



L200

2-CHANNEL LINE AMPLIFIER

OPERATING AND MAINTENANCE MANUAL



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DESCRIPTION

The ATI Model L200 2-Channel Line Amplifier is an inexpensive, high performance amplifier, which is ideal as a gain block, attenuator, impedance converter, summing amplifier and signal splitter. It is housed in a NanoAmp™ style case which is 1/3 RU wide.

The inputs provide balanced 40Kohm bridging impedance for line levels up to +24dBm. The high input impedance allows the L200 input to also bridge -10dBu lines, such as those found in consumer audio equipment, without loading.

Front panel, screwdriver adjust, full range gain controls provide 26dB gain at full clockwise rotation, unity gain at twelve o'clock and a smooth audio taper to full off.

The output drivers are servo controlled, ground-sensing circuits, which will supply over +22dBm to 600 ohm balanced loads and +20dBu to high impedance, unbalanced loads. The L200 uses rugged XLR type input and output connectors.

Loop-through DC connectors allow several NanoAmp units to share a single external 24VDC power supply. Carry cases, battery packs and DC-DC converters for portable use are also available.

Up to three NanoAmp size units will mount side-by-side in only one rack unit using the available rack mounting kit. Your L200 may also be neatly stacked or mounted side by- side on your desk with the available angled desk mounting kits or horizontal joiner.

CIRCUIT DESCRIPTION

INPUT STAGES

The balanced input stages of the L200 Line Amplifier utilize an FET input LF347 quad opamp in a clean, quiet inverting instrumentation amplifier configuration. Input levels up to +24dBm will be handled without clipping, and excess levels cause only clean clipping without hang-up or phase reversal. Equal -6dB gains from both HI and LO inputs allow unbalanced sources to be easily accommodated. Bridging impedance is a high 40Kohms with good CMR.

GAIN STAGES

A low noise NE5532 provides 26dB maximum gain. Inexpensive linear controls are used in a unique circuit configuration to provide a logarithmic gain control characteristic in a variable gain stage with optimum noise performance. Output noise at unity gain is low enough to allow performance to exceed 16-bit digital dynamic range even at -10dBu nominal output.

LINE OUTPUT

Balanced output stages of the L200 utilize a unique active balanced output driver IC, the Analog Devices SSM2142, that senses whether the connected load is balanced and floating or is unbalanced due to either side being grounded. A balanced output load will be driven with equal and antiphase levels on the HI and LO output lines. An unbalanced (one side grounded) load will cause the driver IC to shut off the signal output to the grounded side of the load and double the output level applied to the other side, thus maintaining equal output to either type of load. The output stage provides 6dB gain and will drive loads of 600 ohms and higher. Nominal output is +4dBm with clipping at +22dBm (10Vrms) into 600 ohm balanced loads for 18dB nominal headroom. Maximum output is reduced to +20dBu (7.8Vrms) when driving an unbalanced load since the full output swing of only one driver is available. This still provides a very comfortable 30dB of headroom above the typical -10dBu nominal unbalanced signal.

POWER SUPPLY

The L200 requires 22 to 30VDC and is supplied with a WA100-1 external 24VDC "Wall Wart" type power supply. (Specify External Power Supply Model WA100-2 for international use at 90-264VAC.) A pair of loop-thru DC connectors on the rear of each module permit several units to be daisy-chained with P/N20602-1 DC power cables to a single power supply. The WA100-1 and WA100-2 are 400mA supplies. The L200 draws 70mA. Any combination of which add up to less than the supply rating can be powered by a single supply.

INSTALLATION

UNPACKING

Inspect the equipment. If there is any visible damage to the unit or to the box it came in, contact the factory but do not return anything to ATI without prior authorization and shipping instructions. It may be necessary to have the shipping company inspect the unit and the box at your location. Count the pieces! Don't throw out the boxes and packing material until you are sure you have everything that is coming to you.

Rack and desk mounting hardware may be packed in with the unit even though ordered separately.

MOUNTING

Single desk mounting kits consist of a pair of angled base plates that mount under the lower front and rear cover screws of a single unit, to raise and to tilt it for easy use. In addition, one or more sets of vertical stacking plates, mounting to the upper front and rear cover screws of the bottom unit, allow multiple units to be stacked. Several units can be desk mounted side-by-side and even stacked side-by-side using horizontal joiner kits together with mounting base and stacker

kits. P/N20617-501 is the angled base kit. P/N20617-502 is the base plus one stacker kit (two high). P/N20617-503 is the base plus two stackers (three high). P/N20617-504 is the stacker kit by itself and P/N20617-505 is a horizontal joiner kit. Rack mount system 21075-501 mounts three units in one rack. When rack mounting fewer than three units, 21097-501 1/3RU Filler Panels are available.

WIRING

AUDIO CONNECTIONS

Balanced XLR type inputs and outputs are wired with pins 2 as HI and pins 3 as LOW. Pin 1 is the cable shield and ground connection. Pin 1 is grounded as shipped but may be floated to interrupt a hum producing ground loop by opening the unit and clipping out the GND LIFT jumpers. For unbalanced lines, use pin 2 as HI and ground pins 3 and 1. Active balanced outputs and inputs require a reference ground connection to the source or receiving device for proper operation. This ground can be provided by the rack frame or a studio buss connection if it is not carried through by the output cable shield.

