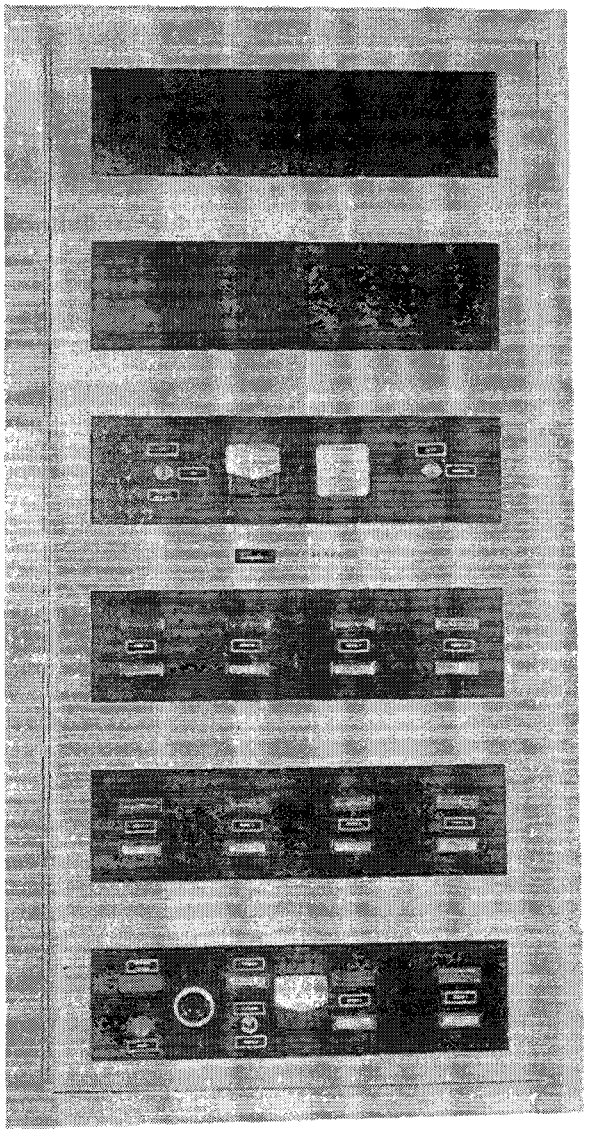
Simplex®

Type 4208 Fire Alarm

Service Instructions



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TYPE 4208 FIRE ALARM SYSTEM

INTRODUCTION

The Type 4208 Fire Alarm System consists of a combination of various panels, modules and peripheral equipment that is designed to meet a customer's particular fire protection requirements.

The "A" and "AX" panels are the control units of the system. They provide the power to operate the alarm, supervision and trouble circuits. The "A" panel automatically transfers to standby battery power if an AC power failure occurs.

Power Requirements

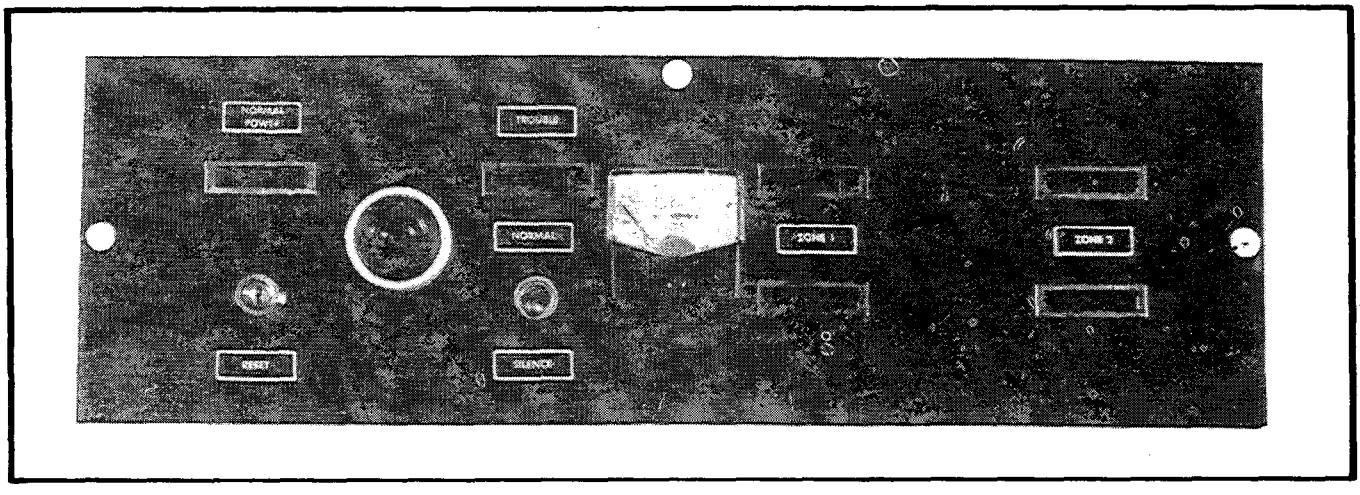
The Type 4208 System operates on 115VAC, 50-60Hz, with 230VAC operation available on request. The system is also adaptable to other power requirements, if required.

CAUTION
ELECTRICAL HAZARD
Remove power when making any internal adjustments or repairs.
Installation and servicing should be performed by qualified technicians.

OPERATING INSTRUCTIONS
TYPE 4208 "A" AND "AX" PANELS

INTRODUCTION

This section outlines the functional operation of the Type 4208 "A" and "AX" panels. Words in capitals refer to labels as they appear on the panels.



TYPE 4208 "A"
PANEL OPERATION

Normal Operation

Green NORMAL POWER lamp illuminated, RESET switch vertical, NORMAL/SILENCE switch in the NORMAL position, red ZONE alarm lamps glow dimly.

Alarm Condition

Red ZONE alarm lamp brightly illuminated, Sonalert sounding, building alarm signaling devices sounding, amber TROUBLE lamp illuminated, milliameter (optional) indicates alarm current.

PROCEDURE:

To silence the building alarm signaling devices, turn the RESET switch clockwise.

To silence the Sonalert, place the NORMAL/SILENCE switch in the SILENCE position.

Restore the alarm initiating device (pull station, heat detector, etc.).

Return the RESET switch to the vertical position. The red ZONE alarm lamp glows dimly, amber TROUBLE lamp out, Sonalert sounds ("ringback").

To silence the Sonalert, place the NORMAL/SILENCE switch in the NORMAL position.

Trouble Conditions

POWER FAILURE

Green NORMAL POWER lamp out, Sonalert sounding, amber TROUBLE lamp illuminated.

PROCEDURE:

To silence the Sonalert, place the NORMAL/SILENCE switch in the SILENCE position.

When the power is restored, the green NORMAL POWER lamp illuminates, amber TROUBLE lamp out, Sonalert sounds ("ring-back").

To silence the Sonalert, place the NORMAL/SILENCE switch in the NORMAL position.

ZONE TROUBLE

(Example: An open occurs in an alarm initiating circuit.)

Amber ZONE lamp illuminated, amber TROUBLE lamp illuminated, Sonalert sounding.

PROCEDURE:

To silence the Sonalert, place the NORMAL/SILENCE switch in the SILENCE position.

When the alarm circuit "trouble" condition is repaired, the amber ZONE lamp goes out, amber TROUBLE lamp out, Sonalert sounds ("ring-back").

To silence the Sonalert, place the NORMAL/SILENCE switch in the NORMAL position.

COMMON SYSTEM TROUBLE

(Example: An open occurs in a supervised panel.)

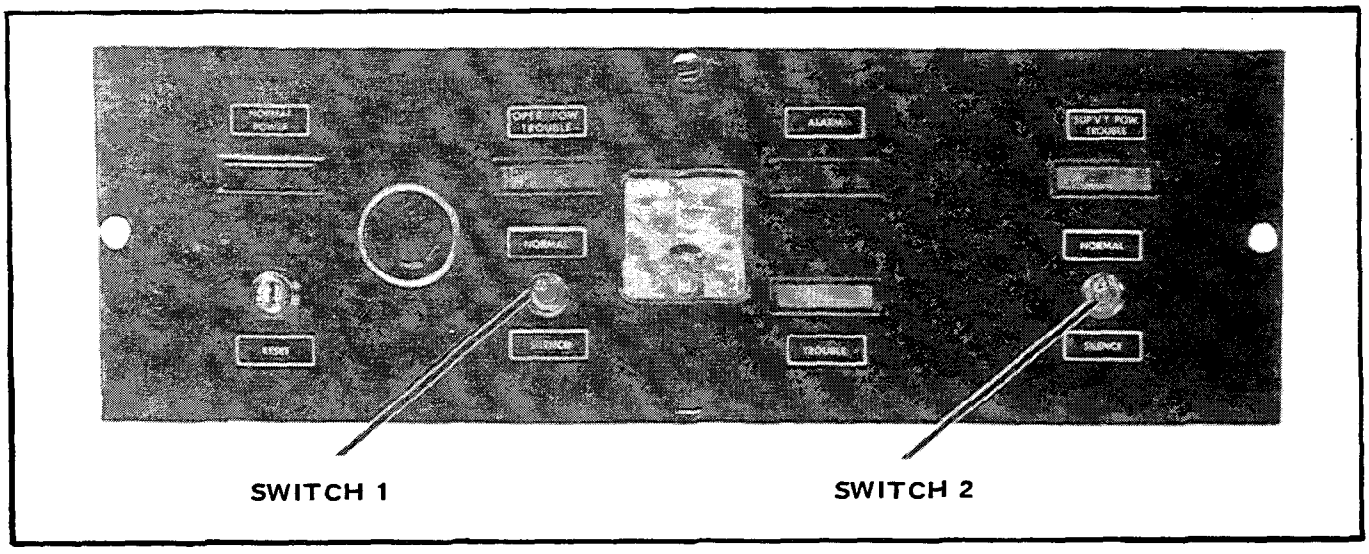
Amber TROUBLE lamp illuminated, Sonalert sounding.

PROCEDURE:

To silence the Sonalert, place the NORMAL/SILENCE switch in the SILENCE position.

When the "trouble" is repaired, the amber TROUBLE lamp goes out and the Sonalert sounds ("ring-back").

To silence the Sonalert, place the NORMAL/SILENCE switch in the NORMAL position.



TYPE 4208 "AX"
PANEL OPERATION

Normal Operation

Green NORMAL POWER lamp illuminated, RESET switch vertical, NORMAL/SILENCE switches (1&2) in the NORMAL position, red ALARM lamp glows dimly.

Alarm Condition

Red ALARM lamp brightly illuminated, Sonalert sounding, building alarm signaling devices sounding, amber OPER. POW. TROUBLE lamp illuminated.

PROCEDURE:

To silence the building alarm signaling devices, turn the RESET switch clockwise. The green NORMAL POWER lamp goes out, red ALARM lamp out.

To silence the Sonalert, place the NORMAL/SILENCE switch (1) in the SILENCE position.

Restore the alarm initiating device (pull station, heat detector, etc.).

Return the RESET switch to the vertical position. The green NORMAL POWER lamp illuminates, the OPER. POW. TROUBLE lamp out and the Sonalert sounds ("ring-back").

To silence the Sonalert, place the NORMAL/SILENCE switch (1) in the NORMAL position.

Trouble Conditions

OPERATING POWER FAILURE

Green NORMAL POWER lamp out, Sonalert sounding, amber OPER. POW. TROUBLE lamp illuminated.

PROCEDURE

To silence the Sonalert, place the NORMAL/SILENCE (1) switch in the SILENCE position.

When operating power is restored, the green NORMAL POWER lamp illuminates, amber OPER. POW. TROUBLE lamp out, Sonalert sounds ("ring-back").

To silence the Sonalert, place the NORMAL/SILENCE switch (1) in the NORMAL position.

SUPERVISORY POWER FAILURE

Amber SUP'V'Y. POW. TROUBLE lamp illuminated, Sonalert sounding.

PROCEDURE:

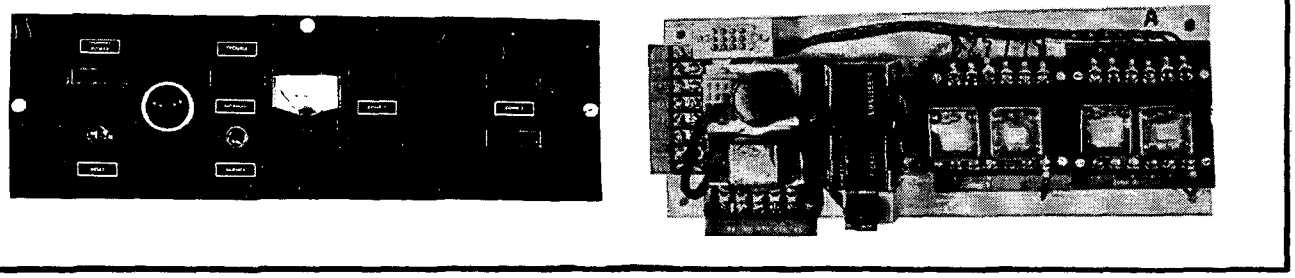
To silence the Sonalert, place the NORMAL/SILENCE switch (2) in the SILENCE position.

When the supervisory power is restored, the SUP'V'Y. POW. TROUBLE lamp goes out and the Sonalert sounds ("ring-back").

To silence the Sonalert, place the NORMAL/SILENCE switch (2) in the NORMAL position.

ALARM CIRCUIT TROUBLE

Similar to "Operating Power Failure" except that the NORMAL POWER lamp remains illuminated.



TYPE 4208 "A" STATION PANEL

INTRODUCTION

The "A" panel is the control center of the 4208 DC system. It contains two independent zone circuits and each zone has its own trouble and alarm circuits. The "A" panel will transfer to stand-by battery power during an AC power failure without interfering with the normal operation of the trouble and alarm circuits.

CIRCUIT OPERATION (FIG. 1)

POWER SUPPLY

Normal Operation

During normal operation, 120VAC is transformed and rectified to 24VDC. This 24VDC is applied to the NORMAL POWER lamp (illuminating the lamp) and also to relay K1 (energizing relay K1).

When relay K1 energizes, its contacts transfer and -24VDC is applied to the -24 terminals in the system.

Note: The +24VDC in the circuit description and in the wiring diagrams is the system "common." The potential at points labeled +24 is actually the "O" reference with respect to -24VDC. The difference in potential between points labeled +24 and -24 is 24V not 48V.

Power Failure Condition

If a power failure occurs, relay K1 de-energizes and the NORMAL POWER lamp goes out. When the K1 contacts transfer, stand-by battery power (-24VDC) is applied to terminals -24VDC and to terminal 5.

Standby battery power is applied to terminals -24VDC to insure normal operation of the system trouble and alarm circuits. Current flows from terminal -BAT. through contacts K1A (4&1) to terminals -24VDC.

The battery also applies -24VDC to terminal 5 to indicate a trouble condition. Current flows from terminal -BAT, through contacts K1A (4&1), diode D9, contacts K1B (8&5) to terminal 5. Refer to "A" Panel – Trouble Condition, paragraph three for detailed circuit description.

When power is restored, relay K1 energizes and its contacts transfer. When the K1A and K1B contacts transfer, -24VDC is removed from terminal 5, the COMMON TROUBLE lamp goes out and the Sonalert sounds ("ring-back"). Refer to "A" Panel – Trouble Repaired for detailed circuit description.

ZONE CIRCUIT

Normal Operation

During normal operation, current from terminal -24VDC splits into two paths.

One path is through resistor R1, terminal 8, the zone ALARM lamp (dimly illuminating the lamp) to terminal +BAT. Resistor R1 limits the current through the ALARM lamp so that the filament glows dimly. This permits visual monitoring of the ALARM lamp filaments.

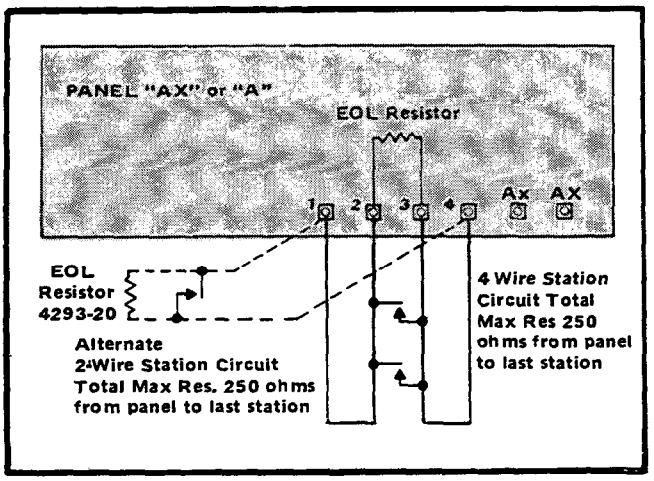


Figure A

The other path depends on whether the alarm initiating devices are connected by the two-wire or the four-wire method.

TWO-WIRE CONNECTION: If the alarm initiating devices are connected by the two-wire method (Fig. "A" broken lines) current flows from terminal -24VDC, through resistor R2, terminal 4, out the building wiring to one side of the alarm initiating devices, through the EOL resistor to the other side of the alarm initiating devices and through the building wiring to terminal 1.

FOUR-WIRE CONNECTION: If the alarm initiating devices are connected by the four-wire method (Fig. "A" solid lines), current flows from terminal -24VDC, through resistor R2, terminal 4, out the building wiring to one side of the alarm initiating devices, and back to terminal 3, through the EOL resistor, out the building wiring to the other side of the alarm initiating devices, and back to terminal 1.

From terminal 1 current flows through zone trouble relay K2 (energizing K2), zone alarm relay K3, the milliammeter (optional), remote reset switch (optional) and the KEY RESET switch to terminal +BAT. EOL resistor R5 limits the current through relays K2 and K3 so that K2 is energized and K3 is de-energized during normal operation.

Trouble Condition

If an open occurs in an alarm circuit, trouble relay K2 de-energizes and its contacts transfer. The transferred K2A contacts via D4 apply -24VDC to the zone TROUBLE lamp and to terminal 5.

Current to the zone TROUBLE lamp flows from terminal -24VDC, through contacts K2A (1&3), terminal 6, the zone TROUBLE lamp (illuminating the lamp) to terminal +BAT.

When -24VDC is applied to terminal 5, the COMMON TROUBLE lamp illuminates and the Sonalert sounds. Current flows from terminal 5 to terminal EL to where the current flow splits into two paths.

One path is through the COMMON TROUBLE lamp (illuminating the lamp) to terminal +BAT.

The other path is through diode D8, the Sonalert (sounding the Sonalert), diode D6, the NORMAL position of the NORMAL/SILENCE switch to terminal +BAT.

(If external trouble bells are used, -24VDC is applied from terminal EL, the NORMAL/SILENCE switch, terminal -TB, the bells (ringing the bells), terminal +TB to terminal +BAT.)

To Silence The Sonalert

The Sonalert can be silenced by placing the NORMAL/SILENCE switch to the SILENCE position. This places a -24VDC counter-potential on the Sonalert from terminal -24VDC through the SILENCE position. With -24VDC on both sides of the device, current flow stops and the device is silenced.

Trouble Repaired

When the system is restored, the -24VDC is removed from terminal 5 which causes the COMMON TROUBLE lamp to go out and the Sonalert to sound again ("ring-back"). When -24VDC is removed from the Sonalert D5-D8 junction, current flows from terminal -24VDC, through the SILENCE position, D7, the Sonalert (sounding the device), D5, R4 to terminal +BAT. The "ring-back" can be silenced by placing the NORMAL-SILENCE switch in the NORMAL position. The "ring-back" feature insures that the NORMAL-SILENCE switch will always be in the NORMAL position during normal operation.

Alarm Condition

When an alarm occurs, the alarm initiating device

contacts make and shunt out the EOL resistor R5. With the EOL resistor out of the circuit, alarm relay K3 energizes and its contacts transfer. When the K3A contacts transfer they apply -24VDC from terminal -24VDC through K3A (1&3) to: (1) illuminate the particular zone ALARM lamp, (2) activate the alarm signaling devices and, (3) latch relay K3.

The zone ALARM lamp illuminates brightly when current flows through diode D3, terminal 8, the ALARM lamp to terminal +BAT.

The alarm signaling devices sound when current flows through diode D2 and out terminal 7 to the signal panel.

Current flows through diode D1, terminal 1, relays K2 and K3 to terminal +BAT to latch relay K3. NOTE: Diode D1 is removed for coded operation and relay K3 does not latch.

Contacts K3B are used for auxiliary purposes.

Reset Circuit

The KEY RESET switch is used to silence the alarm signaling devices and to restore the "A" panel to normal operation after an alarm. Turning the KEY RESET switch 60 degrees clockwise breaks the holding circuit for relays K2 and K3 and causes them to de-energize. The "A" panel operation is identical to a Zone Trouble Condition operation.

After the alarm initiating device contacts have been reset, the KEY RESET switch must be returned to the normal (vertical) position. When the KEY RESET switch is returned to the normal position the "A" panel resumes normal operation and the Sonalert sounds ("ring-back"). Refer to "A" Panel – Trouble Repaired for detailed circuit description.

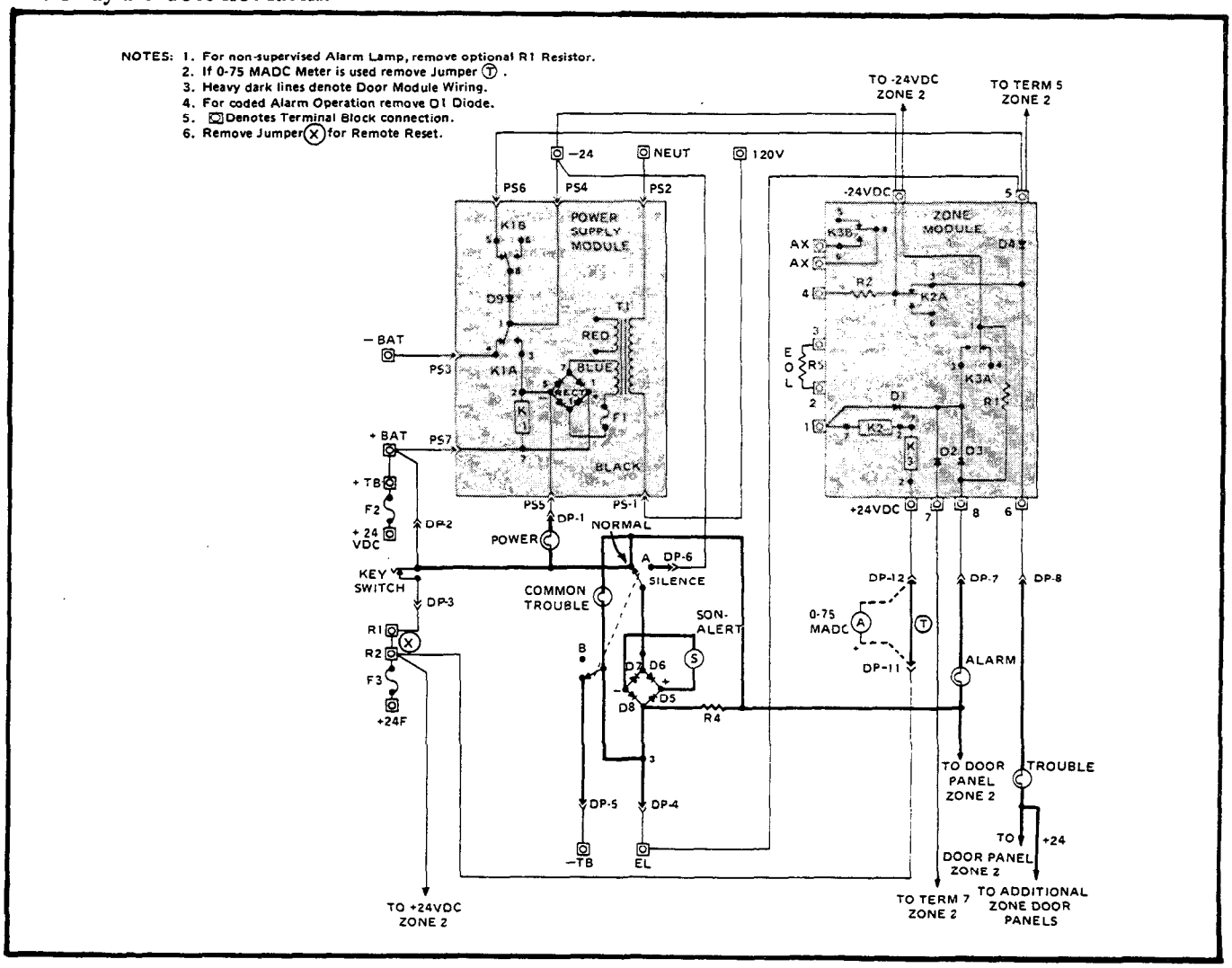
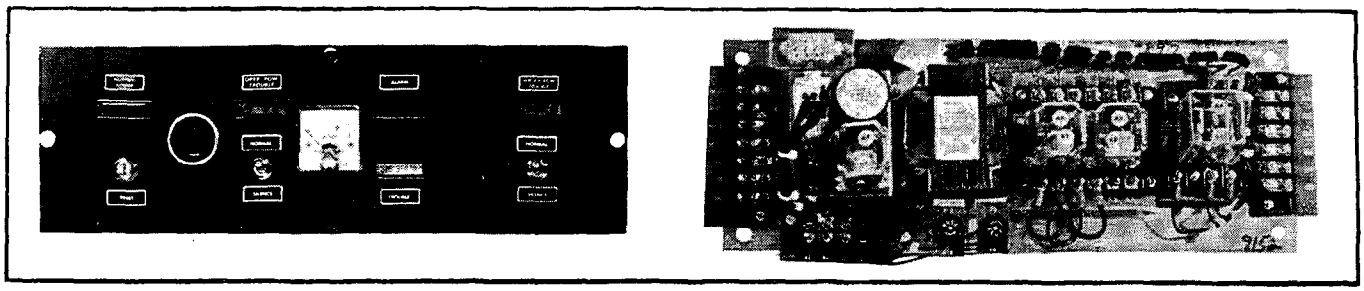


Figure 1



TYPE 4208 "AX" STATION PANEL

INTRODUCTION

NOTE: This circuit description refers to "AX" panels manufactured since 3/24/72 which begin with serial number D77114.

Two phases of 120VAC are used on this type 4208 "AX" panel. One phase, the Operating Power, supplies the power to operate the system. The other phase, the Supervisory Power, is used to provide a "trouble" indication if the Operating Power fails.

CIRCUIT OPERATION (FIG. 3)

POWER SUPPLY

Normal Operation

During normal operation, 120VAC (operating power) is applied through terminal OP, the KEY RESET switch, transformer T1 to terminal NEUT. The transformer applies power to the rectifier which provides -24VDC to the system.

NOTE: The +24VDC in the circuit description and in the wiring diagrams is the system "common." The potential at points labeled +24 is actually 0VDC with respect to -24VDC. The difference in potential between points labeled +24 and -24 is 24VDC not 48VDC.

The -24VDC from the rectifier splits into three paths.

The first path is from the negative side of the rectifier, through the NORMAL POWER lamp (illuminating the lamp) to terminal +24.

The second path is through diode D9, relay K1 (energizing K1), resistor R6 to the positive side of the rectifier.

The third path is to terminal -24VDC.

Also, 120VAC (supervisory power) is applied through terminal SP and terminal 7 to relay K4 energizing relay K4).

Operating Power Failure

If Operating Power fails, relay K1 de-energizes and the NORMAL POWER lamp goes out. Supervisory Power (120VAC) is then applied from terminal SP, through contacts K1A (1&4), terminal EL2 to the NORMAL/SILENCE switch NORMAL position where the current flow splits into two paths.

One path is through the OP. POWER TROUBLE lamp (illuminating the lamp) to terminal NEUT.

The other path is through resistor R4 and the rectifier (which causes the Sonalert to sound) to terminal NEUT. Resistor R4 is used to drop the line voltage to the operating range of the Sonalert (6 to 28VDC).

The Sonalert can be silenced by placing the NORMAL/SILENCE switch in the SILENCE position. When this switch is in the SILENCE position the current path to the rectifier is broken and the Sonalert is silenced.

Operating Power Restored

When Operating Power is restored, the NORMAL POWER lamp illuminates, relay K1 energizes and its contacts transfer. When the K1A contacts trans-

fer, the circuit from terminal SP through the OP. POWER TROUBLE lamp is broken and the OP. POWER TROUBLE lamp goes out.

Simultaneously, 120VAC from terminal SP flows through the transferred contacts K1A (1&3), the NORMAL/SILENCE switch SILENCE position, resistor R4 and the rectifier which causes the Sonalert to sound ("ring-back"). The "ring-back" feature insures that the NORMAL/SILENCE switch will be in the NORMAL position during normal operation.

The Sonalert can be silenced by placing the switch in the NORMAL position.

Supervisory Power Failure

If the Supervisory Power fails, relay K4 de-energizes and its contacts transfer. When the K4A contacts transfer, 120VAC from terminal OP is applied through the K4A contacts and terminal EL5 to the NORMAL/SILENCE switch NORMAL position where the current flow splits into two paths.

One path is through the SUP. POWER TROUBLE lamp (illuminating the lamp) to terminal NEUT.

The other path is through the NORMAL/SILENCE switch, resistor R3 and the rectifier (which causes the Sonalert to sound) to terminal NEUT. Resistor R3 is used to drop the line voltage (120 VAC) to the operating range of the Sonalert (6 to 28VDC).

The Sonalert can be silenced by placing the NORMAL/SILENCE switch in the SILENCE position. When this switch is in the SILENCE position, the current path to the rectifier is broken and the Sonalert is silenced.

Supervisory Power Restored

When the Supervisory Power is restored, relay K4 energizes and its contacts transfer. When the K4A contacts transfer, the current flow path through the SUP. POWER TROUBLE lamp is broken and the lamp goes out.

Simultaneously, 120VAC from terminal OP flows through the transferred K4A contacts, the NORMAL/SILENCE switch SILENCE position, resistor R3 and the rectifier which causes the Sonalert to sound ("ring-back").

The Sonalert can be silenced by placing the switch in the NORMAL position.

ZONE CIRCUIT

Normal Operation

During normal operation, -24VDC from the rectifier is applied to zone terminal -24VDC. From terminal -24VDC the current flow splits into two paths.

One path is through resistor R1, terminal 8, the ZONE ALARM lamp (dimly illuminating the lamp) to terminal +24. Resistor R1 limits current through the ZONE ALARM lamp so that the filament glows dimly. This permits visual monitoring of the lamp filament.

The other path depends on whether the alarm initiating devices are connected by the two-wire or the four-wire method.

TWO-WIRE CONNECTION: If the alarm initiating devices are connected by the two-wire method (Fig. 2 broken lines), current flows from terminal -24VDC, through resistor R2, terminal 4, out the building wiring to one side of the alarm initiating devices, through the EOL resistor to the other side of the alarm initiating devices and through the building wiring to terminal 1.

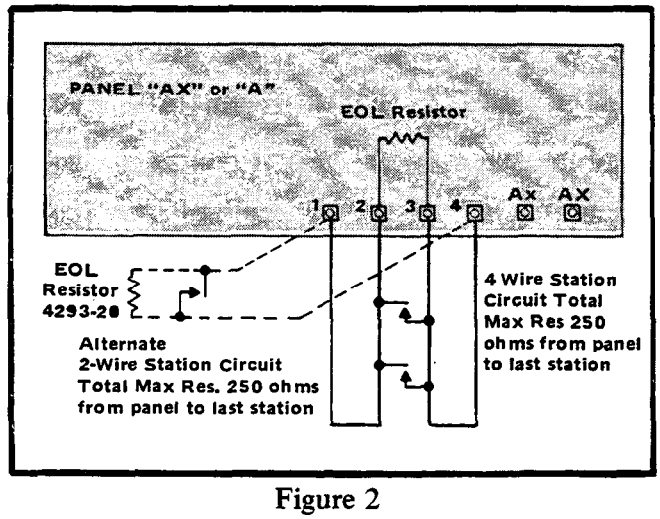


Figure 2

FOUR-WIRE CONNECTION: If the alarm initiating devices are connected by the four-wire method (Fig. 2 solid lines), current flows from terminal

-24VDC, through resistor R2, terminal 4, out the building wiring to one side of the alarm initiating devices, and back to terminal 3, through the EOL resistor, out the building wiring to the other side of the alarm initiating devices, and back to terminal 1.

From terminal 1, current flows through zone trouble relay K2 (energizing K2) and through alarm relay K3. Because of the current limiting effects of the EOL resistor, relay K2 is energized and relay K3 is de-energized.

Trouble Condition

If an open occurs in the alarm circuit, zone trouble relay K2 de-energizes and its contacts transfer. Current from terminal -24VDC flows through contacts K2A (1&3) and splits into two paths.

One path is through terminal 6, the ZONE TROUBLE lamp (illuminating the lamp), to terminal +24. The other path is through diode D4 to terminal 5.

From terminal 5, current flows through diode D10 to relay K1. With a negative potential on both sides of relay K1 it de-energizes and its contacts transfer.

NOTE: Relay K1 is very voltage sensitive and consequently diode D10 is used to equalize the voltage that is dropped across blocking diode D9. This insures that exactly the same voltage is on both sides of relay K1.

When relay K1 de-energizes, supervisory power (120VAC) is applied from terminal SP, through contacts K1A (1&4), terminal EL2, to the NORMAL/SILENCE switch NORMAL position where the current flow splits into two paths.

One path is through the OP. POWER TROUBLE lamp (illuminating the lamp) to terminal NEUT.

The other path is through resistor R4 and the rectifier (which causes the Sonalert to sound) to terminal NEUT. Resistor R4 is used to drop the line voltage to the operating range of the Sonalert (6 to 28VDC).

The Sonalert can be silenced by placing the NORMAL/SILENCE switch in the SILENCE position. When this switch is in the SILENCE position, the current path to the rectifier is broken and the Sonalert is silenced.

Trouble Repaired

When the trouble is repaired, relay K1 energizes and its contacts transfer. When the K1A contacts transfer, the circuit from terminal SP through the OP. POWER TROUBLE lamp is broken and the OP. POWER TROUBLE lamp goes out.

