M1703
OMNIBUS INPUT INTERFACE

Length: Extended
Height: Quad
Width: Single

M1703
12-BIT WORD 8/E
BUS INTERFACE
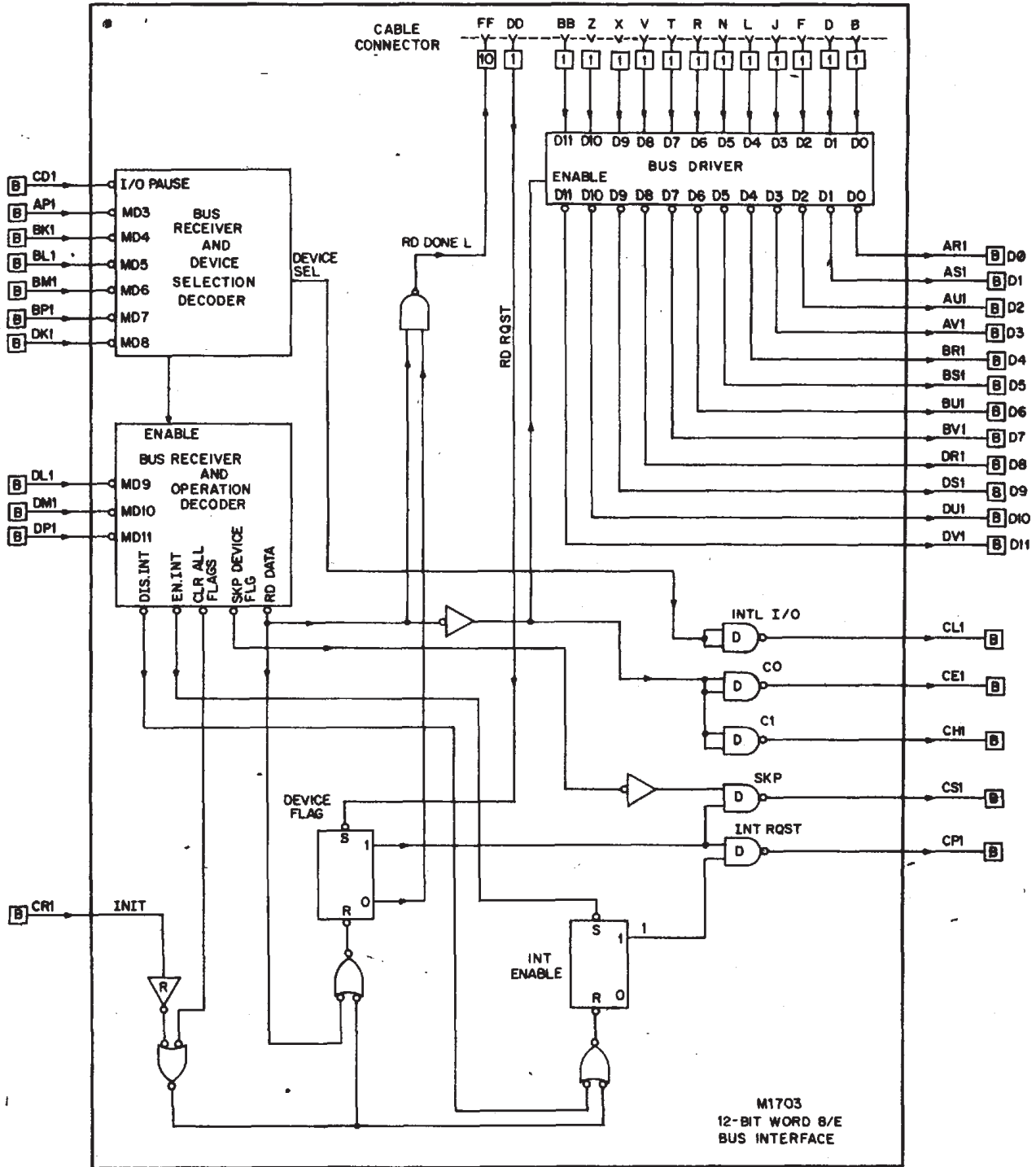
Volts	Power mA (max.)	Pins
+5	555	AA2, BA2, CA2
GND		AC2, BC1, BC2, CC1, CC2, DC1, DC2
		AN1, AN2, BN1, BN2, CN1, CN2, DN1, DN2
		AT1, AT2, BT1, BT2, CT1, CT2, DT1, DT2
		AF1, AF2, BF1, BF2, CF1, CF2, DF1, DF2

