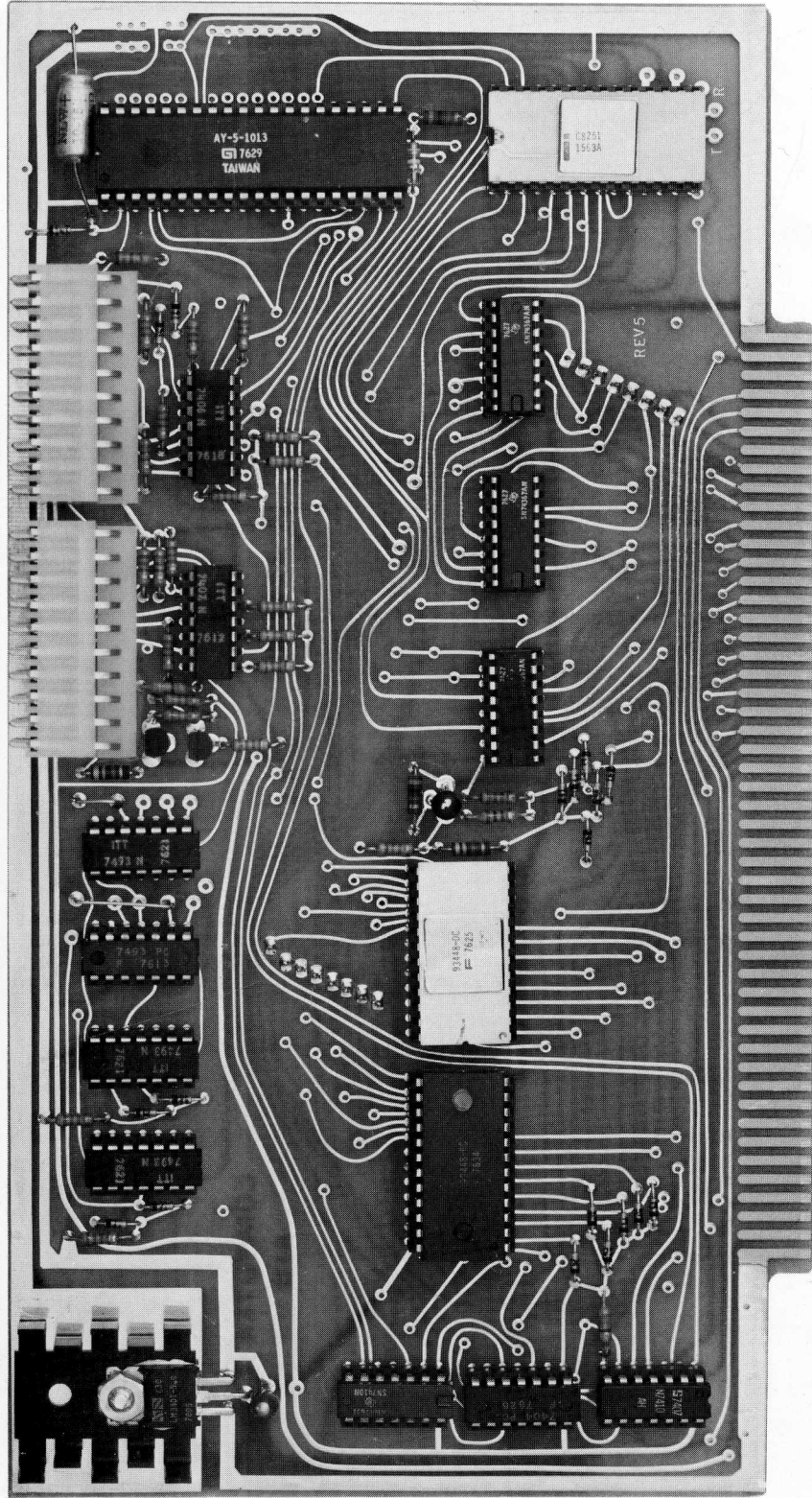


NATIONAL MULTIPLEX COMPUTER OPERATING SYSTEM



2SIO(R)

CASSETTE OPERATING SYSTEM

(The Bootstrap Eliminator)

With the addition of the 2SIO (R) Board, NATIONAL MULTIPLEX now offers a COMPLETE CASSETTE OPERATING SYSTEM and Terminal I/O for use with the CC-7A or any newer digital cassette unit. The 2SIO (R) board is designed to fit the Altair and Imsai main frames and offers a complete computer monitor system plus the ability to search for single or multiple file entries.

