Introduction	2
Technical specifications	4
Safety precautions	5
Tambourine Ultra	6
Tambourine Ultra CLUTCH	10
Tambourine Ultra TUBE	11
Tambourine Ultra BOOKSHELF SPEAKER	19
Tambourine Ultra SPEAKER	22
Tambourine Ultra MAX	26
For notes	47

In the present day world, it is very important to ensure confidentiality of conversations. Extensive set of security devices is manufactured for this purpose. Their basic principle of operation is based on jamming of the conversation by generating noise. According to the type of noise, most devices can be divided into several types:

- 1. Acoustic;
- 2. Radio-frequency;
- 3. Ultrasonic;
- 4. Combined.

Let's consider in detail every type of generated noise, its advantages and disadvantages.

Acoustic jamming

The basis of jamming audio-recording devices (or microphones) is in generation of an audible noise, which is superimposed on the sound of a conversation such that the final recording contains mostly the noise. The advantage of this type of sound noise is practically complete suppression of human voices in the record. However, this type of acoustic noise strongly interferes during the conversation, because for good suppression level of the noise signal must be the same or higher in comparison to the volume of voices of the people speaking. Therefore, in most cases, it's almost impossible to carry long conversations. As an exception, there are devices, where this disadvantage is minimized by means of using wired headsets used by everyone who is involved in the conversation. However, this implementation is not convenient in use.

Radio-frequency jamming

The source of acoustic noise is radio-frequency radiation, as a rule in the range from 400Mhz to 900 MHz, modulated by a low-frequency signal. The impact is aimed at the elements of printed circuits, wires and components of the circuits, which can act as antennas. Complete absence of extraneous audible sounds can be distinguished among the advantages. The disadvantage is that there is only small number of modern recording devices that can be influenced by this interference (because they are small in size and they are well shielded). They also have high level of radiated power to achieve high-quality signal suppression, which can be unsafe for health.

Ultrasonic

Ultrasonic transducers are the sources of noise, which emit sound waves at frequencies around 25 KHz, which is beyond the audible range, but this noise is still accepted by all types of microphones. Quality of the generated noise signal depends on the number of independent generation channels, number of emitters and type of the modulating signal.

The disadvantages include large variation in the range of suppression for different types of recording devices, clearly expressed direction of the emitted noise and sharp attenuation of suppression if there are obstacles present between the source of suppression and the audio recording device.

The advantages include near-silent noise signal, large number of devices with 100% suppression of recording within the operating range of the transducer, and also the great efficiency, which allows one to make the devices portable.

Combined

These types of devices are designed as a combination of the operation principles described above with their inherent advantages and disadvantages.

This manual presents a set of jamming devices used to suppress recorders and microphones related to the combined type. Principle of construction of these devices is generation of both the ultrasonic and the acoustic noise. In our opinion, this combination of two principles helps to accomplish the most effective resistance to the illegal withdrawal of information by means of sound recorders and hidden microphones.

This manual provides specifications of devices, description of device's operation along with examples of application and installation.

We hope that the provided information will help you to create an effective security configuration.

Parameter	Бубен Ультра	Бубен Ультра КЛАТЧ	Бубен ультра ДИНАМИК/ КОЛОНКА.	Бубен Ультра ТУБУС	Бубен Ультра МАКС
Number of ultrasonic emitters, pcs	6	12	24	12,24	до 192*
Radiation angle of USN, degrees	55	55	55	55,110	до 220
Number of generators of USN, pcs			6		24
Frequency range of USN, KHz			24-26		
Frequency range of VN, Hz			300-10000		
Alteration of the type of USN			No		Yes
Type of emitted noise	complex, time-variable				
Capacity of the amplifier of VN, W	2 2x6; 2x1				2x6; 2x10
Analysis of the power supply USN	Av	vailable			
Operational analysis of USN		f	or each chann	el	
Voltage, V	9 9 10-13 10-13 2			22-26	
Current, not larger than, A	1	1 1 2 2		5	
Autonomous operation	Available Available Optional				
Operating temperature range, C ^O	+5+40				
Relative humidity, not greater than	a 85%				
Overall dimensions, not greater than, mm L x W x H	150x 100x40	220x 130x50	Ø200x65/ 200x200x260	Ø120x280	160x 120x70
Net weight, max, g	450	500	600/4100	950	1150

USN - ultrasonic noise, VN - human voice-like noise;

*- with parallel connection of four devices

SAFETY PRECAUTIONS

It is PROHIBITED to bring the ultrasonic emitters at a distance closer than 70 cm to the ear (when the number of emitters is up to 6), and closer than 120 cm (when the number of emitters is up to 24).

