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1 OSCar to impOSCar

In these days of affordable, and largely high-quality plug-in instruments, it's easy to forget that many years ago, in the intrepid days of hardware behemoths, things were very different. For example, in the late 1970s the highly desirable Minimoog would set you back a whopping £1500 and only play one note at a time. And even an outlying Minimoog competitor would leave you needing a skin-graft, such was the size of the hole burnt in your pocket.

During this period, and in spite of the fact that every manufacturer's mission was 'affordable monophonic synthesis for all', it was unclear how that could be achieved due to the high component costs.

The big breakthrough came in the UK in 1978 when the first truly affordable monophonic synthesizer was released to an eager but unsuspecting world. Conceived by Chris Huggett and Adrian Wagner, the EDP Wasp, at a price of £199, heralded a new era of synthesis and was undoubtedly responsible for introducing legions of young adults to electronic sound exploration. Of course, in order to bring a synth in at approximately half the price of any competitor certain compromises had to be made, the most noticeable one being a 'toy-like' touch-sensitive keyboard. In terms of sound, the Wasp was far from a toy and featured multi-mode filters, resonance, portamento and three stage envelope generators. Needless to say, it was a huge success and reportedly provided Dave Stewart and Thomas Dolby with their first synths.

After a succession of add-on devices, revised models and increased competition from US and Japanese markets, the EDP collaborators went their separate ways, but in 1983 Chris Huggett resurfaced with a new beast. The radical looking OSCar, resplendent with chunky rubber end-cheeks and front panel dividers, continued the theme started by the Wasp with some notable exceptions.

Primarily, it was certainly not a synth for beginners and it also had a real keyboard - the OSCar was a monster of a synth with a sound to match.

Although often lumped-in with rest of the analog contingent, in truth, the only thing analog about the OSCar (and the Wasp) was the sublime filter. Almost every other aspect of it was digital. In terms of features it was positively jam-packed, and included two oscillators containing sine, saw, square, and variable pulse width waveforms. portamento and glissando, a comprehensive arpeggiator, on-board sequencing and a cornucopia of filtering options. The OSCar even boasted a unique additive synthesis feature which allowed users to construct and save their own waveforms using 24 fundamental harmonics. It even had patch storage too! All these features, plus the unique filter separation control and amazing filter overdrive had converged to create a truly magnificent sounding instrument.

So why did the OSCar not become one of the greatest selling synths of all-time and why are they so rare today?

Firstly, in 1983 the OSCar cost £699, only marginally cheaper than Roland's polyphonic Juno 60, and at a time when affordable polyphonic synthesis had succeeded affordable monophonic synthesis as the holy grail, it's easy to see why it could be passed over in favor of a chord playing rival.

Secondly, 1983 was the year of MIDI, which was notably absent on the first production run of OSCars, although it was quickly added after the first few hundred had been shipped.

And thirdly, the reason for its rarity is simple - there were only around 2000 OSCars produced. However, those fortunate enough to have owned one have always remained convinced that this was one of the world's great synths and their passion has helped elevate this instrument into the realms of synth folklore.

In terms of sound potential, it's difficult to categorize the OSCar. On one hand, by utilizing the additive synthesis functions, it was possible for it to sound very digital and harsh. On the other hand, by using the PWM in conjunction with the overdriven filter, screaming leads and corpulent bass sounds were without doubt the order of the day for many.

With regards to its overdriven power, sound designer and programmer Paul Wiffen, who had been a key part of the EDP and OSCar team, recalls that many synth players like Billy Currie and Jan Hammer were putting their synths through distortion pedals to create their own unique sounds, and during development he suggested to Chris Huggett that a similar effect could be achieved by applying an internal overdrive to the filter. Using this feature he came up with an emulation of the classic Ultravox lead which eventually became the OSCar default sound. This turned out to be a clever marketing move too, because when he demonstrated the OSCar to Ultravox some months later, the band each bought one to take over tour duties from their now aging ARP Odysseys.

During its life, the OSCar has appeared on countless tracks, acting as the main instrument on Ultravox's Love's Great Adventure, as well as performing bass duties on Stevie Wonder's track, Skeletons, (taken from the 'Characters' album). In fact, the entire world became unwittingly aware of the OSCar sound via its bass on Band Aid's 'Do they Know it's Christmas' in 1985. Returning to slightly more hip territory though, Mark Moore of S-Express used it for the bassline on 'The Theme From S-Express', and it's also appeared on a host of Underworld tracks from 'Rez' to 'Rowla'.

GMEDIA Music has had a long term love affair with the OSCar too. Some time ago Dave Spiers was asked by Underworld to find a back-up for their instrument. This he did but was so taken by its character that he was unwilling to give it up – having to find another for the band!

"After hearing it, my wife insisted that I should keep it, despite the fact that she's usually totally disinterested in synths. After that, the OSCar quickly became part of any programming project I worked on, and in early 2002 after I'd voiced my concern as to how rare and expensive they are becoming to Jon Hodgson, he offered to begin the detailed task of turning it into a virtual instrument."

"Of all the monosynths the OSCar has always been very interesting to me, for two main reasons," says Jon. "The first is that it's different - the double filter with separation, the different waveforms, the additive synthesis. It does things in its own slightly unique way and I like that in an instrument. The second is that it's the only one of what you might call the 'old school' of monosynths that I can actually remember seeing adverts in magazines for. I guess it must have been in its last days when I first started getting interested in synths and music, and it certainly was eye catching!"

