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<td>NOVEMBER 1980</td>
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<td>NOVEMBER 1980</td>
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<td>USE OF 16K EPROM PACK</td>
<td>NOVEMBER 1980</td>
<td>JAN. 1981</td>
</tr>
</tbody>
</table>
PRELIMINARY INFORMATION FOR MAKING BOARD REVISIONS

I. REMOVING THE LOGIC BOARD FROM THE SORCERER

1. Remove the screws attaching the top of the Sorcerer to its bottom.

2. Facing the front of the Sorcerer, lift off the top. Disconnect the keyboard cable connector retainer clip and unplug the cable. Put the top aside.

3. Unplug the transformer connector. The transformer connector is composed of several wires fastened together, coming from the black transformer box in the rear left of the Sorcerer and plugging into the piggy-back power supply board.

4. Unscrew the 6 screws fastening the logic board to the bottom case and lift the logic board from the case.

II. DETERMINING THE SORCERER REVISION LEVEL

1. Set the board down in front of you so EXIDY, INC, in the center of the board, can be read upside down. Search for the EXIDY, INC label located behind the third row of chips to your left.

2. Immediately to the right of EXIDY, INC are the FAB and ASSY (assembly) numbers. Both numbers are hyphenated and the Revision level of your Sorcerer II is at the end of each number.

FOR EXAMPLE:

FAB SC 77-3240-24-A1

"A1" means that this board is a Revision A.
III. PRELIMINARY INFORMATION FOR SOLDERING

1. To make the necessary modifications, you need the following tools:

- Phillips screwdriver (medium size)
- Pencil tip soldering iron
- Wire stripper
- Wire cutters (small)
- X-acto knife
- Solder
- Kynar wire wrap wire (2 feet, 30 gauge)

2. The logic board should be faced so the center EXIDY, INC label is right-side-up. All Integrated Circuit (IC) numbers may be quickly found by looking up the row number (letters A to H on the side of the board) and column number (numbers labeled from left to right 1-22). For example, IC 8A is in column 8 and row A. Looking at the IC with the notch on the top, all pin numbers are read counter-clockwise, starting with pin #1, located left of the IC notch, as shown in the following illustration for a 16 pin IC. All IC pins are numbered in the same direction regardless of the number of pins they contain.

3. Wire wrap wire should be neat and close to the board. When soldering Kynar wire, only a small amount of insulation need be removed. Be careful not to make bridges between pins and traces on the board. Use an X-Acto knife for cuts. This can be done by making two cuts 1/16" apart and removing the center.
SUBJECT: Revision of Sorcerer II boards and the Display Disk System and Floppy Disk Subsystems.

PROBLEM: The Display Disk System and Floppy Disk Subsystem cannot perform at their optimum capacity with Revision A3, B, and C2 Sorcerer II boards.

SOLUTION: Determine the Revision level of the Sorcerer II and make modifications to the main logic board to bring it up to Revision C4 specifications.

I. MODIFICATIONS NECESSARY TO BRING C2 BOARD TO C4 SPECIFICATION

1. Remove R35 resistor and replace with a 1/4 watt 1Ω 270K OHM resistor. R35's location is illustrated below in figure.

![Resistor Color Code Bands](image)

- 120KOHM = brown, orange, yellow, gold
- 270K = red, violet, yellow, gold

2. Solder in the following jumpers on the component side of the main logic board. Using the 30 gauge Kynar wire wrap wire.

<table>
<thead>
<tr>
<th>Jumpers</th>
<th>Destination</th>
</tr>
</thead>
<tbody>
<tr>
<td>14B-10</td>
<td>TO 14B-14</td>
</tr>
<tr>
<td>15B-10</td>
<td>TO 6D-15</td>
</tr>
<tr>
<td>8A-15</td>
<td>TO 11C-12</td>
</tr>
<tr>
<td>11C-13</td>
<td>TO 8D-2</td>
</tr>
<tr>
<td>11C-9</td>
<td>TO 12C-11</td>
</tr>
<tr>
<td>10C-8</td>
<td>TO 12C-12</td>
</tr>
</tbody>
</table>
3. Make the following cuts to the circuit board traces with an X-Acto knife as previously described:

<table>
<thead>
<tr>
<th>IC</th>
<th>Pin #</th>
<th>Side of board</th>
</tr>
</thead>
<tbody>
<tr>
<td>8A</td>
<td>15</td>
<td>both (component and circuit sides)</td>
</tr>
<tr>
<td>10C</td>
<td>8</td>
<td>circuit side</td>
</tr>
<tr>
<td>11C</td>
<td>9</td>
<td>circuit side</td>
</tr>
</tbody>
</table>

II. MODIFICATIONS NECESSARY TO BRING A3 AND B SORcerer BOARDS TO C4 SPECIFICATION

1. Add 150 pf Capacitor from 2F-1 to Ground Plane.

2. Solder in the following jumpers on the component side of the main logic board, using 30 gauge wire wrap wire.

```
8A-15 TO 11C-12
8A-16 TO 14B-8
14B-10 TO 14B-14
12C-11 TO 11C-9
1F-2 TO 3H-11
1F-13 TO 2F-2
14B-12 TO 12C-9
12C-11 TO 14B-3
12C-12 TO 14B-13
12C-12 TO 10C-8
10C-8 TO 9C-9
9D-4 TO 15B-11
15B-10 TO 6D-15
16H-7 TO 16H-10
8D-2 TO 11C-13
14C-3 TO 9B-4
10C-13 TO 14C-1
8D-2 TO 14C-2
14B-3 TO 14B-11
```
3. Make the following cuts to the circuit board traces with an X-Acto knife as previously described.

a) On circuit side:
   9B-4 (both traces)
   8A-15
   10C-8
   8A-16
   12C-11

b) On component side
   8A-15
   11C-9
   10C-8
   10C-11
   1F-18,19

4. Remove R35 and replace with a 1/4 watt 1% 270K OHM resistor.

5. Make video mod changes as indicated in the drawing below, by taking out the two resistors near IC 10H and adding another one:

   ![Diagram showing IC 10H and IC 12F with resistors being removed and added]
SUBJECT: 32K Sorcerer I computers and the Floppy Disk Subsystem and Display Disk System.

PROBLEM: The Floppy Disk Subsystem and the Display Disk System can not perform at their optimum capacity with 32K Sorcerer I computers.

SOLUTION: Incorporate UP8K and Expansion Bus modifications.

REFERS: ECN 100010.

1. Remove the screws attaching the top of your Sorcerer to its bottom.
2. Facing the front of the Sorcerer, lift off the top and put it aside.
3. Look for the Expansion Bus traces (J3) at the back right edge of your Sorcerer board.
4. Count each trace from the right corner of the board in toward the center and cut the third trace (J3-45 RESET EXP). Cut only this trace at the PCB connector as shown in Figure 1.

NOTE: CUTTING THIS TRACE DISABLES THE EXTERNAL RESET CAPABILITY OF A SORCERER I.

5. To make UP8K Modification, install jumpers as follows:
   a) 11H-11 to 8E-13
   b) 11H-12 to 10B-10
   c) 11H-13 to 9B-8
   d) 8E-12 to 8B-5
   e) cut the trace between pins 5 and 6 on IC 9B as shown to the right by the X.
SUBJECT: Modification of S100 P.C.B.

PROBLEM: The Micropolis disk controller's boot address conflicts with the computer's (48K) memory.

SOLUTION: 1. On S-100:
   a. Jumper S-100 bus pin 21 to 1A-11.
   b. Jumper 1A pin 9 to J3 pin 46.

2. On Micropolis disk controller PCB:
   a. Remove all jumpers at location D4.
   b. Jumper D8 pin 4 to D8 pin 8.
   c. Jumper D8 pin 9 to J1 pin 21 (bottom edge connector).
   d. On circuit side of PCB, at D8 cut trace from pin 2 to pin 4.
   e. Boot address is now at BC00H.

Dated from SUN II(1):8, Jan 80
* see SA 4(6):135, Sep 82
SUBJECT: Cassette interface test procedure for Sorcerer I.

PROBLEM: Unreliability of cassette interface circuit.

SOLUTION: Proper procedure for setting up cassette interface.

