TECHNICAL BULLETIN NO. 109

June 1980

COMPOSITE OF EXPANDORAM II MODIFICATIONS

In the past months, modifications have been issued for several versions of SD Systems ExpandoRAM II boards.

The following explains which modifications are necessary for different Revision levels of the ExpandoRAM II.

Modifications for ExpandoRAM II Boards

Revision A Only:

1. Cut the etch on the front side of the board from U22-6 to U21-3 just to the left of the plated thru hole above pins 1 and 2 of U21. NOTE: U21-3 should still be connected to U21-11.

2. Add a jumper from U22-5 to U21-3.

Revision B Only:

1. Cut the etch on the back side of the board from U16-2 to U21-3 just below pin 2 of U16.

2. Add a jumper from U16-2 to U22-6.

Revision C Only:

1. Cut the etch on the back side of the board from U16-2 to U21-6 just below pin 2 of U16.

2. Add a jumper from U16-2 to U22-6.

Revision A, B, or C:

1. Cut the etch from U11-14 to U16-7.
2. Cut the etch from U16-10 to U21-10.
3. Cut the etch from U17-9 to U22-5.
4. Connect a jumper from U11-14 to U11-16.
5. Connect a jumper from U7-1 to U16-7.
6. Connect a jumper from U17-9 to U22-6.
7. Replace U6 with a 74S74.
8. Replace R7 with a 20K OHM.

SD SYSTEMS
A SUBSIDIARY OF THE MICHIGAN GENERAL CORPORATION

TECHNICAL BULLETIN NO. 111 JULY 1980

EXPANDORAM II
Cromemco/Northstar Compatibility

The Expandoram II board, Revs A, B or C may not work with the Northstar or Cromemco CPU boards. The following mods to Expandoram II will make it compatible to most Northstar or Cromemco CPU boards (refer to your Expandoram II manual to implement the mods).

1. Install phantom disable jumper. (E9 to E10)
2. Install Wait State jumper if 4 MHZ. (E14 to E15)
3. Cut etch from U22-11 to pin 25 at the connector.
4. Jumper pin U22-11 to pin 24.
5. Cut etch between U18-11 and pin 99.
6. Jumper U18-11 to pin 75.

The updates in Technical Bulletin #109 must be implemented first.

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TECHNICAL BULLETIN NO. 105

APRIL 1980

EXPANDORAM II

Extensive field usage and further R&D in our engineering department has determined that the ExpandoRAM II could hang up in Wait State Refresh cycles under certain conditions. The modifications delineated below solve this problem:

To Identify Problem:
The following modifications are necessary for any system running with 60K SDOS or COSMOS.

To Modify Board:

1. Change U6 from 74LS74 (Low-Power Schottky) to 74S74 (Schottky).

2. Change R7 from 10K ohms to 20K ohms.

3. Using the diagram on the back of this page, rework boards to change WAIT STATE REFRESH TIME to leading edge of ø1.

    a. Cut etch from U11-14 to U16-7
    b. Cut etch from U16-10 to U21-10
    c. Cut etch from U17-9 to U22-5
    d. Connect an insulated jumper wire from U11-14 to U11-16
    e. Connect an insulated jumper wire from U7-1 to U16-7
    f. Connect an insulated jumper wire from U17-9 to U22-6

If you need technical assistance to comfortably execute these modifications, call SD Systems.