DESCRIPTION

The M1703 provides, on a single quad-height module, a complete, self-contained interface that will input 12 bits of parallel TTL-level data to the PDP-8/A, 8/F, 8/E or 8/M OMNIBUS, under interrupt or programmed I/O control. The M1703 plugs directly into the OMNIBUS connector assembly, and the external device plugs into a 40-pin flat cable connector on the module itself. The module includes a device selector, an operation decoder, flags, and all control logic needed to request interrupt and respond to programmed I/O commands on the OMNIBUS. Command codes assigned to this module include:

ENABLE AND DISABLE INTERRUPT
CLEAR FLAGS
SKIP IF DEVICE FLAG SET
READ DATA

A device selection code of 14 (octal) is assigned to this module but the code can be changed by moving wire jumpers.

FUNCTIONS

Device Selection Decoder: The device is addressed through this decoder when I/O PAUSE is asserted and the octal device code for the decoder is received through <MD03:08>. The decoder output asserts the INT. I/O line and enables the operation decoder.

Operation Decoder: The select bits (MD09, 10 and 11) determine the type of operation to be performed when the operation decoder is enabled by the device selection decoder.

DATA <00:11>: Data from the external device is applied to the bus drivers on these lines. A READ DATA command enables the bus drivers and asserts C0 and C1, thereby entering the data into AC0-11 via corresponding OMNIBUS data lines.

READ RQST: When the external device is ready to input stable data, it applies a logic LOW for at least 50 ns on this control line, to set the DEVICE FLAG. READ DONE goes HIGH within 60 ns after READ RSQT goes LOW.

DEVICE FLAG: After being set by a LOW on the RD RQST line, this flag initiates an interrupt request (if INTERRUPT is enabled). This flag is sensed by the SKIP control line.

INTERRUPT RQST: When this line is asserted by the DEVICE FLAG, an interrupt request is sent to the computer which responds by executing a JMSO instruction.

INTERRUPT ENABLE: This flip-flop is set to enable and cleared to disable the interrupt request function.

SKIP Control Line: If the device flag is set, the instruction SKIP ON DEVICE FLAG asserts the SKIP line, incrementing the contents of the computer's program counter.

READ DONE: This line stays HIGH as long as the DEVICE FLAG is set, and signals the end of a data transfer by going LOW after the end of a RD DATA pulse.

Changing the Device Code: The device selection decoder is preset for a device code of 14 octal. However, split lugs on this module permit the code to be changed by the user to any octal number from 00 to 77. To obtain the

desired octal number, jumper the split lug pairs that select the binary equivalent of the device code, as shown below:
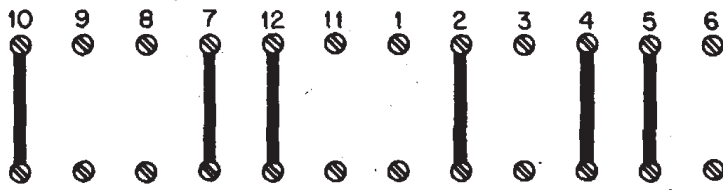
A. PHYSICAL LAYOUT OF SPLIT LUGS
(SHOWING JUMPERS FOR DEVICE CODE 14 OCTAL)

ADD JUMPER AT:	DEVICE CODE					
	8^1			8^0		
	2^2	2^1	2^0	2^2	2^1	2^0
BIT = 1	1	3	5	7	9	11
BIT = 0	2	4	6	8	10	12

EXAMPLE

0	0	1	1	0	0	BINARY EQUIV. OF 14 OCTAL CODE
2	4	5	7	10	12	REQUIRED JUMPERS

B. DETERMINING JUMPERS FOR NEW CODE ASSIGNMENTS

IOT INSTRUCTION ASSIGNMENTS

Octal Code	Instruction	Purpose
6140	Disable Interrupt	Clears the INTERRUPT ENABLE flag to disable the INT RQST line
6141	Enable Interrupt	Sets the INTERRUPT ENABLE flag to enable the INT RQST line
6142	Clear Flags	Clears the DEVICE FLAG, asserts READ DONE and clears INTERRUPT ENABLE flag
6143	Skip-if Device Flag Set	Asserts the SKIP line if the DEVICE FLAG is set. The computer responds by incrementing the program counter so that the next instruction is skipped.
6144	Read Data	Transfers input data bits <00:11> to <AC00:11> through the OMNIBUS data lines. Also clears the DEVICE FLAG, allowing the RD DONE output to go LOW when the data transfer is complete.

SPECIFICATIONS
Propagation Time:

FROM	TO	ns (max.)
LOW on RD RQST input	RD DONE going HIGH	60