Netsine

_____NETSINE Nr1, 18 Oct. 1999_____

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1) Netsine status

We are very pleased to launch this first issue of Netsine. Due to the increased activites within The Synthesizer network this newsletter is a bit thin. An interview with a celebrity is not 100% complete, but will perhaps be included later on.

The entire articles, including photos can be viewed on the web if you direct your browser to http://www.analogue.org/network/password.htm

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If you find something on the Internet that might be of interest to the Netsine reader -or if you´d like to participate as a writer please send a mail to morgan@analogue.org

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2) Short News

Paul Schreiber at Synthesis Technology will be offering the rare "Curtis-chip" once again. If you need some spare parts here´s your chance http://www.synthtech.com/

JoMoX have announced that their latest development Sun Sun will be available in March. More information can be found on http://www.jomox.de

The company Music And More dissolved on the 30th of September. Touched By Sound will continue manufacturing some of the earlier MAM products.

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3) Using sequencers with modular systems.

By Andy Chapman.

Sequencers and their application in the context of a modular system involves techniques that are not really practicable on a smaller, prewired synthesiser, and a modular synth offers considerably more in the way of sequencing possibilities, even if its use is still something of a specialist subject.

A modular instrument gives the user control not only of pitch but also of tone, amplitude, pulse width, modulation level, and in some cases, envelope shape, and all these parameters can, if desired, be manipulated by a sequencer. Before we go any further into the world of sequencer application, however, let's first take a look at the various types of unit available.

Analogue sequencers were the first type to be produced, and almost all such models feature a row of potentipmeters which are tuned to whichever control voltage levels are necessary to produce a short sequence of programmed events. Most commonly, these events are then applied to one or more VC0s for melodic sequences, though as with any CV, they can also be used in conjunction with any voltage-controllable module.

There are two main problems with these units. First, they are inordinately cumbersome to program, and second, they have only a limited storage capacity - usually in the region of 24 events, depending on the make and model. However, more often than not these can be split into three channels of eight events each, with the result that each channel can be used to control separate VC0s (for,melodic counterpart) or routed to a VCF and/or VCA for tonal and amplitude changes.

A further alternative is to use one channel to control the tempo of the sequencer's voltage controlled clock, facilitating the construction of more intricate rhythm patterns. It's also possible to interact with the sequencer as it's running, switching notes in and out and varying the preprogrammed CV levels so that a degree of improvisation can be introduced into what may otherwise be a short and rather repetitive sequence. The normal mode of operation, however, is to feed each channel to a separate set of voice modules (comprising VCO(s), a VCF, a VCA and associated EGs) so that the various layers of sound can be crossfaded to give the effect of longer sequences.

Nowadays, analogue sequencers can seem a bit limited, but they do offer some possibilities not available on the latest microprocessor-based units, and there's no reason why they can't be usefully employed even in today's microcomposed music.

Figure 1 shows the most basic use of a sequencer - to play one or more VC0s for a melodic sequence: of course, the voice modules can be set up for any sound you wish. The keyboard is also connected so that the sequence can be transposed up or down.

Figure 2 is essentially the same, except that it uses two control channels to play a two-part sequence. This technique is more suited to use with an analogue sequencer, but if you're lucky enough to own more than one digital device you could doubtless achieve the same result. The number of channels can be multiplied as many times as you wish - assuming you have enough hardware at your disposal - and you can then mix each channel, cross-fading them in and out gnd adding EQ and effects as desired. This technique lends itself particularly well to the dreamy 'floating' music pioneered by Tangerine Dream and copied (with varying degrees of success) by so many others. Be careful you don't get too carried away with this technique, however: it's an easy

mistake to make in these circumstances.

One adaptation of this patch is to use the other channels' CV outputs to control some other voltage-controllable device. The first one that springs to mind is the VCF, which you can modify so that more interesting, especially if you mess around with the channel controlling the VCF - again, a technique more suited to analogue sequencing. A further option is to use a third CV channel to control the gain of a VCA, thereby giving you dynamic as well as tonal control.