Simultaneously, 120VAC from terminal SP flows through the transferred contacts K1A (1&3), the NORMAL/SILENCE switch SILENCE position, resistor R4 and the rectifier which causes the Sonalert to sound ("ring-back"). The "ring-back" feature insures that the NORMAL/SILENCE switch will be in the NORMAL position during normal operation.

The Sonalert can be silenced by placing the switch in the NORMAL position.

Alarm Condition

When the alarm initiating device contacts are closed, the EOL resistor is bypassed and the increased voltage across alarm relay K3 causes K3 to energize (zone trouble relay K2 is unaffected and remains energized). When alarm relay K3 energizes, its contacts transfer and current from terminal -24VDC flows through contacts K3A (1&3) where it splits into three paths.

The first path is through diode D3, terminal 8, the ZONE ALARM lamp (illuminating the lamp) to terminal +24.

The second path is through diode D2, terminal 7 to the signal panels which causes the alarm signaling devices to operate.

The third path is through diode D1, terminal 1, relays K2 and K3 to terminal +24 to provide a holding circuit for relay K3.

NOTE: Diode D1 is removed for coded operation and relay K3 does not latch.

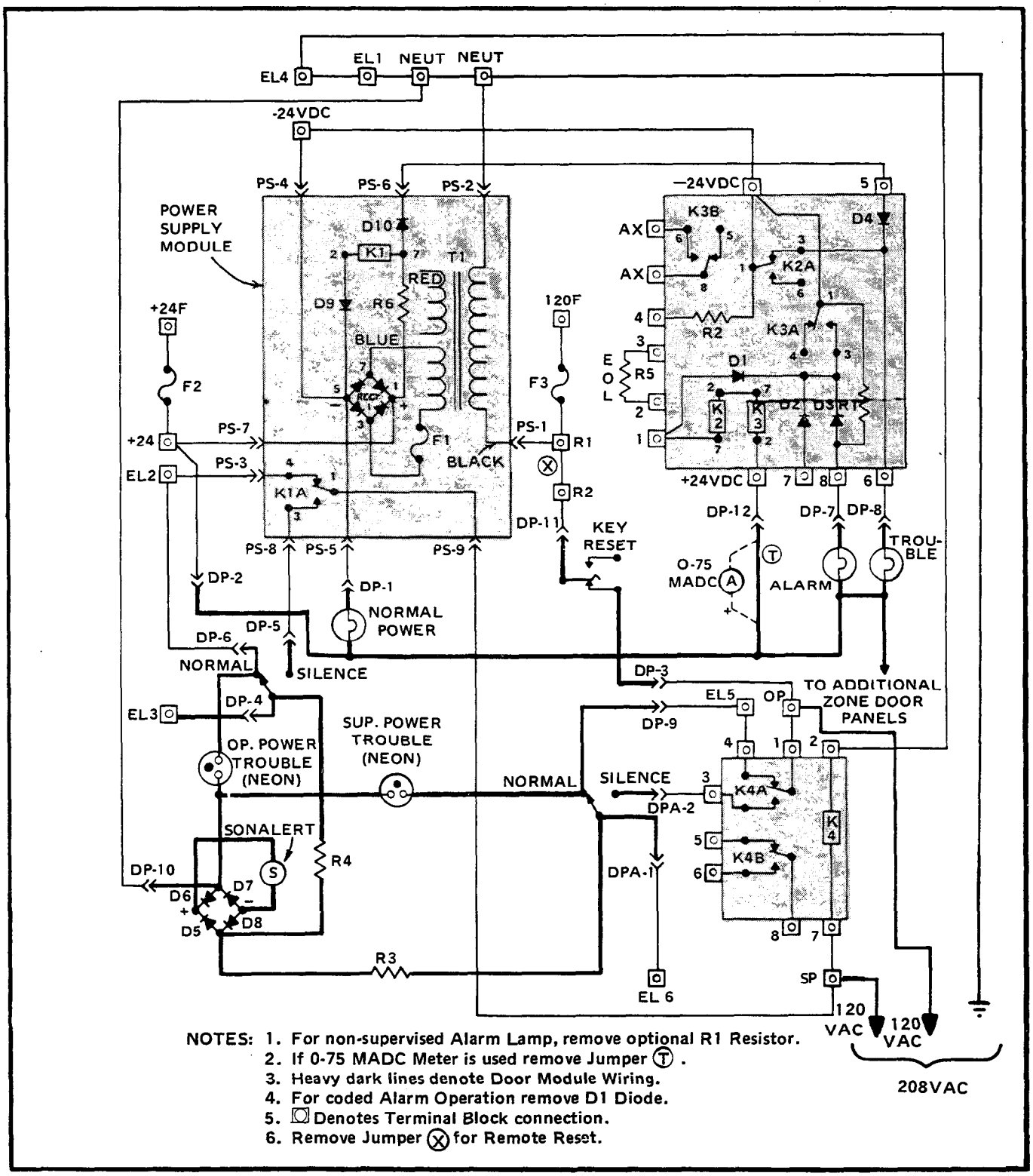
Reset Circuit

The KEY RESET switch is used to silence the alarm signaling devices and to return the system to normal operation after an alarm. When the KEY

RESET switch is turned clockwise, the Operating Power is interrupted, relays K2 and K3 de-energize and the alarm signaling devices are silenced. The circuit functions as in Operating Power Failure.

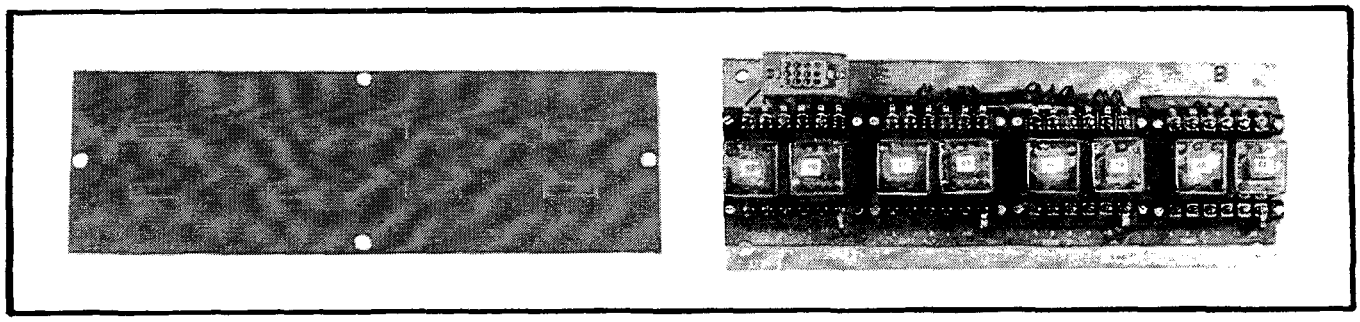
After the KEY RESET switch is operated the alarm initiating device can be reset.

When the alarm initiating device is reset, the KEY RESET switch is returned to the vertical position. The circuit functions as in Operating Power Restored.



NOTES:
1. For non-supervised Alarm Lamp, remove optional R1 Resistor.
2. If 0-75 MADC Meter is used remove Jumper (T).
3. Heavy dark lines denote Door Module Wiring.
4. For coded Alarm Operation remove D1 Diode.
5. ☐ Denotes Terminal Block connection.
6. Remove Jumper (X) for Remote Reset.

Figure 3



TYPE 4208 "B" STATION ZONE PANEL

INTRODUCTION

The "B" panel provides additional zone circuits to the 4208 Fire Alarm System.

A "B" panel can include from one to four zone circuits each with an individual ZONE TROUBLE and ZONE ALARM per zone.

A maximum of 37 "B" panels can be added to a system to give a total of 150 zones to an "A" panel or 149 zones to an "AX" panel.

Trouble Condition

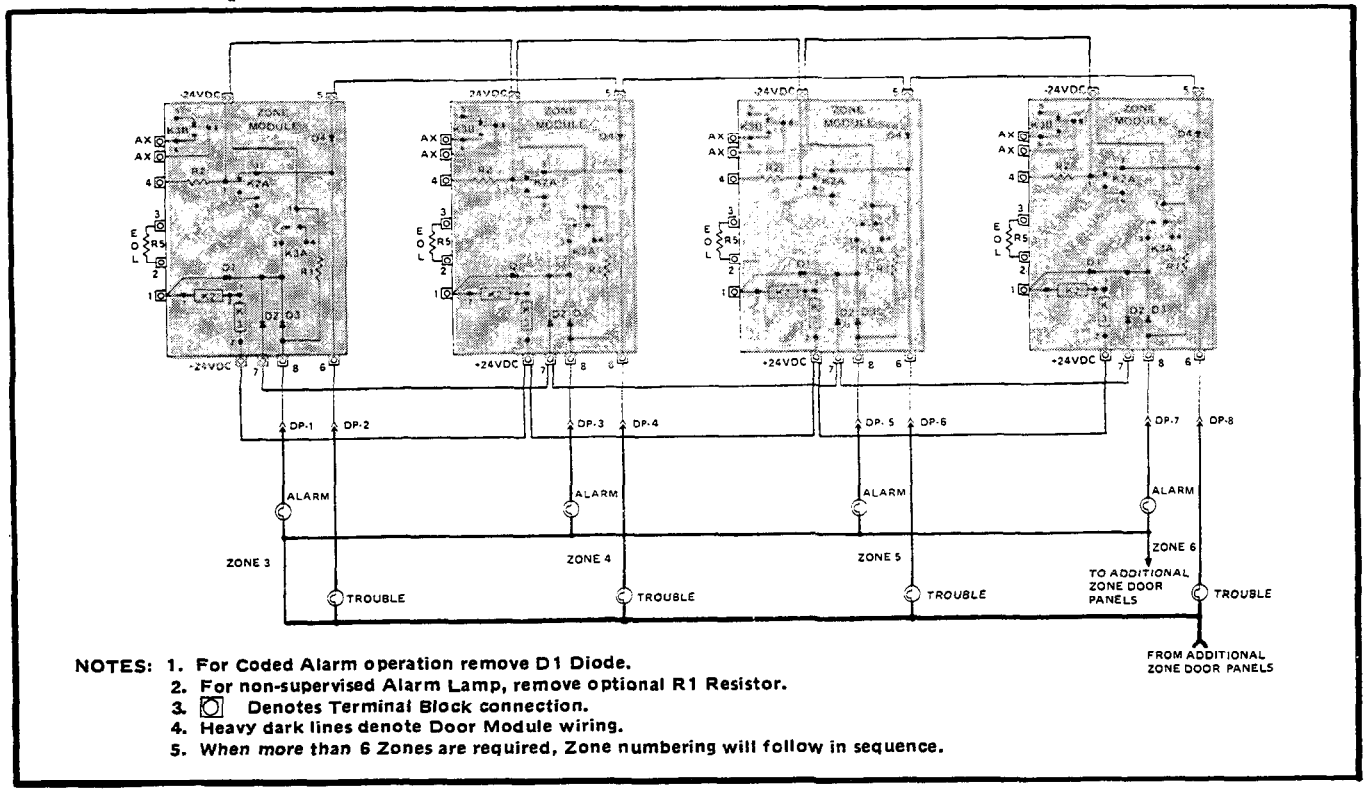
This circuit operates identically to the "A" Panel – Zone Trouble circuit.

Alarm Condition

This circuit operates identically to the "A" Panel – Zone Alarm circuit.

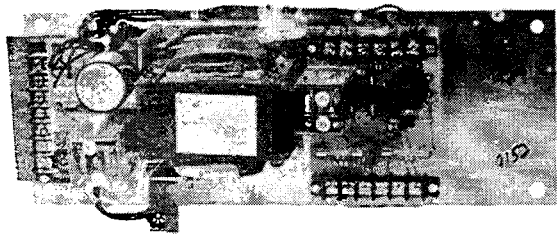
Reset Operation

The KEY RESET switch on the "A" or "AX" panels is used to reset activated "B" panels.



NOTES:
1. **For Coded Alarm operation remove D1 Diode.**
2. **For non-supervised Alarm Lamp, remove optional R1 Resistor.**
3. **Denotes Terminal Block connection.**
4. **Heavy dark lines denote Door Module wiring.**
5. ***When more than 6 Zones are required, Zone numbering will follow in sequence.***

Figure 4



TYPE 4208 "C"
NON-SUPERVISED DC SIGNAL PANEL (OBSOLETE)

GENERAL

The "C" panel is used to control two circuits of alarm signaling devices. It operates similarly to the "N" panel except that the "C" panel has no provisions for supervision. Refer to "N" panel for detailed circuit operation.

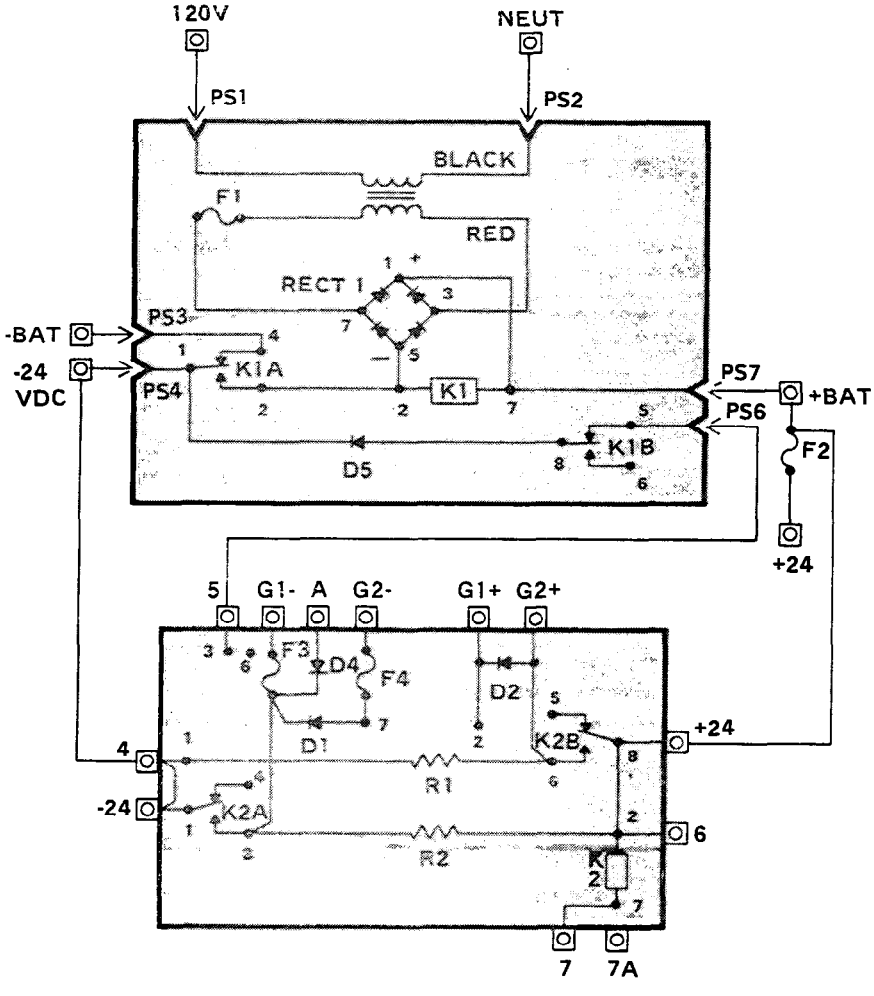
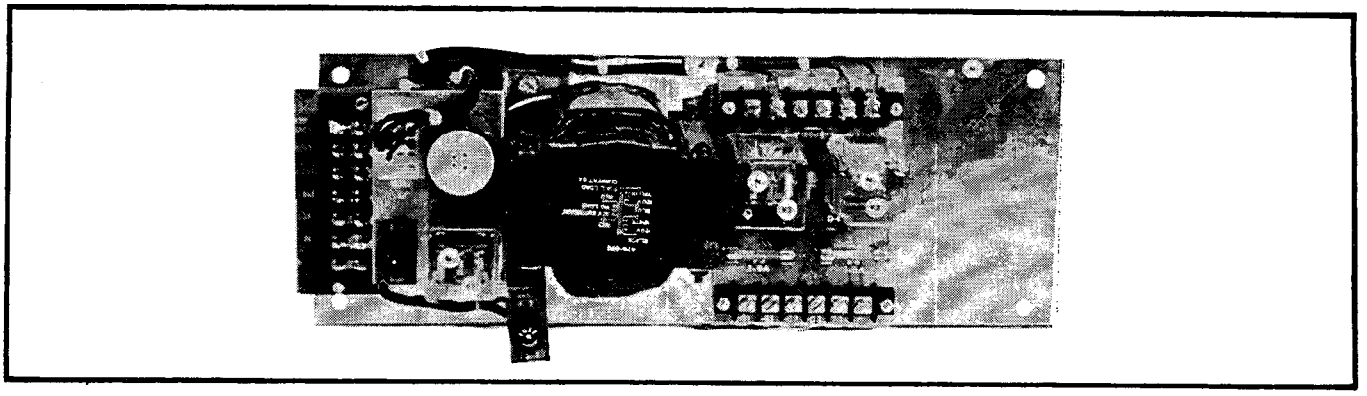


Figure 5



TYPE 4208 "N"
SUPERVISED DC SIGNAL PANEL

INTRODUCTION

The "N" panel controls two supervised circuits of alarm signaling devices. It has an automatic transfer relay (K1) that switches the panel to standby battery power if a power failure occurs.

CIRCUIT OPERATION (FIG. 6)

POWER FAILURE CIRCUIT

Normal Operation

During normal operation, power failure relay K1 is energized by -24VDC from RECT 1.

Power Failure Condition

If a power failure occurs, power failure relay K1 de-energizes and its K1A and K1B contacts transfer. When the K1 contacts transfer, standby battery power (-24VDC) is applied to terminal 5 on the "A" panel which causes the Sonalert to sound and causes the COMMON TROUBLE lamp to illuminate. Current flows from terminal -BAT through contacts K1A (4&1), diode D5, contacts K1B (8&5) to "N" panel terminal 5 and also to "A" panel terminal 5.

Standby battery power is also applied to the "N" panel alarm and supervision circuits to provide for normal operation of these circuits during an AC power failure.

Current flows from terminal -BAT through contacts K1A (4&1), terminal -24VDC, to terminal 4 and the alarm and supervision circuits.

SUPERVISION CIRCUIT ("N" PANEL ONLY)

Normal Operation

During normal operation, the alarm signaling devices are supervised by current that flows from terminal -24, through terminal 4, resistor R1, terminal G2+, to one side of the alarm signaling devices, the EOL diode, the other side of the alarm signaling devices, terminal G2-, fuse F4, supervisory relay K3 (energizing relay K3), terminal G1+, to one side of the second circuit of alarm signaling devices, the EOL diode, terminal G1-, fuse F3 and resistor R2 to terminal +24.

Trouble Condition

If an open occurs in an alarm signaling circuit, supervisory relay K3 de-energizes and its contacts transfer. A -24VDC potential is applied to terminal 5 in the "A" panel which causes the Sonalert to sound and causes the COMMON TROUBLE lamp to illuminate. Current flows from terminal -24VDC through terminal 4, contacts K3A (1&3) and terminal 5 to terminal5 in the "A" panel.

ALARM CIRCUIT

Alarm Condition

When an alarm is initiated within the 4208 Fire Alarm System, -24VDC is applied to "N" panel terminal 7 which energizes alarm relay K2. When relay K2 energizes, its contacts transfer and power is applied to the alarm signaling devices causing them to sound. Current flows from terminal -24, through contacts K2A (1&3) to fuse F3 where the current flow splits into two paths.

One path is from fuse F3 through terminal G1-, the alarm signaling devices (sounding the devices), terminal G1+, diode D2, contacts K2B (6&8), to terminal +24.

The other path is from fuse F3, through diode D1, fuse F4, terminal G2-, the alarm signaling devices (sounding the devices), terminal G2+, contacts K2B (6&8) to terminal +24.

NOTE: Diode D4 and terminal "A" are not used.

Also, unlike other signal panels the supervisory relay (K3) remains energized during an alarm, and a trouble signal is not sent to the "A" panel. Current flows from terminal -24, through contacts K2A (1&3), diode D1, relay K3, diode D2, contacts K2B (6&8) to terminal +24.

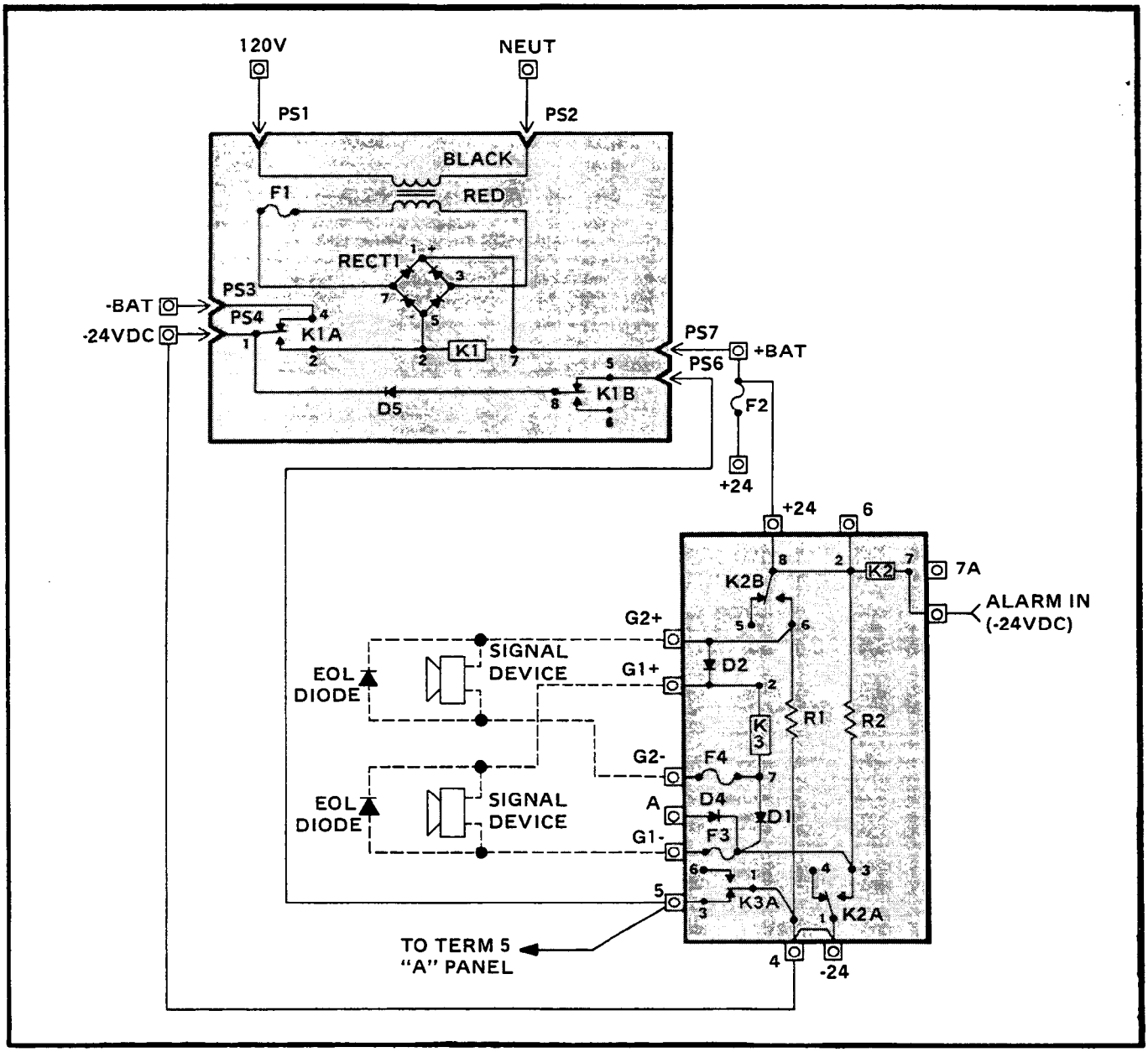
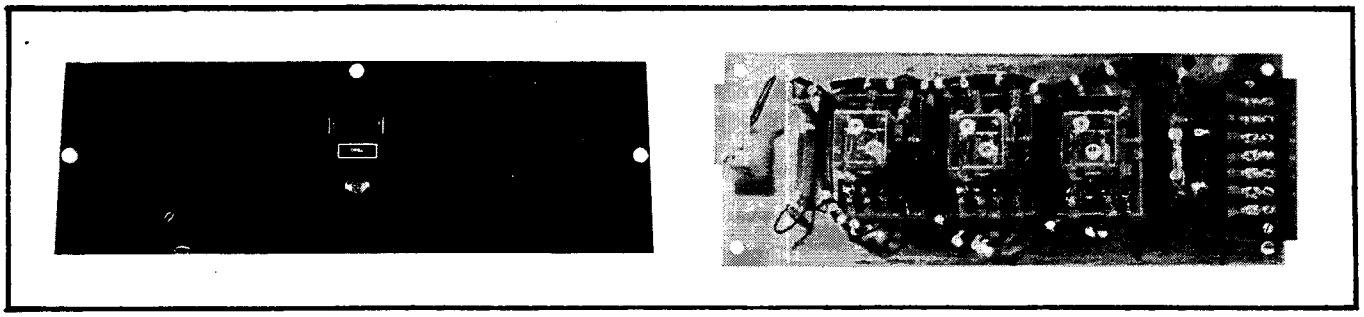


Figure 6



TYPE 4208 "D"
LOCAL ENERGY AND SHUNT CONTROL PANEL

General

The "D" panel is used to control auxiliary municipal fire alarm boxes. It includes a "Drill" function that sounds the local alarm signals without tripping the municipal box. This section is divided into two parts: the first part explains "D" panel operation when it is used with a local energy master box; the second part explains "D" panel operation when it is used with a shunt type municipal box.

"D" PANEL AND LOCAL ENERGY MASTER BOX

INTRODUCTION

In a local energy type system, the lines between the "D" panel and the municipal box are supervised. An open in these lines will cause a system "trouble" condition.

In an alarm condition, current is increased to energize the municipal box. After the alarm condition is restored, the trouble signal will continue to sound until the municipal box mechanism is reset.

NOTE: When a local energy box is used with a "D" panel, the local energy box is connected between terminals 13 and 14. Contacts K1B and K3A are not used.

CIRCUIT OPERATION (FIG. 7)

SUPERVISION CIRCUIT

Normal Operation

During normal operation, -24VDC is applied to terminal 12. Current flows from terminal 12 through the fuse, the L.E.B. (between terminals 13 and 14), resistor R1, trouble relay K3 (energizing the relay) to +24VDC at terminal 11. The L.E.B. is not energized at this time because of the current limiting effects of K3.

Trouble Condition

If an open occurs in the supervised lines, supervisory relay K3 de-energizes and its contacts transfer.

When the K3B contacts transfer, -24VDC is applied from contacts K3B (8&5) to "A" or "AX" panel terminal 5 which causes the COMMON TROUBLE lamp to illuminate and causes the Sonalert to sound. Refer to "A" or "AX" panel – Zone Trouble Condition for detailed circuit description.

ALARM CIRCUIT

Alarm Condition

When an alarm is initiated within the 4208 system, -24VDC is applied to terminal 15 and current flows through alarm relay K1 (energizing the relay), through contacts K2B (5&8) to +24VDC at terminal 11.

When the K1A contacts transfer they shunt supervisory relay K3 and cause it to de-energize. The L.E.B. is activated when the resistance of K3 is removed from the line circuit. Current flows from terminal 12, through the L.E.B. (activating the L.E.B.), resistor R1, contacts K1A (3&1), terminal 8 to +24VDC at terminal 11.

Also, when K3 de-energizes contacts K3B apply -24VDC to panel "A" or "AX" terminal 5 which causes a trouble indication on the panel. Refer to "D" panel Trouble Condition for detailed circuit description.

DRILL CIRCUIT

Drill Operation

When the DRILL switch is closed, drill relay K2 energizes and its contacts transfer. Current flows from terminal 12 through relay K2 (energizing the relay), the closed contacts of the DRILL switch, terminals 1, 8 and 7 to +24VDC at terminal 11.

Also, the DRILL lamp illuminates when the DRILL switch is closed. Current flows from terminal 12, through terminal 2, terminal 1, the DRILL lamp (illuminating the lamp), the closed contacts of the DRILL switch, terminals 1, 8 and 7 to +24VDC at terminal 11.

When contacts K2A transfer, -24VDC is applied from terminal 15 to the signal panels to sound the alarm signaling devices. Current flows from terminal 12, through contacts K2A (1&3) and out terminal 15 to the alarm signaling devices.

When contacts K2B transfer, they break the circuit through alarm relay K1 and prevent K1 from energizing. This keeps the alarm from energizing the municipal alarm box. Refer to "Alarm Condition" for alarm relay K1 operation.

"D" PANEL AND SHUNT TYPE OPERATION (FIG. 7)

NOTE: When a shunt type control is used with a "D" panel, a jumper must be placed between "D" panel terminals 13 and 14. The shunt type box is controlled through "D" panel terminals 16 and 17, and contacts K1B. Also, no supervision is provided for the lines to the municipal alarm box in shunt type systems.

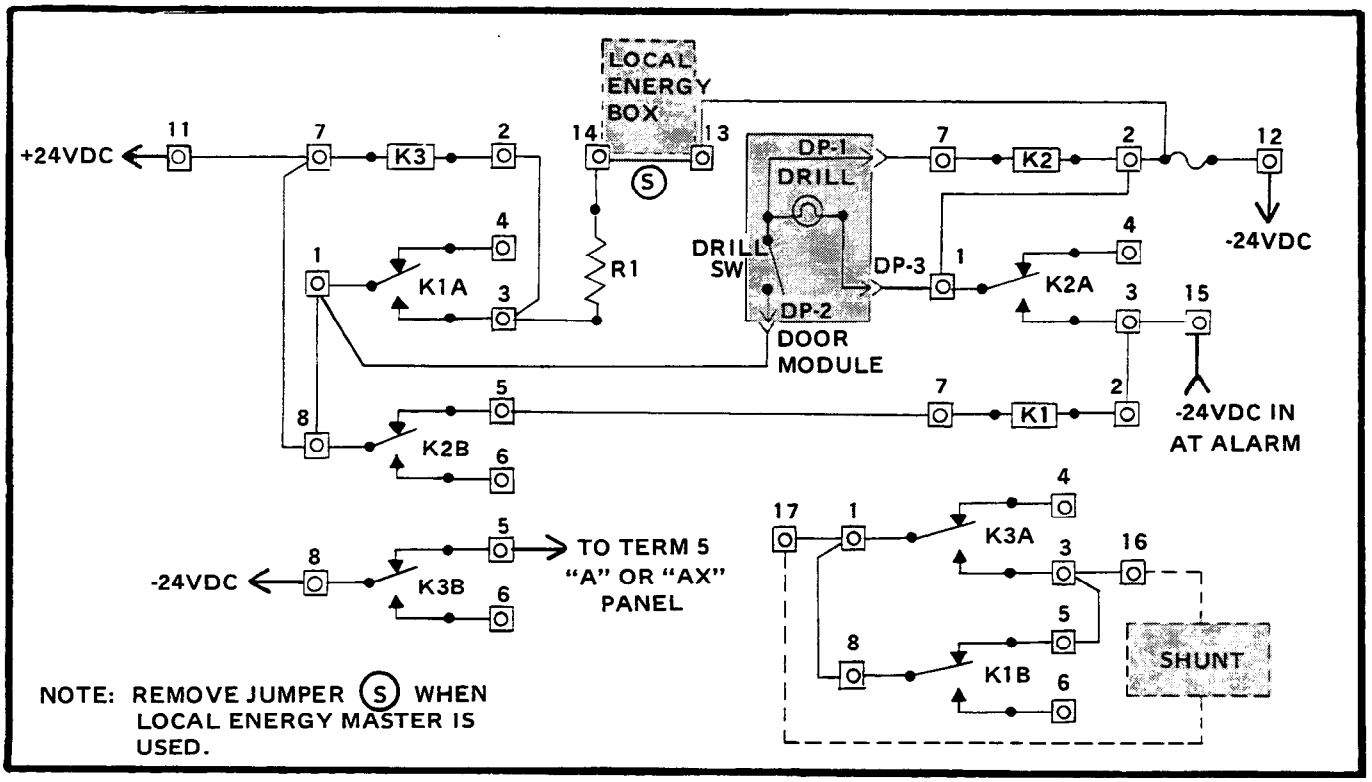


Figure 7

ALARM CIRCUIT

Alarm Condition

When an alarm is initiated within the 4208 system, -24VDC is applied to "D" panel terminal 15 which energizes alarm relay K1.

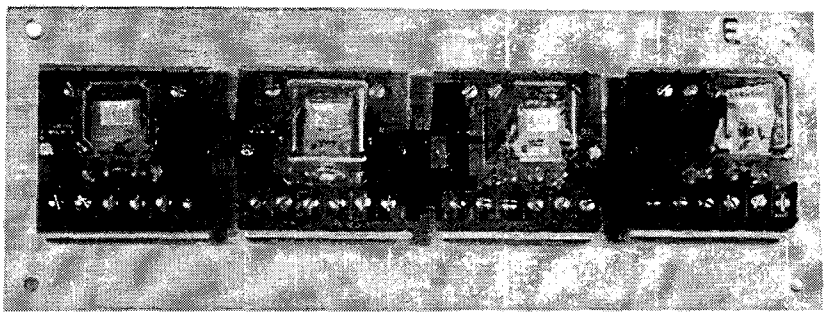
Contacts K1A (1&3) transfer which shunts trouble relay K3 and causes it to de-energize. The transferred K3B contacts apply -24VDC to "A" or "AX" terminal 5 which causes a "trouble" indication on the panel.

Contacts K1B transfer and interrupt the muncipal shunt control circuit, which causes the muncipal shunt control to indicate an alarm condition.

DRILL CIRCUIT

Drill Operation

Identical to L.E.B. Drill Operation.



TYPE 4208 "E"
AUXILIARY RELAY PANEL

GENERAL

The "E" panel provides auxiliary relays to control functions such as fan shutdown and door release. An "E" panel can have a maximum of four relays each of which has three sets of contacts. "E" panel operation is determined by application.

