

# **DERRY FIRE DEPARTMENT LISTED AGENT CERTIFICATION PROGRAM**

THIS COURSE IS FOR AGENTS WISHING  
TO DISABLE TRANSMITTING SIGNALS IN  
ORDER TO PERFORM MAINTENANCE  
TESTING AND DRILLS.



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# OBJECTIVE

- The objective of the course is to provide the basic understanding of town fire alarm systems and transmitting equipment.
- Given this you will have the basic knowledge and understanding of the system you are working on to provide maintenance, testing and drills for a give facility.
- A passing grade of 70% is required upon completion of this course to be a listed agent.



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# OUTLINE

- Definitions
- Regulatory mandates
- Types of fire alarm systems
- Types of transmitting equipment
- Fire alarm system components
- Basic Fire alarm wiring
- Rules for listed agents
- Test/Certificate



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# DEFINITIONS

- **Approved** – Acceptable to the “Authority having jurisdiction”
- **Authority Having Jurisdiction** – The organization, office or individual responsible for “approving” equipment, an installation or a procedure.
- **Code** – A document containing only mandatory provisions using the word “shall”.
- **Listed agent**
  - **Citywide agent** – One who works for a Fire Alarm or Sprinkler Company and may disconnect a fire alarm system from any Master Box in the town of Derry for the purpose of maintenance or service.



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# Definitions Continued

- **PROPERTY AGENT** - One who is a representative of a property owner and may disconnect a fire alarm system from a specific Master Box or Boxes in the town of Derry for the purpose of maintenance, service or drills.
- **FIRE DRILL COORDINATOR**- A person who may disconnect a fire alarm system from a specified master box or boxes on a specified property in the town of Derry, N.H. for which the agent is legally responsible. Disconnections shall be allowed only for legitimate fire drill activities. In the case where a short arm is needed, the site shall maintain a short arm key which will remain the property of the Derry fire department. This key shall have the markings on it to indicate what school, or facility it belongs to. No short arm keys shall be used in any alarm system for which they are not engraved for. Short arms and master box keys for non-publicly owned facilities shall be purchased at the current rates included in the fee schedule.



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# Disclaimer

- The Derry Fire Department by virtue of listing agents does **NOT** guarantee, warranty, qualify, approve or certify any individual or company or their performance.
- The training provided and the Rules and Regulations which govern the listed agent program are intended to set minimum standards and procedures for listed agents.
- It is the responsibility of the listed agent and the property owner to assure that the fire alarm system and the master box is restored to a normal operating condition after each disconnection.



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# Regulatory Mandates

**The following regulatory documents apply to the fire alarm system.**

- 1. NFPA 101 Life Safety Code** — Denotes which occupancies are required to have fire alarm systems.
- 2. NFPA 72 National Fire Alarm Code** — Lays out overall system design parameters, such as location and spacing of heads and pull stations, testing and maintenance procedures, minimum performance requirements and operational protocols.



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# Mandates Continued

**The following regulatory documents apply to the fire alarm system.**

- 3. NFPA 70 National Electric Code** — Article 760 covers the equipment and wiring of the fire alarm system.
- 4. Underwriters Laboratory** — List all components such as control panel, smoke detecting heads, horns, pull stations, and any other equipment.



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# Types of Fire Alarm Systems

- Protected Premises system
- Central station Fire alarm system
- Proprietary System
- Remote Station System
- Auxiliary System



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# Protected Premises

- The main purpose of a Protected Premises system is to activate local audible and visible alarm notification appliances to notify the occupants that they must evacuate the protected building.
- In a protected premises building the alarm is not relayed automatically to the fire department. Someone must notify the fire department by other means.



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# Central Station System

- A Central Station fire alarm system is designed to receive signals from a protected premises at a constantly attended location operated by a company.
- The central station must be listed.



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# Proprietary System

- Proprietary systems are widely used in large commercial and industrial occupancies.
- Many existing systems have separate initiating circuits for each building zone.



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# Remote Station

- A remote fire alarm system connects the outputs from a building fire alarm control unit and transmits them to a remote location.
- NFPA 72 specifies that the fire alarm signal be received at the public fire service communications center, at the fire station, or at the location of the public agency that has the responsibility to receive fire alarms from the public.



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# Auxiliary System

- An auxiliary fire alarm system provides the interface between a protected premises fire alarm system and a public fire reporting system.



