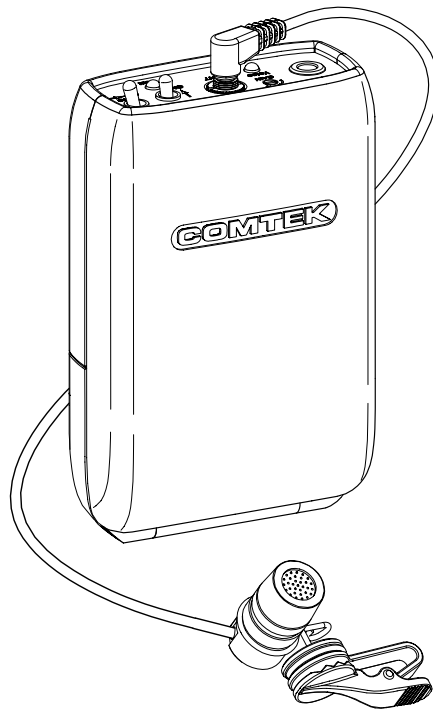


M-169
Wireless
Microphone
Transmitter



COMTEK[®]

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INTRODUCTION

M-169 ***Wireless*** ***Microphone*** ***Transmitter***

The M-169 transmitter offers the ultimate performance and versatility for applications where one-way personal communication is required. This compact, personal transmitter is ideal for instructors and presenters who must communicate with persons some distance away or in a noisy environment.

The M-169 incorporates the latest digital and analog technologies to produce low residual noise, wide dynamic range, and extended frequency response rendering the most natural sound possible from a personal communications system.

The audio processing circuit produces full fidelity frequency response from 100 Hz to 10 kHz in the companded or non-companded mode to accommodate a greater variety of receivers. Operating under FCC Regulation Part 90 the M-169 has greater transmission range and reliability.



M-169 SETUP

Setup

a. Check to ensure that the M-169 transmitter's radio frequency channel is the same as the associated COMTEK receiver's channel.

(Channels and mode of operation are indicated by the rotary channel selector switches on the back of the transmitter. See page 8 and 9.)

b. Open the battery door cover on the transmitter (see page 4) and insert a new nine volt alkaline battery (Eveready E522 or equivalent). This type of battery will offer up to 20 hours of operation. *Replace the battery before every use if the demand for fail-safe operation outweighs battery cost. The use of carbon batteries is not recommended.*

NOTE: If a rechargeable battery is to be used, ensure that it has been allowed to charge at least twelve hours to bring it to full charge (see page 5 for battery charger instructions).

c. Connect the microphone to the transmitter by inserting the microphone plug into the receptacle on the top of the transmitter. The transmitter is operating when the transmitter power switch is turned on and the battery status/on indicator illuminates.

NOTE: The 48-inch microphone cord also functions as part of the transmitter's antenna system. For optimum performance, this cord should be fully extended. Coiling or bunching the microphone cord may reduce the range of the transmitter. The transmitter should be carried by the snap-on belt clip (included) or in a pocket or belt-clip pouch.

d. In a situation where an extremely loud voice or a very soft voice is used, it is necessary to adjust the audio input gain control while observing the audio "voice" level modulation indicator. A full bright LED indicates full audio compression at 100% modulation. For best performance, the audio input gain should be adjusted for some low level LED luminescence during normal audio levels with occasional full bright peaks indicating 100% modulation.

M-169 CONTROLS

1 CHANNEL AND MODE SWITCHES: These rotary switches are used to set the transmitter to the desired operating frequency and companded or non-companded mode of operation.

(See page 8 and 9 for frequency selection chart.)

2 BATTERY COMPARTMENT: The battery compartment features a hinged battery cover and an alignment system that ensures proper battery polarity. Battery installation and removal is facilitated by simply manipulating the bottom of the battery.

3 AUXILIARY AUDIO INPUT JACK: Allows transmitter to use line level, earphone level, or fixed AUX as an audio source.

4 AUDIO "VOICE" MODULATION INDICATOR:

This indicator is used in making adjustment with the Audio Input Gain Control.

