INSTALLATION MANUAL
FOR THE
MSR RADIO MODULE

All Models Are Designed and Operate In A Point To-Point Configuration Only

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FCC REGULATORY COMPLIANCE
INTEGRATION AND USE INFORMATION

INTEGRATION AND INSTALLATION REQUIREMENTS

The MSR RADIO MODULE is designed exclusively for use in the VideoComm RTWave family of wireless video systems. The MSR RADIO MODULE will not function in any other system. However, there are certain criteria relative to integrating the radio into the RTWAVE system that must be considered to ensure continued compliance with FCC compliance requirements

The MSR module was tested and certified to meet FCC Parts 15 in a stand-alone configuration.
This demonstrates that the MSR module complies with Part 15 emission limits regardless of the system into which it may be installed. To simplify system integration of the same Radio Module into different systems and to help keep costs down on future systems using the same module, The MSR RADIO was FCC approved under the LIMITED MODULAR APPROVAL process for a radio transmitter. The Requirements as outlined in FCC Public Notice DA 00-131407 released June 26, 2000 are intended to afford relief to equipment manufacturers by eliminating the requirement for obtaining a new equipment authorization for the same transmitter when installed in a new device.

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 communications. 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.

VideoComm as the SYSTEM integrator of the module must follow all installation instructions and cautionary information necessary to comply with FCC RF exposure requirements.

In order to use the MSR RADIO MODULE without additional FCC certification approvals, the installation must meet the following conditions. Otherwise, additional FCC approvals must be obtained.

VideoComm specifies many SYSTEM models with different power levels and antenna gains. These are provided as part of this manual (see included exhibits for FCC test results) System Labeling will match the specific system as it is assembled.

INDUSTRY CANADA REGULATORY COMPLIANCE
INTEGRATION AND USE INFORMATION

INTEGRATION AND INSTALLATION REQUIREMENTS

This device has been designed to operate with the antennas listed herein and having a maximum gain of 32dB. Antennas not included in the list herein or having a gain greater than 32dB are strictly prohibited for use with this device. The required antenna impedance is 50Ohms

Operation is subject to the following two conditions:

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

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication

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Fixed and "mobile" applications

1. **See Tables for models specific to the FIXED and MOBILE applications, ALL SYSTEMS ARE POINT TO POINT ONLY.**

This device has been designed to operate with the antennas listed below, and having a maximum gain of 32 dB. Antennas not included in this list or having a gain greater than 32 dB are strictly prohibited for use with this device. The required antenna impedance is 50 ohms				
OUTDOOR ALL WEATHER SYSTEMS ALL INSTALLED AS FIXED POINT TO POINT ONLY				
Rubber Duck Family 5.8 GHz				
SYSTEM MODEL	**AMPLIFIER**	**PEAK POWER**	**ANTENNA GAIN**	**SEPARATION DISTANCE**
RT-L1R5803	NO	26.59 dBm	3dBi Ducky	20cm (7.9 Inches)
RT-X1R5803	YES	29.04 dBm	3dBi Ducky	20cm (7.9 Inches)
Antennas Tested By TCB				
Panel Antenna Family 5.8 GHz				
SYSTEM MODEL	**AMPLIFIER**	**PEAK POWER**	**ANTENNA GAIN**	**SEPARATION DISTANCE**
RT-L1R5807	NO	26.59 dBm	7dBi Embedded	20cm (7.9 Inches)
RT-X1R5807	YES	29.04 dBm	7dBi Embedded	20cm (7.9 Inches)
RT-L1R5814	NO	26.59 dBm	14dBi Embedded	30.19 cm (11.9 Inches)
RT-X1R5814	YES	29.04 dBm	14 dBi Embedded	40.03 cm (15.8 Inches)
RT-L1R5821	NO	26.59 dBm	21 dBi External	67.59 cm (26.6 Inches)
RT-X1R5821	YES	29.04 dBm	21dBi Embedded	89.62 cm (35.3 Inches)
Antennas Tested By TCB				
Parabolic Antenna Family 5.8 GHz				
SYSTEM MODEL	**AMPLIFIER**	**PEAK POWER**	**ANTENNA GAIN**	**SEPARATION DISTANCE**
RT-L1R5829	NO	26.59 dBm	29 dBi	169.79 cm (66.8 Inches)
RT-X1R5829	YES	29.04 dBm	29 dBi	225.11 cm (88.6 Inches)
RT-L1R5832	NO	26.59 dBm	32 dBi	239.83 cm (94.4 Inches)
RT-X1R5832	YES	29.04 dBm	32 dBi	317.98 cm (125.2 Inches)
Antennas Tested By TCB				
Rubber Duck ANTENNA FAMILY 2.4 GHZ				
SYSTEM MODEL	**AMPLIFIER**	**PEAK POWER**	**ANTENNA GAIN**	**SEPARATION DISTANCE**
RT-L2R2403	NO	26.80 dBm	3dBi Ducky	20cm (7.9 Inches)
PANEL ANTENNA FAMILY 2.4 GHZ				
SYSTEM MODEL	**AMPLIFIER**	**PEAK POWER**	**ANTENNA GAIN**	**SEPARATION DISTANCE**
RT-WR2L245	NO	26.80 dBm	15 dBi	34.71 cm (13.7 Inches)
Antennas Tested By TCB				

