

**Response of Globalstar, Inc. to the OFCOM
Consultation on the Award of Available Spectrum:
2500-2690 MHz, 2010-2025 MHz**

Globalstar, Inc., headquartered in Milpitas, California, USA, is the owner and operator of a worldwide mobile-satellite service system with subscribers in the United Kingdom. In that capacity, Globalstar, Inc. hereby provides its response to the OFCOM consultation on the Award of Available Spectrum: 2500-2690 MHz, 2010-2025 MHz.

Interference Potential

The Globalstar system utilizes the 2483.5-2500 MHz band for downlinks between its spacecraft and its handheld terminals. The handheld terminals receive signals from the spacecraft in that band and transmit to the spacecraft in the 1610-1626.5 MHz band. As one of the bands of spectrum that will be awarded by OFCOM is immediately adjacent to the Globalstar downlink band, there is the potential for significant interference to the receivers of the Globalstar handheld terminals. Calculations were performed to evaluate this potential interference and the results of those calculations are presented below.

Evaluation of Potential Interference

The method and parameters used to evaluate the potential interference from sources in the 2500-2690 MHz band into Globalstar system downlinks in the 2483.5-2500 MHz band are contained in Annexes 12 and 13 of the December consultation document.

Transmission loss between the component of the interfering system in the 2.5/2.6 GHz band and the Globalstar handheld terminal was calculated using the equations given in Section 12.21 and the parameters given in Table 54 of Annex 12. These are summarized as follows:

$$L_{DS} = L_{FS}(d_0) + A * 10\log(d/d_0) + L_N \text{ (B)}$$

where: $L_{FS} = 32.45 + 20\log(f_{\text{MHz}}) + 20\log(d_{\text{KM}})$

L_N (B) signifies the Log-Normal distribution. The value in this case is taken to be zero as the mean transmission loss is calculated here.

DIRECTION OF INTERFERENCE	BASE TO BASE	BASE TO MOBILE/MOBILE TO BASE	MOBILE TO MOBILE
do (m)	200	100	50
ROLLOFF EXPONENT	3	3.5	4

The propagation model assumes that the loss up to and including do increases as the square of the range ("free space loss"). For ranges greater than do, the loss increases proportional to the "Rolloff Exponent."

The characteristics of the interferers are taken from Annex 13 and summarized in the Table below.

Interferer Type	Power Output	Antenna Gain	ACLR	Effective Interference Power	Antenna Height
TDD D/L	24 dBm	0 dBi	45 dB	-21.0 dBm	10m
TDD U/L	1.6 dBm	0 dBi	33 dB	-31.4 dBm	1.5m
FDD D/L	35 dBm	5 dBi	45 dB	-5.0 dBm	10m
FDD U/L	6.6 dBm	0 dBi	33 dB	-26.4 dBm	1.5m

