

Air Talk 900™

Installation and Setup

Note to Installers: *After installation, make sure this document is passed on to service personnel.*

Understanding the Air Talk 900™

System Information and Basic Specifications

The Air Talk 900™ is a wireless, full-duplex intercom system (audio only) that supports any combination of 1 to 4 audio consoles communicating with 1 to 8 drive-thru lanes. Thus, the system can be as simple as 1 audio console communicating with 1 lane or as complex as 4 audio consoles communicating with up to 8 lanes. The system consists of two basic modules; the **5030 Wireless Console** and the **5031 Wireless Lane Module**. The audio quality of the Air Talk 900™ is superb because of advanced audio processing features such as background noise cancellation, echo cancellation, and RF compression / expansion techniques. Below are the basic technical specifications for the Air Talk 900™ wireless intercom:

- Console Frequency: 925.5MHz (Tx), 904.5MHz (Rx) +/- 1.5MHz
- Lane Frequency: 904.5MHz (Tx), 925.5MHz (Rx) +/- 1.5MHz
- RF Channels: 20 at 150KHz spacing
- Antenna Impedance: 50 Ohm
- Line of Sight Range: 100 feet maximum
- Power Requirements for the 5030 Wireless Console
 - Voltage: 14Vdc +/- 2.5Vdc (center pin of barrel connector is +)
 - Current: 250mA maximum (8-lane keypad)
 - 200mA maximum (4-lane keypad)
- Power Requirements for the 5031 Wireless Lane Module
 - Voltage: 14Vdc +/- 2.5Vdc (center pin of barrel connector is +)
 - Current: 200mA idle, 250mA talk/idle, 350mA peak when talking
- 5030 Console FCC ID: UY5 5030AIRTALK900
- 5031 Lane Module FCC ID: UY5 5031AIRTALK900

Understanding the Base Frequency and Communication Frequency

The Air Talk 900™ utilizes a **base frequency** for communication between the 5030 wireless audio consoles and the 5031 wireless lane modules while in the *idle* state. Every console and lane module communicates on this base frequency.

When the wireless audio consoles and lane modules are in the *idle* state they are simply listening on the base frequency for commands. When a lane button is selected the wireless audio console sends a command requesting that the selected lane enter into a *private* communication session with the console. If the desired lane is present in the system, and is listening on the base frequency, the lane will acknowledge the command and both the wireless lane module and the requesting wireless audio console will switch to their own **private communication frequency**. All the other idle lanes and idle consoles will remain at the base frequency. When the teller hangs up, or puts the customer on hold, both sides will switch back to listening on the base frequency.

The private communication frequency is determined by the audio console number setup. The number for each audio console must be unique for proper operation of the system.

Because so much communication occurs on the base frequency it is important that the base frequency be free from interference. Thus, there are 4 possible base frequency settings which may be tested and / or changed in the maintenance setup mode. See the section **Maintenance Setup on the 5030 Console** for more information.

Installation Procedure

Typical Installation Procedure

The typical installation for the Air Talk 900™ is a very simple process consisting of the following steps:

1. Determine the desired number of 5030 consoles (1 to 4) and 5031 lane modules (1 to 8)
2. Setup a unique console number for each 5030
3. Connect power to the 5030 wireless consoles (*power supplies included*)
4. Setup the lane number for each 5031 wireless lane module
5. Mount the 5031 wireless lane modules & antennas
6. Connect the speaker, microphone & call button at each lane to the 5031 module
7. Connect power to the 5031 wireless lane modules (*power supplies included*)
8. Test the system and adjust as needed

IMPORTANT: DO NOT change any jumper on the 5030 or 5031 boards that are not identified in this document unless directed by factory technical support personnel.

Console Number Setup on the 5030 Wireless Console

Every 5030 wireless audio console **MUST** have a unique console number. This includes consoles at one installation AND any other installation located within a 1000 foot radius. There are 16 unique console numbers available which are selected as follows:

Turn the rotary switch on the back of the audio console to any of the available 16 positions labeled 0 through F. The private communication Tx and Rx frequencies are listed in the table to the right.

