COLOSSUS

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Colossus

What is Colossus?

Analogue Solutions is a UK based company specialising in true analogue synthesisers, sequencers and eurorack modules. With over 25 years experience in the industry, Analogue Solutions were there right at the start of the eurorack revolution.

Analogue Solution instruments are hand built in England, with all being designed and tested by founder Tom Carpenter, who has hands on involvement in all aspects of the company.

Analogue Solutions' award winning products have been applauded for having a truly vintage sound that is full of character. The synthesisers have a full analogue audio path, and analogue LFOs and EGs. Also no memories means nothing in the synth is being made sterile by CPU control. When you turn a knob you are directly changing the voltage or current in an actual synth circuit.

Analogue Solutions founder, Tom Carpenter, has a genuine passion for analogue synths, drawing on his years of using and owning vintage analogue synths and drum machines, which he uses, along side AS products, in his own music productions.

Analogue Solutions: music electronics for electronic musicians.

Tom Carpenter is excited to introduce Colossus, an exciting new mega-synth with a design ethos truly from the dawn of analogue synths. It is more than a powerful analogue 'workstation' - it is also art, architecture, exquisite studio furniture.

Design inspiration is of course from the 1970's EMS Synthi 100, however, no circuit from the Synthi has been cloned or copied. We prefer to make our own designs. We have chosen some of our favourite circuits from our own large back catalogue synths such as Polymath, Telemark and Vostok - so there will be no doubting the quality of sound.

The original Synthi was so large it wouldn't fit through a standard doorway. We didn't make that mistake however don't underestimate its size. It will be prominent in your studio, or art gallery!

It is sized at 1585mm wide, 700mm deep and 655mm high and weighing in at too big to fit on the scales.

All the voice and modulation circuits are of course 100% analogue. We purposely steered away from digital, it doesn't even have MIDI or USB (there are plenty of MIDI converter boxes out there should you need that facility). This wasn't designed to be the solution to your modern digital studio but rather a serious analogue power house of sound. There are of course digital elements to the sequencer control - that is unavoidable - even classic analogue sequencers like the ARP sequencer use digital logic chips. In fact the Synthi 100 features a digital sequencer.

This synth is purely for those who want it just as it was in the 1970s - but new with parts still in production. For those who want a synth that *could* have been built in the 70s.

Colossus is large scale, featuring large knobs that control metal shaft potentiometers. VCOs have multi-turn verniers. The two enormous pin matrix panels dominate the horizontal panels - these are incredibly expensive Swiss made broadcast quality signal routers - one for CV and one for Audio.

There are two spring reverbs, two touch keyboards, step sequencers, moving coil meters, joysticks and so much more. An immense expanse of jack sockets for additional patching within or without the system.

There are no gimmicks - this is pure synthesiser. A huge sound enclosed in a solid metal case wrapped in solid hardwood. No expense has been spared to bring this incredible machine to life.

Synthesisers like this only come around once in a decade, or possibly a generation.

www.analoguesolutions.com

Pre-Purchase Notes

Only the first 8 Colossus (all sold) will have the CRT scope featured in some photos. CRT scopes are all but discontinued - and finding new supply of scopes that will fit and look good in this enclosure are all gone.

Serial number 9 onwards will have a LCD oscilloscope we have specifically designed for Colossus. It still retains the look and feel of a CRT scope, and has a couple of additional features.

Ordering

If you wish to order please email us. A deposit will eventually need to be made, and ultimately final payment. Shipping costs and tax, where applicable, need to clear in our account before despatch.

Something of this scale is built to order. Therefore we do not accept refunds / returns. The sheer weight and cost of shipping makes that an unrealistic proposition anyway.

Repairs

Again, due to its size, we will not accept units back for repair. However, we have designed the internal electronics to be modular. So should a circuit die, this can easily be removed by the user and returned to us for repair. The rest of the synth will still be able to be used whilst this is happening. Warranty is 1 year, but we will continue to repair the modules, at our discretion, for an additional (excluding parts and delivery). Delivery costs in either direction are not included.

Tax Notes

If tax is not paid to us direct (eg if you live in the UK or EU), you will be charged import tax by your government. The exact situation changes depending which country you are in and whether the UK remains in the EU with or without certain deals in place. One way or another whether you pay tax direct to us or to your government, the final prices won’t vary too much. There’s no legal way to avoid tax - it has to be paid one way or another!

On Delivery

Note! Talk of crates really applies to non-mainland UK deliveries. For mainland UK most likely we would deliver in person (for a fee), or of course you could arrange collection, in person (we will not hand over to a courier). It will fit into most SUV style vehicles (but check before you leave).

On delivery day you will need a 2nd person to help lift Colossus. Four people would be required to lift it whilst it is in a crate.

Colossus will be delivered by truck in an enormous wooden crate. If all goes well the courier can get the crate to your door using a pallet trolly. The floor would need to be smoothish without steps. But even with the best plans I find it can be a little hit or miss whether the tail lift truck and pallet trolley come as booked. You may have to unpack it on the truck and then carry it from there without the crate.

To open the crate use common sense and care. Just use a screwdriver - don't use a crow bar or hammer! Take great care! Unpack like an archaeology dig. Maybe get a 2nd screwdriver - it will enable you to open the crate quicker, and keep the truck driver from tutting in the event you have to unpack it inside the truck.

The crate can be completely 'flat packed' should you wish to keep it.

You will need a Posidrive cross-head screwdriver -size 2 (PZ2). Use a little mechanical common sense to figure out which screws to undo. Remove the top panel first. Then one side. You will need someone to support any side panel that isn't connected to another side panel. If you remove all sides it will be must easier to lift Colossus out.

Through The Door

Colossus will fit through most standard doorways. You can tilt the unit approximately 45 degrees to further reduce the width. Bear in mind turns, for example, can you get this round a tight corner? A tight hallway say, or twist in a stairwell. Same format as for moving a piece of furniture. Colossus should be able to make it through most households.

Have your table ready! Colossus is a two person lift. Colossus is naturally a little heavier on the rear side. So bear that in mind when you lift it - don't let it roll over backwards.

Bend your knees!

If you find the synth won't fit through your door - and this isn't too likely unless you live in a really odd place - the driver cannot take it back (he would have left by this point anyway!), and we won't accept refunds. Do your measurements before hand!

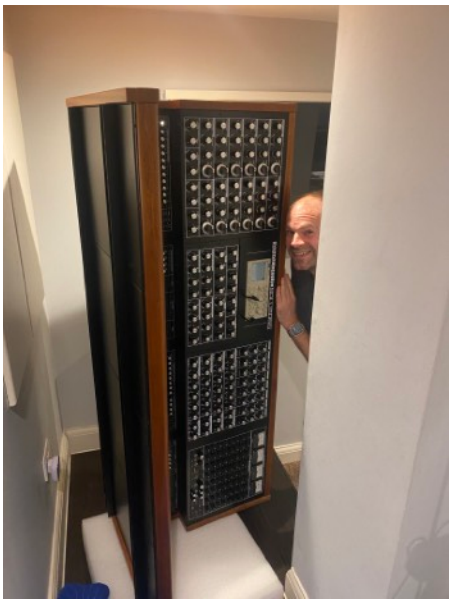
Also note, don't damage the wood when going through door ways. Add some protection to the edges. We photograph the wood of each Colossus prior to packing.

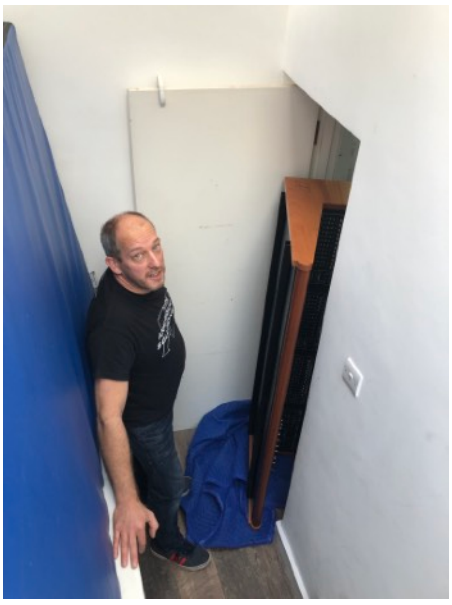
We have delivered quite a few now through narrow doors and stairways! In one instance we had to take a door off in a particularly narrow corridor. That's easy to do.

Also, another way to get through narrow doors is to put Colossus vertically on its end. This way the 'L' shape of the synth can be pivoted through the door.

Before doing that, place a soft blanket, or similar, on the floor, so the wood does not get scratched.

You can also use the sheet to drag Colossus through narrow spaces, were you can only take it through on its end.





Note: white foam pad (left), blue blanket (right).

Specification

VCO Panel

12 x Analogue VCOs. The pitch range is very high and these can be used as LFOs also.

Four waveforms, Pulse Width, Osc Sync, Sub Osc.

Precision control using high quality multi-turn vernier dials.

Sample and Hold Generator.

Random Voltage Generator.

2x White/Pink Noise Generators.

Multiple.

Scope Panel

Oscilloscope. Type may vary from pictures.

2x LFO (in addition to the VCOs).

4x VCA (in addition to the VCF VCAs).

4x A(D)SR Envelopes.

Multiple.

Note!
VCOs can be used as LFOs. So Colossus has in fact a potential total of 14 LFOs!
Each of the eight VCFs have VCAs hard wired inline, so these plus the individual VCAs means there are in fact a total of 12 VCAs!

Filter Panel

4x Multimode filters - Low, Band and High pass 12dB filters.
Each with serial VCAs.
The circuit was originally based on the Oberheim SEM - though we have done some heavy modifications. But ‘Oberheim SEM’ gives you an idea of the type of sound.

4x Low Pass filter - 24dB transistor ladder filters.
These filters have a ‘Moog’ style sound.

Each VCF has a serial VCA.

(8 VCF/VCA combinations in total.)

2x Analogue mechanical Spring Reverbs. Each one features a triple spring tank.
2x Ring Modulators.
2 Voltage Slew Generators.
4x ADSRs with repeat and hold-repeat feature.

Sequencer Panel

4x large 10V signal level meters that are backlit.

64 step / 2x 32 step Analogue CV/Gate sequencer.
With clock generator, glide, jump, reset, CV, gate and other control features.

Touch Panel

6 channel stereo audio mixer with level, pan and mute.
2x Joystick Controllers.
2x Touch Keyboards with digital note sequencers.

Matrices

2x Broadcast quality CV and Audio Pin Matrix panels.

Jack Socket Patch Panels

4x minijack patch panels - providing I/O from all circuits.

Rear Panel

Mixer output jacks; Left and Right.
IEC power socket.
Neon lit power switch.
Fuse holder.

About This Manual

This manual doesn't aim to educate the reader about sound synthesis, or the methodology of patching. Despite this synth appearing to have been teleported from the 1970s, we are in fact in the 21st century. There are a wealth of tutorial videos on the internet about what synths are, how they work, the individual functions explained, how to patch and create sounds. It would be ridiculous to repeat all that here when it has already been explained a 1000 times in many languages.

You can learn everything you need to know from those YouTube videos, and other online resources, to enable you to patch Colossus, and indeed any other synth. We won't be able to teach you about all this - we can sell you the car but we can't teach you to drive!

If you are new to modular - then you have to accept there is a learning curve - you won't necessarily be making Stella sounds right away. It's a whole skill and take many weeks and months to become competent - and it's an ongoing learning process. Take smalls steps, simple patches, and build up over time. Don't get frustrated. You'll get there and the results will be rewarding. The journey is half the fun!

Pin Patch Panels

The pin patch panels are 31 x 31 matrices. These are of extremely high broadcast quality. The advantages of using pin matrices are:

Tidy panels (no messy wires).

Multiple sources can go to a single destinations without the need for mixers.

A single source can go to multiple destinations without the need for splitter cables.

A new way of working: new ways often mean different results.

They look so cool!

Pin matrices are very very expensive. 31 x 31 is the largest standard panel. Going larger would mean a custom panel and then the already high price would be unthinkable. The panels and the pins are a significant factor in the build cost of Colossus.

It's not possible to have large enough panels to have every single parameter available. So careful consideration has been made as to which signals to put in the panels. Of course there would be differing opinions as to what signals to put in there, but we feel we have made a good choice.

All the signals are available on individual jack sockets to enable additional patching or to patch with the outside world. Colossus is compatible with most modular including Eurorack.

Just like normal patching with cables bear in mind that not every patch you make using pins (or cables!) will always be a good patch.

Be careful when inserting pins. You should not need excessive force. Insert and extract perpendicular to the panel. Don't bend them!

The matrices themselves are not buffered, but the circuits for the most part are. Most patches will split and mix the signal very well. So in a sense the panels are buffered.

The resistor pins work best for mixing audio signals, however, the resistor pins cost about 10x the price of shorting pins to purchase since they are custom made. So use shorting pins for most patches, certainly when only patching to one destination.

It is impossible to test every combination of patches! Some patches might produce unusual (but still interesting) results. Or you could get something not mixing or buffering in quite the way you expect. Just remember this is a living *analogue* synth - not a giant software controller that has clinical 'perfection'.

The pins are expensive - the resistor pins are custom made. Don't lose them!

