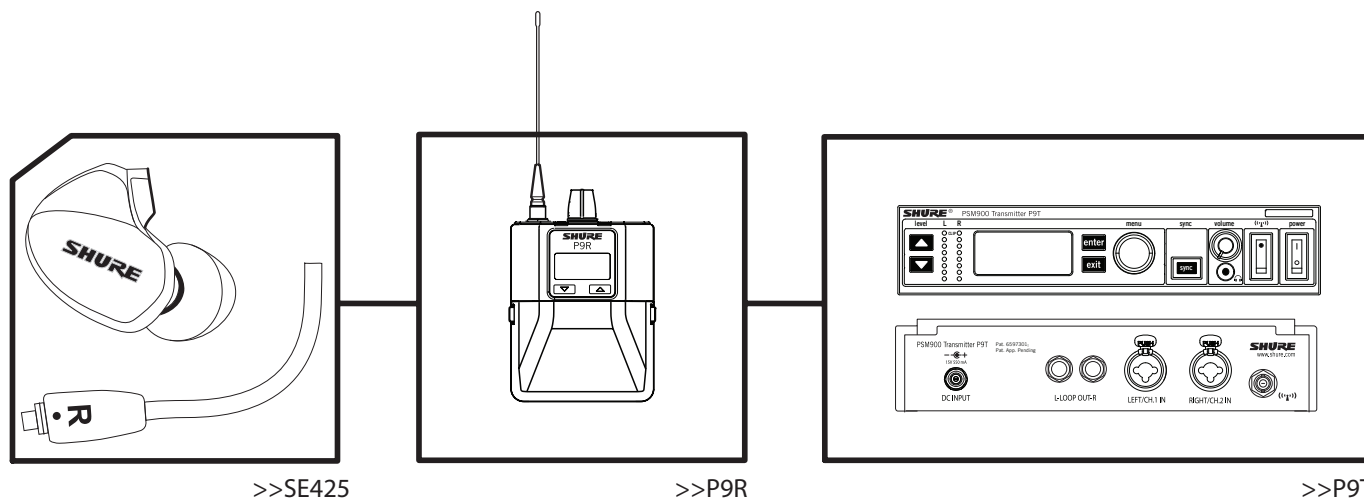


SHURE®

LEGENDARY
PERFORMANCE™

PSM®900

Personal Monitor System User Guide



**WARNING!**

USING THIS SYSTEM AT EXCESSIVE VOLUMES CAN CAUSE PERMANENT HEARING DAMAGE. USE AS LOW A VOLUME AS POSSIBLE.

In order to use this system safely, avoid prolonged listening at excessive sound pressure levels. Please use the following guidelines established by the Occupational Safety Health Administration (OSHA) on maximum time exposure to sound pressure levels before hearing damage occurs.

90 dB SPL at 8 hours
95 dB SPL at 4 hours
100 dB SPL at 2 hours
105 dB SPL at 1 hour
110 dB SPL at 1/2 hour
115 dB SPL at 15 minutes

120 dB SPL — avoid or hearing damage may occur

It is difficult to measure the exact Sound Pressure Levels (SPL) present at the eardrum in live applications. In addition to the volume setting on the PSM, the SPL in the ear is affected by ambient sound from floor wedges or other devices. The isolation provided by the fit of quality earphones is also an important factor in determining the SPL in the ear.

Here are some general tips to follow in the use of this product to protect your ears from damage:

1. Turn up the volume control only far enough to hear properly.
2. Ringing in the ears may indicate that the gain levels are too high. Try lowering the gain levels.
3. Have your ears checked by an audiologist on a regular basis. If you experience wax buildup in your ears, stop using the system until an audiologist has examined your ears.
4. Wipe the earphones with an antiseptic before and after use to avoid infections. Stop using the earphones if they are causing great discomfort or infection.



