal Schematic of the Type MG-6 Relay in the Type FT Case.

CHARACTERISTICS

The types MG-4 and MG-6 relays have an operating time of approximately 2 cycles on a-c and 5 cycles on d-c (on a 60 cycle basis) when energized at the rated voltage. If faster operation is desired and if the application requires only intermittent energization of the relays, the operating coils may be energized at higher than rated voltage. Twice rated voltage will give an operating time of approximately 1 cycle on a-c, and the coil will stand this voltage safely for over two minutes if 60 cycles or 4 minutes if 25 cycles. The time of the d-c relay can be reduced to slightly over 1 cycle if the coil is energized at five times rated voltage and there is not more than one back contact. The coil will stand this voltage for one minute. If faster time is desired on a d-c relay which must be energized continuously, the use of a low voltage coil with a series resistor will reduce the time. (With 10% of the line voltage across the relay coil and the balance across a series resistor, the reduced inductance of the circuit results in an operating time of approximately 2 cycles).

Reset coils are for intermittent duty only and should not be energized longer than one minute.

The relay contacts will close circuits carrying 30 amperes. They will carry this current for 1 minute, and will carry 12 amperes continuously.

The contacts will interrupt the following currents, in non-inductive circuits, at the voltages listed:

Current	Volts A-C
30	115
20	230
15	460
10	575

Volts D-C	
30	12
15	24
10	32
8	48
3	125
1	250

The type MG-4 relay can be used with any combination of circuit-closing or circuit-opening contacts. The type MG-6 relay for a-c also can be used with any combination of contacts, but the d-c relay cannot have more than four circuit-opening contacts if the normal contact pressures and armature travel are maintained.

RELAYS IN TYPE FT CASES

The type FT cases are dust-proof enclosures combining relay elements and knife-blade test switches in the same case. This combination provides a compact flexible assembly easy to maintain, inspect, test and adjust. There are three main units of the type FT case: the case, cover and chassis. The case is an all welded steel housing containing the hinge half of the knife-blade test switches and the terminals for external connections. The cover is a drawn steel frame with a clear window which fits over the front of the case with the switches closed. The chassis is a frame that houses the relay elements and supports the contact jaw half of the test switches. This slides in and out of the case. The electrical connections between the base and chassis are completed through the closed knife-blades.

Removing Chassis

To remove the chassis, first remove the cover by unscrewing the captive nuts at the corners. There are two cover nuts on the S size case and four on the L and M size cases. This exposes the relay elements and all the test switches for inspection and testing. The next step is to open the test switches. Always open the elongated red handle switches first before any of the black handle switches or the cam action latches. This opens the trip circuit to

prevent accidental trip out. Then open all the remaining switches. The order of opening the remaining switches is not important. In opening the test switches they should be moved all the way back against the stops. With all the switches fully opened, grasp the two cam action latch arms and pull outward. This releases the chassis from the case. Using the latch arms as handles, pull the chassis out of the case. The chassis can be set on a test bench in a normal upright position as well as on its top, back or sides for easy inspection, maintenance and test.

After removing the chassis a duplicate chassis may be inserted in the case or the blade portion of the switches can be closed and the cover put in place without the chassis.

When the chassis is to be put back in the case, the above procedure is to be followed in the reversed order. The elongated red handle switch should not be closed until after the chassis has been latched in place and all of the black handle switches closed.

Electrical Circuits

Each terminal in the base connects thru a test switch to the relay elements in the chassis as shown on the internal schematic diagrams. The relay terminal is identified by numbers marked on both the inside and outside of the base. The test switch positions are identified by letters marked on the top and bottom surface of the moulded blocks. These letters can be seen when the chassis is removed from the case.

The potential and control circuits thru the relay are disconnected from the external circuit by opening the associated test switches.

A cover operated switch can be supplied with its contacts wired in series with the trip circuit. This switch opens the trip circuit when the cover is removed. This switch can be added to the existing type FT cases at any time.

Testing

The relays can be tested in service, in the case but with the external circuits isolated or out of the case as follows:

Testing In Service

Voltages between the potential circuits can be measured conveniently by clamping #2 clip leads on the projecting clip lead lug on the contact jaw.

Testing In Case

With all blades in the full open position, the ten circuit test plug can be inserted in the contact jaws. This connects the relay elements to a set of binding posts and completely isolates the relay circuits from the external connections by means of an insulating barrier on the plug. The external test circuits are connected to these binding posts. The plug is inserted in the bottom test jaws with the binding posts up and in the top test switch jaws with the binding posts down.

The external test circuits may be made to the relay elements by #2 test clip leads instead of the test plug.

Testing Out Of Case

With the chassis removed from the base, relay elements may be tested by using the ten circuit test plug or by #2 test clip leads as described above. The factory calibration is made with the chassis in the case and removing the chassis from the case will change the calibration values by a small percentage. It is recommended that the relay be checked in position as a final check on the calibration.

INSTALLATION

The relays should be mounted on switchboard panels or their equivalent in a location free from dirt, moisture, excessive vibration and heat. Mount the relay vertically by means of the two mounting studs for the standard cases and the type FT projection case or by means of the four mounting holes on the flange for the semi-flush type FT case. Either of the studs or the mounting screws may be utilized for grounding the relay. The electrical connections may be made direct to the terminals by means of screws for steel panel mounting or to terminal studs furnished with the relay for ebony-asbestos or slate panel mounting. The terminal studs may be easily removed or inserted by locking the two nuts on the studs and then turning the proper nut with a wrench.

ADJUSTMENTS AND MAINTENANCE

The relays are shipped from the factory correctly adjusted for armature travel and for contact follow and pressure, and it should not be necessary to disturb these adjustments. The relays normally are shipped with all contacts assembled for circuit-closing operation. To convert them for circuit-opening operation, it is necessary merely to loosen the mounting screw for the stationary contact bracket, turn this bracket over, and tighten the screw. No bending of the contact bracket should be necessary to obtain correct contact follow. However, if several of the contacts are reversed in this manner and if it is necessary that all contacts close at the same point as closely as possible, it may be necessary to bend certain of the brackets by about 1/64" or less.

If a relay has been dismantled and is being reassembled, the following adjustments should be made or checked. Reference should be made to Figs. 1 and 2 for identification of the parts mentioned in these instructions.

The armature stop nut should be adjusted so that when the armature is in contact with it the lower edge of the armature is 7/16" above the position which it assumes when the relay is energized. When adjusting the armature spring tension, the locking screw for the spring adjusting screw is loosened, and this adjusting screw is turned (inward, to reduce the spring tension) until the spring barely holds the armature against the stop nut. The relay must be in its normal vertical position when this adjustment is made, with all contacts assembled as circuit-closing.

The armature spring should then be tightened by turning the adjusting screw 4 turns counterclockwise for a-c relays or 2 turns for d-c relays, and the locking screw should be tightened. If the relay is being used with a number of break contacts, it may be necessary to increase the spring tension to obtain full follow on the break contacts. The adjusting screw should be turned just enough farther to obtain full follow.

The follow of the moving contact fingers should be 3/32" for the make contacts and 1/16" for the break contacts, measured at the contacts. This can be checked more conveniently by measuring the travel of the lower edge of the armature after the contacts touch.

This should be approximately 1/8" for the make contacts and 3/32" for the break contacts. In case moving contact fingers have been removed from their guide pins, it is important that the coil springs on the two sides of the fingers be replaced correctly. The springs which are compressed by circuit-closing contacts are approximately three times as strong as the ones compressed by circuit-opening contacts and thus they can be readily distinguished. The positions of the two springs are reversed at the two ends of the relay.

If the complete armature assembly is to be removed from the relay, the screws which fasten the lower ends of the moving contact leads to the terminals should be removed, the armature spring tension adjusting screw should be turned in as far as possible, and the armature stop nut should be removed. The upper end of the armature spring should then be slipped off of the grooved member at the lower end of the adjusting screw, and the armature should be lifted off of its bearing carefully so as to avoid distortion of the coiled leads. The leads to the upper center moving contacts (on the type MG-6 relay) are not coiled but the coiling of the four other moving contact leads should be such that when the relay base is horizontal and the armature is on its bearings and approximately at its mid-position, the lead terminals will just touch the base terminal inserts or be within about 1/8" of that position. A pair of tweezers on which the ends are bent at a right angle to the body, or a similar tool, is useful in replacing the upper end of the spring in the groove of the adjusting member. Such a tool is particularly helpful on relays which have an electrical reset assembly.

On latch-type relays the latch screw is adjusted so that with the armature latched and the operating coil deenergized, there will be a gap of between .005 and .010 inch between the electromagnet pole face and the raised section of the armature which is opposite the pole face. The locking screw should be tightened securely after making this adjustment. There is a small amount of clearance between the armature and its supporting posts, and in order to insure proper operation allowance must be made for this in the following manner. With the armature held against its left-hand support and nearly closed, the latch spring or reset armature should be moved to the left as far as it will go by means of the hand reset. To assure that the latch will always release the armature the resulting space between the latch and the latch screw should be at least .005 inch, and should not be more than about 1/64". This should also be checked electrically if electrical reset is provided. Some change of this gap can be made by loosening the mounting screws in the relay base and moving the latch support in the desired direction. The gap also can be changed by loosening the two screws which hold the moving contact insulation block to the armature and shifting the armature in the desired direction.

On electrical reset relays, the tension of the spring which draws the reset armature toward the latch screw must be adjusted if these parts are being reassembled. The locking screw (Fig. 2) is screwed out until its head clears the head of the adjusting screw. The main armature is then held completely closed and against its right hand support, and the latch spring tension adjusting screw is turned until the latch barely touches the stop projecting from the center of the latch screw. Then the latch spring tension should be increased by turning the screw clockwise 5 turns, and the locking screw should be tightened.

