

ROOFTOP ANTENNA SYSTEMS 2004-5

COMPETENCIES listing

Proposed Skills Standards and Competencies for workers studying to become satellite systems installers and technicians, as well as for use as a curriculum outline for educational institutions providing training for satellite industry personnel.

1.0 Antenna Theory

- 1.1 Demonstrate an understanding of electrostatic and electromagnetic wave propagation
- 1.2 Identify common frequencies utilized by various broadcast services – frequency bands and relationships between bands of frequencies
- 1.3 Describe polar patterns of common TV and radio antennas; directivity and ghosts reflections
- 1.4 Explain different types of antennas and special usages for each
- 1.5 Describe the dipole antenna – horizontal, circular & vertical polarity – ground plane – physical length and thickness considerations of antenna elements
- 1.6 Define parasitic elements – directors – reflectors – resonators
- 1.7 Explain antenna gain – front-to-back ratios and their usages
- 1.8 Perform calculations using dB's; 0 dBmV reference; dBmV relationship and use wavelength formula to calculate antenna length or resonant frequency
- 1.9 Describe antenna and OSHA safety rules for working at heights
- 1.10 Describe how towers and rotors are utilized
- 1.11 Properly demonstrate safe use of linemans belts and ladders

2.0 Components

- 2.1 Name the uses of splitters – taps – filters – and terminators
- 2.2 List where hi/lo and U/V bandsplitters, diplexers, tilt compensators and attenuators are used
- 2.3 Describe Video Switch Boxes and list their usages
- 2.4 Name 5 types of electronic equipment where RF modulators are used and explain the RF modulator function
- 2.5 Explain the function of band pass filters, signal combiners, diplexers, multi-switches and amplified signal combiners

3.0 Installation Procedures

- 3.1 Demonstrate use of common and special antenna, cable and Telco hand tools
- 3.2 Explain trenching of satellite and antenna cables and precautions
- 3.3 Describe how to locate and mark buried cables
- 3.4 Describe wall and chimney mounts
- 3.5 Describe types of roof mounts for antennas and satellites, including non-penetrating mounting procedures
- 3.6 Describe N.E.C. antenna grounding rules and building wiring standards

4.0 Antenna Positioners

- 4.1 Explain the operation of an antenna rotator system
- 4.2 Explain the voltage readings or resistance readings to be expected on rotor cables
- 4.3 Describe methods used to re-synchronize an antenna rotor
- 4.4 List anticipated difficulties when replacing either unit of a rotor

5.0 Towers

- 5.1 Describe the parts of an antenna tower
- 5.2 Explain how concrete bases should be installed to prevent metal rot
- 5.3 Explain mounting procedures for installing rotor, preamplifier and antennas on towers
- 5.4 Explain proper grounding of antenna towers
- 5.5 Describe procedures for co-locating scanner, FM, ham, satellite or other equipment on antenna towers
- 5.6 Explain what a gin pole is and how it is used
- 5.7 Demonstrate the proper use of a lineman's belt and body harness

6.0 Interference

- 6.1 Explain the difference between co-channel and adjacent channel interference
- 6.2 Describe the symptoms indicating overdrive signal levels
- 6.3 Define signal egress and ingress
- 6.4 Describe anticipated problem when combining signals
- 6.5 Explain the uses for signal traps and filters
- 6.6 Describe power line hash and its causes

7.0 Troubleshooting & Repairs

- 7.1 List typical antenna reception problems caused by open and shorted connections
- 7.2 Explain standing waves and identify their presence in a video picture
- 7.3 Describe interference types and methods of prevention or reduction
- 7.4 Identify and solve rooftop antenna problems caused by RF or power interference
- 7.5 List problems which are frequently caused when interconnecting various customer-owned equipment
- 7.6 Demonstrate proper use of antenna signal measurement service equipment including volt-ohm-meter; signal strength meter; signal generating equipment and signal substitution equipment

End Rooftop Antenna Systems competencies 2004-5