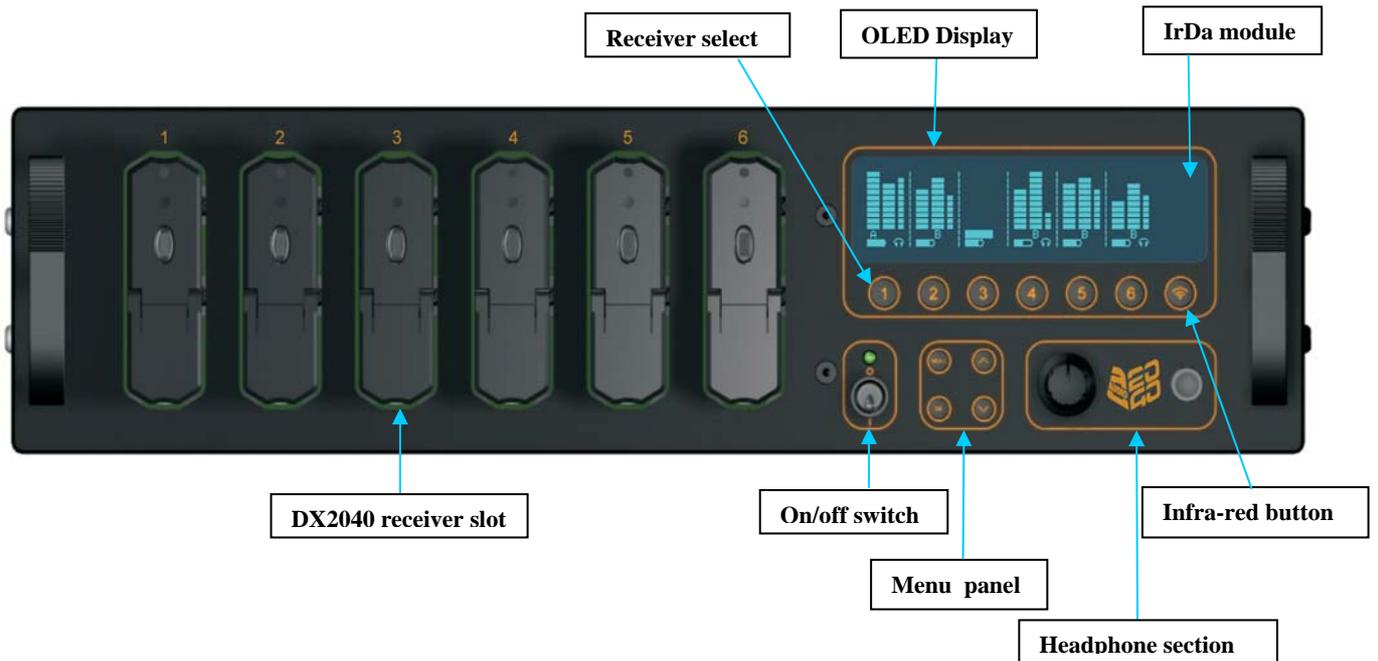# AUDIO LTD
RK6 USER GUIDE

Firmware revision 037-100, document revision 01

AUDIO LTD RK6 USER GUIDE

Audio Ltd has designed the RK6 rack to be simple to use.
The RK6 rack accepts up to six DX2040 true diversity receivers to enable a multi-channel set-up in a very small form factor.

Front Panel Features.

6 slots for DX2040 receivers.

A high resolution OLED emissive display (no power-hungry backlight).

An IrDA infra-red transceiver module. This is located behind the display window, at the right-hand end of the screen.

