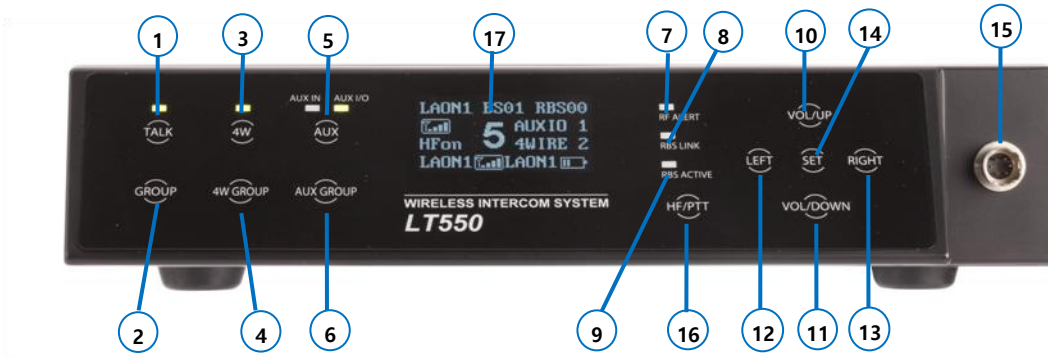


## LaON LT550 EXPERT SYSTEM with RBS25 QUICK REFERENCE

(Ver.1.1\_30 JULY 2017\_'LT550 EXPERT')

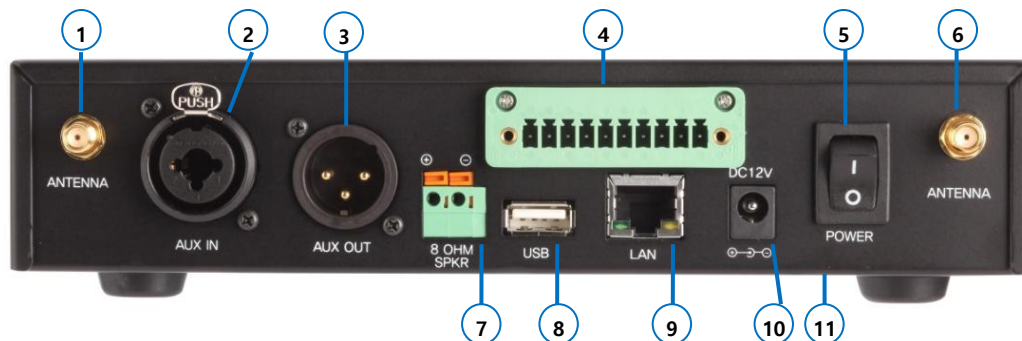
### 1) SYSTEM AT A GLANCE and HOW TO SUPPLY THE POWER

#### 1-1) BS (Base Station)



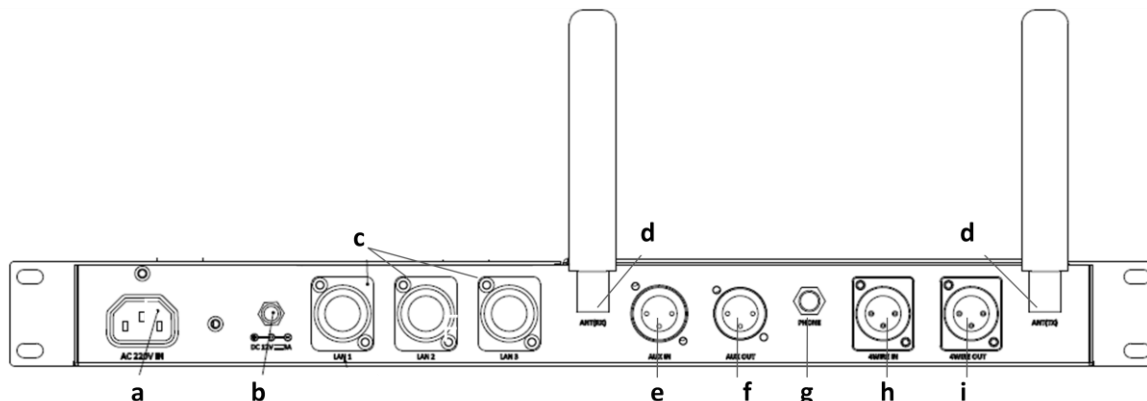
[Figure 1-1] Front panel of the Base Station, LTWI-BS550

- |   |  |
|---|--|
| 1. BS Headset TALK button with indicator light    | 10. Headset speaker volume control (UP)/ Menu selection  |
| 2. BS communication group selection               | 11. Headset speaker volume control(DOWN)/ Menu Selection |
| 3. 4-Wire on/off button with indicator light      | 12. Menu selection (LEFT)                                |
| 4. 4-Wire communication group selection           | 13. Menu selection (RIGHT)                               |
| 5. AUX IN, AUX IN/OUT on/off with indicator light | 14. Menu SET button                                      |
| 6. AUX IN, AUX IN/OUT comm. group selection       | 15. Headset cable connector                              |
| 7. RF ALERT indicator light                       | 16. Hands free/PTT mode selection                        |
| 8. Remote Base Station LINK Indicator light       | 17. OLED menu display                                    |
| 9. Remote Base Station ACTIVE indicator light     |  |



[Figure 1-2] Rear panel of the Base Station, LTWI-BS550

- |   |   |
|---|---|
| 1. Antenna connector                          | 7. 8-Ohm speaker 2-pin spring clamp connector |
| 2. AUX IN connector                           | 8. USB connector                              |
| 3. AUX OUT connector                          | 9. LAN RJ-45 connector                        |
| 4. 4-Wire and Multiple Base Station connector | 10. Power connector                           |
| 5. Power switch                               | 11. Wall-mount bracket holder (on the bottom) |
| 6. Antenna connector                          |   |



