TECHNICAL RECOMMENDATIONS

Polarisation Planes and Frequency Allocations

This technical recommendation defines the polarisation property of the electromagnetic waves propagating from the ASTRA Satellite System to the earth and the frequency allocations of the different channels.

Polarisation Planes

For transmissions from the ASTRA Satellite System orthogonal-linear polarisation is applied.

To reduce the polarisation offset angle to a minimum at reception sites in the centre of the ASTRA footprints, a 7.5° pre-set angle is maintained for all ASTRA satellites. This means that a vertically polarised transmission from the spacecraft has an Electrical (E) vector defined as lying in the plane formed by rotating 7.5° counter-clockwise (looking towards the earth) from the plane of the satellite North-South axis and the centre of the earth. A horizontally polarised transmission has an E vector in the plane orthogonal to the vertical plane (see Figure 1).

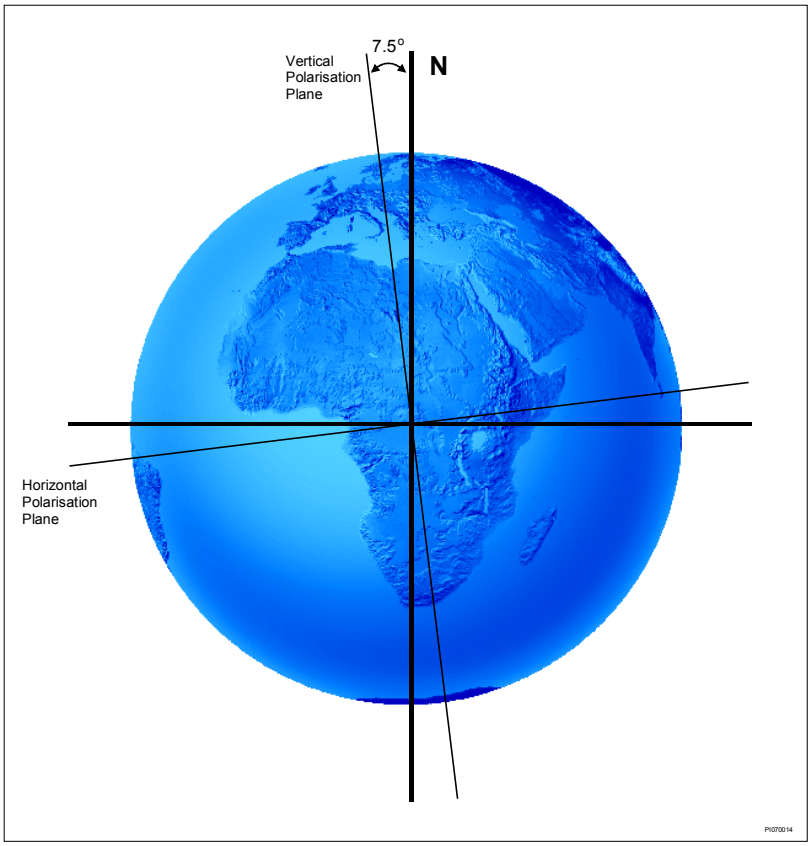

Figure 1: Vertical and Horizontal Polarisation Planes

Frequency Allocations

Odd numbered channels have nominally Horizontal polarisation while even numbered channels have nominally Vertical polarisation.

ASTRA 1 Satellites (19.2° East)

In the frequency ranges 10.70 to 11.70 GHz and 12.50 to 12.75 GHz the channel spacing is 29.5 MHz between co-polarised channels (14.75 MHz between cross-polarised channels). The nominal -1 dB bandwidth of each channel is 26 MHz.

In the frequency range 11.70 to 12.50 GHz the channel spacing is 39.0 MHz between co-polarised channels (19.50 MHz between cross-polarised channels). The nominal -1 dB bandwidth of each channel is 33 MHz.

