Technical Manual

AES 900 Door Control System

AES CORPORATION Security Products

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This Document Covers Models
726, 900, 905, 910, 914, 915, 920, 940, 944, 945, 946, 950-6

900 Series Door Control System
Operation & Installation Instructions

The AES 900 Door Control Product Group is a modular, flexible and expandable system for high security applications. All modules fit into a special rack system that allows the security designer to tailor the system to the application. Modules are housed in the AES 900 cabinet, which holds up to 9 modules and fits a standard 19" rack. The system buss structure provides for an unlimited number of modules.

The model 950-6, a small desktop console capable of controlling 6 doors, is available for small systems.

The system is powered by the AES 726, 727 or 780 Power Supply:
AES #726: 4 relays, 4 locks, 2 doors*
AES #727, 8 relays, 8 locks, 4 doors*,
AES #780, 12 relays**, 12 locks, 6 doors

* Each door typically uses an access / strike lock and an emergency (usually magnetic) lock.
** Order relay cards separately, #727-RB with 4 relays

What follows are detailed operating instructions and detailed wiring diagrams for the system and its various modules.

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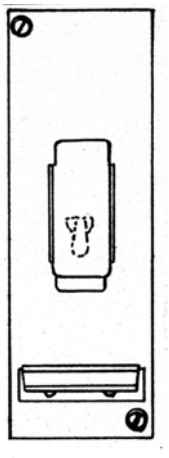
AES 910 EMERGENCY MODULE



DESCRIPTION:

The 910 Emergency Module provides a complete system lock down at the flip of a switch. It can be used in conjunction with any number of doors connected to 940, 941-M or 945 control modules. In an emergency, the operator can lock all doors - even overriding an UNLOCK condition caused by input from a fire control. The operator can then open the doors one at a time as needed, or all at once in the case of a true emergency.

RACK LOCATION: MUST BE LOCATED IN FIRST (LEFT-MOST) POSITION

GUARDED TOGGLE SWITCH OPERATION:

Down Position - Normal Operation; in the event of a fire, the external fire control system will unlock all doors

Up Position - Emergency Lock Down; all doors are locked regardless of any other inputs; overrides fire control

STATUS INDICATORS: None

TO OPEN DOORS DURING EMERGENCY LOCK DOWN: (910 switch in UP position)

To Open Individual Door(s): On each 940, 941-M and/or 945 module, lift guard and push toggle switch into UP position

To Cancel Emergency Lock Down: Restore switch on 910 to DOWN (normal) position

At 946 Status Display Panel, at Door: use key switch at door to release lock

INSTALLATION:

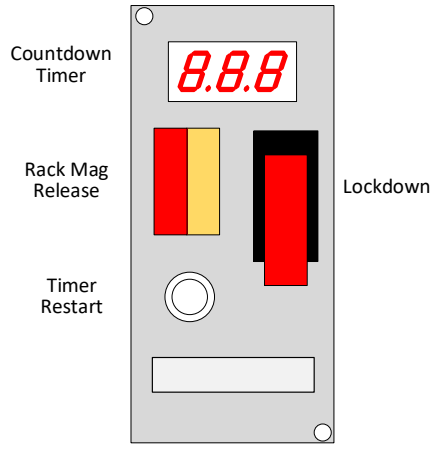
In general, wiring should be made in accordance with the wiring diagram(s) provided.

910 module must be mounted in first (far left) position of rack.

AES 915 EMERGENCY MODULE WITH TIMER

DESCRIPTION:

The 915 module is installed in the primary rack and provides a time delay between a fire alarm assertion and unlocking the emergency doors. When a fire alarm is reported, the timer will begin to count down, the Rack Mag Release button will flash red indicating an alarm is pending, accompanied by an audible beep. The operator can unlock the doors immediately by pressing the Rack Mag Release button, or can keep the doors locked using the Lockdown switch. If the operator needs more time, pressing the Timer Restart button resets the timer. If the operator does nothing the doors will unlock automatically when the delay expires. When the doors are unlocked the Rack Mag Release button will turn yellow.



RACK LOCATION: MUST BE LOCATED IN THE FIRST (LEFT-MOST) POSITION

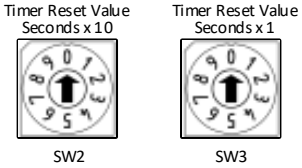
GUARDED TOGGLE SWITCH OPERATION:

Down Position - Normal Operation; in the event of a fire, the external fire control system will unlock all doors when the timer expires.

Up Position - Emergency Lock Down; all doors are locked regardless of any other inputs; overrides fire control

STATUS INDICATORS: The Rack Mag Release button will flash red if an alarm is pending, and will turn yellow when the doors have been unlocked. The Countdown Timer shows the remaining time in seconds until automatic unlock occurs.

TIMER SETTING: There are two rotary switches on the 915 board to set the time delay to any value between 1 and 99 seconds. SW2 sets seconds x 10, and SW3 sets seconds x 1. Example: SW2=3, SW3=0 yields a delay of 30 seconds.



