

# INSTALLER'S REFERENCE

THIS DOCUMENT HAS BEEN CRAFTED TO MAKE INSTALLATION, SYSTEM EXPANSION AND TROUBLE-SHOOTING, A QUICK AND EASY PROCESS. THE INFORMATION PROVIDED, SHOULD BE REVIEWED PRIOR TO INSTALLING AND/OR ADJUSTING THE 403a.

## CONNECTING THE HEAD UNIT

The 403a is a three channel, full-range, 400 Watt amplifier. It is equipped with a 2 pair of RCA input jacks to simplify connection to a standard two or four channel head unit.

Both front and rear inputs must be used when the amplifier is in the 4 channel mode. Only front inputs need be used when you select 2 channel mode on the 2/4 channel jumper. When this procedure is followed, the signal available at both RCA input jacks will be identical. If you intend to utilize the amplifier's RCA output jacks to supply a stereo signal to another amplifier, you must supply a stereo signal to the inputs.

## INPUT SENSITIVITY

The input stage of the 403a incorporates Xtant's *Balanced Line* circuitry. This circuitry may be "enabled" or disabled ("defeat") via the *Balanced Input Mode Jumper* located above and to the left of the RCA input jacks. With the *Balanced Line* circuitry "engaged", the input sensitivity ranges from 100 mV to 17 Volts. When in the "defeat" mode, input sensitivity ranges from 100 mV to 8 Volts. Input sensitivity is adjustable in 10 dB steps via the *Input Gain Select* jumper located above the *Balanced Input Mode Jumper*. Each of the five jumper positions correlate to a specific range of input signal levels. A chart detailing jumper position to input signal levels is located on the opposite side of this "Installer's Reference".

The amplifier is shipped with the *Input Gain* set at the +10 dB position. If you do not know the output signal level of the head unit and you want to change the factory setting, simply move the jumper to the +20 dB position to increase the gain. Move the jumper to the 0, -10 or -20 dB position to decrease the gain.

The input circuitry operates similar to a line driver by increasing the signal level when placed in the +10 and +20 dB positions. The following chart illustrates this function:

INPUT VOLTAGE MULTIPLYING FACTOR		
INPUT JUMPER POSITION	=	MULTIPLYING FACTOR
+20 dB	=	10
+10 dB	=	3
0 dB	=	1
-10 dB	=	.3
-20 dB	=	.1

(ie: A head unit with 300mV output with input jumper @ +20dB = 3 Volts input)

The input stage may be over-loaded by a high-level signal if the input gain is set too high. If this should occur, simply reduce the input sensitivity setting.

## USING THE BALANCED LINE CIRCUITRY

The *Balanced Line* circuitry provides two unique features which add versatility to your head unit selection. First, the *Balanced Line* circuitry increases the input sensitivity to 17 Volts when receiving a signal from a balanced source and, secondly, isolates signal ground. These two features allow connection with OEM factory head units and high-powered (BTL) head units. The *Balanced Line* circuitry will also accept a speaker level input signal. **If the head unit has a *Floating Ground* output, you must "enable" the *Balanced Line* circuitry prior to connecting the head unit. Failure to "enable" the *Balanced Line* may result in damage to the head unit.**

The *Balanced Line* circuitry also helps eliminate noise (ie alternator whine) induced into the signal cables. If you are experiencing a noise problem, simply "engage" the *Balanced Line* circuitry. If the problem continues, call Xtant Technologies' Customer Service at 888-449-8268 for assistance.

## ADDING ACCESSORY MODULES

The 403a is equipped with five accessory docking ports. The four ports dedicated to the amplifier are labeled *Amp Vert/ Horiz Acc. Port* and *Amp Vert. Acc. Port*. The fifth port is dedicated to the RCA line outputs and is labeled *Line Out Vert. Acc. Port*.

Xtant offers two types of accessory modules which are designed for either "Horizontal" or "Vertical" mounting. The docking port, located behind the RCA line outputs, labeled *Amp Vert/ Horiz Acc. Port* will accept any module, while the ports labeled "Vert" will only accept modules designed for vertical mounting.

The four accessory ports dedicated to the amplifier allow you to add the level(s) of signal processing that your system requires. An example would be if a *band pass function* is required, a CM12H (high pass at the lowest frequency of the band pass) and a CM12L (low pass at the highest frequency of the band pass) could be used to create a 12 dB per octave band pass filter. A more basic set-up would be a PQM-1 EQ module and a CM 12 crossover module.

