1. Introduction

Module **A-134** (**PAN**) is designed to provide **voltage-controlled panning** for audio signals.

It can equally well pan **between inputs** (with two inputs going to one output) and **between outputs -** one input going to two outputs.

As well as the manual mode, panning can also be voltage-controlled. Two CV inputs (one with an attenuator control are included for that purpose.

Two **LEDs** give a visual indication of what's happening to the signals.

To set the incoming audio signals at the right level, both Audio Inputs have **attenuators**.

A-134

VC Panning Module

CV 1 — Pan

CV 2 — CV 2

Lev 1 — Audio In 1

Lev 2 — Audio In 2

Left Out

Mix Out

Right Out

2. PAN - Overview

A-134   PAN
VC Panning Module

CV 1

①

Pan

CV 2

②

CV 2

0   10

②

Audio In 1

③

Lev 1

0   10

③

Audio In 2

④

Lev 2

0   10

④

⑤

Left Output   Mix Output   Right Output

⑤

⑥

⑦
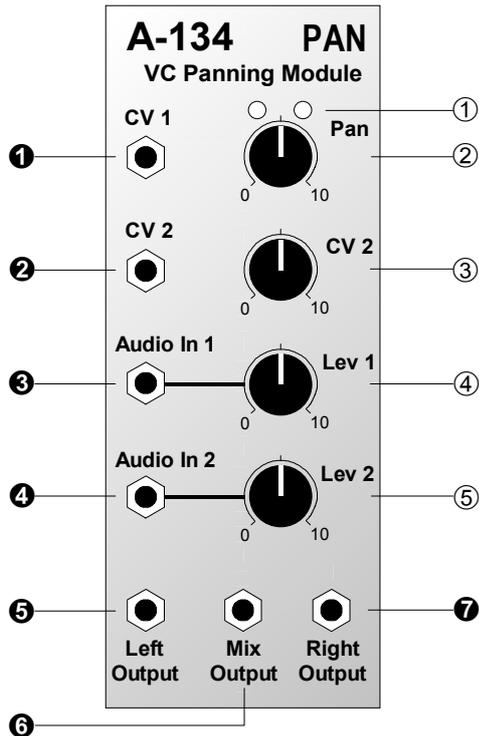
Controls and indicators:

① **LEDs** :   status indicators for audio output
② **Pan** :   manual panning control
③ **CV 2** :   attenuator for the CV at input ❷
④ **Lev 1** :   attenuator for audio signal at input ❸
⑤ **Lev 2** :   attenuator for audio signal at input ❹

In- / Outputs:

❶ **CV 1** :   control voltage input
❷ **CV 2** :   ditto, with attenuator ❸
❸ **Audio In 1** : input for first audio signal
❹ **Audio In 2** : input for second audio signal - a swit-
                        ched socket, so that if nothing is
                        connected to it, it is automatically lin-
                        ked to socket ❸
❺ **Left Output** : left audio output
❻ **Mix Output** : mix output
❼ **Right Output**: right audio output

3. Basic layout

The A-134 provides both manual and voltage-controlled panning. It basically contains two matched linear VCAs like the A-130, and a mixer (see fig. 1).
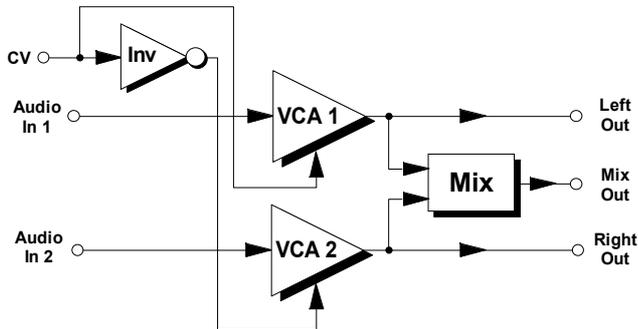
Fig. 1: basic construction

In **input mixing mode,** the signals from the two audio inputs are mixed and sent to Mix Output ❻. By using the two pan controls ② and/or any control voltages connected, you can control the **relative amounts of the two input signals in the mix**. The matched VCAs, with one signal inverted, enable the relative levels of the signals to be controlled automatically.

In **output panning mode,** the signal present at audio input 1 (❸) is sent to the left (❺) and right (❼) audio outputs at levels determined by the pan control ② and/or the control voltage/s input to the module. In this way, you can control the **position of the signal in the stereo soundstage**.

A typical application is to make a signal move regularly about in the stereo soundstage. To do this, a slow LFO is connected to CV input ❶ and/or ❷ on the A-134.

