

DX300 EU

Wireless Headset System



Operating Instructions

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TABLE OF CONTENTS

SECTION 1. INTRODUCTION	1
Basic 5-Coach System	1
Expanded 10-Coach System	1
SECTION 2. EQUIPMENT IDENTIFICATION	2
STANDARD EQUIPMENT	2
OPTIONAL EQUIPMENT	3
EQUIPMENT FEATURES	4
Base Station	4
Beltpac	6
All-In-One Headset (optional)	6
SECTION 3. EQUIPMENT SETUP	7
BATTERY CHARGER	7
AC40 Battery Charger Setup	7
AC50 Battery Charger Setup	8
BASE STATION	9
Optional Battery Operation of Base Station	10
Primary/Secondary Base Station Setting	11
Multiple Base Stations	11
Initialize Multiple Base Stations	11
Audio Connection	12
Single/Dual Channel Setting	12
Base Station Microphone Gain Adjustment	12
BELTPACS	13
Beltpac Registration	13
Beltpac Operating Mode Setup	14
Beltpac Adjustments	15
OPTIONAL REMOTE ANTENNA INSTALLATION	16
OPTIONAL AUXILIARY EQUIPMENT CONNECTION	17
SECTION 4. EQUIPMENT OPERATION	18
THE BASICS	18
Base Station Operation	18
Beltpac / All-In-One Headset Operation	19
Changing Batteries	20
SECTION 5. EU BASE STATION ADAPTIVE FREQUENCY HOPPING	21
CE Base Station Adaptive Frequency Hopping - Background	21
CLEAR-COM Adaptive Frequency Hopping	21
Operation in Severe Environments	21
Required AFH Equipment	22
Non-AFH Equipment	22
Interference Mitigation	22
SECTION 6. TROUBLESHOOTING	23
FREQUENTLY ASKED QUESTIONS	25
SECTION 7. TECHNICAL DATA	26
EQUIPMENT SPECIFICATIONS	26
Base Station	26
BLOCK DIAGRAM	28
SECTION 8. SECTION INDEX	29

FCC NOTICE

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communication. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Changes or modifications not expressly approved by HM Electronics, Inc. could void the users authority to operate this equipment.

MANDATORY SAFETY INSTRUCTIONS FOR INSTALLERS AND USERS

Use only manufacturer or dealer supplied antennas, power supplies, batteries and battery chargers.

All products are compliant with regulatory requirements when installed correctly per HME installation instructions..

The Federal Communications Commission has adopted a safety standard for human exposure to RF (Radio Frequency) energy, which is below the OSHA (Occupational Safety and Health Act) limits.

Base Station Antenna minimum safe distance: 7.9 inches (20 cm) at 100% duty cycle.

Base Station Antenna gain: This device has been designed to operate with an antenna having a maximum gain of up to 2dBi. The required antenna impedance is 50 Ohms.

Antenna mounting: The antenna(s) used for the base transmitter must be installed to provide a separation distance of at least 7.9 inches (20 cm) from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

Antenna substitution: Do not substitute any antenna for the one supplied by the manufacturer or radio dealer. You may be exposing person or persons to excess radio frequency radiation. You may contact your radio dealer or the manufacturer for further instructions.

WARNING: Maintain a separation distance from the base station transmit antenna to a person(s) of at least 7.9 inches (20 cm) at 100% duty cycle.

You, as the qualified end-user of this radio device must control the exposure conditions of bystanders to ensure the minimum separation distance (above) is maintained between the antenna and nearby persons for satisfying RF exposure compliance. The operation of this transmitter must satisfy the requirements of Occupational/Controlled Exposure Environment, for work-related use. Transmit only when person(s) are at least the minimum distance from the properly installed, externally mounted antenna.

Canada IC Notice to Users English/French in accordance with RSS GEN

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil est conforme avec Industrie Canada RSS standard exempts de licence (s). Son utilisation est soumise à Les deux conditions suivantes:

(1) cet appareil ne peut pas provoquer d'interférences et (2) cet appareil doit accepter Toute interférence, y compris les interférences qui peuvent causer un mauvais fonctionnement du dispositif.

Hereby, HM Electronics, Inc. declares that the DX300 is in compliance with the essential requirements and other relevant provisions of R&TTE Directive 1999/5/EC" with "Radio Equipment Directive (RED).



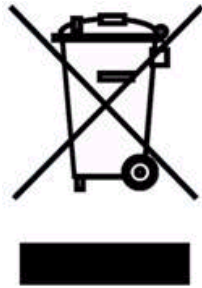
This product operates in the 2400 to 2483.5 MHz frequency range. The use of this frequency range is not yet harmonized between all countries. Some countries may restrict the use of a portion of this band or impose other restriction relating to power level or use. You should contact your Spectrum authority to determine possible restrictions. European Telecommunications Standards Institute (ETSI) EN 300 328 v.1.8.1 compliant, when operated in the E mode.

WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)

The European Union (EU) WEEE Directive (2012/19/EU) 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.



HM Electronics, Inc. is not responsible for equipment malfunctions due to erroneous translation of its publications from their original English version. Illustrations in this publication are approximate representations of the actual equipment, and may not be exactly as the equipment appears.

SECTION 1. INTRODUCTION

The DX300 provides secure communication among the coaching staff.

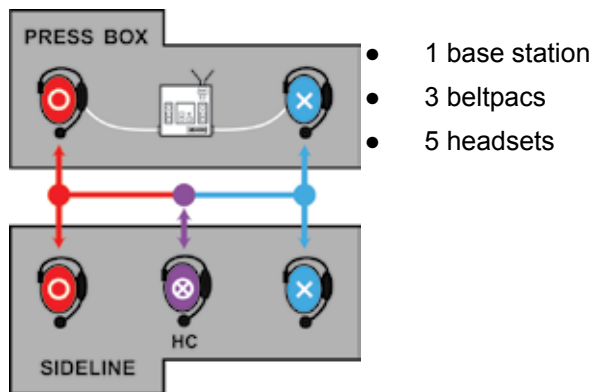
Spotters in the press box can communicate with offense “O” only, defense “X” only or “ALL” coaches via headsets connected directly to the base station.

Coaches on the sideline wear beltpacs with headsets to communicate with each other and the spotters.

