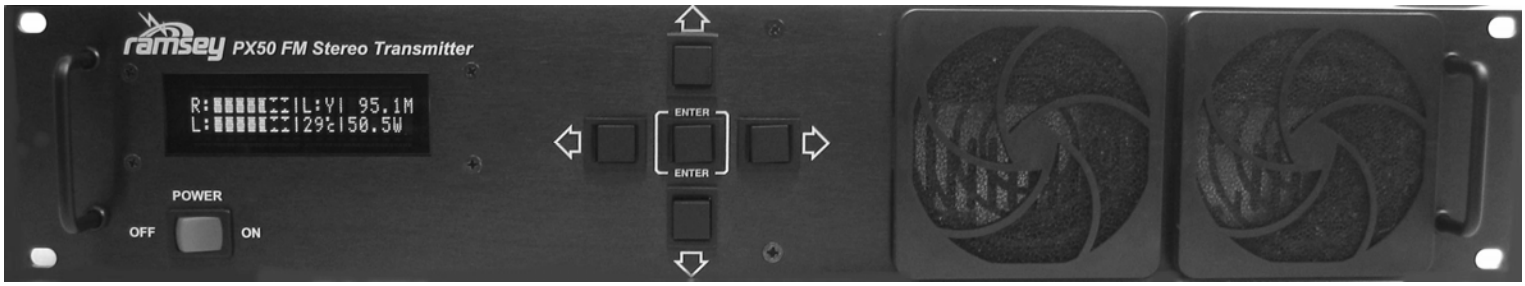
PX50

COMMERCIAL FM STEREO TRANSMITTER



PX50 COMMERCIAL FM STEREO TRANSMITTER

Owner's Manual

Ramsey Electronics Inc. 590 Fishers Station Drive Victor, NY 14564
Tel: 585-924-4560 Fax: 585-924-4555

FCC Labeling, Warning and Information to User Requirements

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 provided 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.

Warning: Changes or modifications not expressly approved by Ramsey Electronics, Inc. could void the user's authority to operate the equipment

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.

Ramsey Publication No. MPX50
Price $10.00

INSTRUCTION AND CALIBRATION
MANUAL FOR

PX50 COMMERCIAL FM STEREO TRANSMITTER

TABLE OF CONTENTS

RAMSEY ELECTRONICS, INC.
590 Fishers Station Drive
Victor, New York 14564
Phone (585) 924-4560
Fax (585) 924-4555
www.ramseyelectronics.com

INTRODUCTION

The PX 50 is a 50 Watt FM Stereo Transmitter/ Exciter. It is frequency-agile, and can be programmed via the front panel to any frequency within the 87.5 to 108.1 MHz commercial FM broadcast band. Output power is adjustable from 1 to 50 watts.

The Interface Screen, is a 2 by 20 line Vacuum Fluorescent display. In order to show more information in a small space, options have been broken up into different screens or “pages”. There are 14 screens for the PX50; 9 are adjustment screens, meaning they contain values you can change, and 5 are informational screens containing diagnostics information that you cannot change.

There are 5 buttons used to navigate the display screens and to update settings. The up and down buttons move through the display “pages”. The left and right buttons are used to make adjustments to displayed parameters. An “enter” key programs new settings into the PX50.

USING THE PX50 INTERFACE

This brief tutorial on your PX50 will help you navigate the interface more efficiently.

Here is the list of menu items in order which is accessed using the up down keys.

