



REFERENCE TUBE MICROPHONES

REF CARDIOD • REF SILVER • REF GOLD



OWNER'S MANUAL



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Package Contents



REFERENCE 1

ii) Introduction

Thank you for selecting a Manley Reference Series Microphone. This manual covers the Reference Cardioid, the Reference Silver and the Reference Gold Microphones.

Our microphones are all hand crafted in the USA for maximum performance and reliability. These designs are optimized for extremely wide frequency response and exceptionally accurate transient response. Each microphone system has been carefully designed to operate in a rugged studio environment.

The sensitive gold plated capsule and tube electronics are housed in a machined body which requires little maintenance. A double suspension system is employed in all three models, minimizing any mechanical interaction whilst recording.



The entire working “guts” of the microphone may be removed for servicing in one piece, no need to remove the microphone from the suspension. We also provide a very useful Manley swivel, its T-bar handle and locking clutch action require no tools.

The Manley Reference Cardioid has a fixed cardioid pattern.

The Manley Reference Silver has two variable patterns, cardioid or omni-directional.

The Manley Reference Gold has three continuously variable polar patterns, from omni through cardioid to figure of eight.

All three microphones are supplied with a separate power supply unit. The Ref-Cardioid and Ref-Gold uses the MICROPHONE REFERENCE PSU1 with a 6 pin XLR cable. The Ref-Silver uses the MICROPHONE REFERENCE PSU2 with a 7-pin XLR cable.

iii) Reference Models

REFERENCE CARDIOID

The REF-C microphone as it is commonly known, went into production in the early nineties. Its distinctive black and red body makes it very recognizable. Used by countless artists and engineers, becoming the “GO TO” microphone for many studios as the preferred vocal microphone. The capsule features a 6 micron gold sputtered diaphragm which is based on the vintage U47.

REFERENCE SILVER

The Reference Silver is our newest microphone in the Manley stable. It went into production in 2017. This microphone is very distinctive with its silver, scale like body. The hand made capsule features a 5 micron evaporated gold diaphragm which is based on the vintage C37A. This microphone has an adjustable mechanical vent on the rear of the grille, which changes the polar pattern.

REFERENCE GOLD

The Reference Gold microphone is our flagship microphone, it went into production in 1993. Its very distinctive housing with impressive 24 karat gold finish on a solid brass body confirms its quality and performance. Featuring our own custom designed large 1 inch diaphragm capsule. The 5 micron gauge gold film exhibits inherently stable characteristics over years (unlike thinner diaphragms) while still maintaining the speed, “air”, and ultra-high frequency response. Its precise nature and highly detailed response makes this microphone very popular for strings, piano and orchestral.



1) Power Supply

A separate power supply is required to power the Manley microphones. The tube electronics which are the amplifying devices in the microphone, require a separate high voltage source. The PSU connects to the microphone through the 6 or 7 pin XLR cable provided. DO NOT USE ANY OTHER CABLES FOR THIS PURPOSE. It also has a 3 pin XLR which provides the audio output to your microphone preamplifier.

REF CARДИOID & REF GOLD PSU



REF SILVER PSU



PSU FRONT VIEW



1) General

Manley microphones will beat all others on grounds of sheer naturalness of sound without coloration or perceivable sonic signature. The design is optimized for extremely wide frequency response and exceptionally accurate transient response. Visually impressive, our microphones inspire confidence in artists and producers.

We have chosen a very open weave stainless-steel grille for the capsule window for zero-loss acoustical transmission. The open mesh design of the microphone allows all the highs to reach the capsule unimpaired and allows the engineer to choose if, when and how much pop screen is appropriate. Vocal “pops” may distort the capsule without a pop screen. Air movement and wind can overload a good capacitor microphone capsule much easier than loud levels. We strongly recommend a good 2 layer nylon pop screen with these microphones on close vocals.