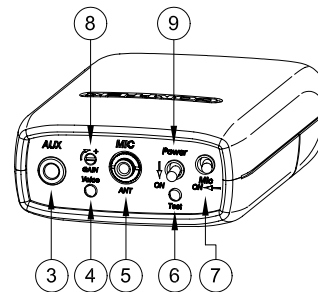
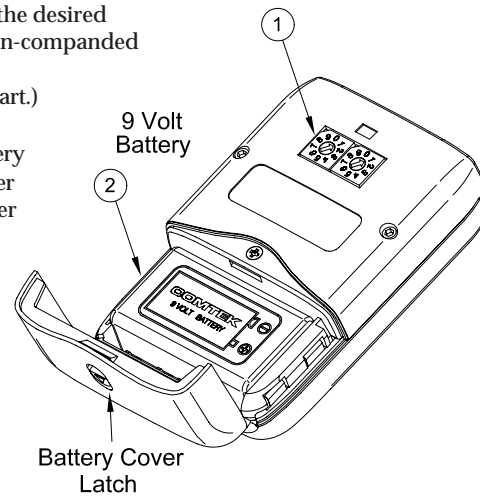
5 MIC / ANTENNA JACK: This jack accepts an electret type microphone having a 48" long cord with a micro-mini 2.5mm mono plug. The microphone cord functions as part of the transmitter's antenna system and must be in place for auxiliary audio input operation. If microphone function is not necessary, the optional microphone switch should not be on for this operation.

6 POWER / BATTERY STATUS INDICATOR: This LED indicator will illuminate continuously when the unit is on, indicating normal operation. When the battery voltage drops below 6 volts, the LED will flash *rapidly*, indicating that a new battery is needed.

7 OPTIONAL MIC SWITCH: This switch turns off the microphone without turning off the transmitter carrier.

8 AUDIO INPUT GAIN CONTROL: This is a microphone and AUX level input gain control. This control is used with the "Voice" modulation indicator.

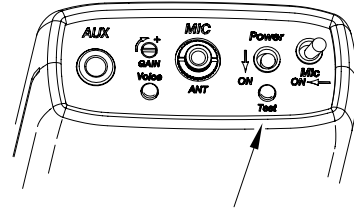
9 ON / OFF SWITCH: This switch turns the transmitter on and off.



M-169 BATTERY REMOVAL / REPLACEMENT

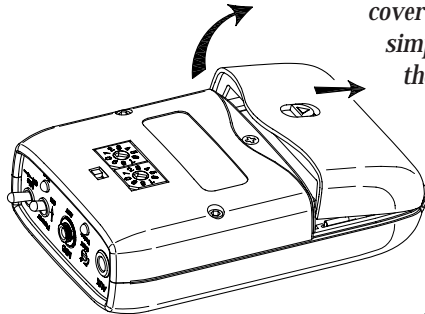
Low Battery Indicator

The LED on the top of the transmitter indicates the status of the battery as well as indicating that the unit is turned on. When the transmitter is turned on, the LED illuminates. If the battery is low, the green LED will blink rapidly to warn you that the battery will soon be dead. Replace a low battery immediately.



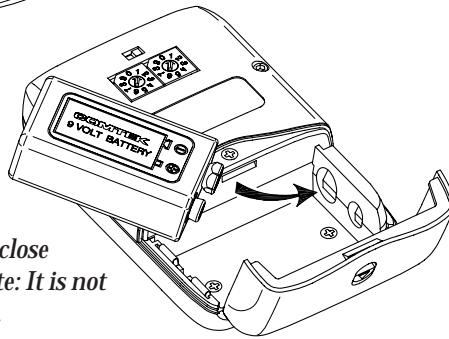
Battery indicator LED

Battery Removal / Replacement



Pull back battery door latch and allow battery cover door to spring open. To remove battery, simply manipulate the bottom of battery out of the compartment and remove.

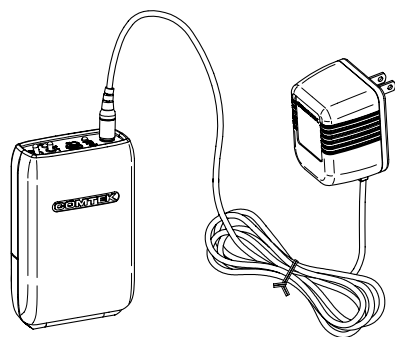
To insert battery, face battery with negative terminal in line with large hole in battery compartment, press battery into compartment and close battery door until it snaps shut. Note: It is not possible to put battery in backwards.