[Figure 1-3] Rear panel of the 19" cascade kit, 'BSCCK100'

- [a](#) AC100-240V power in for [PoE HUB](#) which is built in the kit
- [b](#) 100-240VAC power adapter for [BS](#)
- [c](#) PoE Port 1, 2, 3
- [d](#) Antenna connectors (RX, TX)
- [e](#) Auxiliary In
- [f](#) Auxiliary Out
- [g](#) Phone jack for 8Ω Speaker output (1W into 8Ω)
- [h](#) 4-Wire In
- [i](#) 4-Wire out

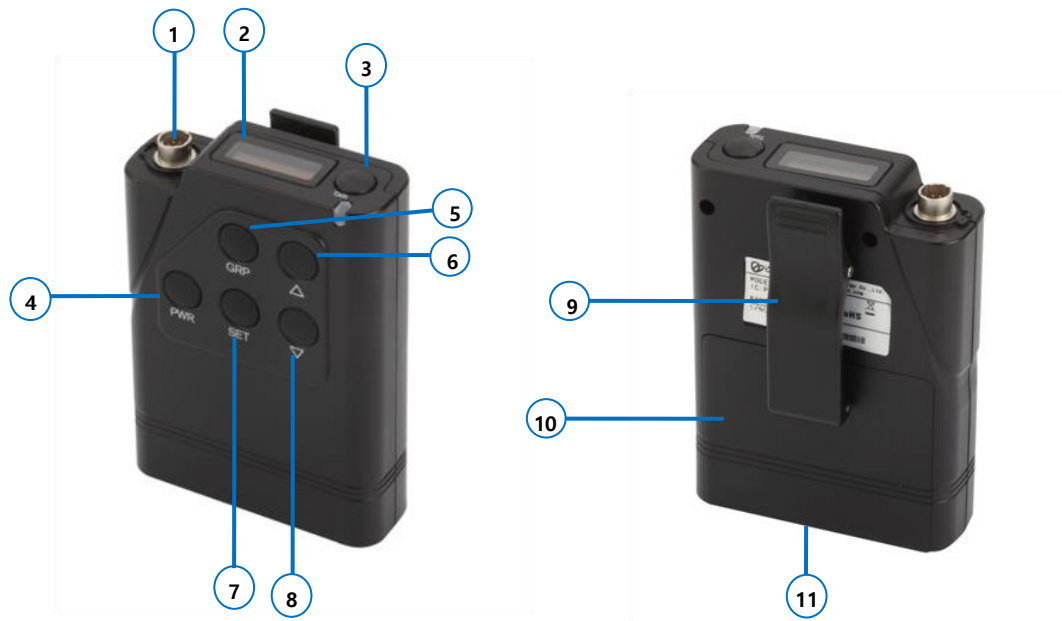
※NOTE

['Power toggle switch'](#) is on the [rear panel of the Base station BS750](#) or [on the front panel of the 19" cascade kit](#).

- [If you install the Base Station 'without' the cascade kit;](#)  
Connect the power cord to the power connector on the rear panel of the Base Station BS750 and turn on the power toggle switch on the rear panel of the BS.
- [If you install the Base Station 'with' the cascade kit;](#)  
Connect the power cord to the power connector on the rear panel of the cascade kit and turn on the power toggle switch on the front panel of the cascade kit.

Then the BS screen on the front panel of the BS will be displayed. Wait for one(1) minute until the RF channel is scanned automatically for the Base Station.

## 1-2) BP (Belt pack)



[Figure 1-4] Belt Pack front and rear controls

- |   |  |
|---|--|
| 1. Headset cable connector                                | 7. Menu SET button   |
| 2. OLED display   | 8. Headset speaker volume control (DOWN)/<br>Menu selection button |
| 3. BP TALK button with indicator light                    | 9. Belt clipper  |
| 4. Power (PWR) button                                     | 10. Battery cover  |
| 5. Communication group selection (GRP)                    | 11. Charger terminals (bottom)                                     |
| 6. Speaker volume control (UP) /<br>Menu selection button |  |

### NOTE

- Keys to use for BP pairing: **PWR + SET**
- Keys to use for manual hands off between BS and RBS or RBSs: **PWR+PWR(double click of PWR)**

There are three ways to supply power to BP as following;

- LaON provided rechargeable NiMH battery, LTWI-BAT50
- AA type alkaline battery (x 2ea)
- Non-LaON provided rechargeable battery

Press the power button('PWR') on the front of the BP longer than 2 seconds after the battery is equipped. Do the same to turn off the BP.

### ※CAUTION

- While you do not use the system long, store the battery after charged and separate from the Belt Pack.
- Turn off the Belt Pack when charging.