In some instances you might get a slight change in signal level, pitch, or modulation strength, when inserting a 2nd or 3rd signal into a destination. Just sometimes. It really depends on what you patch where, and what additional pins you insert in the same row or column. Often, using the 10K pins helps the signals to mix. So try these pins if you have any oddness.

Red pins are 10K Ohms
Black pins are 0 Ohms

Jack Patch Bays

Just about every parameter is available on its own jack socket.

Mono 3.5mm minijack cables are required.

Patch these just like you would any other modular system, like the Roland System 100m or Eurorack.

Patching - pins and jacks

How do you patch? How do you make a sound?

Colossus is the same as any other synth in this respect. You create your sounds just like any other modular. You think about signal flow. Generally audio signals flowing from VCO to VCF to VCA.
And use CVs modulating these.
You use thought and experience, a little luck too! Some patches will sound great, and some won't. So you alter your patches until you get that great sound!

Note: ensure you have a voltage going to the filter VCA CV inputs! Otherwise you won't hear anything. Normally you'd use a triggered Envelope to control the VCA. But it is possible to hold the VCA open using the 12V signal on the matrix panel - or use a Joystick CV.

Blank Centre Panel

The centre blank panel is there for your convenience - to place on top ancillary gear such as a drum machine or external effects.

It is all there for possible future optional upgrades. We may for example develop a vocoder option. Please feel free to let us know what option you would like to see become available. Whether we do or not partly depends on demand.

Repairs

Of course we hope you should not have a problem, and we have designed this to be strong and reliable, but it just wouldn't be feasible to ship the whole thing to a synth repair tech should a circuit develop a problem. We won't accept whole units back for repair.

We have designed all the internal electronics to be individual modules that can easily be extracted should be an actual problem with some circuit.

Nearly all wiring is on connectors, so it would be a simple case of disconnecting the mains. Then, for the module in question, remove the knobs, front panel nuts, and rear connectors (between 2-3).

It would be a good idea to mark the cables, take pictures, and notes about this procedure and which cable goes where. So that you can refit these when you reinstall the module.

Post the module back to AS for repair, noting warranty conditions.

The whole of the rest of the machine will still be useable.

There are four rear covers that can be removed using the thumb screws for easy access!

There is currently no 'full service manual'. It is not likely there will be one available since you'd only ever need to send back an individual board if there was a problem.

Always contact us before posting anything back. Postage in either direction is not included.

Receiving

So your crate has been delivered!

Firstly ensure your studio work space is prepared. The area must be large enough and sturdy, to accommodate Colossus.

Colossus will fit through standard doors, you may have to tilt the synth slightly. The synth requires a smaller opening if tilted 45 degrees. This brings width down to 620mm.

Be careful not to damage the wood front edge against a door frame. We recommend you put protection around the wood. The unit will be sent with edge protectors taped on. We photo the wood of all Colossus before crating.

Have a rain cover handy incase the weather turns bad whilst unpacking outside.

Opening the Crate

It goes without saying you should take extreme care when opening the crate. Carefully peel each layer back like an archaeologist. You wouldn't want to scratch that beautiful wood!

We carefully inspect the wood prior to packing, and we take photographs of each system. Once packed the only way it can get scratched is via careless unpacking.

Handling

Colossus is very big and heavy (the clue is there somewhere). Definitely a two person lift. Bend your knees!

Covering

We suggest you buy a king sized double bed sheet (black looks cool) and use that as a dust cover. Buy one that is not a 'fitted' type.

Other

Be sure not to put anything on top of the system - at least not anything that is likely to drop off and break those very expensive matrices (replacement parts likely to be around £2000 or more). Also bear in mind that some products that have rubber feet can mark surfaces. If you need to put something on top of the synth, I would suggest placing a small square of lint free cloth underneath to protect the wood.

Rear Covers

These can be removed using the thumb screws. Always physically disconnect the mains cable before removing covers. There is no real reason to remove the covers other than curiosity. Just remember what happened to the cat! So remove that mains cable first. General use, always keep them in place to keep out foreign objects like dust and cats.

Note: we may ship these screwed in place using normal screws, in which case the thumb screws will be in the accessory box. These can be fitted later.

Matrix Panel Covers

The two matrix covers are to protect any inserted pins and to keep out the dust.
The covers have protective film on one or both sides. Peel this off prior to first use.

Before Powering On

First check you are using the right voltage!

The internal power supplies are switchable from 115V and 230V. We would normally pre-select this for you based on the delivery country, but it is advisable to check.
Before removing the rear covers and checking, physically disconnect the mains cable.
There are three power supplies. Check the voltage switch - this is clearly visible - a chunky beige switch.

Whilst you are in there we recommend you check each connector is seated properly. Give each one a gentle push. These should be fine, but with a possible journey of 1000s of miles via several trucks and an aircraft, vibration could work something loose.
Many of the connectors are latched, so cannot come loose - but due to the large number of circuits and connectors, there is not always enough space to use latched type connectors for every point.

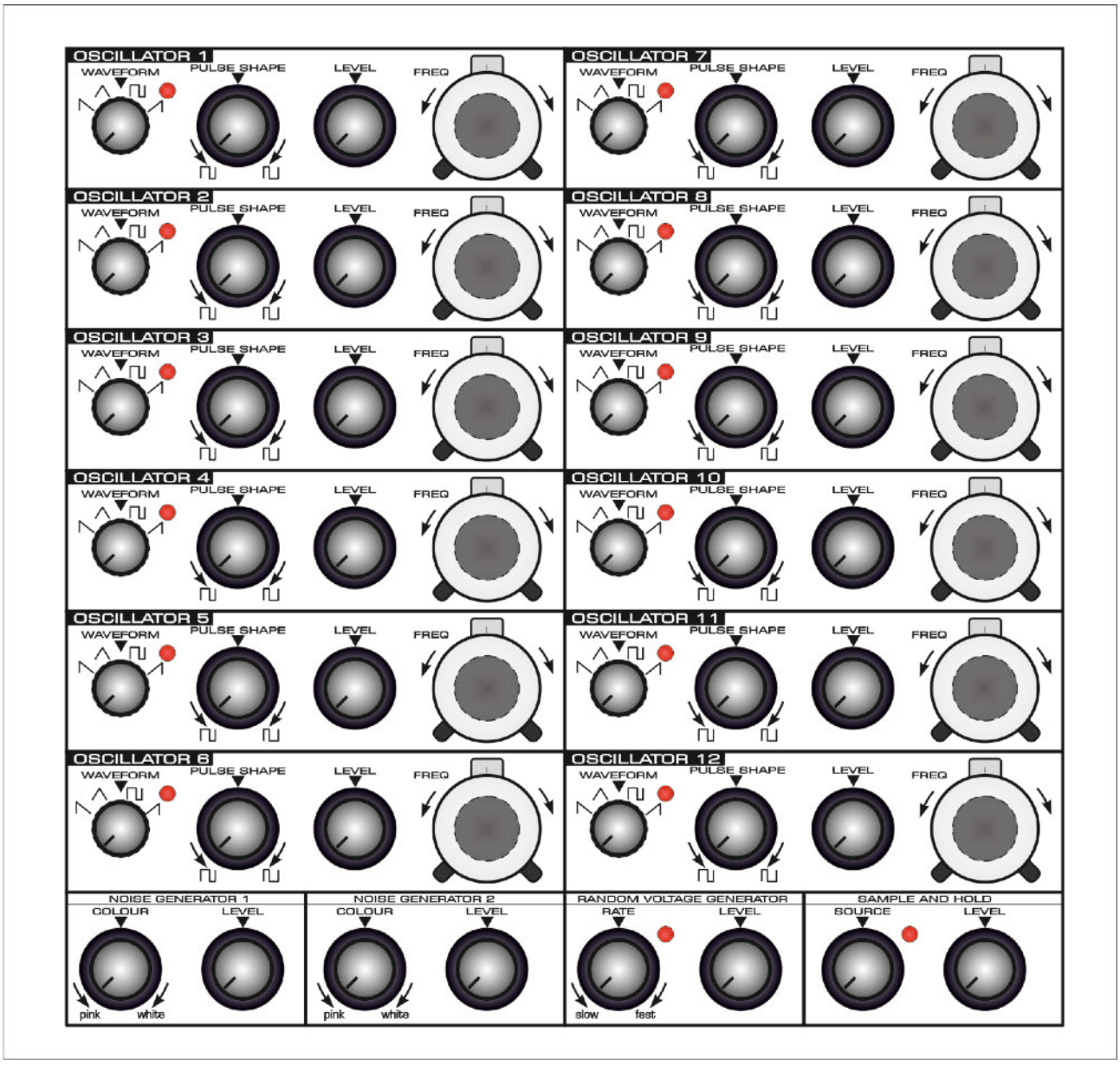
Calibration

Some parts of some circuits are of course calibrated, for example, VCO tune, scale, VCF cutoff. Note, however, it was never our intention that the tone of each circuit be literally identical - as you might expect on a polysynth where each voice must sound the same. In general use you may not notice, but you may find, if you purposely search, that each filter has a slightly different tone. Certainly the tone of the two spring reverbs are slightly different. The tanks themselves are not identical to each other and the circuits all have their own natural variance in component tolerance.

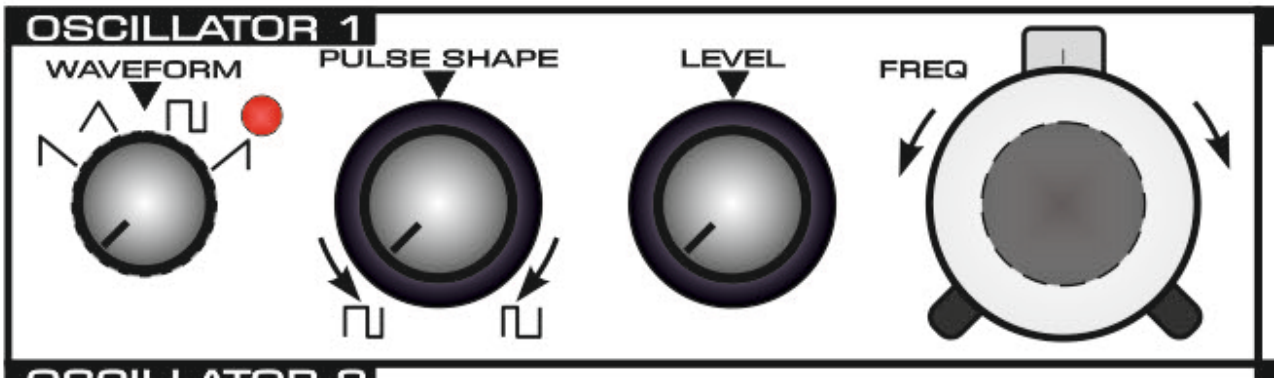
This all adds to the wonderful analogue sound that we want to deliver.

The VCO Panel

Overview of the VCO panel that also features the Noise Generators, Random Voltage Generator and Sample and Hold.



Voltage Controlled Oscillators



Colossus has 12 VCOs. These have a very wide pitch range so they can of course also be used as voltage controlled LFOs.

Each VCO is identical.

WAVEFORM

Choices are Sawtooth, reverse Sawtooth, Square, Triangle. Whatever is selected here is routed to the pin matrix and jack panel.

FREQ

Changes the pitch!

PULSE SHAPE

The pulse width of the square can manually be changed.

LEVEL

Sets the output level.

JACK PATCH POINTS

Each VCO has a pitch CV jack, with an attenuator control.

Odd numbered VCOs have Pulse Width CV inputs.

Even numbered VCOs have a sub-oscillator output.

They all have Sync in and audio out jacks.

NOTE: VCO TUNING AND SCALING

VCOs 1-6

These are calibrated to run in tune when using the Touch Keyboards, patched (Touch keys 1 or 2 out to VCO Pitch 1-6 in) with 10K resistor pins.

Due to the many ways you could patch the VCOs (10K pins vs 0 Ohm pins, cables, with or without external gear) in some instances (impossible to test all) the scaling or tune could change a little when patched in other ways. This kind of synth is a little unusual compare to, for example, a eurorack, with having so many different ways to patch into VCO pitch, and the number of simultaneous signals that you can patch at once to a single destination. It's impossible to guarantee perfect scaling in all circumstances.

With external MIDI converters you may need to adjust tune scale settings on the device. Using the Pitch CV jack sockets on Colossus you may need to adjust the CV attenuator control.

As a general rule, if you want to use the Touch Keys and play 'in tune', use VCOs 1 to 6 using 10K patch pins.

If you find adding additional pins to patch, say, LFO to pitch affects tune or scale in an undesirable way (most patches won't affect), then you can try patching the signal to the pitch jack socket instead.

Changing the number of pins patched from say the Touch Keys to the VCOs can also slightly affect scaling. How much that will affect what you are doing just depends on how many octaves you plan on using, personal taste/opinion, and the patch overall.

VCOs 7 to 12

You may consider using 1-6 for melodies via the touch keys and using 7-12 for modulation and sound effects. This of course is not a rule, just one way of an unlimited possibilities.

These have been calibrated with a patch cable patched from the Touch Keys to the CV in on the sub panel under the VCOs. The attenuator knob is set to about 95% when calibrating. This gives you the chance to trim the scaling from the front panel.