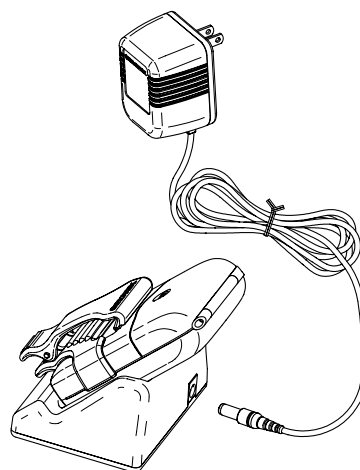
M-169 BATTERY CHARGING

Battery Charging

1. Make sure that a seven cell 9 volt Ni-MH rechargeable battery is used with a minimum of 200 mAh capacity. **(Alkaline batteries must not be charged.)**
2. Make sure the M-169 is turned **OFF**.
3. Note that the red charging indicator on the charger is **ON** when the M-169 is plugged into the charger through the audio output jack.
4. When using the NBC 9-2C charger allow the battery to charge for 14 hours for a full charge. Unit must then be unplugged. When using the NBC 9-3-1 digital fast charger the charger will automatically end the charge cycle and the red LED will change to green. With this charger the unit may be left in the charger until the unit is used.
5. Periodically open the battery compartment on stored COMTEK units to check for battery leakage. If a battery is leaking, it must be discarded, and the battery compartment must be cleaned or returned to COMTEK's service department for repairs.



NBC 9-2C
14-hour charger



NBC 9-3-1
digital fast charger

M-169 AUXILIARY AUDIO INPUT OPERATION

Auxiliary Audio Input Operation

The M-169 transmitter may transmit a variety of audio sources such as tape and C.D. players, TV and VCR's, or any audio device having an auxiliary or line level audio output.

The auxiliary input cable supplied with the M-169 transmitter (CB-36 ST) will operate with any device having a mini 3.5 mm jack, stereo or mono, and with line level or earphone level output.

To accommodate a variety of specialty applications, auxiliary input cables with RCA phono plug, 1/4" audio phone plug, and XLR connectors are available from COMTEK.

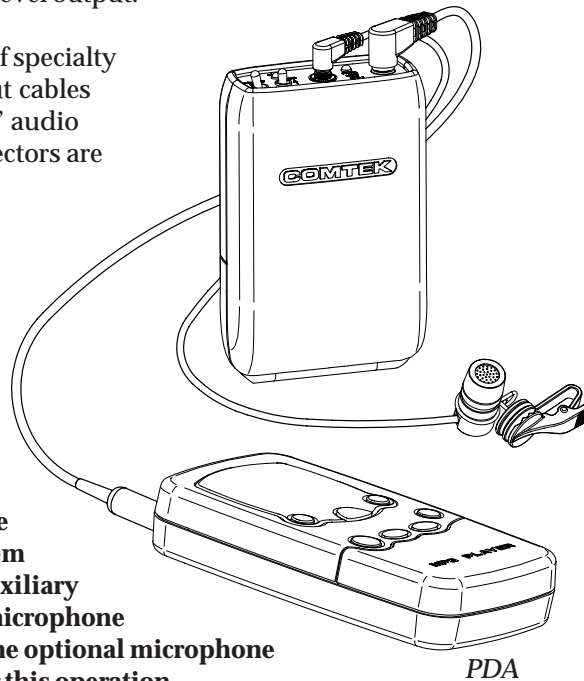
Setup

a. Connect the microphone to the transmitter by inserting the microphone plug into the receptacle on the top of the transmitter.

Note: The microphone cord functions as part of the transmitter's antenna system and must be in place for auxiliary audio input operation. If microphone function is not necessary, the optional microphone switch should not be on for this operation.

b. Connect the proper auxiliary input cable to the audio source. Connect the right-angle mini plug end of the auxiliary input cable in the "AUX" input jack of the M-169 transmitter.

Note: Check to ensure that the audio source is a line level, earphone level, or fixed AUX level output.