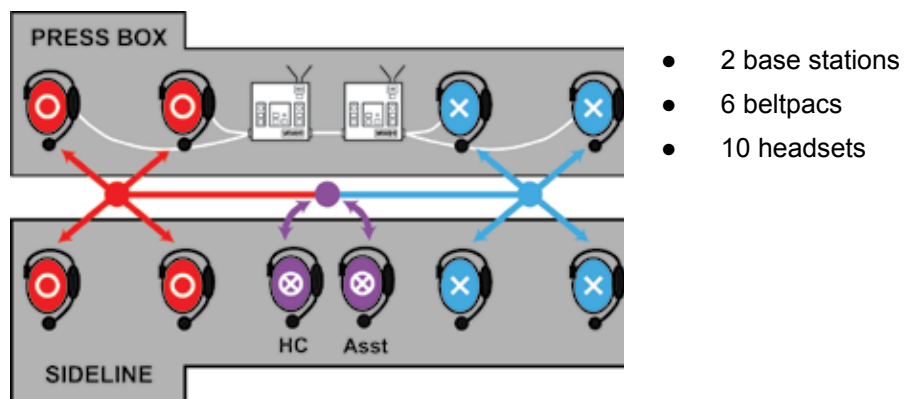
Beltpacs can be set up for communication with any combination of offense, defense and **ALL**.

This manual includes detailed setup and operating instructions for your DX300 system.

Basic 5-Coach System



Expanded 10-Coach System



SECTION 2. EQUIPMENT IDENTIFICATION

STANDARD EQUIPMENT



Base Station



Antennas



All-in-one
Headset and BAT50 battery



Battery Sled



Power Adapter and Cord



Travel Case



10-pin Spring
Clamp Connector



Beltpac with Headset,
Pouch and Battery



Base Station
Interconnect Cable

AC40 (for beltpac)
Battery charger



AC50 (for All-in-one headset)
Battery charger



OPTIONAL EQUIPMENT

Headset with dual ear muffs
Model #HS15D or CC-30-MD4



Headset, all-in-one, with battery
Model # WH301



Headset extension cable, 6 ft (1.83 meter)



Battery charger for base station batteries
Model # AC850



Rechargeable battery for base station Model # BAT850



Remote antenna kit with 30 foot (9.14 meter)
cable and bracket



Remote antenna kit with 6 foot (1.83 meter) cable and
bracket



Adapter cable for headset with dynamic microphone and
XLR connector

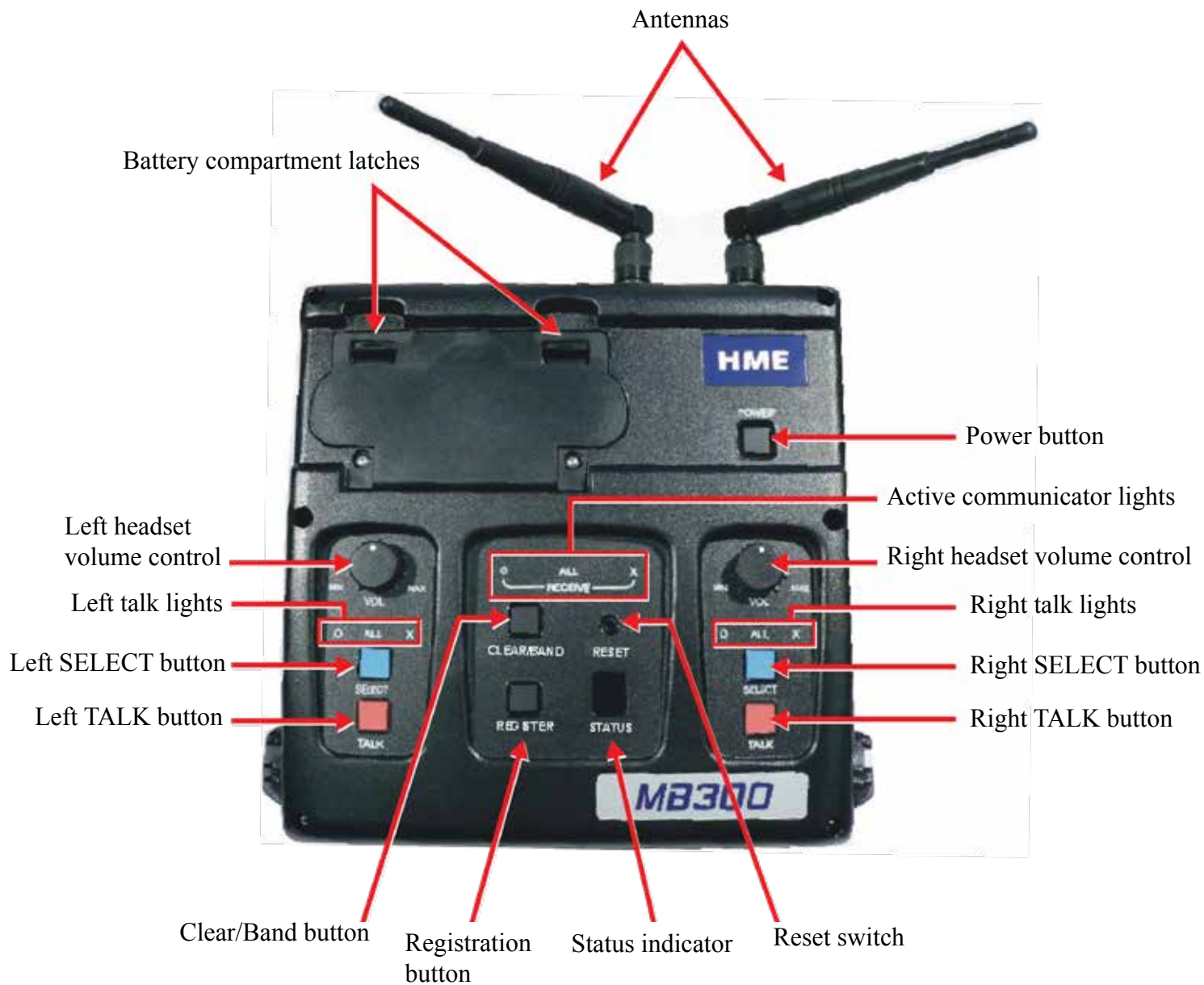
Model # MD-XLR4F, MD-XLR4M, MD-XLR5F



EQUIPMENT FEATURES

Base Station

Top Panel



Front Panel



Auxiliary audio in/out
volume adjustments
(recessed)