4. Controls and indicators

① LEDs

The two LEDs ① **indicate the level of signals** going to outputs ❺, ❻ and ❼; how they do this depends on the mixing / panning mode:

Input mixing mode:

In this mode, the left LED refers to audio input ❸, and the right to audio input ❹. The LEDs show the relative **signal levels** from each of the inputs being sent to Mix output ❻. Table 1 shows the result of differing control voltages or positioning of the Pan control.

Pan	LEDs	Mix Output
0	☀ ○	Just the signal from Audio In 1
5	☀-☀	Equal amounts of signal from Audio In 1 and Audio In 2
10	○ ☀	Just the signal from Audio In 2

Table 1: Input mixing mode

Output panning mode:

In this mode, the left LED monitors the left audio output ❺, the right LED the right audio output ❼. The LEDs indicate the relative **position in the stereo soundstage** produced by the two audio outputs. Table 2 shows the result of differing control voltages or positioning of the Pan control.

Pan	LEDs	Left Output	Right Output
0	☀ ○	100 %	0 %
5	☀-☀	50 %	50 %
10	○ ☀	0 %	100 %

Table 2: Output panning mode

② **Pan**

Control ② is used to control the **relative signal levels** at outputs ❺, ❻ and ❼. In **input mixing mode,** you control the **relative amounts** of each of the input signal present at the Mix output; in **output panning mode** this determines the **position in the stereo soundstage**.

③ **CV 2**

Attenuator ③ is used to adjust the **level of control voltage** present at CV input ❷ .

④ **Lev 1** • ⑤ **Lev 2**

The **level of the audio signals** at inputs ❸ and ❹ is controlled by attenuators ④ and ⑤ .

5. In- / Outputs

❶ CV 1 • ❷ CV 2

Inputs ❶ and/or ❷ are for **the control voltages** to be used for voltage-controlled panning.

☞   The actual amount of panning is governed by the sum of the voltages produced by the pan control ② and CV control ③.

❸ Audio In 1 • ❹ Audio In 2

Sockets ❸ and ❹ are the module's **audio inputs.** This is where one or two audio signals are input, with their level controlled by attenuators ④ and ⑤.

☞   **Audio input ❹ is a switched (normalled) socket.** If there's nothing connected to it, it's automatically linked with input ❸.

❺ Left Output • ❼ Right Output

Sockets ❺ and ❻ are the **left** and **right audio out-puts**. These are used in output panning mode.

❻ Mix Output

The **Mix Output ❻** is used in input mixing mode.

6. User examples

There are a whole load of possibilities for using Module A-134, principally because any signal you think of can be used as a control voltage:

● **LFO**
cyclical changes in output panning;
depending on the frequency, waveform and amplitude of the LFO, the signal moves from left to right and vice versa.

● **ADSR, VC-ADSR, VCD**
panning depending on the envelope's voltage.

● **Random-CV**
random panning;
fig. 2 shows a patch in which the position of the sound in the stereo soundstage changes with each new note played. The patch in fig. 3 produces an output signal which alter the degree of rasp in the osound with each new key-stroke or sequenced note. (See also the user examples for the A-126)

● **Foot-Controller**
Foot-controlled panning.

● **Theremin**
Panning uy using hand-movements (see fig. 4) relative to the theremin's antenna.

- **Sequencer**
  Panning controlled by voltages put out by a sequencer such as the A-155.
  In the patch in fig. 5, the control voltages are produced by the lower row of the A-155, so that as the sequence runs, each note is positioned at a different place in the stereo soundstage. (Lessening the abrupt changes between voltages can be achieved by using Post Out 2 on the A-155.)
- **MIDI Interface**
  By patching in a MIDI interface (such as the A-190 or A-191) you can use virtually any MIDI Controller message to control panning (for instance the mixing two signals using Aftertouch).

