

# **ARGIRIADIS**

## **ANALOGUE ELECTRONICS**

# **OWNER'S MANUAL**

## **VALVE DISTORTION UNIT USER GUIDE**

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## FRONT PANEL CONTROLS

From left to right and bottom to top

### LEFT CHANNEL

- 1) Mute Button : This momentary push button switch mutes the output of the channel, in order to avoid potentially very loud 'clicks' when changing settings, while using the various switches.

Always press the mute switch and hold it in while operating them. These mute buttons are there to protect your other audio equipment and your ears.

- 2) Input Level Control (P1A) – LINEAR
- 3) Power Amp Drive (P2A) Controls the signal level entering the output power valve, and how hard this valve and the output transformer are driven. Its response is logarithmic, so that the power distortion increases very gradually at low settings. After half way the units' amplification and distortion stage is driven harder and can produce some very hard distortion effects, provided the input level is also turned up high and no (-20dB) attenuation is used.

TIP : Always set this control about half way when you start.

- 4) Output Level Control (-LINEAR) P3A. Always set this low if possible to protect the equipment that the unit is driving.

### RIGHT CHANNEL

- 5) Input Level Control P1B
- 6) Power Drive P2B
- 7) Output Level P3B
- 8) Mute Button : Note that for convenience this switch is on the right end of the front panel.

### LEFT CHANNEL

- 9) Triode Cascode Switch : This is in the input (preamp) stage. In CASCODE (= cascade cathode) more gain is produced and the distortion contains more third and higher odd harmonic frequencies.

If the input stage is switched to cascode, it may be a good idea to introduce -20dBs attenuation to the power drive (next switch) to get the effect.

- 10) Gain Switch : When switched up, signal coming out of the input stage is attenuated by approx. 20dBs for better control of the power drive (P2A,B) and smoother sound. Also very useful (and perhaps even necessary) on Secondary Load Off operation.

11) Phase Switch : reverses phase.

#### RIGHT CHANNEL

- 12) Triode Cascode Switch
- 13) Gain Switch
- 14) Phase Switch

#### LEFT CHANNEL

15) Load Off Switch : It switches off the internal load – but without protection!  
This is only to be switched OFF (in the up position) when a suitable load is plugged into the channels 'mini power output' 3A & 3B. This could be an  $8\Omega$  speaker or  $8..10\Omega$  input spring reverb tank. Under all other conditions this switch must always be ON, i.e. facing downwards.

16) Primary Loading & Output Mode Switch : This refers to the primary connection of the output transformer and the operating mode of the output valve. On high loading (lower primary impedance) more second and even harmonic distortion is produced. On normal loading (higher primary impedance) in pentode mode more odd third and higher orders are produced while in normal triode a much cleaner response results with good bass.

Generally pentodes give more distortion, and of the higher order type (harsh), while triodes give even, low harmonics and sound smoother. Also, in single ended stage such as the one in the unit, pentode mode boosts the treble, and slightly cuts off bass while triode (normal loading) produces much more integrated sound.

In ultra-linear connection the valve works somewhere between triode and pentode, widely used in 50's & 60's hifis, so the sound is more like triode but with a bit more volume and odd type harmonic distortion.

All these different modes give various different types of sound colouration, and it may take a while to familiarize with them but it is worth experimenting.

NOTE : In the sixth position, this switch switches OFF the whole output stage of that channel, (useful if not in use), the valve heater however is still on.

