

# Roland Juno 106 Polysynth

Geoff Twigg gives us a quick synthesis philosophy lesson and takes a look at Roland's latest budget polyphonic: he finds it's rather more than just a Juno 60 update.



The Juno 106 is the successor to Roland's Juno 6 and Juno 60 polyphonic synthesizers. It has a five-octave C-C keyboard, and falls into the same approximate price bracket as the Korg Poly 800, Sequential Six Trak, and Yamaha DX9.

With two successful models already under their corporate belt, Roland obviously had the option of either following this design concept or developing a different range, perhaps based on digital oscillators and FM synthesis. However, rather than a totally new design, they have opted for the former course and produced this instrument, the latest in the Juno range; so what is it that makes the concept and design so successful?

It was the first instrument to be produced, the Juno 6, that set the basic pattern for the range. It had six Digitally Controlled Oscillators (DCOs) which passed through six voltage controlled filters and 6 voltage controlled amplifiers with conventional ADSR envelope shaping. This basic arrangement was retained on the Juno 60 and is still to be found on the 106. For ease of operation, each of these parameters is accessed by one set of controls, with sliding pots which allow more immediate and tangible control than on many competing machines.

This of course is an arrangement familiar to anyone who has worked with a voltage-controlled synth, whether mono or polyphonic. Isn't it perhaps a little old fashioned? The answer is very definitely 'no'.

The reasoning behind Roland's insistence on this presentation, this approach to generating sound, is the way most musicians wish to arrive at the sounds they use. There are two ways of arriving at a synthesised sound: you can either make it up with individual harmonics, each at the appropriate volume, until you arrive at the sound you require – this is called additive synthesis – or alternatively you can start with a full, fairly rich sound with lots of harmonic content and gradually chop it down with filters until it is the sound you require. The benefits of

additive synthesis should be obvious to all. You need to produce only the actual harmonics required; there are fewer components in the system so that the sound produced is of superior quality; and you can produce unusual sounds by adding harmonics as and when you wish. The main problem is that many musicians simply don't know what sound they want. I don't mean that disrespectfully – can you describe your favourite brass sound in terms of its harmonic content? I know I can't.

What's much easier is to start with a sound approximate to the one you want and subtract harmonics from it, until you arrive at an acceptable result. The obvious basic difficulty with this subtractive synthesis is that you need a very versatile filter stage to in any way approach the more unusual sounds that are obtainable from digital oscillators by additive means.

It's therefore desirable to have a filter that can remove only a 'notch' of sound from the middle of the note, as well as others that can remove the top (low pass) or bottom (high pass) or both together.

Roland's answer to this problem of how to approach synthesis shows a good understanding of how the typical musician (if such a person exists) would prefer to compose sounds. Not only have they used the principle of subtractive synthesis in providing the oscillator-filter-envelope layout described above, but they have extended the facility to apply to preset voices as well. The Juno 60 was provided with 56 pre-programmed voices, arranged in seven banks of eight: the 106 is given two groups of eight banks, each with eight presets – a total of 128 distinct sounds, each of which may be written in to memory by the musician at the touch of a single button. Each of these can be instantly recalled and edited using the performance controls, though of course this new version of the voice is not written into memory – it exists only as you have it on the keyboard until you decide you are ready to store it. The Juno 106 adopts

the same system as the 60 to show that the sound you have is not an unaltered preset voice; as soon as any performance controls are moved, a dot appears on the central LED display after each number. To return to the original sound, you only have to press the preset number again. It is also unnecessary to reselect the bank every time you change presets – the instrument assumes the same group, bank or preset number unless you tell it otherwise. Therefore, in order to go from Group A, Bank 6, voice 3 to Group A, Bank 7, voice 3 it's only necessary to press 7 on the bank selector. Similarly there are one-button facilities for saving, loading and verifying on tape, accessed through quarter-inch jack sockets on the rear panel.

