

CIRCUITS AND OPERATION OF E. P. C. LOCAL BURGLAR ALARM SYSTEM  
AS PROPOSED FOR UNITED STATES WAR DEPARTMENT SIGNAL CORPS

A. C. Operation:

Operation from A. C. power lines is obtained by the use of a transformer and copper oxide rectifier. The rectifier is connected across the dry cells with two resistors in series with the positive line. A 25 $\mu$ fd 25 volt electrolytic condenser is shunted across the output of the rectifier to provide filtering action for the rectified current. The adjustable resistor (R-5) is provided so that the current required for the system can be varied and should be adjusted so that no current is flowing either into or out of the batteries.

A Resistor R8 is utilized to prevent a ground on the normally ungrounded loop from causing a "short circuit" across the 70 volt secondary of the transformer, eliminating the possibility of injury to the transformer.

In the accompanying schematic drawings "sketch B", the A. C. power supply and trouble locating system, wiring is indicated in red so that it is readily identified from the system as called for in the basic bid. The operation of the trouble locating system is readily apparent and in view of the inherent characteristics of Neon gas it can be seen that normally the trouble locating Neon lamps have no effect on the system, however, upon operation of the trouble switch 70 volt A. C. is applied to the protection wiring and the Neon gas becomes active and the lamps will glow.

The resistor R-7 is included to provide a completed circuit through the protective wiring when the trouble locating switch is operated to its "on" position. An 8ma A. C. circuit is established through the contacts, window contacts, wall panels, etc. This current is decided upon in order to burn out any locating corrosive coating on small particles of foreign matter that may accumulate on the contacts during the protection "off" period.

Normal "Protection On" Condition:

The circuit as shown on sketch B is in its normal "protection on" position. It consists of a conventional single circuit that may be traced from the positive terminal of the battery to the alarm magnet, then through Resistor R3, the housing lining and tamper, continuing through control pryoff tamper, contact SW3 and contact Ts1 to the ungrounded side of the premises wiring. The circuit may be further traced through contact Ts2, resistor R1 to the milliammeter, the control unit door tamper, contact SW1, to the magnet of the alarm relay A, through contact SW2 and grounded loop of the protective premise wiring, to ground. The circuit continues through contact A1 of the alarm relay to the negative side of the battery. The relay L is connected parallel with the alarm bell by a circuit established through the fuse, contacts C1 and SW4.

The current in the night protective circuit is adjusted to .010A by means of the adjustable resistor R1.

#### Alarm Condition:

The opening of any attachment, a break or cross in the premises wiring will cause the magnet of the alarm relay to become de-energized. Upon de-energization, the contact A1 of the alarm relay will open and contact A2 will close. Contact A2 connects the alarm device and locking relay directly across the dry cell batteries and output of the rectifier, causing the alarm device to sound continuously and the locking relay to become energized. The back contact L(L1) of the locking relay opens, making it impossible to restore the circuit by merely closing the attachment or opening or removing the cross in the protective wiring, and the front contact L (L1) closes, creating a holding circuit through the magnet of the locking relay and maintaining the circuit through the alarm device. The parallel connection of contacts A1 and A2 of the alarm relay and L (L1) of the locking relay is utilized to minimize the possibility of false alarms from extraneous (building) vibrations, etc., and to eliminate the use of a wiring suspension method of mounting the alarm relay.

The locking relay is also arranged to perform the following functions: contact L (R-3) operates the headquarters annunciators. Contact L (R1) shunts out the adjustable (rectifier) resistor R5 so that the greater portion of the current required for the operation of the bell is taken from the rectifier and only a minor portion is taken from the dry cells. This feature is included to obtain dry cell economy and eliminate frequent replacements.

#### "DAY" OR "PROTECTION OFF" CONDITION:

When the premise is to be opened, the shunt switch is first operated to "off" (contact closed) position. This places a shunt around the contacts on the main entrance door, and other removable attachments, allowing entry without sounding the alarm. The control cabinet is then opened and the key switch returned to its "off" position. The circuit through the protective (premises wiring) is opened by contacts SW1, SW2 and SW3 of the switch. A holding circuit for the alarm relay is established from the battery and output of the rectifier through the resistor R8, the key switch, alarm relay magnet and closed contact of SW2. The current in this circuit will be .010 amperes.

#### Test Procedure:

When the key switch in the control unit is operated to its "test" position a test circuit is established from the positive side of the battery and rectifier, through the alarm bell mechanism, R3, the housing lining and tamper contacts, to the protective (premises) wiring (live side), continuing through resistor R1, the milliammeter, the back contact of the control

cabinet door tamper, resistor R4, the grounded protective loop, returning through the ground conductor to the outer housing and contact A1 to the negative side of the battery. With the circuit in this condition the meter should read .010 amperes. If no reading is obtained on the meter, it indicates an improperly closed attachment or a defect or trouble in the wiring. The trouble can generally be located by use of the Neon trouble locating feature, previously described.

The operation as indicated here is for one control, controlling one area and the alarm unit in both the message room and guard room. The procedure for the other area is identical and is independent of the first area.

DESCRIPTION OF E. P. C. LOCAL BURGLAR ALARM SYSTEMGeneral:

The E. P. C. Grade "A" Mercantile Burglar Alarm System is the most modern and efficient available on the American market. In it, features are incorporated which take advantage of modern developments in electrical science. Basically, E. P. C. systems exceed the rigid requirements of the Underwriters Laboratories, Inc. for Grade "A" Burglar Systems.

The system as called for in Signal Corps Outline Specification, Invitation No. (R-4875) W-1049-40-1, would not include many of the features incorporated in the E. P. C. Grade "A" system. However, an additional quotation has been made over and above our basic bid which would be the cost of adding these features to the system as specified.

A description of the system as specified follows:

Protection Methods:

The protection methods to be employed are to follow standard practice as recommended by the Underwriters' Laboratories, Inc. and in each detail will comply with the specifications; specifically, double circuit protective circuits are to be employed in such a manner as to afford the highest possible degree of immunity against attack. All screens are to be of standard recommended material, dimensions, and circuit wiring. A choice of two types of screen circuit wiring is offered, ie-alternate bars of the same polarity which is known as 1-4 wiring or adjacent bars of the same polarity which is known as 1-3 wiring. This circuiting cannot be changed once the screens are constructed.

All contact devices, door shunt switches, connection and circuit wiring shall be approved standard as recommended for burglar alarm practice. (See photograph).

Local Control Units:

Local control units in each protected area shall consist of E. P. C. key operated control cabinet which contains an "on"- "off" lock switch, supervisory meter, and necessary wiring and devices for its proper functioning. The cabinet is equipped with a hinged door operated by a key, such hinged door being equipped with tamper contacts. One control unit is to be provided in each protected area. (See photograph).

The E. P. C. key control has circuits which are so arranged that it requires the operation of the key switch in the control cabinet and the key switch on the outside of the premises at the time of setting the alarm. If the switch in the control cabinet is left in the "off" position and the operator attempts to operate the door switch upon leaving the premises, an alarm will sound immediately notifying the subscriber of his neglect.

In other systems it is possible to completely forget and omit the operation of the "on" and "off" switches in the control unit cabinet and to

-2-

leave the premises, operating the door switch in the usual manner. In doing so, the operator would naturally assume protection on the area as being established but inasmuch as the "on" and "off" switch in the control unit was in the "off" position, there would be absolutely no protection on the area.

It is this circumstance which forces some manufacturers to employ the use of an outside system operation light in an attempt to overcome the above described operation deficiency. The weakness of the light is apparent in view of the fact that it is something else to operate and can itself be forgotten.

