



Model UHF-R® Wireless Systems User Guide UR1M Micro bodyPack Transmitter



IMPORTANT SAFETY INSTRUCTIONS

1. READ these instructions.
2. KEEP these instructions.
3. HEED all warnings.
4. FOLLOW all instructions.
5. DO NOT use this apparatus near water.
6. CLEAN ONLY with dry cloth.
7. DO NOT block any ventilation openings. Allow sufficient distances for adequate ventilation and install in accordance with the manufacturer's instructions.
8. DO NOT install near any heat sources such as open flames, radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat. Do not place any open flame sources on the product.
9. DO NOT defeat the safety purpose of the polarized or groundingtype plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wider blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. PROTECT the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. ONLY USE attachments/accessories specified by the manufacturer.
12. USE only with a cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. UNPLUG this apparatus during lightning storms or when unused for long periods of time.



14. REFER all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. DO NOT expose the apparatus to dripping and splashing. DO NOT put objects filled with liquids, such as vases, on the apparatus.
16. The MAINS plug or an appliance coupler shall remain readily operable.
17. The airborne noise of the Apparatus does not exceed 70dB (A).
18. Apparatus with CLASS I construction shall be connected to a MAINS socket outlet with a protective earthing connection.
19. To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
20. Do not attempt to modify this product. Doing so could result in personal injury and/or product failure.
21. Operate this product within its specified operating temperature range.



This symbol indicates that dangerous voltage constituting a risk of electric shock is present within this unit.



This symbol indicates that there are important operating and maintenance instructions in the literature accompanying this unit.

WARNING: Voltages in this equipment are hazardous to life. No user-serviceable parts inside. Refer all servicing to qualified service personnel. The safety certifications do not apply when the operating voltage is changed from the factory setting.

Contents

Important Safety Instructions	2
Feature Overview	4
System Components	5
Receiver Controls and Connectors	6
Receiver LCD Interface	7
Receiver Parameters	7
Connecting Multiple Receivers to the RF Distribution Ports	8
Automatic Frequency Selection	9
Networking Receivers	10
Handheld and Bodypack Transmitter Controls and Connectors	11
Transmitter LCD Interface	12
Transmitter Batteries	12
Transmitter Parameters	13
Setting Transmitter Gain	13
RF Safety Mode	13
Automatic Transmitter Sync	14
Troubleshooting	15
Specifications	16
Replacement Parts and Accessories	19
UHF-R Wireless System Compatibility Guide	21

Feature Overview

The UHF-R® Wireless Microphone System uses the latest wireless technology, delivers outstanding audio clarity, and is rugged and reliable. It is easy to set up and operate with advanced features for professional installations requiring multiple wireless microphone systems.

Frequency Band Selection

Shure offers wireless systems in a selection of bands that conform to the different government regulations of specific nations or geographic regions. These regulations help limit radio frequency (RF) interference among different wireless devices and prevent interference with local public communications channels, such as television and emergency broadcasts.

The system's band and frequency range are identified on the face of the receiver and transmitter. For example, "H4 518–578 MHz." For information on bands available in your area, consult your local dealer or phone Shure. More information is also available at Shure's website (www.shure.com).

Groups and Channels

To transmit audio through a wireless system, the transmitter and receiver must be set to the same radio frequency, or channel. A wide selection of channels allows more microphones to be used at the same time, since each microphone must operate on a different channel. It also provides a greater choice of open channels—those that are free from interference from television broadcasts, electronic devices, or other wireless systems.

A *group* is a selection of compatible channels. Wireless microphones work better together when set to channels in the same group.

Automatic Frequency Selection

The following features scan the RF environment to find the best group and channel settings for a particular installation.

- **Group Scan**—finds the group with the most open channels, then sets all networked receivers to channels in that group.
- **Channel Scan**—finds the first open channel in the currently selected group and sets the receiver to that channel.

Follow the steps on page 9 for instructions on using these features.

Automatic Transmitter Sync

This feature automatically transfers the group and channel settings from a receiver to a transmitter. You can also program other transmitter settings on a receiver and transfer those settings too. See page 14.

Interface Lock

This feature locks the receiver and transmitters so that users cannot change settings. The transmitter power switch can also be disabled so that the transmitter remains on if the power switch is accidentally toggled during a performance.

Audio Gain Structure

The following settings allow you to adjust audio gain throughout the system:

- **Sensitivity** (bodypack only). A 25 dB range of gain adjustment at the bodypack transmitter input.
- **Transmitter Gain**. A 30dB range of audio gain adjustment within the transmitter (affects audio level at the receiver, as indicated by the **Audio LEDS**.)
- **Output Level**. 32 dB of attenuation at the receiver output, plus a mute setting.
- **Mic/Line switch**. –30 dB pad for matching audio levels at the receiver XLR output.

Networking

Each receiver has an RJ-45 port on the back for connecting to other receivers over an Ethernet network. Networking receivers allows you to automatically set channels for all the receivers with a single group scan command. You can also control and monitor all networked receivers through the Shure Wireless Workbench PC software.

RF Distribution Ports

Use the RF distribution ports to share the signal from a single pair of antennas with up to 10 single or dual receivers within the same frequency band. The RF ports eliminate the need for antenna splitters or distribution amplifiers. Active circuitry minimizes insertion losses, preserving signal quality. Input filtering keeps the signal free from out-of-band interference. Distribution circuitry is active only when additional receivers are connected to the RF distribution ports. When not used, the port circuitry is bypassed, allowing the receiver to be used as a stand-alone component.

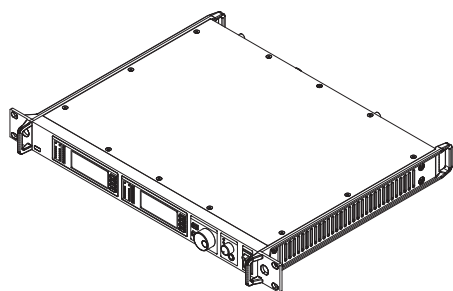
Shure Wireless Workbench Software

Simply install the software on your computer and connect it to a network of receivers to monitor and control receivers and transmitters throughout the network. (See page 10 for more information on networking).

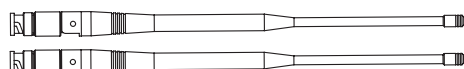
Instructions on using the Wireless Workbench software are available in the online help files after you install the software.

System Components

All systems include:



UR4S+ or UR4D+ Receiver
(UR4D+ pictured)



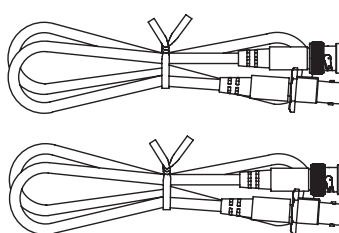
Two 1/2 Wave Antennas



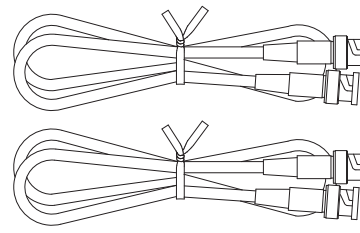
2 Antenna hole plugs
4 Rack Mount Screws with Washers



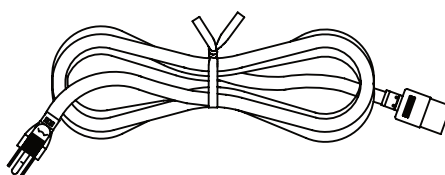
AA or AAA Batteries



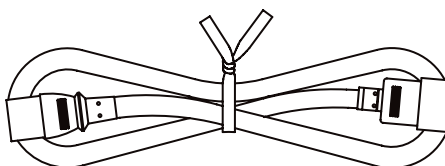
Two Antenna Cables



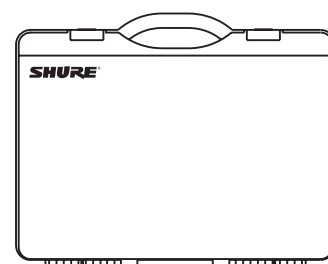
Two RF Distribution Cables



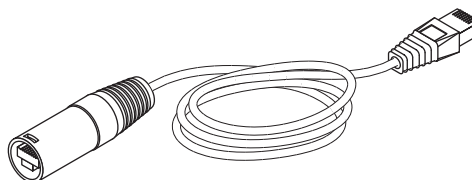
IEC Power Cable



IEC Power Extension Cable



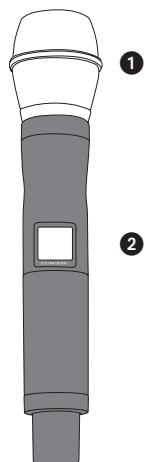
Transmitter Carrying Case



Ethernet Network Cable with "Ruggedized" plug

Handheld Systems Include:

- ① Microphone Head (choice of SM58®, Beta 58A®, Beta 87A™, Beta 87C™ or KSM9/BK, KSM9/SL)
- ② UR2 handheld transmitter
- ③ Microphone clip

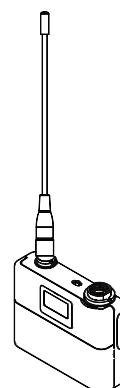


Bodypack Systems Include:

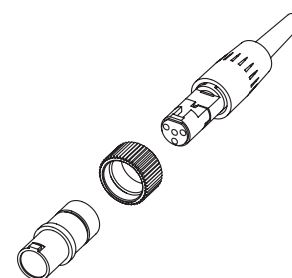
- UR1 Bodypack Transmitter
- UR1M Micro bodypack Transmitter
- Threaded TA4F Adapter



UR1

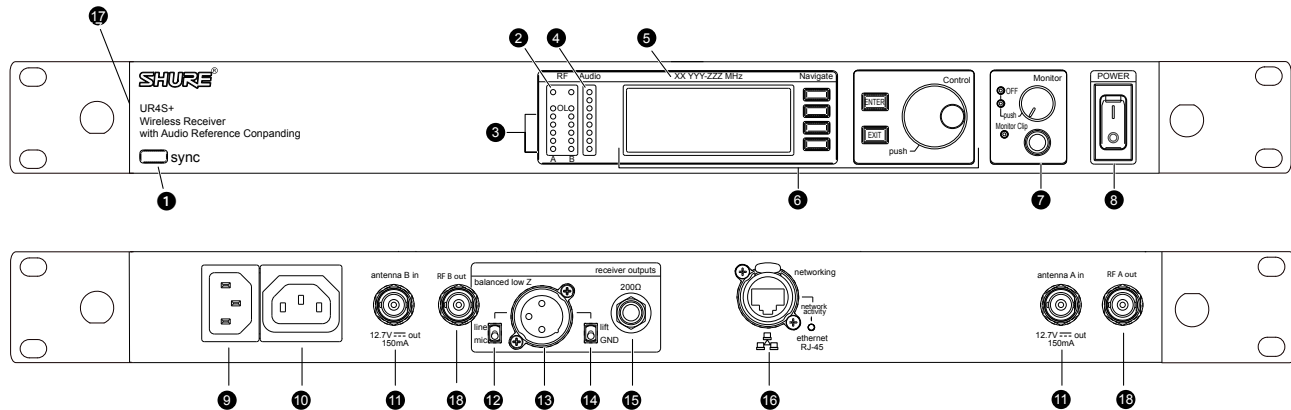


UR1M



Threaded TA4F Adapter

Receiver Controls and Connectors



- ① **SYNC** Infrared (IR) port. Transmits group, channel, and other settings to a transmitter. See page 14.

