INSTALLATION • OPERATION • MAINTENANCE

INSTRUCTIONS

TYPE SRC-1 RELAY

APPLICATION

The SRC-1 is a multi-shot solid-state reclosing relay that provides:

1. Optional instantaneous first shot reclosing.
2. Optional 0 (.050 sec.) — 2 second first shot reclosing.
3. Two additional independently adjustable, 15 to 130 second, reclosures.
4. Load tap changer control lockout, to block effect of faults on LTC regulating relay. This allows tap-changer time delay to be set independent of fault clearing time on distribution circuits. Blocking is released when SRC-1 is reset or in lockout condition.
5. Optional instantaneous trip cutout after any trip or when closing in from lockout. This allows protection of a distribution circuit lateral fuse on a temporary fault. Another function this may provide is to allow minimum tripping time following a manual closure.
6. Optional 1 to 3 reclosures to lockout.
7. Indication of position of solid-state sequencer.
8. Indication of lockout condition.

CONSTRUCTION AND OPERATION

The type SRC-1 Relay is composed of (1) a counter printed circuit module, (2) a reclose timer printed circuit module, (3) a sequence check printed circuit module, (4) a reset timer printed circuit module, (5) a tap changer blocking printed circuit module, (6) a power supply printed circuit module, (7) a instantaneous trip blocking relay, (8) a close relay, (9) a tap changer blocking relay, (10) a lockout indicator, and (11) position indicators. All components are identified on the internal schematic in Figure 1.

COUNTER MODULE

The counter module is a 4 step sequential counter, using integrated-circuit components for sequencing, that responds to signals from the 52b contact and sequences the relay through its preset functions. Refer to Figure 3 for component location and board layout.

RECLOSE MODULE

The reclose module contains the reclose timer and the necessary logic for the position indicators. The timer is controlled by the counter module and the 52b contacts, with the output of the timer controlled by the sequence check module. The front panel potentiometers allow a choice of three separately set reclose time delays between the limits shown. Provisions have been made whereby a tap screw setting in the Instantaneous Reclosing tap block will preset the close relay contacts, thus permitting a reclose operation with no intentional time delay. Refer to Figure 4 for component location and board layout.

SEQUENCE CHECK MODULE

The sequence check module contains the output amplifier for the reclose timer and a sequence check function. The purpose of the sequence check circuitry is to check the operation of the counter to prevent any malfunction of the counter from causing pumping of the breaker by preventing the close relay from being energized. Refer to Figure 5 for component location and board layout.

RESET MODULE

The reset module contains the reset timer and is normally controlled by the operation of the counter module and the 52b contact. Provisions have been made so that external blocking of the reset timer is

possible. The front panel potentiometer allows a choice of reset time delay between the limits shown. The time delay circuit is of the quick reset type and enables the reset times to always be consistent with the front panel setting. Refer to Figure 6 for component location and board layout.

TAP CHANGER BLOCKING MODULE

The tap changer blocking module contains the necessary logic to perform the instantaneous trip blocking function, the tap changer blocking function, and the lockout indicator function. Refer to Figure 7 for component location and board layout.

POWER SUPPLY MODULE

The power supply module contains a dual voltage regulated power supply with a 22 volt dc output for most relay functions, and a 12 volt dc output for the integrated circuit counter function. Refer to Figure 8 for component location and board layout.

INSTANTANEOUS TRIP BLOCKING RELAY

The operation of the instantaneous trip blocking relay is controlled by the counter and the instantaneous selector tap block setting.

CLOSE RELAY

The operation of the close relay is controlled by the operation of the 52b contact and the reclose module.

TAP CHANGER BLOCKING RELAY

The operation of the tap changer blocking relay is controlled by the counter module and the logic on the tap changer blocking module. The TCB relay contact will be closed in the home and lockout position.

LOCKOUT INDICATOR

The lockout indicator is controlled by the counter module, the 52b contact, and the related circuitry on the tap changer blocking module. The amber indicator is energized when the counter is at its lockout position and the 52b contact is closed.

POSITION INDICATORS

The position indicators are controlled by the counter module and the related circuitry on the sequence check module. The appropriate indicator is energized to indicate that the counter is at that particular point in the closing cycle. At no time should more than one indicator be energized.

THEORY OF OPERATION

Operation of the SRC-1 relay will be described with the aid of Figure 1, internal schematic drawing 612F556; Figure 2, external schematic and logic diagram drawing 6269D36; and Table 1.
Assume that the breaker is open and normal voltage is applied to the relay, with the relay set for three reclosing operations to lockout and an instantaneous trip on the number one position of the instantaneous selector tap block. Under these conditions the relay will be in a "locked out" state. This means that counter module 202C998G01 output terminals 17, 15 and 13 are at a "0" logic level and no reclosing can take place. The lockout indicator will be energized and the tap changer blocking relay will be de-energized due to the logic "0" voltages applied to tap changer blocking module 202C965G01 terminals 6, 7, 9 and 14. All other indicators will be de-erergized since logic "0" voltages are applied to reclose timer module 202C957G01 terminals 8, 10, and 13. The reset timer module 202C961G01 is made inoperative by the positive voltage applied to its terminal 10, from terminal 11 of the counter module, which turns transistor Q3 on, shorting reset timer capacitors C5 and C26.