On the average installation, it is possible for an intruder to hide in the protected area during the open period and after the area is closed and protection applied, the intruder can go to the control unit and with a knowledge of the location of the control tamper contact, use means to prevent its operation while prying open the cover on the local control unit. Once the cover is open the system can be turned off at the local control and all protection removed from that area.

This possibility does not exist with the E. P. C. system inasmuch as both the door shunt switch and the switch in the control unit must be operated to their "off" position before the alarm is inoperative.

When an attack of the type mentioned above is made, the intruder may pry or otherwise succeed in opening the E. P. C. control unit, however the alarm will ring when an attempt is made to turn the system off even with the proper key because it is also necessary to operate the door switch before the system is inoperative. It is absolutely necessary that the outside door switch also be operated before the alarm bell could be silenced. The lock switch used on the outside door consists of a cylindrical type locking barrel and this arrangement has been approved as pick-proof by the Underwriters' Laboratories, Inc. Furthermore the keys furnished cannot be duplicated except at the factory, due to their unique type, and then only when a proper code number is supplied to the manufacturer.

This code number does not appear on any of the keys nor can be identified in any manner on the lock. E. P. C. contains no record of such numbers and keys can be ordered only by authorized representatives of the subscriber. Many lock switches employing ordinary Yale keys or other flat tumbler keys can easily be duplicated at the nearest hardware store.

#### Alarm Units:

Alarm units are to be of E. P. C. manufacture and are to be connected in accordance with the specifications to the local control units by fully supervised double circuit wiring in such a manner as to prevent tampering without initiating proper signals in the alarm unit. The alarm unit shall consist of a steel cabinet equipped with tamper contacts which will prevent access to the alarm equipment without sounding an

-3-

alarm. The cabinet shall contain the necessary relays, wiring, bells, annunciator drops, etc., for the proper and efficient operation and control of the system. Dry cell batteries will be included either in this cabinet or in a tamper-proof cabinet adjacent thereto as required:

In the B. P. C. circuit design, the bell is under constant electrical supervision and should there be any derangement of the bell wiring, it would be impossible to place the system in service at closing. This feature eliminates the need of normal operation of the alarm bell for testing purposes when unlocking the system, which procedure is worthless inasmuch as the test occurs after the use of the system instead of before. (Equipment shown in photograph to be modified in accordance with the specifications).

#### Wall Protection:

For the protection of wall surfaces we recommend and propose the use of foiled panels which is considered the most effective method of protecting such surfaces. This method consists of the application of an approved foil directly on the selected type panels. The foil is spaced and circuited in accordance with specifications.

The construction of these panels is as follows:

Panels of pre-determined dimensions designed to accurately fit the wall space are cut to size and approved foil of not less than  $\frac{1}{8}$ " width nor more than 1" width, is fastened to the surface of each panel, with high-grade asphaltum, on 5" centers and circuited in a manner which provides approved 1-3 or 2-4 wiring as selected. The entire surface of the panel is then covered with asphaltum and the foiling is covered with a sheet of building paper, thus forming a moisture-proof envelope for the foil. The panels are then installed on the wall to be protected and painted as required. The advantages of this method of protection are as follows:

- (1) The panels are moisture-proof thereby reducing false alarm and trouble difficulties due to corrosion or moisture short circuits.
- (2) The panels are less susceptible to open circuits because of the flexible nature of the foil.
- (3) The protection offers the greatest resistance to attack or tampering by virtue of the concealed nature of the foil and the inherent susceptibility of the foil to breakage upon direct attack.
- (4) Test blocks in each panel are provided so that ready access to the circuits for testing purposes is available.
- (5) This is the only method approved by the Underwriters' Laboratories for the direct protection of walls where the highest possible quality of protection is necessary.

-4-

Screens for Windows & Doors:

Due to the fact that electrical protection applied to windows and doors is susceptible to mechanical injury, it is recommended and proposed that electrical wood screens be provided, these screens to be constructed as follows:

Wood frame works of approximately 1" x 1" poplar are constructed to proper window size and supported in the frame work are 3/8" wood dowels spaced on 4" centers, such dowels to be slotted to receive 24 gauge enameled wire. The circuiting of the screens is to be as described above under "Protection Methods". Applied to each corner of each screen will be a removable contact ear through which the circuit is carried to the window frame by means of a corresponding latch, in other words, there will be four latches on the frame for each screen and the screen can be easily removed for washing windows, etc. The latches and ears as well as carrying the electrical circuit to the screen provide mechanical support for each screen. All such exposed screens are to be painted at our factory to match the present color of paint on the window frames. This same type screen construction is proposed for the protection of door surfaces.

Contacts on Doors and Windows:

Approved contacts (See photographs 317, 318, 319, 320, 321 and 322) are to be used as window contacts and door contacts.

E. P. C. BURGLAR ALARM SYSTEM WITH ADDITIONAL FEATURES  
NOT INCLUDED IN THE SPECIFICATIONS

General:

The following are some of the main features which we strongly recommend to be incorporated in the system to be installed in order to provide the highest possible quality protection obtainable:

- (1) It is recommended that the E. P. C. System which uses both alternating current from building power supply as well as dry cells for its operation be used. A special circuit arrangement provides for normal operation of the system from the building supply and the dry cells are used as stand-by power to be used only in emergencies in case of failure in building power supply or an attempt to defeat the system by disconnection of the building power supply to the system. This circuit is so arranged that there is no normal drain on the dry cells, this keeps the dry cell's energy at its full operating capacity at all times. There is no danger of the system failing to operate, due to power failure, in case of an attack.

The advantages of using two sources of power supply such as recommended is apparent when comparison is made to a system which uses dry cells only as a power source. Dry cells such as are ordinarily used, generally have the capacity for operating the system for approximately one year when no alarms are experienced on the system. However, as the batteries age, their capacity decreases and it is possible that even though the batteries maintain the protection circuit in proper operating condition there may not be sufficient energy to operate the alarm bells upon attack.

Failure of the batteries from battery operated systems at the time of closing would prevent the use of the system until such batteries were replaced. Also failure of the protective circuit batteries during the protected period would cause a false alarm and the system would be out of service until the batteries were replaced.

- (2) Systems operated from dry cells alone usually do not employ more than 5 milliamperes drain in the protection circuit. This amount of current is sometimes insufficient to break down oxides or small particles of dust which may collect on window and door contact surfaces, thus the presence of such dust or oxide in any one contact would prevent the use of the system until the trouble was located and remedied. The E. P. C. system, because of the use of building power which does not require the conservation of battery energy, can employ up to ten milliamperes in the protection circuit which current is much more effective in breaking down the oxides and small dust particles which normally collect on the various contact surfaces, than the smaller currents necessarily used when batteries alone are used. This feature alone tends to reduce the number of times that it may be impossible to place the system in operation at closing time and further prevents false alarms after the system is set.
- (3) The E. P. C. arrangement of floating the dry cell batteries in the circuit consists of a signal transformer power unit containing a transformer with 12 volt and 70 volt taps and a copper oxide full wave rectifier with filtering resistors and condensers. The 12 volt rectifying supply is used to float the batteries and to supply normal current to the system, while the 70 volts A. C. is used to operate trouble locating devices later described.
- (4) The trouble location feature is of extreme importance in view of the fact that it makes it possible to operate the system in regular day-in and day-out service with the minimum of operating difficulty. The trouble locating feature makes it possible to immediately locate improperly closed windows or doors and other forms of trouble which prevent ready and convenient closing and setting of the system.

In this particular installation where there will be a considerable amount of wall protection made immediately inaccessible due to the wallboard covering, it is obvious that a broken wire or other fault in the concealed wiring would introduce unusual difficulty in locating the exact point of the fault. It is our experience with regard to the use of electrical wall protection that regardless of manufacture, open circuits sometimes occur and are a serious consideration in the maintenance of the system. These openings sometimes occur due to the normal settling, building vibration, impact of office furniture, chairs, etc.