17) Secondary Loading Switch (see 7 & 8)

#### LED

- 18) STAND-BY SWITCH RIGHT CHANNEL LED
- 19) Load Off (mark position)
- 20) Primary Loading & Mode
- 21) Secondary Loading

- 22) Ground Lift Switch LEFT CHANNEL
- 23) Ground lift Switch RIGHT CHANNEL

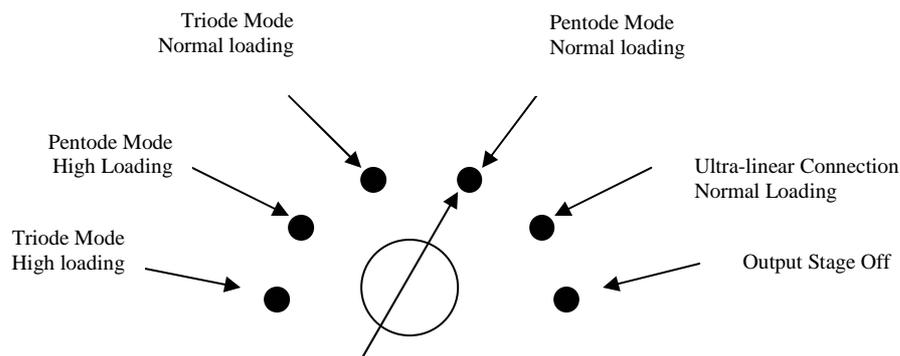
## SECONDARY LOAD OFF OPERATION

Each channel has two switches that disconnect the output load, (15), (19) and (17), (21). However, if no precautions are taken **serious damage will occur in the output stage**. This is why switches (15) & (19) are **always on**, unless an external load such as a speaker or a spring reverb tank is connected.

The secondary loading switches (17) & (21) also disconnect the internal load but at the same time, they reduce the high voltage applied to the output stage and also limit the current in the output valves. So switches (17) and (21) provide two functions simultaneously.

When they are OFF (i.e. up) a very interesting echo-y sound colouration occurs – very good for vocals, stings, keyboards, especially when the primary loading & output mode switches(s) (16) & (20) are set in the high loading pentode mode, see switch (16, 20) diagram. It helps to investigate this mode by turning the ‘DRIVE’ P2 control gradually and perhaps with the -20dB attenuation switch. The signals that come out of the unit are very high in this mode! Turn the output level controls to the lowest (P3 A & B) and increase them very carefully. Again, there are limiting components inside but this mode with caution.

## OUTPUT OPERATING MODE & PRIMARY LOADING SWITCH



## SWITCHING ON

**For normal operation all load off switches must be ON i.e. downwards unless a reverb or a speaker is connected. This is because the output must always be connected to internal load.**

**For secondary load off operation see below.**

### 1) MAKE SURE

- a) The stand-by switch (18) – the one right in the middle of the front panel is OFF.
- b) Turn all controls fully \*anti-clockwise especially the power drive P2A, P2B and level out P3A, P3B ones. Turn the ground switches down.
- c) The LOAD OFF switches (15) & (19) must be ON i.e. pointing downwards.