Left Side Panel

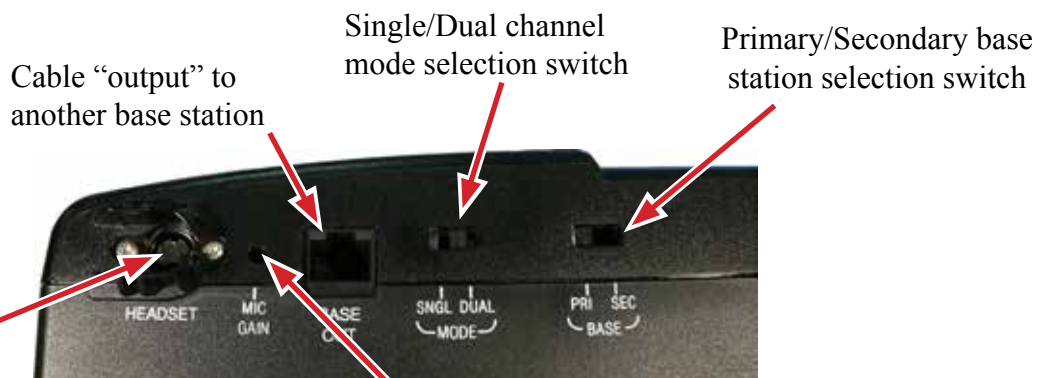


Cable "input" from
another base station

Left headset connector

Microphone gain adjustment
for left headset

Right Side Panel



Cable "output" to
another base station

Single/Dual channel
mode selection switch

Primary/Secondary base
station selection switch

Rear headset connector

Microphone gain adjustment
for right headset

Rear Panel



Power supply connector

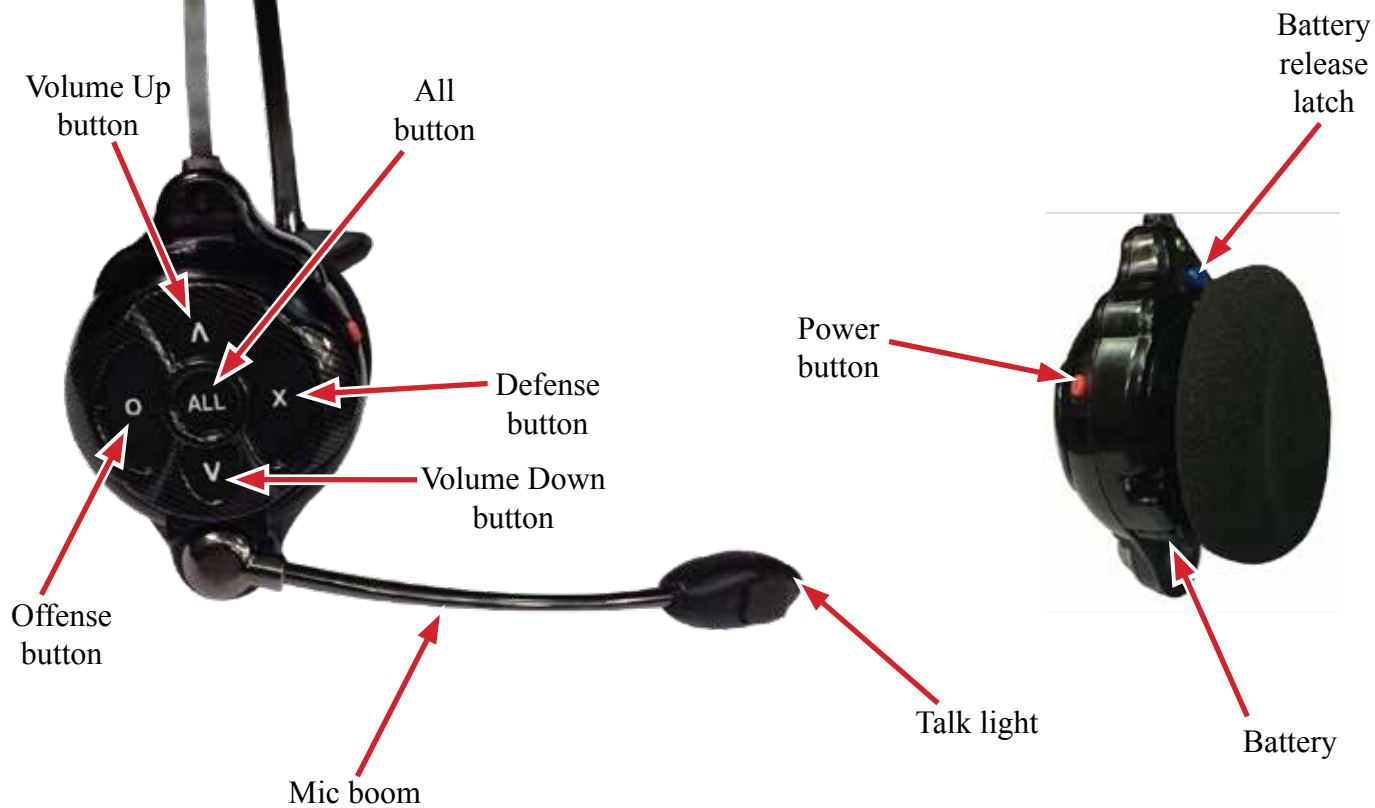
Auxiliary audio
input/output
connector

Antenna connectors

Beltpac



All-In-One Headset (optional)



SECTION 3. EQUIPMENT SETUP

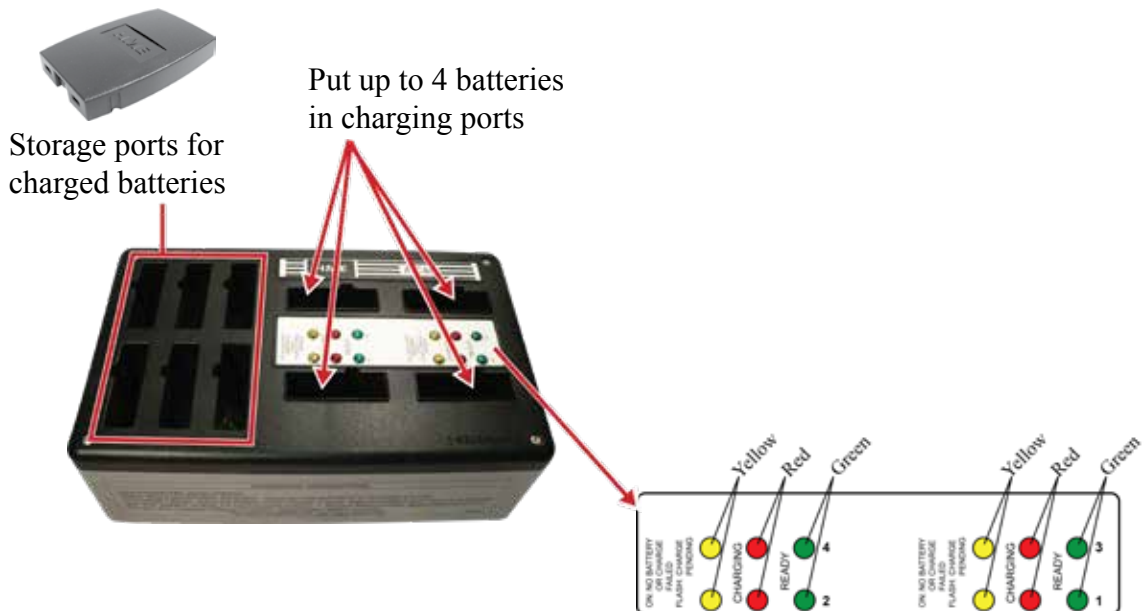
BATTERY CHARGER

AC40 Battery Charger Setup

NOTE: Set up the battery charger and charge all beltpac batteries while you are setting up the base station.