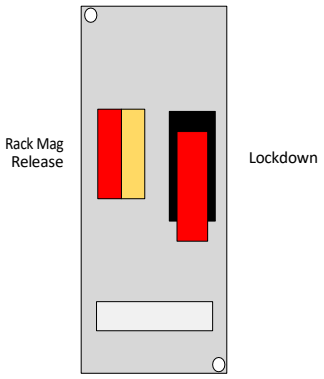
INSTALLATION: These wiring changes need to be done on all racks that will be using the 915 module. See wiring diagram Figure 1 on Page 6.

1. A vendor-supplied wire needs to be added to the TB1 cable inside the rack to connect TB1 pin 12 to P1 pin 12 of the board connector. See Fig 1.
2. The 915 module must be installed in the first (far left) position in the rack.

AES 914 SECONDARY EMERGENCY MODULE

DESCRIPTION:

The 914 module is installed in secondary racks and is used in conjunction with the 915 module in the primary rack to provide a time delay between a fire alarm assertion and unlocking the emergency doors. When a fire alarm is asserted, the Rack Mag Release button will flash red indicating an alarm is pending, and an audible beep will be generated. The operator can unlock the doors immediately by pressing the Rack Mag Release button, or can keep the doors locked using the Lockdown switch. If the operator does nothing the doors will unlock automatically after the delay set by the 915 module. When the doors are unlocked the Rack Mag Release button will turn yellow.



RACK LOCATION: MUST BE LOCATED IN THE FIRST (LEFT-MOST) POSITION

GUARDED TOGGLE SWITCH OPERATION:

Down Position – Normal Operation; in the event of a fire, the external fire control system will unlock all doors when the timer expires on the 915

Up Position – Emergency Lock Down; all doors are locked regardless of any other inputs; overrides fire control

STATUS INDICATORS: The Rack Mag Release button will flash red if an alarm is pending, and will turn yellow when the doors have been unlocked.

INSTALLATION: These wiring changes need to be done on all racks that will be using the 914 module. See wiring diagrams in Figure 1 and 2 below.

1. A vendor-supplied wire needs to be added to the TB1 cable inside the rack to connect TB1 pin 12 to P1 pin 12 of the board connector. See Fig 1.
2. A user-supplied wire is needed connecting TB1 pin 12 on the primary rack to TB1 pin 12 on all other inter-connected racks. See Fig 2.
3. The 914 module must be installed in the first (far left) position in rack.

System wiring modifications for 915 or 914 installations

Fig 1: P1 Board connector to terminal block wiring diagram

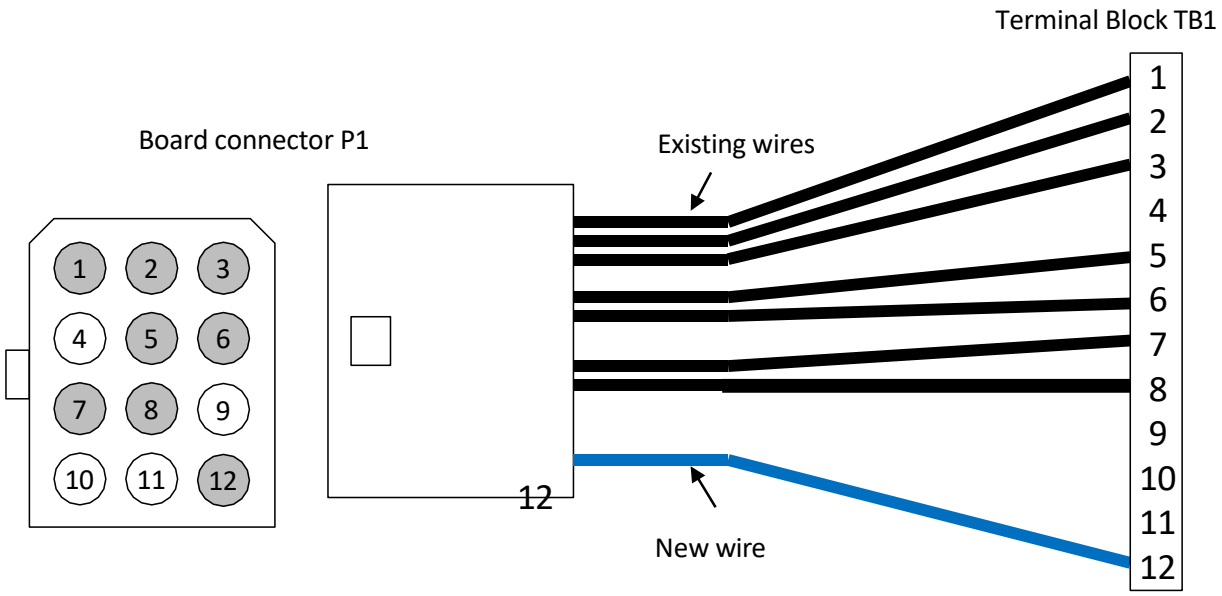
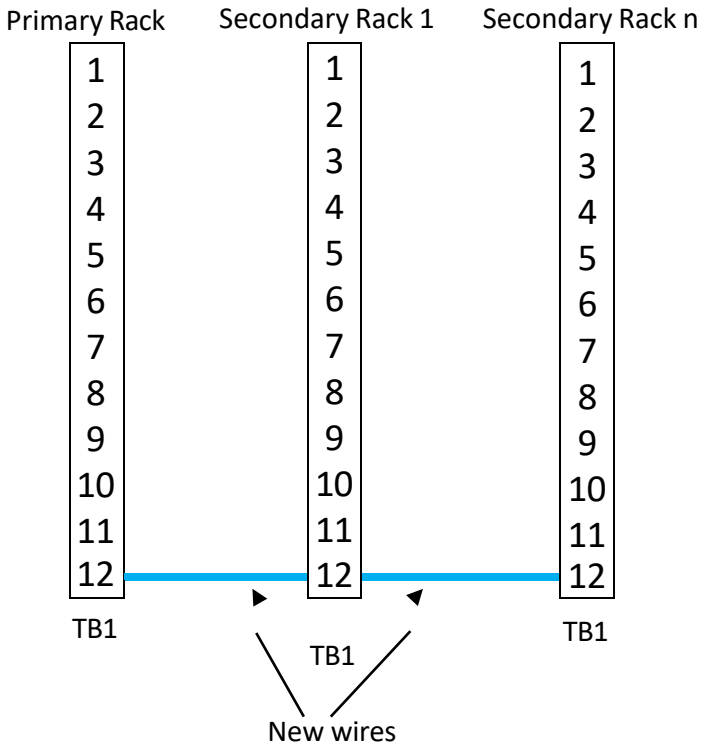
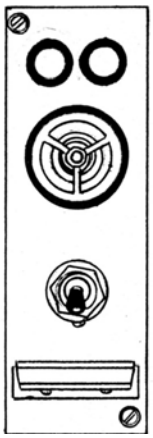