The patches for these alternatives are given in Figures 3a and 3b. Note that in the latter diagram, the third CV channel is routed to a second VCA, as this should give you more control over the final output level than you'd have if the sequencer's CV output was mixed with that of the EG. This is because the EG's CV output will always be at the same level unless you program a higher voltage into the sequencer, and if you do this, you may well find the VCA 'overshoots', causing distortion. So, if you have a second VCA, it's best to use it since the sound will then respond to the slightest voltage change.

If you don't have a second VCA to play with, you may be able to get round the problem by setting the VCA's EG modulation level fairly low so that the sequencer's output determines the final level, though as 1 say, the degree of control you'll have probably won't be as great.

These patches should provide quite some variation over the simple noteplaying sequencer-and-prewired-synthesiser array. If you don't have access to a modular synth but do possess a multi-channel sequencer, you should be able to do some of the things I've outlined if you can get hold of a couple of monophonic synthesisers along the lines of the Pro One, Minimoog, Prodigy, ARP Axxe or Odyssey, which have separate CV inputs for the VCF and, in the case of the Minimoog, a second VCA.

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3) THE MOOG INDUSTRY PROFILE 1983

By E&MM 1983

President of Moog Music, David Luce discusses latest developments:

We first introduced the MemoryMoog last year and it's been a very successful instrument for us, and as we have been promising everybody for the last year, there will be a sequencer in it and indeed we now have the sequencer with the MIDI interface now available. We have completed the development work on it now and the only delay is getting it into production. 1 think it is perhaps what you would expect from a sequencer - but it does have some unique features. The sequencer drives both the polyphonic internal sound generating elements in the instrument and also an external control signal so that you can, for example, link a monophonic synthesizer to it directly and run that at the same time.

At the present time this is Moog's only MIDI interfaceable machine, but as you might guess, from now on it's going to be on all the instruments that will benefit by its inclusion. The sequencer with the MIDI in the MemoryMoog can also be synchronised directly with a number

of rhythm machines and other kinds of instruments which now have a fairly standardised clocking system in them. You can indeed synchronise this both ways either out or in to other clocked systems.

The nice thing about the sequencer is that it is built-in and what we did was to go for double function controls so that the existing instrument push buttons could be used. It is retro-fitableto all the instruments in the field and those will be made available to be installed by authorised service centres. It's a straightforward job, just a matter of putting a printed circuit board inside and making a few connections.

The gap at the back of the MemoryMoog was intended precisely forthis purpose. The new sequencer basically, although you have to be careful in putting numbers to it, is a 4800-note polyphonic sequencer, and then roughly has a 300-note monophonic sequencer section. It's a good bit of storage, there are larger storage in some of the peripheral types of sequencers but this is quite a bargain, believe me, in terms of cost and certainly adequate for most purposes. If you want to go larger you can use the MIDI.

Our Central Sales person, Jeff Burger, in the US here, has prepared a video demonstration which explains basically what you can do with MIDI, because even though everybody seems to have a general feeling of what you can do, it's nice to know exactly what it can be used for. What the MIDI does is to give you access to every control that's on the instrument. That includes the keyboard too, if you look at the keyboard as a control. So you can do everything via the computer that the player normally does in either playing the notes or turning knobs and switches. You can use it in just a playing fashion or tutorial fashion and develop programs to teach about synthesis, about music or both.

In my view there's no question, that teachers will want to use the MIDI, it's now going to happen. A lot of people have been unwilling toapproach synthesizers because there has not been good tutorial kinds of information, but now somebody can virtually work with a system on a totally start-up basis: the computer is the teacher where it can work inter-actively or be a freestanding system.

We already have interface cards for the Apple 11 and lie but the price has not been pinned down exactly. The sequencer basically adds $300 retail cost to the product and l think that will probably include the cost of the Apple interface. There may be a small amount above that because we are still finishing some of our own costing on it.

We're planning to link up to a Commodore 64 computer next - it's doing well here and in Europe. After that we're I'm sure going to do a bunch of them. Frankly, 1 wouldn't be a bit surprised to see a company or two spring up that does nothing more than make interfaces, because at some point it's going to be almost a whole business in itself.

