Specifications for ColOSCil

Spectral Controls on MUSIC input

Weight	Bass filter (shelving) ±12dB gain from around 80Hz@6dB/8ve
Edge	Treble filter (shelving) ±12dB gain from around 8kHz@6dB/8ve
Switch	Pressed in this activates Spectral Controls

Inputs

Connectors	¼" jack, two pole, TIP input signal, SLEEVE 0V
Levels	Optimum results occur with input levels of +2dBu to +12dBu , maximum input level >+12dBu
Freq Response	Music inputs <20Hz to >35kHz, modulator input DC to >35kHz
Input Impedance	>10k
MOD	Modulation Input - this feeds one side of Ring Mod
MUSIC	Main Input - this feeds the other side of the Ring Mod. If Spectral Controls are activated they vary the spectrum of this input
Breakthrough	MOD in +10dBm with no MUSIC signal, MOD out <-65dBm maximum, typically <-70dBm, same for MUSIC signal with no MOD

Outputs

Connectors	¼" jack, two pole, TIP input signal, SLEEVE 0V
OSC	Oscillator output at ca +6dBu
Levels	For input levels of +4dBu to +12dBu output will be around[1] +4dBu-+12dBu, max output level +20dBu
Freq Response	Flat from DC to a -3dB point at around 65kHz
Signal to noise	-82dB (equivalent to a good mic set to medium gain)

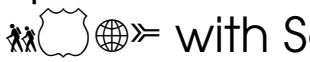
Osc

Fine	Varies around centre frequency by ca 5%
Tune	Varies centre frequency over selected range
Range	Selects from 5 ranges - .1Hz-2Hz, .3Hz-15Hz, 1Hz-200Hz, 15Hz-2kHz, 500Hz-19kHz

[1] The modulation process involves the interaction of both inputs, and as such it is impossible to predict exact output levels

FwS

the ultimate sound experience

Unique Creative Tools to  with Sound

ColOSCil

Instructions for Installation and Use

Please read carefully

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ColOSCil

Instructions for use and installation

Welcome

At DACS we are very pleased that you have chosen to purchase one of our products. We take a pride in our work and are sure that this **ColOSCil** will give you years of exemplary service. If you have any suggestions or comments about this product please call, fax, write or e-mail us with your thoughts. Thank you.

Introduction

Ring Modulation has been around for a long time. Its usefulness was always limited by the high level of breakthrough of the original signals. Some years ago we developed a device which reduced this breakthrough to levels compatible with digital technology. The **FwS** series of ring modulator based effectors retains the purity of the effect with low noise performance.

With this unit and others in the range you will be able to transform your existing sound generators creating an almost infinite range of unique sounds using your hands and your ears. We're not filled with nostalgia for the 'good old days' but do believe that programming has severe limitations; human creativity and interaction can create a much more flexible and individual musical result than pre-sets.

We have included a number of possible setups and applications for you to try. Some will be model dependent, but most of them can be achieved with the **ColOSCil**. They are intended as a starting point for your exploration rather than an exhaustive list of possibilities.

If you come up with some particularly good or unusual way of using this **FwS** device, and are willing to share it with others please send us your ideas and personal/professional details so that we can place them on our web-site and in subsequent editions of our application notes and manuals.

Try this...

- Vary the MOD input frequency to produce output harmonically related to the music
- Feed the melody into the MOD input and the percussion will 'play the tune'
- Feed any old music to the MOD to produce an effect similar to scratching
- Feed to the MOD with carefully selected samples synchronised with the percussive sounds
- Using ColOSCil's oscillator set on the 2nd or 3rd range generate deep subharmonics on bass drums
- Using ColOSCil's oscillator set on the 4th or 5th range generate grain, grit and glitter on snares, hi hats, cymbals, maracas

Vocal inputs

Set Up

Feed your voice into the MUSIC input and feed a variety of signals into the MOD input - music, tone, noise... ***Try this...***

