DX200

Wireless Intercom

Operating Instructions

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Table of Contents

Illustrations in this publication are approximate representations of the actual equipment, and may not be exactly as the equipment appears.

HM Electronics, Inc. is not responsible for equipment malfunctions due to erroneous translation of its publications from their original English version.

Waste Electrical and Electronic Equipment (WEEE)

The European Union (EU) WEEE Directive (2002/96/EC) places an obligation on producers (manufacturers, distributors and/or retailers) to take-back electronic products at the end of their useful life. The WEEE Directive covers most HME products being sold into the EU as of August 13, 2005. Manufacturers, distributors and retailers are obliged to finance the costs of recovery from municipal collection points, reuse, and recycling of specified percentages per the WEEE requirements.

Instructions for Disposal of WEEE by Users in the European Union

The symbol shown below is on the product or on its packaging which indicates that this product was put on the market after August 13, 2005 and must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of the user's waste equipment by handing it over to a designated collection point for the recycling of WEEE. The separate collection and recycling of waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local authority, your household waste disposal service or the seller from whom you purchased the product.

SECTION 1.   INTRODUCTION

The DX200 provides private, secure communication. Each base station can have up to a total of fifteen BP200 Beltpacs and/or WH200 All-in-one Wireless Headsets and/or WS200 Wireless Speaker Stations "registered" to it. All Beltpacs or all WH200 Headsets, or a combination of Beltpacs, Headsets and Speaker Stations can be used. Four of the fifteen can transmit at the same time. However, by connecting two or more base stations together, these numbers can be increased. For example, two base stations can support thirty Beltpacs/ Headsets/Speaker Stations, of which eight can transmit at the same time. Beltpacs, Headsets or Speaker Stations can be used either in the push-to-talk or hands-free mode. The base station operator can stop all Beltpacs/Headsets/Speaker Stations from transmitting.

The DX200 can be used with RTS® and Clear-Com® cabled intercom systems. On the intercom channel, 2-wire and 4-wire cabled intercoms can be operated at the same time. Also, using the AUX In and AUX Out connections, a second 4-wire intercom channel can be used.

Either a monitor speaker or a local headset can be used with the DX200. Using a local headset, the base station operator can talk to crew members on the cabled intercom channel, Beltpacs/Headsets/Speaker Stations only, or all channels.

The BS200 Base Station and WS200 Speaker Station can be operated using standard DC electricity or a vehicle electrical system for mobile operation. A power supply and cable are included with the base station.

System Usage Example

1
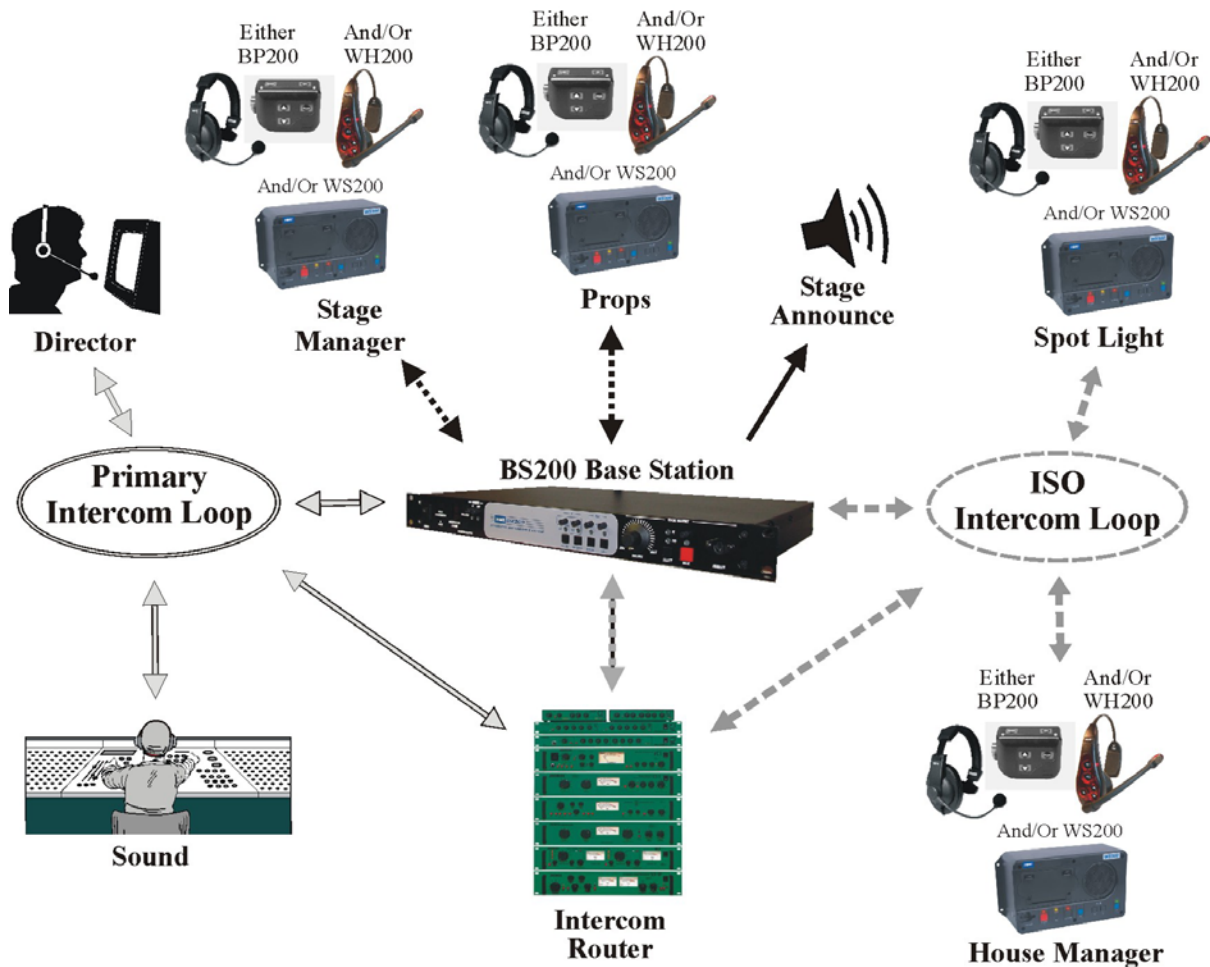
EQUIPMENT IDENTIFICATION

The following equipment is standard with the DX200 Wireless Intercom System.
As you unpack the equipment, check the enclosed shipping document to be sure you received all items listed.

BS200 Base Station

115/230 Volt AC Power Supply
(1 per Base Station, with Power Cord)
(1 per AC40A Battery Charger, with Power Cord)

Base Station Antennas
(2 per Base Station)

WH200 All-in-one
Wireless Headset

Battery

BP200 Beltpac

HS15 Headset

Beltpac Pouch

AC40A
Battery Charger

WS200
Wireless Speaker Station

WS200 Battery Sled

115/230 Volt AC Power Supply
with Power Cord for WS200

OPTIONAL EQUIPMENT

HS4-3 Earpiece & Lapel Microphone

HS15 Single-Muff Headset

HS15D Dual-Muff Headset

HS16 Lightweight Headset

HSI6000 Headset Adapter

XLR Headset Adapters:

　MD-XLR4M Mini-DIN to 4-Pin Male

　MD-XLR4F Mini-DIN to 4-Pin Female

　MD-XLR5F Mini-DIN to 5-Pin Female

BAT850 Rechargeable Battery for WS200

AC850 Battery Charger for WS200

MAIN EQUIPMENT FEATURES

Beltpac Features
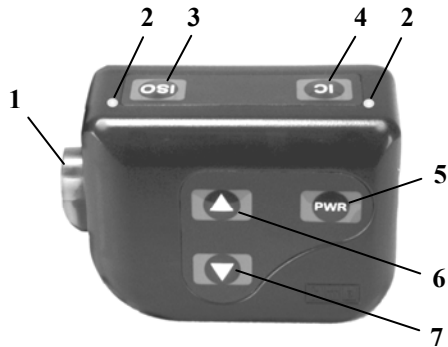
1. Headset cable connector
2. Beltpac power and transmit lights
3. **ISO** (Isolate) button
4. **IC** (Intercom) button
5. **PWR** (Power) button
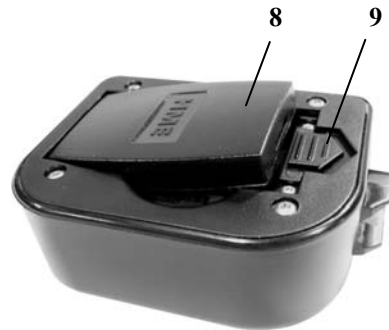
6. Volume-up ▲ button
7. Volume-down ▼ button
8. Battery
9. Battery release latch

WH200 Headset Features
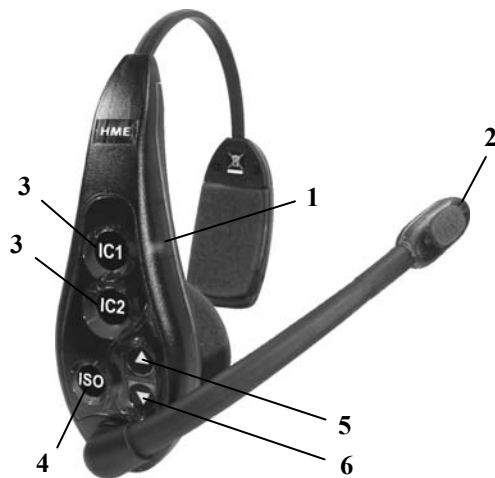
1. Power light
2. Transmit light
3. **IC1** & **IC2** (Intercom) buttons
4. **ISO** (Isolate) button
5. Volume-up ▲ button

6. Volume-down ▼ button
7. Power button
8. Battery release latch
9. Battery

Speaker Station Features

Left side panel	Front panel	Right side panel
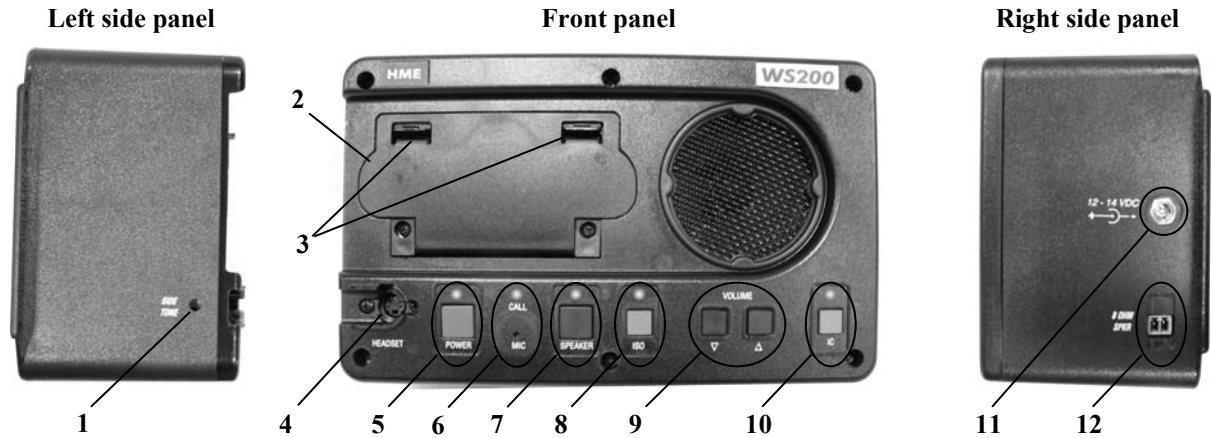
1. **SIDE TONE** adjustment (recessed)
2. Battery compartment cover
3. Battery compartment cover release latches
4. **HEADSET** connector
5. **POWER** button and light
6. **CALL** light and **MIC** (microphone)

