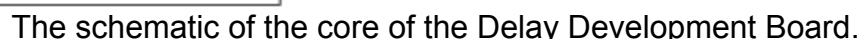


PREVIEW - TESTED. DOCUMENTATION IN PROGRESS

A little on how it works:



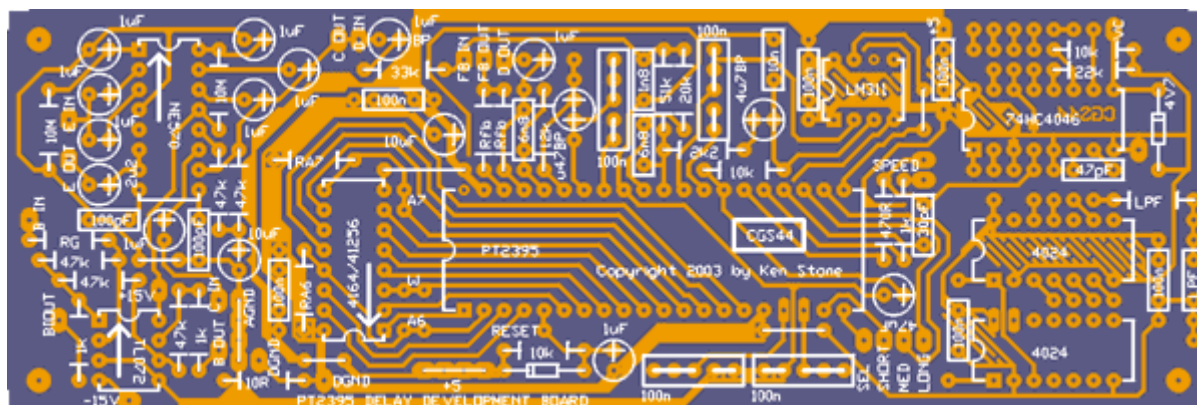
[\(Click here for high-res version\)](#)

- A buffer for boosting the output signal up to levels suitable for synthesizer use.
- A basic compressor and
- A basic expander to reduce noise generated by the delay chip.
- The delay block itself.
- An experimenters area.

https://web.archive.org/web/20180215203324fw_/http://www.cgs.synth.net:80/modules/cgs44_ddb.html

contradictory in places. There are several other versions of the app. note/data sheet, but all are cut-down versions, and are more or less useless.

Construction



The component overlay. Connections can be determined from the circuit diagram and the text below.

This is one of those PCBs than can be assembled in a number of different ways to suit the builder's needs.

On the first run of boards, a track is missing. It runs between pin 4 of the NE570 and AGND (0 volts).

Note that some chips are mounted in the opposite direction to others on this board. Large arrows on the overlay make this clear.

There is a development area to the right end of the board, allowing a 74HC4046 and associated components to be fitted, including two 4024 divider chips. The theory is that voltage control of the delay can be achieved using the 74HC4046, and frequency dependent delays achieved using the phase-locked-loop. At this point this area has not been developed, and is up to the individual experimenter to use or ignore as s/he sees fit.

Connections to and from the PCB:

- **B IN** Buffer in. The input to the op-amp buffer.
- **B IOUT** Buffer inverted output.
- **B OUT** Buffer output.
- **C IN** Compressor input. Feed input signal in here.
- **C OUT** Compressor output. Feed this to the input of the delay
- **D IN** Delay input.
- **D OUT** Delay output.
- **E IN** Expander input. Feed from the output of the delay
- **E OUT** Expander output. Feed this to the buffer, if needed, or to your output jack via an external 1k resistor.
- **FB IN** Feedback input.
- **FB OUT** Feedback output. Basically a SPST switch is wired between these two connections to enable the repeat function. A variable resistor may give some degree of control to reduction of successive echos. As it stands, a standard level control "potentiometer" will not work. (i.e. use two wires to the pot, not three. Earthing one end of the pot's travel will foul things up.)
- **+5** Connect to 5 volt power supply.
- **+15** Connect to 15 volt power supply.
- **-15** Connect to negative 15 volt power supply.
- **AGND** Analog ground. Connect to 0V at PSU if possible, or to 0 volt bus if not.

- **DGND** Digital ground. Connect to 0V at PSU if possible, or leave disconnected if not. There is a 10R resistor linking the two grounds on the PCB.
- **A6** Pair of pads. Provision to cut the trace and route the A7 address line through a switch for reducing the minimum delay. (untested)
- **A7** Pair of pads. Provision to cut the trace and route the A6 address line through a switch for reducing the minimum delay. (untested)
- **W** Pair of pads. Provision to cut the trace and route the Write line through a switch to allow for "holding" of a captured sample. (untested)
- **Reset** Not used. May be needed if experimenting.
- **SEL** Select between 64k or 256k modes if using 41256 RAM chip, or permanently wire to DGND if using 4164
- **SHORT** Sets short delay mode. Tie the other two length selectors to DGND. Connect this pin to +5 volts.
- **MED** Sets medium delay mode. Tie the other two length selectors to DGND. Connect this pin to +5 volts.
- **LONG** Sets long delay mode. Tie the other two length selectors to DGND. Connect this pin to +5 volts.

Numbered/coded components:

- **RA6** Pull-down resistor to be added if A6 line is cut.
- **RA7** Pull-down resistor to be added if A7 line is cut.
- There is no provision for resistor on the write line, so one would need to be added on the rear of the PCB.
- **Rfb** Value not specified in the app. note. Feedback resistor. Try something between 10k and 100k. There are two Rfb resistors.
- **RG** Gain setting resistor for the buffer. 47k would give a gain of 1, 4k7 would give a gain of 10, etc.

There are some capacitors marked as high precision in the app. note, and on the circuit diagram above. I suggest using 5% mylar capacitors or better (styrene, poly prop, poly carb, 1%, 2%, etc.) in these positions. Match them if you have a capacitance meter.

Before you start assembly, check the board for etching faults. Look for any shorts between tracks, or open circuits due to over etching. Take this opportunity to sand the edges of the board if needed, removing any splinters or rough edges.

When you are happy with the printed circuit board, construction can proceed as normal, starting with the resistors first, followed by the IC socket if used, then moving onto the taller components.

Take particular care with the orientation of the polarized components such as electrolytics, diodes, transistors and ICs.

When inserting ICs into sockets, take care not to accidentally bend any of the pins under the chip. Also, make sure the notch on the chip is aligned with the notch marked on the PCB overlay.

Notes:

- One builder says he got better results by adding a 10k resistor between pin 12 of the NE570 and ground (thus in parallel with the internal 30k resistor).
- **PCB info:** 6" x 2" with 3mm mounting holes 0.15" in from the edges.
- Please [email me](#) if you find any errors.

Parts list

Ooops.... lost it!

This is a guide only. Parts needed will vary with individual constructor's needs.

The delay chip can be purchased from [Small Bear Electronics](#).

If anyone is interested in buying these boards, please check the [PCBs for Sale](#) page to see if I have any in stock.

Can't find the parts? See the [parts FAQ](#) to see if I've already answered the question. Also see the [CGS Synth discussion group](#).

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