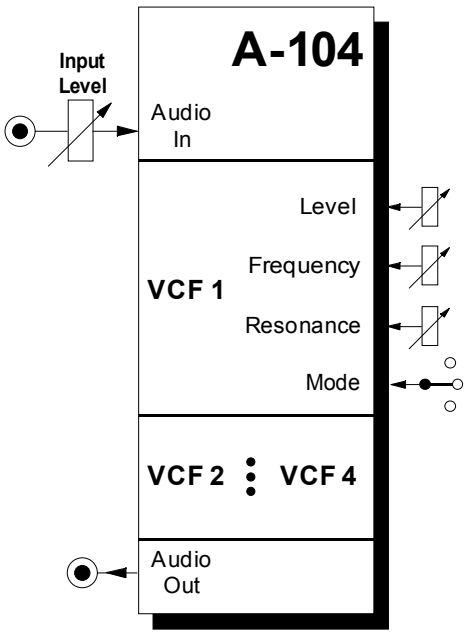


1. Introduction

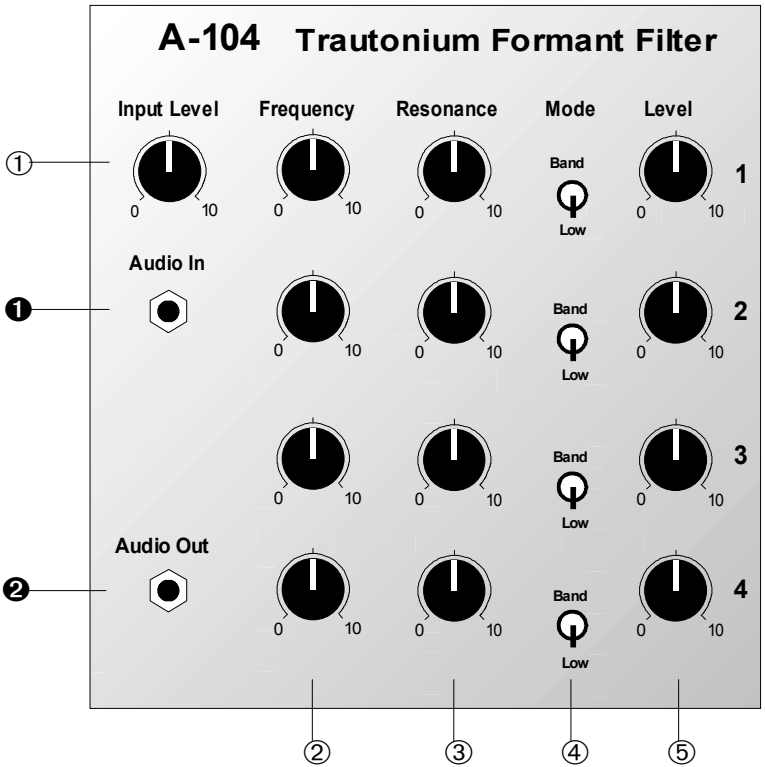
Module **A-104** is a replica of the **Formant Filter** of the **"Mixtur Trautonium"** by Oskar Sala. It is made of **four parallel resonance filters** with common input and output (see fig. 1 on page 3). Each filter can be switched to **low pass** or **band pass** or off. **Frequency**, **resonance, mode** (band/low/off) and **level** are controlled for each filter separately by hand (no voltage control !). The frequency range for each filter is about 50Hz...5kHz.

The **input level** for all filters is controlled by an attenuator. The filter audio inputs are very sensitive so that distortion may intentionally be used to create new sounds - if desired.

The A-104 is a versatile module for **sound modification**. In the first place it is used for reproduction of **resonances** (e.g. the **vocal-like effects** known from the Trautonium). In combination with the **subharmonic generator A-113** one obtains the complete replica of the Trautonium sound generation.

More detailed information about the Trautonium can be found on our internet site www.doepfer.com.

2. TFF - Overview



Controls:

① **Input Level** : Attenuator for audio input signal (effective for all filters)

For each VCF:

② **Frq.** : Frequency control

③ **Resonance** : Resonance control (Q, emphasis)

④ **Mode** : Mode switch (band/off/low)

⑤ **Level** : Level control (share of the filter signal in the mix output)

In- / Outputs:

❶ **Audio In** : Common filter audio input

❷ **Audio Out** : Common filter audio output

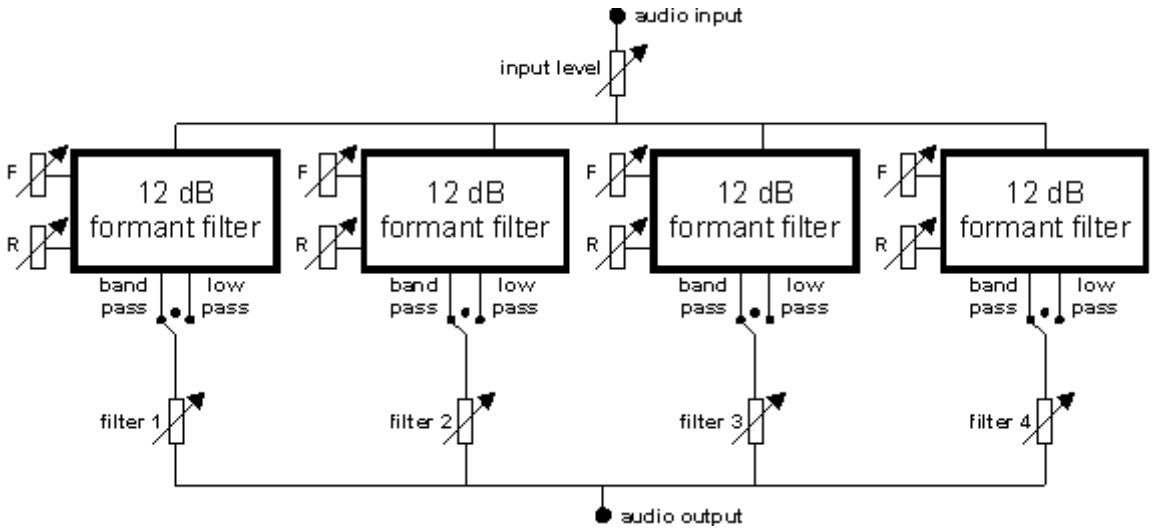


Fig. 1: Sketch of the A-104

3. Controls

① Input Level

Attenuator ① adjusts the **level** of the audio input signal applied to the audio input socket ❶. The attenuated signal is fed to each of the four resonance filters.

☞ The audio inputs of the filters are very sensitive so that **distortion** - even with normal A-100 audio levels (e.g. VCO A-110) - may intentionally be used to create new sounds. Distortion appears about from the middle position of the input level control ①.

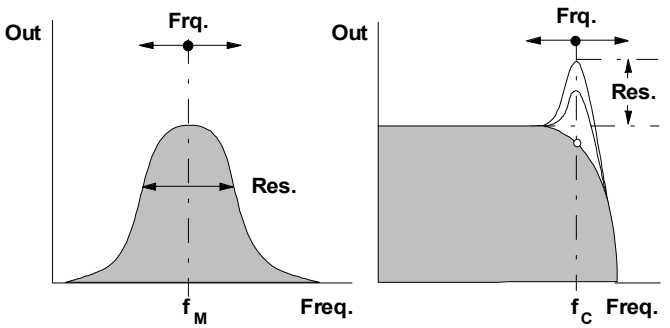


Fig. 2: Frequency response of band pass and low pass

② Freq.

Control ② is used to adjust the **filter frequency** (see fig. 2):

- In **band pass** mode i.e. the middle frequency $\mathbf{f_M}$
- In **low pass** mode i.e. the cutoff frequency $\mathbf{f_C}$

The frequency range for each filter is about 50Hz ... 5kHz (same as for the Trautonium filter).

③ Resonance

Control ③ is used to adjust the **filter resonance** (or emphasis or Q, see fig. 2):

- In **band pass** mode i.e. the **band width**
- In **low pass** mode i.e. **frequency emphasis** around the cutoff frequency

Self-oscillation - as for some other filters of the A-100 (e.g. A-120, A-121, A-122, A-123 and so on) - is not available.

④ Mode

The three-position switch ④ is used to select the **mode** of the corresponding filter:

- **band pass** (upper position)
- **off** (middle position)
- **low pass** (lower position).

⑤ Level

Attenuator ⑤ is used to adjust the **signal level** of the corresponding filter (share in the **mix** output socket ❷).

4. In- / Outputs

❶ Audio In

This is the filter's **audio input** socket**.** Patch in the output from the sound source (e.g. Subharmonic Generator A-113, VCO A-110/A-111, Noise Generator A-117/A-118, Mixer A-138).

❷ Audio Out

Filter output socket ❷ sends out the filtered signal, i.e. the **sum signal** of the four resonance filters.

5. User Examples

Module A-104 is used in the first place for the **simulation** of **resonances**.

Even **vowel-like effects** may be generated with this module (refer to the user's manuals of A-127 and A-128).

In combination with the **Subharmonic Generator A-113** one obtains a nearly complete replica of the **Trautonium sound generation** (refer to the user's manual of A-113 on page 11 for the complete sketch).

More detailed information about the Trautonium and the realization with A-100 modules can be found on our internet site www.doepfer.com.

A module that's related very close to the A-104 is the **A-127 Voltage Controlled Resonance Filter**. In contrast to the A-104 the filter frequencies are voltage controlled and each filter has an own LFO for frequency modulation. This enables automatic filter sweeps or multiple voltage controlled filtering (e.g. with sequencer or MIDI-to-CV interface).
For filter applications with fixed frequencies the **Fixed Filter Bank A-128** may be used.

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.

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