7. **SPEAKER** and light
8. **ISO** (Isolate) button and light
9. **VOLUME** down ▼ and up ▲ buttons
10. **IC** (Intercom) button and light
11. *12-14VDC* power adapter cable connector
12. External speaker connector

Base Station Features
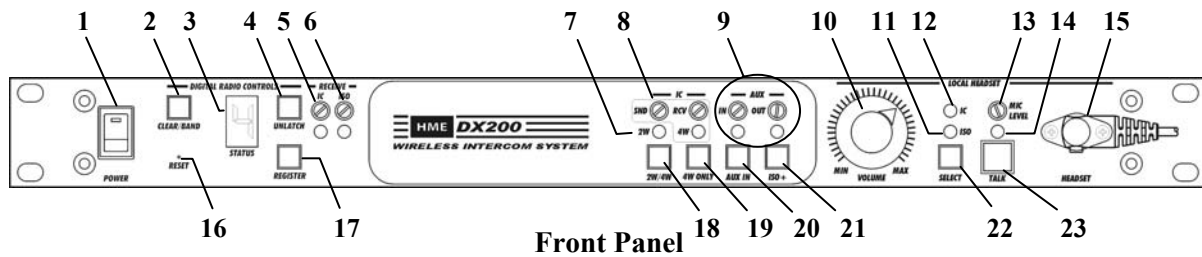
Front Panel

1. **POWER** switch
2. **CLEAR/BAND** button
3. **STATUS** display
4. **UNLATCH** button
5. **IC** (Intercom) receiver level control and indicator light
6. **ISO** (Isolate) receiver level control and indicator light
7. **2W** and **4W** indicator lights
8. **SND** and **RCV** (Send and Receive) controls
9. **AUX IN** and **OUT** (Auxiliary In and Out) controls
10. **LOCAL HEADSET VOLUME** control

11. **LOCAL HEADSET ISO** indicator light
12. **LOCAL HEADSET IC** indicator light
13. **LOCAL HEADSET MIC LEVEL** control
14. **LOCAL HEADSET TALK** indicator light
15. **LOCAL HEADSET** cable connector
16. **RESET** button (recessed)
17. **REGISTER** button
18. **2W/4W** button
19. **4W ONLY** button
20. **AUX IN** button
21. **ISO+** button
22. **LOCAL HEADSET IC/ISO SELECT** button
23. **LOCAL HEADSET TALK** button
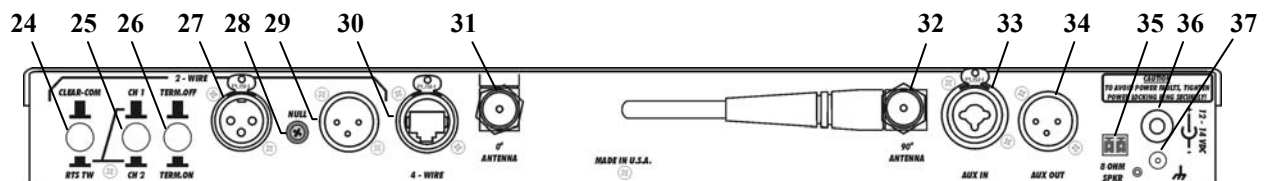
Rear Panel

24. **CLEAR-COM / RTS TW** button
25. **CH1/CH2** RTS channel select button
26. **TERM OFF/TERM ON** local termination select button
27. **2-WIRE** intercom connector (female)
28. **NULL** control
29. **2-WIRE** intercom connector (male)
30. **4-WIRE** connector

31. **0° ANTENNA** connector
32. **90° ANTENNA** connector
33. **AUX IN** connector
34. **AUX OUT** connector
35. **8-OHM SPKR** 2-pin Phoenix connector
36. **12-14VDC** Power connector
37. Chassis ground connector

BATTERY CHARGER SETUP

IMPORTANT! – Before installing the system, connect the AC power supply to the AC40A Battery Charger and plug it into an electrical outlet. Charge all the batteries for the Beltpacs and/or WH200 Headsets while the other equipment is being installed. Charging time is about 2.5 hours.

Connect AC Power Supply

- Attach the AC power supply cable connector to the screw connector on the battery charger.
- Plug the power cord connector into the AC power supply.
- Plug the power cord into an electrical outlet.

The red lights on the charger will come on and go off, and then the yellow lights will come on and stay on.

Power supply cable connector   Power cord connector   To electrical outlet

AC40A Battery Charger   AC power supply   Power cord
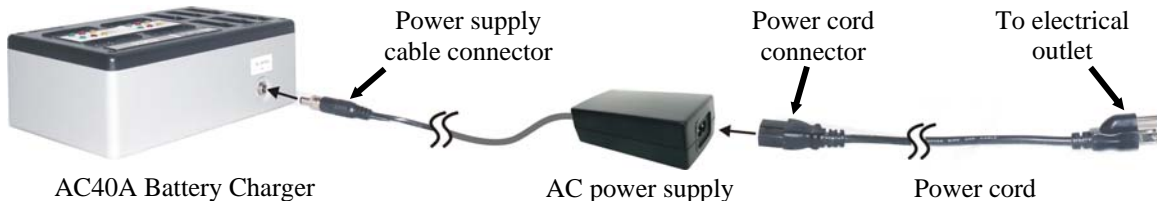
Charge Batteries

Up to four batteries can be charged in the battery charger at the same time. The battery status lights next to each charging port are explained below.
Up to six fully charged batteries can be stored in the battery storage ports.

- Insert a battery in each of four charging ports until it clicks in place.
- A yellow light next to each charging port stays on while the port is empty. When a battery is in a charging port, a flashing yellow light next to it indicates CHARGE PENDING, which means the battery is too hot. Adjust the room temperature or move the charger to a cooler area. When a battery is in a charging port, a yellow light on steady next to it means CHARGE FAILED. If this happens, follow the instructions on the side of battery charger.
- A red CHARGING light next to a battery port stays on while a battery in the port is charging.
  A green READY light next to a battery port goes on when a battery in the port is fully charged.

Store fully charged batteries in storage ports.

Batteries should not be left in charge ports after being fully charged. If a battery is left in a charge port for more than three weeks, the yellow indicator may light up. In this case, it does not indicate a faulty battery.

Charged batteries in storage ports

Empty charging ports

Battery in charging port
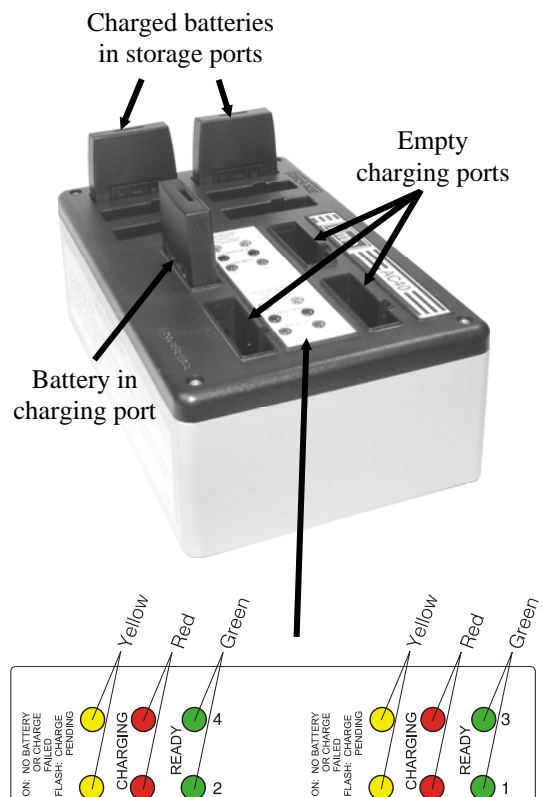
BASE STATION SETUP

The following description is for a basic, stand-alone DX200 system setup.

Connections and setup for multiple, daisy-chained base stations are described on pages 8 – 10.

Connections with 2-wire and 4-wire intercoms, and other auxiliary equipment are described in the **INTERCOM AND AUXILIARY EQUIPMENT SETUPS** on pages 20 and 21.

Equipment Connections
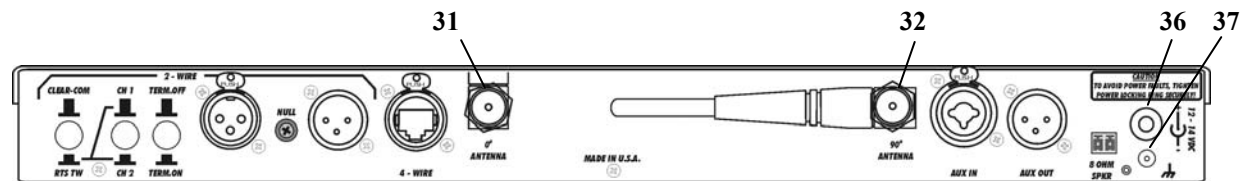
Rear Panel
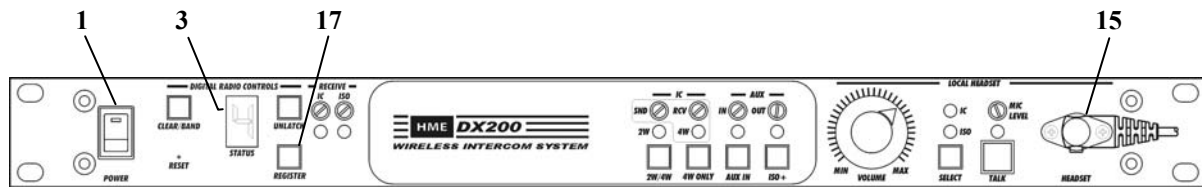
Front Panel

Step 1. Connect the two enclosed antennas to the antenna connectors (#**31** and #**32**) on the rear panel of the base station. Position the antenna at the **0° ANTENNA** connector (#**31**) vertically. Position the antenna at the **90° ANTENNA** connector (#**32**) horizontally, pointing to the left as indicated on the panel. Turn the sleeve on each of the antenna connectors clockwise to tighten them securely in place.

Step 2. Plug the connector at the end of the AC power supply cord into the **12-14VDC** power connector (#**36**) on the rear panel of the base station. Turn the nut on the cable connector clockwise to secure it to the base station. Plug the large female connector at one end of the AC power cord into the power supply. Plug the other end of the AC power cord into an electrical outlet.

Step 3. Connect a grounding wire from #**37** to an earth ground.

Step 4. Plug a headset into the **HEADSET** connector (#**15**) on the front panel of the base station.

Step 5. Press the **POWER** switch (#**1**) to turn on the base station. The red light on the switch should go on.

Interference Avoidance

Interference, which may be heard in a headset as popping sounds, may occur whenever other equipment such as WI-FI systems, wireless DMX systems, other HME Base Stations, etc. use the same frequency band. If these systems can be limited to one portion of the band, then the DX200 can be set to the opposite half of the 2.4 GHz to 2.48 GHz band. To avoid this type of interference, select the upper part of the frequency range on one Base Station (or more), and the lower part of the frequency range on the other(s) as follows:

- Turn on the Base Station power. An *"8"* will appear on the **STATUS** display for a few seconds.
- After the *"8"* disappears and the **STATUS** display is blank (primary base) or shows a double bar (secondary base), press and hold the **CLEAR/BAND** button and then, while you are still holding the **CLEAR/BAND** button, press and hold the **REGISTER** button and wait until a **L**, **H** or **A** appears, and then release both buttons.

NOTE:　Base stations are shipped in the **A** (default) position.