Fig 2: Inter-rack wiring diagram





AES 920 MONITOR FOR WALK THROUGH METAL DETECTOR

****THIS ITEM IS DISCONTINUED****

This page is included for reference of previously fielded systems.

DESCRIPTION:

The AES 920 is a remote display for a walk through metal detector. Its audible and visual indicators work in unison with the indicators on the metal detector.

RACK LOCATION: Any Location EXCEPT the first (far left) position

TOGGLE SWITCH OPERATION:

Down Position - Turns off audible alert

Up Position - Turns on audible alert

STATUS INDICATORS:

Red Lamp - Indicates metal has been detected

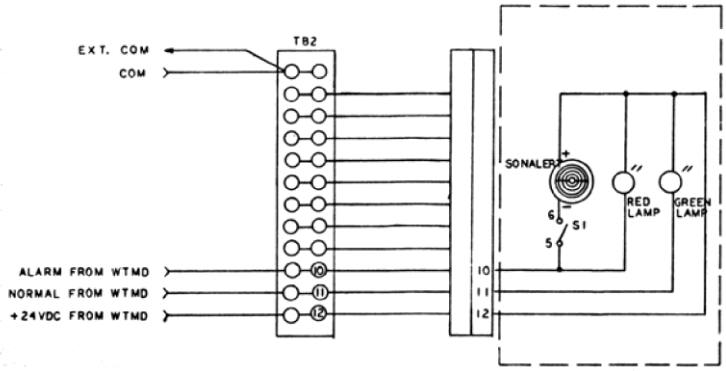
Green Lamp - Indicates no metal has been detected

AUDIBLE INDICATOR:

Indicates metal has been detected, operates in unison with Red Lamp. May be disabled by moving toggle switch to DOWN position

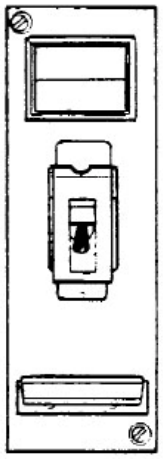
INSTALLATION:

In general, wiring should be made in accordance with the wiring diagram(s) provided.



AES 940 DOOR CONTROL MODULE

DESCRIPTION:



Each 940 module controls one (1) door. Each door includes two (2) locks: an emergency/magnetic lock; and an access/strike lock. Both locks must be released for the door to open. Indicators on the module display the status of the emergency/magnetic lock, and the door position (open/closed) as sensed by a contact switch at the door.

RACK LOCATION: Any Location EXCEPT the first (far left) position

GUARDED TOGGLE SWITCH OPERATION:

Down Position - Release emergency/magnetic lock

Middle Position - Locks emergency/magnetic lock

Up Position - Overrides Emergency Lock Down (see 910 module); releases door during and emergency lock down period

PUSH BUTTON (LIGHTED) SWITCH OPERATION:

Push - Releases access/strike lock

STATUS INDICATORS:

Red Lamp - Indicates that the emergency/magnetic lock is secured, confirming that the door is closed and cannot be opened

Yellow Lamp - Indicates that door is open

TO OPEN DOORS DURING EMERGENCY LOCK DOWN:

Lift switch guard and push toggle switch into UP position

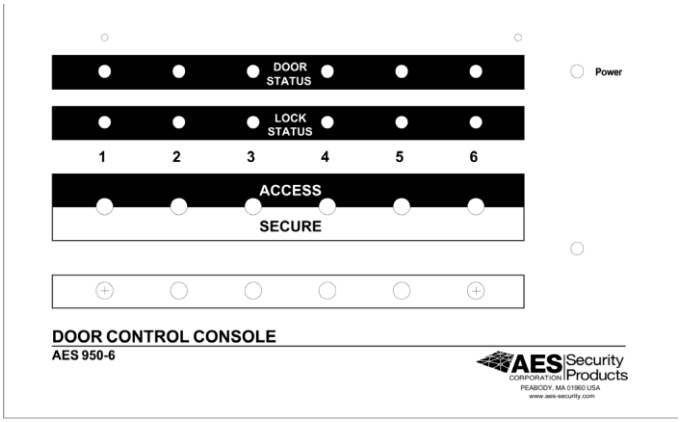
INSTALLATION:

In general, wiring should be made in accordance with the wiring diagram(s) provided.

AES 950-6 DESKTOP DOOR CONTROL

DESCRIPTION:

This desktop console is used to monitor and control six (6) doors. Each door includes two (2) locks: an emergency /magnetic lock; and an access/strike lock. Both locks must be released for the door to open. Indicators on the console display the status of the emergency/magnetic lock, and the door position (open/closed) as sensed by a switch contact at the door.



APPLICATIONS: The 950-6 is a cost effective solution for applications that do not require the comprehensive system provided by the 900 rack system.

TOGGLE SWITCH OPERATION:

Down "SECURE" Position - Latches emergency/magnetic lock

Up "ACCESS" Position - Releases emergency/magnetic lock

PUSH BUTTON SWITCH OPERATION:

Push - Releases access/strike lock

STATUS INDICATORS:

Amber "LOCK" Lamp - Indicates emergency/magnetic lock is not activated, confirming that door can be opened

Red "DOOR" Lamp - Indicates that door is open

AUDIBLE WARNING:

An audible warning sounds whenever a door is opened. This feature can be defeated on a door by door basis. A 6 position DIP switch inside the unit allows the installer/operator to switch the buzzer for door numbers 1 - 6 on or off individually.

INSTALLATION:

In general, wiring should be made in accordance with the wiring diagram(s) provided.

FIRE EXIT DOOR CONTROL SYSTEM, AES 944,
SYSTEM DESCRIPTION & INSTALLATION

SYSTEM COMPONENTS

• **945 Fire Exit Door Control Module** fits 900 or 905 rack, with adapter wire

• **946 Fire Exit Door Status Display Panel**, which is mounted adjacent to the fire exit. Surface mount and flush mount boxes are provided (#'s 946-SB and 946-MB).

ALSO REQUIRED (not included in this package): AES 900 or 905 Rack Cabinet; AES 910 Emergency Module in position #1 of above rack; AES 726, 727, 780, 926 (or equiv) 24 volt DC power supply; Panic Bar Release, (NO/NC) bond sensing contacts; and Magnetic Contact Switch N.O.

INSTALLATION

• Before installing the 945 module into the 900 or 905 rack cabinet, locate the rack connector in the position to be used. Pin #1 of this connector should be wired to the common buss. In some earlier versions of the 900 rack however, Pin #1 has no wire. This wire must be installed for the 945 to operate. A pre-cut adapter wire with connectors has been provided to make the connection from Pin 1 to the common bus.

• In general, wiring should be made in accordance with the diagram provided.

OVERVIEW OF SYSTEM FUNCTIONS

The fire exit door control system provides an automatic, controlled delay of fire door release with abort and override capabilities.

- Allows time for a guard or operator at the door control console to determine who is attempting to leave via a fire exit door before releasing the lock.

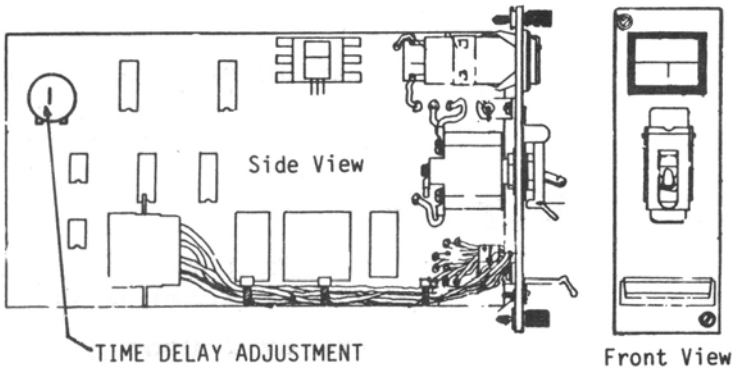
- Automatically releases the fire door lock after a delay period (adjustable from approx. 0 – 20 seconds). The guard or operator can release the door, keep it locked or allow the automatic delay to run its course.

- Provides visual and audible annunciation of door and lock status at the control console at the door location.

- A fire alarm system input can override the time delay and release the lock.

