

Air Talk 900™

User's Manual

Rev D – 03/01/2007

FCC Statement

This statement applicable for both the 5030 Wireless Audio Console and 5031 Wireless Lane Module

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Understanding the Air Talk 900™

System Information and Basic Specifications

The Air Talk 900™ is a wireless, full-duplex intercom system 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 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 RF 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

The Air Talk 900™ consists of two basic modules; the **5030 wireless console** and the **5031 wireless lane module**. Both the 5030 and 5031 require only 12Vdc +/- 2.5Vdc to operate. No other wiring is required.

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
4. Setup the lane numbers for each 5031
5. Mount the 5031 wireless lane modules
6. Mount the 5031 lane antennas and connect to the 5031 modules
7. Connect power to the 5031 wireless lane modules
8. Test the system and adjust as needed.

Understanding the Base Frequency and Communications Frequency

The Air Talk 900™ utilizes a **base frequency** for communications 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* communications 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 **communications frequency**. All the other idle lanes and 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 communications frequency is determined by the unique audio console number setup. This is why the audio console number must be unique or the communications session between the teller and customer will not be private.

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 on *Maintenance Setup* for more information.

Understanding the Master Lane Module

As described above, when a teller and lane customer are communicating they are on a *private* frequency and thus are not privy to what is occurring on the base frequency. Thus, during this conversation the wireless audio console does not have access to the status of the other consoles and lanes and so the lane status LED's on the console will not be updated. The purpose of the master lane module is to update the system status to an audio console that has been communicating with a lane and has hung up or put a lane on hold. In a system that has installed a master lane module every *idle* console will have an updated LED status. This may be important in a system with multiple tellers. In smaller installations it may not be necessary to have a master lane module because there may only be 1 or 2 tellers and the status of every lane is easily obtained without looking at the console LED's.

It is possible to enable or disable the use of the master lane module on a wireless audio console. If the use of the master lane module is enabled but not present there will be a 5 second communication delay after hanging up or putting a lane on hold before another button press will take effect. This is because the console is waiting for an answer from the master lane module. Thus, if a master lane module is not present it should be disabled in maintenance setup. See the section on *Maintenance Setup* for more information.

Keypad Operation of the 5030 Wireless Console

<input type="checkbox"/> To Talk to a Customer	Press LANE button when idling
<input type="checkbox"/> To Put Customer on Hold	Press HOLD button when talking
<input type="checkbox"/> To Take Out of Hold	Press LANE button when on hold
<input type="checkbox"/> To Hang-up with Customer	Press LANE button when talking
<input type="checkbox"/> To Increase Console Volume	Press VOLUME UP button when talking
<input type="checkbox"/> To Decrease Console Volume	Press VOLUME DOWN button when talking
<input type="checkbox"/> To Increase Lane Volume	Press HOLD-VOLUME UP buttons when talking
<input type="checkbox"/> To Decrease Lane Volume	Press HOLD-VOLUME DOWN buttons when talking
<input type="checkbox"/> To Toggle Noise Cancellation	Press NOISE CANCEL button when idling*
<input type="checkbox"/> To Enable CS50 Interface	Press WIRELESS button when idling
<input type="checkbox"/> To Enter Maintenance Setup	Press HOLD button for > 3 seconds when idling

* Note: The NOISE CANCEL button is only available on the 2-lane, 4-lane and 8-lane keypads. Use the VOLUME UP button when idling on a 12-lane keypad to Toggle Noise Cancellation. The LED's for lanes 1 and 2 will indicate whether or not the feature is on (blinking fast green) or off (blinking fast red).

<input type="checkbox"/> SOLID GREEN LED	Talking to customer
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<input type="checkbox"/> BLINKING GREEN LED	Customer is on Hold
<input type="checkbox"/> SOLID RED LED	Another console is Talking to the lane (with Master Lane Module)
<input type="checkbox"/> BLINKING RED LED	Another console has customer on Hold (with Master Lane Module)

Console Number Setup on the 5030

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 setup as follows:

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

Table 1. Console number setup

To adjust the console number on the 5030 wireless intercom boards turn the rotary switch on the back of the audio console to any of the available 16 positions labeled 0 through F. The Tx and Rx frequencies are the same as in the above table.

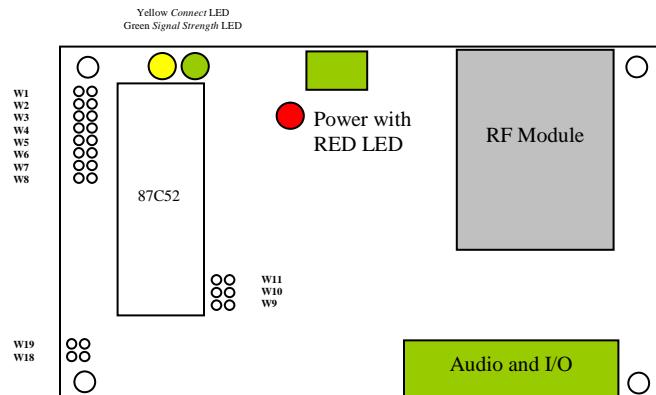
Application Note: If the wireless audio console or customer lane is receiving interference from another RF source during teller to customer communications try changing the console number to another one that is available. *The console power must be cycled whenever the console number is changed.*

Lane Number Setup on the 5031 Wireless Lane Module

Every 5031 wireless lane module *MUST* be a unique number from 1 to 12. The lane number setup will match what button will be pressed on the 5030 wireless audio console in order to communicate with the lane.

