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TWO WORD CAMAC I/O MODULE*

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INTRODUCTION

This note describes the 2 Word I/O subsystem and details its operating characteristics. SLAC drawings in the 926-306 series support this device and should be referenced for construction and connection details.

GENERAL DESCRIPTION:

The 2 Word I/O subsystem consists of a single width CAMAC module, a switch box, a display box and two interconnecting cables. The subsystem was developed for use on the SLAC 40" HBC Hybrid Facility (SHF) to provide insight into the data acquisition computer's operation during its data gathering operations. As the name implies the subsystem can handle two (2) 16 bit words in and two (2) 16 bit words out. The 2 input words are controlled by 32 individual toggle switches which are gated onto the CAMAC dataway when appropriate CAMAC commands occur. Conversely, when the appropriate CAMAC commands appear on the CAMAC dataway, data is strobed, 16 bits at a time, into latches on the CAMAC module. These 32 latches drive 32 indicators in a remote indicator box. Four of these latches have been wired to 50 ohm drivers whose outputs are available on the front of the CAMAC module. In addition one of these latches enables an alarm circuit.

COMMANDS AVAILABLE:

The Following Commands Have Been Implemented:

F(0)·A(0).....Gates switch position information from word 0 onto dataway
F(0)·A(1).....Gates switch position information from word 1 onto dataway
F(8).....Gates LAM onto Q bus of dataway
F(10).....Resets LAM

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F(16)·A(0)....Takes first 16 bits off dataway write lines and strobes them into word 0

F(16)·A(1)....Takes first 16 bits off dataway write lines and strobes them into word 1

F(16)·A(2)....Takes first 4 bits off dataway write lines and strcbes them into tone register

F(24).....Resets ENABLE flip-flop

F(26).....Sets ENABLE flip-flop

X is asserted for all executable instructions. Q is asserted only on F(0)·A(0-14)- and F(8) if LAM is on.

OPERATION DETAILS:

F(0) Operation:

Issuing F(0) results in dataway reads with the following conditions, depending on the sub-address being used.

<u>Function</u>	<u>Data</u>	<u>Q</u>	<u>X</u>
F(0)·A(0)	1st 16 switches (wd 0)	1	1
F(0)·A(1)	2nd 16 switches (wd 1)	1	1
F(0)·A(2-14)	All Zeros	1	0
F(0)·A(15)	All Zeros	0	0

This Q characteristic allows Block transfer operation testing with some CAMAC crate controllers.

LAM OPERATION:

Normally, LAM will be set by an operator pushing a button on the remote box.

If (or when) ENABLE is set LAM will cause L to be asserted on the CAMAC dataway.

If the CAMAC controller allows, the L will cause an interrupt to the host computer. The host computer will respond by reading the contents of the 32 switches. When the F(0)·A(1) occurs LAM will be reset.

If the programmer does not want to use interrupts he can disallow interrupts in the CAMAC controller and poll the controller for assertion of the L line.

If the programmer does not want to use the L line he can keep the ENABLE bit in the RESET condition and poll the LAM status by issuing an F(8).

If the programmer does not wish to read the contents of the switches he can abort the cycle by issuing an F(10).

F(16)·A(0) and F(16)·A(1) Operation:

32 individual LED indicators are always connected to the 32 bits in word 0 and word 1. The eight least significant bits (LSB) of word 1 are also connected to a dual hexadecimal display for added convenience.

The LSB of word 1 is also used as the tone enable bit for the alarm circuit.

Bits 2 (next to the LSB) and 16 of both words are also routed through 50 ohm coax drivers and are available on the front panel of the module on LEMO connectors. An assertion is represented by a low level (0.0-+0.5v) and the negation by a high level (+2.0v nominal).

Alarm Circuit Operation:

The tone generator is the basis for two-tone alarm system. For the alarm to sound, both the tone enable bit (see above) and the ARM flip-flop must be set. The ARM flip-flop normally comes up in the RESET condition, it is set whenever output word 1 is accessed. The ARM flip-flop will be RESET if the operator pushes the SILENCE momentary pushbutton on the remote display box. Note that in this condition the tone enable bit is still set so a visual indication of the alarm condition is still present.

The first four bits of sub address 2 form the tone generator word. The size of this word determines the difference between the base note (a high tone) and the alternate note (a lower tone). i.e. 0000 cause no difference (a high monotonic note), 1111 cause maximum difference (a high note alternating with a low note). The length of each tone is fixed at approximately one quarter second.

The loudness of the alarm is fixed.

The loud speaker for the alarm is located in the remote display box.