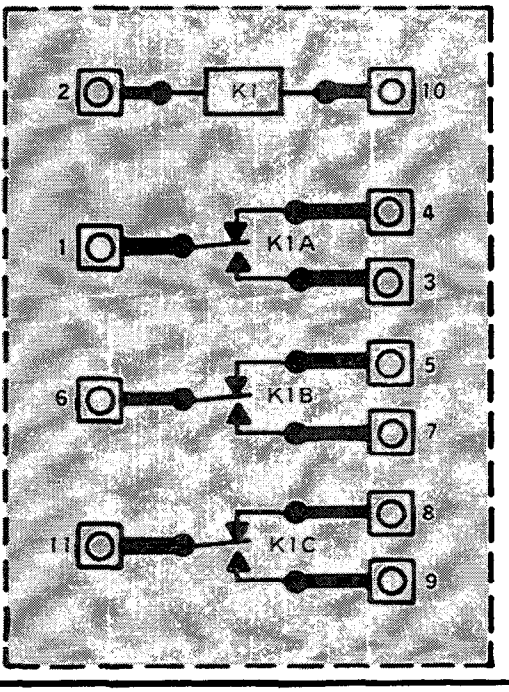


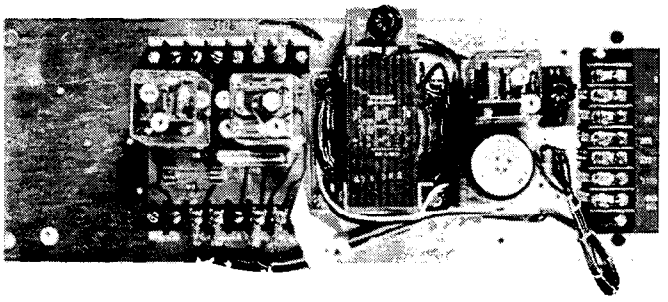
Figure 8

TYPE 4208 "F" PANEL AND "G" PANEL SUPERVISED DC SIGNAL PANELS

INTRODUCTION

The "F" panel and the "G" panel supervise each alarm signaling device and its associated wiring. The panels will automatically provide standby battery operation if the normal AC power should fail.

The "G" panel has a McCulloh circuit which insures that the alarm signals will sound even if one of the alarm circuit wires is defective.



TYPE 4208 "F"
SUPERVISED DC SIGNAL PANEL

CIRCUIT OPERATION (FIG. 10)

POWER FAILURE CIRCUIT

Operation of the "F" panel and "G" panel power supply is similar to the operation of the "N" panel power supply. Refer to "N" panel Power Failure Condition (Page 16) for detailed circuit description.

SUPERVISION CIRCUIT

Normal Operation

During normal operation each alarm signaling device is supervised as current flows from terminal -24VDC through fuse F3, contacts K4B (4&1), terminal 5, the building wiring, terminals 2 of the signaling devices, to terminal 1 of the last device where the current flow splits into two paths.

One path is through the signaling devices via terminals 1 and 4 to "F" panel terminal 3. From terminal 3, current flows through the K3A contacts, supervision relay K2 (energizing K2) to terminal +BAT.

The other path is through the EOL resistor to all terminals 3 of the signaling devices to "F" panel terminal 4. (Current flow through the 3-4 terminal diodes is not sufficient to keep relay K2 energized if an open developed in one of the alarm signaling devices.) From "F" panel terminal 4 current flows through contacts K4A (8&5), diode D1, relay K3 (energizing K3) to terminal +BAT.

Trouble Condition

If an open occurs in any of the alarm signaling devices, supervisory relay K2 de-energizes, its contacts transfer and -24VDC is applied from "F" panel terminal 7 to terminal 5 of the "A" panel which causes a "trouble" condition in the "A" panel. (Refer to "A" panel Trouble Condition for detailed circuit description.) Current flows from terminal -24VDC through terminal 6, contacts K2A (1&4), terminal 7 to "A" panel terminal 5.

If an open occurs in the alarm circuit wiring, relay K3 de-energizes and its K3A contacts open. When the K3A contacts transfer, relay K2 de-energizes and causes a "trouble" condition in the "A" panel. (Refer to the preceding paragraph for a de-

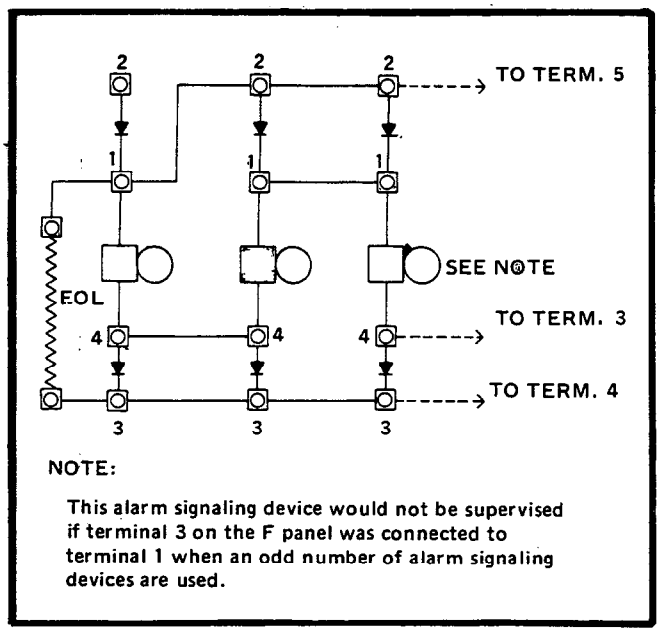


Figure 9

tailed circuit description.)

ALARM CIRCUIT

Alarm Condition

When an alarm is initiated within the 4208 Fire Alarm System, -24VDC is applied to the "F" panel at terminal 9 which causes alarm relay K4 to energize and causes the alarm signaling devices to sound. Current flows from terminal 9 through alarm relay K4 (energizing K4) to terminal +BAT.

The alarm signaling devices sound when alarm relay K4 energizes. Current flows from terminal -24 VDC through fuse F3, contacts K4A (6&8) to terminal 4. From terminal 4, negative current flows to terminal 3 of each alarm signaling device, through the alarm signaling devices (causing them to

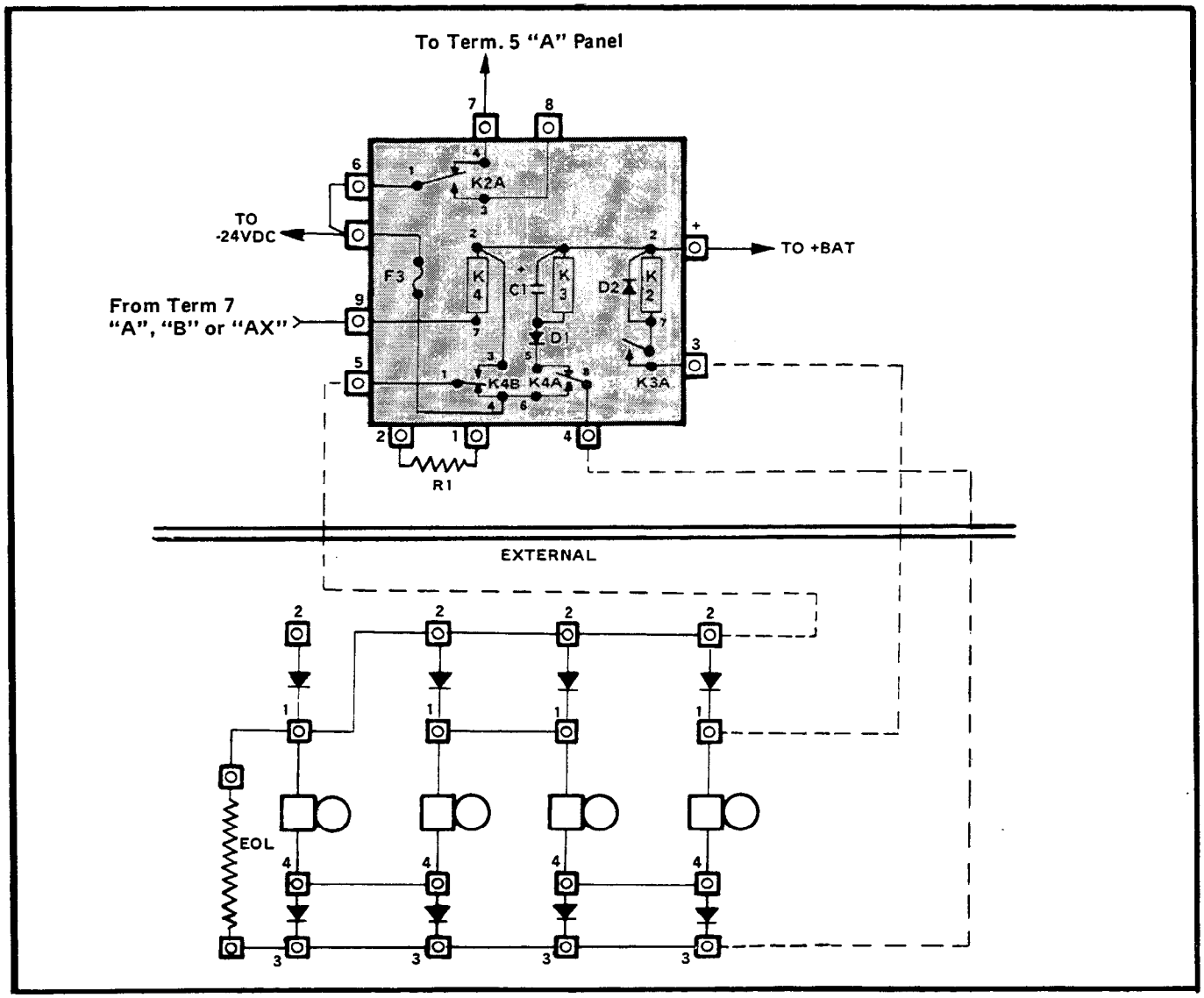


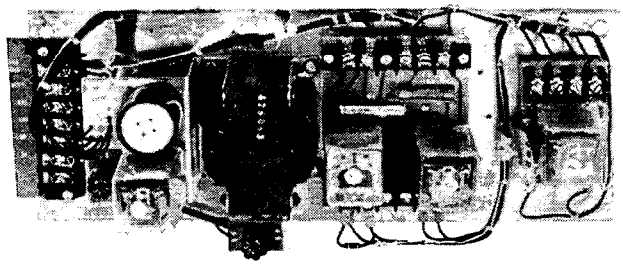
Figure 10

sound), the terminal 1-2 diodes, terminal 5, contacts K4B (1&3) to terminal +BAT.

Simultaneously, relay K3 de-energizes when the K4A contacts transfer. When the K3A contacts transfer, relay K2 de-energizes and causes a "trouble" condition in the "A" panel.

NOTE: When an *even* number of alarm signaling devices is to be used, connect terminal 1 of the first device to terminal 3 of the "F" or "G" panel.

When an *odd* number of alarm signaling devices is to be used, connect terminal 4 of the first device to terminal 3 of the "F" or "G" panel. (This provides supervision to the first device. See Fig. 9).



TYPE 4208 "G"
SUPERVISED DC SIGNAL PANEL
WITH MC CULLOH LOOP

POWER FAILURE CIRCUIT

The Power Failure Circuit for the "G" panel is identical to the Power Failure Circuit for the "F" panel.

CIRCUIT OPERATION (FIG. 11)

SUPERVISION CIRCUIT

Normal Operation

During normal operation, each alarm signaling device is supervised as current flows from terminal -24VDC through terminal -, fuse F3, contacts K4B (4&1), terminal 5, the building wiring, terminals 2 of the alarm signaling devices, to terminal 1 of the last device where the current flow splits into two paths.

One path is through the signaling devices via terminals 1 and 4 to "G" panel terminal 3, the K3A contacts, supervision relay K2 (energizing K2) to terminal +BAT.

The other path is through terminal 1 of the last device, McCulloh contacts K5A (1&4), "G" panel terminal 2, resistor R1, terminal 1, McCulloh contacts K5B (5&8), alarm signal terminals 3, "G" panel terminal 4, contacts K4A (8&5), diode D1, relay K3 (energizing K3) to terminal +BAT.

Trouble Condition

Same as "F" panel "Trouble Condition."

ALARM CIRCUIT

Alarm Condition

When an alarm occurs, -24VDC is applied to the "G" panel at terminal 9 which energizes alarm relay K4 and McCulloh relay K5 and causes the alarm signaling devices to sound. Current flows from terminal 9, through alarm relay K4 (energizing K4) to terminal +BAT. Simultaneously, current also flows from terminal 9, through McCulloh relay K5 (energizing K5) to terminal +BAT.

The alarm signaling devices sound when relays K4 and K5 energize. Current flows from terminal -24VDC, through terminal -, fuse F3, contacts K4A (6&8) to terminal 4 where the current flow splits into two paths.

One path is to terminal 3 of the first alarm sig-

naling device, the other path is through contacts K5B (6&8) to terminal 3 of the last alarm signaling device. (These double paths insure alarm signal operation in case of a break in one of the lines.)

Current flows through the terminal 3-4 diodes, the signaling devices (causing them to sound), the terminal 1-2 diodes to terminals 2 (and terminal 1 of the last device) where the current flow splits into two paths.

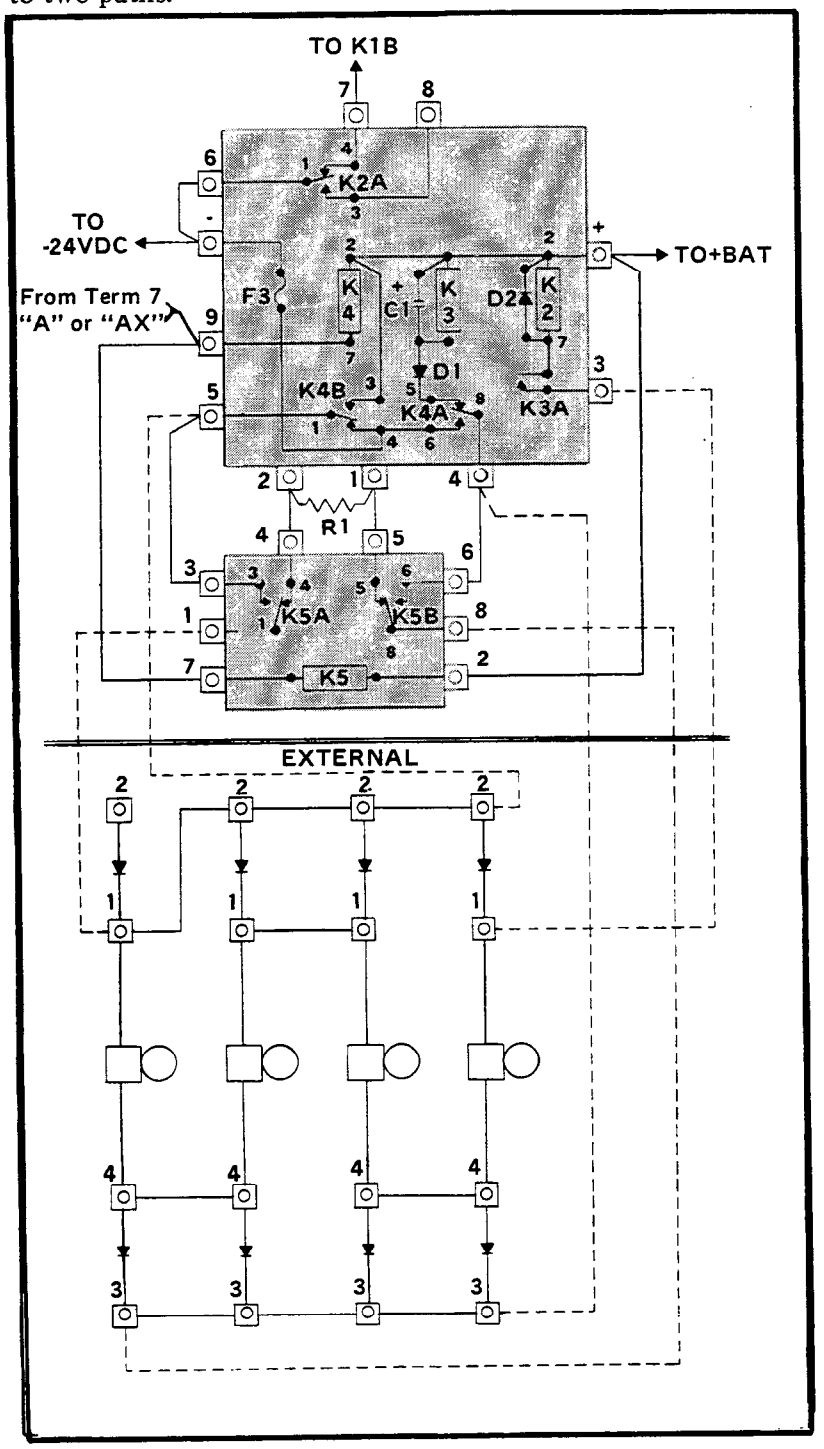


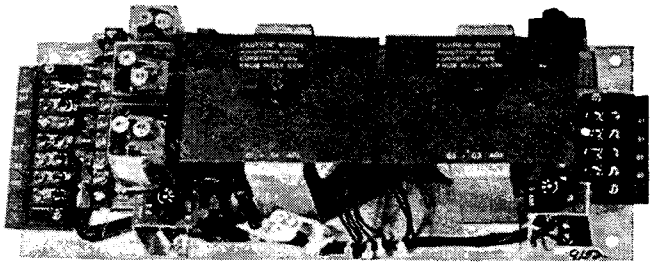
Figure 11

One path is from terminal 2 of the first device, through "G" panel terminal 5, contacts K4B (1&3), to terminal +BAT.

The other path is from terminal 1 of the last device, through contacts K5A (1&3), "G" panel terminal 5, contacts K4B (1&3) to terminal +BAT. (These double return paths insure alarm operation if one of them should fail.)

When alarm relay K4 energizes it causes relays K3 and K2 to de-energize which causes a "trouble" in the "A" panel. (Refer to "F" panel – Alarm Condition for detailed circuit description.)

NOTE: When an *even* number of alarm signaling devices is to be used, connect terminal 1 of the first device to terminal 3 of the "F" or "G" panel. When an *odd* number of alarm signaling devices is to be used, connect terminal 4 of the first device to terminal 3 of the "F" or "G" panel. (This provides supervision to the first device.)



TYPE 4208 "H"
AC SIGNAL PANEL

INTRODUCTION

The "H" panel provides AC power to control the series connected alarm signaling devices. It can operate one signal circuit (H1) or two signal circuits (H2). These circuits can be operated together or separately.

The number of "H" panels used in a system is determined by the system requirements.

CIRCUIT OPERATION (FIG. 12)

NORMAL OPERATION (H2 CIRCUIT)

During normal operation, 120VAC Operating Power is applied to terminal 120V. Current to supervise the signal circuits flows through fuse F1, terminal 3, resistor R2, contacts K3B (5&8), terminal B, terminal G2, the signaling devices, terminal G2, fuse F3, terminal C, contacts K3A (1&4), resistor R1, contacts K2B (5&8), terminal D, terminal G1, the signaling devices, terminal G1, fuse F2, terminal E, contacts K2A (1&4), diode D1, relay K1 (energizing K1), terminal A to terminal NEUT.

Relay K1 energizes, but the signaling devices do not sound because of the current limiting effects of resistors R1 and R2.

TROUBLE CIRCUIT

An open in the alarm signaling devices or in the signal circuit wiring will cause relay K1 to de-energize. When the K1 contacts transfer, -24VDC from terminal TB1 is applied to terminal 5 in the "AX" or "A" panel which causes a trouble condition. Current flows from TB1 through terminal 7, contacts K1D (4&12), contacts K1B (2&10), terminal H, terminal TB2 to terminal 5 in the "AX" or "A" panel. (Refer to "AX" or "A" Panel – Trouble Condition, paragraph three.)

Alarm Condition

When an alarm occurs, -24VDC is applied to terminal AL2 in the "H" panel. At terminal AL2 the current flow splits into two paths.

One path is through terminal 2, relay K2 (energizing K2), terminal G, terminal F to +24VDC at terminal AL1.

The other path is from terminal AL2 through terminals 2 and 1, relay K3 (energizing K3), terminal F to +24VDC at terminal AL1.

When relay K2 energizes its contacts transfer and current is supplied from T1, through terminal 6, contacts K2A (3&1), terminal E, fuse F2, terminal G1, the signaling devices (sounding the devices), terminal G1, terminal D, contacts K2B (8&6), terminal A to terminal NEUT.

When K3 energizes, current is supplied from T2 through terminal 5, contacts K3A (3&1), terminal C, fuse F3, terminal G2, the signal devices (sounding the devices), terminal G2, terminal B, contacts K3B (8&6), terminal A to terminal NEUT.

SIGNAL CIRCUIT

When only one signal circuit is used, connect the signal devices to terminals G1, remove relay K3, and place a jumper between terminals 3&4 on the P. C. module.

Adjust the variable transformer for each circuit as shown.

Signal Device	Voltage	Adjust Current	Max. Qty. Per Circuit
Vibrating Bell	4	1.5	27
Vibrating Bell	12	0.5	9
Vibrating Bell	24	.26	4
Single Stroke Bell	4	2.5	27
Single Stroke Bell	6	1.5	18
Single Stroke Bell	12	1.0	9
Horn	6	2.5	18
Horn	12	1.5	9
Horn	24	1.1	4

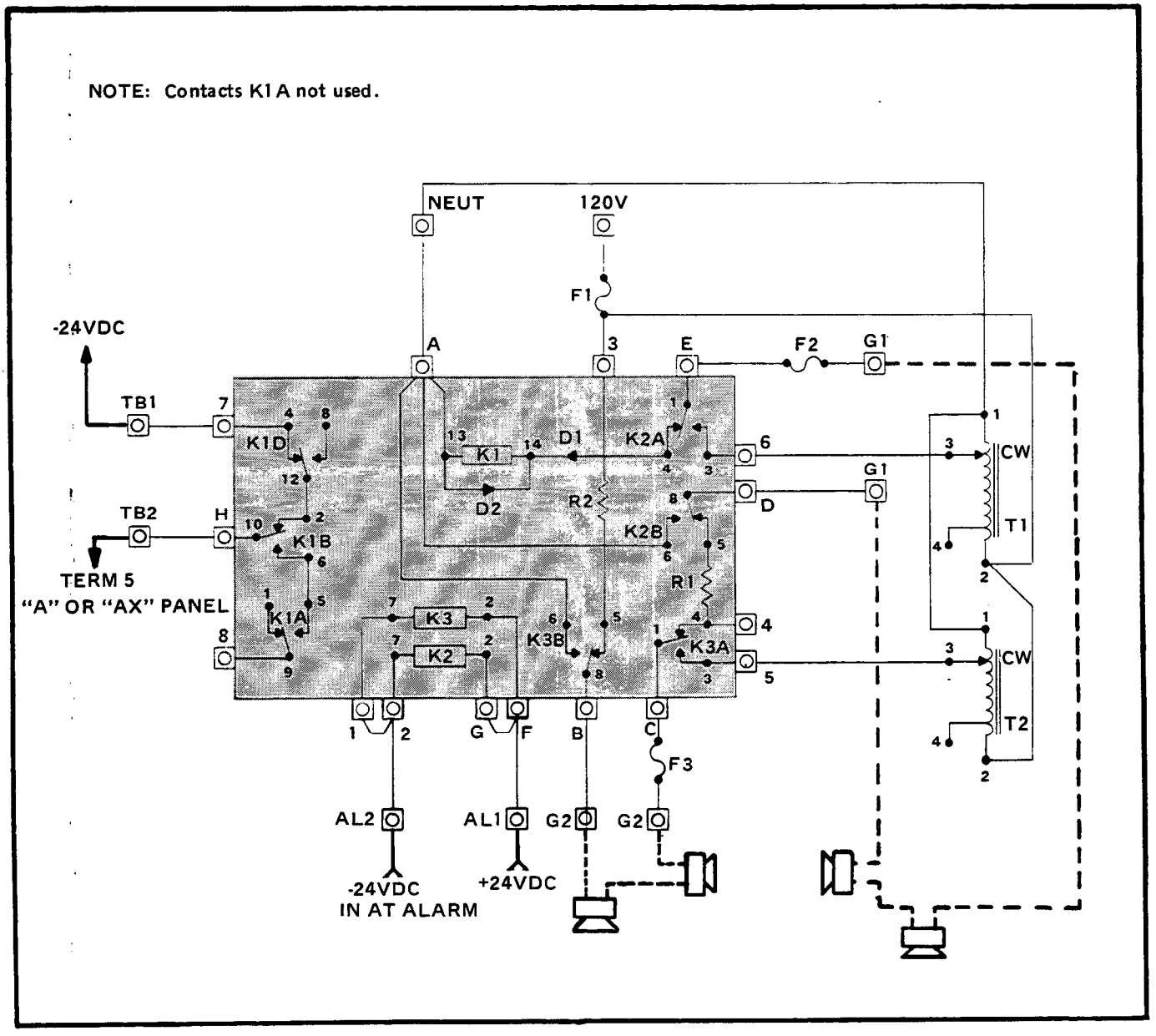
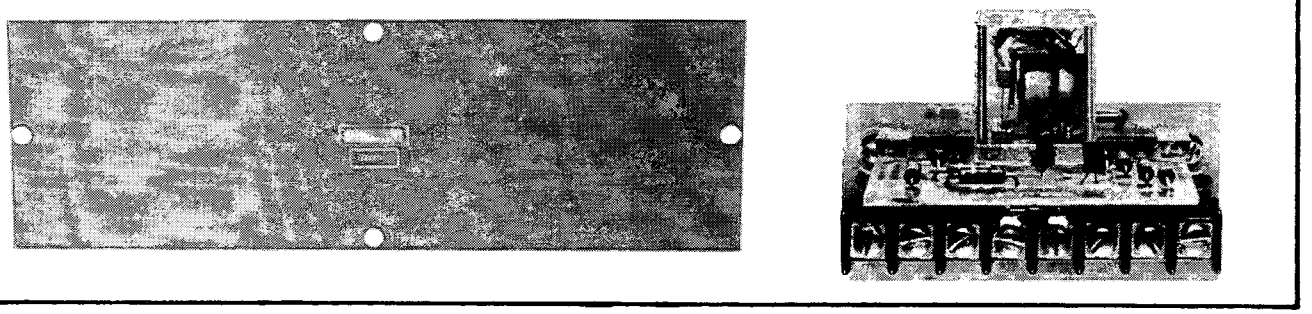


Figure 12



TYPE 4208 "J"
EARTH DETECTION MODULE

INTRODUCTION

The "J" module is designed to detect if -24VDC becomes grounded in the 4208 Fire Alarm System. The "J" module can either be mounted on its own panel or on available space in other panels.

CIRCUIT OPERATION (FIG. 13)

EARTH DETECTION CIRCUIT

Normal Operation

Terminal 21 is connected to the building ground (e.g. cold water pipe). Transistors Q1 and Q2 are biased "off" by a positive potential applied to the base of the transistors from terminal 22 (+BAT.).

Negative Grounded Condition

When -24VDC becomes grounded, a negative potential is applied to the base of transistor Q1 which causes Q1 to conduct.

When Q1 conducts, a negative potential is applied to the base of transistor Q2 which causes Q2 to conduct.

The conduction of Q2 completes the circuit from terminal 27 (-24VDC) through relay K1 and transistor Q2 to terminal 22 (+BAT.) which energizes relay K1.

When relay K1 energizes, its K1A contacts transfer which causes the EARTH lamp to illuminate and causes a "trouble" condition in the "A" or "AX" panel. Current flows from terminal 27 (-24 VDC) through contacts K1A (9&5), to terminal 25 where the current flow splits into two paths.

One path is from terminal 25 through the EARTH lamp (illuminating the lamp) to terminal 22 (+BAT).

The other path is from terminal 25, through diode D5, terminal 24 to terminal 5 on the "A" or "AX" panel. The presence of -24VDC on terminal 5 causes a "Trouble" condition in the "A" or "AX" panel. (Refer to "A" or "AX" panel – Trouble Condition for detailed circuit description.)

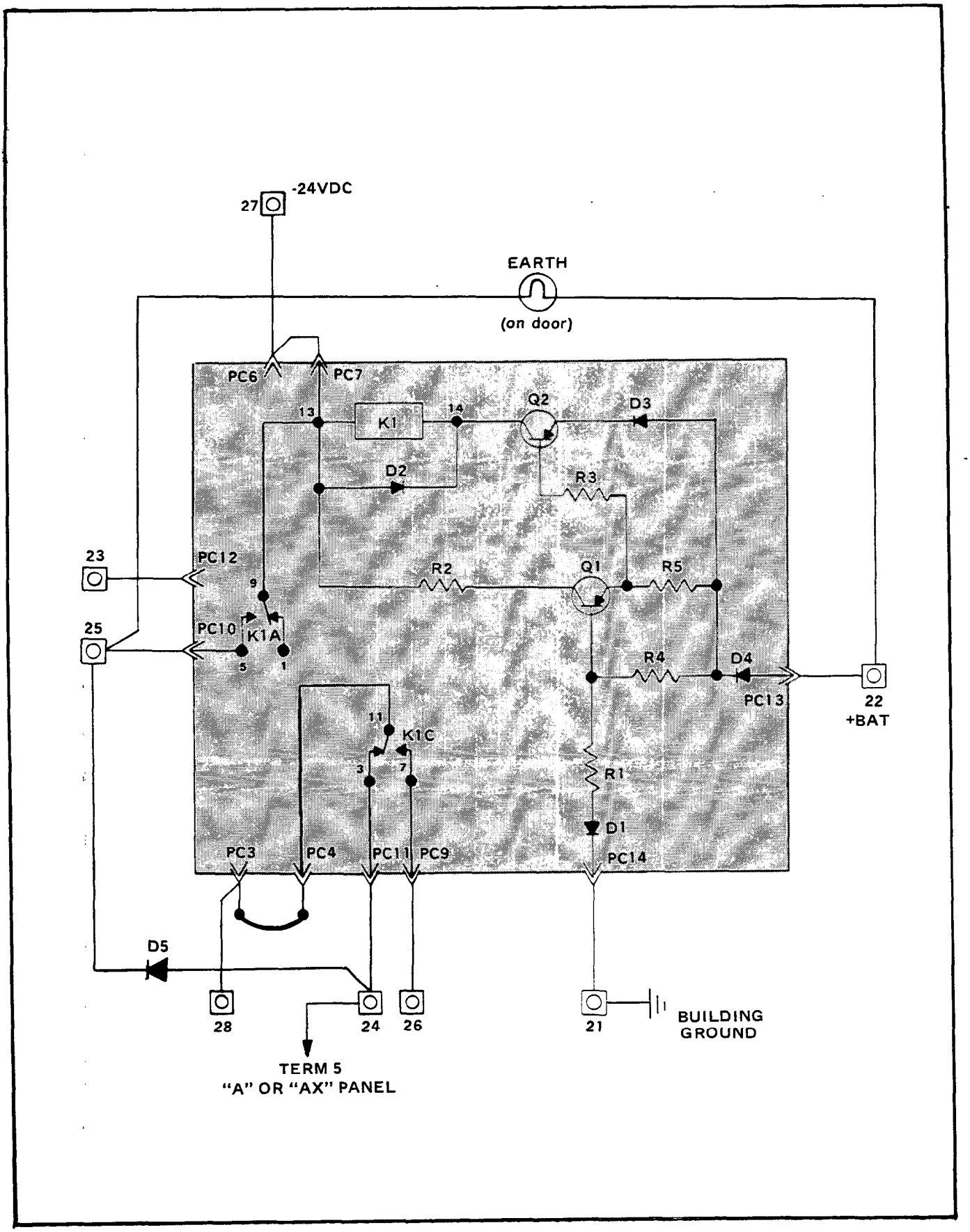
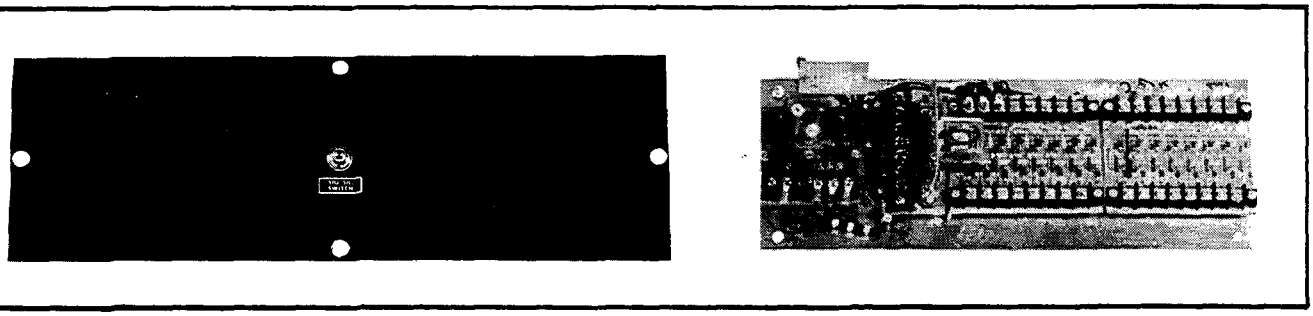


Figure 13



TYPE 4208 "K"
ALARM RESOUND PANEL

INTRODUCTION

The "K" panel allows the alarm signaling devices to be silenced after an alarm while still enabling the devices to be sounded again if *another* alarm zone is activated.

CIRCUIT OPERATION (FIG. 14)

ALARM CIRCUIT

Alarm Condition

An alarm signal (-24VDC) from an "A", "B" or "AX" panel is applied to the "K" panel resound module at an "A" terminal (e.g. 1A, 2A, etc.). The -24VDC allows the associated capacitor to charge. This charging circuit causes a negative potential to be applied momentarily to the base of transistor Q1, turning it on.

When Q1 conducts, a negative potential is applied to the base of transistor Q2 which causes Q2 to conduct. The conduction of Q2 causes relay K1 to energize. Current flows from terminal 27 (-24 VDC) through relay K1 (energizing K1), transistor Q2 diodes D3 and D4 to terminal 22 (+BAT.)

The K1A contacts transfer and apply -24VDC to relay K2 (energizing K2). Current flows from terminal 27, through contacts K1A (9&5), terminal 25, terminal 2, relay K2 (energizing K2), terminal 10 to terminal 22 (+BAT.).