- 1** Connect power supply to charger and electrical outlet.
- 2** Charge all beltpac batteries. Charging time is approximately three hours.



Status lights next to each charging port

Red light

- Stays on steady while battery is charging

Green light

- Goes on when battery is fully charged

Yellow light

- Stays on steady when charging port is empty
- Flashes if battery is too hot to charge
- Next to battery in charging port means charge has failed – See instructions on side of charger

AC50 Battery Charger Setup

The AC50 is the charger for All-in-One headsets.

Before installing the system, connect the AC power supply to the battery charger and plug it into an electrical outlet. Charge all the batteries while the other equipment is being installed. Charging time is about 2.5 hours.

Connect AC Power Supply

To connect the AC power supply to the battery charger:

- Connect the AC power supply cable connector to the power connection on the battery charger.
- Connect the AC power cord to an electrical outlet.

The red lights on the charger will briefly display, and then the yellow lights will appear and remain on.

Charging the Batteries

Up to four batteries can be charged in the battery charger at one time. The battery status lights next to each charging port indicate the battery status. Up to four 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 a Charging port indicates that the port is **EMPTY**.
- A red light next indicates that the battery port is **CHARGING**.
- A green light indicates that the battery is **READY**.
- A steady yellow light indicates that the **CHARGE FAILED**. If a charge fails, refer to the instructions on the side of battery charger.
- A flashing yellow light next indicates **CHARGE PENDING**, which means the inserted battery is too hot. Adjust the room temperature or move the charger to a cooler area.
- Store fully charged batteries in storage ports.

IMPORTANT: Batteries should not be left in charge ports after being fully charged. A battery left in a charging port for more than three weeks may display the yellow indicator light, but it does not indicate a faulty battery.



AC50
Battery Charger



BAT50 Battery



AC50
Power Supply

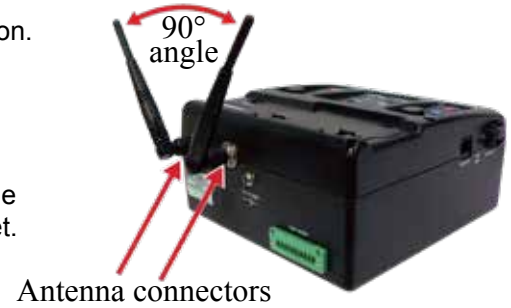


Batteries in
Charging ports

Batteries in
Storage ports

BASE STATION

- 1** Fasten both antennas onto the connectors on the back of the base station.
Tighten at 90° angle.



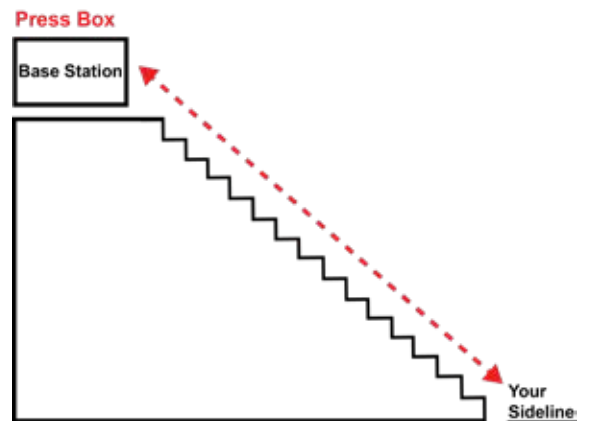
- 2** Plug the power adapter into the base station, and tighten the nut onto the connector. Next, plug power cord into power adapter and electrical outlet.



NOTE: A fully charged battery can be kept in the base station as a backup in case of AC power interruption.

- 3** Set up the base station in the press box with no objects blocking the line-of-sight from base station to your sideline.

If interference occurs due to objects in the line-of-sight or sun screen on press box windows, see remote antenna installation on [page 16](#).



- 4** Press **POWER** button to turn power on.

- 5** Plug headsets into the base station, inserting headset plugs all the way into connectors.



Optional Battery Operation of Base Station

A base station can operate on battery power when AC power is unavailable.

NOTE: Always plug base station into AC power when it is available. Turn the base station off during halftime to conserve battery power.

Typical base station battery life when used continuously is as follows:

Energizer ULTIMATE Lithium5 hours
BAT850 Rechargeable Battery2¼ hours
Duracell Quantum35 minutes

- 1** If you are using the battery sled, insert six “AA” batteries.
- 2** Pull back on the battery compartment latches, and lift the battery compartment cover on the base station.

Battery
compartment
latches

Battery
compartment
cover



Battery sled



BAT850 Battery



- 3** Insert the battery sled or rechargeable BAT850 battery (optional) into the battery compartment, and close the cover.
- 4** If you are using the BAT850 battery, insert it in the AC850 battery charger (optional) for recharging after each use.

Follow the instructions received with the charger. Charging time is approximately 3 hours.



AC850 Battery Charger

NOTE: When base station battery power is low, everyone connected or registered to that base station will hear a headset tone that repeats every 8 seconds. Additionally, both headset select lights will blink.

Primary/Secondary Base Station Setting

On the right side of the base stations, leave the BASE switch in the PRI position for the primary base station. Move the BASE switch to the SEC position on each secondary base station, and then press the base station POWER switch twice to turn the power off and back on again.



Right side of base station

Multiple Base Stations

Up to 20 coaches can communicate using the DX300 (five per base station) by interconnecting up to four base stations as described below. With multiple base stations, one will be considered the main or primary base station, and all others will be considered secondary base stations.

Initialize Multiple Base Stations

Multiple base stations must be "initialized" according to the following instructions, so their frequencies will not cause self-interference. After initializing each base station, register each beltpac and/or all-in-one headset that will be used with that base station.



Status window with double bar

- 1** With the primary base station powered on first, turn on the secondary base station. The STATUS window will display a double bar.
- 2** Press the REGISTER button on the primary base station. The STATUS window will show a small "o".
- 3** Press the REGISTER button on the secondary base station to assign it a number (1, 2 or 3). Wait until the base is initialized (approximately 10 seconds).



CAUTION: If more than two base stations will be used, each secondary base station must be assigned a different number (1, 2 or 3), or interference will occur

RECOMMENDED: If only two base stations will be used, set the secondary base station to #2

HINT! Mark each base station with its assigned number, and then, when registering beltpacs and/or all-in-one headsets, mark

- 4** When initialization is complete, the STATUS window will show one bar.
- 5** Press the REGISTER button on the primary base station to clear the STATUS window. The display will also go blank after timing out.
- 6** Repeat steps 1 – 5 to initialize up to three secondary base stations.



NOTE: If the primary base is powered off for more than 30 seconds, all secondary bases will begin to operate independently. When that happens, the STATUS window on each base will show 3 bars.

If the primary base is turned back on, it will be necessary to press the RESET switch on each secondary base, to allow it to initialize to the primary base again.