1. Jumper C12 to R1.
   a. LED will go out.

2. Use Digital Multimeter (Fluke 8010A or Equivalent.) (Do not use oscilloscope) to check 1B (LM324). If batch is Taiwan 7945AC or Malaysia 7919AB, remove and replace with Malaysia 7945AB.

4. Check that R6 has a 270K resistor. If not, then replace resistor with a 270K.

5. Disconnect jumper from cassette interface. Circuit should now be functional. If problems still exist, contact Exidy Customer Service.
SUBJECT: Cassette interface test procedure for Sorcerer II.

PROBLEM: Unreliability of cassette interface circuit.

SOLUTION: Proper procedure for setting up cassette interface.

   a. LED will go out.

2. a. Use Digital Multimeter (Fluke 8010A or Equivalent.)
    (Do not use Oscilloscope).
   b. Check 14F pin 11 for 2.0V.
   c. Adjust VR1 for 2.00V setting.

3. Check 1B (LM324). If batch is Taiwan 7919AB or Malaysia 7919AB, remove and replace with Malaysia 7945AB.

4. Check that R35 has a 270K resistor. If any other value, then replace resistor with a 270K.

5. Disconnect jumper from cassette interface. Circuit should now be functional. If problems still exist, contact Exidy Customer Service.
SUBJECT: Cassette interface modification

PROBLEM: Unreliability of cassette interface circuitry.

SOLUTION: To verify that the phase lock loop oscillator (PLL) will adjust through the lowest (resting) frequency and adjust the PLL to lock in the required capture range.

I. Equipment needed:

A. An oscilloscope with 500 KHz minimum bandwidth that includes a low capacitance.

B. A ground isolating plug for AC.

C. A jumper wire about 4" long on each end.

D. Soldering Iron and assoc.

II. Interface changes re

RECEIVER:

13K to 4A
270K R6 R35
10K mica C16 C67
120K (MOTOROLA ONLY) R17 R69

TRANSMITTER

10K to 1K R23 R65
470 ohm to 4.7K R24 R64
III. Initial Setup:

A. Disassemble Sorcerer
1. Take off top of the unit and place at a right angle on the right side of the base.
2. Keep the keyboard connected to the main computer board.
3. Connect the video monitor cable.
4. Connect the AC power.

B. Set up the oscilloscope.
1. Use the AC ground adapter on the power cord and plug into the AC.
2. Set the input voltage "mode" to "DC".
3. Set input voltage attenuation for 2 volts/div or 10 volts P-P full scale.
4. Ground probe on the point nearest the circuit being measured. Use the shortest ground path between the probe and ground.

IV. Check out PLL frequency.

A. Check PLL frequency
1. Connect the Probe to pin 4 of the PLL:
   a. On the Sorcerer I IC 3C.
   b. On the Sorcerer II IC 14F.
2. Reset the Sorcerer.
3. Adjust VR1 for a full wave, squarewave of 60us to 65us. VR1 should be in the middle 1/3 of its wiper travel.

B. Check PLL Lock on Range
1. Set the Oscilloscope time/div (sweep) to 500us/DIV or 5 KHz.
2. Connect the jumper wire from the "ear" jack center conductor to the junction of:
   a. R22 & R23 on the Sorcerer I
b. R43 & R65 on Sorcerer II

3. Connect the probe pin 9 of the PLL:
   a. IC 3C on the Sorcerer I.
   b. IC 14F on the Sorcerer II.

4. Hit RESET and type the following:
   SA T 0 2FFF <Carriage Return>

5. Adjust scope for a stable display.

6. The signal should range from 0 volts to minimum of 3.5 volts. Adjust VR1 within the middle 1/3 of its mechanical range.

7. The signal should look like Figure 2.

8. Remove jumper wire and put Sorcerer back together.

C. If problems persist do not hesitate to contact the Exidy Customer Service Department for further help.

*****************************************************************
* SPECIAL NOTE: *
* THIS NOTE SUPERCEDES ALL RELATED CASSETTE INTERFACE BULLETINS *
*****************************************************************
SUBJECT: TEC/CITO H DAISEY WHEEL PRINTERS

PROBLEM: THE DAISEY WHEEL WILL NOT INTERFACE PROPERLY. THE HANDSHAKING SQUENCE IS NOT OPERATING SUFFICIENTLY.