Over the ensuing two years the impOSCar was developed by Jon regardless of cost or effort. Capturing the sonic essence and tonal characteristics of the original instrument was absolutely paramount.

Of course, in this day and age it would have been foolhardy not to have incorporated certain new features, such as the ability to sync the tempo of both the arpeggiator and LFO to the sequencer host, as well as adding polyphonic capability, velocity sensitivity and an additional effects section.

Regarding many of the enhancements, Jon comments: "Many of these, in particular the new filter modes, were achievable on the original OSCar with a scalpel, some wire and a soldering iron, so I don't think it goes against the spirit of the original. In fact I hope people will find that, if anything, many of the enhancements will add to the fundamental character of the original instrument. The OSCar could transmit polyphonically from the keyboard and as a result many musicians wondered what a polyphonic OSCar would sound like - now's their chance to find out."

So that's the story behind the impOSCar. But given that the sounds and features of this eminent beast are still so highly sought-after today, what happened to the team behind the original instrument who provided the inspiration for this plug-in? Well, we're glad to say that they have enjoyed (or perhaps endured) long careers within the Musical Instrument Industry. Paul Wiffen is now an Apple consultant in the UK, as well as being a highly respected industry journalist, while Chris Huggett went on to develop operating systems for Akai Samplers and, more recently, heads the design team for Novation.

An Appeal – Please support developers, not pirates.

If you're reading this from the printed manual, the chances are you paid for this software and as such we'd like to say a heartfelt thanks. The money that we receive from sales of the impOSCar will be channelled back into further development projects and used to create other interesting and valid musical products. However, if you did not pay for this please take the time to understand the implications of piracy for small companies such as ourselves. This product took almost two years to produce and has involved the small development team in many personal and financial sacrifices - Nonetheless we have tried to keep the cost of the instrument at a realistic level and make the copy protection as unintrusive as possible. As such we would kindly ask you not to support the pirates and not to post the impOSCar on any newsgroup or P2P group. Many thanks.

OSCar web resources.

www.airburst.co.uk/oscar/intro.htm

www.sospubs.co.uk/sos/sep99/articles/oscar.htm

www.sonicstate.com/synth/osc_oscar.cfm

OSCar book resources.

A-Z of Analogue Synthesisers (Part Two. N - Z) - Pete Forrest

Vintage Synthesisers - Mark Vail.

2 Installing the impOSCar

Included on the Master CD are multiple versions of the impOSCar. The impOSCar installer allows you to install any or all versions via a single installer, one for Mac and one for PC.

PC – Insert the impOSCar Master CD into your CD-ROM drive. From the setup window select the “Install” option and follow the onscreen instructions carefully, entering your unique User Name and Registration codes EXACTLY as you find them printed within this Getting Started guide.

During installation, 14 sound banks—each containing 36 presets—will be installed to your desktop; these can later be moved to a location of your choice.

Mac – Insert the impOSCar Master CD into your CD-ROM drive. Double-click on the GForce impOSCar disc icon to open the disc. Double-click on the impOSCar.dmg file and then run the impOSCar Installer, following the onscreen instructions carefully and entering your unique User Name and Registration codes EXACTLY as you find them printed within this Getting Started guide. During installation, be sure to click on the Next button until the installation routine is complete.

During installation, 14 sound banks—each containing 36 presets—will be installed to your desktop; these can later be moved to a location of your choice.

Special note about .fxb sound files:

During installation, the impOSCar sounds are installed to your desktop in a folder called “impOSCar.” You can load the .fxb’s by dragging and dropping one of the files to the impOSCar user interface.



3 Registration

Please take the time to register your impOSCar on-line at www.gmediamusic.com/registration/

Registration is required to receive free technical support.

4 Loading Sounds

Cubase

ImpOSCar sounds are loaded and saved as Banks. To load a Bank, simply click on File>Load Bank, navigate to the impOSCar folder and select the desired Bank. Once a Bank has loaded, you can use the normal Cubase Patch Management system to scroll through each sound.

Importing OSCar sounds via sysex

Although we have included the original OSCar presets as an impOSCar Bank, it is also possible to import original OSCar sounds via sysex or tape. This is done via a standalone program which is freely available to Registered users from the support area of the GMEDIA Music web site.

Oscillator Controls

- **OSC1 Waveform Knob**

Because the Oscillators on the OSCar were digital they were referred to as OSC1 and 2 (as opposed to VCO 1 and 2). OSC1 contains the following waveforms: Triangle, Sawtooth, Square, Variable Width Pulse, Pulse Width Modulation, Full Organ, Harpsichord, Strong Lead, Double Pulse, Gritty, UserWave1 and UserWave2. The waveform selected is displayed in the blue screens above the Waveform Knobs.

Note: When selecting either UserWave1 or UserWave2, for either OSC1 or OSC2, the waveform used will be that created and selected from within the USER WAVES section.

- **OSC2 Waveform Knob**

Features exactly the same waveforms as OSC1 but, whereas with OSC1 you can simply select a waveform shape, OSC2 offers a few more options listed as follows:

- **OSC2 Oct Shift Knob (OCT SHIFT)**

This allows you to change the octave position of OSC2 across a six octave range.

- **OSC2 Transpose Knob**

Allows transposition of OSC2 by either + or - seven semitones.