There is another product which we've been showing to various people at the Chicago music show. This is the SL-8 (standing for 'Split Layered 8-Voice Polyphonic'). At the present time this instrument is just a working prototype using digitallycontrolled oscillators but still with analogue synthesis. We also have some programmes going in the direction of sampling machines. This is a big step, but one of the reasons that 1 feel now is the appropriate time is that if we resolve what I think are some of the fundamental problems associated with digital synthesisperse - it's not really the digital synthesis that's the problem, for a lot of it relates generically to the methods and

the techniques that you use to put the sound together whether it's analogue or digital. Synthesizers are things that have a lot of versatility and that's their great benefit. On the other hand, if they're impossible to get to where you want to go from where you are in a fairly straightforwardway,then it makesthingsverydifficult. You defeat the real benefit of the synthesizer - it's versatility, and one of our aims is to produce systems that let you deal with sound in a straightforward way."

Val Podlasinski, Sales Manager Moog Music.

We're based in Buffalo New York and that's where we build all our synthesizers. We think of it as a small operation rather than a huge corporation, with approximately 200 people at the factory. Recently we have gone through some changes that will set us in the direction we want to go for the future. We've invested very heavily in some very sophisticated computer-controlled equipment that helps us build our products.

We use them in two areas - for component insertion and for testing. The first area, component selection, lets us set the tolerances we want for all components. These are then assembled onto a reel which is put onto an 'Inserter' so that the components get stuffed onto the board completely by the computer-controlled machine. It runs on its own programme and it can stuff up to four boards at one time, running at a horrendous rate! Once the boards are assembled, they get tested by a computer which prints out checks on all the components - the tolerances and state of the transistors, the resistors and the capacitors.

It can also set and calibrate the boards where necessary. We feel that this is much more cost eff icient, so we are getting to the point now where most of the instruments are completely assembled by machines and then tested by the computer, with maybe just the final audit, from an audio and a visual point of view, still done by people.

When it makes sense, we have particular parts manufactured outside the factory. On the MemoryMoog we designed our board layout, of course, but we don't actually produce the PCBS. We use as many common parts as possible so it's easy to service them.

After the general components, even the ICs are inserted by machine, but through an operator. Then all the components get soldered onto their boards, and here we use a flow soldering machine process. After that they are given their first electronic test, plus a visual check to see if all components are sitting on each board properly. If anything fails, it gets sent back for re-work. If it gets through that process, then it starts to get assembled into what we call 'subframe assemblies'. The boards are put onto the sub-frame - it's usually the bottom plate, (in the case of the MemoryMoog, the chassis plate), and then the board gets tested one more time. That's when we start making the jack connections, so that the important step of calibrating the instrument can be done by our highly skilled technicians.

When you have an instrument as sophisticated as the MemoryMoog with 18 oscillators, you have to calibrate each one, so by definition that makes it a complex piece of engineering. Recently, we updated our auto tuner, for instance, to make the actual calibration of the instrument much easier and it will pull in the oscillators plus or minus a semitone very quickly.

When the instrument has been calibrated by a technician, it goes for

its final audio and technical test by a technician who is also a musician. He goes in a separate sound room and tests the system over with speakers and headphones. A reference file is made to complete the final testing and then the instrument is packed for despatch.

The 3 EPROMS providing control data for the MemoryMoog also hold the new polyphonic sequencer software. The sequencer for the new SL-8 instrument will not be quite as sophisticated as the MemoryMoog's. The SL-8 will still use the Moog filters because our surveys (including a lot of input from Europe) through our Interface magazine show that's still the sound people want. The MemoryMoog has a continuing programme of development and we are now coming out with a sequencer which is retrofittable as well as some other things in the pipeline for this and the SL-8. Our Ohilosophy is to make a product that has a good lifespan.Theconsumerreallyappreciates that when he's buying an instrument, it's going to be supportive and we really do intend doing that.

It's very important to have a standard and I'm very happy to see that most of the manufacturers that we're speaking to are adopting that attitude. 1 see this as the starting point if you like and 1 know that it's going to mushroom out just like computer music - a lot of software companies are going to come out of the latter. They'll become a specialist supportive industry on their own and that's very, very exciting: just think of all the possibilities that can be achieved from computer control. What MIDI on Moog instruments, and of course others, will achieve is to bring in the home computer to serious music making. There are many people in the US, and in Europe too, with their micros at home and they want to integrate those systems - they don't just want to play video games the whole t.ime, they want to do a lot more in the way of music and Moog Music plans to make a significant contribution in the years to come."