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

PSM900

The PSM 900 Wireless Personal Monitor System from Shure offers an unprecedented combination of superb audio quality, robust RF performance, and category-leading setup features for the most demanding professional applications. All new, patent-pending CueMode allows the sound engineer to monitor different stage mixes with the touch of a button. Precision front-end RF filtering significantly reduces dropouts from RF interference, and the enhanced digital stereo encoder provides excellent stereo separation and audio clarity.

Superb audio quality

- Digital stereo encoder provides a wider stereo field with exceptional separation, enhancing audio detail and clarity
- Patented Audio Reference Comping sounds more like wired
- Available with Shure SE425 Sound Isolating™ Earphones featuring dual high-definition MicroDrivers for accurate and balanced audio response

Robust RF Performance

- Precision front-end RF filtering for a cleaner, stronger RF signal and fewer dropouts and audible artifacts.
- Exceptional transmitter linearity vastly reduces frequency intermodulation, allowing more channels per frequency band.
- Automatic RF gain control prevents signal distortion due to RF overload.

Advanced Setup and Operation

- Patent-pending CueMode allows monitoring of the stage mixes of up to 20 separate transmitters from one bodypack.
- Front panel RF mute switch for disabling RF transmission during setup
- Scan and Sync setup identifies the best group and channel for your system and assigns it over a wireless IR link
- MixMode® Technology allows the bodypack user to adjust their own onstage monitor mix
- High-frequency EQ boost on bodypack

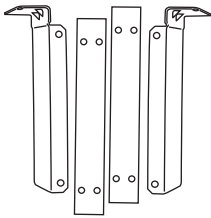
Components

- Rack unit with mounting hardware and detachable antenna.
- Bodypack with detachable antenna.



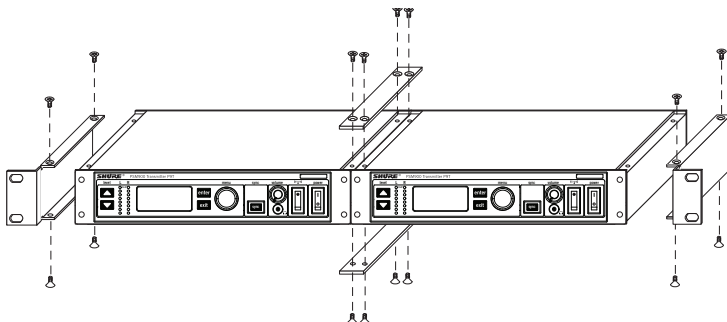
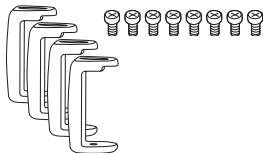
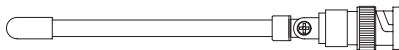
UA506

1/2 RACK MOUNT HARDWARE



UA507

FULL RACK MOUNT HARDWARE



Features

Frequency Scan

The scan feature analyzes the RF environment for interference to identify available frequencies. The PSM900 has two frequency scan modes:

- **Channel Scan** Press the **scan** button on the bodypack. Finds the first available channel.
- **Group Scan** Press and hold the **scan** button for two seconds. Finds the group with the greatest number of available channels. (Each group contains a set of frequencies that are compatible when operating multiple systems in the same environment.)

Sync

The PSM900 transfers settings in either direction: from the bodypack to the rack unit, or from the rack unit to the bodypack.

- **Sending settings to the bodypack:** Align the IR windows and press the **sync** button on the rack unit. The blue LED on the bodypack flashes.
- **Downloading settings from the bodypack:** First press the **scan** button on the bodypack. Then align the IR windows and press the **sync** button on the rack unit while the bodypack display is flashing "SYNC NOW...". The **level** LEDs flash on the rack unit.

MixMode

Some performers need to hear more of their own voice or instrument, while others want to hear more of the band. With MixMode, the performer creates their own mix using the balance control (▼▲ buttons) on the bodypack.

To use MixMode, send a solo mix of the performer to the **CH. 1 IN** input on the transmitter, and send a band mix to the **CH. 2 IN** input.