1. **General Display.** The PX50 defaults to this screen upon power up. It displays frequency, left and right audio levels, the PLL lock, transmitter temperature, and the RF power output.
2. **Audio Display.** This displays the left and right peak hold meters for modulation level setting. 0dBm is five full bars from the right of the display. Try not to exceed this level since it represents close to 100% modulation.
3. **VSWR (Voltage Standing Wave Ratio) Display.** This screen displays the current forward power, reverse power, and VSWR of your antenna - amplifier match. If the VSWR is very poor, the PX50 will automatically reduce power to protect the amplifier stage from damage. Ideally VSWR should be 1.25 or less (1.0 is a perfect match). A higher VSWR indicates a poorer antenna match. This results in reduced transmission range, higher operating temperature in the power amplifier stage, and could shorten the expected life of some components.
4. **Temperature Display.** This allows you to monitor the running temperature of both amplifier stages. The main amp is the 0-4W exciter on the main board, and the power amp is the 0-50W power amp. If either stage reaches a temperature of 75 degrees Celsius, the amplifier will automatically power down to cool for a while. Power will resume once the temperature falls below 60 degrees Celsius. If you experience overheating, it may mean that your ventilation fan is not running or the vents are blocked. Check frequently to be sure the vent fans are not blocked!
5. **Adjust Audio Levels (Adjust Modulation) Display.** The first of the adjustment displays. If controls are not locked (as indicated by a dim display) then you can adjust the audio levels here. This will affect the overall gain of the input amplifiers and will display left and right level meters as well as the summed audio value for both left and right signals. Note the 5th solid bar from the right is 0dBu. To change the levels, use the Left and Right cursor buttons to step the control. Step size is in 0.5dB increments.
6. **Adjust Modulation Display.** This displays the signal levels that are being sent to the VCO of the transmitter. This includes the pilot, L+R audio, and any other signals added in. The two marks on the display indicate where the 100% modulation setting is. During editing mode use the Left and Right cursor buttons to adjust the audio levels to keep the bargraph from just touching the 100% markers. Overmodulation causes breakup on a listener's receiver, and interference with adjacent channels. Press the up arrow once to see the current audio level setting.

   For your convenience there is also an automatic level adjustment. If you press the Enter key for 5 beeps on this display, the PX50 will sample the audio for a period of time and look at all of the peaks. Then it will adjust the audio levels for you to prevent overmodulation.
7. **Audio AGC Display.** This allows you to turn the "smart AGC" feature on and off. With the smart AGC on, the PX50 will constantly monitor the modulation level at the VCO for 100% modulation. If the PX50 exceeds 100% modulation, the AGC code will automatically turn down the audio levels to prevent overmodulation in the future. The smart AGC will hold this new volume level for 10 seconds before slowly raising levels back up to the set volume level. The rate of increase is gradual and will not be detected by your listeners. When an overmodulation event is seen however, the AGC code will turn the gain down instantly. This is called fast attack, slow recovery.

   By default this mode should be left on. In fact the AGC will never affect your gain settings unless you go over 100% modulation. If you have a properly adjusted compressor and/or limiter in front of the

PX50, the AGC will never activate. However, leaving it on provides a safety net to prevent interference with other stations.

8. **Adjust Frequency Display.** Used to program the operating frequency of your radio station in increments of 100 kHz. Use the navigation keys after pressing enter to edit the value. No decimal point is necessary upon entering the frequency.

   This display will also show you the state of the VCO and PLL. The PLL volts shows the voltage currently used to lock the PLL. The higher the frequency, the higher this voltage is. If this display reaches 12V or 0V, the PLL will not lock.

   If the Locked indicator says it is not locked, no RF power is generated. This prevents interfering with other stations while tuning and aligning your PX50; power is automatically set to 0 while adjusting.

9. **Adjust Power Display.** Used to adjust RF output power within the 1-50W range. Note that your Effective Radiated Power (ERP) is a function of your transmitter—antenna—feed line combination. The power display is calibrated based on the measured forward and reflected power at the RF output connector.

   Use the up down arrows to adjust the power setting. The amplifier will track and lock to that power setting as shown on the second line of the display. The PX50 will periodically compare this power setting with the measured output power, and make adjustments to maintain power over a variety of conditions such as reduction in supply voltage, temperature changes, or antenna changes.

10. **Adjust Stereo Mode Display.** Selects stereo or mono broadcast modes. In mono mode the stereo modulator is completely shut down and the carrier is removed. This allows you to transmit a bit further with better sound. Most users will never use this mode other than for troubleshooting purposes. Controls must be in an unlocked condition to allow you to change this setting. Use the left and right keys to toggle this value.

11. **Adjust Station ID Display.** Use the right arrow key or Enter to begin editing the fields and the navigation keys to cycle positions and characters. All characters will be in upper case. A maximum of 6 characters may be used. You can use all of the keys to adjust these values. This is simply designed to let you identify your unit in the event that you have more than one in a building.

12. **Options Display [1].** Auto modes. The top line indicates whether the auto power leveling is on or off. This is the feature that maintains the set power level by periodically checking the output level. If disabled, power adjustments will not be made. Toggle this by using the Left Arrow Key. Default = ON.