If either the core nut of the electrical reset assembly or the screws which mount its armature have been loosened, the relative positions of the core and plunger may shift sufficiently to cause the plunger to strike on the side of the conical core opening. To assure correct alignment of these parts, .042 diameter holes are provided through the center of the core and about 1/16" deep in the center of the plunger. After tightening the core nut, a close fitting pin should be inserted through the core and into the plunger. With the pin in place, the plunger pressed firmly against the core, and the mounting end of the armature centrally located with respect to the electromagnet, the two armature mounting screws should be tightened. The pin then should be removed.

A slight amount of oil is applied at the factory to the polished and hardened surfaces of the latch screw and the latch plate to minimize wear and as protection against corrosion. Oil should be re-applied after any cleaning and reassembling of these parts, and it is desirable also to renew this at the regular maintenance periods.

RENEWAL PARTS

Repair work can be done most satisfactorily at the factory. However interchangeable parts can be furnished to the customers who are equipped for doing repair work. When ordering parts, always give the complete nameplate data.

ENERGY REQUIREMENTS

Operating Coil Burdens at Rated Voltage

Frequency (Cycles)	Closed Gap Watts	Closed Gap Volt-Amps.	Open Gap Watts	Open Gap Volt-Amps.
25	6.8	23	19.6	53
50	9.8	31	17.4	78
60	12.	37	17.6	92
D-C	7.8 cold	--	7.8 cold	--
D-C	6.5 hot	--	6.5 hot	--

Reset Coil Burdens at Rated Voltage

Frequency (Cycles)	Closed Gap Watts	Closed Gap Volt-Amps.	Open Gap Watts	Open Gap Volt-Amps.
25	23	26	24	27
50	18	23	20	25
60	23	32	26	36
D-C	31 cold	--	31 cold	--

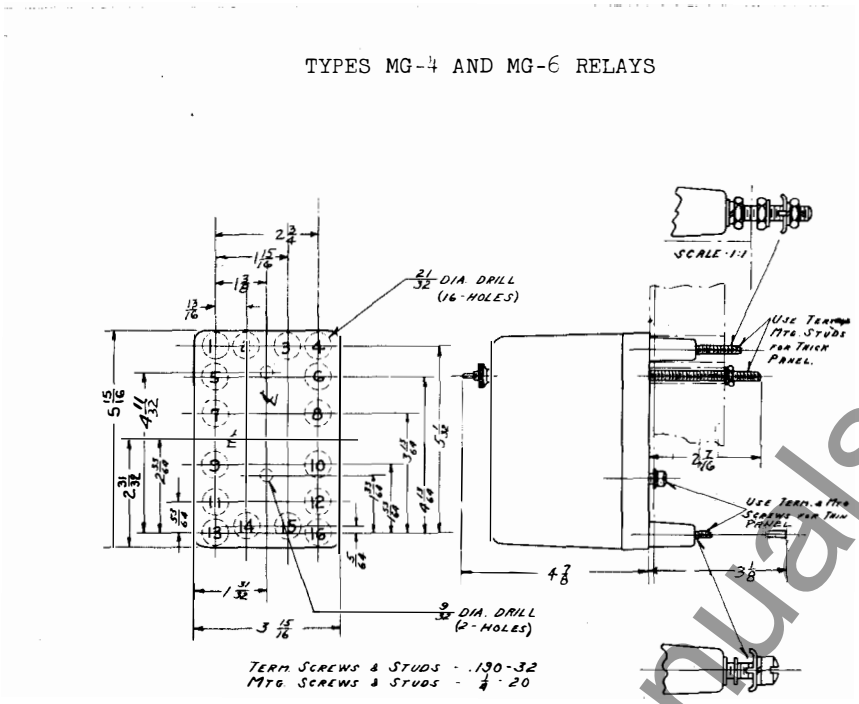

Figure 11
Outline & Drilling Plan For The Types MG-4 and MG-6 Relays in the Rear Connected Moulded Case. (See The Internal Schematic For The Terminals Supplied). For Reference Only.

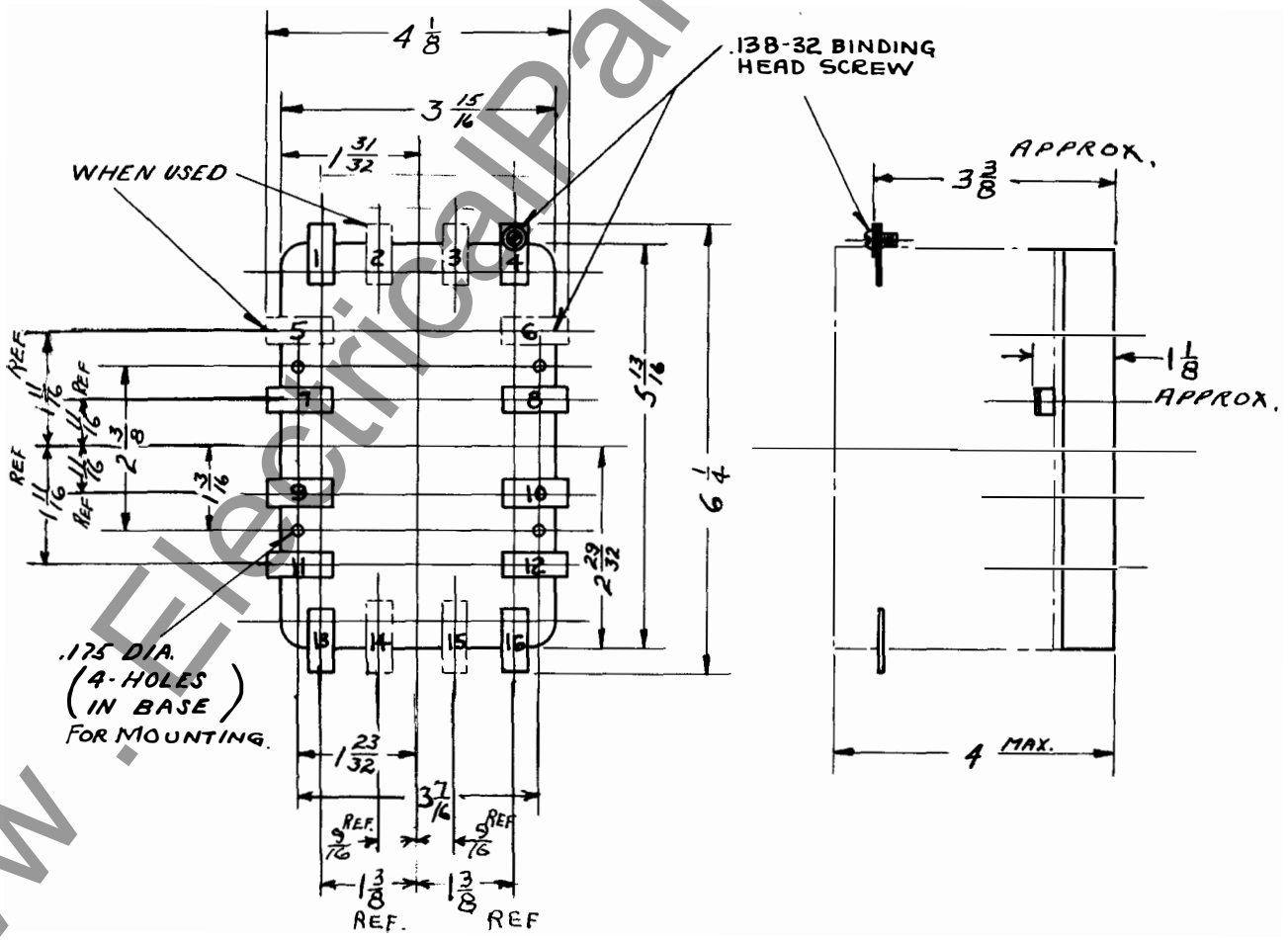

Figure 12
Outline & Drilling Plan For The Types MG-4 and MG-6 Relays In the Front Connected Moulded Case. (See The Internal Schematic For The Terminals Supplied). For Reference Only.