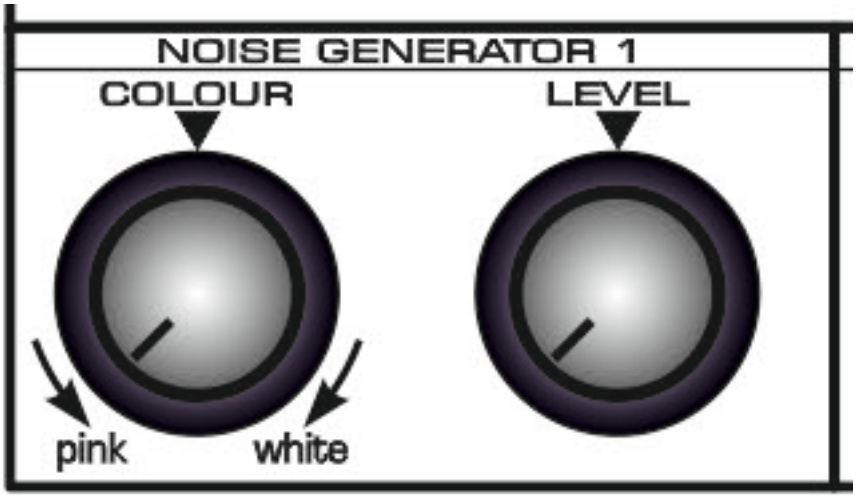
To do this patch up the Touch Keys to VCO 7 (or any VCO higher) using a cable to the CV in socket. Set the knob to about 95%. Then play octaves on the Touch Keyboard (or external controller) and gently adjust the CV attenuator knob until you get octaves.

Unquantised Sources.

When using the 64 step sequencer it doesn't really matter too much how you patch, since the CV out from the sequencer isn't quantised. So you just turn the CV knobs to where you want.

If tuning/scale isn't an issue then just patch how you want.

Noise Generators



There are two Noise Generators:

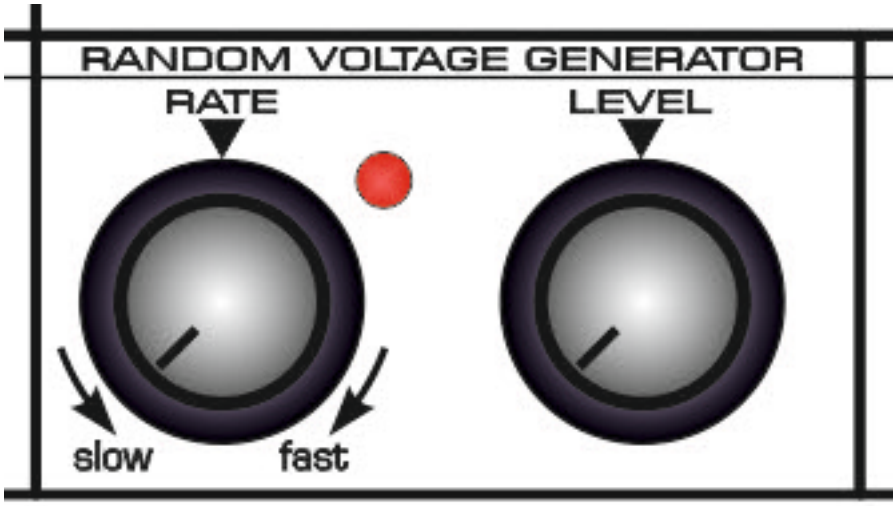
COLOUR

This is the ‘tone’ of the noise. Left is pink noise, right is white noise.
Both sound very similar, however, white sounds more harsh.

LEVEL

Sets the output level.

Random Voltage Generator



This circuit produces a stepped random voltage. The same as when you clock and feed noise through a sample and hold.

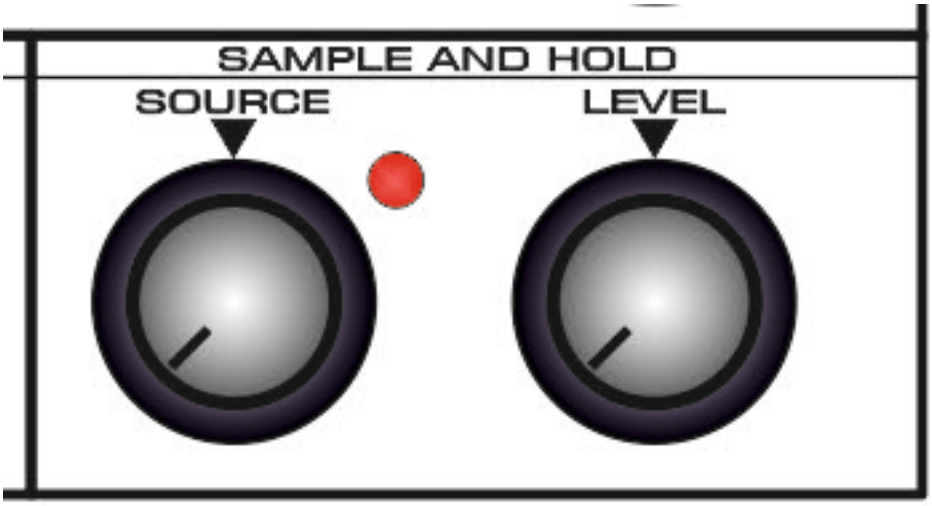
RATE

Sets how often the voltage changes.

LEVEL

Sets the output level.

Sample And Hold



A sample and hold will ‘sample’ the input voltage, and hold it a static level. The sample takes place each time a clock signal is received.

For example, feed in a triangle LFO to the signal in, and at the output you will get a stepped triangle shape. The steps will be at the same rate as the clock.

SOURCE

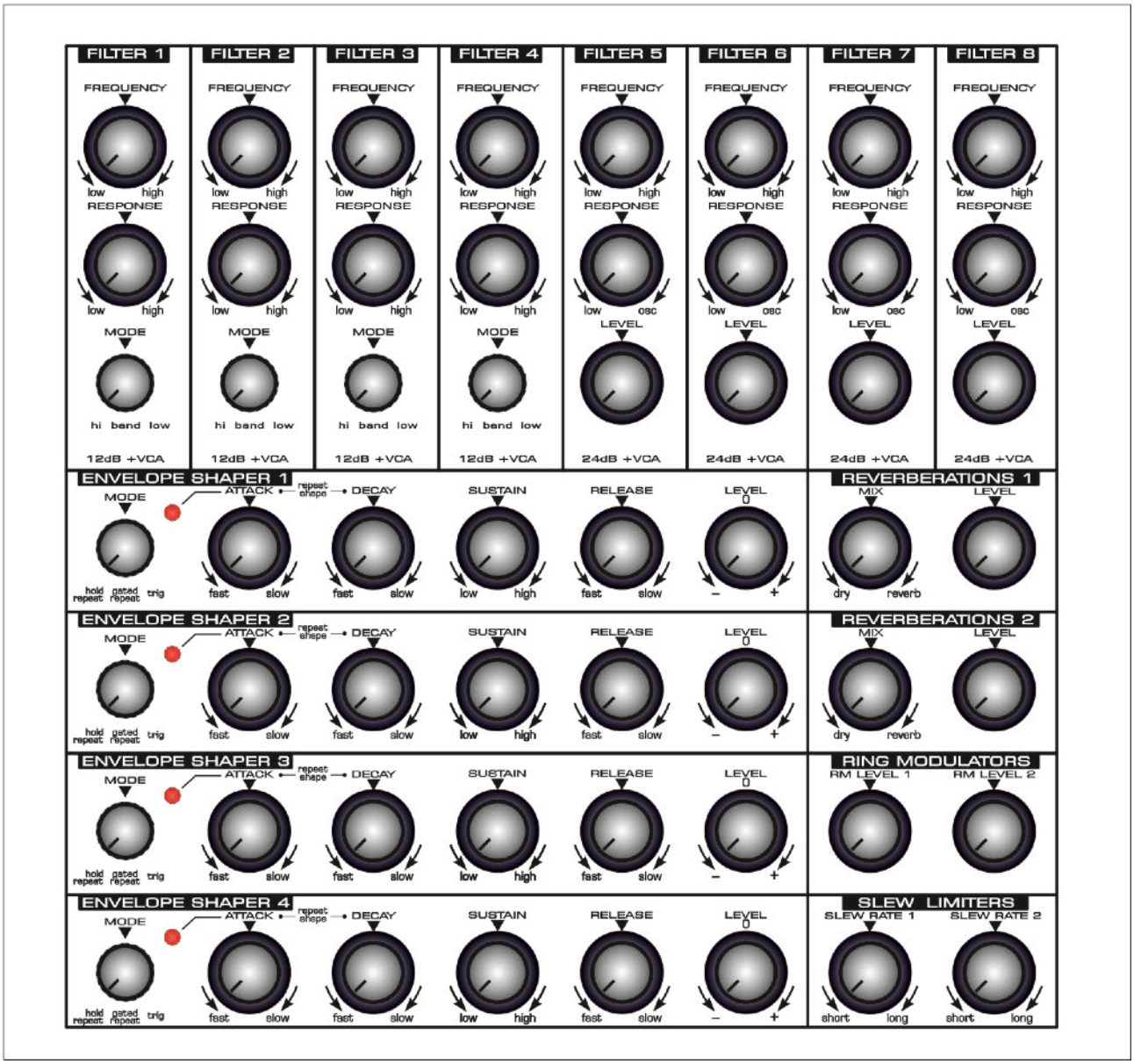
This is the input level of the CV input signal

LEVEL

Sets the output level.

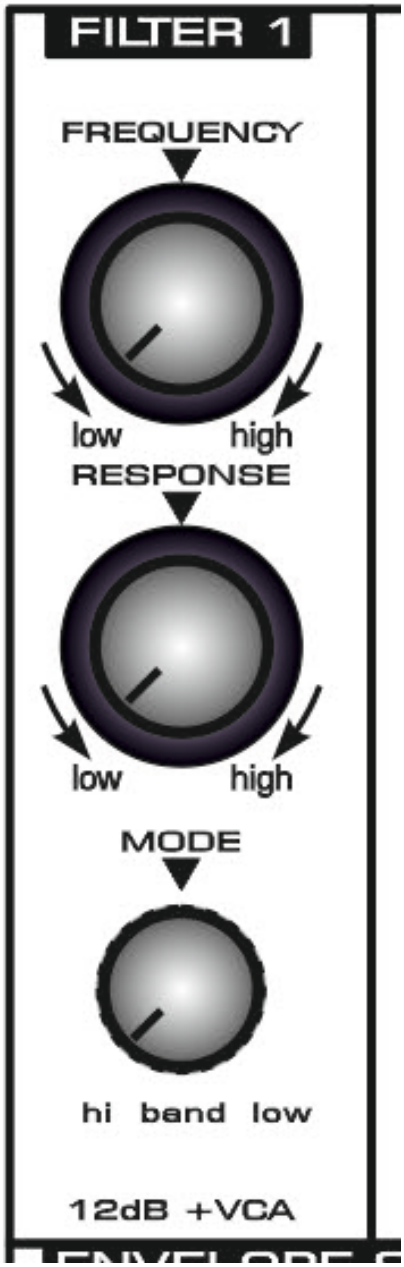
The VCF Panel

Overview of the VCF panel that also features the 4 ADSRs, 2 Spring Reverbs, 2 Ring Modulators and the 2 Slew Limiters.



Voltage Controlled Filters

FILTERS 1-4 ARE 12DB MULTIMODE FILTERS.



FREQUENCY

This sets the filter cut-off.

RESPONSE

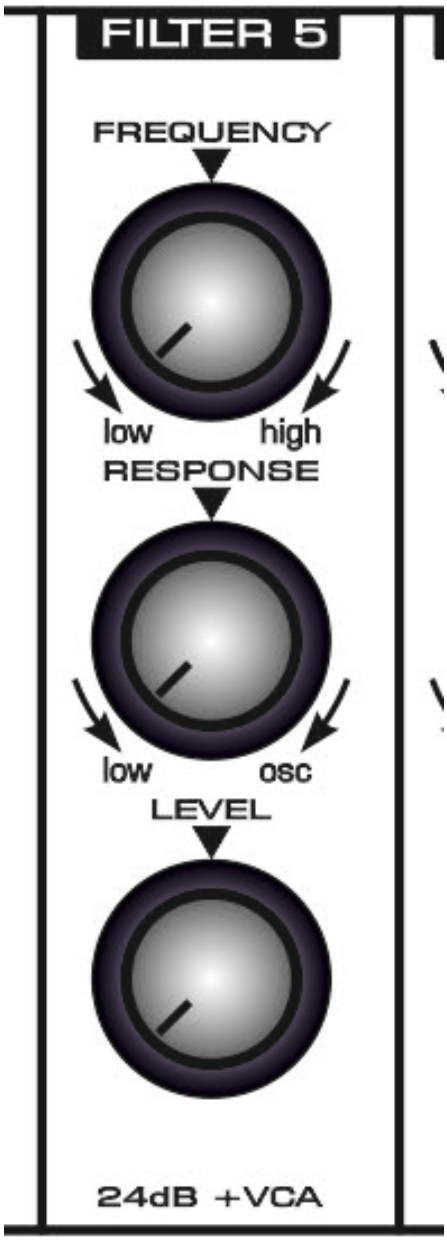
This sets the resonance.

MODE

This switch selects one of three filters - high pass, band pass, or low pass.

Note: Each VCF has its own VCA hard wired in series after the filter. You must send a voltage to the VCA to 'open' it otherwise you will hear no audio.
Patch a voltage to the VCA CV input. If you want to hold it open you can use the 12V pin selection on the matrix panel.

