

RECOMMENDATION ITU-R M.1462

**CHARACTERISTICS OF AND PROTECTION CRITERIA FOR RADARS
OPERATING IN THE RADIOLOCATION SERVICE
IN THE FREQUENCY RANGE 420-450 MHz**

(Question ITU-R 226/8)

(2000)

The ITU Radiocommunication Assembly,

considering

- a) that antenna, signal propagation, target detection and large necessary bandwidth characteristics of radar to achieve their functions are optimum in certain frequency bands;
- b) that the technical characteristics of radars operating in the radiodetermination service are determined by the mission of the system and vary widely even within a band;
- c) that considerable radiolocation and radionavigation spectrum allocations (amounting to about 1 GHz) have been removed or downgraded since WARC-79;
- d) that some ITU-R technical groups are considering the potential for the introduction of new types of systems (e.g. fixed wireless access and high density fixed and mobile systems) or services in bands between 420 MHz and 34 GHz used by radars in the radiodetermination service;
- e) that representative technical and operational characteristics of systems operating in bands allocated to the radiodetermination service are required to determine the feasibility of introducing new types of systems;
- f) that procedures and methodologies are needed to analyse compatibility between radars operating in the radiodetermination service and systems in other services;
- g) that propagation and target detection characteristics to achieve these functions are optimum in certain frequency bands, and that 420-450 MHz is particularly useful for very long range (e.g. space) object identification, tracking, and cataloguing by terrestrial radars;
- h) that the frequency bands 420-430 MHz and 440-450 MHz are allocated to the fixed and mobile services on a primary basis and to the radiolocation service on a secondary basis;
- j) that the frequency 430-440 MHz is allocated to the radiolocation service on a primary basis, and to the amateur service on a primary basis in Region 1 and in those Region 2 countries listed in RR No. S5.278 and on a secondary basis in Regions 2 (except for countries listed in RR No. S5.278) and 3;
- k) that there are many alternative and additional allocations, and different categories of service throughout the frequency range 420-450 MHz, with respect to the fixed, mobile, radiolocation and amateur services,

recommends

- 1 that the technical and operational characteristics of the radiolocation systems described in Annex 1 be considered representative of those operating in the frequency range 420-450 MHz;
- 2 that Recommendation ITU-R M.1461 be used as a guideline in analysing compatibility between radars operating in the radiodetermination service with systems in other services;
- 3 that an interfering signal power to radar receiver noise power level, I/N , ratio of -6 dB be used as the required protection level for the radiolocation systems, and that this represents the net protection level if multiple interferers are present (see Note 1).

NOTE 1 – The protection criterion given in *recommends* 3 should not be applied to the space object tracking radars described in Annex 1; these are highly sensitive radars that cannot tolerate the resulting 6% degradation in detection range (corresponding to a 19% loss of surveillance volume). Specialized studies of compatibility with these radars are required.

NOTE 2 – This Recommendation will be revised as more detailed information becomes available.

ANNEX 1

Technical and operational characteristics of radiolocation systems operating in the frequency range 420-450 MHz

1 Introduction

High power airborne, shipborne and ground radars operate in the frequency range 420-450 MHz. Their operational and technical characteristics are described in the following paragraphs.

2 Characteristics of radars in the 420-450 MHz range

Representative characteristics of radiolocation systems in the band 420-450 MHz are provided in the following paragraphs. The information presented in this Annex is sufficient for general calculations to assess the compatibility between these radars and other systems.

2.1 Ground radars

The frequency band 420-450 MHz provides unique characteristics that are ideal for very long range detection, identification, and tracking of objects. Space object tracking and cataloguing are accomplished in this frequency band using very high power (up to 5 MW) transmitter powers and high antenna gains. The radars operate continuously; around the clock and year round. They scan from a surveillance “fence” from around 3° up to 60° in elevation, in 120° sectors in azimuth. The radar receivers are very sensitive in order to detect returns from exo-atmospheric and space objects. Because of their specialized function and requisite design characteristics (e.g. very large antenna arrays) these particular ground radars are not numerous, but because of their sensitivity and function they deserve special recognition and protection. Table 1 gives the characteristics of the radars, and Table 2 gives the identified locations for such radars.