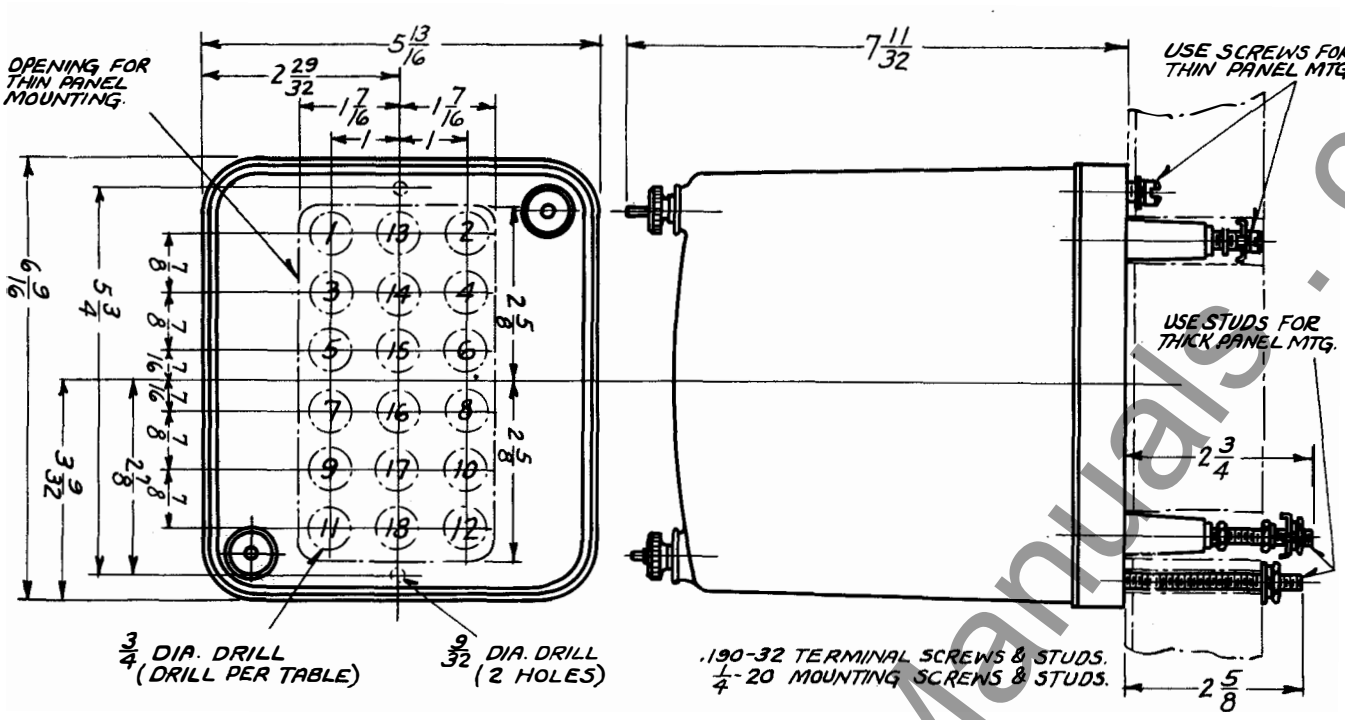

Figure 13
Outline & Drilling Plan For The Types MG-4 and MG-6 Relays In the Standard Projection Case. (See the Internal Schematic For the Terminals Supplied). For Reference Only.

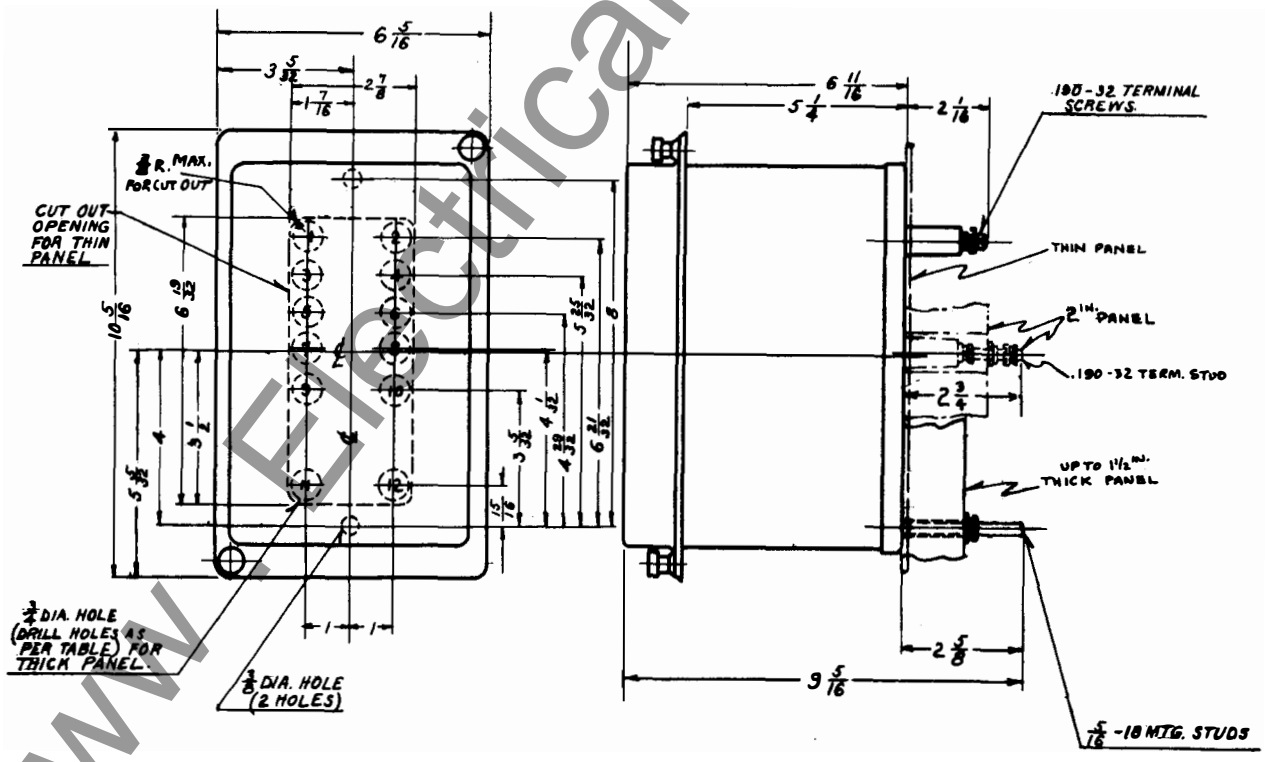

Figure 14
Outline & Drilling Plan of the S10 Projection Type FT Flexitest Case. See the Internal Schematics For the Terminals Supplied. For Reference Only.

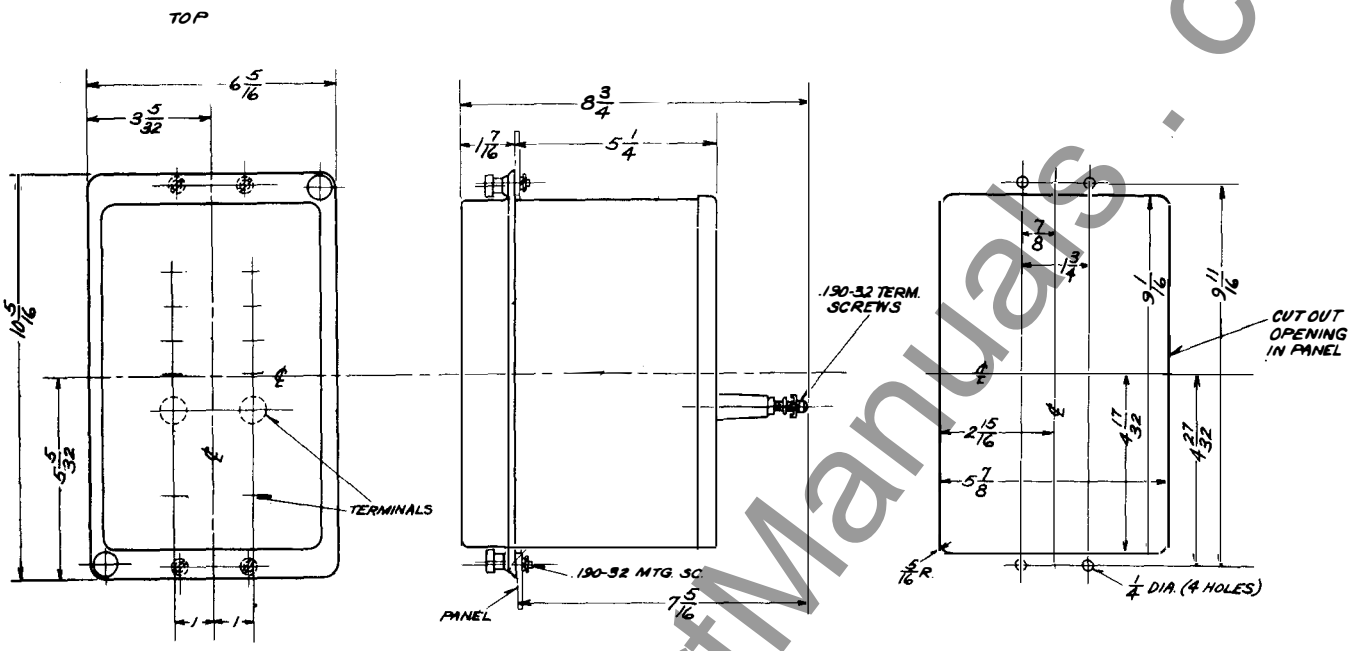

Figure 15
Outline & Drilling Plan of the S10 Semi-Flush Type FT Flexitest Case. For Reference Only.