- The 910 Emergency Module (a separate option) overrides the automatic release. The fire system input is also overridden by the 910. The operator can still release the lock using the switch on the 945 module or the keyswitch on the 946 panel.

945 FIRE EXIT DOOR CONTROL MODULE



Guarded Toggle Switch

The guarded switch controls the lock on the fire exit door:
- **Center Position – Secure**
- **Down Position – Release**
- **Up Position – Unconditional Release**

Push Button Switch with Indicators

- Push Button Switch: The function of the push button is to cancel/reset the timed release function. If the timer is in the process of timing out, the push button will cancel its process preventing the lock from releasing. If the timer has reached the end of its cycle and the door has not yet been opened, pushing the button will secure the lock.

- Indicators: The indicator section of the push button is divided into three segments.

    - The **green** segment in the upper half lights when the door is secured, as sensed by the magnetic bond detector.

    - The **amber** segment in the lower left quarter flashes to indicate that the exit timer is running. A steady light from this segment indicates the timer period has expired and the lock is released, as sensed by the magnetic bond sensor.

    - The **red** segment, in the lower right quarter lights when the door is physically open, as sensed by the door status switch.

Buzzer

The buzzer sounds whenever the panic release bar on the fire exit door is pushed, which also activates the timer. The buzzer continues to sound until the door is open or the delay circuit is deactivated.

NOTE: The audible and visual indicators on the 945 module operate simultaneously with the indicators on the 946 panel.

Time Delay Adjustment

The time delay adjustment sets the delay time period between the moment the panic release bar is pushed and the time the door would automatically unlock if not manually overridden. The range of adjustment is approx 0-20 seconds. An adjusting potentiometer is located on the 945 printed circuit board (see diagram above).

Individual, Isolated Fire Control Input

A direct, isolated input is provided in the 945 module. It is isolated from other system modules and the 900 system fire buss. It allows a separate fire control to immediately release the lock controlled by the 945 module. The emergency lock down function activated by a 910 module overrides this input.

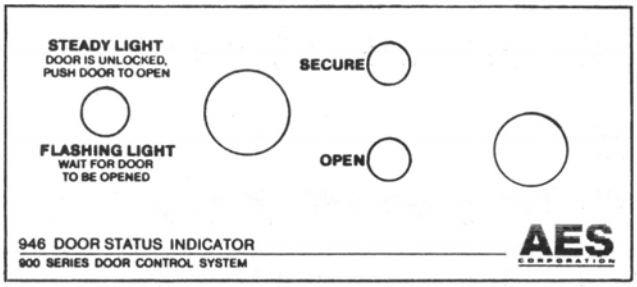
945 Module, Continued

False Alarm Protection Features

Several electronic circuits are included to prevent casual or accidental initiation of functions.

- The panic release bar must be pushed for at least ½ second to activate the exit delay timer.
- The fire input must be switched on (to minus [–]) for ½ second to release door.
- The push button switch must be held in for ¼ second to cancel the timer.
- The door must be open for ¼ second to reset the buzzer.
- The emergency/magnetic lock must be present for ¼ second to be acknowledged.

946 STATUS DISPLAY PANEL



The 946 status display panel is mounted adjacent to the fire exit door. It annunciates the door status, informing anyone attempting to leave via that exit when the door is released.

Buzzer

A buzzer sounds when the panic release bar on the fire exit is pressed. The buzzer continues to sound until the door is opened or the delay circuit is deactivated. In addition to acknowledging the exit attempt, the buzzer serves to notify a guard or other personnel in the area that someone is attempting to exit.

Indicator Functions:

- The **green** light labeled “secure” lights when the door is secured, as sensed by the magnetic bond detector.

- The **amber** light labeled “flashing…steady…” flashes to indicate that the exit timer is running. A steady light indicates the timer has expired and the lock is released, as sensed by the magnetic bond detector.

- The **red** light labeled “open” lights when the door is physically open, as sensed by the door status switch.

NOTE that these indicators operate in sequence with indicators on the 945 module.

Key Switch Function:

A sustained position key switch is included to release the lock at any time. This key is the final factor in the circuit because it physically breaks the electrical circuit to the lock.

Other Features:

A relay is mounted in the display panel and serves to disable the panic bar switch contact when the lock is released.

FIRE EXIT COMPONENTS: INTERACTION WITH OTHER SYSTEM COMPONENTS:

910 EMERGENCY LOCK DOWN MODULE

The AES 910 Emergency Lock Down module is a standard component on AES 900 Series Door Control Systems. Its impact on the Fire Exit Door Section of the system is discussed here.

