

Reference Materials:

NFPA 1901, *Standard for Automotive Fire Apparatus*, 2003 Edition, Chapters 1-25 & appendix

NFPA 1936, *Standard for Powered Rescue Tool Systems*, 2005 Edition,

to order NFPA documents call 800-344-3555 or order online at www.nfpa.org

Getting Started in Electronics, Forrest Mims, \$17.95 plus shipping www.w5yi.org or 1-800-669-9594

Auto Electricity & Electronics, James Duffy, Goodheart-Wilcox 1-708-687-5000 or the book can be ordered from www.amazon.com

Guide to Hydraulic Power Generation, Russell Scott Dixon. Call the EVT office at 847-426-4075 to request a copy to be emailed to you for no charge for a limited time, compliments of Scott Dixon.

Class One ES-Key/USM Network Multiplexing Manual, page 1 thru 11, can be downloaded for no charge from http://www.class1.com/_Downloads/class1/manuals/ES-Key-USM.pdf

V-MUX 6-Step Troubleshooting Guide, can be downloaded for no charge from

<http://www.weldoninc.com/pages/downloads/Sixsteps.pdf>

LEARNING OBJECTIVES FOR THE FA-4 EXAM

The technician shall understand the concepts, terms, and phrases related to:

1. A/C Line Voltage

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|------------------------------|--|
| a. Components and terms | (10) Photo resistor |
| (1) Single phase | (11) Temperature senders |
| (2) Three phase | (12) Resistor |
| (3) Neutral wire | (13) Thermistor |
| (4) Ground wire | (14) Thyristors |
| (5) Bonding | (15) Transistors |
| (6) Inrush / startup current | (16) True Power |
| (7) Soft start | (17) Prime Movers |
| (8) Frequency | (18) Voltage Drop |
| (9) Sine wave | (19) Testing |
| | (20) Dielectric testing |
| b. Labeling | |
| (1) Requirements | |
| (2) Conspicuity | |
| c. Troubleshooting | (5) Wire routing |
| (1) Wiring connections | (6) Diagnostic tools |
| (2) Wiring methods | (7) NFPA standards |
| (3) Repair techniques | (8) effects of voltage drops on components |
| (4) Receptacle types | |
| d. Installations | (3) Switching |
| (1) Receptacles | (4) light masts |
| (2) Wet & Dry | |

2. System Knowledge

- | | |
|---------------------------------------|------------------------------|
| a. Circuit drawings | (5) Thermistors |
| (1) Resistor | (6) Wire Splice |
| (2) Diode | (7) Pulse Width Modulation |
| (3) Rectifier | (8) Capacitor |
| (4) Transistors | |
| b. Circuit protection | (4) Wet/dry listings |
| (1) Overcurrent protection | (5) Circuit breaker switches |
| (2) Circuit rating | |
| (3) Ground fault circuit interrupters | |
| c. Transfer switches | |
| d. Power transmission | |
| (1) Branch circuits | |
| (2) Distribution remote | |
| e. Amperage loads | |

- f. Component information
 - (1) capacitor
 - (2) relays

3. Sources

- a. Shoreline power
- b. Invertors & converters
- c. Generators
 - (1) Interlocks
 - (2) Generator installation
 - (3) Drives
 - (4) Generator Governors
- (5) Generator Diagnostics
- (6) Drive Diagnostics
- (7) Generator poles
- (8) Hydraulic generators
 - A. Capacitor effects

4. Accessories

- a. Cable reels
- b. Scene lighting
 - (1) Requirements
 - (2) Interlocks
 - (3) Light towers
 - (4) Remote towers
 - (5) Operational testing
- c. Rescue tools
- d. Ladder rack
 - (1) interlocks

5. Low Voltage Systems

- a. Load managers/sequencers
 - (1) Setup
 - A. Minimum continuous loads
 - B. Programming
 - C. Prioritizing
 - D. Amp loads
 - (2) Troubleshooting
 - A. Shedding loads
 - B. Interlocks
 - C. Alarms
- (3) Testing
 - A. Electromagnetic interference
- (4) Parallel & Series wiring
- (5) System Knowledge

6. Multiplex Systems

- a. Components
 - (1) modules
 - (2) VMUX
 - (3) Class 1- ES-KEY
 - (4) connectors
- b. Interface
- c. Programming
 - (1) Interlocks
- d. Terminology
 - (1) CAN
- e. Troubleshooting
 - (1) VMUX
 - (2) Welding
- f. System Knowledge
 - (1) Wiring
 - (2) amount of components
 - (3) effect of AC voltage

7. Operations

- a. Load minder
- b. Auto level
- c. Rotation limiting
- d. Pressure governor
 - (1) transducer signal
- e. Transducers
- f. Proximity switches
- g. Engine Controls