# **Tron TR30 AIR**

Emergency VHF AM radio
User Manual





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Abbrev	viatons
ADR	European Agreement concerning the International
	Carriage of Dangerous Goods by Road
AM	Amplitude Modulation
ANSI	American National Standards Institute
CE	European Commission
CFR	The Code of Federal Regulations
EMC	Electromagnetic compatibility
EN	European standards
ERM	Electromagnetic compatibility and Radio spectrum matters
ETS	European Telecommunications Standard
ETSI	European Telecommunications Standards Institute
FCC	Federal Communications Commission
GHz	Gigahertz
GMDSS	Global Maritime Distress and Safety System
HW	Hardware
IATA	International Air Transport Association
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IMDG	International Maritime Dangerous Goods Code
IP code	International Protection Marking code
kHz	Kilohertz
MHz	Megahertz
NC	Noise cancelling
PEP	Peak Envelope Power
PTT	Push to talk
RF	Radio Frequency
RID	Reglement concernant le transport International
	ferroviare des meRHandises Dangereuses par chemin de
	fer (Transportation of Dangerous Goods by Train)
RSS	Radio Standards Specification
SAR	Specific Absorption Rate
SINAD	Signal-to-Noise and Distortion ratio

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SMA	Sub miniature version A connector
SOLAS	Safety of Life at Sea
STCW	Standards of Training, Certification and Watch keeping for seafarers
SW	Software
VHF	Very High Frequency

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#### 3 General

Jotron manufactures safety products designed for the search and rescue of human lives and property. For this product to be effective according to the design parameters, it is imperative that it is handled, maintained, serviced and stowed in accordance with this manual.

All information contained within this manual has been verified and is to Jotron's knowledge correct. Jotron reserves the right to make changes to any product(s) or module(s) described herein to improve design, function or reliability, without further notice.



Jotron is not liable and cannot be held responsible for any injury or damages caused directly or indirectly by an error or omission of information, incorrect or misuse, breach of procedures or failure of any specific component or part of this product.

Jotron documentation can be downloaded from <u>jotron.com</u>.

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#### 4 Standards

Jotron declares that this radio is compliant with Radio Equipment Directive 2014/53/EU.

A copy of the declaration of conformity can be downloaded from jotron.com.

The Tron TR30 AIR has been verified, tested and meets the following product standards:

7
Maritime navigation and radio
communication equipment and systems
- General requirements - Methods of
testing and required test results
Technical characteristics and methods
of measurement for fixed and portable
VHF equipment operating on 121,5
MHz and 123,1 MHz.
Electromagnetic compatibility and
Radio spectrum Matters (ERM);
Electromagnetic Compatibility (EMC)
standard for radio equipment and
services.
Part 22: Specific conditions for ground-
based VHF aeronautical mobile and
fixed radio equipment.
Electronic Code of Federal Regulations,
Title 47, Telecommunications.
Electronic Code of Federal Regulations,
Title 47, Telecommunications.
Aviation Services
Radiofrequency radiation exposure
evaluation: portable devices.
Part 2 - Frequency allocations and radio
treaty matters; general rules and
regulations

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enclosures (IP Code).  IEC 62368-1:2018 Audio/video, information	
IEC 62368-1-2018 Audio/video_information	
Addio/video, illioillation	and
communication technolog	gy equipment -
Part 1: Safety requiremen	nts.
IEEE 1528 (2013) Recommended Practice for	or Determining
the Peak Spatial- Average	e Specific
Absorption Rate (SAR) in	the Human
Head from Wireless Comi	
Devices: Measurement Te	echniques.
ANSI/IEEE Std. C95.1 (1999) Standard for Safety Levels	
to Human Exposure to Ra	•
Electromagnetic Fields, 3	kHz to 300
GHz	
EN 50566:2017 Product standard to demo	
compliance of wireless co	
devices with the basic res	
exposure limit values rela	
exposure to electromagn	
the frequency range from	
GHz: hand-held and body	
EN/IEC 62209-1:2016 Measurement procedure	
assessment of specific ab	· ·
of human exposure to rac	
fields from hand-held and mounted wireless commu	•
devices - Part 1: Devices u	
the ear (Frequency range	
6 GHz).	101 300 101112 10
EN/IEC 62209-2 Ed.1(2010) Human exposure to radio	frequency
fields from hand-held and	· · · · · · · · · · · · · · · · · · ·
mounted wireless commu	•
devices - Human models,	
instrumentation, and pro	
2: Procedure to determin	

