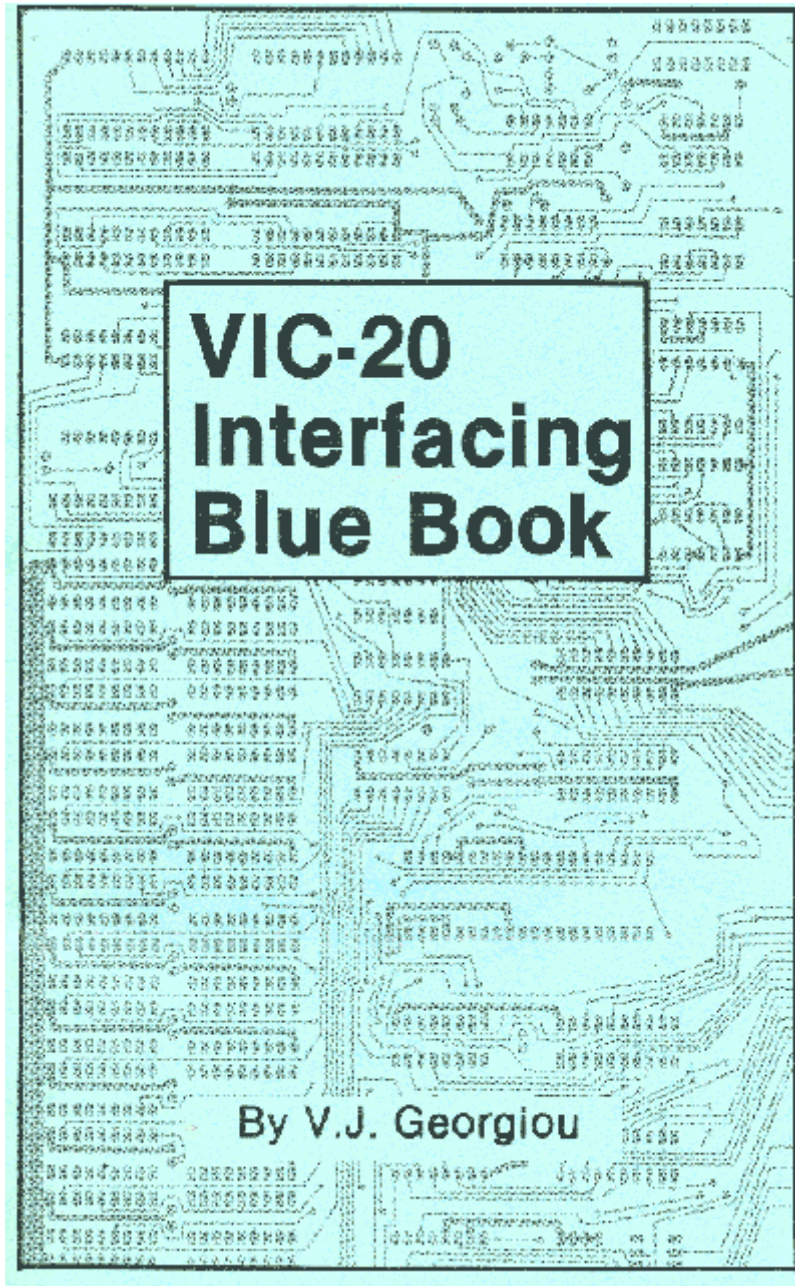


Vic20 D/A



source: Vic-20 Interfacing Blue Book, c1982

by V.J. Georgiou

8-bit precision D/A

DESCRIPTION

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 This project describes a full 8-bit precision D/A converter with built in reference and voltage output. An 11-bit D/A converter chip is used giving excellent linearity, so this D/A approaches textbook performance.

THEORY OF OPERATION

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 An ideal D/A converter is impossible to make. However, if we want a very good 8-bit D/A converter, we can take a converter specified for higher resolution and configure it for the lower resolution we need. Its cost is somewhat higher but we get outstanding performance. In this project we use an 11-bit D/A converter IC configured for 8-bits plus sign.