FILTERS 5-8 ARE 24DB LOW PASS FILTERS.



FREQUENCY

This sets the filter cut-off.

RESPONSE

This sets the resonance.

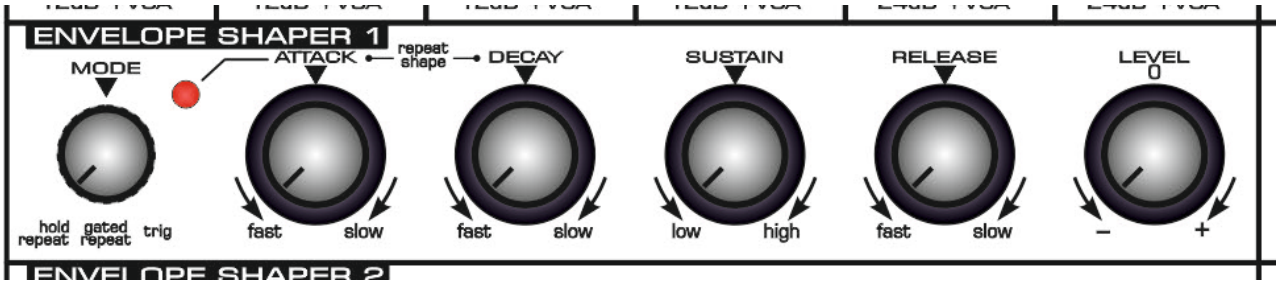
LEVEL

Sets the output level.

Note: Each VCF has its own VCA hard wired in series after the filter. You must send a voltage to the VCA to 'open' it otherwise you will hear no audio.
Patch a voltage to the VCA CV input. If you want to hold it open you can use the 12V pin selection on the matrix panel.

ADSR Envelope Generators

There are four ADSR generators.



MODE

There are three trigger Modes:

Hold repeat

The EG will continuously loop and retrigger itself. In this mode it acts like a LFO with variable wave shape. No external triggering is required. The speed is set with the Attack and Decay controls. You will also have to adjust Sustain to a near zero level for repeat to work.

It is also a handy 'test mode' for when you want to have an EG auto trigger - or to use as a rhythmic device.

Gate repeat

This is similar to above, except it will only repeat when it has a gate voltage on at the trigger input jack/matrix.

Trig

This is just a normal ADSR mode where you need to trigger the EG externally.

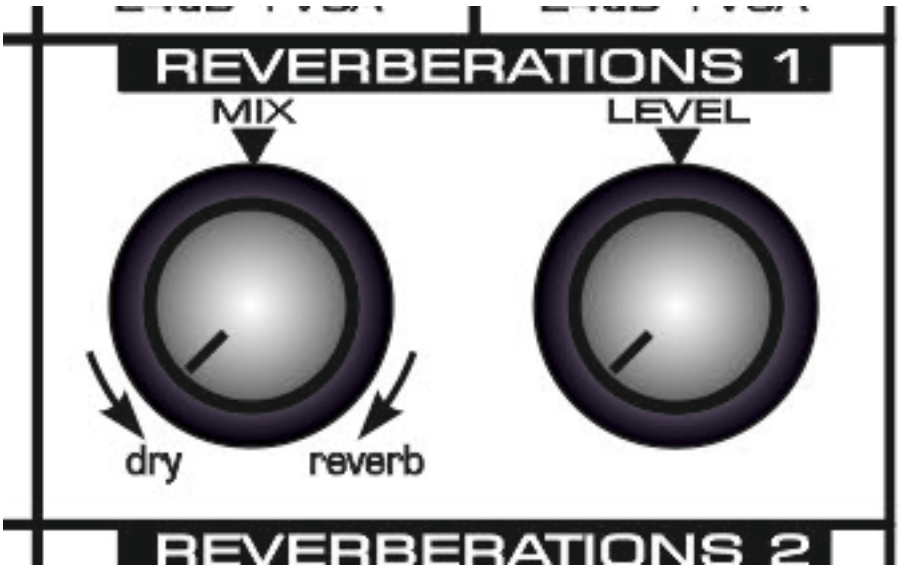
LEVEL

Sets the output level.

Centre is zero level. Turn left for a negative envelope, and right for a positive envelope signal.

Reverberations

Colossus features two spring reverbs. These are real mechanical springs. Each reverb tank has three springs.



MIX

This sets the mix between dry and wet (reverb) signals.

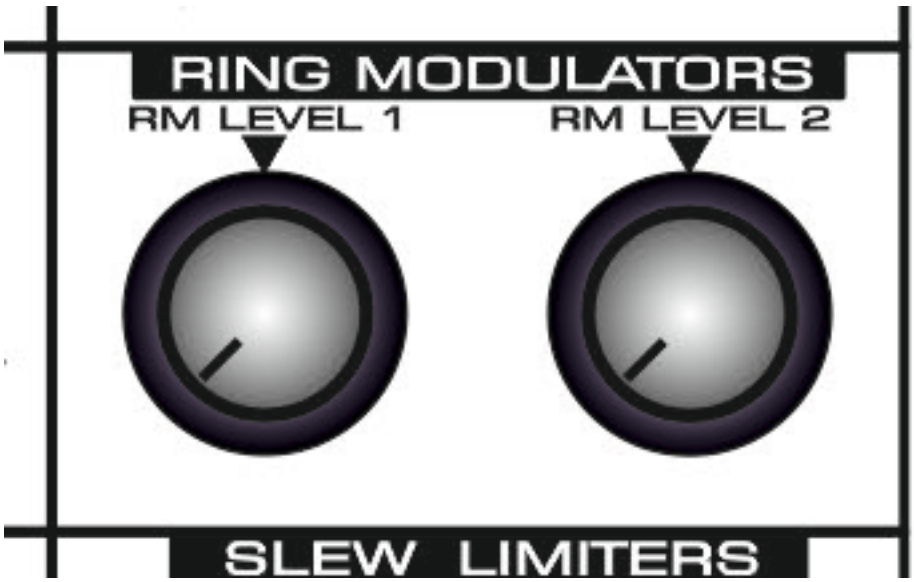
LEVEL

Sets the output level.

Ring Modulators

There are two Ring Modulators.

To use you would typically feed two separate VCO audio signals in to the two inputs.

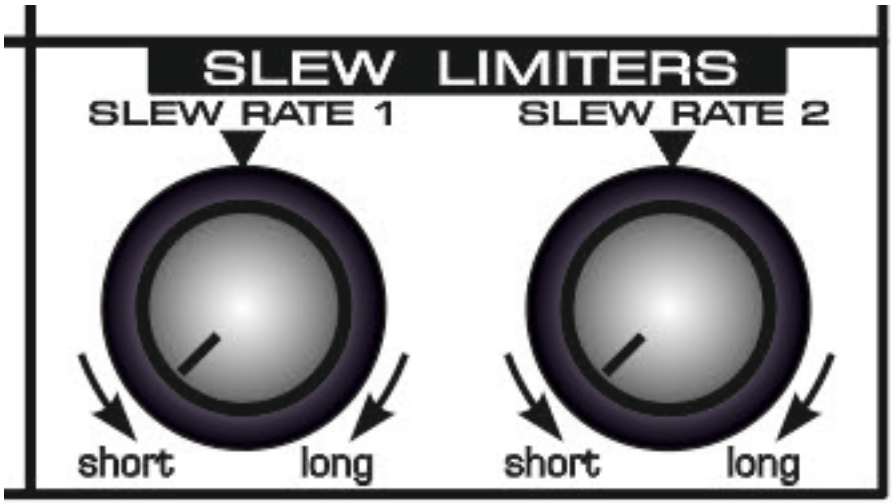


RM LEVEL

Sets the output level.

Slew Limiters

There are two Slew Limiters. These will smooth out any stepped CV you feed into them. Think of them as glide or portamento.



SLEW RATE

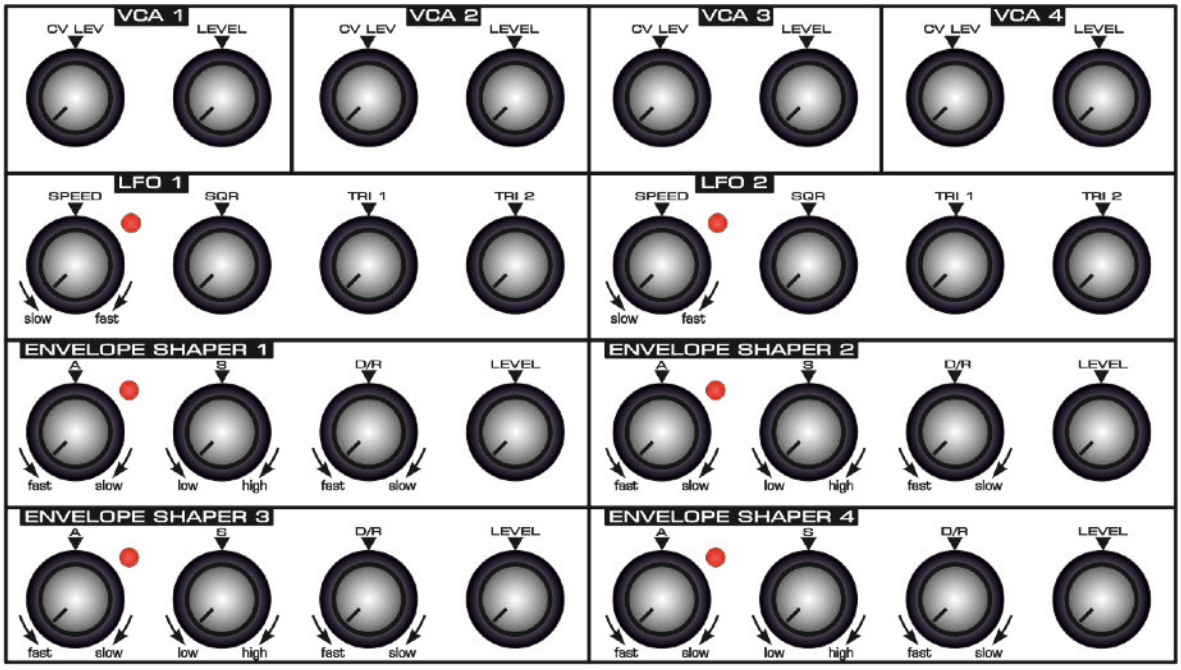
This sets the amount of 'smoothing' - the rate at which the output signal will glide between voltages.

The Scope Panel

Overview of the scope panel which features the Oscilloscope (at the top), 2 LFOs, 4 VCAs, 4 A(D)SR envelopes.

As there are different Oscilloscopes available (subject to stock, availability etc) - please refer to a separate document (oscilloscope user manual) referring to the scope you have installed.

Note: if you have an early Colossus with a CRT scope - to prevent screen burn in, I suggest you always have a signal going into the scope. A good idea anyway since a waveform will look more cool than a straight line. Simple patch one of the VCO audio outs to the Scope's Y input.

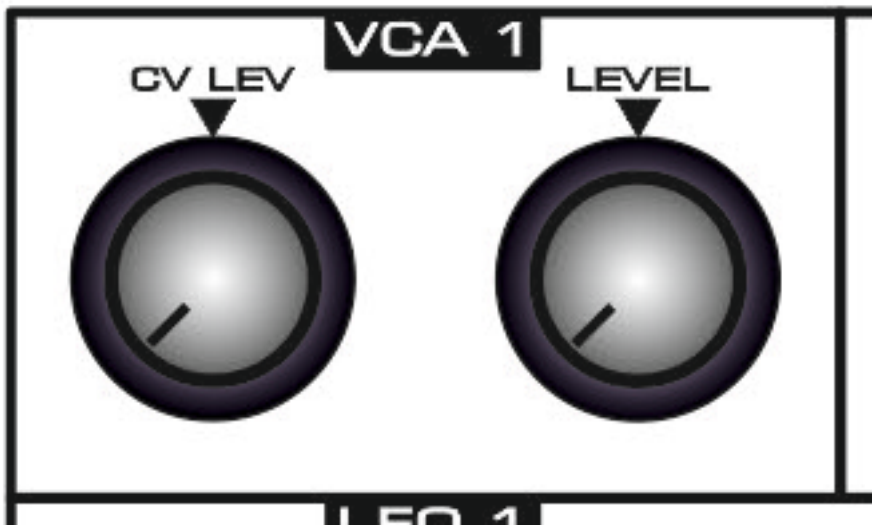


Voltage Controlled Amplifiers

Each VCF has its own built in VCA, but there are also four discrete VCAs in the Scope panel. These can be used to change the level of audio and CV signals.

CV LEV is the voltage level control for the amplifier amplification amount.

LEVEL is the output level of the VCA.



Note: to get a signal through these VCAs, aside from of course patching in your signals, you have to be aware there are three level controls:

Input signal level: this is the small knob on the sub Jack panel.

CV input level: Large knob on the main panel.

Output level: Large knob on the main panel.

If any of these are at zero you won't get a signal through.

Input and output signals:

VCAs 1 and 2 are wired into the CV Matrix panel.