- (5) E. P. C. provides a special circuit arrangement very simple but effective which makes it possible to place small Neon lights in the protective wiring at various intervals, such as at each group of windows and in each section of wall protection, so that when an O. K. signal cannot be obtained at the local control panel, a trouble locating switch supplied in the local control panel can be immediately operated and the Neon lights can be observed throughout the protected area. These lights can be arranged near the ceiling so that it is only necessary for the operator to observe the lights in proper sequence until a point is reached where an unlighted lamp is found. The defective portion of the system would then be between the last lighted lamp and the first unlighted lamp. Should the defect be found to be in a wall panel, that panel is immediately identified and the trouble is immediately isolated for repair.

It is obvious that this method of trouble location eliminates many sources of annoyance and inconvenience in the operation of the system and further assures a minimum of time that the system might not be available for use. As can be seen from the accompanying circuit diagram, the source of supply for the Neon lamps is obtained from the 70 volt taps in the power supply transformer. The Neon light method of locating openings is the latest and most efficient method designed and utilizes recent scientific advances in electrical engineering.

The Neon light method of locating openings and trouble in connection with the protective circuits is an exclusive and patented feature used in conjunction with E. P. C. systems only.

E. P. C. agrees to furnish and install all accessories, devices, equipment, etc. for the addition of the above described double power source and Neon trouble locating system for the sum of TWO HUNDRED DOLLARS (\$200.00), in addition to the basic bid.

# ELECTRO - PROTECTIVE CORPORATION

*Fire - Burglary - Holdup Systems and Services*

500 BROAD STREET, NEWARK, N. J.  
TELEPHONE • MITCHELL 2-4076

Republic 2131  
Albee Building  
Washington, D. C.

Office of the Chief Signal Engineer  
Supply Division  
Munitions Building  
Washington, D. C.

Reference: OCSICO, Invitation No. (R-1875 W-1049-40-1)  
Attention: C. D. Giny, Major, Signal Corps, U. S. A.

Gentlemen:

Attached hereto you will find our bid with regard to the subject invitation for Burglary Protection as specified in Restricted Document #2.

Attached hereto you will find:

1. Executed standard Government form of bid #21 in triplicate
2. Standard Government form of bid bond #24 in triplicate
3. A group of photographs of E. P. C. equipment
4. Description of E. P. C. Local Burglar Alarm System
5. Description of Circuits and Operation of E. P. C. Local Burglar Alarm System.
6. Sketch A, Straight Line Diagram of Proposed Installation
7. Sketch B, Engineering Schematic Diagram of complete system.

The complete schematic diagram was submitted in its present form due to the fact that insufficient time was available for proper preparation of blue prints. However, the sketch used in conjunction with the description of circuit operation should enable you to determine the merits of the system offered.

All restricted documents, still in our possession, will be returned in accordance with the standard agreement which was executed by us.

We trust that consideration of our bid will enable you to decide in favor of our proposal.

Very truly yours,

ELECTRO-PROTECTIVE CORPORATION

  
Robert S. Meyers  
Commercial Manager

RSM/ceb

 PREVENTING LOSS

Furnishes Broadest Scope of Protection against Destruction of both Tangible and Intangible Assets, Business Continuity, and other Complications caused by Far-Reaching Effects of Fire, Burglary and Holdups.

February 8, 1940

SIGNAL CORPS OUTLINE SPECIFICATIONS

(Constituting RESTRICTED DOCUMENT NO. 2, attached to and forming part of OCSIGO. INVITATION NO. (R-4875) W 1049-40-1.)

R E S T R I C T E D

Notice. - This document contains information affecting the national defense of the United States within the meaning of the Espionage Act (U.S.C. 50:31, 32). The transmission of this document or the revelation of its contents in any manner to any unauthorized person is prohibited.

Section I - General Conditions:

- Description of Specifications;
- Drawings Required of the Contractor and Installation and Maintenance Instructions;
- Material and Workmanship;
- Final Inspection and Test;
- Control of and Access to Work;
- Liability for Damages;
- Compensation Insurance;
- Notice.

Section II - Special Conditions:

- Federal Tax;
- Certificate Reference Growth & Production United States;
- Patents;
- Eight-Hour Law - Convict Labor;
- Bonds Required;
- Termination when Contractor not in Default;
- Descriptive Data with Bid;
- Experience and Facilities;
- Statement of Facts;
- Prevailing Rates of Wages.

Section I - General Conditions:

I - 1 - Description of Specifications: These specifications cover the requirements of the United States Signal Corps for the supply and installation of a complete local electric burglar alarm system in Rooms 3335 to 3337 inclusive and Rooms 3341 to 3350 inclusive, Munitions Building, Washington, D. C., including the corridor within this area. This system shall be of the double-closed circuit, fully supervised type (A.D.T. or equal).

Declassified by NSA/CSS

SIGNAL CORPS OUTLINE SPECIFICATIONS  
(Cont.)

Section I - General Conditions: (Cont.)

I - 1 - Description of Specifications: (Cont.)

Scope:

The rooms designated shall be protected by means of burglar alarm screens on all windows, exterior doors and walls, - all to be installed as hereinafter described, so that when protection is established, any attempt to enter the rooms through protected points or any unauthorized tampering with the protective wiring will automatically cause an alarm gong to ring and an annunciator drop to operate in the alarm units in the Guard Room, Munitions Building, on first floor and in the Message Center, Munitions Building, on third floor. Operation of the drop will indicate the room into which entrance is being attempted or whose protective wiring is being tampered with, before access to the room is obtainable.

Each suite of rooms as underlined above shall be operated under one local control unit and shall be considered as one protective area, a total of two areas to be covered in this project.

All equipment and apparatus shall constitute a unified system for the satisfactory operation of which one manufacturer shall be responsible.

Wires & Cables & Conduit:

Wirings inside of the rooms specified shall consist of individually insulated conductors or cables of a character and size recommended by the manufacturers and approved by the contracting officer. Wiring from local control units to alarm units to be of double-closed circuit fully supervised type in lead-covered, non-coded cables. Wiring from room to room across corridors shall be inclosed in galvanized or sherardized conduit. All circuits shall be so arranged and installed that the breaking or shorting of the protective circuit or cutting of the protective cable will automatically initiate an alarm and indicate in the alarm units the protective circuit or circuits in trouble.

Room Protection:

All outside windows shall be fully protected with removable double circuited screens and contacts. The window screens are to be applied directly to the inside of the sash and must be so designed that the sash must be closed before the protection can be established. The screens must be such as not to interfere with the opening and closing of the windows without removing screens. The circuit shall be so arranged that there-after any unauthorized opening of the sash will initiate an alarm. Walls and partitions, except beams and columns, shall be fully protected with permanent double circuited screens. All screens to provide continuous electric circuits not over 4" apart, the breaking of any one of which will initiate an alarm. All circuits on walls shall be covered by suitable wall board, unpainted.

RESTRICTED

SHEET NO. 3

SIGNAL CORPS OUTLINE SPECIFICATIONS  
(Cont.)Section I - General Conditions: (Cont.)I - 1 - Description of Specifications: (Cont.)Room Protection: (Cont.)

Screens and contacts similar to those on the windows shall be applied to the inside of the doors leading into the protected room, screens to cover entire surface of door. A light will be mounted in each of the two areas so that when the system is turned on a check as to the operative condition of the system can be determined. A suitable switch is to be provided to turn this light off after check has been made.