- **OSC2 Detune Knob**

This enables you to detune OSC2 against OSC1 in order to create 'thicker' or 'chorus' type sounds.

- **Pulse Width Knob (PW)**

Provided either one, or both, Oscillators are using Pulse Width or Pulse Width Modulation waveforms, this knob applies an independent LFO to the waveform(s) in order to modulate them. Turned to the left, the PW Knob will have a minimal effect and will create a more 'hollow' sound. As this knob is turned further to the right it will create a 'thicker' sound as a result of the increase in modulation.

- **Octave Transpose LEDs**

Clicking on the red lights will transpose both Oscillators globally. Use this in conjunction with the OSC2 transpose knobs to create relative transpositions.

Wheels Section

- **Bend Knob**

This allows you to determine the effect the pitchbend wheel – on either the impOSCar interface or your master keyboard – has on the impOSCar sound. You can select any amount between 0 (off) and 24 semitones (two octaves).

- **Mod – Pitch Amount Knob**

Here it's possible to choose the amount of pitch modulation introduced by the modulation wheel. Both + and - pitch modulation settings are available, with a zero setting at 12 O'clock. The speed of this modulation is governed by the LFO rate.

- **Mod – Filter Amount Knob**

Similar to the aforementioned Pitch Mod function, only this time the modulation wheel will affect the Filter Amount. Again the speed of Filter Modulation is determined by the LFO rate.



Glide Controls

• Glide Type Knob

The impOSCar contains an exceptionally comprehensive set of Glide options. The six modes are as follows:

1. **Normal:** A simple portamento where the time between each note is governed by the Glide Time Knob. In the first three 'unfixed' modes the Glide Time is the time taken to slide one octave, which means that the larger the interval the longer the glide time.
2. **Auto:** The same as Normal mode except that in monophonic mode glide is activated only between notes that are held.
3. **Gliss:** The Glissando mode is similar to Normal mode but instead of a smooth transition between each note you actually hear the semitone steps.
4. **Normal - Fixed:** As per Normal mode with the exception that in the Normal Fixed mode the glide time is the time taken between any two notes, no matter how large the interval.
5. **Auto - Fixed:** As per Auto mode whereby portamento is only triggered by legato notes, except that the glide time is the time between any two notes, no matter how large the interval.
6. **Gliss - Fixed:** As per the previous Glissando mode except that in this case the glide time is the time between any two notes, no matter how large the interval.



Mix Controls

• Osc Balance Knob

Determines the relative balance between OSC1 and OSC2.

• Noise Balance Knob

Alters the balance between the combined tones of OSC1 and OSC2 and a 'white-noise' generator.



LFO Controls

• LFO Waveform Knob

While the original instrument had six LFO waveforms, this amount has doubled on the impOSCar. The original OSCar waveforms were:

Triangle, Sawtooth, Square, Filter Env, Random and Kbd. The latter was replaced by Guitar (a positive-only wave, so vibrato will happen only above the key pitch).

Additional new waveforms include:

Triangle 3 Step, Sawtooth 4 Step, Triangle 5 Step, Sawtooth 8 Step, Pattern1 and Pattern 2. Selected LFO waveforms are displayed in the blue screen above the Waveform Knob.

• LFO Filter Amount Knob

Controls the depth of the LFO and, in turn, the effect the LFO has on the filter. This parameter has both negative and positive values and the resultant effect is directly related to both the LFO Waveform shape and the LFO rate.

• LFO Rate Knob

This governs the speed of the LFO. There are four LFO modes which are dependent on the position of the LFO Sync Knob. For example, with the Sync Knob set to 'Free' the speed is given in Hertz, but if the Sync Knob is set to 'MIDI' the value is displayed in Cycles Per Bar. See LFO Sync Knob (below) for more details on sync modes.



- **LFO Intro Knob**

This knob allows you to delay the start of the LFO after playing a note. The LFO delay or 'Intro' time, is given in seconds.

- **LFO Pitch Modulation Knob**

This knob determines the amount of pitch modulation or vibrato applied to a sound. As with the LFO Filter Amount Knob, this is directly related to the LFO Waveform shape and the LFO Rate. This parameter also has both positive and negative values with values of up to + or - seven semitones.

- **Env2 – Pitch Knob**

With this knob it's possible to use the filter envelope (ENV2) to make changes to the pitch of your sound. Again, this has both positive and negative values giving a range of up to + or - seven semitones.

- **LFO Synchronization Knob**

Provides four sync modes under which the LFO can operate:

1. **Free:** Free-run mode providing no sync between polyphonic voices. Great for swirling chords.
2. **Lock:** Selecting this locks all polyphonic voices in sync with each other.
3. **Clock:** Synchronizes the LFO to main tempo clock, which may itself be synchronized to MIDI in order to create LFO effects that match the Arpeggiator.
4. **MIDI:** Synchronized to MIDI, bypassing main clock.

Filter Controls

The OSCar's filter was unique in that it consisted of two 12dB filters which could be combined in series to create 24dB filtering. The filtering modes were LPF, BPF and HPF with a 'no track' option. We have removed the 'no track' option as it's possible to achieve the same using the KEYB TRACK knob. However, the impOSCar has expanded on these original modes by adding several more that were achievable on the original instrument with the careful use of a soldering iron.

