

Appendix A
of the
RADIO LICENCE ENGINEERING RULES
FOR
APPROVED RADIO ENGINEERS

and

APPROVED CERTIFIERS
(PIB 38)

Fixed Services Radio Frequencies
(Derived from PIB 22)

Dated: 21 October 2004

Disclaimer

This document reflects the current policies and practices of the Radio Spectrum Management (RSM) group of the Ministry of Economic Development (MED) in regard to the engineering of radio licences to meet the requirements of regulation 12(b) of the Radiocommunications Regulations 2001.

Approved persons, being Approved Radio Engineers and Approved Certifiers, are required to comply with these rules when issuing engineering certificates relating to radio licence applications. The rules, however, do not represent the entirety of the knowledge and expertise that an approved person must bring to bear to the task of engineering technical compatibility.

These rules are amended from time to time to reflect evolving technologies and services. It is the responsibility of approved persons to ensure that they are familiar with the latest provisions as published on the RSM website.

No liability is or will be accepted by Ministry, or its officers, servants or agents for any loss suffered, whether arising directly or indirectly, due to sole reliance on the accuracy or contents of these rules.

Amendment History	
Date of effect	Description of Amendment
23 September 2004	Issue 1 for Public Release
21 October 2004	Amendments to KK Band

Contents

1. Introduction
2. EE Band 162.20 - 170.31 MHz
3. JL Band 440-449 MHz
4. J Band 450 – 470 MHz
5. KK Band 806-812 / 851 - 857 MHz
6. K Band 915 – 935 MHz
7. LL Band 1427 – 1525 MHz
8. O Band 2500 – 2690 MHz
9. P Band 3600 – 4200 MHz
10. 5 GHz Band 4400 – 5000 MHz
11. R Band 5925 – 6420 MHz
12. T Band 6430 – 7100 MHz
13. V Band 7100 – 7425 MHz
14. U Band 7425 – 7730 MHz
15. W Band 7730 – 8290 MHz
16. Y Band 8290 – 8500 MHz
17. H Band 10500 – 10680 MHz
18. Z Band 10700 – 11700 MHz
19. X Band 12750 – 13250 MHz
20. G Band 14500 – 15350 MHz
21. 18 GHz Band 17700 – 19700 MHz
22. 23 GHz Band 21200 – 23600 MHz
23. 38 GHz Band 37000 – 40000 MHz
24. 50 GHz Band 50400 – 51150 MHz
25. 60 GHz Band 57200 – 58200 MHz

Introduction

This document is intended as a convenient reference for Approved Radio Engineers and Certifiers, and should be used in conjunction with PIB 38. It lists those frequency bands used in the Fixed Service, which are available for engineering by Approved Radio Engineers and Certifiers.

In the fixed service we have introduced the concept of maximum and minimum path lengths along with notional antenna performance. The notional antennas have two main purposes.

- 1 To provide a guide to the expected minimum performance external persons will use when engineering. Providing compromise between cost and spectrum efficiency.
- 2 Due to a number of data migration exercises in some cases the Radio Spectrum database record for some existing assignment the antenna data is unknown. For coordination analysis these notional antennas can be used.

The Structure of PIB 38 is as follows:-

- Section One : Covers the generic radio system philosophy recommended by the Radio Spectrum Management Group.
- Appendix A : Fixed Radio Services Notional Antennas
- Appendix B : Land-mobile Radio Services RF Channels (derived from PIB 23).

Some general principles governing the arrangements of Fixed Service bands are as follows:

- All the 'go' channels should be in one half of the band and all the 'return' channels should be in the same half of the band, at any particular site.
- It is often desirable that alternate polarisation should be used for adjacent channels in the same half of the band.
- There are considerable advantages in using a uniform frequency channeling arrangement which can accommodate a range of system capacities.

Note: Inclusion of a band plan, or a particular channel in any band plan in this section, indicates that it is available for Approved Radio Engineers or Certifiers to consider its use in regard to producing technical compatibility certificates as a part of the licensing process.

Bands

ref <http://www.med.govt.nz/rsm/publications/pibs/pib22.pdf>

1. EE Band 162.20 - 170.31 MHz

Note: These channels (EEW) are allocated for the use of high efficiency digital services using advanced modulation methods.

Refer to POLDOC [Spectrum band Plan 007](#) – EE Band 25 kHz Fixed Service (FS) Channels

2. I Band 420 - 430 MHz

Note: Refer to POLDOC [Spectrum Band Plan 003](#) – 400 – 450 MHz Band Plan

3. JL Band 440 - 449 MHz

Note: Refer to POLDOC [Spectrum Band Plan 003](#) – 400 – 450 MHz Band Plan

4. J Band 450 - 470 MHz

5. KK Band 806 – 812 / 851- 857 MHz

6. K Band 915 - 935 MHz

Note: These bands are restricted to use for Studio to Transmitter links

7. LL Band 1427 - 1525 MHz

Note: See Poldoc Spectrum Band Plan 004 – Band and Channel Plan for Narrow-Band High Efficiency Digital Fixed Links in the Bands 1427.0 - 1429.5 and 1522.0 - 1525.0 MHz

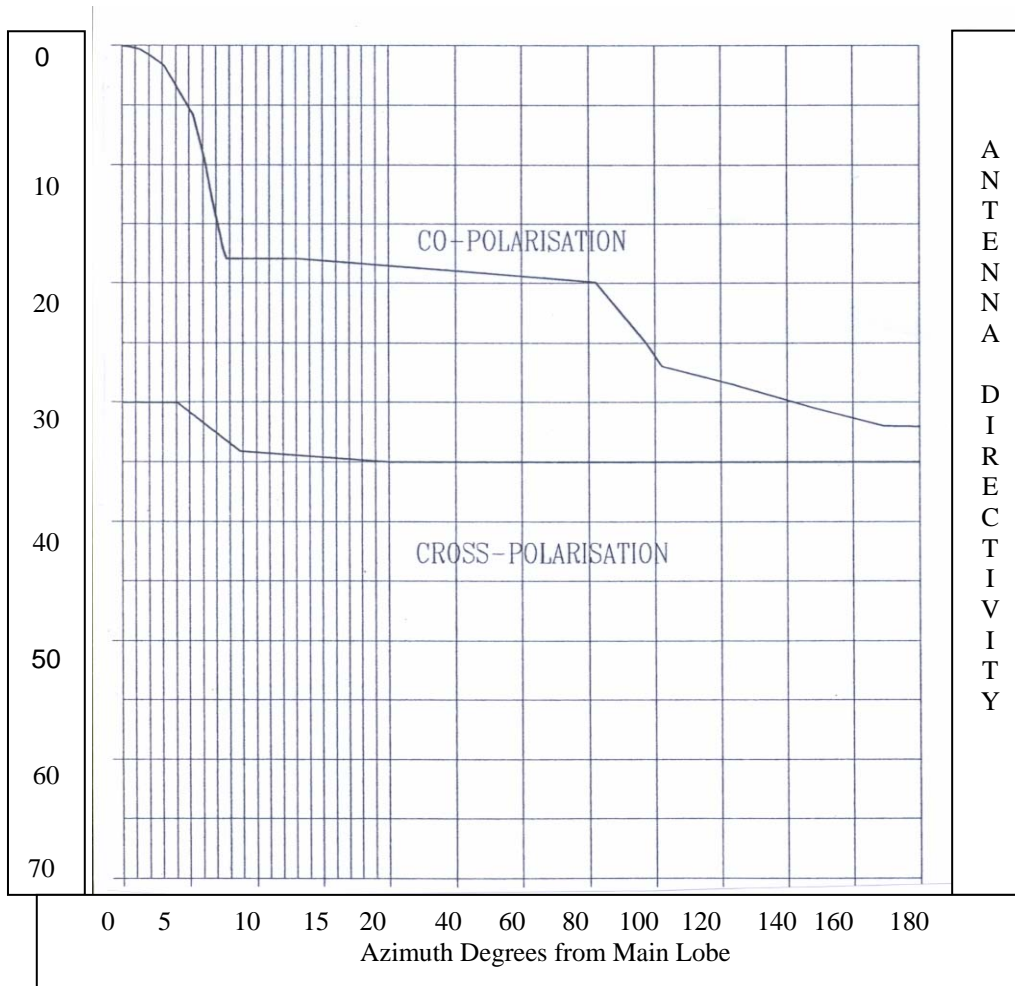
L Band 1427 – 1525 MHz

Refer to PIB 22 for channeling mainly used for Rural Multi-Access Radio Systems

LL Band 1427 - 1525 MHz

NOTIONAL ANTENNA RADIATION PATTERN

Diameter	1.8 m (grid parabolic dish)
Notional Half – Power Beamwidth	8.0degrees
Notional On–Axis Gain	26.0 dBi



The above notional antenna performance is required for exposed, elevated sites such as hilltops that would unduly constrain the reuse of channel(s). Antennas with a minimum gain of 16 dBi, a 3 dB beamwidth not greater than 25 degrees, and a front-to-back ratio equal to or greater than 20 dB are to be used at all other sites.

