General

MEGAZWERG is a monophonic, semi-modular, analogue synthesizer. It can be used as an autonomous synthesizer, as an expansion to our MFB-KRAFTZWERG or in combination with any compatible modular synthesizer-system. It offers eleven sections that can be either used for the internal sound-generating-system or separated to be integrated into the signal-path of semi- or fully modular synthesizers.

A lot of important audio- and modulation-routings in MEGAZWERG are internally prewired, so that the synthesizer can be played immediately using a MIDI-keyboard or a cv/gate-sequencer. By using patch chords, you can split up these internal prewirings any time. All MEGAZWERG functions not prewired can be integrated into the internal signal path or to external components using patch chords.

Set-up and connections

Connect the external power-supply to the **Power** jack. Use **VCA Out** (in Loop-Envelope section) to connect MEGAZWERG to a mixing desk, an audio-interface or an amplifier. MEGAZWERG is controlled by MIDI or cv/gate. Use a MIDI-cable to connect **MIDI In** to the MIDI-output of a keyboard or MIDI-interface. Alternatively, inputs **CV In** (Dual Glide or VCO sections) and **Gate In** (Loop-Envelope section) can be connected to an analogue sequencer or cv/gate-keyboard. Press **On/Off** to switch MEGAZWERG on and off.

Dual Glide

This section contains two independent slew limiters. These can be used to delay changes of control voltages. A typical application would be the generation of portamento/glide-effects for the oscillators' pitch or the deformation of a LFO-square into a trapezoid waveform shape. **Slew1** offers larger delays and is only recommended to be used with control voltages, while the shorter delay range of **Slew2** makes it also applicable for audio signals.

Connect the cv-signal to be modified to input **In1** or **In2** and patch the outputs **Out1** or **Out2** to the target. Controls **Slew1** or **Slew2** set the amount of delay, with **Slew1** being able to create longer delay settings.

Internally, **In1** is prewired to the pitch of the MIDI-input while **Out1** is connected to the oscillator's cv-input, resulting in a portamento-effect. Input **In2** is prewired to the cv-output of the internal mod-sequencer (see below) to be able to smooth out its stepped values.

Modulation Sequencer

MEGAZWERG's mod sequencer is a simple four-step-sequencer that can be externally synchronized. When needed, the sequence length can be reduced to two or three steps using the **2 – 3** switch. **Rate** sets the sequence-tempo/speed, ranging from approx. 0.1 Hz to 500 Hz. **Gate Out** outputs a corresponding clock-gate-signal of 10 volts at the **Rate** setting. With the **Clock** input being patched, the sequence-tempo/speed will follow incoming clock-signals.

This input can also be used to advance the sequence stepwise automatically by 5-volt-gate-impulses. The sequence values are set by **Step1** to **Step4** controls. Depending on the position of the **Range** switch, the step controls will output a maximum of 2, 5 or 10 volts. The sequence is output at **CV Out**. **CV Out** is internally wired to input **X-IN** of the ring modulator as well as to **In2** of **Slew2** to be able to smooth out the sequence's stepped values. The combination of mod sequencer and slew limiter forms a LFO with a free formable waveform shape.

Oscillator/Ring modulator

The analogue, voltage-controlled oscillator is fixed to octave-register 16'. It can be tuned within a range of approx. +/- 1 octave using the **Tune** control. It can be played by a cv-keyboard scaled to 1 volt/octave using the **CV** input. **CV** is internally wired to **Slew1** and therefore also connected to inputs **CV** (key) and **MIDI**.

The VCO offers triangle, square and saw tooth waveform shapes, switchable by the upper selector. The selected waveform is output to **Out**.

The ring modulator is an analogue circuit, building the sum and difference of two signals at inputs **X-In** and **Y-In**. The resulting RM-signal is send to output **Out**. **X-In** and **Y-In** are internally prewired to the outputs of the mod sequencer and the VCO. To use the ring modulator with external audio signals, simply patch these to inputs **X-In** and **Y-In**.

Mixer

The mixer allows mixing of up to three audio- or cv-signals. Inputs **In1** and **In2** offer attenuator controls, while input **In3** always runs at full level. Internally, the VCO output is wired to mixer-input **In1** and the ring modulator to **In2**. The mixer's output is prewired to the filter's audio input.