- ② **Squelch LEDs.**

- Blue (On) = Transmitter signal detected
- Off = no signal or signal squelched because of poor reception or no tonekey

NOTE: The receiver will not output audio unless at least one blue LED is illuminated.

- ③ **RF LEDs.** Indicate RF signal strength from the transmitter at each antenna and diversity condition.

- Amber = normal
- Red = overload (greater than -25 dBm)

- ④ **Audio LEDs.** Indicate audio signal strength from transmitter.

- Green = signal present
- Yellow = normal peak
- Red = overload

To correct this level, adjust the transmitter gain.

- ⑤ Indicates the name and range of receiver frequency band.
- ⑥ **LCD Interface.** Provides a convenient way to program the receiver from the front panel (see detail on next page).
- ⑦ **Monitor.** 1/4" output jack and volume knob for headphones.
- **Monitor Clip** LED indicates headphone audio is clipping.
 - Dual models: Push the knob to switch from receiver one to receiver two.

- ⑧ **Power** switch. Powers the unit on and off.

- ⑨ AC mains power input, IEC connector. 100–240 Vac.

- ⑩ **AC mains power passthrough (unswitched).** Use IEC extension cables to connect up to five UR4+ receivers to a single AC power source.

- ⑪ Diversity antenna inputs A and B.

Note: Antenna inputs are DC biased. Use only antenna combiners and accessories listed in page 19. Some types of antenna splitters or other products may short the DC power and damage the receiver.

- ⑫ **Mic/Line switch.** Changes output level 30 dB (XLR output only).

- ⑬ Electrically balanced XLR output jack

- ⑭ **Lift/GND switch.** Lifts ground from Pin 1 of the XLR connector (default = **GND**).

- ⑮ Impedance balanced 1/4" output jack (200Ω)

- ⑯ RJ-45 jack for Ethernet network interface. Accepts both regular and "ruggedized" RJ-45 plugs.

- ⑰ Temperature-activated fan ensures top performance in high temperature environments. Clean fan screen as needed to remove dust.

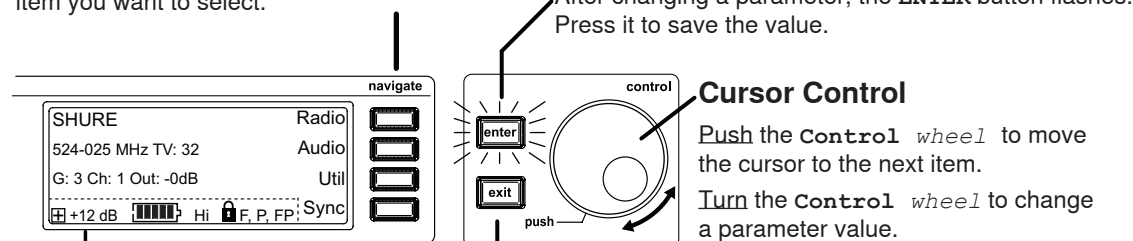
- ⑱ The RF distribution ports pass the RF signal from one receiver to the next, allowing a maximum of 10 receivers to share a single pair of antennas.

Note: The diagram above represents the UR4S single channel receiver. The UR4D dual channel receiver is functionally identical to the UR4S, adding a second LCD interface and set of output jacks for channel 2.

Receiver LCD Interface

Menu Access

Press the **Navigate** key next to the menu item you want to select.



Transmitter Status Display

Everything under the dotted line reflects the settings for the transmitter, if present. (main title screen only).

Accept Changes

After changing a parameter, the **ENTER** button flashes. Press it to save the value.

Cursor Control

Push the **Control wheel** to move the cursor to the next item.

Turn the **Control wheel** to change a parameter value.

Exit/Cancel

Press the **Exit** button to cancel changes and return to the previous menu.

Receiver Parameters

Use the following instructions to set parameters through the LCD interface.

NOTE: After adjusting a parameter, you must press the flashing ENTER button to accept the change.

Group and Channel

Menu: Radio

- Push the **Control wheel** to move the cursor to the Group (G) or Channel (Ch) parameter.
- Turn the **Control wheel** to change the parameter.

Frequency

Menu: Radio

- Push the **Control wheel** to move the cursor to the integer value (524.025 MHz) or fractional value (524.025).
- Turn the **Control wheel** to change the value.

Automatic Transmitter Sync

Menu: Sync

- See page 14.

Receiver Name

Menu: Util

- Turn the **Control wheel** to change the letter.
- Push the **Control wheel** to move to the next letter.

Output Level

Menu: Audio

This setting adjusts the signal level at the XLR and 1/4" audio output jacks.

- Turn the **Control wheel** to change the relative level in dB. (0 dB to -32 dB).
- Turn the wheel all the way down to mute the outputs.

Squelch

Menu: Radio > Squelch

- Turn the **Control wheel** to change the parameter

Receiver Lock

When locked, the receiver settings cannot be changed from the front panel. However, you can still navigate the LCD menu to view the settings (and turn the lock off).

Menu: Util > Lock

- Turn the **Control wheel** to toggle the lock on or off (ON or OFF).

LCD View

Menu: Util > Title

- Turn the **Control wheel** to mark an item for display.
- Push the **Control wheel** to move to the next item.

LCD Contrast

Menu: Util > Contrast

- Turn the **Control wheel** to increase or decrease contrast.

Tonekey

Menu: Radio > Squelch > Tonekey

Tonekey squelch mutes the outputs unless the receiver detects a transmitter. Tonekey should be left on (On) except for certain troubleshooting operations.

Network Parameters

NOTE:

- The receiver reboots after you press **ENTER** to accept network parameter changes
- In dual models (UR4D+), these settings affect both receivers (the dual receiver is treated as a single network device).

Set the Receiver Network Mode

Menu: **Util > Network**

1. Push the **Control** wheel to move the cursor to the **Mode** parameter.
2. Turn the **Control** wheel to set the receiver to one of the following values:
 - **DHCP**: use this setting when connecting the receiver to a DHCP server.
 - **Manual**: allows you to set the receiver to a specific IP address or subnet.

IP Address and Subnet

Menu: **Util > Network**

NOTE: To change these settings, the network mode must be set to **Manual**.

1. Push the **Control** wheel to move the cursor to any of the following parameters:
 - **IP** (IP address)
 - **Sub** (Subnet mask)
2. Turn the **Control** wheel to change the value.

Device ID

Assists in identifying receivers through the Wireless Workbench Software (has no effect on network identification).

Menu: **Util > Network**

1. Push the **Control** wheel to move the cursor to the **DevID** parameter.
2. Turn the **Control** wheel to set the receiver to change the value.

Custom Groups This feature allows you to create your own groups of frequencies.

Creating new groups...

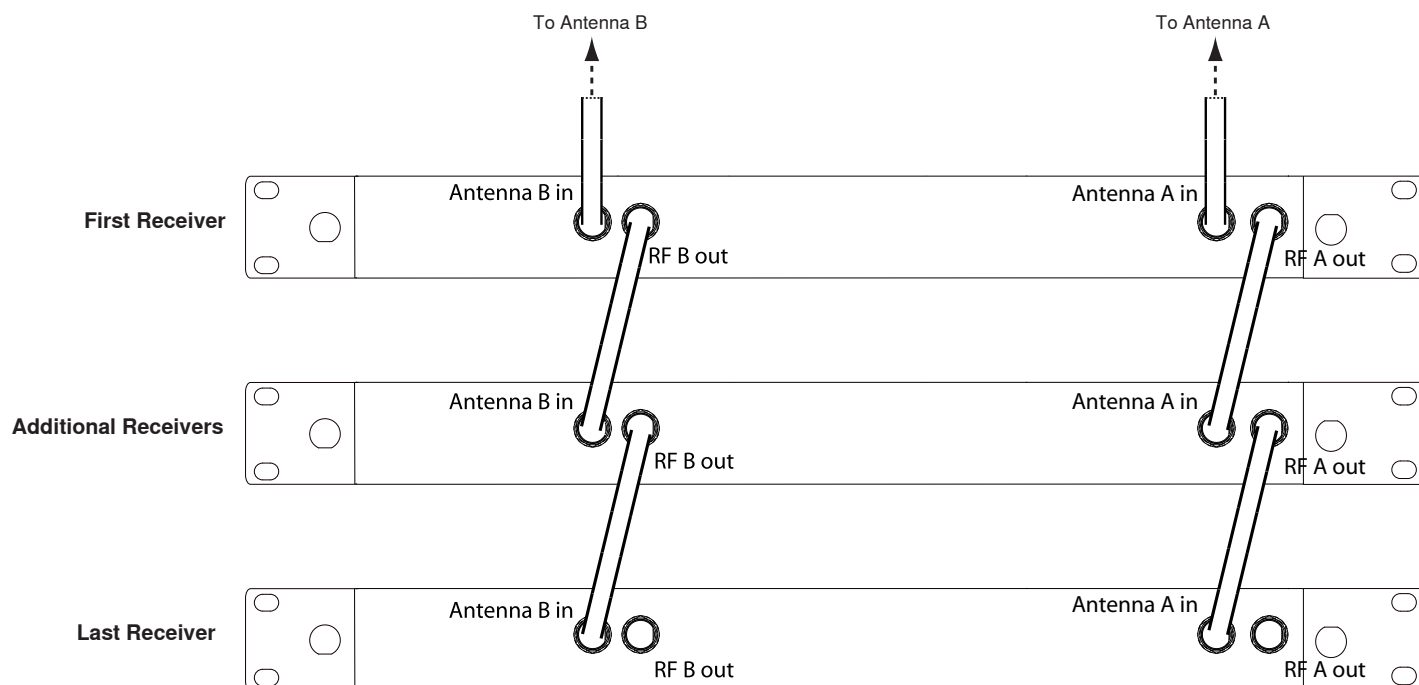
Menu: **Radio > Custom**

1. Turn the **Control** wheel to select a custom group number (**U1**, **U2**, **U3**, etc.)
2. Push the **Control** wheel to move to the **Channel** parameter and turn it to select a channel (**01**, **02**, **03**, etc.)
3. Push the **Control** wheel to move to the **Freq** parameter and select a frequency for that channel.
4. Push the **NEXT** menu key to select a frequency for the next channel in that group.