Note: See Poldoc Spectrum Band Plan 004 – Band and Channel Plan for Narrow-Band High Efficiency Digital Fixed Links in the Bands 1427.0 - 1429.5 and 1522.0 - 1525.0 MHz.

8. O Band 2500 – 2690 MHz and OX Band 2700 – 2900 MHz

These bands are designated for itinerant point – to – point linking for Television outside broadcasting.

Channelling	:	28 and 10 MHz
Typical Use	:	Video linking
Minimum Path Length	:	not specified
Notional Antenna	:	not specified

Note: See Poldoc Spectrum Band Plan 008– OX Band Plan

9. P Band 3600 – 4200 MHz

This band is designated for use by high capacity fixed point – to – point links.

Channelling	:	40
Typical Use	:	140 Mb/s data
Minimum Path Length	:	20 km
Notional Antenna	:	1.8m parabolic dish

References

1. Rec. ITU-R F. 635 - 6, “*Radio-frequency channel arrangements based on a homogeneous pattern for radio-relay systems operating in the 4 GHz band*”.

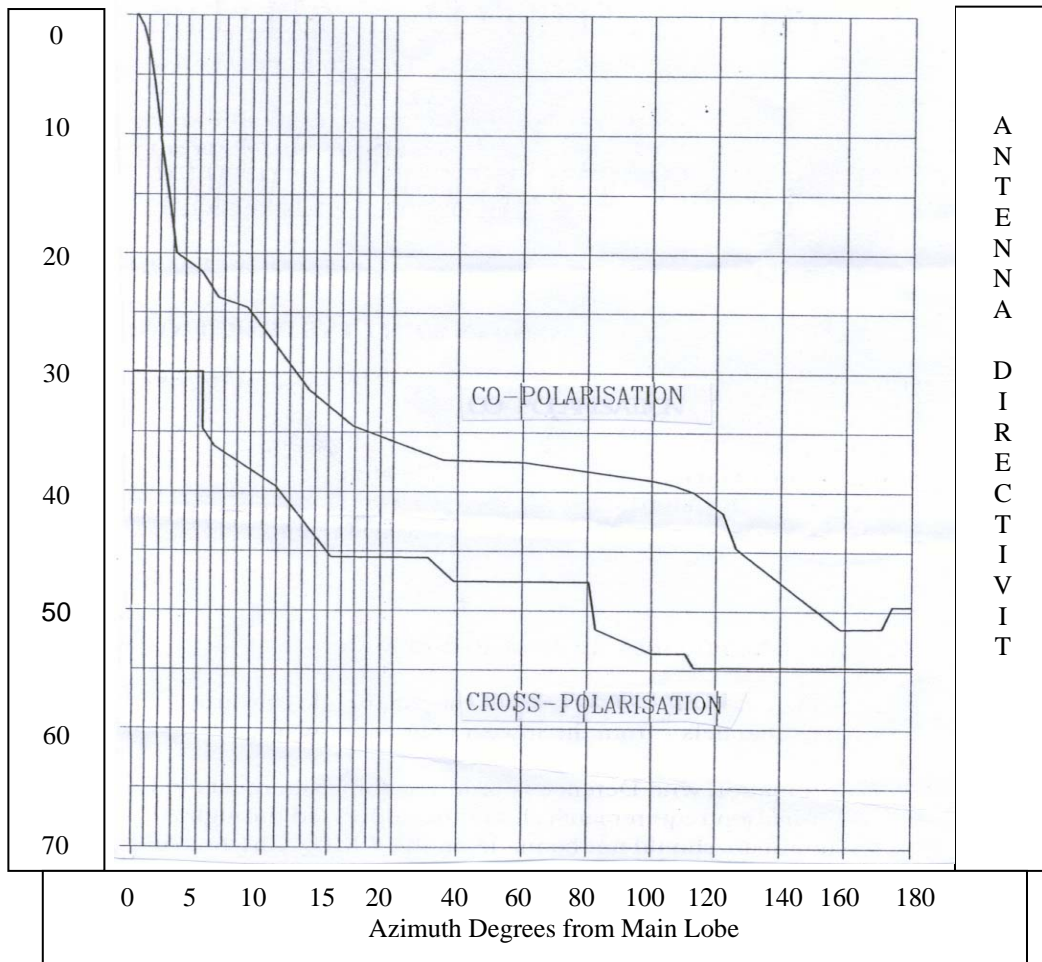
Note:

Proposed links need to be co-ordinated with satellite earth stations services operating in this band.

P Band 3600 – 4200 MHz

NOTIONAL ANTENNA RADIATION PATTERN

Diameter	1.8 m (standard parabolic dish)
Notional Half – Power Beamwidth	1.7 degrees
Notional on–Axis Gain	40.0 dBi



10. 5 GHz Band 4400 – 5000 MHz

This band is designated for use by digital high capacity fixed (N + 1) point – to – point links

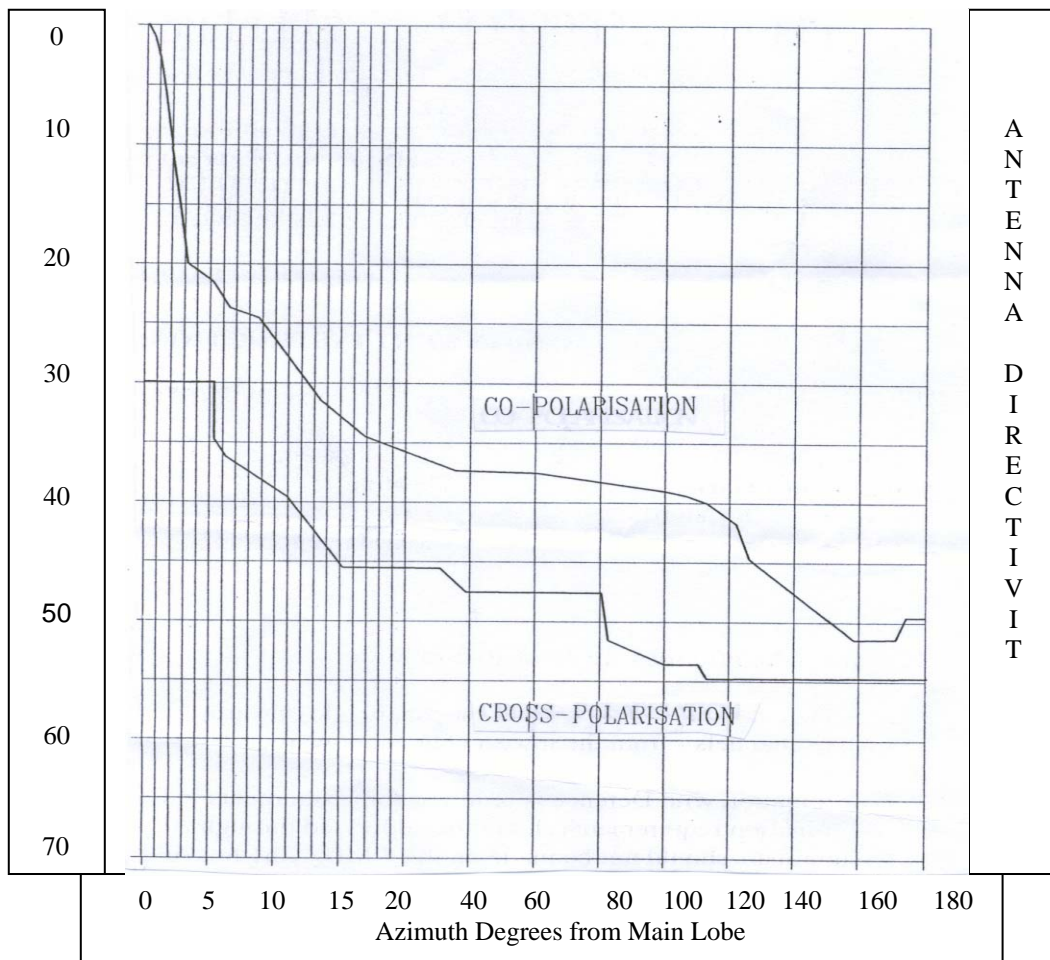
Channelling	:	40 MHz
Typical Use	:	155 Mb/s (STM-1) data
Minimum Path Length	:	20 km
Notional Antenna	:	1.8m parabolic dish

References

1. Rec. ITU-R F.1099- 3, “Radio-frequency channel arrangements for high capacity digital radio-relay systems operating in the 5 GHz (4400 – 5000 MHz) band”.