- **Filter Type Knob**

Selects from the following nine filter options:

1. **Low Pass 24dB:** Where the two 12dB filters are combined in 'series' and allow the low frequencies to pass through while filtering high frequencies.
2. **Band Pass 24dB:** Where the two 12dB filters are combined in 'series' and allow the selected band of frequencies to pass through while filtering out anything outside that range. Note: In this mode the two filters are arranged as one Lo Pass and one Hi Pass, not 2 Band Pass.
3. **Hi Pass 24dB:** Again where the two 12dB filters are combined in 'series' to allow the high frequencies to pass through while filtering out low frequencies.
4. **Low Pass 2 Pole:** Where the two filters are arranged in 'parallel' and allow the low frequencies to pass through while filtering high frequencies. In this mode when the Separation is set to zero it's the same as a normal 12dB filter. However when it's set to anything other than zero you get two resonant peaks and cutoff points.
5. **Band Pass 2 Pole:** Where the two 12dB filters are combined in 'parallel' allowing the selected band of frequencies to pass through while filtering out anything outside that range. Again, when the Separation is set to zero it's the same as a single 12dB filter. However, when it's set to anything other than zero, you get two resonant peaks and cutoff points
6. **Hi Pass 2 Pole:** Where the two 12dB filters are combined in 'parallel' allowing the high frequencies to pass through while filtering out low frequencies. Again, when the Separation is set to zero it's the same as a single 12dB filter. However when it's set to anything other than zero you get two resonant peaks and cutoff points
7. **Lo Pass//Band Pass:** Where the Lo Pass and Band Pass filters are arranged in 'parallel'. In this mode with zero or higher Separation you get a 'notch' or 'band reject' effect.
8. **Lo Pass//Hi Pass:** Similar to the above but where the Lo Pass and Hi Pass filters are arranged in 'parallel'
9. **Band Pass//Hi Pass:** Again, similar to the previous two filter modes only this time the Band Pass and Hi Pass filters are arranged in 'parallel'.



- **Q Knob or Resonance**

This boosts the harmonics around the cut-off frequency.

- **Separation Knob**

Unique to the OSCar and impOSCar. This takes the two 12dB filters and allows independent control of their cutoff frequencies. When used with either the four- or two-pole filter modes, it's possible to separate the filters by up to 24 semitones.

Note: In the first six filter modes zero separation takes place when the knob is turned fully to the left. In the last three multi-modes zero separation takes place when the knob is at 12 O'clock.

- **Amount Knob**

Determines the filter amount applied to the filter envelope (ENV2). This also works in positive and negative modes.

Env 1 – Amplitude ADSR controls

- **Attack Knob**

Used to alter the attack time of the amplitude envelope generator between 0.001 and 15 Secs



- **Decay Knob**

Used to alter the decay time of the amplitude envelope generator between 0.001 and 30 Secs

- **Sustain Knob**

Used to alter the sustain level of the amplitude envelope generator between -∞ (minus infinity) and 0dB

- **Release Knob**

Used to alter the release time of the amplitude envelope generator between 0.001 and 60 seconds.

Env2 – Filter ADSR controls

- **Attack Knob**

Used to alter the attack time of the filter envelope generator between 0.001 and 30 Secs.

- **Decay Knob**

Used to alter the decay time of the filter envelope generator between 0.001 and 30 Secs.



- **Sustain Knob**

Used to alter the sustain level of the filter envelope generator between 0% and 100%.

- **Release Knob**

Used to alter the release time of the filter envelope generator between 0.001 and 60 seconds.

- **Delay Knob**

This applies a delay of up to two seconds to the start of the filter envelope generator and is useful for creating those long, evolving sounds.

Triggering Controls

- **Keyboard Triggering Knob**

The impOSCar has five triggering modes as follows:

1. **Single:** Using this mode the envelopes are only retriggered once their cycle is complete. When playing legato lines, the first note triggers the envelope contour and all successive notes are heard at sustain level.
2. **Multi:** Here, the envelopes are retriggered each time a note is played without waiting for the envelope cycle to finish first. Unlike Single trigger, when playing legato lines, all notes will retrigger the envelope contour.



3. **Rpt 1:** Used in conjunction with the Tempo Knob, Rpt1 activates the retriggering of the Amplitude Envelope (Env1).
4. **Rpt 2:** Similar to the Rpt1 function, Rpt2 activates the retriggering of the Filter Envelope (Env2) in accordance with the selected tempo.
5. **Rpt 1+2:** This activates the retriggering of both the Amplitude and Filter Envelope in accordance with the Tempo Knob.

- **Tempo Knob**

Controls the tempo of either the Arpeggiator or the retriggering of the envelopes as described previously. The tempo of the impOSCar can be clocked internally or synchronized to an external source (see arpeggio sync page 16). If set to Internal Clock the Tempo Rate is shown as BPM. If set to External Clock the Tempo Rate is shown as Beats Per Bar.

- **Gate Time Knob**

When using any of the aforementioned Rpt triggering options this knob can be used to alter the Gate Time of either one or both envelopes. The default Gate Time setting is 50% and moving the knob to the right extends the Gate Time whereas moving the knob to the left shortens the Gate Time.

For optimum Gate Time control ensure the Release Times of each envelope are not too long.