### 1-3)RBS (Remote Base Station)



[Figure 1-5] Remote Base Station

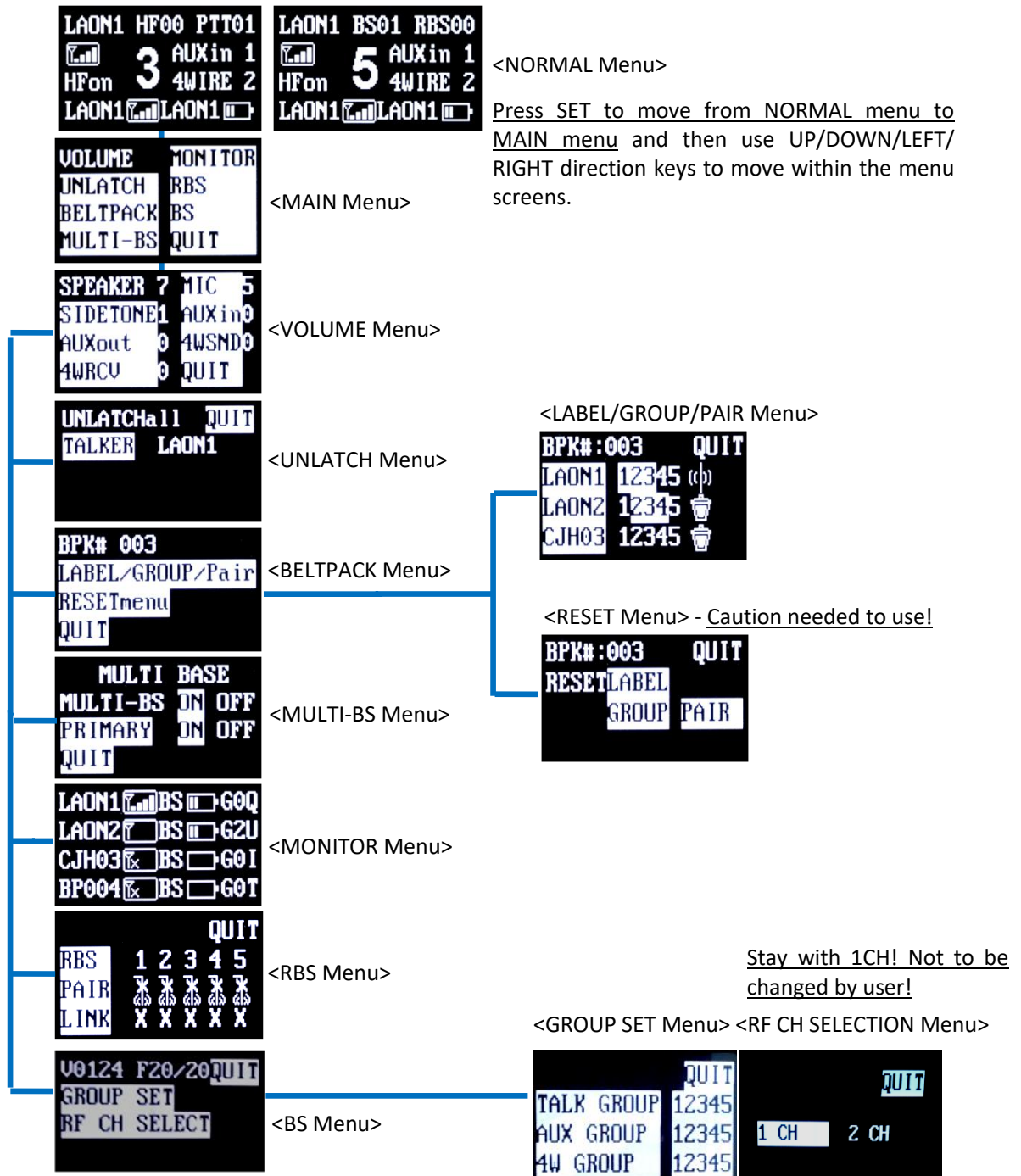
- |                        |                           |
|------------------------|---------------------------|
| 1. Antenna connector   | 5. 12V DC power connector |
| 2. Antenna connector   | 6. USB connector          |
| 3. Null (Power button) | 7. LAN RJ-45 connector    |
| 4. Status lights       | 8. Cover                  |

There are two ways to supply power to RBS as following;

- Power of Ethernet(PoE) Hub
- LaON provided power adapter

Upon the power supply to the RBS, it will be turned on automatically without pressing the power button.

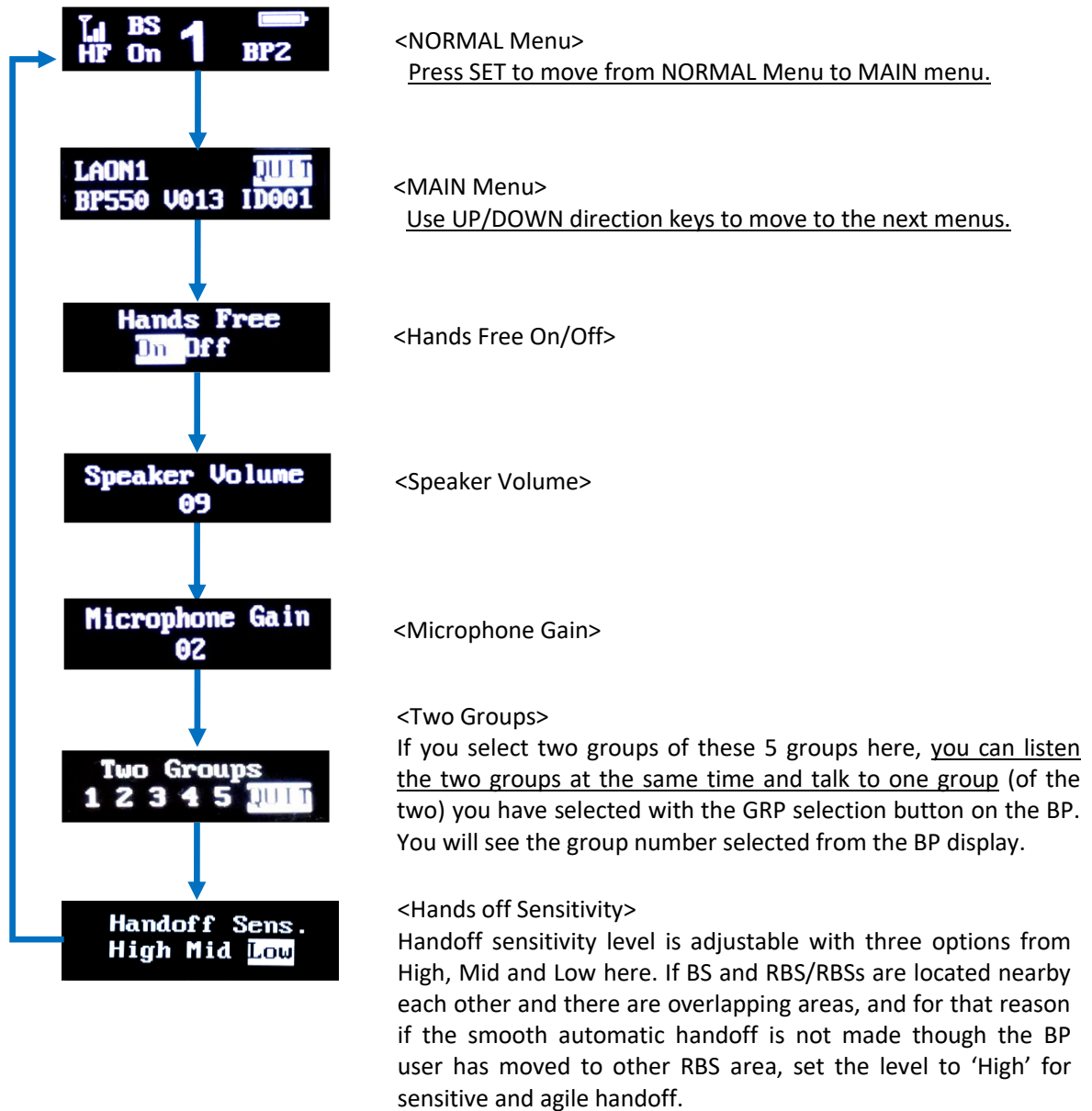
2) DISPLAY MENU CONTROL  
2-1) Base Station display menu