It is PROHIBITED to use the devices by persons under the age of 18 years.

In the devices with built-in rechargeable batteries (due to high energy capacity of rechargeable batteries):

It is FORBIDDEN to make any modifications to the protection circuits and power supply.

It is FORBIDDEN to use the device for unintended purposes.

It is FORBIDDEN to use the device in conditions different from those described in technical specifications.

It is FORBIDDEN to use defective devices.

IMPORTANT!

Study and follow requirements of all provided safety instructions. Before using the device, please study all warnings and perform appropriate actions.

- Do not use aerosols and liquid detergents for cleaning; use only dry fabric.

- Do not install the device near sources of heat such as radiators, heaters, stoves and other equipment that emits heat;

- Protect the device from water and other liquids;
- Take necessary measures to protect the device against lightning strikes and voltage surges;
- Adjust only the control elements described in the manual;
- Use only the original power supplies that came with the device;
- All maintenance operations should be executed only by qualified staff;
- Install the device in accordance with instructions and local regulations and rules;
- Use the auxiliary equipment recommended by the manufacturer;
- Protect all connecting cables from damage, especially at the points of connection.

Tambourine Ultra

FEATURES

- Constant power of ultrasonic noise.
- Portable version powered by two Li-ion batteries with total capacity of 5200 mAh.
- Integrated battery charger with protection against deep discharge and overcharge of the batteries.
- Ability to work from batteries and external adaptor.
- Indication of battery charge level.
- Battery voltage balancing circuit to prolong the service life.
- Increased battery life.
- Battery voltage balancing circuit to extend service life.
- Extended battery life.

PURPOSE

The device is intended for the full or partial suppression of useful sound signal in an attempt to eavesdrop using portable or stationary recorders, special technical means and external microphones, by means of generation of three types of noise signals. Namely:

- Noise in the ultrasonic range, directly influencing the microphone membrane;
- Complex acoustic noise influencing automatic gain control of the recorder, thereby increasing influence of the ultrasonic noise;

- Human voice-like noise with periodic restructuring in time in order to impede its extraction from the useful signal.

BOX CONTENTS

- 1. Device "Tambourine-ultra", 1 pcs.
- 2. Charger, 1 pcs.
- 3. Packaging, set, 1 pcs.
- 4. Operation manual, 1 pcs.
- 5. Stand, 1 pcs.

ADDITIONAL TECHNICAL SPECIFICATIONS

- 1. Type of the built-in battery—Li-ion, 2 pcs., 18650.
- 2. Capacity of each battery 2600мА-hr.
- 3. Built-in battery charger Available.
- 4. Monitor of the battery discharge Available.
- 5. Protection of the battery against overcharging Available.
- 6. Protection of the battery against deep discharge Available.
- 7. Built-in battery voltage balancing circuit Available.
- 8. Current of battery balancing circuit. Not more than, mA 50.
- 9. Protection circuit at external power supply inlet—quick 2A fuse.
- 10. Protection circuit at the battery outlet Available, quick 2A fuse.
- 11. Battery charging current, not more then, mA 500.
- 12. Time of continuous operation with fully charged battery, not less than 4 hours.
- 13. Time of full charging cycle, no more than 10 hours.
- 14. Possibility of interim charging Available.

FIRST SWITCHING-ON

The device is designed to have its battery disconnected when it is shipped from the manufacturer's plant. This measure prevents the device from unauthorized activation during transportation and storage. To disable the protection circuit, connect the power supply (supplied) to the device for 10 seconds, and the device will be ready for operation.

RECOMMENDATION!!!

We recommend you charge the built-in battery using the power supply, when the device is switched on for the first time.

CONTROLS AND INDICATORS

- 1. On/Off button.
- 2. Battery charge indicator.
- 3. Multi-function indicator



- 4. Human voice-like noise On / volume increase.
- 5. Human voice-like noise Off / Volume decrease.
- 6. Power jack.

Turning the device ON and OFF Turn the device on by pressing and holding button 1 for 1 sec. Indicator 3 will glow green (for more details about display modes, see "Status of indicators"). To turn the device off, press and hold button 1 for 1 sec.

