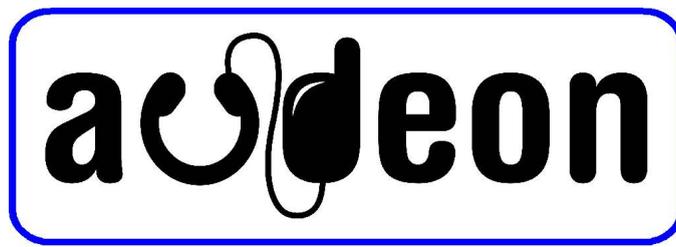


RX7 Receiver

Installation, Commissioning and Maintenance



RX7 Receiver

Installation, Commissioning and Maintenance

This note applies to the RX7 receiver and describes the installation of the system into a fitness studio, though it is applicable to many other situations.

Introduction - RX7 Receiver

The RX7 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 RX7 receiver commenced in September 2006.

The RX7 has facilities to enable the installer to reassign the channel frequency allocation and to reduce the number of available channels which are received. This 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. If the display is not already lit, the unit will switch on when the exercise equipment is in use. The display shows the channel selected. Pressing the up arrow underneath the display increments the channel number, until all channels have been selected when it returns to channel '1'. Pressing the '+' and '-' buttons will increase or decrease the volume. Avoid increasing the volume control before wearing the headphones as the sound 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). Because the RX7 does not have an internal battery you will need to test the reception with the receiver connected to exercise machines in a number of locations around the gym. 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.

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 three small pozi drive M2.5 screws, the case can then be gently pulled apart to reveal the electronic PCBs. The main receiver PCB designated RX710 has the jumper link (LK1) in one corner. Remove the jumper link 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.

Entering the Software Programming Mode

When first connecting the equipment the installer will need to access the programming mode by holding down the channel select switch whilst connecting the receiver 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 predefined 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 865MHz). 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 is switched on. Do not hold the channel select button down 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 alternate 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 appear channels 1, 2, 3 and 4 on the display. 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 in the program memory has been reset for frequency plan number 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 and hold down 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 program memory 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.

Fastening the Receiver to a machine

Fasten the receiver to the machine in a position where the receiver is easily accessible for the user and it is out of the way of moving parts. The receiver should be attached using the two 7.6mm wide cable ties (supplied) which are fed through the appropriate holes in the receiver mounting plate. The receiver can be attached at any orientation - in multiples of 45° - to the bar to which you are fixing it. Choose holes in the bracket which give the strongest pull and the closest fixing. The mounting plate is designed so that it can be fastened to different sizes of bar and this can be seen by the stepped shape of the moulding. Check for the appropriate mounting position and then select the correct holes for



the cable tie. The cable tie should be a snug fit round the equipment bar so that the greatest surface area of the tie is in contact with the bar to reduce slippage. For bars with a polished surface where friction is poor a thin layer of neoprene rubber (one non-slip mat is supplied for each receiver) can be used to increase the friction. Farnell sell a suitable material 'multigrip anti-slip mat' (their part no. 152 - 150B) which can be cut to size (75mm × 55mm). One roll will provide approximately 50 pieces. Note that the users will probably play with the receiver during exercise so make sure it is firmly attached to the machine. Extra cable ties and non-slip mats are available from the factory.

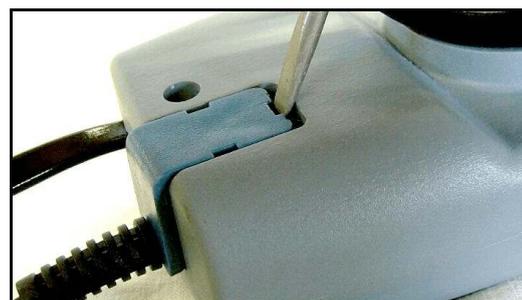
Connecting the power lead to the CSAFE outlet

The power cable should be connected to the 8 pin RJ45 socket on the machine and then fixed down so that it cannot interfere with the user or the moving parts of the machine. Check that the receiver is working. 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. The receiver will operate and return to the state it was in before the headphone lead was removed as soon as the headphones are reconnected or the channel select button is pressed once. When connecting the RX7 to a self powered machine you will have to operate the machine whilst testing the operation, an assistant will probably be required for this test. Some equipment may have a CSAFE socket which has not been enabled or no CSAFE outlet.

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

Changing the headphone lead

To change the headphone lead, insert a small (4mm) screwdriver into the rectangular hole between the end of the plastic part of the headphone lead and the box. Twist the screwdriver to lever out the plastic insert. When inserting a new headphone lead, be careful not to bend the metal pins of the connector on the circuit board.





Other facilities

Hours Used Counter

The receiver will record the total time that the unit has been operating which will provide the factory with useful information when the receiver is serviced.

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 receiver's use and can only be read 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.

User maintenance

The venue staff should be instructed on how to operate the receivers 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. The receivers should be checked once a week for malfunctions.

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 after approximately 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 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, online 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

Selected frequencies are assigned to consecutive channel numbers. Each frequency number refers to the channel number associated with the required frequency 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, 7 & 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 |



Fastening the RX7 to exercise equipment

The bracket for the RX7 is designed to fit round or square bars of differing sizes. It is important that the correct cable ties are used and they are fed through the correct holes in the mounting bracket to avoid premature failure due to distortion of the bracket. The following photos show both the correct and incorrect ways to fasten them to equipment.

Smaller round bars



Correctly fastened to a round bar using 7.6mm cable ties, a non slip mat and the inner mounting holes - no distortion of the bracket. The bracket must be securely fastened on to the exercise equipment to prevent the users "playing with it" and the wires coming loose and fracturing.

Incorrectly fastened bracket using the outer mounting slots - bracket distorted and will then fail



in use due to the stress placed on the central mounting screw hole. This occurs when users try to move the receiver whilst exercising.

Correctly fastened bracket attached to a large flat or round bar - no distortion of the bracket



For further information please contact the Audeon service line **0113 252 5582**