- **Function Knob**

A radical departure from the original instrument, here the Function Knob selects from six polyphony modes:

1. **Mono:** Selects monophonic mode, ideal for lead or bass lines.
2. **Duo:** A maximum of two notes can be played simultaneously with either note having the ability to play one or both oscillators depending on whether one or two notes are played (see Using Duo Mode page 20)
3. **Poly4:** A four voice polyphonic mode.
4. **Poly8:** An eight voice polyphonic mode.
5. **Poly12:** A twelve voice polyphonic mode.
6. **Poly16:** A sixteen voice polyphonic mode.

A word about CPU load and polyphony

When using a maximum of, say, eight voices (notes) use Poly8 mode as this can drastically reduce CPU overhead (if using 4 voices select Poly4, if 12 Poly12).

There are two reasons for using less than maximum permitted 16 voices:

1. It puts a cap on the processor use and
2. It limits the amount of voices playing when using sounds with long envelope release times.

Keyboard Velocity Response Controls

- **Keyboard Track Knob**

This allows you vary the keyboard tracking in relation to the filter cutoff. Choosing a knob position towards the left opens the filter more on the lower keys of your keyboard and decreases this effect as you play up the keyboard. Setting a knob position towards the right of center has the opposite effect.



Note: Setting the keyboard tracking to a value of one, the filter cutoff frequency tracks the keyboard in the same way the original OSCar did in the first three (tracked) filter modes. Here, a one octave change on the keyboard gives approximately a one octave change in cutoff. Setting the tracking to a value of zero means there is no tracking at all as per the no-track filter settings on the original instrument.

- **Attack/Decay Knob**

With 12 O'clock being a zero value, turning the knob to the left will shorten the envelope attack times when playing at high velocities and turning the knob to the right will lengthen the attack time when playing at high velocities.

- **Release Knob**

With 12 O'clock as the zero value, turning the knob to the left will shorten the envelope release times when playing at high velocities and turning the knob to the right will lengthen the release time when playing at high velocities.

- **Velocity – Filter Drive Knob**

With both positive and negative settings, the Env1 Filter Drive Knob allows you to set the degree of control note-on velocity has over the amount of filter drive.

Note: As well as increasing amplitude dynamics, the Filter Drive also introduces 'overdrive' – if you do not want to introduce this to your sound when playing at high velocities make sure you reduce the Filter Drive level accordingly.

- **Env2 Peak Knob**

With both positive and negative settings, the Env2 Peak knob allows you to set the degree of responsiveness note-on velocity has over the Filter Envelope.

Filter Drive and Volume Knobs

On the original instrument there was a single knob to perform both these tasks. On the impOSCar we've split these into two knobs allowing a greater range of combinations between subtle and blitzkrieg 'overdrive'. For extremely 'overdriven' sounds both high filter drive and volume settings are recommended, and rolling-off the filter drive knob will produce distortion free tones.



Note: Because there is independent control of both filter drive and volume, it's easy to achieve very high audio output levels. These can overload the output channel of your host application, therefore it's important that you take into consideration the balance between volume, filter drive and your host application mixer output when programming sounds.

Arpeggiator and General controls

Arpeggiator Knob

The impOSCar Arpeggiator contains four arpeggio modes:

1. Up
2. Down
3. Up and Down
4. Random



- **Tempo/Arpeggiator Clock Button and LED**

As indicated earlier in the Tempo Knob section, the Arpeggiator can be set to 'Internal' or 'External' synchronization via the Clock Button. If this is set to 'Internal Source' (INT) the Tempo rate is shown as BPM in the Selected Parameter Window. However, if this is set to External Source (EXT) the Tempo rate is shown as Beats Per Bar in the Selected Parameter Window.

- **Keyboard Hold Button and LED**

As the name implies, when switched on, this button acts as a hold function for both normal chords and arpeggios. Using this, it's possible to play sustained chords and control arpeggiations in real-time with minimal effort.

Edit Mode Knob

Used to close the keyboard and to provide access to parameters besides those shown on the main impOSCar panel:

- **Min:** Set to this only the main impOSCar control panel is visible.
- **Kbd:** Opens the impOSCar keyboard. This mode also gives access to the Pitch-Bend and Modulation wheels.
- **W1:** Opens the matrix window used to create UserWave1.



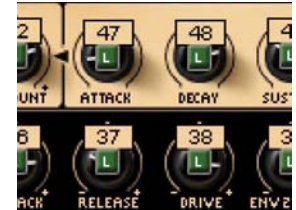
In addition to a traditional subtractive method, the impOSCar also allows the user to create and store an assortment of additive waveforms generated by mixing the fundamental and 23 harmonics.

There are two UserWave locations, the settings from which can be assigned to either or both OSC1 and OSC2. The settings assigned to each UserWave location can be saved as part of a patch and as individual UserWaves for quick recall. (See the using User Waves section on page 13).

- **W2:** Similar to the W1 mode but used to create the waveform for UserWave2.
- **CC:** Selecting this Edit Mode reveals a window above each knob, button or controller. Here you can select the MIDI Continuous Controller (CC) you wish to control any impOSCar parameter, extremely useful when using an external control device that transmits a fixed range of MIDI CC's. The impOSCar comes with a pre-defined list of controller numbers (see page 21) but these can be easily changed to suit your needs.



A MIDI CC 'learn' function is also available in this mode. This is activated in the following way: Click on the green 'L' button above any knob. Now move your external controller's knob or slider. The MIDI CC value that the external controller knob or slider has transmitted will appear in the parameter value box.



