

**UNITED REPUBLIC OF TANZANIA  
TANZANIA COMMUNICATIONS REGULATORY AUTHORITY  
ISO 9001: 2015 CERTIFIED**



**MINIMUM TECHNICAL SPECIFICATIONS**

**FOR**

**RADIO HEARING AIDS**

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## **PART 1: Introduction**

Tanzania Communications Regulatory Authority (TCRA), established under the Tanzania Communications Regulatory Authority Act No.12 of 2003, is mandated among other duties, to license communications and broadcasting operators and type approve electronic communication equipment for use in the United Republic of Tanzania.

Furthermore, pursuant to Regulation 4(1) of The Electronic and Postal Communications (Electronic Communications Equipment Standards and E-Waste Management) Regulations, 2020 empowers the Authority to determine standards for electronic and communications equipment in the country and review them from time to time.

This document is principally intended to provide a revision of the Minimum Technical Specifications for Radio Hearing Aids developed by TCRA in 2018. The revised specifications are based on technological enhancement, which has led to development of new standards for the devices operating as Radio Hearing Aids.

The Authority, therefore, wishes to notify all manufactures, suppliers and importers of devices and/or equipment the revised minimum technical requirements and specifications for Radio Hearing Aids devices.

## **PART 2: Scope and Purpose**

This Specification defines the minimum technical requirements for Radio Hearing Aids which operate in one of the authorised frequencies. Radio Hearing Aids may include devices comprising electro acoustic amplifiers, including a microphone and a loudspeaker and having a frequency response and dynamic characteristics specific to each person's individual hearing loss. This specification focus on portable and inear radio hearing aids which uses radio technologies such as hearing loop and FM.

## **PART 3: Definitions and Abbreviations**

3GPP	3 <sup>rd</sup> Generation Partnership Project
AC	Alternating Current
EMC	Electro Magnetic Compatibility
EU	European Union
FM	Frequency Modulation
ITU-T	International Telecommunication Union standardization sector
PMSE	Programme-Making and Special Events
RF	Radio Frequency

## PART 4: References

For the technical requirements captured in this specification, reference has been made to the following standards. Where versions are not indicated, implementation of this specification shall be based on current and valid versions of these standards published by the respective standards development organizations.

S/N	Reference No.	Title
1.	ETSI EN 300 422-2	Wireless Microphones; Audio PMSE up to 3 GHz; Part 2: Class B Receivers; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU
2.	ETSI EN 300-422-4	Wireless Microphones; Audio PMSE up to 3 GHz; Part 4: Assistive Listening Devices including personal sound amplifiers and inductive systems up to 3 GHz; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU
3.	ETSI EN 301 489-1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements.
4.	ETSI EN 301 489-9	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 9: Specific conditions for wireless microphones, similar Radio Frequency (RF) audio link equipment, cordless audio and in-ear monitoring devices; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU
5.	ETSI EN 303 348	Induction loop systems intended to assist the hearing impaired in the frequency range 10 Hz to 9 kHz; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU
6.	IEC 60118-4	Electroacoustics – Hearing aids – Part 4: Induction loop systems for hearing aid purposes – System performance requirements
7.	IEC 60118-7	Electroacoustics - Hearing aids - Part 7: Measurement of the performance characteristics of hearing aids for production, supply and delivery quality assurance purposes
8.	IEC 62489-2	Audio-frequency induction loop systems for assisted hearing – Part 2: Methods of calculating and measuring the low-frequency magnetic field emissions from the loop for assessing conformity with guidelines on limits for human exposure.

9.	ITU-T H.870	ITU Guidelines for safe listening devices/systems.
10.	EN 50332-3	Sound system equipment: headphones and earphones associated with personal music players - Maximum sound pressure level measurement methodology - Part 3: Measurement method for sound dose management.
11.	ETSI TR 102 791	Electromagnetic compatibility and Radio spectrum Matters (ERM); System Reference Document; Short Range Devices (SRD); Technical characteristics of wireless aids for hearing impaired people operating in the VHF and UHF frequency range

## PART 5: General Requirements

### 5.1 Power supply

- a. Radio Hearing Aids shall be powered by either primary cells of the zinc air type or secondary rechargeable cells. The use of either type of the cell shall not affect the capability of the equipment to meet the requirements of this specification.
- b. Where the rechargeable cells are used, appropriate battery chargers should be provided together with clearly stated instruction for proper use of the cells and the chargers.