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	absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz).
RSS-102 Issue 5 Safety Code (2015)	Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

Table 1 GMDSS emergency mode - product standards



This device complies with the provision of part 80 of the FCC rules.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.



Tron TR30 AIR is compliant for localized Specific Absorption Rate (SAR) for uncontrolled environment/general population limits as specified in ANSI/IEEE Std. C95.1-1999.



This class 2 CE approved product is available for sale and purchase in the following countries: Brazil, Canada, China, Europe, Korea, Russia and the United States of America. The relevant CE marking of CEO470 is found on the product and the packaging.



Regulations for the use of VHF radios varies from country to country. Check the national radio requirements for VHF radio operators and ensure this radio conforms to all the local regulations prior to use. The channel frequencies listed in this manual reflect only as they are available and displayed on the radio.

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The following instructions are in accordance with national and international regulations regarding obligations of any radio operator:

STCW 95 including the STCW	The radio log shall be kept in accordance
code (including relevant	with requirements in the Radio
regulation regarding watch	Regulation, SOLAS Convention, national
keeping on board passenger	requirements regarding radio
and cargo ships)	installations and the STCW Convention
STCW Code BVIII/2 No. 32	Unauthorized transmissions and
	incidents harmful interference should, if
	possible, be identified, recorded in the
	radio log and brought to the attention of
	the Administration in compliance with
	the Radio Regulations, together with an
	appropriate extract from the radio log

Table 2 National and international radio operator obligation regulations

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#### 5 Product description

The Tron TR30 AIR is a ruggedly designed radio made for easy operation. It is a portable emergency VHF radio for two-way communication between vessel and aircraft. The radio is possible to operate using one hand, even when wearing gloves. The high contrast graphical display including integrated back lighting of the display and keys are very effective for visibility and usage in low light conditions.

It is also water, oil and sunlight resistant. This radio is compact in size with smooth edges to avoid damage to clothing or a raft.

The Tron TR30 AIR radio is waterproof down to 1 meter and floats in water, battery included. The radio is designed with a self-draining loudspeaker.

The Tron TR30 AIR radio includes the following components:

- Tron TR30 AIR radio
- TR30 Emergency battery (orange)
- TR30 Test battery (black)
- RH-30 battery holder
- Antenna
- Belt clip
- Wrist strap



## **5.1** Product images



Figure 1 Tron TR30 radio

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Figure 2 Tron TR30 in the RH-30 battery charger

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## **6** Functional description

### 6.1 Tron TR30 AIR components

An overview of the radio components.



Figure 3 Tron TR30 AIR components

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Item no.	Item
1	Antenna
2	Volume, squelch and monitor control
3	Loudspeaker
4	Up arrow button
5	Down arrow button
6	Backlight button
7	Emergency mode indicator
8	Frequency indicator
9	Microphone
10	Squelch and signal strength indicator
11	Transmitter power indicator
12	Battery status indicator
13	Volume control indicator
14	Key lock/unlock button
15	Enter button
16	Channel 121.5 button (instant access)
17	PTT transmit button
18	Power button
19	Jack cover (external accessories connector)

Table 3 List of components - Tron TR30 AIR radio

#### 6.2 Antenna

The antenna for the Tron TR30 AIR is fitted with a standard SMA connector.



Ensure you are using the correct antenna. The antenna must be marked with "JOTRON TR30 AIR" along the side.



Figure 4 Illustration: Tron TR30 AIR Jotron approved antenna

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The Tron TR30 AIR is not waterproof when the standard antenna is not attached or if the antenna is not assembled correctly.

