DOCUMENT RESUME

ED 254 686 CE 040 962

TITLE	Low Voltage Alarm Apprenticeship. Related Training Modules. 0.1 History of Alarms.
INSTITUTION	Lane Community Coll., Eugene, Oreg.
SPONS AGENCY	Oregon State Dept. of Education, Salem.
PUB DATE	[82]
NOTE	21p.; For other apprenticeship documents related to this trade, see CE 040 963-969.
PUB TYPE	Guides - Classroom Use - Materials (For Learner) (051)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*Alarm Systems; *Apprenticeships; Autoinstructional Aids; Behavioral Objectives; *Crime Prevention; Electrical Occupations; Electrical Systems; Electronic Equipment; *Fire Protection; Individualized Instruction; Job Skills; Learning Activities; Learning Modules; Postsecondary Education; *Trade and Industrial Education

ABSTRACT

This packet of one learning module on the history of alarms is one of eight such packets developed for apprenticeship training for low voltage alarm. Introductory materials are a complete listing of all available modules and a supplementary reference list. Each module contains some or all of these components: goal, performance indicators, study guide (a check list of steps the student should complete), a vocabulary list, an introduction, information sheets, assignment sheet, job sheet, self-assessment, self-assessment answers, post-assessment, instructor post-assessment answers, and a list of supplementary references. Supplementary reference material may be provided. (YLB)

APPRENTICESHIP

LOW VOLTAGE ALARM

RELATED TRAINING MODULES

0.1 HISTORY OF ALARMS

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THIS PROJECT WAS DEVELOPED AND PRODUCED UNDER A SUB-CONTRACT FOR THE OREGON DEPARTMENT OF EDUCATION BY LANE COMMUNITY COLLEGE, APPRENTICESHIP DIVISION, EUGENE, OREGON, 1984.

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APPRENTICESHIP

LOW VOLTAGE ALARM
RELATED TRAINING MODULES

0.1 History of Alarms

TRADE MATH

1.1 Linear - Measurement
1.2 Whole Numbers
1.3 Addition and Subtraction of Common Fractions and Mixed Numbers
1.4 Multiplication and Division of Common Fractions and Mixed Numbers
1.5 Compound Numbers
1.6 Percent
1.7 Mathematical Formulas
1.8 Ratio and Proportion
1.9 Perimeters, Areas and Volumes
1.10 Circumference and Area of Circles
1.11 Areas of Planes, Figures, and Volumes of Solid Figures
1.12 Graphs
1.13 Basic Trigonometry
1.14 Metrics

ELECTRICITY/ELECTRONICS

2.1 Basics of Energy
2.2 Atomic Theory
2.3 Electrical Conduction
2.4 Basics of Direct Current
2.5 Introduction to Circuits
2.6 Reading Scales
2.7 Using a V.O.M.
2.8 OHM'S Law
2.9 Power and Watt's Law
2.10 Kirchoff's Current Law
2.11 Kirchoff's Voltage Law
2.12 Series Resistive Circuits
2.13 Parallel Resistive Circuits
2.14 Series - Parallel Resistive Circuits
2.15 Switches and Relays
2.16 Basics of Alternating Currents
2.17 Magnetism
3.1 Electrical Symbols
3.2 Circuit Diagrams and Schematis
3.3 Schematics and Alarm Design
4.1 Solid State Power Supply System
4.2 Charging Circuits
4.3 Selecting the Power Size of Power Supply
4.4 Fuse and Circuit Breaker Protection
4.5 Battery Standby Capacity
4.6 Batteries
5.1 Troubleshooting - Electrical Tracing
5.2 Troubleshooting - Environmental Factors
5.3 Documentation of Design

SAFETY

6.1 General Safety
6.2 Hand Tool Safety
6.3 Power Tool Safety
6.4 Fire Safety
6.5 Hygiene Safety
6.6 Safety and Electricity