NOTE

- Press SET button for 2 seconds on any menu screens will lead you to the NORMAL menu.
- Menu displays will be in sleep mode if no touch is made for approximately 30 minutes. Touching any button on the front panel of the Base Station will have the screen waken up.
- RESET Menu and RF CH SELECTION Menu are basically not to be used by users frequently. Please make an enough caution to use these menus.

## 2-2) Belt pack display menu



### NOTE

- Press PWR button on any menu displays of the BP will make you return to the NORMAL menu.
- From the NORMAL Menu, you can monitor the applicable RSSI signal, the linked device, battery status, hands free on/off status, group number selected and BP ID(Label).

### 3) PAIR UP/REGISTER THE SYSTEM

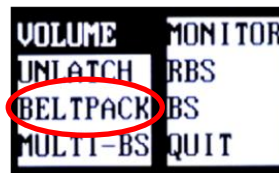
#### 3-1) Pair up BP with BS

Before initially using, all BPs to be in use should be registered to an applicable BS with required information. Once the pairing is done, BPs will automatically be linked to all RBSs in each area, of which are registered to the applicable BS as well.

Connect the antennas enclosed firmly to the BS and turn the power on. From the initial screen of the BS, press SET button then it will lead you to the menu screen as shown from the figure 3 below. Move to BELTPACK menu and press SET button on it.

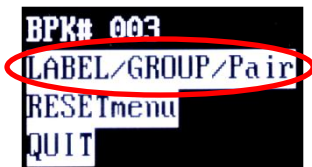


[Figure 2] NORMAL menu (Initial display of BS)

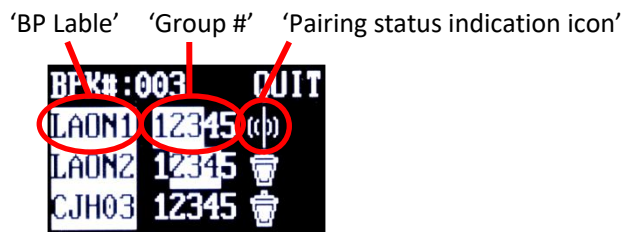


[Figure 3] MAIN menu (Menu selection)

Set the maximum number of BP on the first row in the BELTPACK menu display by using UP and DOWN direction key as shown from the figure 4 below. If 40 BPs to be registered, input '040'. Any BP exceed this number set initially in this screen will not be registered. Move into LABEL/GROUP/PAIR menu then the display as shown from the figure 5 will appear and you will see the maximum number of BP you have just set from the first row.



[Figure 4] BELTPCK menu






[Figure 5] LABEL/GROUP/PAIR menu

#### Pairing status indication icon

- (🗑️): Factory default status with no input of paring data
- (🗑️): Data edited and being ready to execute paring
- (🕒): Paring processing
- (🚫): Paring failed
- (📶): Paring completed – communication is available from this stage.

Move to the 'BP Label(ID) column' in the second row with LEFT/RIGHT keys and set the ID as you want by using UP/DOWN keys. Press SET to save and move to 'Group # column' and select group or groups for the applicable BP by pressing SET button onto each number. Move onto the icon 🗑️ and stay.

Turn on the BP near the BS antenna. For all BPs which are not registered yet will go on red LED blinking. Go back to the BS screen. Press SET on the icon then it will try to start pairing with the BP by changing the icon to .

On BP, confirm if the OLED screen is on and NORMAL menu is displayed. While pressing and holding the PWR button, quickly press the SET button and release both after confirming the message 'Pairing....' on the BP screen. 'Pairing completed' message will be shown shortly if properly done. The pairing status indication icon on the BS screen will be changed to  and the BP ID you have input for the applicable BP will be displayed on the BP screen. If the pairing is failed, 'Pairing failed' will be shown on the BP screen and the icon  will be indicated on the BS screen. If failed, try again in the correct order and timing.

In the same way above, execute the pairing for all BPs one by one on each row. Going down on the screen with direction key will show you the next rows.