Herb Deutsch, Research and Development Moog Music.

Where we stand actually is very close to the musicians, the musicians' needs, as we always have been. We have consistently prided ourselves on the involvement we have with our artists and the closeness that we maintain to where the industry is and what people really want to have. We have established a very strong reputation as the makers of instruments that sound very good and because of that we spent a lot of effort in developing the very finest of instruments that use the Moog sound design in with analogue electronics. Of course, in the last few years we have added digital control and have developed digital/ analogue hybrid instruments which sound great - the MemoryMoog is obviously a very clear example of that. We've continued that kind of development in our new SL-8 instrument.

What we're doing is putting together the finest of analogue technology with the latest of microprocessor-based skills and our engineers are very strongly adept in both of these areas. One of the main reasons for maintaining our work in analogue technology is because we hold the patent on the filter that creates the sound that so many people love and therefore we are obviously going to use that as long as it is an available thing for us. Moog is developing some very exciting digital instruments but at this time 1 can't say anything about them. What we have done is taken the most sophisticated technology in terms of digital control as seen by the very fine MemoryMoog sequencer that we have and combined that with the very finest in analogue systems. That is where we stand now, and we have hinted at where we're going to go in the future.

As a corporation, Moog is even stronger than we were a few years ago

because we have divisionalised our corporation to the point where we now manufacture our musical instruments in one division. There's another division which is manufacturing in the telecommunications field, where we're making telephones, telephone dialing and other specialised equipment, and there's a third division which does limited sub-contractural work in the plant. Overall, it makes the plant more efficient, it reduces a great deal of the overheads and it allows each of those divisions to operate more economically and efficiently. The music synthesist division continues to grow, because that is the one that requires the greatest amount of research and development.

My own work with Moog instruments began when I met Bob Moog in 1963 - we dreamt about synthesizers and made the first prototype in 1964! Possibly the single key to Moog's success has been its ability to listen. From the earliest days in Trumansburg, New York with Bob and his little shopfront operation to today's sophisticated manufacturing facility in Buffalo, this cornpany has listened to major artists as well as the average consumer. At that time 1 was a composer of the Avante Garde style, rather than a purely experimental composer if you want to use that term. I was interested then in Serial music and Pointillistic music and various multimedia things, and I did a lot of things for dance, film and projected mages.

Nowadays, it's quite difficult to define my role with the company fully. I have been Director of Marketing for about three years and now 1 am going to move to a position of what is basicaly an Assistant to the President, involved with special project developments.

We can see too that the home musicmaking thing with fairly sophisticated recording equipment has probably had its beginnings in the UK - the States are a little bit behind in that area. Already we've arrived at a new stage of development with the computer musician and micro music but we haven't arrived at the boom part, we've arrived at the 'b' of it - the'oom' is going to come in the future, 1 think."

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5) The pioneers in the early days

By Paul Jensen

The birth of the transistor in the late 1950s heralded a major turning-point in the development of facilities for electronic music. Hitherto the evolution of devices had been governed by the characteristics of thermionic valves. Problems of heat dissipation, fragility, and the sheer size of these components thwarted efforts to design systems which were both versatile and compact. The new technology suffered from none of these disadvantages and generated remarkably few of its own.

One of the first engineers to grasp the significance of this technological revolution for electronic sound synthesis was Harald Bode, the inventor of the Melochord. In 1961 he published an article on transistor-based devices, drawing particular attention to the advantages of modular design. Such a concept was new indeed, for with the advent of miniaturization it had become possible to envisage the production of easily transportable system packages, containing customized selections of self-contained and mutually compatible units such as oscillators, filters, and modulators.