SOLUTION: MODIFICATION TO THE TEC/CITO H CPU 8BIT P.C.B.

1. REMOVE TOP REAR COVER AND SET ASIDE.
2. REMOVE BRACKET HOLDING DOWN THE FOUR (4) PRINTED CIRCUIT BOARDS.
3. DISCONNECT THE TWO CABLES FROM THE RIGHT REAR PRINTED CIRCUIT BOARD.
5. MAKE THE FOLLOWING MODIFICATIONS TO THE P.C.B.:
   A. CUT THE TRACE ON THE COMPONENT SIDE FROM IC #17 PIN ONE (1).
   B. SOLDER A JUMPER FROM IC #17 PIN ONE (1) TO IC #13 TO PIN THIRTY-SEVEN (37).
6. REINSTALL P.C.B. INTO UNIT, THE PRINTER WILL NOW WORK PROPERLY.
SUBJECT: DDS and FDS fail to boot and show excessive error messages. Also, cassette fails to load or save effectively.

PROBLEM: RTV silicon rubber used for gypting Exidy potentiometers on disk controller P.C>B. (VR1) and cassette interface (VR1) has caused deterioration of wipers and cause related adjustments to become maligned.

SOLUTION: Remove above mentioned VR's and replace.

A. DDS and FDS

1. Remove VR1 (5K potentiometer) on disk controller PCB (77-3352-15) replace with an equivalent 5K pot.

2. A field adjustment may be made by doing the following instructions:
   a. Move boot address into RAM by giving monitor command MO BF00 BFF 1000
   b. Modify loader as follows:
      1. EN 1071: 03
         EN 1072: E0/
      2. EN 1084: 00
         EN 1085: 10/
      3. EN 10A6: 00
         EN 10A7: 10/

3. Begin adjustment with potentiometer turned fully counter-clockwise and adjust until error message cease and control returns to monitor prompt (>).
B. CASSETTE FAILURES

A. Remove VR1 (100K) and replace with an equivalent.

B. Adjustment for VR1 should be in accordance of the criteria set in technical note #6.
SUBJECT: Cassette interface modification

PROBLEM: Unreliability of cassette interface circuitry.

SOLUTION: To verify that the phase lock loop oscillator (PLL) will adjust through the lowers (resting) frequency and adjust the PLL to lock in the required capture range.

I. Equipment needed:

   A. An oscilloscope with 500 KHz minimum bandwidth that includes a low capacitance probe

   B. A ground isolating plug for AC.

   C. A jumper wire about 4" long with insulated clips on each end.

   D. Soldering Iron and associated tools.

II. Interface changes required:

   Receiver:          | Sorcerer I | Sorcerer II |
   -------------------|------------|-------------|
   13K to 4.7K        | R4         | R62         |
   270K to 10K        | R6         | R35         |
   1000 pf to 620 pf silver mica |
   C16                | C67        |
   1000 pf to 330 pf disc ceramic |
   C18                | C66        |
   3.3 meg to REMOVE  | R5         | R34         |
III. Initial Setup:

A. Disassemble Sorcerer

1. Take off top of the unit and place at a right angle on the right side of the base.

2. Keep the keyboard connected to the main computer board.

3. Connect the video monitor cable.

4. Connect the AC power.

B. Set up the oscilloscope.

1. Use the AC ground adapter on the power cord and plug into the AC.

2. Set the input voltage "mode" to "DC".

3. Set input voltage attenuation for 2 volts/div or 10 volts P-P full scale.

4. Ground probe on the point nearest the circuit being measured. Use the shortest ground path between the probe and ground.

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A. Check PLL frequency

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2. Reset the Sorcerer.

