SINTEFEX
REPLICATOR
ANALOGUE MODELLER

Previewed in Audio Media in May 1999 LEN DAVIES brings
us the much-awaited user review of the Sintefex Replicator.

When I was asked to review a piece of equipment called a Replicator, being a *Star Trek* fan I almost expected Chief O'Brien to deliver and install it, and I was definitely excited at all the possibilities that the name conjures up. However, being only the 21st Century, as opposed to the galaxy-spanning 24th, what can today's interpretation of a Replicator do? Imagine being able to call upon any of the best analogue processors at the touch of a button, and even better, being able to carry around with you the sound of 'that processor that you liked in the studio last week but can't afford to buy yet'. Well, the possibility is here and is likely to cause as many upsets as the first sampled string section way back when.

Dynamic Convolution
The 'FX 8000 Digital Audio Effects Replicator' (to give it its proper name) can emulate the processing applied to audio paths by almost any analogue unit that it snapshots, (or samples), which in its simplest form means it's possible to build up a bank of processing capabilities gleaned from many different units and add them to your own personal arsenal. Naturally, it will never sound 100 percent the same as the original processors, as it can only approximate the function of some of the elements that it may not possess, but it will be close enough that only those who know better will spot the difference. In order to achieve this, the unit operates under a system called Dynamic Convolution.

I must confess that I hadn't heard of the term 'Convolution' before, but apparently it's the processing heart of many systems that emulate analogue circuitry. The limitation being that it only emulates the processing at one level of sound. The Replicator uses an enhancement of that process — Dynamic Convolution — which enables the unit to duplicate not only the way treated sounds respond at one level of sound, but at all different levels as specified

by the operator's chosen sample program. The control of the unit is by the well-designed and uncluttered front panel, or by PC via MIDI or USB.

Unit Description
Manufactured by Sintefex, the Replicator is a basic 2U design that has a pleasant appearance and is obviously designed to stand out in a rack. Uniquely it has two power switches, one at the rear by the IEC mains socket, that remains permanently on while rack mounted, and a soft-touch cream-coloured button actually controls the powering up and down of the unit.

The unit comes fitted with two channels of input and output, although by the addition of extra cards it is possible to expand up to eight, all of which can be processed by a single effect if needed. The audio interfaces to the outside world are via a 25-pin D connector on the installed card that provides Channels 1 and 2 balanced I/O as well as AES I/O, and by four unbalanced phono sockets for unbalanced analogue I/O. This would be duplicated on the other three optional cards up to the eight-channel limit. The centre section at the rear features all of the other required interfaces, such as unbalanced Stereo Out, SPDIF In and Out, Optical In and Out, MIDI In, and Out, Word clock reference In, and AES reference In, as well as Instrument In, and the jack and XLR Analysis Out sockets, of which more later.

From left to right on the front of the unit there are six visible sections that are logically laid out, the fifth being an amazingly clear LCD screen which features two valves as its logo on the main screen. It's here that all the options from the other five sections are displayed. Starting from the left, the input section features a black Input Select button that brings up the input/output display with a choice of Router, Analogue or Digital, and further choices of making the analogue inputs balanced or unbalanced, and which of the input sources from the instrument, SPDIF ▶

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➤ or eight ADAT channels will feed the router. The choice of input and output gain control completes the options. To the left of the LCD screen are five vertically-placed select buttons that feed whichever option shows on the left on the LCD screen. 'Do it' is the phrase used to implement any changes. The input gain control attenuates from +20dB down to silence, but only in the digital domain after the analogue signal is converted into 24 bits. The only exception to this is the instrument jack where the gain is controlled whilst still in the analogue domain.

A point of interest is the input level indicator which changes its appearance depending on how

process control duplicates. Selecting non-lin or linear chooses the appropriate treatment required, and adjusting the drive control increases or decreases the overall treatment, with a 'limit' LED indicating any overload.

To the right of the Process section are the five Call/Bypass buttons for the EQ, Compressor, Process, AFX, and System, which are on when the associated green LED is lit, and bypassed when off, and on the far right, beyond the LCD, is the rotary data control for entering parameters, the left, right, up, down cursor buttons, and the output gain with a range from -40dB to +20dB, with no centre detent at 0.

layer of options, one of which is marked 'sample', which takes us into the sampling page.

To ensure that the signal is flowing correctly and to adjust any external levels, there is a 'level set-up' which allows the generation of signals between a low pulse to a 40K sine wave to be generated at a set-up level between -80dB and 0dB (the nominal level being -12dB). Once the level is checked, selection of the menu item Compressor Curve leads us into the next window, which will display the curve characteristic of the compressor being sampled. Apart from the curve itself, there are threshold and ratio settings to be entered, which should match the settings of the compressor itself. The aim is to collect a series of snapshots of the compressor at different thresholds and ratios, in order to create a realistic overall picture of the dynamic processing employed by the unit. The best analogy is to liken the procedure to instrument multi-sampling where the dynamics of the sound will change dependent on the force used in playing.

Having entered the threshold and ratio settings currently used by the compressor, hitting the Go button activates the sampling procedure, which involves a tone being generated from the Analysis Out socket starting at -60dB and getting progressively louder, indicating to the Replicator how the unit reacts. Once this curve is established, resetting the compressor and re-sampling under the new settings produces Curve 2, and so on up to 24 curves. These can then be saved as a program, which can then be employed across all eight channels if needed.

The Replicator LCD screen: 'amazingly clear'.

many channels are fitted to the unit. It indicates from -60dB to -3dB with 0 being digital clip, but it's in a novel way that I found a bit confusing, as all of the lights remain green and the legend by the side is too small to read, unless you're close to the unit. For two channels, each side is three dots wide, while in eight channels there are eight rows occupying just one dot each. (I use the term 'dot' as that's literally what the display icons are).