Set the performers bodypack for MixMode. The bodypack combines the two signals and sends them to both earphones, while the balance control on the bodypack adjusts the relative levels for each.

CueMode

CueMode allows you to upload the name and frequency settings from multiple rack units and store them as a list on a single bodypack. You can then, at any time, scroll through that list to hear the audio mix from each transmitter, just as each performer does during a show.

CueMode lists are retained even if CueMode is exited, the bodypack is turned off, or batteries are removed.

LOOP Applications

Use **LOOP OUT L** (left) and **R** (right) outputs to send a copy of the audio signal going into the transmitter to other devices. Following are a few of the many applications for these outputs.

Note: The input level control and the input pad do not affect the **LOOP OUT** signals.

Stereo for Multiple Systems

Send one stereo signal from the mixing console the inputs on the first transmitter, then connect the LOOP outputs to the inputs on the next transmitter. Repeat for all transmitters to form a chain.

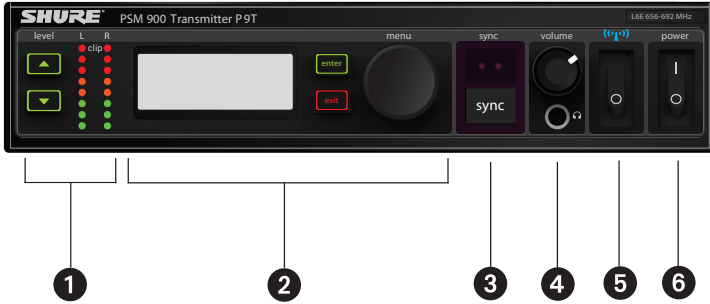
Floor Monitors

Send the audio from the LOOP outputs to onstage loudspeakers. The bodypack and the onstage monitors receive the same audio signals.

Recording Devices

To record a performance, connect the LOOP outputs to the inputs of a recording device.

P9T



Front Panel Controls

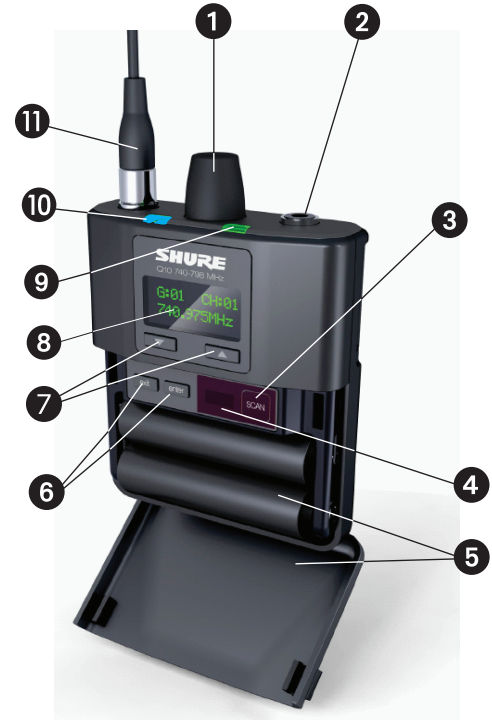
- ① **Input Level Control and Display** Use the ▼▲ buttons to adjust the audio so that, for the average input signal level, the top two yellow LEDs flicker and the lower LEDs are solid. The red **clip** LED indicates the inputs are overdriven. Reduce the level at the audio source or change the input sensitivity of the rack unit from the **AUDIO>INPUT** menu.
- ② **Status Display and Menu Controls** Use the **enter** and **exit** buttons and the menu wheel to access the configuration menu. Push the menu wheel to move the cursor to the next item. Turn the menu wheel to change a parameter—the **enter** button flashes. Press it to save the value. Press the **exit** button to cancel changes and return to the previous menu.
- ③ **Synchronization Button** Press the **sync** button while rack unit and bodypack IR windows are aligned to transfer settings.
- ④ **Headphone Monitoring** The **volume** control adjusts signal output to the 3.5 mm headphone jack. NOTE: it does not affect rear panel outputs.
- ⑤ **RF switch** mutes RF output. For setting up multiple systems or adjusting settings without transmitting unwanted RF or audio signals.
- ⑥ **Power Button** Turns the unit on and off.