6 numbered receiver selection buttons. These are located just below the OLED screen and are aligned with each DX display.
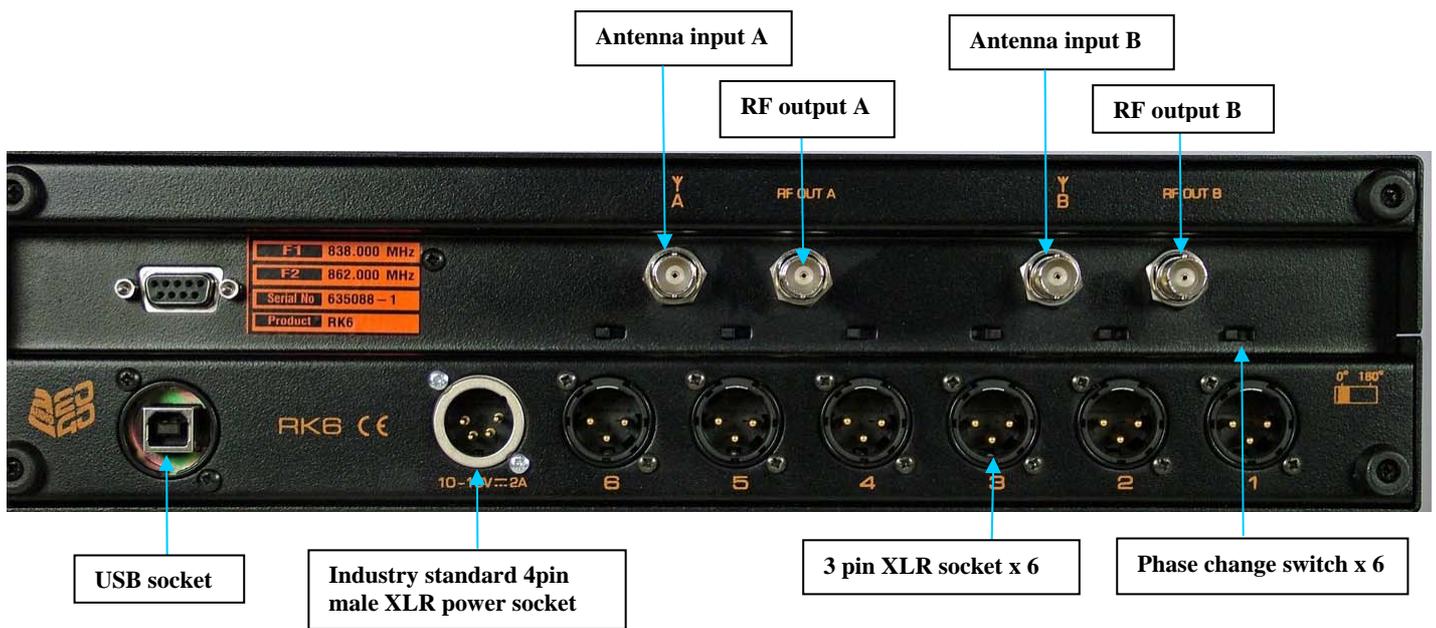
The infra-red interface button. This button is located to the right of the receiver selection buttons.

The master On/Off switch and power indicator lamp.

The menu navigation buttons.

A ¼ " headphone socket and level control.

Rear panel view

Antenna input A
RF output A
Antenna input B
RF output B

USB socket
Industry standard 4pin male XLR power socket
3 pin XLR socket x 6
Phase change switch x 6

Installing the DX2040 receivers.

Holding each receiver with the LEMO connector at the bottom and facing towards the rack, tilt the receiver downwards slightly and engage the bottom of the receiver into the slot in the RK6 front panel. Raise the receiver until it is parallel to the guide rails and slide it fully into the slot. Press firmly on the receiver until you feel the connectors engage. Do not use undue force.

Repeat for all the receivers that you are using.

Setting up the RK6 rack.

Ensure that the power switch on the rear of each receiver is ON (in the down position).

The receivers are powered from the RK6 rack. If batteries are left in the receivers, they will not be connected. However, we recommend that batteries are removed if the receivers are to be left in the rack for long periods.

Connect the supplied DC power source to the 4-pin XLR connector on the rear panel of the rack.

Switch on the RK6.

The microprocessor in the RK6 will detect the presence of the DX2040 receivers in the slots. The rack will interrogate each receiver via its IrDA infra-red interface and store the frequency table and settings for each one. During this period, an hourglass icon will be displayed in the appropriate position on the screen.

Once all the installed receivers have been logged in, the screen will display the current RSSI levels, AF level, transmitter battery level and diversity state for each one.

Connect an antenna to each of the 2 BNC connectors on the rear panel marked with an antenna icon and the letter A or B.

If the receivers are already programmed to the required frequencies and attenuator settings and passive antennae are being used, the RK6 is now ready to use.