ALARM BASICS

7.1 Theory of Diodes
7.2 Theory of Bi-polar Devices
7.3 Theory of Integrated Circuits
8.1 Binary Numbering Systems
8.2 Logic Gates
8.3 Dialers
9.1 Blueprint Reading, Building Materials and Symbols
9.2 Design of Alarm Systems
10.1 Types and Applications of Alarm Systems
10.2 Burglar Systems
10.3 Fire Alarms
10.4 Hold-up Alarm Systems
10.5 Bank Alarm Systems
10.6 Wireless Alarm Systems
11.1 Hand and Power Tools
11.2 Maintain Hand and Power Tools
11.3 Safety Practices
12.1 Photoelectric Space Detectors
12.2 Passive Infrared Motion Detectors
12.3 Microwave Detectors (Radar)
12.4 Stress Detectors in Space and Volumetric Applications
12.5 Capacitance Detectors
12.6 Sound Discrimination
12.7 Ultrasonic Motion Detectors
12.8 Gas Detectors
12.9 Airborne and Structural Problems
12.10 Audio Detection Systems
13.1 Trade Terms
14.1 Invisible Beam Detectors
14.2 Fence Distrubance Sensors
14.3 Electric - Field Sensors
14.4 Seismic Sensors
14.5 Car Annunicators
15.1 Annunciators
15.2 Fire Extinguishing Systems
15.3 Signal Reporting Systems
16.1 Detection Devices
16.2 Contacts
16.3 Volumetric and Space Devices
16.4 Problems and Applications of Devices
17.1 Key Stations
17.2 Keyless Control Stations
17.3 Types of Annunication
17.4 Shunt Switches

18.1 Red Tape Procedures
19.1 Builder Board Requirements
19.2 Licensing
20.1 Central Stations
20.2 Fire Department Monitoring
20.3 Police Department Monitoring
20.4 Telephone Answering Service Monitoring
21.1 Fire/Police/Emergency Responses
22.1 Card Access Control
22.2 Telephone Access Control
22.3 Computerized Controls and Interfaces
22.4 Key Access Control
22.5 Vehicular Access Control
23.1 Telephone Services
24.1 Basic Sound Systems
25.1 Business Letters
26.1 Video Surveillance Systems
26.2 CCTV Cameras
26.3 CCTV Cables
26.4 CCTV Monitors and Recorders
26.5 Time - Lapse Video Recorders and Videotape
26.6 CCTV Camera Lens
26.7 CCTV Computer Interface Control
26.8 Video Transmission
26.9 CCTV Enclosures
26.10 CCTV Control Equipment

COMPUTER USAGE

27.1 Digital Language
27.2 Digital Logic
27.3 Computer Overview
27.4 Computer Software

HUMAN RELATIONS

28.1 Communication Skills
28.2 Feedback
28.3 Individual Strengths
28.4 Interpersonal Conflicts
28.5 Group Problem Solving, Goal-setting and Decision-making
28.6 Worksite Visits
28.7 Resumes
28.8 Interviews
28.9 Work Habits and Attitudes
28.10 Expectations
28.11 Wider Influences and Responsibilities
28.12 Personal Finance

DRAWING

29.1 Types of Drawings and Views
29.2 Blueprint Reading/Working Drawings
29.3 Scaling and Dimensioning
29.4 Sketching
29.5 Machine and Welding Symbols

LOW VOLTAGE ALARM

SUPPLEMENTARY REFERENCE MATERIAL

Intrusion Detection Systems: Principles of Operation and Application

Author: Robert L. Barnard
Edition: 1981

Understanding and Servicing Alarm Systems

Author: H. William Trimmer
Edition: 1981

In the event additional copies are needed, they may be purchased through:

Batterworth Publishers
10 Tower Office Park
Woburg, Ma. 01801

RECOMMENDATIONS FOR USING TRAINING MODULES

The following pages list modules and their corresponding numbers for this particular apprenticeship trade. As related training classroom hours vary for different reasons throughout the state, we recommend that the individual apprenticeship committees divide the total packets to fit their individual class schedules.

There are over 130 modules available. Apprentices can complete the whole set by the end of their indentured apprenticeships. Some apprentices may already have knowledge and skills that are covered in particular modules. In those cases, perhaps credit could be granted for those subjects, allowing apprentcies to advance to the remaining modules.