Local Control Equipment:

A single local control panel shall be installed within each of the two protected areas near entrance. Each panel shall house switch, supervisory meter and other equipment necessary to control its respective protected area; all enclosed in cabinet. In addition, a lock switch shall be installed at each entry door to the protected areas. Upon entering an area, lock switch at door must be operated, followed by operation of switch in local control panel to disconnect protection in its respective area. Alarm should be given whenever anyone enters even with proper key. Leaving the area, lock switch at door is operated and switch in control panel set for protection. Tamper springs must be provided on cabinets.

Alarm Units:

These units shall be located in the Guard Room, Munitions Building, on first floor and in the Message Center, Munitions Building, where designated. They shall consist of necessary control apparatus and a drop for each area as visual signals. In addition, a 6" alarm bell and trouble bell shall be included at each. All cabinets shall be tampered and shall include necessary dry cells for the operation and supervision of the system. The alarm bells shall have tamper proof contacts so that signal will be given if attempt is made to disconnect the bell. This installation shall comply with The National Electrical Code and the Fire and Building Regulations of the District of Columbia.

I - 2 - Drawings Required of the Contractor and Installation and Maintenance Instructions: At the time of completion of this installation, contractor shall submit for approval and in accordance with the general provisions of these requirements, complete drawings in quadruplicate of the various items and units required for the installation, complete wiring diagrams showing the manner of connecting and installing each of the various units and general instructions for the regular maintenance and inspection and tests of the system.

RESTRICTED

RESTRICTED

SHEET NO. 4

SIGNAL CORPS OUTLINE SPECIFICATIONS

(Cont.)

Section I - General Conditions: (Cont.)

I - 3 - Material and Workmanship: All the material used in the construction of the apparatus shall be selected as the best available for the purpose for which used, considering strength, conductivity, durability, and the best engineering practice. All work shall be done and completed in a thorough workmanlike manner and shall follow the best modern practice in the manufacture of high-grade machinery notwithstanding any omissions from these specifications. All work shall be done by mechanics skilled in their various trades. All parts shall be made accurately to standard gauge where possible so as to facilitate replacement and repair. All equipment shall be of a type which is commercially standard and which has proved satisfactory in service over a period of years.

I - 4 - Final Inspection and Test: When the installation has been completed, the contractor shall furnish a responsible technical expert to give the installed system one thorough checking and complete testing and adjustment. The system shall be guaranteed for a period of one year against mechanical defects.

I - 5 - Control of and Access to Work: The work is entirely under the control of the contracting officer and he or his authorized representative shall have access to same at all times.

I - 6 - Liability for Damages: The contractor will be held responsible for all damage to the work under construction of whatever nature. He will also be held responsible for all damages which may occur to persons, property, animals or vehicles from want of proper safety precautions or from any accidents arising from defective apparatus or any negligence on the part of himself or his employees.

I - 7 - Compensation Insurance: The contractor shall provide adequate workmen's compensation insurance for all labor employed on the project who may come within the protection of such laws and shall provide, where practicable, employers' general liability insurance for the benefit of his employees not protected by such compensation laws and proof of such insurance shall be given to the contracting officer to his satisfaction.

I - 8 - Notice: These specifications are furnished with the explicit understanding that when Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility or any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use or sell any patented invention that may in any way be related thereto.

RESTRICTED

SIGNAL CORPS OUTLINE SPECIFICATIONS

(Cont.)

5. 7. 1.

Section II - Special Conditions:

II - 1 - Federal Tax: Prices bid herein include any Federal tax heretofore imposed by the Congress which is applicable to the material on this bid. If any sales tax, processing tax, adjustment charge, or other taxes or charges are imposed or changed by the Congress after the date set for the opening of this bid and made applicable directly upon the production, manufacture, or sale of the supplies covered by this bid, and are paid to the Government by the contractor on the articles or supplies herein contracted for, then the prices named in this bid will be increased or decreased accordingly, and any amount due the contractor as a result of such change will be charged to the Government and entered on vouchers (or invoices) as separate items.

The prices herein do not include any Federal taxes from which exemption is granted, or as to which a credit or refund is provided for under the provisions of Section 401 of the Revenue Act of 1935 (Act of August 30, 1935; (49 Stat. 1014, 1025-1026)) as amended; nor any tax imposed by a state, county or municipality upon the transaction of this procurement of these materials.

II - 2 - Certificate Reference Growth and Production in United States: It is hereby warranted that in the event award is made to the undersigned the unmanufactured articles, materials, or supplies furnished the United States will have been mined or produced in the United States, and the manufactured articles, materials, and supplies will have been manufactured in the United States all from articles, materials, or supplies mined, produced, or manufactured, as the case may be, in the United States, except as noted below or otherwise indicated in this bid.

Bidder's Signature \_\_\_\_\_

Title \_\_\_\_\_

II - 3 - Patents: The contractor shall hold and save the Government, its officers, agents, servants, and employees, harmless from liability of any nature or kind, including costs and expenses, for or on account of any patented or unpatented invention, article, or appliance manufactured or used in the performance of this contract, including their use by the Government.

II - 4 - Eight-Hour Law - Convict Labor: (a) No laborer or mechanic doing any part of the work contemplated by this contract, in the employ of the contractor or any subcontractor contracting for any part of said work contemplated, shall be required or permitted to work more than eight hours in any one calendar day upon such work at the site thereof. For each violation of the requirements of this article a penalty of five dollars shall be imposed upon the contractor for each laborer or mechanic for every calendar day in which such employee is required or permitted to labor more than eight hours upon said work, and all penalties thus imposed shall be withheld for

RESTRICTED

RESTRICTED

SHEET NO. 6

SIGNAL CORPS OUTLINE SPECIFICATIONS  
(Cont.)Section II - General Conditions: (Cont.)II - 4 - Eight-Hour Law - Convict Labor: (Cont.)

the use and benefit of the Government: Provided, That this stipulation shall be subject in all respects to the exceptions and provisions of the act of June 19, 1912 (37 Stat. 137), relating to hours of labor.

(b) The contractor shall not employ any person undergoing sentence of imprisonment at hard labor.

II - 5 - Bonds Required:

Payment Bond: Payment Bond, with a surety or sureties satisfactory to the contracting officer for the protection of all persons supplying labor and material in the prosecution of the work provided for in this contract for the use of each such persons shall be furnished herewith in the sum of fifty percent (50%) of the total consideration of this contract.

Performance Bond: Bond, with surety satisfactory to the contracting officer, guaranteeing the faithful performance of the provisions of this contract shall be furnished herewith in the sum of ten percent (10%) of the total consideration of this contract.

II - 6 - Termination when Contractor not in Default: If, in the opinion of the contracting officer upon the approval of the Secretary of War, the best interests of the Government so require, this contract may be terminated by the Government, even though the contractor be not in default, by a notice in writing relative thereto from the contracting officer to the contractor. In case such notice be given the contractor this contract shall terminate, ipso facto, upon the giving of said notice. Upon such termination the contractor shall forthwith deliver to the Government f.o.b. factory, in their then state of completion, all articles, spare parts, drawings, and other information and things called for herein, not previously delivered, and all work in process, materials, and fabricated parts acquired and/or produced by the contractor for the performance of this contract, and the Government shall then forthwith pay the contractor all amounts, if any, remaining due and unpaid under this contract for completed articles, spare parts, drawings, and other information and things called for herein, theretofor completed, delivered, and accepted by the Government; and the Government shall also forthwith pay the contractor for all partially completed articles, spare parts, work in process, materials, fabricated parts, drawings, and other information and things to be so delivered hereunder, an amount to be computed as follows:

(a) There shall be determined by an audit conducted by or for the contracting officer, the total net amount of all expenditures and obligations made and/or incurred by the contractor under this contract in designing, manufacturing, and delivering said partially completed articles, spare parts, work in process, materials, fabricated parts, drawings, and other information and things so delivered hereunder.