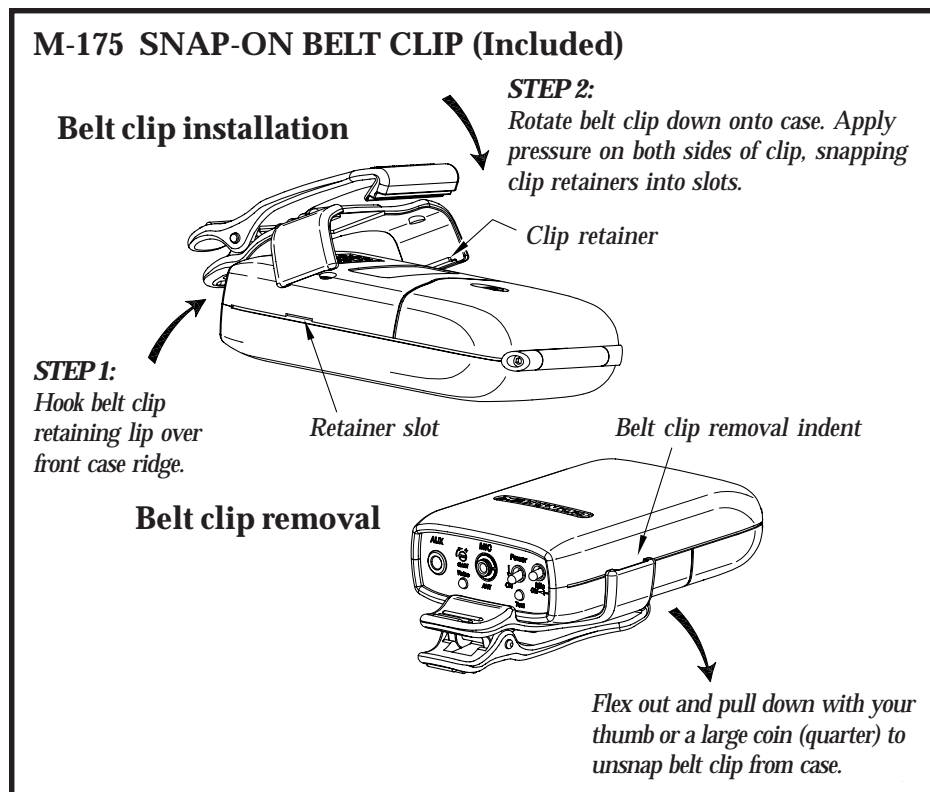


M-169 AUX OPERATION (Cont.) / SNAP-ON BELT CLIP

c. Turn on the transmitter with program from the audio source being fed to the transmitter. Observe the audio “voice” level modulation indicator. A full bright LED indicates full audio compression at 100% modulation. For best performance, the audio input gain should be adjusted for some low level LED luminescence during normal audio levels with occasional full bright peaks indicating 100% modulation.

d. When using the auxiliary audio input with the microphone plugged into the transmitter, priority should be given to the microphone gain adjustment. The mixing balance between the auxiliary audio and the microphone should be made with the volume control of the auxiliary audio source.

Note: The optional microphone switch only affects the microphone. It does not affect the auxiliary audio input.

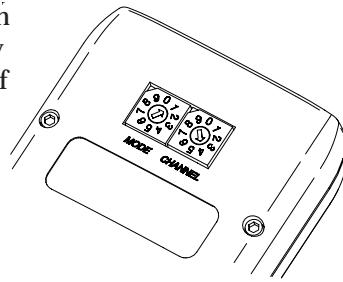


M-169 FREQUENCY SELECTION

Frequency Selection (169.445 - 171.905 MHz)

The M-169 transmitter can operate on eight FCC dedicated assigned channels for wireless microphone operation under FCC Regulation Part 90. These channels may be used in two groups of four channels for multi-channel operation. (Refer to frequency charts on page 9.)

After you have determined the channel on which you are going to operate, position the two rotary switches to indicate the channel and the mode of operation. The left rotary switch determines mode of operation. Position "1" is for COMTEK companded receivers. Position "0" is for non-companded receivers of different manufactures other than COMTEK. The right rotary switch selects the frequency by channel number (1-8). (Refer to frequency chart on page 9.)



Multiple Channel Operation

When multiple transmitters are broadcasting in the same immediate area (within 100 feet), the RF signals will "mix" together generating additional signals. If these product frequencies are too close to a frequency which you are using, you will experience intermodulation interference. This condition is common to all radio receivers to some extent.