Rear Panel Connectors

- ⑦ **Power** Connect the transmitter to a power outlet using the supplied power adapter.
- ⑧ **LOOP OUT** Sends a copy of the audio signal going into the transmitter to another device. See LOOP Applications.
- ⑨ **Audio Inputs** Connect to balanced or unbalanced outputs. Use either connector for mono input. Accepts both 1/4-inch or male XLR connectors.
- ⑩ **Antenna (BNC)** Attach supplied antenna. If you are rack mounting, use a front panel or remote mounting kit from Shure.

P9R



Bodypack Receiver

- ① **Power Switch and Volume Control** Turns the bodypack on and off and adjusts earphone volume.
- ② **3.5 mm Earphone Jack** Insert earphones here.
- ③ **Scan Button** Press the scan button to find an available frequency. Press and hold for two seconds to find the group with the most available channels.
- ④ **IR Window** For transmitting settings between bodypack and rack unit.
- ⑤ **Battery Compartment** Requires 2 AA batteries. Open by pressing the latches on both sides and pulling.
- ⑥ **Menu buttons** Use in conjunction with the ▼▲ buttons to access the configuration menus.
- ⑦ **▼▲ Buttons** Use to adjust the audio mix (in MixMode only), or in conjunction with the menu buttons to change settings.
- ⑧ **LCD Screen** Displays current settings and menus.
- ⑨ **Tri-Color Battery LED** illuminates green, orange, red, or flashing red, to indicate battery power. When flashing red, change batteries immediately.
- ⑩ **Blue RF LED** Indicates the bodypack is receiving a signal from the transmitter.
- ⑪ **Detachable Antenna SMA Connector**

Battery Indicator	Tri-Color Battery LED	Approximate Hours Remaining	
		Alkaline	NiMH (2450 mAh)
	Green	5-7	4
	Green	3½-4	3-3½
	Green	3-3½	1½-2
	Green	2-2½	½
	Orange	½-1	0
	Red	½-½	0

Quickstart Instructions

Bodypack

Insert batteries and attach antenna. Turn on using the volume knob. The battery light illuminates.

Rack Unit

1. Connect to a power outlet using the supplied power adapter.
2. Attach the supplied antenna to the ANTENNA OUT BNC connector.
3. Connect the audio source, such as the output of a mixer, to the audio inputs. You can use both input jacks or choose either one for a mono source.
 - For mono (one input), access the **AUDIO** menu and select **MONO**.
 - Set the input sensitivity to match the source by selecting **AUDIO>INPUT** from the LCD configuration menu: **AUX -10dBV** or **LINE+4dBu**.
4. Turn the power ON. Make sure the RF switch is OFF.
5. Adjust the audio source level so that, for the average input signal level, the top two yellow LEDs flicker and the lower LEDs are solid.
 - If the red **clip** LED illuminates, the inputs are overdriven. Decrease the level using the **▼▲** buttons or change the input sensitivity to **-10 dBV**.
 - If the signal level is too low, change the input sensitivity to **+4dBu**.

Scan and Sync

1. Press the **scan** button. The display flashes **SYNC NOW . . .**
2. Align the IR windows on the bodypack and rack unit and press the **sync** button. The rack unit **level** LEDs flash, and it displays **SYNC SUCCESS**.
3. Turn the RF switch on. The blue RF LED illuminates on the bodypack to indicate that it is detecting the transmitter. The bodypack also displays the RF signal strength (**RF**).
4. **IMPORTANT:** Turn bodypack volume down before plugging in earphones.
5. Insert the earphones and slowly turn up the volume.

Multiple System Setup

When setting up multiple systems, designate a single bodypack to scan for available frequencies and download them to all the rack units.