INDOOR DESKTOP SYSTEMS POINT TO POINT ONLY					
INDOOR DESKTOP SYSTEMS 5.8 GHz MOBILE APPLICATIONS POINT TO POINT ONLY					
SYSTEM MODEL	**RPS**	**AMPLIFIER**	**PEAK POWER**	**ANTENNA GAIN**	**SEPARATION DISTANCE**
XRT-L1R583	**YES**	NO	26.59 dBm	3dBi Ducky	20cm (7.9 Inches)
XRT-L1R588	**YES**	NO	26.59 dBm	8 dBi Magnetic panel	20cm (7.9 Inches)
XRT-X1R583	**YES**	YES	29.04 dBm	3dBi Ducky	20cm (7.9 Inches)
INDOOR DESKTOP FAMILY 2.4 GHZ MOBILE APPLICATIONS POINT TO POINT ONLY					
SYSTEM MODEL	**RPS**	**AMPLIFIER**	**PEAK POWER**	**ANTENNA GAIN**	**SEPARATION DISTANCE**
XRT-L2R243	**YES**	NO	26.80 dBm	3 dBi Ducky	20cm (7.9 Inches)
XRT-L2R248	**YES**	NO	26.80 dBm	8 dBi Magnetic panel	20cm (7.9 Inches)
	(RPS= Reverse polarity SMA Connector)				

2. If used with a desktop or other application where the antenna can be easily relocated to meet the 20 cm criteria, then this is considered a **“mobile”** application. If used in a **"mobile**" application where the antenna is normally separated at least 20 cm (7.9 in) from the human body during device operation, then an appropriate warning label must be placed on the host unit adjacent to the antenna.

3. The label will contain a statement such as the following:

WARNING
RF exposure: Keep at least 20 cm (7.9 in) separation distance from the antenna and the human body.

4. The MSR RADIO MODULE or associated SYSTEM will not be used as a portable device.

5. Host unit user manuals and other documentation must also include appropriate caution and warning statements and information.

6. If the FCC ID for the MSR Radio is not visible when installed in the host platform, then a permanently attached or marked label must be displayed on the host unit referring to the enclosed radio.
7.

   For example, the label should contain wording such as:

Contains MSR Radio transmitter module
FCC ID: SU5-MSR-RTWAVE
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

Or

Contains FCC ID: SU5-MSR-RTWAVE

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.

8. All supplied antennas have been tested to comply with FCC requirements

7. The transmitter and antenna must not be co-located or operating in conjunction with any other antenna or transmitter. Violation of this would allow a user to plug another transmitter in to the product and potentially create an RF exposure condition.