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# Transmitting Equipment

## City Master Box

- One of the most traditional methods is via a City Master Box that is a street fire alarm box modified so that it can be activated by a fire alarm control panel in addition to being manually operated.



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# How it Works

- The box mechanism contains normally closed contacts that are connected in series with a huge series “balloon” loop that could stretch for miles.
- A municipal switchboard maintains a current in the loop of 1/10 ampere that has remained unchanged for almost a century, except we now use the modern way of expressing it as 100 milliamperes. Supervision is provided via the current flowing through the loop.



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# How it works

The act of pulling the hook causes the clockwork mechanism to unwind, rotating a code wheel with teeth cut in accordance with the code assigned to the box. The teeth on the wheel cause the contacts to open and close in accordance with the code. Note that I said that the contacts are normally closed. Since supervisory current is flowing through the circuit,

Continued on next slide



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# How it works

a break in the municipal loop will cause the energized single stroke gongs, etc. in the circuit to fall out and sound a single blow. This differentiates a break from an alarm, and indicates the need for an investigation by the fire department. An operated box will sound its code on all the gongs, registers at the monitored location.



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# Radio box

- Radio boxes receive an alarm from the fire alarm control panel and re-transmit the alarm to a receiving station or fire department directly over air waves.
- There are numerous styles and types including combination units.



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# Fire Alarm System Components

- **Initiating devices** - capable of placing the system in the alarm state. These can be photoelectric smoke and heat detectors, ionization smoke detectors, heat detectors, in-duct smoke detectors, manually operated pull stations and sprinkler water flow sensors.
- **Notification Appliance** - whose purpose is to announce to building occupants or at a remote location when the system enters the alarm state, such as horns, strobe lights, chimes, bells, or combination units.



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# Components continued

- **A control panel** - containing programming and operating electronics and user interface, is fed by standard branch-circuit wiring and contains replaceable circuit cards — one for each zone. This includes an alphanumeric display, showing the state of the system and providing troubleshooting information, and a touchpad so that onsite personnel can silence an alarm or trouble signal, reset the system following an event, and reprogram if necessary.



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# Components continued

- **Sealed batteries** - similar to emergency light batteries but listed for fire alarm systems. These are usually 6V batteries wired in series to make up 24VDC for a power-limited system. The batteries can be contained in the control panel or in a separate enclosure. When AC power fails, the batteries take over with no interruption in fire protection. Of course, there is also a charger.



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# Components continued

- **Auxiliary devices** - including remote annunciators with LEDs showing the state of the system, an alarm silence switch, and visual LED indication of the zone from which a fire alarm is initiated.
- **Electromagnetic door holders** (floor- or wall-mounted) are available. In case of alarm, the magnet is de-energized, allowing the door to swing shut. Later, it is reopened manually.



# Fire Alarm Wiring

## 3 Classifications for wiring a fire detection loop

1. Class B 2 wire
2. Class B 4 wire
3. Class A



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# Class B 2 Wire

- A Class B device circuit can distinguish between an open or ground fault (trouble), versus a short across the loop.
- The end of line device may be a resistor or whatever the manufacture may need to allow the circuit to be totally supervised.
- A loss of current indicates a break in the circuit wiring and causes a trouble condition.
- Note that a single open in the circuit will allow all devices up to the open to operate normally, while all devices past the open to are disabled and incapable of sensing or indicating an alarm.



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# Class B 4 Wire

- A Class B 4 wire is identical to a 2 wire with the exception that the end of line resistor is located at a central place to make troubleshooting easier, such as back at the main fire alarm control panel.



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# Class A Wire

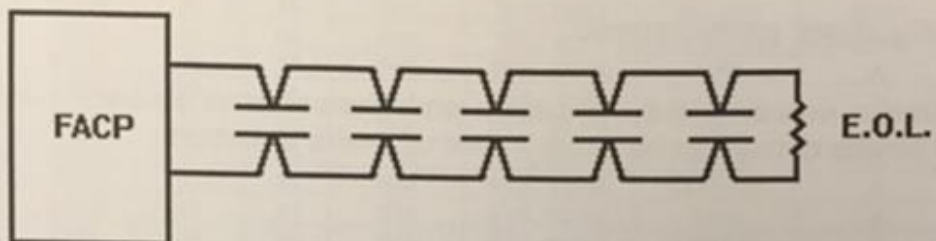
A Class A circuit is wired in the same manner as the 4-wire Class B circuit.