The bodypack must be from the same frequency band as all the transmitters.

1. Power on all the rack units. **Turn off the RF.** (This prevents them from interfering with the frequency scan.)
 - Note:** Turn **on** all other wireless or digital devices as they would be during the performance or presentation (so the scan will detect and avoid any interference they generate).
2. Use the bodypack to **scan for a group** by pressing and holding the **scan** button for **two seconds**. The bodypack displays the group and the number of available channels, and flashes **SYNC NOW . . .**
 - Important:** Note the number of available channels. If you have more rack units than available channels, eliminate potential sources of interference and try again, or call Shure Applications for assistance.
3. Sync the bodypack with the first rack unit by aligning the IR windows and pressing **sync**.
4. Press **scan** again on the bodypack to find the next available frequency.
5. Sync the bodypack with the next rack unit.
6. Repeat with all the rack units.
7. Sync each performer's bodypack to its respective rack unit by aligning the IR windows and pressing **sync**. **DO NOT** press scan on the bodypacks.
8. Turn on the RF on all rack units. The systems are ready to use.

MixMode for Multiple Systems

Configure each system for MixMode. From the mixing console, send a mix of the whole band to input 2 of the first transmitter. Connect the **LOOP OUT R** output to the **CH. 2 IN** input of the next transmitter. Continue the chain with all the transmitters.

Next, create solo mixes for each performer. Send each mix to input 1 of the transmitter for that performer.

CueMode

Note: Set the channel frequency and assign display names for each transmitter **before** creating your CueMode list.

Adding Transmitters to the CueMode List

Note: The transmitter must be from the same frequency band as the bodypack.

1. Open the battery door and press the **enter** button.
2. From the main menu, scroll to **UTILITIES** and press **enter**. Select **CueMode** and press **enter** again.
3. Align IR windows and press **sync** on the rack unit.
 - The LCD displays **SYNC SUCCESS** after frequency and name data are uploaded to the CueMode list. It also displays the CueMode number for that transmitter and the total number of transmitters.
4. Repeat the above step for each transmitter.
 - Note:** Syncing while in CueMode does not change any of the settings on the bodypack.

Auditioning Mixes

1. Enter CueMode from the **UTILITIES** menu.
2. Use the **▼▲** buttons to scroll through your CueMode list to hear the mixes.

Exiting CueMode

Exit CueMode by pressing **enter** and selecting **EXIT CUEMODE**.

Managing CueMode Mixes

While in Cue Mode, you can access the following menu by pressing **enter**:

REPLACE MIX Select and press sync on a rack unit to upload new data for the current mix (for example, if you have changed the transmitter frequency).

DELETE MIX Removes the selected mix.

DELETE ALL Removes all mixes.

EXIT CUEMODE Exits CueMode and returns the bodypack to the previous frequency setting.

Configuration Menu

Press **enter** to access settings. After adjusting a setting, press **enter** to accept the change.

Note: Configuration menu items may vary with regional model variations.

P9T Rack Unit Transmitter

RF Settings

RADIO	
G	Sets the group number
CH	Sets the channel number
888.888MHz	Manual frequency selection
RF POWER	Select from 10, 50, or 100 mW (varies by region)

Audio Settings

AUDIO		
MODE	Selects monitor mode	
	STEREO/MX	Transmits both channels
	MONO	Transmits a mono signal to bodypack
INPUT	Sets nominal input level	
	LINE +4 dBu	line level
	AUX -10dBV	aux level