Simultaneous operation of more than three channels requires frequency coordination to avoid intermodulation interference which could result in poor or unusable performance.

To avoid this type of interference, you should select frequencies from one of the standard groups (see group frequency charts on page 9), or use COMTEK's frequency selection software available at www.comtek.com to determine appropriate frequencies or contact COMTEK to obtain a free copy.

M-169 FREQUENCY INFORMATION

169 MHz BAND CHANNELS

| CHANNEL | FREQUENCY |
|---------|-------------|
| 1 | 169.445 MHz |
| 2 | 169.505 MHz |
| 3 | 170.245 MHz |
| 4 | 170.305 MHz |
| 5 | 171.045 MHz |
| 6 | 171.105 MHz |
| 7 | 171.845 MHz |
| 8 | 171.905 MHz |

GROUP A

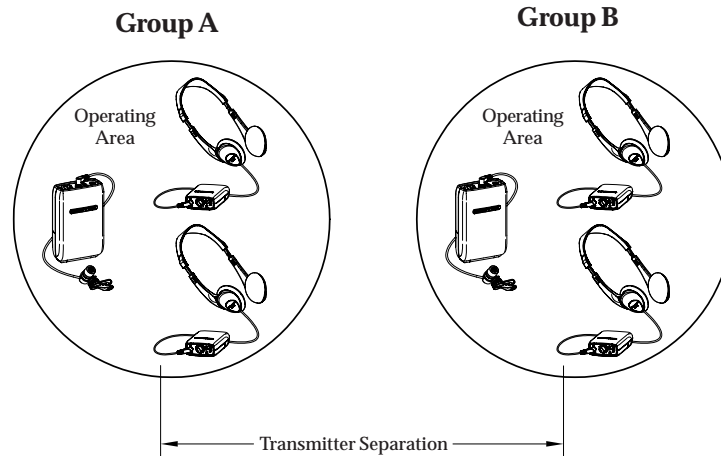
| CHANNEL | FREQUENCY |
|---------|-------------|
| 1 | 169.445 MHz |
| 4 | 170.305 MHz |
| 6 | 171.105 MHz |
| 7 | 171.845 MHz |

GROUP B

| CHANNEL | FREQUENCY |
|---------|-------------|
| 2 | 169.505 MHz |
| 3 | 170.245 MHz |
| 5 | 171.045 MHz |
| 8 | 171.905 MHz |

Transmitter Proximities For Multiple Channel Operation

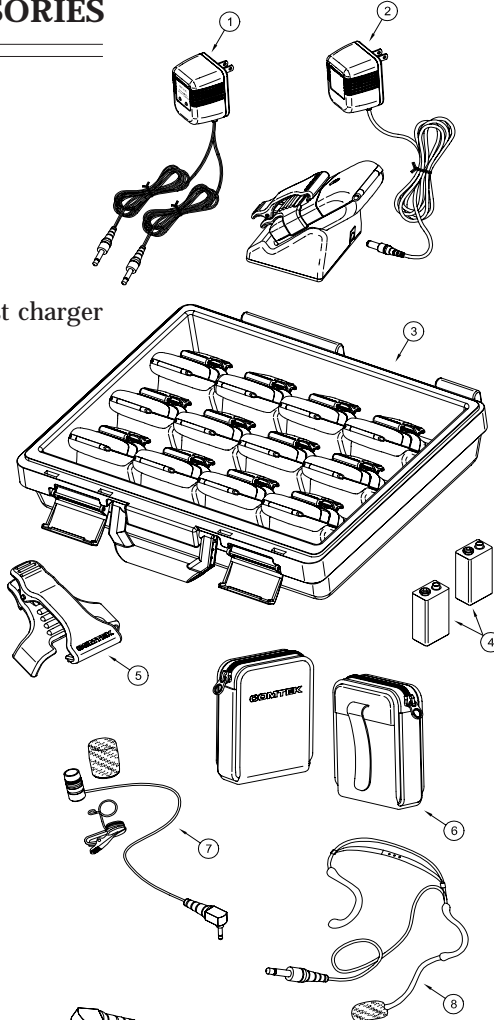
Frequency groups being transmitted should be separated by 2X the operating area; and for best performance, the group operating areas should have a 100 ft. minimum separation.