When the breaker is closed manually, the 52b contact opens and removes the short from the base of transistor Q12, allowing it to turn on. This, in turn, shorts the base drive to transistor Q13, turning it off. This puts a logic "1" output on counter module terminal 2 which, on the tap changer blocking module, results in turning transistor Q29 on, and thereby Q27 off to de-energize the lockout indicator. At the same time, the turn off of transistor Q13 also caused diode D18 to be reverse biased. This allows base drive to turn transistor Q14 on, thereby removing the base input from Q3, turning it off to allow capacitors C5 and C26 to charge through resistor R15 and potentiometer R105 to the firing voltage of unijunction transistor Q4. The time required for C5 and C26 to charge and fire unijunction Q4 is controlled by

potentiometer R105 on the front panel, set at the desired reset calibration. When unijunction Q4 fires, C5 and C26 discharge through Q4 and R17 to cause a voltage rise across R17. This voltage rise turns on transistor Q5, thereby applying a logic "0" to the counter module to reset the counter to the normal position. In this position, counter module terminal 17 has a logic "1" which allows transistor Q3 to turn on, disabling the reset timer module. The logic "1" signal is also applied to reclose timer module terminal 8 and tap changer blocking module terminal 9. The logic "1" on terminal 8 turns on transistors Q15 and Q18 to light the number one indicator and also energize the number one reclose time delay circuitry. However, since the breaker is closed, transistor Q21 is conducting, shorting capacitor C15 to keep the close relay from being energized through the amplifier transistors Q6, Q7 and Q8. The logic "1" on terminal 9 of the tap changer blocking module allows transistor Q29 to remain on, keeping the lockout indicator de-energized. It also turns on transistor Q23, which removes the base drive from Q26 keeping the tap changer blocking relay from being energized at the home position, and also, through the tap screw in the number one position of the instantaneous selector tap block, allows a logic "1" signal to be applied from terminal 10 to terminal 13 of the tap changer blocking module to turn transistor Q24 on and thereby Q25 off to de-energize the instantaneous trip blocking relay. The SRC-1 relay is now in the state shown in Figure 1 on internal schematic drawing 612F556 with the breaker closed and the relay reset.

We now assume that a permanent fault occurs on the line. Since the relay is set to allow an instantaneous trip with the tap screw in the number one position of the instantaneous selector, the breaker trips open instantaneously. The 52b contact closes, and on the counter module the collector of Q13 (terminal 2) goes to logic "0" and the collector of Q14 (terminal 11) goes to logic "1". The logic "0" generated from Q13 turns transistor Q21 off, allowing reclose time delay capacitor C15 to charge beyond the breakdown voltage of zener diode Z12 to energize the close relay through amplifier transistors Q6, Q7 and Q8. Note that on the sequence check module the flip-flop, consisting of transistors Q9 and Q10, had to be in the state with Q10 off in order for Q8 to turn on to energize the close relay. Meanwhile, the logic "0" generated from Q13 is also applied to terminal 6 of the tap changer blocking module depriving transistors Q23 and Q24 of base drive to result in the energization of the tap changer blocking relay and the energization of the instantaneous trip blocking relay. Meanwhile, the logic "1" generated from Q14 keeps the reset timer disabled by shorting capacitors C5 and C26 with the on transistor Q3, and on the sequence check module turns off transistor Q11, allowing one shot capacitor C11 to charge.

When the close relay was energized its contacts closed the breaker, thereby opening the 52b contact. The counter module now has a logic "1" output on terminal 2 and a logic "0" output on terminal 11. Counter module terminal 17 (output to first reclose circuit) now becomes a logic "0" and remains as such, turning off transistors Q15 and Q18 and the number one indicator. Counter module terminal 15 (output to second reclose circuit) now becomes a logic "1", turning on transistors Q16 and Q20 and and energizing the number two indicator.

When the 52b contact opened upon reclosure of the breaker, one shot capacitor C11 discharged to flip the sequence check flip-flop consisting of transistors Q9 and Q10, turning Q10 on. The change in energization of indicators from the number one to the number two indicator reflips the flip-flop back, thereby checking the sequencing of the counter. If the indicators did not switch to reflip the flip-flop, the on transistor Q10 and diode D13 would prevent the close relay from being further energized.

With the breaker closed the reclose timer is again disabled by the on transistors Q19 and Q21, and the reset timer circuitry begins to charge, timing the desired reset calibration set on the front panel. However, since it was assumed that a permanent fault occurs on the line, the breaker is tripped open before the reset time has elapsed. Transistor Q3 once again turns on to short out the charge that started to build up on the reset timer capacitors, disabling the reset timer, due to the logic "1" present on counter module terminal 11. Counter module terminal 2 now has a logic "0" and terminal 15 remains a logic "1" to allow reclose timer number two, set to the desired calibration on potentiometer R107, to charge and energize the close relay in a manner similar to that of reclose number one.

Again the breaker closes, opening the 52b contact giving a logic "1" output on terminal 2 of the counter module, a logic "0" on terminal 11, a logic "0" remaining on terminal 17, a logic "0" on terminal 15 (the output to second reclose circuit), and a logic "1" on terminal 13 (the output to the third reclose circuit). Again the reclose timer is held inoperative, the reset timer starts its attempt to reset, and the sequence check flip-flop operates with the turning

off of the number two indicator and the turning on of the number three indicator.

However, since it was assumed there is a permanent fault on the line, again the breaker is tripped open before the reset time set has elapsed. With the logic "1" on counter module terminal 13 and with the relay functioning in a manner similar to that previously described, the close relay is energized in the time set to the desired calibration on potentiometer R108.

Again the breaker closes, opening the 52b contact, giving a logic "1" output on counter module terminal 2, a logic "0" output on terminal 11, and logic "0" outputs on terminals 17, 15 and 13, the three outputs to the reclose circuitry. The reset timer again attempts to reset, but since the assumed permanent fault is still on the line, the breaker is tripped open before the reset time set has elapsed. With the counter module outputs to the reclose circuitry at a logic "0" and terminal 11 at a logic "1" to disable the reset timer, the SRC-1 relay is now at the lockout position. The lockout indicator is energized and the tap changer blocking relay is de-energized due to the logic "0" voltages applied to tap changer blocking module terminals 6, 7, 9 and 14. The SRC-1 will remain at lockout until the breaker is manually or electrically reclosed.

If we now assume that the fault has been cleared and the breaker is closed in, the reset circuitry of the SRC-1 will perform in the manner previously described to reset the relay to the state shown in Figure 1, ready to go through a full sequence in line with the settings made at the beginning of this description.

The first reclosure may also be set to be an instantaneous reclosure having no intentional time delay by a tap screw setting in the instantaneous reclosing tap block. This feeds the first reclose logic "1" output from counter module terminal 17 to sequence check module terminal 11 to energize the close relay, thereby presetting the close relay contacts.

