INTRODUCTION

The EPROM I/O Operating System is designed to turn your Timex Sinclair Computer into a powerful machine code development system. It enables you to monitor and control all of the hardware facilities of the EPROM I/O. You will soon discover, however, that it does much more. To make the most of this software system, please read this document thoroughly.

SOFTWARE OPERATION

The EPROM I/O software is transparent to the BASIC system and does not require any exclusive area Of RAM workspace. The software operates in the 8K–1OK area of the computer's memory. Any other device, such as a 64K RAM, should be selected not to operate in this area.

To call the system, type "RAND USR 8192", then ENTER (for frequent calls keep ENTER pressed). The title should appear, followed by the menu of System Commands. The menu has seven options, as well as five hidden functions. You may quit any operation and return to this menu with RETURN (shift–Y).

This system uses a blinking cursor to reguest parameters. Numbers are assumed to be decimal unless preceeded by a "$", which makes them hexadecimal. A request for data Source or Destination may be answered with any of the following mnemonics:

INRAM – the computer's internal RAM.

EXRAM – the EPROM I/O external RAM.

EPROM – any device in the program socket.

The following pages detail the operation of each system command and hidden function. Many of the subroutines used in this system have been designed to be accessed by the BASIC system, as discussed in the last section of this document.

SYSTEM COMMANDS

1) BLOCK MOVE – transfers blocks of data from SOURCE to DESTINATION. If the SOURCE and DESTINATION are the same, such as "INRAM to INRAM," the data will upload or download, whichever is appropriate.

2) ERASE CHECK – checks all byte locations within the defined block to read as 255 ($FF). Checking is performed sequentially starting at the first address. The first non–erased address, if any, is displayed. The erase check operation can be repeated without reentry of the parameters.

3) EPROM PROGRAM/VERIFY — programs EPROMs from SOURCE data. An erase check is first performed in the area to be programmed. The EPROM is then programmed sequentially starting at the first address and performs a verify after each byte is programmed. Should a byte not verify, programming halts and the non-programmed EPROM address is displayed. The erase check/program/verify can be repeated without re-entry of the parameters.

4) INSPECT/POKE — displays SOURCE addresses and data. Function keys:

7 — Scroll up.

6 — Scroll down.

K — List from new address.

O — Print two-byte value [(addr) +256 * (addr + 1)].

shift O — Poke new value at addr. The new data will be written, read,and redisplayed. (Data writes to ROM or EPROM will do nothing).

Z — Copy screen to printer.

5) I/O CONTROL — performs single 8255 I/O operations. The seven operation mnemonics are: WR PA, WR PB, WR PC,CNTRL, RD PA, RD PB, and RD PC. For WR and CNTRL operations, data will be requested; for RD operations, data will be displayed in parenthesis.

6) PORT MONITOR — configures the 8255 as all input and monitors PORTA, PORTB, and PORTC 0-3. Pressing "H" puts Port B in the hold mode; data is gated into Port B when PC2 is low. This mode can be used to store data from a real time event.

7) BASIC SYSTEM — returns to BASIC.

SYSTEM COMMAND HIDDEN FUNCTIONS

D — Display all numbers in decimal.

H — Display all numbers in hexadecimal.

shift S — Save BASIC program in EXRAM. If BASIC program is greater than 4K bytes, then error 4.

shift J — Load BASIC from EXRAM. If there is not enough room in INRAM, then error 4.

shift U — Load BASIC from EPROM. If there is not enough room in INRAM, then error 4.

BASIC ACCESS

The following single 8255 I/O operations, which use byte 16417 as the I/O buffer, can be called from BASIC:

WR PA – RND USR 9750

WR PB– RND USR 9756

WR PC– RND USR 9762

CNTRL – RND USR 9768

RD PA – RND USR 9774

RD PB – RND USR 9780

RD PC – RND USR 9786

For WR & CNTRL operations, type "POKE 16417, Data", then type "RND USR Routine address".

For RD operations, type "LET N = RND USR Routine address". The input data will be in N and in Z80A register C.

To write an address to the EPROM I/O's secondary address bus from BASIC, type "POKE 16507, address – 256 ∗ INT (Address/256)";
"POKE 16508, INT (Address/256)"; then
type
"RND USR 9642".

Four other useful routines may be called using RAND USR:

Save BASIC in EXRAM – 8303

Load BASIC from EXRAM – 8331

Load BASIC from EPROM – 8327

Port Monitor – 9478

MEMORY SIZE

This system requires a completely expanded display file for main menu selections. Calling this system when the displayfile is condensed allows use of the main menu's hidden functions only. If the available memory, as defined by RAMTOP, is less than 3.25K bytes, the computer automatically condenses the display file.

If less than 3.25K bytes are available, you may still access the main

menu. Provided that the BASIC program and variables do not use too much memory, you may POKE 16389, 80, and then call the system. This fools the computer into fully expanding the display file.