
# RX6 Receiver

Installation, Commissioning and Maintenance

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This note applies to the RX6 receiver, the CS range of power supplies and chargers and the DS range of docking stations. These notes describe the installation of the system into a fitness studio, though it is applicable to many other situations.

# Introduction - RX6 Receiver

The RX6 is a 16 channel stereo UHF radio receiver designed as part of the Audeon wireless audio system. It receives frequency modulated radio signals with Zenith-GE stereo encoding in the 864 MHz ISM band and in TV channel 69 (854 MHz to 862 MHz). Production of the RX6 receiver commenced in June 2005.

The RX6 has facilities to enable the installer to reassign the channel frequency allocation and to reduce the number of available channels which are received. This new facility will allow the reception of signals from the single channel transmitters where the frequency allocation requires non harmonically related carriers.

## Operating the receiver

Connect a suitable pair of headphones to the 3.5mm jack socket. Switch the receiver on by turning the on/off switch and volume control clockwise. The display will be illuminated and the message “H E L L O” will be displayed followed by a “1" indicating the first channel to be selected. Rotation of the volume control will increase the sound in the headphones. Avoid increasing the volume control before wearing the headphones as the program content may be very loud and uncomfortable.

# Installation of the system

## Initial testing

After the successful installation of the transmitter (see appropriate instructions for either the MCTX or the SCTX), test the reception with an RX6 receiver. All the receivers are despatched from the factory fully charged, so a walkabout test can be performed throughout the venue before they are attached to a machine. Check for range, weak signal strength and dead spots. Any problems at this stage should be addressed and the transmitter

aerial re-sited if required. You should expect to have a minimum 90% coverage in most venues but metal pillars and similar objects which are in direct line of sight will obstruct the radio signals

# Installing the Receivers

The receivers are supplied with the internal jumper link set to 8 channel operation unless the installer has requested a different frequency plan. The PIC microcontroller which is inside the receiver has the software version indicated on its label and it is also displayed following the "HELLO" message. Before connecting to the power supply check that the receiver works correctly.

Changing the number of channels from the standard 8 channel frequency plan to the standard 16 channel plan can be done either in hardware or software.

# Changing the Frequency Plan in the Hardware

To change from the standard 8 channel to 16 channel operation, open the receiver by unscrewing the two small pozi drive screws, then the case can be gently pulled apart to reveal the electronic PCBs. The main receiver PCB designated RX610 has the volume control with the jumper link (JP1) adjacent to it. Move the jumper link down so that the two pins are not connected then fasten the two halves of the receiver back together making sure that the boards locate together correctly. Test the operation of the receiver before connecting it to the charger & power supply.

# Entering the Software Programming Mode

Upon switch on of the receiver the installer will need to access the programming mode by holding down the channel select switch whilst the HELLO message is displayed until the flashing letter "P" appears. After displaying the letters "H E L L O" followed by a "1" (the software version) a flashing letter "P" (for programming mode) will be displayed. The receiver is now in programming mode and the letter "A" is displayed. Pressing the channel select button will cycle through the three menus "A" "L" and "C". Holding the channel select button down whilst one of the letters is displayed will allow the installer to select options from that menu.

Selection of the required frequency plan is achieved by using one of the three menus.

## Menu "A" Alternate Frequency Plan

Selecting this menu will enable the installer to easily select a number of popular pre defined frequency plans. These are designed for the lowest intermod when using single channel transmitters in an installation. Please note that to avoid crosstalk and intermodulation we do not recommend using single channel transmitters on more than 4 frequencies within the licence free band (863MHz to 865 MHz). The frequency assignments for these plans are shown in appendix ii.

When "A" is displayed hold the channel select button down until "-" is displayed, release the button and a "1" is now displayed. To select this as the required frequency plan press the channel select button until "F" (finish)

is displayed. The plan for selection 1 has now been written to the EEPROM along with the last channel number to be displayed (in this case a 1. Switch the receiver off and the new frequency plan will be effective when the receiver switched on. Do not hold the channel select button down on whilst HELLO is displayed unless you wish to re-enter the programming mode.

The selection can be easily changed back to the standard frequency plan using menu "C" (see "C" to clear selection), or reprogrammed with an alternat plan "A" or placed in learn mode "L". To select a new frequency plan from those in appendix ii proceed as above. On switch on hold the channel select button down until "P" flashes, select "A" and hold until the "-" appears. Now select the required new frequency plan. This time choose the 4 channel plan which will reallocate the standard frequencies allocated to channels 1, 3, 6 and 8 to a new plan where they will be channels 1, 2, 3 and 4. Press the channel select button until "4" is displayed, then hold the button down until "F" for finish is displayed. The EEPROM has now been updated with the new plan, the number of channels selected has been saved as 4 and the flag has been reset for frequency plan no 4.