We suggest the the apprenticeship instructors assign the modules in numerical order to make this learning tool most effective.

INSTRUCTIONAL LEARNING SYSTEMS

0.1

HISTORY OF ALARMS

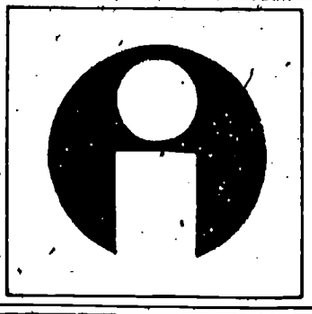
Goal:

The apprentice will understand the evolution of security alarm systems.

Performance Indicators:

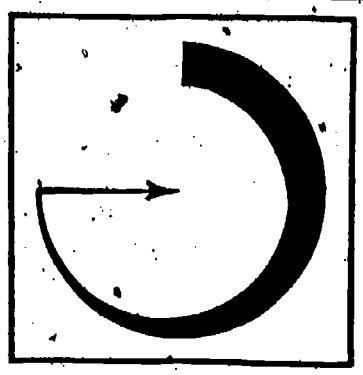
1. Describe security systems of ancient man.
2. Describe steps in development of modern alarm systems.

Study Guide



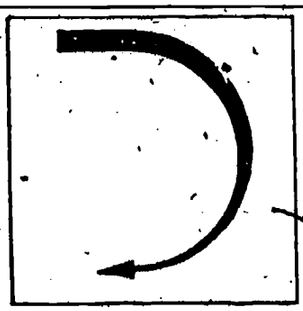
- Read the goal and performance indicators to find what is to be learned from package.
- Read the vocabulary sheet to find new terms that will be used in the package.
- Study the introduction and information sheets.
- Read the assignment. It is extremely informative and interesting.
- Job Sheet (none in this package).
- Complete self assessment and check answers.
- Complete post assessment and have instructor check answers.

Vocabulary



- Central station
- Coaxial cable television
- Digital dialing systems
- Electric field sensor system
- Electromagnetic telegraph
- Fire alarm telegraph system
- Infrared filter
- Ionization smoke detector
- Magnetic reed switch
- McCulloh circuit
- Multiplex signaling
- Vault detector system

Introduction

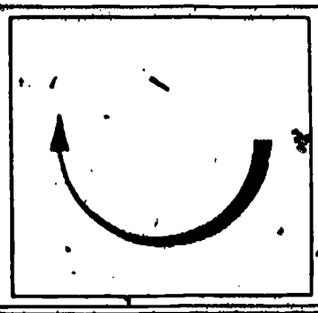


Security systems are as old as man himself. Early man spent much of their time in the protection of life and property. Crude systems were developed for detection of intruding enemies. They used signaling systems to warn others of danger.

The security alarm business arises from more than 5,000 years of insecurity. In an effort to protect human life and property, a highly complex system has developed. Today's system is a product of the history of mankind. As the threat level increased, the detection systems became more complex.

An apprentice should understand the history of security alarms. The struggles of the past will likely be repeated in some form. A knowledge of history will help one in preparing for those future struggles.

Information



ANCIENT TIMES

An alarm system is basically a call for help. Men and dogs have been part of alarm systems for thousands of years. The protection of life and property has been serious business for a long time.

Keyed locks have been discovered in China and Egypt that date back to 3,000 B.C. Those locks resemble the pin-tumbler lock of later years. The Bible makes many references to locks and keys. The Egyptians used locked vaults in pyramids to protect valuables. That principle is used in bank security today.

The Greeks used fire extenguishers as early as 440 B.C. It consisted of a leather sac filled with water attached to the dried entrails of an ox. When the leather sac was compressed, a stream of water was forced through the dried entrails. A water pumping fire engine is recorded as early as 200 B.C.

The Romans and Greeks developed many alarm and signaling systems. The Romans used geese as an intrusion alarm to detect the Gauls as they approached Rome. The geese have sensitive ears and warned the Romans with their squaking.