- The circuit however, is superior to the Class B circuit because should a single open or ground fault occur, the circuit will reconfigure itself by an arrangement within the panel to assure that every device is still capable of sensing and indicating an alarm.

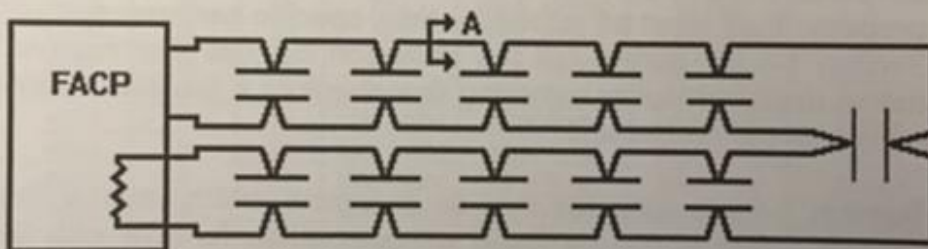


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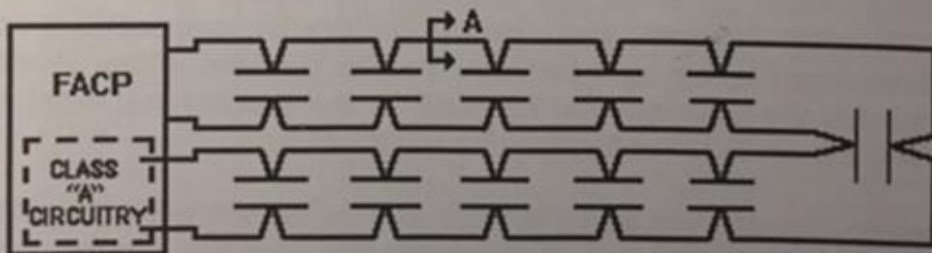
### CLASS "B" 2 - WIRE



### CLASS "B" 4 - WIRE



### CLASS "A"



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# Listed Agent Rules

## DURATION OF AGENT LISTING:

- An agent listing shall remain in effect through December 31, regardless of the month of year the agent is listed, or until the individual no longer meets the requirements for an agent listing, or has violated the rules and regulations of the Derry Fire Department for fire alarm listed agents.
- Listed agents who change employment must reapply for a new listing under their new employer's name.
- If an agent's listing expires they must reapply and retest. Any applicable application or testing fees will apply.



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# Rules Continued

## TRAINING / TESTING (LISTED AGENT):

- To become a listed agent, you must complete this training and show proof of competency in short arming a box, and knowledge of the town of Derry code related there to.
- The town of Derry code as it pertains to fire alarm systems can be found at the town of Derry/fire department website <http://www.derry.nh.us/fire-department/pages/municipal-fire-alarm-system> , administrative office or fire alarm/communications center.
- The town of Derry does not extend reciprocity to listed agents that are listed from other area towns.



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# Rules Continued

## **RENEWAL APPLICANTS:**

- Renewal applications for listed agents with current certification may be processed by mail provided the applicable fees are included with the application and an online certificate has been issued.



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# Rules Continued

## **MASTER BOX “SHORT ARMS” AND KEYS:**

- New Derry listed agents must have a Master-box “short arm” engraved with their listed agent number.
- Applicants may supply their own key to the Derry fire department for engraving, or one may be purchased.
- Master box keys are also available for purchase.
- Please see the current fee schedule; all fees must be paid through the fire administration office.



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# Rules Continued

## **TRAINING / TESTING (FIRE DRILL COORDINATOR):**

- There is no charge to become a fire drill coordinator.
- This listing is primarily designed for educational, healthcare, and large scale manufacturing facilities.
- To become a fire drill coordinator, the individual must be actively employed by the facility and in a role whereby virtue of job classification they are responsible for conducting fire drills.
- Complete this online presentation and test with proof by certificate. Then they will be issued a fire drill coordinator number.
- Fire drill coordinators are only authorized to short arm a box, or put a radio box on test for the purpose of conducting a property fire drill.



