



**AUDIO
TECHNOLOGIES
INCORPORATED**

Dedicated to sound engineering

7 JUN 84

**OPERATION
AND
MAINTENANCE MANUAL**

Encoke Series

P100

**EQUALIZED
TURNTABLE AMPLIFIER**

Technical specifications are subject to change at the discretion of the manufacturer.

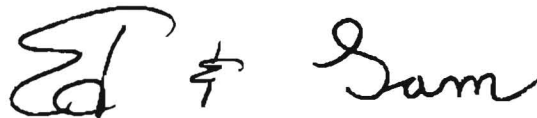
**328 W. MAPLE AVENUE • HORSHAM, PA. 19044
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Thanks for buying ATI equipment. Since ATI does not have the biggest name, the most dealers, the fanciest advertising or the lowest prices we must assume that your ATI preamp has been purchased because you searched long and hard to find the BEST EQUIPMENT to do your job. Congratulations on finding us, we will do our best to merit your confidence.

If you have comments or complaints, suggestions or sarcasm, praise or panic, please call us direct at (215) 443-0330 (no panics accepted before morning coffee).

Thank you for selecting ATI.

A handwritten signature in black ink that reads "Ed & Sam". The "Ed" is stylized with a large loop, and the "&" is a simple ampersand. "Sam" is written in a cursive, flowing script.

Ed Mullin & Sam Wenzel
Audio Technologies Inc.

SIMPLE LIMITED WARRANTY

ATI warrants that:

The P100 will work when you get it.
The P100 will do what our published specs say it will do.
The P100 will continue to do the above for at least one year.

As Long As:

You treat it right.
Your power company treats it right.
You don't take it swimming.

If it doesn't work, Call us first
we will immediately:

Tell you with a straight face that you are the first person
who ever had a problem with the P100.
Send you a replacement part or
Send you a replacement unit.
Ask you to return the defective unit prepaid.
Help you put in a damage claim to the shipper.
Recommend you to a competitor.

We are not responsible for:

Acts of God
Murphy's Law
The wrath of your boss and other consequential damage.

DESCRIPTION

Reading this section won't make you much smarter and won't make your Encore preamp sound any better. It may however give you some good buzz words to use on your boss when you want him to buy a dozen more.

A turntable preamplifier is a deceptively simple device which, although it has major effects on your sound, has been the victim of an amazing amount of poor design. One problem frequently encountered results from the use of oversimplified design techniques for the RIAA equalizer network and/or loose tolerance equalizer components. Equalizer errors can have major audible effects on your sound because the result of shifting an equalizer corner frequency slightly is to boost or cut a wide band of frequencies. For example, dropping all levels from 2KHz all the way up to 20KHz by only one db due to a ten percent tolerance equalizer error is far worse audibly than flat response up to 15KHz with a droop of 1db between 15 and 20KHz...however both fit within the typical ± 1 db response specification on the data sheet! A professional preamplifier should hold these midband equalizer response errors to $\pm .25$ db using precision film resistors and polystyrene capacitors for long term stability. Your P100 Preamp will typically run $\pm .1$ db from 50 to 15000Hz.

Another chronic problem is insufficient input stage headroom. Headroom limitation can result from making the first stage gain high to overcome a high noise level in the following output stage. With groove stylus velocities on digitally mastered and direct to disc recordings regularly exceeding 50cm/Sec peaks at midband, a high output cartridge can readily overdrive the 80mV maximum input level limit of many preamps.

Your ATI preamp will comfortably accept 350mV peaks (250mVrms) at mid frequencies and up to 2Vpk levels at 20KHz. These levels are so far in excess of the velocity capabilities of both cutter heads and playback cartridges that you can forget about input headroom as a limitation for the foreseeable future.

The RIAA feedback equalizer, when scaled down in impedance to minimize input noise generation, forms a low impedance, high capacity load for the input stage and can readily overload almost all low noise IC op-amps. This output current limit leads to Slew Rate Limiting, Transient Intermodulation Distortion, rising high frequency Harmonic Distortion, excessive IM distortion and probably a few other distortions we haven't found names for as yet. A high slew rate specification for the input IC amplifier although very necessary is no guarantee of protection from slew rate problems. Equally important, the amplifier must have sufficient output current swing capability to drive the high capacity of the equalizer network. ATI preamps use the 5533 IC which has a 35mA peak output current and can drive the equalizer with full rail to rail output swings at its rated internal slewing rate of 13 volts per microsecond.