    The second line indicates the state of the reflected power (VSWR) protection. Default = ON. Use the Right Arrow Key to toggle. When you change the mode to off, a warning will display on how this mode could potentially damage your transmitter. Press the Enter key to accept this choice, any other key to leave it on.

    If you are broadcasting at high RF levels and the reflected power becomes high, it can cause permanent damage to the transmitter. It is recommended you leave this ON at all times other than for testing purposes.

13. **Options Display [2].** Test timer. This allows you to choose a running time for the PX50 for testing purposes. By turning this on, and selecting a time in the second line, the PX50 will broadcast with the current settings for the selected time before running the power to 0. This allows you to “range test” the PX50 by driving away from the transmitter, and not having to return to power down the unit yourself.

    Reset Defaults. This allows you to reset all of the settings back to default so all values will be the same as when the unit was shipped to you. Press the right arrow twice to perform this.

14. **Controls Locked Display.** Allows you to disable the controls so that they cannot be easily modified. When controls are locked, all of the adjustable displays are dimmed, and the keys for controlling those adjustments are disabled. When the controls are unlocked, all the available keys are usable in the adjustment screens. Remember to turn this back to the locked position when you are finished changing

your settings. Use the left and right keys to change this value.

NOTE: When you make changes to the adjustment screens, the changes are immediately saved to the EEPROM of the microcontroller **when you scroll to the next screen**. If you do not scroll to the next screen, the PX50 assumes you are simply testing this change and will not save it during a power cycle. Be sure to go to the next screen after your changes to assure that they have been saved to persistent memory.

The PX50 has a "Super User" mode with additional screens for trained technicians only. In the event that you accidentally enter super user mode and want to exit, press the right arrow key to Lock the controls on screen 14, and press it again to unlock the controls. Super User mode is now off. Super user mode should only be used by trained technicians with appropriate test equipment, so the functions won't be covered in this manual. Ramsey Electronics, Inc. is not responsible for poorly calibrated equipment that has been altered by the user intentionally or otherwise. If you have changed a setting and need to have it reset please send your unit back to Ramsey for proper calibration.

SETTING OPERATING FREQUENCY:

The PX50 requires an FCC license for operation in the United States. Your FCC license will specify your broadcast frequency, antenna height, and Effective Radiated Power (ERP)

If you are not within the continental United States, It is your responsibility to know the local regulations regarding FM broadcast, and operate in accordance with those regulations.

Should you be in an area that is not regulated, it is NOT sufficient to just "check" the FM band for an empty frequency, using the FM portable radio closest at hand. You must carefully research what FM stations can be listened to with a good system within the transmitting range of your PX50. The most reliable way of finding a truly open frequency on the FM band is to check the band with a very sensitive FM receiving system using an external antenna. If you do not have access to such a radio, most modern car radios (with exterior antenna) are very sensitive and usable to help you know what stations your neighbors really can be receiving on a particular frequency.

In choosing an operating frequency, remember that most "digital-tuning" receivers, whether portable, mobile or hi-fi, are designed to tune in 200 KHz increments and therefore might not receive well a signal operating between these pre-tuned standard broadcasting frequencies. Please study Appendix A of this manual before using your PX50. In America, all frequency allocations are on odd 200 KHz steps, and in other countries they are on even 200 KHz steps.

User Notes:

The PX50 is classified as an LPFM transmitter for stand-alone operation, or as an exciter for higher-powered RF transmitters. It is up to **YOU** as the user to know what your restrictions and rights are as a broadcaster. Remember that ignorance of the law is not a defense.

As per section 15.21 of the CFG 47, any circuit changes or modifications not expressly approved by Ramsey Electronics can void the user’s authority to operate the equipment legally according to the FCC.

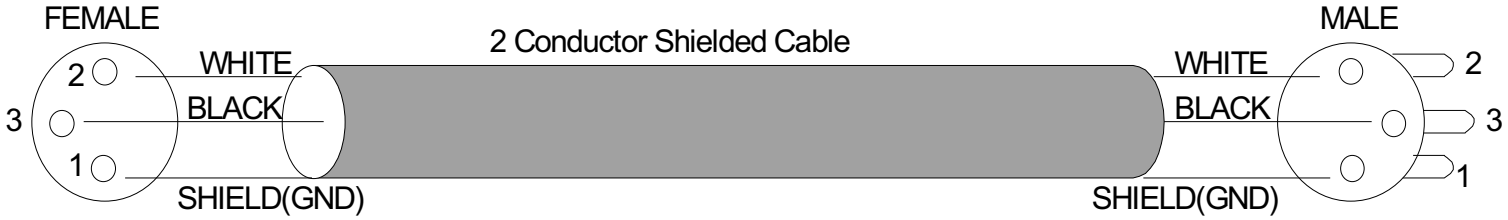
PX50 CONNECTIONS

Audio Inputs:

The PX50 has Left and Right Balanced XLR input connectors. The typical setup will include a mixing console to combine audio sources into balanced left and right stereo outputs, which are in turn connected to the PX50 input. If you are using an audio processor or compressor/limiter, it should be connected between the mixer and the PX50.

XLR connectors provide a balanced connection that rejects common mode noise for a cleaner audio signal. Make sure your XLR connectors are WIRED CORRECTLY! Some manufacturers make them incorrectly, you may want to check the connectors and re-make them to standards if necessary. Current standards dictate that XLR connectors should be wired as follows:

Ground = pin 1, White = Pin 2, Black = Pin 3. Sometimes you will find red instead of white. Both ends of the cable are wired in the same order, per the following diagram.



Across pins 2 & 3 of the XLR inputs look for +4dBu (1.23VRMS) as equivalent of +- 100% modulation. The audio input can take up to a maximum of 20V pk/pk, but then you have to scale the level back down with your audio gain to get acceptable sound.

MPX Input:

If you will be broadcasting on a sub carrier, your SCA encoder is connected here. This connector is also used to input RDS encoded data.

Pilot Output:

This connection provides a 19 KHz pilot for synchronizing your external subcarrier input.

Power:

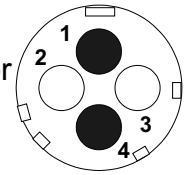
Line power is via a standard equipment cord connection. The PX50 is configured to accept 100 to 240VAC. No adjustments to the power supply are required as long as the AC input is between 100 and 240 VAC.

The PX50 is also equipped for 12V DC power operation. If your are using 12 VDC to power the unit, you do not need to make any adjustments to the settings on the power supply. The provided 12VDC adaptor will mate with the rear panel connector such that your positive wire (Red normally) is connected to the upper contact, closest to the large key tab.

Antenna:

The PX50 has a type N RF connector (50 ohms) for RF output.

Rear Panel 12 VDC Connector (Male)



1 = +12 VDC (Red)
2 = No Connection
3 = No Connection
4 = Ground (Black)

PROGRAMMING THE PX50 TRANSMITTER:

Keep all tests very brief. Ideally setup would be performed in a shielded room, like a screen-room, but most of the time this is not practical. Take steps to avoid causing interference during testing and alignment. The PX50 by default is set to zero power, and will not produce any power until you specify it to.

1. Transmitting Frequency:

You must be connected to an antenna or dummy load to perform this adjustment.

To adjust the frequency you must first enter the *Controls Locked* Display and turn off the lock. Then go to the *Adjust Frequency* Display, and use the Up, Down, Left, and Right to edit the desired frequency. On the frequency display you will see the PLL voltage and a locked indicator. It takes a little while for the PX50 to lock, this is normal. While the PLL is attempting to lock, the RF power output is shut off. Once the PLL locks, go to the *power adjustment* screen, and press the up arrow ten times to get a display of 10 W. Connect your antenna and tune in your receiver to see if it “quiets” at the requested frequency. No audio input is needed to make this first adjustment, you can simply listen for a "quieting" in the normal background noise "hiss."

With your antenna connected, check the VSWR meter to see the quality of your antenna match.

2. Modulation Levels:

The PX50 comes pre-calibrated for modulation levels. The meter on the modulation display is accurate ± 2% based on display limitations, but it will definitely indicate over-modulation. Be sure to set your audio levels so that the bar graphs NEVER pass the 100% tick marker. Use the meter on the right for a peak-hold function to help you see if the peak has been surpassed or not.

Be aware that because of pre-emphasis the PX50’s modulation sensitivity is much higher at 14 kHz than at 1 kHz. Sensitivity to music with plenty of high frequency information such as classical is much higher with pre-emphasis, so you may need to adjust your levels according to the type of music you play most often.