#### 6.3 Emergency battery

The emergency battery (orange) is a lithium metal battery.



Figure 5 Tron TR30 Emergency battery (orange)

This battery is specially designed for use in an emergency and cannot be recharged. Keep the emergency battery in the RH-30 battery holder (battery storage bay).



The emergency battery is a single use item. You must replace the batter before the battery expiry date and/or if the protective seal on the battery is broken.

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Always bring a sealed emergency battery with the radio when boarding a lifeboat or life raft.

#### 6.4 Test battery

The test battery (black) is designed to use for test and training.



Ensure you check the battery for damage prior to use.

#### 6.5 Battery endurance

Below is a list of the operation times of the battery and usage.

Battery type	Hours of usage*				
	Standby time (-20°C)	Multi-usage**(-20°C)			
TR30 Emergency battery	70 hours	>20 hours			
TR30 Test battery	60 hours	>20 hours			



- \*The hours indicated are based on 2W (tested at -20°C).
- \*\* Multi-usage hours have been tested in accordance with 10:10:80 ratio (Send:Listen:Standby).
  For more information refer to the ETS 225 standard.

#### 6.6 RH-30 holder

The RH-30 holder is without any electronics or charging capability. This holder has two storage bays, one to store a radio with or without an attached test battery and the second for storing an emergency battery.



The recommended that the test battery always be attached to the radio and stored in the RH-30 holder when not in use. This will not drain the battery when the radio is turned off.





Figure 6 Tron TR30 AIR and emergency battery in storage bays

#### 6.6.1 RH-30 holder components

An overview of the RH-30 holder components.

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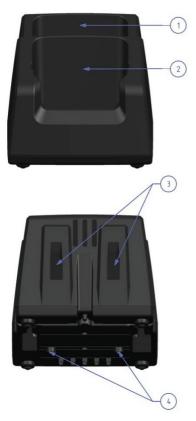


Figure 7 RH-30 holder components

Item no.	Item
1	Battery storage bay
2	Radio storage bay
3	Vertical mounting holes (36mm spacing)
4	Horizontal mounting holes (43mm spacing)

Table 4 List of components - RH-30 battery holder

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#### 7 Installation



The emergency battery should only be installed on the Tron TR30 AIR radio in the event of an emergency.

#### 7.1 Upon receipt of the radio

Upon receipt of the radio, do the following:

- 1. Mount the RH-30 holder (refer to the RH-30 holder mounting section).
- 2. Connect the antenna to the radio.



When assembling the antenna to the radio, ensure you hold it with two fingers at the base. Turn it clockwise. When the antenna starts to resist turning, turn it another ¼ turn (90 degrees).

Holding the antenna anywhere but at the base during assembly will damage it.

3. Using the fixing track, attach the test battery onto the back of the Tron TR30 AIR radio.



Do not force the battery. Ensure that you enter the bottom edge of the battery into the bottom edge of the radio.

- 4. Squeeze the black battery clips om either side of the battery to lock the battery into place.
- 5. Place both the radio and the emergency battery in RH-30 holder storage bays.



The emergency seal sticker must not be removed from the battery unless an emergency occurs.



#### 7.2 Mounting the RH-30 holder

The RH-30 holder can be securely mounted on a flat surface in one of two ways:

- 1. Horizontal mounting
- 2. Vertical mounting

To mount the RH-30 holder, do the following:

1. Use either the two horizontal or the two vertical mounting holes and screw the RH-30 holder to the desired surface.



Place the radio in a location away from direct sea spray, chemicals, oil and vibration.

### 8 Operation instructions

The Tron TR30 AIR shall only be used with a Jotron emergency or test battery. The emergency battery is only for use in an emergency. Use only a test battery for testing or training.



Ensure that the antenna and jack cover are assembled correctly, if not the radio is not waterproof.

#### 8.1 In an emergency



Changing the battery must be done in a dry environment or under shelter as the radio is only waterproof when the battery, antenna and jack cover are correctly assembled.