Mouse Control (System Default window)

By clicking on the System Default window it's also possible to determine the way the impOSCar's knobs react to mouse control. The choices are as follows:

System Default: Simply sets the default control method as determined by your host application.

Circular: Sets the mouse control method to circular movements.

Linear: Sets the mouse control method to horizontal and vertical movements.



Panel Switches

- **Compare** - switches between the panel settings you've set, and the original ones of the selected program.
- **Reset** - puts parameters back to the original ones for that program.
- **Store** - puts the panel settings into a temporary memory.
- **Recall** - reads the temporary memory back to the panel.



Effects Section

The impOSCar also features a chorus and delay effects section. This is revealed or closed by clicking on the Panel Open/Close text situated to the right of the Chorus Level, Delay Level and Delay Tempo knobs. To turn the effects ON or OFF click on the green Effect On/Off button. Effects settings are stored as part of an impOSCar patch.

- **Chorus Depth Knob**

Sets the depth of the chorus effect.

- **Chorus Rate Knob**

Sets the speed of the chorus effect.

- **Chorus Level Knob**

Controls the amount of chorus applied to your impOSCar patch.

- **Gate Knob**

Using the 12 O'clock position as a zero value, turning the knob to the right will produce a 'gating' effect, the percentage of which indicates the drop in delay mix when there is no input signal present. This is especially useful for rhythmic sounds where you want to make them bigger but keep the sound tight.

Turning the knob to the left will produce a 'ducking' function. This will be the percentage by which the delay mix is dropped when there is signal present and is particularly useful for lead sounds where you want clarity when playing fast runs, and yet still producing a nice echo within the gaps.



- **Delay Units Knob**

Sets the beat divisions between 32 and 4. Use this in conjunction with the left and right Delay Length Knobs to create interesting delay times for left and right channels respectively. For example if you want to set a delay time of 3/16 set the delay length to 3 and the units to 16.

- **Delay Hi Pass (HP) Filter Knob**

Allows you to filter out the low frequency of the delay feedback or signal and lets the high frequency feedback pass through.

- **Delay Lo Pass (LP) Filter Knob**

Allows you to filter out the high frequency of the delay feedback or signal and lets the low frequency feedback pass through. Used in conjunction with the HP Filter you can fine-tune the delay feedback so that your sound retains its depth without becoming too 'muddy'.

- **Left and Right Delay Length Knobs**

Sets the delay time for the left and right channels between 1 and 32 units. Use these to create wide stereo delays.

- **Left and Right Feedback Knobs**

Use these to set the feedback level for left and right channels respectively.

- **Crossed and Uncrossed Button**

Works with the Left and Right Feedback Knobs for different delay effects. When uncrossed, the signal from the left output feeds back into the left input and the signal for the right output feeds back into the right input. When crossed the signal from the left output feeds into the right input and the signal from the right output feeds into the left input.

- **Left and Right Channel Mix Knobs**

Sets the overall level of the left and right delay channels.

- **Delay Level Knob**

Sets the global level of the delay effect.

- **Delay Tempo Knob**

Sets the global delay tempo from between 32 and 192BPM with the option to sync to the host application tempo when switched to MIDI BPM.

Creating and using User Waves

As explained previously, in addition to a traditional subtractive synthesis sound creation method, the impOSCar also allows the creation of additive synthesis waveforms via the User Wave Matrix.

To create your own User Wave make sure that you have User Wave 1 selected for OSC1. Then move the Edit Mode Knob to W1, this reveals the User Wave Matrix with each of the 24 harmonics being represented by a vertical line of LED's.

The level of a particular harmonic is increased by switching more of its LED's on, conversely switching them off decreases the level of that particular harmonic. Simply select the desired harmonic by clicking on the bottom of the grid at the appropriate point and dragging upwards. You'll see the level of the harmonic indicated by the position of the red line - the taller the line the louder the harmonic.

Using this method of sound creation it's easy to create your own User Waves which can be named and saved for use within a Patch.

- **Storing User Waves**

To save a User Wave simply click in the box underneath the User Wave Matrix, type in your desired name, then click on the green Save button.



• Recalling User Waves

All stored User Waves can be quickly assigned to the appropriate oscillator first by dialling-up User Wave1 or 2 via the OSC Waveform Knob, then by choosing a stored User Wave from either of the User Wave Windows on the main panel. The upper and lower windows are used to assign User Waves to oscillators 1 and 2 respectively.

Note: When saving a Preset containing a User Wave, the Preset is stored with the actual User Wave values, not the User Wave name. This is so that changing the contents of a previously named User Wave does not change any other patches using that same User Wave. For example, let's say you have several Presets which use the same User Wave, e.g. 'Full Odds'. During the course of programming a new Preset you change the harmonics of the 'Full Odds' User Wave then store it, any Presets which were previously using 'Full Odds' do not change - they are now simply listed as '--Unnamed--', but the harmonic content of the sound remains the same.

Using the Arpeggiator

The impOSCar arpeggiator can be used in monophonic, duophonic and polyphonic modes and although at first glance it looks fairly basic but there are a number of options that can open up a wealth of creative potential. However, we're the first to admit that some of these are not immediately obvious due to the grouping of certain knobs on the front panel.