Connecting Multiple Receivers to the RF Distribution Ports

The RF distribution ports pass the RF signal from one receiver to the next, allowing a maximum of 10 single or dual receivers to share a single pair of antennas. Use the supplied RF distribution cables to connect the ports of each receiver as shown.

NOTE: All receivers must be operating in the same frequency band.



Automatic Frequency Selection

Follow these steps to use the channel scan and group scan features.

Before you begin...

- Install the receivers in the location where they will be used and power them on.
- Mute all inputs on mixing devices connected to receivers.
- Turn off all bodypack or handheld transmitters for the systems you are setting up.
- Turn on potential sources of interference such as other wireless systems or devices, computers, CD players, effects processors, and digital rack equipment so they are operating as they would be during the presentation or performance.

Single Receiver

1. Select **Radio > Scan > Chan Scan** using the **Navigate** keys on the receiver LCD interface.
2. Turn the **Control** wheel to select a group.
3. Press **Chan Scan**. The display indicates that the receiver is searching. Once it has finished, it displays the selected channel.
4. Press the flashing **ENTER** button to accept the suggested channel.
5. Sync the transmitter (see page 14).

Networked or Dual Receivers

With networked or dual receivers, you can take advantage of the group scan feature to set group and channel settings for all the receivers at the same time. (See page 10 for instructions on networking.)

Perform a group scan from any receiver...

1. Select **Radio > Scan > Group Scan** using the **Navigate** keys on the receiver LCD interface. The display indicates that the receiver is searching (Scan In Progress). Once it has finished, it displays the group with the most open channels.
2. If you wish, turn the **Control** wheel to change groups. The number of open channels for each group is displayed.
3. Press the flashing **ENTER** button to set all receivers to open channels in that group.

NOTE: The group scan feature only works for receivers in the same frequency band. For example, if you did a group scan on a "H4" band receiver, all "H4" band receivers would be set up, but not "J5" band receivers.

Multiple Receivers—Not Networked

If your receivers are not networked (or in different bands), the group scan cannot automatically set their group and channel settings. However, you can still take advantage of the group scan feature to find the group with the most open channels and the channel scan feature to find open channels in that group.

Find the group with the most open channels...

Perform a group scan using the steps for a networked receiver (above). However, make a note of the selected group before pressing the flashing **ENTER** button to accept it.

Set the receivers to open channels in that group...

Perform a channel scan on the remaining receivers using the steps for a single receiver (above). Make sure to select the same group for each receiver before performing the channel scan.

IMPORTANT: After setting the channel for the first receiver, immediately sync the transmitter for that receiver and leave it on so that the next receiver detects that channel during its channel scan. Otherwise, all the receivers will be set to the same open channel.

NOTE: Receivers in different bands (H4, J5, L3, etc.) do not need to be set to the same group.

Networking Receivers

Basic Network

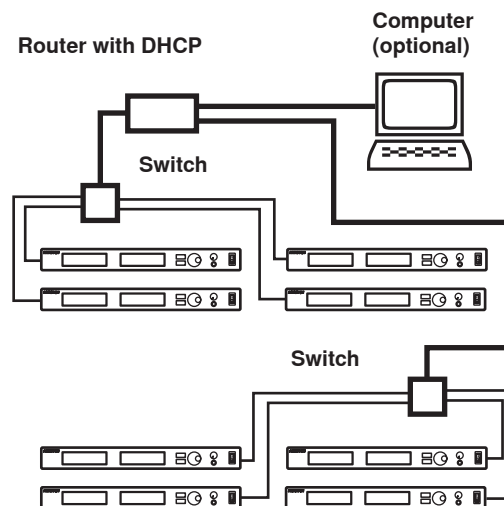
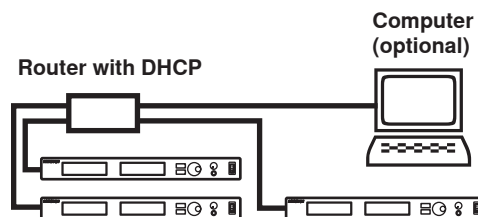
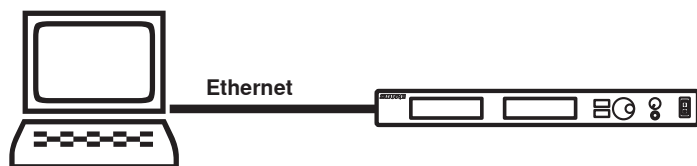
Connect receivers to an Ethernet router with DHCP service. Use Ethernet switches to extend the network for larger installations.

Use the receiver's default network setting
(Util > Network > Mode = DHCP).

Accessing the Network with a Computer

If you want to use the Wireless Workbench software, connect your computer to the network and install the software from <http://www.shure.com>. Make sure your computer is configured for DHCP (from Control Panel, click Network Connections. Double-click on Local Area Connection. Select Internet Protocol (TCP/IP) and click Properties. Select Obtain IP address automatically and Obtain DNS server address automatically and click OK).

NOTE: Some security software or firewall settings on your computer can prevent you from connecting to the receivers. If using firewall software, allow connections on port 2201.

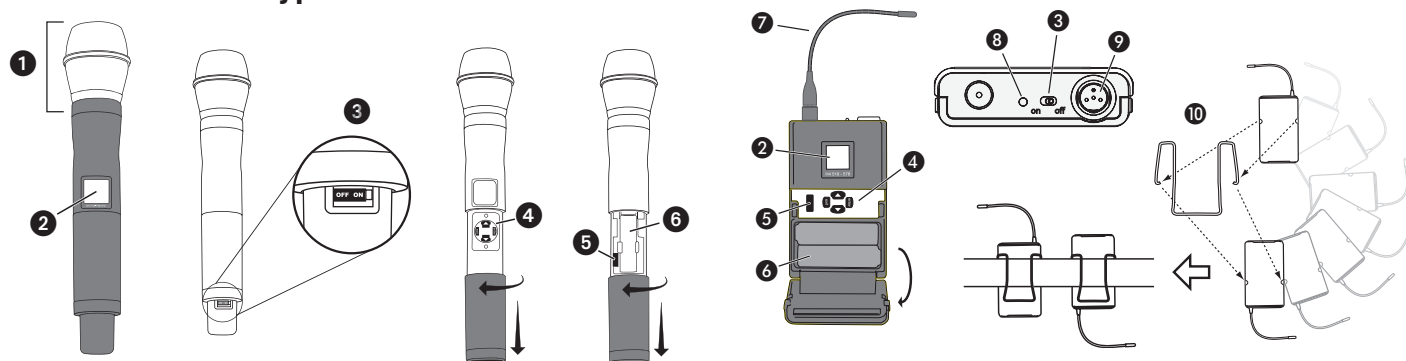


Static IP Addressing

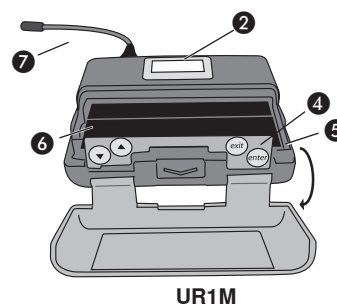
The receiver also supports static IP addressing. Assign your own IP addresses (Util > Network > Mode = Manual). See "Network Parameters" on page 8.

NOTE: Dual receivers use a single IP address, which may be set through either LCD interface.

Handheld and Bodypack Transmitter Controls and Connectors



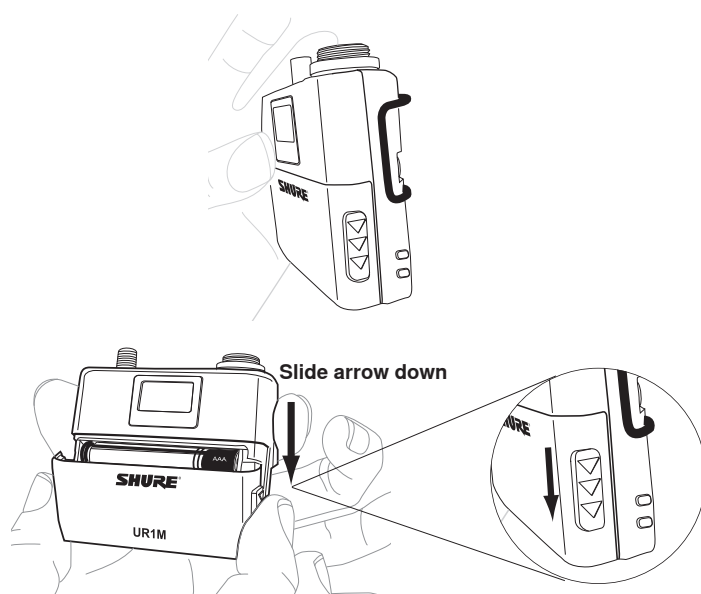
- ❶ Interchangeable microphone head (BETA 87A pictured).
- ❷ LCD Panel.
- ❸ Power Switch.
- ❹ Control buttons for LCD interface.
- ❺ Infrared (IR) port. See page 14.
- ❻ Battery compartment.
- ❼ Flexible Antenna.
- ❽ Power LED.
- ❾ 4-Pin Microphone Input Jack.
- ❿ Reversible Belt Clip.



UR1M Features

- Same audio performance as UR1
- Rapid two-way infrared (IR) data transmission
- RF output level (10 mW)
- Operates with three types of primary batteries: alkaline, lithium or NiMH
- Audio signal is input through a TA4F connector (UR1M)
- Selectable battery metering by battery type
- Audio metering on UR1M transmitter

To open the micro bodypack transmitter, see illustrations below:



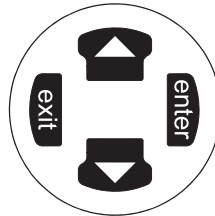
Transmitter LCD Interface



Main Menu

exit Key. Move to the left, or exit without saving changes.

Up Arrow Key. Scroll up or increase a value.



enter Key. Press to select parameters and accept the selected value.

Down Arrow Key. Scroll down or decrease a value.

Transmitter Batteries

Transmitters operate on standard AA and AAA batteries. Turn off the transmitter before changing the batteries.

The battery fuel gauge displayed on the transmitter LCD gives an indication of remaining battery life, as shown below.