Multimode-Filter

MEGAZWERG offers a multimode-resonance-filter with a slope of 12 dB per octave. The available modes are low-pass-, band-pass-, high-pass- and notch-filtering. **LP-BP-NO-HP** selects between these modes. Note, although this is a continuous control, the filter modes are switched NOT cross faded. Input **In** feeds audio into the filter. This input is internally prewired to the mixer's output. The filter's output is available at output **Out**.

Cutoff allows manual setting of the filter's cutoff frequency. This parameter can be modulated using inputs **CV-Cut** and **CV2** with corresponding attenuators. **CV-Cut** is internally wired to the envelope section as well as to **CV2** combined with key-cv from the MIDI-input.

The filter resonance is set manually using the **Resonance** control. Modulation of this parameter is possible through input **CV-Reso** with the corresponding attenuator. Resonance can reach self-oscillation.

Loop-Envelope/VCA

MEGAZWERG's envelope section consists of five stages **Attack**, **Hold**, **Decay**, **Sustain** and **Release**, all offering individual controls. In addition, stages 1 to 3 can be looped. The **Loop** switch enables/disables the loop-function. If enabled, the loop is carried out as long as there is an active gate signal. The envelope receives its gate-triggers from input **Gate** or any incoming MIDI-note-command.

The VCA controls MEGAZWERG's audio output which is under cv-control only. Input **VCA In** is internally connected to the filter's output. Control input **CV In** is internally patched to the gate-signal created by incoming MIDI-note-commands. It uses a minimal release time to avoid clicks at the end of sounding notes.

Inverse/Multiple

Inverse is a voltage-inverter with additional offset-function. Any control voltage sent to input **In** will be inverted and send to output **Out**. As an example, this allows to create a negative modulation using the envelope section. **Offset** controls the threshold value from which the signal will be inverted. 0V means "+" becomes "–" and "–" becomes "+". 5V means "0" becomes "5" and "5" becomes "0". 10V means "0" becomes "10" and "10" becomes "0".

The 1 > 3 Multiple section serves to duplicate cv- and audio-signals. An example would be to route the LFO's output to multiple destinations. Output **Buf Out** offers a low impedance signal. This jack cannot be used as input.

Digital Delay

The multitap-delay generates delay times between approx. 2 ms and 4 sec. Adjust the delay time using the **Time** control, while input **CV Time** allows modulation of this parameter. The **Range** control broadens the time range or narrows it to a ms-range. Audio signals enter this section at input **In** which is internally wired to the filter's output. The output is available at **Out**. **Feedback** sets the amount of signal fed back from the delay output back into its input. With **FB Send** and **FB Return** jacks you can access the delay's feedback loop and send it to any other module or effects processor and back into the feedback loop return. In addition, the feedback-signal can be set to infinite playback. To do so, enable the **Freeze** switch or send a positive control voltage to **Freeze In**.

Attenuator

MEGAZWERG offers two attenuators **Att1** and **Att2** that can be used to manually limit or amplify audio- und cv-signals as well as cv-sources. Attenuation is set using **Att1** and **Att2** controls from 0 to center-positions. Higher values result in signal amplification. With unpatched inputs, the outputs will be steady cv-signals ranging from 0 to 10 volts.

MIDI

MIDI note commands and velocity data (via gate) are received at the **MIDI** input. The MIDI-channel is set using the dip-switches at the unit's rear as follows:

Channel	1	2	3	4	Channel	1	2	3	4
1	ON	ON	ON	ON	9	ON	ON	ON	OFF
2	OFF	ON	ON	ON	10	OFF	ON	ON	OFF
3	ON	OFF	ON	ON	11	ON	OFF	ON	OFF
4	OFF	OFF	ON	ON	12	OFF	OFF	ON	OFF
5	ON	ON	OFF	ON	13	ON	ON	OFF	OFF
6	OFF	ON	OFF	ON	14	OFF	ON	OFF	OFF
7	ON	OFF	OFF	ON	15	ON	OFF	OFF	OFF
8	OFF	OFF	OFF	ON	16	OFF	OFF	OFF	OFF

Start/Stop and **Clock** jacks are interconnected to MMC-Start/Stop and MIDI-Clock. Use dip-switches 5 and 6 to set the output as follows:

Switch 5	ON = start 0 volts, stop 5 volts	OFF = start/stop (1 impulse each)
Switch 6	ON = clock 1/96	OFF = clock 1/16

Owner's manual

MFB-MEGAZWERG