WARNING

The transmitter and antenna must not be colocated or operating in conjunction with any other antenna or transmitter. Failure to observe this warning could produce an RF exposure condition.

PROFESSIONAL INSTALLATION

The MSR RADIO MODULE will be installed into its system only by VideoComm. The system once assembled will be knows as an RT Wave (family of products)

The RT^{WAVE} wireless system is designed and marketed for professional installation. This is ensured by VideoComm through the very nature of its marketing strategies and distribution network.

All of VideoComm's marketing and sales are directed to the professionals within the many industries we supply. These include Law enforcement, Government, Military, Industry, Manufacturing, Education and Industrial to name a few.

VideoComm sells its products to Master Distributors and Dealers only. These dealers and distributors sell only to industry professionals who have experience in the installation of products like those manufactured by VideoComm. VideoComm's distributors do not sell to the general public. These distributors are generally trade only.

Please contact us if you have any additional questions.

Best Regards
Jeff Johnson
President

VideoComm Technologies

MSR MODULE INSTALLATION INSTRUCTIONS

The MSR radio will be packaged in a pink anti-static plastic bag. It is critical that it only be opened at an ESD safe work station and the technician be properly instructed on how to handle ESD devices and be grounded with an approved tested wrist strap.

The Module will be accompanied by a MASTER BUILD SHEET when removed from inventory and given to a technician for assembly into a SYSTEM. The Radio MODULE will be marked externally with its SERIAL number and this number must be copied to the master build sheet for the system. Additional Serial number labels will also accompany the MODULE to be attached to the outside of the SYSTEM enclosure.

As the technician installing the module you must clearly indicate on the build sheet your ID number for QC purposes.

The radio will be packaged with the following accessories to complete the installation. (This may vary with SYSTEM model being assembled, see BUILD SHEET)

1. Any necessary U_FL (IPEX)-SMA shielded jumper cables (depending on the SYSTEM model).
2. 1 piece of (foam center) 2 sided mounting tape to help secure the module within the MINI PCI connector.
3. 1 set of FCC labels to be installed on the approved MODULE.
4. 1 set of FCC labels to be installed on the outside of the finished SYSTEM.
5. 1 amplifier assembly (depending on SYSTEM model).
6. Antenna or antennas configured for the SYSTEM on the build sheet.
7. 6 tie wraps to secure wiring.

Installation is as follows:

1. First attach the 2 sided foam tape within the marked area on the PCB shown on the master build sheet. Trial fit the radio module on the PCB and ensure it locks in place. (Adjust the PCI fingers to ensure a good fit if needed). Release the Radio and peel off the 2nd protective layer of the 2 sided tape and install the RADIO MODULE (press to make good contact with the tape).

2. Attach the U_FL (IPEX) jumper cables to the module (follow the build sheet) using the special U_FL (IPEX) installation tool. Attach the other end to where the build sheet indicates (amplifier, antenna or antennas). Follow wiring diagram very carefully.

3. Confirm all cables are connected as indicated on your build sheet.

4. Attach the MAIN SYSTEM PCB (with the module installed) on the metal mounting plate (be careful not to get any wires caught on the mounting studs. Put in the 3 pieces of 4-40 screws. Tighten with torque set screwdriver until it clicks.

5. Route the antenna wires to their appropriate place indicated on the build sheet. Secure with Tie Wraps

6. (if build sheet indicates amplifier) the amplifier comes attached to a heatsink with its power supply attached but not connected. Attach wires as indicated in the diagram. (see attached exhibits)