Transmitter Display	Approximate Hours Remaining (alkaline batteries)
	UR1, UR2
	7.5 to 9.5
	5.75 to 7.5
	4 to 5.75
	2 to 4
	15 minutes to 2 hours

UR1M

Transmitter Display	Approximate Hours Remaining		
	(alkaline batteries)	(lithium primary)	NiMH 1000 mAh
	4 to 5	10 to 8.5	4.5 to 6
	3 to 4	6.5 to 8.5	3.5 to 4.5
	2 to 3	4.5 to 6.5	2.5 to 3.5
	1 to 2	2.5 to 4.5	1.5 to 2.5
	15 minutes to 1 hour	30 minutes to 2.5 hours	15 minutes to 1.5 hours

Select Battery Type:

Set the micro bodypack transmitter switch to **on**. Press **enter** key, then scroll using button to select battery type. Press **enter** key to confirm.

Note: For the most accurate battery metering and performance, make sure to select the correct battery type.

Transmitter Parameters

Press **ENTER** from the main menu to access the following parameters:

```
G: 34 Ch: 21
524.025MHZ
Gain +20dB
SHURE INC.
```

Group (G) and **Channel (Ch)**. Must match the receiver's settings.

Frequency (MHz). Manual frequency selection in 0.025 MHz increments.

Gain (Gain). Adjusts audio level from -10 dB to +20 dB

Sensitivity (Sens) (bodypack only).

Sets audio input to +15 dB, 0 dB, or -10 dB recommended for guitars.

Name Display. 12-digit ASCII.

Use the following key combinations to access additional features and parameters:

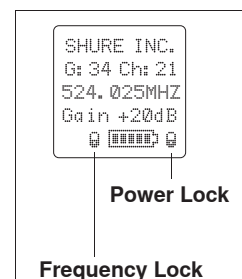
LCD Panel
 +  Changes LCD Panel

Frequency Lock
 +  Toggles setting. When enabled, frequency cannot be changed, and a transmitter sync will not overwrite the frequency setting.

Power Lock
 +  Toggles power lock. When locked, power switch does not turn off transmitter.

RF power level setting*
 +  *Power level cannot be changed for Hong Kong models. Power setting is locked to 10 mW.

Lock Indicators



Setting Transmitter Gain

Adjust the transmitter gain and input sensitivity so that the **Audio** LEDs on the receiver peak within the yellow range during use. On the bodypack transmitter, you can change the sensitivity setting to compensate for different audio levels when connecting different instruments or microphones to the input.

To adjust gain, turn on the transmitter and press the **enter** button. Scroll down to the **Gain** parameter or the **Sens** parameter (bodypack only) and press enter again. Use the arrow keys to adjust the setting and press **enter** to save it (**Exit** cancels without saving).

RF Safety Mode

This special feature temporarily mutes RF broadcast. This allows you to change frequency settings on a transmitter without accidentally “cutting in” on a channel being used by another transmitter.

1. Turn the transmitter off.
2. Hold down **exit key** while turning on the transmitter power (for handheld microphones, you need to pull the battery cover off the handle). The LCD flashes while the unit is in RF safety mode.
3. Change group and channel settings as you normally would—the transmitter will not broadcast.
4. Power the transmitter off and on to exit RF safety mode.

Automatic Transmitter Sync

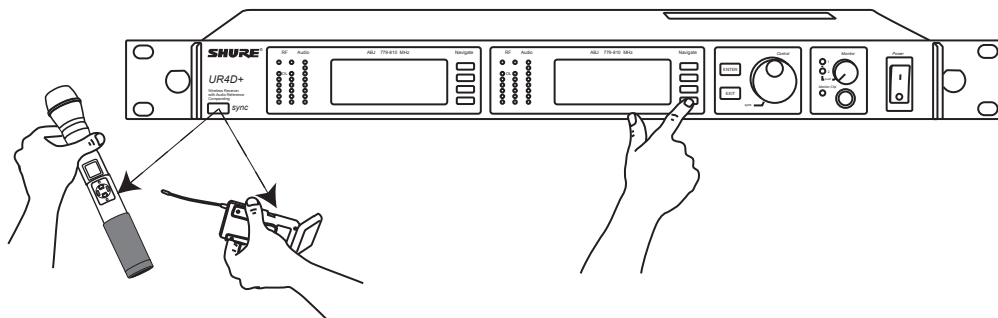
This feature automatically updates a bodypack or handheld transmitter's group and channel settings to match those of a selected receiver.

To perform a transmitter sync...

1. Open the transmitter battery cover to display the infrared (IR) port.
2. With the IR port exposed to the receiver, select **Sync** > **sync** from the receiver LCD interface.

The display on the receiver indicates whether the sync was successful. If the sync fails, try again, making sure that the IR port on the transmitter is exposed and directly faces the IR port on the receiver.

NOTE: Close the battery door before performing a sync on other transmitters.



To transfer other transmitter settings...

Optionally, you can transfer other transmitter settings from a receiver when you perform a sync. Use the following steps:

1. Select **Sync** > **Setup** from the receiver LCD interface.
2. Turn the **Control** wheel to change parameter settings.
3. Push the **Control** wheel to move to the next parameter.
4. Push the flashing **ENTER** button to save the settings.

The transmitter settings you set on the receiver remain for future syncs.

NOTE: If you don't want the sync to send a setting, set the parameter to **No Change**.

Available Settings...

The following settings are available from the **Sync** > **Setup** menu:

- Sensitivity (**Sens**) bodypack only
- Gain (**Gain**)
- RF Power (**Pwr**)

NOTE: Power cannot be changed for the Hong Kong models
- Power and Frequency Lock (**Lock**), which has the following values:
 - Power lock only: (**Pwr Only**)
 - Frequency lock only: (**Freq only**)
 - Both: (**Freq and Pwr**)
 - Neither: (**Unlocked**)
- Custom Groups (**CG**):
 - On (**ON**): Send custom groups to transmitters during sync
 - Off (**OFF**): Do not send custom groups (reduces sync time)

Troubleshooting

Issue	See Solution...
No sound	Power, Cables, or RF
Faint Sound or Distortion	Gain
Lack of range, unwanted noise bursts, or drop outs	RF
Cannot turn transmitter off or change frequency settings, or can't program receiver	Interface Locks
Excessive hum or buzzing	Ground lift

Power

Make sure that the transmitter and receiver are receiving sufficient voltage. The receiver requires at least 90 Vac. Check the battery indicator on the transmitter and replace battery if necessary.

Gain

Adjust the transmitter gain and sensitivity settings (see page 13) or the receiver output level (page 9), or toggle the **mic/line** switch on the back of the receiver.

Cables

Check that all cables and connectors are in working order.

Ground Lift

Lifting the ground on pin 1 of the XLR output on the receiver can sometimes remove hum or buzz in the audio signal. Set the **GND/LIFT** switch on the receiver to **LIFT** if you are using the XLR connector.

Interface Locks

Both the transmitter and receiver can be locked to prevent accidental changes. On transmitters, look for a lock symbol on the LCD and use the key combinations illustrated on page 13 to turn it off.

To turn off the receiver interface lock, see page 7.

Increasing Range

If the transmitter is more than 6 to 60 m (20 to 200 ft) from the receiver antenna, you may be able to increase range by doing one of the following:

- Reduce interference (see above)
- Increase transmitter RF power level (see page 13).
- Use an active directional antenna, antenna distribution system, or other antenna accessory to increase RF range (see page 19).

Radio Frequency (RF)

Using the RF LEDs

If neither blue **RF** LED is illuminated, then the receiver is not detecting the presence of a transmitter.

The amber **RF** LEDs indicate the amount of signal being received. This signal could be from the transmitter, or it could be from an interfering source, such as a television broadcast. Turn the transmitter off. If more than one or two of the amber **RF** LEDs are still illuminated, then that channel has too much interference, and you should try a different channel.

The red **RF** LED indicates RF overload. This will usually not cause a problem unless you are using more than one system at the same time, in which case, it can cause interference between systems.

Eliminating RF Overload

If you see the red **RF** LED on a receiver, move the transmitter further away from the receiver—at least 6 m (20 ft). If you are using active antennas, reduce antenna or amplifier gain.

Compatibility

- Perform a transmitter sync, or make sure the transmitter and receiver are set to the same group and channel.
- Look at the label on the transmitter and receiver to make sure they are in the same band (H4, J5, L3, etc...).

Reducing Interference

- Use a different channel or perform an automatic group or channel scan (see page 9).
- For multiple systems, check that all systems are set to channels in the same group (systems in different bands do not need to be set to the same group).
- Maintain a line of sight between transmitter and receiver antennas
- Move receiver antennas away from metal objects or other sources of RF interference (such as CD players, computers, digital effects, network switches, network cables and Personal Stereo Monitor (PSM) wireless systems).
- Eliminate RF overload.

Specifications

Frequency Range and Transmitter Output Power

Band	Range	Transmitter Power (mW)	
		Handheld	Bodypack (UR1, UR1M)
G1HK	470-530 MHz	10	10
H4HK	518-578 MHz	10	10
J5HK	578-638 MHz	10	10
L3HK	638-698 MHz	10	10
Q5HK	740-806 MHz	10	10

NOTE

This Radio equipment is intended for use in musical professional entertainment and similar applications.
This Radio apparatus may be capable of operating on some frequencies not authorized in your region. Please contact your national authority to obtain information on authorized frequencies and RF power levels for wireless microphone products.

RF Carrier Frequency Range

470-806 MHz

Working Range

UR1, UR1M, UR2

100m (300 ft.), under typical conditions

NOTE: Actual working range depends on RF signal absorption, reflection and interference.

Audio Frequency Response

40 – 18,000 Hz, (+1 dB, –3 dB).

NOTE: Overall system frequency response depends on the microphone element

Gain Adjustment Range

UR1, UR1M: –20 to +35 dB

–10 dB recommended for guitar

UR2: –10 to +20 dB

Modulation

FM (45 kHz max. deviation), compander system with pre- and de-emphasis

RF Power Output

10 mW maximum, non-adjustable

Dynamic Range

>105 dB, A-weighted

Image Rejection

>110 dB typical

RF Sensitivity

UR4S+	UR4D+
–110 dBm Typical 12 dB SINAD	–107 dBm Typical 12 dB SINAD
–105 dBm Typical 30 dB SINAD	–102 dBm Typical 30 dB SINAD

Spurious Rejection

>90 dB typical

Ultimate Quieting (ref. 45 kHz deviation)

>100 dB, A-weighted

Signal Polarity

Positive pressure on microphone diaphragm (or positive voltage applied to tip of WA302 phone plug) produces positive voltage on XLR output pin 2 with respect to XLR pin 3 and on the tip of the 1/4-inch output jack.

System Distortion (ref. ± 45 kHz deviation, 1 kHz modulation)

<0.3% Total Harmonic Distortion typical

Power Requirements

UR1, UR2: Two 1.5V AA batteries

UR1M: Two 1.5V AAA alkaline, lithium primary, and NiMH batteries

UR4: 100 to 240 VAC, 50/60 Hz

Current Drain

UR1, UR2: 180 mA max.

