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COMPUTER CONTROL SYSTEM FOR ORIC*

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ABSTRACT

A computer control system is being implemented for the Oak Ridge Isochronous Cyclotron (ORIC). At the start of a run, operating parameters are set automatically using data stored in a disc library. Adjustments of these parameters are made through an operator-computer interface consisting of a CRT unit with a keyboard. An array of assignable push-button switches is available for fine tuning various machine parameters. ORIC has 43 ungrounded power supplies requiring adjustment resolution to within 1 part in 10^3 to 1 part in 10^5 depending upon their function. These supplies are controlled by reference voltages derived from 12- to 16-bit digital-to-analog converters (DAC's). A programmable comparator associated with each power supply relays information on power supply performance to the computer. The power supplies, DAC's, and comparators are isolated from the computer by optical couplings and blocking capacitors. The control system sets and fine tunes the rf system, monitors and controls binary functions, switches power supplies to required circuits, alerts the operator if any cyclotron parameter exceeds the specified limits, and processes and stores new run parameters.

INTRODUCTION

Computerized control systems are considered as standard equipment for many new accelerators. For existing facilities, the expense of converting to computerized controls is justified only if it will result in improved machine utilization and performance. ORIC has always been a rather complex facility and it is becoming more complex with the addition of new external and internal ion sources,[1,2] new experimental areas, and an isotope separator (UNISOR). Also in the National Heavy-Ion Laboratory (NHL)[3] Proposal ORIC is included as

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