Press button 4 to enable human voice-like noise signal. Human voice-like noise will turn on at the



lowest level. Press button 4 to increase volume of the acoustic noise, press button 3 to decrease volume of the human voice-like noise signal. Press button 3 at minimum volume level to turn off the human voice-like noise signal.

DEVICE OPERATION FROM EXTERNAL POWER SOURCE AND RECHARGABLE BATTERY Your device can work both from the built-in battery and from an external power source. When operating from an external power source, device operation and charging of the battery can happen simultaneously. Status of the indicator 2 is described in the chapter "Status of indicators".

Indicator 3 shows the level of battery discharge. When the battery is charged, the indicator glows green. When the battery is discharged down to the remaining 1 hour of operation, the indicator will blink green once per second. When the discharge level is unacceptably low, the indicator begins to flash red and the device will turn off after one minute.

RECOMMENDATION!!!

Try to charge the battery in due time to avoid premature shutdown of the device. Charge the battery when the indicator 3 starts blinking.

STATUS OF INDICATORS

Status	Event	What to expect	What to do?			
	Indicator 3					
Glows green	The battery is charged, the device is ready for use	Completely fit for operation				
Flashing green once per second	The battery is discharged (device will work at most for one more hour	Completely fit for operation	Battery must be charged			
Flashing green color, number of flashes is 1 - 6	Failure of the ultrasonic channel. Number of flashes shows how many channels are malfunctioning.	The device works with the exception of faulty channels	Contact the vendor			
Flashing red color once per second	Battery is discharged to a critical level	The device will turn off in 1 min.	Recharge the battery			
Flashing red color twice per second	Malfunction in secondary converters of ultrasonic emitters	The device will turn off the ultrasonic mode; other modes active.	Contact the vendor			
	Indicator 2	2				
Glows red	Battery is being recharged	Completely fit for operation				
Flashing red color, when the device is turned on	The battery is charging in pulsed mode	Completely fit for operation	Charge the device being turned off			
Flashing red color, when the device is turned off	End of charging event	The battery is not being charged.	See Note 1			

Note 1.

In this mode, charging error is indicated.

The following reasons could cause the error:

- Increased temperature of the battery above the permissible level (it can happen when the device is charged in a hot room or under direct sunlight);

- The batteries didn't finish charging within a fixed timeout period (it usually happens when the batteries are strongly discharged). Disconnect and reconnect the charger.

TAMBOURINE ULTRA, version CLUTCH

FEATURES

- Increased number of emitters: up to 12 pcs.
- Camouflaged design in form of a clutch.
- Two directions of radiation.
- Human voice-like noise function is turned off to exclude unmasking attributes.

Use of the device and status of indicators are identical to the standard device version "Tambourine Ultra".

TAMBOURINE ULTRA, version TUBE

FEATURES

- Constant power of ultrasonic noise.
- Number of emitters 12 and 24 pieces.
- Radiation angle is up to 110 degrees.
- Fully camouflaged.
- Different types of the acoustic fabric.
- Supplied with wired and RF wireless remote control.

The device is completely camouflaged in shape of a cylindrical column, which allows one to hide the built-in piezo-emitters. Frame of the device is covered with an acoustic fabric. You can choose out of the six commonly used options of the type of fabric while ordering the device. For easy connection, there is a one-and-a-half-meter long stranded power cable from the column. All necessary materials needed for installation and connection come with the device.

PURPOSE

The device is designed for full or partial jamming of useful audio signals by means of generation of three types of noises against attempted recording using portable or stationary recorders, special technical means and external microphones. Namely:

- Noise in the ultrasonic range, which directly influences the microphone membrane;
- Complex acoustic noise influencing automatic gain control of the recorder, increasing as a result the influence of ultrasonic noise;

- Human voice-like noise with periodic restructuring in time to complicate its extraction from the useful signal.

BOX CONTENTS

- 1. Device "Tambourine-ultra tube", 1 pcs.
- 2. Power supply, 12 V, 3 A, 1 pcs.
- 3. Power supply cable EU, 1 pcs.
- 4. Wired remote control board, 1 pcs.
- 5. 8-core cable for the wired remote control, meters 2.
- 6. RF remote control, 1 pcs.
- 7. Battery for the RF remote control (27 A, 12 V), 1 pcs.
- 8. Terminal box, 1 pcs.
- 9. Adapter, 1 pcs.
- 10. Packing, set, 1 pcs.
- 11. Operation manual, 1 pcs.