This industry has been engaging in a futile headroom horsepower race for higher and higher preamp output swing capability. These potential outputs (as high as +27dBm) only succeed in overloading console input stages unless padded way down. The great headroom quest can also be satisfied by a reduction in the output stage noise floor thus allowing lower average output levels to be used. For example, your P100 will easily meet 80db S/N performance at nominal outputs below -10dBm because it has an output stage noise floor of only -96dBm. Operating at -10dBm out is a good match for many console inputs and provides 28db of preamp output headroom. This is the functional equivalent of a +36dBm clipping point above a nominal +8dBm out, NOW THAT'S HEADROOM!

Another important consideration is the presence of high amplitude, subsonic input signals which originate in record warp, eccentric center holes and seismic pick up from small earthquakes and dancing DJs. These signals are strongest in the neighborhood of the cartridge and tone arm resonant frequency, typically 6 to 10Hz. In studio applications these signals can overload amplifiers, saturate console transformers, overdrive limiters and damage loudspeakers. The preamp input stage is the optimum location for a subsonic filter. That filter should ideally remain in the circuit at all times since it is impossible to predict when "twinkle toes" is going to get carried away and break into the latest dance at the mike. However, previous attempts at "Rumble Filters" noticeably rolled off low frequency audio and had to be switched out most of the time. Your Encore P100 preamp incorporates an active, two pole subsonic filter bridged around the RIAA feedback equalizer. This filter follows the RIAA curve within .5db down to approximately 28Hz, rolls off only 6 db at 20Hz then plunges quickly to -30db at 7Hz. Excellent subsonic rejection is thus attained without loss of low frequency audio.

The high end sound of many cartridges can be noticeably altered by adjusting the resistive and capacitive loading. You may jumper program the cartridge loading from 47 pf up to 394 pf and from 50 to 100K ohms.

Our power supply uses a couple of unique regulating devices called zener diodes. In contrast to most fancy three terminal IC regulators, these devices will live through power line transients and simultaneously protect your valuable circuitry.

INSTALLATION

We recommend that you plug together your turntable, arm, preamp, output and ground connections prior to permanent, semi-inaccessible installation in order to check for RF pickup, hum from ground loops, shorted cables, etc. You can also trim the cartridge loading at this time by first removing AC power, removing the cover and pulling jumpers from the IC socket located on the PC board just behind the phono jack.

CAUTION! Always remove the AC power plug before removing or replacing the cover. Exposed internal AC at the fuse clips is very likely to short to the cover while it is being placed into position or being removed from the preamp.

MOUNTING

Your Encore preamp won't win any beauty contests and should be hidden away under the turntable. Mount it vertically on the side wall of your turntable cabinet with screws through the keyhole slots on either end of the preamp. Avoid strong magnetic fields from the turntable motor and make sure your cartridge leads reach the preamp before final mounting.

WIRING

Our insurance company insists on three wire grounded plugs. The third wire ground can cause a ground loop with your studio ground. If you are very sure that your studio ground will provide adequate protection to your personnel in case of an AC line short to the chassis, a 3 to 2 AC line adapter can be used to isolate the power line ground. We recommend that the adapter be removed and the power line ground be reconnected prior to any service work requiring removal of the studio ground from the preamp chassis.

The four inch, low inductance copper strap which you are, of course, using for your studio ground is not going to fit over the #6 ground stud on the P100 chassis. Run copper strap to within a few inches of the chassis and jump to the chassis with shield braid. Connect the tone arm ground lead to the same stud.

Plug cartridge leads into the phone jacks. Convention is white for left channel, red or black for right channel.

Your Encore preamp is decorated with more beads than Bo Derek (Who?). Well our beads are ferrite and although we don't have nearly the movie stars capacity, what we do have is tuned for good FM and AM rejection. Any RF shielding and suppression system is no better than the ground system into which it is trying to dump the unwanted RF. If you have a decent ground system and still have RF problems give us a call and we will hold a telephone prayer meeting. If you don't have a ground system you will still be O.K. as long as you don't turn on your transmitter.

