

FINAL YEAR PROJECT REPORT  
DIPLOMA IN ELECTRONIC ENGINEERING  
SCHOOL OF ENGINEERING  
MARA INSTITUTE OF TECHNOLOGY, SHAH ALAM.

SPECTRUM DAC/ADC BOARD

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## PREFACE.

This report is on the project of SPECTRUM DAC/ ADC BOARD was prepared and submitted in partial fulfillment of the final year course for the award of Dip. in Electronic Engineering, MARA Institute of Technology.

With something like a million ZX Spectrum computers now in circulation there are, no doubt, a great many in the possession of electronics enthusiasts who would like to use them in computer based measurement and control applications. One of the ZX Spectrum's main shortcomings is a lack of built in interfaces. It is quite easy to fit interface on to the expansion port and an analogue interface is one of the most useful from the electronics enthusiasts point of view.

The port featured in this project gives both analogue to digital and digital to analogue conversion. Both have 8 bit resolution which is more than adequate for most practical application.

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## INTRODUCTION:

DAC or Digital to Analogue Converter is a device to convert digital or binary data into discrete analogue voltage. The resolution of DAC is dependent on the number of bits used. Step size is the maximum output voltage of Dac over the number of steps.

i.e. say for a maximum voltage of 2.55 volts.

and for an 8 bit resolution DAC

$$\begin{aligned} \text{the step size} &= \frac{2.55}{255} \\ &= 0.01 \text{ volt.} \\ &= 10 \text{ mVolt} \end{aligned}$$

ADC on the other hand stands for Analogue to Digital Converter. It is a device where an analogue signal is sampled and converted into digital data. Both the DAC and ADC used in our project were 8 bit.

### 1.1 SYSTEM OPERATION.

The selection of DAC or ADC was done by using address Decoder(74LS138) which is a 3 to 8 line active low decoder. All the outputs are high except for the selected output which are low.