NOTIONAL ANTENNA RADIATION PATTERN

Diameter	18 m (standard parabolic dish)
Notional Half – Power Beamwidth	1.7 degrees
Notional on–Axis Gain	40.0 dBi



11. R Band 5925 - 6420 MHz

This band is designated for use by digital high capacity fixed (N + 1) point – to – point links

Channelling	:	29.65 MHz (interleaved)
Typical Use	:	34 Mb/s data, Video linking
Minimum Path Length	:	20 km
Notional Antenna	:	1.8m parabolic dish

References:

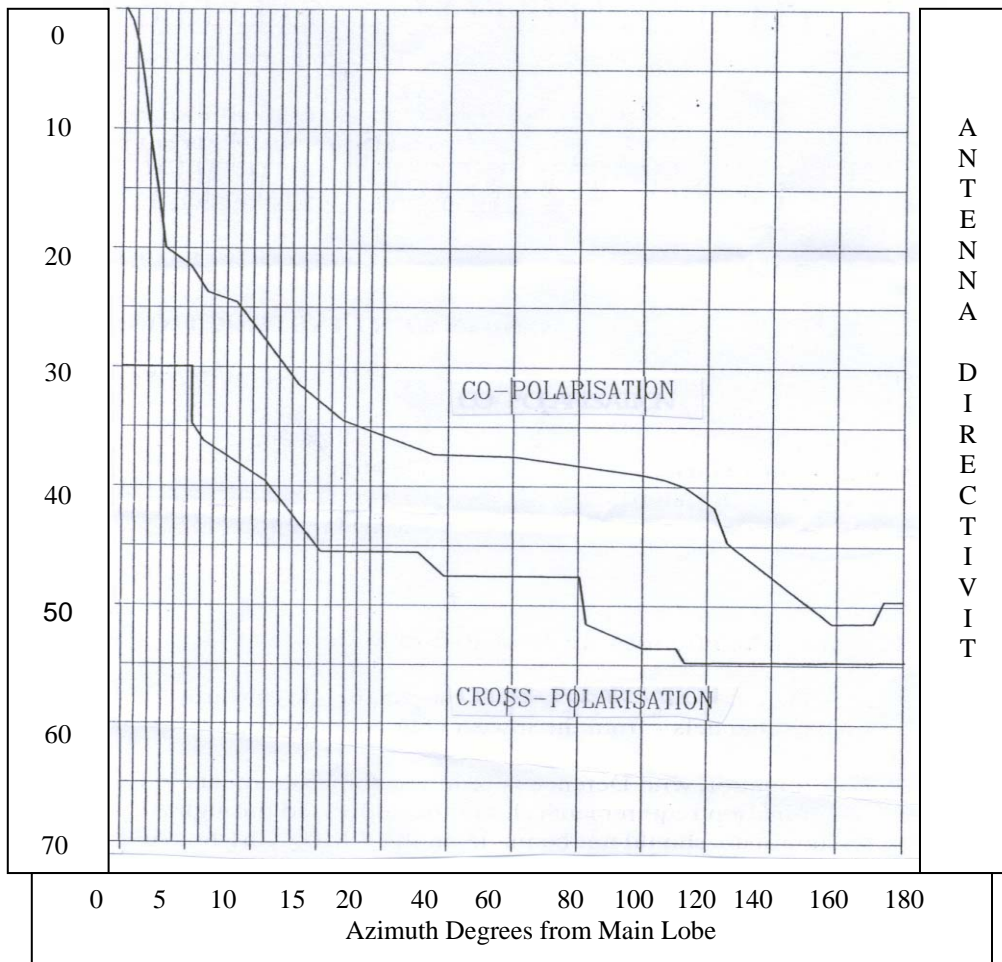
Rec. ITU-R F.383- 5, “Radio-frequency channel arrangements for high capacity radio-relay systems operating in the lower 6 GHz band”.

Notes:

1. Proposed links need to be co-ordinated with earth stations operating in this band.
2. The two groups of channels are interleaved.

NOTIONAL ANTENNA RADIATION PATTERN

Diameter	1.8 m (standard parabolic dish)
Notional Half – Power Beamwidth	1.7 degrees
Notional On–Axis Gain	40.0 dBi



12. T Band 6430 - 7100 MHz

This band is designated for use by digital high capacity fixed point – to – point links.

Channelling	:	40 MHz (interleaved)
Typical Use	:	140 Mb/s data
Minimum Path Length	:	20 km
Notional Antenna	:	1.8m parabolic dish

References:

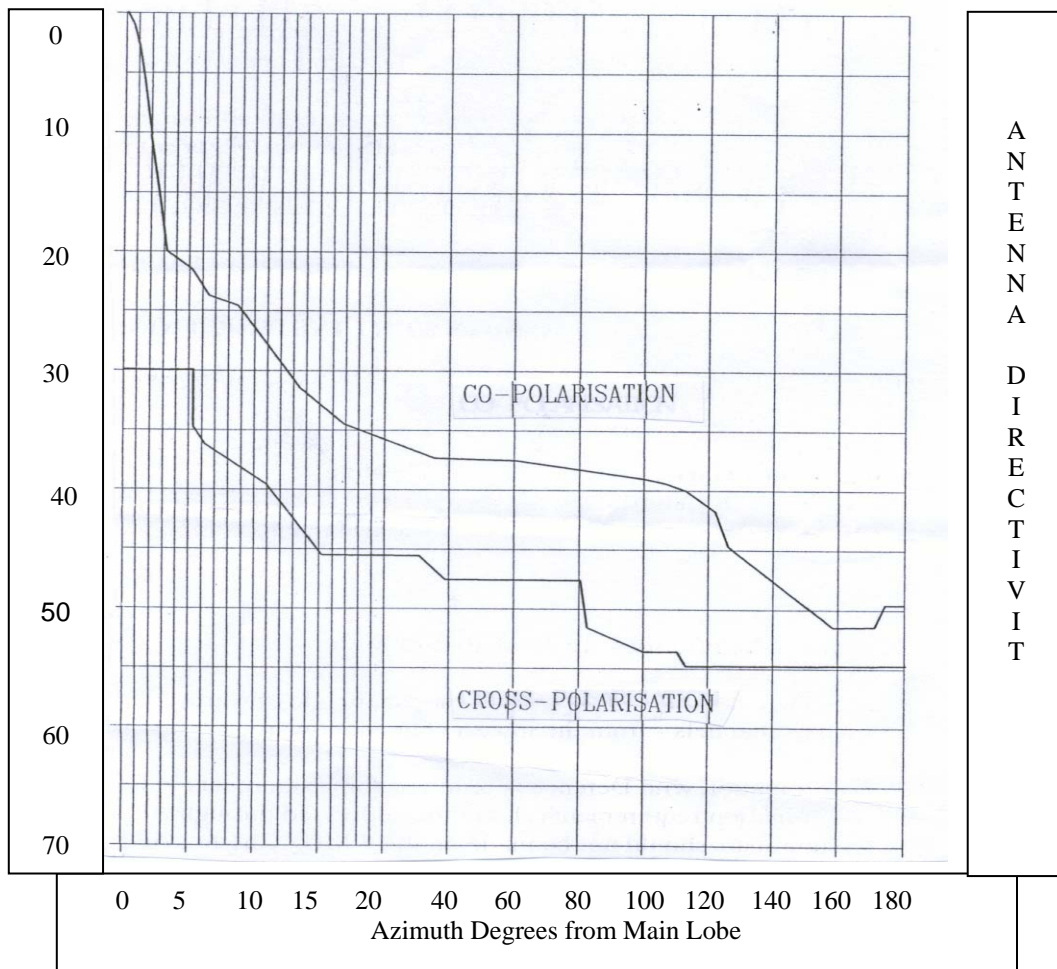
Rec. ITU-R F.384 - 7, "Radio-frequency channel arrangements for medium and high capacity analogue or high capacity digital radio-relay systems operating in the upper 6 GHz band".

Notes:

- 1 Proposed links need to be co-ordinated with earth stations operating in this band.
- 2 The two groups of channels are interleaved.

