SWTPC 6800 Serial Interface Diagnostic SERINT-1

This serial interface diagnostic is one designed to locate problems in the SWTPC 6800 Computer System serial interface board, MP-S. It is assumed that before loading this program the rest of the system is functioning normally with no problems. The program itself uses 41_{10} words and is loaded within the 128 word RAM used by the MIKBUG operating system on the MP-A Microprocessor/System Board. A program may reside in external RAM memory simultaneously with the diagnostic loaded within the 128 word RAM, or the diagnostic may be run with no MP-M memory boards installed on the system at all. The diagnostic may be loaded either from tape or instruction by instruction using MIKBUG starting from address A048, thru A072. The address of the serial interface to be diagnosed is set by using MIKBUG to load the hexadecimal address of the selected port into memory locations A002 and A003 with the most significant byte going into A002 and the least significant byte going into A003. The starting address locations of the interface ports are given below:

Port	Address in Hex
I/0 #0	8000
I/0 #1	8004 (reserved for control interface)
I/0 #2	8008
I/0 #3	800C
I/0 #4	8010
I/0 #5	8014
I/0 #6	8018
1/0 #7	801C

Since the program counter is set when the program is initially loaded, the diagnostic is initiated as described in the "Go to User's Program" section of the Engineering Note 100. Once initiated, the program can be stopped only by depressing the "RESET" button. The program may then be re-started after resetting the program counter to A04A as described in the "Display contents of MPU Registers Function" section of Engineering Note 100.

The diagnostic itself simply programs the selected serial interface to echo all incoming data back to the transmitting device. It does not check all of the internal operations of the interface. Interrupts and parity are not in any way tested; however, it is unlikely that the rest of the interface would check properly with only these portions inoperative. With the diagnostic loaded, the interface may be tested with any serial terminal including, if you are careful, the control terminal which is normally plugged onto the control interface.

To test a selected interface, first attach the baud rate jumper on the interface board for the selected baud rate. With the power off plug the board onto the selected interface position. If you are using a terminal other than the control terminal for testing connect it to the interface's input/output connector along the top edge of the board. Power up the system and load in the diagnostic program and the address of the serial interface to be tested. Then execute a "Go to User's Program" function as described in Engineering Note 100. If you plan to use the control terminal to check the interface, carefully unplug its connector from the control interface and plug it onto the serial interface under test. You cannot of course remove power from the unit during this procedure since doing so will wipe out the diagnostic program previously loaded into memory. You should make sure also that the baud rate setting on the terminal is the same as that on the interface under test.

At this time you should be able to type in data from the keyboard and have it echoed back by the computer for confirmation of proper interface operation. To return to terminal control, when testing with the control terminal, the control terminal's 1/0 connector will have to be removed from the serial interface and plugged back onto the control interface where it normally resides.

Never install or remove the interface board when the system is powered up. Doing so is not only hazardous to the equipment, but bypasses the normal power-up sequence required by the internal registers within the 6850 integrated circuit in order to guarantee proper operation.

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A002                  LOADDR      Port Address MSB
A003                              Port Address LSB

                                  Start Loading Program at A048

A048    A0                        Program Counter MSB
A049    4A                        Program Counter LSB
A04A    FE        START           LDX LOADDR
A04B    A0
A04C    02
A04D    86                        LDA A #$13
A04E    13
A04F    A7                        STA A 0,X
A050    00
A051    86                        LDA A #$11
A052    11
A053    A7                        STA A 0,X
A054    00
A055    86        LOOP1           LDA A #$0l
A056    01
A057    A4                        AND A 0,X
A058    00
A059    27                        BEQ LOOP1
A05A    FA
A05B    86                        LDA A #$B0
A05C    B0
A05D    A4                        AND A 0,X
A05E    00
A05F    27                        BEQ SKIP1
A060    06
A061    E6                        LDA B 1,X
A062    01
A063    C6                        LDA B #$5E
A064    5E
A065    20                        BRA LOOP2
A066    02
A067    E6        SKIP1           LDA B 1,X
A068    01
A069    86        LOOP2           LDA A #$02
A06A    02
A06B    A4                        AND A 0,X
A06C    00
A06D    27                        BEQ LOOP2
A06E    FA
A06F    E7                        STAB 1,X
A070    01
A071    20                        BRA LOOP1
A072    E2
                                  END
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