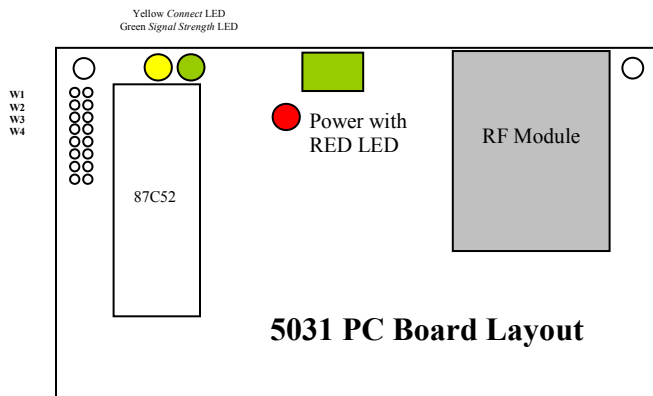
Application Note: If the wireless audio console or customer lane is receiving interference from another RF source during teller to customer communications, try changing the console number to another one that is available. It is not necessary for the consoles to be numbered consecutively. **The console power must be cycled whenever the console number is changed.**

Console #	Tx Freq (MHz)	Rx Freq (MHz)
0	924.00	903.00
1	924.15	903.15
2	924.30	903.30
3	924.45	903.45
4	924.60	903.60
5	924.75	903.75
6	924.90	903.90
7	925.05	904.05
8	925.20	904.20
9	925.95	904.95
A	926.10	905.10
B	926.25	905.25
C	926.40	905.40
D	926.55	905.55
E	926.70	905.70
F	926.85	905.85

Lane Number Setup on the 5031 Wireless Lane Module

Each 5031 wireless lane module within a particular system **MUST** be a unique number from 1 to 8. The lane number setup will determine which button will be pressed on the 5030 wireless audio console in order to communicate with the lane. Set jumpers W1 through W4 according to the chart below. After setting these jumpers, write the lane number on the cover of the module as indicated on the label.

Lane #	W1	W2	W3	W4
1	Off	Off	Off	Off
2	On	Off	Off	Off
3	Off	On	Off	Off
4	On	On	Off	Off
5	Off	Off	On	Off
6	On	Off	On	Off
7	Off	On	On	Off
8	On	On	On	Off



Mounting the 5031 Lane Module and Antenna

1. Determine mounting locations for the 5031 lane module and antenna
 - Antenna cable length is 32"
 - Antenna should be mounted to the top of the pneumatic unit with an unobstructed view to the building
2. Drill a 1/4" hole in the top of the pneumatic unit for the antenna
3. Unthread the antenna from it's mounting stud
4. Mount both the lane module and antenna stud using appropriate hardware
 - The antenna cable must be routed to avoid any contact with moving parts of the pneumatic unit
5. Thread the antenna back onto it's mounting stud

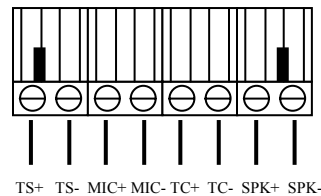
Wiring the 5031 Lane Module

The chart and drawing below show the wiring from the 5031 lane module to the speaker, call button, microphone, and optionally a traffic sense device. The wire colors in the chart apply to the pigtail cable which is supplied pre-wired to the connector. A traffic sense device, if used, should have a dry contact that closes to activate the input.

Application Note: The traffic sense input will cause the teller consoles to beep (if they are listening on the base frequency) but no lane LED will light. The console beep from a traffic sense input is different than the beep from a call button input. The call button would also flash the associated lane LED.

IMPORTANT: When retrofitting, it is necessary to disconnect the interconnect cabling from the old system before wiring the devices to the 5031 lane module. The two systems should never be wired in parallel.

Signal Name	Description	Wire Color
SPK-	Speaker -	Black
SPK+	Speaker +	White
TC-	Call Button -	Black
TC+	Call Button +	Green
MIC-	Microphone -	Black
MIC+	Microphone +	Red
TS-	Traffic Sense -	
TS+	Traffic Sense +	



Operation & Adjustment of the Air Talk 900™ System

Keypad Operation of the 5030 Wireless Console

Operation information for end users is found on the label on the bottom of each 5030 console. The instructions below contain additional information about changing lane volume and entering maintenance mode. ***This information should generally not be given to end users to avoid possible mis-adjustment of the system.***