Your PX50 also contains a hard limiting circuit which helps to prevent over-modulation. This circuit will try to keep your modulation levels at 100%, but is not completely effective due to the “knee” of a diode. The idea here is to turn up your levels to a point where the clipper begins to activate, which in our case is when the bar meters are touching 100%, but not above that. Much above that and you will begin to over-modulate slightly due to this knee (a common problem in many clippers) Fast signal transients then are “clipped” off, but normally this is performed well below the hearing threshold of a listener.

A clipper is necessary to achieve the loudness levels to make best use of available bandwidth, as well as preventing filter overshoot. Filter overshoot is caused by the “brick wall” audio filters. When there is an abrupt change in frequency response of a circuit, you will get overshoot or ringing due to that fast change in response. If a sharp waveform such as a square wave is sent into the PX50, an overshoot of 6 dB or greater can be seen at the output of the filters. This overshoot is undesired signal, and uses a fair chunk of your modulation bandwidth. The clipper takes care of this and removes it for you so that you may run the PX50 much “louder” than without it.

3. Stereo balance:

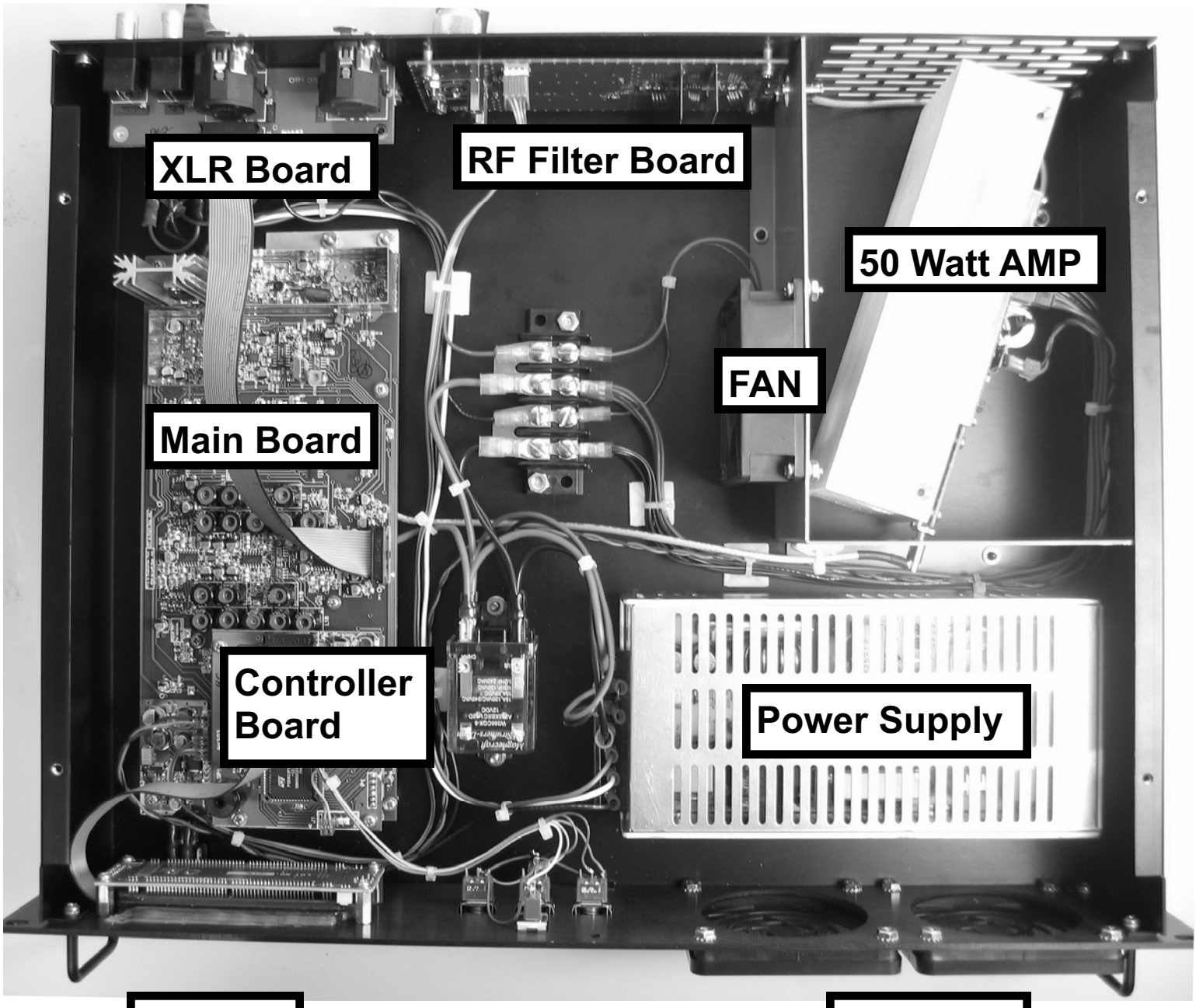
The PX50 comes pre-calibrated for balance. All audio level adjustments are done simultaneously and equally on both channels. If you need balance control, your mixer should provide that for you.