NOTIONAL ANTENNA RADIATION PATTERN

Diameter	1.8 m (standard parabolic dish)
Notional Half – Power Beamwidth	1.7 degrees
Notional on–Axis Gain	40.0 dBi



13. V Band 7100 - 7425 MHz

This band is designated for use by medium and high capacity fixed point to point links, as well as outside broadcast FM video operations

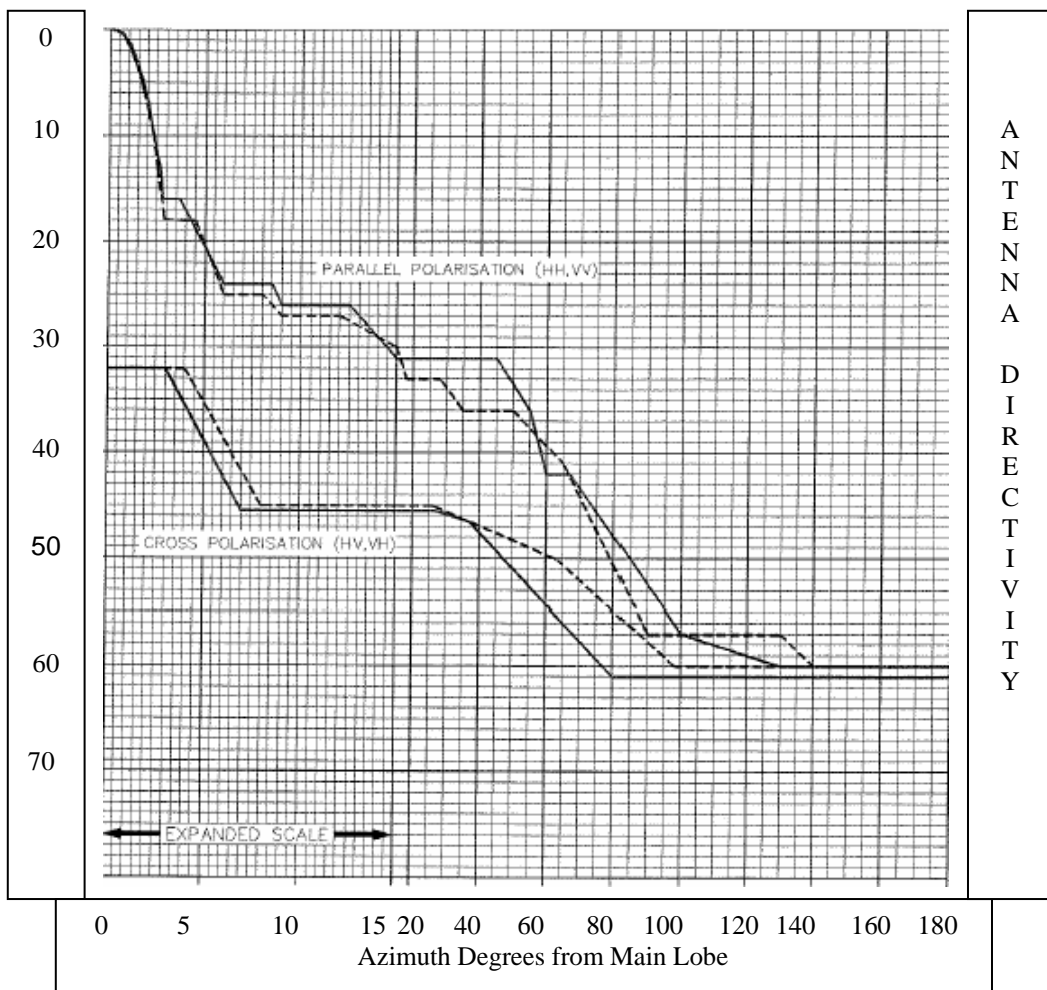
Note:	Channelling	:	28, 14, 7 an 3.5 MHz
Typical Use		:	2 – 34 Mb/s data, Video linking
Minimum Path Length		:	20 km
Notional Antenna		:	1.2 m parabolic dish

References:

Rec. ITU-R F.385 - 7, "Radio-frequency channel arrangements for radio-relay systems operating in the 6 GHz band".

NOTIONAL ANTENNA RADIATION PATTERN

Diameter	1.2 m (standard parabolic dish)
Notional Half – Power Beamwidth	2.3 degrees
Notional on–Axis Gain	37.0 dBi



14. U Band 7425 – 7730 MHz

This band is designated for use by medium and high capacity fixed point to point links

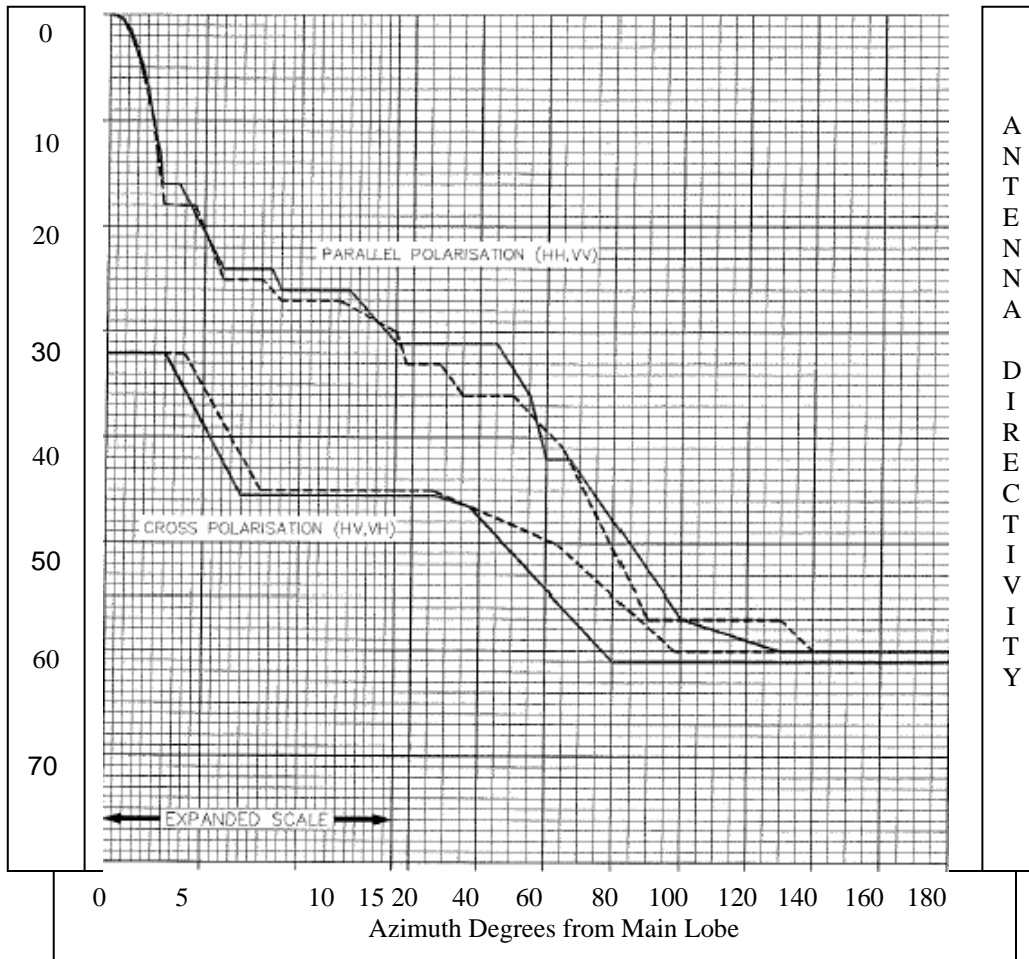
Note: Channelling	:	28 and 7 MHz
Typical Use	:	2 - 34 Mb/s data
Minimum Path Length	:	20 km
Notional Antenna	:	1.2 m parabolic dish

References

Rec. ITU-R F.385 - 7, "Radio-frequency channel arrangements for radio-relay systems operating in the 7 GHz band".

NOTIONAL ANTENNA RADIATION PATTERN

Diameter	1.2 m (standard parabolic dish)
Notional Half – Power Beamwidth	1.4 degrees
Notional on–Axis Gain	34.80 dBi