ALWAYS Remember the position of these switches

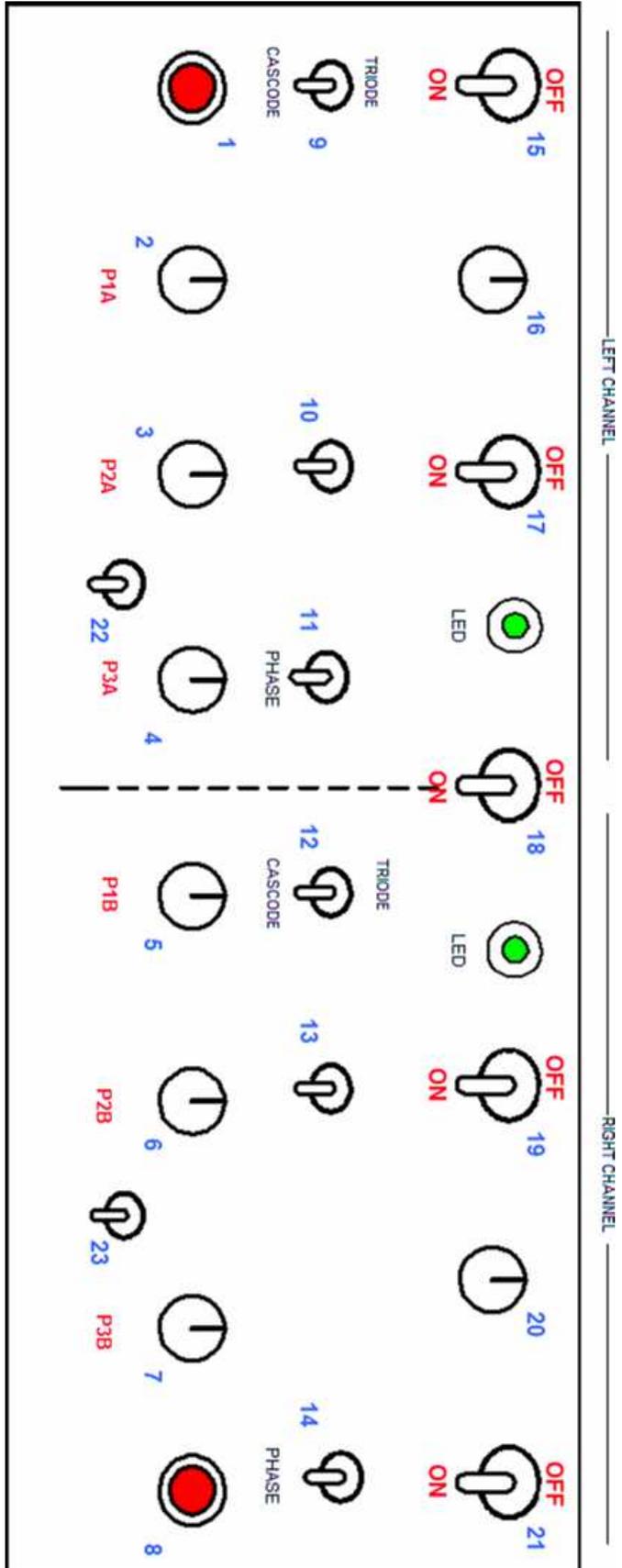
- i) The one for the left channel is the first on from the top left
- ii) The one for the right one is the first after the right LED.

\* The unit is capable of producing high output levels especially if the secondary LOAD OFF switches (17) and (21) are OFF, i.e. in the up position. These high level signals may generate enough of an output to damage your mixer, speaker(s) or ears. The output of the unit contains protection circuits to avoid problems like this but it is better to be cautious. This is why it is a good idea to start quietly and gradually turn the levels up, so that you keep control of the units overall output levels.

iii) Also, for similar reasons keep the secondary loading switches ON (i.e. downwards) until you are more familiar with both the unit itself and the secondary LOAD OFF functions. (Switches 17 & 21).

2) Turn on the mains (ROCKER) switch on the power supply unit (P.S.U) and wait for approx. 30 seconds for the valves to reach their optimum working temperature. This is because it is detrimental for the longevity of the valves to supply them with high voltages when they are cold.

3) No turn on the stand0by (S-By) switch (18) on, and both LED's will light up.



## FUSES

Various new components have been used in this project, for instance a very high quality Toroid mains transformer, and high value electrolytic capacitors etc.

Consequently, as in any improved design, fuse choice is based on estimates. That means that some of the fuses have slightly low ratings. They may blow for no apparent reason – especially the mains fuse on the kettle lead socket. I have chosen a 1A (T) fuse here (T stands for time delay or anti-surge). If it blows intermittently, try replacing it with a 1.6A (T). Note, that if this fuse blows then the **ROCKER MAINS** switch on the power supply unit will **NOT** illuminate when pressed.

Similar applies, but to a lesser degree, to the other two (high voltage) fuses on the front panel of the P.S.U. Be careful with these fuses. If they keep on blowing and if they look black once they've blown, there may be something wrong with the unit, i.e. output values etc.

**HOWEVER:** during long testing none of the fuses have blown.

