



# **DA206 AND DA412**

## **ANALOG AUDIO DISTRIBUTION AMPLIFIERS**

### **OPERATING AND MAINTENANCE MANUAL**



© Copyright 2011, ATI Audio Inc.

## DESCRIPTION

The DA206 and DA412 Analog Audio Distribution Amplifiers provide two (DA206) or four (DA412) 1X3 distribution amplifier channels with balanced inputs and outputs. A master gain adjustment for each channel controls all three outputs together to adjust for varying inputs, while individual trimmers for each output allow adjustment over a 20dB range to accommodate -10dbu semi-pro up to +8dBm line levels.

Another of the DA206 and DA412 Distribution Amplifiers many claims to fame is the use of XLR type input and output connectors. XLRs are easy to use but make paralleling inputs for 1X6 or 1X12 operation difficult. However, if you look under the hood (remove the top cover) you will find some convenient jumper plugs that allow you to parallel inputs A and B (P4 & P5), B and C (P6 & P7), C and D (P10 & P11), individually or simultaneously. If you are making a stereo 1X6 DA, drive inputs A and C with Left and Right signals and jumper inputs A to B and C to D. You can use the empty input connectors to loop-thru to the other dozen ATI distribution amps that we hope you are using.

A rugged NE5532 IC forms the quiet, clean, gain selectable, 20Kohm instrumentation amplifier input stage with good common mode hum rejection. An internal gain selection jumper plug for each input (P2, P3, P8, P9) lets you optimize for nominal inputs at -20dBu, -10dBu or +4dBu. Inputs up to +24dBu will not clip in the +4dBu position and input signals exceeding +24dBu will clip cleanly with no hang-up or phase reversal.

An LF347N quad bi-fet opamp forms the three variable gain output adjustment stages. These variable gain stages use a unique circuit arrangement that allows us to provide a smooth, logarithmic gain control for each output using an inexpensive (but good) linear cermet potentiometer. Since we actually reduce the stage gain for low outputs rather than taking the more conventional approach of reducing the input level to a fixed gain amplifier, you can use the DA at low output levels with very little noise penalty. You can use the DA to match console medium level inputs (-20dBu) or to drive semi-pro IHF inputs without requiring outboard attenuator pads.

SSM2142 active balanced output drivers sense the voltage on their high and low output lines and will shut off drive to a grounded output line while doubling the drive on the other. This capability allows you to connect the outputs to balanced or unbalanced loads without regard to whether or which side of the output is grounded. Maximum output at clipping is +22dBm into balanced loads; however, even though the gain is the same under either condition, clipping output is reduced by 6dB when driving an unbalanced load since the full output swing capability of only one driver of the two is available.

Your DA206 or DA412 operates from a bipolar 15VDC regulated power supply. The power supply is designed for minimum susceptibility to power line transients and conducted RFI using ferrite beads, double bypassing and a non-concentric wound semi-toroidal transformer.

## **INSTALLATION**

### **MOUNTING**

Your DA is designed for rack mounting on standard EIA 1-3/4 inch centers. Each unit dissipates approximately 10 watts and is designed for use in an office environment. Avoid excessive heat buildup (such as might be due to nearby power amplifiers in unventilated racks) to ensure maximum component life.

### **AUDIO CONNECTIONS**

XLR inputs and outputs are wired with pins 2 as HI and pins 3 as LOW. Pin 1 (shield) of all input and output connectors are permanently grounded in accordance with current AES recommendations. The pin 1 grounds are routed via a large, low impedance ground path directly to the chassis separately from any audio ground paths. Internal circuit ground is also connected to the chassis for shielding through an independent path. AC ground (green wire) is also separately grounded to the chassis. Active balanced outputs require a reference ground connection to the receiving device for proper operation. This ground is carried through pin 1. If the pin 1 shield ground is not carried through to the receiving device, the AC ground, rack frame, or studio ground system may complete this ground. Noisy grounds require excellent common mode rejection in the receiving device for quiet system operation.

We have taken measures to keep RFI out of your DA, including split and bypassed input networks, beaded, bypassed and isolated power inputs, nonconcentric wound, semi-toroidal power transformers, double ground plane PC boards and a nice enclosure to keep rain and snow off the circuit boards. However, in difficult broadcast applications, the RF shielding and suppression system can be no better than the ground system into which it is trying to dump the unwanted RF. For optimal product performance, be sure to have a good grounding system

### **ADJUSTMENTS**

The Master and individual Output level controls should all be set close to 2 o'clock to provide nominal +4dBm outputs for a nominal +4dBu input. These settings allow +6/-16dB output adjustment range around nominal, which will allow outputs of +10 to -12dBm to be set. In addition, the Master gain has +10dB to OFF adjustment range to compensate for input level variations from -6dBu to input clipping at +24dBu.

Changing the position of the input gain compensates for lower level inputs by setting jumper plugs P2, P3, P8 and P9. These plugs add 14 or 24dB of extra gain to permit nominal inputs of -20dBu and minimum inputs as low as -30dBu for +4dBm out.