- Press the **CLR/BND** button to cycle through parts of the frequency band; **L** = Low end, **H** = High end and **A** = All.

- Wait until *"c"* appears on the display.

- Initialize each Base Station and register all Beltpacs/Headsets/Speaker Stations to be used with each Base Station as instructed on pages 11 – 18.

NOTE:　*"c"* will only appear on the **STATUS** display if you are setting the frequency band the first time, or you are changing the setting.
　　　　　If you stop at **L**, **H** or **A** that was already set, an *"8"* will appear for a few seconds and the **STATUS** display will become blank.
　　　　　If you change a base station's existing frequency band setting, you will have to re-register all beltpacs and/or all-in-one headsets that were registered to that base station.

Multiple Base Stations

This mode of operation can be used to expand the number of users communicating through multiple HME Base Stations operating in the same portion of the 2.4 GHz to 2.48 GHz frequency band. Two or more base stations can be "daisy-chained" together with cables connected to the 2-wire connectors (#**27** and #**29**) on the rear panel of each base station, following Clear-Com®/RTS® standards.

NOTE:　The base station does not provide or require 2-wire line power.

The cable connectors must be 3-pin XLR type with the following pin connections:

	RTS® Mode	**Clear-Com® Mode**
	Pin 1 = Common	Pin 1 = Common
	Pin 2 = Channel 1	Pin 2 = N/C
	Pin 3 = Channel 2	Pin 3 = Audio

If "daisy-chaining" multiple base stations, you must do the following:

Step 1.　Press **TERM** button in (**TERM ON**) to terminate the last base station in the daisy chain. Be sure you do this to **only one base station**.

Step 2.　For each base station, follow all the steps under **Equipment Connections** on page 7.

Step 3.　Follow the procedures on pages 9 and 10 to set each base station as primary or secondary, select frequency bands and initialize each base station.
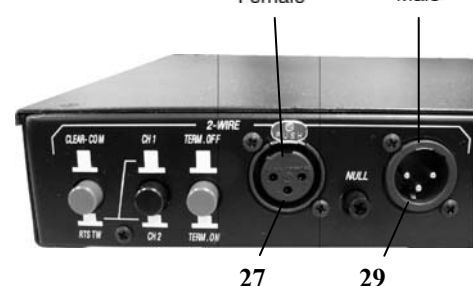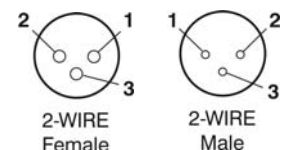
Primary and Secondary Base Station Settings

One base station must be designated as "primary" while the others are designated as "secondary". You may have only one primary and up to 3 secondary base stations. Secondary base stations are assigned numbers 1, 2, or 3 during initialization, to differentiate them in frequency offset.

- Label the base stations as "Primary," "1," "2" and "3."
- Start with every base station and Beltpac/Headset/Speaker Station power off.

Configure each secondary base station as follows:

- First, remove the six screws from the top and three screws from each side of the top cover, and lift the cover off and set it aside.
- Locate the DIP switch on the transceiver circuit board inside the base station. Set DIP switch #4 to the **ON** position. Leave #s 1 and 3 in the **OFF** position.

DIP switch inside
secondary base station
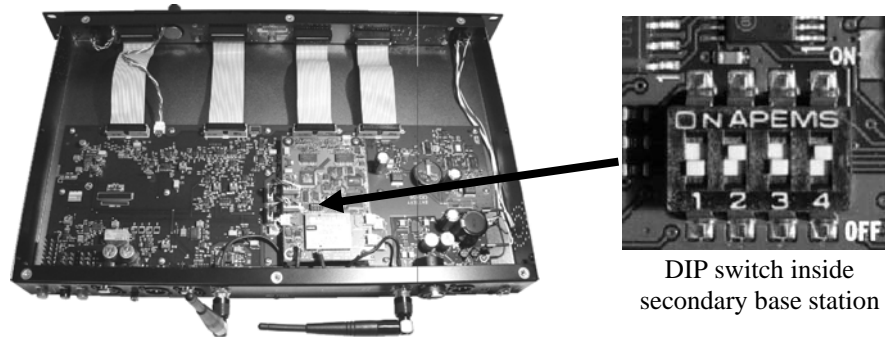
- Replace the cover and screws on the base station.
- The **primary** base station DIP switch #4 should be in the **OFF** position.

Base Station Initialization

For multiple HME base stations to operate without interference, they must all be properly initialized before performing any other setups. After initializing each base station, register each Beltpacs/Headsets/Speaker Station that will be used with that base according to the procedures on pages 11 - 18.

NOTE: Base stations must be set up for split-band operation prior to initialization. If a different frequency band needs to be selected to avoid interference, the primary base station must be set to this frequency band before base station initialization is started. (See Interference Avoidance on page 8.)

Initialize each base station and register all Beltpacs/Headsets/Speaker Stations as follows:

- Turn the primary base station power on. Register any Beltpacs/Headsets/Speaker Stations to be used with the primary base station (See pages 11 - 18). Turn each Beltpac/Headset/Speaker Station off after registering it.
- Power on one **secondary** base station. The **STATUS** display will show a double bar, indicating the secondary base is ready to be initialized.

Double bar   Small "o"
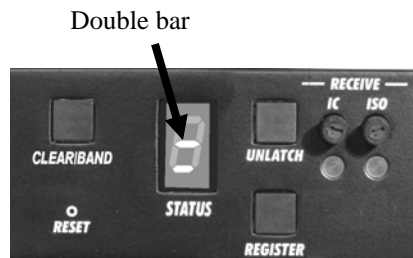
Base station ready to be initialized   **Small "o" indicates primary base is open for registration**
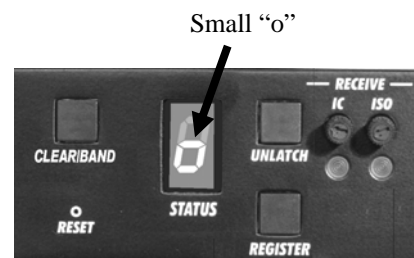
- Press the **REGISTER** button on the primary base. The **STATUS** display will show a small "o."

9

- To assign a number to a secondary base station and initialize it, press the **REGISTER** button on the secondary base. Pressing the button repeatedly causes it to cycle through the numbers 1, 2, and 3. When the desired number appears, stop pressing and wait. While the secondary base initializes using the displayed number, the **STATUS** display will continue showing the secondary number selected. When initialization of the secondary base station is finished, the display will show one bar, to indicate the secondary has initialized to the primary.

Secondary base number

One bar
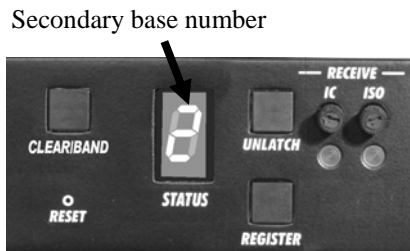
Secondary 2 searching for primary
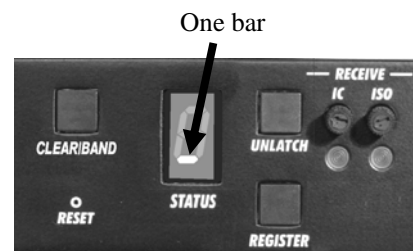
Secondary is initialized to primary

- Press the **REGISTER** button on the primary. The **STATUS** display will go blank.
- Register Beltpacs/Headsets/Speaker Stations to the secondary (See pages 11 - 18). After registration, turn off the secondary base and all Beltpacs/Headsets/Speaker Stations.
- Repeat these steps for each remaining secondary base. Use a different number for each. Only the primary base and the secondary base you are working with should have power on during initialization. All other equipment should be off.
- After all secondary bases are initialized and Beltpacs/Headsets/Speaker Stations are registered power up all bases. Press reset on the primary base and let it recover. Turn on the primary Beltpacs/Headsets/Speaker Stations and let them link. Press the reset on each secondary base one at a time and let it initialize to the primary, as indicated by a single bar. Turn on the Beltpacs/Headsets/Speaker Stations associated with the secondary bases. Do one group at a time until they have all linked. Then do the next group. At this point all bases and Beltpacs/Headsets/Speaker Stations should be powered up and linked, ready for use.
- Now proceed with normal system configuration, setting functions and levels as required.
- If it becomes necessary to replace a secondary base, use the procedure above to initialize the new secondary with the same number as the old secondary. After initialization you will have to register any Beltpacs/Headsets associated with the old secondary to the new secondary.
- If it becomes necessary to replace a primary base, follow the above procedure completely. Before initialization of the secondary bases, clear the previous secondary initialization as follows. For each secondary, press the **CLEAR/BAND** button and the **RESET** button at the same time. Continue holding the **CLEAR/BAND** button after you release the **RESET** button, until the clear code "**c**" (lower case) appears on the **STATUS** display. Any Beltpacs/Headsets/Speaker Stations associated with the old primary will have to be registered to the new primary after secondary base initialization. All Beltpacs/Headsets/ Speaker Stations associated with secondary base stations also have to be registered again.
- If the primary base is shut down or if the primary base is powered off for more than 30 seconds, all secondary bases will drop their Beltpac/Headset/ Speaker Station connections and begin searching for the primary. If the primary is not found in 30 seconds, the secondary will automatically revert to primary-mode operation and reconnect the Beltpacs/ Headsets/Speaker Stations. At this point the secondary **STATUS** displays will show three bars. If the primary is turned back on it will be necessary to press **RESET** on all secondary bases to allow them to find and initialize to the primary again. It is therefore important to have all bases connected to the same AC circuit to prevent this situation when the system is shut down after hours and powered up again the next day.

Three bars
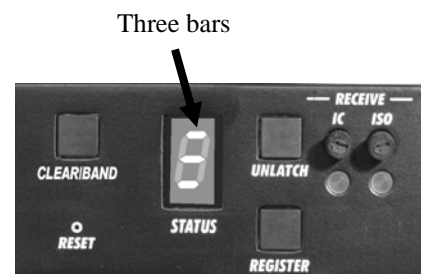
Secondary base operating in primary mode when no primary base is found

NOTE: You cannot register Beltpacs/Headsets/Speaker Stations to a base that is set to primary mode, and then switch the base mode to secondary for initialization. Once in secondary mode, the base cannot recognize the Beltpacs/Headsets/Speaker Stations registered during primary operation. For secondary bases, the Beltpacs/Headsets/Speaker Stations must always be registered after secondary base initialization, with the primary base remaining active and the secondary base displaying one bar.

BELTPAC / WH200 HEADSET / SPEAKER STATION SETUP AND REGISTRATION

The first time you operate the DX200 system, you must register each Beltpac, WH200 Headset and/or WS200 Speaker Station for use with a specific base station. The base station will then recognize all registered Beltpacs/Headsets/Speaker Stations when their power is on, and will know the difference between them and other electronic equipment operating on the same frequencies. If a Beltpac/Headset/Speaker Station is added, replaced or repaired later, the new one must be registered and the old one remains in memory. A maximum of 15 Beltpacs and/or Headsets and/or Speaker Stations can be registered to a single base station at one time. If the maximum number of 15 is exceeded, you must clear all current registrations and re-register all active Beltpacs/Headsets/ Speaker Stations.

NOTE: The following two pages are for Beltpac setup and registration. WH200 Headset setup and registration instructions are on pages 13 and 14. Instructions for WS200 Speaker Station setup and registration are on pages 15 - 18.

Set Up Beltpacs

Before registering them, set up all Beltpacs as follows.

Step 1. Insert a fully charged battery in the Beltpac, with the metal contacts on the end of the battery inserted first. Press it in until it snaps.