To install the emergency battery on the Tron TR30 AIR radio, do the following:

1. Pull back and remove the emergency seal sticker on the battery. Ripping the sticker off at the edge.

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2. Using the fixing track, attach the emergency battery onto the back of the Tron TR30 AIR radio.



Do not force the battery. Ensure that you enter the bottom edge of the battery into the bottom edge of the radio.



3. Squeeze in the black battery clips on either side of the battery to lock the battery into place.

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4. Press and hold the power button for approximately 3 seconds to turn the radio on.



5. Push the PTT button to transmit.



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#### 8.1.1 Replacing the emergency battery

If the emergency battery has expired or the battery has been used, it must be replaced with a new one. The emergency seal sticker must not be removed as only a sealed battery can be used in the case of an emergency. A new emergency battery and radio should always be stored together.

#### 8.2 Turning on the radio

1. Press and hold the power button for approximately 3 seconds to turn the radio on.





The radio loads the following settings: Frequency 121.5MHz, High volume and Low squelch

#### 8.3 Channel selection

1. Press the up or down arrow buttons to change the channel.



#### 8.4 Frequency 121.5MHz button

1. Press the 121.5 button to jump directly to the 121.5MHz emergency frequency.

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#### 8.5 Volume adjustment

1. Turn the volume control clockwise to increase and anti-clockwise to reduce the volume.





The volume symbol in the display indicates the volume level. Ensure that you do not press down the volume control while adjusting the volume.

#### 8.6 Squelch adjustment

Squelch adjustment. The squelch bar appears on the screen display indicating the current active sensitivity level. When the bar is adjusted fully to the left, the squelch is completely open. Adjusting the bar to the right lowers the receiver sensitivity. The signal strength of the current channel appears on the bar below the squelch bar. If the received signal is strong enough, the squelch opens and voice is received. This is indicated by the Rx symbol. When the squelch control is pressed twice, it opens the squelch immediately. Press twice to recall the previous squelch setting.

1. Press and turn the squelch control anti-clockwise to increase receiver sensitivity.

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When the receiver signal is too distorted (by radio noise) to be readable, the loudspeaker or speaker mic is automatically muted. This is indicated by the Noise Cancel (NC) symbol that appears in the display.

#### 8.7 Key lock and unlock

1. Press and hold the key lock/unlock button for 2 seconds to lock or unlock the buttons on the front.





A key symbol appears when the radio is locked. PTT, instant access 121.5MHz, volume and squelch are still available when the radio is locked.

#### 8.8 Menus

1. Press the up and down arrow buttons at the same time to enter or exit the menu system.

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2. Use the up or down arrow buttons to navigate and select using enter.



#### Menus:

Exit:	Display screen:
Use this menu option to exit the menu system.	MENU  Exit Settings System

Settings:	Display screen:
Use this menu option to adjust the following settings:  • Key sound	1.0 Settings
<ul><li>Key volume</li><li>Backlight level</li><li>Contrast</li></ul>	<ul><li>Exit</li><li>Key Sound</li><li>Key Volume</li><li>Backlight level</li><li>Contrast</li></ul>

Key sound:	Display screen:
•	· ·

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Use this menu option to choose between four different tones.	1.1 Settings
Using the up or down arrow keys, select from 1-4.	<ul><li>Exit</li><li>Key Sound</li><li>Key Volume</li><li>Backlight level</li><li>Contrast</li></ul>

Key volume:	Display screen:	
Use this menu option to set the volume of the key sound.	1.2 Settings	
(Off=0, low to high= 1-6).	<ul> <li>Exit</li> <li>Key Sound</li> <li>Key Volume</li> <li>Backlight level</li> <li>Contrast</li> </ul>	

Backlight level:	Display screen:		
Use this menu option to set the display backlight level. (Off=0, low=1 or high=2).	1	1.3	Settings
		- ◀	Exit
		1	Key Sound
		2	Key Volume
		3	Backlight level
		4	Contrast

Contrast:	Display screen:		
Use this menu option to set the display contrast level. (Low=1, medium=3 or high=3).		1.4	Settings
		4	Exit Key Sound
		2	Key Volume
		4	Backlight level Contrast