CONNECTIONS

REFERENCE GOLD & REFERENCE CAROID MODEL - connect the 6-pin cable (supplied) between the PSU and the microphone. Audio comes from a separate 3 pin XLR cable from the PSU (not supplied)

REFERENCE SILVER MODEL - connect the 7-pin cable (supplied) between the PSU and the microphone. Audio comes from a separate 3 pin XLR cable from the PSU (not supplied)

If possible, use a short 3 pin XLR cable and a high quality microphone preamplifier (with the phantom power turned off) located near the microphone. This is usually the best for audio quality. Try to avoid running the microphone signal thru a patch bay or extra connectors and wires. Attach the microphone securely to a good mic stand and lay the cables so that people cannot trip over the cable or topple the stand. Connect the power supply to the wall outlet and turn on the supply. Let the microphone warm up for at least 5 minutes before using.

2) Microphone Controls





-10 dB PAD SWITCH, REF-CARDIOID & REF-GOLD

This tiny switch near the base of the microphone body reduces the signal by 10 dB. Rather than changing the capsule voltage or adding a resistor into the signal path we chose a better technique. We change the amount of negative feedback derived from a dedicated transformer winding.

While the tube circuit will handle any signal the capsule can deliver, the pad may be needed with some pre-amps. If you suspect that the mic is distorting, first try a different mic pre. The capsule is rated for 150 dB SPL but wind or air movement are exceptions. A pop filter will be needed for close vocals.



LOW PASS FILTER SWITCH, REF SILVER

This switch activates a filter which is useful if trying to remove unwanted low frequency noise from a room such as rumbling from traffic etc. Switching to this position  activates the -3dB 55 Hz filter. Switching to  is back to a flat frequency response.

CARDIOID



OMNI

FIGURE 8

PATTERN SELECT CONTROL, REF-GOLD

This control provides the user with a choice of any typical polar pattern. Many high quality condenser microphones give the user 3 or 4 patterns only; The Gold Mic provides you with an infinite number of patterns via this control.

For example, a setting between the “heart shaped” CARDIOID and FIGURE 8 will result in “SUPER-CARDIOID” and “HYPER-CARDIOID” patterns.



2) Microphone Controls

Remember that proximity effect is primarily affected by the polar pattern. Often with vocalists, one wants a certain amount of bass boost associated with certain mics and certain distances. Rather than just hoping that the CARDIOID setting will do the right thing, this time try adjusting the PATTERN SELECT CONTROL to “dial in” the amount of proximity effect for this particular vocal. More OMNI will give less proximity effect, while more FIGURE 8 will bring in more lows. In other words, while this is only true for close miking, the PATTERN SELECT can be an effective bass control.

TIP: You may notice that as the pattern becomes more FIGURE 8, certain air conditioning rumbles and room noise may exhibit reduced pick-up. Conversely, if you want more room sound, try moving the pattern select closer to OMNI.

Compared to many microphones, the Manley Reference Gold Microphones exhibit less proximity effect for a given close distance. This, we feel is a clear advantage. Most engineers we consulted preferred the options of bass control from the console rather than the typical situation where a few inches of distance can make or break a take. We also chose to allow the frequency response of the Reference Mics to extend below 20 Hz. Some mics seem to have a low frequency resonance that can be desirable at times while boomy or tubby at other times. Our goal is “flat and natural”.



PATTERN SELECT CONTROL, REF-SILVER

The Reference Silver Microphone offers two different patterns, Cardioid and Omni. Changing the pattern is achieved by inserting the supplied tool into the opening in the back of the grille and turning the screw. This adjusts the backplate vents, allowing the capsule to operate in two modes.

2) Microphone Controls

PATTERN SELECT CONTROL, REF-SILVER (continued)



Turning the screw clockwise closes the vent (omni) while turning counterclockwise opens it (cardioid). These patterns are marked on the control port as above. The REF-S achieves its directional response by subtracting sound that enters from the rear of the capsule, from the sound entering the front of the capsule. This allows us to tune a “null” value towards the rear, the response to sounds arriving from the rear may be reduced by 20 dB or more from response to sounds arriving from other directions.