Firstly, decide whether you want to synchronize your arpeggio to the host sequencer or set the BPM with the Tempo Knob in the Triggering section. If you choose to synchronize, click the EXT Clock button next to the Arpeggiator Knob then choose a beats-per-bar value from the aforementioned Tempo Knob, the value of which will be shown in the Selected Parameter Value window. Return to the Arpeggiator Knob and select any of the Up/Down and Random modes, then play a chord. Activating the KBD HOLD button will hold that arpeggio indefinitely. And free up your hands for other creative pursuits.



Several options are now available to you, including the ability to repeat either or both of the envelope generators in accordance with the synchronized tempo value. This is achieved by selecting RPT1, RPT2 or RPT1+2 from the Triggering Knob. Select RPT1+2 to retrigger both envelopes and you should immediately notice a difference in the sound of your arpeggiation. From here try changing the values of certain filter envelope generator controls (such as decay) and listen to the changes.



You can also alter the gate time of the envelopes via the Gate Time Knob but first, make sure that the release times of both envelope generators are set approximately halfway. Now turn the Gate Time Knob from right to left and you'll hear some interesting changes.

It's also possible to create patterns synchronizing the LFO to the Arpeggio tempo by selecting either Clock or MIDI via the LFO Sync Knob. For a more detailed explanation of the sync options check the LFO section on page 11 of the manual, but once you've chosen the most appropriate one, try setting the LFO Waveform to Random before applying it via the LFO Amount Knob.

Finally, experiment with the various Mono/Duo and Poly modes - with the right sounds assigned, duophonic and polyphonic arpeggio patterns can sound amazing.

Using Duo Mode

To get an idea of how duo mode works set OSC1 to a PWM waveform and set OSC2 to a Square wave and transpose it two octaves higher than OSC1. Play and hold a single note (middle C) - you will hear that this triggers both oscillators. Now with the original middle C held down, play additional notes below and above - you'll hear that these additional notes are only triggering OSC2 while the original sustained middle C plays the OSC1 sound.



Keeping the middle C held, add the G below. Having done this, stop playing the original middle C but continue to hold the G. Any additional notes played will now trigger the OSC1 sound while the original G will play the sound associated with OSC2.

MIDI Continuous Control Messages

Each of the impOSCar's parameters responds to a standard MIDI Continuous Control message (MIDI CC's) as shown opposite. Additionally the impOSCar responds to the following MIDI CC's.

<u>CC</u>	<u>Pedal</u>	<u>Function</u>
64	Sustain(damper)	holds all notes played when the pedal is pressed and while it is held
66	Sostenuto	holds all notes which were playing at the moment the pedal was pressed
67	Soft	multiplies all velocities by 0.5 (changeable on a global basis in the .sup file)
68	Legato	if you're in multi-trigger mode, puts you in single, and vice-versa
69	Hold2	multiplies release times by 2 (changeable on a global basis in the .sup file)
123	All Notes Off	

MIDI Guitar

The impOSCar has a feature specifically designed for MIDI Guitar players. In Mono Mode the impOSCar behaves as if it were 16 mono synths in parallel, with separate note and bend control response for each MIDI channel. Make sure your sequencer track is set to receive on 'all' MIDI channels and both your MIDI guitar and the impOSCar are set to a pitchbend range of 12.



Parameter Name	Short Name	Parameter Name	Short Name
1 Filter Type	Flt Typ	47 Glide Time	Gld Tme
2 Filter Q	Flt Q	48 <none>	Empty 2
3 Filter Freq	Flt Frq	49 LFO Waveform	Lfo Wave
4 Filter Sep	Flt Sep	50 LFO Rate	Lfo Rte
5 Filter Drive	Flt Drv	51 LFO Intro	Lfo Intro
6 Kbd->Filter	Kbd Trk	52 LFO Sync	Lfo Snc
7 Env->Filter	Flt Env	53 LFO->Pitch	Lfo Ptch
8 Volume	Volume	54 LFO->Filter	Lfo Flt
9 Osc1 Wave	Osc Wav 1	55 FilterEnv->Pitch	Env2 Ptch
10 Osc2 Wave	Osc Wav 2	56 <none>	Empty 3
11 Osc2 Octave	O2 Oct	57 Chorus Rate	Chr Rte
12 Osc2 Transpose	O2 Trns	58 Chorus Depth	Chr Depth
13 Osc2 Detune	O2 Detn	59 Delay Left Level	DL Lvl
14 Pulse Width	PW	60 Delay Right Level	DR Lvl
15 Master Octave	Octave	61 Delay Left Feedback	DL Fbk
16 <none>	Empty 1	62 Delay Right Feedback	DR Fbk
17 Triggering	Trigger	63 Delay Left Length	DL Len
18 Tempo	Tempo	64 Delay Right Length	DR Len
19 Gate Time	Gte Tme	65 Delay Highpass Cutoff	Del HP
20 Function	Funct	66 Delay Lowpass Cutoff	Del LP
21 Vel->Attack	Vel Atk	67 Delay Units	Del Unt
22 Vel->Release	Vel Rel	68 Delay Gate	Del Gte
23 Vel->Drive	Vel Drv	69 Delay Feedback Mode	Del Fbk
24 Vel->Env2	Vel Env 2	70 <none>	Empty 4
25 Amp Attack	Amp Atk	71 <none>	Empty 5
26 Amp Decay	Amp Dec	72 <none>	Empty 6
27 Amp Sustain	Amp Sus	73 Wave1 Fundamental	W1 Hr 01
28 Amp Release	Amp Rel	74 Wave1 2nd Harmonic	W1 Hr 02
29 Filter Attack	Flt Atk	75 Wave1 3rd Harmonic	W1 Hr 03
30 Filter Decay	Flt Dec	76 Wave1 4th Harmonic	W1 Hr 04
31 Filter Sustain	Flt Sus	77 Wave1 5th Harmonic	W1 Hr 05
32 Filter Release	Flt Rel	78 Wave1 6th Harmonic	W1 Hr 06
33 Filter Delay	Flt Dly	79 Wave1 7th Harmonic	W1 Hr 07
34 Arpeggio	Arp Type	80 Wave1 8th Harmonic	W1 Hr 08
35 Kbd Hold	Kbd Hld	81 Wave1 9th Harmonic	W1 Hr 09
36 Tempo Source	Clock	82 Wave1 10th Harmonic	W1 Hr 10
37 Chorus Level	Chorus	83 Wave1 11th Harmonic	W1 Hr 11
38 Delay Level	Delay	84 Wave1 12th Harmonic	W1 Hr 12
39 Delay Tempo	DlyTmp	85 Wave1 13th Harmonic	W1 Hr 13
40 Effects Active	FX On	86 Wave1 14th Harmonic	W1 Hr 14
41 Osc Mix	Osc Mx	87 Wave1 15th Harmonic	W1 Hr 15
42 Noise Miz	Nse Mx	88 Wave1 16th Harmonic	W1 Hr 16
43 ModWheel->Pitch	MW Ptch	89 Wave1 17th Harmonic	W1 Hr 17
44 ModWheel->Filter	MW Flt	90 Wave1 18th Harmonic	W1 Hr 18
45 Bend Range	Bend	91 Wave1 19th Harmonic	W1 Hr 19
46 Glide Type	Gld Typ	92 Wave1 20th Harmonic	W1 Hr 20