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## •DISCONNECTION PROCEDURES FOR MASTER/RADIO FIRE ALARM BOXES

### •DISCONNECTION PROCEDURE:

•ALL LISTED AGENTS SHALL ABIDE BY THE FOLLOWING PROCEDURES WHEN DISCONNECTING A LOCAL FIRE ALARM SYSTEM FROM A MASTER BOX:

1. CALL THE DERRY FIRE DEPARTMENT COMMUNICATIONS CENTER AT (603) 432-6121, BEFORE ANY ALARM WORK OR DISCONNECTION ACTIVITY IS PERFORMED.
2. GIVE THE COMMUNICATIONS CENTER OPERATOR YOUR NAME AND LISTED AGENT ID NUMBER. DESCRIBE THE BOX LOCATION AND TYPE OF ACTIVITY REQUIRING THE DISCONNECTION.
3. AFTER RECEIVING AUTHORIZATION TO DISCONNECT THE ALARM SYSTEM, TAKE THE FOLLOWING STEPS:
  - **WIRED MASTER BOX:** OPEN THE RED OUTER DOOR AND THE WHITE INNER DOOR OF THE MASTER BOX. CAREFULLY REMOVE THE “LONG ARM” FROM THE MECHANISM. REPLACE WITH THE “SHORT ARM”. PLACE THE LONG ARM ON THE TOP OF THE WHITE INNER CASE. CLOSE THE WHITE INNER DOOR AND SECURE THE OUTER RED DOOR. UNDER NO CIRCUMSTANCES LEAVE THE RED OUTER DOOR UNSECURED.
  - **RADIO MASTER BOX:** MOVE THE MASTER BOX DISCONNECT SWITCH OR SWITCHES INTO THE DISCONNECT POSITION AND SILENCE THE INTERFACE TROUBLE SIGNAL. IN THE EVENT THAT NO DISCONNECT SWITCHES EXIST IN A PARTICULAR INSTALLATION, THE AGENT SHALL NOTIFY THE COMMUNICATIONS CENTER TO DISREGARD THAT BOX WHILE WORK IS IN PROGRESS.
4. PROCEED WITH THE SYSTEM MAINTENANCE ACTIVITY.
  1. WHEN THE MAINTENANCE ACTIVITY HAS BEEN COMPLETED, TAKE THE FOLLOWING STEPS:
    - **WIRED MASTER BOX:** OPEN THE RED OUTER DOOR AND THE WHITE INNER DOOR OF THE MASTER BOX. CAREFULLY REMOVE THE “SHORT ARM” FROM THE MECHANISM. REPLACE WITH THE “LONG ARM”. CHECK TO ASSURE THAT THE METAL ACTUATOR ARM IS PROPERLY LOCATED UNDER THE TRIP MECHANISM AND THAT THE TRIP ARM IS IN THE SET POSITION. CHECK TO ASSURE THE MASTER BOX IS FULLY WOUND. CLOSE THE WHITE INNER DOOR AND ASSURE THAT NO KEYS, SHORT ARMS OR OTHER OBJECTS ARE IN CONTACT WITH THE WIRING, THE BELL OR THE TELEGRAPH KEY INSIDE THE BOX. SECURE THE OUTER RED DOOR. UNDER NO CIRCUMSTANCES LEAVE THE RED OUTER DOOR UNSECURED.



▫ **RADIO MASTER BOX:** MOVE THE MASTER BOX DISCONNECT SWITCH OR SWITCHES INTO THE NORMAL POSITION AND MOVE THE TROUBLE SIGNAL SILENCE SWITCH TO THE NORMAL POSITION. IN THE EVENT THAT NO DISCONNECT SWITCHES EXIST IN A PARTICULAR INSTALLATION, THE AGENT SHALL RESTORE THE PANEL TO NORMAL CONDITION AND NOTIFY THE COMMUNICATIONS CENTER TO REGARD ALL FURTHER ALARMS FROM THE BOX.

▫ CHECK THE STATUS OF THE FIRE ALARM SYSTEM BEFORE LEAVING THE PROPERTY. IF ANY YELLOW OR RED INDICATORS ARE DISPLAYED OR IF A TROUBLE SIGNAL IS SOUNDING, THE AGENT MUST CHECK THE SYSTEM AND CORRECT THE PROBLEM.

6. IF AT ANY TIME WHILE WORKING IN A WIRED MASTER BOX AND THE BELL TAPPER SOUNDS, **STOP** ALL ACTIVITY AND WAIT FOR THE BELL TO STOP TAPPING.