The new designs were to prove revolutionary in another respect. Hitherto the functional characteristics of most studio devices had been controlled by uniquely assigned knobs or sliders. Connections between these units were thus concerned solely with the passing of audio signals from one stage in the synthesis chain to another. The versatility of transistor-based electronics made it possible to design any number of devices which could be controlled by a common set of voltage characteristics. These could be supplied either internally via manually operated regulators, or externally, from any suitable voltage source. The former mode of operation differed little from that employed for traditional studio equipment. The latter, however, introduced an entirely new dimension: the passing of control information from device to device via a secondary chain of interconnections.

Despite Bode's interest, the primary initiative passed elsewhere. In 1964 Robert Moog, an American engineer working in New York, constructed a transistor voltage-controlled oscillator and amplifier for the composer Herbert Deutsch. This led to the presentation of a paper entitled 'Voltage-Controlled Electronic Music Modules' at the sixteenth annual convention of the Audio Engineering Society in the autumn of the same year, which stimulated widespread interest.

Similar developments were taking place on the West Coast. Sender and Subotnick had become increasingly dissatisfied with the limitations of traditional equipment at the San Francisco Tape Music Center, and their quest for new devices led to an association with another engineer, Donald Buchla. Buchla, like Moog, appreciated the musical possibilities of transistor voltage-control technology, and proceeded to develop his own prototype modules. On the strength of their early successes both engineers, quite independently, decided to establish their own manufacturing companies, launching the first commercial versions of the Moog Synthesizer and the Buchla Electronic Music System almost simultaneously in 1966.

During 1964-5 a third engineer, Paul Ketoff, designed and built a portable voltage-controlled synthesizer, known as the Synket, for the composer John Eaton. Although interest in its capabilities, especially as a live performance instrument, led to the construction of a number of copies, the synthesizer was not marketed commercially. By the end of the decade other manufacturers were entering the market. Two became major rivals for Moog'and Buchla: Tonus, marketing under the trade name ARP in America, and EMS Ltd., pioneered by Peter Zinovieff in England. For several years synthesizer production was dominated by these four firms, each struggling for a major share of a highly lucrative and rapidly expanding market.

The growing accessibility of system packages was to prove a mixed blessing, for in many instances the ease of device interaction led to a fascination with the technology for its own sake, rather than the musical premises for its use. Manufacturers were naturally keen to publicize the more novel features of their wares, leaving unsuspecting composers to discover for themselves the practicalities of utilizing such equipment. Several of the smaller models offered only the most basic facilities, dissuading a number of potential electronic composers from investigating the possible merits of the medium any further.

In order to evaluate the musical characteristics of voltagecontrolled systems it is advantageous to understand the general principles upon which they operate. Except in the rarest of circumstances every studio device offers one or more adjustable characteristics. Oscillators, for example, are usually controllable in terms of both frequency and

amplitude. Even a ring modulator, which is essentially of a fixed design, usually incorporates an amplifier to regulate the level of signals appearing at its output.

It´s interesting imagine a world without the above mentioned constructors. When I meet Bob Moog during the eighties he gave me the impression of beeing at the right location att the right time. It´s not new to me that every period of time supplies a weaving of ideas to get stuck into. I will not discredit Moog and other electronic circuit designers, but by way of conclusion I´d like to say that no one can escape the shaping power of social arrangements and social institutions.

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6) Rewiev: Spectral Audio NEPTUNE

By Axel Holsbergen

Since Moog, analog synths have been known for their deep bases. An interesting new appearance in this category is the Neptune. Axel Holsbergen is running warm to get into deepness with this purple animal. The high popularity of the original analog synthesizersound let it happen that in the past two years the one after the other virutal anlog synth appeared. For everybody that still want to have the orignal analog sound Spectral Audio is launching the Neptune on the market: a monophonic, analog synth which can also be used for filtering external signals.

The Neptune is 2U high and the front panel is in the purple colour with yellow 1, what would you like to have more? Still the front panel is in the first place very clear. In one view you can see how the device is working and because of the lay out of the panel you can see how the sound will be made by reading from left to right. From the VCO's to the filter, from filter to volume envelope to reach at the end the fuzzer/distortion which is making the sound ready to use. The first thing that you notice by connecting the Neptune is that there is no on/off switch. The most of us will have a masterswitch for their setup but I can think of situations that it could be handly having an individual switch.

