

Two 3-channel mixers in a single module with a switch to combine the mixers into a single 6-channel mixer.

C1 to C6 are coupling capacitors to remove the DC component of the input signals. This is important as many synth modules produce a signal that is not centered about 0V (e.g. the oscillator's outputs are in the range 0V to 10V). The voltage at the RHS of the capacitors will roughly be the voltage at the LHS but shifted to have a 0V mean. These are easier to sum, as they allow us to make full use of the op-amp's voltage range.

RV1 to RV6 control the gain of their respective input.

RV7 and RV8 control the volume of the mixed signals. The output volume of the mixer is the resistance of this potentiometer multiplied by a constant.

R4 and R5 protect the circuit in the case that one of the output jacks is shorted out to ground.

There are two output per mixer:
 – a jack with no ground connection for internal use within the synthesizer (all modules are internally connected to ground by means of their connection to the power supply).
 – an audio jack with a signal and ground wire for connections to external devices.
 The mixer has an audio output jack because it's likely the final element in most signal chains constructed with the synthesizer. Additionally, it's probably safer for external signals to be centred about 0V and the mixer happens to center its input signals about 0V as part of its regular operation, so it's a good opportunity to allow an external device to connect.

This is an inverting adding op-amp circuit. Due to the coupling capacitors, input signals are centered around 0, so inverting them in the process of summing them has little practical effect, and inverting adders are simpler than non-inverting adders.

SW1 and SW2 should be the same physical switch with two gangs. It switches between the two sides of the mixer being two disconnected mixers, and all 6 channels being mixed together and connected to both outputs (the second combined volume control is disconnected in this configuration).