The RK6 Display Screen.
The RK6 features a state of the art organic light emitting diode (OLED)display.
This display is composed of 16,384 individual light emitting diodes and requires no backlight.
Unlike LCD displays, this display is viewable at angles up to ±80 degrees in both the vertical and horizontal planes.

The Power-on Display Sequence.
At power-on or when a receiver which is switched on is inserted into a slot, the RK6 attempts to read the current receiver settings. If the RK6 is in normal operating mode during this time, the screen will display an hourglass icon, which should rotate ONCE, then be erased. If the RK6 is unable to communicate with the receiver, it will re-try up to a maximum of 3 attempts. If the hourglass icon is observed to rotate three times, this indicates that the RK6 failed to communicate with the receiver's infra-red module, so it will be unable to read or change any of the receiver settings.
If no receiver is installed in a slot or the power switch on a receiver is switched off, that section of the display will remain blank.

The NORMAL Display Screen.
When the RK6 is in the NORMAL operating mode, the display screen is divided vertically into 6 sections, corresponding with the 6 receiver slots.
Each section displays the following information for one DX2040 true diversity receiver.
- The RSSI levels for receivers A and B.
- The current diversity state, i.e. the receiver (A or B) that is supplying the audio output.
- The audio output level.
- The battery level of the associated transmitter.
- The status of the headphone monitor (connected or not connected).

RSSI Levels and Diversity State.
The two wide vertical bar graphs indicate the RSSI level of the two receivers in the DX2040. The diversity state is indicated by one of the following, beneath the RSSI bar positions: -
- If receiver A is currently supplying the audio output, a letter **A** will be displayed.
- If receiver B is currently supplying the audio output, a letter B will be displayed.
- If the DX2040 is in the SQUELCHED state, the squelched icon will be displayed.
   This icon takes the form of a rectangular block spanning both the A and B RSSI columns.

Audio Output Level.
The current audio output level is indicated by a narrower bar immediately to the right of the RSSI bars.
NOTE: While the DX2040 is in the squelched state, the audio output bar display will be blanked.

The Transmitter Battery Level Icon.
The transmitter battery level icon is displayed below the RSSI and audio level bars.
This icon displays the transmitter battery level in 25% steps.
If the transmitter battery level falls below the recommended minimum operating voltage, the icon will flash.
NOTE: While the DX2040 is in the squelched state, the transmitter battery level icon is not updated and will continue to display the last battery level received from the transmitter.

The Headphone Monitoring Icon.
If the audio output from the DX2040 is being switched to the headphone amplifier, a headphone icon will be displayed to the right of the transmitter battery level icon.

The Screensaver Mode.
If the screen goes blank during normal operation, it is probable that the screensaver feature has been activated. See later for details.

The Front-panel Control Buttons.

These consist of: -
6 DX2040 selection buttons **1 - 6**.
An infra-red interface mode button
A **MENU** button.
An **OK** button.
A ▲ (move cursor UP) button.
A ▼ (move cursor DOWN) button.

When in normal display mode, the buttons **1 - 6** serve to connect/disconnect the receiver audio to the headphone amplifier. These buttons can be set in any combination, in order to monitor any mix of the audio outputs. When the audio from a receiver is connected to the headphone   amplifier, a headphone icon is displayed to the right of the transmitter battery level icon for that receiver.
The monitor output is available at the front-panel jack socket and the level is controlled by the adjacent knob.
When using the settings menu, these buttons are used to select a DX2040.

The infra-red select button   activates the IrDA infrared interface mode (see later).

The **MENU** button is used to activate and navigate through the menu system (see later).

In the normal display mode, pressing the **OK** button displays the DX2040 summary screen, which is described later. This screen is only displayed while the button is held.

Within the menu system, the **OK** button selects the currently highlighted option.

The ▲ and ▼ buttons are only active within the menu system. They are used to move the cursor between the available options.

Using The Settings Menu System.

To activate the menu system, press and hold the **MENU** button (for more than 1 second) at any time when the normal screen is being displayed.

The display will then change to the top level menu screen, as shown below: -

The Top Level Menu Screen.

