ALPHA MICROSYSTEM AM-300

SIX PORT SERIAL INPUT/OUTPUT BOARD DESCRIPTION

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I. Introduction

The Alpha Microsystem AM-300 Six Port Serial Input/Output Board has been designed to provide six full programmable RS232 I/O ports on a single printed circuit card.

The following is a summary of the AM-300 capability:

- S-100 bus compatible

- Six fully programmable RS232 I/O ports

- 16 selectable baud rates for each I/O port under software control. (max rate = 19,200 baud)

- Synchronous and Asynchronous operating modes for each port utilizing versatile Western Digital Corporation Asynchronous Synchronous Receiver/Transmitter (UC1671B)

- Five I/O ports utilized for data and control

- Multiple level interrupt compatibility

II. I/O Port Definitions

Five I/O ports are required by the AM-300. These are summarized in tables I and II. The I/O port address block is jumper selectable via a plug in header (Z33) and normally is configured for I/O address F8 thru FC (HEX).

Note that the first four I/O addresses are contained in the Western Digital Corporation UC1671B ASTRO. See the data sheet on the chip for a detailed explanation of the register contents.

In addition to the registers contained in the UC1671B, there are three other functions that must be considered:

A. MUX Control Register

See table II for description of control bits.

B. Baud Rate Programming

The baud rate for a given serial I/O channel can be programmed as follows:

1. Set up the MUX Control Register with bit 3 set to a "1" and bits 0-2 set to address the appropriate channel.

2. Write to port XO with bits 0-3 used to select the appropriate baud rate. The Western Digital Dual Baud Rate Clock Generator (BR1941L) is utilized to provide the programmable baud rates. See the BR1941L spec sheet for detailed baud rate codes.

C. Interrupt Programming

Interrupts can be enabled by setting bit 4 of the MUX Control Register to a "1". Once set, any of the six channels can generate an interrupt to the CPU. A single line interrupt is used for all channels. To determine which channel has generated an interrupt, the following sequence must be programmed.

1. After receiving the interrupt, set up the MUX Control Register with bit 5 set ot a "1" and bits 0-3 set to a "0".

2. Read port XO. The AM-300 will return the address of the channel that has generated the interrupt according to the following format:

Bit 7	MSB
Bit 6	
Bit 5	Interrupting
Bit 4	Channel Number
Bit 3	LSB
Bit 2	1 = Read Interrupt
	0 = Write Interrupt

The channels have been prioritized such that I/O channel 1 has the highest priority and I/O channel 6 has the lowest.

III. RS232 Interface

Three edge connectors are provided at the top of the Am-300 to allow connection to RS232 compatible perpherals. Each connector conatains interface signals for two I/O channels. The following RS232 signals are provided:

Inputs: 1. BB   Received Data

            2. CB   Clear to Send

            3. CC   Data Set Ready

            4. CF   Carrier Detector

Outputs: 1. CD   Data Terminal Ready

            2. BA   Transmitted Data

            3. CA   Request to Send

            4. Misc Miscellaneous

TABLE I
I/O PORT DEFINITIONS

I/O Port Address △	Input	Output	Comments
X0	Control Register 1	Control Register 1	See UC1671B spec
X1	Control Register 2	Control Register 2	See UC1671B spec
X2	SYN and DLE Register	Status Register	See UC1671B spec
X3	Receiver Holding Register	Transmitter Holding Register	See UC1671B spec
X4	----	MUX Control Register	See Table II

△ the base I/O Port address (shown as 0) is jumper selectable to any block of eight I/O addresses.

TABLE II
MUX CONTROL REGISTER (X4)

Bit	Function	Comments
0	Multiplex Control Bit 0	
1	Multiplex Control Bit 1	3 bit code addressed the appropriate RS232 channel. Legal addresses are 1-6.
2	Multiplex Control Bit 2	
3	Program Baud Rate	Set to "1" to program addressed channel's baud rate. Set to "0" to program addressed channel's ASTRO.
4	Interrupt Enable	
5	Read Interrupt	Set to "1" to enable reading of interrupt vector