- To Talk to a Customer..... Press the LANE button
- To Put a Customer on Hold..... Press the HOLD button
- To Talk to a Customer on Hold..... Press the LANE button
- To Hang-up with a Customer Press the LANE button
- To Increase Console Volume (in steps) Press VOLUME UP button while lane is selected
- To Decrease Console Volume (in steps) Press VOLUME DOWN button while lane is selected
- To Increase Lane Volume (in steps) * Press HOLD-VOLUME UP buttons while lane is selected
- To Decrease Lane Volume (in steps) * Press HOLD-VOLUME DOWN buttons while lane is selected
- * DO NOT change lane volume until reading Adjusting Outgoing Lane Volume below.**
- To Toggle Noise Cancellation..... Press NOISE CANCEL button while lane is NOT selected
- To Toggle Wireless Headset Mode Press WIRELESS button while lane is NOT selected
- To Enter Maintenance Setup ** Press HOLD button for >3 seconds while lane is NOT selected
- ** DO NOT enter maintenance setup until reading the section Maintenance Setup on the 5030 Console later in this document.**

- SOLID GREEN Lane LEDLane is Selected by this console
 - BLINKING GREEN Lane LEDCustomer is on Hold from this console
 - SOLID RED Lane LED ***Lane is Selected by a different console
 - SLOW BLINKING RED Lane LED ***Lane is on Hold from a different console
 - FAST BLINKING RED Lane LED ***Customer is Calling
- *** The lane status LED's on each console will only be updated while that particular console is listening on the base frequency. During the time a console is communicating with a lane on a private communication frequency, its status LED's will not be updated - for example when a different console selects a different lane.

Adjusting Outgoing Lane Volume

In most installations the outgoing lane volume can be left at factory default settings with no need for further adjustment. Keep in mind that the volume of the user's voice along with the distance from the microphone make a difference in the volume at the lane. If an adjustment is necessary, try the procedures below ***in the order listed*** until the desired volume is achieved.

- Begin by speaking directly into the console microphone at a distance of approximately 6". If the volume is too low, continue to move closer to the microphone until "teller echo" becomes objectionable. Optimal distance is just before teller echo begins. *Note: The distance between the lane speaker and microphone will make a big difference in the amount of teller echo in the system. Another factor is acoustical coupling (sound from the speaker bouncing around inside the enclosure of the unit being picked up by the microphone).*
- Puncture the black dot in the label on the bottom of the 5030 console and trim the microphone gain. This pot is factory set at 6 o'clock. As shown on the label, higher clock numbers increase the gain and lower clock numbers decrease the gain. Make slight adjustments of no more than one hour at a time and re-test.
- While communicating with a lane, press the HOLD and Volume UP or Volume DOWN arrow buttons at the same time to increase or decrease the lane volume one step. After pressing the buttons you will either hear a "high frequency" beep confirming that the volume change passed or a "low frequency" beep telling you that the volume change *may* have failed. Always test the volume level after each change attempt.

The outgoing lane volume level is stored in non-volatile memory in the 5031 lane module. If necessary, it is possible to return to the factory default level with the following procedure.

1. Remove power from the 5031 lane module and remove the cover from the enclosure.
2. Install the jumper across the pins of W19 which is located below the processor on the left side of the board.
3. Wait for the power up sequence to complete (loud static from the speaker) and then remove the jumper and replace the enclosure cover. *Note: If the jumper is not removed, the lane module will revert to the factory default volume level every time power is cycled to the module.*

5031 Diagnostic LED's

The 5031 wireless lane module contains three diagnostic LED's that are defined as follows:

LED	GENERAL DESCRIPTION	ON	OFF
Red	Power	Power is on	Power is off
Green	Signal Strength *	RF signal strength is above the preset threshold	RF signal strength is below the preset threshold
Yellow	Connect	Lane is connected	Lane is idle

* Signal Strength Notes:

1. The Green LED being ON means that the RF signal strength is very strong.
2. The Green LED being OFF does not necessarily mean that the signal strength is too low for quality communications but it does mean that the signal strength is not ideal.
3. It is normal for the Green signal strength LED to flicker during communications with a 5030 wireless audio console. However, it is not normal for the LED to be completely off during console communications.
4. If the Green LED is ON when the lane is not connected, that means there is another strong RF signal present in the area at the base frequency. This is a sign that there is the potential for RF interference at the base frequency resulting in poor performance of the system.