ADDITIONAL TECHNICAL SPECIFICATIONS

	Tube-D 12/55	Tube-D 24/55	Tube-D 24/110	Tube-U 12/55	Tube-U 24/55	Tube-U 24/110
Number of ultrasonic emitters, pcs	12	24	24	12	24	24
Radiation angle of ultrasonic noise, degr	ees 55	55	110	55	55	110
Type of installation	De	esktop		Uni	versal	
Receiver / transmitter frequency of RF remote control	433 Mhz					
Modulation type of RF remote control	ASK					
Chip type of RF remote control	Pt2264, PT2260, PT2262					
RF remote control range, max	3m					

EXTERIOR APPEARANCE. CONTROLS AND INDICATORS FIGURE TUBE-D(U)

Functions of the wires:

Red — power supply (plus 12 V power supply).

Pink —to the on/off button of the device.

White — output to the indicator MODE.

Gray — output to the indicator ERROR.

Purple — to the "volume down" button.

Blue — to the "volume up" button.

Yellow - antenna.

Black - common (power source negative lead).

INSTALLATION AND CONNECTION

Choose location to install the product. While choosing the location in order to ensure best efficiency of the device operation, proceed based on the following considerations:

- The device should be placed between yourself and the place of potential eavesdropping,

- The closer is the device to the place of potential eavesdropping, the more effective the device will be;

- If one requires complete camouflaging of the device, we recommend installing two devices parallel to each other at the edges of the table, so that they look like computer speakers,

- While installing the device, consider the angle of the direction pattern of the emitters. If you require a wider angle, it is possible to use several devices or to install the device with a larger angle of direction pattern,

- Avoid obstacles in the path of propagation of ultrasonic radiation as they reduce the efficiency of jamming.



Axis of radiation of ultrasonic emitters is located opposite to the seam of the acoustic fabric (see figures). Find a place to install the commutation box, wired remote control and power source, considering that the length of the wire from the device is 1,5 meters, and the length of the wire from wired remote control is 2 meters.

Direction pattern of the devides TUBE - N(U)



TUBE- D(U) / 55



Connect the device according to the wiring diagram (see below). In the commutation box and wired remote control fastening of the wires is envisaged with ties. Follow the tips considering the color of the connecting wires in the commutation box and the wired remote control. IMPORTANT! You don't have to use a commutation box and wired remote control while installing and operating the device. It's enough to supply voltage from the power source to the appropriate wires (red and black) and to control the device with RF remote control. Use the adapter and do not forget to isolate individually all the remaining wires. In this case, there is no indication related to the device operation and errors.

<u>IMPORTANT!</u> Yellow wire in the common cable is the antenna for the receiver of the RF remote control. When the wire length is made shorter, one can possibly decrease the operation range of the RF remote control. Maximum range of operation of the RF remote control is given in the technical specifications. In real conditions, it can be even less due to the presence of electromagnetic radiation and reduction of the capacity of the batteries in the RF remote control, as well as the presence of blocking obstacles.



WIRING DIAGRAM OF THE DEVICE "TUBE-D(U)"



WIRING DIAGRAM OF 2 DEVICES "TUBE-D (U)"

ATTENTION! Yellow wires must be insulated and disconnected



FIGURES

Wired remote control Functions of the indicators: MODE - indicator of operation status ERROR - error indicator. Functions of the buttons: POWER - the device is turned on/off. MODE - not used.

- Volume decrease/increase.

RF remote control Functions of the indicators and buttons:

- A Turns device on/off.
- B Not used.

C – Volume decrease of the human voice-like noise.

D — Volume increase of the human voice-like noise.

LED indicator - Lights up when the button is pressed on the remote control and it shows that the remote control unit is functioning.



SWITCHING ON FOR THE FIRST TIME

Plug the adapter into a 220V AC receptacle. Test the operation ability of the device by pressing and holding the «POWER» button on the wired remote control or the button «A» on the RF remote control for 1 second. Green indicator MODE will light up. The device is working. In order to switch the device on and increase the volume level of the human voice-like noise, press the "volume up" button, and, to decrease the volume, press the "volume down" button. When the minimum volume level is reached and the "volume down" button is pressed repeatedly, the human voice-like noise turns off. If all of the above procedures are completed successfully, the device is connected correctly.