- Use the voice to gate the MOD inputs
- Use the voice as a percussion imitator to produce hot rhythm sections from modulated MOD inputs
- With ColOSCil units try the 1st range to produce gating and heavy breathing effects, the 2nd range to produce tremolo and panting effects, the 3rd range to produce heavy modulation effects (Dalek among others) while the 4th and 5th ranges will produce higher and higher harmonic effects

Same signal or L & R of stereo into both inputs

Set Up

Feed the same signal or the left and right of a stereo signal into the MUSIC and MOD inputs... ***Try this...***

- Mix the output into the original signal to harmonically enhance the signal
- Left and right inputs into MOD and MUSIC inputs respectively on both modules in dual models can produce phasing and other spectral phenomena, particularly if the spectral controls are varied
- With dual FwS units try varying the edge and/or weight controls contrariwise ie turn one up as you turn the other down, to produce stereo effects

Delay/feedback

Set Up

Use a delay line to process signals going in to or out from the units... ***Try this...***

- Feed audio out back to MUSIC input via delay at tempo or multiple of tempo
- Do the above with long decays on the end of sounds
- Split the signal to both inputs and use delay line on one input to produce weird flanging effects
- With dual modules, feed as above, but delay only one side then pan both outputs centrally

Multiple Modulation

Set Up

Feed music into the MUSIC input of one modulator and use the internal oscillator to modulate it. Take this OUT to the MUSIC input of the second modulator and modulate it with the same internal oscillator. The result is that the original signal is reconstituted and additional higher partials are also added.

Application Ideas

This section is not intended to be a comprehensive list of everything that can be done with the FwS effectors. Rather it is a list of starting points for you to experiment with. Using the FwS series producers and engineers can almost infinitely extend the range of their existing battery of synthesisers and sound generators. Create vast ranges of completely new sounds. Add depth and warmth to early digital synthesisers, give drums new power, radically transform voices...

Introduction

We have found that the most satisfactory set up for experimentation is to have the inputs to the units fed from pre-fader auxiliary outputs on a mixer. This means that you have good control of what is going into the units AND you can mix the processed and unprocessed signals together. Some treatments will require mixing with the original signal and some will not. For example adding distortion to a continuous sound will need mixing while gating effects will not.

Tone and music

Set Up

Feed a stable tone, or a slightly varying one, into the MOD input and the music or tune into the MUSIC input. The MOD input could be from the internal oscillator for the ColOSCil units. If the MOD input is harmonically related to the key of the music the OUTPUT will tend to be harmonic eg the MOD input is a D and the music is in the key of D, then the output will tend to be harmonically rich. If the MOD input is not related, then the output will be rough, bell like and/or noisy depending on the frequency of the input... ***Try this...***

- Use held chords that have a certain amount of vibrato - as the pitch of the chords varies so the harmonic content of the sound will vary
- Vary the MOD frequency to generate sliding upper and lower harmonics
- Use randomly generated frequencies from synthesisers on MOD input
- With dual FwS units try varying the edge controls contrariwise ie turn one up as you turn the other down, to produce stereo effects
- With ColOSCil units try the 1st range to produce gating effects, the 2nd range to produce tremolo effects, the 3rd range to produce heavy modulation effects while the 4th and 5th ranges will produce higher and higher harmonic effects

Drums

Set Up

Feed percussive sounds into the MUSIC input and tones or other sounds into the MOD input. The MUSIC input will then act as a trigger and give a gating effect, only producing OUTPUT when the MUSIC input signal is present...

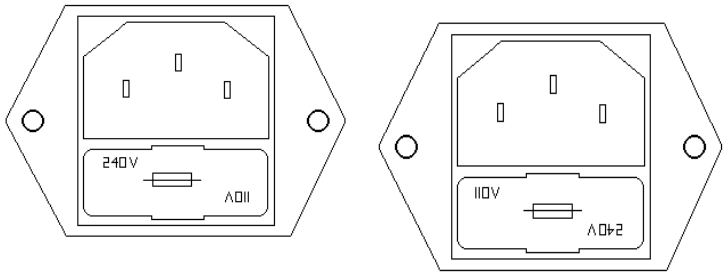
Using the DACS ColOSCil (see Figure 1)

Installation

1 Connecting the Power

The unit will accept 240VAC and 110VAC mains supplies. The IEC inlet's fuse holder is used as a selector as shown in Fig 2. The factory setting is for 240VAC.