7. Route power wires from main PCB to the mounting plate connections. Secure any loose wiring with Tie Wraps.

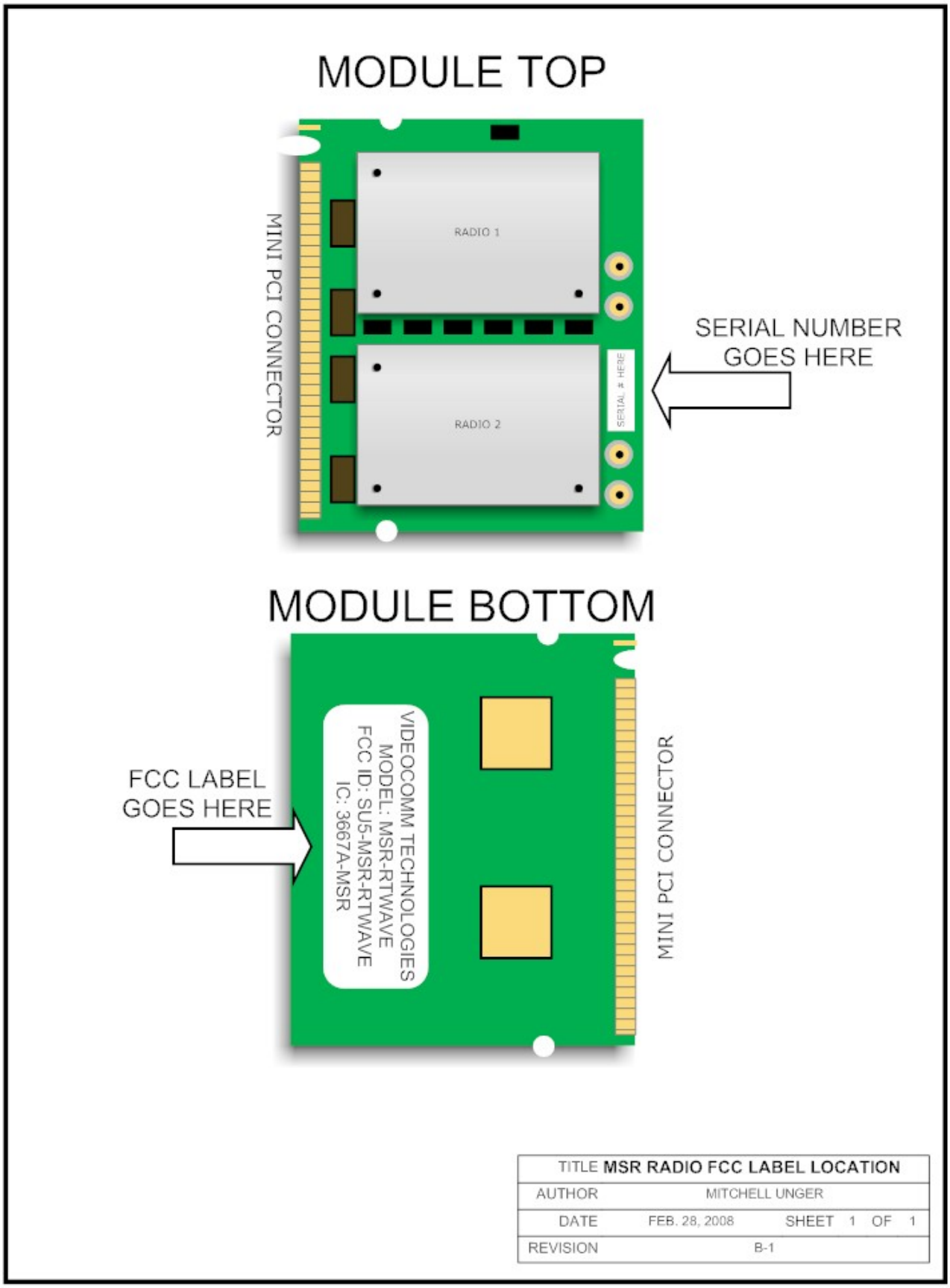
8. Install any RCA cable jumpers from the main PCB to the mounting plate. Secure any loose wires with Tie Wraps.