Output connections are indicated on the label. DO NOT GROUND either HI or LO output terminals. If you are driving a single ended (unbalanced - one side grounded) high impedance or 600 ohm load it should be connected between either HI to GND or LO to GND. If you are driving a balanced load connect it between HI and LO output terminals. It is generally unnecessary to terminate the P100 with a 600 ohm load if it is driving a high impedance input although placing a terminating resistor across a hi Z input at the receiving end will occasionally reduce RF pickup between the preamp and the console input.

ADJUSTMENTS

Your P100 has sufficient gain and output to overdrive some console inputs, particularly those providing preamps for high level inputs. Full clockwise settings of the level set pots will provide approximately +10dBm balanced output at a reference 5cm/Sec, 1KHz recording level from a cartridge providing 1mV/Cm/Sec. Two o'clock on the level pots is approximately 0dBm while Twelve o'clock equals -10dBm out. Good S/N performance is maintained even with nominal outputs as low as -10dBm, however for lower nominal output levels a fixed attenuator pad should be placed between the preamp and console input.

Trimming the cartridge loading can optimize the response, brighten a dull sounding cartridge or smooth out a peaky high end. You can trim by ear, use a test record or just pull out J7 and J8 which leaves the cartridge terminated with 200 pF, a good nominal value. If you lose the little jumpers, replace them with #26 wire (.015 DIA) or flatten some cut off resistor leads to .015 thick so that they fit comfortably into the DIP socket.

MAINTENANCE

Power supply voltages are + and - 15VDC nominal.

IC output DC Voltages under no signal, shorted input conditions should remain within .1V of ground. Greater deviation is an indication of IC or circuit problems.

Five to ten years from now replace all the aluminum electrolytic capacitors.

Keep 250W soldering guns out of the preamp.

If hit by lightning replace A1, A2 and anything that has turned black.

If 110 VAC is fed in phono input buy a new preamp.

MODIFICATIONS

230 VAC OPERATION

Your preamp is wired for 115 VAC, 50/60Hz operation unless otherwise requested at the time of ordering. It can be modified for 230 VAC operation by removing the power transformer primary jumpers J11 and J13 and inserting a jumper in J12.

NEW RIAA CURVE

The RIAA has proposed a modification to its standard curve to help roll-off subsonic rumble. This modification adds a roll off corner in the playback response at 20Hz. Although the active two pole subsonic filter in your P100 is

more effective at blocking subsonic inputs than the proposed RIAA curve change, that change will also affect low frequency audio response by about 1.6db at 30Hz.

When the new curve becomes more generally used you will be able to precisely match its low frequency response to 30Hz simply by clipping out capacitors C39B and C40B, thus adding an additional matching 20Hz corner.

MODEL P100 TURNTABLE PREAMPLIFIER

TECHNICAL SPECIFICATIONS

INPUT IMPEDANCE

Jumper programmable, 50 to 100 Kohms, 47 to 394 pF in 47 pF steps.

INPUT LEVEL

250 mVrms maximum @ 1 KHz
5 mV nominal @ 1 KHz for +4 dBm out.

OUTPUT LEVEL

+18 dBm into 600 ohms, balanced or unbalanced, 10 Vrms single ended into high Z load.

OUTPUT IMPEDANCE

400 ohms balanced, 200 ohms single ended, split and RF bypassed.

GAIN

54db maximum, continuously adjustable.

SLEW RATE

13 V/ μ Sec. assures minimum TIM.

CHANNEL SEPARATION

80 db or better

SUBSONIC (RUMBLE) FILTER

Two pole active input filter
Flat to 30 Hz, -6 @ 20 Hz, -18 @ 10 Hz, -30 db @ 5 Hz in addition to RIAA specified rolloff.

NOISE PERFORMANCE

S/N= 80 db min, ref 10 mV, 1KHz, unweighted over 20KHz measurement band with input terminated in 600 ohms.

S/N= 90 db min, ref 10 mV, 1KHz, with A weighting filter, 600 ohm input term.

HARMONIC DISTORTION

.10% max. THD, 20-20000 Hz @ +18 dBm

INTERMODULATION DISTORTION

.05% maximum, SMPTE measurement

FREQUENCY RESPONSE

± 5 db, 30 to 20,000 Hz ref. old or new RIAA curve, either curve available by jumper change.

POWER REQUIREMENT

115 or 230 VAC, int. jumper select, 50/60 Hz @ 6VA. 3 cond. RF filtered.