Figure 2



Set for 240VAC Set for 110VAC

2 MODulator Input

As a rule of thumb, both MUSIC and MOD inputs should be between +2dBu and +12dBu. This will give an output approximately equal to the two input signals. The two MOD inputs are autoswitched so that if only one jack plug is inserted, both MOD inputs receive the same signal.

The MOD input is used to *modulate* the signal going to the MUSIC input. In most ways the two inputs are interchangeable, but **FwS** series **MODule8**ors are configured to favour this method of operation (in particular see 5 below). Modulation tones or secondary signals should be fed into this input; if using subsonic LFOs to modulate this input will accept them since its frequency response is flat down to DC.

3 MUSIC Input

This input is for the main signal coming in.

4 OUTPUT

This is the **MODule8**ed output. See the **MODule8ion Techulation** box below for more information on what happens.

5 Internal OSCillator Output

This is the output of the internal oscillator that feeds the MOD input of the **MODule8**or when the internal OSCillator is activated. It is present even when the front panel switch is not activated.

6 Input Level Meters

These meters are based on the same PPM ballistic circuitry as our award winning MicAmp. They are calibrated to help you ensure that you get the right level in to the unit. There are two LEDs, one above the other, for each input. The lower green one indicates the presence of signal above about -40dBu. The upper yellow one illuminates at around +2dB. For optimum sonic performance the yellow LED should be illuminating with the strong beats or the louder elements of the signal. **NB** Like many other features of the **FwS** series, this is not a hard and fast rule, but depends on the input.

7/8 Spectral Controls/Activation Switch

These controls allow variation in the spectral content of the **MODule8**ed output. They work on the MUSIC input and add ***OR*** subtract WEIGHT at the bottom end and add ***OR*** subtract EDGE at the top. From the centre détente position clockwise adds, anti-clockwise subtracts. Their effect will depend on the relationship between the inputs.

9-12 Oscillator Controls/Activation Switch

The switch connects the internal oscillator to the MOD input of the **MODule8**. The range switch selects one of five ranges: .1Hz-2Hz, .3Hz-15Hz, 1Hz-200Hz, 15Hz-2kHz and 500Hz-16kHz. The TUNE control varies the frequency over the full range and FINE over ca ±5% from TUNE's position respectively.

Earthing and Interconnection

The audio 0V and the chassis/mains earth are not linked. If connected directly to a single device, eg a mixing console, for its ins and outs, the unit will not be prone to hum loops. Where it is connected to balanced ins and outs we would recommend connecting the balanced HOT to the tip of the jack and the balanced COLD to the ring, leaving the balanced screen unconnected at the jack end. A balancing upgrade is available for all devices.

MODule8ion Techulation

RING MODULATION IS THEORETICALLY A SIMPLE PROCESS BUT CAN RESULT IN VERY COMPLEX AND STRIKING RESULTS. THE MATHEMATICS ARE STRAIGHTFORWARD:
FREQUENCIES PRESENT IN OUTPUT = SUM OF FREQUENCIES IN INPUT + DIFFERENCE BETWEEN FREQUENCIES IN INPUT
IN PRACTICE LET ME OFFER TWO EXAMPLES:

MUSIC AND MOD INPUT HAVE A 100HZ SINE WAVE GOING TO THEM
OUT = (100+100)+(100-100) => 200HZ + 0HZ
THUS BY SENDING THE SAME SIGNAL TO BOTH INPUTS WE ADD 2ND HARMONIC DISTORTION TO SIGNALS, WARMING THEM UP THE WAY VALVES DO.

MUSIC IN IS 100HZ, MOD IN IS 75HZ
OUT = (100+75)+(100-75) => 175HZ + 25HZ
PLAY WITH THE MOD FREQUENCY TO GENERATE SUPER SUB BASS RIGHT DOWN TO THE FLOOR!!!