Relay K2 contacts transfer and apply -24VDC to latch K2 and to sound the alarm signaling devices. Current flows from terminal 27, through terminal 3, contacts K2A to terminal 1 where the current flow splits into two paths.

One path provides the latch circuit for relay K2. Current flows from terminal 1 through the SIGNAL SILENCE switch, terminal 2, relay K2 to terminal 10 (+BAT.).

The other path applies power to the alarm signaling devices. Current flows from terminal 1, through terminal 11, contacts K2C, terminal 9 to the signal panel.

To Silence The Alarm Signals

The alarm signals can be silenced by operating the "K" panel SIGNAL SILENCE switch. When the switch is operated, the circuit through relay K2 is opened, K2 de-energizes and its contacts transfer. The K2A contacts break the latch circuit and the K2C contacts break the circuit to the alarm signaling devices.

Although the alarm signaling devices were silenced after the previous alarm, they can be sounded again if an alarm is initiated from *another* zone. Another alarm signal would charge its associated circuit capacitor and cause an alarm condition in the "K" panel as previously described.

Reset Operation

The "K" panel is reset by operating the KEY RESET switch on the "A" or "AX" panel. When the KEY RESET switch is operated it allows the charged capacitor(s) to discharge through resistor R1.

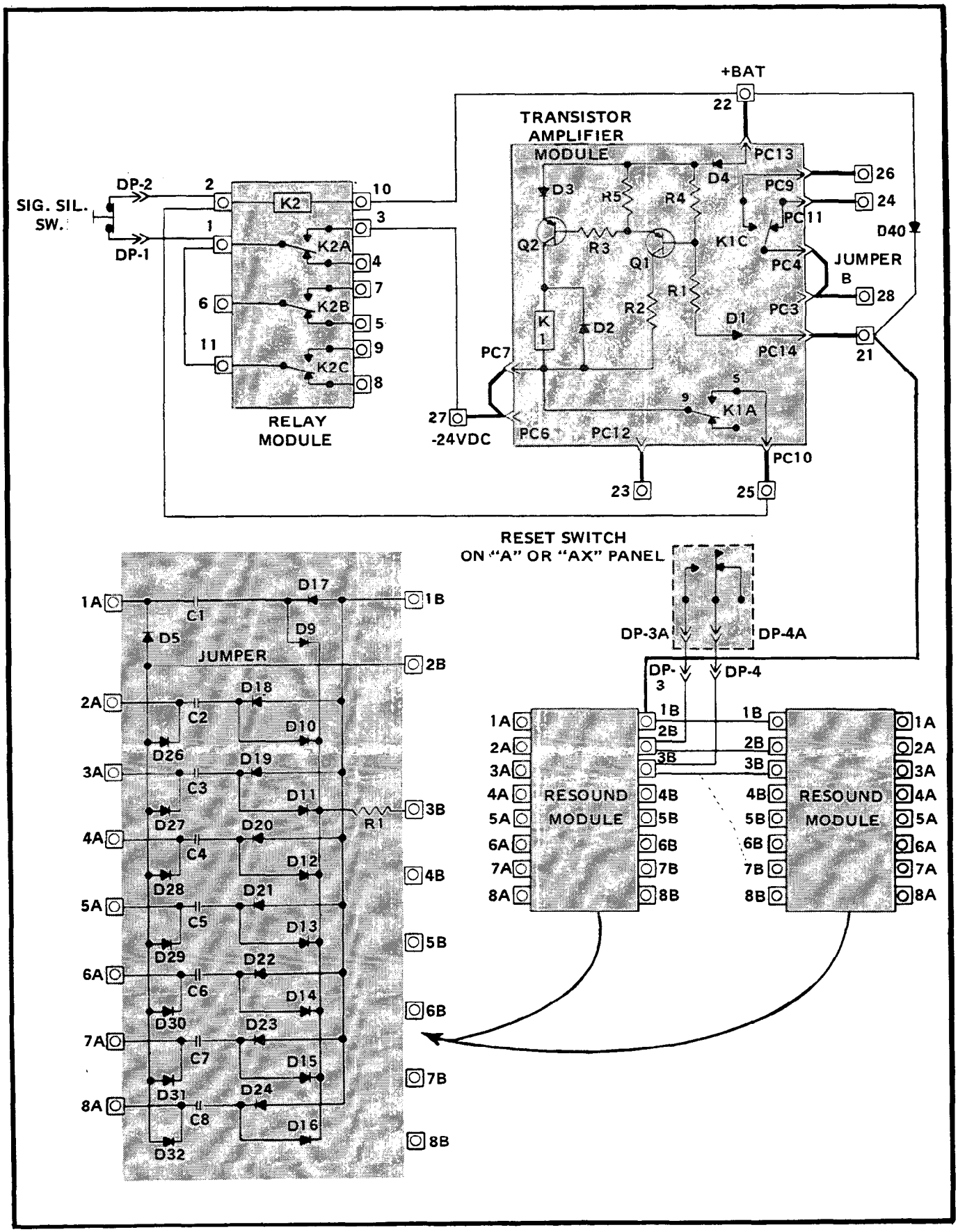
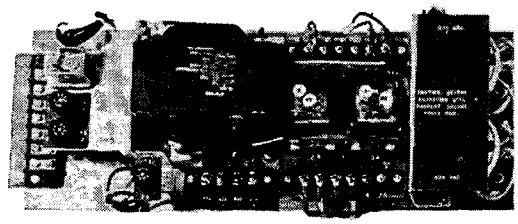


Figure 14



TYPE 4208 "L"
SERIES DC SIGNAL PANEL

INTRODUCTION

The "L" panel is designed to operate series connected, single stroke DC bells or chimes. All signal circuit wiring and signal coils are supervised during normal operation. Each panel has its own power supply and can operate two signal circuits or each circuit can be activated separately.

CIRCUIT OPERATION (FIG. 15)

Normal Operation

During normal operation, relay K1 is energized and supervisory current -24VDC flows from the rectifier through contacts K1B (6&10) to terminal -24 where the current flow splits into two paths.

One path is from terminal -24, to PC7 on the Trouble Module.

The other path is from terminal -24, through resistor R2, contact K3D (4&12), terminal G2+, terminal G2A+, the series signaling devices, terminal G2A-, rheostat R4, terminal G2-, fuse F5, contacts K3A (9&1), resistor R1, contacts K2A (1&9), terminal G1+, terminal G1A+, the second circuit of series signaling devices, terminal G1A-, rheostat R3, terminal G1-, fuse F4, contacts K2D (12&4) to PC4 on the Trouble Module. Current flows through the Trouble Module and out PC2 to terminal +24.

Trouble Module - (Fig. 16)When -24VDC is applied to PC4 from the signal circuit, current flows through diode D1 and resistor R4 and a negative potential is applied to the base of transistor Q1 turning Q1 on.

With Q1 "on" a positive potential is applied to the base of Q2 (from PC2 via R1 and Q1) keeping Q2 "off."

With Q2 "off", a negative potential is applied to the base of Q3 keeping Q3 "off" (from PC7 via R6, R7).

Power Failure Condition (Fig. 15)

If a power failure occurs, relay K1 de-energizes and its contacts transfer. The -24VDC from terminal -BAT is applied to terminal 5 through contacts K1A (1&9) and diode D2 which causes a "trouble" condition in the "A" panel. Also, -24VDC is applied to the panel to provide power for normal operation. Current flows from terminal -BAT, through fuse F3, contacts K1D (4&12) to terminal -24. Contacts K1B and K1C perform the same function as the K1D contacts.

Trouble Condition (Fig. 16)

If an open occurs in the signal loop, the negative potential (from PC4) is removed from the base of Q1 which turns "off" Q1.

With Q1 "off", a negative potential is applied to the base of Q2 which turns "on" Q2 (-24VDC from PC7 via R5). When Q2 is "on" a positive potential is applied to the base of Q3 which turns "on" Q3.

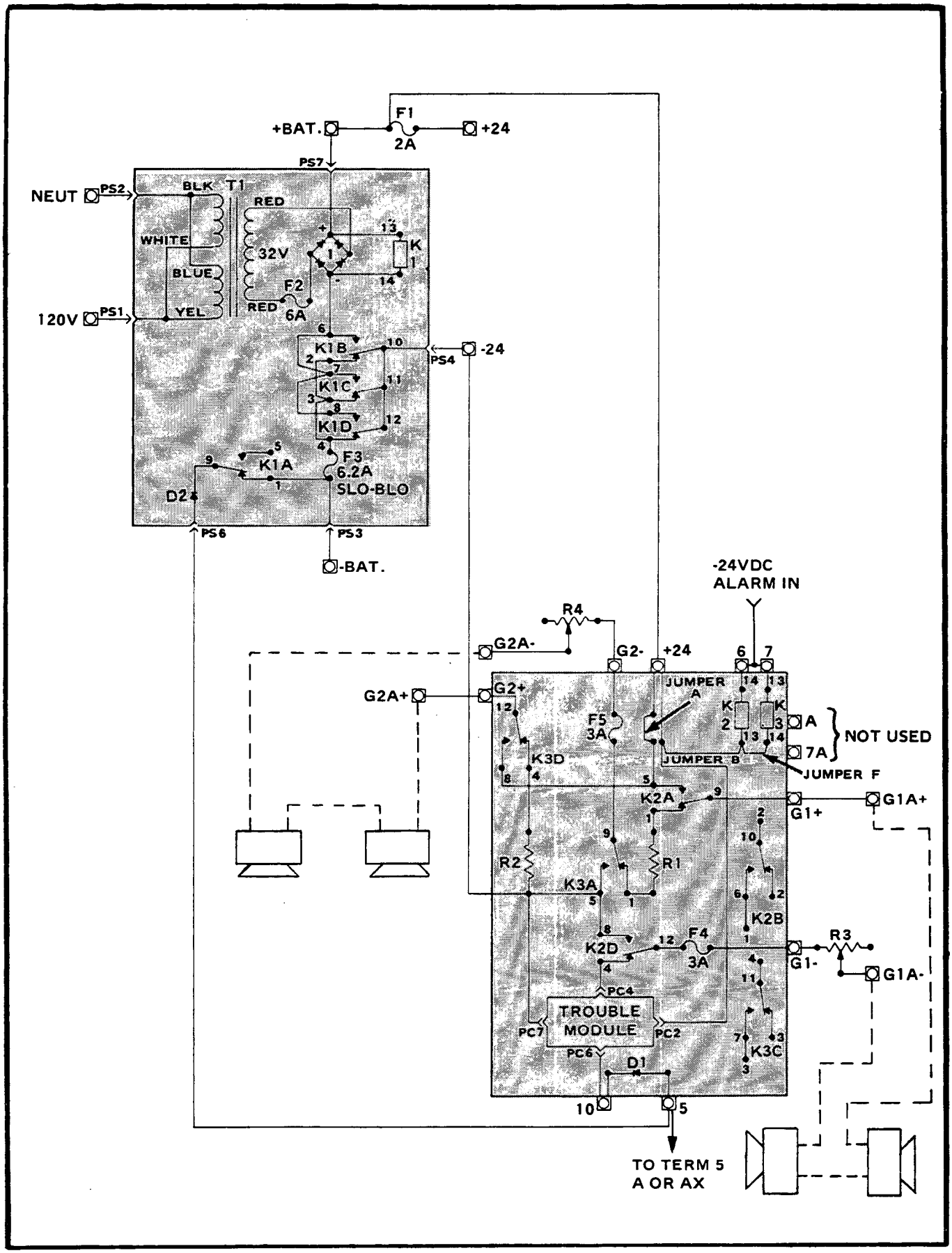


Figure 15

With Q3 "on", -24VDC is applied to terminal 5 from PC6, (Fig. 15) through terminal 10 and diode D1. A -24VDC potential at terminal 5 causes a "trouble" condition in the "A" panel. (Refer to "A" panel – Trouble Condition for detailed circuit description.

Alarm Condition (Fig. 15)

When an alarm is initiated, -24VDC from a coded or March Time unit is applied to terminals 6 and 7 which causes relays K2 and K3 to energize.

When the K2 contacts transfer, one circuit of alarm signaling devices sounds. Current flows from terminal -24 through contacts K2D (8&12), fuse F4, terminal G1-, rheostat R3, terminal G1A-, the series signal devices (sounding the devices), terminal G1A+, terminal G1+, contacts K2A (9&5), to terminal +24.

A "trouble" condition occurs in the "A" panel when the K2D contacts transfer and remove the negative potential from PC4 of the Trouble Module (Refer to "L" panel – Trouble Condition for detailed circuit description.)

When relay K3 energizes, the second circuit of alarm signaling devices sounds. Current flows from terminal -24, through contacts K3A (5&9), fuse F5, terminal G2-, rheostat R4, terminal G2A-, the series alarm signaling devices (sounding the devices), terminal G2A+, terminal G2+, contacts K3D (12&8) to terminal +24.

NOTE: If separate alarm signaling circuits are required, terminals 6 and 7 are not jumpered together. If only one circuit of series alarm signaling devices is used, jumper "F" is removed.

Bell Current

Before adjusting the bell current turn rheostats R3 and R4 fully counterclockwise. Adjust the alarm bell current to 2.5 amps.

NOTE: Signaling devices should be connected to the Type 4208 Signal Panel "L" in accordance with the following specifications:

MAX. NO. OF SIGNALS	WIRE SIZE	TOTAL MAX. LENGTH OF SIGNAL LOOP @20° C
18	14	500 FT.
18	12	870 FT.

With No. 14 wire, the signal loop length may be increased by 109 Ft. for each signal less than the max. of 18.
With No. 12 wire, the signal loop length may be increased by 302 Ft. for each signal less than the max. of 18.

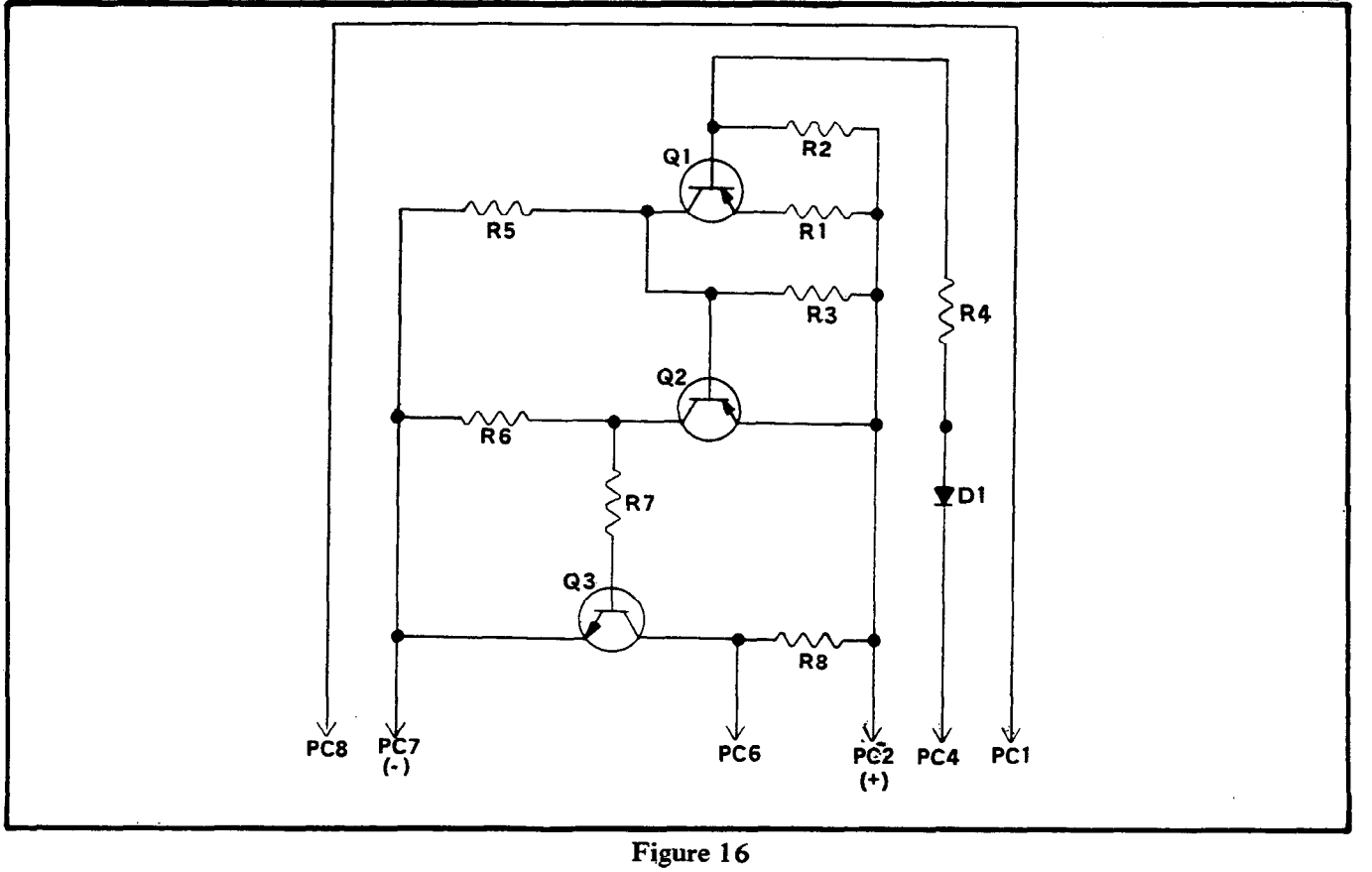
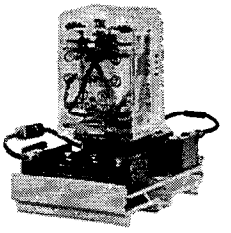


Figure 16



TYPE 4208 "M"
SUPERVISION RELAY MODULE

INTRODUCTION

The "M" module is used in a 4208 Fire Alarm System when DC signal panels F, G, N, Z (C and V obsolete) are used with an "AX" control panel.

Since a standby battery is not used with an "AX" panel, the "M" module is used to supervise the signal panels in case the signal panel power supply fails. Without an "M" panel the signal panel power supply could fail and no indication would show on the "AX" panel.

Only one "M" module is required per "AX" panel regardless of the number of signal panels used in the system.

The "M" module can be mounted in a panel of its own or in any available space.

CIRCUIT OPERATION (FIG. 17)

Normal Operation

During normal operation, -24VDC from "AX" terminal -24 is applied to the "M" module at terminal 3. Current flows from terminal 3, through resistor R1 to terminal 2 where the current flow splits into two paths.

One path is through terminal 2, relay K4 (energizing K4), terminal 7, resistor R2 to +24VDC at terminal 8.

The other path is to terminal -BAT on the signal panel.

Power Supply Failure

If the signal panel power supply fails (refer to a DC signal panel wiring diagram), signal panel relay K1 de-energizes and its contacts transfer. When the K1A and K1B contacts transfer, current flows from terminal -24VDC on the "AX" panel, through terminal 3 on the "M" module, resistor R1, terminal 2 to terminal -BAT on the signal panel.

From terminal -BAT on the signal panel, current flows through signal panel power supply contacts K1A (4&1), the diode, contacts K1B (8&5), through terminal 5 (C, N, V, Z panels) or terminal 7 (F and G panels) to "M" module terminal 7.

The negative potential on both sides of relay K4 (terminals 7&2) causes the relay to de-energize.

When the K4 contacts transfer, current flows from "AX" terminal -24VDC through "M" module terminal 3 and terminal 1 to "AX" terminal 5.

This -24VDC at "AX" terminal 5 causes a "trouble" condition in the "AX" panel. Refer to "AX" panel "Trouble Condition" for detailed circuit description.

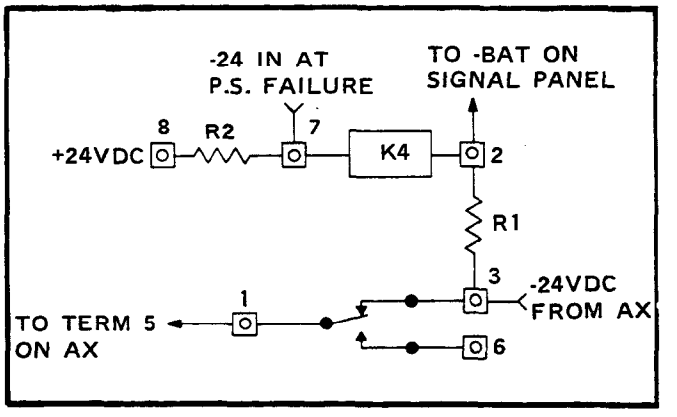
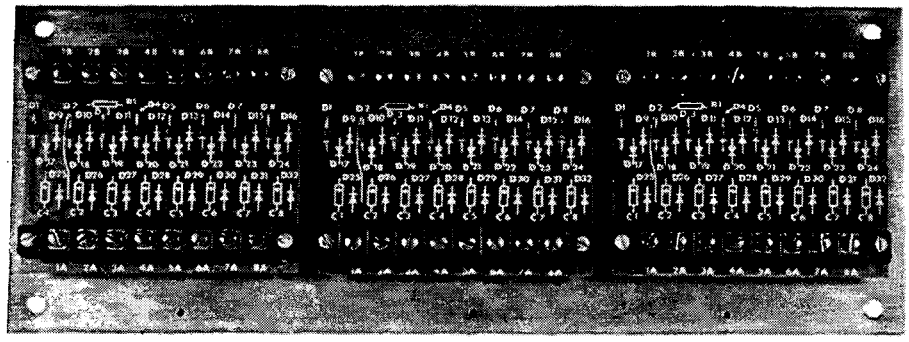


Figure 17



TYPE 4208 "P"
DIODE MATRIX PANEL

"P" panel operation is determined by application.

The "P" panel provides EOL diodes for the "N" and "Z" panels when their circuits are terminated inside the fire alarm control panel.

It is also used in applications where circuit isolation is desirable such as in annunciator lamp circuits or for selective relay functions.

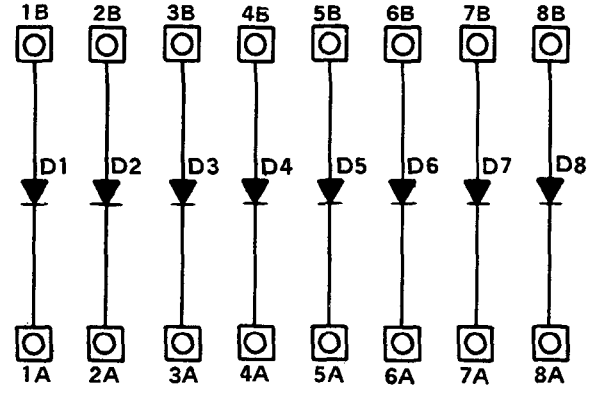
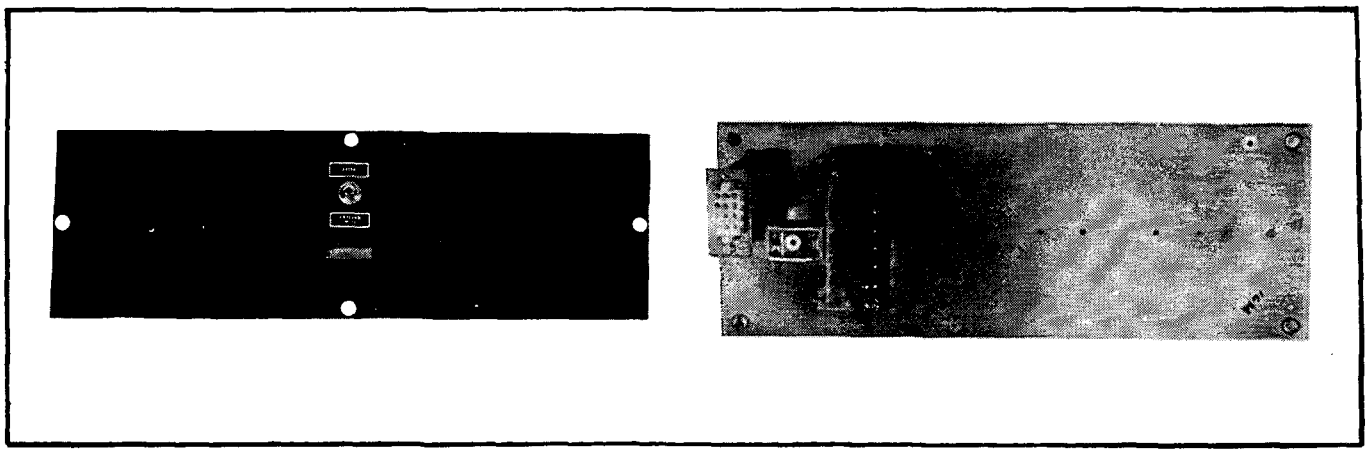


Figure 18



TYPE 4208 "Q"
LOW BATTERY DETECTION PANEL

INTRODUCTION

The "Q" panel is used to monitor the voltage level of the standby battery. If the battery voltage falls below 22.5VDC, the LOW BATTERY lamp on the "Q" panel will illuminate and a "trouble" condition will occur in the "A" panel.

LOW BATTERY DETECTION CIRCUIT (FIG. 19)

Normal Operation

The battery which is connected between terminals 25 (-) and 28 (+) keeps relay K2 energized during normal operation. Current flows from terminal 25, (-BAT) through variable resistor R1 (R1 is adjusted so that K2 will de-energize if battery voltage falls below 22.5VDC), relay K2 (energizing K2) to terminal 28 (+BAT).

Low Battery Condition

When the battery voltage falls below 22.5VDC, relay K2 de-energizes and its contacts transfer. The transferred K2A contacts apply -24VDC from terminal 27, through contacts K2A (1&9) to terminal 26 where the current flow splits into two paths.

One path is from terminal 26, through the LOW BATTERY lamp (illuminating the lamp) to terminal 28 (+BAT).

The other path is from terminal 26 through diode D1, terminal 22 to terminal 5 on the "A" panel. This -24VDC on "A" panel terminal 5 causes a "trouble" condition in the "A" panel. (Refer to "A" panel – Trouble Condition for detailed circuit description.)

Reset Operation

When the battery voltage is restored to its proper level, the "Q" panel must be returned to normal operation by operating the RESET switch on the panel. When the RESET switch is operated, relay K2 energizes. Current flows from terminal 25 (-BAT), through the RESET switch, terminal 21, relay K2 (energizing K2) to terminal 28 (+BAT).

Operational Requirements

The "Q" panel is not to be field-adjusted or repaired. If it is suspected that a problem exists in the "Q" panel, the following test is to be performed:

Disconnect the 4208 System from normal AC power. (The System will then go to standby power, placing a load on battery.)

If the battery voltage, under load, is between 22V and 23V, and the relay in the panel remains energized (LOW BATTERY lamp out) it is to be assumed that the Panel is good.

If the relay de-energizes (LOW BATTERY lamp illuminated) under these conditions, it is to be as-

sumed the panel is defective.

The defective "Q" panel *is* to be removed and returned to the factory for repair, and a replacement "Q" panel is to be ordered.

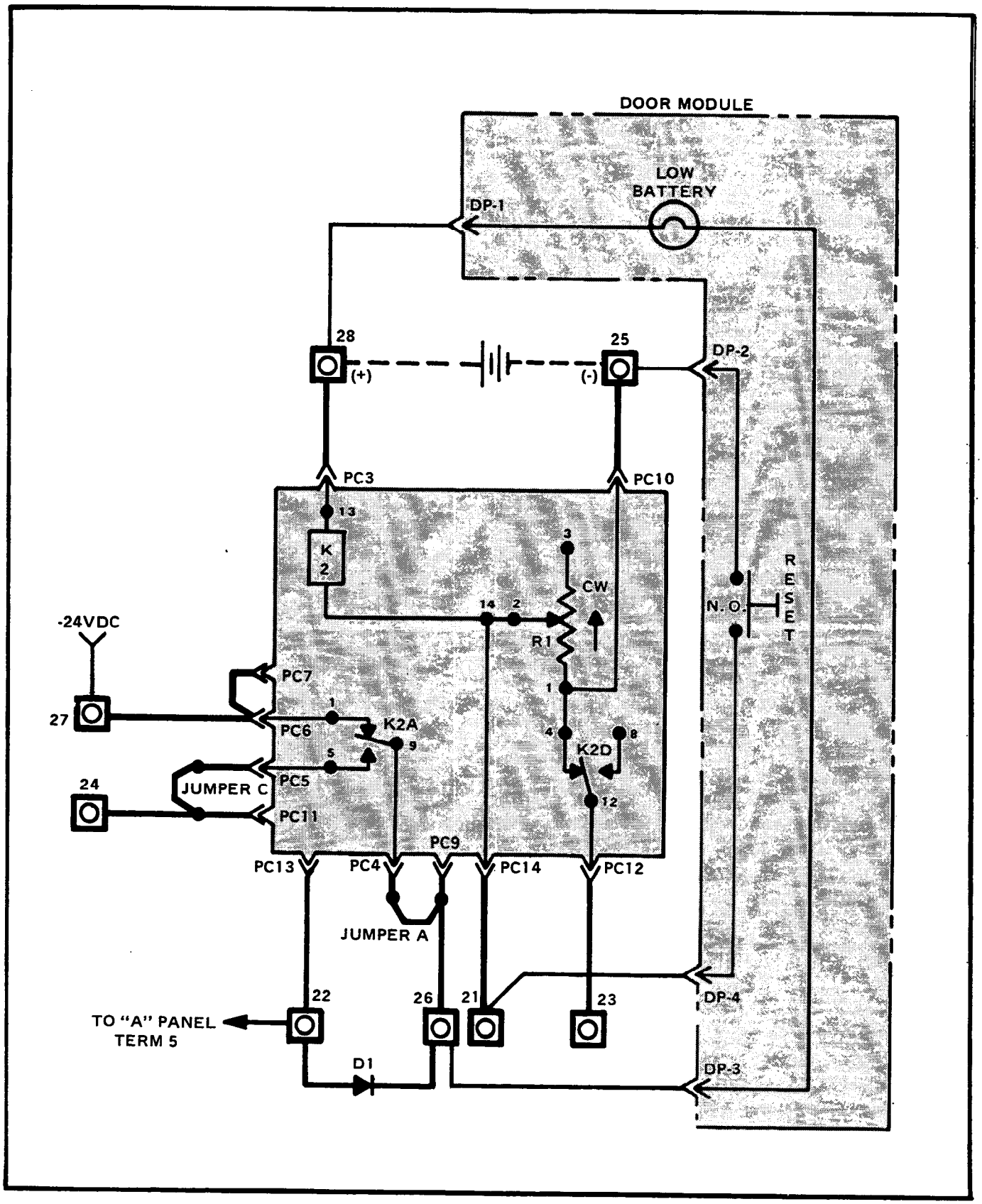
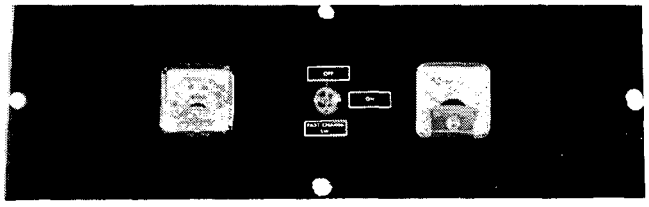
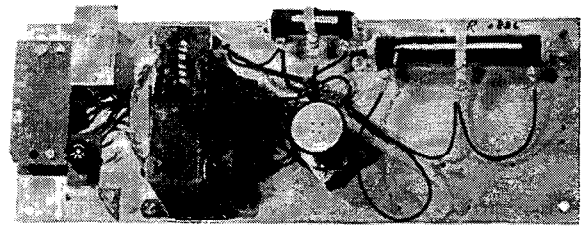


Figure 19





TYPE 4208 "R"
BATTERY CHARGER PANEL

INTRODUCTION

The "R" panel is installed in the main panel cabinet and it is used for charging remote standby batteries. This panel provides a normal (trickle) charge rate and a fast charge capability.

A door mounted milliameter is included to monitor the trickle charge rate.

A door mounted voltmeter is included to indicate battery voltage.

CHARGING CIRCUIT (FIG. 20)

Normal (Trickle) Charge

The "R" panel converts 120VAC to -24VDC to charge the standby battery. Current flows from the negative side of the rectifier, through variable resistor R2 (R2 is adjusted according to the particular battery used – see Table), the milliammeter, terminal OV, the battery, to terminal +24V. A voltmeter may be connected between terminal OV and terminal +24V.

To Adjust The Trickle Charge

Resistor R2 is the smaller of the two wire-wound resistors on the "R" panel and it controls the trickle charge to the standby battery.

The trickle charge rate is monitored by the milliameter on the panel.

Adjust resistor R2 to the trickle charge rate listed in the Trickle Charge Rate Table for the particular battery in the system.

If a "Q" panel is included in the system, add 14 MA to the charge rate listed in the table.

Fast Charge

When the FAST CHARGE switch is operated, current (2 amps) flows through resistor R1.

Resistor R1 is adjusted at the factory for a maxi-

TRICKLE CHARGE RATE TABLE

BATTERY TYPE	TRICKLE CHARGE RATE AMPS @ 77° F	CAPACITY A. H.	BATTERY TYPE	TRICKLE CHARGE RATE AMPS @ 77° F	CAPACITY A. H.
* 4294-1	.005	8 A. H.	4294-22	.013	13 A. H.
* 4294-2	.010	16 A. H.	4294-23	.018	18 A. H.
* 4294-3	.015	24 A. H.	4294-24	.030	30 A. H.
* 4294-4	.018	30 A. H.	* 4294-25	.010	16 A. H.
* 4294-21	.005	8 A. H.	* 4294-26	.015	24 A. H.

*Lead Acid Batteries

Lead acid batteries are at full charge when voltage per cell is 2.15 volts and specific gravity is approximately 1.215. Nickel Cadmium voltage is 1.4 per cell. Both lead acid and nickel cadmium batteries should be checked periodically. Adjust trickle rate accordingly. A 15° temperature rise doubles the charge rate.

mum fast charge rate of 2 amps and this setting should not be changed.

caution: Be sure to turn off the FAST CHARGE switch when the battery is properly charged.