The REF-S allows the traditional omni and cardioid patterns to be selected repeatedly, and with some care it is possible to set the pattern control vent to produce “WIDE” or “SUBCARDIOID” patterns. However, the range from omni (full clockwise) to cardioid (counterclockwise 90 degrees to the stop) is not linear; subcardioid is achieved with the adjustment vent just slightly counterclockwise from omni. Results for intermediate patterns are not easily repeatable from microphone to microphone or if the adjustment is moved.

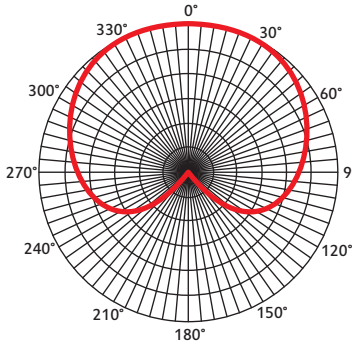


CAUTION

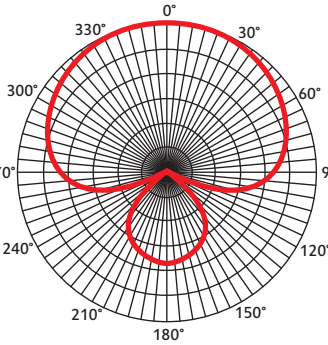
Adjust the REF-S microphone pattern ONLY when the microphone is disconnected and powered OFF.

3) Polar Patterns

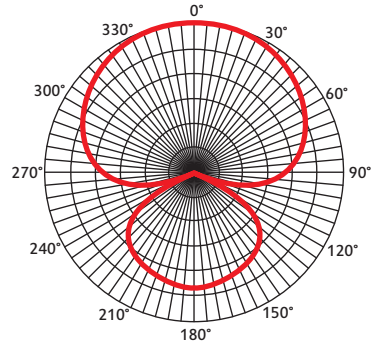
Examples of Typical Polar Patterns



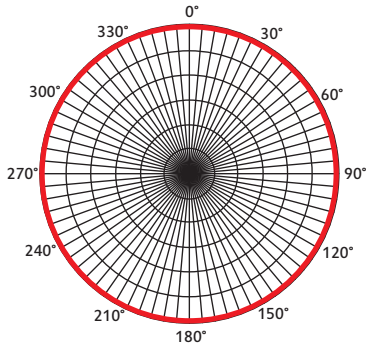
CARDIOID



SUPER-CARDIOID



HYPER-CARDIOID



OMNI-DIRECTIONAL

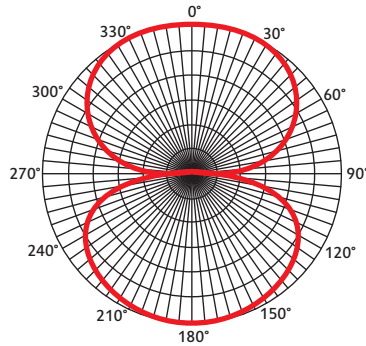


FIGURE-EIGHT

4) Circuit Topology

The tube electronics found in the Manley Reference Series Microphones consist of two triodes per capsule in cascade, forming an entire gain-block.

The tube employed in the Reference Gold and Reference Cardioid is a dual-triode 12AX7 and the tube used in the Reference Silver is a 5670 dual-triode. Both tube types are easily obtainable and replaceable.

Removing the two Philips screws at the base of the microphone body, allows the complete microphone assembly to be removed so the tube may be replaced easily, which is mounted in a ceramic socket with silver pins. There is no need to remove the body from the suspension system. Be wary not to touch the gold capsule at the top of the assembly, this is very fragile, even a finger-print on the diaphragm will impede performance.

The output of the tube stage is coupled through a custom built Manley Iron output transformer of unparalleled quality and substantial physical size employing pure nickel laminations. The windings incorporate a bi-filar winding technique which stops any possibility of “humbucking”. The finished transformer is then resin potted in a mu-metal enclosure maximizing stability.