**NOTE**

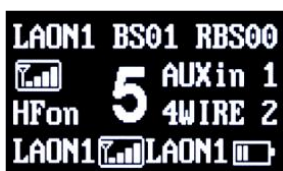
- [For the 33<sup>rd</sup> BP to the 128<sup>th</sup> BP registered to a BS will be automatically in shared and grouped in #5 with hands free off/PTT mode.](#)
- [Do not press the BP PWR button longer than 2 seconds that will make the power turned off.](#)
- The BS screen will be in a sleep mode if no touch is made for a while. Touch any button on the BS will make the screen waken up.
- The BP screen will be in a sleep mode if no pressing is made for a while. Pressing any button on the BP will make the screen waken up. [When set up the pairing, the BP screen should be on.](#)
- On BS screen, press SET in 2 seconds on any menu will take you to the initial NORMAL menu.

**3-2) Pair up RBS with BS**

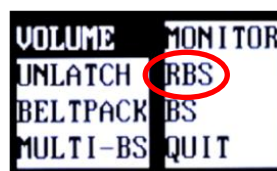
Before initially using, BS and RBS or RBSs should be paired up. The pairing set up can be done for one(1) RBS at once. Therefore, connect the LAN cable with the applicable one(1) RBS only and disconnect all other cables for the rest of RBSs. For this pairing, prepare a short LAN cable to connect between BS and the applicable RBS will be enough.

Connect the LAN cable between BS and the applicable RBS by using LAN port. If you have 19" cascade kit, there are 3 LAN(PoE) ports on the rear panel of the kit and you may wish to use any of them. For the power supply to the RBS, PoE Hub or batteries can be used.

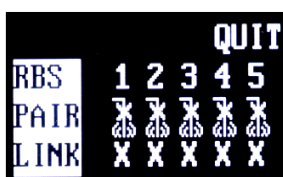
Once the power is supplied and LAN cable is connected to the BS and RBS properly, from the initial screen of the BS, press SET button on the BS then it will lead you to the menu screen as shown from the figure 7 below. Move to RBS menu and press SET button on it then the RBS menu will be displayed as shown from below figure 8.



[Figure 6] NORMAL menu (Initial display of BS)






[Figure 7] MAIN menu (menu selection)



[Figure 8] RBS menu



Implement the [RBS pairing from the number '1' on the display in order. Move onto '1' with direction key and press SET then the pairing will start](#) by changing the pairing icon indication from  to . If the pairing is successfully completed, the icon will be changed to  and the LINK indication on the bottom line of the display will be changed from 'X' to 'O'. You may observe the change of LINK indication after getting out from the current display with QUIT button and return to the display again. When failed, the pairing icon will be returned to the initial indication. If failed, confirm the power supply, LAN cable and LINK LED status on both BS and RBS then try again.

### LED status lights on the front panel of the BS and RBS

'RF ALERT light'

When there are audio breakups seriously, RF ALERT light will go on.

'BS LINK light / RBS LINK light'

When the BS and RBS are connected, BS LINK/RBS LINK light will go on.

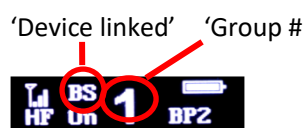
'BS ACTIVE light / RBS ACTIVE light'

When the BS/RBS exchanges data, BS ACTIVE/RBS ACTIVE light will be flashing.

[Disconnect the LAN cable for the first RBS\(R1\) if the pairing is properly done, then, connect the next RBS for pairing. Again, for the pairing, RBS should be connected one by one exclusively and have to be located in order from #1, the nearest area from the BS, to #5, the farthest area from the BS.](#) Implement the pairing one by one for each RBS with the same process above.

[If you want to test the RBS coverage at this stage, while all the RBSs are placed at each area with cabling, reboot the BS with the power toggle switch while the RBS is TURNED ON, then wait for one\(1\) minute for the RF scan of BS and then 20 seconds for each RBS until the system is fully activated.](#)

With above pairing setup and system reboot, each BP within the RBS coverage will be linked to the respective RBS and the wireless intercom communication will be activated. You may wish to test the BP communications and RBS coverage. As shown from the figure 9 below, [BP users will be able to confirm to which device the BP is linked from the first row of the BP display as well as the signal strength, battery status, group number selected, BP ID and etc.](#) If the BP is linked to BS within the BS coverage, the display indicates 'BS' and if 'RBS', 'R1' 'R2' 'R3'... 'R5'.



[Figure 9] NORMAL menu (Initial display of BP)

And, when there are data exchanges by communications, the 'RBS ACTIVE' LED light of the BS and 'BS ACTIVE' LED light of the RBS will go on.

### NOTE

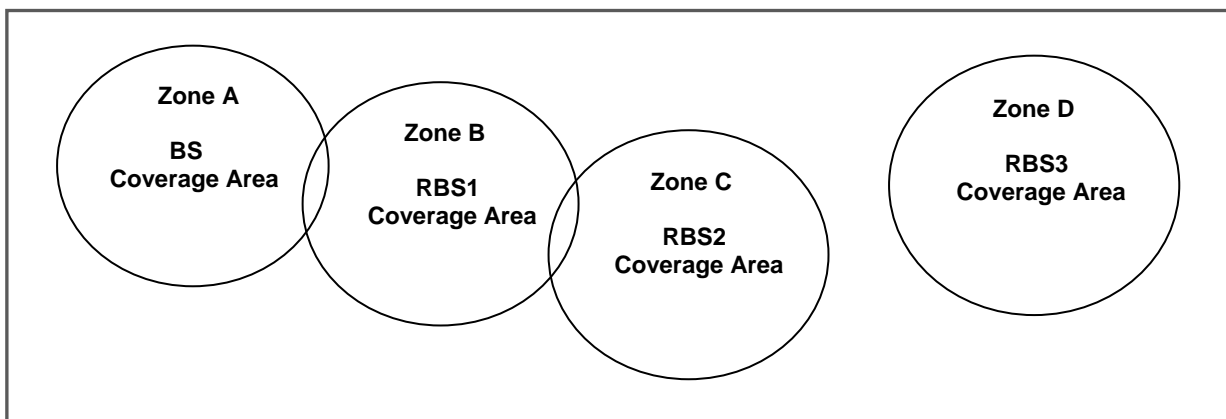
- During the BS and RBS pairing process, communication will be inactivated.
- When users changed any settings by accident, there could possibly a disconnection of the pairing between the BS and RBS unintentionally. If you have any issue on communication, firstly check out the power supply with PoE Hub, specification of the LAN cable in use, LAN cable connection status and then RF LINK and ALERT light indications. And implement the pairing setup again to retrieve.