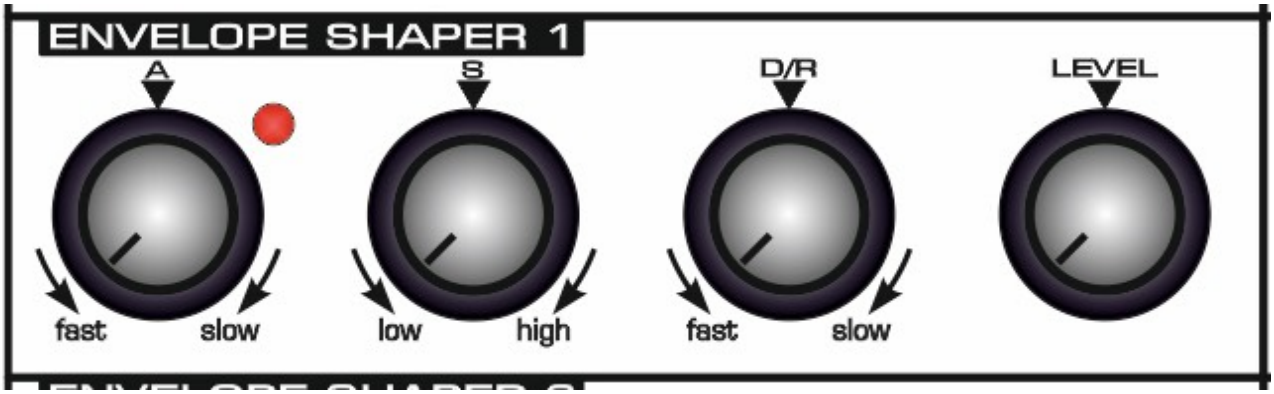
VCAs 3 and 4 are wired into the Audio Matrix panel.

For all four VCAs, the amplifier CV levels are wired into the CV Matrix panel.

A(D)SR Envelope Shapers

Colossus has four A(D)SR envelope shapers in addition to the four full ADSR envelopes.

Note, the D/R control affects both Decay AND Release. So really, the A(D)SR envelopes are ADSRs!



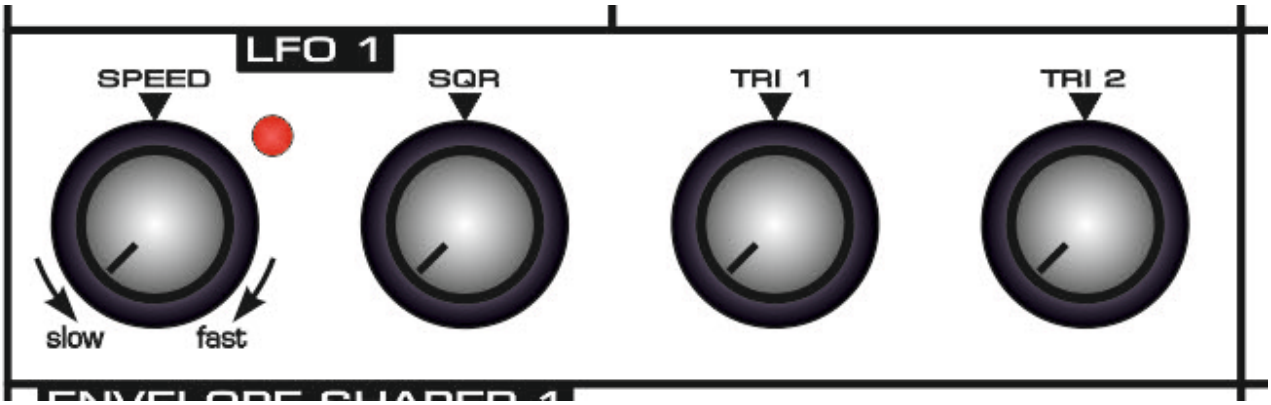
Low Frequency Oscillators

In addition to the 12 VCOs which can be used as LFOs, there are two additional separate LFOs in the Scope panel.

The LFOs feature Triangle and Square waves.

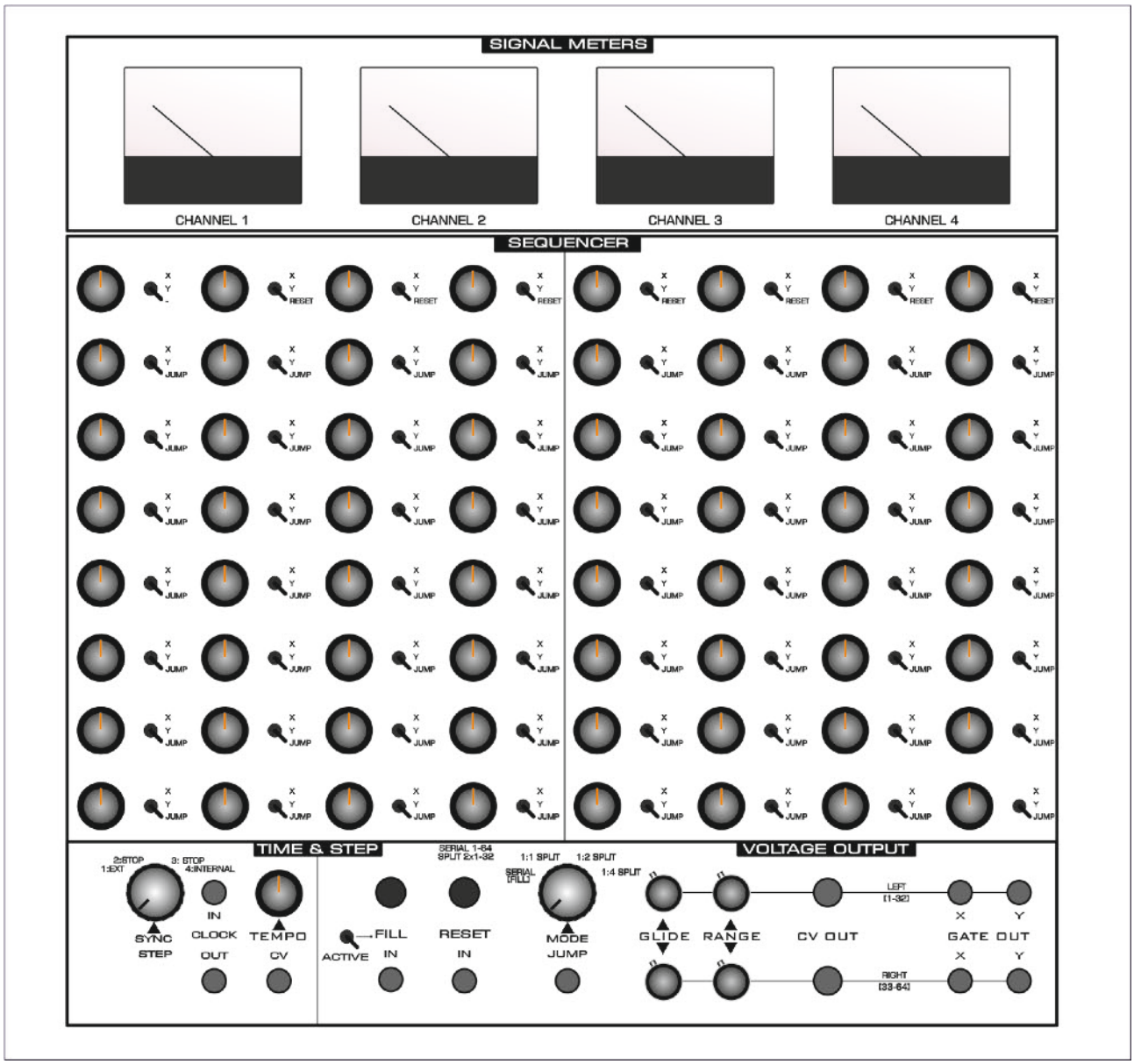
SQR is the square wave output level.

TRI 1 and 2 are the same LFO signal but with two outputs with their own level control.



The Sequencer Panel

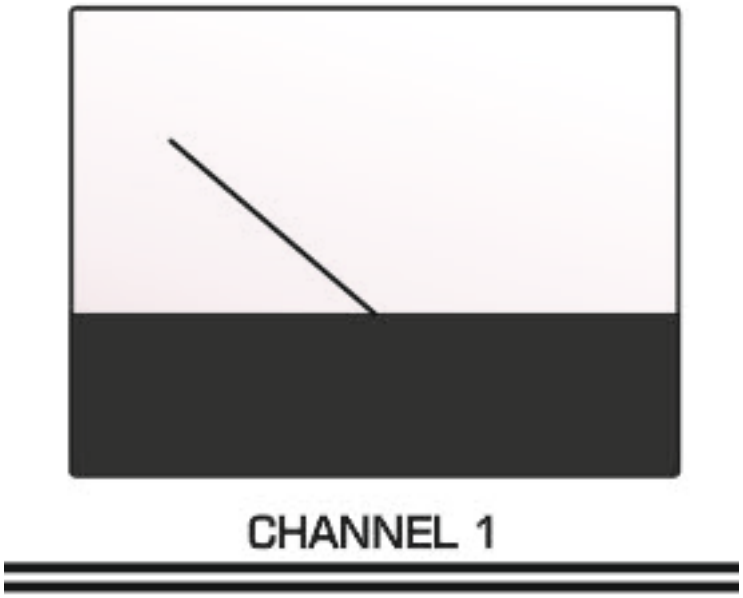
Overview of the CV Sequencer panel that also features the 4 Signal Meters.



Signal Meters

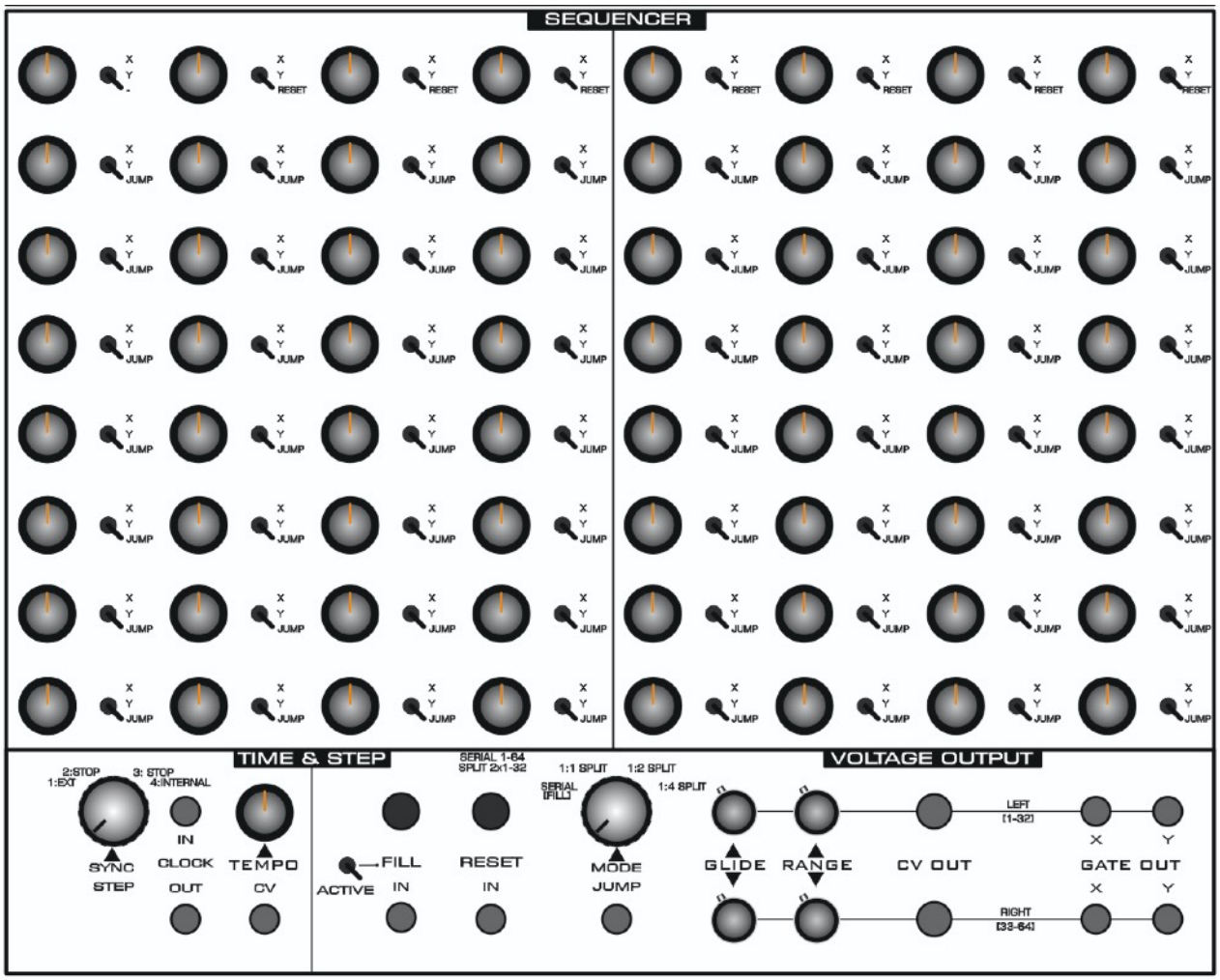
Colossus features four backlit moving coil signal meters. These have a range of approximately 10V.

Note: they have not been precision calibrated - there is no need since this is a musical instrument. There is no reason to know *exact* voltages! They are there more for vintage flavour. The rule should always be 'does it sound good?' - not 'what voltage is this or that?'