The *Line Out Vert. Acc. Port* will only accept one of the "vertical" accessory modules. This will allow bass equalization or a crossover function to be dedicated to the RCA line outputs. If a module is not used (jumpers in place), signal is still present at the RCA outputs.

## FUSING

The 403a does not have an on-board fuse. **An out-board, 60 Amp fuse must be added at the positive terminal of the battery.** For added safety, an outboard 60 Amp *service* fuse may also be added close to the amplifier.

## CONNECTING THE WIRES

Xtant recommends that all wires be terminated with "spade" or "ring" style connectors. **Care should be taken not to strip the Power, Ground, Remote Turn-On lead and Speaker Wires over or near the exposed circuit board. If a stray wire falls on the board and power is applied to the amplifier, failure may occur!**

There are five sets of speaker terminals provided on the 403a. The outputs labeled *Chan 1 and 2* are a direct connection to the amplifier. The terminals labeled *Passive Chan 1 and 2* only become active when one of Xtant's RM Modules is installed on the module port towers. These terminal are connected in parallel to the main terminals via the RM Module. The terminals labeled mono are a direct connection to the amplifier's mono channel.

For high-powered, bridged operation, connect the speaker(s) to the Channel 1 "plus" terminal and the Channel 2 "minus" terminal. The speaker load across the bridge should be 4Ω or higher. With an RM Module installed, a bridged connection can be made across the "passive" terminals. This output will be attenuated based upon the value of the RM module installed. If a bridge connection is made across both sets of terminals, each speaker load must be 8Ω or higher.

## RESISTOR MODULES

The RM Modules serve two purposes – They activate the "passive speaker terminals" while adding attenuation to any speakers connected to these terminals. Normally, the "passive terminals" are used for the rear fill speakers but any speakers (ie tweeters / center channel) that you desire to attenuate (turn down) may be connected to these terminals. The RM Modules offer four levels of attenuation: -4, -8, -12, or -16 dB. The appropriate RM Module is dependent upon speaker efficiency and the distance of the listener to the speakers. In a pick-up truck, where the rear speakers are in relatively close proximity, the higher value RM 12 or RM 16 may be appropriate. In a sedan or coupe, the RM 4 or RM 8 may be better suited. The modules are easily interchanged and a little experimentation will help you determine the best value.

## SERVICE JUMPER

This jumper breaks the connection of the Remote Turn-On lead. It has been provided to allow easy "turn-off" and "turn-on" of the amplifier during the fine-tuning process. With the amp playing, simply move the *Remote Turn-On* jumper to *Amp-Off* position, make your adjustments and move the jumper to the *Enable* position to turn the amp back on

## OUTPUT GAIN

The output gain for each channel is controlled by board-mounted potentiometers. These pots independently adjust the output level of each channel. Xtant suggests setting this level in conjunction with any equalization or signal processing equipment in the system. Output gain is adjusted independently from the *Input Gain Select*.

If your customer desires max output, don't be afraid to adjust the *Input Gain Select* to +20 and turn the output gain pot wide open (full clockwise rotation). If you should encounter distortion (input clip), turn the amp off via the *Remote Turn-On* jumper and reset your *Input Gain Select* to +10. Place the *Remote Turn-On* jumper to the "enable" position and audition the system. Repeat this process if distortion (input clip) continues. The object is to pass as much input signal as possible without over-loading the input stage. Finally, adjust the output pot for desired "max" volume setting on the head unit's volume control.

## DIAGNOSTIC LED's

The **Red LED** indicates that the amplifier is on.

The **Yellow LED** indicates that an over-current condition (low impedance) exist and will turn the amp's output power down to maintain uninterrupted operation. The Yellow LED will light if a speaker load falls below the 403a's 2Ω rating and/or a speaker lead / speaker voice coil is shorted.

The **Orange LED** indicates that an over-heating condition exists and will turn the amp's output power down to maintain uninterrupted operation. The Orange LED will light if the heatsink temperature exceeds rated spec due to a blocked air intake or exhaust opening. If the fan should fail, the Orange LED will also light.