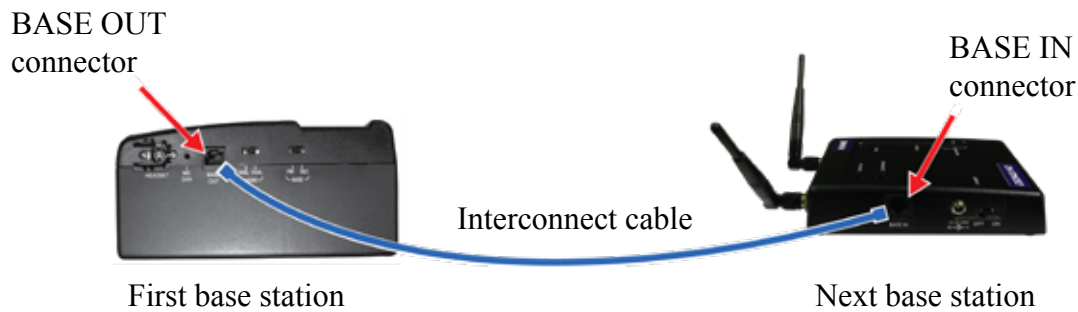


Reset Switch

Status window with triple bar

Audio Connection

Connect base stations with the provided interconnect cable, from the BASE OUT connector on one to the BASE IN connector on the other.



Single/Dual Channel Setting

In the single-channel (SNGL) mode — four belt-pacs can be used in the hands-free mode, communicating in “O” channel only.

In the dual-channel (DUAL) mode — three belt-pacs can be used in the hands-free mode, communicating in either “O” or “X” channel, or “ALL” (both channels).

On the right side of the base station(s), set the MODE switch to the single or dual-channel position.



Right side of base station

Base Station Microphone Gain Adjustment

The microphone gain adjustment allows you to adjust the level of your voice as it is transmitted from the headsets plugged into the base station.

Microphone gain must be adjusted for each base station headset.

- 1** Using a headset plugged into the right side of a base station, locate the recessed MIC GAIN adjustment hole on the right side of the base station.
- 2** Insert a small screwdriver in the hole, and turn the adjustment clockwise (to increase) or counterclockwise (to decrease) microphone gain.
- 3** Speak into the right headset microphone and listen to your voice level (sidetone) as you adjust the microphone gain.
- 4** Using a headset plugged into the left side of the base station, locate the MIC GAIN adjustment on the left side of the base station, and then repeat Steps 2 and 3.
- 5** Repeat Steps 1 through 4 for each base station.

Insert small screwdriver



Base station microphone gain adjustment

NOTE: Base station microphone gain is factory set at about one-third from minimum level.

BELTPACS

Belpac Registration

- 1** Turn the base station power on, and the belpac power off.
- 2** Plug the headset into the belpac, and put the headset on your head.
- 3** Press the **REGISTER** button on the base station registration panel. A lower case "o" will appear on the STATUS window.
- 4** Press and hold the **ALL** button on the belpac as you press and release its **PWR** (power) button. After a brief delay, you should hear "Registration complete". An ID number for the belpac will appear briefly on the STATUS window.
- 5** Repeat Steps 1 through 4 for each belpac.



NOTE: If registration is not successful, you will hear "Registration failed" and the STATUS window will be blank. If this happens, refer to **TROUBLESHOOTING** in Section 6, [page 23](#).

NOTE:

If you're attempting to register more than 15 belpacs to a base station:

- An "F" (Full) will appear in the STATUS window, and you will hear "Registration failed" in the headset.
- Clear all current registrations by pressing and holding the **CLEAR/BAND** button while you press and release the **RESET** button with the point of a pen. Continue holding the **CLEAR BAND** button after you release the **RESET** button until the clear code "c" (lower case) appears on the STATUS window.
- Register all belpacs, one at a time, including previously registered belpacs.

Belpac Operating Mode Setup

Set up belpacs to operate in the desired mode by pressing and holding the button combinations shown below. Button combinations work in unison with the **PWR** (power) button.

Mode	Button Combination	Button Functions
Head Coach (default)	Hold X + O + ALL and press PWR	X, O & ALL have normal functions
NOTE: Belpacs and all-in-one headsets are shipped in the Head Coach mode		
Offense only	Hold O and press PWR	X & O work as O ALL has no function
Offense + ALL	Hold O + ALL and press PWR	X & O work as O ALL has normal function
Defense only	Hold X and press PWR	X & O work as X ALL has no function
Defense + ALL	Hold X + ALL and press PWR	X & O work as X ALL has normal function
Offense + Defense only	Hold X + O and press PWR	X & O have normal functions ALL has no function
Latching (Hands-Free, Full-Duplex)	Hold ALL + ▲ and press PWR	X & O will latch on when pressed and released, for a normal two-way conversation
Push-To-Talk (PTT)	Hold ALL + ▼ and press PWR	X, O & ALL must be pressed and held while you talk, and released to listen

NOTE: Mode settings will be stored to memory, so your belpacs will have the same mode settings each time you power them off and on.

NOTE: **ALL** does not latch on, and must be held down to hear both **O** and **X**.

Beltpac Adjustments

Sidetone Adjustment

When you speak into the microphone, you can hear sidetone (your own voice) in the beltpac headset.

Sidetone can be adjusted as follows:

- 1** Be sure the beltpac power is on.
- 2** While holding down the “O” button, press the volume-up (▲) or volume-down (▼) button as many times as needed to reach an acceptable level. If you reach the high limit, you will hear “maximum” in the headset. If you reach the low limit, you will hear double beeps.

Maximum sidetone level is recommended.

Microphone Gain Adjustment

Some users speak louder or softer than average.

The microphone gain adjustment helps to compensate for extremes in speaking level of coaches using beltpacs.

NOTE: The microphone gain can be monitored through sidetone, at the base station or preferably by someone else using a beltpac.

- 1** Be sure the beltpac power is turned on.
- 2** While holding down the “X” button, press the volume-up ▲ or volume-down ▼ button as many times as needed to reach an acceptable level. If you reach the high limit, you will hear “maximum” in the headset. If you reach the low limit, you will hear double beeps.

Recommended microphone gain levels are:

- Beltpacs – 12 presses down from maximum
- All-in-one headsets – 8 presses down from maximum.

NOTE: Microphone gain and sidetone adjustments will be saved in memory. A reset is not required when the unit is powered off and on.

OPTIONAL REMOTE ANTENNA INSTALLATION

It may be necessary to place the antennas away from the base station if it is not possible to avoid obstructions between it and the sideline, or if the press box has windows that are coated with a metalized sun reflecting film. Either of these situations may block signals from the press box base station to the beltpacs on the field.

Remote antenna kits with either 6 foot (1.83 meter) or 30 foot (9.14 meter) cables can be used to mount the antennas wherever necessary to alleviate this problem.