15. W Band 7730 – 8290 MHz

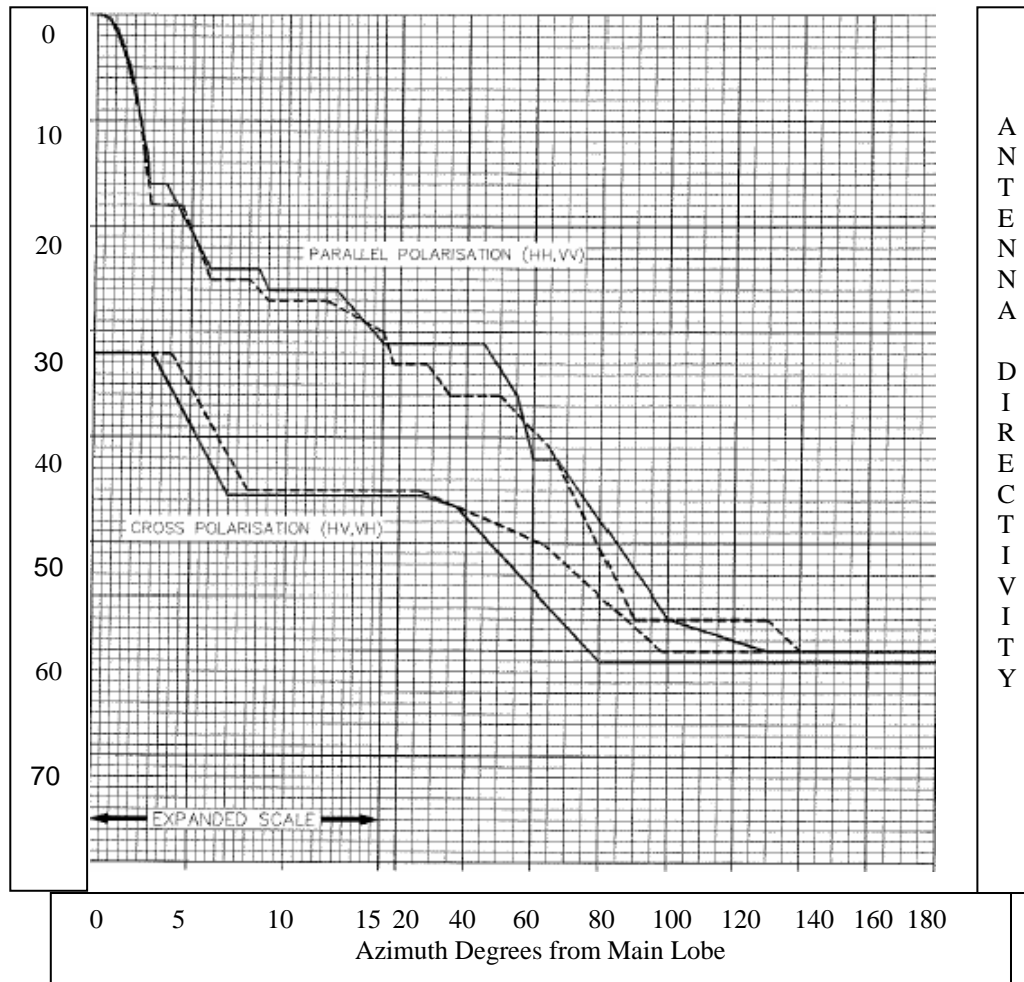
Note: Channelling	:	34 Mb/s data FM video
Typical Use	:	Video linking
Minimum Path Length	:	not specified
Notional Antenna	:	1.2m parabolic dish

References

Rec. ITU-R F.386 - 6, "Radio-frequency channel arrangements for medium and high capacity analogue and digital radio-relay systems operating in the 8 GHz band".

NOTIONAL ANTENNA RADIATION PATTERN

Diameter	1.2 m (standard parabolic dish)
Notional Half – Power Beamwidth	1.4 degrees
Notional on–Axis Gain	34.80 dBi



16. Y Band 8290 - 8500 MHz

Note: Channelling	:	28 MHz
Typical Use	:	Video linking
Minimum Path Length	:	not specified
Notional Antenna	:	parabolic dish (not defined)

17. H Band 10500 - 106800 MHz

Note: Channelling	:	7 and 21 MHz
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Refer to POLDOC Spectrum Band Plan 001 - 10 GHz to 17.70 GHz Band

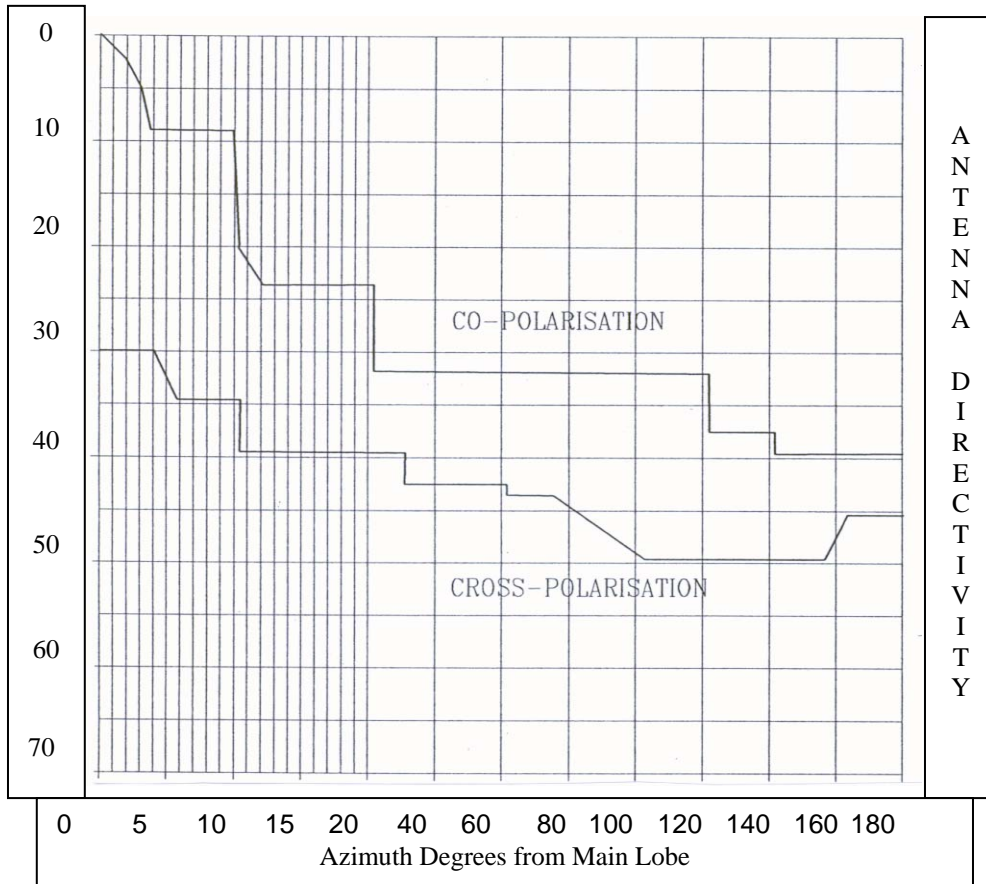
Typical Use (Low and Medium capacity fixed point to point)	:	2 – 34 Mb/s
Minimum Path Length	:	5 km
Notional Antenna	:	0.6 m parabolic dish

References

1. Rec. ITU-R F. 747, "Radio-frequency channel arrangements for radio-relay systems operating in the 10 GHz band".

NOTIONAL ANTENNA RADIATION PATTERN

Diameter dish)	0.6 m (standard parabolic
Notional Half – Power Beamwidth	3.6 degrees
Notional on–Axis Gain	33 dBi



18. Z Band 10500 - 106800 MHz

Note: Channelling : 40 MHz

Only 11 channels (2A --12A) are available in 'A' Group

See POLDOC Spectrum Band Plan 001 - 10 GHz to 17.70 GHz Band

Typical Use : 140/155 Mb/s

Minimum Path Length : 5 km

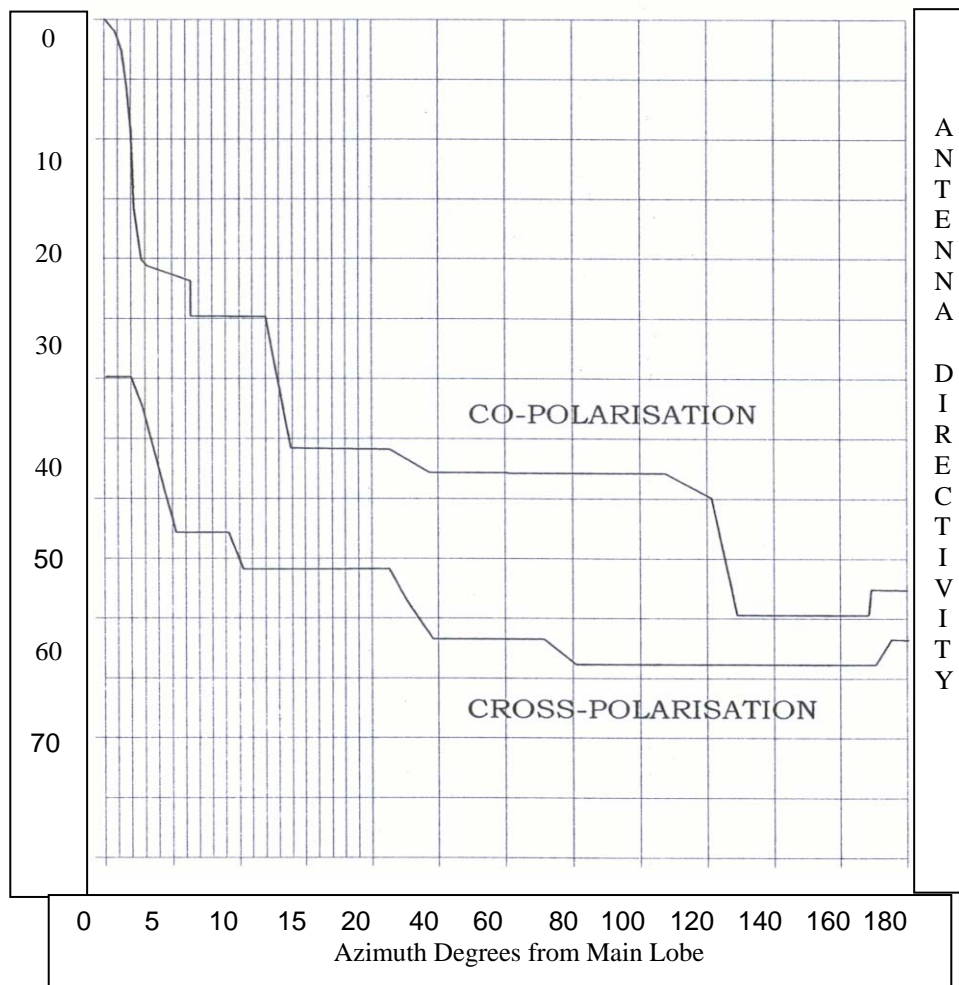
Notional Antenna : 0.6 m parabolic dish

References

- 1 Rec. ITU-R F. 387-8, "Radio-frequency channel arrangements for radio-relay systems operating in the 11 GHz band".