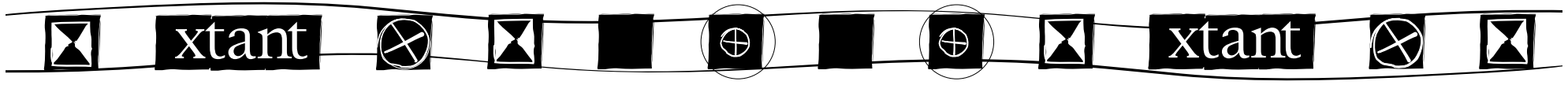
## TROUBLE SHOOTING

Symptom/Condition	Cause	Solution
Red LED <u>not</u> on. No Sound.	Loss of 12V Power at Amplifier	Check out-board fusing Check +/- 12 Volt connections Measure for + 12 Volts or higher @ amp. Check Turn-On lead
Red LED on. No Sound.	No Input Signal	Check integrity of RCA cables Check connection at amp and head Unit.
Red LED on. No Sound.	Loose Speaker Wires	Check integrity of speaker connection at amp and speakers.
Red LED on. No Sound.	Lack of Turn-On Voltage	Voltage @ Turn-On lead needs to be 8 Volt minimum
Red LED on. No Sound.	Missing Accessory Port Jumper	Check Port Jumpers, two jumpers per port are required. Check jumper alignment, jumper must be seated properly.
Red LED on. No Sound.	Accessory module not installed properly	Be sure "key" on module connector and port are aligned when installing module. Reseat module to insure proper connection.
	Alternator/System Noise	"Enable" Balanced Input
	Induced noise / ground loop	



# INSTALLER'S REFERENCE

## XTANT 403A



### REMOVE AMPLIFIER COVER

DO NOT REMOVE PROTECTIVE COVERING UNTIL INSTALLATION IS COMPLETE.

### TEMPORARILY MOUNT AMPLIFIER

THE AMPLIFIER IS DESIGNED TO BE ANCHORED THROUGH THE FOUR HOLES LOCATED ON THE CIRCUIT BOARD/BASE ASSEMBLY.

### MARK WIRES FOR TERMINATION

DETERMINE WIRE LENGTHS FOR POWER, GROUND, REMOTE, & SPEAKER CABLES. MARK FOR CUTTING/TERMINATION. REMOVE 403A. CUT AND TERMINATE ALL WIRES. CAUTION: STRIPPING WIRES OVER THE CIRCUIT BOARD MAY CAUSE PRODUCT FAILURE.

#### ① BALANCED INPUTS

MAKE ALL INITIAL ADJUSTMENTS AT YOUR WORK BENCH. TO SELECT "BALANCED INPUT" FOR OEM INTEGRATION OR INDUCTIVE NOISE CANCELLATION, MOVE THE TWO JUMPERS, LOCATED ABOVE AND TO THE LEFT OF THE RCA INPUT CONNECTORS TO THE "ENABLE" POSITION.

#### ② INPUT GAIN

THE INPUT GAIN IS FACTORY PRESET AT +10dB AND WILL WORK WITH AN INPUT SIGNAL OF 300mV TO 1 VOLT. TO INCREASE THE GAIN, MOVE THE JUMPER TO THE +20dB POSITION. TO DECREASE INPUT GAIN, PLACE JUMPER IN THE 0, -10, OR -20dB POSITION.

#### ③ INSTALL ACCESSORY MODULES

AT YOUR BENCH, ADJUST CROSSOVER MODE JUMPERS AND CHANGE CROSSOVER FREQUENCY SIPS. REMOVE PORT JUMPERS AND INSTALL MODULE(S) - OBSERVE "KEY" ON CONNECTOR FOR PROPER FIT. ADJUST PQM-1 OR LFQ 45 EQ MODULES AFTER AMP IS MOUNTED.

#### ④ MOUNT THE AMPLIFIER AND CONNECT SPEAKERS

TWO PAIRS OF SPEAKER TERMINALS ARE PROVIDED. THE ATTENUATION FUNCTION OF THE TERMINALS LABELED ⑤ "PASSIVE" IS ONLY ACTIVATED WHEN XTANT'S "PASSIVE ATTENUATION BOARDS" - RM 4, RM 8, RM 12 OR RM 16 ARE INSTALLED.