240 mA max.

UR1M: 130 mA max. at 3V

UR4D+, UR4S+: 0.8 Amps max.

Battery Life (Typical)

UR1, UR2: 9.5 hours (normal RF power),

UR1M:

Alkaline: 6 hours

Lithium primary: 9 hours

NiMH 1000 mAh: 6 hours

Operating Temperature Range

–18° to +57° C (0° to +135° F)

NOTE: Battery characteristics may limit this range

NOTE: Electrical safety approval is based on a maximum ambient temperature of 35° C (95° F).

Overall Dimensions

UR1: 98 mm L x 60 mm W x 17 mm D (3.84 x 2.38 x 0.66 in.)

UR1M: 47.5 mm L x 63 mm W x 17 mm D (1.9 x 2.5 x 0.67 in.)

UR2/SM58: 261 mm L x 51 mm Dia. (10.27 x 2 in.)

UR2/KSM9/BK, UR2/KSM9/SL: 250 mm x 49 mm Dia. (9 7/8 x 1 15/16 in.)

UR2/BETA 58: 258 mm L x 51 mm Dia. (10.15 x 2 in.)

UR2/BETA 87A, UR2/BETA 87C: 254 mm x 51 mm Dia. (10 x 2 in.)

UR4S+/UR4D+: 44 mm H x 483 mm W x 366 mm D
(1.72 x 19.00 x 14.39 in.)

Net Weight

UR1: 97 g (3.4 oz.) without batteries

UR1M: 64 g (2.3 oz.) without batteries

UR2/SM58: 356 g (12.6 oz.) without batteries

UR2/BETA 58: 314 g (11.1 oz.) without batteries

UR2/KSM9/BK, UR2/KSM9/SL: 410 g (14.5 oz.) without batteries

UR2/BETA 87A, UR2/BETA 87C: 325 g (11.5 oz.) without batteries

UR4S+: 5.0 kg (10.9 lbs)

UR4D+: 5.1 kg (11.2 lbs)

Housing:

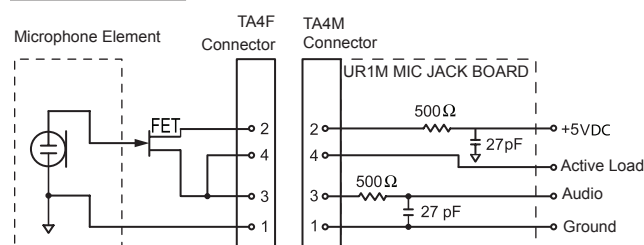
UR1, UR1M: Cast magnesium

UR2: Aluminum die-cast handle and aluminum machined battery cup

UR4S+, UR4D+: Galvanized steel

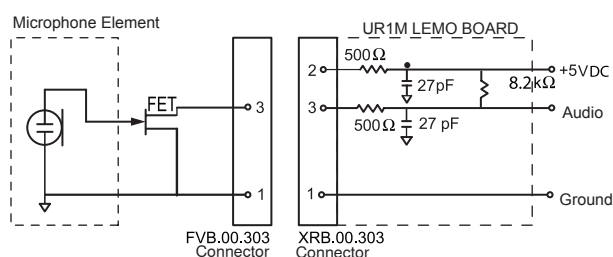
Wiring

TA4F Connector



NOTE: LAVALIER MIC TIES PINS 3 AND 4 TOGETHER—GUITAR CABLE DOES NOT.

LEMO Connector



Inputs and Outputs

UR1 Transmitter Audio Input

Connector:	4-Pin male mini connector (TA4M)
Input Configuration:	Unbalanced, active
Maximum Input Level: (1 kHz, 1% THD)	+10 dBu (sensitivity 0 dB) +20 dBu (sensitivity -10 dB)
TA4M Connector Pin Assignments:	Pin 1: Ground Pin 2: +5 Vdc bias Pin 3: Audio, 200 kΩ Pin 4: Tied through active load (on main board) to Ground. (On instrument adapter cable, Pin 4 floats)

UR1M Transmitter Audio Input

Connector:	4-Pin male mini connector (TA4M) 3-Pin female mini connector (LEMO XRB.00.303)
Input Configuration:	Unbalanced, active
Maximum Input Level: (1 kHz, 1% THD)	+5 dBu (sensitivity 0 dB) +15 dBu (sensitivity -10 dB)
TA4M Connector Pin Assignments:	Pin 1: Ground Pin 2: +5 VDC bias Pin 3: Audio, 200 kΩ Pin 4: Tied through active load (on main board) to ground. (On instrument adapter cable, Pin 4 floats)

UR2 Transmitter Audio Input

Input Configuration:	Unbalanced, active
Actual Impedance:	>1 MΩ
Maximum Input Level: 1 kHz, 1% THD	+4.8 dBu

UR1, UR1M Transmitter RF Output

Connector:	SMA
Actual Impedance:	50 Ω
Pin Assignments:	Shell = Ground Center = Signal

RF Distribution Ports

	RF IN	RF OUT
Connector Type	BNC	BNC
Vdc Bias	12 Vdc @ 150 mA	-

NOTE: The RF distribution circuitry is activated only if connected to an RF input that has 12 Vdc bias.

Each UR4+ RF antenna input port provides 12 Vdc bias @ 150 mA. The 12V dc bias is present only when the UR4+ receiver is powered on. Therefore, if a cascaded UR4+ Receiver is powered off, the RF signal will not appear in the UR4+ receivers that follow the powered-off receiver.

Receiver Input

	Antenna	Power
Connector Type:	BNC	IEC
Actual Impedance:	50 Ω	-
Nominal Input Level:	-95 to -30 dBm	100-240 VAC, 50/60 Hz
Maximum Input Level:	-20 dBm	240 VAC, + 10%, 50/60 Hz
Pin Assignments:	Shell = Ground Center = Signal	IEC Standard
Bias Voltage*	12 Vdc @ 150 mA maximum	N/A

* For remote antenna amplifiers

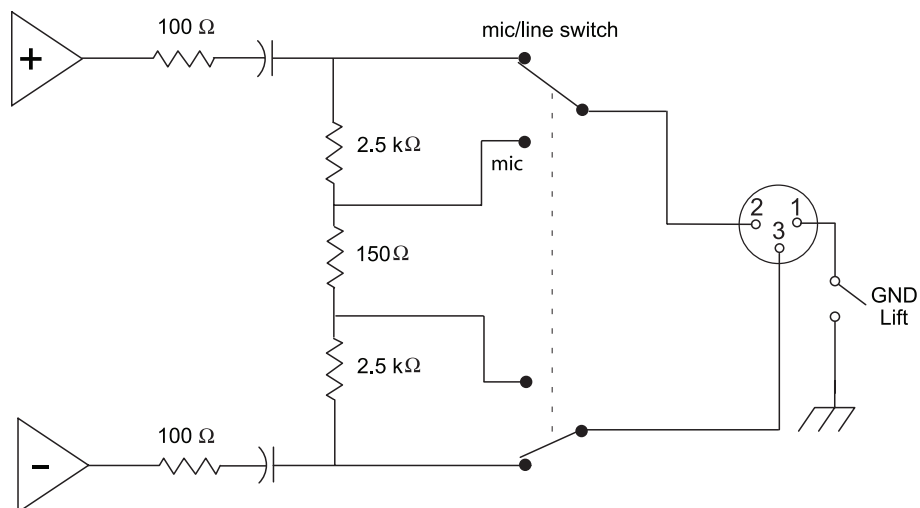
Receiver Audio Output

	Monitor (1/4" Headphone)	1/4" Phone	XLR
Output Configuration:	Unbalanced mono, 1/4 inch	Impedance Balanced	Electrically Balanced
Actual Impedance:	50 Ω	200 Ω	200 Ω (active balanced) (150 Ω mic)
Maximum Output Level:	1 Watt @ 63 Ω	+18 dBu	+24 dBu (-6 dBu mic) with 100 Hz modulating tone
Pin Assignments:	Tip = Hot Ring = Hot Sleeve = Gnd	Tip = Hot Ring = no signal Sleeve = Gnd	1 = Ground 2 = Audio + 3 = Audio -
Phantom Power Protection:	No	Yes	Yes

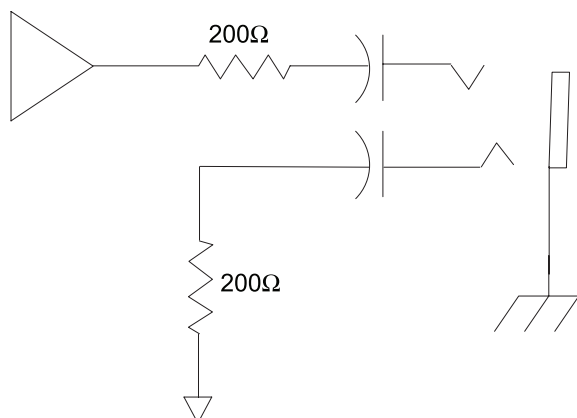
Computer/Network Interface

Ethernet
RJ45

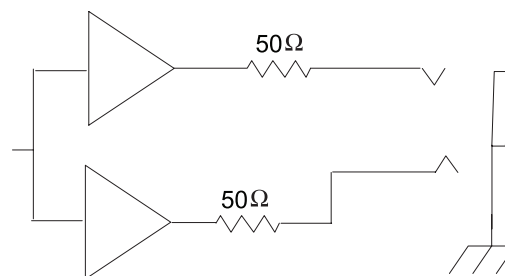
XLR



1/4" Phone



1/4" Monitor/headphone



Replacement Parts and Accessories

Furnished Accessories

Microphone Stand Adapter (UR2)	WA371
Threaded locking Adapter (with TA4F), UR1, UR1M	WA340
Zipper Bag (UR1, UR1M)	26A13
Zipper Bag (UR2)	26A14
Antenna Extension Cables (2)	95B9023
RF Distribution Cables (2)	95N2035
Antenna (UR1, UR1M), 470-530 MHz	UA700
Antenna (UR1, UR1M) 518-578 MHz	UA710
Antenna (UR1, UR1M), 578-698 MHz	UA720
Antenna (UR1, UR1M), 740-865 MHz	UA730
Antenna (UR1, UR1M), 944-952 MHz	UA740
Two Antennas (UR4), Band Dependent (see table)	UA820
Transmitter Carrying Case	95A9053

Optional Accessories

SM58 Head with Grille	RPW112
SM86 Head with Grille	RPW114
BETA 58 Head with Grille	RPW118
BETA 87A Head with Grille	RPW120
BETA 87C Head with Grille	RPW122
SM87A Head with Grille	RPW116
KSM9/SL Head with Grille	RPW180
KSM9HS Head with Grille (Champagne, Condenser)	RPW182
KSM9/BK Head with Grille	RPW184
KSM9HS Head with Grille (Black, Condenser)	RPW186
Matte Silver Grille (SM58)	RK143G
Matte Silver Grille (SM86)	RPM266
Matte Silver Grille (BETA 58)	RK265G
Black Grille (SM87)	RK214G
Matte Silver Grille (BETA 87A)	RK312
Matte Silver Grille (BETA 87C)	RK312
Black Grille (BETA 58)	RK323G
Black Grille (BETA 87A/BETA 87C)	RK324G
Champagne Grille (KSM9/SL)	RPM260
Black Grille (KSM9/BK)	RPM264
Popper Stopper® Windscreen	A85WS
Belt Clip (UR1)	44A8031
Belt Clip (UR1M)	44A8039
Bodypack Pouch (Black), UR1	WA580B
Bodypack Pouch (White), UR1	WA580W
Bodypack Pouch (Black), UR1M	WA581B
Bodypack Pouch (White), UR1M	WA581W
3-Pin mini Lemo conversion kit	WA335
Mute Switch for Bodypack	WA661
Mute Switch for 2 Bodypacks	WA662

Antenna Combiners and Accessories

- Antennas and receivers must be from the same frequency band.
- The supplied 1/2 wave antennas can be remotely mounted or mounted directly to the UA845.
- Antennas and cables for use with the UA845 can also be used with stand-alone UHF-R receivers.