Step 2. Place the Beltpac in the pouch.

Step 3. Plug the headset cable connector into the Beltpac.

Register Beltpacs

Beltpacs must be within 6 feet (1.83 meters) of the base station while you are registering them. Be certain the base station power is on, and each Beltpac you are going to register is turned off before you begin. Beltpacs that are already registered can be on or off.

NOTE: If you are setting up multiple, daisy-chained base stations, the following steps must be repeated for Beltpacs being registered to each base station.

Step 1. Put the headset, of the Beltpac being registered, on your head.

Step 2. Press the **REGISTER** button on the front panel of the base station (#**17** on base station front panel illustration).

- The **STATUS** display (#**3** on base station front panel illustration) will show a small "**o**" for open.

  NOTE: If you wait too long before going on to Step 3, the base station will go out of the registration mode and you will have to repeat Step 2.

Step 3. Press and hold the **ISO** button on the Beltpac while you press and release the **PWR** (power) button to turn the unit on, then release the **ISO** button. This will cause the Beltpac to enter the registration mode.

- The two power lights at the corners of the Beltpac near the **IC** and **ISO** buttons will begin blinking red, then will blink green two or three times and go off.

- *Wait!* There may be a short delay.
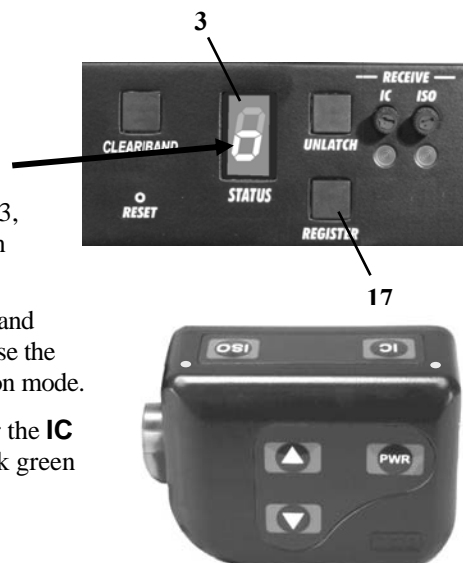
If registration is successfully completed:

- A voice message in the headset will say "Power on, Beltpac #, Version #, Begin registration, Registration complete, …"
- After a delay of up to 15 seconds, the **STATUS** display will show the ID number assigned to this Beltpac for about 10 seconds.
  NOTE: ID numbers are assigned sequentially as 0 thru 9, A, b, C, d and E.
- The power light on the Beltpac, next to the **IC** button, will remain on steady green.
- **Repeat Steps 1 to 3 on page 11 for each Beltpac to be registered.**

If registration failed:

- A voice message in the headset will say "Power on, Beltpac #, Version #, Begin registration, …" Both power lights on the Beltpac will be blinking red, and there may be a delay of up to 90 seconds before you hear "Registration failed" and the **STATUS** display goes blank.
- Press **RESET** (#**16**) on the base station. To press **RESET**, insert a small paper clip or similar object into the **RESET** hole at the lower-left corner of the base station front panel. When the **STATUS** display (#**3**) becomes blank, press the **REGISTER** button (#**17**) and register the Beltpac again. If registration fails again, call your dealer for assistance.
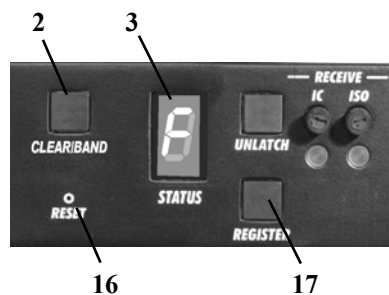
If you try to register more than 15 Beltpacs and/or WH200 Headsets and/or Speaker Stations to a base station:

- An **F** (for registration "Full") will appear on the **STATUS** display (#**3**) on the base station and you will hear "Registration failed" in the Headset.
- Clear all current registrations by pressing the **CLEAR/BAND** button (#**2**) and **RESET** (#**16**) at the same time. To press **RESET**, insert a small paper clip or similar object into the **RESET** hole at the lower-left corner of the base station front panel. Continue holding the **CLEAR/BAND** button after you release **RESET**, until the clear code "**c**" (lower case) appears on the **STATUS** display.

- Register all active Beltpacs, one at a time.
  Previously registered WH200 Headsets and Speaker Stations must also be re-registered.

Set Up WH200 Headsets

Before registering them, insert a fully charged battery in each Headset, with the metal contacts on the end of the battery inserted first. Press it in until it snaps.

Power On/Off

● **To turn power on**

   Press and release the power button on the inside of the Headset housing. A voice message in the earpiece will say "Headset #" and the power light on the opposite side of the earpiece will go on.

● **To turn power off**

   Press and hold the power button for approximately 3 seconds. A voice message in the earpiece will say "Headset off," and the power light on the opposite side of the earpiece will go off.

Power button

Power light

Register WH200 Headsets

Headsets must be within 6 feet (1.83 meters) of the base station while you are registering them. Be certain the base station power is on, and each Headset you are going to register is turned off before you begin. Headsets that are already registered can be on or off.

NOTE: If you are setting up multiple, daisy-chained base stations, the following steps must be repeated for Headsets being registered to each base station.

Step 1. Put the Headset on your head.

Step 2. Press the **REGISTER** button on the front panel of the base station (#**17** on base station front panel illustration).

   ● The **STATUS** display (#**3** on base station front panel illustration) will show a small "**o**" for open.

      NOTE: If you wait too long before going on to Step 3, the base station will go out of the registration mode and you will have to repeat Step 2.

Step 3. Press and hold the **ISO** button on the Headset while you press and release the power button to turn the unit on, then release the **ISO** button. This will cause the Headset to enter the registration mode.

   ● The Headset power light will begin blinking red, then will blink green two or three times and go off.

      Wait!   There may be a short delay.

3

17
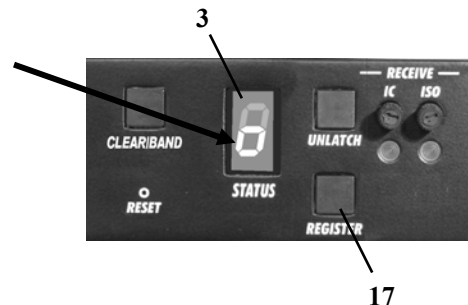
If the registration is successfully completed:

- A voice message in the Headset will say "Power on, Headset #, Version #, Begin registration, Registration complete, …"
- After a delay of up to 15 seconds, the **STATUS** display will show the ID number assigned to this Headset for about 10 seconds.

  NOTE: ID numbers are assigned sequentially as 0 thru 9, A, b, C, d and E.

- The power light on the Headset will remain on steady green.
- Repeat Steps 1 to 3 above for each Headset to be registered.

If registration failed:

- A voice message in the Headset will say "Power on, Headset #, Version #, Begin registration, …" The power light on the Headset will be blinking red, and there may be a delay of up to 90 seconds before you hear "Registration failed" and the **STATUS** display (#**3**) goes blank.
- Press **RESET** (#**16**) on the base station. To press **RESET**, insert a small paper clip or similar object into the **RESET** hole at the lower-left corner of the base station front panel. When the **STATUS** display (#**3**) becomes blank, press the **REGISTER** button (#**17**) and register the Headset again.   If registration fails again, call your dealer for assistance.
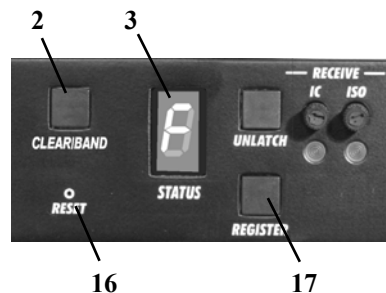
If you try to register more than 15 WH200 Headsets and/or Beltpacs and/or Speaker Stations to a base station:

- An **F** (for registration "Full") will appear on the **STATUS** display (#**3**) on the base station and you will hear "Registration failed" in the Headset.
- Clear all current registrations by pressing the **CLEAR/BAND** button (#**2**) and *RESET* (#**16**) at the same time. To press **RESET**, insert a small paper clip or similar object into the **RESET** hole at the lower-left corner of the base station front panel. Continue holding the **CLEAR/BAND** button after you release **RESET**, until the clear code "**c**" (lower case) appears on the **STATUS** display.

- Register all active WH200 Headsets, one at a time.
  Previously registered Beltpacs and Speaker Stations must also be re-registered.

Set Up Speaker Stations

The WS200 Speaker Station can be used together with Beltpacs and WH200 All-in-one Headsets. It provides wireless communication through its built-in microphone and speaker, or a plug-in headset. A remote speaker can also be connected to the unit.

The Speaker Station can be used on a table top or mounted on the wall. It can be operated with standard AC power, 12-14VDC or with six AA batteries or an optional rechargeable battery. A power supply with cord and a battery sled are provided. Whether used on a table top or mounted on the wall, if AC operation is required, the Speaker Station must be located close enough to an electrical outlet to be reached with the power supply and cord.

Wall Mounting

- Hold the unit against the wall where you will mount it and mark the wall through the four holes in the flanges on its left and right sides.
- Drill holes in the wall at the four marked spots, and mount the WS200 over the holes with your selected hardware (not provided).

AC Power Operation

If using the WS200 with AC power —

- Plug the connector at the end of the power supply cable into the **12-14 VDC** power connector on right side of the unit. Turn the sleeve on the connector clockwise to secure it to the unit.
- Plug the large female connector at one end of the AC power cord into the power supply. Plug the other end of the AC power cord into an electrical outlet.

Power supply

Power supply cable

AC power cord
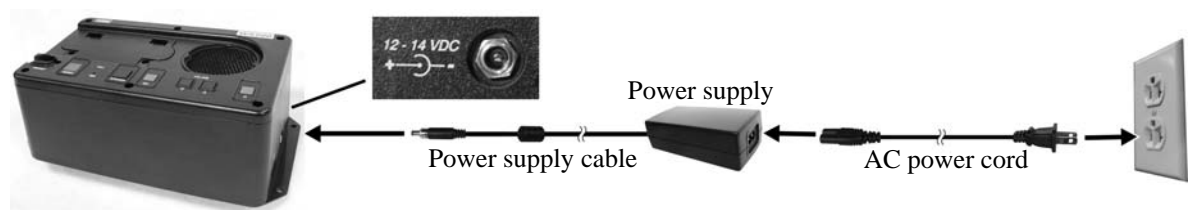
Having a fully charged (or new) battery in its battery compartment when operating the WS200 with AC or external DC power can prevent interruption of communication during a power outage. The WS200 will automatically switch to battery power.

Battery Operation

If using the WS200 with battery power —

Battery cover
release latches

- Press down and pull out on the two battery cover release latches and lift the cover to open the battery compartment.

- Insert six AA batteries into the battery sled, in the positions shown inside the sled, and install the sled in the battery compartment.

Battery sled
with batteries

Battery
sled

Battery
compartment

NOTE: An HME BAT850 Rechargeable NiMH Battery can be used instead.