The 910 Lock Down Module Disables the Following Functions:

In almost every case the emergency lock down switch will secure or keep secured the fire exit door by:

- Disabling the panic bar switch
- Disabling the fire exit module's individual fire input circuit
- Deactivating the exit timer circuit, if timing out or time out
- Applying power to both the fire buss and emergency buss of the rack in its usual manner

The 910 Lock Down Module May be Overridden in the Following Ways:

With the emergency lock down switch active, there are two ways to release the fire exit door:

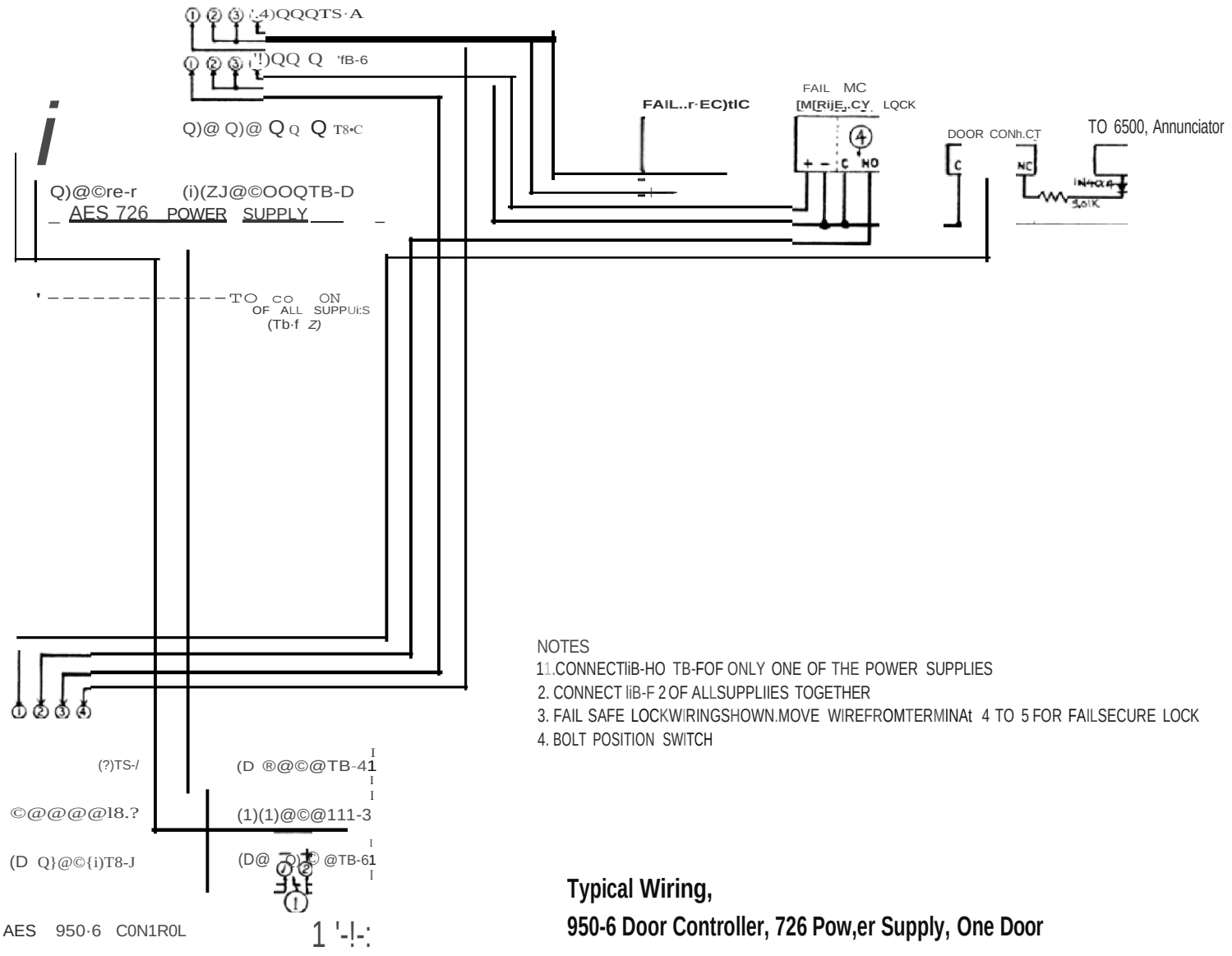
- Lifting the switch guard on the 945 module and moving the switch to its uppermost position
- Using the key switch on the 946 fire exit door status display panel.

FIRE INPUT, 900 SYSTEM BUSS

The fire circuit of the 910 emergency module forms a system-wide buss that can be used to release this type of lock along with any other locks in the 900 rack.

The manual emergency lock down will secure all locks in the usual manner even when released by this fire circuit.