M-169 OPTIONAL ACCESSORIES

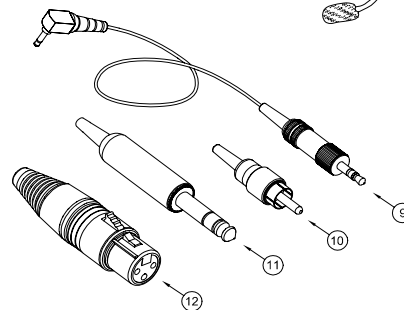
Optional Accessories

1. NBC 9-2C Battery charger
2. NBC 9-3-1 Digital fast charger
3. NBC 9-3-12 Digital 12-station fast charger
4. NH9-200 Rechargeable batteries
5. BC-216 Snap-on belt clip (supplied with M-175)
6. P1 Universal pouch
7. SM-185 Unidirectional electret condenser microphone
8. PSC-HM Headworn unidirectional electret microphone



Auxiliary Audio Input Cords

9. CB-36 STM Stereo mini 3.5mm (supplied with M-175)
10. CB-36 RCA Phono plug (optional)
11. CB-36 ST1/4 Stereo 1/4" (optional)
12. CB-36 XLR XLR-F 3 pin connector (optional)



M-169 SPECIFICATIONS

Audio Input:

- Microphone input impedance for electret type microphone - 3000 ohm
- Aux/Line input impedance - 10 k ohm (0 dBV nominal)

Connectors:

Microphone - Micro-mini mono 2.5mm

Auxiliary - TRS 3.5mm jack

Audio: Tip and sleeve

Battery Charging: Tip and sleeve

Controls and Indicators:

- Synthesized channel selection and mode switches
- Power On/Off switch
- Optional microphone switch
- Audio input gain control
- Power/Battery status indicator
- Audio (voice level) modulation indicator

Frequency Response:

100 Hz to 10 kHz

Audio Distortion:

Less than 1% at 50% modulation

Modulation Limiter:

Soft compressor with 30 dB linear overload protection; attack time - less than 1 ms, recovery time - 10 ms

Frequency Modulation:

10 kHz deviation

Operating Radio Frequency:

8 synthesized channels in the 169.445 - 171.905 MHz band.

Out-of-Band Emissions:

Better than 50 dB below carrier

R.F. Stability:

20 ppm XTL controlled
Digitally synthesized

RF Power Output:

25 mW to antenna system

FCC Compliance:

Type Accepted under FCC Part 90

Antenna System:

Body induction microphone cord antenna.

Current Drain:

25 mA constant current

Battery:

- 9 volt alkaline Eveready 522 or equivalent for up to 20 hours of use
- Rechargeable 9 volt Ni-MH 200 mAh battery for up to 8 hours of operation
- Rechargeable 9 volt Lithium Polymer 500 mAh battery for up to 20 hours of use

Dimensions:

1 1/16" x 2 1/4" x 3 1/2"
(27 mm x 57 mm x 89 mm)

Weight:

5 ounces (140 grams)

NOTE: Specifications subject to change without notice or obligation

M-169 WARRANTY AND SERVICE

Warranty

COMTEK warrants this product to be free from defects in workmanship and material under normal use and conditions for a period of one year from date of original purchase. Items such as batteries, neckloops, and cords are not covered by the warranty. Damage due to misuse, ill treatment and unauthorized modification and repairs are not covered by this warranty. COMTEK is not liable for consequential damages arising out of any failure of the equipment to perform as intended. COMTEK shall bear no responsibility or obligation with respect to the manner of use of any equipment sold by it. COMTEK SPECIFICALLY DISCLAIMS AND NEGATES ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF SUCH EQUIPMENT INCLUDING, WITHOUT LIMITATION, ANY WARRANTY THAT THE USE OF SUCH EQUIPMENT FOR ANY PURPOSE WILL COMPLY WITH APPLICABLE LAWS AND REGULATIONS.

Service Policies

Warranty repairs must be done by COMTEK. Only factory technicians are authorized to perform warranty service on the M-169 transmitter. Before returning the M-169 for service, a Return Authorization Number should be obtained from the service department by calling 1-800-496-3463 or 1-801-466-3463. Return the unit to the factory with the original or comparable packing. COMTEK will pay for insurance and ground return shipping costs in the United States for all warranty service.