NOTIONAL ANTENNA RADIATION PATTERN

Diameter	1.2 m (standard parabolic dish)
Notional Half – Power Beamwidth	1.4 degrees
Notional on–Axis Gain	40 dBi



19. X Band 12750 - 13250 MHz

Note: Channelling : 7, 14, and 28 MHz

Co-ordination is required between satellite and Terrestrial services that share this band.
See POLDOC Spectrum Band Plan 001 - 10 GHz to 17.70 GHz Band

Typical Use : Capacity 2 - 34 Mb/s

Minimum Path Length : 5 km

Notional Antenna : 0.6 m parabolic dish

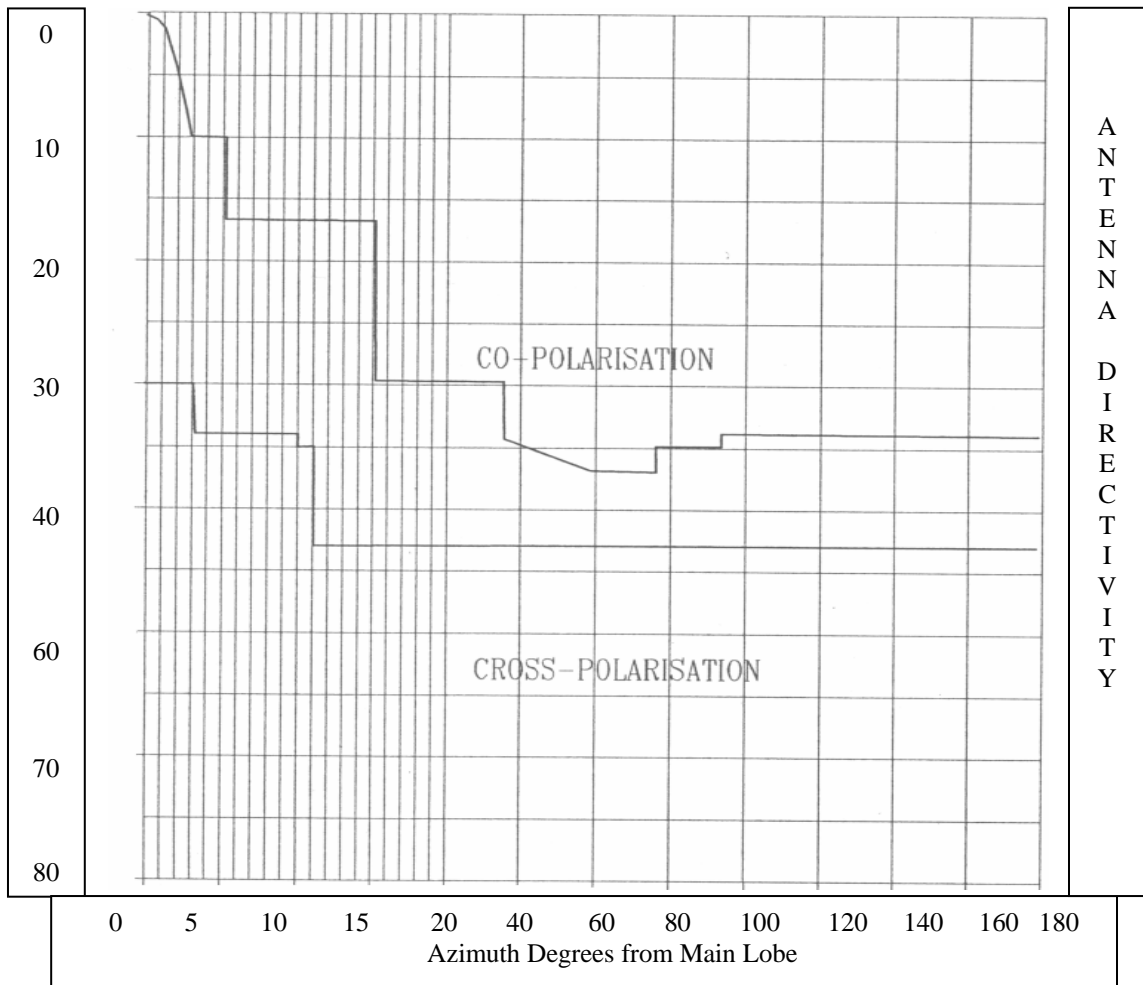
Note: See Poldoc Spectrum Band Plan 001 – 10 GHz to 17.70 GHz Band Plans

References

1. Rec. ITU-R F. 497-6, "Radio-frequency channel arrangements for radio-relay systems operating in the 13 GHz band".

NOTIONAL ANTENNA RADIATION PATTERN

Diameter	0.6 m (standard parabolic dish)
Notional Half – Power Beamwidth	2.3 degrees
Notional on–Axis Gain	36 dBi



20. G Band 14500 - 15350 MHz

Note: Channelling = Channels G1, G2, G3 and G4 could be sub-divided in 14, 7 or 3.5 MHz.
(The sub-division of G2 is shown above as an example.)

Co-ordination is required between satellite and Terrestrial services that share this band.

See POLDOC Spectrum Band Plan 001 - 10 GHz to 17.70 GHz Band

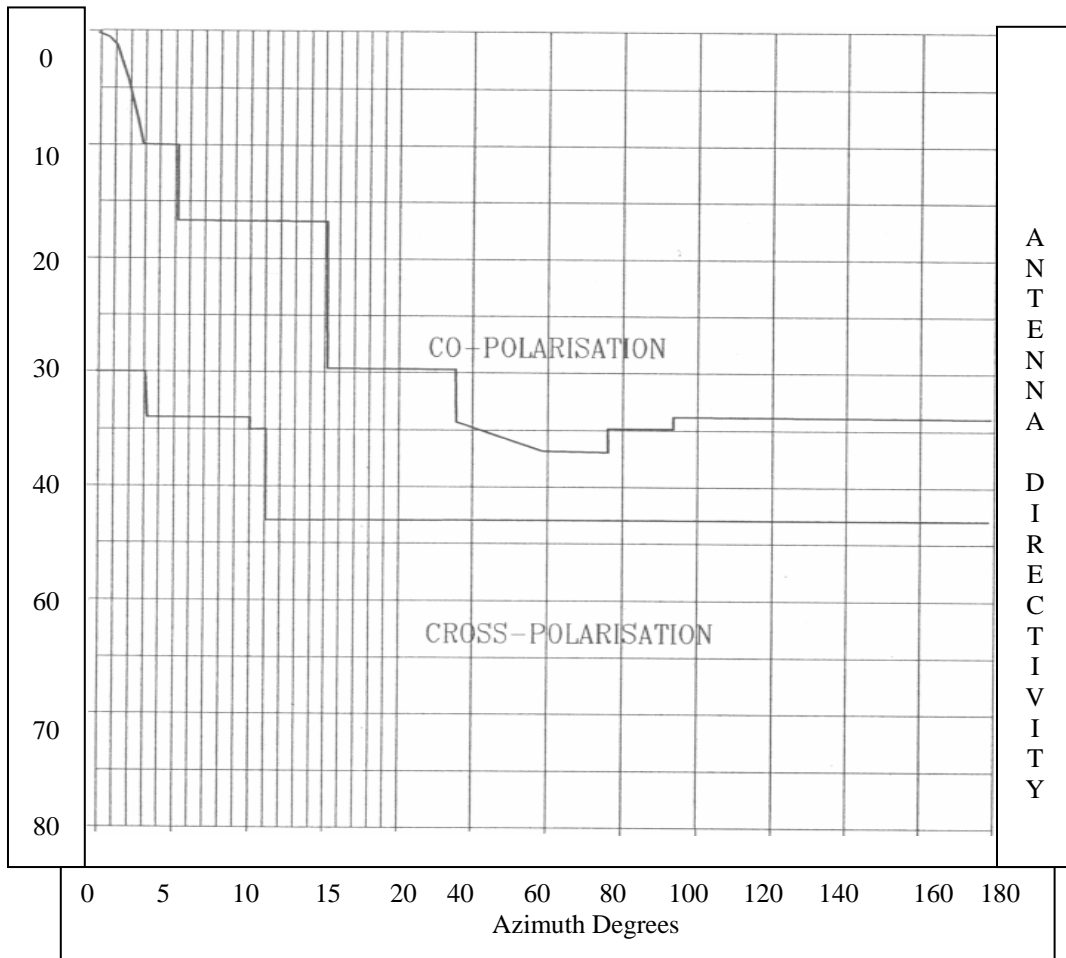
Typical Use	:	2 – 34 Mb/s
Minimum Path Length	:	5 km
Notional Antenna	:	0.6 m parabolic dish

