

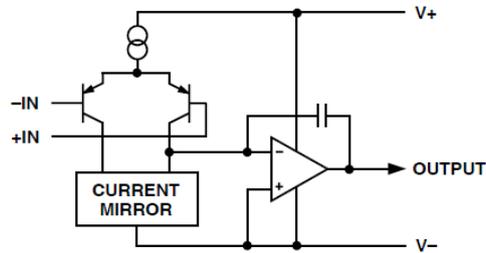


The “Solid Diamond” Phono Stage (Australian No-Frills Version)

The JLTI Phono Stage is unlike any other Phono belying what it does in an unassuming way.

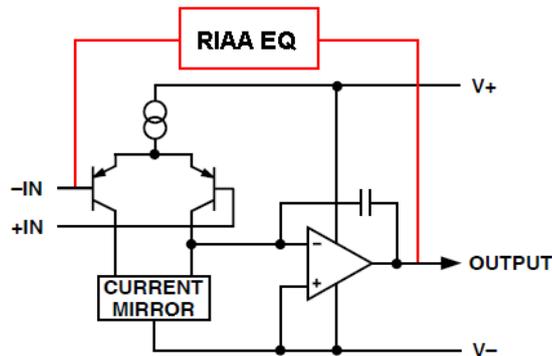
The name denotes that this is a Solid State device using something that is called Diamond Transistor Theory, rarely used on High-End Audio products. The most simple and linear audio voltage amplification device is a Vacuum Triode which consists of three electrodes only. They are the Grid (input), Cathode (grounding) and Anode (output). On the other hand, the Solid State Transistor is a current device but is nowhere near as linear as the Triode. It consists of Base (input), Emitter (grounding) and Collector (output). The idea behind a Diamond Transistor is actually a composite circuit that emulates the near perfect and linear Transistor as a current device. Three points in the circuit then becomes the equivalent of the Base, Emitter and Collector followed by a Unity Gain Buffer.

This is what a conventional IC Operational Amplifier looks like:



Simplified "Opamp" Transistor Amp

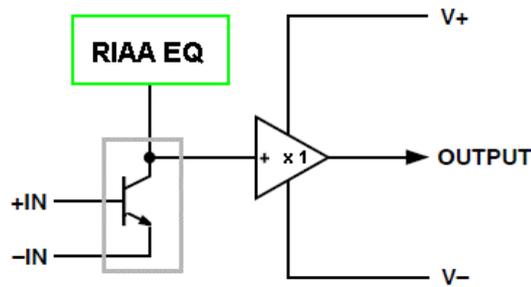
For the Phono have the correct Equalisation, this is inserted as feedback and called Active EQ:



Simplified "Opamp" Transistor Amp

Note the small ‘compensation’ cap near the output, this is typical of this kind of circuit. This too is a feedback loop that has significant effects on how the circuit behaves and is referenced to poor ground via the power supply V- as shown. It is apparent that a massive amount of feedback is used and that it is not a particularly fast circuit. We want a much faster circuit with no internal compensation and no feedback and Passive rather than Active EQ. Also we want a conceptional simpler circuit and one referenced to a clean ground.

Our Diamond Transistor eschews feedback completely and uses Passive EQ:



Simplified "Diamond" Transistor Amp

The theoretically single Diamond Transistor is a transconductance amplifier of a type normally associated with Current Feedback circuit, but our circuit needs no feedback, has a huge bandwidth, arguably the largest Bandwidth ever in a non-feedback Phono Stage, even after EQ it has a 1MHz Bandwidth and a fast settling time (please note that in audio circuit, speed is gauged by how fast a circuit can stop rather than acceleration).

Note that we still have two inputs, but they are no longer symmetrical (and in our case an advantage). One is for the signal from the Phono Cartridge and the other is to control gain, of which we have two settings implemented. The output after the EQ is Unity Gain Buffered for low output impedance.

The JLTi Phono Stage is at once a very advanced concept and yet also elegant in its simplicity when executed properly. The Power Supply is pure Class A Constant Current "SuperReg" as developed by Vaccum State Electronics and now increasingly been copied in High-End Audio.

The JLTi Phono Stage is easy and straightforward in operation. It does not have any On/Off Switch and designed to be left permanently On. Only when away on holidays, it may be advisable (as with other electrical appliances) to disconnect from the Mains Supply.

Inputs for both Moving Coil and Moving Magnet cartridges.

Load Sockets to Optimise Cartridge Performance.

Two Gain Levels, high for 60dB MC (Moving Coil) and low 45dB for MM (Moving Magnet).

The Loading Plugs standard value is usually 100 Ohm load of Moving Coil cartridges. Without Loading the default input impedance is 47K.