CHARACTERISTICS AND SETTINGS

TRIPPING SEQUENCES

The tripping sequences can be all instantaneous, all time delayed, or any combination of instantaneous and time delayed as desired. For instantaneous operation, the numbers above the taps on the instantaneous selector tap block indicate which of the sequence of trips that would be instantaneous. For instantaneous operation on the first trip, a tap screw should be placed in the tap numbered 1. Time delayed trips will occur on all positions that do not have a tap screw. A tap screw must be placed in position 4 when instantaneous tripping is desired during manual closing of the breaker.

RESET TIME

The reset timer can be set with the calibrated potentiometer on the front panel, allowing a choice of reset time delay between the limits shown, 3 to 30 seconds.

RECLOSE TIME

The SRC-1 relay can be set for an instantaneous first reclosure by a tap screw setting in the instantaneous reclosing tap block, or have a reclose time delay set to the respective calibrated potentiometer on the front panel, allowing a choice of reclose time delay between the limits shown:

1st Reclose	0 (.050 sec.)	to 2 seconds
2nd Reclose	15	to 130 seconds
3rd Reclose	15	to 130 seconds

When operating on less than 3 reclosing operations to lockout, the reclosing intervals will be dropped starting with the third interval first.

RECLOSING OPERATIONS TO LOCKOUT

The SRC-1 Relay can be set to lockout the breaker after 1, 2, or 3 reclosing operations by placing a tap screw in the desired tap in the reclosing operations to lockout tap block. The number above the tap indicates the number of operations that will occur before lockout is reached.

ENERGY REQUIREMENTS

STATION BATTERY

48 or 125 volts as indicated on name plate of relay.

TABLE I

LOGIC OUTPUTS OF COUNTER MODULE

BREAKER POSITION	COUNTER MODULE 202C998G01					RELAY FUNCTION	INDICATORS ENERGIZED
	TERMINAL 2	TERMINAL 11	TERMINAL 17 OUTPUT TO 1ST RECLOSE CIRCUITRY	TERMINAL 15 OUTPUT TO 2ND RECLOSE CIRCUITRY	TERMINAL 13 OUTPUT TO 3RD RECLOSE CIRCUITRY		
CLOSED (Reset Position)	1	0	1	0	0	Reset Position	Reclose #1
OPEN (First Trip)	0	1	1	0	0	Enables First Reclosure	Reclose #1
CLOSED (First Reclosure)	1	0	0	1	0	Enables Reset †	Reclose #2
OPEN (Second Trip)	0	1	0	1	0	Enables Second Reclosure	Reclose #2
CLOSED (Second Reclosure)	1	0	0	0	1	Enables Reset †	Reclose #3
OPEN (Third Trip)	0	1	0	0	1	Enables Third Reclosure	Reclose #3
CLOSED (Third Reclosure)	1	0	0	0	0	Enables Reset †	None
OPEN (Fourth Trip)	0	1	0	0	0	Lockout Position	Lockout

† If fault is cleared, reset timer will time out to reset relay.

ADJUSTMENTS AND MAINTENANCE

The proper adjustments to insure correct operation of this relay have been made at the factory. Upon receipt of the relay, no customer adjustments other than those covered under "SETTINGS" should be required.

ACCEPTANCE CHECK

The following check is recommended to insure that the relay is in proper working order. Before proceeding, connect relay to breaker as per Figure 2, or to auxiliary test relay per Figure 9.

1. Test Settings
   a. Instantaneous Selector tap screw in position 1.
   b. Reclosing Operations to lockout tap screw in position 3.
2. Trip open the breaker or the test relay and observe if the SRC-1 relay opens and closes the breaker or test relay in line with the settings made in paragraph 1. It will be necessary to trip open the device being controlled by the SRC-1 after each reclosure until lockout is reached. The device being controlled by the SRC-1 relay can be tripped open manually or electrically. The reclose times should be within the time set on the front panel of the SRC-1 relay, plus or minus 5%.
3. When at lockout, close the device being controlled by the SRC-1 relay. Time the interval that elapses before the SRC-1 relay resets. The integrator will be reset when the reclose #1 indicator becomes energized. This time should equal the reset time set on the front panel of the SRC-1 relay, plus or minus 5%.

ROUTINE MAINTENANCE

All relays should be inspected periodically and the time of operation should be checked at least once every year or at such other intervals as may be indicated by experience to be suitable to the particular application.

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.