- Close the battery compartment by pressing down on its cover next to both of the latches at the same time until they snap in place.
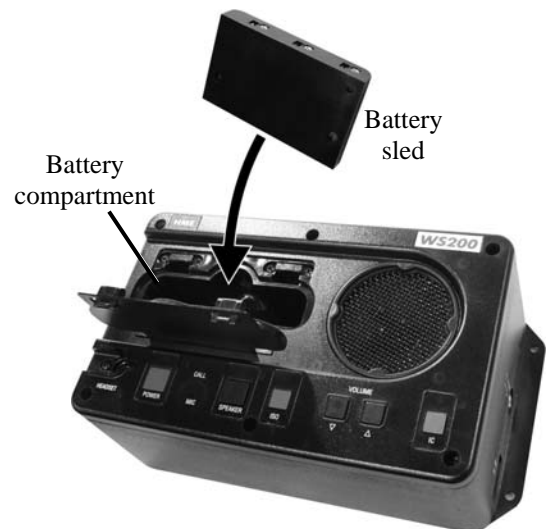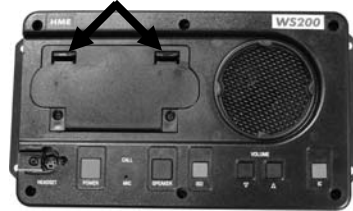
Register Speaker Stations

The first time you operate a WS200, you must register it for use with a specific base station. The base station will then recognize the WS200 when its power is on, and will be able to tell the difference between it and other electronic equipment operating on similar frequencies, or DX family Beltpacs or All-in-one Headsets.

NOTE: The WS200 must be within 6 feet (1.83 meters) of the base station while being registered.

Registration Procedure:

- Be sure the WS200 is turned off and the base station power is on.
- On the base station, press and release the **REGISTER** button.
  — The **STATUS** display will show a small "**o**" for open.

STATUS
display

REGISTER
button

- On the WS200, press and hold the **ISO** button while you press and release the **POWER** button to turn the unit on, and then release the **ISO** button. This will cause the WS200 to enter the registration mode.
  — The **STATUS** display on the base station will continue to show a small "**o**."
  — The **ISO** and **IC** lights on the WS200 will be blinking red then will change to a steady green **IC** light.

ISO button
and light

IC button
and light
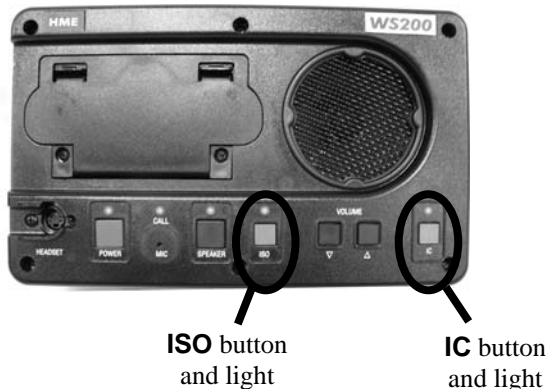
If registration is successfully completed:

- If you have a headset plugged into the WS200 or if the speaker is on, you will hear a voice message in the headset or speaker saying "Power on, Speaker #, Version #, Begin registration, Registration complete…"
- After a delay of up to 15 seconds, the **STATUS** display on the base station will show the ID number assigned to the WS200, for about 10 seconds.

NOTE: ID numbers are assigned sequentially to registered Beltpacs, All-in-one Headsets and Speaker Stations as 0 thru 9, A, b, C, d and E (up to 15 total).

- The **IC** light on the WS200 will remain on steady green.

If registration failed:

- A voice message will say "Power on, Speaker, Version #, Begin registration, …"
  The **ISO** and **IC** lights on the WS200 will be blinking red, and there may be a delay of up to 90 seconds before you hear "Registration failed" and the **STATUS** display goes blank.
- Press **RESET** (#**16**) on the base station. To press **RESET**, insert a small paper clip or similar object into the **RESET** hole at the lower-left corner of the base station front panel. When the **STATUS** display (#**3**) becomes blank, press the **REGISTER** button (#**17**) on the base station and register the WS200 again.   If registration fails again, call your dealer for assistance.
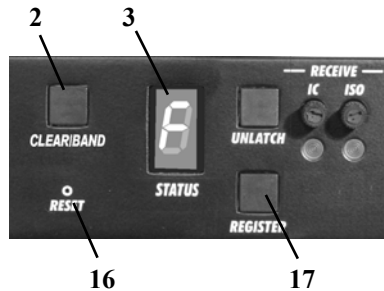
If you try to register more than 15 Beltpacs, WH200 Headsets or Speaker Stations:

- An **F** (for registration "Full") will appear on the **STATUS** display (#**3**) on the base station and you will hear "Registration failed."
- Clear all current registrations by pressing the **CLEAR/BAND** button (#**2**) and **RESET** (#**16**) on the base station at the same time. To press **RESET**, insert a small paper clip or similar object into the **RESET** hole at the lower-left corner of the base station front panel. Continue holding the **CLEAR/BAND** button after you release **RESET**, until the clear code "**c**" (lower case) appears on the **STATUS** display.

- Register all active Speaker Stations, one at a time.
  All previously registered Beltpacs and WH200 Headsets and must also be re-registered.

NOTICE

You have completed the stand-alone system setup.

The instructions under INTERCOM AND AUXILIARY EQUIPMENT SETUPS on the following pages are for setting up additional equipment which you may want to use with your DX200, such as a 2-wire intercom, 4-wire intercom, an external speaker or other auxiliary audio equipment. Instructions are also provided for daisy-chaining two or more base stations together.

INTERCOM AND AUXILIARY EQUIPMENT SETUPS

24   25   26   27   28   29   30   31   32   33   34   35 36   37

Rear Panel

2   3   4 5 6   7   8   9   10   11 12   13 14

16   17   18   19   20   21   22   23
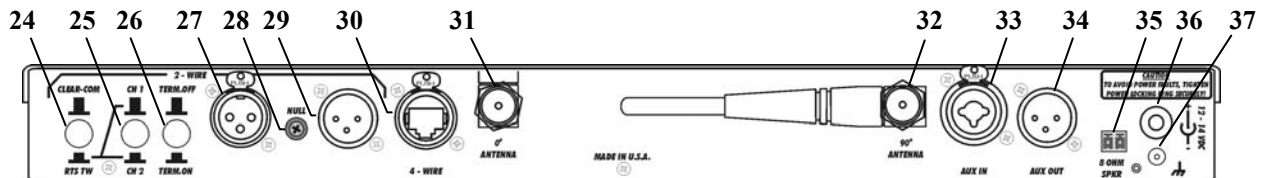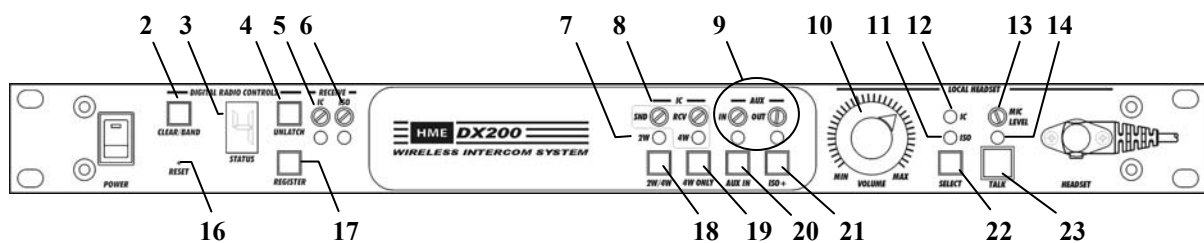
Front Panel

2-Wire Intercom

Step 1. If using a 2-wire intercom, plug it into the base station at **#27** or **#29**, depending on whether a male or female connection is required.

Step 2. Depending on whether you are using a Clear-Com® or RTS® compatible 2-wire intercom system, position the **CLEAR-COM ⁄ RTS TW** button (**#24**) as follows:

           In position = RTS® Mode   Out position = Clear-Com® Mode

Step 3. If you selected **RTS TW**, position the **RTS CHANNEL** select button (**#25**) to the desired channel as follows:

           Out position = Channel 1   In position = Channel 2

Step 4. Press the **2W/4W** button (**#18**) on the front panel of the base station. The **2W** and **4W** lights (**#7 & #8**) above the button should go on. Turn the Beltpac/Headset/Speaker Station power on. Press the **IC** button on the Beltpac/Headset/Speaker Station and speak into the microphone. If you hear a delayed echo of your voice, adjust the **NULL** control (**#28**) while you are speaking, until the echo is eliminated.

4-Wire Intercom

Step 1. If using only a 4-wire intercom, plug it into the **4-WIRE** connector (**#30**).

Step 2. Press the **4W ONLY** button (**#19**). The **4W** light (**#7**) above the button should go on.

Step 3. Adjust the **NULL** control (**#28**) while you are speaking, until the echo is eliminated.

Step 4. Adjust the 4-wire intercom send and receive levels with the **SND** and **RCV** controls (**#8**).

Pin designations for the RJ45
4-WIRE connector are as follows: Pins 1, 2, 7 & 8 = N/C
                                        Pin 3 = Intercom Out +
                                        Pin 4 = Intercom In +
                                        Pin 5 = Intercom In –
                                        Pin 6 = Intercom Out –
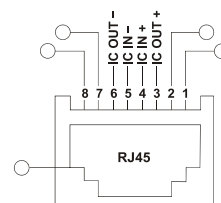
NOTE: If no 2-wire intercom will be used, you **<u>must</u>** press the **4W ONLY** button (**#19**), or a squeal will be heard in the headsets.

The numbers (#_) below refer to items on the illustrations on page 20.

Auxiliary Equipment

Step 1. If using auxiliary equipment, such as another intercom, a CD player or other audio source, connect its output cable connector (male) to the **AUX IN** connector (#**33**), and its input cable connector (female) to the **AUX OUT** connector (#**34**) (if applicable).

The cable connectors must be 3-pin
XLR type for balanced +20dBV   Pin 1 = Ground
maximum audio input/output, with   Pin 2 = Audio +
the following pin connections: Pin 3 = Audio –

AUX IN Female   AUX OUT Male
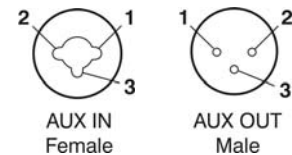
Step 2. If the auxiliary equipment provides audio input only, press the **AUX IN** button (#**20**). The light above the button (#**9**) should go on. Listen to the audio input in your headset as you adjust the **IN** control (#**9**) above the light to the desired level.

Step 3. If the auxiliary equipment requires two-way communication, have someone listening at the auxiliary unit. Press the **ISO+** button (#**21**) on the front panel of the base station. The light above the button should go on. While speaking into your headset microphone, adjust the **OUT** control (#**9**) above the light to the desired listening level at the auxiliary unit. Listen to the audio input in your headset as you adjust the **IN** control (#**9**) above the light to the desired level.

Step 4. ISO+ Only Setting - If you require **ISO** audio output to the **AUX OUT** connector (#**34**), but do not want it broadcasted to other beltpacs, headsets or speaker stations, configure your equipment as follows:

- Turn the base station off.

- Remove the six screws from the top and three screws from each side of the base station top cover, and lift the cover off and set it aside.

- Locate the DIP switch on the transceiver circuit board inside the base station. Set DIP switch #3 to the **ON** position. Leave #s 1 and 4 in the **OFF** position in secondary base station mode.
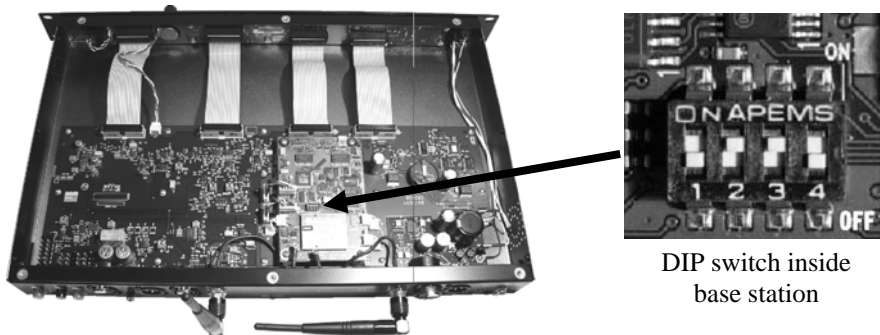
DIP switch inside
base station

- Replace the cover and screws on the base station.