5) Troubleshooting

NO POWER, NO INDICATORS - Check the IEC cable is plugged in firmly. PSU may be in protection mode, try turning the PSU OFF, wait 2 minutes then switch on again. Check the fuse on the back panel. A blown fuse often looks black inside . Try replacing the fuse with one of the same value and size. If it blows then prepare to send the unit back to the dealer or factory for repair. The fuse is a protection device and it should blow if there is a problem.

LIGHTS BUT NO SOUND - This typically indicates a cabling problem. Check to ensure the XLR microphone cables you are using are not damaged. If the XLR and microphone preamp (and the rest of the signal path) are known to be good, it may be the microphone.

LEVELS SEEM TO BE WRONG, NO BOTTOM - Most likely one of two scenarios. One, a partially broken cable. You would then be missing half the balanced signal and levels would be down approximately -6dB. Second possibility, the signal's polarity has been reversed somewhere. Try flipping the phase on your microphone preamp (if it has a phase switch), and see if that helps. ****Put on some headphones, close your eyes, and speak into the microphone from a distance of about one foot. Your voice should be full and clear with a solid low-end. With the phase reversed, this solidity goes away and your voice will sound like it is swimming all around your head with no clearly defined center image.****

HUM - This is most likely a ground loop. It is possible to use an XLR 3-pin to 2-pin adapter with its ground separated or to remove the internal ground lift jumper on the PSU. See the **SERVICING** section in this manual for this procedure.

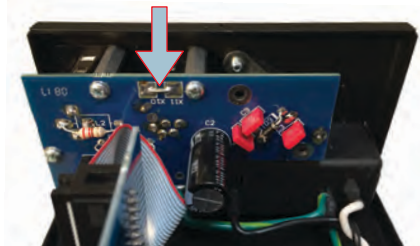
BUZZ - This is most likely a faulty ground somewhere in the chain. Make sure all the philips screws holding the microphone body to the microphone base are tight. Older models might have loose set-screws that hold and ground the connectors to the body system. Use a 1/16 hex key to tighten these set screws around the base of the microphone. It might also be the tube making a bad noise, in that case please refer to the servicing section in this manual.

EXCESS NOISE, DISTORTION, SNAPS CRACKLES & POPS - Most likely a tube please refer to the **SERVICING** section in this manual.

6) Servicing

As discussed before it is possible to remove the working “guts” from the microphone body in one operation to replace a tube. Please follow the procedure below;

1. Turn the power supply off, disconnect it from the wall, and disconnect the 6 or 7-pin cable from the microphone.
2. Using a Philips screwdriver, remove the two Philips screws on the microphone body that hold it to the base of the microphone.
3. Gently pull the base of the microphone out from inside the body. The guts of the microphone will come out as one assembly.
4. When you've pulled the insides all the way out (DO NOT touch the delicate capsule!)
5. Gently grasp the tube between your thumb and forefingers, and wiggle it out of the socket.
6. Taking care to align the pins properly, insert the new tube into the socket, and repeat these steps (again, CAREFULLY) returning the guts to the inside of the microphone. Make sure to properly tighten the screws at the base for a good chassis ground connection!



INTERNAL GROUND LIFT

This jumper is located on the rear PCB of the PSU. On earlier models it is a wire link (as pictured) on later models it is a removable jumper. If the circuit ground is required to be separated from the chassis to stop hum generated by an “earth loop”, this link can be cut or the jumper simply removed.



VOLTAGE CHANGE

Type 1 PSU will have the correct voltage set for your country. If you need to change the voltage it can be done by setting the links on the PSU PCB as described on the AC Selector chart next to the links. This procedure will require a soldering iron. Type 2 PSU does not require any changes for different mains input voltages.