References

1. Rec. ITU-R F. 636-3, "Radio-frequency channel arrangements for radio-relay systems operating in the 15 GHz band".

NOTIONAL ANTEENA RADIATION PATTREN

Diameter	0.6 m (standard parabolic dish)
Notional Half – Power Beamwidth	2.3 dBi
Notional on–Axis Gain	36 dBi



21. 18 GHz Band 17700 - 19700 MHz

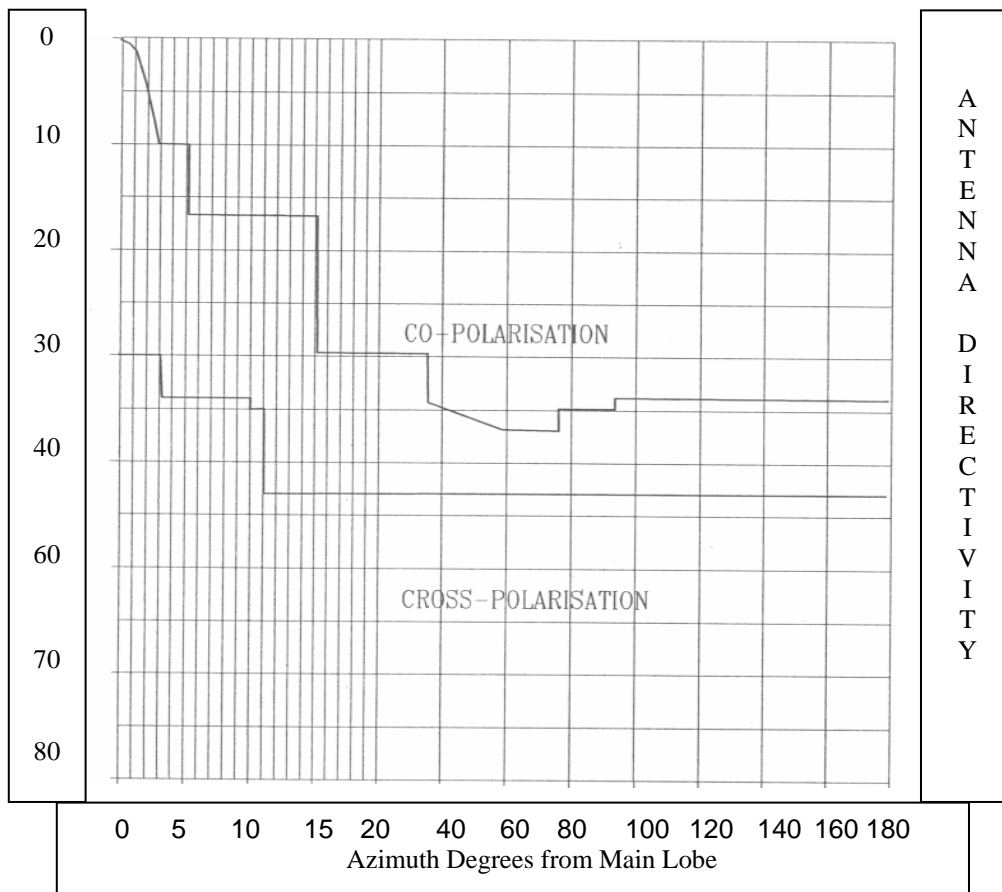
Typical Use	:	8/16/34/155 Mb/s data
Minimum Path Length (relaxed for high capacity system 155Mb/s)	:	2 km
Notional Antenna	:	0.3 m parabolic dish

References

Rec. ITU-R F. 595, "Radio-frequency channel arrangements for radio-relay systems operating in the 18 GHz band".

NOTIONAL ANTEENNA RADIATION PATTERN

Diameter	0.3 m (standard parabolic dish)
Notional Half – Power Beamwidth	3.6 degrees
Notional on–Axis Gain	33.5 dBi



22. 23 GHz Band 21200 - 23600 MHz

Minimum Path Length : not specified

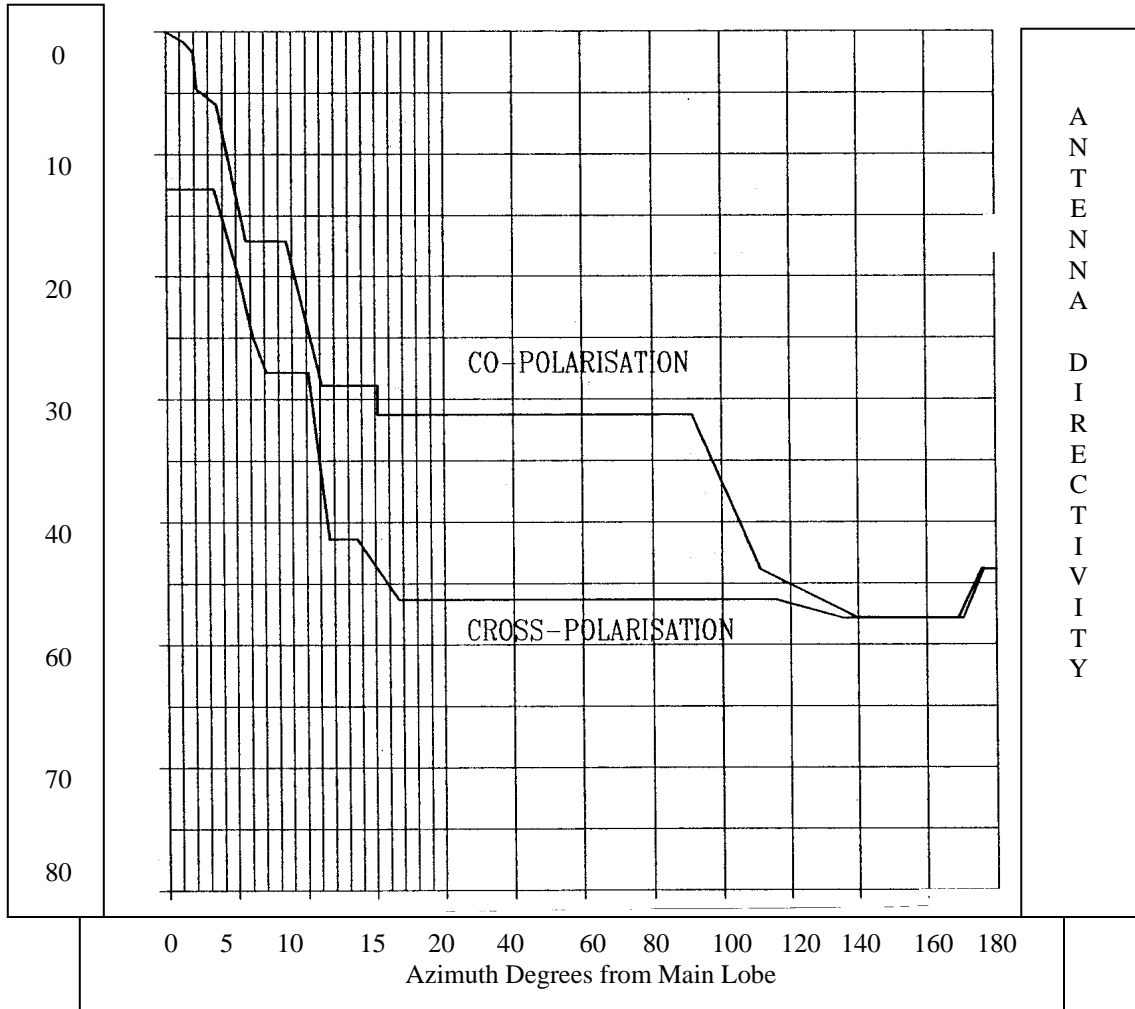
Notional Antenna : 0.3 m standard parabolic disk

Reference

- 1 Rec. ITU-R F. 637-2, "Radio-frequency channel arrangements for radio-relay systems operating in the 23 GHz band".

NOTIONAL ANTEENA RADIATION PATTERN

Diameter	0.3 m (standard parabolic dish)
Notional Half – Power Beamwidth	3.0 degrees
Notional on–Axis Gain	33.0 dBi



23. 38 GHz Band 14500 - 15350 MHz

Note: Channelling : 28 MHz and 14 MHz

Each block has 10 x 28 MHz (20 x 14 MHz)

Top Channel in each block is subdivided to 7 and 3.5 MHz

This band is designated for use by short haul low – medium capacity fixed point – to – point services.