1. IF A WIRED MASTER BOX IS INADVERTENTLY TRIPPED DURING WORK, ALLOW THE BOX TO COMPLETE ALL FOUR ROUNDS AND THEN SEND A MANUAL SIGNAL FROM THE TELEGRAPH KEY OF 2-2-2. AFTER SENDING IN THE 3 ROUNDS OF 2, IMMEDIATELY CALL THE DERRY FIRE DEPARTMENT COMMUNICATIONS CENTER (603-432-6121) AND VERIFY THE ACCIDENTAL TRIP WITH THE OPERATOR, THEN REWIND THE BOX.

2. LISTED AGENTS SHALL NOT, UNDER ANY CIRCUMSTANCES, JUMP OUT OR DISCONNECT ANY WIRING INSIDE A MASTER BOX.

3. LISTED AGENTS MAY BE ISSUED A SET OF MASTER BOX KEYS. THE KEYS REMAIN THE PROPERTY OF THE DERRY FIRE DEPARTMENT AND MUST BE RETURNED IN THE EVENT OF TERMINATION OF LISTED AGENT STATUS OR WHENEVER REQUIRED BY THE DERRY FIRE DEPARTMENT. LOST KEYS WILL BE SUBJECT TO A \$10.00 FEE FOR REPLACEMENT, WHETHER AN INDIVIDUAL CONTINUES AS A LISTED AGENT OR NOT.

4. LISTED AGENTS MAY PURCHASE GAMEWELL "SHORT ARMS" FROM THE DERRY FIRE DEPARTMENT FOR \$50.00 EACH. LISTED AGENTS MAY USE A SHORT ARM SUPPLIED BY ANOTHER MUNICIPALITY PROVIDED THE SHORT ARM CONTAINS A UNIQUE IDENTIFIER NUMBER PERMANENT AFFIXED OR ENGRAVED BY THAT MUNICIPALITY. LISTED AGENTS REQUESTING RECIPROCITY AND WISHING TO USE THESE SHORT ARMS MUST BE ABLE TO PROVIDE THE NUMBER AT THE TIME OF APPLICATION OR THE APPLICATION PROCESSING WILL BE DELAYED.

5. ALL QUESTIONS REGARDING THIS PROGRAM SHALL BE DIRECTED TO THE DERRY FIRE DEPARTMENTS DIRECTOR OF COMMUNICATIONS OR THE DIRECTOR OF FIRE PREVENTION/INSPECTION.

6. A LISTED AGENT SHALL NOT LEAVE THE PROPERTY WHILE THE MASTER BOX IS DISCONNECTED. IF FOR ANY REASON THE AGENT CANNOT RECONNECT THE MASTER BOX AND CLEAR THE FIRE ALARM SYSTEM CONTROL PANEL THEN THE AGENT SHALL NOT LEAVE THE PROPERTY UNTIL THE PROBLEM IS CLEARED. IF THE PROBLEM CANNOT BE CLEARED, THE AGENT SHALL NOT LEAVE THE PROPERTY UNTIL BOTH THE PROPERTY OWNER AND THE DERRY FIRE DEPARTMENT HAVE BEEN NOTIFIED AND THE DETAILS OF THE PROBLEM HAVE BEEN DISCUSSED WITH THE ON-DUTY BATTALION CHIEF OR HIS DESIGNEE.

7. THE LISTED AGENT MUST UNDERSTAND AND WILL ABIDE BY ALL RULES AND REGULATIONS OF THE DERRY FIRE DEPARTMENT REGARDING THE MASTER FIRE ALARM BOX LISTED AGENT PROGRAM. THE LISTED AGENT WILL NOT DIVULGE THE LISTED AGENT ID TO ANY OTHER INDIVIDUAL NOR ALLOW ANY OTHER INDIVIDUAL TO ACT IN THEIR PLACE AS A LISTED AGENT."



# Disclaimer

- The Derry N.H. fire department, by virtue of the listed agents/fire drill coordinator program, does not guarantee, warrantee, qualify, approve or certify an individual or company or their performance.
- The rules and regulations which govern the listed agent/fire drill coordinator program are intended to set minimum standards and procedures for listed agents.
- It is the sole responsibility of the listed agent and the property owner to assure that the fire alarm system is operational and the master or radio box is restored to a normal condition after each disconnection.
- If any property owner, listed agent, or fire drill coordinator deviates from the above listed procedure, you shall be in violation of state/local fire code violations.



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# Test and Certificate

- Click on the Link below to access the test. Upon completion you can request a copy of the certificate to be E-mailed to you.
- The certificate is required to show proof of passing the on-line training.
- <http://quizegg.com/q/108718>



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