To order a remote antenna kit, refer to the optional equipment shown on [page 3](#). Installation instructions are enclosed with the remote antenna kit.

OPTIONAL AUXILIARY EQUIPMENT CONNECTION

Auxiliary equipment such as audio/video recorder or a hardwired intercom can be connected to the rear panel of the base station.

- 1** Connect the wires from your auxiliary audio equipment to the enclosed 10-pin connector in accordance the table below.

Pin Connections	
1	Aux In – O
2	Aux In – O
3	Aux Out – O
4	Aux Out – O
5	Ground
6	No Connection
7	Aux In – X
8	Aux In – X
9	Aux Out – X
10	Aux Out – X



- 2** Plug the connector into the back panel of the base station as shown above.
- 3** By inserting a small screwdriver in the holes on the front panel of the base station, you can adjust the IN and OUT sound level of “O” and “X” communication channels as needed.



SECTION 4. EQUIPMENT OPERATION

THE BASICS

IN THE PRESS BOX

Base Station Operation



- 1** Press base station **POWER** button to turn on power.
- 2** Place the left or right headset on your head, then use the left or right base station headset controls to adjust.
- 3** Adjust the headset volume as needed.

CAUTION: Having your headset at a high volume level for a long time can cause hearing damage.

- 4** Press the channel **SELECT** button; a Green light appears above **O**, **ALL** or **X** selection — Press the **SELECT** button again to change selection.
- 5** To talk to coaches, press and release **TALK** button – the Green light turns red. Talk and listen to coaches as you would in normal telephone conversation. Press and release **TALK** button again when you finish talking. (You will still hear the other coaches, but they will not hear you.)
- 6** To turn base station off, press and hold **POWER** button until the lights turn off.

ON THE FIELD

Belpac / All-In-One Headset Operation

- 1 Be certain a fully charged battery is in the unit.
- 2 Plug the headset into belpac, and place the headset on your head. Slide belpac into its pouch, and clip it on your belt.

- 3 Press and release the **PWR** (power) button to turn the unit on.



Belpac power button

- 4 Press and release the **O** button to communicate with offense coaches, or press the **X** button to communicate with defense coaches.



Speak to Offensive coaches



Speak to Defensive coaches

- 5 To communicate with both offense and defense coaches, press and hold the **ALL** button while talking.



Speak to all coaches

- 6 Adjust the belpac or headset volume as needed.



Increase volume



Decrease volume

CAUTION: Having your headset at a high volume level for a long time can cause hearing damage.

- 7 To turn the unit off, press and hold the power button for about two seconds until you hear "Power off".

Changing Batteries

Batteries typically provide 20 hours of continuous use in listen mode.

If you hear “Change battery” in your headset:

- 1** Remove the beltpac it from its pouch.
- 2** Slide the battery release latch in direction of the arrow, or press the release button on the headset.
- 3** Lift or slide the battery out.
- 4** Place the battery in the battery charger port for recharging.
- 5** Install a fully charged battery.
- 6** Place the beltpac back into its pouch.



SECTION 5. EU BASE STATION ADAPTIVE FREQUENCY HOPPING

Hereby, HM Electronics, Inc., declares that DX300 is in compliance with the essential requirements and other relevant provisions of R&TTE Directive 1999/5/EC" with "Radio Equipment Directive (RED). In AFH mode, DX300 complies with European Telecommunications Standards Institute (ETSI) harmonized European standard EN 300 328. Customers, Distributors or Installers operating in a CE regulated country that switch off or disable AFH will render the product non-compliant with the directive and will be considered the manufacturer of the product.

CE Base Station Adaptive Frequency Hopping

Background

The DX300 wireless system utilizes a Frequency Hopping Spread Spectrum (FHSS) radio in order to provide robust communications. This system operates in the unlicensed 2.4 GHz band. With the proliferation of other devices over the past few years in the same 2.4 GHz band, instances where these devices and systems can interfere with each other has greatly increased. The European Union has updated the radio standards for equipment operating in this band in an attempt to reduce interference between equipment from different manufacturers. This European Telecommunications Standards Institute (ETSI) harmonized European standard is known as EN 300 328.

CLEAR-COM Adaptive Frequency Hopping

In order to reduce interference with other equipment and comply with ETSI Regulations, Clear-Com has implemented an **Adaptive Frequency Hopping** (AFH) mode for the new DX EU base stations. The key idea behind AFH is using only the good frequencies, or channels, unoccupied by other equipment. The system scans for other signals and avoids these signals during operation. Since the radio environment is constantly changing, there is a continuous process of scanning for used frequencies and updating the list of good channels.

The Clear-Com system utilizes 46 discrete frequencies, or channels, within the 2.4 GHz spectrum in order to communicate voice and data. The process of deciding which channels should be used is a 3-stage process. The process includes scanning for occupied channels, the broadcast of a channel exclusion list and the use of the exclusion list. The process is completed in three steps coexisting in time.

Operation in Severe Environments

During normal operation, the fact that the system is constantly changing the channel list in use is transparent to the user. It is possible, however, that in an environment with severe interference that the system may experience a slight degradation. The Clear-Com system will use a minimum of 15 channels. If the environment is very crowded and less than 15 channels are truly available, there could be increased radio 'packet loss' due to the high interference. The following symptoms may be observed with AFH systems in a highly congested radio environment:

- This may result in system 'busy' indications. Channel lists are updated every few seconds, and in a severe environment it is possible that these lists get missed by the communicator.
- Slight degradation in audio fidelity between the headsets and base station. This would be due to the same symptom as the 'busy' indications. The HD audio processing is tolerant to this condition, which is why the degradation may only be slight.
- Longer times to register. Registration may take longer, since the headset has to acquire the channel list from the base station. If the base station has excluded a lot of channels, this takes longer as the communicator does not have the exclusion list and looks for the base on channels it is not using.
- Initial sync time increase. For the same reason registration may take longer, the initial headset sync on power up may take longer.

EU Bases are shipped in the AFH (E-mode)

Do not tamper with the AFH mode if you are operating in a region that requires compliance with ETSI EN300 328. Changes and modifications not expressly approved by HM Electronics, Inc. could void the user's authority to operate this equipment.

Required AFH Equipment

AFH capable headsets and belt packs will have the letters 'AFH' labeled on the belt pack and headsets.

Non-AFH Equipment

Headsets and belt packs that are not AFH capable must be operated with either a non-AFH base station. Headsets and belt packs that are not AFH capable will not have the letters 'AFH'.

