

AVD(Audio-Video Distribution) Competencies—2007

This technician certification program

is named: AVD, or AUDIO-VIDEO DISTRIBUTION.

This exam shall be for a stand-alone certification. The title of the technician who successfully passes the exam and shows the minimum required experience will be: **Certified Audio-Video Distribution Technician**.

Passing this exam also can qualify as the specialty option exam which, along with the ETA C.E.T. **Associate** Level core exam, results in a **Certified Electronics Technician with AVD Specialty**.

Requirements:

I AVD Terminology

- a. identify terminology commonly used in AVD applications
- b. identify terms used in related fields, such as electrical, computer, radio, TV, security systems, etc.
- c. explain the meaning and use of acronyms such as SWR, dBmV, MDU and P-P

II AVD Component and System familiarity

- a. explain the function of the devices commonly included in AVD systems
- b. demonstrate how to interconnect all of the common devices that may be included in an AVD system
- c. draw a block diagram of a basic telephone system, explaining the operations and connections of each section
- d. explain the difference between common analog twisted pair telephone wiring and CAT-5 and similar cabling and connections
- e. describe the use of coaxial cable types RG58, 59 and 6. Draw a diagram of a simple multi-outlet coaxial cable signal distribution system and calculate system signal losses
- f. demonstrate knowledge of in-home wiring principles, including the electrical wiring
- g. compare daisy-chain and home-run MDU MATV distribution systems and explain the benefits and disadvantages of each
- h. explain the use of modulators when combining multiple A/V sources
- i. compare RF signals with audio or video signals. List common frequency bands. Discuss the use of specialty antennas for dealing with special problems (ghosting, interference, distance or weak signal problems)
- j. explain pre-wiring precautions so as to minimize future problems resulting from alterations by other contractors and the homeowner
- k. list problems affected by acoustics, speaker types and their placement
- l. explain basic concepts of DTV/HDTV reception (Digital TV and High Definition TV)
- m. describe the differences between C and KU bands, SCPC channels and internet data acquisition and transmission (Direct PC-Hughes) and have a basic familiarity with GI VCII decoder and decipher operation
- n. describe how and where to use signal combiners
- o. explain special considerations and precautions when wiring plenum areas
- p. explain the differences between the popular types of dish antennas (Echo, DirectTV, C/Ku-band)
- q. list the TV channels your local DTV broadcasters use for NTSC signals and for DTV broadcasting
- r. interpret and explain manufacturer equipment specifications
- s. describe proper installation of audio system wiring, in-wall and box speakers, selectors and amplifiers
- t. draw a wiring diagram for a closed-circuit monitor cabling system

III AVD Operation and Servicing capabilities

- a. demonstrate the operation of common products and devices included in AVD systems
- b. explain the procedures in servicing devices commonly included in an AVD systems
- c. describe the step by step method of counseling an owner on AVD system design
- d. discuss protection devices used to shield against power surges and interruption problems in electrical and telephone circuits
- e. describe reasons and procedures for customizing AVD devices having optional setup characteristics
- f. describe the basic concepts, operation, installation procedures and troubleshooting methods for small dish satellite systems, including 2-way Internet communications satellite systems
- g. explain C/KU band satellite system operation, installation and programming procedures and describe unit-level troubleshooting methods
- h. list basic fiber-optic concepts. Demonstrate a basic knowledge of the installation procedures for fiber optics cabling. Show ability to use light sources and light meters
- i. describe A/V grounding safety and static precautions
- j. discuss the proper installation of display screens, covers and automatic controls and sensors
- k. explain polarity, skew, noise specifications and switching voltages as they relate to LNBS and dual LNBSs
- l. sketch a TV screen pattern showing co-channel and adjacent channel interference symptoms and list the possible causes for these hindrances to clear reception. Describe cable leakage problems, common types of RF interference and ghosts. Explain how and where to use band pass and notch filters to reduce the detrimental effects of adjacent, co-channel and other common interference
- m. explain when, why and how to use in-line amplifiers
- n. measure the signal levels in a distribution system. Explain how the length of the legs of a system affects the different bands
- o. identify and list the differences between RG6, 11 and 59 and indicate where each would most likely be used
- p. demonstrate familiarity with audio and video remote-control operations