- Turn the base station on.

8-Ohm Speaker

Step 1. If an external 8 ohm speaker will be used, connect its cable wires to the **8 OHM SPKR** 2-pin Phoenix connector (#**35**).

Step 2. Adjust the speaker volume with the *LO*CAL HEADSET VOLUME control knob (#**10**).

> **NOTE:** Either a local headset or an external speaker can be used, but not both. The **LOCAL HEADSET VOLUME** control knob is the adjustment for both.

SECTION 3.   EQUIPMENT OPERATION

BASE STATION OPERATION

Front Panel Controls, Indicators and Connector
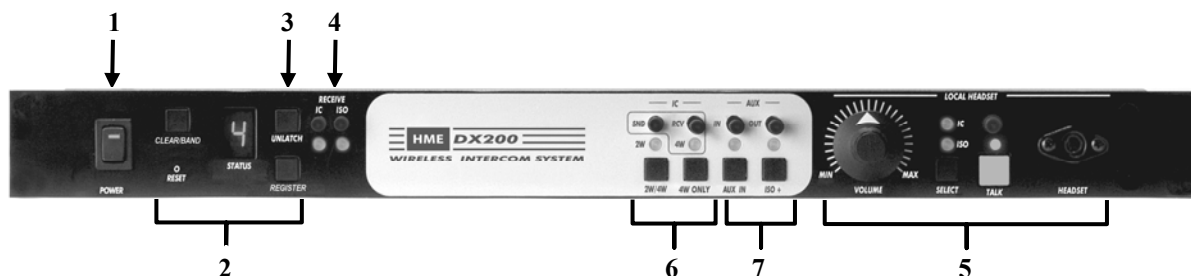
1. **POWER Switch**

   Press the upper part of the switch to turn the power on. A light on the switch will be lit when the base station power is on. Press the lower part of the switch to turn the power off. The light will go off. All settings are preserved when the power is turned off, and will be restored when the power is turned on again.

2. **Beltpac, WH200 Headset or Speaker Station Registration Controls and Status Indicator**

   Use these controls to register each Beltpac, WH200 Headset and/or Speaker Station used with a specific base station, as described on pages 11 - 18.

3. **UNLATCH Button**

   Use this button to unlatch all Beltpac/Headset/Speaker Station transmitters. (Beltpac/Headset/Speaker Station users can "latch" their units on, to talk and listen to each other in the Hands-free mode. Base station operators can use the **UNLATCH** button to stop Beltpac/Headset/Speaker Station conversations.)

4. **IC (Intercom) and ISO (Isolate) Receiver Indicators and Controls**

   Lights indicate whether Beltpac/Headset/Speaker Station reception is **IC** or **ISO**. Use **IC** and **ISO** controls to independently adjust **IC** and **ISO** receive levels.
   NOTE: This adjustment does not affect communication between Beltpacs, Headsets and Speaker Stations.

5. **Local Headset Connector, Indicators and Controls**
   - Adjust the microphone level control, above the **TALK** button on the front panel, to mid-point. The level can be readjusted during use, as needed.
   - Adjust the receive level by turning on a Beltpac/Headset/Speaker Station, speaking into the microphone and listening through the local headset earpiece while adjusting the **VOLUME** control on the base station to the desired level.
   - With either the **2W/4W** or **4W ONLY** button engaged, use the **SELECT** button to select communication via **IC** or **ISO+** connectors. Above the **SELECT** button, the indicator light will be lit for the selection you made. **IC** will allow you to communicate via the intercom channel as well as Beltpacs/Headsets/Speaker Stations. If **ISO** is selected and the **ISO+** button has been pressed (See #**7** in the illustration above), you will communicate via the **AUX OUT** connection as well as to Beltpacs/Headsets/Speaker Stations.

     NOTE: If neither **2W** nor **4W** is on, this will have no effect. It will stay on **ISO**.
   - For open communication, press and release the **TALK** button quickly to "latch on." To "latch off," press and release the button again quickly.
   - For momentary communication, press and hold the **TALK** button for more than one second. In this mode, the selected channel will remain open only as long as you are pressing the **TALK** button.
   - The **TALK** light indicates the **TALK** mode is active via the local headset.
   - Use the **TALK** control knob to adjust the outbound audio level from the local headset microphone.
   - Use the **VOLUME** control knob to adjust the input to the local headset earpiece.

The following base station indicators and controls are used only if 2-wire or 4-wire intercoms, or other auxiliary equipment is being used with the DX200, as described under INTERCOM AND AUXILIARY EQUIPMENT SETUPS on pages 20 and 21.

6. **2Wire/4Wire IC Indicators and Controls**

   The **2W/4W** button turns on/off both 2-wire and 4-wire intercoms simultaneously. The 2W light above the button indicates intercom on/off status. The **4W ONLY** button turns on/off the 4-wire intercom alone. The **4W** light above the button indicates intercom on/off status. Use the **SND** and **RCV** controls in the outlined area to adjust the 4-wire intercom send and receive levels.

7. **AUX IN and ISO+ Indicators and Controls**

   The **AUX IN** button enables audio input from auxiliary equipment connected to **AUX IN**, to Beltpacs/ Headsets/Speaker Stations and local headset. The **ISO+** button enables the **ISO** audio output to auxiliary equipment connected to **AUX OUT**, from Beltpacs/Headsets/Speaker Stations and local headset. When the **IN** light is on, only **AUX IN** is active. When the **OUT** light is on, **AUX IN** and **ISO+** are both active. The **IN** and **OUT** controls adjust auxiliary inbound and outbound audio levels.

   NOTE: If your equipment was set up for "**ISO**+ only" operation (See page 21, Step 4), when **ISO+** is on, outbound audio will only be output to auxiliary equipment connected to **AUX OUT**, not broadcast to other Beltpacs/Headsets/Speaker Stations. The local headset will always communicate to Beltpacs/ Headsets/Speaker Stations whether in the "**ISO**+ only" mode or not.

BELTPAC OPERATION

The Beltpac control buttons have a snap action. They will activate when pressed firmly. Use your fingertips, not your fingernails, to press the buttons.

Power lights

Power On/Off

- **Power On —** Press and release the **PWR** (power) button.
  A voice message in the earpiece will say "Power on, Beltpac #, Version #," and the red power lights at the corners of the **IC** and **ISO** buttons will go on. After a short time, one light will go off and the other will change to green, indicating the Beltpac is ready for use. The **STATUS** indicator on the base station will momentarily indicate the ID of the Beltpac.

- **Power Off —** Press and hold the **PWR** button for approximately 2 seconds.
  A voice message in the earpiece will say "Power off," and the green power light will go off.

NOTE: While the Beltpac is transmitting, the green power light will be flashing.
The green power light will be on steady whenever the Beltpac is ready, but not transmitting.

ISO (Isolate) and IC (Intercom)

Use the **ISO** button to communicate with other Beltpac/Headset/Speaker Station users and the base station operator. Pressing **ISO** on the Beltpac will send audio to **AUX OUT** if **ISO+** button on the base station is on.
The ISO feature can be locked out, causing the **ISO** button to function the same as the **IC** button.

Use the **IC** button to communicate via the intercom channel and with the base station operator, or anyone listening to a local speaker connected to the base Station. Pressing **IC** on the Beltpac will send audio to the hardwired intercom if the intercom is on.

- **Push-To-Talk Mode —** To set the Beltpac for push-to-talk (PTT) communication, with the power off, press and hold the volume-down ▼ and **ISO** buttons while you press and release the **PWR** (power) button. You will hear "Power on, Beltpac #, Version #, Hands-free off" in the headset earpiece. Press and hold the **IC** or **ISO** button while talking.

- **Hands-free Mode —** To set the Beltpac for hands-free communication, with the power off, press and hold the volume-up ▲ and **ISO** buttons while you press and release the **PWR** (power) button. You will hear "Power on, Beltpac #, Version #, Hands-free on" in your headset earpiece. When set up for hands-free communication, the Beltpac can be operated in either hands-free or PTT.

- **ISO Lockout Mode —** To set the Beltpac with the ISO feature locked out, with the power off, press and hold the **IC** button while you press and release the **PWR** (power) button. You will hear "Power on, Beltpac #, Version #, ISO off" in your headset earpiece. When set up for the ISO Lockout mode, the **ISO** button will operate the same as the **IC** button, in either hands-free or PTT communication.
  To reset the ISO feature for normal **ISO** button communication, with the power off, press and hold the **ISO** and **IC** buttons while you press and release the **PWR** (power) button. You will hear "Power on, Beltpac #, Version #, ISO on" in your headset earpiece.

NOTE: The above settings are saved in memory and only need to be repeated when you want to change between hands-free and PTT operation. When changing modes, if both power lights begin blinking, turn the Beltpac off and begin again.
Hands-free and Push-To-Talk mode settings affect both **IC** and **ISO**. Individual adjustment is not possible.

- **Push-To-Talk Mode Operation —** Press and hold the **IC** or **ISO** button for more than one second. In PTT operation, audio will be transmitted only while you are pressing the **IC** or **ISO** button.

- **Hands-free Mode Operation —** Quickly press and release the **IC** or **ISO** button to "latch" the transmitter on in the hands-free mode. Talk and listen, as in a normal telephone conversation. Press and release the **IC** or **ISO** button again to "unlatch," to end the conversation. If either button is held down for more than a half second, the Beltpac will function as PTT. All Beltpacs/Headsets can be unlatched by the base station operator, by pressing the **UNLATCH** button on the base station.

NOTE: In hands-free mode, pressing the **IC** button while latched in **ISO** will latch on **IC**. Pressing the **ISO** button while latched in **IC** will latch on **ISO**.

Volume Up/Down

- **Volume Up Adjustment** — Each time you press and release the volume-up ▲ button, you will hear a higher pitch beep in the earpiece as the volume increases one step. If you press and hold the volume-up button, you will hear beeps of ascending pitch as the volume steps up to maximum. When maximum volume is reached, you will hear "maximum" repeating until you release the volume-up button.

- **Volume Down Adjustment** — Each time you press and release the volume-down ▼ button, you will hear a lower pitch beep in the earpiece as the volume decreases one step. If you press and hold the volume-down button, you will hear beeps of descending pitch as the volume steps down to minimum. When minimum volume is reached, you will hear rapidly repeating beeps until you release the volume-down button.

Sidetone Adjustment

To adjust sidetone, the volume level of your own voice that you hear in the headset earpiece as you speak into the microphone, press and hold the **IC** button while you press the volume-up ▲ or volume-down ▼ button. If you reach the maximum volume level you will hear "Maximum" in the headset earpiece. If you reach the minimum volume level you will hear double beeps. Your sidetone setting will be saved in memory, and does not require readjustment each time the Beltpac is turned off and on.

NOTE: This adjustment only affects the level of your voice in your own headset, not how anyone else hears you.

Microphone Gain Adjustment

Some users talk louder or softer than others. To allow for this, microphone gain adjustment is provided.

To increase microphone gain — Press the volume-up ▲ button while holding down the **ISO** button in the normal operating mode. The microphone gain increase can be monitored through sidetone, or preferably by someone else on a Beltpac/Headset/Speaker Station or at the base station.

To decrease microphone gain — Press the volume-down ▼ button while holding down the **ISO** button in the normal operating mode. The microphone gain decrease can be monitored through sidetone, or preferably by someone else on a Beltpac/Headset/Speaker Station or at the base station.