ELECTRICAL PARTS LIST

CIRCUIT SYMBOL	DESCRIPTION	WESTINGHOUSE STYLE NO.	CIRCUIT SYMBOL	DESCRIPTION	WESTINGHOUSE STYLE NO.
	RESISTORS				
R1	260 40 W 5% (2 Req'd.)	184A642H03	R53	330 ½W 5%	184A763H15
			R54	20,000 ½W 5%	184A763H58
R2	4,000 5 W 5% (48 volts)	763A129H13	R55	330 ½W 5%	184A763H15
			R56	100 ½W 5%	184A763H03
R2	40,000 5 W 1%(125V)	763A130H11	R57	20,000 ½W 5%	184A763H58
R3	200 2 W 5%	185A207H10	R58	27,000 ½W 5%	184A763H61
R4	5,100 ½W 5%	184A763H44	R59	10,000 ½W 5%	184A763H51
R5	51,000 ½W 5%	184A763H68	R60	22,000 ½W 5%	184A763H59
R6	10,000 ½W 5%	184A763H51	R61	22,000 ½W 5%	184A763H59
R7	10,000 ½W 5%	184A763H51	R62	27,000 ½W 5%	184A763H61
R8	5,100 ½W 5%	184A763H44	R63	10,000 ½W 5%	184A763H51
R9	68,000 ½W 5%	184A763H71	R64	22,000 ½W 5%	184A763H59
R10	47,000 ½W 2%	629A531H72	R65	22,000 ½W 5%	184A763H59
R11	4,700 ½W 5%	184A763H43	R66	27,000 ½W 5%	184A763H61
R12	82,000 ½W 5%	184A763H73	R67	10,000 ½W 5%	184A763H51
R13	33,000 ½W 5%	184A763H63	R68	22,000 ½W 5%	184A763H59
R14	10,000 ½W 5%	184A763H51	R69	22,000 ½W 5%	184A763H59
R15	100,000 ½W 1%	862A378H01	R70	47,000 ½W 5%	184A763H67
R16	680 ½W 5%	184A763H23	R71	20,000 ½W 5%	184A763H58
R17	47 ½W 5%	187A290H17	R72	20,000 ½W 5%	184A763H58
R18	1,000 ½W 5%	184A763H27	R73	10,000 ½W 5%	184A763H51
R19	47,000 ½W 5%	184A763H67	R74	10,000 ½W 5%	184A763H51
R20	68,000 ½W 5%	184A763H71	R75	2,490 ½W 1%	862A376H39
R21	33,000 ½W 5%	184A763H63	R76	39,200 ½W 1%	862A377H58
R22	10,000 ½W 5%	184A763H51	R77	27,000 ½W 5%	184A763H61
R23	33,000 ½W 5%	184A763H63	R78	27,000 ½W 5%	184A763H61
R24	51,000 ½W 5%	184A763H68	R79	47,000 ½W 5%	184A763H67
R26	10,000 ½W 5%	184A763H51	R80	47,000 ½W 5%	184A763H67
R27	10,000 ½W 5%	184A763H51	R81	47,000 ½W 5%	184A763H67
R28	10,000 ½W 5%	184A763H51	R82	10,000 ½W 5%	184A763H51
R29	330 ½W 5%	184A763H15	R83	47,000 ½W 5%	184A763H67
R30	47 ½W 5%	187A290H17	R84	10,000 ½W 5%	184A763H51
R31	47,000 ½W 5%	184A763H67	R85	4,700 ½W 5%	184A763H43
R32	47,000 ½W 5%	187A763H67	R86	4,700 ½W 5%	184A763H43
R33	10,000 ½W 5%	184A763H51	R87	10,000 ½W 5%	184A763H51
R34	330 ½W 5%	184A763H15	R88	10,000 ½W 5%	184A763H51
R35	47 ½W 5%	187A290H17	R89	33,000 ½W 5%	184A763H63
R36	10,000 ½W 5%	184A763H51	R90	33,000 ½W 5%	184A763H63
R37	270,000 ½W 5%	184A763H85	R91	10,000 ½W 5%	184A763H51
R38	30,000 ½W 5%	184A763H62	R92	15,000 ½W 5%	184A763H55
R39	2,000 ½W 5%	184A763H34	R93	4,700 ½W 5%	184A763H43
R40	10,000 ½W 5%	184A763H51	R94	10,000 ½W 5%	184A763H51
R41	10,000 ½W 5%	184A763H51	R95	10,000 ½W 5%	184A763H51
R42	20,000 ½W 5%	184A763H58	R96	10,000 ½W 5%	184A763H51
R43	3,000 ½W 5%	184A763H38	R97	15,000 ½W 5%	184A763H55
R44	20,000 ½W 5%	184A763H58	R98	47,000 ½W 5%	184A763H67
R45	10,000 ½W 5%	184A763H51	R99	10,000 ½W 5%	184A763H51
R46	10,000 ½W 5%	184A763H51	R100	33,000 ½W 5%	184A763H63
R47	5,100 ½W 5%	184A763H44	R101	15,000 ½W 5%	184A763H55
R48	10,000 ½W 5%	184A763H51	R102	10,000 ½W 5%	184A763H51
R49	20,000 ½W 5%	184A763H58	R103	15,000 ½W 5%	184A763H55
R50	330 ½W 5%	184A763H15	R105	1 MEG Potentiometer	878A379H01
R51	100 ½W 5%	184A763H03	R106	500,000 Potentiometer	878A379H02
R52	100 ½W 5%	184A763H03	R107	350,000 Potentiometer	878A379H03
			R108	350,000 Potentiometer	878A379H03

ELECTRICAL PARTS LIST

CIRCUIT SYMBOL	DESCRIPTION	WESTINGHOUSE STYLE NO.
CAPACITORS		
C1	1 MFD 200V	187A177H06
C2	1.5 MFD 35V	187A508H18
C3	.22 MFD 60V	187A508H21
C4	.047 MFD 200V	849A437H04
C5	22 MFD 100V	862A177H04
C6	1.5 MFD 35V	187A508H18
C7	.01 MFD 50V	184A663H01
C8	.47 MFD 35V	187A508H05
C9	.01 MFD 200V	764A278H10
C10	6.8 MFD 35V	184A661H10
C11	4.7 MFD 35V	184A661H12
C12	.1 MFD 200V	764A278H11
C13	6.8 MFD 35V 5%	184A661H21
C14	6.8 MFD 35V 5%	184A661H21
C15	8 MFD 30V 5%	862A177H07
C16	150 MFD 30V 5%	862A177H05
C17	150 MFD 30V 5%	862A177H05
C18	150 MFD 30V 5%	862A177H05
C19	150 MFD 30V 5%	862A177H05
C20	.22 MFD 60V	187A508H21
C21	.22 MFD 60V	187A508H21
C22	.22 MFD 60V	187A508H21
C23	.22 MFD 60V	187A508H21
C24	.22 MFD 60V	187A508H21
C25	.22 MFD 60V	187A508H21
C26	1.5 MFD 35V	187A508H18
TRANSISTORS		
Q1	2N3638	849A441H04
Q2	2N2219	762A585H15
Q3	2N3417	848A851H02
Q4	4JX5E695	629A435H02
Q5 to Q10	2N3417	848A851H02
Q11	2N3645	849A441H01
Q12 to Q14	2N2219	762A585H15
Q15 to Q17	2N3417	848A851H02
Q18	2N3645	849A441H01
Q19	2N3417	848A851H02
Q20	2N3645	849A441H01
Q21	2N3417	848A851H02
Q22	2N3645	849A441H01
Q23 to Q29	2N3417	848A851H02