Model #	EU Version Part #	Non-EU Version Part #	Comments
BP200	G29663-2B10	G26705-XXX	All BP200 Beltpacks with G26705-XXX part #'s are non AFH compatible.
BP210	G29663-4B30	G28703-XXX	All BP210 Beltpacks with G28703-XXX part #'s are non AFH compatible.
WH210		G28741-XXX	All WH210's are non AFH and will not work with Base in AFH mode.
WH200		G27593-XXX	All WH200's are non AFH and will not work with Base in AFH mode.
WH220	G29090-8D13		ALL WH220's are AFH compatible.
Part number is located on label under the battery on beltpacks and wireless headsets			

Interference Mitigation

Certain techniques can be used in an attempt to mitigate interference between different equipment in the 2.4 GHz spectrum. Some of these are:

- **Physical separation.** If possible, equipment operating in the 2.4 GHz spectrum should be operating as far as physically possible from the HME base station. A Wi-Fi access point or router is a common piece of equipment that could interfere with the DX300 system, or vice versa. These two pieces of equipment in particular should not be located close together.
- **Spectral separation.** Most Wi-Fi access points allow the administrator to set the channel and bandwidth that system operates on. Some systems employ an 'auto' mode, in which the Wi-Fi access point will automatically selected the channel. With Wi-Fi access points, it is sometimes advantageous to manually select a channel number to keep the Wi-Fi transmission at a fixed location.
- **Spectral efficiency.** Wi-Fi systems employ a standard sometimes referred to as 802.11. The number "11" is simply the number given to the standard by the Institute of Electrical and Electronics Engineers (the IEEE). Modern Wi-Fi routers will allow operation employing the 802.11n mode. This mode will allow higher data rates, but it also may consume twice the number of radio channels. If the Wi-Fi router is set to 802.11n mode, it is best to limit Wi-Fi bandwidth to 20 MHz.
- **Alternate band selection.** While most Wi-Fi systems operate at 2.4 GHz, which is the same band as the DX300 system. Most allow operation at 5 GHz. If possible, move any Wi-Fi access points and equipment to 5 GHz. This of course requires all Wi-Fi equipment to be 5 GHz capable, and most older equipment may only allow 2.4 GHz operation. Selection of 5 GHz may also not be desirable if the Wi-Fi network is for customer access.

SECTION 6. TROUBLESHOOTING

If you are unable to correct any of the problems described below or if your problem is not covered, call 1-800-909-6604 for assistance.

1 Power light on base station does not come on when power button is pressed.

- Be sure the power supply is properly connected to the base station, and the power cord is properly connected to the power supply and electrical outlet.
- If operating on battery power, be sure the battery is charged and in the battery compartment with the cover is securely closed.

2 Beltpac power lights do not turn green and you hear “out of range”.

- Be sure the base station power is on.
- Turn beltpac power on and off.
- Beltpac may be too far from the base station.

3 When trying to register a beltpac, you hear “registration failed”.

- Press the **RESET** button on the base station with the point of a pen.
- The STATUS window will show “8” and then become blank.
- Try again to register the beltpac.
- If registration fails again, call your dealer for assistance.

4 Other coaches cannot hear me when I talk.

- Be sure you are pressing the **X** or **O** button on the beltpac or the **TALK** button on the base station.
- Be sure you are pressing the button for the correct channel.
- Be sure the headset plug is properly connected to the beltpac or base station.

5 With more than one base station, offensive spotter can not hear O or ALL transmission from another base, or defensive spotter can not hear X or ALL transmission from another base.

- Be sure interface cable is properly connected from BASE OUT on one base station to BASE IN on the next base station, and so on.
- If problem is not resolved, try using a different interface cable.

6 No or low auxiliary audio sound.

- Check wiring from auxiliary equipment to AUX AUDIO connector on back of the base station.
- Turn AUX AUDIO adjustments on front of base station with a small standard (flat) screw driver, clockwise to increase level and counterclockwise to decrease level.

7 Coaches using beltpacs cannot hear or talk to coaches using base station headsets.

- Be sure base station headsets are fully plugged into the base station headset connectors.
- Be sure the appropriate SELECT lights are red (**O**, **X** or **ALL**) when coaches at base station are talking.
- Be sure coaches are talking or listening on the right channel (**O**, **X** or **ALL**).

8 Beltpac range is bad.

- Be sure antennas are properly connected and tightened on base station.
- Be sure base station is positioned where there are no physical obstructions blocking line-of-sight from the base station to your sideline.

9 Beeping is heard in base station headset and **SELECT** lights are blinking.

- Base station is operating on battery power, and the battery is low.

10 Not all beltpac buttons are working.

- Button functions may have been changed to work in the desired operating mode (see [page 14](#)).

11 There is interference from a cordless telephone.

- If there is a 2400MHz cordless telephone nearby, interference may occur.
- If it does occur, changing frequencies on the telephone should eliminate the problem.
- If it does not, move the phone as far as possible from the base station, or use another type phone.

(If your base station does not have a battery backup)

In the event of an electrical power outage, such as from lightning or a power generator failure, if you experience problems with your DX300 equipment after the power comes on again, unplug the AC power supply from its electrical outlet and wait 15 seconds, then plug it back in.

FREQUENTLY ASKED QUESTIONS

- 1** Are the battery charger and base station power supplies interchangeable?
 - Yes.
- 2** What is the maximum recommended number of base stations that can be linked together with interconnect cables?
 - Four.
- 3** Does linking the base stations automatically prevent them from interfering with each other?
 - No, all base that are linked together must be initialized to prevent them from interfering with each other's frequencies.
- 4** If the primary base station is turned off just momentarily (before the secondary base(s) have a chance to start working independently), will the secondary base(s) automatically re-initialize to the primary?
 - Yes, the secondary base(s) will re-establish communication without being initialized again.
- 5** Will a secondary base station continue to operate if its primary is turned off for a period of time?
 - Yes & No. Secondary base stations will initially stop operating when the primary base is turned off, but will resume operation independently after about 40 seconds.
 - Three bars will appear in its STATUS display, and its belt pacs will still be able to communicate.
 - If the primary base station is turned back on, the secondary base must be turned off and on again to re-establish proper initialization.
- 6** Can I use more than three belt pacs on a single base station in dual channel mode?
 - Yes, but only three users will be able to transmit at the same time. Up to 15 belt pacs can be registered to a single base station. Belt pacs should be placed in press-to-talk mode when more than three belt pacs are used.
- 7** What should I do if my carrying case and equipment get wet?
 - Dry them out thoroughly before further use. Be sure all equipment is dry before using it again.