As mentioned before, we are having it about a real analog synth and the soundgeneration can be called classic with on some places a few interesting, less used features.

Two VCO's are used for a basic source. Both VCO's can be tuned with two knobs which have unfortunately no restpoint on zero. In the VCO compartment we also find a ringmodulator and a sync switch which can be used to make rough sounding leads by detuning VCO 2.

With VCO 1 you can choose out of Sawtooth, square wave and noise. The last one is very handy to make spectaculair effects. With VCO 2 you can choose out of sawtooth and square wave and the VCO can be switched into 4 octave with a seperate switch. Also you can choose instead of using VCO2 to use receive an external signal into the Neptune.

Direct to the right next to the VCO compartment there is the filter section. Here you first find the knobs for Cutoff and resonance together with the lowpass/highpass switch and under the filter envelope with the usual knobs for attack, decay, sustain and release. The amount of the envelope curve for the cutoff frequency can be controlled by the envlope mode knob. This envelope mode can also have

negative values to change the envelope curve upside down. The whole filtersection is pretty clear and very flexible. In a second you change the sterotype bass synth sound into leads which are so raw and agressive that the fuzzer/distortion, a nice bonus, which can be found at the end of the signal path a not neading luxury is.

The Neptune containes a very comprehensive and usefull LFO which can be used to modulate VCO1, VCO 2 and or the cutoff frequency. With a knob you can choose the shape of the LFO; sawtooth, triangle, square, random or noise and you can choose to use VCO 2 and modulation source. The speed of this LFO can be changed with a knob and octave switch and also the LFO can be syncronised over midi.

In the LFO section we also find a sub oscillator switch to change the LFO into a third oscillator; a thinkable old Moog function. The total will be made ready with a volume envelope (A-D-S-R) and the previous mentioned fuzzer/distortion effect.

The Neptune is controllable by CV/Gate but the most of us will use Midi interface. The Neptune is velocity sensitive and some parameters can be controlled by Control Messages or Program Changes. In the manual there has been written that from the internet site of Spectral Audio (www.spectralaudio.ch) mixermaps can be downloades for several software sequencers. When writing this there was nothing to find for the Neptune but the Neptune is not using any Sysex so it is a peice of cake to make in a logic environment a programmer for the Neptune. Unfortunately not all controllers on the frontpanel are midi controllable. Still we cannot suspect that from an analog synth we have been getting used to that with all recently virtual analog synth.

For the fatness and the filters The Neptune will not be everybody's dream synth but those which love the original analog sound will not be disappointed. The Neptune sound fat and lively, exactly as you expect from an analog synth. Also just the fact that you can filter external signals will be enough to buy the Neptune.

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7) The co-operation between Kraftwerk and Dieter Doepfer

By Dieter Doepfer

Our collaboration with Kraftwerk started many years ago as we made some special designs for them (e.g. the miniature keyboards the use on stage for Taschenrechner/Pocket Calculator and a special phonetic keyboard for voice synthesis). The first unit we built in cooperation with Florian Schneider was the MAQ16/3. We built some prototypes and Florian tested them and told us what we would improve and which features are not required. So we went many times to the Klingklang studio in Dusseldorf until the final version of the MAQ was complete. A similiar cooperation - but not as close as with MAQ - was made for the SCHALTWERK.

The next coop. was the A-100 vocoder. We tested all of the vocoders of Florian (and that's a lot) and compared them to our A-100 vocoder prototypes (the first versions with different filter designs in quantity and filter response types, e.g. 10 band passes, 8 band passes and high/low pass, 13 band passes and the final version with 13 band passes and high/low pass). And so we found a very good compromise between price and sound. Even the very high priced vocoders sounded not significant better than the final A-129.

We learned a lot about vocoders e.g. that a treble boost of the incoming speech signal is very important for a good vocoder effect (is now included in the A-129-5). All high priced vocoders imply such a treble boost but the customers is not aware of this detail as there is sometimes no remark in the user manuals. We experimented together with Florian with a 32 band graphic equalizer to find the best treble boost for good speech recognition and implemented it into the A-129-5.

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A new synthesizer publications from THE SYNTHESIZER NETWORK.

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