#### ⑥ CHANNEL INPUT MODE JUMPER

BOTH FRONT AND REAR INPUTS MUST BE USED WHEN THE AMPLIFIER IS IN THE 4 CHANNEL MODE. ONLY FRONT INPUTS NEED BE USED WHEN YOU SELECT 2 CHANNEL MODE ON THE 2/4 CHANNEL JUMPER.

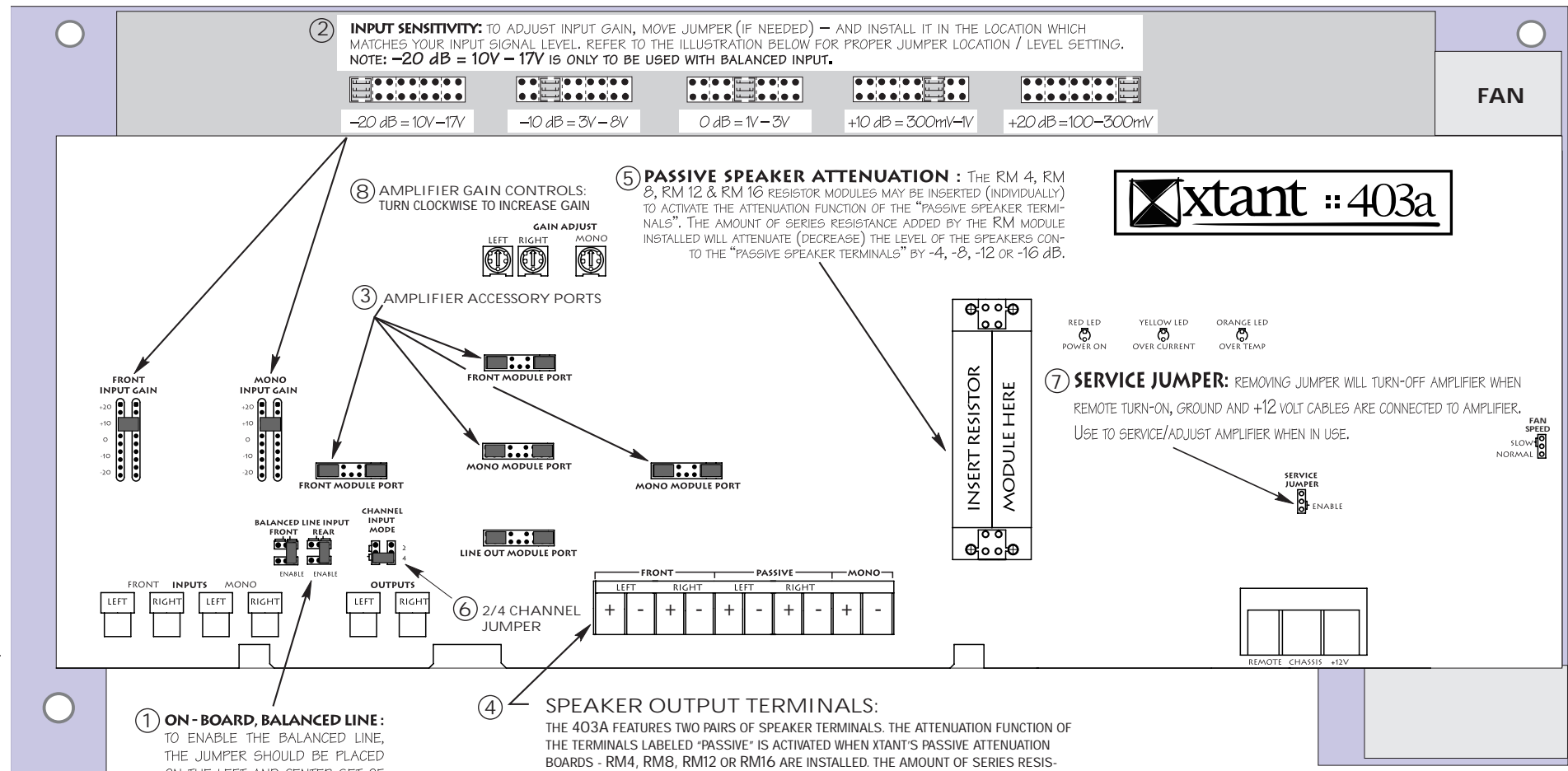
### MAKE REMAINING CONNECTIONS

DOUBLE CHECK ALL CONNECTIONS! TURN ON AMPLIFIER. CHECK RED LED, IT SHOULD BE ON. IF ANY OTHER ADJUSTMENTS NEED TO BE MADE (CROSSOVER MODULES/INPUT GAIN ADJUSTMENT)