> RK6 Settings
> ▶ **Frequency**
> AF Level
> System Info

The currently indexed option is indicated by the flashing arrow-head cursor to the left of the option text.
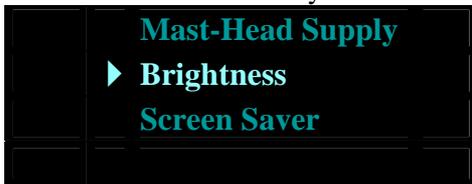To move the cursor to a different option, use the ⋀ and ⋁ buttons.
To select the indicated option, press the **OK** button.
To exit from the menu system without making any selection, press the **MENU** button.

The screens which can be selected from the top level menu screen are described below.

The RK6 Settings Menu Screen.

This screen is a secondary menu screen for selecting less frequently used options.

> Mast-Head Supply
> ▶ **Brightness**
> Screen Saver

The currently indexed option is indicated by the flashing arrow-head cursor to the left of the option text.
To move the cursor to a different option, use the ⋀ and ⋁ buttons.
To select the indicated option, press the **OK** button.
To return to the Top Level Menu screen without making any selection, press the **MENU** button.

Frequency.

This option accesses the frequency changing facility. When this option is selected, the display will first change to the DX2040 selection screen, as shown below.

The DX2040 Selection Screen.
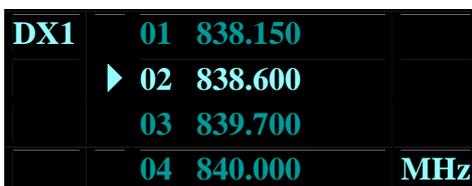
> Select DX
>
> ⋁ ⋁ ⋁ ⋁ ⋁ ⋁

This screen is used to select the DX2040 for which you wish to change the frequency.
For each slot that contains an active receiver, a flashing arrow-head cursor is displayed above the selection buttons. If any active receiver is not marked by a flashing arrow-head cursor, this indicates that the RK6 was unable to read the frequency table from that receiver.

Press the button corresponding to the DX2040 for which you wish to change the frequency.
The display will then change to the frequency setting screen, as shown below.

> DX1   01   838.150
>   ▶ 02   838.600
>   03   839.700
>   04   840.000   **MHz**

The selected DX2040 is shown at the top-left corner of the screen. The currently programmed frequency is indicated by the flashing arrow-head cursor to the left of the channel number.
To move the cursor to a different frequency, use the ⋀ and ⋁ buttons.

To select the indicated frequency, press the **OK** button.
The display will freeze momentarily while the receiver memory is updated, then it will change back to the top level menu screen.
If, instead of returning to the top level menu screen, the display remains in the frequency setting screen with the cursor indicating the original frequency, this indicates that the programming was unsuccessful.
To exit from this screen *without* changing the frequency, press the **MENU** button.

The AF Level Setting Screen.

When this option is selected, the display will first change to the DX2040 selection screen, as shown below.

The DX2040 Selection Screen.

|			
Select DX			
▼	▼	▼ ▼	▼ ▼

This screen is used to select the DX2040 for which you wish to change the AF level.

For each slot that contains an active receiver, a flashing arrow-head cursor is displayed above the selection buttons. If any installed receiver is not marked by a flashing arrow-head cursor, this indicates that the RK6 was unable to read the AF attenuator setting from that receiver.

Press the button corresponding to the DX2040 for which you wish to change the AF level.

The display will change to the AF level setting screen, as shown below.

DX1 -03	
▶ -04	
-05	
-06	**dB**
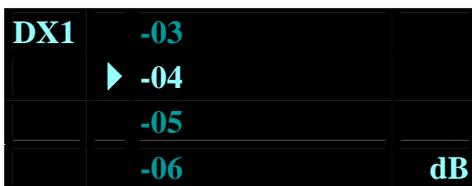
The selected DX2040 is shown at the top-left corner of the screen. The currently programmed AF level is indicated by the flashing arrow-head cursor to the left of the option text.

To move the cursor to a different AF level, use the ⋏ and ⋎ buttons.

To select the indicated AF level, press the **OK** button.

The display will freeze momentarily while the receiver memory is updated, then it will change back to the top level menu screen.

If, instead of returning to the top level menu screen, the display remains in the AF level setting screen with the cursor indicating the original level, this indicates that the programming was unsuccessful.

To exit from this screen *without* changing the AF level, press the **MENU** button.

The System Info Screen.