Status	Event	What to expect	What to do?		
	Indie	cator MODE			
Glows green	Device is ready for use	Completely fit for operation			
Flashing green, number of flashes is 1-6	Failure of the ultrasonic channel. Number of flashes shows how many channels are malfunctioning.	The device works with the exception of malfunctioning channels	Unplug the device from the electric outlet for one minute, then plug it in again. If the problem persists, contact the vendor		
Indicator ERROR					
Glows red	Malfunction of the secondary converter of ultrasonic emitters	The device will switch off ultrasonic all other modes are working	Contact the vendor		

STATUS OF INDICATORS

PURPOSE

The device «Tambourine Ultra» version BOOKSHELF SPEAKER is designed to protect acoustic information from eavesdropping by means of full or partial suppression of useful audio signal against an attempt to record on Dictaphones, special equipment and various types of microphones by means of generation of two types of noises. Namely:

- The noise in the ultrasonic range, directly influencing the microphone membrane;

- Acoustic pseudo-random signal of the "human voice choir" type to impede its extraction from the useful signal.

FEATURES

- Camouflaged design as the sound system.
- Two types of complex noise signals.
- Complex ultrasonic noise signal in the frequency range from 24 kHz to 26 kHz.
- Human voice-like noise in the frequency range from 300 Hz to 18 kHz.
- Algorithm to analyze each channel of ultrasonic noise with indication of faults.
- Increased distance range of the suppression using proprietary technology.

BOX CONTENTS

- 1. Device "Tambourine Ultra" BOOKSHELF SPEAKER, 1 pcs.
- 2. Loudspeaker (to generate acoustic interferences), 1 pcs.
- 3. Wired remote control, 1 pcs.
- 4. 8-wire cable for the wired remote control, 1 pcs.
- 5. RF remote control, 1 pcs.
- 6. Battery for RF remote control, (27 A, 12V), 1 pcs.
- 7. Packing, set, 1 pcs.
- 8. Operation manual, 1 pcs.

EXTERIOR. CONTROLS AND INDICATORS



- 1. Volume controls.
- 2. On/Off switch.
- 3. Wired remote control jack.
- 4. Status indicator.
- 5. Plug for connection of the loudspeaker.

Functions of the buttons and indicators of wired remote control and RF remote control are described in the section "Tambourine Ultra", version TUBE.

* Dimensions may vary depending on the speaker system

SWITCHING ON FOR THE FIRST TIME

- Connect the loudspeaker to the main unit.
- Connect the wired remote control.
- Set the volume control to the desired level.

- Plug the device into a 220V 50Hz outlet. The device is ready for use

SWITCHING the device ON and OFF

Turn the switch "on/off" on the rear panel of the device. After the switch is turned ON, the device is in the standby mode. To turn on the MAIN operation "silent suppression" mode using the ultrasonic noise, press the button "A" (hold for 1 sec) on the RF remote control or press the "POWER" button on the wired remote control for 1 sec.

To turn on and to adjust the level of acoustic human voice-like noise, rotate the volume controls located in the rear panel of the main unit and/or by pressing the buttons "D" and "C" on the RF remote control unit.

Status	Event	What to expect	What to do?
Glows green		Fully working	
Flashing green	Faulty ultrasonic channel	The device works except for the faulty channels	Contact the vendor
Flashing red twice per second	Fault of secondary converter of ultrasonic emitters	Прибор отключит УЗП. Все остальные режимы работают полностью	Contact the vendor

STATUS of INDICATORS

Status of indicators of wired remote control and RF remote control are described in the section "Tambourine Ultra, version TUBE"

Tambourine Ultra, version SPEAKER

PURPOSE

The device «Tambourine Ultra SPEAKER» is designed to protect acoustic information from eavesdropping by full and (or) partial suppression of useful sound signal against attempted recording using recording devices (like cell phones, tablets, etc.) radio and wired special technical tools and various types of microphones by means of generation of noise signals of two different types in the ultrasonic range, directly influencing the microphone membrane.

BOX CONTENTS

Device «Tambourine Ultra SPEAKER», 1 pcs.
Power supply 12V, 3A, 1 pcs.
Power cable, 1 pcs.
Wired remote control, 1 pcs.
-8-wire cable for wired remote control, 1 pcs.
-RF remote control, 1 pcs.
-Battery for the RF remote control (type 27A, 12V), 1 pcs.
Commutation box, 1 pcs.
-Adapter, 1 pcs.
-Packing, 1 pcs.
Operation manual, 1 pcs.

FEATURES

- Camouflaged design as a ceiling public announcement system speaker.
- Complex ultrasonic noise in the frequency range from 24 kHz to 26 kHz.
- Human voice-like noise in the frequency range from 300Hz to 18 kHz.
- Multistage algorithm for analysis of each ultrasonic channel with indication of malfunction.
- Increased range of suppression using proprietary technology.

