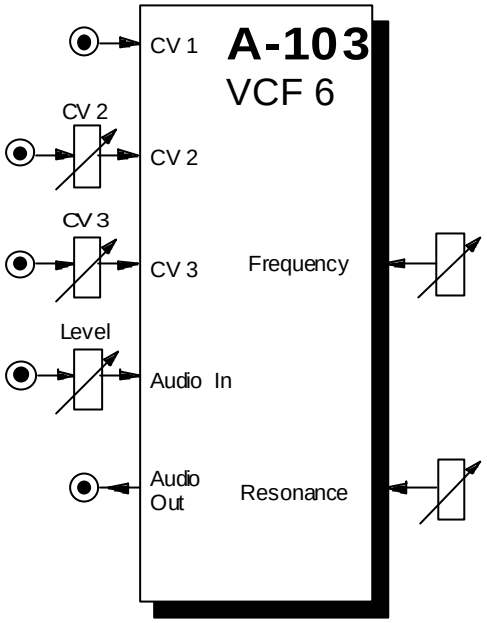


1. Introduction

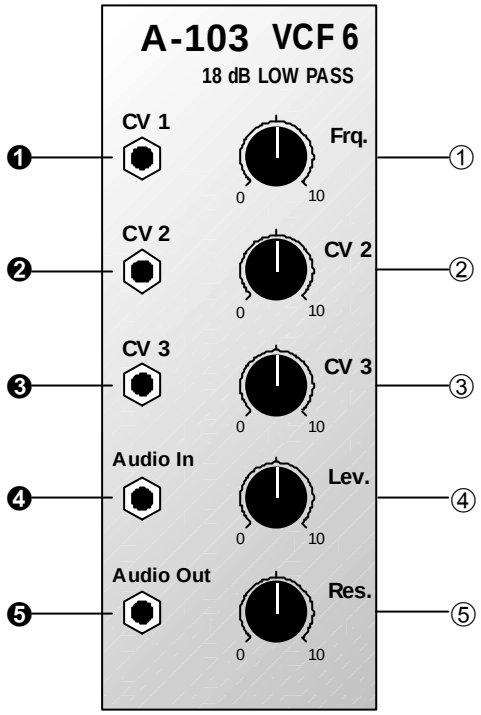
Module **A-103 (VCF 6)** is a **voltage controlled low-pass filter** with a **cut-off slope** of **-18dB/octave**. It filters out the higher parts of the sound spectrum and lets lower frequencies pass through.

The **Cut-Off Frequency** determines the point at which filtering takes effect. You can control this manually, or by voltage control (**filter modulation**, for instance by an LFO). Three CV inputs are available, and the sum of the voltages from these affects the filter cut-off.

Resonance (or Emphasis) is adjustable all the way up to self-oscillation - in which case the filter behaves like a sine wave oscillator.

A-103 uses a so-called **transistor ladder** with a slope of 18 dB/Octave as frequency controlling element. It is very similar to the transistor ladder of the A-120 (24dB Moog type low pass) but the ladder of the A-103 is a modification of the original Moog ladder and identical to the ladder used in the **Roland TB-303** (base and collector of each transistor are connected).

2. VCF 6 - Overview



Controls:

1	**Freq.**:	Cut-off frequency control
2	**CV 2**:	Attenuator for CV at input "
3	**CV 3**:	Attenuator for CV at input §
4	**Lev.**:	Attenuator for audio input $
5	**Res.**:	Control for setting the filter's resonance (emphasis)

In / Outputs:

!	**CV 1**:	Control Voltage input
"	**CV 2**:	ditto, level controlled by 2
§	**CV 3**:	ditto, level controlled by 3
$	**Audio In**:	Audio input to the filter
%	**Audio Out**:	Audio output from the filter

3. Controls

1 Frq.

With this control you adjust the **Cut-Off Frequency f_c**, above which the filter attenuates all frequencies. At 10, the filter is fully open. The more you turn down this control, the more the high frequencies are filtered. The sound becomes mellower and less bright (see Fig. 1) until at 0 the filter is completely shut, and there will be no output signal at all.