DARK AGES

The church bell was the only alarm to be developed in the dark ages. The bell was rung to sound fire alerts.

THE EVOLUTION OF MODERN ALARM SYSTEMS

Early 1600's -- First combination lock made.

1667 -- First fire protection company formed in London by Dr. Nicholas Barbon.

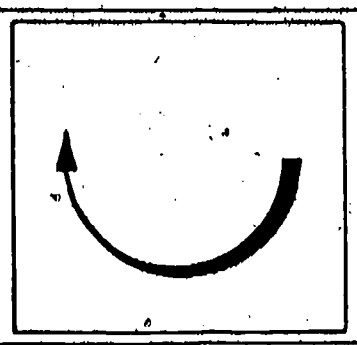
Early 1700's -- First burglar chime system developed.

1736 -- Ben Franklin and others formed the first American fire brigade in Philadelphia.

1832 -- Clock mechanism for strong boxes on stage coaches was patented.

1837 -- Electromagnetic telegraph patented.

Information



1845 -- Fire alarm telegraph system with central alarm stations was developed in Boston.

1852 -- First burglar alarm patented in Boston.

1872 -- First central station burglar alarm in New York City.

1874 -- First time lock patented by James Sargent. Became instant success for bank protection.

1882 -- McCulloh circuit patented.

1905 -- American Telephone and Telegraph Company entered the alarm industry.

1916 -- American District Telegraph (ADT) patented a vault protector.

1924 -- Bell Laboratories developed a vault detector system with carbon microphones.

1930's- Electric eye detection developed by Lindsay by putting an infrared filter over the light beam.

1933 -- Lindsay developed the electric field sensor system -- Telapproach.

1938 -- ADT developed a projected beam photoelectric smoke detector.

1940 -- 1946 -- War security prevailed. Applications were refined by wartime contracts.

1948 -- Bell Labs patented transistor.

1951 -- National Burglar and Fire Alarm Association was formed.

1952 -- Magnetic reed switch invented.

1952 -- Sam Bagno patented the first ultrasonic alarm.

1955 -- Ionization smoke detectors first marketed in the United States.

1957 -- General Electric introduced closed circuit TV for bank protection.

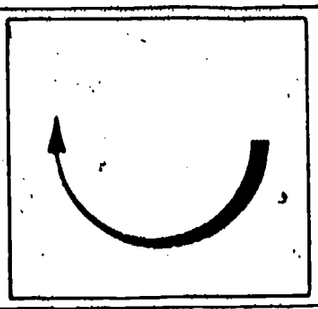
1964 -- Grinnell Corporation's monopoly on central station field was broken by an anti-trust suit. This allowed small companies to become involved in central station management.

1968 -- Honeywell entered the alarm field from computers.

1968 -- Federal Bank Protection Act demanded high security standards for banks.

1970 -- Multiplex signaling adapted to alarm industry.

Information



1970's -- Dispute with telephone company over line rates, markets and signaling systems.

1980's -- Computerization of central stations, digital dialing systems have revolutionized the alarm industry.

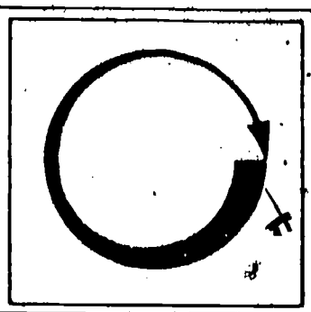
1980's -- Coaxial cable television companies have entered the security alarm field.

SUMMARY

The history of the alarm industry has been briefly sketched in this information sheet. This sketch does not tell the history of big company takeover of the industry at one point in time. It does not detail how Grinnell Corporation was broken down by an anti-trust suit in 1964. That landmark decision opened up the security alarm field to many smaller companies. Many of the small companies that entered the industry have become giants. Honeywell is a good example of such growth.

