

RECOMMENDATION ITU-R F.1519

Guidance on frequency arrangements based on frequency blocks for systems in the fixed service*

(Questions ITU-R 215/8, ITU-R 125/9, ITU-R 136/9, ITU-R 108/9 and ITU-R 229/9)

(2001)

The ITU Radiocommunication Assembly,

considering

- a) that frequency band plans have continued to be developed over many years for point-to-point (P-P) digital radio-relay systems and which exclusively feature conventional channelling arrangements;
- b) that new generations of systems include P-P, point-to-multipoint (P-MP) and multipoint-to-multipoint (MP-MP) systems;
- c) that systems may feature frequency reuse in geographically contiguous, cellular-type deployments;
- d) that a frequency arrangement based on frequency blocks is already in use by some administrations;
- e) that fixed service systems may be deployed on an area basis and utilize flexible frequency arrangements within the area, rather than by link-by-link frequency assignment basis;
- f) that systems may feature, *inter alia*, dynamic frequency control; variable traffic (e.g. temporal, fixed asymmetric, symmetric or adaptive); integral in-band, network infrastructure (backhaul); variable or dynamic modulation arrangements;
- g) that there are a number of important factors that need to be considered in developing such sub-banding arrangements, including *inter alia* the choice of appropriate width for the sub-band(s)/block(s) (see Annex 2),

recommends

- 1 that administrations consider possible use of frequency arrangements based on contiguous frequency blocks in the fixed service (FS) bands, as shown in Annex 1;
- 2 that the material in Annex 2 may be considered as guidance where frequency block-based plans are applied (see Note 1).

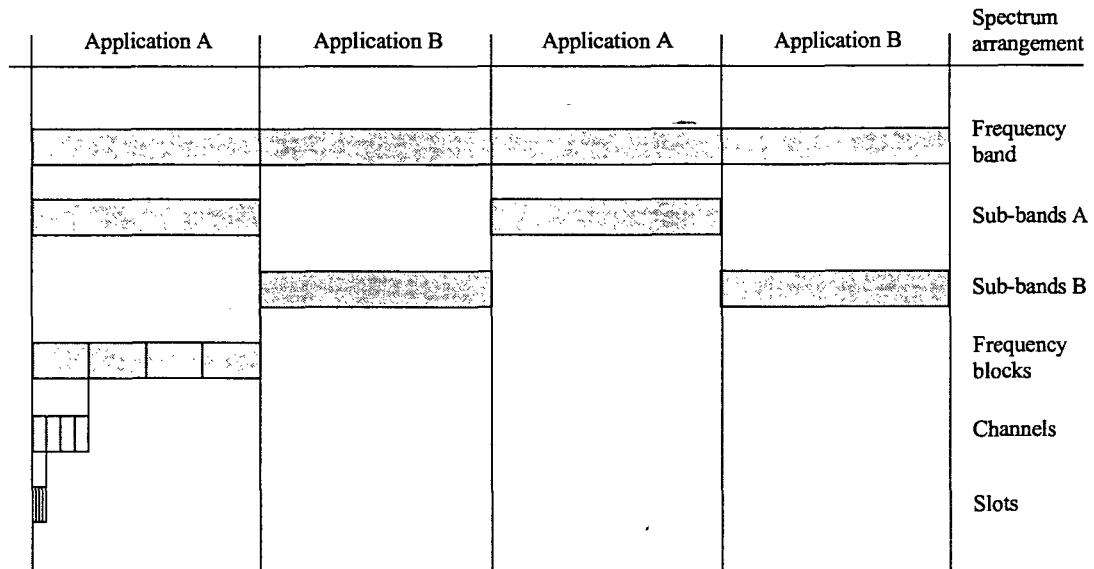
NOTE 1 – Two examples of such arrangements are provided in Annex 3 of this Recommendation and Recommendation ITU-R F.1488.

* This Recommendation should be called to the attention of Radiocommunication Study Group 8.

ANNEX 1

Illustration of fixed service spectrum terminology (see also Recommendation ITU-R F.1399)

FIGURE 1
**Frequency arrangement using sub-bands, frequency blocks and their
relationship to channelization**



Note 1 – Guardbands can occur at any frequency edge in this diagram

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ANNEX 2

Guidance material in connection with the preparation and use of fixed service frequency arrangements based on sub-bands and contiguous frequency blocks, especially for multipoint systems

1 Introduction

The material presented here primarily addresses considerations on P-MP and MP-MP systems as used for fixed wireless access (FWA), but may be more generally applicable to FS systems. These systems generally feature air-side concentration and contiguous cellular (area) deployment arrangements, and it is necessary to take account of the several important similarities with, and differences between, these systems and both conventional P-P systems on the one hand and cellular mobile systems on the other hand.

Specific bands are not discussed in detail in this Annex, and the material is qualitative rather than quantitative. However, an existing large scale FWA application example is described in Annex 3.

Frequency arrangements based on contiguous sub-bands/blocks can facilitate:

- simpler, efficient planning of the spectrum;
- simpler administration of frequency allocations and the accommodation of market/technology evolution;
- faster deployment of new services due to reduced administrative burdens;
- equitable treatment of several operators in a region;
- the encouragement of innovative technologies in a less prescriptive and more flexible regulatory regime (multiple standards, different air interface protocols, technologies, etc.) than is the case for conventional channelization arrangements.

Many of these systems are appropriate for the delivery of Internet Protocol (IP) – or asynchronous transfer mode (ATM) – based communications traffic.

1.1 Guidance on coordination and related issues

Guidance material has been identified as an important requirement for effective use of available spectrum, including intra-system, inter-system, inter-service issues. In due course this will contain information on interference calculation methodology, systems parameters, reference model results for model scenarios, and some information on interpretation (including sensitivities, identification of simplifying assumptions and other factors which may need considering). Sections 2 to 5 present useful considerations on spectrum engineering issues, including frequency plans for geographical co-deployment of FWA systems.

2 Frequency allocation guidance

For co-deployment of FWA systems in the same geographical area, it is necessary to:

- take account of regional or other recommendations on preferred frequency bands for FWA systems;
- allocate sufficient spectrum to enable operators to be competitive; frequency blocks should not be too small to preserve spectrum efficiency since any guardbands must be included, and wherever possible co-sharing¹ should be encouraged;
- take note that generally best spectrum efficiency is obtained by use of contiguous rather than non-contiguous arrangements, taking into consideration systems design and necessary frequency separation issues;
- plan for traffic growth, and to remember that in general one needs contiguous spectrum, although some systems may assist planning in using non-contiguous spectrum;

¹ Equitable, efficient apportionment of the band between operators within the same region/area, not co-frequency sharing normally.