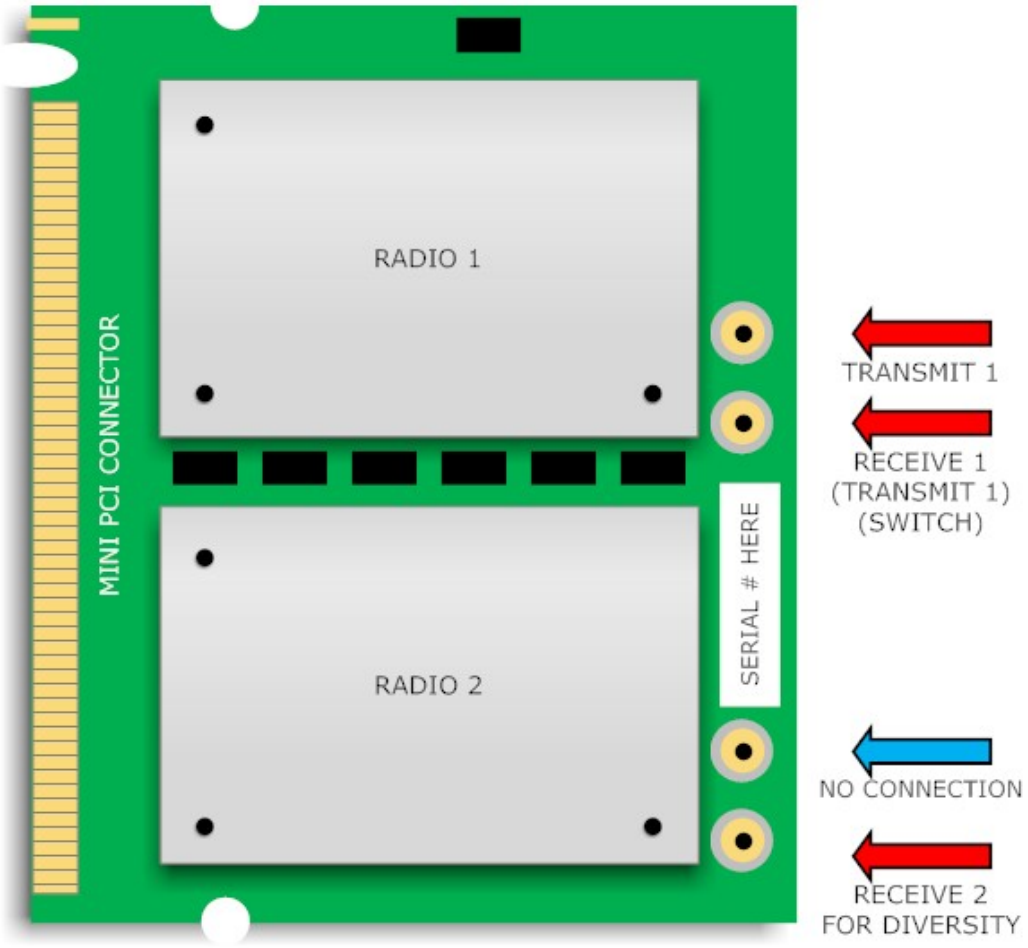
9. Confirm all wiring is connected as described on the build sheet and there is no loose wiring.

10. Initial to confirm all wiring steps.

11. Install the mounting plate with attached PCB and module into the enclosure. Secure with 3 screws and ensure they are snug only. Don’t over tighten or you will strip the plastic threads.

12. Pass the system to the test bench.


MODULE TOP
MINI PCI CONNECTOR
RADIO 1
RADIO 2
SERIAL # HERE
SERIAL NUMBER
GOES HERE
MODULE BOTTOM
FCC LABEL
GOES HERE
VIDEOCOMM TECHNOLOGIES
MODEL: MSR-RTWAVE
FCC ID: SU5-MSR-RTWAVE
IC: 3667A-MSR
MINI PCI CONNECTOR
TITLE MSR RADIO FCC LABEL LOCATION
AUTHOR MITCHELL UNGER
DATE FEB. 28, 2008 SHEET 1 OF 1
REVISION B-1