64 Step CV / Gate Sequencer

The sequencer is 64 steps in Serial mode, or split into two parallel sequences of 32 steps.



STEP SWITCH

Pressing this advances the sequencer one step forward.

SYNC SWITCH

This selects the sync source:
1 External clock - from the IN jack
2 STOP
3 STOP
4 Internal - from the internal clock

TEMPO

Sets the speed of the internal clock.

IN AND OUT JACKS

Clock in and out!

CV

Use a CV into here to change the clock speed. You will need to lower the TEMPO control setting first if using the CV input.

FILL

The sequencer has a fill-in feature.

This is only active if the sequencer is set to Mode 1 - Serial mode, and, the Fill Active switch is on (down).

The sequencer will just loop the left side (1-32). To activate the Fill pattern/sequence (steps 33-64), press the FILL button, or send a trigger pulse to the FILL IN jack. If you press button or pulse the jack multiple times the Fill pattern will loop for that many times.
The Fill will play after the current left side loop has finished playing a whole bar.

RESET

Pressing the Reset push button or pulsing the Reset jack with a trigger will reset the sequencer to step 1 on the following clock signal.

PLAYBACK MODE

This switch selects 4 different playback modes:
1 Serial mode - runs as a single 64 step sequence.
2 ‘Split’ Parallel mode 1:1. Two 32 step sequences.
3 ‘Split’ Parallel mode 1:2. As above but the Right plays at half tempo.
4 ‘Split’ Parallel mode 1:4. As above but the Right plays at quarter tempo.

The left and right sequences each have their own CV Glide and CV Range controls.

GLIDE

This adds portamento to the CV output.

RANGE

This sets the voltage range of the output.

CV OUT

This is the CV out for the Left or Right sequence.

GATE X / Y

This is a trigger/gate output for the Left / Right sequences.

64 STEPS

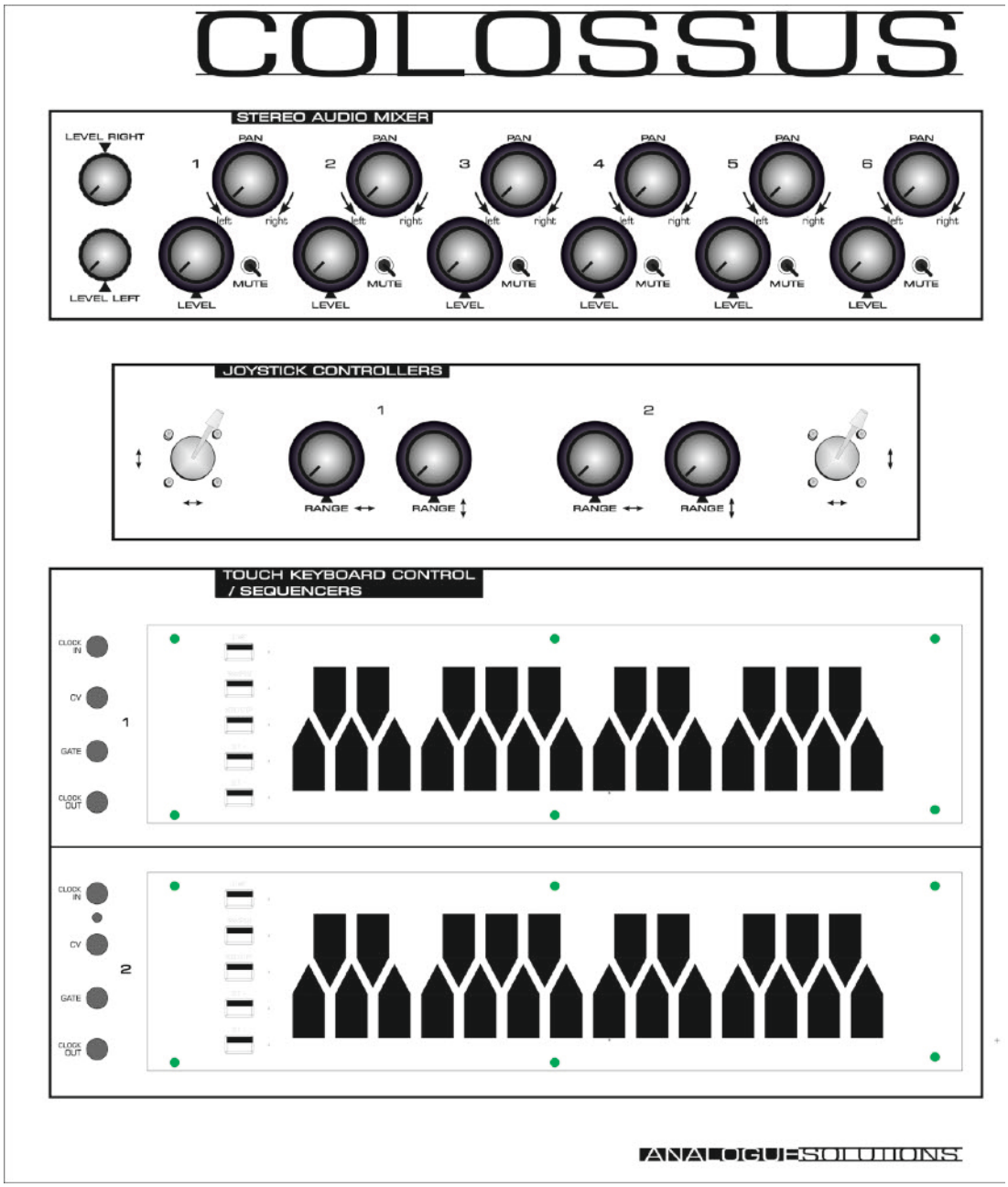
Each step has its own CV level control.

Also a X/Y/Reset-Jump toggle switch:
X A trigger is sent to the X jack socket.
Y A trigger is sent to the Y jack socket.
Jump The sequencer order will jump to the start of the next column to the right.
Reset The sequencer will jump to the first step of the first column.

Note: the CVs are not quantised - this is a purely analogue CV sequencer.

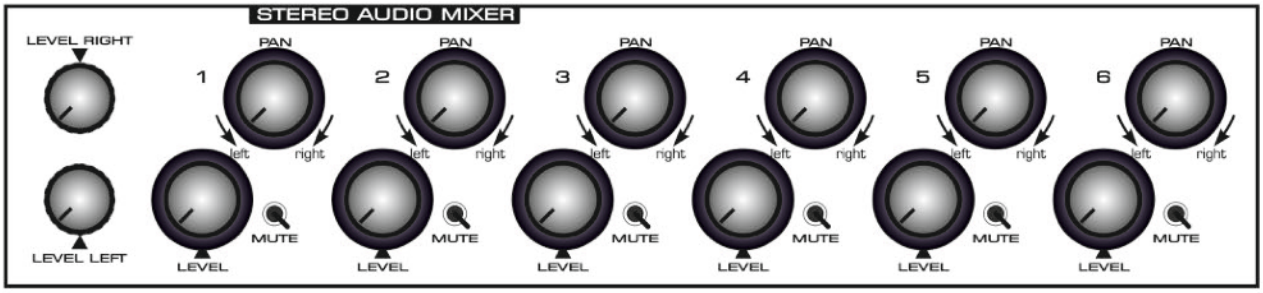
The Touch Panel

Overview of the Touch panel that also features the two Joysticks, six channel stereo Mixer and the two Touch Keyboards/Note Sequencers.



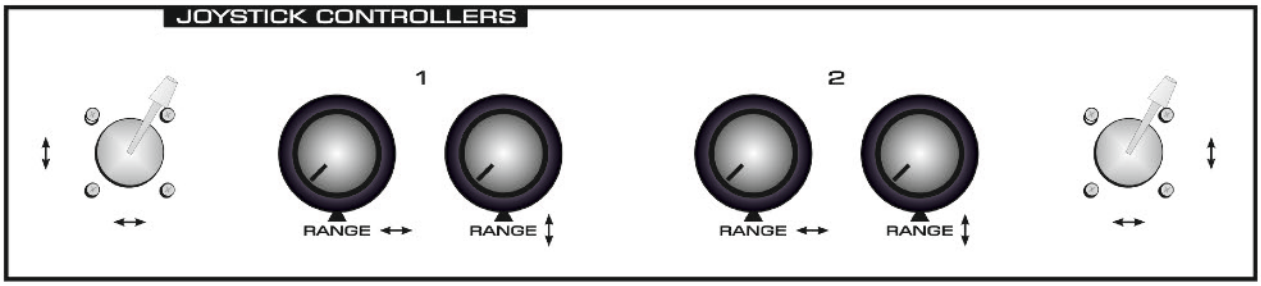
Stereo Audio Mixer

Colossus features a six channel stereo mixer. Each channel features Mute, Level and Pan. There are master Left and Right levels 1/4" output jacks on the front Sub panel and on they are duplicated on the rear. You can always take your outputs straight to a modern advanced mixer if you need additional processing.



Joystick Controllers

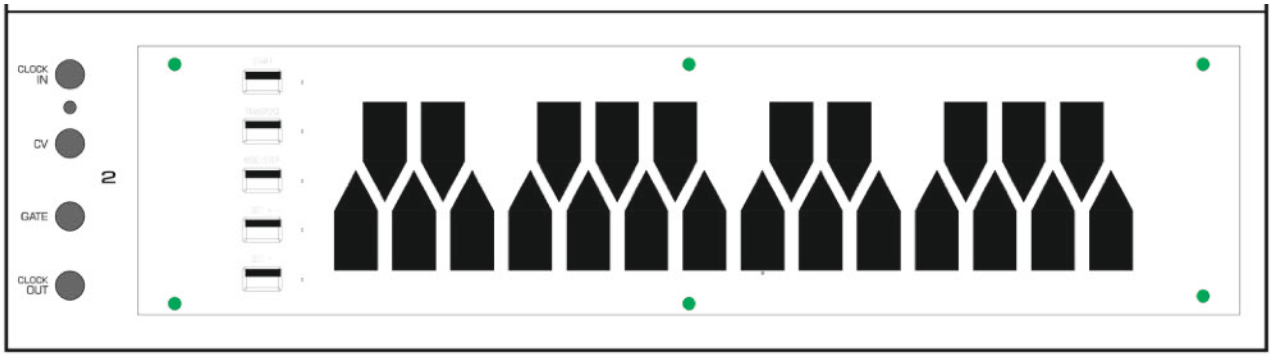
Colossus features two joystick controllers. These provide a bipolar voltage range of approximately -12V to +12V. There are range controls for each axis.



Touch Keyboard / Note Sequencers

There are two touch keyboard / note sequencers on Colossus.

The keys can be played in the 'traditional' sense. The keys are also for entering notes into the note sequencers, and then transposing the sequences.



CLOCK IN / OUT

This is for clocking the note sequencer. The Out can be daisy chained to the other sequencer's in.

CV / GATE

CV is 1V/Oct.
Gate is positive 5V gate.

ENTERING NOTES

The sequence length is 16 notes long. The keyboard is continually scanning for new notes - each time you press a key this is logged into the 16 note memory. If a 17th note is entered the memory will loop around and will overwrite the older notes. The sequence can be over written whilst it is playing.

PLAYBACK

The sequencer will only run when you have a clock signal patched in (the clock out of the CV sequencer will do) and RUN is activated.

RUN

This needs to be active (and a clock patch in) to run the sequence. The LED will flash each time a clock pulse is received when Run is active.

TRANSPOSE

Whilst the sequence is playing you can use the keyboard to transpose your pattern.

The sequence has to be running. Press Transpose. The LED will light to show Transpose mode is active.

Use the note and octave keys to transpose the sequence.

Exiting Transpose mode will restore the original pitch.

The middle C key has a little white dot underneath it. This is to highlight that this is the centre key for transpose. When in transpose mode, pressing this key cancels / zeros transpose.

MODE/STEP

You can reverse the playback / stepping order by pressing the Mode/ Step key.

OCTAVE KEYS

You can transpose the keyboard up or down one octave at a time using the Octave keys.

NOTE KEYS

There are 24 keys on each keyboard (ie 2 octaves).