GROUNDING

Operation in high RF broadcast environments requires special attention to grounding and shielding. The chassis **must** be grounded directly to a good, low impedance studio ground system. Input and output connections must be properly shielded and free of ground loops. It may even be necessary to add shielding to the DC input leads to avoid RF pickup.

POWER DISTRIBUTION

Multiple amplifiers sharing a single wall-wart power supply should be looped through each other using the DC interconnect cables P/N20602-1. Hum and noise performance of the units can be degraded by poor DC ground connections between units sharing a common supply. Use of the recommended rack and desk mounting kits will assure a good ground connection between units by firmly strapping their chassis together. **CAUTION!** The outer shell of the DC interconnect cables is positive relative to the chassis. Do not allow a DC cable plugged into a powered unit to hang loose where it might short against the chassis or rack frame.

OPTIONS

230VAC

The WA100-2 tabletop power supply accepts 90-264VAC/47-63Hz via interchangeable AC input connectors.

Battery Operation

Alkaline battery packs (BBU100-1) and 24VDC converters for operation from 12V belt pack or automotive batteries (DC100-1) power modules are available.

MAINTENANCE

There is no routine maintenance required by your L200 amplifier. If you have a problem, check the front panel LED indicator to assure that the unit has DC power, eliminate by substitution input and output cables, connectors, downstream devices, DC interconnect cables and wall wart power supplies.

POWER SUPPLY LEVELS

The recommended loaded DC input voltage range is 22VDC minimum to 32VDC maximum over the full range of AC line voltage tolerances. The audio circuits continue to work with reduced headroom below 22VDC. Momentary surges up to 36VDC will cause some increased internal heating, but above 36VDC may cause IC failure.

OPERATING POINTS

An internal reference voltage equal to 1/2 the supply voltage is generated. All audio stage IC inputs and outputs should show a DC level equal to this voltage when measured with a high impedance meter. Audio inputs and outputs are capacitor coupled and ground referenced.

MODIFICATIONS

Increased Gain

If more gain is required for a particular application, increase the values of R25 (left) and R34 (right). 20K ohms adds 6dB, 30K ohms adds 10dB, 62K adds 16dB, 100K adds 20dB. A corresponding decrease in the input clipping level will result.

Summing Amplifier

If you wish to sum the inputs, remove the cover and find the jumper plug J4. Move J4 from the parked position so that it jumps both terminal pins. Either input signal will now appear at both outputs at a level as set by the individual input gain control. The summing network causes 6dB of loss however the two inputs sum to +3dB (+6dB for in phase sine waves).

PERFORMANCE SPECIFICATIONS

GAIN:	28dB maximum, 0dB at 12 o'clock pot position
NOMINAL LEVELS: load	+4dBu in, +4dBm out to 600 ohm balanced
PEAK LEVELS: load	+24dBu in, +22 dBm out to 600 ohm balanced
NOISE 20kHz B.W.:	-90dBm maximum output
HARMONIC DIST.: 20Hz to 20 kHz	.02% Max at Peak Level .005% max at Nominal Level
FREQUENCY RESP.:	±.25dB, 20 to 20,000Hz
CROSSTALK:	70dB minimum at 10kHz
INPUT IMPEDANCE:	Balanced, 40kohm bridging
OUTPUT IMPEDANCE:	Balanced, 40 ohms maximum impedance
DIMMENSIONS:	1.5" (3.8cm) H x 5.5" (14cm) W x 5.75" (14.6) D
WEIGHT:	1.5 lbs. Net; 3 lbs. Shipping Weight
CONNECTORS:	Input—2 x XLR Female Output—2 x XLR Male
POWER:	24VDC @ .07A, connector sleeve is positive.
POWER SUPPLIES:	All units operate from an external 24VDC power supply, as follows:
WA100-1:	Wall mount power supply (UL), 24VDC @ .4 amp, 120 VAC/60 Hz, for use with multiple units (supplied as standard)
WA100-2:	Wall mount power supply for international use, interchangeable AC connectors, 24VDC at .4A out, 90-264VAC, 47-63Hz, 16VA input, optional at extra cost
20602-1:	DC power cable to loop through the DC power between BGDs, 13 inches (33cm) long with 2.1mm DC plugs on each end
BBU100-1:	Battery Pack unit houses four 9V alkaline batteries (batteries not included). 4 to 6 hour life

DC100-1:

DC to DC converter powers several units from 12VDC mobile and belt pack batteries.
Supplies 24VDC @ .2amp maximum

DESK MOUNT KITS:

20617-501 Angled Desk Mount Base
20617-502 Angled Desk Mount Base and One Stacker (2 units high)
20617-503 Angled Desk Mount Base and Two Stackers (3 units high)
20617-504 Stacker (2 units high)
20617-505 Horizontal Joiner (2 units side-by-side)

RACK MOUNT KITS:

21075-501 Rack mount shelf
21097-501 1/3RU Filler Panel

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 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.