RESTRICTED



RESTRICTED

SHEET NO. 7

SIGNAL CORPS OUTLINE SPECIFICATIONS  
(Cont.)Section II - General Conditions: (Cont.)II - 6 -- Termination when Contractor not in Default: (Cont.)

(b) The contractor and the contracting officer shall agree upon an estimate, based on the foregoing audit and any other pertinent data, of the net cost to the contractor of fully completing and delivering said partially completed articles, spare parts, drawings, and other information and things called for herein, all in accordance with the requirements of this contract had it not been terminated, including in such estimate all cost previously incurred under this contract in designing and manufacturing said partially completed articles spare parts, drawings, and other information and things, as well as those costs which would be required in the future for the entire completion and delivery thereof. In the event of the failure of the contractor and the contracting officer to arrive promptly at such an agreement, said estimate shall be determined in the manner provided in this contract for the adjustment of claims and disputes.

(c) The percentage which the foregoing item (a) is of item (b) shall then be determined and a sum of money equal to that same percentage of the total contract price (plus or minus any additions or deductions for changes), of such partially completed articles, spare parts, drawings, and other information and things, had they been completed, delivered, and accepted in accordance with the terms of this contract, shall then be computed.

(d) The total of all payments, if any, previously made to the contractor on account of such partially completed articles, spare parts, drawings, and other information and things, shall then be ascertained.

(e) The contractor shall then be paid the same sum of money computed in accordance with (c) above, less the total of item (d).

Upon the making of said payment all obligations of the Government to make further payments or to carry out other undertakings hereunder shall cease forthwith and forever, except that all rights and obligations of the respective parties under the articles, if any, of this contract applicable to Patent Infringements and Reproduction Rights shall remain in full force and effect.

II - 7 - Descriptive Data with Bid: Bidder shall submit with his bid the following data:

- (a.) Complete descriptive data of the equipment offered.
- (b.) A complete schematic diagram of the proposed circuits.
- (c.) Such theoretical and practical data as may be necessary to determine fully, without further reference to the bidder, the excellence of the equipment offered and the need for any unusual circuit or appliance.

RESTRICTED

RESTRICTED

SHEET NO. 8

SIGNAL CORPS OUTLINE SPECIFICATIONS  
(Cont.)Section II - General Conditions: (Cont.)

II - 8 - Experience and Facilities: The bidder may be required to furnish satisfactory evidence of experience and facilities for handling the work and may also be required to furnish satisfactory evidence that he has adequate shops, plants, facilities, equipment, financial resources, business and technical organizations and working capital to begin the work properly and prosecute it vigorously in such manner as to secure completion within the time specified.

II - 9 - Statement of Facts: The Signal Corps reserves the right to require, prior to the award of the contract, a statement of facts in detail of the business and technical organization of the bidder available for the contemplated work including financial resources for such part of the work to be used, and experience of organization in construction of comparable work. The Signal Corps reserves the right to reject any bid respecting when the facts as to business and technical organizations, financial resources, or experience, compared with the project bid upon, justify such rejection.

II - 10 - Prevailing Rates of Wages: The Act of Congress (Public #403, 74th Congress), approved August 30, 1935, "To amend the Act approved March 3, 1931, relating to the rates of wages for laborers and mechanics employed by Contractors and Subcontractors on Public buildings," applies to this project and in accordance with the provisions of said Act, the following schedule of minimum hour wage rates has been determined by the Secretary of Labor to be the prevailing rates of wages for the crafts specified to be employed on the installation of a Protective System at Washington, D. C.:

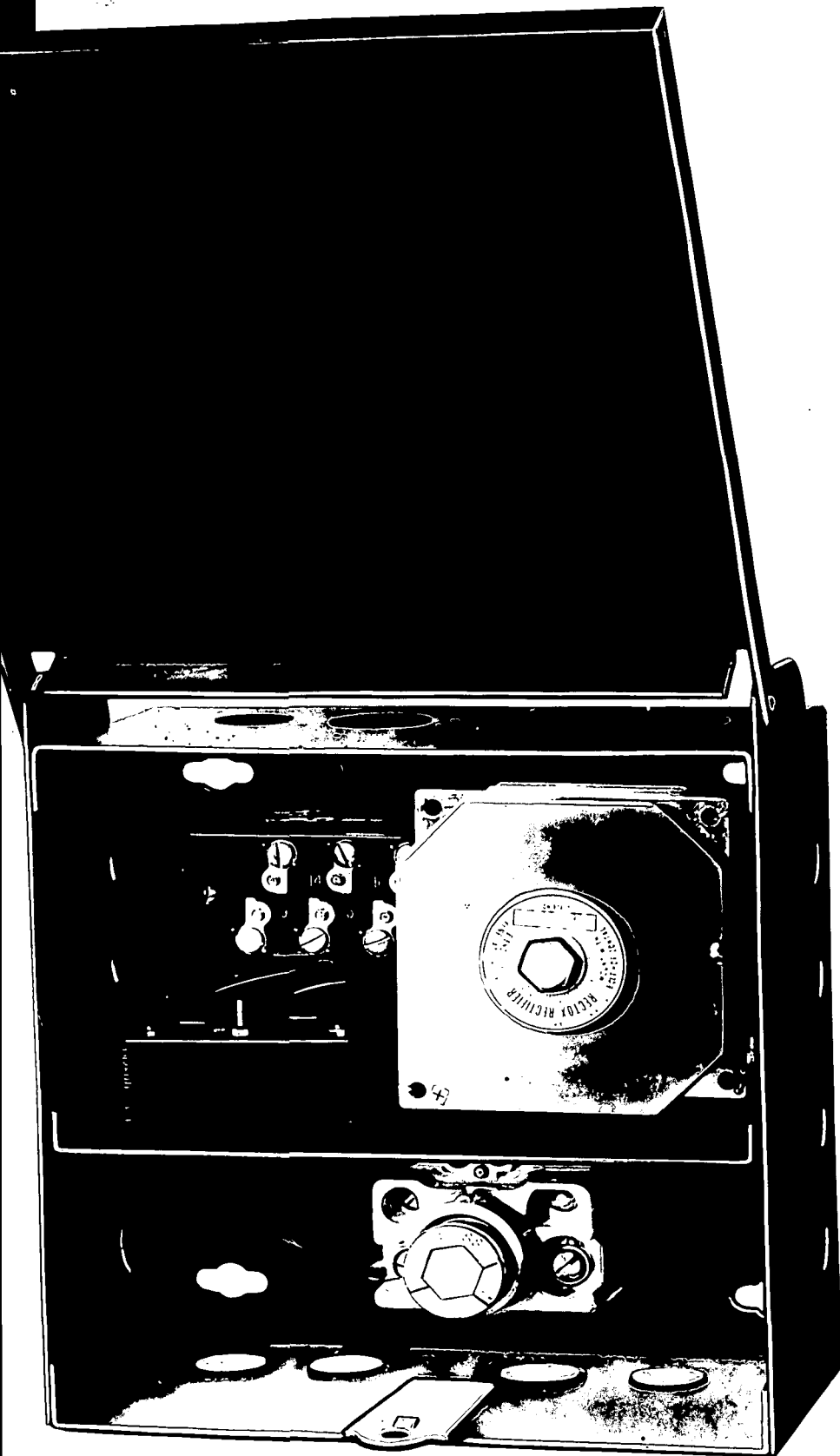
<u>CLASSIFICATION OF LABOR:</u>	<u>RATES PER HOUR</u>
Carpenters, journeymen	\$1.56-1/4
Electricians	1.80
Laborers	.75
Painters	1.57-1/7

Labor Classes Not Listed - Any class of laborers and mechanics not listed in the preceding paragraph, which will be employed on this contract, shall be classified or reclassified conformably to the foregoing schedule. In the event the interested parties cannot agree on the proper classification or reclassification of a particular class of laborers and mechanics to be used, the question, accompanied by the recommendation of the contracting officer, shall be referred to the Secretary of Labor for final determination.