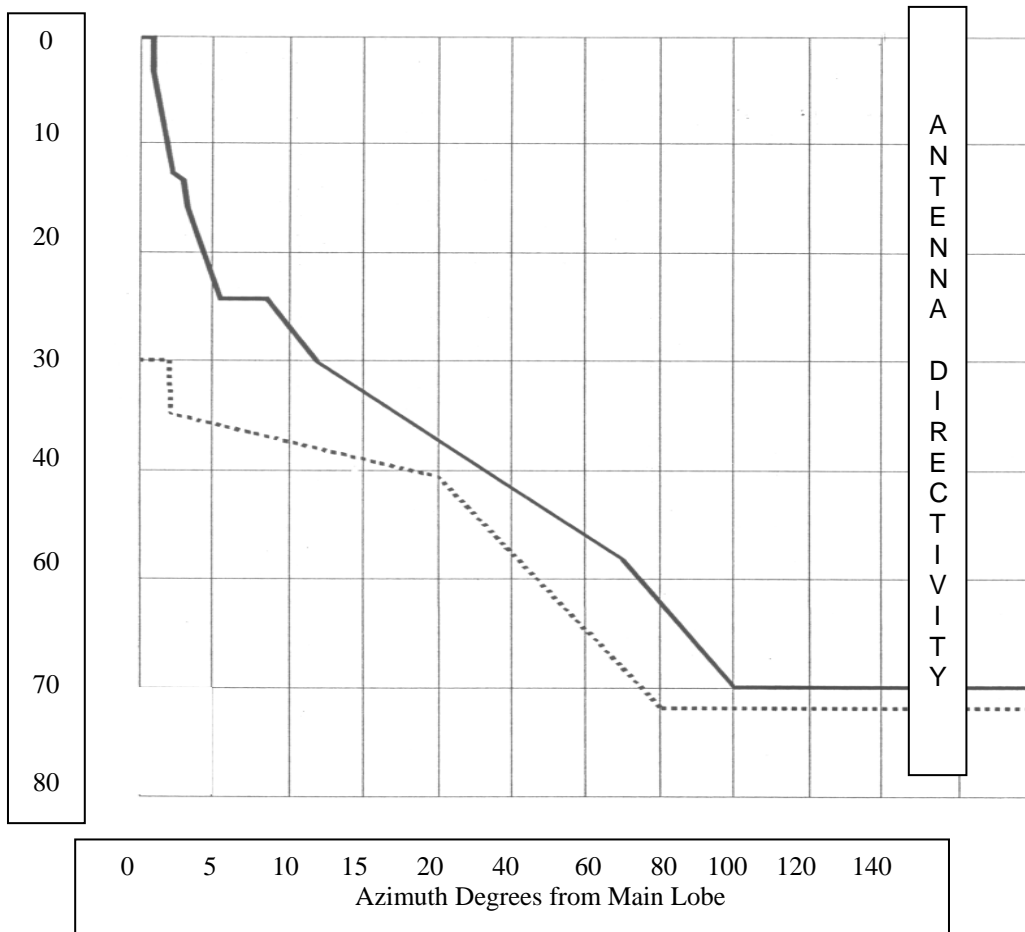
Typical Use : not specified

Minimum Path Length : not specified

Notional Antenna : 0.3 m parabolic disk

NOTIONAL ANTEENA RADIATION PATTERN

Diameter 0.3 m (standard parabolic dish)
 Notional Half – Power Beamwidth 1.7 degrees
 Notional on–Axis Gain 39.5 dBi



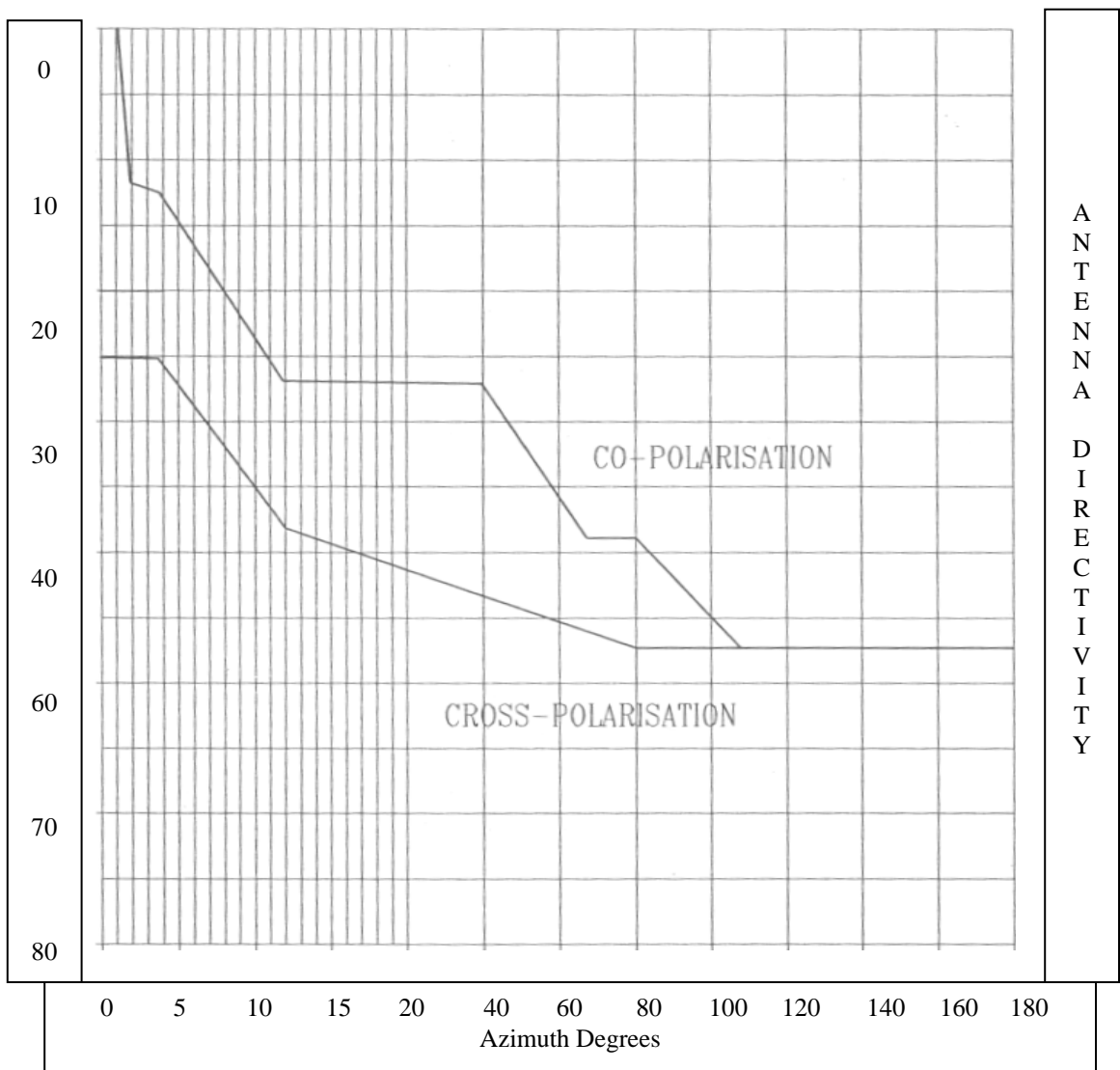
..... Cross-polarisation _____ Co- polarisation

24. 50 GHz Band 50400 - 51150 MHz

Note: Channelling	:	40 MHz and 10 MHz
Typical Use	:	2/8 Mb/s data, FM video
Minimum Path Length	:	not specified
Notional Antenna	:	0.3 m standard parabolic disk

NOTIONAL ANTEENA RADIATION PATTREN

Diameter	0.3 m (standard parabolic dish)
Notional Half – Power Beamwidth	1.3 dBi
Notional on–Axis Gain	44 dBi



25. 60 GHz Band 57200 - 58200 MHz

Note: Channelling = 100 MHz

Typical Use : Mobile Telephone Base Station back haul

Minimum Path Length : not specified

Notional Antenna : See next page

Notes:

1. Detailed Co-ordination is not necessary for this band. The Radio Licence is required to record device location.
2. Licences in this band are to be endorsed with a condition of no interference / no protection with respect to other licensees in the band.

References

1. ITU-R Recommendation F. 1100 "Radio-frequency channel arrangements for radio-relay systems operating in the 55 GHz band".

NOTIONAL ANTENNA RADIATION PATTERN ENVELOPE

The notional antenna is specified as a minimum 30 dBi directional antenna with an out of main beam RPE as shown in Figure I (see ETSI standard ETS 300 408). System EIRP is limited to 15 dBW.