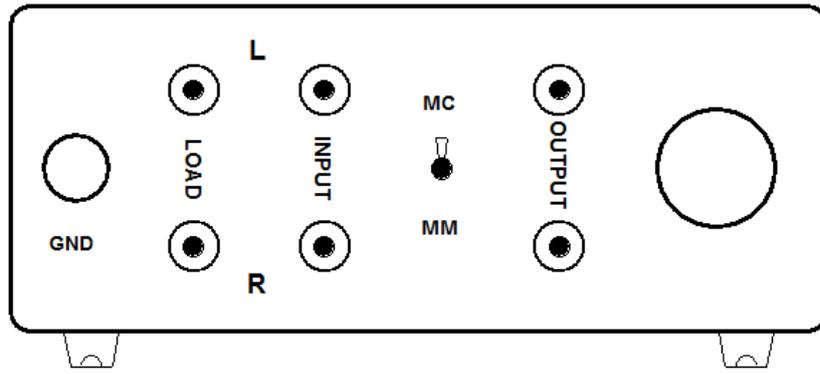
Changing this Load Value in turn changes the minute electro-mechanical damping of the cartridge and can be tuned by experimentation to obtain best subjective sound. Typically, some Moving Coil cartridges sound at their best with as low as 10 Ohm Load rather than the usually recommended 100 Ohm.

Optimising Moving Magnet cartridges can go as low as 2K Ohm, and High Output Moving Coil even lower. By using trial and error and careful listening, the potential best performance can be attained for your expensive investment, as good quality cartridges (and turntables) are not cheap. The rule is simple, the lower the Load Value, the higher the damping. Listen to the effect of increased damping and you will soon discover the sonic effect and how to arrive at the best result. Most cartridges are listened to under-damped and you can benefit from listening to optimised damping. Improve your sonic performance at no significant additional cost.

Please note: The internal circuit is direct coupled with a very slow Servo Control tuned to an incredibly low frequency, approximately 100th of a Hertz. There are no coupling capacitors as the best capacitor is no capacitor. The best Teflon Caps are \$300+ each. There is no LF filtering that many other inferior Phono Stages use. When making changes to the input, whether changing cartridge or turntable, or changing Load Values, please allow some minutes for the Servo-Control to settle and with Moving Coil cartridges this can take up to five minutes.

JLTi Products by *Custom Analogue Audio* Sydney, Australia

LAYOUT:



JLTi Phono:

"My continued listening has been most pleasurable... I find the JLTi [Phono] resolves an amazing amount of detail. It also captures an extended bass response and a large hall ambience. My favorite test for these last two characteristics is found on side two of "The Mission", a soundtrack recording. A concert bass drum is played on a couple of the tracks. With the JLTi, one hears not only the deep note of this very large drum, but the attack and decay as the mallet strikes the drum skin, then the sense of space from the recording studio as each note fades away are fully revealed...most tracks are interesting and fun to listen to."

Tim Price, California USA

JLTi Phono:

Hi Joe

The phono stage arrive today. I soldered on the *wall wart. Soldering is not my thing. I didn't burn the house down, but I came close. The unit works fine, despite my efforts to do it in.

I played about 3 hours of music thru it. My initial impressions are that it is very quiet, very smooth. It does not sound like solid state. It has lots of bass slam. Heavy metal is loads of fun. Your unit has a wide soundstage, though not terribly deep. The major drawback is that the instruments and vocalists are not three dimensional. They are more two dimensional in a three dimensional soundstage. I know, if I want three dimensional instruments I have to *pay more* and use tubes, which is why I have my Herron tube phono stage. Now if you could put your bass slam and blackness into the Herron, then you would have a world contender.

It is a very good unit for the price. I am quite happy with it.

Best Regards,

Roger S. Gordon, USA

* The external wall wart needs to be 115V AC, widely available within the U.S. The connector was supplied and only two wires needed soldering.

Second view from Roger:

I lent the phono stage to a [colleague]. He preferred the JLTi to the Sutherland. Thought your unit sounds less like solid state and had a warmer, more expansive midrange than the Sutherland... My friend still prefers the Steelhead [US \$7,300]. However, he thought your unit was a bargain at the price, particularly since he thought it better than the US \$3,000 Sutherland.

Third view from Roger:

Buying the JLTi phono stage from you was the one of the best audiopurchases I ever made.

JLTi Phono:

I've now had time to burn in the JLTi phono pre, and I like it a LOT. Very quiet, tonally right with a very musical presentation without being soft. Very low listener fatigue. Nice job!

Bill Thalmann, [Music Technologies](#), formerly with Conrad-Johnson