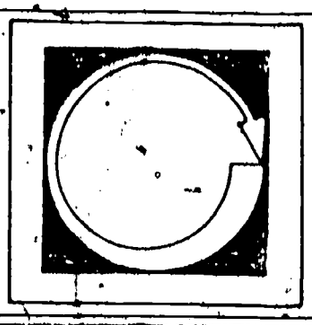
The technology growth came with the new and energetic companies. Competition was responsible for the advanced systems of today. The competition continues as the industry moves into the computer age. The future will see many new applications of old devices. New devices will be patented in the coming years. As crooks became more skilled, so must the alarm industry.

Assignment



- Read as much as possible in A History of Alarm Security. National Burglar and Fire Alarm Association, Inc. Washington, D.C. 1980.
- Complete self assessment and check answers.
- Complete post assessment and have instructor check your answers.

Self Assessment



1. Keyed locks were found in _____ and China some 5,000 years ago.

2. These ancient locks resemble _____ locks of modern times.

3. The _____ were the first people to use fire extinguishers.

4. Church bells were developed as an alarm during the _____ ages.

5. The _____ used geese as an intrusion alarm.

6. Who formed the first American fire brigade in Philadelphia?

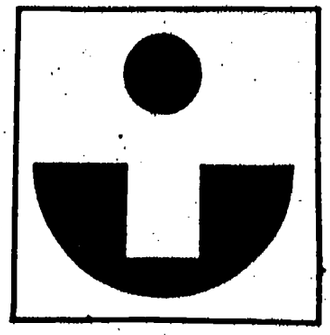
7. The first central station burglar alarm was started in _____ in 1872.

8. Electric eye detection was developed in the 19__'s.

9. Bell Laboratories patented the first transistor in _____.

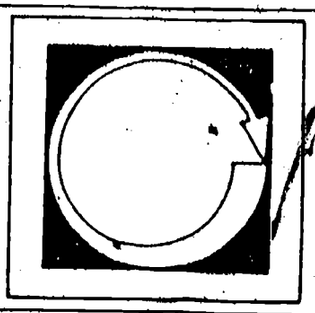
10. Grinnell Corporation's monopoly on central station management was broken by an anti-trust suit in _____.

Self Assessment Answers



1. Egypt
2. Pin-tumbler locks
3. Greeks
4. Dark
5. Romans
6. Ben Franklin
7. New York City
8. 1930's
9. 1948
10. 1964

Post Assessment



1. The one alarm developed in the Dark Ages was the _____ _____.

2. How did the Romans detect intrusion by the Gauls?

3. The Greeks used fire extinguishers as early as 440 B.C. What were the extinguishers made from?

4. The first fire protection company was formed in _____ in 1667.

5. Ben Franklin and his friends formed the first American fire brigade in _____ in 1736.

6. The first burglar alarm was patented in _____ in 1852.

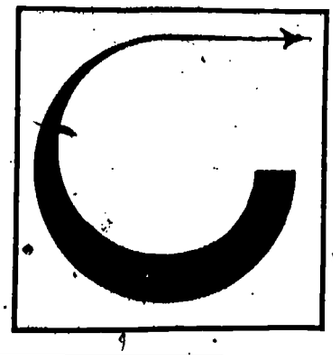
7. The first projected beam smoke detector was developed by _____ in 1938.

8. The National Burglar and Fire Alarm Association was formed in the 19__'s.

9. The McCulloh circuit was patented in the _____'s.

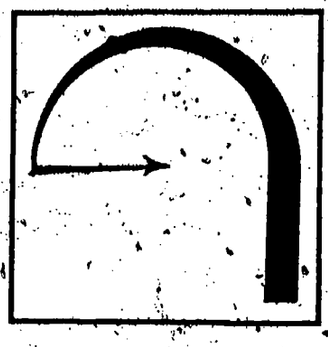
10. The anti-trust suit that broke Grinnell Corporation's monopoly on central station management was in _____.

Instructor Post Assessment Answers



1. Church bell
2. Used geese as an audible annunciator.
3. Leather sac filled with water attached to dried entrails of an ox.
4. London
5. Phjladelphia
6. Boston
7. ADT (American District Telegraph)
8. 1950's
9. 1880's
10. 1964

Supplementary References



Green, William. A History of Alarm Security. National Burglar and Fire Alarm Association. Washington, D.C. 1980.