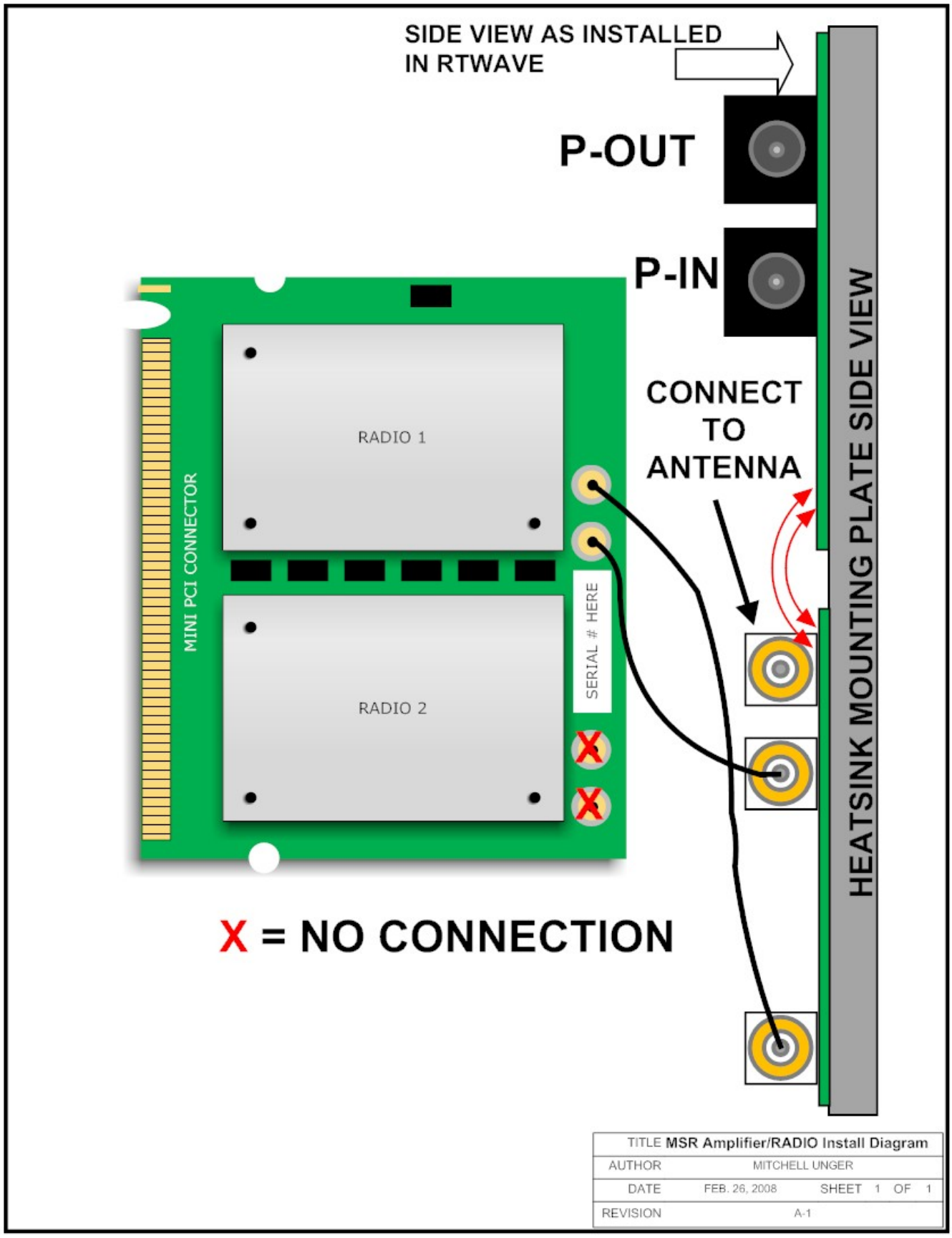


For systems with amplifier, connect as follows:
CONNECT TRANSMIT 1 TO AMPLIFIER INPUT AND RECEIVE 1 TO THE RECEIVE CONNECTION ON THE AMPLIFIER ASSEMBLY