#### 4) LOCATE the BS and RBS/RBSs

Before you fix out the BS and RBSs' locations, consider the best spots for each of them at the installation site. If BS and RBS will be located on each individual floor level, or where there is a concrete wall between the spaces and totally isolated not allowing any gap, you may not needed to consider the overlapping area between the BS and RBS. If the BS and RBS will be co-located in one open space where there is no obstruction, or located closer though there are obstructions, you may wish to test and check out the coverage and overlapping area in each BS and RBS area and [install them at the best locations as higher as possible not allowing wide overlapping area.](#)

Please note that the [RF signal range can be various and alternative depending on the site environment such as the location of obstructions, materials of the walls, doors, windows and ceiling, and the system installation height and location, and other equipments used in the site and etc.](#) Please note that the typical distance of LaON intercom is approximately 100m-140m for both of BS and each RBS in LOS (line of sight) environment however it could be increased due to reflection or decreased due to obstructions as well.

Therefore, test and checking out each of coverage by BS and RBSs and select the best location is very important for the efficient cabling and the best-in-class wireless communications performance.



[Figure 10] Mapping coverage zones

Draw the coverage map and [deploy the BS and RBS in order from the RBS1\(R1\) in the nearest area from the BS, and RBS2\(R2\) in the next nearest area from the BS.....and RBS5\(R5\) in the farthest area from the BS](#) as shown from the figure 10.

#### 5) CABLING and CONNECTION BETWEEN BS and RBSs

[For multiple RBSs connections, it is necessary to connect through PoE\(Power of Ethernet\) Hub.](#) For sole RBS connection, either direct connection or connection via PoE Hub should work. However, it is still strongly recommended to use a PoE Hub if you prefer a convenient power supply to RBSs during the critical live operations.

[Connect the BS and RBSs through LAN cable.](#) The LAN port can be found from the rear panel of the BS or 19" cascade kit and bottom of the RBS.



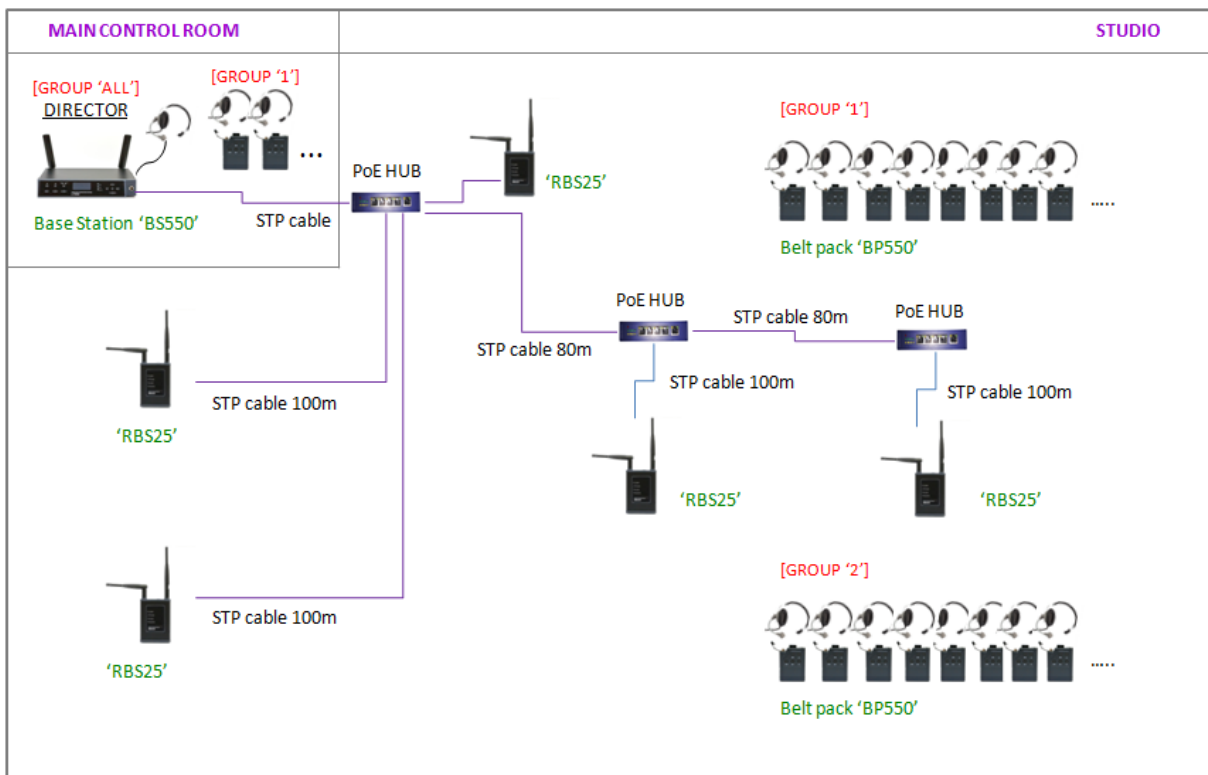
[Figure 11] LAN ports of the BS and RBS

If the cable length is exceeded 80m, STP cable is strongly recommended to use for a stable network environment.