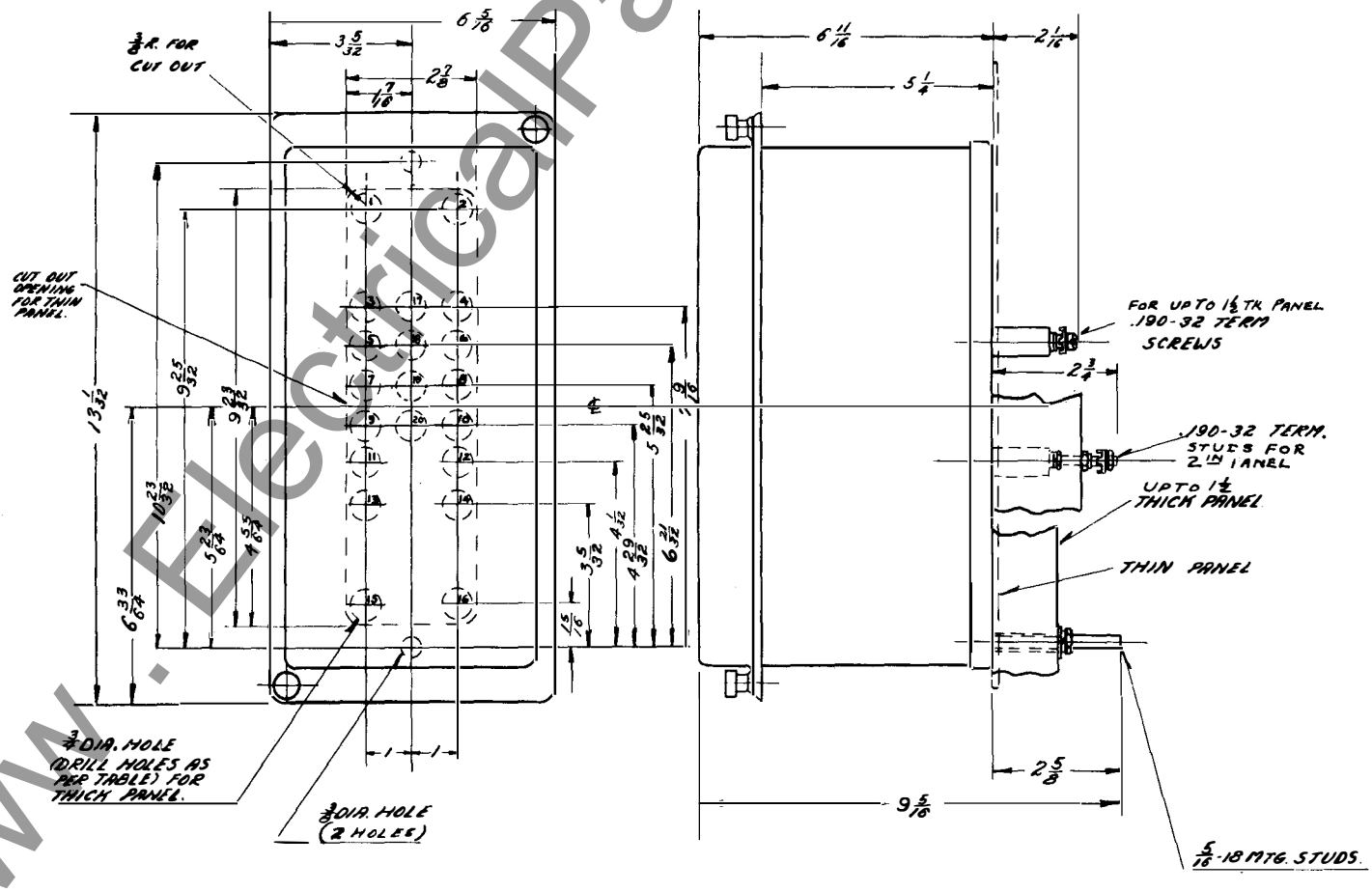

Figure 16
Outline & Drilling Plan of the S20 Projection Type FT Flexitest Case. See the Internal Schematics For the Terminals Supplied. For Reference Only.

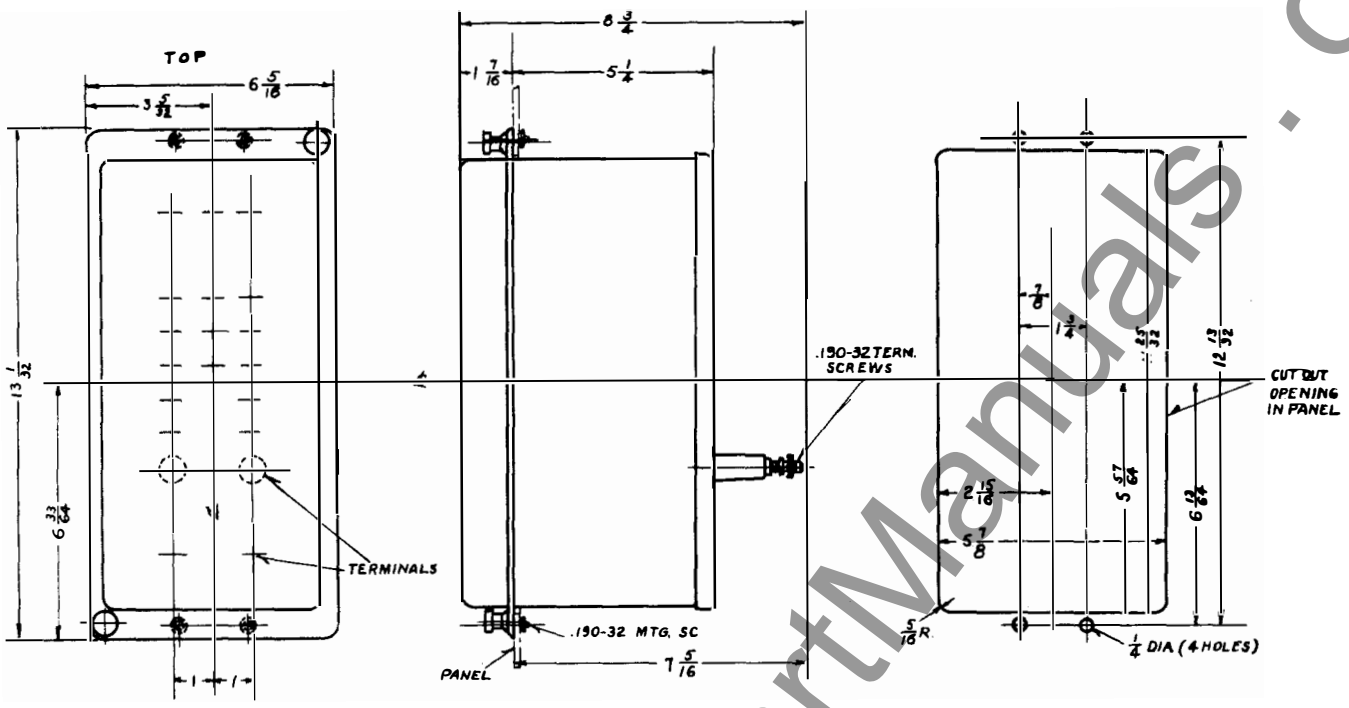

Figure 17
Outline & Drilling Plan of the S20 Semi-Flush Type FT Flexitest Case. For Reference Only.

WESTINGHOUSE ELECTRIC CORPORATION
Meter Division, Newark, N. J.

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12-46

INSTALLATION • OPERATION • MAINTENANCE

INSTRUCTIONS

TYPE JM ANNUNCIATOR AND CURRENT INDICATOR

CAUTION Before putting relays into service, remove all blocking which may have been inserted for the purpose of securing the parts during shipment, make sure that all moving parts operate freely, and operate the relay to check the settings and electrical connections.

APPLICATION

The type JM relay is available for two different applications. The JM annunciator may be used to indicate circuit operations of any relay scheme. The target indicators provide visual indication of any desired circuit operation.

The JM current indicator provides a range of six steps of current level, indicating the highest current reached in a series circuit.

CONSTRUCTION AND OPERATION

The JM annunciator consists of a group of identical operating elements connected as shown in Fig. 1, 2, or 3. It also may be supplied as a 13-terminal relay, containing 12 target indicators all connected to a common terminal. The JM current indicator contains 6 operating elements connected as shown in Fig. 4 or 5.

The operating element consists of a small solenoid coil mounted in a steel frame, a spring-restrained armature, and a white target flag. When the coil is energized, the armature releases the white target which then falls into a visible position indicating that a particular circuit has been energized. The indicators are reset from outside of the case

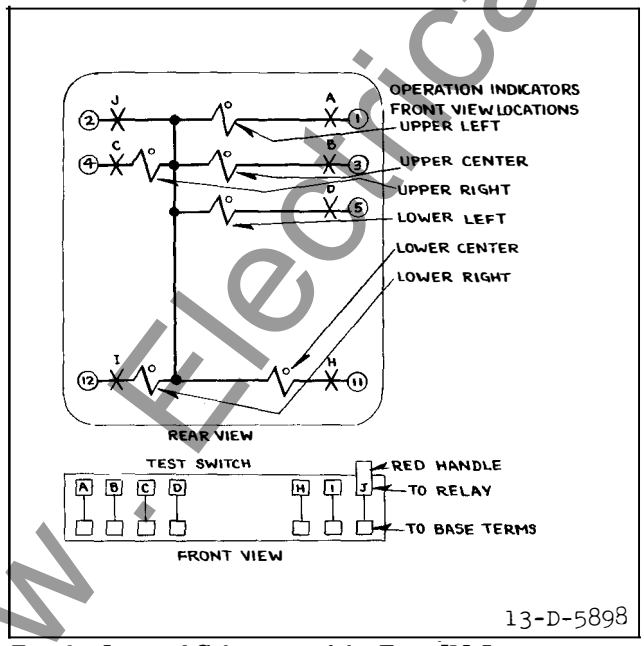

Fig. 1—Internal Schematic of the Type JM Annunciator in the Type FT Flexitest Case. Six Elements with One Terminal Common.