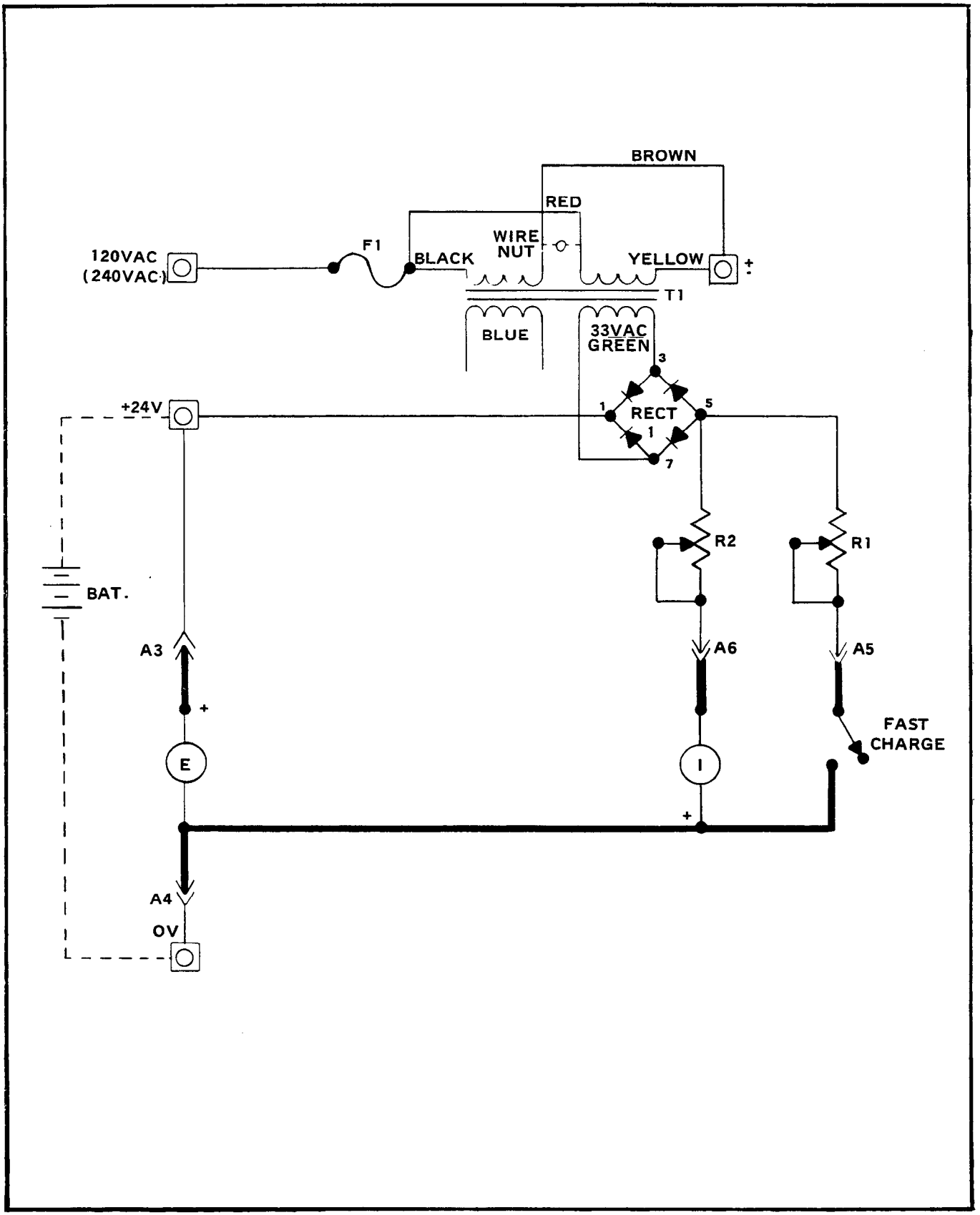
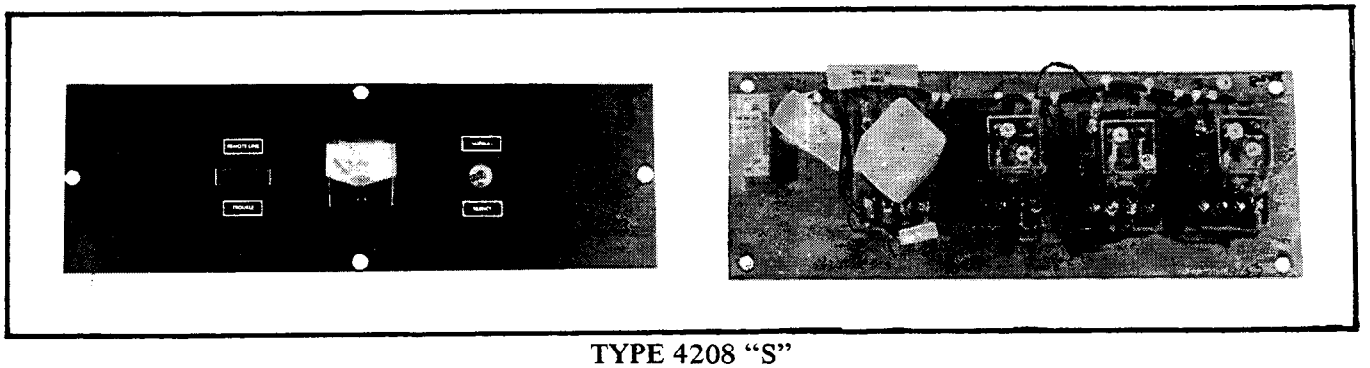


Figure 20



TYPE 4208 "S"
REMOTE STATION PANEL

INTRODUCTION

The "S" panel is used to transmit alarm and trouble signals (via telephone lines) from the protected property to the remote station control unit type 4293A or 4293AB. The "S" panel also supervises the lines.

CIRCUIT OPERATION (FIG. 22)

SUPERVISION CIRCUIT

Normal Operation

During normal operation, supervisory relay K1 is energized. Current flows from K3B terminal 8 (-24 VDC), through the milliammeter (if used), K4B terminal 6, contacts K4A (4&1), telephone line, the remote station, telephone line, contacts K4B (8& 5), K3A terminal 4, contacts K2A (4&1), K3A terminal 1, K4A terminal 3, relay K1 (energizing K1), resistor R2, K1 terminal 8, diode D1, K1 terminal 1, K2 terminal 2 to +24VDC at K4 terminal 2.

NOTE: Zener diode D2 is used to regulate voltage surges. The Zener breaks down at -24V so that excess voltage doesn't get to the remote station.

Trouble Condition

If an open occurs in the supervised circuit (including the remote station), supervisory relay K1 de-energizes and its contacts transfer. Current flows from K3B terminal 8 (-24VDC), through contacts K1A (6&4), the REMOTE TROUBLE lamp (illuminating the lamp) and the buzzer (sounding the buzzer) to +24VDC at K1 terminal 1.

The buzzer can be silenced by placing the NORMAL/SILENCE switch on the "S" panel in the SILENCE position (the REMOTE TROUBLE lamp remains illuminated).

When the trouble is repaired, supervisory relay K1 energizes, its contacts transfer, the REMOTE TROUBLE lamp goes out and the buzzer sounds ("ring-back").

The buzzer can be silenced by returning the NORMAL/SILENCE switch to the NORMAL position.

POWER FAILURE CIRCUIT

Normal Operation

During normal operation power failure relay K3 is energized (120VAC is applied to K3 terminal 2 and neutral is applied to terminal 7.

Power Failure Condition

If AC power fails, relay K3 de-energizes and its contacts transfer.

Simultaneously, a "trouble" signal (-24VDC) is sent from terminal 5 on the "A" panel to K2 terminal 7 on the "S" panel. This "trouble" signal (-24 VDC) energizes relay K2 and causes its contacts to transfer.

When contacts K2A (1&4) transfer, the circuit

to relay K1 is broken. Simultaneously, an alternate path is provided by contacts K3A (1&4) when K3 de-energizes which keeps "S" panel trouble relay K1 energized.

The current flow in a power failure condition is from K3B terminal 8, through the milliameter (if used), K4B terminal 6, contacts K4A (4&1), the telephone line, the remote station, the telephone line, contacts K4B (8&5), contacts K3A (4&1), K4A terminal 3, relay K1, resistor R2, K1 terminal 8, diode D1 to +24VDC at K1 terminal 1.

SYSTEM TROUBLE CIRCUIT

Trouble Condition

When a trouble occurs in the 4208 system (other than AC power failure) a "trouble" signal is sent from terminal 5 on the "A" panel to K2 terminal 7 on the "S" panel which energizes K2 and causes its contacts to transfer.

When the K2A contacts transfer, the normal supervision circuit is broken through contacts K2A (4&1) but an alternate path is provided by contacts K2A (1&3) to keep "S" panel supervision relay K1 energized.

"S" panel supervision relay K1 remains energized during a system trouble condition but the remote station is bypassed by contacts K2A (1&3) which causes a "trouble" indication on the remote station panel.

The current path to "S" panel supervision relay K1 is from K3B terminal 8 (-24VDC) through K3B terminal 6, resistor R1, contacts K2A (3&1), K3A terminal 1, K4A terminal 3, relay K1, resistor R2, K1 terminal 8, diode D1 to +24VDC at K1 terminal 1.

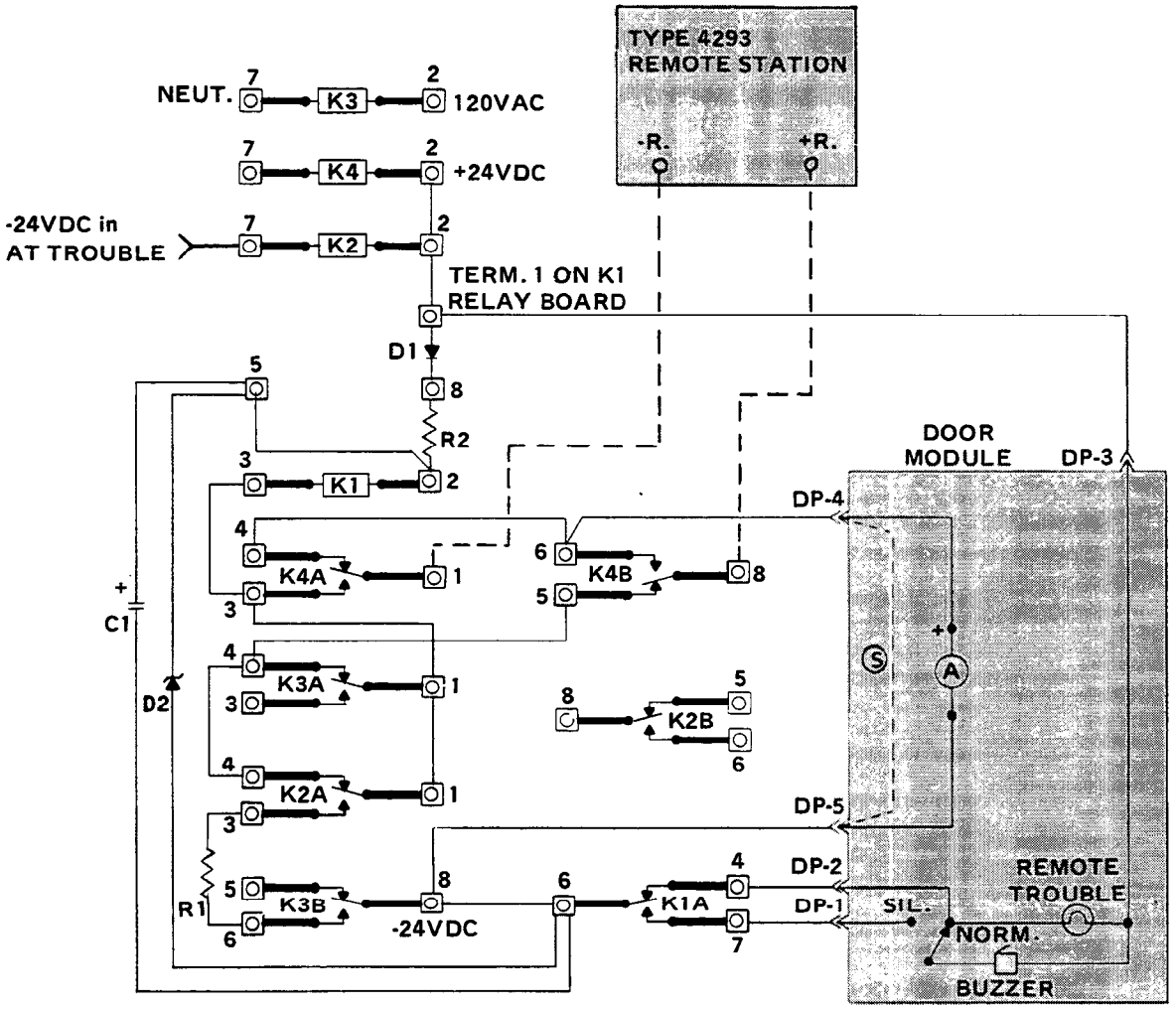
ALARM CIRCUIT

Alarm Condition

When an alarm is initiated within the 4208 system, -24VDC is applied to the "S" panel at K4 terminal 7 which causes alarm relay K4 to energize.

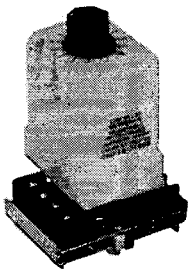
When the K4 contacts transfer, the polarity of the potential that is normally applied to the remote station is reversed and this causes the remote station to indicate an alarm condition.

Current flows from K3B terminal 8, through the milliameter (if used), contacts K4B (6&8), the telephone line, the remote station (activating the station), the telephone line, contacts K4A (1&3), relay K1, resistor R2, terminal 8, diode D1 to +24 VDC at K1 terminal 1.



NOTES: 1. IF METER IS NOT USED, ADD JUMPER Ⓢ.
2. HEAVY DARK LINES INDICATE WIRING ON PRINTED CIRCUIT BOARDS.
3. ◯ DENOTES TERMINAL BLOCK CONNECTIONS.

Figure 22



TYPE 4208 "T"
TIME LIMIT CUTOUT MODULE

INTRODUCTION

The "T" module is used as a timer for the alarm signaling devices. It allows the alarm signaling devices to be sounded for a specific duration. The signal duration can be adjusted for two to eight minutes by a knob on top of the relay.

The "T" module can be mounted on its own back plate or on vacant space in one of the signal panels.

CIRCUIT OPERATION (FIG. 23)

The "T" module is activated by an "alarm" signal (-24VDC) from an "A", "B" or "AX" panel.

The "alarm" signal enters the "T" module at terminal 2 and it is applied via contacts K4A (1&4) to the signaling devices (sounding the devices).

The signaling devices sound for the preset duration (two to eight minutes) and then relay K4 energizes and its contacts transfer.

When the K4A contacts transfer, the "alarm" signal is removed from the signaling devices and they stop sounding.

When the K4B contacts transfer, -24VDC is applied through contacts K4B (8&6) to terminal 5 in the "A" or "AX" panel. This -24VDC on terminal 5 causes a "trouble" condition in the "A" or "AX" panel.

NOTE: The K4A contacts are no longer used for "A" or "AX" panel "trouble" indication, although this type operation may still exist in some older systems. Contacts K4B are used to activate the "trouble" circuitry as explained above.

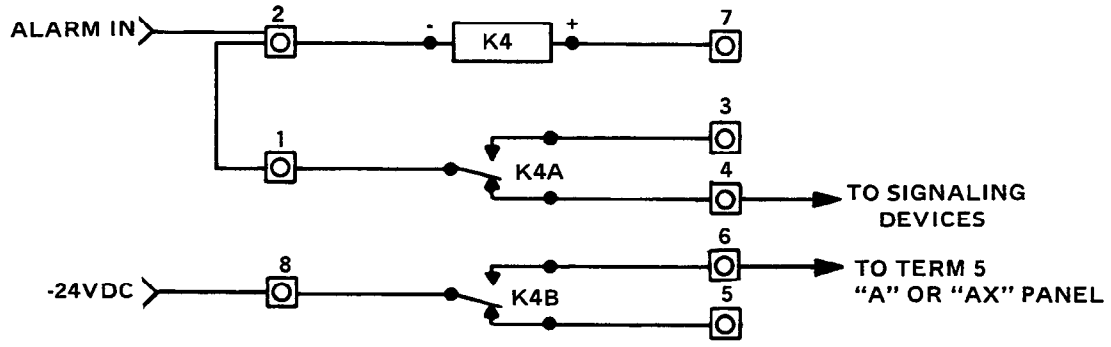
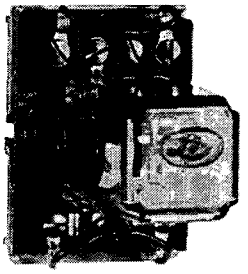


Figure 23



TYPE 4208 "U"
ADAPTER RELAY MODULE

INTRODUCTION

The "U" module provides a holding circuit for the "D", "E" and "S" panels when these panels are used in a system with coded alarm-initiating devices. The "U" module latches at the first alarm pulse and applies a steady alarm signal (-24VDC) to the "D", "E" or "S" panels.

CIRCUIT OPERATION (FIG. 24)

The coded alarm signal from terminal 7 of the "A", "B" or "AX" panel is applied to the "U" module terminal 5. Current flows from terminal 5, through the K4B contacts, terminal 8, diode D3, terminal 7, relay K4 (energizing K4), to +24VDC at terminal 2.

Relay K4 energizes at the first coded pulse and its contacts transfer. Current flows from terminal 6 (-24VDC), through terminal 8, diode D3, terminal 7, relay K4 (latching relay K4) to +24VDC at terminal 2. Current also flows from terminal 6, through terminal 3, terminal 1 to the "D", "E" or "S" panels.

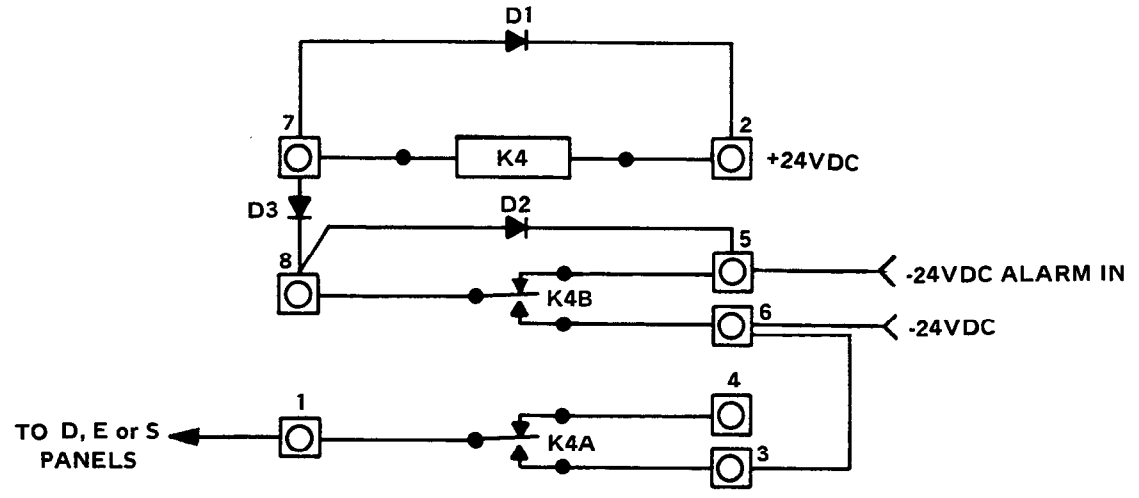


Figure 24

TYPE 4208 "V"
NON-SUPERVISED DC MARCH TIME PANEL

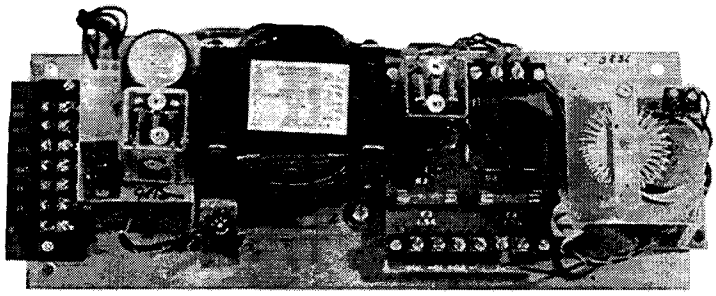
TYPE 4208 "Z"
SUPERVISED DC MARCH TIME PANEL

INTRODUCTION

The "V" and "Z" panels are used to provide a march time of approximately 120 pulses per minute on two circuits of alarm signaling devices.

The "V" panel is not supervised.

The "Z" panel is supervised.



"V" PANEL

CIRCUIT OPERATION (FIG. 25)

POWER FAILURE CIRCUIT

Same as "C" and "N" panel Power Failure Circuit except that diode D5 in the "C" and "N" panels is referred to as diode D6 in the "V" and "Z" panels.

ALARM CIRCUIT

Same as "C" and "N" panel Alarm Circuit (See page 17).

MARCH TIME CIRCUIT

An "alarm" signal (-24VDC) from terminal 7 of the "A" or "AX" panel is applied to "V" or "Z" panel terminal 7A which energizes the march time motor. Current flows from terminal 7A, through resistor R3, the march time motor (starting the motor), diode D5 to +24VDC at terminal 6.

When the march time motor shaft rotates, it operates a cam that cycles switch SW1 at the march time rate of 120 pulses per minute. Switch SW1 sends the pulsing "alarm" signal to alarm relay K2.

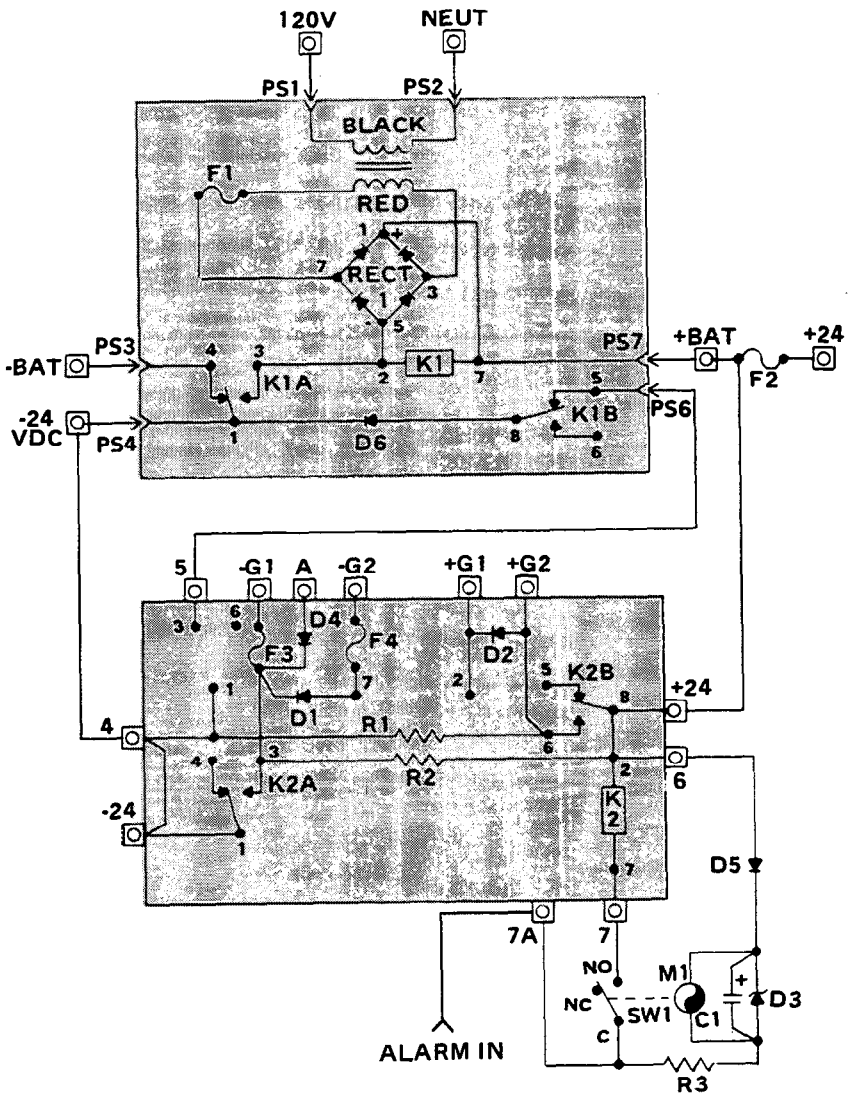
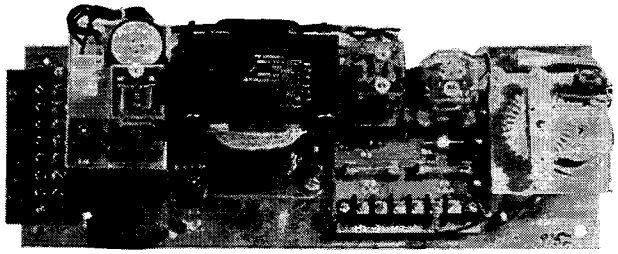


Figure 25



TYPE 4208 "Z" PANEL
CIRCUIT OPERATION (FIG. 26)

SUPERVISION CIRCUIT

Same as "N" panel Supervision Circuit (See page 16).

MARCH TIME CIRCUIT

Same as "V" panel March Time Circuit (See page 45).

ALARM CIRCUIT

Same as "C" and "N" panel Alarm Circuit (See page 17).

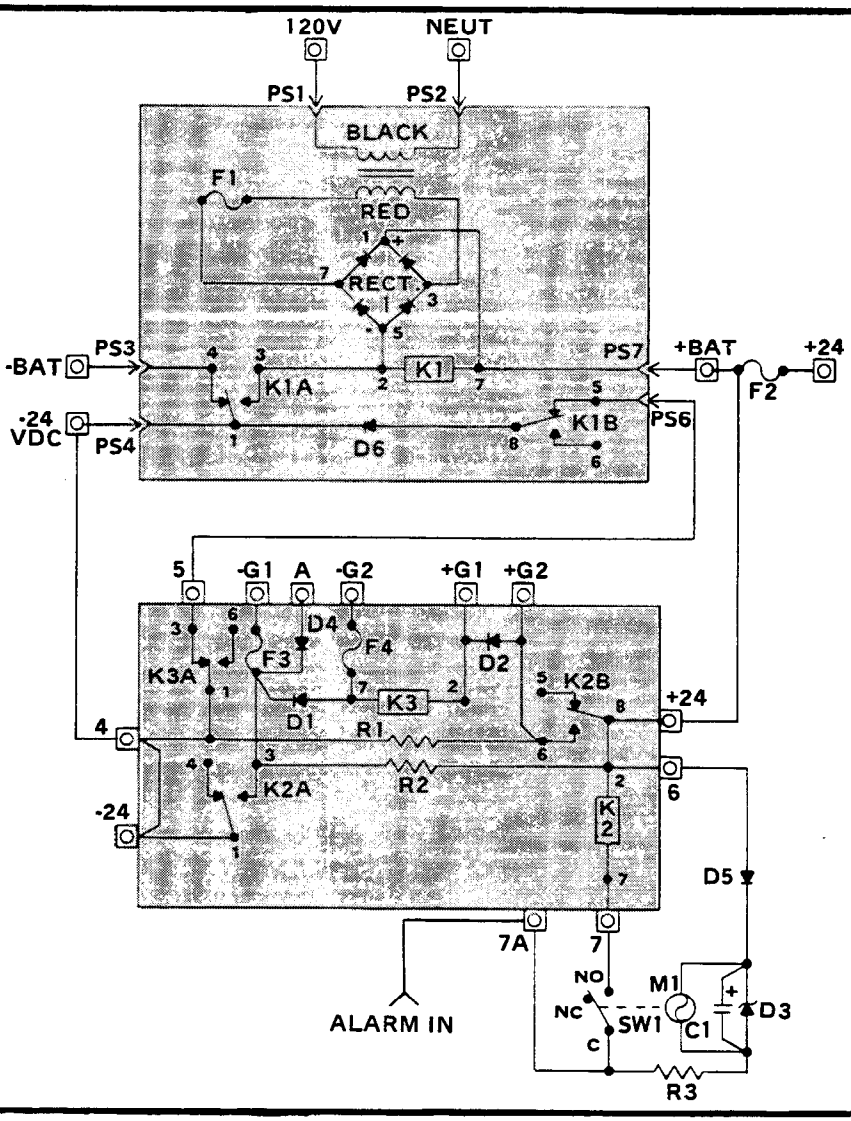
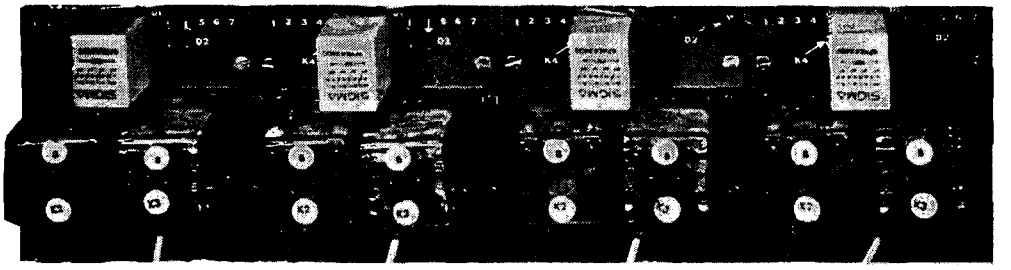


Figure 26



TYPE 4208 "W"
MC CULLOH LOOP MODULE

INTRODUCTION

The "W" module is used in the alarm-initiating device circuit(s) of the "A", "B" or "AX" panels and it allows the alarm-initiating devices to operate if there is an open in the circuit wiring. One "W" module is required per zone.

CIRCUIT OPERATION (FIG. 27)

An open in the supervised alarm circuit wiring causes a "trouble" signal (-24VDC) to be sent from terminal 6 in the "A" or "AX" panel to relay K4 in the "W" module. (Refer to "A" or "AX" panel – Trouble Condition for detailed circuit operation.)

When -24VDC is applied to relay K4, it energizes and its contacts transfer.

When contacts K4A and K4B transfer, they provide an alternate alarm path for the alarm initiating devices(s). For example, if alarm initiating contacts "A" were closed while there was a break in the circuit at point "X" current would flow from terminal 4, through contacts K4A (5&9), terminal 3, alarm initiating contacts "A" to terminal 1.

Contacts K4D provide a holding circuit for relay K4. Current flows from terminal -24, through contacts K4D (8&12), relay K4 and diode D2 to terminal +24. Also, -24VDC is applied out terminal 6 of the "W" module to terminal 6 of the associated zone module. This keeps the zone TROUBLE lamp illuminated and maintains a common trouble condition (even though contacts K4A and K4B complete the circuit between terminals 4 and 1).

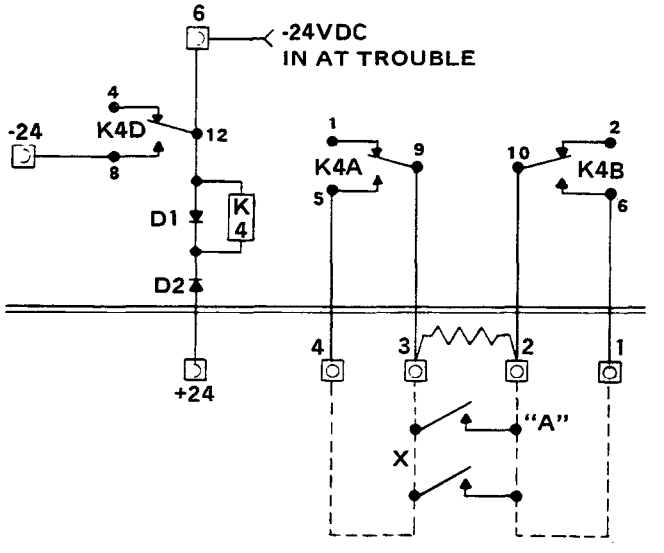
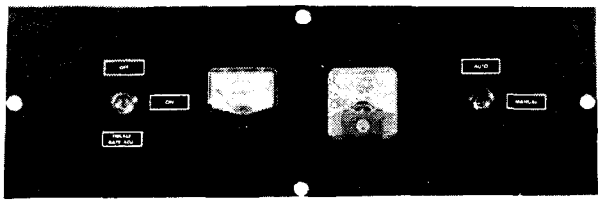
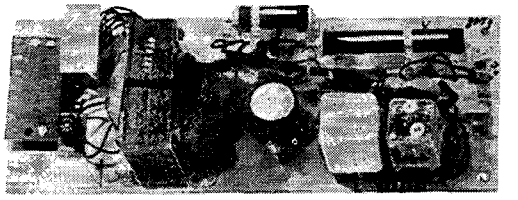


Figure 27





TYPE 4208 "Y"
AUTOMATIC BATTERY CHARGER PANEL

INTRODUCTION

The "Y" panel monitors the charge level of the standby battery and supplies the necessary charge to keep the battery at its proper potential.

The "Trickle Charge" circuit operates during normal conditions. When the battery voltage falls below 90% of the full charge, the panel automatically transfers to the "Fast Charge" circuit.

An AUTO/MANUAL switch is provided to override the automatic charge circuit. This allows the battery to be charged periodically as specified by the manufacturer's maintenance recommendations.

The "Y" panel includes two door mounted meters: a milliammeter to indicate the trickle charge rate, and a voltmeter to indicate the battery voltage level.

CIRCUIT OPERATION (FIG. 28)

TRICKLE CHARGE CIRCUIT

In normal operation, a trickle charge is applied to the battery. Current flows from the negative side of the rectifier, through resistor R2, the TRICKLE RATE ADJ. switch (OFF position), the AUTO/MANUAL switch (AUTO position) to terminal 0V (-BAT). (The trickle charge rate can be monitored by placing the TRICKLE RATE ADJ. switch to the ON position.)

When the battery is fully charged, relay K1 is energized and relay K2 is de-energized. Current flows from terminal 0V (-BAT.), through relay K1, contacts K2A (5 & 1), resistors R5 and R3 to terminal +24VDC.

FAST CHARGE CIRCUIT

If the standby battery voltage falls below 90% of full charge, relay K1 de-energizes and its contacts transfer.

The transferred K1A contacts complete the circuit through relay K2. Relay K2 energizes and its contacts transfer. Current flows from terminal 0V (-BAT.), through relay K2 (energizing K2), contacts K1A (6 & 4) to terminal +24VDC.

The K2B contacts complete a path for a fast charge (2 amp) to be applied to the battery. Current flows from the rectifier, through resistor R1, the TRICKLE RATE ADJ. switch (OFF position), contacts K2B (7 & 6), the MANUAL/AUTO switch (AUTO position) to the battery via terminal 0V.