## Menu "L" Learn a new plan

This menu will allow the installer to create a frequency plan to suit the venue. Sometimes frequencies are required in TV channel 69 and others in channel 70. This is often the case where radio microphones are in use on the same site. Hold the selector button down when "L" is displayed until the "-" is displayed. Release the button and "1" is displayed. Frequencies which are not required are deleted from the frequency plan so assuming that frequencies allocated in the standard frequency plan (appendix i) for channels 2, 4 and 16 are to be deleted press the selector button once so that "2" is displayed. Now press the button until "E" (erase) flashes. When the "E" stops flashing the next channel number (3) will be displayed and the receiver has removed channel 2 from the frequency plan. The number 3 is now showing on the display, you require this frequency so press the button once so that the number 4 is displayed. Channel 4 is not required so press the button until "E" (erase) flashes. When the "E" stops flashing number 5 will be displayed. Channels 5 to 15 are required so press the button once for each of these. At channel 16 which is not required hold the button down until "E" flashes. When "E" stops flashing the number 17 will be displayed for a short time followed by "F" (finish). The new frequency plan has been written to the EEPROM, the last channel number has been set for the new total of required channels and the flag has been set inside the receiver to indicate that a new frequency allocation has been set. Turn the receiver off, then switch it on again to check the new frequency plan. You will have a total of 13 channels which have been reallocated to the frequencies which were not deleted in ascending order.

To change the channels to a different plan repeat the above learn mode "L" or use the allocation mode (A) or the clear mode to return to the standard frequency plan.

## Menu "C" Clear selections

This menu allows the installer to quickly reset the channel frequency plan to the standard frequency plan. Hold the selector button down whilst "C" is displayed until "-" is displayed. Release the button and "F" (finish) is displayed. The EEPROM has been reset to the original settings. Switch the receiver off and when you switch it on again the original factory settings will be restored.

# Other facilities

## Hours Used Counter

The receiver will record the total time that the unit has been operating which is useful for service and determining the battery life. We estimate that the battery life is in the order of 10,000 hours but there is insufficient data to be certain. After 10,000 hours use the display will change on start up to show a pattern before the “HELLO” message and “H” will be displayed after the hello message. After 12,500 hours of use a “U” will be displayed following the “H”. These displays will not affect the operation of the receiver when in use but do indicate that a service is required. When the batteries are replaced the hours counter will be reset as part of the service. The hours counter can count up to 640,000 hours!

## Switch On Counter

This counter will record the number of times the receiver has been switched on so that we can determine how much use the receiver has had. It can only be read at the factory during a service.

## Headphone Disconnect Counter

This counter records the number of times the headphones have been removed when the receiver is switched on. Like the Switch On Counter above it will provide information on the receivers use and can only be read at the factory.

## 40 Minute Timer

The information for this timer is stored in the EEPROM and the timer can be changed so that the receiver will run for up to a maximum of 80 minutes before switch off. This timer can only be changed at the factory.

## Software Version

The current software version is indicated following the “HELLO” message. For version 1 software a “1” is displayed so you may not notice this before the first channel is displayed.

# Fastening the receiver to the power supply cradle

The RX 6 receiver clips into the charger & power supply cradle. The belt clip will locate inside the power supply and can only be released using the special release key supplied. Following the installation of the receiver into the charger & power supply cradle check the operation of the receiver. Signals should be received on all channels. Unplug the headphones and check that the receiver goes into standby mode after approximately 2 minutes, when the sound is muted and the display will turn off. The receiver will operate and return to the state it was in before the headphone lead was removed as soon as the headphones are re connected or the channel select button is pressed once. The receiver will switch off after 40 minutes use to save the battery in case it has

been left on with the headphones plugged in. To restore the receiver press the channel select switch once and it will return to the state it was in before the 40 minute timer operated.

The installation procedure should be repeated for all of the receivers.

## Release Keys

Leave a suitable number of release keys for the operator to remove the receivers from the power supply if required. Caution; If you leave too many release keys the staff will assume that the receivers are to be removed and changed round.