<p>CAUTION: Plugging wet electrical equipment into an AC power outlet is dangerous!</p>

SECTION 7. TECHNICAL DATA

EQUIPMENT SPECIFICATIONS

Base Station

GENERAL

Frequency Range:	..... All, 2400 – 2483.5 MHz Low, 2401.92 to 2439.94 MHz High, 2443.39 to 2481.41 MHz
Frequency Response:	..... 200 Hz to 7 kHz
Power Requirements:	..... 100-240VAC, 50-60Hz 12-14VDC or six AA batteries (NiMH optional)
Temperature Range:	..... 32-122°F (0-50°C)
Size:	..... 8" x 8" x 3.5" (20.32 x 20.32 x 8.89 cm)
Weight:	..... 2.75 lb with battery (1.25 kg)
of Beltpacs per Base:	..... 15 can be registered; any 4 can have simultaneous full-duplex communication at one time (in single channel mode)
8-Wire I/O:	..... RJ45, 600Ω balanced out, high impedance in
Auxiliary Audio:	..... 10-Ckt Phoenix connector, 600Ω balanced out, high impedance in, level adjustable
Headset Connectors:	..... 4-pin mini-DIN
Electret microphone:	..... 45 KΩ
Headset Output:	..... 200mW into 32Ω
Top Panel Controls & Indicators:	.. Power button Left and Right headset controls Rotary knobs for headset volume (VOL) adjustment Headset SELECT buttons (O=Offense, X=Defense or ALL) Headset TALK buttons Registration controls CLEAR/BAND button REGISTER button RESET switch (recessed) STATUS indicator Headset transmit dual-color LEDs, left and right (red/green) – O, X, ALL RECEIVE LEDs (green) – O, X, ALL
Front Panel:	..... Auxiliary input and output level adjustments
Left Panel:	..... 8-wire audio port Microphone gain adjustment Left headset connector
Right Panel:	..... Right headset connector Microphone gain adjustment 8-wire audio port Single/Dual selection switch Primary/Secondary selection switch (Disabled in this version)
Rear Panel:	..... Auxiliary input and output connectors Antenna connectors
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, TDMA
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

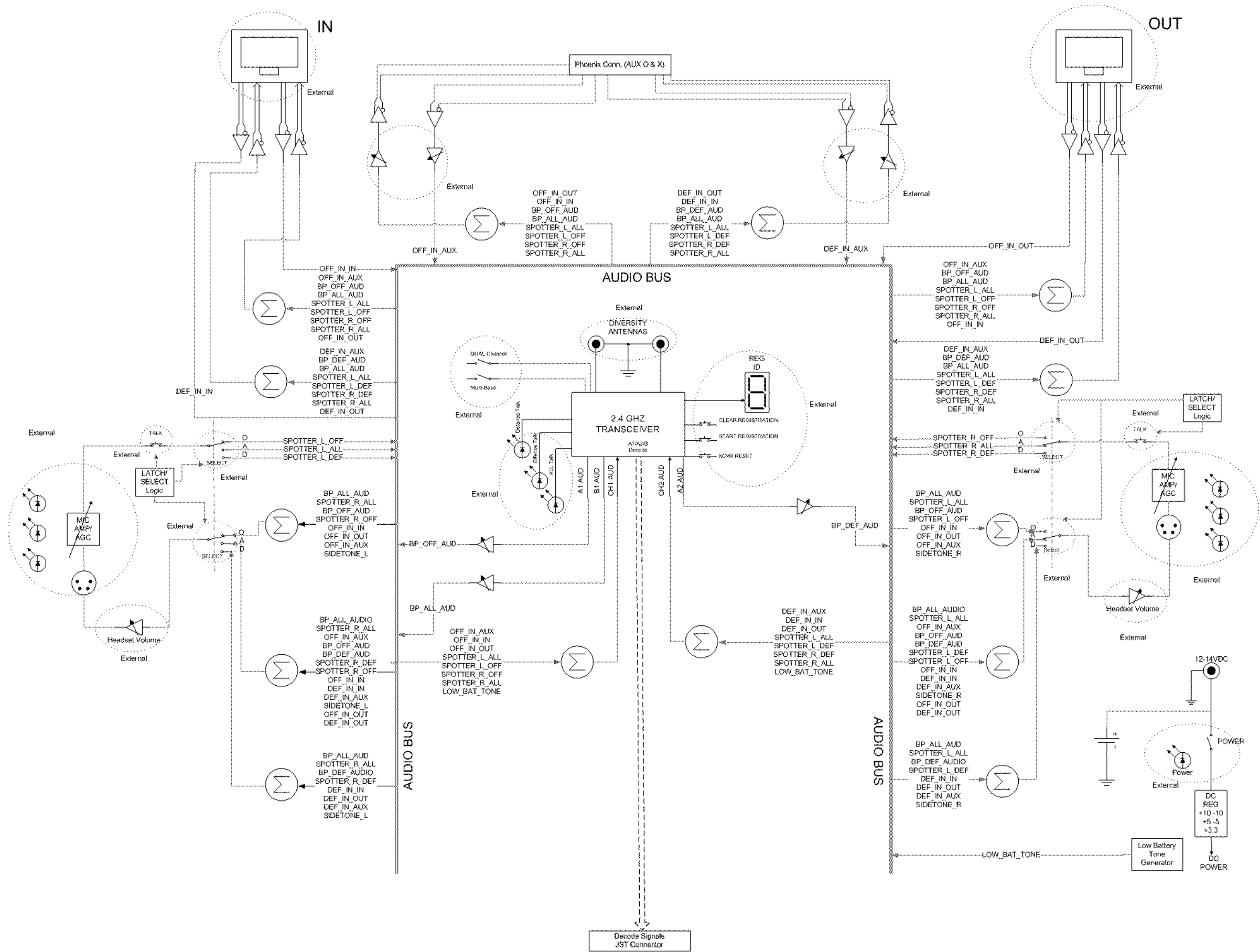
Frequency Range:* 2400 MHz – 2483.5 MHz
Antenna: Internal, horizontal/vertical diversity
Frequency Response: 200 Hz to 3.5 kHz
Transmit Power: 100mW burst
RF Sensitivity: <-90dBm w 10-3 BER
Battery Requirements: 3.6V lithium ion, rechargeable
Battery Life: Hands-free – up to 14 hours
..... PTT – up to 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 PWR, Volume-up ▲, Volume-down ▼, O, X, ALL
Indicators: Dual-color LED (red/green)

ALL-IN-ONE 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 ▼, O, X, ALL
Indicators: Transmit LED (red in defense / green in offense)
..... Power LED (red/green)

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

BLOCK DIAGRAM



SECTION 8. SECTION INDEX

Base Station

Audio connection (multiple base stations)	12
Features	4
Microphone gain adjustment	12
Operation	18
Setup (single base station)	9
Setup for battery operation	10
Single/dual channel setting	12
Specifications	26

Beltpac

Changing batteries	20
Features	6
Microphone gain adjustment	15
Operating mode setup	14
Operation	19
Registration	13
Side tone adjustment	15
Specifications	27
Block Diagram	28

Equipment

Basic 5-coach layout	1
Extended 10-coach layout	1
Optional	3
Standard	2

Headset, all-in-one

Changing batteries	20
Features	6
Operating mode setup	14
Operation	19
Registration	13
Specifications	27

Optional equipment installation

Auxiliary equipment connection	17
Remote antennas	16
Troubleshooting	23
Frequently Asked Questions	25