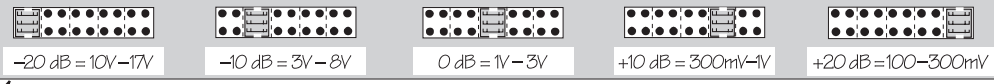
THE ⑦ SERVICE JUMPER MAY BE USED TO TURN THE AMP OFF. MAKE ADJUSTMENTS AND PLACE JUMPER IN THE ENABLE POSITION TO TURN THE AMP BACK ON.

#### ⑧ ADJUST OUTPUT GAIN TO SET SYSTEM LEVEL.

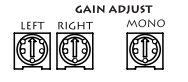
AFTER FINE TUNING THE SYSTEM, REMOVE PROTECTIVE COVERING AND SPRAY A LIGHT COATING OF WD40™ ON A SOFT CLOTH AND CLEAN COVER.



② **INPUT SENSITIVITY:** TO ADJUST INPUT GAIN, MOVE JUMPER (IF NEEDED) — AND INSTALL IT IN THE LOCATION WHICH MATCHES YOUR INPUT SIGNAL LEVEL. REFER TO THE ILLUSTRATION BELOW FOR PROPER JUMPER LOCATION / LEVEL SETTING. NOTE: -20 dB = 10V - 17V IS ONLY TO BE USED WITH BALANCED INPUT.



⑧ **AMPLIFIER GAIN CONTROLS:** TURN CLOCKWISE TO INCREASE GAIN



⑤ **PASSIVE SPEAKER ATTENUATION :** THE RM 4, RM 8, RM 12 & RM 16 RESISTOR MODULES MAY BE INSERTED (INDIVIDUALLY) TO ACTIVATE THE ATTENUATION FUNCTION OF THE "PASSIVE SPEAKER TERMINALS". THE AMOUNT OF SERIES RESISTANCE ADDED BY THE RM MODULE INSTALLED WILL ATTENUATE (DECREASE) THE LEVEL OF THE SPEAKERS CONNECTED TO THE "PASSIVE SPEAKER TERMINALS" BY -4, -8, -12 OR -16 dB.



RED LED POWER ON  
YELLOW LED OVER CURRENT  
ORANGE LED OVER TEMP

⑦ **SERVICE JUMPER:** REMOVING JUMPER WILL TURN-OFF AMPLIFIER WHEN REMOTE TURN-ON, GROUND AND +12 VOLT CABLES ARE CONNECTED TO AMPLIFIER. USE TO SERVICE/ADJUST AMPLIFIER WHEN IN USE.

① **ON - BOARD, BALANCED LINE :** TO ENABLE THE BALANCED LINE, THE JUMPER SHOULD BE PLACED ON THE LEFT AND CENTER SET OF PINS. TO DISABLE, REMOVE JUMPER AND PLACE IT ON THE CENTER AND RIGHT SET OF PINS. OBSERVE THE LABELING ON THE CIRCUIT BOARD.

④ **SPEAKER OUTPUT TERMINALS:** THE 403A FEATURES TWO PAIRS OF SPEAKER TERMINALS. THE ATTENUATION FUNCTION OF THE TERMINALS LABELED "PASSIVE" IS ACTIVATED WHEN XTANT'S PASSIVE ATTENUATION BOARDS - RM4, RM8, RM12 OR RM16 ARE INSTALLED. THE AMOUNT OF SERIES RESISTANCE ADDED WILL REDUCE THE LEVEL OF THE SPEAKER SYSTEM (ATTACHED TO THE "PASSIVE TERMINALS") BY -4, -8, -12 OR 16 db.

**CAUTION:**  
THE 403A IS NOT FUSE PROTECTED! FOR SAFETY, AN OUTBOARD 60 AMP FUSE MAY BE ADDED CLOSE TO THE AMPLIFIER. A 60 AMP FUSE MUST BE INSTALLED IN-LINE WITH THE POWER WIRE AT THE BATTERY.

**CAUTION: SHARP EDGES**  
**BE CAREFUL WHEN HANDLING TOP AND BOTTOM METAL.**