Communications Interference Test for the 5031

When a jumper is placed on W18 of the 5031 (below the processor on the left side of the board), the board will enter a communications interference test. The wireless lane module will enter into a mode where it will transmit data out over and over again on *all* of the frequencies that may ever be used. The data is sent out on one frequency at a time until all of the frequencies have had data sent out and then the test will automatically start over again at the beginning.

The purpose of this test is that it permits an easy way to see if the 5031 wireless lane module will ever interfere with surrounding equipment. Place jumper W18 on and then test all other 900MHz equipment for possible interference.

The test may be stopped at any time by removing W18. It is easy to identify if the board is in test mode because the yellow diagnostic LED will turn on for a while, turn off, and then turn back on. This pattern will continue until the jumper is removed.

Maintenance Setup on the 5030 Console

The wireless audio console is equipped with a maintenance setup mode that permits maintenance personnel to change and test base frequencies. See the section **Understanding the Air Talk 900™** before attempting to use maintenance setup.

Entering and Exiting Maintenance Setup

- To enter the maintenance setup mode** press the HOLD key for greater than 3 seconds. After entering maintenance setup the audio console will beep 1 to 4 times indicating the current base frequency number. Remember, there are 4 possible base frequencies. Additionally, while in maintenance setup the status LED's for lanes 1 and 2 will provide a visual indication of the base frequency. The following chart shows all base frequency information.

Base Frequency #	Lane 1 LED	Lane 2 LED	# Beeps	Tx Freq (MHz)	Rx Freq (MHz)
1	Blink	Off	1	925.35	904.35
2	Off	Blink	2	925.50	904.50
3	Blink	Blink	3	925.65	904.65
4	Green	Green	4	925.80	904.80

- To exit the maintenance setup mode** press the HOLD key while not performing a test.

Base Frequency Communication Test with Any Lane

While in maintenance setup mode it is possible to perform a base frequency communication test with any lane as follows:

- To start the test select the desired lane
- A steady high frequency beep pattern means each communication attempt passed
- An unsteady high frequency beep pattern means some communication attempts had to be re-sent (signal strength is marginal or the signal is being interrupted)
- A low frequency beep means the communication attempt failed
- To stop the test for that lane press and hold the lane button until the beeping stops

Changing the Base Frequency

Each 5030 console and 5031 lane module ships from the factory preset for base frequency #1. This programming is stored in non-volatile memory so it is retained while the module is powered down. In most installations the base frequency will not need to be changed. However, if interference exists with some other 900MHz equipment, such as the audio system from a fast food restaurant next door, you should be able to correct the problem by changing the base frequency. *Don't automatically assume the base frequency needs changed. If the interference only happens when using one particular console, try changing the console number first. (See the section Console Number Setup on the 5030 Wireless Console)*

If changing the base frequency is necessary, it is recommended to experiment using one console and one lane module. Once a suitable base frequency is found, the other lane modules and consoles can then be changed to match. Remember that the entire system needs to be set to the same base frequency. **Please read the entire procedure that follows before attempting any changes to avoid confusion. It is assumed at this point that signal strength is not an issue. This should have been verified before installation.**

1. Enter setup mode and determine the current base frequency for the console by the number of beeps and LED status as shown in the chart on the previous page.
2. To change the base frequency on **both the console and the lane module**, press and hold down the lane key until you hear a status beep. A high frequency beep indicates the base frequency change attempt passed and a low frequency beep indicates the base frequency change attempt failed. *NOTE: A low frequency beep also means the console and lane module may no longer be at the same base frequency. Perform a base frequency communication test by selecting the appropriate lane (see the procedure Base Frequency Communication Test with Any Lane above). If necessary change the base frequency of only the console (see step 4) and retest the communications. Repeat until communication is re-established.*
3. Repeat step 2 to change the base frequency on each remaining lane module. Either use a different console in the system which is still on the old base frequency, or change the original console back to the old base frequency (see step 4). *Remember that the console and lane module must both be on the same base frequency before a change can be made to the lane module.*
4. To change the base frequency on the **console only**, press the VOLUME UP key. The console will beep 1 to 4 times indicating the new base frequency. Also see the chart for the LED status.
5. Exit setup mode by pressing the HOLD key while no test is being performed.
6. Test the operation of each lane with each console in the system for proper operation. Remember that all consoles and lane modules in the system must be set to the same base frequency.