4. Stereo Vs. Mono operation:

Since the PX50 has a limiter contained inside and clips at a very specific level, you will need to run your mono signal into both the left and right channels simultaneously. If you do not, and try to run with only the left or right input, the clipper will take effect much sooner than desired and will not allow you to modulate to ± 75 kHz but instead to only ± 50 kHz. Be sure to make a “Y” adapter to parallel your audio source into both the left and right inputs.

To make a “Y” adapter, simply use two male XLR connectors connected in parallel on one end of the wire. This means connect 1 to 1, 2 to 2, 3 to 3, etc. Then use the diagram on page 9 as your guide for the rest.

PX50 Internal Layout From Top



APPENDIX A: HIGH POWER TRANSMISSIONS

The PX50 requires an FCC license for operation in the United States. Your FCC license will specify your broadcast frequency, antenna height, and Effective Radiated Power (ERP)

In the US, LPFM licenses are a new and evolving area of the FCC regulations, it is your responsibility to understand and obey these rules.

To get copies of the latest rules in the LPFM section, call the US Government, Superintendent of Documents, at 202-512-3238, or fax them at 202-512-2250.

Complete and current Information is also available via the internet at http://www.fcc.gov.

It is the policy of Ramsey Electronics, Inc., that knowing and observing the lawful use of all products is a first responsibility of our customers. We do not endorse any unlawful use of any of our products. Further, it is the policy of Ramsey Electronics, Inc., to cooperate with all applicable federal regulations in the design and marketing of our electronic products. We urge all of our overseas customers to know and observe the regulations of their own national telecommunications authorities.

In all instances, compliance with FCC rules in the operation of what the FCC terms an "intentional radiator" is always the responsibility of the user of such an "intentional radiator".

APPENDIX B: TROUBLESHOOTING

PROBLEM: Nothing happens at all when I turn it on.
SOLUTION: Check your fuse. If it is blown, replace it. If it blows again, there is something seriously wrong somewhere in your PX50. Send it in for repair. Also check your power source; if you are operating from 12VDC, you may not have heavy enough wire or enough current to run the PX50.

PROBLEM: Everything seems to work, but I have no transmission power!
SOLUTION: The PX50 has an intelligent integrity checker built in. At a constant rate the PX50 checks the VSWR and frequency lock of the transmitter. If either of these are not within a set range, the power output is turned off for protection. To get your unit transmitting, first make sure the PLL display says LOCKED, then check your antenna wiring. If the antenna is shorted in the cable, or open, the VSWR will be very poor and it will cause the power to be shut off. Once you have corrected your antenna problem, try turning up the power again. If it still doesn't transmit, check the Power Adjust Display to make sure the setting isn't turned all the way down. Also check your operating temperature; if it is over 60 degrees Celsius, check the fan for blockage.

PROBLEM: I can't get the PLL to lock!
SOLUTION: At the extreme ends of the frequency band, the PLL may not lock if the power supply is low, for example running from batteries. Try another frequency towards the middle of the band to see if it locks. If it still does not, call Ramsey for more information.

PROBLEM: One channel out completely, other one sounds OK.
SOLUTION: More than likely a short or open somewhere in your cabling or equipment. If the bargraph meters on the Audio Level Display are not indicating levels, there is no audio entering the PX50.

PROBLEM: Very distorted sound on a receiver.
SOLUTION: Turn down your Audio level controls. To make the job easy, go to the Deviation Adjust Screen and use the auto-adjust feature. This should tone down the modulation levels so they are within the specifications for FM stereo transmissions. If you have to adjust the audio to ridiculously low levels to make it sound OK, maybe you are over-modulating. Go to the modulation display and hold the Enter key for a few seconds to let the PX50 calibrate itself.