Lane #	W1	W2	W3	W4
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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
9	Off	Off	Off	On
10	On	Off	Off	On
11	Off	On	Off	On
12	On	On	Off	On
13	Reserved			
14	Reserved			
15	Reserved			
Master Lane Module	On	On	On	On



5031 PC Board Layout

Table 2. Lane Number Setup on the 5031 Using Jumpers W1-W4

Application Note: To setup the wireless lane module as the master lane module install jumpers W1 through W4. This module should be NOT be installed at any lane but inside closer to the wireless audio consoles. **DO NOT ADJUST ANY OTHER JUMPERS WITHOUT FIRST CONSULTING FACTORY TECHNICAL SUPPORT PERSONNEL.**

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 should be considered 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 that 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 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 problems.

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

The wireless audio console is equipped with a maintenance setup mode that permits maintenance personnel to test base frequency communications, change base frequencies, and to enable or disable the master lane module. Please see the section on *Understanding 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 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 as follows:

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

Table 3. Base frequency Information

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

Base Frequency Communications Test with Any Lane

Once in maintenance setup it is possible to perform a base frequency communications test with any lane as follows:

- To start the test select the desired lane
- A high frequency beep means the communications attempt passed
- A low frequency beep means the communications attempt failed
- To stop the test press and hold the lane button until the beeping stops

Note: When using a 4-lane or 8-lane keypad pressing the Noise Cancel button will begin a base frequency communications test with the Master Lane Module.

Changing the Base Frequency on a 5030

Press the VOLUME UP key to change the base frequency on the 5030 wireless audio console under test press. The console will beep the number of times indicating the new base frequency and the LED's for lanes 1 and 2 will also visually indicate the new base frequency as described in the *Table 3*.

Changing the Base Frequency on a 5030 and a 5031 Simultaneously

It is possible to change the base frequency for both the 5030 wireless audio console under test and a 5031 wireless lane module at the same time. To do this, press and hold down the desired lane key until you hear a status beep.

A high frequency beep(s) indicates the base frequency change attempt passed and a low frequency beep indicates the base frequency change attempt failed.

Changing the Base Frequency for the Entire Air Talk 900™ System

Changing the base frequency for an entire system is accomplished by changing the base frequency on the 5030 wireless consoles and 5031 wireless lane modules as described above. The following procedure may be used:

1. Select a console that will be used to change the base frequency of every lane.
2. Starting with Lane 1, perform a communications test to make sure that the lane and the console are communicating on the same base frequency.
3. Exit the communications test. If the test was not successful change the base frequency on *only* the console by using the VOLUME UP key and repeat steps 2 and 3 until successful.
4. Change the base frequency on both the console and the lane by pressing and holding down the lane button until the indication beep(s) occur. See above for more information.
5. Repeat steps 2-4 for every lane.
6. Go to all of the consoles and change the base frequency on the console only. See above for more information.

Enabling and Disabling the Master Lane Module

Once in maintenance setup it is possible to enable or disable the master lane module. If the master lane module is desired in order to have the status LED's on the audio consoles up to date while *idle* then it should be enabled. Otherwise, if the master lane module is not present then it should be disabled.

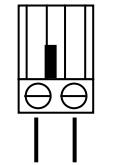
Press the WIRELESS key to toggle support for the master lane module *on the console under test only*. A high frequency beep indicates the master lane module is enabled and a low frequency beep indicates the master lane module is disabled. Setup must be performed on each individual wireless audio console.

5030 and 5031 Power Requirements

Power Requirements for the 5030 Wireless Console

<input type="checkbox"/>	Voltage:	12Vdc +/- 2.5Vdc
<input type="checkbox"/>	Current:	300mA maximum
		250mA maximum
		200mA maximum

12-lane keypad
8-lane keypad
4-lane keypad

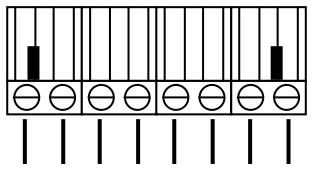


Power Requirements for the 5031 Wireless Lane Modules

+12Vdc GND

<input type="checkbox"/>	Voltage:	14Vdc +/- 2.0Vdc
<input type="checkbox"/>	Current:	200mA idling, 250mA talk idling, 450mA peak when talking

5031 Audio and Input/Output Wiring



TS+ TS- MIC+ MIC- TC+ TC- SPK+ SPK-

Signal Name	Description
SPK-	Speaker -
SPK+	Speaker +

TC-	Call Button -
TC+	Call Button +
MIC-	Microphone -
MIC+	Microphone +
TS-	Traffic Sense -
TS+	Traffic Sense +