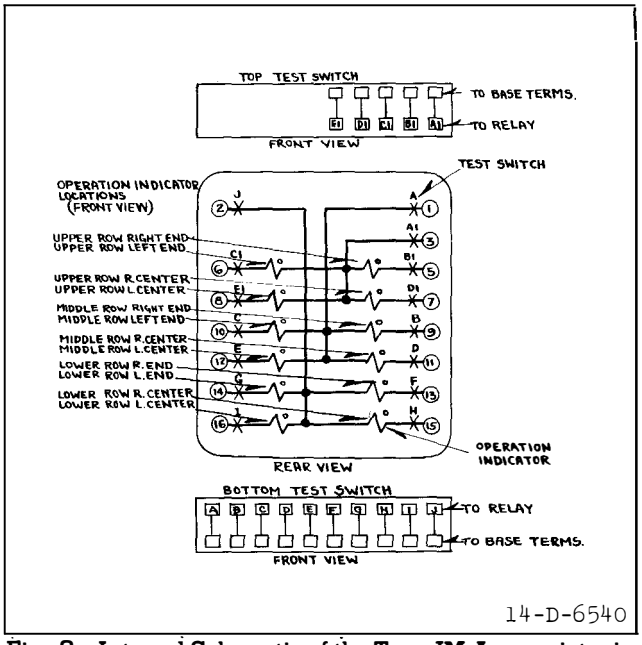

Fig. 2—Internal Schematic of the Type JM Annunciator in the Type FT Flexitest Case. Twelve Elements in Three Groups of Four.

SUPERSEDES I. L. 41-316

EFFECTIVE MAY 1958

*Denotes change from superseded issue.

by a push rod in the cover or cover stud.

CHARACTERISTICS

The standard JM annunciator is supplied with d-c coils which have a resistance of 2.8 ohms * and are nominally rated 0.2 ampere, with thermal rating of 0.6 ampere continuous and 18 amperes one-second.

The JM current indicator is available in a six-step range, between 3 and 50 amperes. * Coils are available, for intermittent use, on 50 and 60 cycles.

ADJUSTMENTS

Adjust the indicator to operate at its rated current, gradually applied, by loosening the two screws on the under side of the assembly, and moving the bracket forward or backward. In the current indicator relay, if the two helical springs which reset the armature are replaced by new springs, they should be weakened slightly by stretching to obtain the proper calibration.

RENEWAL PARTS

Repair work can be done most satisfactorily at the factory. However, interchangeable parts can be furnished to the customers who are equipped for doing repair work. When ordering parts, always give the complete nameplate data.

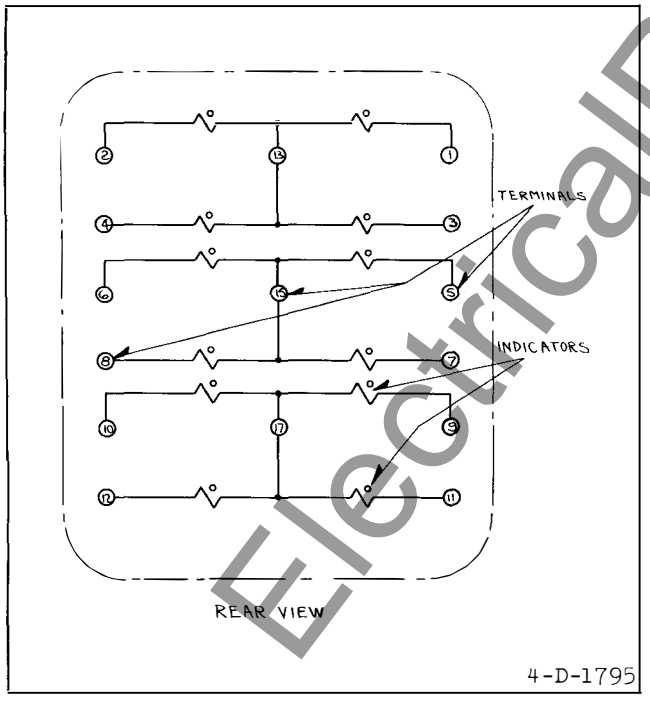

Fig. 3—Internal Schematic of the Type JM Annunciator in the Standard Case. Twelve Elements in Three Groups of Four.

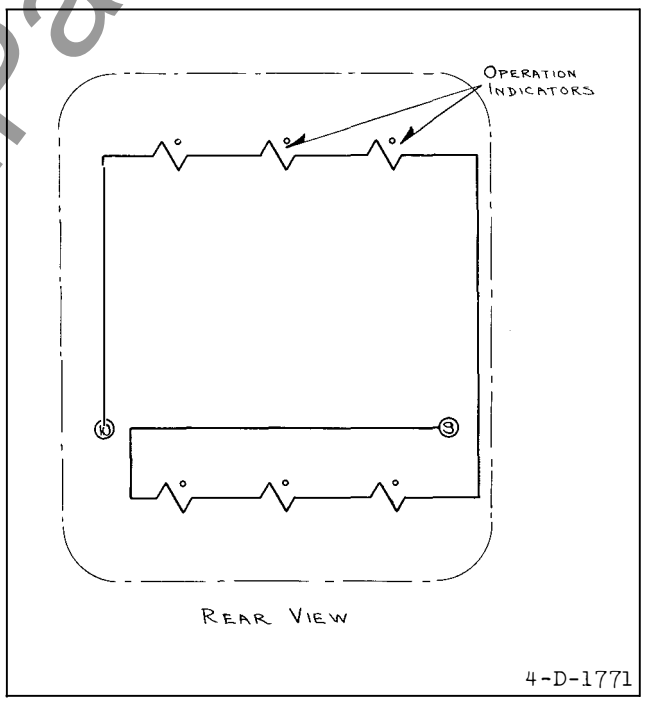

Fig. 4—Internal Schematic of the Type JM Current Indicator in the Standard Case.

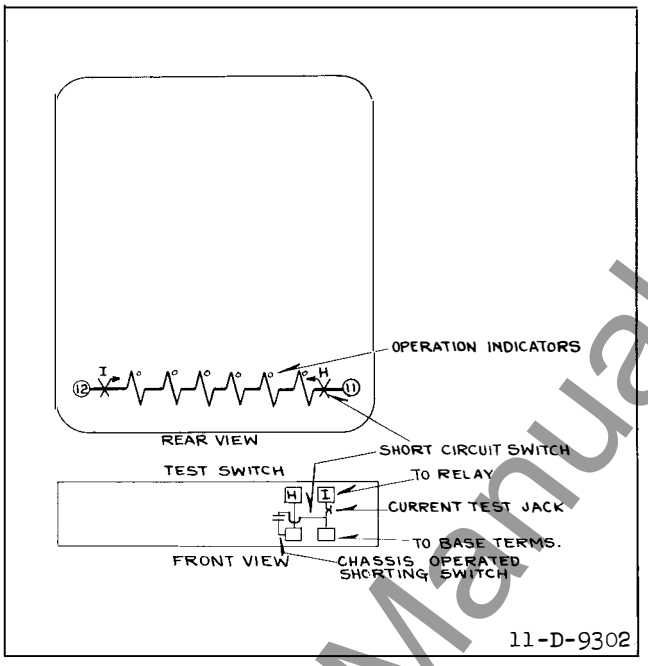

Fig. 5—Internal Schematic of the Type JM Current Indicator in the Type FT Flexitest Case.

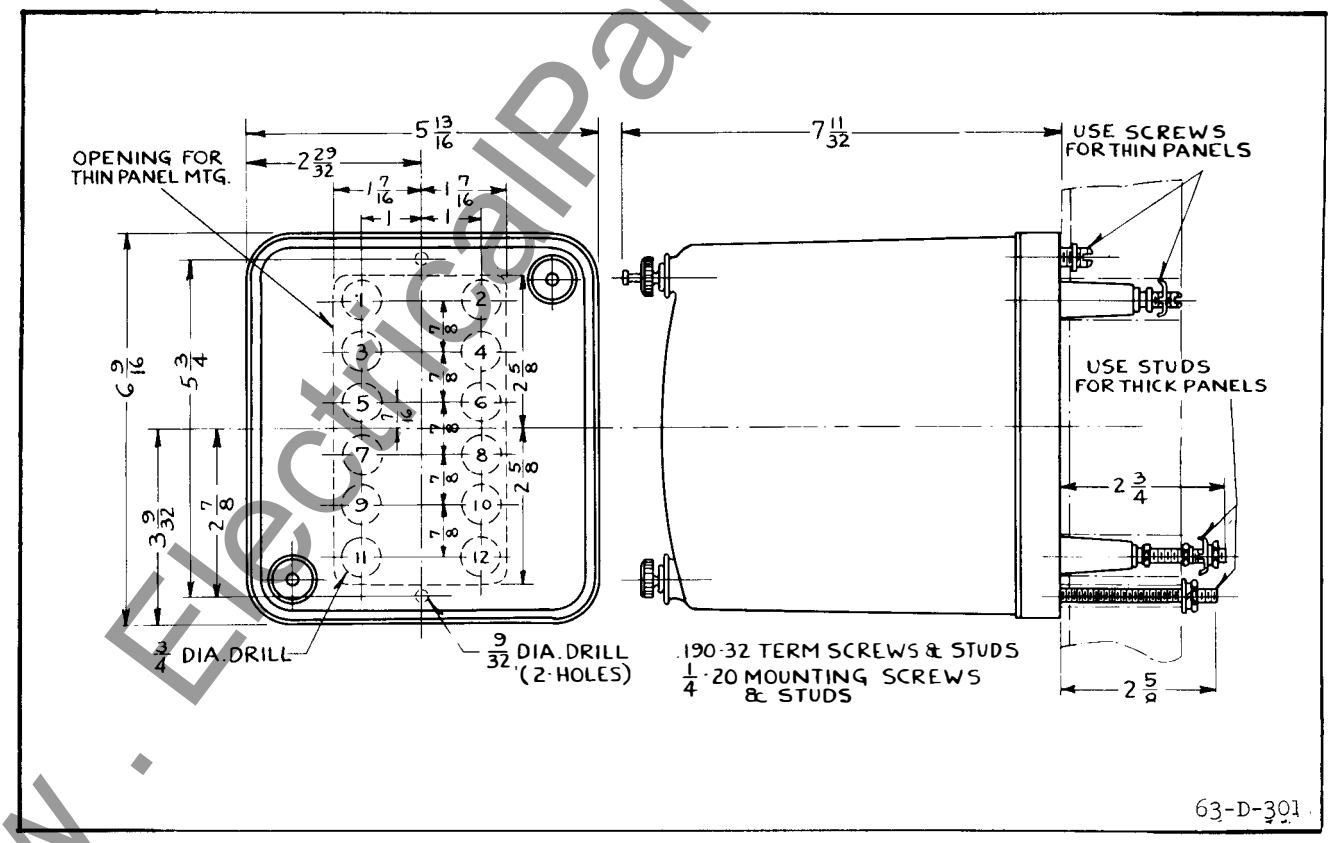

Fig. 6—Outline and Drilling Plan for the Standard Projection Case. See the Internal Schematic for the Terminals Supplied. For reference only.