NOTE: You will hear "Maximum" if you attempt to go higher than maximum microphone gain.
You will hear beeps if you attempt to go lower than minimum microphone gain.
Microphone gain will be saved in non-volatile memory and does not require readjustment each time the power is turned on.

Change Batteries

When a battery becomes weak, a voice in the earpiece will say "Change battery." When this happens, take the Beltpac out of its pouch and remove its battery. Slide the arrow-shaped battery-release latch in the direction of the arrow. Pull up on the end of the battery near the battery-release latch and lift the battery out of the Beltpac, or turn the Beltpac over and catch the battery in your hand.

When replacing a battery in the Beltpac, place the end of the battery with the metal contacts into the battery holder on the Beltpac, in the same position as the battery you removed. Press the top of the battery carefully into the battery holder until it snaps in place under the battery-release latch.

Recharge batteries according to the instructions on page 6.

Battery   Battery
release latch
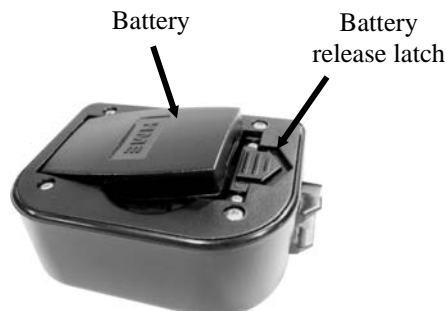
WH200 HEADSET OPERATION

The Headset control buttons will activate when pressed lightly. Use your fingertips, not your fingernails, to press the buttons.

Power On/Off

- **Power On** — Press and release the power button on the inside of the headset housing. A voice message in the earpiece will say "Power on, Headset #, Version #" and the power light will go on. The **STATUS** indicator on the base station will momentarily indicate the Headset ID number.

- **Power Off** — Press and hold the power button for approximately 3 seconds. A voice message in the earpiece will say "Power off," and the power light will go off.

ISO (Isolate) and IC (Intercom)

Use the **ISO** button to communicate with other Headset/Beltpac/Speaker Station users and the base station operator. Pressing **ISO** on the Headset will send audio to **AUX OUT** if **ISO+** button on the base station is on. The ISO feature can be locked out, causing the **ISO** button to function the same as the **IC** button.

Use the **IC1** or **IC2** button to communicate via the intercom channel and with the base station operator, or anyone listening to a local speaker connected to the base station. Pressing **IC1** or **IC2** on the Headset will send audio to the hardwired intercom if the intercom is on.

- **Push-To-Talk Mode** — To set the Headset for Push-To-Talk (PTT) communication, with the power off, press and hold the volume-down ▼ and **ISO** buttons while you press and release the power button. You will hear "Power on, Headset #, Version #, Hands-Free off" in the earpiece. Press and hold the **IC1**, **IC2** or **ISO** button while talking.

- **Hands-Free Mode** — To set the Headset for Hands-Free (HF) communication, with the power off, press and hold the volume-up ▲ and **ISO** buttons while you press and release the power button. You will hear "Power on, Headset #, Version #, Hands-Free on" in the earpiece. When set up for Hands-Free communication, the Headset can be operated in either HF or PTT.

- **ISO Lockout Mode** — To set the Headset with the ISO feature locked out, with the power off, press and hold the **IC1** button while you press and release the power button. You will hear "Power on, Headset #, Version #, ISO off" in your Headset earpiece. When set up for the ISO Lockout mode, the **ISO** button will operate the same as the **IC1** button, in either hands-free or PTT communication.
  To reset the ISO feature for normal **ISO** button communication, with the power off, press and hold the **ISO** and **IC1** buttons while you press and release the power button. You will hear "Power on, Headset #, Version #, ISO on" in your Headset earpiece.

- **Lights-off Mode** — To prevent the power and transmit lights from coming on during headset operation, press and hold the **IC2** button while you press the power button to turn the headset on.
  To return the lights to their normal functions, turn the power off and on again without pressing the **IC2** button.

NOTE: The above settings are saved in memory and only need to be repeated when you want to change between HF and PTT operation. When changing modes, if both power lights begin blinking, turn the Headset off and begin again. Hands-Free and Push-To-Talk mode settings affect both **IC** and **ISO**. Individual adjustment is not possible.

- **Push-To-Talk Mode Operation** — Press and hold the **IC1**, **IC2** or **ISO** button while speaking. In PTT operation, audio will be transmitted only while you are pressing the **IC1**, **IC2** or **ISO** button.

- **Hands-Free Mode Operation** — Quickly press and release the **IC** or **ISO** button to "latch" the transmitter on in the HF mode. Talk and listen, as in a normal telephone conversation. Press and release the **IC** or **ISO** button again to "unlatch," to end the conversation. If either button is held down for more than a half second, the Headset will function as PTT. All Headsets/Beltpacs/Speaker Stations can be unlatched by the base station operator, by pressing the **UNLATCH** button on the base station.

NOTE: In Hands-Free mode, pressing the **IC1** or **IC2** button while latched in **ISO** will latch on **IC**. Pressing the **ISO** button while latched in **IC** will latch on **ISO**.

Volume Up/Down

- **Volume Up Adjustment** — Each time you press and release the volume-up ▲ button, you will hear a higher pitch beep in the earpiece as the volume increases one step. If you press and hold the volume-up button, you will hear beeps of ascending pitch as the volume steps up to maximum. When maximum volume is reached, you will hear "maximum" repeating until you release the volume-up button.
- **Volume Down Adjustment** — Each time you press and release the volume-down ▼ button, you will hear a lower pitch beep in the earpiece as the volume decreases one step. If you press and hold the volume-down button, you will hear beeps of descending pitch as the volume steps down to minimum. When minimum volume is reached, you will hear rapidly repeating beeps until you release the volume-down button.

Microphone Gain Adjustment

Some users talk louder or softer than others. To allow for this, microphone gain adjustment is provided.

To increase microphone gain — Press the volume-up ▲ button while holding down the **ISO** button in the normal operating mode. The microphone gain increase can be monitored through sidetone, or preferably by someone else on a Headset/Beltpac/Speaker Station or at the base station.

To decrease microphone gain — Press the volume-down ▼ button while holding down the **ISO** button in the normal operating mode. The microphone gain decrease can be monitored through sidetone, or preferably by someone else on a Headset/Beltpac/Speaker Station or at the base station.

NOTE: You will hear "Maximum" if you attempt to go higher than maximum microphone gain.
You will hear two beeps if you attempt to go lower than minimum microphone gain.
Microphone gain will be saved in non-volatile memory and does not require readjustment each time the power is turned on.

Change Batteries

When a battery becomes weak, a voice in the Headset will say "Change battery." When this happens, remove the battery from the headset by carefully sliding the battery-release latch and lifting the battery out.

When replacing a battery in the Headset, place the end of the battery with the metal contacts into the battery holder on the Headset, in the same position as the battery you removed. Press the top of the battery carefully into the battery holder until it snaps in place under the battery-release latch.

Recharge batteries according to the instructions on page 6.

Battery

Battery-
release latch
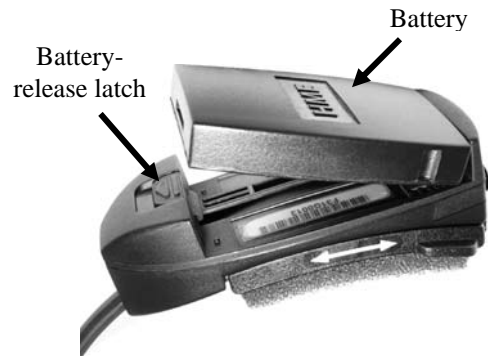
SPEAKER STATION OPERATION

Headset connector

Headset Connection

If you are using a headset with the WS200, plug it into the headset connector. When using a headset, if the red light over the **SPEAKER** button is on, incoming communication can be heard through the headset and the speaker. If the red light over the **SPEAKER** button is off, incoming communication can only be heard through the headset.

Push-To-Talk (PTT) or Hands-Free (HF) Mode Setting

- Be sure the WS200 power is off.
- To set up the WS200 for operation in the PTT mode, press and hold the **VOLUME** down ▼ and **ISO** buttons while you press and release the **POWER** button to turn the unit on. Then release the **VOLUME** down ▼ and **ISO** buttons.
- To set up the WS200 for operation in the HF mode, press and hold the **VOLUME** up ▲ and **ISO** buttons while you press and release the **POWER** button to turn the unit on. Then release the **VOLUME** up ▲ and **ISO** buttons.

NOTE: Mode settings are saved in memory, and only need to be reset if you want to change between PTT and HF operation. Mode settings affect both ISO and IC communication.

Routine Operation

Power On/Off

- **To turn WS200 power on**, press and release the **POWER** button.
  - — Red lights will go on over the **POWER**, **ISO** and **IC** buttons.
  - — If listening with a headset, or the speaker is turned on, you will hear "Power on, Speaker #, Version #."
  - — The light over the **ISO** button will go off.
  - — The light over the **IC** button will change to green.
- **To turn WS200 power off**, press and hold the **POWER** button for 3 seconds.

ISO / IC Buttons

The ISO button is used to communicate with Beltpac and All-in-one Headset users registered to your base station, and with the base station operator. Pressing the **ISO** button on the WS200 will also send audio to any wired product connected to **AUX OUT** on the base station if the *ISO+* button on the base station is on. The **ISO** feature can be locked out, causing the **ISO** button to function the same as the **IC** button.

The IC button is used to communicate with Beltpac and All-in-one Headset users registered to your base station, and with the base station operator. Pressing the **IC** button on the WS200 will also send audio to the 2-wire and/or 4-wire connector on the rear panel of the base station.

Push-To-Talk Mode

- Press and hold the **ISO** or **IC** button while speaking.
  - — The green light over the button will be flashing when the unit is transmitting.
- Release button to listen on headset speaker or internal speaker, if "**ON**."
  - — The green light over the button will be on steady.
- Adjust volume level with **VOLUME** up ▲ and down ▼ buttons if necessary.

Hands-Free Mode

You must be using a headset plugged into the WS200, and the speaker must be off for hands-free operation.

- Quickly press and release the **ISO** or **IC** button.
  - — The green light over the button will be flashing.
- Speak and listen as in a normal telephone conversation.
- Adjust volume level with the **VOLUME** up ▲ and down ▼ buttons if necessary.
- Press and release the **ISO** or **IC** button again to end communication.
  - — The green light over the **IC** button will be on steady.
- Press and release the **ISO** or **IC** button if you want to speak again.
  - — The green light over the button will begin flashing again.
- Pressing and holding the **ISO** or **IC** button for more than a half second will result in PTT operation.

ISO Lockout Mode

To set the WS200 with the ISO feature locked out, with the power off, press and hold the **IC** button while you press and release the **POWER** button. You will hear "Power on, Speaker #, Version #, ISO off." When set up for the ISO Lockout mode, the **ISO** button will operate the same as the **IC** button, in either hands-free or PTT communication.

To reset the ISO feature for normal **ISO** button communication, with the power off, press and hold the **ISO** and **IC** buttons while you press and release the **POWER** button. You will hear "Power on, Speaker #, Version #, ISO on."

CALL Light Function

If the CL200 (optional) Call Light button is pressed, or a call tone from an RTS or ClearCom intercom system is received through the CL200 on the 2-wire circuit:

- One short beep will sound in the WS200 speaker or headset, and will also be heard through all Beltpacs or All-in-one Headsets registered to the same base station as the WS200.
- The yellow **CALL** light next to the **POWER** button on the WS200 will flash 3 times and pause, then flash 3 times and pause, then flash 3 final times.