System:	Display screen:
---------	-----------------

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Use this menu option to access the following information:

 Serial number
 SW version
 HW version

2 MENU

2 Exit
1 Emergency test
2 System...

Serial number:	Display screen:	
Use this menu option to find the serial number of the radio.	2.1 Sy	stem
	2 SW	it rial No I version I version

SW version:	Display screen:	
Use this menu option to find the software version of the radio.	2.2 System	
	<ul><li>Exit</li><li>Serial No</li><li>Sw version</li><li>Hw version</li></ul>	

HW version:	Display screen:	
Use this menu option to find the hardware version of the radio.	2.3 System	
	<b>▼</b> Exit	
	1 Serial No	
	2 SW version 3 HW version	
	TIM VOI SIGHT	

#### 9 Maintenance

The following maintenance should be completed.

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This radio must never be disassembled. Unauthorized disassembly will void your warranty.

If the radio is immersed in seawater, rinse it promptly with fresh water. Wash away dirt and oil from the radio using warm water (no higher than 45°C) and mild dish soap. Finish by rinsing with fresh water and drying.



Only wash the exterior of the radio.

#### 9.1 Regular inspection

The lifetime of any equipment depends on how well you take care of it. The Tron TR30 AIR radio is constructed to endure in rough maritime environments. Regular inspection is important to detect error symptoms and prevent potentially serious problems.

To inspect, do the following:

- 1. Inspect the battery connection pins, the gasket and the lock/release mechanism.
- 2. Inspect the housing for defects regularly. Defects can affect water sealing.
- 3. Verify that the antenna and jack cover are assembled correctly, if not the radio will not be waterproof.

#### 9.2 Regular testing

It is important to perform regular testing of equipment to ensure proper operation. This also ensures the radio is in good working order and therefore, ready for use in a potential emergency.



Ensure you have a test battery available for use during testing to avoid using a sealed lithium battery. Testing should occur according to the requirements indicated in the onboard radio log.

To test, do the following:

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- 1. Use the test battery.
- 2. Turn the radio on and choose the 123.1MHz channel. If you are using test equipment connected through the antenna connector then use can use 121.5MHz.
- 3. Verify sending a transmission to another radio.
- 4. Verify receiving a transmission from another radio.
- 5. Turn off the radio.
- 6. If the antenna was off during testing, attach the antenna now.
- 7. Verify that the emergency battery is still valid.



The expiry date is located on the top of the battery.



8. Verify that the emergency battery is still sealed.



If the seal on the emergency battery is broken, replace the battery immediately.

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#### 10 Test and maintenance records

Below is an overview of all test and control details.

Date	B/N/T*	Signature	Inspector name

<sup>\*</sup>B=New battery, N=New Tron 30 AIR radio, T=Test



### 11 Battery safety instructions

#### 11.1 TR30 Emergency battery (orange)

Type: Primary lithium metal

Lithium metal content: Below 1gram lithium pr battery cell

Approximate weight: 100grams

Chemical system: Lithium iron disulfide

Designated for recharge: No

For information regarding the physical and chemical properties, the potential health and safety measures and the environmental effects of the battery used with this product, refer to the manufacturer's safety information documentation.

The safety information is available for download at <u>jotron.com - product</u>. https://jotron.com/product/tron-tr30-air-emergency-vhf-am-radio/.

#### 11.2 TR30 Test battery (black)

Type: Primary lithium metal

Lithium metal content: Below 1gram lithium pr battery cell

Approximate weight: 100grams

Chemical system: Lithium iron disulfide

Designated for recharge: No

For information regarding the physical and chemical properties, the potential health and safety measures and the environmental effects of the battery used with this product, refer to the manufacturer's safety information documentation.

The safety information is available for download at <u>jotron.com - product</u>. https://jotron.com/product/tron-tr30-air-emergency-vhf-am-radio/.

