



Report ITU-R S.2515-0
(09/2022)

**Uplink interference considerations in the
frequency band 7 025-7 075 MHz
for a broadcasting-satellite
service (sound) in Region 2**

S Series
Fixed-satellite service



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Foreword

The role of the Radiocommunication Sector is to ensure the rational, equitable, efficient and economical use of the radio-frequency spectrum by all radiocommunication services, including satellite services, and carry out studies without limit of frequency range on the basis of which Recommendations are adopted.

The regulatory and policy functions of the Radiocommunication Sector are performed by World and Regional Radiocommunication Conferences and Radiocommunication Assemblies supported by Study Groups.

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ITU-R policy on IPR is described in the Common Patent Policy for ITU-T/ITU-R/ISO/IEC referenced in Resolution ITU-R 1. Forms to be used for the submission of patent statements and licensing declarations by patent holders are available from <http://www.itu.int/ITU-R/go/patents/en> where the Guidelines for Implementation of the Common Patent Policy for ITU-T/ITU-R/ISO/IEC and the ITU-R patent information database can also be found.

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Note: This ITU-R Report was approved in English by the Study Group under the procedure detailed in Resolution ITU-R 1.

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1 Introduction

There has been much analysis of interference into satellite communications and broadcast mobile receiving terminals by the International Telecommunication Union. Most of these analyses have centred on the interference to proper reception at such terminals which is normally termed the ‘downlink’ (the desired radio transmission from the satellite to the mobile receiving terminals). All broadcast and communications satellites also have an ‘uplink’ (the desired radio transmission from central earth stations to the satellite containing the signal(s) that the satellite is to retransmit). There are a wide variety of communications and broadcast satellite systems operating in many different radio frequency bands. The following uses as its technical model the satellite parameters of the Region 2 broadcasting-satellite service (sound) (BSS (sound)) network employing geostationary orbit (GEO) satellites USASAT-28 K, N, O and Q, two located on that orbit near 85° West and two located near 115° West. This BSS (sound) system has operated for two decades [Ref. 1], and currently provides satellite radio broadcast service to nearly 37 million mobile subscribers throughout North America. The satellite uplink radio frequency band for the system is 7 025-7 075 MHz, referred to hereafter as the 7 GHz band. It should be noted that the fixed-satellite service (Earth-to-space) (space-to-Earth) is allocated and operated on a co-primary basis with the fixed and mobile services in the 7 025-7 075 MHz frequency band in accordance with the Radio Regulations. The examples contained in the study are intended to provide guidance to address any potential cross-border interference situations for certain countries in Region 2, and potential domestic interference situations should be considered a national matter and are not addressed in this study.

2 Satellite system configuration

Figure 1 shows the BSS (sound) system that includes the uplink radio transmission from the system’s ground stations to the satellites for retransmission by the satellites to the mobile receiving terminals. There are six uplink carrier frequencies used continuously plus four command carriers at radio frequencies around 7 GHz to the four active satellites in the constellation. Figure 2 shows both the uplink and downlink frequencies. Other uplink frequency configurations than those shown in Figs 1 and 2 can be employed in the 7 025-7 075 MHz frequency band.