Passive Antenna/Splitter Combiner Kit (recommended for 2 receivers)	UA221
UHF Antenna Power Distribution Amplifier	UA845-
U.S.A. (470-952 MHz)	UA845-SWB
Europe	UA845-SWB-E
UK	UA845-SWB-UK
1/2 Wave, Omnidirectional, Wideband Antenna (470-952 MHz)	UA860SWB
Active Directional Wideband Antenna (470-698 MHz)	UA874US
Active Directional Wideband Antenna (470-790 MHz)	UA874E
Active Directional Wideband Antenna (470-900 MHz)	UA874WB
Active Directional Narrowband Antenna (925-952 MHz)	UA874X
Wideband In-Line RF Amplifier (470-698 MHz)	UA830USTV
Narrowband In-Line RF Amplifier (944-952 MHz)	UA830X

Passive Unidirectional Wideband Antenna (470-952 MHz)	PA805WB
Passive Unidirectional Narrow band Antenna (600-1100 MHz)	PA805X
1/2 wave antennas (2)	
G1, G1HK Bands	UA820G
H4E, H4, H4HK Bands	UA820H4
J5E, J5, J5HK Bands	UA820J
L3E, L3, L3HK Bands	UA820L3
Q5, Q6, Q10, Q5HK Bands	UA820Q
R9, ABJ Bands	UA820A
X1 Band	UA820X
10' Antenna Cable	PA725
25' Antenna Cable (RG-8/X)	UA825
50' Antenna Cable (RG-8/X)	UA850
100' Antenna Cable	UA8100

Architects' and Engineers' Specifications

The wireless system shall operate in the UHF band between 470-806 MHz, with the specific range being dependent on the user's locale. The system shall include the option of changing the operating frequency in order to avoid RF interference, enabling up to 160 systems to operate simultaneously in the same location. Preconfigured group, channel and frequency setups shall be available to ensure that multiple systems in use do not interfere with one another.

All transmitters shall be powered by 2 AA or 2 AAA batteries and shall have a power on/off switch. The bodypack will have an LED indicating that power is on. Available transmitters shall include: a body pack for use with electric guitars, basses, and other electric instruments, and a handheld microphone for vocals. The transmitters shall have a DC/DC converter to ensure consistent performance, even if battery voltages change.

The receiver shall have a user-programmable, menu-driven LCD showing group, channel, frequency, name, squelch level, and locked/unlocked status. The system shall use technology such as MARCAD, signal combining circuitry to improve reception, minimize signal dropouts, and achieve the best possible signal-to-noise ratio. An equalizer, tone key squelch, and noise squelch circuitry shall be built into the system to provide optimal sound quality and minimize unwanted noise. The receiver shall include dual RF meters (one for each antenna), an audio level meter, and a Networking Interface connector for computer control and monitoring. The receiver shall have a volume control and an adjustable noise squelch control.

The system shall be the Shure UHF-R Wireless.

Certification

UR1, UR1M, UR2, UR4S+, UR4D+: Type Accepted under OFTA HKTA 1008 (Issue 3).

Emission Designator

120KF3E

UR4S+, UR4D+: Authorized under the Declaration Of Conformity provision of FCC Part 15. Certified under Industry Canada to RSS-123 ("IC: 616A-UR4P"). Meets the essential requirements of the European R&TTE Directive 99/5/EC (EN 301 489 Parts 1 & 9, EN 300 422 Parts 1 and 2). Eligible to carry the CE marking.

Conforms to Australian EMC requirements and is eligible for C-Tick marking.

Have been granted the following Country Safety Approvals:

cULus Mark for US and Canada: Meets UL6500 and CSA/CAN E60065. UL Certified to EN60065.

The "EU Declaration of Conformity" can be obtained from Shure Inc. or any of its European representatives. For contact information please visit www.shure.com/europe/compliance

Note: To fully interact with the Receiver, it is recommended to upgrade the UR4 firmware to 1.166 or higher and Shure Wireless Workbench.

LICENSING INFORMATION:

Licensing: A ministerial license to operate this equipment may be required in certain areas. Consult your national authority for possible requirements.

Changes or modifications not expressly approved by Shure Incorporated could void your authority to operate the equipment. Licensing of Shure wireless microphone equipment is the user's responsibility, and licensability depends on the user's classification and application, and on the selected frequency. Shure strongly urges the user to contact the appropriate telecommunications authority concerning proper licensing, and before choosing and ordering frequencies.

Information to User

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Consult the dealer or an experienced radio/TV technician for help.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Operation of this device is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Note: EMC conformance testing is based on the use of supplied and recommended cable types. The use of other cable types may degrade EMC performance.

Australia Warning for Wireless

This device operates under an ACMA class licence and must comply with all the conditions of that licence including operating frequencies. Before 31 December 2014, this device will comply if it is operated in the 520-820 MHz frequency band. **WARNING:** After 31 December 2014, in order to comply, this device must not be operated in the 694-820 MHz band.

SYSTEM COMPATIBILITY GUIDE FOR FREQUENCY BANDS G1HK, H4HK, J5HK, L3HK, Q5HK

G1HK FREQUENCY BAND (470.125 - 529.875 MHz)

Channel	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10
1	470.525	529.500	471.250	470.750	474.225	470.500	470.300	470.300	471.150	528.600
2	470.975	529.050	471.750	472.500	474.975	472.775	471.000	471.000	472.550	527.200
3	472.000	528.025	472.500	473.250	476.900	474.225	474.775	472.975	472.925	526.825
4	473.725	526.300	479.500	475.250	477.300	476.900	476.700	477.100	474.225	525.525
5	476.725	523.300	481.250	476.250	478.500	482.225	477.100	484.700	477.775	521.975
6	477.550	522.475	483.250	479.500	482.975	485.300	477.900	485.500	482.825	516.925
7	478.875	521.150	484.250	486.750	488.025	486.100	485.100	488.975	485.475	514.275
8	480.850	519.175	492.250	487.250	489.500	486.500	490.025	492.000	487.575	512.175
9	481.200	518.825	496.500	495.750	492.900	490.975	494.300	493.500	488.350	511.400
10	481.775	518.250	499.750	507.500	508.900	505.500	504.225	504.975	490.825	508.925
11	485.200	514.825	513.250	508.250	509.700	510.500	508.700	510.300	491.800	507.950
12	494.275	505.750	513.750	511.500	512.025	512.775	509.900	514.025	494.775	504.975
13	503.650	496.375	515.250	512.500	516.500	516.500	516.700	516.700	503.225	496.525
14	506.075	493.950	519.750	513.750	520.025	522.225	519.000	519.000	505.575	494.175
15	512.300	487.725	520.500	519.750	522.225	522.975	522.025	524.700	470.500	529.250
16	513.500	486.525	523.500	522.500	524.900	524.900	522.775	525.100	476.550	523.200
17	514.875	485.150	527.500	527.250	526.100	526.100	525.500	525.900	478.700	521.050
18	518.075	481.950	528.500	527.750	526.500	526.500	525.900	528.975	502.200	497.550
19	522.475	477.550	529.750	529.250	529.500	472.025	472.225	472.225	509.950	489.800
20	523.075	476.950	474.500	471.500	470.500	477.300	478.300	474.775	511.025	488.725
21	525.400	474.625	475.500	474.500	472.025	482.975	482.775	487.000	473.675	526.075
22	525.775	474.250	478.750	480.500	490.225	488.025	487.000	488.225	475.025	524.725
23	526.475	473.550	480.500	483.250	493.300	492.900	488.225	490.025	484.650	515.100
24	527.350	472.675	482.500	484.250	494.100	497.500	492.700	490.775	487.150	512.600
25	529.500	470.525	487.500	489.750	494.500	500.900	493.900	494.300	490.275	509.475
26	487.475	512.550	498.500	490.500	496.775	501.300	501.100	506.025	493.650	506.100
27	496.375	503.650	499.250	491.750	506.225	506.225	506.025	506.775	499.475	500.275
28	502.825	497.200	503.500	494.750	508.500	509.300	506.775	511.000	501.600	498.150
29	507.000	493.025	504.500	498.500	510.100	512.025	510.300	518.300	505.100	494.650
30	472.775	527.250	505.250	499.500	525.300	516.900	517.500	520.225	505.875	493.875
31	483.300	516.725	505.750	503.750	528.775	525.300	520.225	528.225	506.425	493.325
32	483.725	516.300	511.500	504.500		528.775	520.975		513.150	486.600
33	486.425	513.600	515.750	510.750			527.000		529.250	470.500
34	488.325	511.700	519.250	514.500						
35	489.375	510.650	526.750	523.250						
36	498.825	501.200	529.250	524.250						
37	499.350	500.675		529.750						
38	500.725	499.300								
39	505.725	494.300								
40	509.100	490.925								
41	509.500	490.525								
42	514.000	486.025								
43	516.975	483.050								
44	524.650	475.375								
45	528.675	471.350								

G1HK FREQUENCY BAND (470.125 - 529.875 MHz)