EXTERIOR APPEARANCE. CONTROLS AND INDICATORS.

Functions of buttons and indicators of the wired remote control and RF remote control are described in the Section "Tambourine Ultra", version TUBE.

Switching the device ON AND OFF In order to activate/deactivate the "silent suppression" mode by using the ultrasonic noise, press the "POWER" button on the wired remote control for 1 second or press the button «A» on the RF remote control unit for 1 second.





STATUS of	INDICATORS

Status	Event	What to expect	What to do?	
	Inc	licator MODE		
Glows green	Device is ready for use	Completely fit for operation		
Flashing green, number of flashes 1-6	Failure of the ultrasonic channel. The number of flashes shows how many channels are malfunctioning.	The device works with the exception of the malfunctioning channels	Unplug the device from the electric outlet for one minute, then turn on again. If the problem persists, contact the vendor.	
Indicator ERROR				
Glows red	Malfunction of the second-stage converter of ultrasonic emitters	The device will switch off the ultrasonic.	Contact the vendor	

Status of indicators of the wired remote control and radio channel remote control is described in the section "Tambourine Ultra", version TUBE.





WIRING DIAGRAM OF 2 DEVICES "SPEAKER"



ATTENTION! Yellow wires must be insulated and disconnected

Tambourine Ultra MAX

FEATURES

- Constant power of ultrasonic noise.
- Largest number of connected emitters up to 192 pieces, when four main units are connected.
- Use of different emitter types:

Camouflaged as a ceiling speaker system, as a tube and there is a possibility to camouflage it as any other subject.

- Four types of ultrasonic noise (hereinafter USN) selected by the user based on the operation conditions.
- Flexible selection of the number of USN channels.
- Four channels of the low frequency amplifier (hereinafter LFA) for the output of human voice-like noise.
- Possibility to emit human voice-like noise into loudspeakers, acoustic emitters of different types, piezoelectric and electromagnetic vibro-acoustical emitters.
- LFA gain control in each channel.
- Powering two LFA channels from external power source to ensure operation with any load.
- Overvoltage and undervoltage protection in the power supply.
- Overcurrent protection at the power supply.
- Overcurrent protection at the output of the LFA.
- Protection at the ultrasonic noise output with display of the fault in the LED indicator for each channel.
- Built-in power supply with regulated voltage (12V, 1A) to power auxiliary equipment.
- "Open collector" output type to control auxiliary equipment.

PURPOSE

The device is intended for complete or partial suppression of useful audio signal in case of an attempt to record with recorders, special technical means, microphones by means of generating three types of acoustic interferences. Namely:

- Acoustic interference in the ultrasonic range, directly influencing the microphone membranes.

- Complex acoustic noise influencing automatic gain control of the recorder, thereby enhancing influence of the ultrasonic noise;

- Human voice-like noise with periodic restructuring over time to impede its extraction from the useful signal.

It can also be used as a generator of human voice-like noise with output of the noise to piezoelectric and electromagnetic vibro-acoustic emitters in order to protect against eavesdropping through the building walls, windows, radiators, floors etc.

BOX CONTENTS
Device «Tambourine Ultra MAX», main unit, 1 pcs.
Power supply 24V, 5A, 1 pcs.
Power cable EU, 1 pcs.
Wired remote control unit, 1 pcs.
*8-wire cable for the wired remote control, 1 pcs.
*RF remote control unit, 1 pcs.
Battery for the RF remote control, 1 pcs.
*4-pin Connector, 12 pcs.
*2-pin Connector, 6 pcs.
*Packing, set, 1 pcs.
*Operation manual, 1 pcs.

ATTENTION!!! Emitters of ultrasonic, acoustic, piezoelectric and electromagnetic types are sold separately.

ADDITIONAL TECHNICAL SPECIFICATIONS

Parameter	Main Unit
Number of ultrasonic emitters, pcs	Up to 48
Angle of radiation of USN, at the level of -6 Db	Depends on the type of emitters, up to 220
Output power of LFA1, W	20
Output voltage of LFA1, V	48
Load impedance at the output of LFA1, not less than, Ohm	6
Class of the amplifier	Class D
Output power of LFA2, W	12
Output voltage of LFA2, V	Two voltages*
Load resistance at the output of LFA2, not less than, Ohm	6
Class of the amplifier	Class D
Power supply voltage of the LFA2, V	from 9 up to 32
Type of fastening and installation	Wall mounting, possibility of mounting on a DIN rail
Receiver/transmitter frequency of RRCU	433 Mhz
Modulation type of RRCU	ASK
Chip type of RRCU	Pt2264, PT2260, PT2262
Range of operation for RRCU, max	5m

USN – ultrasonic noise; RRCU – RF remote control unit; LFA1 – low frequency amplifier #1; LFA2 – low frequency amplifier #2.