Headset Microphone Gain Adjustment

Some users speak louder or softer than others. The headset microphone gain adjustment helps to compensate for these differences, raising or lowering the voice level of the user speaking into the microphone. Increase microphone gain for softer voices, decrease for louder voices.

- To adjust microphone gain, first be sure the internal speaker is off.
- Press and hold the **ISO** button while pressing the **VOLUME** up ▲ or down ▼ arrow.
  — When you reach maximum microphone gain, you will hear "Maximum."
  — When you reach minimum microphone gain, you will hear a double beep.
  There are 16 steps between maximum and minimum microphone gain levels.

Headset Sidetone Adjustment

Sidetone is the level of your own voice that you hear in the headset earpiece as you speak into the microphone.

- To increase or decrease the sidetone level, first be sure the internal speaker is off.
- Press and hold the **IC** button while pressing the **VOLUME** up ▲ or down ▼ arrow.
  — When you reach maximum sidetone level, you will hear "Maximum."
  — When you reach minimum sidetone level, you will hear a double beep.
  There are 5 steps between maximum and minimum sidetone levels.

NOTE: A trim pot is provided for fine tuning adjustments with a small screwdriver, through the hole labeled **SIDE TONE** on the left side of the WS200.
This adjustment only affects the level of your voice in your own headset, not how anyone else hears you.

Changing Batteries

When batteries are becoming weak, you will hear "Change battery" from the speaker or headset. When this happens, remove the battery sled from the WS200 and replace the six batteries in it with fresh AA batteries. Be sure battery polarity is correct when replacing the batteries.

Rechargeable BAT850 Batteries

If you are using the optional HME BAT850 Rechargeable Battery, remove the battery from the WS200 and replace it with a fully charged battery. Recharge the battery in the optional AC850 Battery Charger according to the instructions received with the charger. Charging time is approximately 3 hours.

AC850 Battery Charger

Auxiliary Speaker Connection

An 8 ohm auxiliary speaker can be connected to the right side of the WS200, using the enclosed 2-position connector plug. Adjustments affecting the WS200 speaker will also affect the parallel auxiliary speaker.

SECTION 4.   TROUBLESHOOTING

If you are unable to correct any of the problems described below, contact your dealer for assistance.

- **Red light on base station power switch does not come on.**

  Be certain power cords are properly connected to base station, power supply and electrical outlet.

- **Beltpac/Headset/Speaker Station power lights do not turn green, and "out of range" is heard.**

  Be certain your base station power is on. Turn Beltpac/Headset/Speaker Station and base station power on and off.

  You may be too far from the base station. The range varies with each location's layout.

- **When trying to register, it keeps saying registration failed.**

  Check to be sure that the **STATUS** display only goes blank, and does not show a registration number. Follow the instructions on clearing the registrations as found on page 11, 13 or 17, and repeat the registration procedure.

- **Others cannot hear me when I talk.**

  Be certain you are pressing the **IC** or **ISO** button on the Beltpac/Headset/Speaker Station, or the **TALK** button on the base station. Be certain the appropriate **IC** or **ISO** setting is selected under **LOCAL HEADSET** on the base station. If you are using a Beltpac or local headset, be certain the headset connector is correctly plugged in to the Beltpac or base station.

- **People on the 4-wire intercom cannot hear me or I cannot hear them.**

  Be certain the cables are securely connected and the 4-wire intercom is on. If using a local headset, be certain the **IC** setting is selected under **LOCAL HEADSET** on the base station.

- **People on the RTS/ClearCom systems cannot hear me or I cannot hear them.**

  Be certain the cables are securely connected and the 2-wire intercom is on. If using a local headset, be certain the **IC** setting is selected under **LOCAL HEADSET** on the base station.

- **The 2-wire intercom is on and there is a loud squeal whenever I try to talk.**

  This can occur if no intercom is connected to one of the 2-wire connectors. This can also occur if two or more base stations are daisy-chained and the **TERM ON/OFF** button in one of the base stations has not been set properly. Contact your dealer.

- **Settings are not retained when the base station power is turned off and on again.**

  The internal battery may be low. Contact your dealer.

- **Echo cannot be completely nulled when connected to a 2-wire wired intercom.**

  Terminate the base station then lift the termination on the wired intercom and readjust the **NULL** control.

2400MHz cordless telephone interference — If there is a 2400MHz cordless telephone nearby, interference may occur. However, because the DX200 is a frequency-hopping system, this problem is unlikely. If it does occur, changing frequencies on the telephone may alleviate the problem. If not, move the phone as far as practical from the base station, or use another type phone.

In the event of an electrical power outage — such as from a lightning storm or power generator failure, if you experience problems with your HME equipment after the electricity comes on again, unplug the AC power supplies from their electrical outlets and wait 15 seconds, then plug them back in.

EQUIPMENT SPECIFICATIONS

Base Station

GENERAL —

Frequency Range:	All, 2400 to 2483.5 MHz
	Low, 2401.92 to 2439.94 MHz
	High, 2443.39 to 2481.41 MHz
Frequency Response:	200 Hz to 3.5 kHz
Power Requirements:	100-240VAC, 50-60Hz or 12-14VDC
Temperature Range:	32-122°F (0-50°C)
Size:	19” x 1.72” x 17.13” (1-RU) (48.26 x 4.37 x 43.51 cm)
Weight:	9.2 lbs. (4.18 kg) maximum
# of Beltpacs per Base:	15 can be registered
	Any 4 can have simultaneous full-duplex communication at one time
4-Wire I/O:	RJ45, 600Ω balanced, level adjustable, simultaneous operation with 2-wire
2-Wire I/O:	XLR-3M, XLR-3F, externally-switchable RTS® or Clear-Com® mode,
	200Ω, level adjustable, null adjustable
Auxiliary Input:	XLR-3F/¼” (6.35 mm) combo jack, 600Ω balanced, level adjustable
Auxiliary Output:	XLR-3M, 600Ω balanced, level adjustable
8Ω Speaker Output:	1W into 8Ω
Headset Connector:	4-pin mini-DIN
	Electret microphone
Headset Output:	250mW into 32Ω
Front Panel Controls:	Power switch
	Clear/Band, Reset, Unlatch and Register buttons,
	IC and ISO Receive level adjustments, IC 2W/4W and 4W-Only buttons,
	IC4W-Only Send and Receive level adjustments,
	Auxiliary In and ISO+ buttons, Auxiliary In and Out level adjustments,
	Rotary knob for volume adjustment,
	Headset IC/ISO Select button and Headset Talk button
Front Panel Indicators:	Status indicator, IC and ISO Receive LEDs,
	IC 2W and 4W-Only LEDs, Auxiliary In/Out LEDs,
	Headset IC/ISO select LEDs, Headset PTT LED
Rear Panel Controls:	Clear-Com®/RTS® mode switch, RTS® Channel 1/2 switch,
	2-wire channel line null adjustment
Antenna Type:	External ½ -wave dipole (R-TNC connector)
	RX/TX horizontal/vertical diversity
System Distortion:	<2%
Communication Security:	64-bit encryption dual-slot diversity

TRANSMITTER —

Type:	Frequency hopping, spread spectrum
Transmit Power:	100mW burst
Modulation Type:	Gaussian filtered FSK, TDM
Frequency Stability:	13 ppm
Harmonics/Spurious:	Exceeds FCC and ETSI specifications over temperature

RECEIVER —

Type:	Frequency hopping, spread spectrum
RF Sensitivity:	<-90dBm w 10^{-3} BER
Frequency Stability:	13 ppm
Distortion:	<2%

Beltpac

*	Frequency Range:	2400 MHz – 2483.5 MHz
	Antenna:	Internal, horizontal/vertical diversity
	Frequency Response:	200 Hz to 3.5 kHz
	Transmit Power:	100mW burst
	RF Sensitivity:	<−90dBm w 10^{-3} BER
	Battery Requirements:	3.6V lithium ion, rechargeable
	Battery Life:	Hands-free – up to 14 hours
		PTT – up to 20 hours
	Temperature Range:	32-122°F (0-50°C)
	Weight:	7.4 oz (.21 kg) with battery and pouch
	Headset Connector:	4-pin, mini-DIN
	Microphone:	Electret
	Headset Output:	160mW into 32Ω
	Controls:	Power, Volume-up ▲, Volume-down ▼, IC, ISO
	Indicators:	Dual-color LED (red/green)

WH200 Headset

*	Frequency Range:	2400 MHz – 2483.5 MHz
	Antenna:	Internal
	Frequency Response:	200 Hz to 3.5 kHz
	Transmit Power:	100mW burst
	RF Sensitivity:	<−90dBm w 10^{-3} BER
	Battery Requirements:	3.6V lithium ion, rechargeable
	Battery Life:	Hands-free – up to 14 hours
		PTT – up to 20 hours
	Temperature Range:	32-122°F (0-50°C)
	Weight:	5.7 oz (.16 kg) with battery
	Microphone:	Electret
	Headset Output:	160mW into 32Ω
	Controls:	Power, Volume-up ▲, Volume-down ▼, IC1, IC2, ISO
	Indicators:	Transmit LED (red/green), Power LED (red/green)

Speaker Station

*	Frequency Range:	2400 – 2483.5 MHz
	Antenna:	Internal
	Frequency Response:	200 Hz to 3.5 kHz
	Power Requirements:	Six AA batteries (NiMH optional),
		12-14VDC or 100-240VAC, 50-60Hz
	Temperature Range:	32-122°F (0-50°C)
	Size:	9.38” x 5.16” x 3.34” (23.83 x 13.11 x 8.48 cm)
	Weight:	2.56 lb with battery (1.16 kg)
	Microphone:	Electret
	Speaker:	1.5W min into 8Ω
	Headset Output:	200mW into 32Ω
	Controls:	Power, Speaker, ISO, Volume-down ▼, Volume-up ▲, IC
	Indicators:	Power LED (red), Call LED (yellow), Speaker LED (red),
		ISO LED (red/green), IC LED (red/green)
	Connectors:	4-pin mini-DIN Headset, 12-14VDC, 8Ω speaker

* **NOTE:**   Communicators will follow the frequency range determined by the setting on the Base Station (e.g. All, Low or High).

BLOCK DIAGRAM

DX200 Base Station

DIVERSITY ANTENNAS

REG ID

2-WIRE INTERCOM CHANNEL

LINE NULL

4-WIRE INTERCOM CHANNEL

AUX IN

ISO OUT

12-14VDC

POWER

DC REG

DC POWER

SWITCH MEMORY

2.4 GHZ TRANSCEIVER

UNLATCH

CLEAR REGISTRATION
START REGISTRATION
XCVR RESET

IC TALK
ISO TALK

A1 AUD B1 AUD A2 AUD B2 AUD CH1 AUD CH2 AUD

RTS/CLEARCOM SELECT
RTS CH SELECT
2W SELECT
OFF
4W-ONLY
2W / 4W
IC/4W,ON/OFF

2W / 4W CONVERTER

4W EN

2W 4W
2W RCV LVL
2W SND LVL

4W RCV LVL
4W SND LVL
ISO+ EN
AUX EN

IC SND LVL

AUX VOL

IC TALK RCV LVL

IC SND LVL

MIC SELECT
IC
ISO

ISO TALK RCV LVL

ISO+ SND LVL

ISO+ EN

MIC SWITCH

MIC AMP/AGC
MIC GAIN

AUX EN

AUX EN

MIC SELECT

SIDETONE ADJ

HEADSET VOLUME

MINI-DIN HEADSET

EXTERNAL SPEAKER CONNECT

AUX EN
ISO+ EN
MIC SEL IC
MIC SEL ISO
TALK

35