Channel	Group 11	Group 12	Group 13	Group 14	Group 15	Group 16	Group 17	Group 18	Group 19	Group 20	Group 21
1		478.100	486.100	494.100	502.100	510.100	518.100	470.250	470.125	470.375	510.375
2	471.350	479.350	487.350	495.350	503.350	511.350	519.350	470.875	470.750	471.000	511.200
3	471.975	479.975	487.975	495.975	503.975	511.975	519.975	471.775	471.650	471.900	512.325
4	472.800	480.800	488.800	496.800	504.800	512.800	520.800	473.075	472.950	473.200	513.650
5	473.325	481.325	489.325	497.325	505.325	513.325	521.325	474.025	473.900	474.150	514.675
6	475.775	483.775	491.775	499.775	507.775	515.775	523.775	475.700	475.575	475.825	515.175
7	476.200	484.200	492.200	500.200	508.200	516.200	524.200	476.525	476.400	476.650	515.900
8	476.925	484.925	492.925	500.925	508.925	516.925	524.925	476.975	476.850	477.100	517.325
9	477.850	485.850	493.850	501.850	509.850	517.850	525.850	478.600	478.475	478.725	521.900
10	477.275	485.275	493.275	501.275	509.275	517.275	525.275	479.425	479.300	479.550	522.525
11								483.475	483.350	483.600	525.275
12								483.900	483.775	484.025	525.675
13								484.575	484.450	484.700	514.000
14								485.050	484.925	485.175	522.975
15								489.450	489.325	489.575	511.850
16								491.875	491.750	492.000	523.675
17								494.100	493.975	494.225	524.575
18								495.650	495.525	495.775	
19								496.575	496.450	496.700	
20								497.725	497.600	497.850	
21								498.450	498.325	498.575	
22								500.550	500.425	500.675	
23								500.950	500.825	501.075	
24								501.625	501.500	501.750	
25								503.900	503.775	504.025	
26								508.325	508.200	508.450	
27								510.275	510.150	510.400	
28								510.900	510.775	511.025	
29								511.850	511.725	511.975	
30								513.075	512.950	513.200	
31								514.100	513.975	514.225	
32								514.600	514.475	514.725	
33								518.675	518.550	518.800	
34								519.350	519.225	519.475	
35								520.425	520.300	520.550	
36								521.800	521.675	521.925	
37								522.550	522.425	522.675	
38								523.525	523.400	523.650	
39								526.050	525.925	526.175	
40								527.375	527.250	527.500	
41								528.025	527.900	528.150	
42								529.300	529.175	529.425	
43								529.750	529.625	529.875	
44											
45											

H4HK FREQUENCY BAND (518 - 578 MHz)

Channel	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10
1	518.100	518.900	518.750	518.750	518.100	518.500	520.225	518.300	518.500	518.575
2	518.825	519.625	519.500	519.500	521.500	520.025	522.025	519.000	522.250	520.300
3	519.350	520.150	521.250	520.500	522.975	522.225	522.775	522.025	523.675	521.750
4	520.375	521.175	523.250	521.750	525.700	522.975	525.900	524.000	524.500	522.300
5	521.725	522.525	524.250	523.250	532.500	524.900	526.300	530.025	526.350	526.350
6	522.350	523.150	527.500	526.750	532.900	530.225	533.500	532.700	528.000	527.525
7	525.150	525.950	535.250	527.250	534.500	536.775	535.000	533.500	528.500	527.975
8	530.250	531.050	536.500	531.500	538.975	540.900	536.225	533.900	531.900	531.800
9	530.675	531.475	543.750	537.250	544.775	545.500	541.500	542.300	535.075	535.400
10	532.750	533.550	547.750	547.500	546.975	549.300	550.300	546.775	542.700	536.275
11	534.625	535.425	548.250	550.750	550.100	550.500	557.100	549.900	543.425	540.975
12	543.475	544.275	550.750	554.500	561.500	556.500	560.975	560.225	552.550	547.975
13	544.700	545.500	552.500	562.500	565.300	556.900	562.775	560.975	553.725	551.225
14	547.325	548.125	561.750	563.500	565.700	568.025	568.225	568.225	565.425	551.950
15	548.775	549.575	567.500	569.250	568.025	570.975	570.775	570.775	566.025	552.950
16	549.700	550.500	571.250	571.750	572.500	572.900	572.000	572.700	568.125	557.250
17	553.450	554.250	574.750	572.250	574.100	573.700	572.700	573.100	571.675	558.400
18	556.275	557.075	575.750	575.750	576.025	576.025	574.300	574.300	572.150	558.800
19	561.050	561.850	577.250	576.500	577.500	577.500	576.975	576.975	573.675	561.800
20	562.600	563.400	577.750	577.750	520.775	518.100	520.975	520.975	576.650	568.375
21	564.700	565.500	520.500	528.500	534.100	525.300	525.100	528.225	536.075	525.650
22	571.450	572.250	521.750	529.250	538.225	528.775	536.975	540.700	556.975	553.600
23	574.450	575.250	530.500	530.500	540.900	533.300	540.000	544.225	560.575	567.575
24	575.300	576.100	531.250	538.500	541.700	533.700	542.300	550.300	519.125	523.575
25	575.700	576.500	534.750	540.250	546.225	546.225	556.000	556.000	521.700	533.050
26	576.650	577.450	537.250	543.750	549.700	549.700	556.700	556.700	539.550	556.700
27	577.150	577.950	540.250	544.500	552.025	552.025	557.900	557.100	554.600	566.125
28	523.850	524.650	546.500	545.750	560.775	554.975	566.300	557.900	558.050	572.000
29	548.300	549.100	551.500	551.500	564.500	565.700	575.000	562.775	539.025	518.050
30	572.750	573.550	554.500	552.500	566.500	568.775	576.225	566.300	540.725	536.675
31	529.350	530.150	555.500	556.250	573.700	572.500			545.100	538.375
32	533.950	534.750	560.500	558.750					556.125	571.175
33	537.925	538.725	563.500	559.750					557.400	573.100
34	561.950	562.750	564.250	567.500					570.000	575.250
35	565.525	566.325	569.250	568.500						
36	566.575	567.375	570.500	569.750						
37	570.775	571.575								
38	535.750	536.550								
39	551.700	552.500								
40	569.425	570.225								

J5HK FREQUENCY BAND (578 - 638 MHz)

Channel	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10
1	578.375	578.375	578.500	578.500	578.225	578.225	578.775	580.000	589.375	581.050
2	579.400	579.100	579.250	579.250	578.975	578.975	580.000	580.700	590.525	582.400
3	581.750	580.175	579.750	582.750	580.900	580.900	582.300	581.100	591.175	583.950
4	582.625	583.125	583.250	583.250	582.500	581.300	583.000	581.900	595.300	584.950
5	584.675	583.625	585.750	585.750	585.500	582.500	584.975	584.975	596.350	585.700
6	587.350	584.825	587.500	591.750	593.500	586.975	589.100	591.000	600.375	589.250
7	588.825	585.800	593.250	593.250	594.975	592.025	592.225	594.775	601.875	589.900
8	589.225	587.350	595.500	595.500	597.300	598.500	597.100	597.500	602.825	591.125
9	594.200	593.475	598.750	604.250	604.900	606.100	597.900	605.900	604.925	593.350
10	594.725	595.400	610.500	607.500	605.700	608.775	605.500	606.300	605.700	599.100
11	596.975	596.750	611.250	608.500	606.100	609.500	608.975	608.225	616.900	610.300
12	603.475	599.800	615.500	609.250	610.975	610.975	610.775	610.775	622.650	611.075
13	606.050	608.275	623.250	617.750	624.775	620.900	621.500	621.100	624.875	613.175
14	607.725	609.950	623.750	623.250	626.975	624.775	623.000	624.975	626.100	614.125
15	616.200	612.525	625.750	623.750	628.900	628.900	628.000	626.775	626.750	615.625
16	619.250	619.025	631.750	625.750	630.500	630.500	628.700	631.000	630.300	619.650
17	620.600	621.275	633.250	633.250	636.500	634.225	634.775	634.025	631.050	620.700
18	622.525	621.800	634.500	634.500	636.900	634.975	636.700	634.775	632.050	624.825
19	628.650	626.775	635.500	635.500	637.700	637.300	637.100	636.000	633.600	625.475
20	630.200	627.175	636.250	636.250	580.500	637.700	637.900	637.500	634.950	626.625
21	631.175	628.650	583.750	580.250	584.775	586.225	578.025	584.225	594.000	586.250
22	632.375	631.325	585.250	587.750	596.900	588.500	594.025	596.000	620.625	595.375
23	632.875	633.375	599.500	590.750	598.100	589.300	594.775	598.300	629.750	622.000
24	635.825	634.250	600.500	594.500	598.500	600.025	596.700	605.100	579.850	593.850
25	636.900	636.600	601.750	599.750	600.775	604.500	606.300	608.975	580.950	607.800
26	637.625	637.625	602.500	601.750	610.225	605.700	610.025	620.700	586.800	629.200
27	581.200	581.775	603.750	602.500	616.775	614.100	621.900	621.900	608.200	635.050
28	586.450	592.150	606.750	603.500	621.700	621.700	626.775	622.300	622.150	636.150
29	592.725	594.275	608.500	611.250	626.225	626.225	630.300	624.225	598.250	581.900
30	597.900	595.825	609.250	615.500	630.100	626.975	631.000	630.300	606.250	598.100
31	598.600	598.850	612.250	619.250	634.225	630.100			611.900	603.050
32	604.000	600.400	619.500	620.250	634.975	636.500			612.950	604.100
33	605.350	601.550	620.250	625.250					617.900	609.750
34	614.450	610.650	625.250	626.500					634.100	617.750
35	615.600	612.000	626.500	631.500						
36	617.150	617.400	633.750	632.500						
37	620.175	618.100								
38	621.725	623.275								
39	623.850	629.550								
40	634.225	634.800								

L3HK FREQUENCY BAND (638 - 698 MHz)