Moving on to the next section, we find the compressor, with a duplicate level indicator to the input section that indicates the amount of gain reduction being applied. A rotary knob that controls the threshold, and three black buttons selecting the types of attack, release, and slope (offering three choices each) are the active controls here, along with a link button for ganging up the stereo sides. Green LEDs are the choice for active paths on this unit.

The middle section features the Process controls, which are basically a button marked 'non-lin', two LEDs marked 'limit' and 'linear', and a rotary control labelled 'drive'. At this point, I should engage in some terminology as to what implies linear and non-linear with regards to signal processing, as it means so many other things in other branches of the industry. If the output follows the input exactly, (ie. double the input through an equaliser doubles the treated output exactly) then that is 'linear'. However, valve processing varies when the valve itself is driven harder, which leads to 'non-linear' processing, and it's this that the Replicator

How Does It Work?

The Replicator does literally 'sample' what it sees at its input, but bearing in mind that to truly dynamically effect signals, it needs to be able to vary its gain structure, it allows different threshold and ratio curves to be combined to form a program that will dynamically emulate the source unit as closely as possible. The unit comes with banks of programs and effects already programmed, such as Urei 1176, and DBX D160 compressors, and classic effect simulation of US Tube, Euro PE1 US Desk EQs, with the capability to store many more on the units internal hard drive, or dump to PC for storage.

The key to its operation lies in the analysis method used to study what is happening on the unit to be sampled at different gain settings. Analogue systems vary greatly in the way that increased processing works on the signal, and no two systems will ever sound the same, therefore Sintefex went for the 'let's feed it a signal and see what it does' angle, which is where the Analysis Out socket comes in. By connecting this to the input of the processor to be sampled, and feeding the processor output to Channel 1 input of the Replicator, the unit can employ its unique method of sampling. The main window in the LCD is under the 'system' menu, and pressing this reveals further options, including access to the programs and presets banks, the mix for stereo out, the start screen and the one that interests us, 'set-up'. This takes us into another

In Use

In order to truly test a unit of this nature, you have to be fully familiar with the results you're expecting to hear, so I borrowed a couple of my favourite Tubetech and Urei units to sample and apply to a known mix. The sampling process takes a little time to get to grips with, but it is like multi-sampling a piano for example, with the exception that the unit is doing all of the work when you've set up the threshold and ratio controls. After a relatively short time, I had a program for the Tubetech compressor which I set up in an A/B configuration across a stereo split of one of my mixes with the original Tubetech unit, and I must admit that the result was incredibly close although there was still something about the original processor that I found a tad more pleasing. Having put that down to knowing which processor was placed where, I asked a colleague for her opinion, and she couldn't really spot a difference, which tends to prove that the Replicator works well enough when you're not deliberately looking to compare it.

I had borrowed a Urei 1176 because I wanted to compare my sampled curves with the preset Urei 1176 program within the Replicator. I compared my sampled processing curves with the ones already loaded, and found marginal differences, which tends to indicate that local differences and valve processing fluctuations will naturally produce some variations, just as a struck piano note will never ➤

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➤ sound exactly the same twice. Once a sample preset is made, it's possible to edit it by adding gain, shifting pitch, trimming start and end points etc: but I can't help feeling that, unless you're creating new, slightly more way-out effects, you'll want to retain the accuracy of the original samples.

Cue my guitar, and the instrument socket, and a truly fun couple of hours as I seemingly duplicated most of the guitar sounds of the last 40 years using the EQs and processors, and of course, the AFX delays, of which I've made very little mention yet, but which can add a lot of variation to any processing as it's possible to use them as effects, or even practical signal delaying/correction treatment. Some presets already exist using them in isolation or at the end of established presets, but they're very clean and incredibly usable. The manual states that it's also possible to sample early reflections from reverb units, but with the plethora of good-quality, inexpensive reverb units available, I wouldn't waste the Replicator's power on trying it out, I concentrated on the processing strengths of the unit.

Conclusion

A unit as complex as this needs more words than this article to fully cover its depths, and I've just scratched the surface of its capabilities. As with many of my reviews, I prefer not to know the actual cost of the unit so I can judge its worth outside those parameters, and this has the feel of quality that is well designed, well built and very attractive, but valuable.

As to the sampling process itself, this is basically a wonderful concept that I hope will be welcomed with the open-mind that the professional world sometimes lacks. The capability of sampling the processing of classic units can only better the overall direction of our industry when you consider that some of the older and better units that aren't made any more can be brought back to life for the cost of hiring one for a relatively short period of time in order to build up a bank of programs that will enable the newer generations of engineers to access sounds long lost to them. Also, my experience with the guitar indicates that a lot of musicians will greatly benefit from the Replicator, which literally doubles its market capabilities.

As with every new concept, it needs to be developed and my only major gripe was with the manual and the two floppy disks that accompanied the review model. The manual is rather confusing for a first-time user, and while I accept that it may be the translation that fails, I feel that the layout needs to be re-considered with a view to less technical engineers and musicians who basically want to plug in and get started. The review manual was in a ring binder, and the handwritten floppy disks contained the software in ZIP form as opposed to a proper install disk, which I assume will change for the proper release version.

This unit works and works well, which means that the concept of processor sampling is now well and truly established and, like instrument sampling, will inevitably be accepted somewhere down the line and sit side-by-side with other processors in a rack in peace. Sintefex realise the problems that may arise from what they've created, as a part of the manual asks the question, 'Am I infringing anyone's copyright?' and they are very careful about the way they word their answer, but there's no doubt in my mind that the Replicator is here to stay and will be well received. ❑

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INFORMATION

Ⓛ **Sintefex Replicator £5495 + VAT.**
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