



**UGANDA COMMUNICATIONS COMMISSION
STANDARD FOR PERSONAL MOBILE RADIO IN
THE BAND 446.0-446.2 MHZ
(PMR446)**

Communications for All

TABLE OF CONTENTS

1.0 INTRODUCTION	3
2.0 AMENDMENT OF THE GUIDELINES.....	3
3.0 OBJECTIVES	3
4.0 INTERPRETATION	3
5.0 APPLICABLE LEGISLATIONS AND REGULATIONS	3
6.0 SCOPE	4
7.0 APPLICABILITY AND EXCEPTIONS.....	4
8.0 PMR446 OPERATIONAL REQUIREMENTS	4
8.1 General Requirements.....	4
8.2 Marking and Labelling	5
8.3 Minimum technical requirements.....	5
8.3.1 Standards	5
8.3.2 Spectrum allocation	5
8.3.3 Emission mask	5
8.3.4 Antenna	5
8.3.5 Interference mitigation	6
9.0 REGULATORY CONSIDERATIONS	6
9.1 Authorization	6
9.2 Type Approval requirements	6
10.0 ENFORCEMENT	7
11.0 STAKEHOLDER RESPONSIBILITY	7
12.0 ANNEXES.....	7
Table 1: Minimum requirements for the use of PMR446 equipment.....	7

1.0 INTRODUCTION

Personal mobile radio (PMR) communications is a form of land mobile communication. It is used in the simplex mode of operation, with the same radio frequency channel being used for sending and receiving voice and data messages but without employing any switching mechanisms.

PMR systems conform to two variants, that is analogue and digital both operated in the same band. Both variants are governed by the same operating parameters.

2.0 AMENDMENT OF THE GUIDELINES

The PMR446 guideline shall be subjected to periodic reviews to enable inclusion of any new developments as a result of evolution of the communications industry, changes in policies and regulations as well as established good practice

3.0 OBJECTIVES

These guidelines outline the authorization and operational requirements for Personal Mobile Radio (PMR) systems in Uganda in the frequency band 446.0-446.2 MHz. They further define the minimum technical parameters, and regulatory considerations that shall govern the operation of PMR in the allocated frequency bands in accordance with the Uganda Table of Frequency Allocation (UTFA).

4.0 INTERPRETATION

Communication services: means services performed consisting of the dissemination or interchange of audio, visual or data content using postal, radio or telecommunications media, data communication, and includes broadcasting.

Personal Mobile Radio

Communication: means a terrestrial communication services used on personal basis.

5.0 APPLICABLE LEGISLATIONS AND REGULATIONS

Section 5(1)(c) of the Uganda Communications Act 2013 bestows upon the UCC responsibility to allocate, license, standardize and manage the use of the radio frequency spectrum resources in a manner that ensures widest variety of programming and optimal utilization of spectrum resources. Section 25 (1) of the Act further states that, UCC is exclusively responsible for—

- a) Planning, monitoring, managing and allocating the use of the radio spectrum;
- b) Establishing technical requirements and standards in respect to radio communications apparatus and interference-causing apparatus or any class of that apparatus;

- c) Negotiating with the ITU or its affiliated bodies on matters relating to radio spectrum.

Further, Section 3 and 6 of the Communication (radio) regulations, 2005 further underscore the functions of the UCC regarding spectrum management and planning.

Article 4 proclamation 4.2 (a), (b) and (d) of the UCC Spectrum Management, Guidelines 2017 (Annex 1) re-affirm the UCC's spectrum planning responsibilities.

6.0 SCOPE

These guidelines cover the operation of PMR446 in the frequency range 446.0-446.2MHz in accordance with the UTFA. They further specify the mode of operation of PMR in Uganda.

7.0 APPLICABILITY AND EXCEPTIONS

7.1 Applicability

This guideline will only apply to;

- a) All Personal mobile radio communication operated in the band 446.0-446.2MHz only.
- b) All equipment and accessories that facilitate operation of PMR446.

7.2 Exceptions

These guidelines shall not in any way apply to other variant of personal mobile radio Communication systems operated in other bands.

8.0 PMR446 OPERATIONAL REQUIREMENTS

8.1 General Requirements

- a) All PMR446 systems shall operate on unprotected basis (within the band) subject to not causing interference to other authorized radio communication services in the adjacent band.
- b) PMR systems and device vendors shall be required to be registered and in possession of relevant trading documents.
- c) All PMR devices shall have to be type approved and registered with the Commission.
- d) All PMR446 operations shall be in the designated band.
- e) All PMR446 equipment shall come pre-configured to operate in the designated and as certified upon type approval.

8.2 Marking and Labelling

The equipment shall be marked with the following information.

- a) Supplier/manufacturer's name or identification mark.
- b) The equipment's trade name, model name and serial number.
- c) Other markings such as type approval and compliance label for equipment as required by the relevant standards. The markings shall be legible, indelible and readily visible. All information on the marking shall be in English Language.