## User maintenance

The venue staff should be instructed on how to operate the receivers and chargers and how to do simple maintenance. The receivers should be cleaned after use with a damp cloth to remove any sweat and to stop a build up of bacteria. Occasionally the receivers should be removed from their power supplies and both should then be cleaned with a damp cloth and dried with a dry cloth, to prevent the build up of bacteria and germs. The receivers should be checked once a week for flat batteries or a malfunction.

The batteries will not require charging in normal operation (unless the installation uses a docking station) and should not need to be moved around the gym. In the case where some receivers receive heavy usage the operator may wish to rotate them to even out the wear and battery usage over a long period of time. If the receiver has a flat battery it will work once the machine is operated (1 to 2 second delay). If it fails to start then the most likely fault is that the power is not being supplied from the machine, check that power is available from the CSAFE outlet.

The headphone lead is also the aerial and reception will depend on the lead being in good condition. Deterioration of the headphone lead will cause poor reception and crackling in the headphones and will require changing approximately every three months depending on use. You should demonstrate to the staff how to change the headphone lead and offer to leave some spare ones. You should also explain that the headphone lead is a consumable item and therefore does not have a warranty.

## Spare parts

Spare headphone leads, knobs and release keys are available from the manufacturer, we suggest that you leave a price list with the operator.

## Service

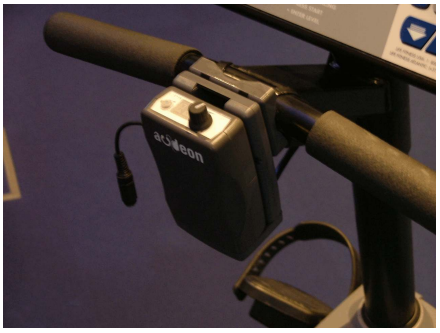
In the UK Audeon has a dedicated service line (0113 252 5582) to coordinate maintenance and repairs of Audeon equipment. The operator should be made aware of the benefits of expert advice and support. The telephone line is staffed by experienced engineers who are familiar with the Audeon range of products. They can

provide advice, on line help and will arrange for maintenance from you, the dealer, if required. A poster is provided with the help line telephone number for display on the staff notice board.

# User Instruction

Before leaving the installation ensure that the staff are;

familiar with the system.
know about it's features and benefits.
they can demonstrate it to the users.
they know how to maintain it and keep it clean.
they can change the headphone lead.
they know how to obtain service for the system.

## Appendix I Standard Channel Plan - Radio Frequencies

ISM licence free band UHF channel 70

| | |
|---|---|
| Channel 1 | 863·10 MHz |
| Channel 2 | 863·35 MHz |
| Channel 3 | 863·60 MHz |
| Channel 4 | 863·85 MHz |
| | |
| Channel 5 | 864·10 MHz |
| Channel 6 | 864·35 MHz |
| Channel 7 | 864·60 MHz |
| Channel 8 | 864·85 MHz |

TV channel 69 (licence required from JFMG in UK)

| | |
|---|---|
| Channel 9 | 854·60 MHz |
| Channel 10 | 855·90 MHz |
| Channel 11 | 856·90 MHz |
| Channel 12 | 857·60 MHz |
| | |
| Channel 13 | 858·70 MHz |
| Channel 14 | 859·30 MHz |
| Channel 15 | 860·20 MHz |
| Channel 16 | 861·00 MHz |

## Appendix ii Reallocation of channels - Alternate Frequency Plans

The selected frequencies (channel numbers) refer to the channel numbers and their associated frequencies in the standard frequency plan (appendix i)

| Plan No. | Frequencies selected | Last Channel No. |
|---|---|---|
| 1 | 1 | 1 |
| 2 | 1 & 3 | 2 |
| 3 | 1, 3, & 6 | 3 |
| 4 | 1, 3, 6 & 8 | 4 |
| | | |
| 5 | 1, 2, 4, 6 & 8 | 5 |
| 6 | 1, 2, 4, 5, 6 & 8 | 6 |
| 7 | 1, 2, 3, 4, 5, 6 & 7 | 7 |
| 8 | 1, 2, 3, 4, 5, 6, 7, & 8 | 8 |
| | | |
| 9 | 1, 2, 3, 4, 5, 6, 7, 8 & 9 | 9 |
| 10 | 1, 2, 3, 4, 5, 6, 7, 8, 9 &10 | 10 |
| 11 | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 &11 | 11 |
| 12 | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 &12 | 12 |
| | | |
| 13 | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 & 13 | 13 |
| 14 | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 & 14 | 14 |
| 15 | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 & 15 | 15 |
| 16 | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 &16 | 16 |