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LS-171

Magnet Measurement Interfacing to the G-64 Euro Standard Bus and Testing G-64 Modules

Introduction

The Magnet Measurement system utilizes various modules with a G-64 Euro (Gespac) Standard Interface. All modules are designed to be software controlled, normally under the constraints of the OS-9 operating system with all data transfers to a host computer accomplished by a serial link.

G-64 Interfacing

To simplify system integration and increase acquisition times all software control is performed by the Magnet Measurement computer, an IBM 386 PC/AT. In order to control the Euro (Gespac) Standard modules an IBM I/O (DIO-32) card along with a DIO-32 to G-64 interface are used.

All module functions are accomplished by I/O transfers. Figure 1 details the bit assignments for the 4 I/O ports of the DIO-32. The DIO-32 to G-64 interface routes the port bits to the G-64 backplane. Signal routing for the DIO-32 to G-64 interface is listed in Table 1.

G-64 Computer Simulator

A simulator was designed to test/troubleshoot purchased, as well as in-house designed, G-64 modules. The computer simulator mimics the functionality of the IBM DIO-32 board.

Operation

The simulator allows the operator to control the module address, control lines and data transfers and receives interrupt requests as if it were the controlling processor to the G-64 bus. While the simulator is enabled the normally active processor must be disconnected. This allows complete testing without computer intervention. The design of the simulator also allows it to be used as a G-64 bus monitor when the simulator is in its disabled (no control) state.

The front panel (see Figure 2) is divided into 4 sections which corresponds to the DIO-32 I/O ports. Switch position and associated logic levels are shown for each port section. The included LEDs will light when a logic bit is active. A bar or line over the bit descriptor implies an active logic level of 0, otherwise the active logic level is a 1. Figure 3 is the schematic of the simulator and is included for additional reference.

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Figure 1.

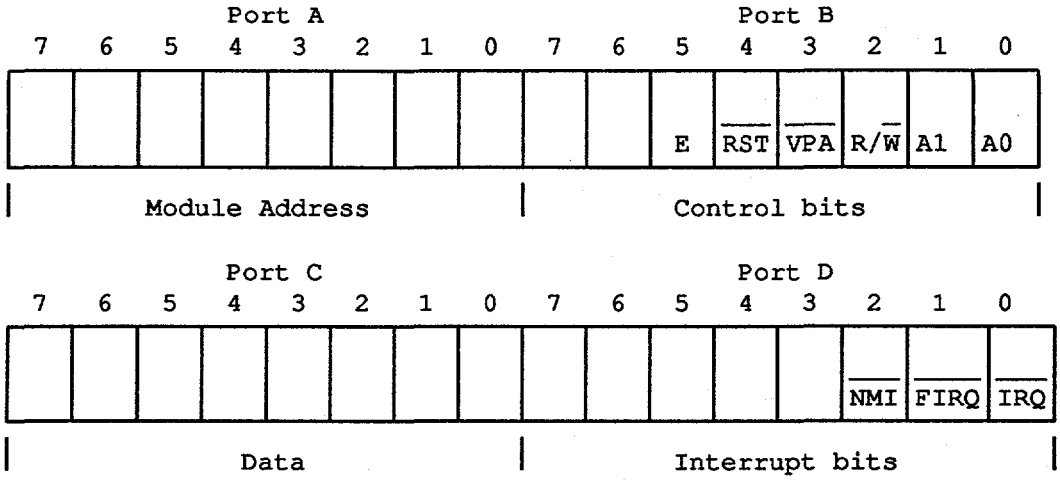
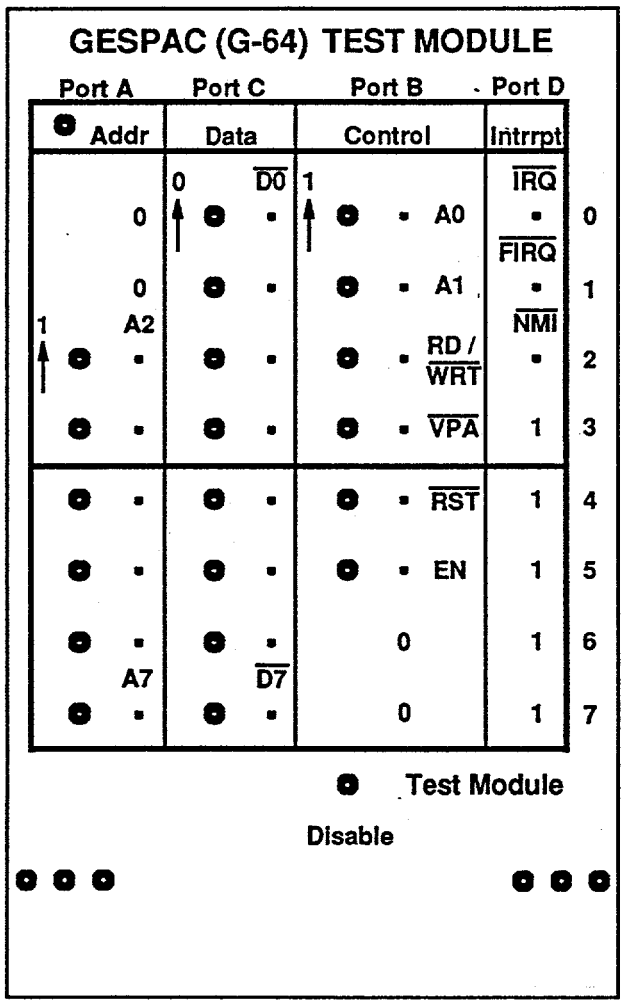