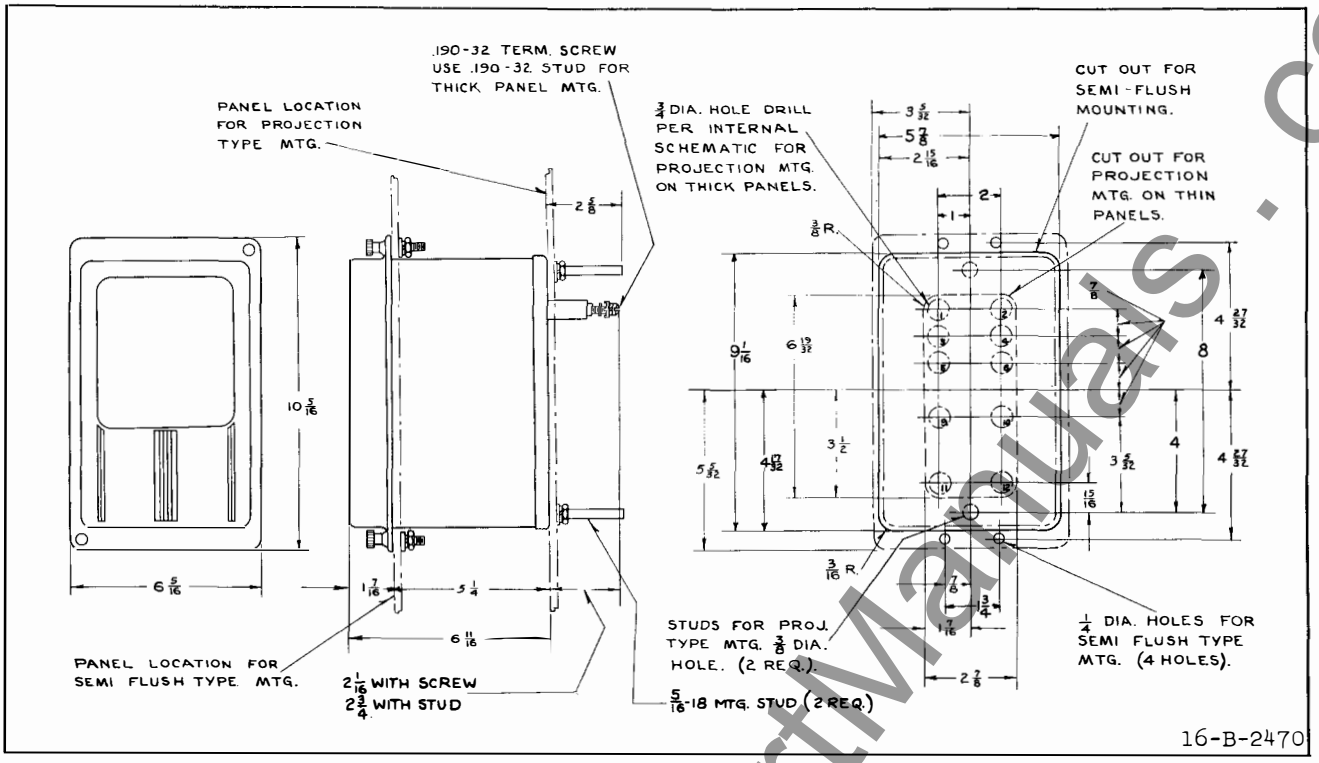

Fig. 7—Outline and Drilling Plan for the S-10 Projection or Semi-Flush Type FT Flexitest Case. See the Internal Schematic for the Terminals Supplied. For reference only.

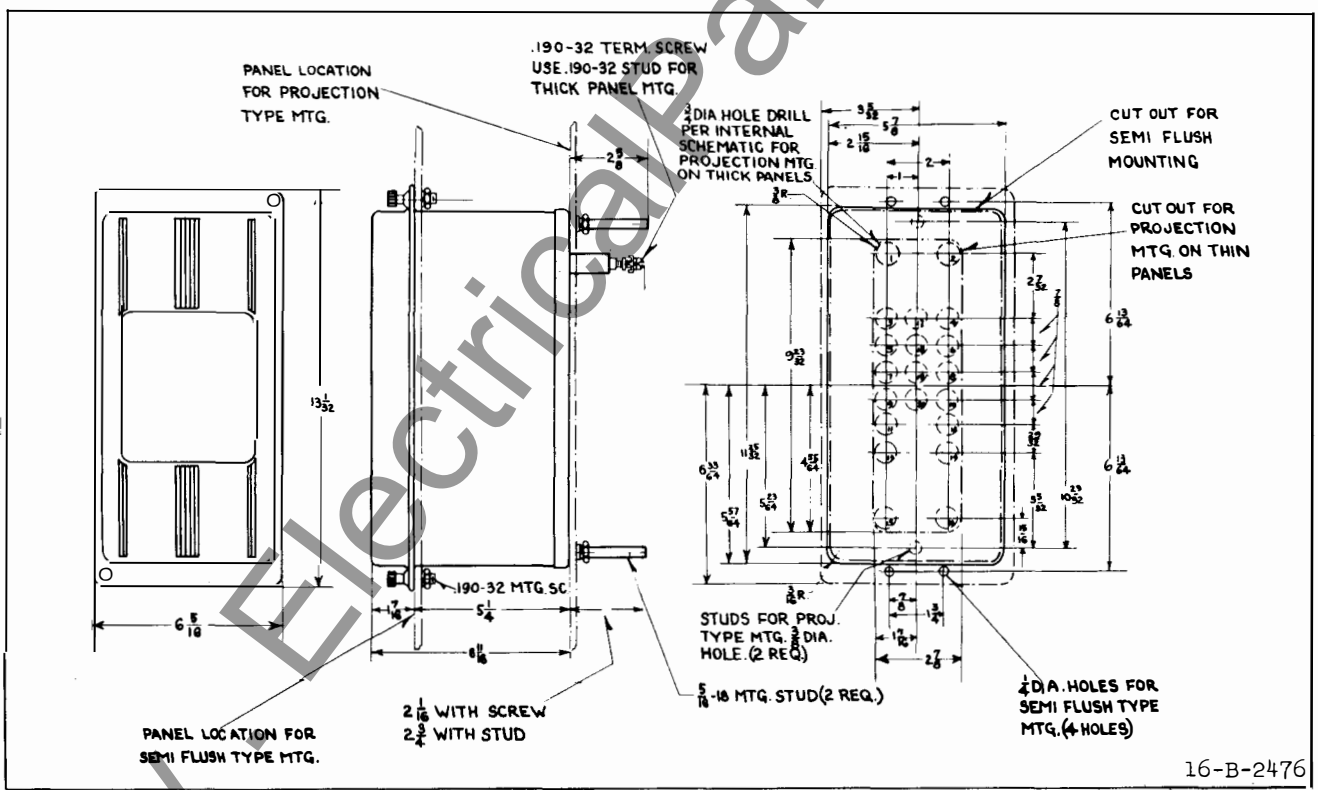

Fig. 8—Outline and Drilling Plan for the S-20 Projection or Semi-Flush Type FT Flexitest Case. See the Internal Schematic for the Terminals Supplied. For reference only.

WESTINGHOUSE ELECTRIC CORPORATION

METER DIVISION • NEWARK, N.J.

Printed in U.S.A.

INSTALLATION • OPERATION • MAINTENANCE

INSTRUCTIONS

TYPE JM ANNUNCIATOR AND CURRENT INDICATOR

CAUTION Before putting relays into service, remove all blocking which may have been inserted for the purpose of securing the parts during shipment, make sure that all moving parts operate freely, and operate the relay to check the settings and electrical connections.

APPLICATION

The type JM relay is available for two different applications. The JM annunciator may be used to indicate circuit operations of any relay scheme. The target indicators provide visual indication of any desired circuit operation.

The JM current indicator provides a range of six steps of current level, indicating the highest current reached in a series circuit.

CONSTRUCTION AND OPERATION

The JM annunciator consists of a group of identical operating elements connected as shown in Fig. 1, 2, or 3. It also may be supplied as a 13-terminal relay, containing 12 target indicators all connected to a common terminal. The JM current indicator contains 6 operating elements connected as shown in Fig. 4 or 5.