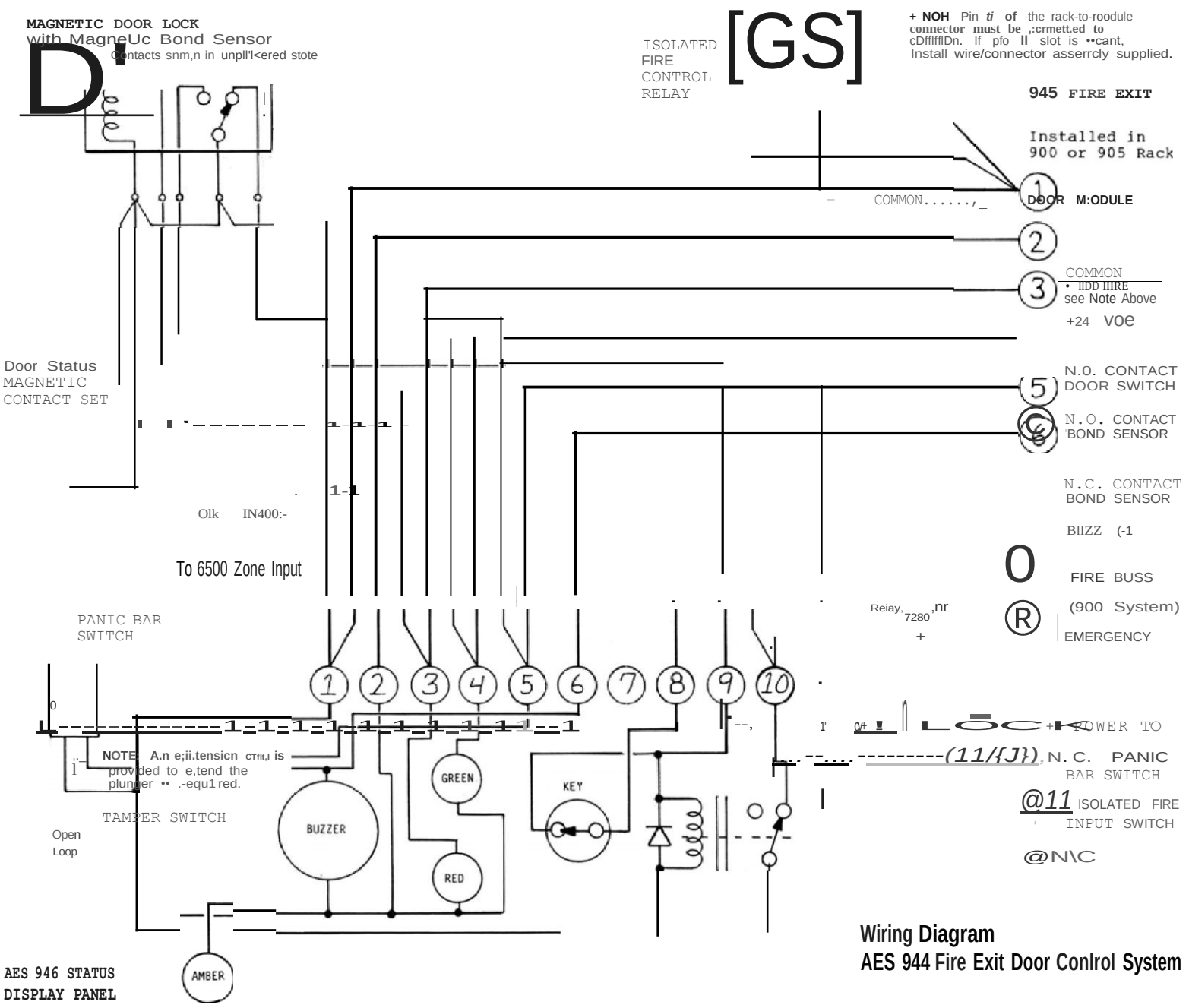
A separate, isolated fire control input is available at the individual 945 module. This input affects only the door controlled by the 945 module. It is described under the heading: Individual Fire Control Input", elsewhere in this document.



NOTES

1. CONNECT TB-HO TB-F FOR ONLY ONE OF THE POWER SUPPLIES
2. CONNECT TB-F 2 OF ALL SUPPLIES TOGETHER
3. FAIL SAFE LOCK WIRING SHOWN. MOVE WIRE FROM TERMINAL 4 TO 5 FOR FAILSECURE LOCK
4. BOLT POSITION SWITCH

Typical Wiring,
950-6 Door Controller, 726 Pow,er Supply, One Door



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Wiring Diagram
AES 944 Fire Exit Door Conlrol System

IncludesAES 945 FireDoor Control Module, and AES 946 Fire DoorStat11s DisplayPanel