One 512 byte ROM is provided which includes the basic monitor program. A second ROM socket is available for additional monitor programs.

The 2SIO(R) board has two ports, independently baud rate selected. Port I using a UART is for the use of a terminal - either CRT or mechanical. It can also be used to enter MITS programs which have not as yet been converted to high baud rate tapes. The maximum baud rate is 19,200 baud. Port II using a USART is for one or two cassettes used either synchronously or asynchronously. The cassettes may be used independently as separate read and write cassettes, or as a single cassette which serves as a dual purpose unit. Maximum baud rates are in the 40-50 kilobaud region. (Note: The CC-7 series is limited to 4800 baud.) This port can be used to enter IMSAI software before conversion to high baud rates. It is used thereafter for all cassette loads and dumps - automatically under software control.

MONITOR PROGRAMS

L	xxxx	LOAD starting at XXXX from the terminal (in Hex)
D	xxxx-yyy	DUMP from Memory starting at xxxx and ending at yyyy. (In Hex)
G	xxxx	Go to address xxxx
CONTROL L	xxxx	LOAD from the Cassette starting at xxxx in binary.
CONTROL D	xxxx-yyy	DUMP to Cassette from x' to y' in binary (formatted or unformatted).
S	ABCDEF	SEARCH for and store ABCDEF file.
CONTROL S	ABCD	SEARCH for and store all files headed ABCD.

(Use of the Search feature requires a dedicated memory block.)

Commands E and P located in RAM convert your computer into a "Word Processor." They also permit you to enter file names and store comments etc. Using these commands, you can set up a file "List." Then searching for "LIST" and printing it will list the files. Other software routines are included in the documentation.

When the computer is first turned on, address C000 (switches A₁₄ and A₁₅ up) is examined. This starts the monitor program which types a "Ready" signal. The user then types in what he desires, such as loading, searching, etc. and the ROM executes the program. The ROM also takes care of time delays in cassette starts so that no additional circuitry is required. Remember, cassette start/stops are under software control.

DESIGN FEATURES: One ROM is provided. A second is optional. Fused linked (80 ns) ROM's are used because EPROM's are too slow. This saves several additional IC's on the board and makes it possible to get a ROM board and I/O board combined in one. Because the ROM program requires designation of Ports and allocation of Search stack, the Ports used are 0,1 for the terminal and 2, 3 for the cassettes. This allocation fits MITS and IMSAI software. Instructions are included for the temporary use of Port 6, 7 software which is converted to 2, 3 for future use. Address C000 was chosen for the 2SIO (R) because it is easy to address. D000, E000 and F000 are left open for 8K ROM boards such as the PTCO and Godbout products.

Sorry - but because the ROM program freezes addresses, you cannot use memory mapped I/O without ROM and board changes.

DTL address logic is used to save board space and facilitate PC board layout. It also conserves power.

A UART is used for Port I (addressed 0,1) because a USART or ACIA is "overkill" for a terminal. MITS SIO (Not Rev. O) status bits and masks are used so that MITS software can be loaded through this port initially.

A USART is used for the cassette terminal because it is the only device permitting independent control of two cassettes in a Synchronous or Asynchronous mode at high baud rates. We are designing for the future when high speed high density machines will be available. This port is addressed 2, 3 in the IMSAI format so that you can load IMSAI software through this port using the IMSAI bootstraps initially. MITS software using other ports can be loaded by means of easily typed in software routines.

2SIO (R) PRICE: In kit form, \$140.00. Fully tested and assembled \$170.00
Please add \$2.00 Shipping & Handling for each Board

DOCUMENTATION, \$2.00. (\$2.00 refunded with purchase.)

NATIONAL MULTIPLEX CORPORATION
3474 RAND AVENUE, Box 288 • SOUTH PLAINFIELD, NEW JERSEY 07080

201-561-3600
BREW
WALWA