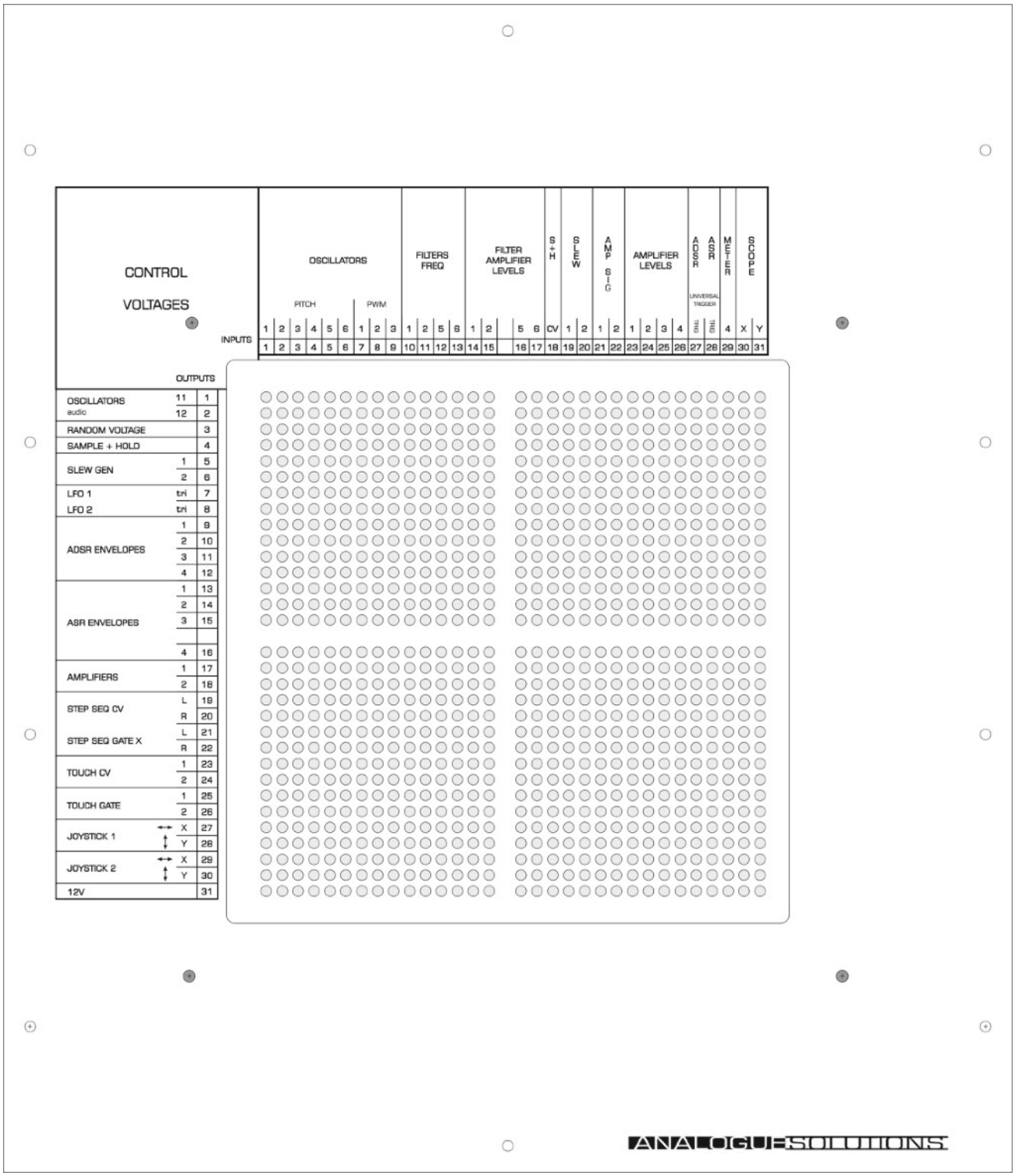
NOTE:

The sequencers have ranges of 8 octaves which equates to 8 volts.

If you program a very low octave sequence, then further transpose that sequence down, or, program a high octave sequence then further transpose that sequence up, you will set the notes outside the 8 octave (8 volt) range and the notes will wrap around (like Pac Man).

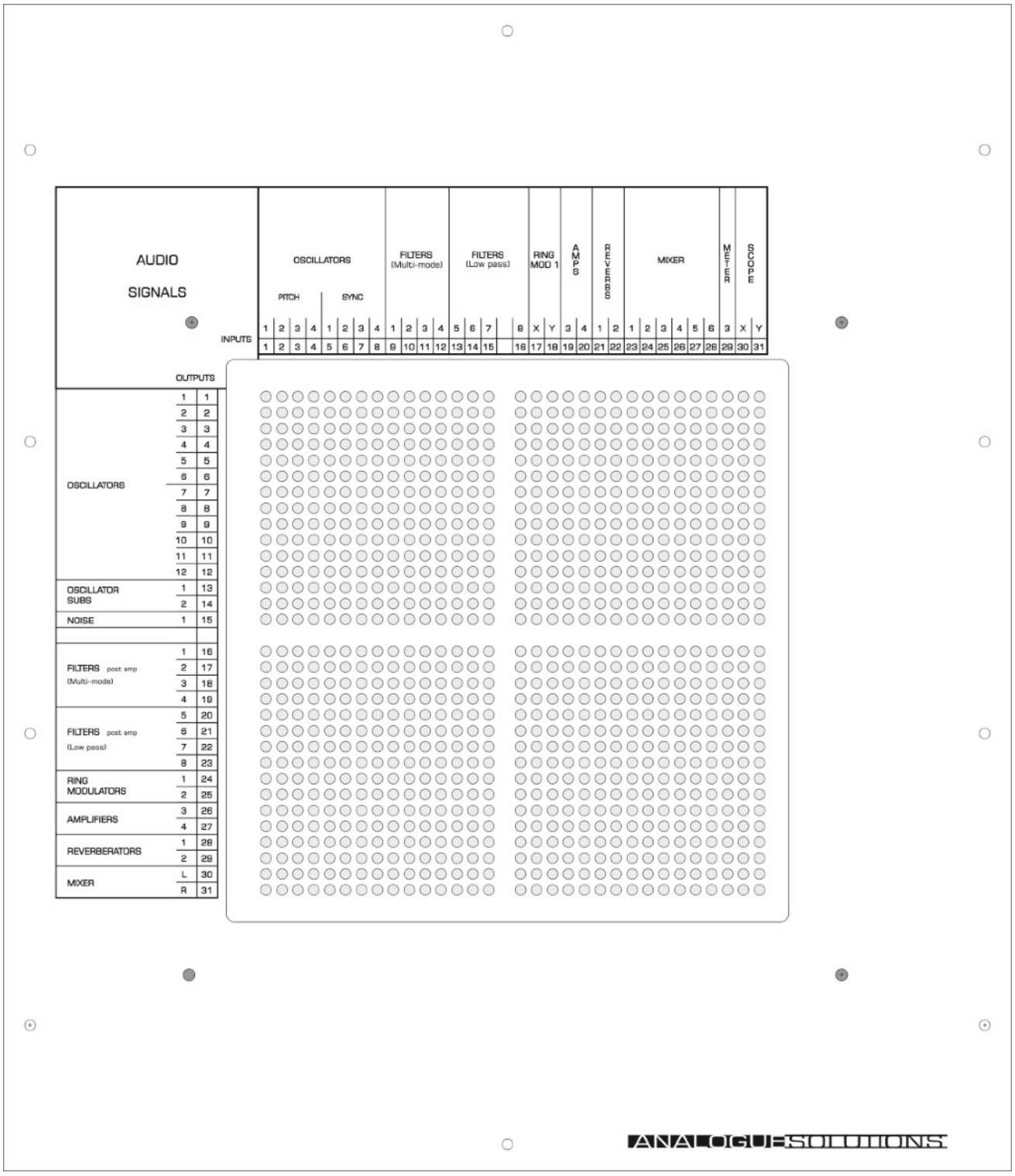
The CV Matrix Panel

This panel is where most of the CV signals come and go. Plus a couple of VCO audio signals for high frequency modulation.



The Audio Matrix Panel

This panel is where most of the audio signals come and go.



Audio Matrix Panel - Vertical Section

	OUTPUTS	
OSCILLATORS	1	1
	2	2
	3	3
	4	4
	5	5
	6	6
	7	7
	8	8
	9	9
	10	10
	11	11
	12	12
OSCILLATOR SUBS	1	13
	2	14
NOISE	1	15
FILTERS post amp (Multi-mode)	1	16
	2	17
	3	18
	4	19
FILTERS post amp (Low pass)	5	20
	6	21
	7	22
	8	23
RING MODULATORS	1	24
	2	25
AMPLIFIERS	3	26
	4	27
REVERBERATORS	1	28
	2	29
MIXER	L	30
	R	31

1-12
These are audio outputs from each of the 12 Oscillators.

13-14
These two are Sub Oscillators outputs from VCOs 1 and 2.

15
Noise 1 output.

16-23
These are audio outputs from all the filters- post VCA, since all filters have a VCA wired in series.

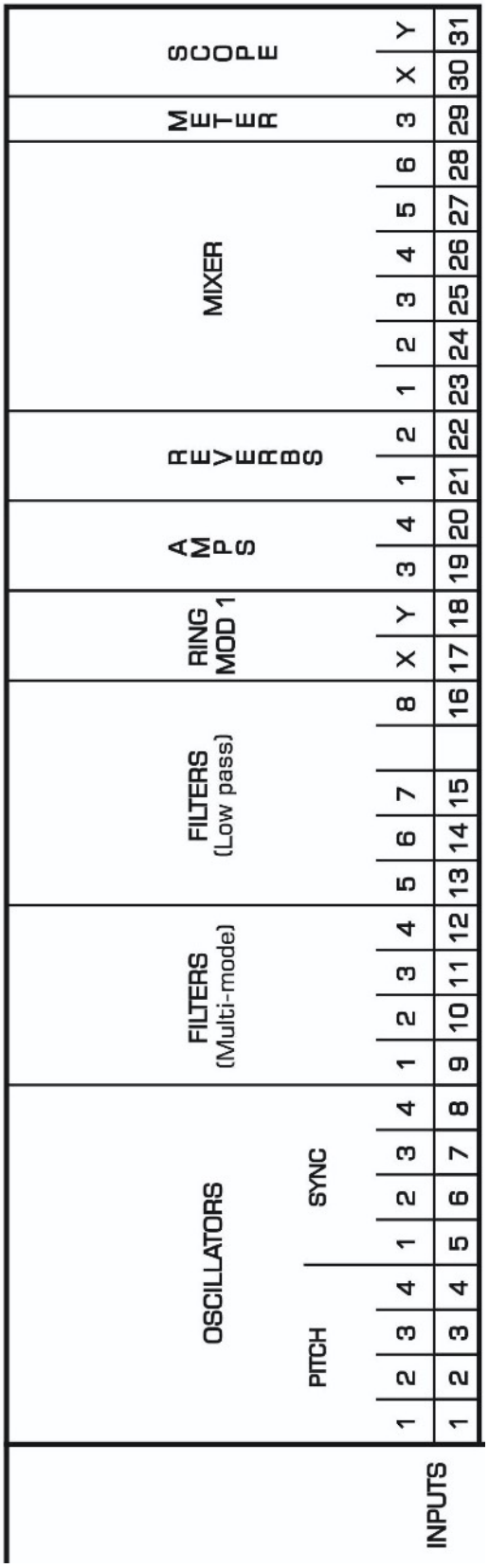
24-25
These are audio outputs from the two Ring Mods.

26-27
These are the outputs from the two discrete VCAs.

28-29
These are audio outputs from the two Reverbs.

30-31
These are the master Left and Right outputs from the mixer.

Audio Matrix Panel - Horizontal Section



30-31
Scope signal inputs:
X / Channel 1
Y / Channel 2

29
Signal input to Meter 3.

23-28
These are audio inputs to the Mixer.

21-22
These are audio inputs to the two Reverbs.

19-20
These are signal inputs to the discrete VCAs.

17-18
These are the X/Y inputs to Ring Mod 1.

9-16
These are audio inputs to the eight filters.

5-8
These are Sync inputs to VCOs 1-4.

1-4
These are Pitch CV inputs to VCOs 1-4.

CV Matrix Panel - Vertical Section

		OUTPUTS
OSCILLATORS audio	11	1
	12	2
RANDOM VOLTAGE		3
SAMPLE + HOLD		4
SLEW GEN	1	5
	2	6
LFO 1	tri	7
LFO 2	tri	8
ADSR ENVELOPES	1	9
	2	10
	3	11
	4	12
ASR ENVELOPES	1	13
	2	14
	3	15
	4	16
AMPLIFIERS	1	17
	2	18
STEP SEQ CV	L	19
	R	20
STEP SEQ GATE X	L	21
	R	22
TOUCH CV	1	23
	2	24
TOUCH GATE	1	25
	2	26
JOYSTICK 1 ↔	X	27
JOYSTICK 1 ↕	Y	28
JOYSTICK 2 ↔	X	29
JOYSTICK 2 ↕	Y	30
12V		31

1-2
Audio Output from VCOs 11 & 12.

3
Output from the RVG.
4
Output from the S+H

5-6
Outputs from the two Slew Generators.

7-8
Triangle outputs from LFOs 1 & 2.

9-12
Outputs from each of the 4 ADSRs.

13-16
Outputs from ASR envelopes.

17-18
Signal outputs from discrete VCAs 1 & 2.

19-20
Step sequencer CV outputs L/R.

21-22
Step sequencer Gate X outputs L/R.