* Two voltages supplied to the connector «POWER to low frequency amplifier #2».

EXTERIOR APPEARANCE



Height H=70mm

INDICATION POWER ON – device operation indicator

ERROR CHx EMITTER – malfunction indicator of the output of the xchannel of ultrasonic noise. The first indicator on the left corresponds to "Output 1", and the last indicator on the right – "Output 6". Glowing LED indicates an error.

CH POWER ERROR – malfunction indicator in the secondary power supplies of the of ultrasonic noise channels. Glowing LED indicates an error of the corresponding channel.

ERROR AMPLIFIER #1 malfunction indicator of the low frequency amplifier #1.

Glowing LED indicates that the low frequency amplifier #1 is off and (or) amplifier output protection circuit was tripped.

ERROR AMPLIFIER #2 malfunction indicator of low frequency amplifier #2. Glowing LED indicates that the low frequency amplifier #2 is off and (or) amplifier output protection circuit was tripped.

CONTROLS OF LOW FREQUENCY AMPLIFIER

First, set the desired gain for each amplifier using the jumpers "Maximum gain of the low frequency amplifier #1 (low frequency amplifier #2)". Then, when necessary, make gradual adjustment for each channel using fine tuning potentiometers «Gain control for the right (left) channel of the low frequency amplifier #1 (low frequency amplifier #2) ». Rotating the potentiometer clockwise corresponds to gain increase.





30



SETTING THE NUMBER OF ULTRASONIC CHANNELS AND SHAPE OF NOISE SIGNAL

We recommend setting the jumpers "Number of active channels of ultrasonic noise" according to the connected channels of ultrasonic noise before installing the device. If there is no load on the switched channel of ultrasonic noise the device will generate the error message on indicators ERROR CH2 (3, 4) EMITTER and on the wired remote control panel. The device "Tambourine ultra MAX" allows for flexible configuration of the shape of ultrasonic noise signal, depending on the number of connected ultrasonic emitters and the size of the room. Switching between shapes of ultrasonic noise signal is accomplished by installing jumpers "Selecting signal of ultrasonic noise". Various features of signals are described below. Signal 1 — identical noise signals are generated in a wide frequency range at the outputs of the "Channel 1 — Channel 4". This noise has large level of suppression. The disadvantage of such signal is that it is audible in the audio-frequency range. It is recommended for use in large rooms with walls built of non-reflective materials.

Signal 2 — identical noise signals are generated in a narrow frequency range at the outputs of the "Channel 1 — Channel 4". This noise has lower level of suppression, but the advantage of its use is its practically silent operation. It is recommended for use in small rooms with walls made of materials with higher reflectivity.

Signal 3— Noise of the "Signal 2" type is generated at the outputs "Channel 1, Channel 2". It is recommended to connect ultrasonic emitters of the type TN and TU to these outputs. Noise of the "Signal 1" type is generated at the outputs "Channel 3, Channel 4". It is recommended to connect ultrasonic emitters of the type D to these outputs.

Signal 4 — Different noise patterns are generated on different channels; thus 24 frequency components are always present in the spectrum, which significantly increases the probability of suppression. Signal 4 is recommended for use when the device is used with ALL ultrasonic emitters connected.

FUCTIONS OF CONNECTORS OF THE MAIN UNIT



CHANNEL 1 (2, 3, 4) of ultrasonic noise — output of the first (second, third, fourth) generator of ultrasonic noise. Ultrasonic emitters of the type TN, TU, D are connected to these outlets. One channel can be loaded with 12 ultrasonic emitters.

Output 1 — output 6 — outputs for connection of ultrasonic emitters.

Common - Common wire to connect ultrasonic emitters.