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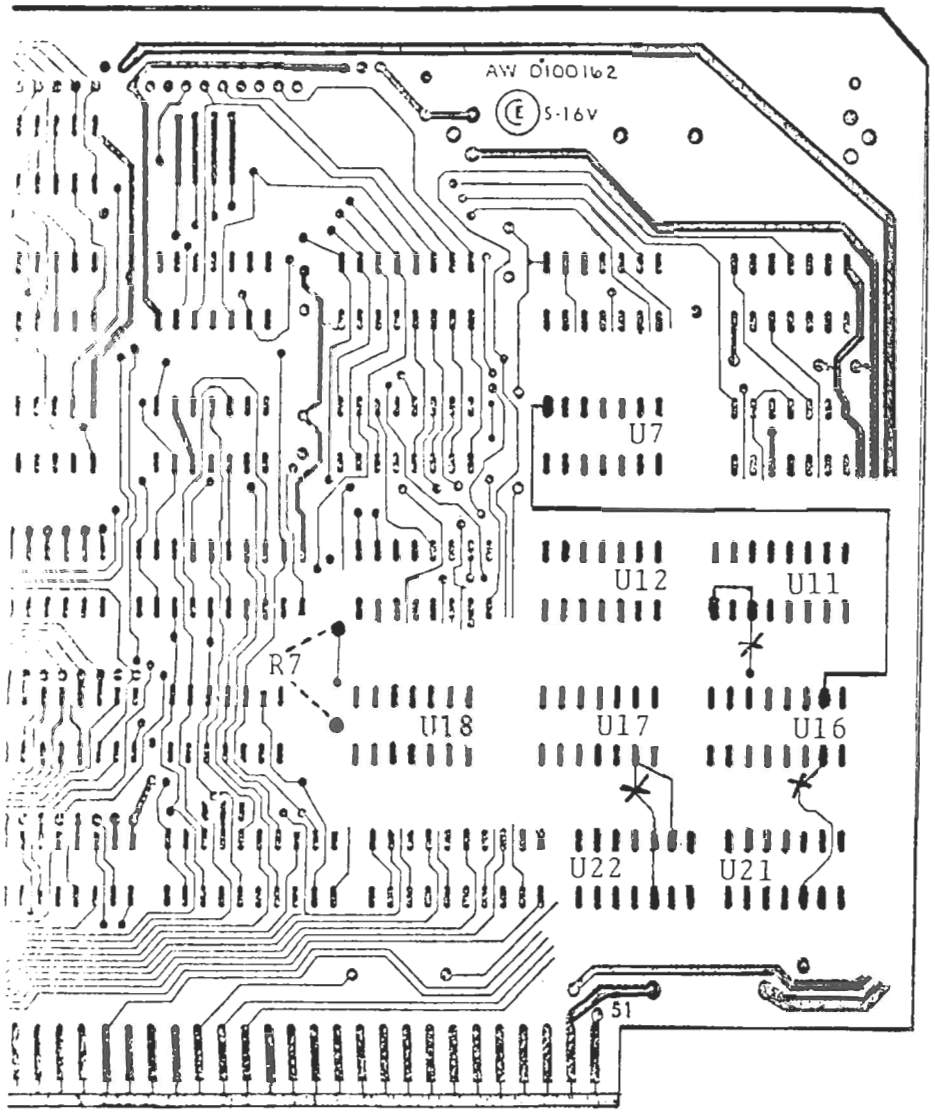
MODS TO BE MADE TO THE EXPANDORAM II



1. Examine diagram to left and locate the three traces marked with an 'X'. Double check to ensure that you have the correct traces and then cut them with a sharp knife. Make the cut deep and 'v' shaped to make sure that the connection is broken.

2. Locate U7; note the only connection and follow it to U16. Using an insulated wire, complete the connection as shown.

3. Locate U11; note the only connection is a jumper between two pins on U11. Using an insulated wire, complete the connection as shown.

4. Locate U17; note the new connection and follow it to U22. Using an insulated wire, complete the connection as shown.

5. Locate R7 to the left of U18; its solder points are indicated by dotted lines. Remove R7 and replace it with the 20K Ohm resistor provided.

6. Turn your PC board over and locate U6. With a small flat blade screw driver, gently and slowly pry U6 out of its socket. Note the way it is placed in the socket. Using the replacement IC provided, line up all pins with the socket. Be sure that the replacement IC is in the correct position and then push it into the socket firmly. Examine closely making sure no pins were bent.

TECHNICAL BULLETIN NO. 112 JULY 1980

EXPANDORAM II
Refresh Problem with Non SD Product

The Expandoram II board, Rev. A, B or C will not refresh properly if: (1) Wait States are used during memory access which exceed 15 usec or (2) the SMEMR or MWRITE signals overlap the refresh signal.

NOTE: This is not a problem in the SD 100/SD 200/SD 700 computers or when used with SD Systems boards.

The following mods will enable the Expandoram II Refresh circuitry to operate properly with long memory Wait States or if the MWRITE or SMEMR lines overlap the Refresh signal.

1. Cut the etch from U6-2 to U6-4.

2. Install a new IC 74LS122 (glue upside down to PC board).
   Wire the new IC as follows:

   Jumper pins 2,3,4,5,9,14 to +5V
   Jumper pin 7 to ground
   Jumper pin 1 to U7-10
   Jumper pin 6 to U6-4

The Modifications in Technical Bulletin #109 must be made first.

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2.4.3 EXPANDORAM II IN NON SD SYSTEMS ENVIRONMENTS

If your Central Processing Unit board supplies a different system clock phase on pins 24 and 25, then make the following changes.

1. Cut etch between E22 and E23.

2. Install a jumper between E23 and E24.

3. Cut etch between E26 and E25.

4. Install a jumper between E26 and E27.

5. If your system has additional memory in conflict with the EXPANDORAM II board, then install the phantom disable jumper between E9 and E10.

6. If your system is operating at 4MHZ, then install the jumper between E14 and E15 to enable M1 wait states.