SLOT	DX S/N	RK6 S/N	123456-20
		BASECODE REV	036-002
1	123456-01	FIRMWARE REV	037-100
2	123456-05		
3	123456-06		
4	123456-04	MAST HEAD STATUS	
5	123456-02	MAST HEAD A =	OFF
6	123456-03	MAST HEAD B =	OFF

This is a read-only screen which mainly displays static information about the RK6 rack and any installed DX2040 receivers, as can be seen from the diagram.

To exit from this screen, press the **MENU** button.

For any vacant slots, the DX2040 serial number will display as **---------**.

If a slot is occupied but the RK6 rack was unable to read the serial number, the display will show *************.

The **MAST-HEAD STATUS** section displays the current status of the mast-head amplifier power supply.

There are only 4 possible options: -

a.   Both mast-head amplifiers are OFF.

b.   Both mast-head amplifiers are ON.

c.   Mast-head amplifier A = FAULT, mast-head amplifier B = OFF.

d.   Mast-head amplifier A = OFF, mast-head amplifier B = FAULT.

If either mast-head supply is tripped due to a fault causing an excessive current level, **both** supplies will immediately be turned off.

The mast-head current monitor is always active if the amplifier supply is turned on, so any change in status occurring while viewing this screen will immediately be displayed.

Screens Accessed from the RK6 Settings Menu.
The following setting screens can be accessed by selecting the RK6 Settings option from the top level menu.

Mast-Head Supply.
Selecting this option displays the mast-head amplifier supply setting screen, shown below.

The currently programmed mast-head supply state is indicated by the flashing arrow-head cursor to the left of the option text.
To change the state, move the cursor up or down, then press the **OK** button.

If a fault in either mast-head amplifier has caused the power supply to trip, the screen will appear as shown below.

The top line will show 'OFF (A = FAULT)' or 'OFF (B = FAULT), depending on which amplifier tripped the power supply.
The other amplifier will have been turned off by the current monitor circuit.

To turn the amplifier power back on (after rectifying the problem), move the cursor to ON and press the **OK** button.
After the normal programming delay, the display should return to the RK6 settings menu.
If the display remains in the mast-head setting screen still showing a fault, the fault condition is still present!
In this case, you have two options; either turn the supply off, which stops the monitoring process and returns to the RK6 Settings menu, or press the **MENU** button to manually return to the RK6 Settings menu. If this option is taken, the power supply will remain turned off by the trip circuit but the *selected* status of the supply will still be ON.
This means that, on power-up, the RK6 will apply power to the antenna sockets. If the fault has not been rectified, this will immediately cause the supply to trip.

Brightness.
Selecting this option changes the display to the OLED brightness setting screen, as shown below.

The flashing arrow-head cursor indicates the current brightness setting. Move it up or down to the required brightness level, then press the **OK** button.
As the cursor is moved, the screen brightness will be adjusted accordingly to enable you to assess the required level. To accept the indicated brightness level, press the **OK** button. After the programming delay, the screen will return to the RK6 Settings menu.
To exit the screen without storing the indicated brightness level, press the **MENU** button. The display will return to the RK6 settings menu with the brightness restored to its previous level.

Screen Saver.
Selecting this option changes the display to the screen saver setting screen, as shown below.

OFF	
▶ **10**	
30	
	Mins

If the OFF setting is selected, the screen saver feature is disabled, otherwise, it shuts down the OLED display when no buttons have been pressed for the selected time (10 minutes or 30 minutes).
The display is turned back on automatically if any button is pressed or any receiver is inserted or removed.

The flashing arrow-head cursor indicates the current screen saver setting. Move it up or down to the required setting, then press the **OK** button.

After the programming delay, the screen will return to the RK6 Settings menu.

To exit the screen without storing the new setting, press the **MENU** button. The display will return to the RK6 settings menu without re-programming the screen saver.

The Transmitter Frequency Synchronising Mode.

The RK6 rack allows the user to synchronise the frequency of a transmitter to the currently selected frequency of any active DX receiver.

The table in the transmitter to be synchronised must be the same as the table in the selected DX receiver.

To synchronise a transmitter frequency to that of a receiver, proceed as follows: -

With the normal screen displayed (i.e. not in a menu screen), press the infra-red button located immediately to the right of the receiver selection buttons ⊚
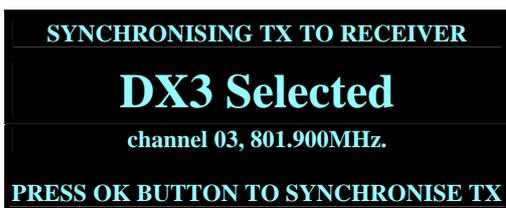
The receiver selection screen shown below will then be displayed.