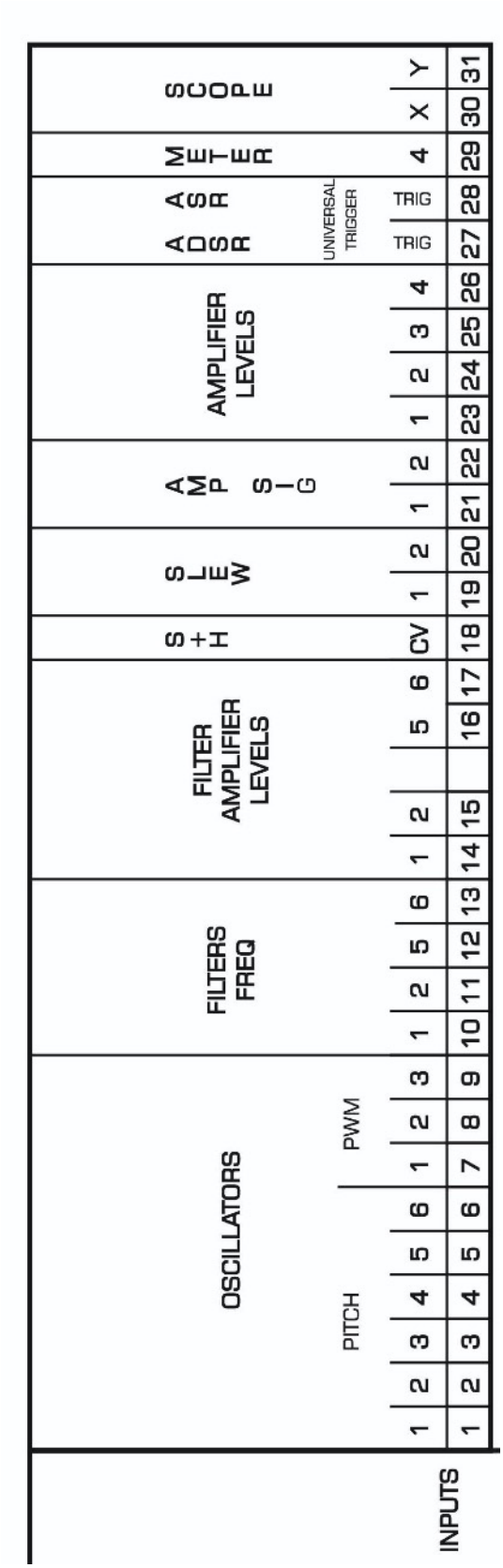
23-24
Touch sequencer CV outputs 1 & 2.

25-26
Touch sequencer Gate outputs 1 & 2.

27-30
Control CV output from Joysticks 1 & 2.

31
12V static voltage.

CV Matrix Panel - Horizontal Section



30-31
Scope signal inputs:
X / Channel 1
Y / Channel 2

29
Signal input to Meter 4.

27-28
Universal trigger - to trigger all ADSRs or all ADRs.

23-26
These are CV control inputs for the discrete VCAs.

21-22
These are signal inputs for the discrete VCAs 1 & 2.

19-20
CV inputs for the two Slew Generators.

18
CV input to the S+H.

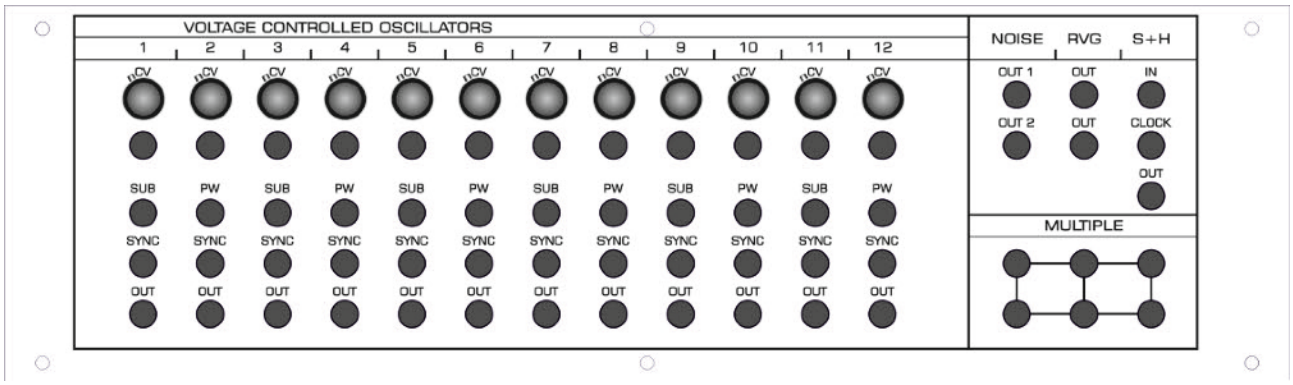
14-17
These are CV control inputs for Filter VCAs 1,2,5,6.

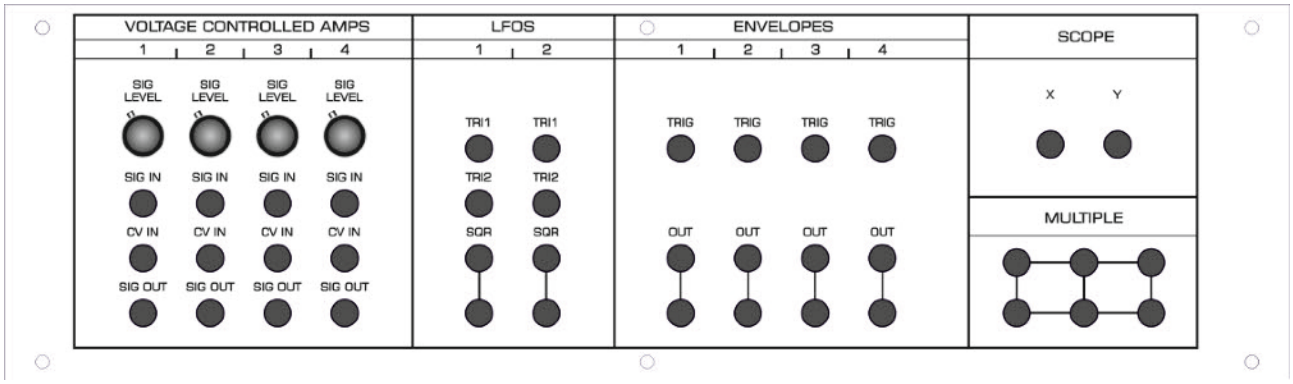
10-13
Filter Cut-Off CV control inputs for VCFs 1,2,5,6.

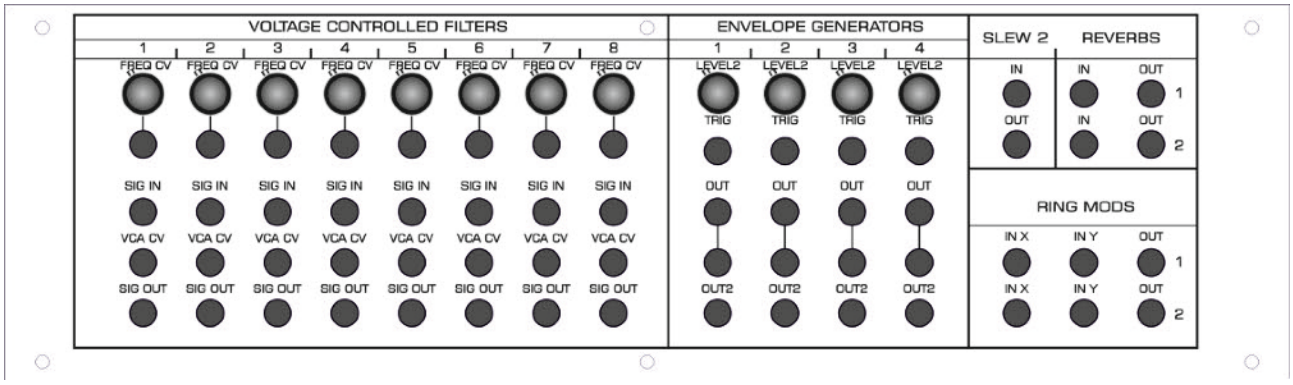
7-9
PW CV control inputs for VCOs 1,2,3.

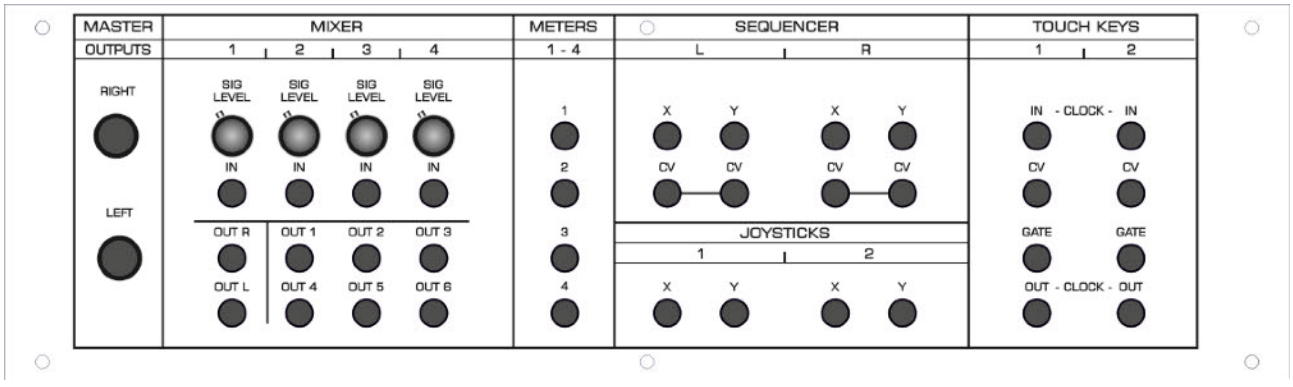
1-6
Pitch CV control inputs for VCOs 1-6.

The 4 Jack Panels









The jack panels require mono 3.5mm jack plugs. It's not possible to fit all the signals on the matrix panels, there are simply too many. So nearly every signal is also available on the jack panels.

These jacks also allow simple connection with external effects or modular gear, and of course is fully compatible with Eurorack.

The 2 master outputs from the Stereo Mixer are available on 6.35mm unbalanced mono jack plugs. Here is where you'd normally take the signals to feed to your eternal mixer or DAW input. These 2 jacks are copied to the rear panel for convenience.

JACK SOCKETS

Hopefully the function of each jack socket should be fairly obvious. They do what they are labelled as. Each Jack panel refers only to the large panel in line above it.

JACK PANEL ATTENUATORS

Some of the jack panels also have attenuator controls wired to jacks. These are signal attenuators and affect the signal patched into the jack directly below it.

Other Stuff

In the accessories box you will find the power lead, pins, CV leads etc.

Also you will have 2 blank lengths of sheet metal.

These are CV Matrix Panel supports. Should you need to inspect the underside of the matrix panels, the metal blank acts as a support to keep the panel elevated.

Place it between the hexagonal PCB spacer on the reverse of the matrix panel and the front inside of the lower case.

Note: you shouldn't really need to look inside the case and just be aware that if you open up Colossus to poke around you may accidentally disconnect a cable, break something, and even possibly cause yourself problems!

No Signal?

There are many settings that can kill the sound! Colossus is immensely flexible making an insanely wide range of sounds, many of which can give you no output, including, due to extreme filtering.

General things-

Do you have audio going into the synth's mixer?
Are you triggering the EGs correctly?
Main volume up?
Leads all OK (double check! Assume nothing)? You could have a bad lead.
Have you patched CV to the VCF VCA level?
Check all the basic stuff first - this usually covers most problems.
Don't assume Colossus is the fault - it could be your external gear/ set-up - or simply incorrect front panel settings. (Or just bad patching).

Colossus is extremely versatile and has a very wide range of possible sounds.

Some settings will result in no sound!

For example, no CV to the VCA level means no sound comes out of the VCA.
VCA EG Attack turned too high might mean no sound.
Ensure the Volume control is up!
Filter cut-off too low.
A rotary or other type of switch in a half way position between two settings.

Carefully work through your patch. You can tap the audio signal by routing various stages direct to your mixer.

The oscilloscope of course is also a useful diagnostic tool.

Also check the following…

- Your mixing desk / monitoring equipment is on and working correctly. We get a few customers a year complaining of faults which end up being some DAW setting.
- Check the synth is switched on and that the power adaptor is functioning correctly. Check you are using the correct mains adaptor.
- Check it is connected to your monitoring equipment correctly and that the cable is not faulty.
- Ensure the output volume is high enough.
- Certain extreme filter settings may filter out all of the signal or produce low level signals. Try adjusting the filter cut-off.
- Ensure EGs are being triggered.

Don’t instantly assume the synth is at fault - we have had dozens of instances where problems turn out to be faulty and intermittent leads, incorrect settings in DAW and audio interfaces, mixer busses set wrong etc. We have heard all manor of crazy and silly mistakes. Many ‘Doh!’ moments.

Physical Specification

SIZE:

1585mm length, 700mm width and 655mm high.

Note, if tilted 45 degrees the synth's effective width reduces to 620mm which may help with unusually narrow doors. There are other tips for narrow doors in the text earlier in this manual.

WEIGHT:

55Kg.
Crate is approximately 90Kg.

POWER:

Switchable 115/230V (ask how if necessary!)

Note: If you have a CRT Oscilloscope, then this is NOT switchable.
You would need to convert the voltage. Disconnect power to the scope if you need to change the power voltage.
Note2: Some more recent CRTs are switchable - check the back panel of the scope to check.
For LCD scopes there is no problem.

IEC power socket.
Neon mains switch.

JACK SOCKETS:

Use 3.5mm mono 'mini jack' cables.
There are two main out jack sockets that are mono/un-balanced 6.35mm 'big' jack. These are also copied to the rear panel.

PINS

These are not compatible with either Vostok or EMS matrices. Suggestion is to order direct from Analogue Solutions.

Two types are available -

Black 0 Ohm (best price)

Red 10K Ohm (expensive!)

ACCESSORIES

Comes with a selection of pins and cables.
IEC mains cable.
Pin matrix covers x2
Matrix panel supports x2

Additional parts are available to order, including (at time of writing) spare CRT oscilloscopes if you require a spare.