Parameter Name	Short Name	Parameter Name	Short Name
93 Wave1 21st Harmonic	W1 Hr 21	109 Wave1 13th Harmonic	W1 Hr 13
94 Wave1 22nd Harmonic	W1 Hr 22	110 Wave1 14th Harmonic	W1 Hr 14
95 Wave1 23rd Harmonic	W1 Hr 23	111 Wave1 15th Harmonic	W1 Hr 15
96 Wave1 24th Harmonic	W1 Hr 24	112 Wave1 16th Harmonic	W1 Hr 16
93 Wave1 21st Harmonic	W1 Hr 21	113 Wave1 17th Harmonic	W1 Hr 17
94 Wave1 22nd Harmonic	W1 Hr 22	114 Wave1 18th Harmonic	W1 Hr 18
95 Wave1 23rd Harmonic	W1 Hr 23	115 Wave1 19th Harmonic	W1 Hr 19
96 Wave1 24th Harmonic	W1 Hr 24	116 Wave1 20th Harmonic	W1 Hr 20
97 Wave1 Fundamental	W1 Hr 01	117 Wave1 21st Harmonic	W1 Hr 21
98 Wave1 2nd Harmonic	W1 Hr 02	118 Wave1 22nd Harmonic	W1 Hr 22
99 Wave1 3rd Harmonic	W1 Hr 03	119 Wave1 23rd Harmonic	W1 Hr 23
100 Wave1 4th Harmonic	W1 Hr 04	120 Wave1 24th Harmonic	W1 Hr 24
101 Wave1 5th Harmonic	W1 Hr 05	121 <none>	Empty 5
102 Wave1 6th Harmonic	W1 Hr 06	122 <none>	Empty 6
103 Wave1 7th Harmonic	W1 Hr 07	123 <none>	Empty 7
104 Wave1 8th Harmonic	W1 Hr 08	124 <none>	Empty 8
105 Wave1 9th Harmonic	W1 Hr 09	125 <none>	Empty 9
106 Wave1 10th Harmonic	W1 Hr 10	126 <none>	Empty 10
107 Wave1 11th Harmonic	W1 Hr 11	127 <none>	Empty 11
108 Wave1 12th Harmonic	W1 Hr 12	128 <none>	Empty 12t

7 Credits and thanks

All Program Code: Jon Hodgson

Jon wrote his first commercial software program at the age of 14. Later, after graduating from Brunel University with a degree in Micro-Electronics Engineering, he went on to assist in the development of 3D sound for stereo equipment for EMI offshoot Sensaura. Aside from being used on several albums such as Frank Sinatra's 'Duets', this technology became one of the main players in the 3D sound-for-games market, being used in the X-Box. An accomplished engineer, guitarist and keyboard player, Jon has also worked in a variety of musical instrument industry jobs including, high-end studio design and installation, synthesizer repair as well as having the dubious pleasure of working for someone who will forever be known as the 'Clockwork Chicken'.

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Installers: Ohm Force

Artwork: Ian Legge

Without whom dept:

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Sounds by: David Spiers, Paul Wiffen, Matt Hooper, Billy Currie, Rick Smith, Chris Macleod, Mark Moore, Tim Dorney and Lee Groves.

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techsupt@m-audio.com – E-mail Tech Support whenever it's convenient for you. You will usually receive a response within one business day.

www.m-audio.com – Check the M-Audio website for any news, FAQs, or updates related to your product. Often, you will find solutions to your problems here that will save you a phone call to Tech Support.

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