### 5.2 Physical design requirements

- a. Radio Hearing Aids shall be designed so that the risk of injury or discomfort to the user is minimized. The external parts of the hearing aids should not have any sharp edges or protrusions.
- b. The individual parts shall be made of durable materials, and designed and finished in a way that minimizes the noise caused by wind and/or physical contact.
- c. The battery compartment shall be designed in such a way that the battery can only be inserted with the correct polarity.

## PART 6: Technical Requirements

### 6.1 RF Requirements

- a. Where applicable, radio hearing aids shall be tested to comply with technical characteristics as specified in standard *ETSI EN 300 422-2* and *ETSI EN 300 422-4*. For induction loop hearing aids, the standard *ETSI EN 303 348* shall be applicable.

- b. Radio Hearing Aids shall operate at frequencies, power and channel spacing specified in table 1 as per *ETSI TR 102 791*.

**Table 1: Frequencies, output power and channel spacing for operating Radio Hearing Aids**

Frequency band	Power	Channel spacing	Notes
100 Hz -9 kHz	120 dB $\mu$ A/m at 10m	Not specified	Radio Hearing Aids made up of Inductive loop systems intended to assist the hearing impaired.
169.4-174 MHz	10 mW e.r.p.	$\leq$ 50 kHz	FM Radio Hearing Aids on a tuning range basis
169.4-169.475 MHz	500 mW e.r.p.	$\leq$ 50 kHz	FM Radio Hearing Aids
169.4875 -169.5875 MHz	500 mW e.r.p.	$\leq$ 50 kHz	FM Radio Hearing Aids

## 6.2 Electro-acoustic specifications

Radio Hearing Aids shall conform to the minimum performance requirements in table 2 as per standard *IEC60118-4*. The measurement should be made in accordance with the standard *IEC60118-7*. The performance requirement specified in Table 2 does not preclude or suggest that performance value in excess of the one listed should not be used as appropriate.

**Table 2: Minimum electro-acoustic performance requirements**

Performance Parameter	Parameter value
Maximum OSPL90	118dB (+/- 4dB)
OSPL90 at 1 kHz	114dB (+/- 4dB)
Maximum full-on acoustic gain	45 – 55 dB
Full-on acoustic gain at 1 kHz	42 dB
Basic frequency response	200Hz to 4500Hz (200Hz to 2000Hz +/- 4dB, 2000Hz to 4000Hz +/- 4dB, on nominal frequency response curve)
Total Harmonic distortion at 70 dB, SPL input	500 Hz < 5% , 800 Hz < 5%, 1600 Hz < 2%
Equivalent input noise level	< 25 dB SPL
Battery Current	$\leq$ 1 mA

### **6.3 Electromagnetic compatibility**

Radio Hearing Aids shall be tested to comply with the EMC requirements as per standards *ETSI EN 301 489-1*, and *ETSI EN 301 489-9*.

### **6.4 Equipment safety requirements**

- a. Equipment safety testing or assessment shall be performed to requirements defined in *IEC/EN 62368-1*.
- b. Where applicable, for safe listening using radio hearing aids, and protection from further hearing loss, radio hearing aids shall be tested to comply with standard *EN 50332-3* and ITU Recommendation *ITU-T H.870 (2018)*.

### **6.5 Human exposure to electro magnetic fields emissions and radiation**

- a. Radio Hearing Aids shall be tested and certified for conformity with *IEC/EN 50566: 2017* standard and ICNIRP guidelines for limiting EMF exposure that will provide protection against adverse health effects.
- b. For audio-frequency induction loop systems for hearing aids, the standard *IEC 62489-2* shall be used in assessing conformity with guidelines on limits for human exposure.

## **PART 7: Testing and Certification Requirements**

Radio Hearing Aids shall comply with this minimum technical specification and other national and international standards accepted and adopted in our country.

## **PART 8: Document Administration**

### **8.1 Amendment**

TCRA may from time-to-time, review, and update or modify this document to ensure its continued service and to meet the international and/or national performance requirements as necessary.

### **8.2 Enforcement**

This document shall comply with appropriate provisions of the TCRA Act, 2003, the Electronic and Postal Communications Act, 2010 and the Electronic and Postal Communications (Electronic Communications Equipment Standards and E-Waste Management) Regulations, 2020 effective from the date it has been published.

### **8.3 Publication**

This document shall be published on the TCRA website <https://www.tcra.go.tz> for public information, compliance and reference purposes.