  You can also use the pitch information generated by the MIDI interface to control any aspect you want - for instance voltage-controlled panning using pitch data, perhaps making lower notes appear more on the left of the soundstage, and higher notes on the right.
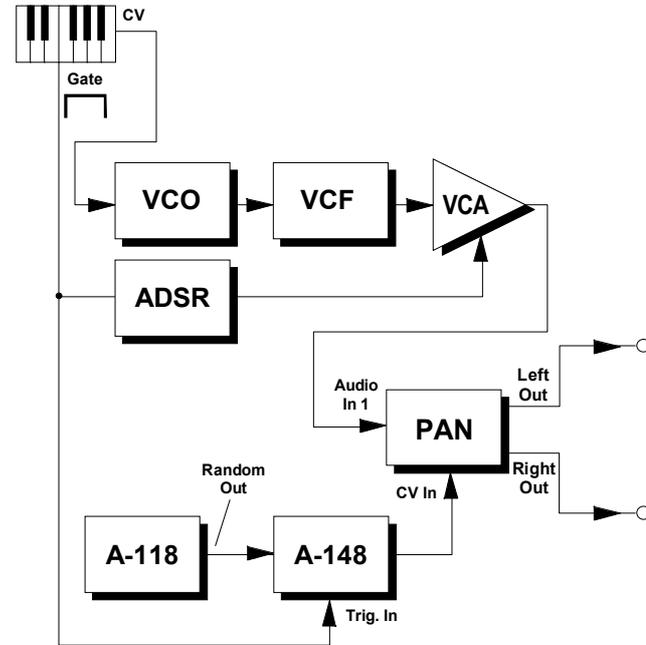
Fig. 2: Random position in the stereo soundstage each time a key is pressed.
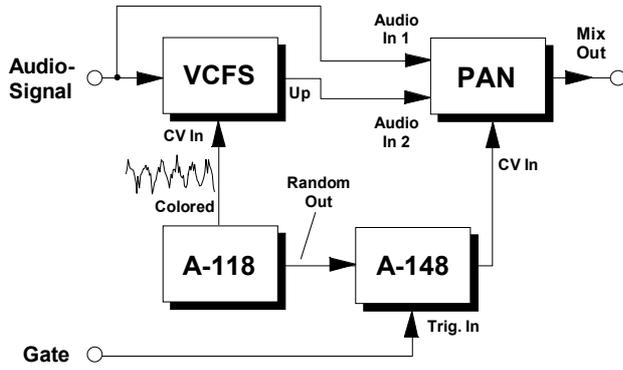
Fig. 3: Randomly making a sound more harsh or rasping each time a note is pressed.
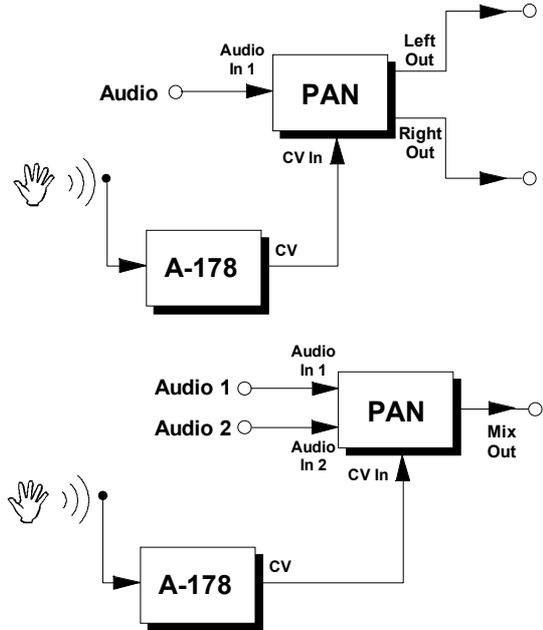
Fig. 4:   Panning using the theremin module.
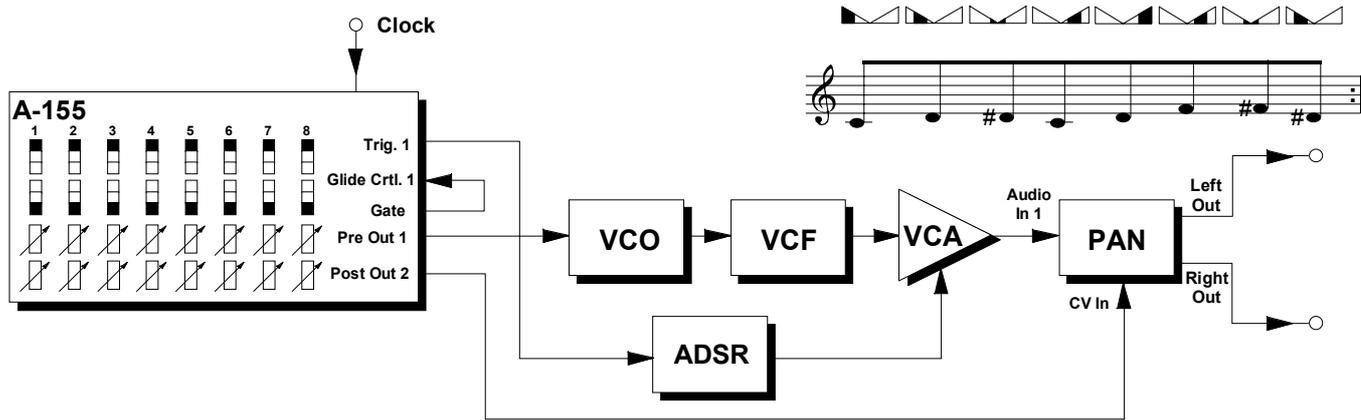
Fig. 5: Output panning using a sequencer.

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.