The input paralleling jumper plugs (P4 & P5, P6 & P7, P10 & P11) are located under the cover just behind the input XLR connectors. They must be used in

pairs (e.g.; P4 & P5 together) to properly jumper HI & LO input lines. These jumper plugs let you use a DA206 as a Dual 1X3 or a Mono 1X6, and a DA412 as a Quad 1X3, Stereo 1X6 or a Mono 1X12 DA.

### **230VAC OPERATION**

Your DA is wired for 115VAC, 50/60Hz operation unless otherwise requested at time of order. It can be easily modified for 230VAC operation by removing the power transformer primary jumpers W1 & W3 and inserting a jumper wire in position W2. Different types of attachment plugs or line cords may be required for connection to alternate supply voltages.

### **MAINTENANCE**

Power supply voltages are regulated by A1 and A2 to +15 and -15VDC respectively. IC output DC voltages under no signal, shorted input conditions should remain within 0.1VDC of ground. A greater deviation is an indicator of IC or circuit problems.

Inputs and outputs are susceptible to high common mode and differential AC and DC voltages fed from external devices or appearing on ground.

### **UL LISTING**

The DA206 and DA412 are listed by Underwriter Laboratories as “Listed Professional Audio Equipment 2D65.”

## SPECIFICATIONS FOR DA206 AND DA412

OUTPUT LEVEL:	+22dBm peak into 600 ohm balanced load +18dBm peak, typical, into unbalanced loads
DISTORTION:	THD .10% maximum, 20 to 20,000Hz at peak output IMD .05% maximum, SMPTE measurement
SLEW RATE:	13 Volts per microsecond
RESPONSE:	± .25dB, 20 to 20,000Hz
NOISE:	-95dBm out at maximum gain, 20kHz bandwidth
GAIN:	40dB maximum
CROSSTALK:	70dB minimum at 10kHz, any path
OUTPUT ISOLATION:	70 dB minimum at 1kHz. A shorted output does not affect any other output.
OUTPUTS:	Active balanced, servo controlled, ground sensing, 50 Ohm output impedance, DC coupled. XLR type male connectors, Pin 2-HI, 3-LO, 1-GND.
INPUTS:	20Kohm active balanced, split and RF bypassed. +22dBm maximum input level, 60dB CMR at 60Hz. XLR type female connectors, Pin 2-HI, 3-LO, 1-GND.
POWER:	115/230 VAC ±10%, 47 - 63Hz, 20VA; use .5A, 250VAC fuse, UL listed, ¼ D x 1-1/4 inches long
SIZE:	19" (48.3cm) W X 1.75" (4.45cm) H X 7.5" (19cm) D
SHIPPING WEIGHT	DA206: 5 lbs. (2.3kg) DA412: 6 lbs. (2.7kg)
MODELS AVAILABLE:	DA206 Dual 1X3 Active balanced outputs DA412 Quad 1X3 Active balanced outputs

## One Year Limited Warranty

ATI warrants this product to be free from defects in materials and workmanship to its original owner for a period of one year from date of purchase. ATI will repair or replace such product or part thereof, which upon inspection by ATI, is found to be defective in materials or workmanship.

The Proper Return Authorization Number must be obtained from ATI in advance of return. Contact ATI at 856-626-3480 or email [sales@atiaudio.com](mailto:sales@atiaudio.com) to receive the number and instructions for return of your unit.

A written statement providing the name, address, daytime telephone number and email address of the original owner, together with receipt from the original purchase, and a brief description of any claimed defects, must accompany all returns. Parts or product for which replacement is made shall become the property of ATI.

The customer shall be responsible for costs of transportation and insurance to the factory of ATI, and shall be required to prepay such costs.

ATI shall use reasonable efforts to repair or replace any product covered by this limited warranty within thirty days of receipt. In the event repair or replacement shall require more than thirty days, ATI shall notify the customer accordingly. ATI reserves the right to replace any product that has been discontinued from its product line with a new product of comparable value and function.

This warranty shall be void in the event a covered product has been damaged, or failure is caused by or attributable to acts of God, abuse, accident, misuse, improper or abnormal usage, failure to follow instructions, improper installation or maintenance, alteration, or lightning, power fluctuations and other incidental or environmental conditions. Further, product malfunction or deterioration due to normal wear is not covered by this warranty.

ATI DISCLAIMS ANY WARRANTIES, EXPRESS OR IMPLIED, WHETHER OF MERCHANTABILITY OF FITNESS FOR A PARTICULAR USE, EXCEPT AS EXPRESSLY SET FORTH HEREIN. THE SOLE OBLIGATION OF ATI UNDER THIS LIMITED WARRANTY SHALL BE TO REPAIR OR REPLACE THE COVERED PRODUCT, IN ACCORDANCE WITH THE TERMS SET FORTH HEREIN. ATI EXPRESSLY DISCLAIMS ANY LOST PROFITS, GENERAL, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES WHICH MAY RESULT FROM BREACH OF ANY WARRANTY, OR ARISING OUT OF THE USE OR INABILITY TO USE ANY ATI PRODUCT.

Some states do not allow the exclusion or limitation of incidental or consequential damages or limitation on how long an implied warranty lasts, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

ATI reserves the right to modify or discontinue, without prior notice to you, any model or style product.

If warranty problems arise, or if you need assistance in using your product contact us.