The K2A contacts break the circuit through relay K1 and K1 remains de-energized until the battery voltage is high enough to break down Zener diode D1.

When the battery becomes fully charged, Zener diode D1 breaks down and completes a path to energize relay K1. Current flows from terminal 0V, through relay K1 (energizing K1), Zener diode D1, resistor R4 to terminal +24VDC.

When relay K1 energizes, its contacts transfer and break the circuit for relay K2. Relay K2 de-energizes and its contacts transfer.

The transferred contacts K2B (4 & 6) break the

fast charge circuit.

The K2A contacts (1 & 5) restore the normal current flow path through relay K1.

Manual Operation

When the AUTO/MANUAL switch is placed in the MANUAL position, the trickle charge circuit is bypassed and a steady 2 amp, unmonitored, charge is applied to the battery. Current flows from the rectifier, through resistor R1, TRICKLE RATE ADJ. switch (OFF position), AUTO/MANUAL switch (MANUAL position) to terminal 0V (-BAT.)

CHARGE RATE ADJUSTMENT

NOTE: Resistors R1, R4 and R5 are adjusted at the factory for proper operation and their settings should not be changed.

To Adjust The Trickle Charge Rate

The AUTO/MANUAL switch must be in the AUTO position and the TRICKLE RATE ADJ. switch must be in the ON position.

To determine the added load, if any, remove the fuse from the negative load of the battery circuit. Any milliameter reading must be added to the charge rate as required for the particular battery. Check the Trickle Charge Rate Table for the proper setting.

Replace the fuse and adjust resistor R2 for the proper charge rate.

NOTE: If the system includes battery supervision ("Q" panel), a "trouble" condition will occur when the fuse is removed. If the "trouble" signal is silenced, make sure that it operates properly when the rate adjustment is completed. In most cases the "trouble" signal will operate when the fuse is replaced if the switch is in the SILENCE position. In some systems it may be necessary to operate the RESET switch.

When the trickle charge rate is too high (excessive water evaporation) or when the charge rate is too low (low specific gravity) the rate of charge should be adjusted so that the system operates properly.

The specific gravity of the cells should be checked and recorded monthly or biweekly.

Individual cell voltage should be checked and recorded at least quarterly.

TRICKLE CHARGE RATE TABLE

BATTERY TYPE	TRICKLE CHARGE RATE AMPS @ 77° F	CAPACITY A. H.	BATTERY TYPE	TRICKLE CHARGE RATE AMPS @ 77° F	CAPACITY A. H.
* 4294-1	.005	8 A. H.	4294-22	.013	13 A. H.
* 4294-2	.010	16 A. H.	4294-23	.018	18 A. H.
* 4294-3	.015	24 A. H.	4294-24	.030	30 A. H.
* 4294-4	.018	30 A. H.	* 4294-25	.010	16 A. H.
* 4294-21	.005	8 A. H.	* 4294-26	.015	24 A. H.

* Lead Acid Batteries

Lead acid batteries are at full charge when voltage per cell is 2.15 volts and specific gravity is approximately 1.215. Nickel Cadmium voltage is 1.4 per cell. Both lead acid and nickel cadmium batteries should be checked periodically. Adjust trickle rate accordingly. A 15° temperature rise doubles the charge rate.

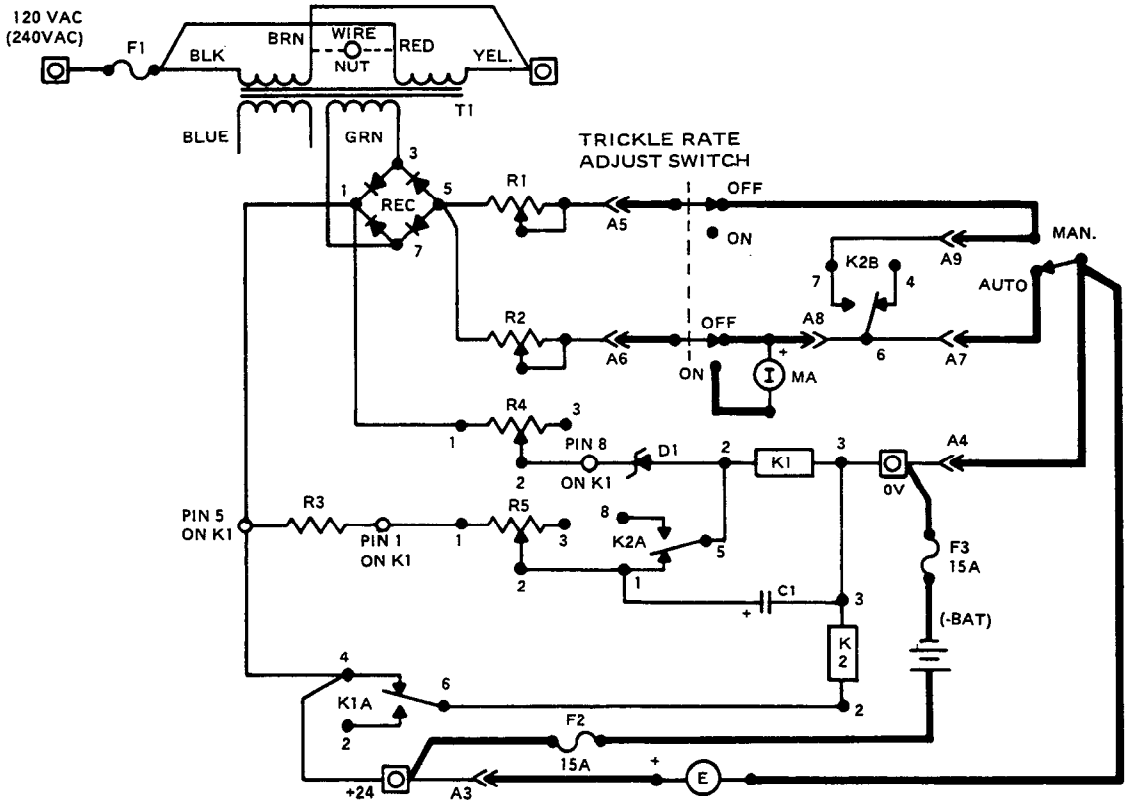


Figure 28

TROUBLESHOOTING

1. COMMON TROUBLE lamp illuminated and Sonalert sounding:

   A. ZONE TROUBLE lamp illuminated – problem in the alarm initiating device circuit.
   B. EARTH lamp ("J" panel) illuminated – ground in the 4208 system.
   C. LOW BATTERY lamp ("Q" panel) – standby battery discharged.
   D. Check the lines to and from the alarm-signaling devices on the "F", "G", "N" or "Z" panels.
   E. Check the lines to and from the local energy master box if "D" panel is provided.

2. REMOTE TROUBLE lamp illuminated and buzzer sounding on "S" panel:

   A. Check the lines to and from the 4293 Remote Station.
   B. To isolate the "trouble" to a particular panel, remove the lead between each panel (refer to following chart) and terminal 5 of the "A" or "AX" panel. The "trouble" signal will stop when the lead is removed from the defective panel.

PANEL	TERMINAL	PANEL	TERMINAL
B	5	L	5
D	5	M	5
F & G	7	N	5
H	TB2	Q	22
J	24	Z	5

3. Alarm-signaling devices do not operate when system is in "alarm" condition.

   A. Check "V" and "Z" panels for operation of march time motor.
   B. Check "C", "N", "V" and "Z" panels for -24VDC at output terminals G1 (+,-) and G2 (+,-).
   C. Check "F" and "G" panels for -24VDC at output terminals 3, 4 and 5.

4. Alarm-signaling devices do not operate when system is in "drill" condition.

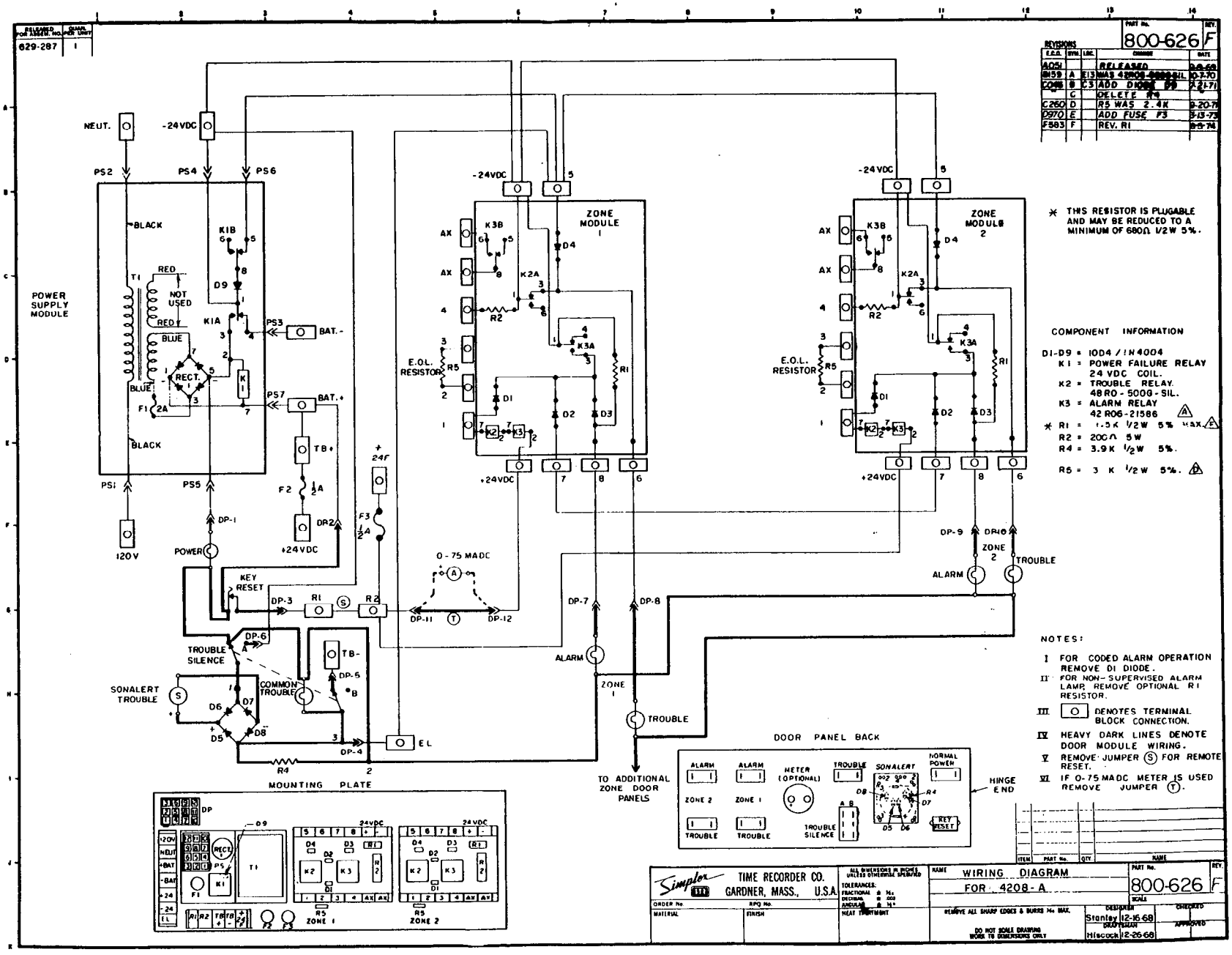
   A. Check operation of "D" panel "drill" relay K2.
   B. Refer to number 3 steps A, B and C.

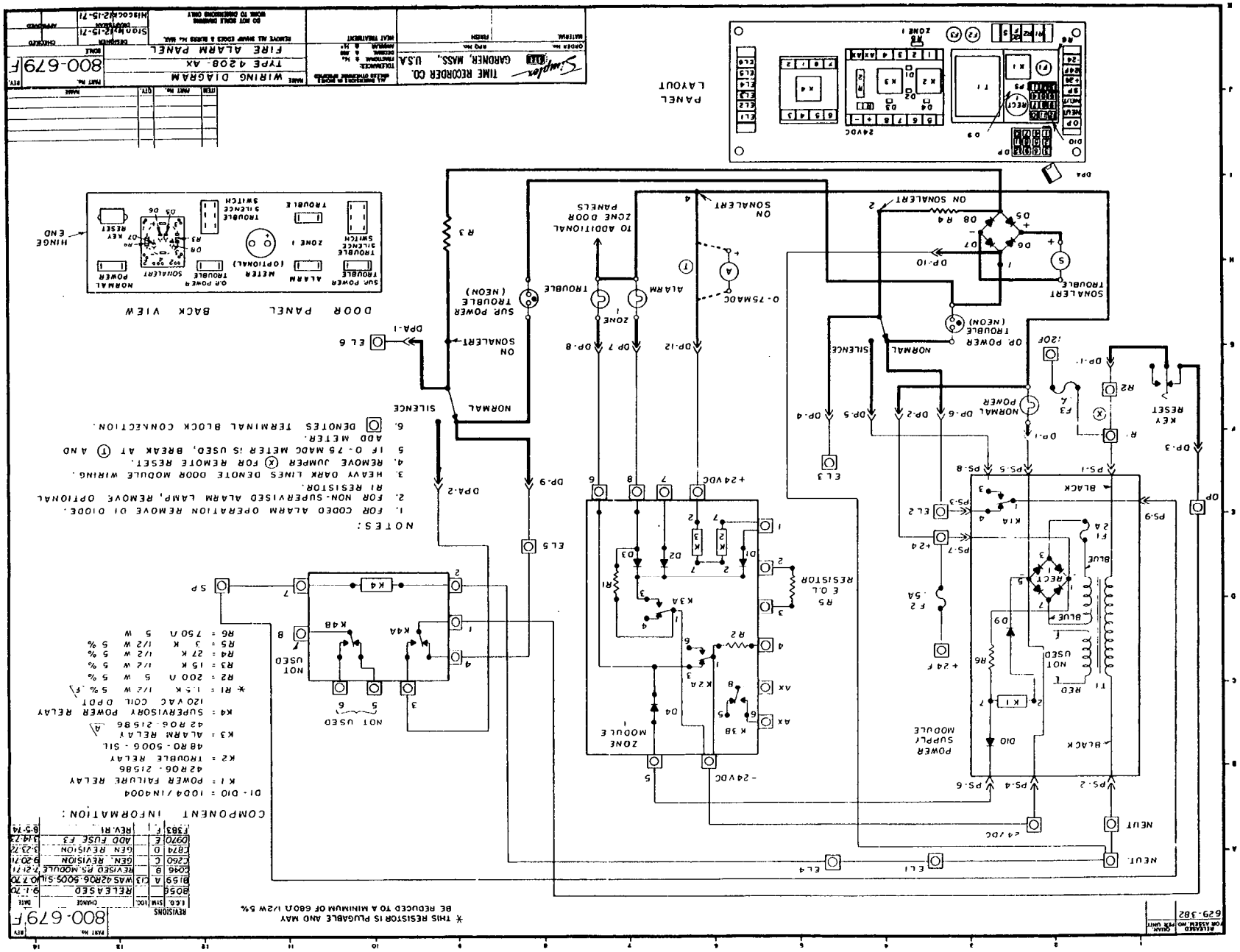
5. Standby battery fails to maintain full charge.

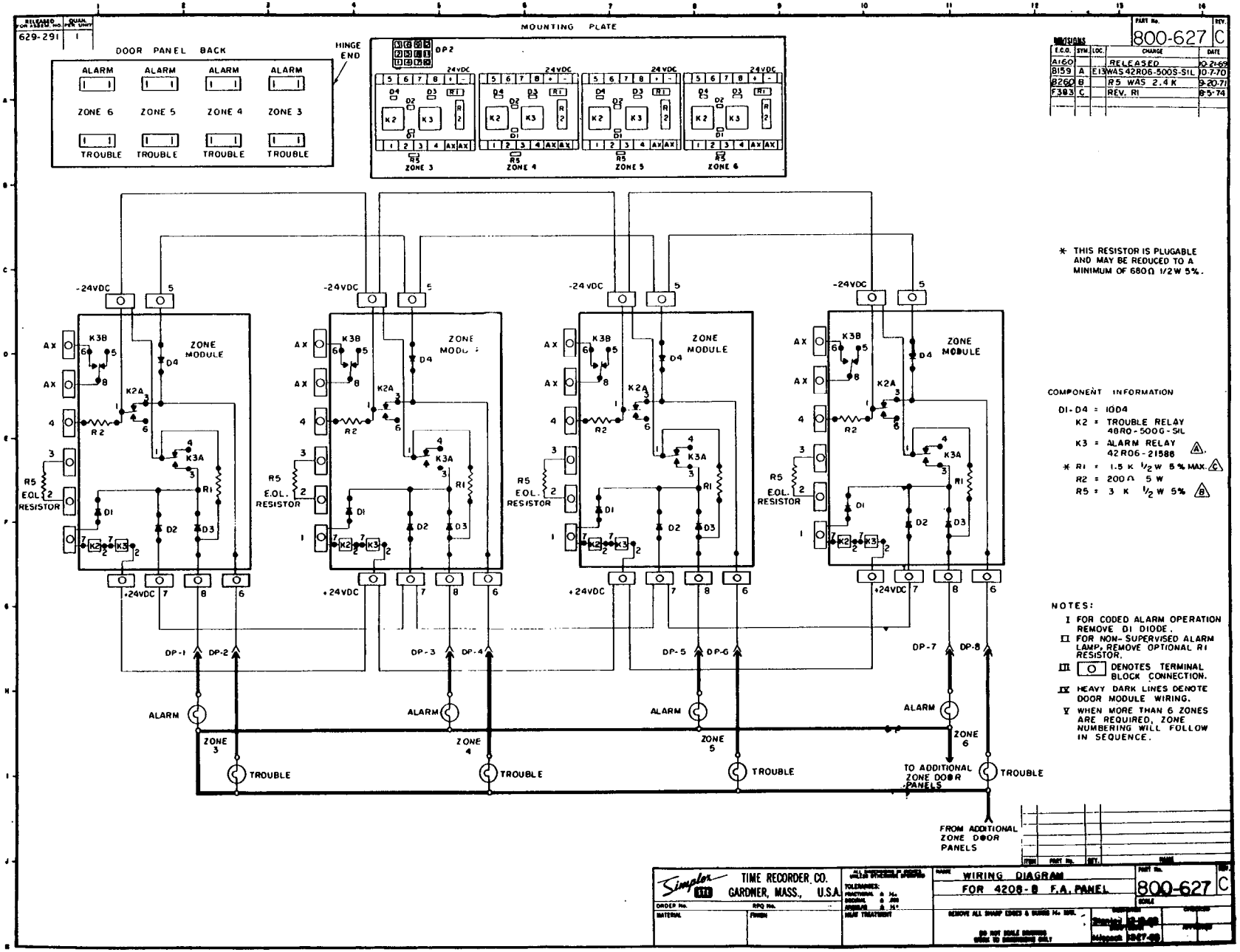
   A. Check setting of "R" panel resistor R2.
   B. Check operation of "Y" panel resistor R2 and the operation of the automatic charging circuit.

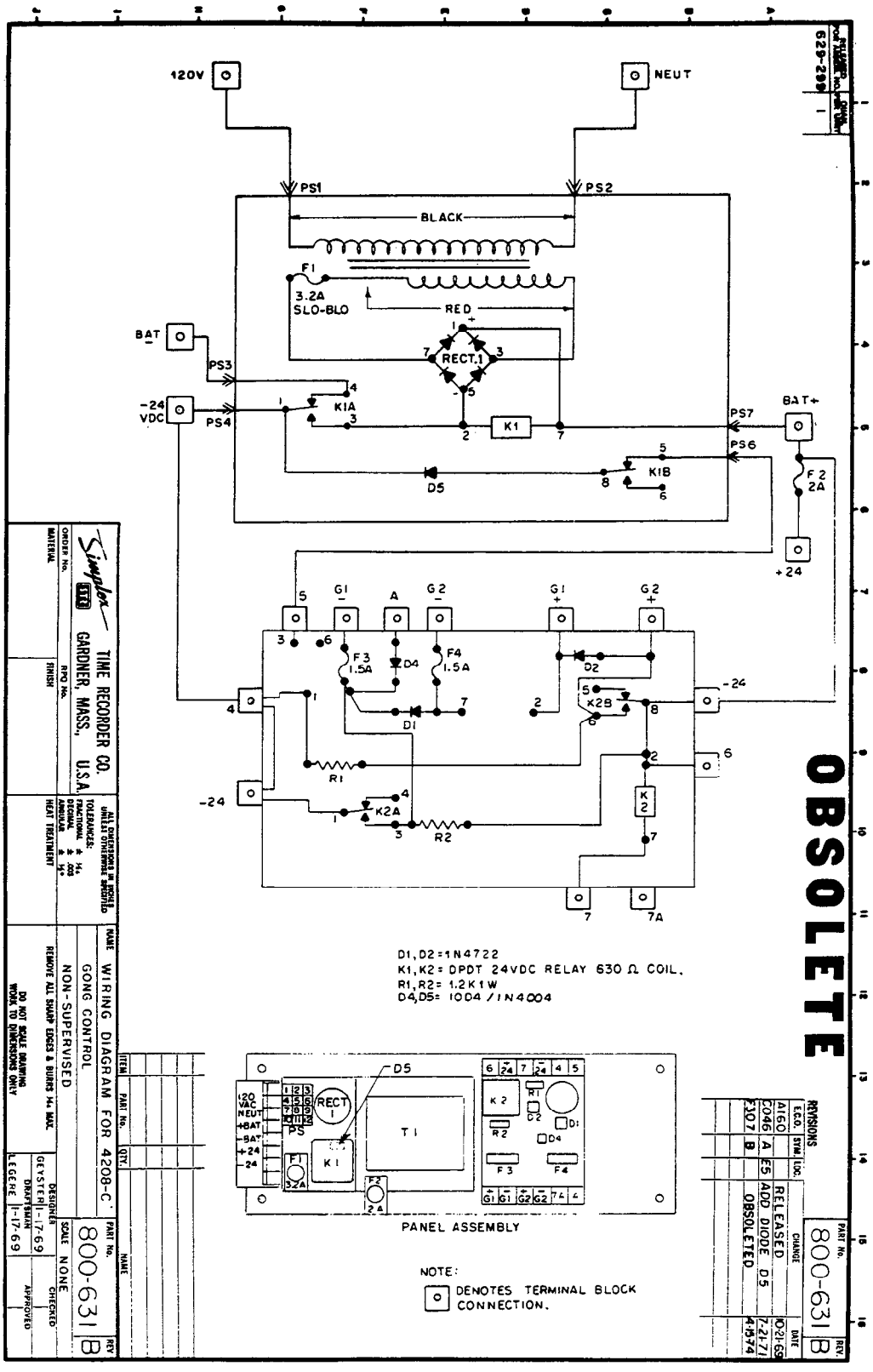
6. Local energy master box fails to trip when system is in "alarm" condition.

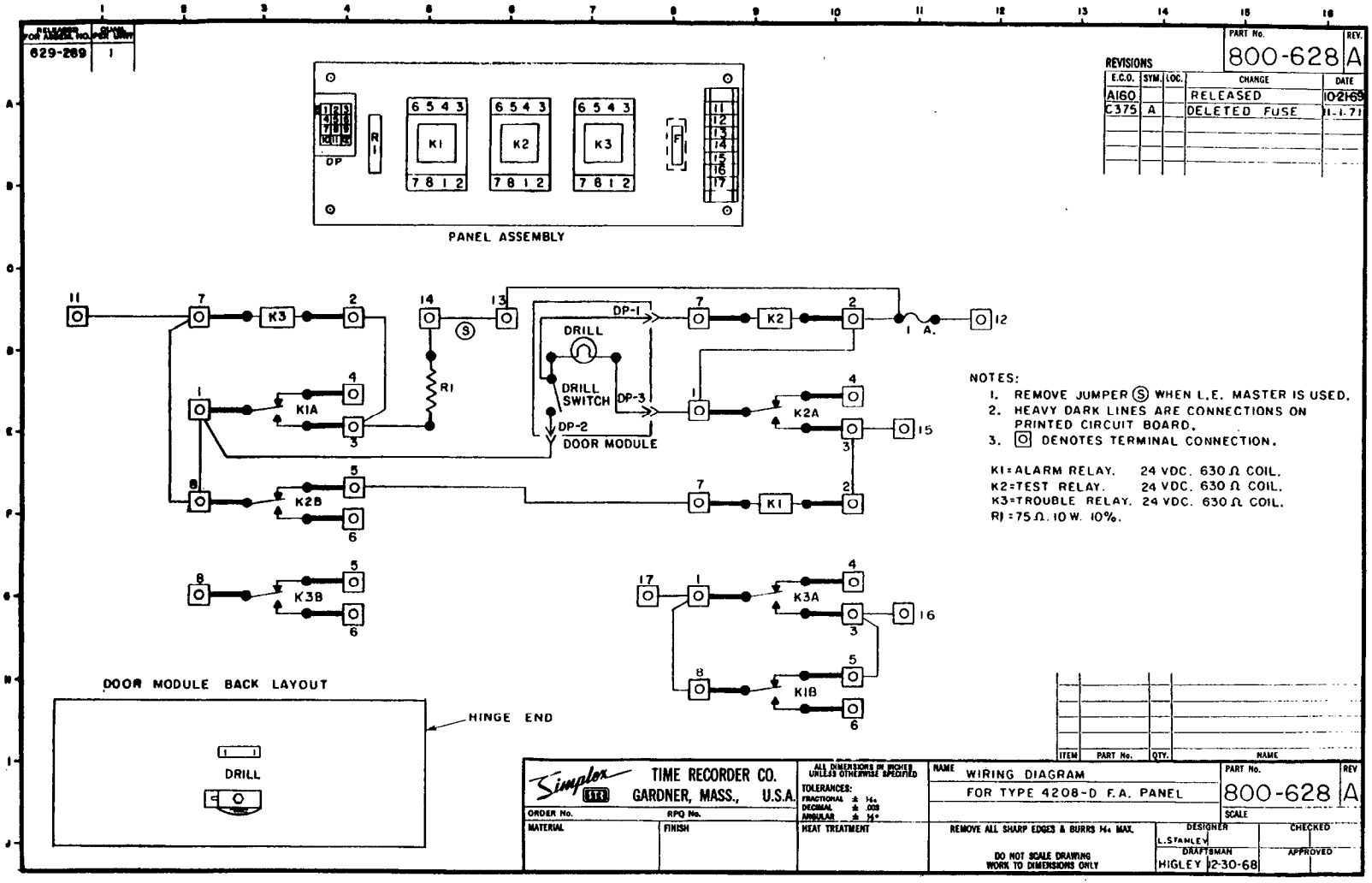
   A. Check the lines to and from the box.
   B. Check the "D" panel circuitry.









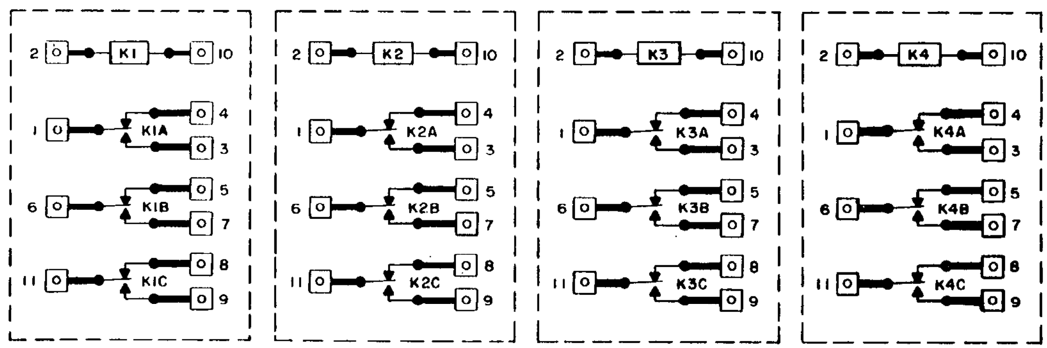


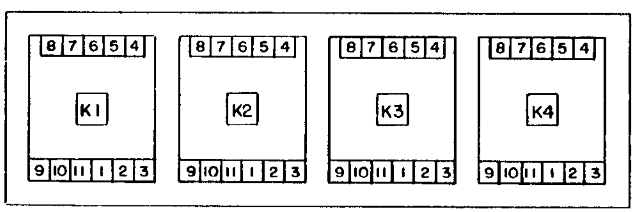
RELEASED FOR ASSEM. NO.	QUAN. PER UNIT
629-295	1

REVISIONS

E.C.O.	SYM.	LOC.	CHANGE
A160			RELEASED

PART No. 800-638





NOTE:

I HEAVY DARK LINES ARE CONNECTION ON PRINTED CIRCUIT BOARDS.

II [O] DENOTES TERMINAL CONNECTION.

III K1-K4 = 3PDT 24VDC RELAY.

ITEM	PART No.	QTY.	NAME

Simplex TIME RECORDER CO. GARDNER, MASS., U.S.A.

ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED
TOLERANCES: FRACTIONAL ± 1/64, DECIMAL ± .010, ANGULAR ± 1/2°

NAME: WIRING DIAGRAM FOR 4208-E FIRE ALARM PANEL

PART No. 800-638

SCALE: NONE

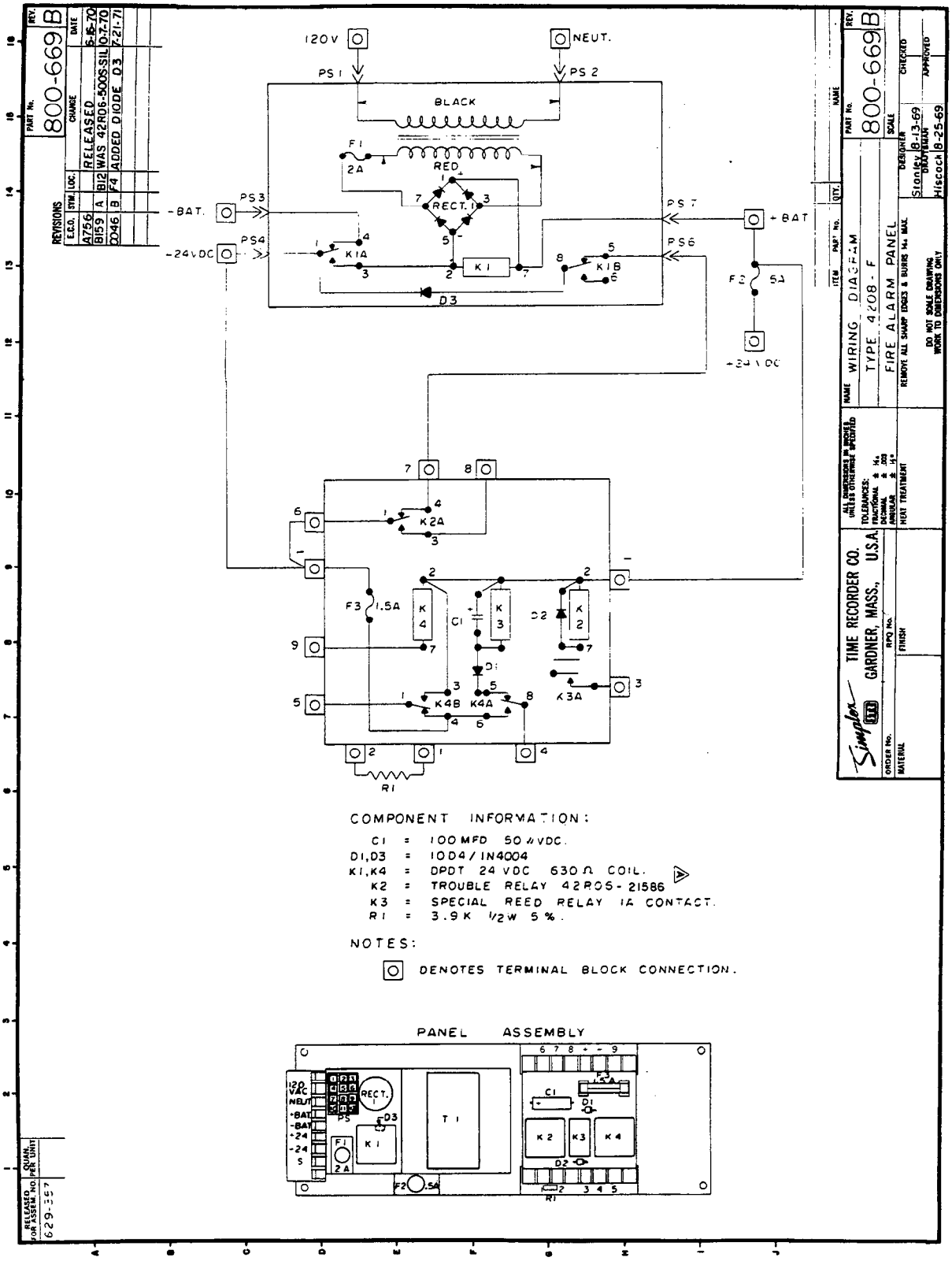
ORDER No. | RPQ No.

MATERIAL | FINISH | HEAT TREATMENT

REMOVE ALL SHARP EDGES & BURRS 1/64 MAX.