3. Adjust VR1 for a full wave, squarewave of 60us to 65us. VR1 should be in the middle 1/3 of its wiper travel.

B. Check PLL Lock on Range

1. Set the Oscilloscope time/div (sweep) to 500us/DIV or 5 KHz.

2. Connect the jumper wire from the "ear" jack center conductor to the junction of:
   a. R22 & R23 on the Sorcerer I
   b. R43 & R55 on Sorcerer II
3. Connect the probe pin 9 of the PLL:
   a. IC 3C on the Sorcerer I.
   b. IC 14F on the Sorcerer II.

4. Hit RESET and type the following:

   SA T 0 2FFF <Carriage Return>

5. Adjust scope for a stable display.

6. The signal should range from 0 volts to minimum of 3.5 volts. Adjust VR1 within the middle 1/3 of its mechanical range.

7. The signal should look like Figure 2.

8. Remove jumper wire and put Sorcerer back together.

C. If problems persist do not hesitate to contact the Exidy Customer Service Department for further help.

*********************************************************
* SPECIAL NOTE:                                  *
* THIS NOTE SUPERCEDES ALL  *
* RELATED CASSETTE INTERFACE BULLETINS           *
*********************************************************
Figure 1: Sorcerer II

Figure 2: Sorcerer I

Figure 3: Valid Signals
Subject: External interrupt handling by Sorcerer I and II from an S100 device via the 50 pin expansion connector.

Problem: If a running program is interrupted while the Z80 is operating in mode 0 and its program counter (PC) contains address xxFCH, xxFDH, xxFEH, xxFFH, the Sorcerer will in its I/O hardware section, erroneously send to the S100 BUS a data bus disable signal. Consequently the interrupting device will not be able to place the interrupt vector on the bus, and the Z80 will begin execution with a meaningless PC address resulting in a program crash.

Solution: Add the Z80 M1 control line to the I/O decode logic by performing the modification to the main logic board as described below.

1. Solder in the following jumper on the component side of the main logic P.C.B.

   **Sorcerer I:**
   
   11F-18 To 5E-11

   **Sorcerer II:**
   
   6H:12 TO 7D-11

2. Make the following cut to the main logic P.C.B. printed circuit trace with an X-ACTO knife:

<table>
<thead>
<tr>
<th>IC</th>
<th>PIN #</th>
<th>SIDE OF BOARD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sorcerer I:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5E</td>
<td>BETWEEN PINS 11 &amp; 12</td>
<td>CIRCUIT SIDE</td>
</tr>
<tr>
<td><strong>Sorcerer II:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7D</td>
<td>BETWEEN PINS 11 &amp; 12</td>
<td>CIRCUIT SIDE</td>
</tr>
</tbody>
</table>

REFERENCE NOTE: More information on the handling of interrupts by the Z80 processor can be found in the MOSTEX Z80 HARDWARE MANUAL or its equivalent.
SUBJECT: Use of 16K EPROM PACKS WITH A3 or B revision level Sorcerer II main logic P.C.B.'s.

PROBLEM: Incorrect addressing of 16K EPROM PACKS when used with A3 or B revision level SORCERER II main logic P.C.B.'s. This problem will only be evident if an EPROM PACK is loaded with 2732/2532 (4Kx8) EPROMS.

SOLUTION: Determine the revision level of the main logic P.C.B. is A3 or B and make the modification to the board as described below:

1. Modification to correct reversed address line to the rompac connector.
   a. Solder in the following jumper on the circuit side of the main logic board. Use 30 gauge wire wrap wire.

   NOTE: The rompac connector pinout is marked on the component side of the board. Care should be taken to make the correct count on the circuit side of the board.

   6E-3 TO ROMPAC CONNECTOR PIN # 22
   16A-8 TO ROMPAC CONNECTOR PIN # 21
   6E-3 TO 4H-3

2. Make the following cuts with an X-Acto knife to the main logic P.C.B.:

<table>
<thead>
<tr>
<th>IC</th>
<th>PIN #</th>
<th>SIDE OF P.C.B.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6E</td>
<td>3</td>
<td>CIRCUIT SIDE</td>
</tr>
<tr>
<td>16A</td>
<td>8</td>
<td>CIRCUIT SIDE</td>
</tr>
<tr>
<td>ROMPAC CONNECTOR 21</td>
<td></td>
<td>CIRCUIT SIDE</td>
</tr>
</tbody>
</table>