CIRCUIT SYMBOL	DESCRIPTION	WESTINGHOUSE STYLE NO.
INTEGRATED CIRCUITS		
1C1 to 1C4	321CJ	717B688H01
ZENER DIODES		
Z1	1N965B	184A797H08
Z2	1N3022B	187A936H14
Z3	1N748A	186A797H13
Z4	HW20B	849A515H06
Z5	1N957B	186A797H06
Z6	1N705	837A693H06
Z7	1N965B	186A797H08
Z8	1N957B	186A797H06
Z9 to Z11	1N748A	186A797H13
Z12	1N960B	186A797H10
Z13 to Z16	1N748A	186A797H13
Z17	1N2984B	762A631H01
Z18	1N748A	186A797H13
DIODES		
D1 to D3	1N4816	188A342H10
D4 to D50	TI-55	183A790H09
D52 to D58	TI-55	183A790H09
THERMISTORS		
TH-1	1D051	185A211H05
MISCELLANEOUS		
CR	Telephone Relay	541D514H22
TCB	Telephone Relay	541D514H22
ITB	Telephone Relay	541D514H22
A	Indicator Light (4 Req'd.)	862A634G01
L-1	Inductor	715B986G01
L-2	Inductor	715B986G01

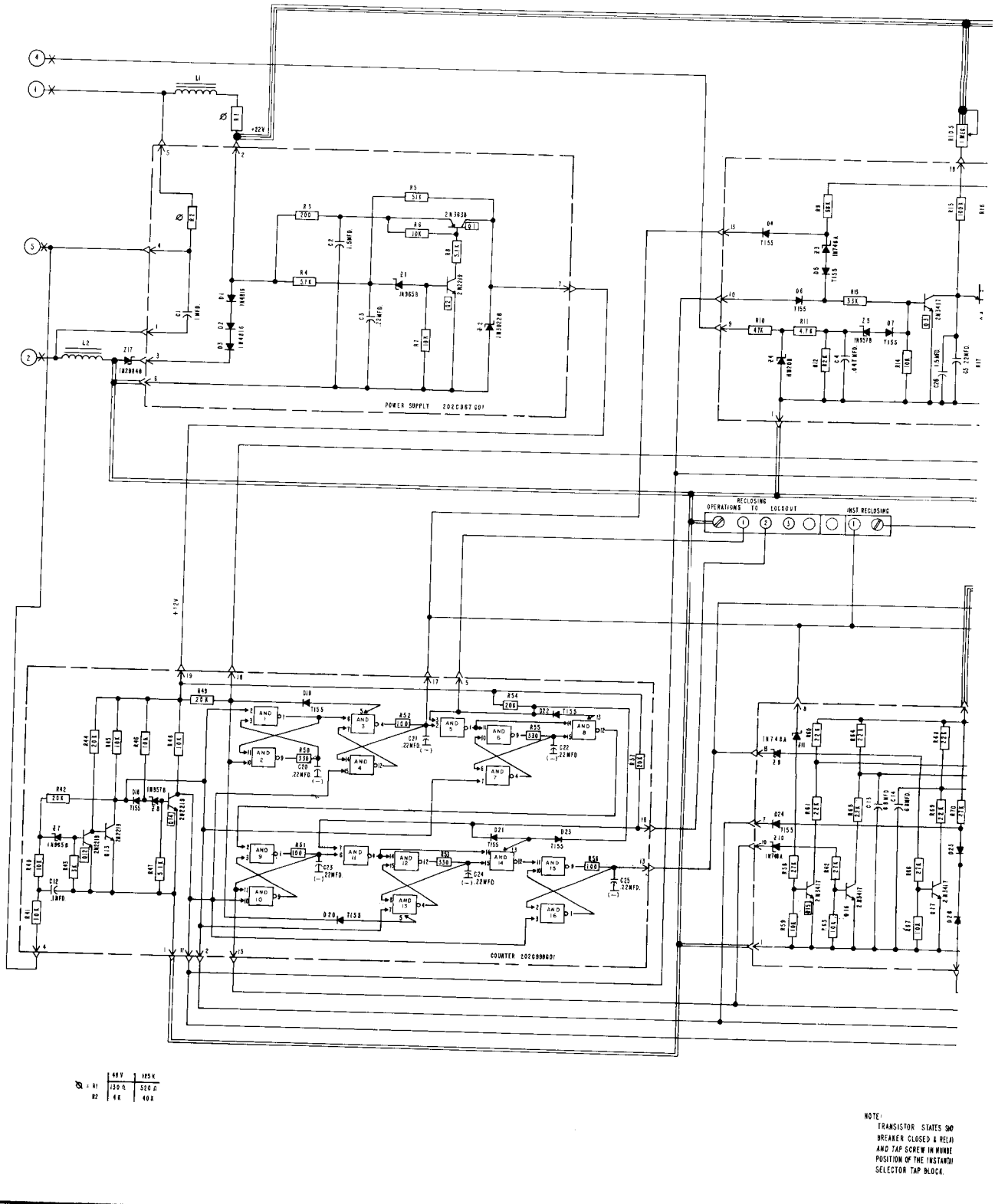
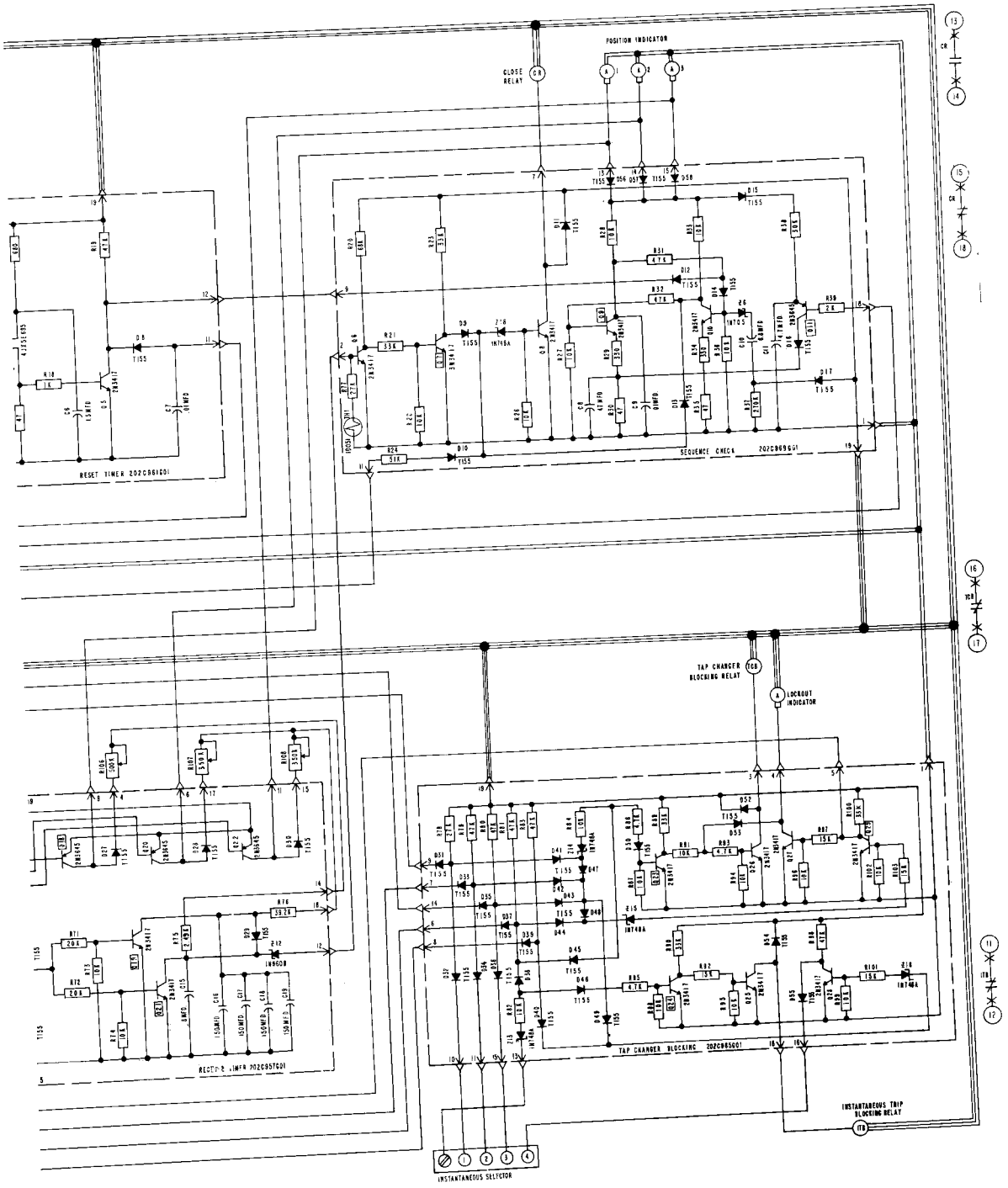