The data lines of the user port drive the data lines of the converter and CB2 drives the sign, controlling the polarity of the output.

The converter has a built-in voltage reference and voltage output so no extra components are necessary. However it needs a $\pm 15V$ power supply which must be supplied externally. Modular power supplies are available for these voltages or one can be built as shown in the schematic.

Full scale output can be adjusted to 10.24 volts exactly (for 40 mV steps) by using an external potentiometer as shown.

Maximum output drive of the converter is 10 mA, which should be sufficient for most applications. If more output is desired a buffer should be used.

PROGRAMMING NOTES

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 Set the user port to output by a POKE 37138,255. For positive output set CB2 to high using the manual mode as follows:

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POKE 37148, (PEEK(37148)AND 31) OR 192
```

For negative output set CB2 to low as follows:

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POKE 37148, (PEEK(37148)AND 31) OR 224
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Poke the value you want converted to analog in the user port data register

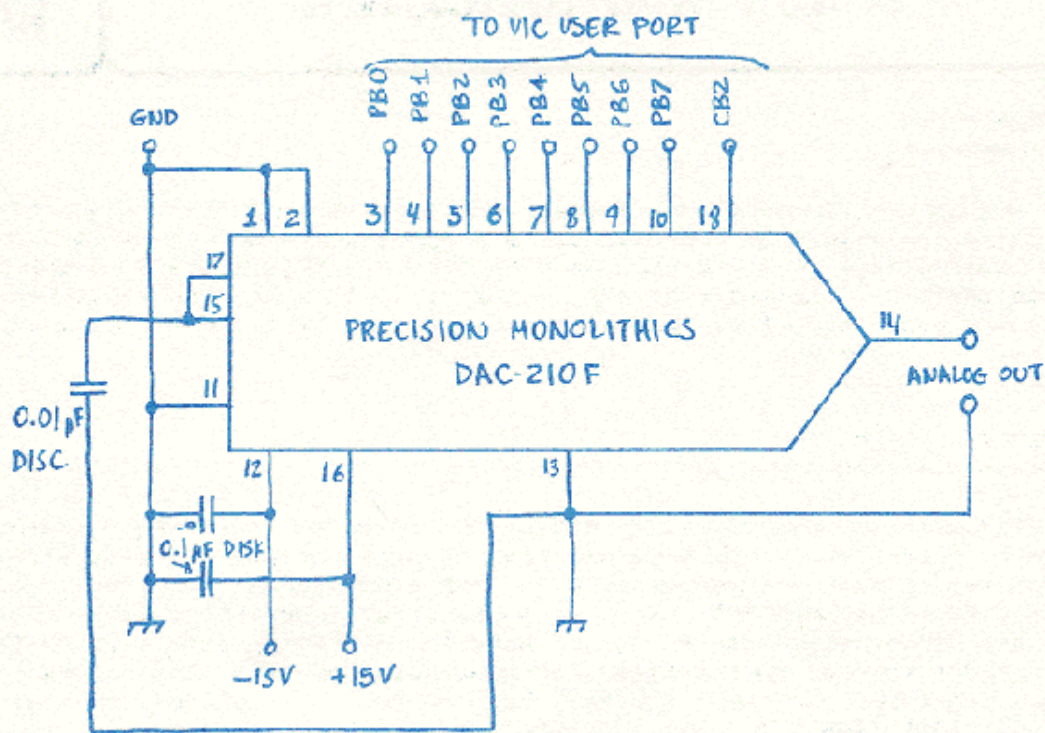
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POKE 37136, VALUE
```

The DAC-210 settles within 1.5 μ s so it can take data as fast as you can output it, even if your program is in machine language.