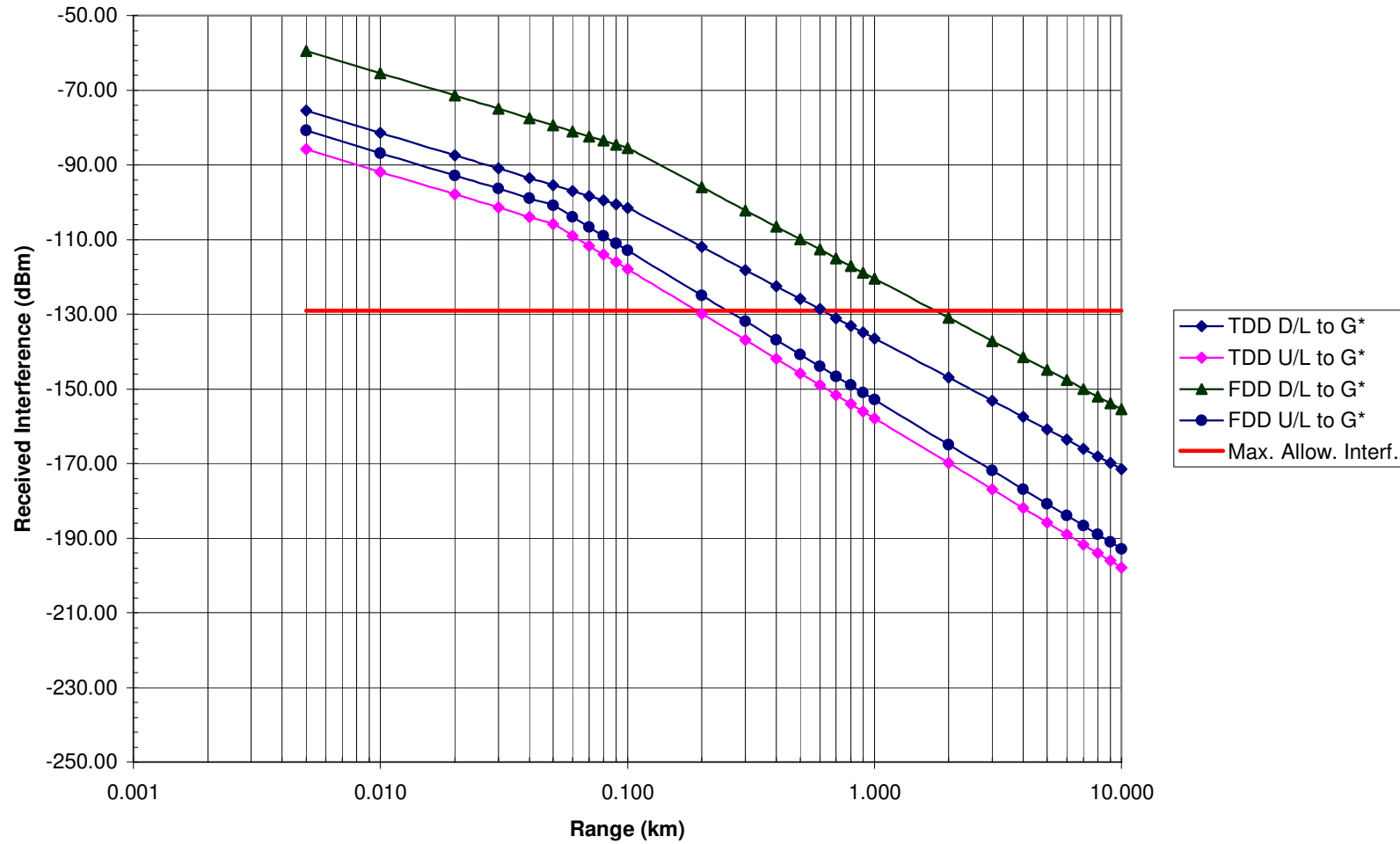
ACLR signifies the adjacent channel leakage power ratio at 5 MHz from the center of the interfering channel.

Appendix C of the "2500-2690MHz, 2010-2025MHz and 2290-2302MHz Spectrum Awards - Engineering Study (Phase 2)" prepared by Mason Communications Limited, listed the interference limit to the Globalstar handheld terminals as -129.1 dBm which corresponded to an interference-to-noise ratio (I/N) of -10 dB. This limit was used as the interference threshold in this study.

Results

The results of these calculations are presented in the accompanying figure showing the interference received at a Globalstar handheld terminal as a function of the range between the interferer and the Globalstar handheld for four different interference sources; TDD base station (TDD D/L), TDD mobile terminal (TDD U/L), FDD base station (FDD D/L) and FDD mobile terminal (FDD U/L).

Interference from 2.5/2.6 GHz Sources into a Globalstar Mobile Handset



The range at which the acceptable interference threshold is exceeded is summarized in the following chart.

Interference Source	Range at which Acceptable Interference Level Is Exceeded (meters)
TDD D/L	600
TDD U/L	255
FDD D/L	1800
FDD U/L	190

Conclusions

It is apparent from the analysis given above that interference can occur to Globalstar handheld terminals, operating in the 2483.5-2500 MHz band, due to out-of-band emissions from terrestrial services operating in the 2500-2690 MHz band. Interference from base stations in the 2500-2690 MHz band will occur over a greater area than interference from mobile terminals operating in that band.

As it is likely that most Globalstar handheld terminals will be used in rural as opposed to urban areas, it is felt that the range from the interferers at which acceptable interference will be exceeded has been conservatively estimated as the effect of terrain clutter on transmission loss will be less in rural areas.

Globalstar, Inc. urges OFCOM to award this spectrum in such a way as to minimize the interference that could be caused to Globalstar terminals. Specifically, the portion of the awarded band closest to 2500 MHz should be limited to use by mobile terminals of the proposed terrestrial systems as opposed to base stations. Further, in order to counter the effects of less terrain clutter in rural areas, channels used by mobile terrestrial terminals in these areas should not be those immediately adjacent to the 2500 MHz band edge but those further in-band where the ACLR at 2500 MHz will be greater.

Globalstar, Inc. thanks OFCOM for the opportunity to respond to this spectrum award consultation.

Respectfully submitted,

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References

1. "Award of Available Spectrum:2500-2690 MHz, 2010-2025 MHz and 2290-2300 MHz," OFCOM, 11 December 2006.
2. "2500-2690 MHz, 2010-2025 MHz and 2290-2300 MHz Spectrum Awards - Engineering Study (Phase 2)," Mason Communications Limited, November 2006.