#### 11.3 Handling and storage

This product should be stored in a cool and well-ventilated area. Elevated temperatures can result in a reduction of battery life. Locations that handle

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large quantities of lithium batteries must ensure the batteries are isolated from combustibles. A short circuit for a few seconds will not seriously affect the battery. A prolonged short circuit will cause the battery to lose energy, generate significant heat and can cause the safety release vent to open. The contents of an open battery, including a vented battery, when exposed to water, may result in a fire and/or explosion. Crushed or damaged batteries may result in a fire. A battery that is disassembled or exposed to water, fire or high temperatures can explode or leak causing burns.

#### 11.3.1 Transportation

The product described in this manual is subject to follow special packing instructions and/or transportation regulations. Information regarding these regulations (in accordance with ICAO/IATA, IMDG code and/or ADR/RID) is included in the product safety information (PSI) and/or in the test summary report (TSR) (in accordance with UN test 38.3.5) and available for download at <u>jotron.com - product</u>. https://jotron.com/product/tron-tr30-air-emergency-vhf-am-radio/.

### 12 Technical specifications

#### **12.1** Product specification

Battery type: Lithium iron disulfide

Full buoyancy: Yes

Unit dimensions (W/H/D): 61mm x 157mm x 40mm (dept with belt

clip 47mm)

Weight: Approximately 300g (incl. battery) Temperature operating:  $-20^{\circ}\text{C to } +55^{\circ}\text{C } (-4^{\circ}\text{F to } +131^{\circ}\text{F})$ 

12.2 Receiver

Frequency range, 2 channels: 121.5MHz & 123.1MHz

Modulation: AM Channel spacing: 25kHz

Maximum usable sensitivity:  $< 2 \mu V$  for 12dB SINAD (Typ. 1  $\mu V$ )

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Adjacent channel rejection: > 70dB Spurious response: > 70dB

Harmonic distortion: < 5% (Typ. 2%)

Internal speaker output: > 200mW (Type. 350mW)

Speaker mic output power:  $15 \text{mW} (8 \Omega)$ 

#### 12.3 Transmitter:

Frequency range, 2 channels: 121.5MHz & 123.1MHz

Channel spacing: 25kHz

Transmitter output power: 0.25 W (DC), PEP<1 W

Modulation AM: > 70%

Harmonics and spurious:  $< 0.25 \mu V$ Frequency error: < +/-500 Hz

### 13 Optional accessories

For an overview of the available optional accessories for this product, refer to <u>jotron.com</u>.

#### 14 Spare parts

For an overview of the available spare parts for this product, refer to <u>jotron.com</u>.

#### 14.1 Counterfeit spare parts

Ensure that all spare parts being fitted to this product are only original spare parts manufactured or approved by Jotron.

Any use counterfeit parts will invalidate the product type-approval certificate

### 15 Recycling and disposal

This product should not be disposed as normal waste and must be handled in accordance with the applicable federal, state and local waste disposal regulations in the country where the equipment is used.

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#### **16** Warranty

All Jotron products are warranted against factory defects in materials and/or workmanship during the warranty period.

Refer to the sales terms and conditions for specific warranty information regarding this product.

#### 17 Service

All services such as testing, installation, programming, replacement, marking and battery exchange are provided by an authorized Jotron service agent.

Improper service or maintenance may destroy the functionality and/or performance of this product.

Jotron does not accept any responsibility for the dismantling or reassembling of any Jotron product that occurs externally from a Jotron authorized facility and/or is handled by someone other than an authorized, training and certified person.

### 17.1 Service agents

Refer to  $\underline{\mathsf{jotron.com}}$  for an overview of Jotron partners and distributors.

https://jotron.com/partners-and-distributors/

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## 18 Document revision log

Do	Document revision log				
Rev	Date	Reason for Issue	Author		
Α	09.05.2019	First version of manual.	ØВ		
В	13.12.2021	Updated content, revised text structure in a new documentation design and layout in accordance with new company profile.	WB		

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### 19 Emergency instructions

This is an overview of how to operate a Tron TR30 AIR radio during an emergency.



Figure 8 Emergency instructions overview

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