RESTRICTED

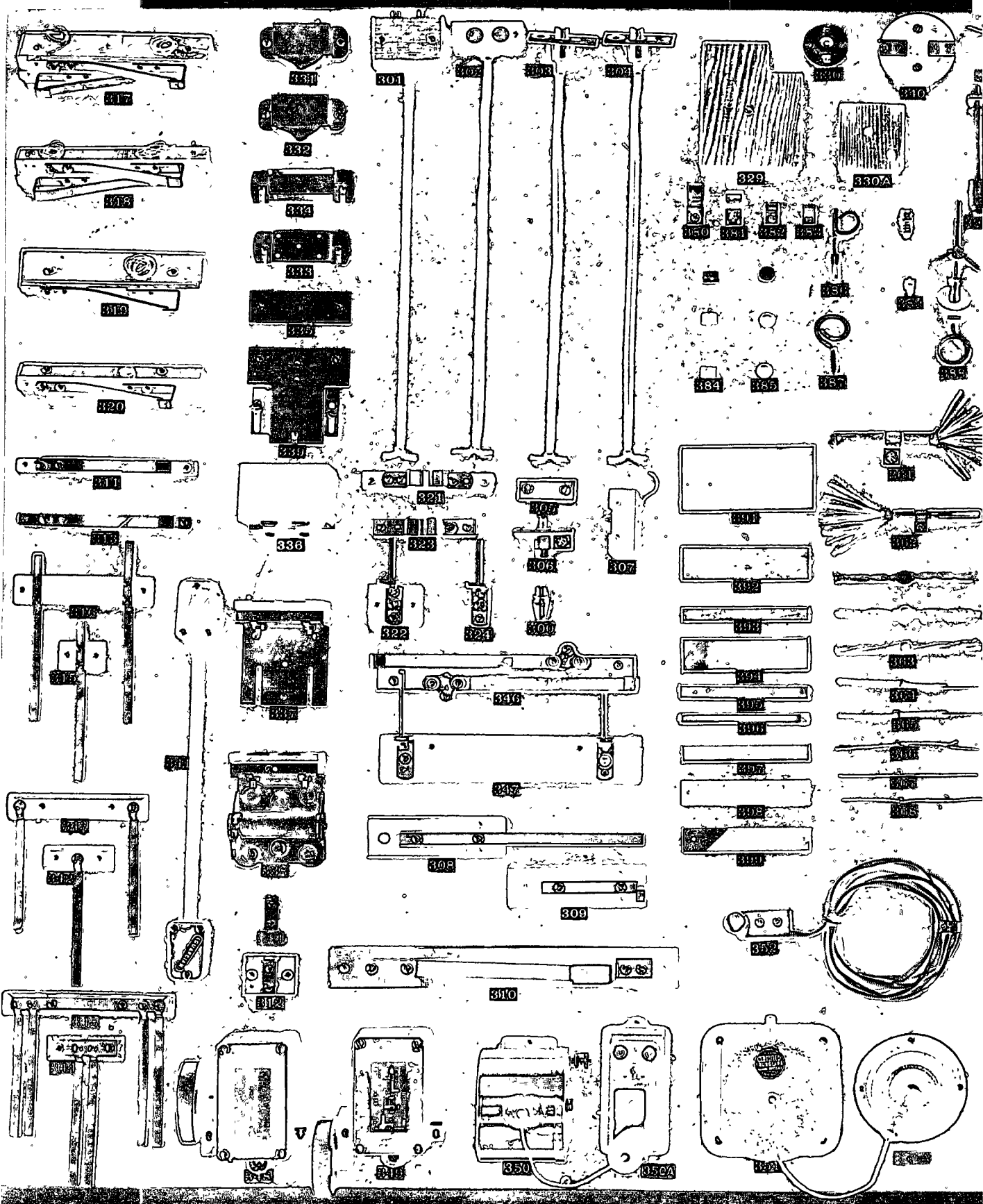
CONTROL SET (COVER LOCKED)





POWER SET INTERIOR

*double power source is retractable*



CONTACTS, WIRE, CABLE & MISC DEVICES

OPERATING INSTRUCTIONS  
TO ESTABLISH PROTECTION

1. CLOSE AND LOCK ALL WINDOWS AND DOORS AND SET OTHER PROTECTIVE DEVICES, IF ANY.
2. TURN KEY SWITCH ON PANEL TO "TEST" POSITION. If protection circuit is complete, meter pointer should go to the red mark. If pointer does not go to the red mark, pull out trouble locating switch to "On" position and locate trouble by observing lamps, following openings in direction to right of control set, the first unlighted lamp indicates improperly closed opening between the preceding lighted lamp and the unlighted lamp. If there more than one floor is protected, start on top level and observe lamps, from left to right, then down to floor below, etc. When all lamps are lighted, push in trouble locating switch to its "Off" position. The pointer should then go to the red mark.
3. TURN KEY SWITCH ON PANEL TO THE "SET" POSITION. (WARNING! Setting the system without obtaining a red indication on the meter may result in an alarm.)
4. CLOSE AND LOCK CONTROL CABINET DOOR.



5. LEAVE PREMISES BY MAIN DOOR, LOCK DOOR AND OPERATE SHUNT SWITCH TO "LOCKED" POSITION.

TO REMOVE PROTECTION

1. OPERATE SHUNT SWITCH TO ITS "UNLOCKED" POSITION.
2. ENTER PREMISES, OPEN CONTROL CABINET, AND TURN KEY SWITCH TO ITS "OFF" POSITION.

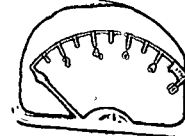
IN CASE OF TROUBLE NOTIFY

ELECTRO-PROTECTIVE CORPORATION, NEWARK, N. J.