Utilities and Display Settings

UTILITIES		
EDIT NAME	Changes the name on the LCD display (this name is uploaded to the bodypack with sync)	
DISPLAY	Changes the display format	
CONTRAST	Changes the display contrast	
LOCK PANEL	Press enter to lock the front panel controls. To unlock, press exit , select OFF , and press enter .	
RX SETUP	These settings are sent to the bodypack during a sync (when the sync direction is from the transmitter). The default KEEP parameter will not change the bodypack settings.	
	LOCK	Lock bodypack
	V LIMIT	Volume limiter
	LIM VAL	Volume limiter value
	MODE	Stereo (ST) or MixMode (MX)
	BAL MX	CH. 1 (L) and CH. 2 (R) mix for MixMode
	BAL ST	Left (L) and right (R) balance for stereo mode
HIBOOST	high frequency boost	
CUSTOM GROUP	For creating custom frequency groups	

P9R Bodypack Receiver

RF Settings

RADIO	
G	Sets the group number
CH	Sets the channel number
888.888MHz	Manual frequency selection

Audio Settings

AUDIO		
MODE	Selects monitor mode	
	STEREO	Stereo
	MIXMODE	MixMode
HIBOOST	High-frequency EQ boost	
	OFF	flat
	6 dB	+6 dB @ 10 kHz
	3 dB	+3 dB @ 6 kHz
V LIMIT	ON	Limits volume level
	VALUE	5–9: analogous to volume knob position (for example, 5 is equal to the 5th dot on the volume knob)
BAL ST / BAL MX	Left and right balance for earphones when in stereo mode, or mix of left and right channel for MixMode	

Utilities and Display Settings

UTILITIES	
CUEMODE	Enters CueMode (to exit, press enter and select EXIT CUEMODE)
DISPLAY	Changes the display format
CONTRAST	Changes the display contrast
LOCK PANEL	Locks all controls except power and volume. To unlock, press exit , select OFF , and press enter .

SPECIFICATIONS

PSM900

RF Carrier Range

470–952 MHz

Note: varies by region

Compatible Frequencies

Per band: 20

Tuning Bandwidth

US: 36–40 MHz

varies by region

Operating Range (environment dependent)

90 m (300 ft)

Audio Frequency Response

35 Hz–15 kHz

Stereo Separation

60 dB

Signal-To-Noise Ratio (A-Weighted)

90 dB (typical)

Total Harmonic Distortion (ref. ±34 kHz deviation

@1 kHz)

<0.8% (typical)

Companding

Patented Audio Reference Companding

Spurious Rejection (ref. 12dB SINAD)

>80 dB (typical)

Frequency Stability

±2.5 ppm

MPX Pilot Tone

19 kHz (±0.3 kHz)

Modulation

FM*, MPX Stereo

* ±34 kHz deviation (nominal)

Operating Temperature

-18°C–+57°C

P9R

Front-End RF Filtering

-3 dB at 30.5 MHz from center frequency

Active RF Gain Control

31 dB

Adjusts RF sensitivity to provide more RF dynamic range

RF Sensitivity (at 20 dB SINAD)

2.2 µV

Image Rejection

>100 dB

Adjacent Channel Rejection

>70 dB

Squelch Threshold

22 dB SINAD (±3 dB)

Intermodulation Attenuation

>70 dB

Blocking

>80 dB

Audio Output Voltage (1kHz @ <1% distortion, peak

power, @32Ω)

100 mW per output

Minimum Load Impedance

9.5 Ω

High Boost

selectable: +2 dB @ 6 kHz, +4 dB @ 10 kHz

Volume Limiter

selectable: 3–9

Reduces maximum output level. Selected value analogous to volume knob increment.

Net Weight

200 g (with batteries)

Dimensions

83 mm X 65 mm X 22 mm

Battery Life

5–7 hours (continuous use)

P9T

RF Output Power

selectable: 10, 50, 100 mW (+20 dBm)

varies by region

Antenna Input Impedance

50 Ω (typical)

Net Weight

850 g

Dimensions

197 mm X 166 mm X 42 mm

Power Requirement (RF on, 100 mW power mode, no

audio)

120 VAC: 415 mA, typical

Audio Inputs

Combination XLR and 6.35 mm (1/4") TRS

Polarity

XLR: Non-inverting (pin 2 positive with respect to pin 3)