8.3 Minimum technical requirements

Technical requirements may include but no limited to standards, spectrum allocation, emission mask, antenna and interference. The minimum requirements in this document are made for reasons related to the effective and appropriate use of the radio spectrum, in particular maximizing spectrum utilization.

8.3.1 Standards

- a) In order to ensure co-existence with other services in the band 400-450MHz, PMR devices shall comply with the maximum Effective Isotropic Radiated Power (EIRP) and Transmitter & Receiver Spurious Emissions prescribed. (For details refer to power limits Annex, table 2).
- b) The authorized EIRP powers are expected to self-limit the transmission coverage of the PMR446 devices.

8.3.2 Spectrum allocation

The frequency band designated for PMR446 is **446.0-446.2MHz**. However, other forms of PMR are operated in other bands as shall be subsequently communicated in respective guidelines.

8.3.3 Emission mask

All PMR446 devices shall conform to the Electromagnetic compatibility requirements as highlighted in the standards and specifications in the Annex below.

8.3.4 Antenna

All PMR devices operated in Uganda in the band 446.0-446.2MHz shall conform to the following antenna characteristics;

- a) Integral (no external antenna socket),
- b) Dedicated (type approved with the equipment).

The UCC shall only authorize (type approved) PMR devices that are designed in such way that no other type of antenna can be used other than the one which was designed and type approved by the manufacturer showing conformity with the appropriate emission level.

This is intended to prevent interference to the licensed radio communication services.

8.3.5 Interference mitigation

All digital PMR446 devices shall be expected to employ Frequency-hopping spread spectrum (FHSS) as a mechanism for mitigating interference.

9.0 REGULATORY CONSIDERATIONS

9.1 Authorization

The approval and use of the PMR446 operations shall be subject to the following terms and conditions;

- a) All PMR446 radio devices shall be type-approved by the Commission.
- b) The Commission shall generate and publish a database for all type approved PMR446 devices.
- c) The use of PMR446 device shall be license exempted unless specified otherwise.
- d) The PMR446 devices must be operated within and must not exceed the technical parameters set out with respect to the frequency band, maximum radiated power, channel spacing, relevant standard, duty cycles and antennas.
- e) The PMR446 devices must not cause interference to any authorized network issued with a radio frequency spectrum authorization.
- f) The use of PMR devices in the license-exempt frequency spectrum shall be on a non-interference and non-protective basis from interference.

9.2 Type Approval requirements

To type approve a PMR device, the following information shall be provided together with a formal application;

- a) Certificate of registration or Incorporation of a company
- b) Company trading License
- c) Complete specifications of the device including.
 - i) Manufacturing Country (Origin)
 - ii) Manufacturing Company
 - iii) Model /Batch No.
 - iv) Operational Frequency Range (446.0-446.2MHz)

- v) Maximum Radiated Power
- vi) Application details / Usability
- d) Copies of manufacturer's technical specifications of the PMR equipment.
- e) Dully paid type approval fees.
- f) Description and declaration of conformity of the measurement facilities where conformity tests were performed and relevant technical documentation in English language must accompany the application for certification. (See type approval guidelines for details)

Upon fulfilling the above requirement, a type approval certificate shall be issued.

10.0 ENFORCEMENT

UCC will undertake the enforcement of these guidelines in accordance with the Communication Act 2013 and Spectrum Management Guidelines of 2017 in case of any breach of any requirements for operations of PMR446 outlined in this document.

11.0 STAKEHOLDER RESPONSIBILITY

Table1 below summaries the identified stakeholders and respective responsibilities;

Table 1: stakeholders' responsibilities

Stakeholder	Role
Uganda Communications Commission (UCC)	1. To provide information/updates on the guidelines 2. To undertake enforcement action against any operations that are contrary to the provisions of the guidelines.
PMR operators	1. To implement this guideline in accordance with its provisions.

12.0 ANNEXES

Table 1: Minimum requirements for the use of PMR446 equipment

Table 1: Minimum requirements for the use of PMR446 equipment		
Mandatory (1-9)		
1	Frequency band(s)	446.0 MHz to 446.2 MHz
2	Radio communication service	Mobile
3	Application	PMR446

4	Channeling	Analogue: Channel spacing:12.5 kHz Digital: Channel spacing:12.5 kHz or 6.25KHz.
5	Modulation / Occupied bandwidth	Single-frequency simplex
6	Maximum transmit power / Power Density	-3 dBW (500mW) ERP.
7	Channel access and occupation rules	Maximum continuous transmission time: 180 seconds
8	Duplex type/separation	TDD
9	Additional essential requirements.	Type approval certification
Informative (11-15)		
11	Frequency planning assumptions	Devices are pre-configured and pre-defined for operation of band 446.0-446.2MHz
13	Standards and specifications	ETSI TS 103 236 EN 300 113-2 EN 301 166-2 EN 300 296-2 ETSI TR 102 335-1 V1.1.2 ETSI TR 102 443
14	Equipment type	Portable-Hand Held