The operating element consists of a small solenoid coil mounted in a steel frame, a spring-restrained armature, and a white target flag. When the coil is energized, the armature releases the white target which then falls into a visible position indicating that a particular circuit has been energized. The indicators are reset from outside of the case

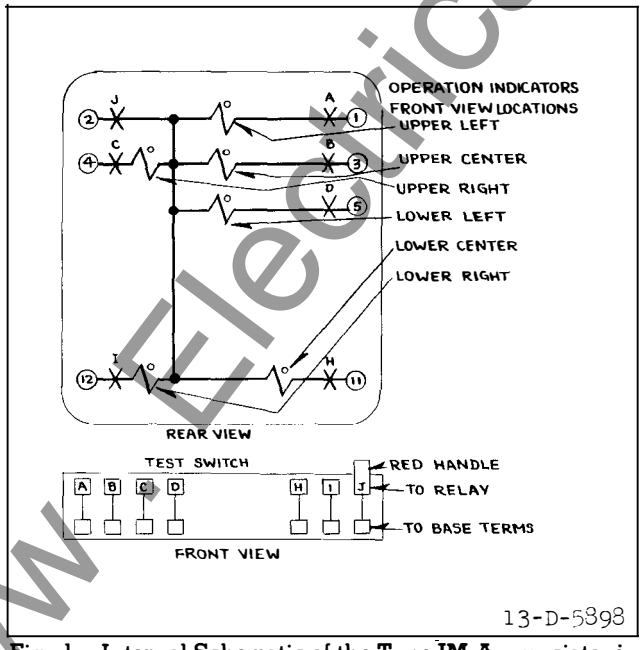

Fig. 1—Internal Schematic of the Type JM Annunciator in the Type FT Flexitest Case. Six Elements with One Terminal Common.

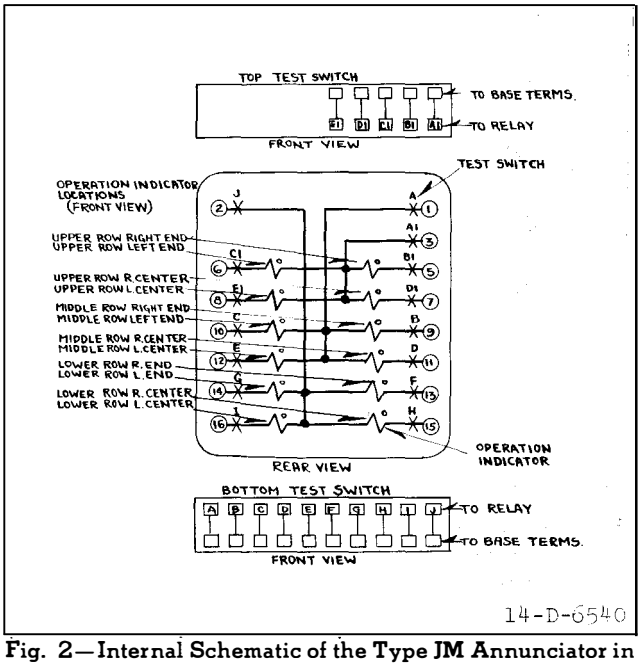

Fig. 2—Internal Schematic of the Type JM Annunciator in the Type FT Flexitest Case. Twelve Elements in Three Groups of Four.

by a push rod in the cover or cover stud.

CHARACTERISTICS

The standard JM annunciator is supplied with d-c coils which have a resistance of 2.8 ohms and are rated 2 amperes continuous and 18 amperes one-second. Coils are available for 25, 50 and 60 cycles.

The JM current indicator is available in a six-step range, between 3 and 50 amperes, 60 cycles.

ADJUSTMENTS

Adjust the indicator to operate at its rated current, gradually applied, by loosening the two screws on the under side of the assembly, and moving the bracket forward or backward. In the current indicator relay, if the two helical springs which reset the armature are replaced by new springs, they should be weakened slightly by stretching to obtain the proper calibration.

RENEWAL PARTS

Repair work can be done most satisfactorily at the factory. However, interchangeable parts can be furnished to the customers who are equipped for doing repair work. When ordering parts, always give the complete nameplate data.

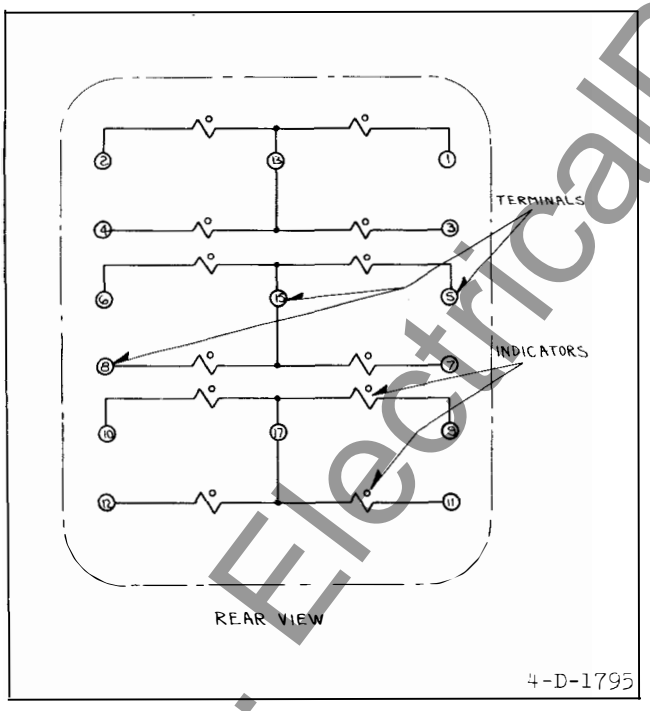

Fig. 3—Internal Schematic of the Type JM Annunciator in the Standard Case. Twelve Elements in Three Groups of Four.

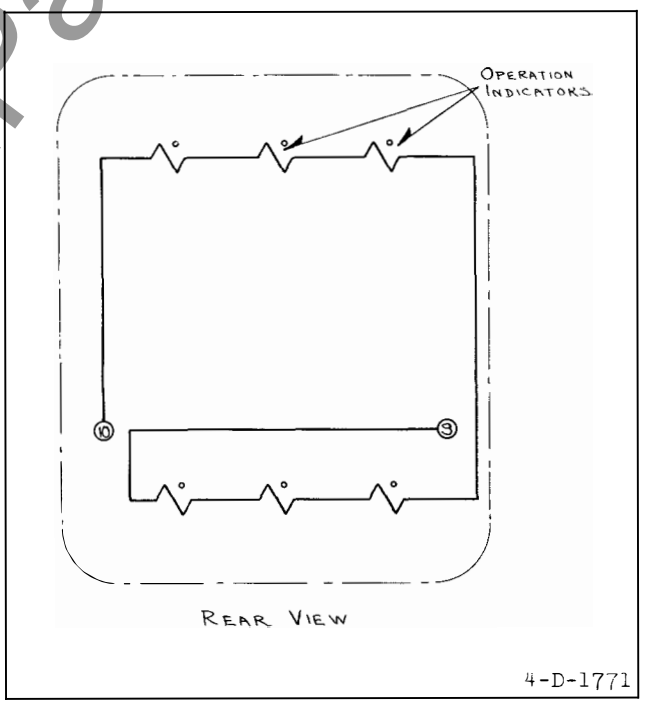

Fig. 4—Internal Schematic of the Type JM Current Indicator in the Standard Case.

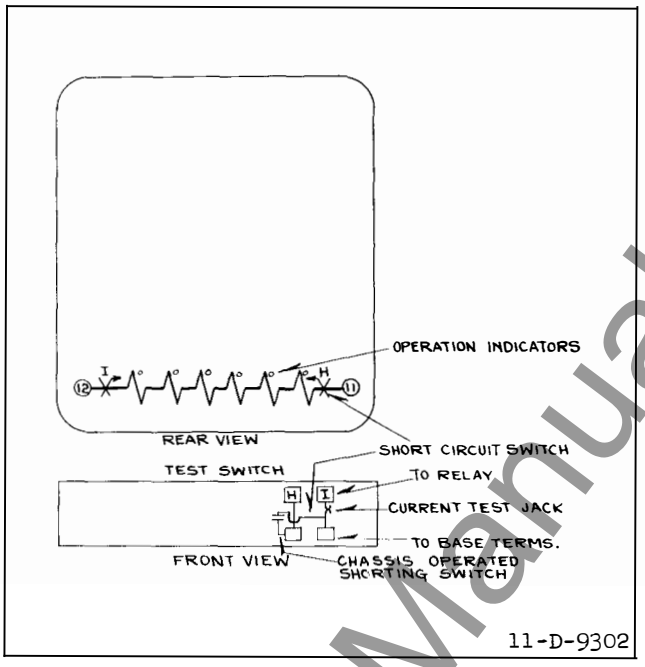

Fig. 5—Internal Schematic of the Type JM Current Indicator in the Type FT Flexitest Case.