- Cable length  $\leq 80\text{M}$ : Connect with CAT-5 STANDARD LAN Cable
- $80\text{M} \leq \text{Cable length} \leq 100\text{M}$ : Connect with CAT-5e STP LAN Cable
- Cable length  $\geq 100\text{M}$ : Connect with Optical Fiber Cable with Converter

To cover wide communication area, RBS can be added and connected through PoE Hub as required as shown from the figure 12 below. Also, to make the cable length longer, you can put additional PoE Hubs at appropriate locations as shown from the system configuration example below. For the cable length of each section between the BS and PoE hub, between the PoE Hub and RBS, and between the PoE Hubs see the guideline above, the same.

When the BS and RBS are properly connected, The BS LINK LED light on the front panel of the RBS and the RBS LINK LED light on the front panel of the BS will go on in green.



[Figure 12] System usage example

## 6) SYSTEM BOOTING and AUTOMATIC RF CHANNEL SCANNING

Once all the pairing set up, RBS deployment and cabling is done, you need to boot/reboot the system and wait until the automatic RF channel scanning is completed.

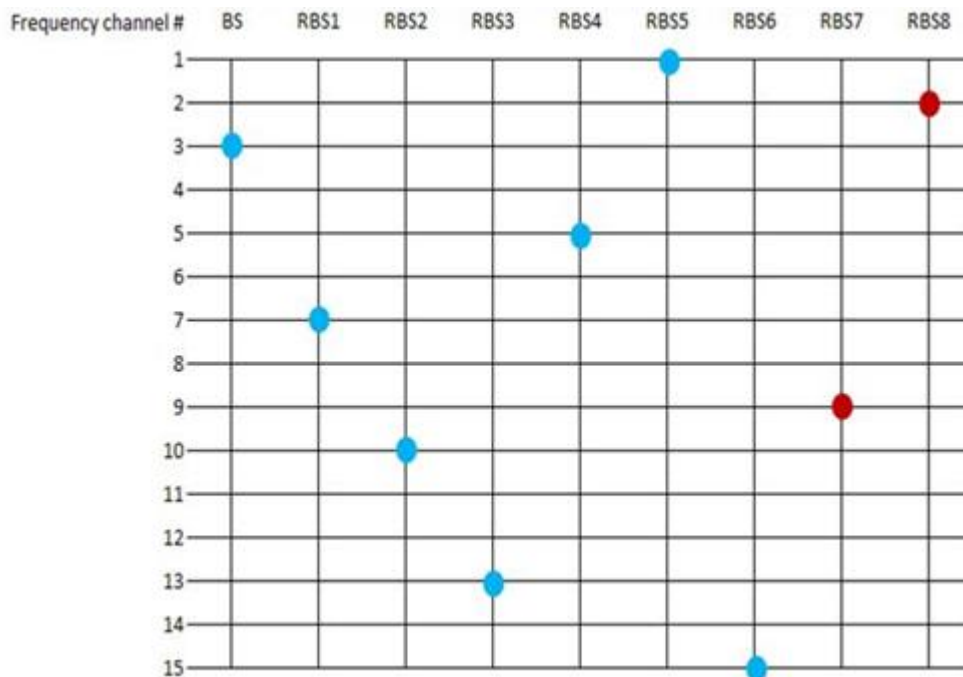
There are two ways to boot the system correctly in order.

- A. Turn on the all RBSs(by PoE Hub) first → Turn on the BS after the RBSs → Wait for one(1) minute until the BS completes the RF scanning → Wait for 20 seconds by each RBS until they complete the RF scanning
- B. Turn on the all BS and RBS after all cable connections → Reboot the BS with the toggle power switch on the BS (this will mean, 'turn on the all RBS first and then BS', the same procedure with above) → Wait for one(1) minute until the BS completes the RF scanning → Wait for 20 seconds by each RBS until they complete the RF scanning

### NOTE

- Time needed for booting and RF auto-scanning in case of '1 BS with 5 RBS' will approximately be '2 minutes and 40 seconds+'. During this processing time, do not try to pair up the BP or RBS.
- If any RBS is not turned on before the BS, the applicable RBS will not properly receive the signal for RF scanning from BS, and could occupy the duplicated RF channel which is used by other BS or RBS and this may cause a RF conflict.
- The Power LED of RBS which is under scanning process goes on RED, and the wireless communication will only be available after all the RF scanning process is completed.

The RF channels for each BS/RBSs will be automatically scanned and taken by upon above system booting or rebooting.



[Figure 13] RF channel scanning matrix

On 5GHz, there are approximately 15 RF channels worldwide. If 1 BS with 8 RBSs are needed to install, the BS will firstly scan and occupy the best RF channel and then, RBS1(R1) will secondly scan and occupy the next best available channel, then RBS 2→3→4→5→6→7 and 8 in order.

[Occupying a RF channel not so closed with the ones already taken by other BS/RBSs is feasible for the pleasant wireless communication quality.](#) Given this, for example, if BS has taken the RF channel #3 as above figure 13, the next device, RBS1 will take a channel leaving some gaps from ch#3 not taking the neighboring channels of it. In that way, [as the multiple RBSs are taking good channels available, there will finally be only neighboring channels left to take, of which case of RBS7 & 8](#) in the figure. Thus, if all the 8 RBSs are located in the narrow same space, there could be interferences between RBS7(ch#9) and RBS2(ch#10), and between RBS8(ch#2) and BS(ch#3) or RBS5(ch#1) as shown from the figure. [However, if they are located far from each other not allowing overlapping areas, it is no matter to use the neighboring RF channels without conflicts or interferences and THAT IS WHY, the RBS deployment 'IN ORDER' from the RBS1 in the nearest area from the BS, to the RBS10 in the farthest area from the BS is highly recommended.](#) Please note that [RBS deployment in order, as paired up, from the nearest area from the BS, without mess up, will deliver a pleasant wireless communication experiences.](#)

