

## ARBITRARY SEQUENCE PULSE PROGRAMMER FOR NMR EXPERIMENTS

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A pulse generator is an electronic circuit used to create a periodic sequence of electrical pulses signals in order to control and/or trigger a physical experiment. A number of applications makes use of programmable pulse generators (e.g., tests in detection systems, synchronous trigger generators, etc.). In this work we present an automated pulse programmer developed for applications in broadband pulsed Nuclear Magnetic Resonance spectrometry, used in the study of magnetic metals. The main characteristic of this system is to generate a complex and arbitrary sequence of several pulses, at the same output channel, in synchronism with several different outputs. It consists of an IBM-PC compatible interface board, with the following characteristics: (i) seven independent TTL output channels, (ii) number and width programmable pulse sequences; (iii) minimum pulse width of 20 ns; (iv) repetition time at the minimum resolution of 10 ms, extendable up to a few seconds; (v) three different operation modes (Loop mode, One Shot mode, External-Trigger mode). Automatic control can be achieved via different software programming (C, Pascal, LabView, etc). The system is based in writing and automatic reading of a fast Static-RAM (512k x 8). The technology makes use of Programmable Logic Devices (PLD) which allow size reduction and facilitates further hardware expansions. The modularity of the system makes easy to double and triple the number of channels. The main limits of the time resolution and the repetition time are the characteristics of the Static-RAM, and they can be increased by substituting the Static-RAM by a faster component.

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