Fig. 1. Internal


POSITION INDICATOR
CLOSE RELAY
SEQUENCE CHECK
RESET TIMER
TAP CHANGER BLOCKING RELAY
LOCKOUT INDICATOR
TAP CHANGER BLOCKING
INSTANTANEOUS TRIP BLOCKING RELAY
INSTANTANEOUS SELECTOR
= NEGATIVE (−)
= REGULATED POSITIVE
= DENOTES NORMALLY CONDUCTING TRANSISTOR
= PRINTED CIRCUIT CONNECTIONS

612F556

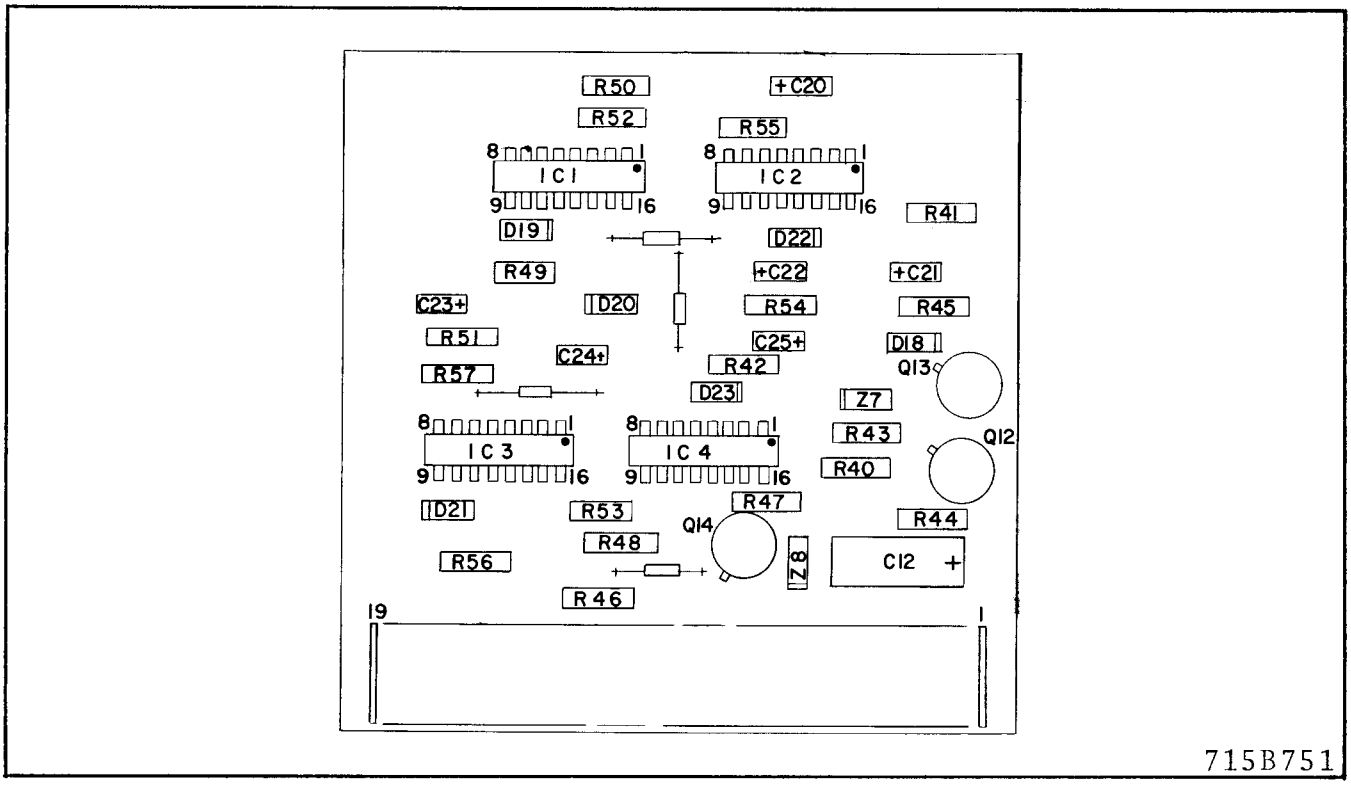


Fig. 3. Counter Module Component Location

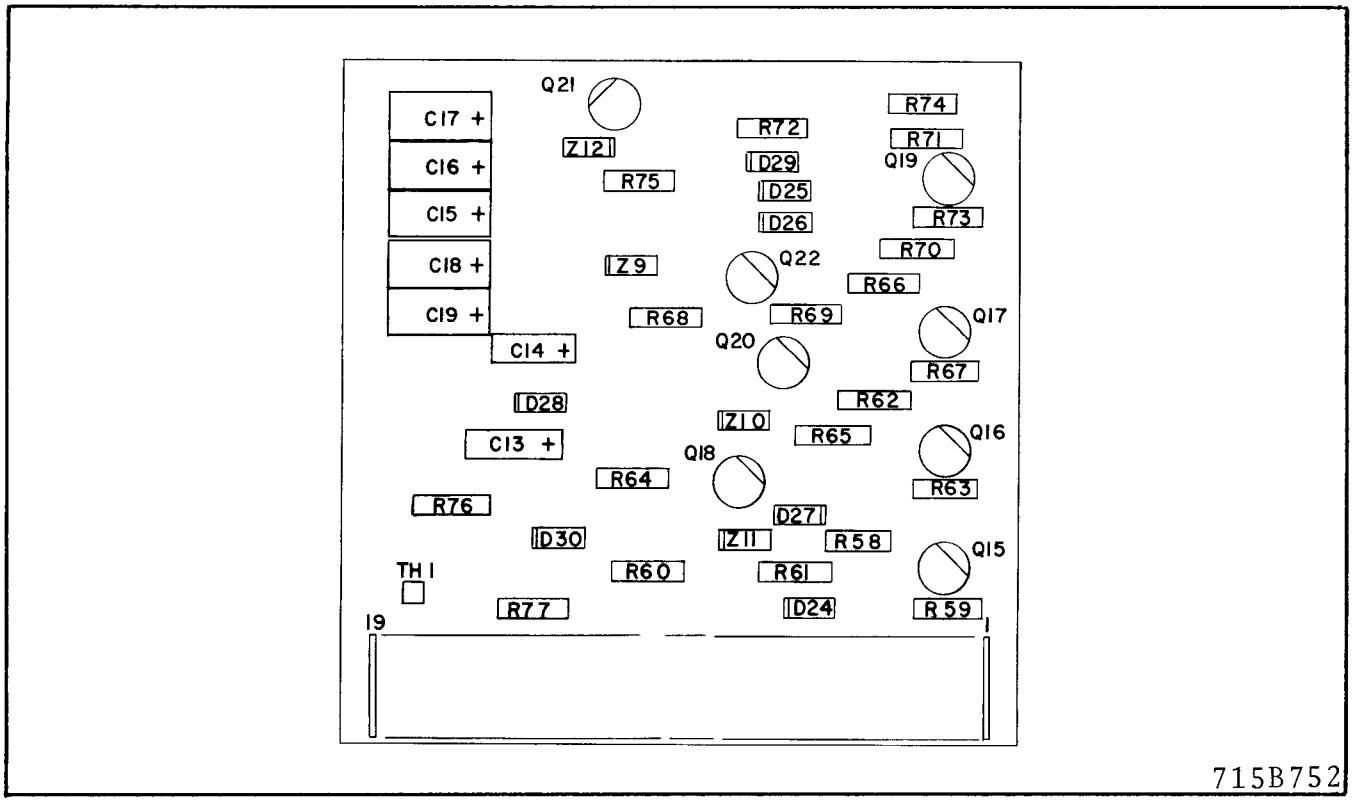
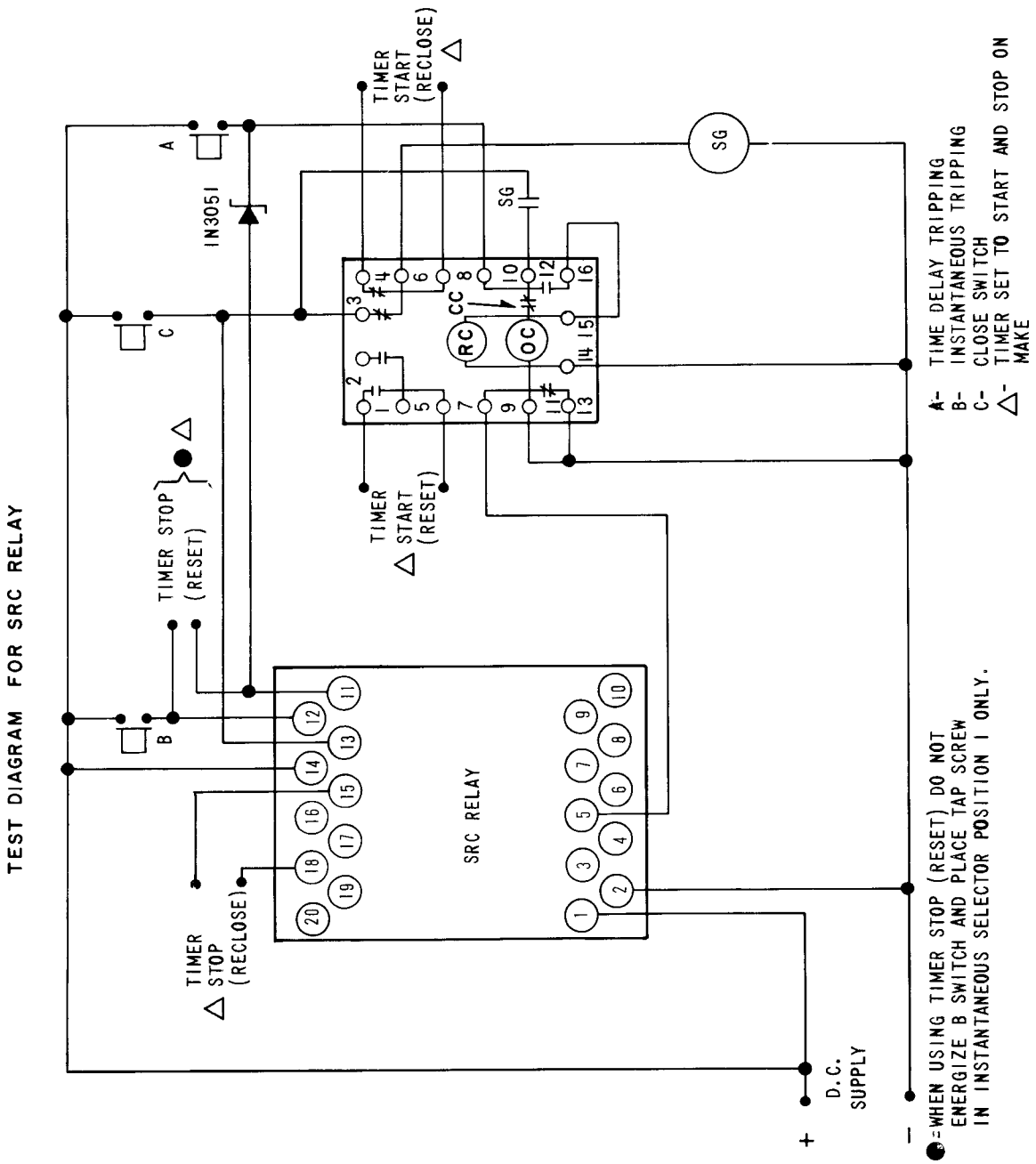
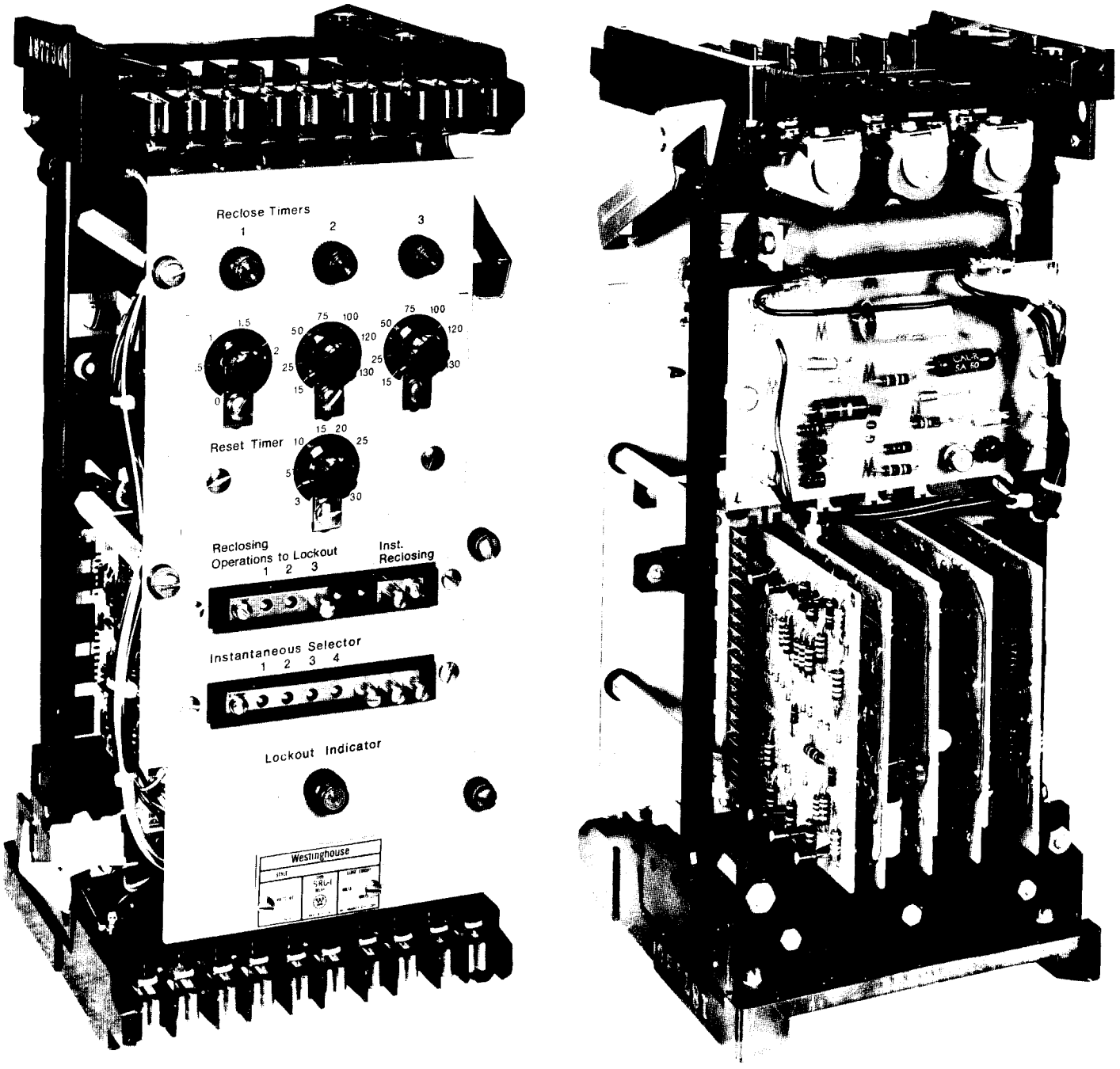


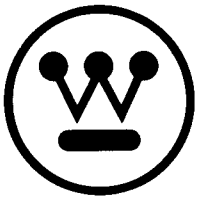
Fig. 4. Reclose Module Component Location



878A518

Fig. 9. Test Diagram


Reclose Timers
1
2
3
Reset Timer
Reclosing Operations to Lockout
1 2 3
Inst. Reclosing
Instantaneous Selector
1 2 3 4
Lockout Indicator
Westinghouse



WESTINGHOUSE ELECTRIC CORPORATION

RELAY-INSTRUMENT DIVISION

NEWARK, N. J.

Printed in U.S.A.