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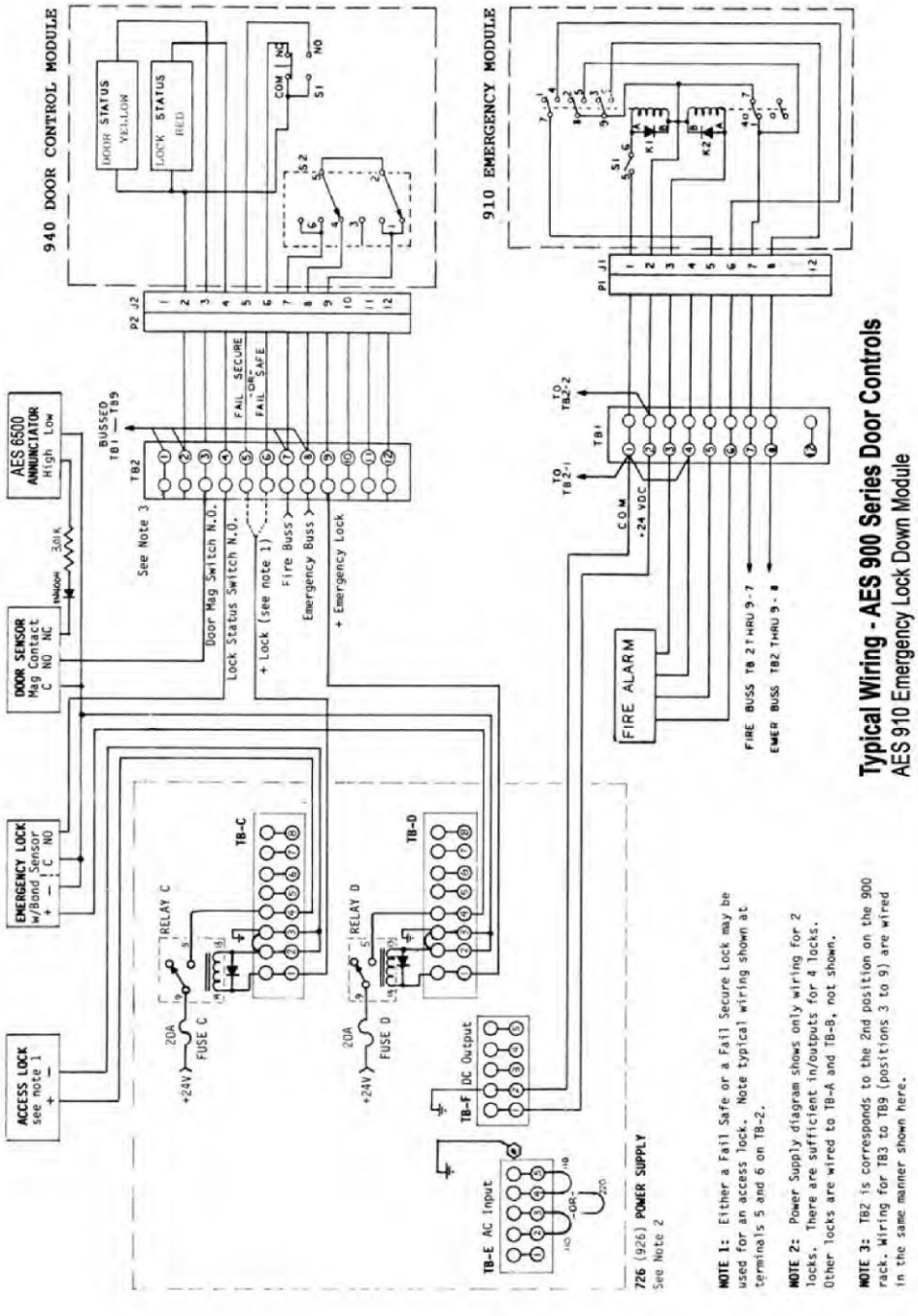

Typical Wiring - AES 900 Series Door Controls

AES 910 Emergency Lock Down Module
AES 940 Door Control Module
AES 726 Power Supply
Electric Strike and Magnetic Lock
AES 6500 Annunciator

NOTE 1: Either a Fail Safe or a Fail Secure Lock may be used for an access lock. Note typical wiring shown at terminals 5 and 6 on TB-2.

NOTE 2: Power Supply diagram shows only wiring for 2 locks. There are sufficient in/outputs for 4 locks. Other locks are wired to TB-A and TB-B, not shown.

NOTE 3: TB2 is corresponds to the 2nd position on the 900 rack. Wiring for TB3 to TB9 (positions 3 to 9) are wired in the same manner shown here.

Ordering Information Summary

Part No.	Description
AES 726	24 V Power Supply (formerly 926) Does not include battery pack, see #726-HDB
AES 726-HDB	24 V Battery Pack, 7AH, for 726 Power Supply
AES 727	24 V Power Supply with 8 Relays
AES 727-HDB	24 V Battery Pack, 12AH, for 727 Power Supply
AES 727-RB	Relay Card, 4 Relays, for use with AES 780
AES 780	24 V Power Supply, Rack Mount, Order Relays Separately
AES 900	Rack Mount Cabinet & Buss, 8 slots
AES 905	Desktop Cabinet & Buss, 3 slots
AES 910	Emergency Lock Down Module
AES 920	Metal Detector Monitor (Discontinued)
AES 940	Door Control Module, 1 door w/2 locks
AES 941-M	ADA Door Control Module
AES 941-R	ADA Door Control Interface for LCN Opener
AES 941-R2	ADA Door Control Interface for 2 LCN Openers / Double Door (Requires 2 – 941-M controls, 1 for each door)
AES 941-PKG	ADA Door Control Pack, includes 1 each, 941-M and 941-R
AES 944	Fire Door Control Pack, includes 1 each, 944 and 945
AES 945	Fire Door Control Module
AES 946	Fire Door Display
AES 950-6	Mini Door Control Console

Accessories:	
AES 930	Blank Plate, standard
AES 935	Blank Plate, large (for left position)
AES 946-MB	Masonry/Flush Back Box for 946**
AES 946-SB	Surface Mount Back Box for 946**

**Included in 944 package

AES CORPORATION

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AES Corporation
285 Newbury Street
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