Channel	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10
1	638.100	638.900	639.500	639.500	640.775	638.500	640.225	639.000	647.625	639.350
2	638.825	639.625	640.500	640.500	642.225	640.775	640.975	640.225	654.200	642.325
3	639.350	640.150	641.250	641.750	645.300	645.300	642.025	640.975	657.200	643.850
4	640.375	641.175	641.750	643.250	646.100	650.225	644.700	642.025	657.600	644.325
5	641.725	642.525	643.250	643.750	648.025	650.975	646.300	644.700	658.750	647.875
6	642.350	643.150	646.750	647.250	650.975	652.900	653.100	652.700	663.050	649.975
7	645.150	645.950	651.500	655.500	660.500	654.100	653.500	653.100	664.050	650.575
8	650.250	651.050	655.500	657.250	660.900	654.500	656.975	660.000	664.775	662.275
9	650.675	651.475	667.250	665.750	662.100	658.225	661.100	662.300	668.025	663.450
10	652.750	653.550	672.500	671.750	668.500	670.500	666.025	668.700	675.025	672.575
11	654.625	655.425	673.750	672.500	672.775	678.100	666.775	669.500	679.725	673.300
12	663.475	664.275	679.250	675.250	680.025	680.775	680.225	680.975	680.600	680.925
13	664.700	665.500	679.750	676.250	681.500	682.975	682.025	685.900	684.200	684.100
14	667.325	668.125	681.250	682.500	690.975	684.900	685.500	687.000	688.025	687.500
15	668.775	669.575	683.750	684.250	692.900	686.500	688.225	692.700	688.475	688.000
16	669.700	670.500	687.500	687.500	694.100	692.900	692.000	693.900	689.650	689.650
17	673.450	674.250	692.250	691.750	694.500	693.700	692.700	694.300	693.700	691.500
18	676.275	677.075	695.500	695.750	696.775	696.025	693.100	696.225	694.250	692.325
19	681.050	681.850	696.500	697.250	697.500	697.500	693.900	696.975	695.700	693.750
20	682.600	683.400	697.250	697.750	638.100	638.100	696.975	650.775	697.425	697.500
21	684.700	685.500	638.750	641.250	648.775	644.900	652.000	656.225	648.425	655.425
22	691.450	692.250	647.250	647.750	650.225	648.775	658.025	663.000	662.400	659.025
23	694.450	695.250	649.250	648.500	661.700	657.500	658.775	664.975	690.350	679.925
24	695.300	696.100	649.750	657.750	666.225	666.975	668.000	672.225	644.000	657.950
25	695.700	696.500	650.500	658.500	666.975	669.300	680.975	682.775	649.875	661.400
26	696.650	697.450	660.250	662.750	669.300	670.100	684.700	685.100	659.300	676.450
27	643.850	697.950	662.750	663.500	669.700	672.775	685.900	686.300	682.950	694.300
28	643.850	644.650	664.500	665.250	682.225	684.500			692.425	696.875
29	668.300	669.100	666.500	667.500	685.700	692.500			640.750	646.000
30	692.750	693.550	671.500	671.250	686.100	694.100			642.900	658.600
31	649.350	650.150	674.500	674.500					644.825	659.875
32	653.950	654.750	684.250	688.500					677.625	670.900
33	657.925	658.725	689.750	689.250					679.325	675.275
34	681.950	682.750	691.750	691.250					697.950	676.975
35	685.525	686.325	697.750	695.250						
36	686.575	687.375								
37	690.775	691.575								
38	655.750	656.550								
39	671.700	672.500								
40	689.425	690.225								

Q5HK FREQUENCY BAND (740 - 805.875 MHz)

Channel	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10
1	740.300	740.425	740.100	740.625	740.250	740.250	742.750	740.900	740.500	740.900
2	740.825	740.850	740.625	741.050	742.750	743.250	743.500	741.300	740.900	741.300
3	742.400	742.100	742.200	742.300	743.250	743.750	745.250	742.100	742.100	746.975
4	742.800	742.650	742.600	742.850	744.500	745.250	746.500	744.025	744.025	748.900
5	745.000	744.025	744.800	744.225	746.500	746.500	747.500	745.500	744.775	749.700
6	745.975	744.675	745.775	744.875	747.250	753.750	751.750	749.300	746.225	752.025
7	748.850	745.600	748.650	745.800	752.500	755.500	753.250	754.225	756.900	753.500
8	749.950	750.050	749.750	750.250	759.750	763.500	753.750	760.025	761.500	764.500
9	753.350	752.625	753.150	752.825	767.500	769.250	758.750	770.975	764.500	768.775
10	756.100	753.525	755.900	753.725	768.500	771.250	771.750	774.100	770.975	774.100
11	764.875	758.825	764.675	759.025	769.750	772.250	775.500	774.500	772.900	776.025
12	770.150	766.275	769.950	766.475	771.750	774.750	776.500	781.300	773.300	778.975
13	771.800	769.350	771.600	769.550	772.250	775.500	777.750	782.500	776.775	781.700
14	772.575	770.025	772.375	770.225	786.500	785.750	787.500	784.025	778.225	782.500
15	774.325	771.300	774.125	771.500	794.500	791.750	791.500	786.225	778.975	784.775
16	776.625	777.375	776.425	777.575	796.250	795.500	799.750	786.975	796.500	796.500
17	782.700	779.675	782.500	779.875	799.750	800.500	801.750	802.975	797.700	800.775
18	783.975	781.425	783.775	781.625	803.500	801.250	803.250			804.500
19	784.650	782.200	784.450	782.400		803.250	804.250			805.700
20	787.725	783.850	787.525	784.050						
21	795.175	789.125	794.975	789.325						
22	800.475	797.900	800.275	798.100						
23	801.325	800.650	801.125	800.850					753.500	
24	803.950	804.050	803.750	804.250	748.250	745.750	744.500	746.225	754.975	744.775
25		805.150		805.350	750.750	750.750	745.750	753.500	757.700	746.225
26					755.750	752.500	751.250	758.100	766.500	750.100
27					759.250	753.250	754.500	758.500	781.700	765.300
28					762.500	754.500	755.500	765.300	788.500	768.025
29					763.500	758.750	759.500	768.775	789.300	772.500
30					766.750	760.500	760.500	769.500	792.025	773.700
31					770.500	767.500	766.750	772.900	792.775	781.300
32	754.400	751.050	754.200	751.250	775.500	770.500	770.500	788.900	797.300	792.025
33	768.000	772.025	767.800	772.225	779.500	776.500	771.250	797.300	798.500	794.975
34	778.000	776.000	777.800	776.200	782.750	777.750	779.500	801.500	800.775	797.300
35	781.975	786.000	781.775	786.200	783.250	779.250	782.750			
36	802.950	799.600	802.750	799.800	784.500	782.750	784.500			
37	743.550	746.200	743.350	746.400	785.250	784.500	785.250			
38	750.400	755.625	750.200	755.825	788.250	785.250	785.750			
39	751.425	768.400	751.225	768.600	791.750	786.500	786.500			
40	785.600	802.575	785.400	802.775	795.500	788.250	790.750			
41	798.375	803.600	798.175	803.800	798.750	796.250	793.250			
42					800.500	801.750	800.500			
43	767.400	754.825	767.200	755.025						
44	768.950	758.375	768.750	758.575						
45	769.700	763.725	769.500	763.925						
46	790.275	784.300	790.075	784.500						
47	795.625	785.050	795.425	785.250						
48	799.175	786.600	798.975	786.800						

Q5HK FREQUENCY BAND (740 - 805.875 MHz)

Channel	Group 11	Group 12	Group 13	Group 14	Group 15	Group 16	Group 17	Group 18	Group 19	Group 20
1	741.100	740.700	741.100	790.100	790.100	790.250	790.300	790.350	790.400	791.475
2	741.900	741.100	741.500	791.050	791.575	792.325	791.250	791.300	790.800	792.525
3	742.300	742.300	742.300	793.575	792.050	792.900	792.950	794.925	798.800	793.200
4	743.000	743.000	744.975	794.675	794.425	793.725	794.875	795.450	803.500	795.625
5	748.700	750.300	746.025	803.200	796.250	795.350	795.400	801.000	804.725	797.125
6	751.000	752.975	748.000	804.425	797.500	799.900	796.150	803.450	805.700	802.525
7	754.025	757.900	752.225		799.575	800.900	798.700			804.850
8	765.500	759.000	757.500				801.775			805.250
9	768.225	770.775	759.000							
10	768.975	772.700	773.100							
11	770.025	774.300	773.500							
12	775.000	778.025	776.225			794.825		793.825	792.475	
13	778.775	781.100	776.975	796.425	790.600			796.675	793.875	
14	780.700	782.300	780.000	797.400	805.500			797.650	794.975	799.400
15	783.000	784.975	781.900	797.900					795.500	
16	797.500	786.775	784.225	800.750					796.725	
17	797.900	797.900	788.700							
18	799.000	800.225	802.025							
19	805.100	804.000	804.700							
20		805.100	805.100							
21										
22										
23										
24										
25	746.775	744.225	752.975							
26	749.100	748.700	754.025							
27	752.225	749.100	756.700							
28	754.775	752.225	774.300							
29	756.700	754.775	782.300							
30	764.000	764.000	788.000							
31	782.300	768.225	789.100							
32	784.225	772.000	789.900							
33	784.975	780.700	792.975							
34	788.000	791.000	802.775							
35	792.225	794.025								
36		794.775								
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Q5HK FREQUENCY BAND (740 - 805.875 MHz)

Channel	Group 21	Group 22	Group 23	Group 24	Group 25	Group 26	Group 27	Group 28	Group 29
1	790.925	742.750	742.100	750.100	758.100	766.100	774.100	782.225	790.100
2	791.400	744.625	742.925	750.925	758.925	766.925	774.925	782.650	790.925
3	792.625	745.100	743.525	751.525	759.525	767.525	775.525	783.900	791.525
4	795.025	745.975	744.575	752.575	760.575	768.575	776.575	784.625	792.575
5	795.650	747.650	745.900	753.900	761.900	769.900	777.900	785.775	793.900
6	797.050	748.225	747.650	755.650	763.650	771.650	779.650	786.400	795.650
7	802.000	753.225	748.050	756.050	764.050	772.050	780.050	787.325	796.050
8	803.575	754.750	749.200	757.200	765.200	773.200	781.200	787.850	797.200
9	805.750	755.950	749.900	757.900	765.900	773.900	781.900	788.675	797.900
10		759.350	746.600	754.600	762.600	770.600	778.600		794.600
11		762.275							
12		770.100							
13		774.375							
14	799.400	775.775							
15		777.500							
16		779.750							
17		782.550							
18		784.475							
19		785.975							
20		787.050							
21		788.350							
22		788.875							
23		743.500							
24		772.075							
25		755.450							
26		756.750							
27		770.825							
28		772.725							
29		776.450							
30		789.875							
31		760.000							
32		783.925							
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Q5HK FREQUENCY BAND (740 - 805.875 MHz)

Channel	Group 30	Group 31	Group 32	Group 33
1	798.100		742.000	740.175
2	798.925		743.200	740.900
2	799.525		743.850	742.300
4	800.575		744.800	742.850
5	801.900		748.175	743.975
6	803.650		748.650	746.550
7	804.050		749.500	747.550
8	805.200		751.250	751.525
9			752.750	751.925
10	802.600		758.025	765.325
11			760.925	766.550
12			770.900	767.425
13			774.450	773.025
14			776.400	773.525
15			777.475	776.625
16			778.875	777.950
17			783.075	781.950
18			796.800	783.775
19			797.975	798.600
20			804.325	804.250
21				
22			741.200	748.175
23			773.450	752.600
24			775.700	770.875
25				778.900
26			745.475	783.375
27			754.900	766.125
28			762.625	771.775
29			768.825	786.450
30			783.575	802.075
31			797.575	
32			755.525	745.950
32			756.650	749.375
33			758.975	763.475
34			781.700	788.125
35				800.900
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