For systems without amplifier, connect as follows:
CONNECT SINGLE ANTENNA TO RECEIVE 1 (INTERNAL SWITCH)

For systems using 3 diversity rubber duck antennas
CONNECT 1 ANTENNA TO EACH TRANSMIT 1, RECEIVE 1 AND RECEIVE 2

TITLE	**MSR RADIO CONNECTION DIAGRAM**		
AUTHOR	MITCHELL UNGER		
DATE	FEB. 26, 2008	SHEET 1 OF 1	
REVISION	A-1		


SIDE VIEW AS INSTALLED
IN RTWAVE
P-OUT
P-IN
CONNECT
TO
ANTENNA
HEATSINK MOUNTING PLATE SIDE VIEW
MINI PCI CONNECTOR
RADIO 1
RADIO 2
SERIAL # HERE
X = NO CONNECTION
TITLE MSR Amplifier/RADIO Install Diagram
AUTHOR MITCHELL UNGER
DATE FEB. 26, 2008 SHEET 1 OF 1
REVISION A-1

TEST BENCH PROCEDURES

Test bench will complete the following tests. Based on the model on the build sheet, the tests will involve RSSI visual test with the system in link ready mode.

Both MASTER server/client will be connected to the setup computer to load software MAC and configure the HARDCODED SSID number and WEP CODE. (USER cannot change codes) SSID and WEP are created by the software using a date code algorithm that will essentially never be repeated.

Check build sheet in case customer ordered 128 BIT WEP. If yes, check the code book for next unused code.

NOTE: Systems with amplifier.
The external heat sink is NOT attached at this point; DO NOT leave the system running for more than 5 minutes during software loading or damage to the amplifier may occur.

1. Attach antenna cable (cables) to antenna (antennas). ***(critical if amplifier is installed)***
2. Connect 1 channel of the LAB power supply set at 9 VDC to server (don't turn on) connect the second channel also set at 9VDC to the client. (don't turn on yet)
3. Attach an RS232 cable with adapter to the client and server motherboards as indicated on the setup photograph.
4. Make sure the computer is running and that 2 copies of Comdebugger software are loaded. One set to COM 7 and the other to COM 8
5. Turn on the Lab Power Supply, verify the current draw meets minimum and maximum requirements for the system being tested.
6. Test Technician must load the correct MAC configured for the system as indicated on the build sheet. (Incorrect software may damage the amplifier or other components).
7. After the COM software provides confirmation of a successful software load, turn off the Lab Power supply.
8. The technician must complete the following QC tests.
9. Confirm power supply is off.
10. Connect client PCB to the video monitor.
11. Connect server PCB to video source.

NOTE: Systems with amplifier.
The external heat sink is NOT attached at this point; DO NOT leave the system running for more than 5 minutes during system testing or damage to the amplifier may occur.

12. Turn on the server and client power supplies and verify a link is established.

13. Observe the video latency, link rate and current consumption of each system; observe the quality of the video picture. Note your findings on the build sheet.

14. Turn off the 2 systems and disconnect the power supplies

15. Recheck all connections and confirm all loose wires are secure, all connectors (Power and RF) are snug. Note any errors on the build sheet.

16. For the Omni Antenna versions (Rubber Duck), leave the antennas loose to be packed in the box. For IP (internal Patch) antennas, secure the antenna to the internal mounting plate making sure the screws are secure and SMA connectors are securely attached to its mating cable or amplifier (as per the build sheet).

17. Close the top of the enclosure and **attach all necessary identification labels as indicated. Attach the FCC labels as indicated on the back of the enclosure (See Below)**.

18. Wrap the front face of the enclosure with low tack protective sticky plastic.

19. Pass the system (PAIR) and any accessories to the packaging department with the serial number labels to be placed on the outside of the box and hand in the build sheet.
20.

FCC & IC Label for Exterior Placement