PROBLEM: Temperature readings are very high (over 60C).
SOLUTION: Your rack or mounting method is preventing the heat from escaping. You will need a fan to circulate air around your components, especially the transmitter. A transmitter by nature requires and generates a lot of power, but a good portion of it is produced as heat. Some people will mount equipment in a closet or closed rack. This is generally a bad practice unless you have ventilation fans to circulate fresh cool air into the enclosure.

PROBLEM: Lots of AC hum in the audio on the tuner.
SOLUTION: You may have a ground loop problem with your equipment. Make sure you have a common ground for all components, and that you have the high power transmission antenna a good distance from the audio equipment (at *least* 30 feet away for anything over 5 watts). Also be aware that when a receiver is too near the high-power transmission, hum will be heard when the receiver is overloaded.

PROBLEM: PX50 didn't save my changes!
SOLUTION: Normally when you are in a screen editing a value, the PX50 thinks you are trying out some settings, sort of like a "scratch pad" mode. It is assuming that you may make some more changes so it doesn't waste time saving all changes. In order to actually save these settings to non-volatile memory, you can flip to a different screen to have the values saved.

PROBLEM: I have bad VSWR.
SOLUTION: Your antenna is no good or your antenna wiring has a problem. While the transmitter will still turn on the power in some pretty adverse loads, be advised that this is not a good way to operate. It may cause your amplifier to do unintended things like self-oscillate, which can cause a serious interference problem, or it could cause your amplifier to overheat. You may wish to consider purchasing a professional grade antenna and wiring to make the best of your PX50. Check out the FM antennas Ramsey offers; you'll find them in the Antennas section of our website at www.ramseyelectronics.com. Also consider getting good cabling that is rated at 50 ohms impedance with low loss. No, 75 ohm cable TV coax WILL NOT WORK! And neither will a length of wire hanging out of the antenna jack. You MUST use a good antenna.

You may even consider using hard-line cable if you have a long run to the antenna, such as running up a tower. Hard-line is a good investment since it is low loss, and very durable. Also be sure to use as few adapters and connectors as possible. Connectors can cause power loss, and can be felt getting quite hot during normal operation, which indicates a large loss of power.

PROBLEM: I just can't get the unit to work!
SOLUTION: Give us a call at (585) 924-4560 or email us at techsupport@ramseymail.com. While some problems can be answered on the phone, others cannot. Read the warranty information in the manual for information on how to send your unit in. Upon its return it will be fully functional according to our specifications.

APPENDIX C: OPERATING TEMPERATURE CHARACTERISTICS

The following table is provided for your reference for normal operating conditions of the PX50. Use what the display on Screen 04 reports for operating temperature, a known good thermometer, and the following chart to verify your PX50's temperature is operating within established parameters . If your temperatures are significantly higher; it may be time to either, clean the filters, clean the dust out of the inside of the PX50 with a dust-vacuum, or check your VSWR for a good rating.

Running the PX50 hot will shorten its lifespan considerably, especially at temperatures over 60 degrees Celsius. Be sure to use this product in a well ventilated or air conditioned room, and DO NOT BLOCK THE AIR VENTS! The PX50 does have over-temperature protection, but it is meant to shut down only at extreme temperatures to prevent short-term damage. The normal shutoff temperature is 75 degrees C.

Power Output (In Watts)	Power Amp Operating Temperature Above Ambient (In degrees Celsius)	Driver Amp Temperature Above Ambient (In degrees Celsius)
50W	9	14
40W	9	13
30W	9	12
20W	9	12
10W	7	11
1W	4	9
0 W (Off)	2	7

Notes and Observations:

PX50 SPECIFICATIONS

- **Power:** 100 to 240VAC, 50/60 Hz at 2.5 Amps; or 12VDC at 10 Amps.
- **Broadcast Modes:** Stereo / Mono + SCA and Digital RDS Inputs.
- **Bandwidth:** ± 75 kHz when properly adjusted, auto adjust feature prevents over-modulation.
- **Separation:** Better than 50 dB (typical 60-70 dB)
- **Cross-Talk:** Better than 50 dB.
- **Asynchronous:** Better than 60 dB
- **THD:** Better than 0.3% with processing.
- **Audio Inputs:** Standard Balanced Inputs, 0 dBm, 775 mV RMS, 2.2 Vpp. –10 to +10 dBm range.
- **SCA and Digital Inputs:** BNC (50 Ohms).
- **RF Output:** 50W Continuous (Max) into a 50 ohm load. Fully adjustable from 1 watt to full power. "N" Connector output. Calibrated meter displays exact transmitted power into any load.
- **RF Filter:** Better than 90 dB down at second harmonic.
- **Case:** Standard 2 unit rack-mount case, 19” wide, 15" deep, 3.5" High.
- **Display:** 2 lines x 20 characters florescent display.
- **Controls:** 5 navigation controls (Up, Down, Left, Right, Enter).
- **Cooling:** High CFM Fan, Front intake, rear exhaust.
- **Over-Power Protection:** Continuously checks for proper power output to within 5%.
- **VSWR Protection:** Continuously VSWR monitoring with auto level control.
- **Over-Temperature Protection:** Auto over-temperature control, 75 degree C max.
- **Over Modulation Protection:** Auto control of modulation levels.
- **Displays:** Temperatures of preamp and final amp. Left and right audio levels, VCO voltage, Modulation Levels, Calibrated Output Power based on a directional coupler, and all user adjustable controls.
- **RF Frequency range:** 87.5 MHz-108.1 MHz in 100 kHz steps. Phase-Locked to crystal for better than 1ppm frequency accuracy. Frequency selection automatically adjusts modulation levels to compensate for variances in modulation sensitivity.
- **Audio Frequency range:** 20 Hz to 16 kHz ±1 dB. Steep "brick wall" 16 kHz low pass filter, down 68 dB @ 19 kHz and above.
- **Adjustments:** Audio input levels (4095 steps), Modulation Level (4095 steps), Power Level, Frequency (In 100 kHz steps), Stereo/Mono mode, Auto Adjust Modulation mode (On/Off).

Meets or exceeds all FCC and CCIR requirements. (Pending approval)

***A**ll specifications are subject to change.*

PX50 PROFESSIONAL STEREO TRANSMITTER INSTRUCTION MANUAL
Ramsey Electronics publication No. PX50 Revision 1.0
First printing: October, 2003 MRW

The Ramsey Test Equipment Warranty

Notice that this is not a "fine print" warranty. We want you to understand your rights and ours too! All Ramsey pre-assembled units were wired and tested at the factory. We give you our assurance that a team of knowledgeable technicians has field-tested it prior to shipping. If you need help, please read through your manual carefully. All information required to properly set up and operate your unit is contained within the pages!

1. WARRANTY:
All factory assembled Ramsey products are covered by a one-year warranty from the date of purchase on parts and workmanship.

2. FACTORY REPAIR OF PRODUCTS:
Factory repair is available for products no longer covered by the warranty at a basic, flat repair fee. To qualify for Ramsey Electronics factory repair, units MUST:

1. NOT be modified in any manner;
2. BE returned in fully-assembled form;
3. BE accompanied by the basic repair fee or validated form of payment.
   (Note: No repair will be undertaken until we have received this.)

3. RETURNING PRODUCTS:
Whether returning a product under warranty or for non-warranty repair, you must call for a Return Materials Authorization number. When sending us your equipment include the filled-out RMA form to facilitate scheduling and tracking.

4. REFUNDS:
You are given ten (10) days to examine our products. If you are not satisfied, you may return your unit with all the parts and instructions and proof of purchase to the factory for a full refund. The return package should be packed securely. Insurance is recommended. Please do not cause needless delays; read all information carefully.

PX50
COMMERCIAL FM STEREO TRANSMITTER

REQUIRED ITEMS

- Antenna designed for FM 88-108 transmissions. VSWR better than 1.5 at operation frequency recommended.
- 50 ohm cable to connect the antenna to the PX50.
- An audio source.
- 12VDC @ 12 AMPS , 100—240VAC, 50/60 Hz @ 2.5A.
- **Federal Communications License if operating within the continental USA. Other licenses where applicable.**

RAMSEY ELECTRONICS, INC.
590 Fishers Station Drive
Victor, New York 14564
Phone (585) 924-4560
Fax (585) 924-4555
www.ramseyelectronics.com

Price: $10.00
Ramsey Publication No. MPX50
Instruction manual for:
RAMSEY MODEL NO. PX50