Table 1.
DIO-32 to G-64 Interface Pin out

Function		G-64	AT-DIO		Function		G-64	AT-DIO	
			37	------	----	D0	a23	14	------
			39	|	|	D1	a24	12	|
-------	A2	a4	38	|	|	D2	a25	13	|
|	A3	a5	40	Port A	Data	D3	a26	11	Port C
Module	A4	a6	35	|	|	D4	b23	16	|
Address	A5	a7	42	|	|	D5	b24	9	|
|	A6	a8	36	|	|	D6	b25	15	|
-------	A7	a9	41	------	----	D7	b26	10	------
	A0	a2	47	------		IRQ	b16	4	------
	A1	a3	50	|		FIRQ	b17	1	|
	R/W	a17	44	|		NMI	b15	7	|
	VPA	a14	48	Port B		D11	a22	3	Port D
	RES	b14	49	|		D12	b19	2	|
	E	b13	43	|		D13	b20	8	|
	A14	b8	46	|		D14	b21	5	|
	A15	b9	45	------		D15	b22	6	------

Figure 2.
G-64 Computer Simulator Front Panel



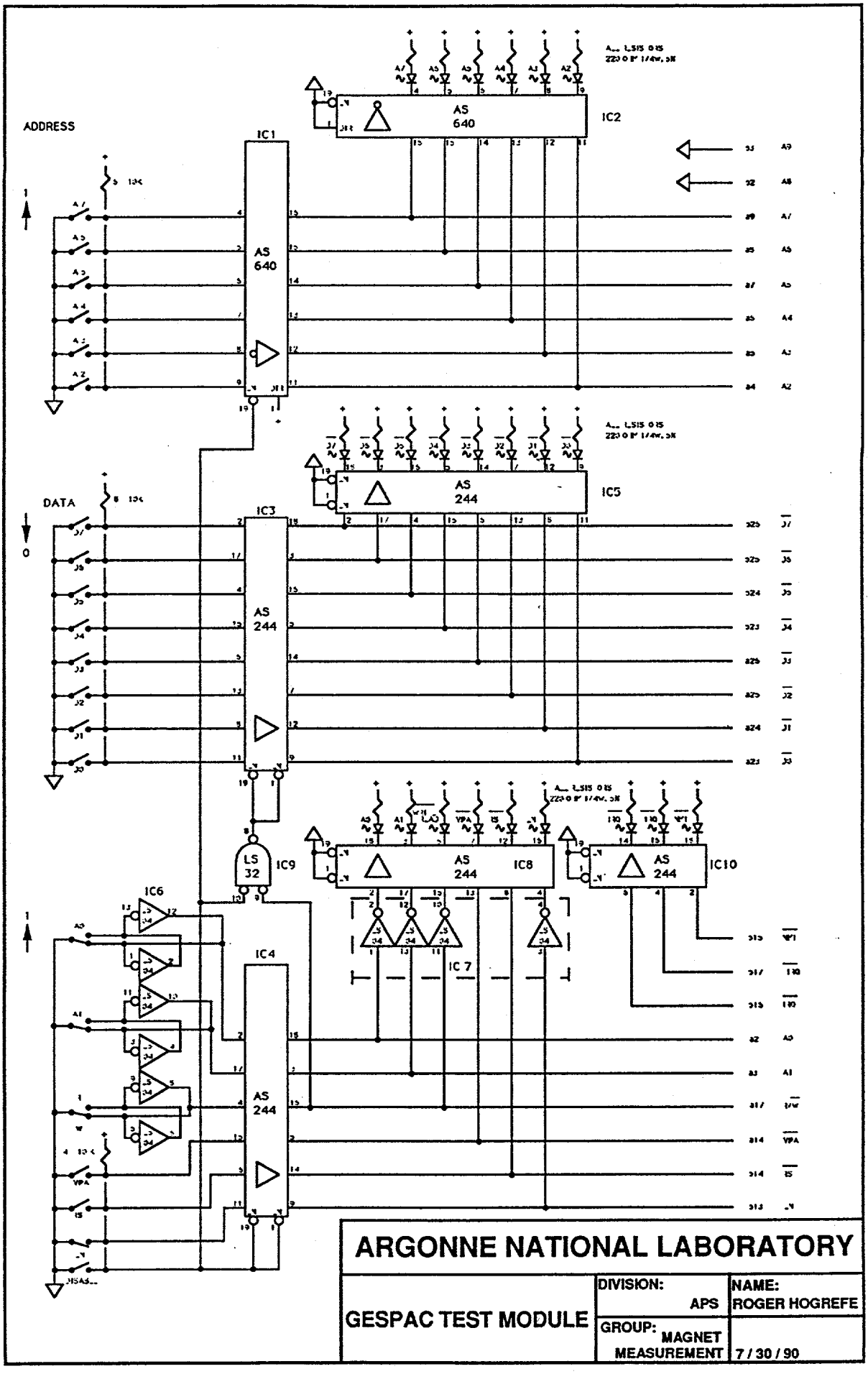


Figure 3. Schematic of the G-64 Computer Simulator