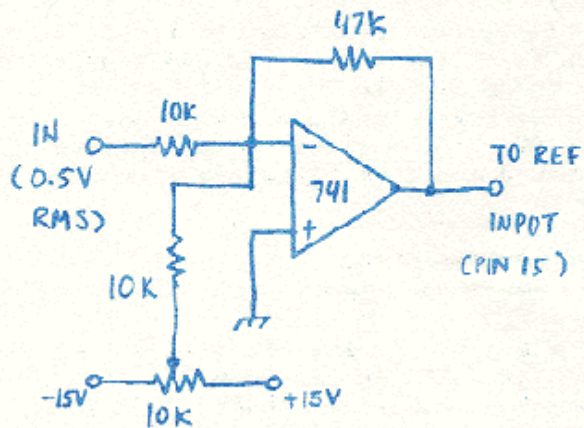
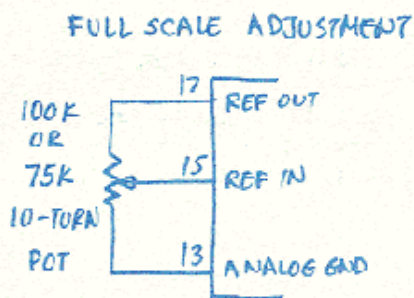
AN UNUSUAL APPLICATION

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 The D/A converter can be used as a multiplier if the reference input is driven by an external signal. The requirements are that the external signal varies between 3 and 10 volts. If the signal fed into the reference input is audio, the D/A converter can act as a digital attenuator to control volume or to create sound effects by modulating under digital control the input signal.

The schematic shows a level shifter required to feed audio in the reference input.

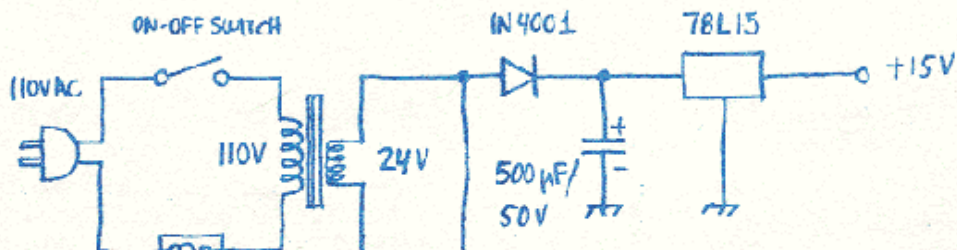


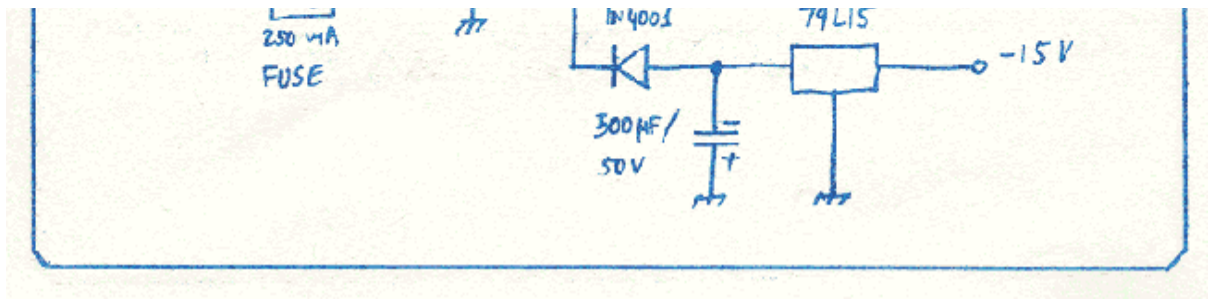
MULTIPLIER OPERATION
LEVEL SHIFTING AMPLIFIER



10-TURN POT. ADJUST FOR 6.5V OUT
WITHOUT INPUT SIGNAL

±15V POWER SUPPLY





posted : 20 oktober 2002