ALARM INDICATOR

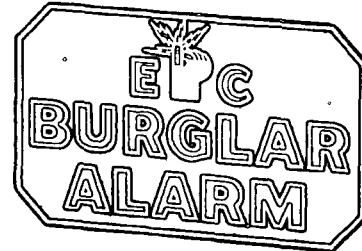
TROUBLE  
LOCATING  
TEST

OFF



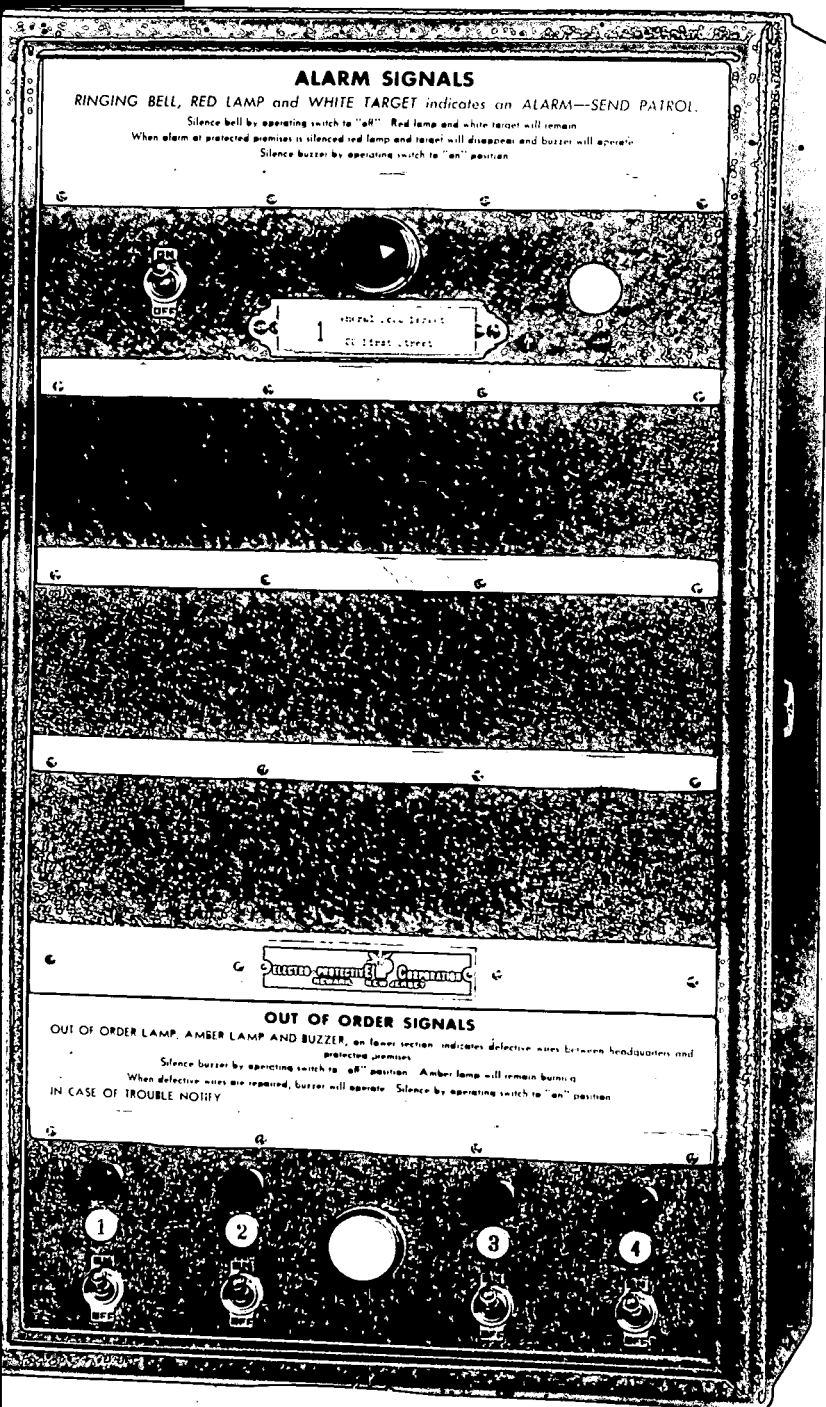
TEST

OFF



REF ID: A4161638

STANDARD KEY OPERATED CONTROL SET

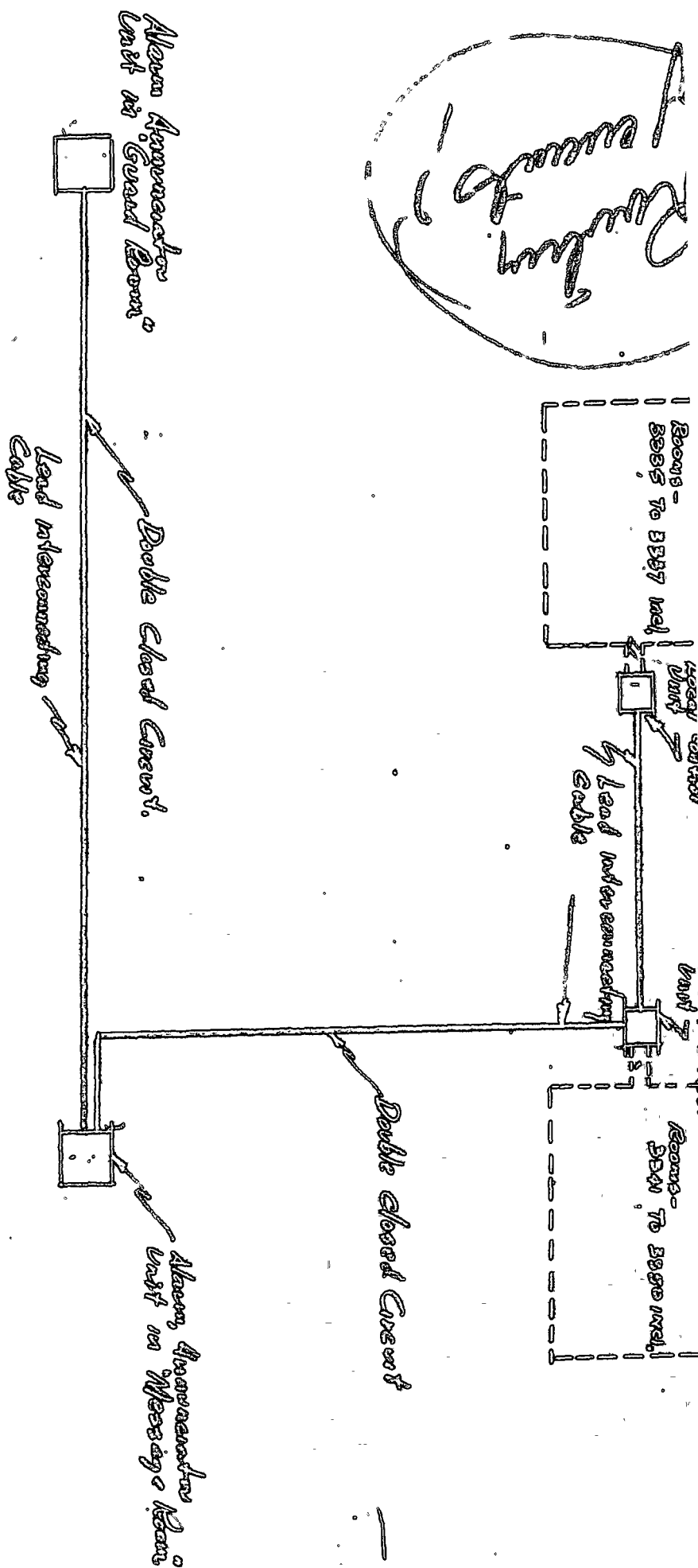


FOUR STATION  
Headquarters Signal Receiving Set

ALARM UNIT

*be modified in accordance with specifications*

*Working*



STRAIGHT LINE DIAGRAM OF PROPOSED INSTALLATION



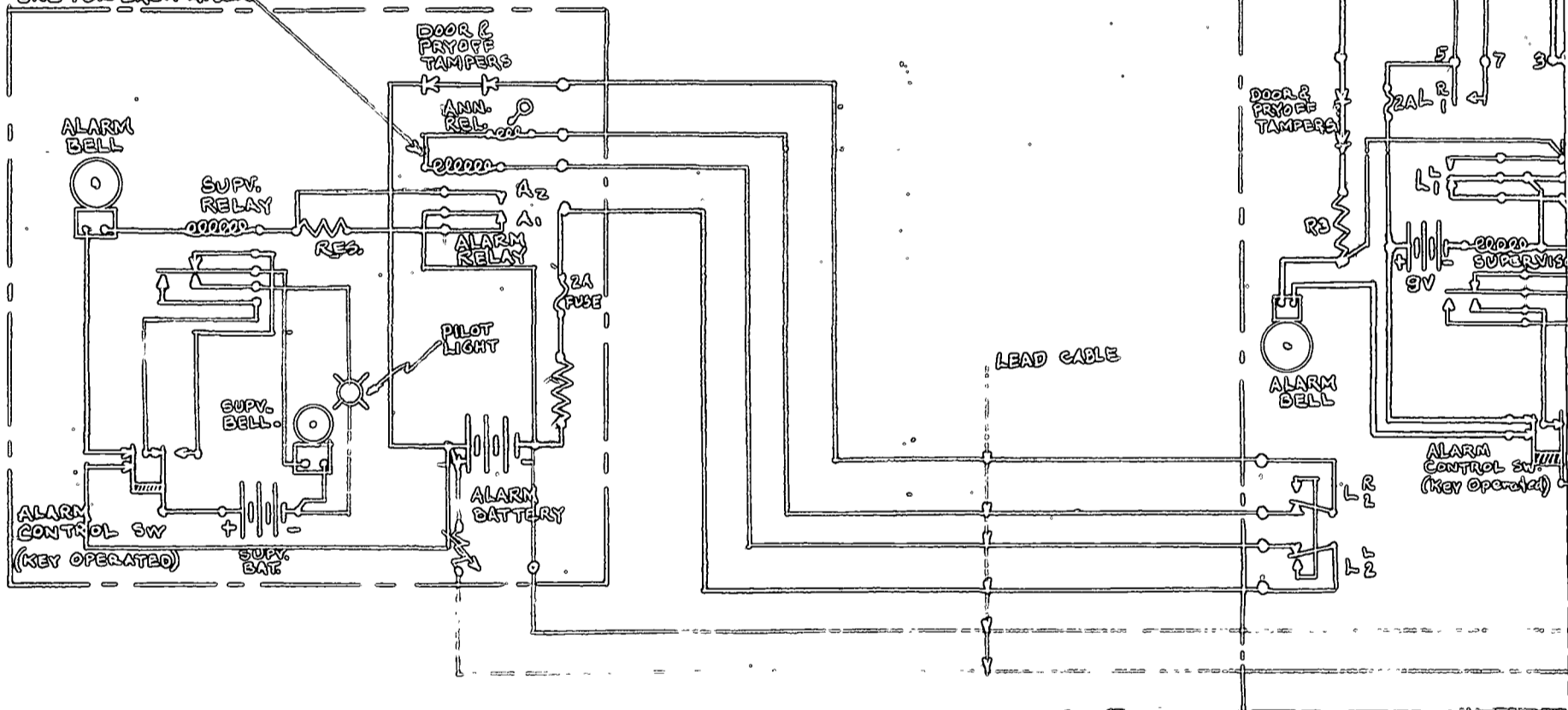
~ LEGEND ~

ENTIRE SYSTEM IN "SET" OR NORMAL NIGHT CONDITION  
 TL - NEON TROUBLE LOCATING LIGHT.  
 A<sub>1</sub>-A<sub>2</sub>-CONTACTS ON ALARM RELAY "A"  
 L<sub>1</sub>-L<sub>2</sub>-L<sub>3</sub>-CONTACTS ON LOCKING RELAY "L"  
 T<sub>1</sub>-T<sub>2</sub>-CONTACTS ON TROUBLE LOCATING SWITCH