Low frequency amplifier #1 (#2) — Output of low-frequency amplifier 1 (2). Human voice-like noise is sent to these outputs. Supply voltage of the low-frequency amplifier #1 is fixed and it is equal to the power supply voltage of the main unit (24 V). Supply voltage of the low-frequency amplifier #2 is brought out to the connector "Connection for auxiliary equipment"; it can be used to connect emitters with different operating voltages. Supply voltage of low-frequency amplifier #2 may be in the range of 9 V to 32 V.

Channel L+, Channel L- (Channel R+, Channel R -) - connectors to connect acoustic, vibro-acoustic and piezoelectric emitters. This outputs are differential, and the load is connected to both connectors.

Wired remote control - connector for the wired remote control. Designations of the pins in the connector coincide with designations of the pins of wired remote control connector.

LED-G – output to control the MODE LED.

VOL+ – input from the button that increases volume VOL+.

 ON_OFF – input from the button that turns the device power on. If you press and release the button, the device will be turned on; if you press and release it repeatedly, the device will turn off.

ON_OFF2 – input responsible for turning the device on/off. When voltage between 5V and 12V is detected on this input, the device turns on; when this voltage is switched off, the device will turn off. This input is auxiliary and is not available on the wired remote control. This input duplicates the function of the ON_OFF input, but it works in a different mode. LED-R – output to control the ERROR LED.

VOL - - input from the button that increases volume VOL-.

MODE – input from the MODE selection button of the device. Modes of operation of the device are described below in the section "Functions of the buttons of wired remote control". Common (GND) – common wire for outputs of this connector.

CONNECTION OF AUXILIARY EQUIPMENT

Auxiliary signals are brought out to this connector.

Control - output signal of the "open collector" type. This output is connected to the common wire depending on the operation mode of the device. Maximum input voltage is 24 V, maximum commutation current is 1000 mA.

Common — common wire for inputs/outputs of this connector.

12V Output - regulated 12 V, 1000 mA output to power auxiliary equipment and(or) the low-frequency amplifier #2.

ATTENTION!!! There is no over-current and short-circuit protection at this output.

Power supply to the low-frequency amplifier #2 — input of positive voltage to power the "low frequency amplifier LFA2". Range of the power supply voltage is from +9 V to +32 V. In absence of the power supply voltage while turning the "low-frequency amplifier #2" on, there will be no noise signal on the output "LFA2".

ATTENTION!!! This input has no protection of the power supply against reversed polarity and no overcurrent protection.

POWER 24 V, 5 A - this input is to connect a power supply. It has a built-in protection against reversed polarity and overcurrent protection (4.2 A).

INSTALLATION AND CONNECTION

1. Decide how many channels of ultrasonic noise will be used and set the jumpers "Number of active channels of ultrasonic noise" accordingly.

2. Decide which shape of the signal of ultrasonic noise will be used, and set the jumpers "Choice of the wave shape for ultrasonic noise" accordingly.

3. Decide whether acoustic and vibration-acoustic emitters will be used in your system. If so, then set the jumper "Maximum gain of the low frequency amplifier #1 and low frequency amplifier #2" to the minimum gain level;

4. Decide whether the low frequency amplifier #2 will be used in your system. If so, then apply the voltage in accordance with the "Wiring diagram of power supplies connection to the low frequency amplifier #2" and the parameters of connected sensors.

5. ATTENTION!!! Maximum output voltage of the LFA1 and LFA2 is twice as high as the power supply voltage. For the LFA1, the maximum output voltage is equal to 48 V.

6. Make choice of the installation site taking maximum length of the cables into consideration.

Function	Device connector	Wire cross- section, mm ²	Maximum wire length, m
Voltage	Power 24V, 5A	1,5	2
Ultrasonic emitters	Ch.1 USN - Ch. 4 USN	0,52	30
Acoustic emitters with input ransformer (ceiling loudspeakers)	LFA1, LFA2	0,75	15
Acoustic and vibro-acoustic emitters	LFA1, LFA2	In accordance with user manual	In accordance with user manual
Connection of RRCU	RRCU	0,52	30
Connection of auxiliary equipment	Connection of auxiliary equipment, output 12V 1A	0,75	15
Power to the low frequency amplifier #2	Connection of auxiliary equipment, power to the LFA2	1,5	2

7. ATTENTION!!! Range of action of the RF remote control is limited by environmental conditions and it is not greater than 5 meters from the main unit.

8. Install the main unit leaving free space around the perimeter of at least 20 cm for air circulation and sufficient cooling.

9. Install the required power supplies.

10. Install emitters and miscellaneous equipment.

11. Lay the wires and connect equipment in compliance with the wiring diagrams.