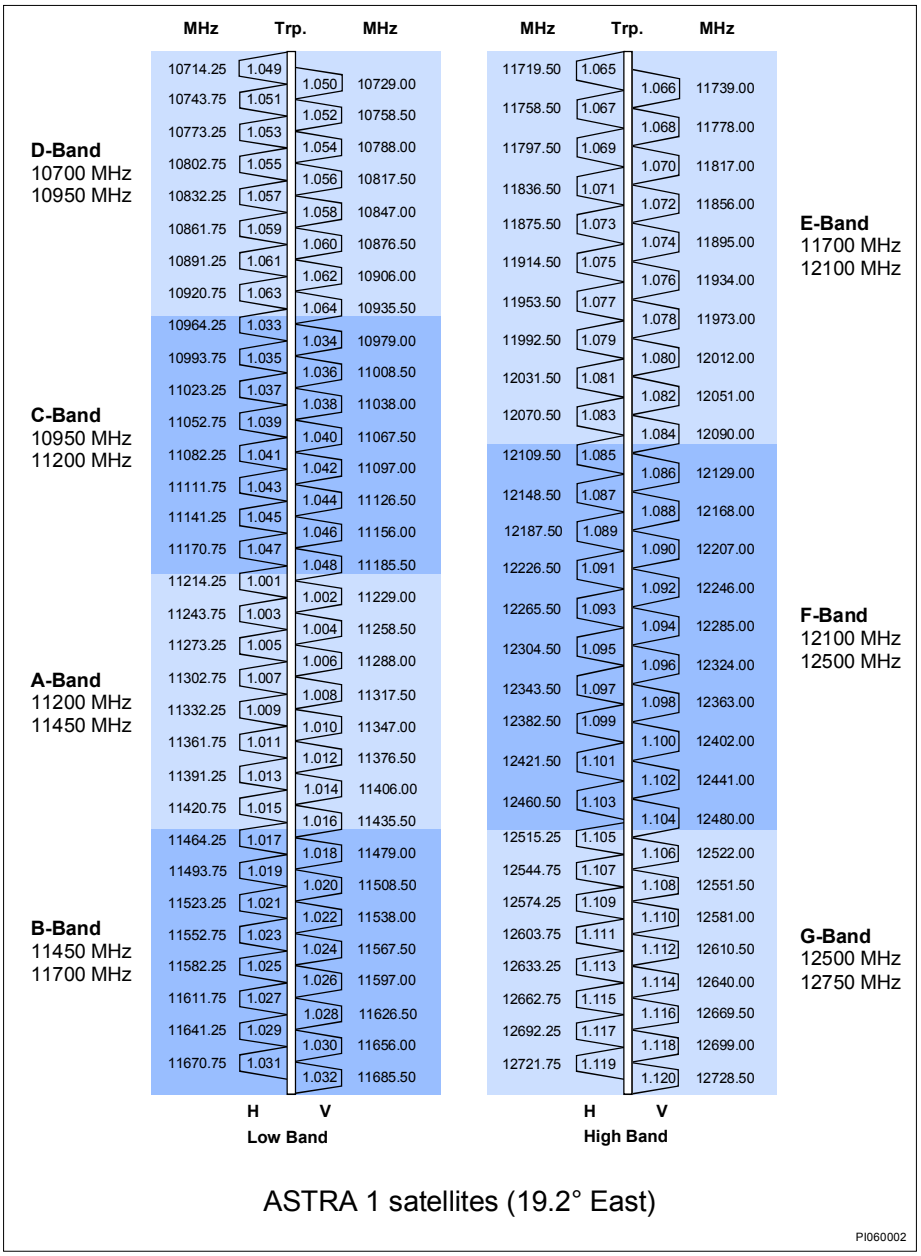

Figure 2: Channel Number Allocation and Downlink Centre Frequencies

ASTRA 2 Satellites (28.2° East)

In the frequency ranges 10.70 to 11.70 GHz and 12.50 to 12.75 GHz the channel spacing is 29.5 MHz between co-polarised channels (14.75 MHz between cross-polarised channels). The nominal -1 dB bandwidth of each channel is 26 MHz.

In the frequency range 11.70 to 12.50 GHz the channel spacing is 39.0 MHz between co-polarised channels (19.50 MHz between cross-polarised channels). The nominal -1 dB bandwidth of each channel is 33 MHz.