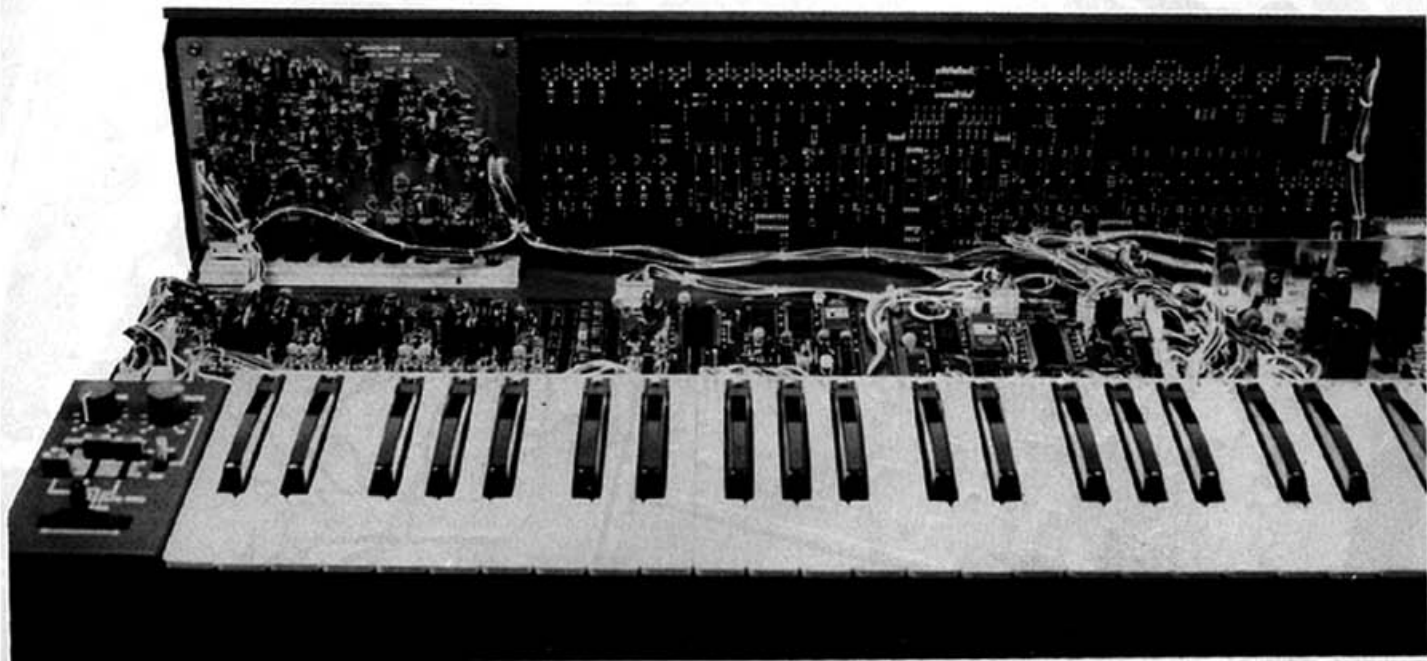
## Layout

From a design standpoint, the Juno 106 follows on logically from its predecessors: the front panel is beautifully clear and simple, and not unlike the Yamaha DX7 in that there is plenty of space around the main control section. In Roland's case, however, space on the Juno 6 was subsequently allocated to the extra program controls on the 60; I wonder whether the space on the 106 might indicate a further, more expensive and better equipped Juno yet to come? Mere speculation, you understand.

The new instrument has the same, very stable digitally controlled oscillators as on the other two models, with 16', 8' and 4' options which were not strictly speaking available before, though of course this is represented on the 6 & 60 as Octave Transpose. Other features are similar to the Juno 60, with the following discrepancies. There is no arpeggiator section and no manual Hold select, though the facility for a Hold pedal, via a rear panel jack socket, remains. The LFO trigger mode is hard-wired automatic instead of offering a manual option, but DCO Pulse width modulation is now either LFO-controlled or manual. Unfortunately, there's no option to control PWM with the envelope shaper. The high pass filter is the same as that on the 60,

with four settings of approximately 0Hz, 350kHz, 1kHz and 5kHz, and although on the review model this filter emitted a substantial click as it fell into each of these notches, I'm fairly certain this problem will be eliminated on production models.

two pedal inputs, one for Hold and one for shifting from one patch to another. At the other end of the rear panel lie the mains on/off switch, Memory Protect and three-way MIDI sockets (in, out and through) together with a function select



## Innovations

Apart from the increase in the number of presets over the Juno 60, the other impressive 106 innovation is on the performance control panel to the left of the keyboard. Whereas before the controls provided were a Bender for DCO and VCF cutoff frequency modulation, an LFO trigger switch and volume control, the 106 sports two pots, one for volume and one for portamento (with a portamento on/off switch) and three sliders – for DCO and LFO modulation depth on the bender or bender modulation of the VCF cutoff frequency. The white LFO trigger button used on previous Junos and Jupiters has now been replaced by an ingenious rocking fulcrum for the bender wheel, constructed so that it triggers the LFO if you push it forwards. This works so well it really should become standard Roland equipment. Two settings for the Chorus effect and the key transpose facility remain standard features, and there is still a range of three output levels so that you can match the synth to your own amplification system; settings of 0dB, -15dB and -30dB are available. The case is of the same black metal as before but the wooden ends of previous models have been replaced by black moulded plastic, giving the instrument a more contemporary look.

Jack sockets are provided for tape, stereo/mono outputs, headphones and

for the precise information sent along the MIDI bus.

Inside, the Juno 106 is of typical Roland design, with fibreglass PCBs fitted with plug-in connectors for easy servicing. To minimise wiring, the front panel controls are mounted straight onto their circuit board, and all the boards are easily accessible. The ICs are mostly soldered in, with only the EPROMs fitted in sockets – this improves reliability and reduces the risk of chips falling out when you are shifting the instrument.

Given then that the 106 would appear on paper to be little more than a revamped Juno 60 containing little in the way of design innovation, it's particularly surprising to discover that the quality of the factory preset voices is considerably higher than on the 60, even if the degree by which those sounds can be altered is essentially the same as it was on the 106's predecessors. Not only are the sounds a good bit clearer and less noisy, but the aural range they cover is also quite a bit greater. While many of the factory voices on the Juno 60 were variations on the strings/piano/organ theme, the 106 is capable of generating all manner of acoustic and/or synthetic-type sounds, a goodly number of which bear more than a passing resemblance to FM-synthesised voices, which is no insult.

I would guess that a fair few internal modifications have been made to the Juno's oscillator and/or filter sections in

order to bring about this sonic metamorphosis, but whatever changes have been made have certainly been well worthwhile.

## Conclusion

To summarise, the Juno 106 is an impressive instrument, well-designed and a joy to play. Although it lacks an arpeggiator, this omission is not really all that serious when you consider how much the inclusion of MIDI sockets has widened the potential for storing your own compositions via MIDI-compatible sequencers such as Roland's own MSQ700.

The inclusion of polyphonic portamento is also a very worthwhile improvement over previous Junos, particularly when you consider the extent to which the Juno's voices lend themselves to this effect. The increased memory space is similarly welcome – surely there can't be many people who'll want to use more than 128 programs in one set?

A very strong contender for my favourite synth of 1984...

Geoff Twigg

E&MM

*The Juno 106 carries an RRP of £799 including VAT, and for further information you should contact Roland UK, Great West Trading Estate, 983 Great West Road, Brentford, Middx TW8 9DN. Tel: 01-568 4578*