

AUSTAR technical recommendations for VAST satellite installations

2011

Document Control Sheet

Contact for inquiries and Proposed Changes

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Introduction

The objective of this document is to provide technical and operational guidelines for the installation of VAST when using an AUSTAR-installed satellite dish and cabling.

The intention is to ensure everyone has a clear understanding of what is required in order for the same receive equipment to be usable for both AUSTAR and VAST services and what standards must be met. In all cases reference should be made to the Australian Standard AS/NZS 1367; 2007 4th edition which includes changes in transmission formats. All materials used should be on the AUSTAR Approved Parts List.

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1. INTRODUCTION

The reliability and quality of your TV reception will largely depend on the quality of your satellite television installation

The technical recommendations set out below reflect AUSTAR's own specifications and are in line with the AUSTAR technical manual CSP-001. They are designed to ensure that:

- the installation meets the Australian standards AS/NZS 1367 and will allow households to receive both the AUSTAR and VAST services through use of the same satellite dish and associated cabling if they want to
- signal issues are minimised
- complete signal integrity is maintained
- quality assurance of the complete installation is maintained

We recommend you only use parts and materials that appear on AUSTAR's Approved Parts List, which can be found at www.austar.com.au/tv/support/installation.aspx

2. EQUIPMENT

Dish type & size

Minimum dish size is 65cm however some areas require a minimum of 90 cm to ensure maximum signal is received

LNB Type & L.O Frequency

A **dual output** Wide band 10.7 GHZ low noise block converter (LNB) is required to support both AUSTAR and VAST decoders

If you have more than 2 decoders, refer to the Installation Matrix in Attachment 1 for guidelines on equipment required

Multi-switch

A multi switch is required when connecting multiple decoders

- Multi-switches must be housed **out** of the weather
- Splitters are **not** to be used as they will **not** provide the switching functionality required

If you have more than 2 decoders, refer to the Installation Matrix in Attachment 1 for guidelines on equipment required

Connectors and cable

- RG6 Quad shield black coaxial cable
- RG6 F type and or IEC **Compression** type connectors are required (**not** crimp type)

Wall Plate ('F Type')

- An 'F' type 3 Ghz Wall Plate is to be used for the installation along with approved compression type 'F' connectors.
- Dual/Triple F type plates are available through various suppliers and should be used when appropriate.
- Wall plates must have F81 connecting barrels that are rated to 3Ghz fitted (blue rings in face of barrel).

3. SATELLITE INFORMATION

Reception of signals from Optus satellites C1 & D3

AUSTAR signals are transmitted in the Ku band 12.25 TO 12.75 GHz from Optus satellites C1 and D3 using a mixture of vertical and horizontal polarity. VAST signals are transmitted in the same band from Optus satellite C1 using the vertical polarity only

Reception of such high frequency signals is reliant on radio line of sight (LOS) so any obstruction will attenuate the signal and may result in poor or lost picture quality

Location of Optus satellite C1

- Location: 156 degrees E
- D/L: 12250 to 12750 MHz
- Polarity: linear

Location of Optus satellite D3

- Location: 156 degrees E
- D/L: 11700 to 12200 MHz
- Polarity: linear

LNB Specification

- RF Input Frequency 10.7 – 12.75 GHz
- RF Output Frequency 1000 – 2050 MHz
- Local Oscillator (L.O.) 10.7 GHz

4. SIGNAL MEASUREMENTS

Signal measurements

- Signal measurements should to be taken on 3 different Transponders - T20, T17, T10 (Fox17, Aus10 typically measured on an HST-2 Meter)
- This is so an abnormal variance in signal can be identified and aligned correctly and to ensure the cross polarity alignment is maximised

Signal Level

- The signal from the Satellite should be maximized using either 1989 MHz for 10.7 LNB's using the appropriate digital Field Strength Meter on 18V DC
- This alignment should be done on Horizontal Transponder 20 (T20)

X Polarisation (Modulation Error Ratio – MER reading)

- The LNB needs to be rotated until null point is attained to achieve the maximum cross-polarisation between the adjacent Vertical Transponder (T10)

- The LNB alignment should be done on Horizontal Transponder 17 (T17) and this figure should be a **minimum** of 13db MER at the LNB Output and 12db MER at any outlet, across any/all Horizontal Transponders.
- If the Signal Level is maximized, and the LNB Nulled correctly, the MER will be at its maximum level on all transponders. If this is not performed correctly the result will be signal issues and picture loss

Carrier to Noise Ratio (C/NR)

- In conjunction with the MER, Signal Level and the Cross Polarisation, the Dish Signal/ LNB Cross Polarization is to be maximized to provide the AUSTAR acceptable Carrier to Noise
- This figure should be a **minimum** of 14db CNR at the LNB Output and 13db CNR at any outlet, across any/all Horizontal Transponders. This figure will maximize when the LNB alignment (outlined above) is completed correctly.

5. TROUBLE SHOOTING SIGNAL LOSS

Transmitting in Ku Band

- The frequencies used to transmit the AUSTAR and VAST signals are so high that the only equipment that can receive it is the LNB, which sits in front of the dish
- Reception of such high frequency signals is reliant on radio line of sight transmission (LOS) so any obstruction will attenuate the signal and may result in poor or lost picture quality

Atmospheric attenuation

Although frequencies are high, they are still affected by the atmosphere and weather activity. Signal loss on the way to earth may result from:

- Free space attenuation
- Atmospheric attenuation
- Rain attenuation
- (all of which result in virtual friction to the signal, weakening it on its journey to the earth)
- Sun outages

Other causes of Signal Loss or Attenuation

- Trees
- Spider web in the LNB feed horn
- New permanent or temporary building or construction
- Poor dish and LNB Alignment

ATTACHMENT 1 - INSTALLATION MATRIX

Three types of LNB are available for use. Single wide band, Dual wide band and Quad Wide band 10.7 to 11.3 Ghz. It is imperative the below matrix is used when deciding what equipment is to be used.

Service Location Combinations		1 Cable	2 Cable	3 Cable	4 Cable	5 Cable	6 Cable	7 Cable	8 Cable
New Install	LNB	Single	Dual	Quad	Quad	Dual	Dual	Dual	Dual
	Multiswitch	NR	NR	NR	NR	8 Way	8 Way	8 Way	8 Way
Upgrade from 1 cable	LNB	X	Dual	Quad	Quad	Dual	Dual	Dual	Dual
	Multiswitch	X	NR	NR	NR	8 Way	8 Way	8 Way	8 Way
Upgrade from 2 cables (DLNB existing)	LNB	X	X	X	X	X	X	X	X
	Multiswitch	X	X	4 Way	4 Way	8 Way	8 Way	8 Way	8 Way
Upgrade from 3 cables (DLNB existing)	LNB	X	X	X	X	X	X	X	X
	Multiswitch	X	X	X	X	8 Way	8 Way	8 Way	8 Way
Upgrade from 3 cables (Quad existing)	LNB	X	X	X	X	X	X	X	X
	Multiswitch	X	X	X	X	4 Way	4 Way	8 Way	8 Way