3K CONTROL RAM

The 3K Control Ram is a standard logic card containing a fast (90 nsec.) 3072-word by 32-bit read/write microinstruction memory, 8 banks of even faster (40 nsec.) 32-word by 16-bit read/write memory (S registers), and logic to interface those memories to the Alto’s microinstruction bus, processor bus, and ALU output. Unlike other microinstruction memories in the Alto, the larger memory of the 3K Control Ram can hold microinstructions and/or data.

RAM-RELATED TASKS

The 3K Control Ram performs data manipulation (as distinct from microcode fetching) functions in response to the microinstruction. Not all tasks are likely to be interested in these functions. Moreover, not all tasks will have the appropriate values for the microinstruction uncommitted. A Ram-related task is defined as one during whose execution the 3K Control Ram card will respond to microinstructions. The standard Alto is wired so that the CPU emulator task is the only Ram-related task.
NOTE: UNLESS OTHERWISE SPECIFIED.

1. ASSEMBLE PER ALTO II MODULE ASSY. SPEC. DWG NO. 216207

PROGRAMMING THE PROMS:

A. PROGRAM THE PROMS BEFORE IT IS INSERTED INTO THE MODULE.

B. LABEL EACH PROM AS DEFINED AS SHOWN BELOW USING AVERY SELF-ADHESIVE (1/16X1/2)LABEL. STICK THE LABEL ON THE TOP OF THE PROM(IC).

C. PROGRAM THE FOLLOWING PROMS:

<table>
<thead>
<tr>
<th>PROM LABEL</th>
<th>LOCATION</th>
<th>FILE NAME</th>
<th>FILE LOCATION</th>
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<tbody>
<tr>
<td>R21B</td>
<td>A37</td>
<td>R21B.MB</td>
<td>[ISIS]&lt;SPGDOCS&gt;PROMS&gt;3KCRAM.DM</td>
</tr>
</tbody>
</table>

D. ADDITIONAL PROGRAM REQUIREMENT:
   a. PNEW.RUN..............[ISIS]<SPGDOCS>PROLOG.PRESS.

E. HARDWARE REQUIREMENTS:
   a. PROLOG PROGRAMMER.........[ISIS]<SPGDOCS>PROLOG.PRESS
   b. 82S126 PROLOG PERSONALITY CARD.

3. THE FOLLOWING MODIFICATION ARE REQUIRED USING "B" REV PW BOARD ONLY.

   CUT ETCH PER INSTRUCTION:

   A. CUT ALL ETCH LEADING TO
      A52-11 ONE CUT (ETCH SIDE)
      A49-11 TWO CUTS (ETCH SIDE)
      A50-11 TWO CUTS (ETCH SIDE)
      A62-11 TWO CUTS (COMP & ETCH)
      A63-11 TWO CUTS (COMP & ETCH)
      A65-11 TWO CUTS (COMP & ETCH)
      A75-11 TWO CUTS (COMP & ETCH)
      A78-11 TWO CUTS (ETCH SIDE)
      A88-11 TWO CUTS (COMP. SIDE)
      A91-11 TWO CUTS (ETCH SIDE)
      A61-15 ONE CUTS (COMP. SIDE)

      CUT ALL ETCH LEADING TO
      A25-1 ONE CUT (ETCH SIDE)

   B. CUT BOTH ETCH TO FEEDTHROUGH BETWEEN A68-18 AND A69-1 (ETCH,COMP)

   C. CUT ETCH TO FEED THROUGH BETWEEN A52-10 AND A53-9 (COMP SIDE)

   D. CUT ETCH TO EDGE CONNECTOR FINGER J2-13 (ETCH SIDE)
   E. CUT ETCH TO EDGE CONNECTOR FINGER J2-15 (ETCH SIDE)
   F. CUT ETCH TO EDGE CONNECTOR FINGER J2-29 (ETCH SIDE)
   G. CUT ETCH TO EDGE CONNECTOR FINGER J2-30 (ETCH SIDE)
   H. CUT ETCH TO A84-1 (COMP SIDE)

4. THE FOLLOWING MODIFICATION ARE REQUIRED USING "B" REV PW BOARD ONLY.

   ADD JUMPER PER INSTRUCTION

   A. ADD JUMPER FROM P2-12 TO A70-9 (ETCH SIDE)
   B. ADD JUMPER FROM P2-12 TO A90-9 (ETCH SIDE) GND
   C. ADD JUMPER FROM P2-13 TO A90-9 (ETCH SIDE) GND
   D. ADD JUMPER FROM P2-15 TO A91-9 (ETCH SIDE) GND
   E. ADD JUMPER FROM P2-15 TO A92-9 (ETCH SIDE) GND
   F. ADD JUMPER FROM P2-29 TO A93-9 (ETCH SIDE) GND

PROPRIETARY NOTE ON SHEET 1 APPLIES TO ALL SHEETS

FILE:       3KCRAM02.SIL

<table>
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<tr>
<th>TITLE</th>
<th>ASSEMBLY, P.W.</th>
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<tr>
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<th>DWG. SIZE</th>
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<td>217812</td>
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<tr>
<td>SHEET REV.</td>
<td>E</td>
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<td>SHEET OF</td>
<td>2 17</td>
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</table>
4. THE FOLLOWING MODIFICATIONS ARE REQUIRED USING "B" REV PW BOARD ONLY.
ADD JUMPER PER INSTRUCTION:
   a. A49-11 TO A23-5
      A62-11 TO A23-3
      A75-11 TO A23-1
      A88-11 TO A12-1
      A50-11 TO A12-3
      A52-11 TO A23-9
      A63-11 TO A12-5
      A65-11 TO A23-11
      A78-11 TO A23-13
      A91-11 TO A12-13
      A21-15 TO A21-8
      A24-13 TO A25-1
      A87-15 TO A87-8
      A66-11 TO A35-7
      A57-1 TO P1-69
      A57-2 TO A39-1
      A57-3 TO A61-15
      A45-4 TO A12-9
      A12-8 TO FEED THROUGH BETWEEN A52-10 AND A53-9
NOTE: THE FOLLOWING MODIFICATION INSTRUCTION (5,6,7) SHOULD BE DONE ON "B" REV PWB ONLY.

5.0 DRILL HOLE: a. DRILL HOLE PER FIGURE 3.

6.0 MOUNT CABLE ASSEMBLY (2533) AND PLATE ASSEMBLY (218054-001) PER FIG. 1 AND FIG. 2.

7.0 ADD WIRE (OBSERVE FIGURE 4)

CONDUCTOR 1 TO A83-07  GND  CIRCUIT SIDE
CONDUCTOR 2 TO A84-08  GND  CIRCUIT SIDE
CONDUCTOR 7 TO A84-13  CT8  CIRCUIT SIDE
CONDUCTOR 8 TO A84-14  CT4  CIRCUIT SIDE
CONDUCTOR 9 TO A84-15  CT3  CIRCUIT SIDE
CONDUCTOR 10 TO A84-01 CT1  CIRCUIT SIDE

8.0 THE FOLLOWING MODIFICATION INSTRUCTIONS SHOULD BE DONE ON "C" REV PWB ONLY

* CUT ETCH LEADING TO A25-1 2 CUTS ON COMPONENT SIDE

* ADD WIRE: A25-1 TO A24-13
   A38-1 TO A1-09

FIG. 1

FIG. 2

FIG. 3

FIG. 4

FIG. 5

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FILE: 3KCRAM04.SIL

TITLE: ASSEMBLY, P.W.

3K CRAM MODULE

DWG. NO. 217812

DWG. SIZE A4

SHEET 4 OF 17

E