6.35 mm (1/4") TRS: Tip positive with respect to ring

Configuration

Electronically balanced

Impedance

70.2 kΩ (actual)

Nominal Input Level

switchable: +4 dBu, -10 dBV

Maximum Input Level

+4 dBu: +23.3 dBu

-10 dBV: +12.5 dBu

Pin Assignments

XLR: 1=ground, 2=hot, 3=cold

6.35 mm (1/4") TRS: Tip=hot, Ring=cold,

Sleeve=ground

Phantom Power Protection

up to 60 V DC

Outputs

6.35 mm (1/4") TRS

Configuration

Electronically balanced

Impedance

Connected directly to inputs

Furnished Accessories

P9R Antenna	
470–542 MHz	UA700
596–692 MHz	UA720
692–830 MHz	UA730
830–952 MHz	UA740
P9T Antenna	
470–530 MHz	UA820G
500–560 MHz	UA820G7
518–578 MHz	UA820H4
578–638 MHz	UA820J
638–698 MHz	UA820L3
690–746MHz	UA820B
740–814 MHz	UA820Q
900–952 MHz	UA820X
Front Mount Antenna Cable	95A9023
Zipper Bag	95A2313
Rackmount Bracket, Long (1)	53A8612
Rackmount Bracket, Short (2)	53A8611
Link Bar (2)	53B8443
Hardware Kit (Rackmounting	90AR8100
Screws)	
Bumper Kit	90B8977
Energy Efficient Switching Power Supply	
USA	PS41
Brazil	PS41BR
Argentina	PS41AR
Europe	PS41E
United Kingdom	PS41UK
Australia/New Zealand	PS41AZ
China	PS41CHN
Taiwan	PS41TW
Japan	PS41J

Optional Accessories

8-to-1 antenna combiner for better RF performance	PA821SWB
4-to-1 antenna combiner with power distribution to 4 transmitters (better RF performance and eliminates need for external power supply)	PA421SWB
Passive Directional Antenna	PA805SWB
Helical Antenna	HA-8000
Passive Omnidirectional Antenna	PA860SWB
4-Channel Personal Monitor Mixer	P4M
Coaxial Cable, BNC-BNC, RG58C/U type, 50 Ohm, 2 ft length (0.6 m)	UA802
Coaxial Cable, BNC-BNC, RG58C/U type, 50 Ohm, 6 ft length (2 m)	UA806
Coaxial Cable, BNC-BNC, RG8X/U type, 50 Ohm, 25 ft length (7.5 m)	UA825
Coaxial Cable, BNC-BNC, RG8X/U type, 50 Ohm, 50 ft length (15 m)	UA850
Coaxial Cable, BNC-BNC, RG213/U Type, 50 Ohm, 100 ft length (30 m)	UA8100

CERTIFICATION

P9T, P9R

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.

P9T

Certified under FCC Parts 74. (**FCC ID:** DD4P9TA, DD4P9TB, DD4P9TC, DD4P9TD, DD4P9TJ). Certified by IC in Canada under RSS-123 and RSS-102. (**IC:** 616A-P9TA, 616A-P9TB, 616A-P9TC, 616A-P9TD). Meets essential requirements of European R&TTE Directive 99/5/EC, eligible to bear the CE mark. Type approved to EN 300 422 Parts 1 and 2. Meets requirements of EMC Standard EN 301 489 Parts 1 and 9.

P9R

Approved under the Declaration of Conformity (DoC) provision of FCC Part 15. Certified in Canada by IC to RSS-123. (**IC:** 616A-P9RA, 616A-P9RB, 616A-P9RC, 616A-P9RD). Meets requirements of EMC standards EN 300 422 Parts 1 and 2 and EN 301 489 Parts 1 and 9.

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.

The Declaration of Conformity can be obtained from Shure Incorporated or any of its European representatives. For contact information please visit www.shure.com The Declaration of Conformity can be obtained from:

Authorized European representative:
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Department: EMEA Approval
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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:

- 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.

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.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.



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