#### NOTE

- [Regarding more than 5 RBS25 connection, please make an inquiry to the manufacturer.](#)
- The BS antennas can be disconnected with termination caps if the BS signal needs to weaken and all BPs will be linked to RBSs depending on the site environment, conditions of installation and the required wireless communication operation.
- [The BS and RBS antenna direction can be adjustable. To weaken the BS signal, lay down the two antennas. To weaken the RBS signal, bend the two antennas.](#)

### 7) HAND OFF BETWEEN COVERAGE

[When BP users move across the coverage, the applicable BP will be automatically linked to the BS or RBS within the located area.](#) When the automatic roaming is done, user can confirm the change from the display of the BP as shown from the Figure 9 above. If the site environment or installation condition doesn't allow an automatic roaming due to wide overlapping area between coverage, [manual hand off is also available. Approach to the BS or RBS where you want to make the link and double click the power button on the BP](#) then, expect a beep sound with an instant red LED indication upon the new link to the BS or RBS. Confirm the linked device indication in the BP display once you have tried the manual hand off. Please take a caution to not press the power button longer than 2 seconds during this button operation which will make the BP turned off.

[Also, you can adjust the handoff sensitivity level from 'high' to 'low' with a HANDOFF SENSITIVITY menu on the BP for more sensitive and agile handoff operation between areas especially you are located in the non-ideal installation environments.](#)

### 8) LT550 EXPERT SYSTEM MAIN FEATURES

- **5GHz frequency** LAON intercom operates in 5GHz where there are less traffics and interferences with approximately 15 RF channels worldwide.
- **IP based repeater solution, RBS(Remote Base Station)** that can easily expand the coverage without a big burden - multiple studios or multi-floor spaces can be consolidated to one communication range. Up to 5 RBS connections will support you to cover wider area with efficient system volume and the lowest cost.
- **Industry top level best-in-class audio performance** with low latency with audio clarity
- **Up to 5 communication group channels** can be allocated to the Base Station, Belt Pack, 4W



and Aux devices with only one(1) Base Station.

- **Up to 11 full-duplex (1 BS + 10 BPs)** simultaneous audio communication channels with one(1) Base Station.
- **4 wire and Aux I/O interfaces** for connectivity with other existing systems.
- **Various options on battery** LAON designated rechargeable battery pack or alkaline battery or non-LaON provided rechargeable battery with LAON provided battery sled can be used to supply power to Belt Pack.
- **Efficient 7 port charger** 5 ports for the direct Belt pack docking and 2 ports for battery.
- **Compact design** guarantees comfortable wearing and movement experiences during the critical live operations.
- **AES 256bit level 3 encryption** the top level encryption technology secures your communications keep confidential.
- **LAON in-house solution** LaON developed from the wireless SoC and RF module and has number of relevant patents. Quick turnaround, support and recovery can be made upon need.

#### Catalog with System Specification

[http://www.laon-tech.com/2011/eng/03\\_support/1\\_support.html](http://www.laon-tech.com/2011/eng/03_support/1_support.html)

#### Video on Youtube

<https://www.youtube.com/watch?v=xAz0g32YMYk>

## 9) TROUBLESHOOTING

When you have an issue on connecting between BS and RBS;

- Confirm if the LAN cable you are using is appropriate – specification and cable length and etc.
- Check out if the cable or connectors are broken.
- Check out if the PoE Hub is in good condition without a fault.
- Reboot the system and confirm if the LINK LED indications on both BS and RBS are correct.
- Doubt if the pairing setup is cancelled by accident. Implement the pairing setup again between the BS and RBS/RBSs and try again.
- When connecting multiple RBSs, process the pairing one by one from the RBS number 1 to 10. The RBS which is already paired up should be disconnected and the RBS to be paired up should exclusively be connected and turned on. In order to confirm to which the BP in use is linked, see the BS monitor menu or BP display. It will display the linked device such as BS, R1, R2... and R5.
- During the scanning process of the BS and RBS/RBSs after booting or rebooting, audio communication will be inactivated.
- Do not try any pairing for BP or RBS during this time which may cause the RF channel duplication.
- If the system will be installed on the existing network, please refer to the section, 'Remote Base Station Setup' of LT550 Expert system manual or ask for a support to distributor or manufacturer. Please note that configuring an exclusive dedicated network for LaON intercom system is still strongly recommended to secure a stable network communication environment.

When you have an issue on BP;

- If the BP pairing setup does not work or the BP is not linked to the BS, confirm if the BS antenna is firmly connected or if there is a defect on antenna parts.

- If the BP does not link to the RBS, confirm the LAN cable connection, RBS antenna and RBS LINK light.
- Please note that when a BP is under pairing process, the whole system communication will be blocked with red LED flashing.
- If audio break-up occurs, confirm if your BP is linked to the BS or RBS in your area. If not, set the HANDOFF SENSITIVITY level to 'High' in the menu of the BP and approach to the nearest BS or RBS in your location, and double click the PWR button for a manual handoff to the BS or RBS with the strongest signal in the area. Confirm if the BP is now linked to the nearest BS or RBS after the manual handoff. This may happen due to the wide overlapping area and when the signal from the BS or RBS in other areas is still strong.
- If the battery status is low with red LED on, the TX of BP will automatically be off. If the BP user still talks though, it may cause audio break-up to the whole communication network. Change the battery immediately when the battery status is low.

When there is unknown issue such as interference, audio break-up, drop out and etc.

- Reboot the system with BS toggle power switch then wait until all the rescan is completed and try again.
- If the issue is still not solved out though above actions, please contact the distributor in your local area or the manufacturer, LaON Technology at [support@laon-tech.com](mailto:support@laon-tech.com).