DO NOT SCALE DRAWING WORK TO DIMENSIONS ONLY

DESIGNER: STANLEY 2-12-69
DRAFTSMAN: MARKKU 2-12-69
CHECKED
APPROVED



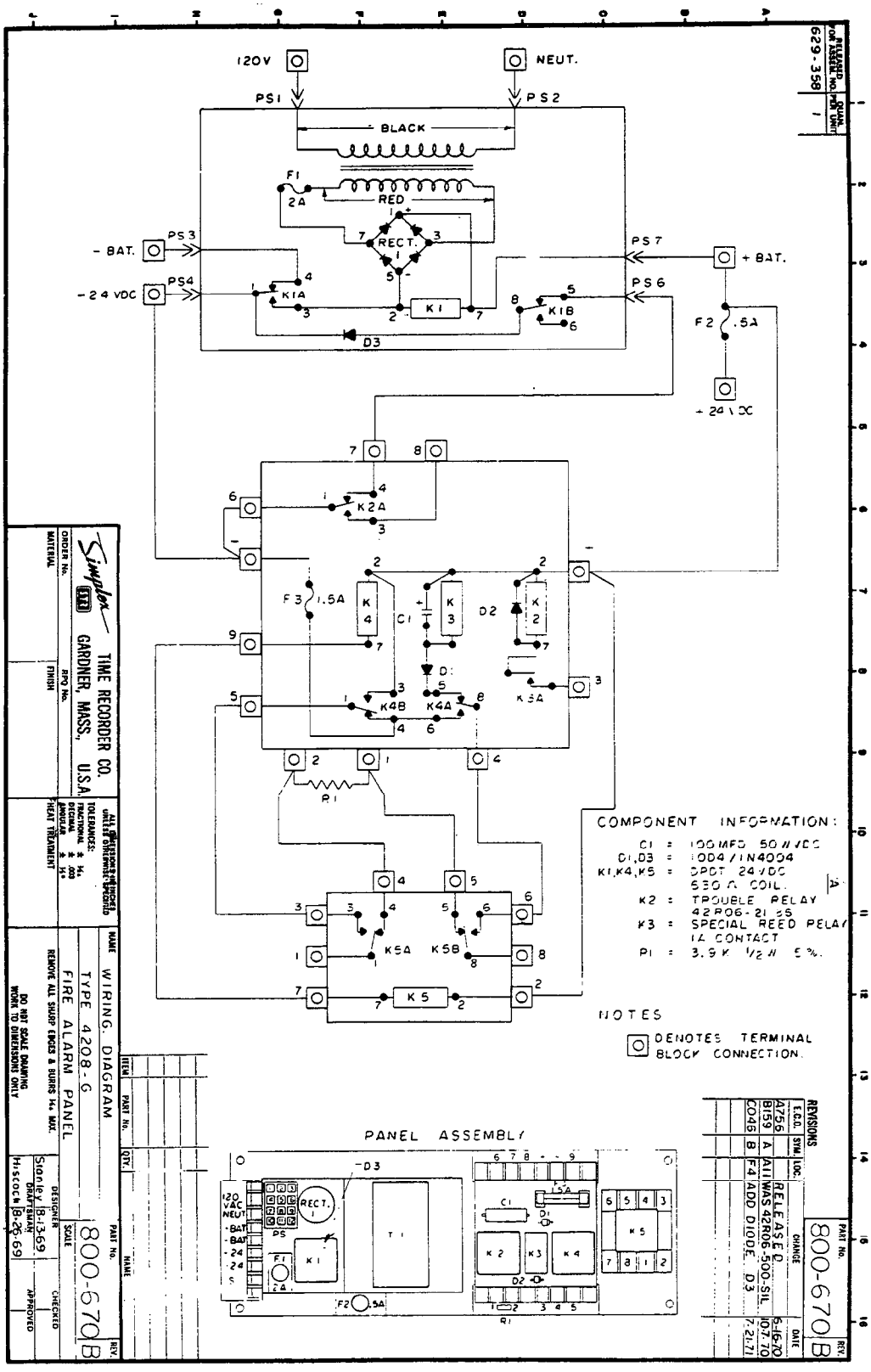
COMPONENT INFORMATION:

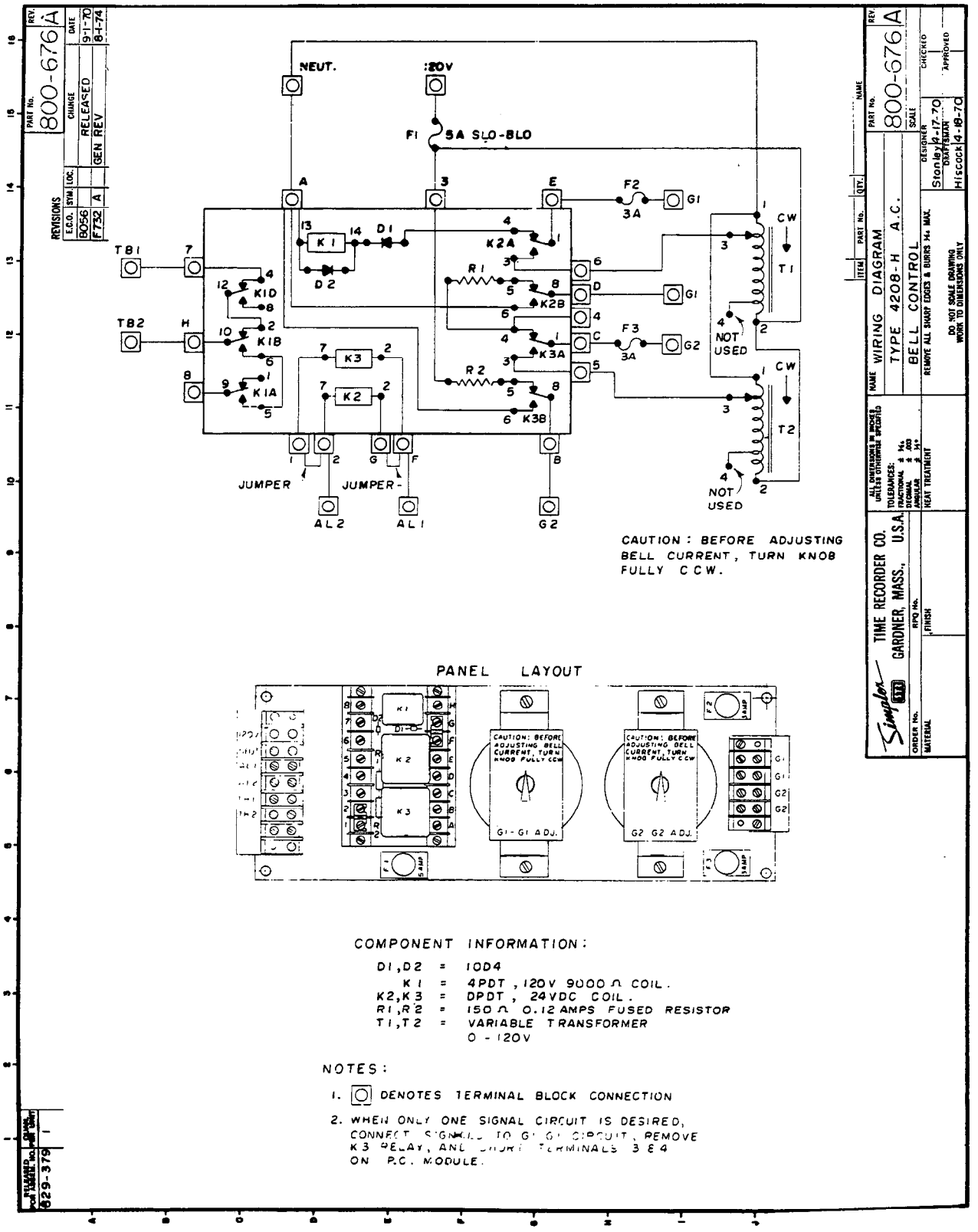
C1 = 100 MFD 50 WVDC.
D1,D3 = 1004 / 1N4004
K1,K4 = DPDT 24 VDC 630 Ω COIL. ▶
K2 = TROUBLE RELAY 42ROS-21586
K3 = SPECIAL REED RELAY 1A CONTACT.
R1 = 3.9K ½W 5%.

NOTES:

⊙ DENOTES TERMINAL BLOCK CONNECTION.

PANEL ASSEMBLY





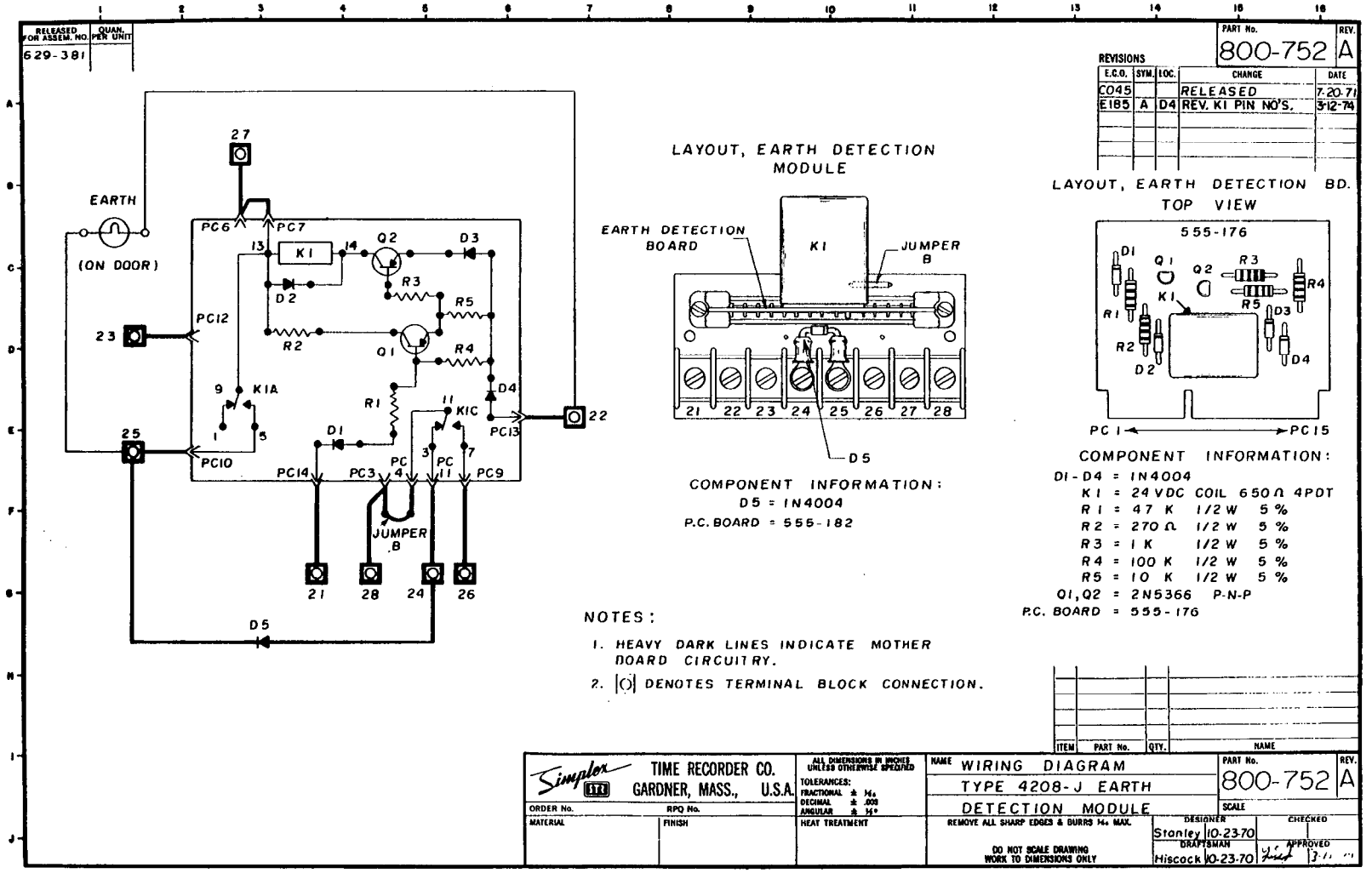
PANEL LAYOUT

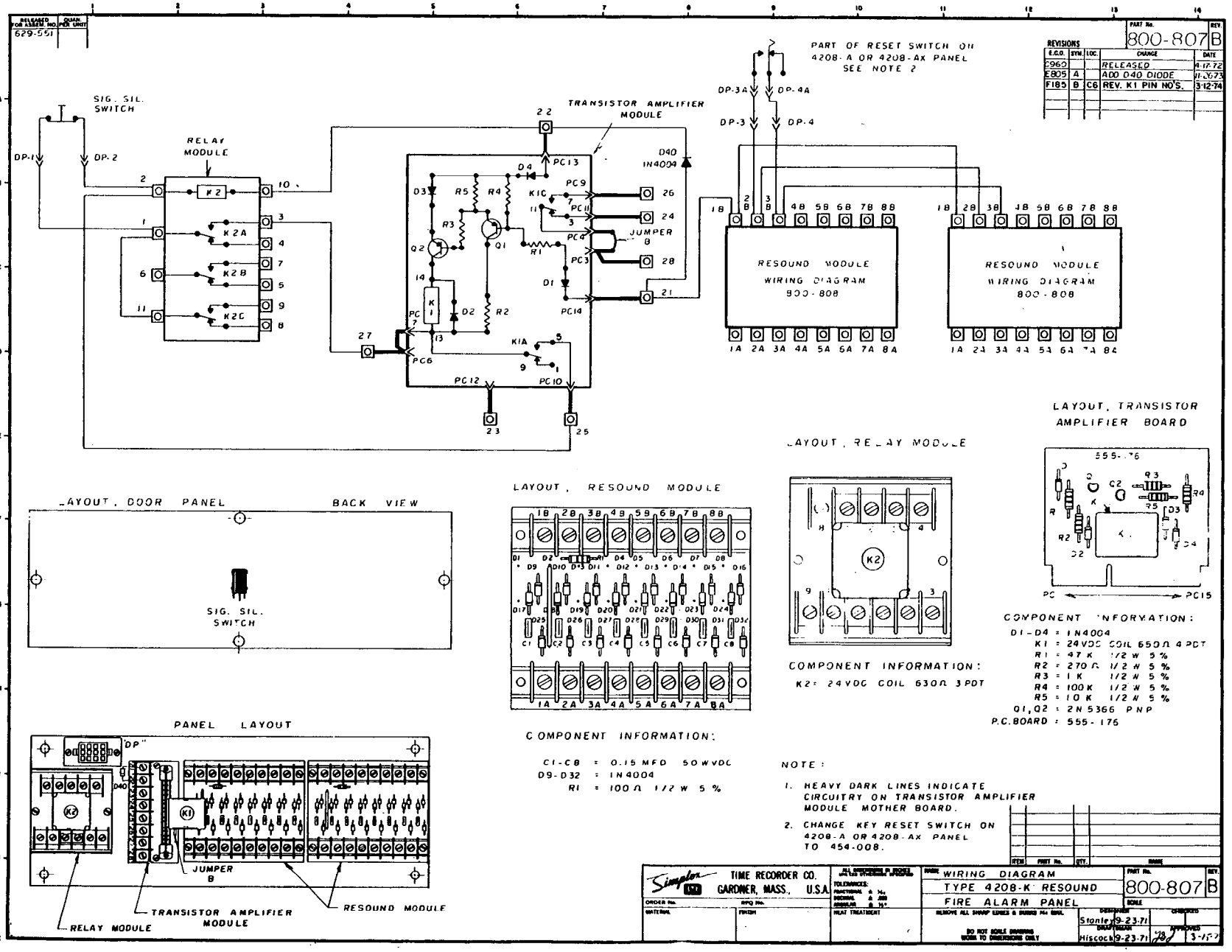
COMPONENT INFORMATION:

D1, D2	=	1004
K1	=	4PDT, 120V 9000 Ω COIL.
K2, K3	=	DPDT, 24VDC COIL.
R1, R2	=	150 Ω 0.12 AMPS FUSED RESISTOR
T1, T2	=	VARIABLE TRANSFORMER 0 - 120V

NOTES:

1. ⊙ DENOTES TERMINAL BLOCK CONNECTION
2. WHEN ONLY ONE SIGNAL CIRCUIT IS DESIRED, CONNECT SIGNAL TO G1 G1 CIRCUIT, REMOVE K3 RELAY, AND JUMPER TERMINALS 3 & 4 ON P.C. MODULE.





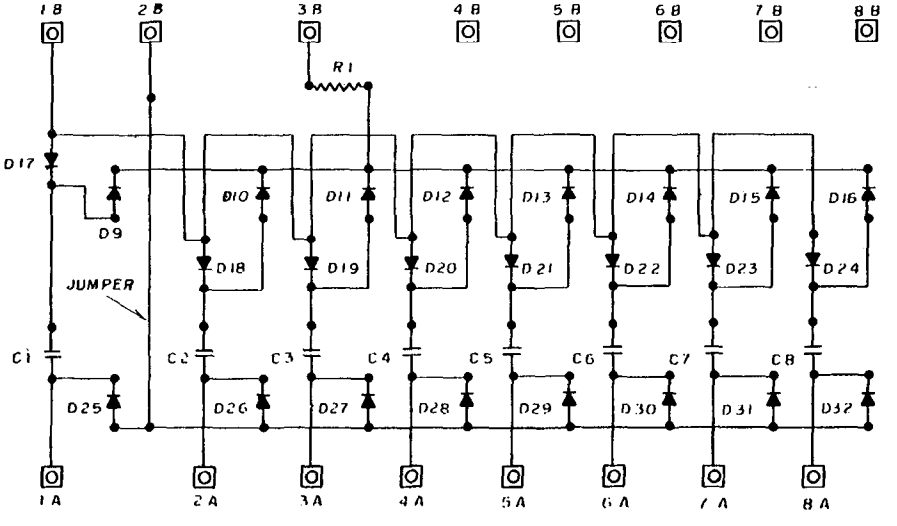
RELEASED FOR ASSEM. NO.	QUAN. PER UNIT
629-550	

PART No. 800-808 REV.

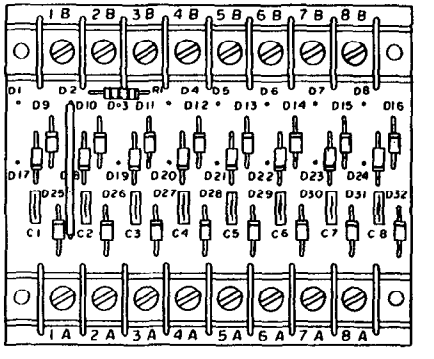
REVISIONS

E.C.O.	SYM.	LOC.	CHANGE	DATE
C960			RELEASED	4-17-72

NOT USED



LAYOUT, RESOUND BOARD



COMPONENT INFORMATION:

C1-C8 = 0.15 MFD 50WVDC
D9-D32 = 1N4004
R1 = 100 Ω 1/2W 5%

ITEM	PART No.	QTY.	NAME

Simplex TIME RECORDER CO. GARDNER, MASS., U.S.A.

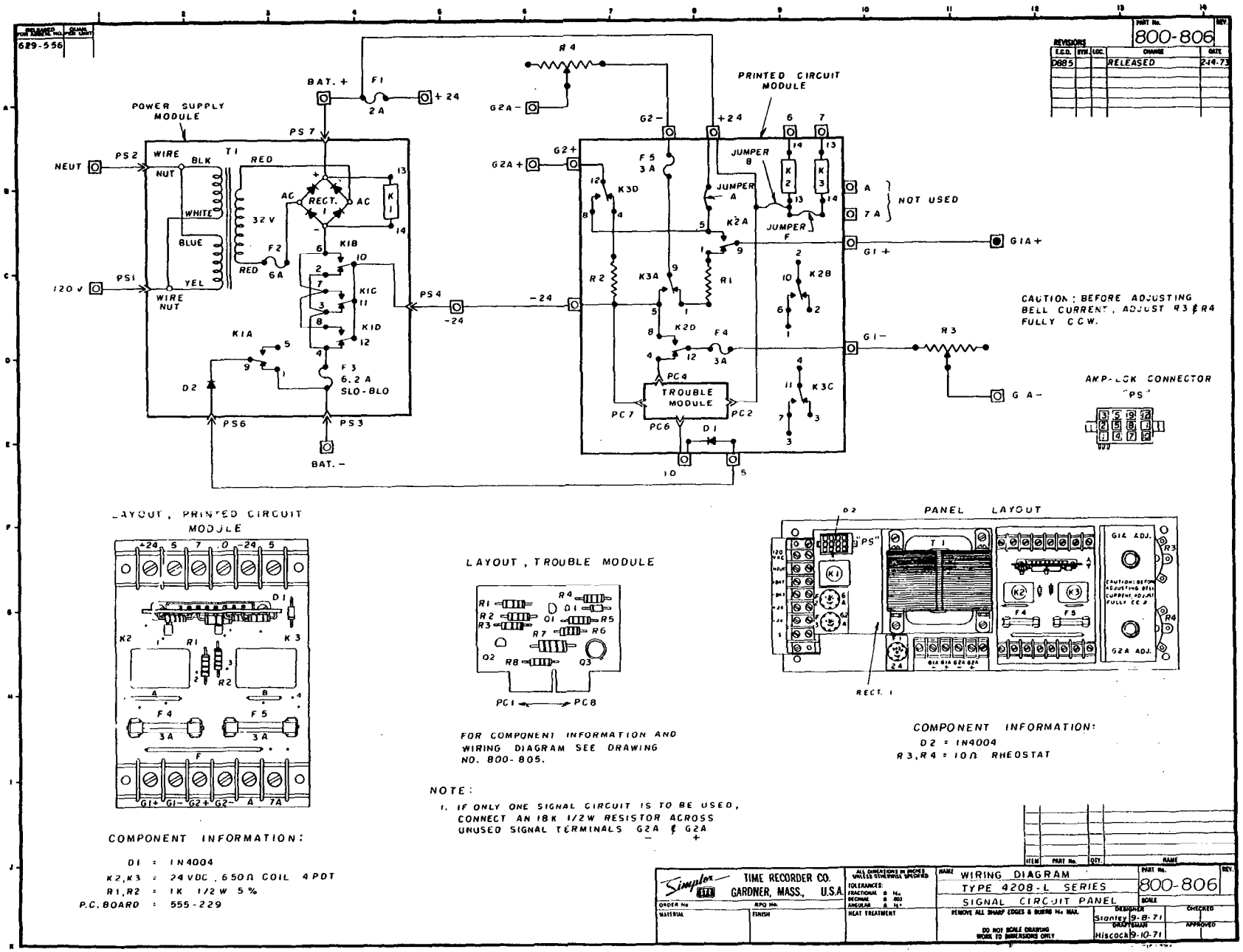
ORDER No. | RPQ No. | MATERIAL | FINISH

ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED
TOLERANCES: FRACTIONAL ± 1/64 DECIMAL ± .005 ANGULAR ± 1/2°
HEAT TREATMENT
REMOVE ALL SHARP EDGES & BURRS 1/64 MAX.
DO NOT SCALE DRAWING WORK TO DIMENSIONS ONLY

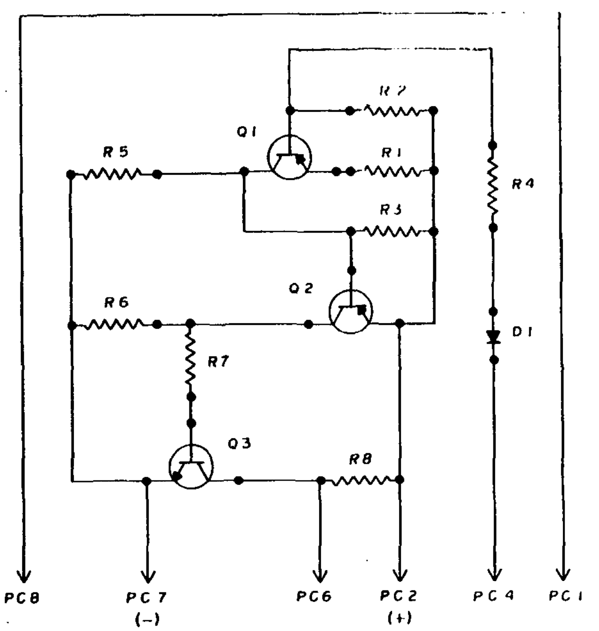
NAME WIRING DIAGRAM
RESOUND BOARD
FOR TYPE 4208-K F.A. PANEL

PART No. 800-808 REV.
SCALE

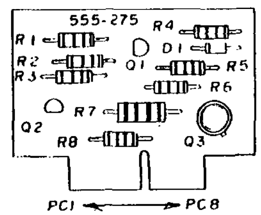
DESIGNED	CHECKED
Stanley 9-23-71	
DRAFTSMAN	APPROVED
Hiscock 9-27-71	



RELEASED FOR ASSEM. NO.	QUAN. PER UNIT
629-468	



LAYOUT , TROUBLE BOARD



COMPONENT INFORMATION:

DI	=	IN4004			
R I	=	270 Ω	1/2	W	5 %
R3, R4	=	100 K	1/2	W	5 %
R2, R5	=	47 K	1/2	W	5 %
R6, R8	=	10 K	1/2	W	5 %
R7	=	1 K	1	W	10 %
Q1, Q2	=	2N5401	PNP		
Q3	=	2N3053	NPN		
P.C. BOARD	=	555 - 275			

PART No. 800-805 REV.

REVISIONS

E.C.O.	SYM.	LOC.	CHANGE	DATE
D885			RELEASED	2-14-73

ITEM	PART No.	QTY.	NAME

Simplex TIME RECORDER CO. GARDNER, MASS., U.S.A.

ORDER No. RPQ No. MATERIAL FINISH

ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED
TOLERANCES: FRACTIONAL ± 1/64 DECIMAL ± .003 ANGULAR ± 1/2°
HEAT TREATMENT

NAME WIRING DIAGRAM TYPE 4208-L TROUBLE MODULE

REMOVE ALL SHARP EDGES & BURRS 1/64 MAX.
DO NOT SCALE DRAWING WORK TO DIMENSIONS ONLY

PART No. 800-805 REV. SCALE

DESIGNER		CHECKED
Stanley	9-8-71	
DRAFTSMAN		APPROVED
Hiscock	9-13-71	

Simplex TIME RECORDER CO.
STR GARDNER, MASS., U.S.A.

ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONAL ± 1/64
DECIMAL ± .003
ANGULAR ± 1/2°

NAME WIRING DIAGRAM 4208-M
TROUBLE RELAY FOR D.C.
SIGNAL PANEL

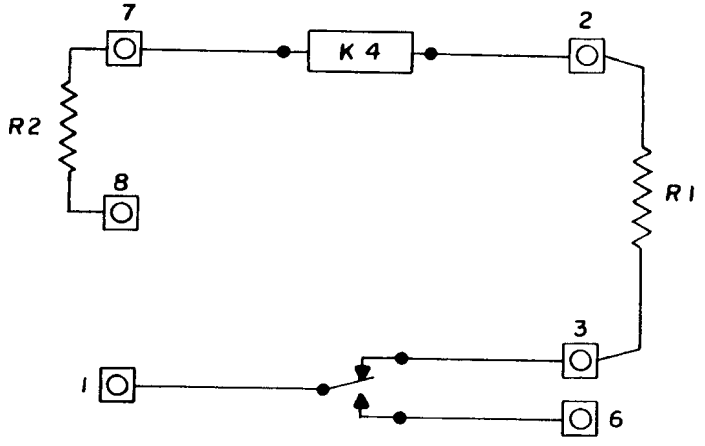
PART No. 800-764
REV.
SCALE

ORDER No. | RPQ No.
MATERIAL | FINISH
HEAT TREATMENT
REMOVE ALL SHARP EDGES & BURRS 1/64 MAX.
DO NOT SCALE DRAWING
WORK TO DIMENSIONS ONLY

DESIGNER Stanley 12-14-70
DRAFTSMAN Hiscock 12-16-70
CHECKED
APPROVED

RELEASED FOR ASSEM. NO.	QUAN. PER UNIT
629-489	1

E.C.O.	SYM.	LOC.	CHANGE	DATE
8581			RELEASED	2-23-71



COMPONENT INFORMATION:

K4 = 48RO-500G-SIL.
R1 = 1K 1W 10%
R2 = 2.7K 1/2W 5%

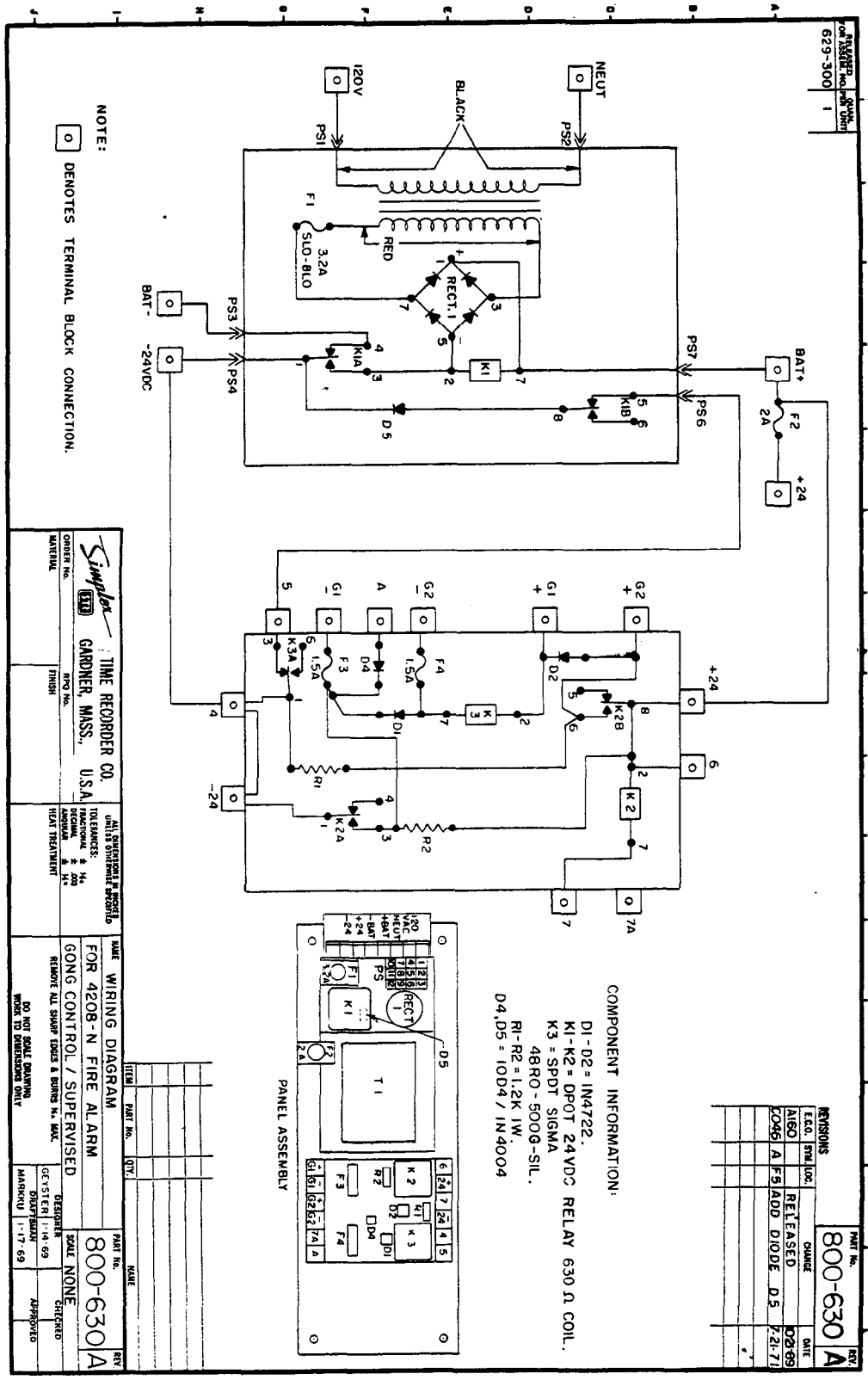
NOTES:

1. ⊡ DENOTES TERMINAL BLOCK CONNECTION.

PART No. 800-764 REV.

SIMPLEX J-824

ITEM	PART No.	QTY.	NAME



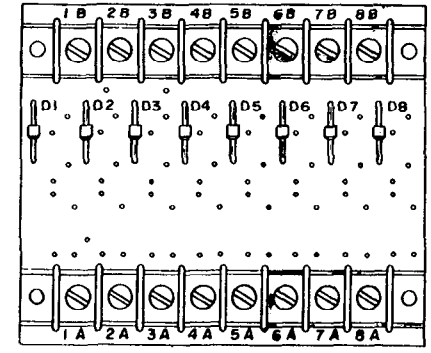
RELEASED FOR ASSEM. NO.	QUAN. PER UNIT
629-475	1

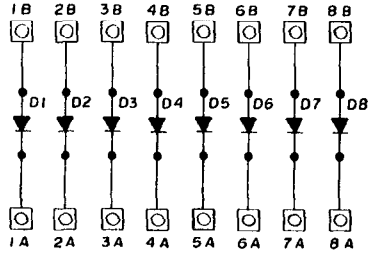
PART No. 800-711 REV.

REVISIONS

E.C.O.	SYM.	LOC.	CHANGE	DATE
8582			RELEASED	2-23-71

LAYOUT, P.C. BOARD
TOP VIEW





COMPONENT INFORMATION:
D1 - D8 = IN4004 / 1004
P.C. BOARD = 555-215

ITEM	PART No.	QTY.	NAME

Simplex TIME RECORDER CO.
GARDNER, MASS., U.S.A.

ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONAL ± 1/64
DECIMAL ± .005
ANGULAR ± 1/2°

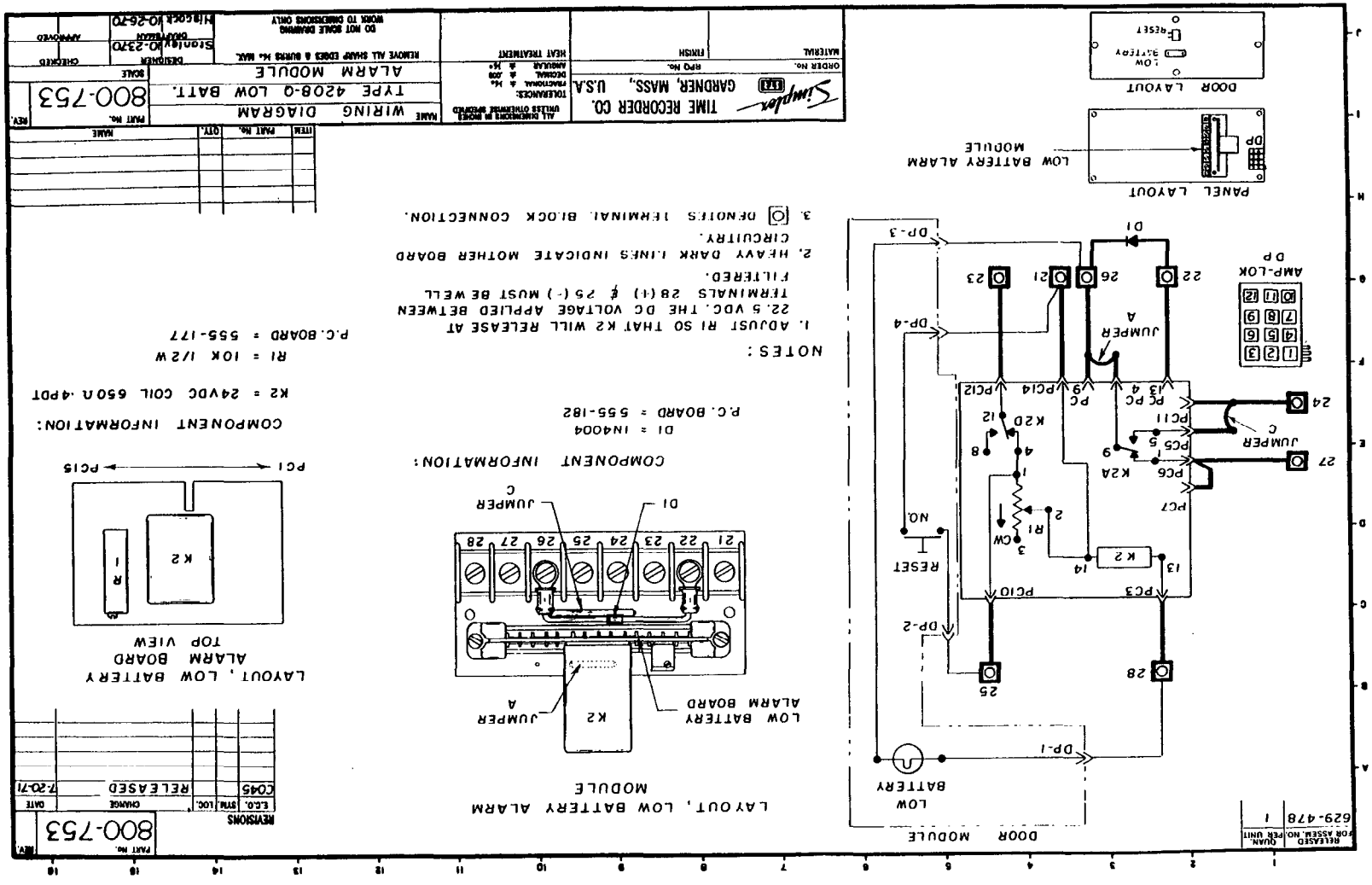
NAME WIRING DIAGRAM
TYPE 4208-P

PART No. 800-711 REV.
SCALE

ORDER No. | RPQ No.
MATERIAL | FINISH
HEAT TREATMENT

REMOVE ALL SHARP EDGES & BURRS 1/64 MAX.
DO NOT SCALE DRAWING
WORK TO DIMENSIONS ONLY

DESIGNER Stanley 10-6-70
DRAFTSMAN Hiscock 10-28-70
CHECKED
APPROVED



RELEASED FOR ASSEM. NO.	QUAN. PER UNIT
629-414	1

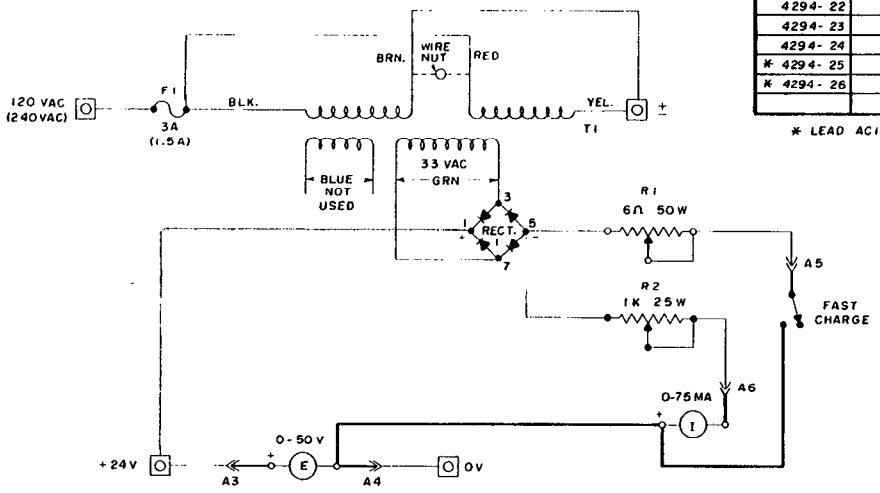
LEAD ACID BATTERIES ARE AT FULL CHARGE WHEN VOLTAGE PER CELL IS 2.15 VOLTS AND SPECIFIC GRAVITY IS APPROXIMATELY 1.215. NICKEL CADMIUM VOLTAGE IS 1.4 PER CELL. BOTH LEAD ACID AND NICKEL CADMIUM BATTERIES SHOULD BE CHECKED PERIODICALLY. ADJUST TRICKLE RATE ACCORDINGLY. A 15° TEMPERATURE RISE DOUBLES THE CHARGE RATE.

BATTERY TYPE	TRICKLE CHARGE RATE AMPS @ 77° F	CAPACITY A.H.
* 4294-1	.005	8 A.H.
* 4294-2	.010	16 A.H.
* 4294-3	.015	24 A.H.
* 4294-4	.018	30 A.H.
* 4294-21	.005	8 A.H.
4294-22	.013	13 A.H.
4294-23	.018	18 A.H.
4294-24	.030	30 A.H.
* 4294-25	.010	16 A.H.
* 4294-26	.015	24 A.H.

* LEAD ACID BATTERIES

REVISIONS				
E.C.O.	SYM.	LOC.	CHANGE	DATE
8656			RELEASED	3-12-71
0634	A		GEN. REVISION	11-21-72

PART No. 800-709 REV. A

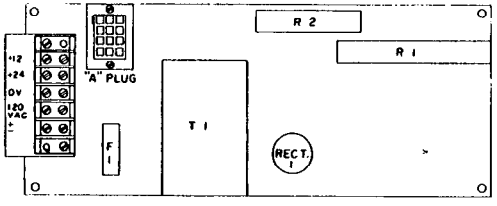


NOTES:

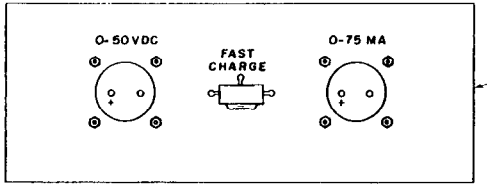
1. R1 HAS BEEN FACTORY ADJUSTED FOR A MAX. FAST CHARGE RATE OF 2 AMPS.
2. ADJUST R2 FOR TRICKLE CHARGE RATE OF BATTERY TYPE AS SHOWN IN CHART.
3. T1 TRANSFORMER TO BE WIRED AS SHOWN FOR 120 VAC. RECONNECT BROWN AND RED AS SHOWN IN DOTTED LINE FOR 240 VAC.
4. HEAVY DARK LINES ARE WIRES IN HARNESS TO CABINET DOOR.
5. [O] DENOTES TERMINAL STRIP CONNECTIONS.


"A" PLUG

PANEL LAYOUT



DOOR PANEL LAYOUT BACK SIDE



ITEM	PART No.	QTY.	NAME

Simplex TIME RECORDER CO. GARDNER, MASS., U.S.A.

ORDER No. | RPQ No.

MATERIAL | FINISH

TOLERANCES: FRACTIONAL ± 1/64, DECIMAL ± .010, ANGULAR ± 1°

HEAT TREATMENT

NAME WIRING DIAGRAM, 4208-R 2 AMP MANUAL BATTERY CHARGER

PART No. 800-709 REV. A

SCALE

REMOVE ALL SHARP EDGES & BURRS

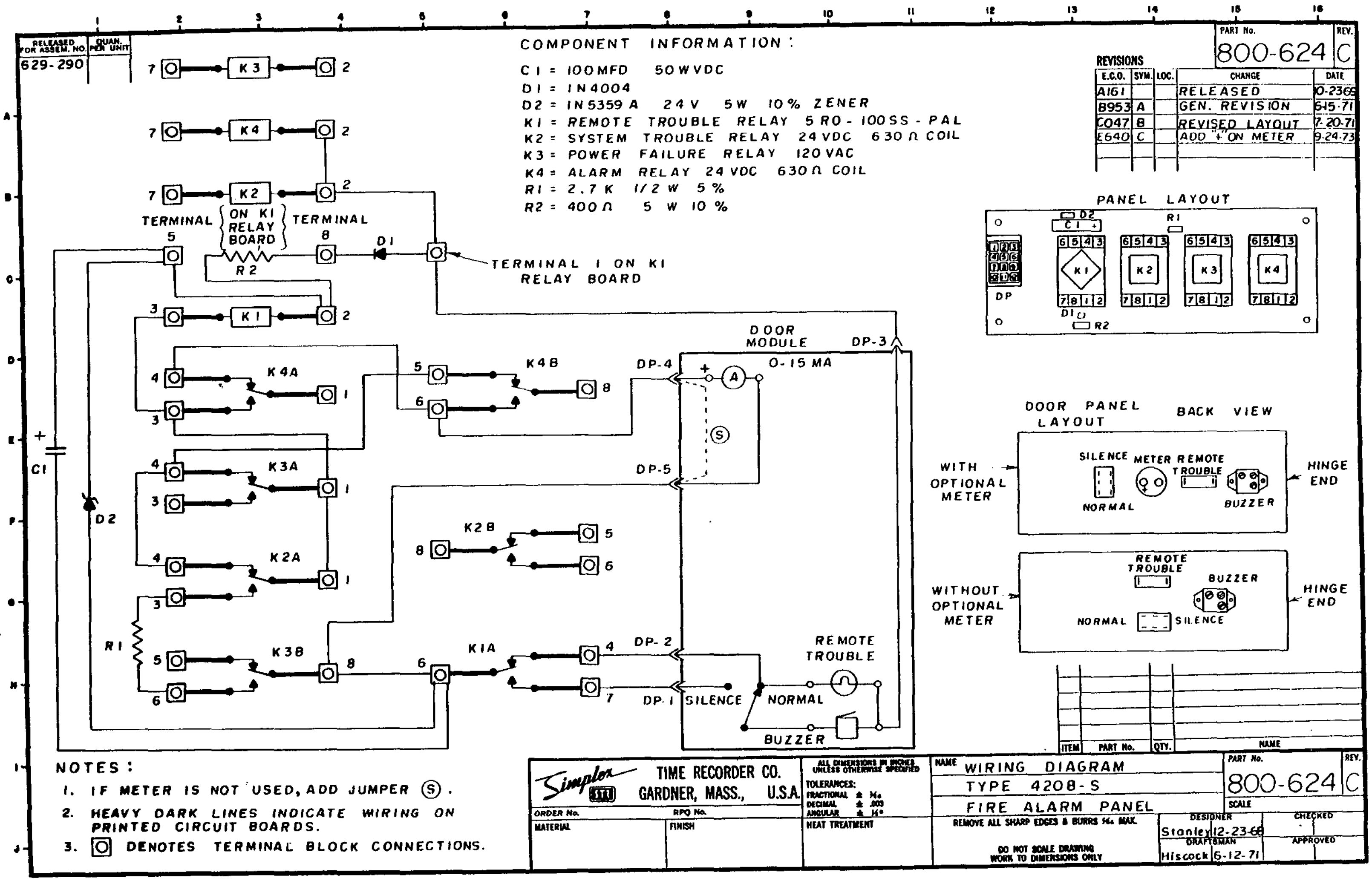
DO NOT SCALE DRAWING WORK TO DIMENSIONS ONLY

DESIGNER Stanley 2-11-70

DRAFTSMAN Hiscock 2-19-70

CHECKED

APPROVED



Simplex TIME RECORDER CO.
GARDNER, MASS., U.S.A.

ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONAL ± 1/64
DECIMAL ± .003
ANGULAR ± 1/2°

NAME WIRING DIAGRAM
4208-T TIME LIMIT CUTOUT

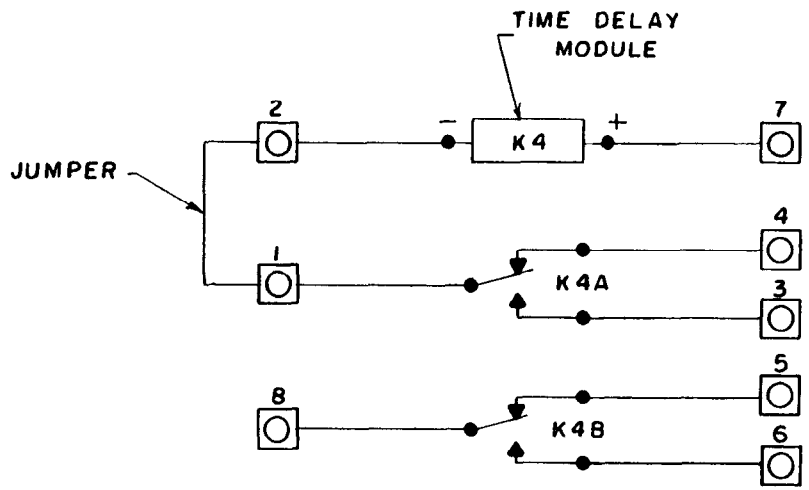
PART No. 800-673
REV.
SCALE

ORDER No. | RPQ No.
MATERIAL | FINISH | HEAT TREATMENT
REMOVE ALL SHARP EDGES & BURRS 1/64 MAX.
DO NOT SCALE DRAWING WORK TO DIMENSIONS ONLY

DESIGNER Stanley 11-18-69
DRAFTSMAN Hiscock 11-19-69
CHECKED
APPROVED

RELEASED FOR ASSEM. NO.	QUAN. PER UNIT
629-359	

E.C.O.	SYM.	LOC.	CHANGE	DATE
A756			RELEASED	6-16-70



NOTE:
1. ○ DENOTES TERMINAL BLOCK CONNECTION.

ITEM	PART No.	QTY.	NAME

PART No. 800-673
REV.

SIMPLEX J-894

Simplex TIME RECORDER CO.
GARDNER, MASS., U.S.A.

ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED
TOLERANCES:
FRACTIONAL ± 1/64
DECIMAL ± .005
ANGULAR ± 1/2°

NAME WIRING DIAGRAM, 4208-U
ADAPTER RELAY
FOR CODED SYSTEMS

PART No. 800-656 REV. A

SCALE

ORDER No. | RPQ No.

MATERIAL | FINISH | HEAT TREATMENT

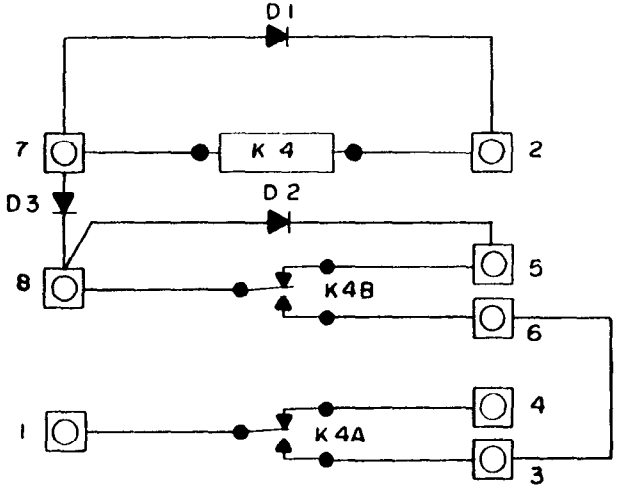
REMOVE ALL SHARP EDGES & BURRS 1/64 MAX.

DO NOT SCALE DRAWING
WORK TO DIMENSIONS ONLY

DESIGNER Stanley 4-22-69 | CHECKED
DRAFTSMAN Hiscock 4-23-69 | APPROVED

RELEASED FOR ASSEM. NO.	QUAN. PER UNIT
629-342	1

E.C.O.	SYM.	LOC.	CHANGE	DATE
A160			RELEASED	10-21-69
B196	A	D2	ADD DIODE D3	10-21-70



COMPONENT INFORMATION

K4 – 24 VDC DPDT RELAY 630Ω COIL.

D1,D2,D3-1004 DIODE

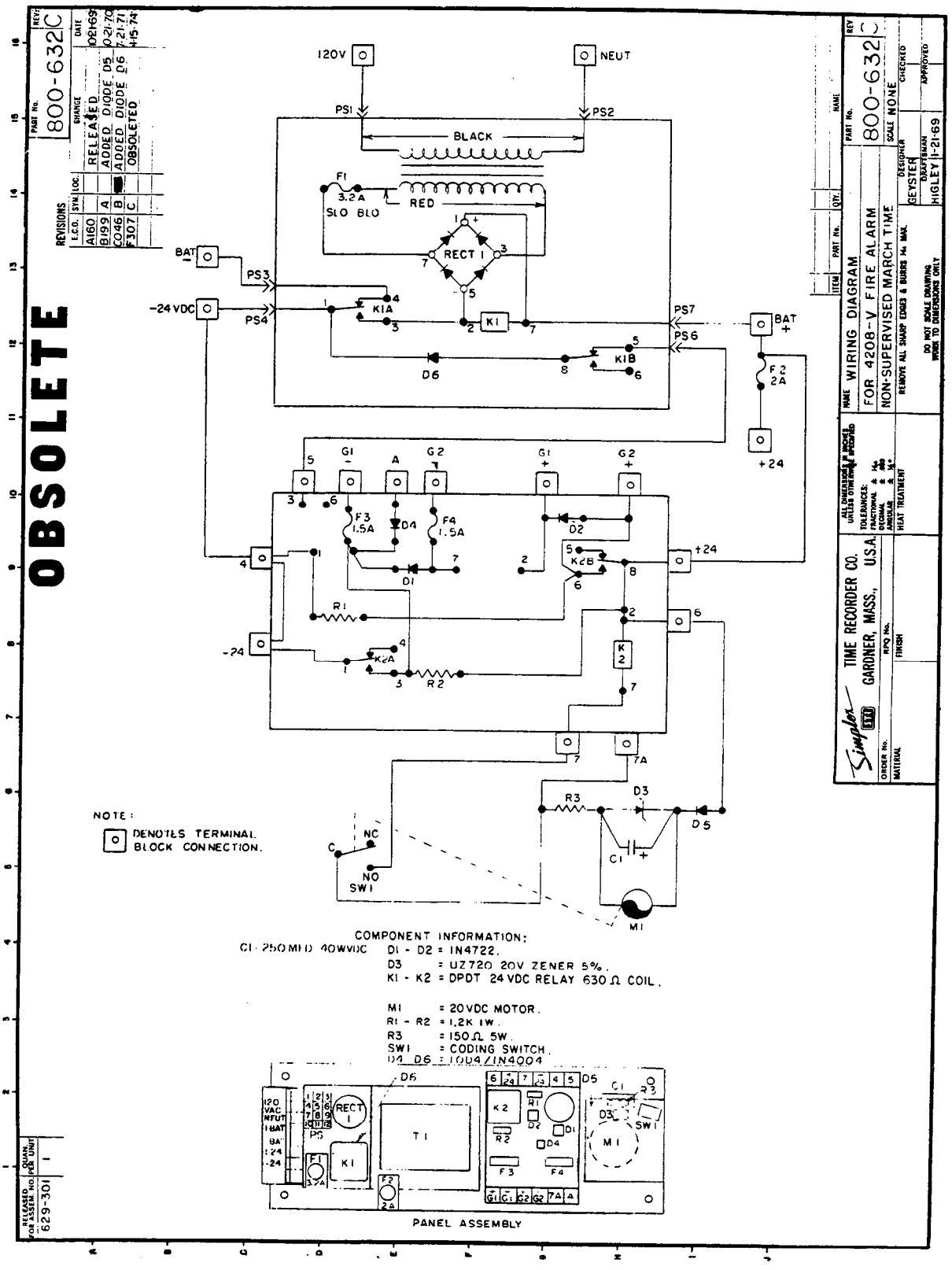
NOTE:

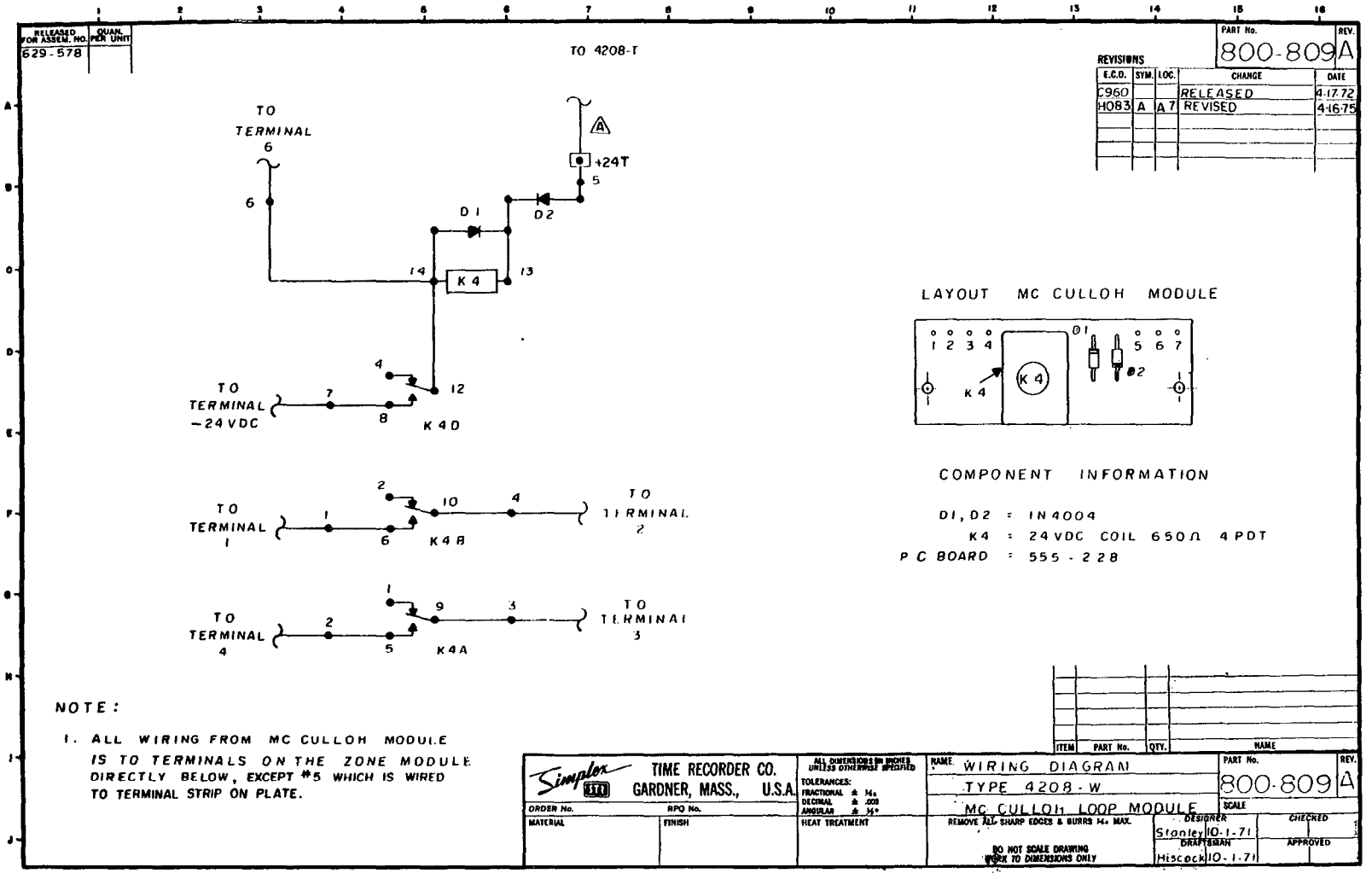
1. THIS RELAY MOUNTED ON EITHER 4208-C OR -N PANEL.
2. ○ DENOTES TERMINAL BLOCK CONNECTION.

ITEM	PART No.	QTY.	NAME

PART No. 800-656 REV. A

SIMPLEX 4-284



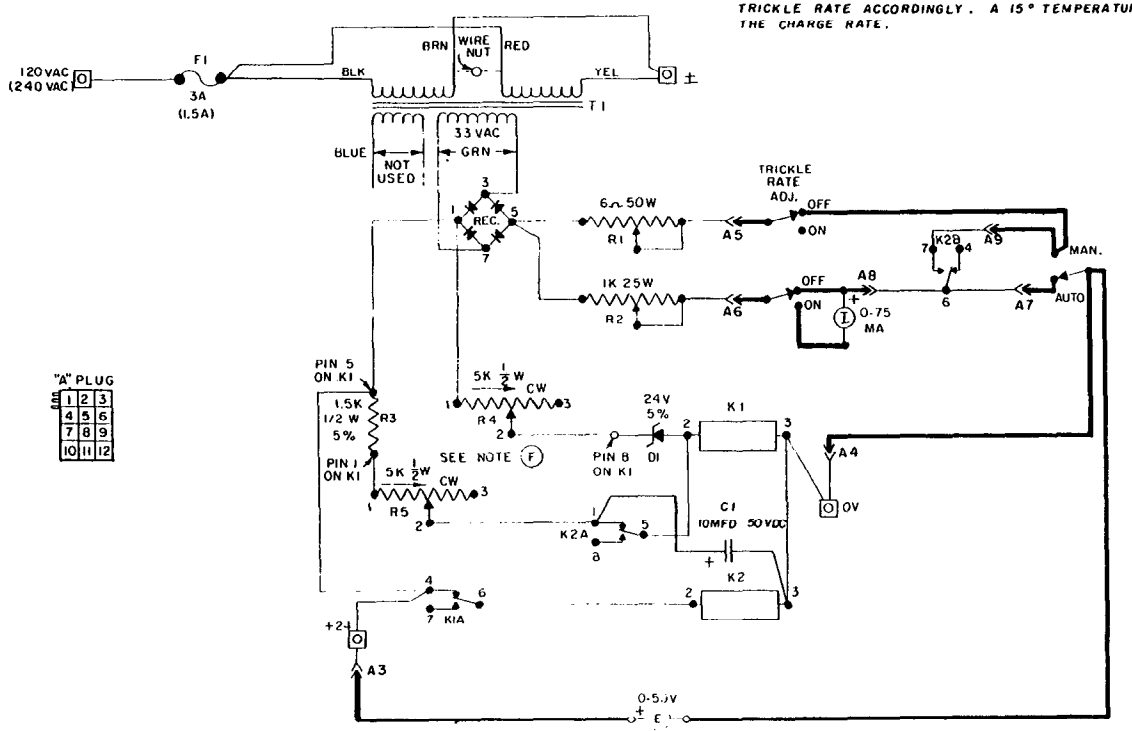


PART No.	REV.
800-642	B

REVISIONS				
E.C.O.	SYM	LOC	CHANGE	DATE
A151			RELEASED	10-21-68
C299	A		REVISED NOTE F	9-29-71
D634	B		GEN. REVISION	11-21-72

PLUNGER FOR LABEL NO.	CHAN PER UNIT
629-276	1

LEAD ACID BATTERIES ARE AT FULL CHARGE WHEN VOLTAGE PER CELL IS 2.15 VOLTS AND SPECIFIC GRAVITY IS APPROXIMATELY 1.215. NICKEL CADMIUM VOLTAGE IS 1.4 PER CELL. BOTH LEAD ACID AND NICKEL CADMIUM BATTERIES SHOULD BE CHECKED PERIODICALLY. ADJUST TRICKLE RATE ACCORDINGLY. A 15° TEMPERATURE RISE DOUBLES THE CHARGE RATE.



NOTES

(A) R1 HAS BEEN FACTORY ADJUSTED FOR A MAX. FAST CHARGE RATE OF 2 AMPS.

(B) ADJUST R2 FOR TRICKLE CHARGE RATE OF BATTERY TYPE AS SHOWN IN CHART.

TRICKLE CHARGE RATE:

(C) T1 TRANSFORMER TO BE WIRED AS SHOWN FOR 115 VAC.
RECONNECT BROWN AND RED AS SHOWN IN DOTTED LINE FOR 230 VAC.

(D) HEAVY DARK LINES ARE WIRES IN HARNESS TO CABINET DOOR.

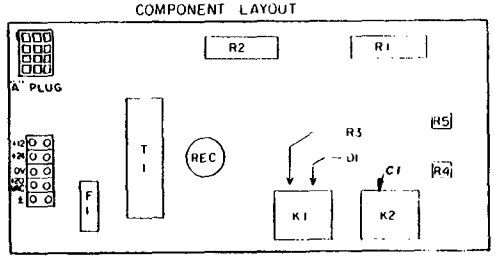
(E) K1=SIGMA 5RO 400 CD-SIL
K2=SIGMA 42RO 1000 S-SIL

(F) R4 HAS BEEN FACTORY SET TO PULL IN K1 RELAY AT 27.5 VDC
R5 HAS BEEN FACTORY SET TO RELEASE K1 RELAY AT 25 VDC
THESE SETTINGS ARE MADE WITH A BATTERY CONNECTED TO CHARGER AND THE RESISTORS ARE THEN LOCKED
ANY TAMPERING WITH THESE ADJUSTMENTS WILL VOID GUARANTEE

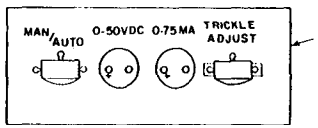
BATTERY TYPE	TRICKLE CHARGE RATE AMPS @ 77°F	CAPACITY A.H.
* 4294-1	.015	8 A.H.
* 4294-2	.020	16 A.H.
* 4294-3	.025	24 A.H.
* 4294-4	.028	30 A.H.
* 4294-21	.015	8 A.H
4294-22	.023	13 A.H.
4294-23	.028	18 A.H.
4294-24	.040	30 A.H.
* 4294-25	.020	16 A.H.
* 4294-26	.025	24 A.H.

* LEAD ACID BATTERIES

COMPONENT LAYOUT

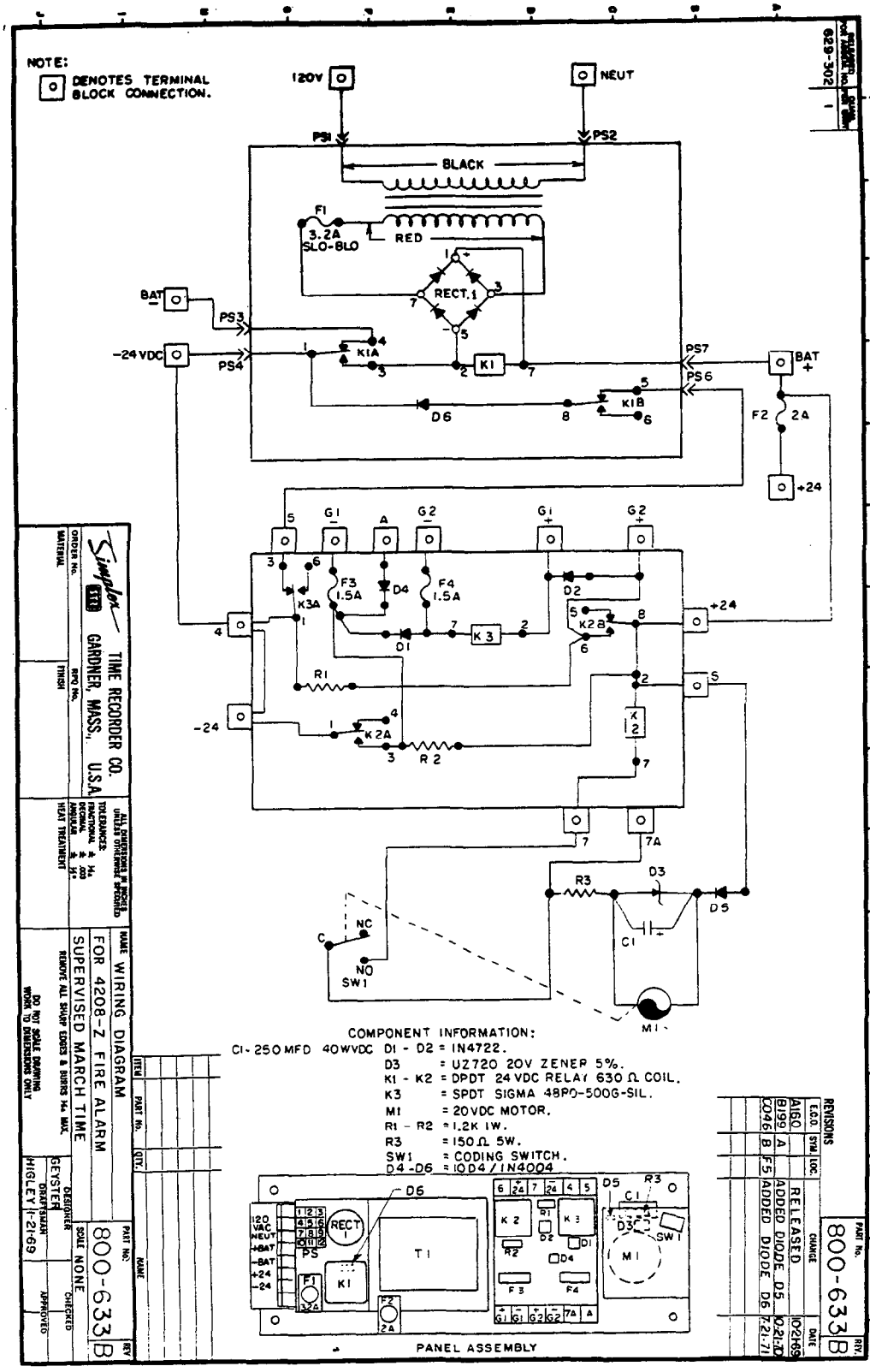


DOOR PANEL BACK LAYOUT



ITEM	PART No.	QTY.	NAME

Simplex TIME RECORDER CO. GARDNER, MASS., U.S.A.	NAME WIRING DIAGRAM	PART No. 800-642	REV. B
ORDER No. / APG No.	2 AMP AUTOMATIC CHARGER	SCALE NONE	
MATERIAL / FINISH	TYPE 4208-Y	DESIGNED Stanley 3-4-69	CHECKED
HEAT TREATMENT	REMOVE ALL SHARP EDGES & BURRS Ma. MAX. DO NOT SCALE DRAWING WORK TO DIMENSIONS ONLY	DRAFTSMAN Hiscock 3-5-69	APPROVED



Simplex

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