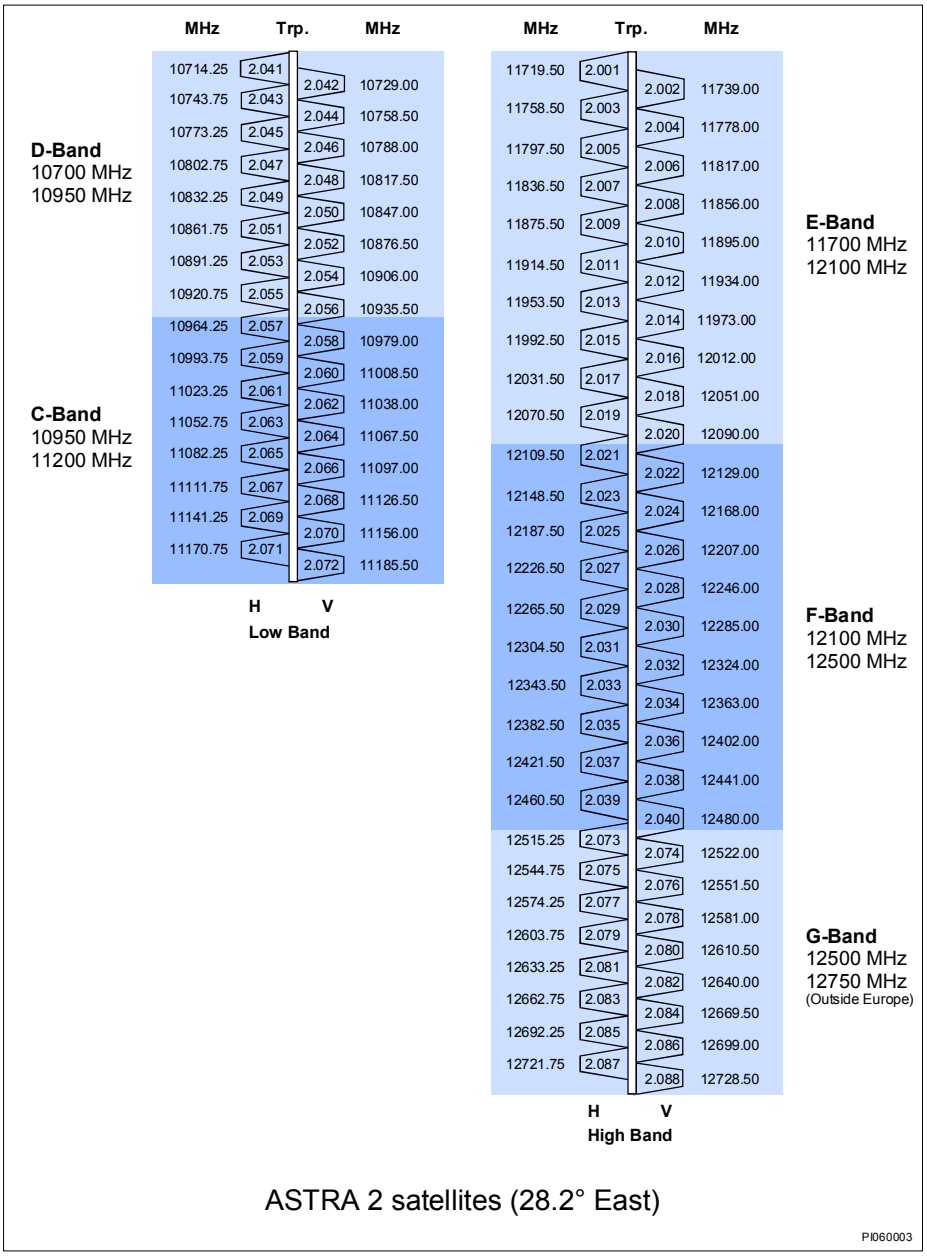

Figure 3: Channel Number Allocation and Downlink Centre Frequencies

ASTRA 3 Satellites (23.5° East)

ASTRA 3A, positionned at 23.5° East, operates in the frequency range 11.45 to 11.70 GHz and 12.50 to 12.75 GHz. The channel spacing for ASTRA 3A is 40.0 MHz between co-polarised channels (There is no spacing between cross-polarised channels). The nominal -1 dB bandwidth of each channel is 36 MHz.

