



**Australian Government**

# **Assessment Requirements for ICTRFN803 Analyse a satellite communications system**

**Release: 1**

# Assessment Requirements for ICTRFN803 Analyse a satellite communications system

## Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 2.0.

## Performance Evidence

Evidence of the ability to:

- analyse satellite communications system architecture
- produce a satellite link budget and calculate link margin for a range of digital modulation types
- calculate the look angles for a geostationary satellite from any receiving location
- analyse and specify the major features of very small aperture terminal (VSAT) systems.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

## Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- identify and perform antenna calculations including:
  - gain
  - beamwidth
  - polarisation
  - effective isotropic radiated power (EIRP)
- define bit error rate (BER) and how it affects satellite communications
- outline carrier and noise ratio
- explain constellation and eye diagrams
- outline distance to satellite and typical delays
- summarise frequency spectrum (satellite bands)
- explain gain-to-noise-temperature G/T ratio
- outline geostationary orbit
- explain link budget calculation

- explain look angle calculations
- describe low earth orbiting (LEO) satellites
- evaluate the following modulation types suitable for satellite communications:
  - n-FSK:
    - 2FSK
    - 4FSK
  - n-PSK:
    - 2PSK
    - 4PSK
    - 8PSK
    - 16PSK
  - n-QAM:
    - 16 QAM
    - 256QAM
- define spread spectrum techniques including:
  - direct sequence
  - frequency hopping.

## Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the telecommunications – radio frequency networks field of work and include access to:

- a site on which satellite analysis may be conducted
- data, calculators and appropriate software tools.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

## Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=a53af4e4-b400-484e-b778-71c9e9d6aff2>