7) Specifications

- **CAPSULE TYPE:** Dual Large Diaphragm Capacitor
- **POLAR PATTERNS:** Continuously Variable (omni through cardioid through Figure 8)
- **DIAPHRAGM SIZE:** 1 Inch; 1.25 Inch Overall
- **DIAPHRAGM THICKNESS:** 5 Micron; Gold Sputtered
- **FREQUENCY RESPONSE:** 10Hz-30kHz, AMP to 60kHz
- **MAXIMUM INPUT SPL:** 150 dB SPL at Capsule
- **SENSITIVITY:** 19mV/Pa
- **AMPLIFIER TYPE:** 2 Triode Gain Block Lo Z Output

REFERENCE GOLD

- **ACTIVE COMPONENTS:** (1) 12AX7 Vacuum Tube
- **OUTPUT TYPE :** Transformer Coupled
- **OUTPUT POLARITY:** Balanced XLR, Pin 2 Hot, Pin 3 Low
- **AMPLIFIER DISTORTION:** Less Than 0.05 % THD+N BW 22-22 kHz (1 Kohm Load, 1kHz -40dBV Output)
- **AMPLIFIER NOISE:** Typically - 101 dBV "A Weighted"
- **BODY:** 24 Karat Gold Over Machined Brass- Weight=2lbs

- **CAPSULE TYPE:** Center-fixed Lg. Diaphragm Capacitor
- **POLAR PATTERN:** Fixed Cardioid
- **DIAPHRAGM SIZE:** 1 Inch; 1.25 Inch Overall
- **DIAPHRAGM THICKNESS:** 6 Micron; Gold Sputtered
- **FREQUENCY RESPONSE:** 10Hz-30kHz, AMP to 60kHz
- **MAXIMUM INPUT SPL:** 150 dB SPL at Capsule
- **SENSITIVITY:** 17mV/Pa
- **AMPLIFIER TYPE:** 2 Triode Gain Block Lo Z Output

REFERENCE CARDIOID

- **ACTIVE COMPONENTS:** (1) 12AX7 Vacuum Tube
- **OUTPUT TYPE :** Transformer Coupled
- **OUTPUT POLARITY:** Balanced XLR, Pin 2 Hot, Pin 3 Low
- **AMPLIFIER DISTORTION:** Less Than 0.05 % THD+N BW 22-22 kHz (1 Kohm Load, 1kHz -40dBV Output)
- **AMPLIFIER NOISE:** Typically -101 dBV "A Weighted"
- **BODY:** Black Anodized Aluminum. Weight=1.5lbs

- **CAPSULE TYPE:** Center-fixed Lg. Diaphragm Capacitor
- **POLAR PATTERNS:** Continuously Variable (omni through cardioid via port entry on rear)
- **DIAPHRAGM SIZE:** 1 Inch; 1.25 Inch Overall
- **DIAPHRAGM THICKNESS:** 5 Micron; Gold Sputtered
- **FREQUENCY RESPONSE:** 10Hz-30kHz, AMP to 60kHz
- **MAXIMUM INPUT SPL:** 150 dB SPL at Capsule
- **SENSITIVITY:** 7mV/Pa
- **AMPLIFIER TYPE:** 2 Triode Gain Block Lo Z Output

REFERENCE SILVER

- **ACTIVE COMPONENTS:** (1) 5670 Tube
- **OUTPUT TYPE :** Transformer Coupled
- **OUTPUT POLARITY:** Balanced XLR, Pin 2 Hot, Pin 3 Low
- **AMPLIFIER DISTORTION:** Less Than 0.05 % THD+N BW 22-22 kHz (1 Kohm Load, 1kHz -40dBV Output)
- **AMPLIFIER NOISE:** Typically -108 dBV "A Weighted"
- **BODY:** Etched Silver Anodized Aluminum. Weight=1.5lbs

PSU TYPE 1

- **TYPE:** Linear Power Supply
- **POWER CONSUMPTION:** 8.4 WATTS
- **WEIGHT:** 2 lbs
- **FUSE:** 250mA 100/120V, 125mA 220/240V-Slow Blow
- **INPUT VOLTAGE SETTINGS:** 100, 120, 220, 240VAC

PSU TYPE 2

- **TYPE:** Switched Mode Power Supply
- **POWER CONSUMPTION:** 15 WATTS
- **WEIGHT:** 1.5 lbs
- **FUSE:** 2A-Slow Blow
- **INPUT VOLTAGE:** 90VAC to 250VAC





Designed & Handcrafted in the USA

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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.