

## **COMMERCIAL 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 VSAT Theory (C, Ka, Ku)**

- 1.1 Define VSAT and name various services
- 1.2 List frequencies used by Ku and Ka bands
- 1.3 Explain the use of single-purpose receivers
- 1.4 Describe cross polarization (cross-pole) and polarization (co-pole) requirements
- 1.5 Describe Internet two-way satellite systems
- 1.6 Identify the transmit power utilized by 2-way Internet dish services
- 1.7 Define MAC - Media Access Control
- 1.8 Define IDU and ODU; AZ/EL and SKEW
- 1.9 Define PING and explain the term CW
- 1.10 Explain the reasons for telecommunications connections to transceivers and the differences between USB and RJ45 or other telecom cable connectors

#### **2.0 Components**

- 2.1 Describe various V-SAT mounts
- 2.2 Compare V-Sat LNB's, LNBF's and feeds with consumer versions

#### **3.0 Offset Reflectors**

- 3.1 Compare size requirements for various satellite systems
- 3.2 Describe declination and elevation adjustments required for satellite reflectors and explain methods for aiming V-SAT reflectors
- 3.3 Demonstrate ability to install, aim and connect V-SAT commercial dish systems. This includes proper roof protection, penetration and waterproofing.

#### **4.0 Feedhorns, LNB's, LNBF's, RFU's and OSU's**

- 4.1 Compare differences in TVRO and 2-way receive/transmit systems
- 4.2 State the supply voltages required to operate LNB's and LNBF's
- 4.3 Compare different reflector types used in V-SAT
- 4.4 Describe how both C and Ku LNB's are mounted and connected to a head-end
- 4.5 Describe multiple LNB arrays for multi-bird reception
- 4.6 Explain focal distance, F/D ratio and centering requirements for prime focus reflectors.

#### **5.0 Special Installation Procedures**

- 5.1 Describe types of roof mounts for antennas and satellites, including non-penetrating mounting procedures
- 5.2 List important concepts when making a satellite site survey
- 5.3 Explain anti-twist pole modification - concrete calculation and work procedures -
- 5.4 Describe wall mounts and tri-pod mounts
- 5.5 Describe how to locate and mark dog fences, power and Telco cabling, gas lines, water supply lines, etc.

#### **6.0 Receivers, Decoders, Authorizations**

- 6.1 Explain the differences between C/Ku - DirecTV, DISH Network and commercial systems
- 6.2 Describe how GI decoders are installed and how to utilize VC II menus

- 6.3 Demonstrate how to obtain consumer or commercial programming
- 6.4 Draw a block diagram of a cable or SMATV head-end
- 6.5 Explain programming 'transport' systems
- 6.6 Describe secondary audio programs - subcarriers - SCPC and pay-per-view services
- 6.7 Describe captioning, on-screen graphics, telephone connections and computer interfacing with the satellite receiver
- 6.8 Describe the signal symptoms in a head-end that is too hot or too cold temperature-wise
- 6.9 Describe the problems rodents may cause inside the head-end facility
- 6.10 Explain advertising and EWS insertion principles
- 6.11 Describe billing and customer contact service and methods and Pay-per-view

## **7.0 Transmitters**

- 7.0 List common uplink frequencies used for Internet services
- 7.1 Describe the power requirements and precautions for transmitters
- 7.2 Describe switching methods

## **8.0 Troubleshooting Reception/Transmission Systems**

- 8.1 Explain causes for the need to reprogram or reauthorize programming
- 8.2 Describe unit substitution methods of location defective units
- 8.3 Explain decoder operation, checks and connections
- 8.4 List problems associated with cabling and connections in a head-end or to outdoor equipment
- 8.5 Describe multi-receiver LNB powering, DC Blocks and potential problems
- 8.6 Describe power measurements required to locate defective equipment

**End Commercial Systems competencies 2004-5**