IV Basic Electronics, Radio, Television, Entertainment device knowledge

- a. demonstrate proficiency in basic servicing skills necessary when installing and servicing electronic devices that might be included in an AVD system
- b. demonstrate the proper use of signal level meters, VOMs and tuning meters
- c. demonstrate wiring and placement considerations needed when installing "Surround-Sound" systems
- d. describe various types of wireless and infrared senders and remote extenders
- e. list the TV channels classified as UHF, VHFhi, VHFlo, Mid-, hyper- and super-band
- f. list the frequencies used by commercial FM and AM radio operations
- g. explain vertical, horizontal and circular signal polarization, polar patterns and dBs as they relate to satellite dish systems
- h. explain the basics of antenna reflectors, directors, active and passive elements and estimate the effect each has on TV signal reception
- i. list typical TV-Audio-RF input voltage levels for common types of amps and pre-amps
- j. list the National Electric Code requirements for grounding telephones, satellites and antennas
- k. describe the general principles of signal and data compression techniques; their advantages, limits and disadvantages
- l. discuss "Playstation" and other popular video game operation and connection
- m. describe the importance of impedance matching in audio-distribution and how to use impedance matching volume controls
- n. explain the principles of "Surround Sound" decoding and separation
- o. list the signal levels normally found at connections to phonograph cartridges, microphones, audio recording heads (low and hi level, magnetic and audio cassette), DC and others
- p. describe audio and video overdrive symptoms

V Servicing skills

- a. demonstrate the proper use of tools and test equipment necessary for servicing AVD devices and systems
- b. identify test points and components used on schematics, block diagrams, flow charts, wiring diagrams, servicing manuals and user manuals
- c. demonstrate the proficient use of test equipment, soldering ability and proper methods of removal and installation of parts in AVD devices
- d. properly and proficiently wire a system and explain how to troubleshoot it to correct problems
- e. determine a practical antenna to be used in an example AVD systems and properly install it to receive-UHF, FM and VHF channels and interconnect with a small dish or C/KU band dish system
- f. describe the common devices used in radio signal communications in AVD systems
- g. install a fiber optic cabling system in an AVD system
- h. describe the importance of following factory and training facility procedures when installing and servicing AVD devices and systems
- i. identify signal and voltage levels expected at equipment ports when interfacing a satellite system with other A/V equipment
- j. explain potential problems, as well as precautions to take when working in and around home security systems. Include potential involvement and liabilities
- k. show how to use special tools and techniques which aid in installation of distribution systems (wall fish, masonry drills, crawl space and attic routing)
- l. list 5 potential problems relating to incompatibility in A/V equipment integration
- m. discuss techniques special with AVD equipment to be used by hearing impaired clients
- n. draw a graph demonstrating tilt as it applies to wire loss and line amplifiers

VI Human relation skills

- a. explain the purpose of the ETA-I CSS (Customer Service Specialist) program. Describe personal relationships with superiors, co-workers, customers, the public, employees, vendors and competitors and the potential problems that may occur when poor human relations behaviors occur. List the benefits of better customer relations skills
- c. discuss customer service skills and give examples of the results of poor skills versus good skills

VII Business practice skills

- a. explain the relationships between good technical and people skills and practices necessary for operating a successful, profitable business
- b. compare efficient, complete and comprehensive installation and servicing techniques with those of poorly trained technicians and installers
- c. explain the benefits to the worker and to the company of staying abreast of developments as they occur in AVD devices and systems

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Suggested Study Guides:

The Antenna Book, #1; ETA members; ISBN 1-891749-15-3; \$24.95 + s&h; 104 pp
The Antenna Book, #2; ETA members; 96 pp; \$24.95 + s&h; call 800 288 3824
CD-R/DVD: Digital Recording to Optical Media; Lee Purcell; 500 pp; \$49.95; 1-800-2-McGraw
Achieve the Ultimate in Custom Sound, 4th Ed; Ken Pohlmann; 736 pp; \$54.95; #134819-0; 1-800-2-MCGRAW
Premises Cabling by Donald J. Sterling, Jr. and Les Baxter; call 800-288-3824
Data, Voice, and Video Cabling by Jim Hayes and Paul Rosenberg; call 800-288-3824

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