ASTRA 1D, positionned at 23.5° East, operates in the following frequency ranges:

- From 10.70 to 11.70 GHz and 12.50 to 12.75 GHz the channel spacing is 29.5 MHz between co-polarised channels (14.75 MHz between cross-polarised channels). The nominal -1 dB bandwidth of each channel is 26 MHz.
- From 11.70 to 12.50 GHz the channel spacing is 39.0 MHz between co-polarised channels (19.50 MHz between cross-polarised channels). The nominal -1 dB bandwidth of each channel is 33 MHz.

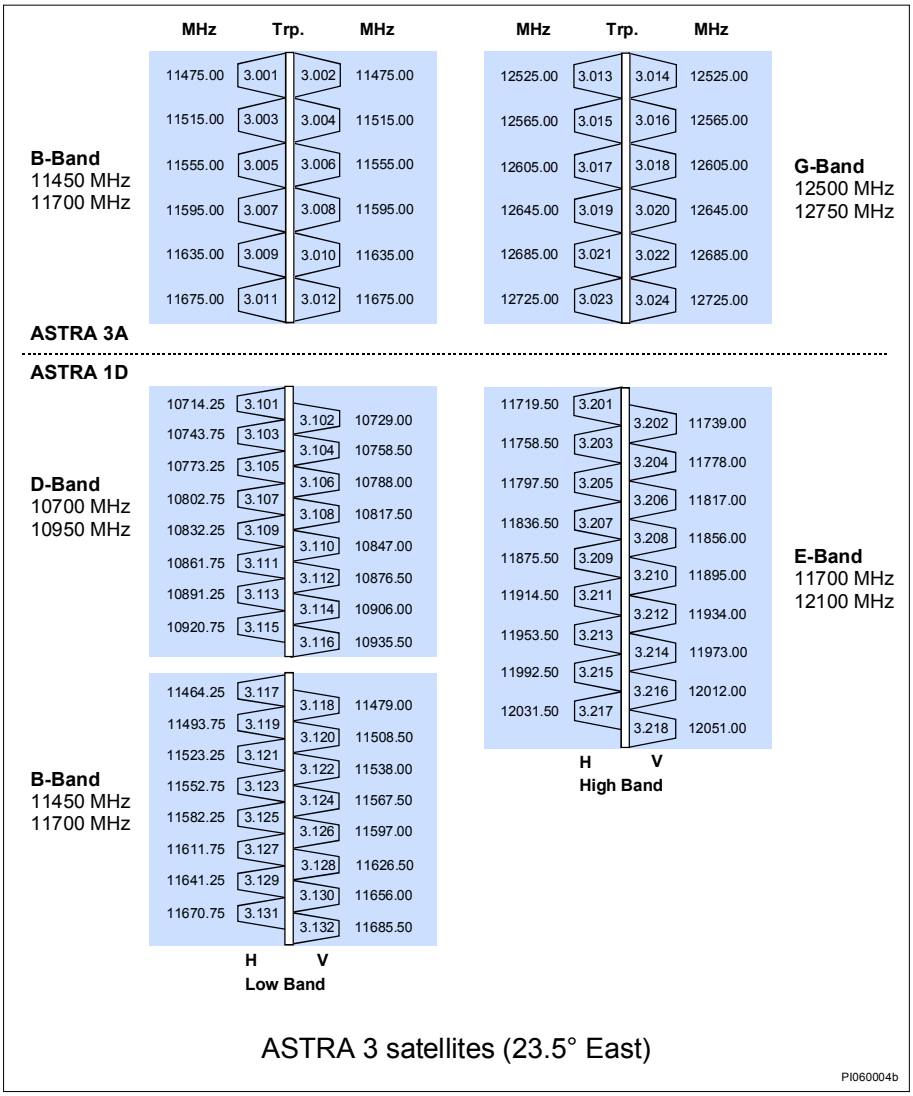

Figure 4: Channel Number Allocation and Downlink Centre Frequencies