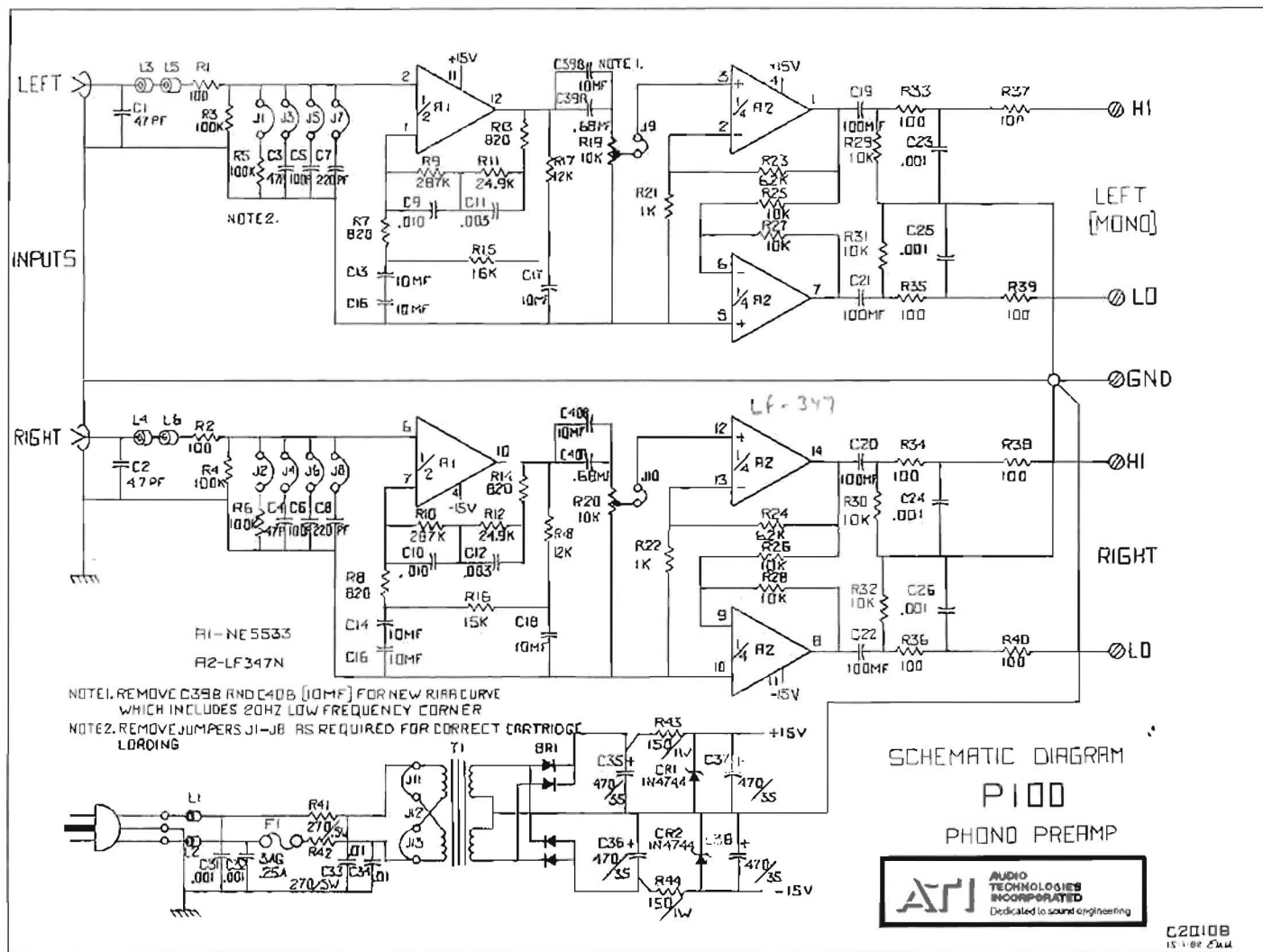
CONNECTORS

Input - RCA type phono jacks
Output - Screw terminal block, 3/8 ctrs.

DIMENSIONS

9 1/4 L x 5 3/8 W x 1 5/8 H, 5 lbs. ship

as received: J1, J5, J2, J6 OM = 50k, 100pf



3-2-97 STB3 No Center Axis

