

# Bill of Materials (BOM)

## 18-Channel Analog Stereo Vocoder

### — General Information —

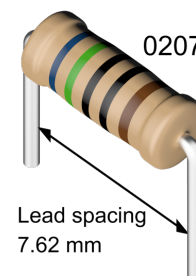
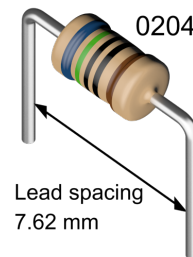
**IMPORTANT NOTICE:** as market conditions change, some material may become hard to find, may become unavailable from certain or all distributors, or may even stop being manufactured. Before you start this project, make sure you are able to procure all components or, in case one or more components are not available, you find viable alternatives for your project.

#### General remarks:

- Except for the SMD capacitors, all other components for PCB assembly are through-hole components.
- In the BOM, the abbreviation RM (German for “Rastermaß”) is used to indicate the lead spacing. RM2.5 is equivalent to a lead spacing of 2.5 mm (0.1 in), RM5.0 is equivalent to 5 mm (0.2 in).
- It is advisable to use IC sockets. Lower-priced sockets may be preferred over the precision sockets suggested in the BOM.

#### Resistors:

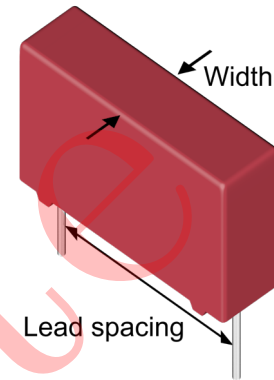
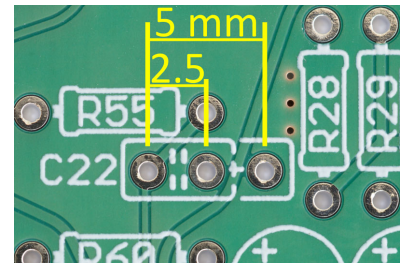
- The lead spacing for the resistors on all boards is 7.62 mm (0.3 in).
- The lead diameter must not exceed 0.7 mm (0.028 in).
- Unless noted otherwise, all resistors are from the E24 series with a resistance tolerance of 1%, a power rating of 125 mW or higher, and body size 0207 or smaller.
- For ease of assembly, use size 0204 resistors. They have a body length of about 3.5 mm (0.14 in). Size 0207 resistors with a body length of about 6.2 mm (0.25 in) will also work. Their leads will have to be bent close to the resistor body.
- The resistors used for the 8-pole channel filters are from the E48 series and are easier to find on the market in body size 0207.



### Film capacitors:

- The capacitors must be rated 35 V or higher.
- The lead diameter must not exceed 0.7 mm (0.028 in).
- All footprints on the PCB are laid out to allow film capacitor lead spacing of 2.54 mm (0.1 in) and 5.08 mm (0.2 in). If a capacitor with 2.54 mm lead spacing is placed on the PCB, make sure to use the correct pads. In the example shown on the right, such a capacitor would be inserted in the left two pad holes of C22.
- The following list shows the maximum body widths:
  - 100 nF and lower: 2.54 mm (0.1 in)
  - 220 nF: 2.54 mm (0.1 in)
  - 330 nF: 3.5 mm (0.14 in)
  - 1  $\mu$ F: 5.5 mm (0.22 in)

Capacitors of larger body sizes than indicated above for their respective capacitance will not fit in most cases.



### Surface-mounted capacitors:

- The SMD pads on all boards are laid out for size 1206. The pads also fit SMD capacitors of size 0805.
- All SMD capacitors should be rated 35 V or higher.
- All SMD capacitors are 100 nF blocking capacitors, with the exception of the SMD capacitors dedicated to the 8-pole channel filters on the channel filter boards.

### Electrolytic capacitors:

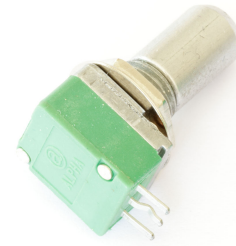
- All electrolytic capacitors should be rated 25V or higher, unless specifically noted otherwise to use higher voltage ratings.
- Make sure the diameter of a given electrolytic capacitor does not exceed the value shown in the BOM as it may otherwise not fit in at its position on the board.
- Tantalum capacitors are not recommended as a replacement for the electrolytic capacitors.

### LEDs:

All LEDs have a diameter of 3 mm and need to have low power consumption (2 mA). Do not use LEDs that have a current typically in the range of 16 . . 20 mA as they will stay dark due to the values chosen for the series resistors. If all 53 high—current LEDs were illuminating, an extra current of about 1 A would be drawn. The power supply is not designed for providing that much extra current.

### Mono potentiometers:

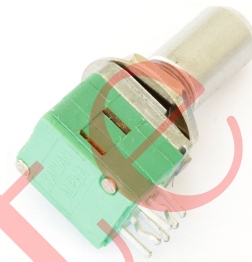
- The potentiometers from Alpha are well known in the DIY community for the use in Eurorack synthesizer modules. Make sure you order the right-angled versions with side adjust, not the vertical types.
- A datasheet for the potentiometers is available [here](#).
- The potentiometers are available from Small Bear (US), Erthenvar (US), Thonk (UK), and Musikding.de (EU).



*Alpha potentiometer, 9 mm, mono.*

### Stereo potentiometers:

The suggested potentiometers are similar to the mono versions and are available from Small Bear (US) and Banzaimusic.com (EU).



*Alpha potentiometer, 9 mm, stereo.*

### Alternative potentiometers:

If you are looking for alternative potentiometers that **have to** fit the optionally supplied 3 mm front panel in combination with Davies knobs, make sure the potentiometer thread is not too long. Otherwise the gap between the knob and the panel surface may become undesirably large. The picture on the right shows an example of a potentiometer that fits well in the PCB but has a thread that is too long.



*This pot fits the board's footprint well but its thread is too long.*



*A close—up view of the vocoder front panel, showing the recessed positioning of the potentiometers. This allows placing the knobs close to the panel surface, leaving only a small gap.*

### Board interconnects:

The channel filter boards are solely interconnected via a 16-pole ribbon cable.

For signal distribution and power supply among all the other boards, a system from Japan Solderless Terminals (JST) was chosen. The connectors are S2B-EH(LF) (SN) and S3B-EH(LF) (SN), the corresponding plugs are EHR-2 and EHR-3, respectively, and the proper contacts are SEH-001T-P0.6.

There is no need to purchase a crimping tool. A little bit of dexterity, some practice and patience should be enough to assemble cables by hand. (*a mini-tutorial to be provided.*)



*An example showing the use of the interconnect system.*