

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