SYNCHRONISING TX TO RECEIVER
Select DX
OR PRESS IR BUTTON TO EXIT
▼   ▼   ▼   ▼   ▼   ▼

A flashing 'down-arrow' cursor will be displayed above the receiver selection button for each receiver that the RK6 rack was able to interrogate via the IrDA interface.

Press the button corresponding to the DX2040 that you wish to synchronise the transmitter to.

The display will change to the screen shown below.

| SYNCHRONISING TX TO RECEIVER |
|---|
| **DX3 Selected** |
| channel 03, 801.900MHz. |
| PRESS OK BUTTON TO SYNCHRONISE TX |

The number of the selected receiver will be shown on the screen, together with its currently selected channel number and frequency. Check that the table in the transmitter has the same frequency at the channel number shown.

Hold the transmitter level and aligned with the blank area of the screen above the infra-red button, at a distance of about 50mm to 100 mm.

Press the OK button to synchronise the transmitter to the selected receiver.

The display should change to the screen below.

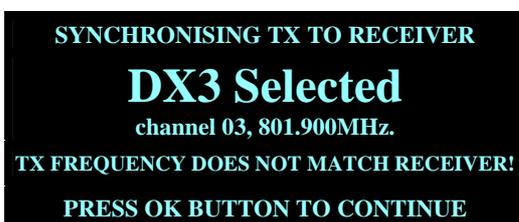| SYNCHRONISING TX TO RECEIVER |
|---|
| **DX3 Selected** |
| channel 03, 801.900MHz. |
| TX SYNCHRONISED OK |
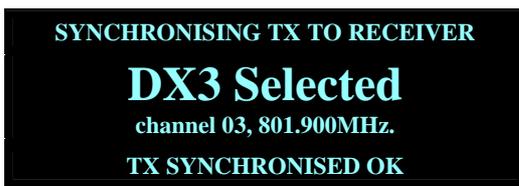
Press the OK button to return to the DX selection screen shown at the top of this page.

To match a further transmitter/receiver pair, press the appropriate numbered button and observe that the arrow associated with that receiver is now displayed at the brighter level.

To exit from the transmitter synchronisation mode, press the infra-red button. The screen will then revert to the normal display.

If the frequency at the transmitter channel number corresponding to the currently selected DX channel does not match the receiver, the display will change to the screen below.

SYNCHRONISING TX TO RECEIVER
DX3 Selected
channel 03, 801.900MHz.
TX FREQUENCY DOES NOT MATCH RECEIVER!
PRESS OK BUTTON TO CONTINUE

If The RK6 rack was unable to communicate with the transmitter, the display will change to the screen below.

SYNCHRONISING TX TO RECEIVER

DX3 Selected

channel 03, 801.900MHz.

NO RESPONSE FROM TRANSMITTER!

PRESS OK BUTTON TO CONTINUE

The DX2040 Summary Screen.

This is a read-only screen which is only displayed while the **OK** button is being pressed when the RK6 rack is operating in normal mode.

```
Mast-Head Amplifiers:   A = ON,  B = ON.

DX1   838.150MHz.    -06dB.   Serial No.123456-01
DX2   838.600MHz.    -03dB.   Serial No.123456-05
DX3   839.700MHz.    -03dB.   Serial No.123456-06
DX4   840.000MHz.    -05dB.   Serial No.123456-04
DX5   842.400MHz.    -03dB.   Serial No.123456-02
DX6   843.200MHz.    -04dB.   Serial No.123456-03
```

The screen shows the following information: -
- The status of the mast-head amplifiers.
  For each of the receiver slots: -
- The currently selected frequency.
- The currently selected AF attenuator setting.
- The serial number.

If a slot is not occupied or the DX2040 is switched off, the message '**Not installed**' is shown. If the RK6 was unable to communicate with an installed DX2040, the message '**No response to IrDA!**' is displayed.

The mast-head current monitor is always active if the amplifier supply is turned on, so any change in status occurring while viewing this screen will immediately be displayed.