2 CV 2 • 3 CV 3

For voltage control or modulation of the cut-off frequency, use these CV inputs " and/or § (see Fig. 1). Use attenuators 2 and/or 3 to adjust the **control voltage level**.

4 Lev.

Use this attenuator to control the amount of signal entering the filter input $.

H If the filter's output distorts, turn this control down, unless you deliberately want the sound as a special effect.

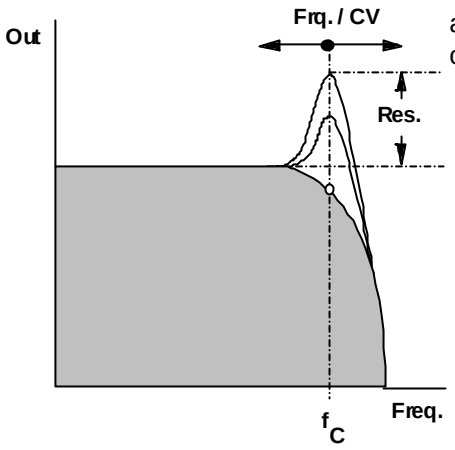


Fig. 1: Frequency response of the A-103

5 Res.

With this control you adjust the filter's **resonance** (*emphasis, Q*) - the parameter which emphasises the frequencies around the cut-off point f_C. Close to its maximum setting, the filter becomes so resonant that it goes into self-oscillation, and starts behaving like a **sine wave**. You can take advantage of this effect, and use the VCF as an additional oscillator.

4. In / Outputs

! CV 1

Socket CV 1 is the filter's standard **voltage control input**, and works on the 1V / octave rule, like the VCOs.

If you patch a modulation source (eg LFO, ADSR) to this input, the cut-off frequency of the filter will be modulated by its voltage: ie., the sound color changes according to the voltage put out by the modulator.

If you use the VCF as a sine wave oscillator, connect the pitch CV into this socket. Do the same if you want the filter's cut-off frequency to track exactly with the pitch of a note (**filter tracking**).

" CV 2 • § CV 3

Sockets CV 2 and CV 3 are also **voltage control inputs for the filter.** Unlike CV 1, you can control the level of voltage - the intensity of modulation effect on the filter - with attenuators 2 and 3.

$ Audio In

This is the filter's **audio input** socket**.** Patch in the output from any sound source (eg. VCO A-110/A-111, Sampler/Wavetable Oscillator A-112, Subharmonic Generator A-113, Ring Modulator A-114, Audio Divider A-115, Waveform Processor/Waveshaper A-116/ A-136, Noise Generator A-117/118, external audio signal e.g. via A-119, VC Divider A-163, mixed signal of different audio sources using A-138 and so on).

% Audio Out

Filter output % sends out the filtered signal.

5. User examples

As the A-103 is very similar to the A-102 please refer to the user examples of the A-120.

The filter's cut-off frequency can be modulated in various ways. The basic modulations types are:

- **VCF - LFO (A-145, A-146, A-147)**
  Cyclical changes of the **sound spectrum**

- **VCF - ADSR** (**A-140, A-141, A-142)**
  Modulation by an envelope results in triggered gradual change of the **sound spectrum**

- **VCF - Keyboard CV**
  This modulation produces pitch-related filter opening: the higher the pitch, the more the filter opens, and the brighter the sound becomes.

But even other voltage sources may be used to control the frequency of the A-103: e.g. Theremin A-178, Light-controlled CV A-179, Joy Stick A-174, MIDI-to-CV interfaces A-190 or A-191, Random Voltage A-118, S&H A-148, Sequencer A-155, Quantizer A-156, Foot Controller A-177 and many more. Please refer to the user's guides of these modules for details and additional examples.

6. Patch-Sheet

The following diagrams of the module can help you recall your own **Patches**. They're designed so that a complete 19" rack of modules will fit onto an A4 sheet of paper.

Photocopy this page, and cut out the pictures of this and your other modules. You can then stick them onto another piece of paper, and create a diagram of your own system.

Make multiple copies of your composite diagram, and use them for remembering good patches and set-ups.

P
- Draw in patchleads with colored pens.
- Draw or write control settings in the little white circles.