

## **C/Ku LARGE DISH 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 Dish Reflector Theory**

- 1.1 Explain gain of a dish reflector
- 1.2 Explain how the LNBF operates and why it is needed. Define skew alignment
- 1.3 Calculate Focal Point and F/D ratio of a prime focus satellite dish reflector
- 1.4 Properly center the feed-horn of a C/Ku satellite dish and check warpage
- 1.5 Demonstrate ability to track the Clarke belt and aim a C/Ku band dish properly
- 1.6 Describe declination and elevation adjustments required for satellite reflectors

#### **2.0 Line Amplifiers**

- 2.1 Describe the function of line boosters, in-line and distribution amplifiers and where they are used
- 2.2 Explain the use of pre amplifiers – powering – gain – traps – tilt and installation requirements and precautions
- 2.3 Explain the symptoms and causes of signal overdrive

#### **3.0 Components**

- 3.1 Explain wave-guide theory, scaler rings and polarity aspects of feed-horn types
- 3.2 Describe servo motor operation, supply and control circuitry
- 3.3 Compare various types of LNBFs, down converters, LNAs and LNAs
- 3.4 Explain how terrestrial interference filters work
- 3.5 Describe the functions of diplexers, multi-switches and signal combiners

#### **4.0 Feedhorns, LNA's, LNB's, LNBF's, Down Converters**

- 4.1 Explain the differences between LNB's, Down Converters, LNA's and LNBF's
- 4.2 State the supply voltages required to operate LNB's and LNBF's
- 4.3 Explain switching voltages contained on the LNBF signal coax
- 4.4 List the approximate gain expected of various LNB or LNBF types and the DC or AC current requirements.
- 4.5 Explain dual vs single LNBF's
- 4.6 Explain the difference between analog and digital signal transmission
- 4.7 Describe coaxial cable requirements for proper LNB operation
- 4.8 Explain the splitting of LNB signals and how to connect LNB line amplifiers

#### **5.0 Cabling Installation Procedures**

- 5.1 Calculate and measure the signal loss in lengths of RG 6 vs 59 coax cable and compare the two
- 5.2 Demonstrate precautions important in long cable runs
- 5.3 Demonstrate proper polarotor (servo motor), drive motor wiring and weather-proofing
- 5.4 Explain home/building entry - crawl space and attic precautions - wall fishing - carpet cut precautions and wall plate usage
- 5.5 Demonstrate the ability to properly install and use diplexers and to configure multiple receiver installations
- 5.6 Explain cable signal leakage requirements by law and how the CSI could contribute to leakage violations if he were ignorant of the rules

5.7 Explain signal leakage and its possible effects to the system that has the leaks and the effects on adjacent equipment.

5.8 Describe flat cable for tight entry, under rugs and thru glass technology

## **6.0 IRD's, Integrated Receiver – Descramblers/Positioners**

6.1 Explain the differences between C/Ku - DirecTV, DISH Network and commercial systems

6.2 Describe how GI stand-alone decoders are installed and how to operate VC II menus

6.3 Demonstrate how to obtain consumer or commercial programming

6.4 Describe the fuses commonly used in IRD's (Integrated Receiver/Decoders)

6.5 Explain special codes, parental supervision functions and remote hand unit use

6.6 Describe basic receiver circuitry (IF input - decoding - audio & video processing - baseband signals - remote control circuitry basics and stereo processing)

6.7 Explain, properly connect and adjust servo and motor-drive circuits and connections

6.8 Describe secondary audio programs - subcarriers - SCPC and pay-per-view services

6.9 Describe captioning, on-screen graphics, telephone connections and computer interfacing with the satellite receiver

6.10 Explain how channel and audio tuning voltages function

6.11 Describe the effects dried out electrolytic capacitors in the video circuits may have

## **7.0 Troubleshooting – Installation/Tools, Test Equipment, T.I.**

7.1 List typical distribution system problems such as open and shorted connections

7.2 Explain standing waves and identify their presence in a video picture

7.3 Describe interference types and possible methods of prevention or reduction

7.4 List possible UHF remote control problems

7.5 List problems that are frequently caused when interconnecting various customer-owned products

7.6 Demonstrate proper use of satellite service equipment including dish alignment tools, electronic service and substitution test equipment such as DMM, Signal Level meter, in-line satellite RF meters and spectrum analyzer

7.7 List common problems associated with drive-positioning arms

## **8.0 Positioners and Aiming**

8.1 Describe power requirements for positioners

8.2 Explain how various types of sensors operate

8.3 Explain resolution and positioner accuracy

8.4 Properly connect drive system to IRD or positioner control

8.5 Explain common fusing of positioners

8.6 Describe proper limit switch setting procedures

**End C/Ku [Large Satellite Dish Systems] competencies 2004-5**