LOCAL CONTROL "ON" & "OFF" SWITCH

SW<sub>1</sub>-SW<sub>2</sub> AS SHOWN IN "ON" POSITION, TRANSPOSED IN "OFF" POSITION  
 SW<sub>3</sub> SW<sub>4</sub> CLOSED IN "ON" & "TEST" POSITION, OPEN IN "OFF" POSITION

RELAY HAS TWO WINDINGS,  
 ONE FOR EACH AREA



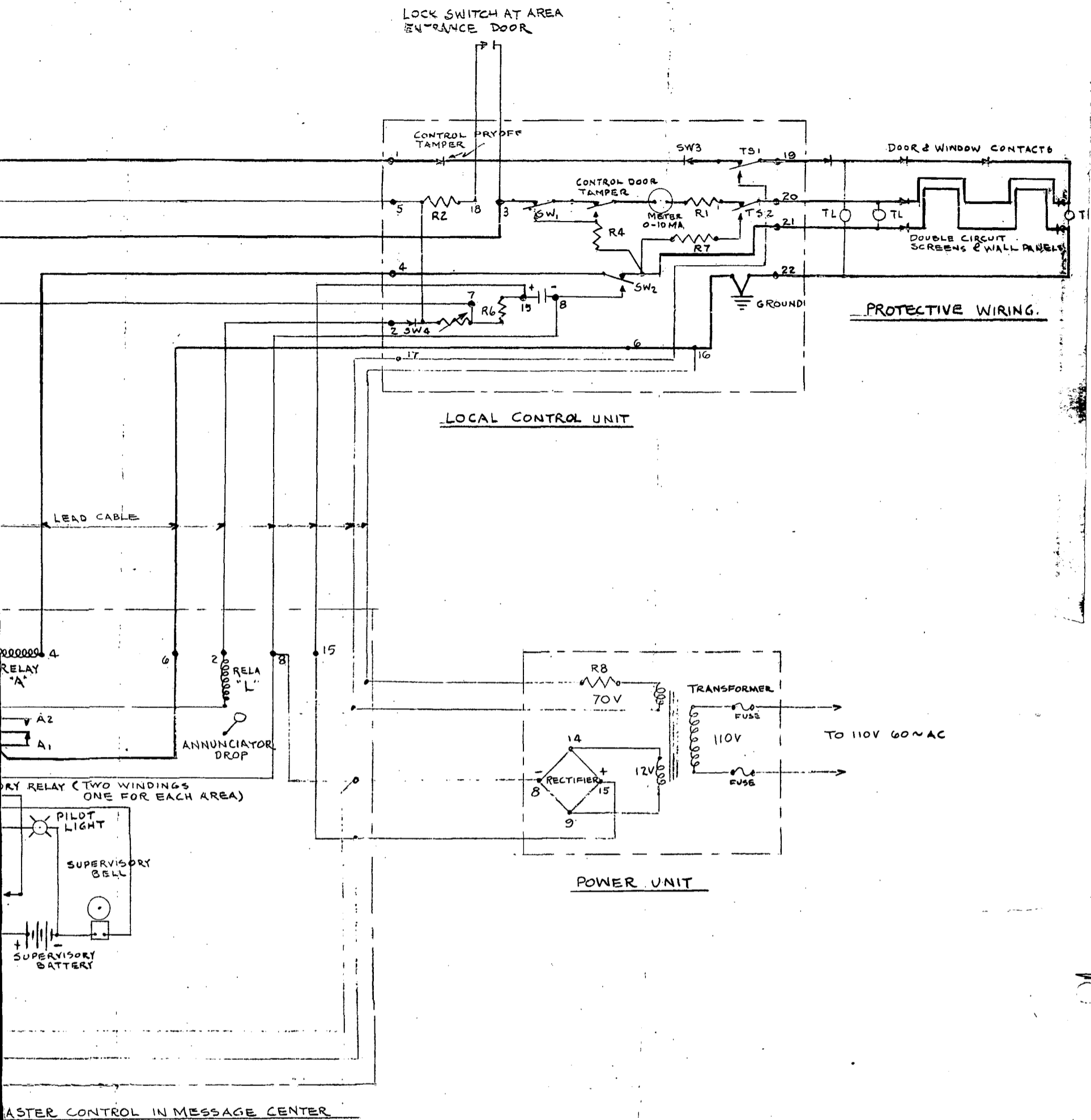
ALARM & CONTROL UNIT IN GUARD ROOM

ALARM UNIT & ...

NOTES:-

1. PROTECTIVE & ALARM CIRCUITS SHOWN FOR ONE AREA, OTHER AREA IDENTICAL.
2. SUPERVISORY EQUIPMENT & CIRCUITS COMMON TO BOTH PROTECTED AREAS.
3. PROTECTIVE CIRCUIT TEST LIGHTS ARE INCLUDED BUT NOT SHOWN.
4. POWER UNIT & NEON TROUBLE LOCATING SYSTEM NOT INCLUDED IN BASIC BID.

SKETCH "B"



SCHEMATIC SHOWING CIRCUIT IN ACCORDANCE WITH OUTLINE SPEC.

ELECTRO-PROTECTIVE CORPORATION  
560 BROAD ST. NEWARK N.J.

RBW  
2/23/40