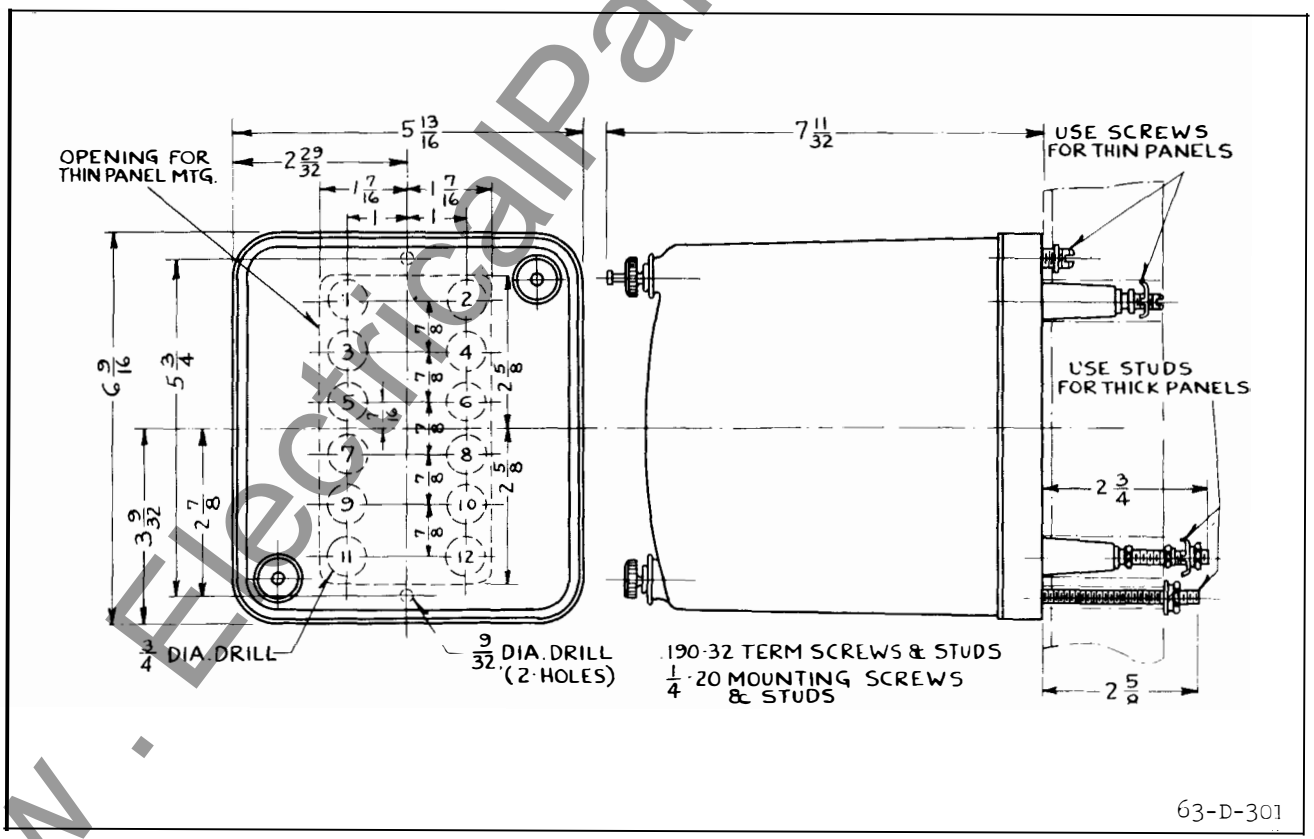

Fig. 6—Outline and Drilling Plan for the Standard Projection Case. See the Internal Schematic for the Terminals Supplied. For reference only.

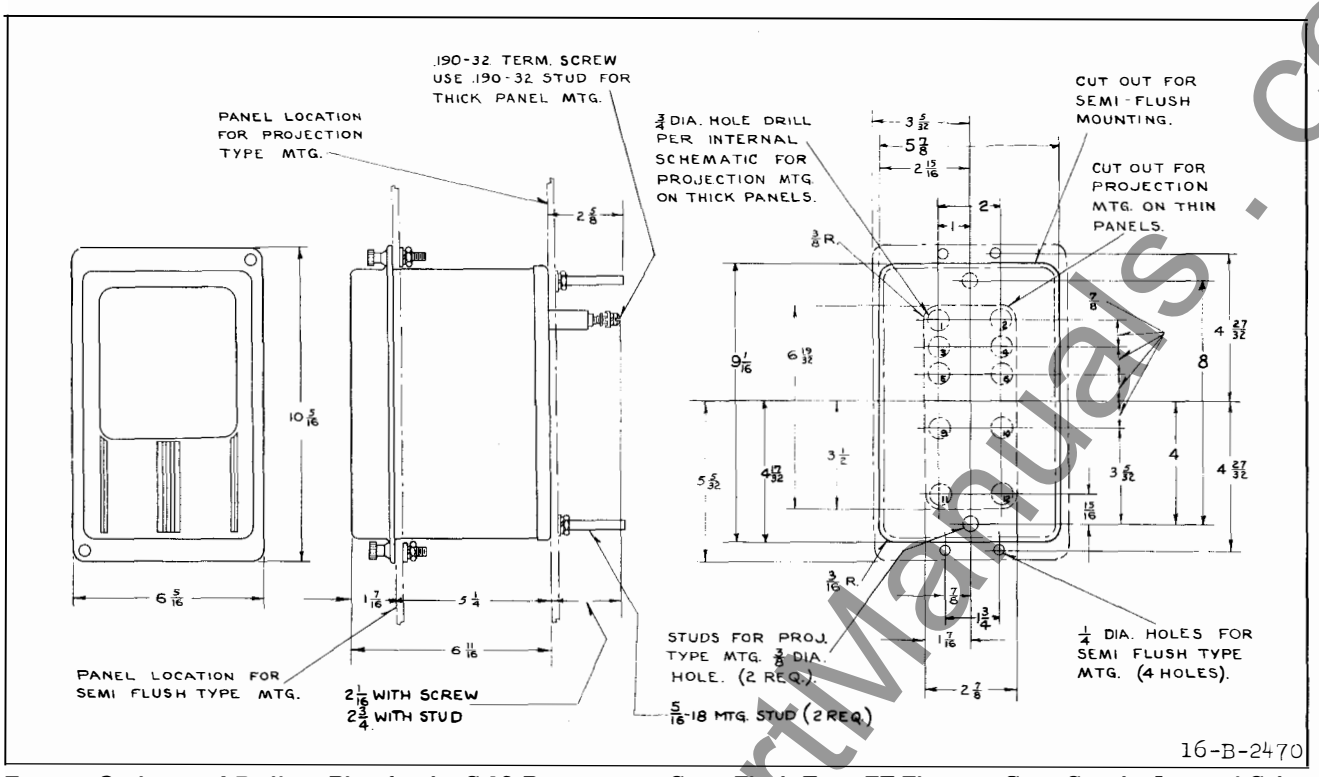

Fig. 7—Outline and Drilling Plan for the S-10 Projection or Semi-Flush Type FT Flexitest Case. See the Internal Schematic for the Terminals Supplied. For reference only.

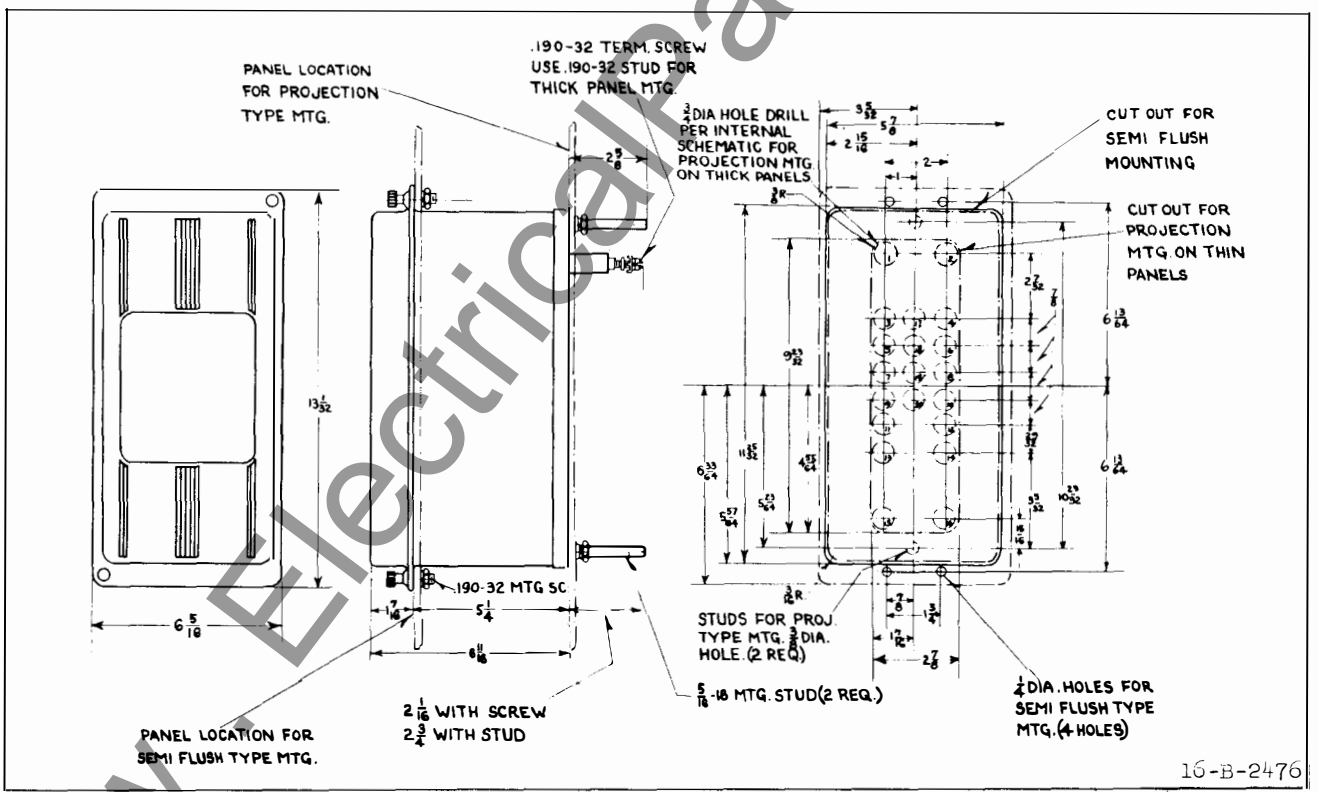

Fig. 8—Outline and Drilling Plan for the S-20 Projection or Semi-Flush Type FT Flexitest Case. See the Internal Schematic for the Terminals Supplied. For reference only.

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