PANGEA CORE

Pangea Core Bypass -- 16 0.01uF across each pair, 8 0.001uF on corners

Pangea Processor I/F Bypass -- two per power/ground pair

Pangea I/O Ring Bypass -- two per power/ground pair

Pangea AMVDD Bypass (one pair per pin)

Pangea Bypass
To locate unused R-PACK pins refer to component location table on page 49.

**Maxbus Pulls**

**AGP Pulls**

**GPIO Pulls**

**PMU Pulls**

**Enet Pulls**

**Modem Pulls**

**New 4.7k resistors can be changed into R-Packs**

**R-Packs can be re-pinned**

**Notice of Proprietary Property**

I agree to the following:

I. To maintain the document in confidence
II. Not to reproduce or copy it
III. Not to reveal or publish in whole or part

AApple computer, Inc.

**Scale**

**Sht**

**Rev.**

**Ecs:1.B**

**Drawing number**

**051-6130-c**

**R-PACKS CAN BE RE-PINNED**
TO LOCATE UNUSED RPAK PINS REFER TO COMPONENT LOCATION TABLE ON PAGE 49

IIC BUS PULLUPS  CARD SLOT BUS PULLS

JTAG PULLS
C66 and C61 should be placed close to J9 pin 26 and 27.

C65 and C63 should be placed close to J9 pin 76 and 77.

NOTE: 5V TOLERANCE LEAVE NC.

---

TABLE 5

<table>
<thead>
<tr>
<th>PART#</th>
<th>QTY</th>
<th>BOM OPTION</th>
<th>CRITICAL</th>
</tr>
</thead>
</table>
| 341S1036 | 1 | TABLE_5_ITEM | 34 |"
DUE TO EMI CONCERNS, THE FOLLOWING PINS (WHICH ARE LOCATED OVER THE CORRECT PORTION OF THE VGA CHASS_GND1 PLANE) ARE CONNECTED TO THE EXTERNAL VIDEO (VGA) INTERFACE VGA_CHASS_GND1 PLANE AS WELL AS DIGITAL GROUND:

- PINS: R90-2, C69-2, C70-2, C76-2, FL2-3/4, FL4-3/4, J12-1/4/6/14, C338-2, C339-2, C340-2, C344-2,
SNAPPER AUDIO, MICROPHONE PREAMP
3V/5V Main Switchers
LOW CURRENT, CAN WE CHANGE TO CHEAPER FET?

POWER FOR:
- VOA DCC POWER

+5V_MAIN

+5V_HD_SLEEP

+5V_CD_SLEEP

+5V_IO_SLEEP

FAN CIRCUIT

POWER SUPPLY LOAD FET SWITCHES

DESCRIPTION:
- ENGINEERING RELEASE P72/P73 MLB & SCHEMATIC
- NOTICE OF PROPRIETARY PROPERTY
- THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY PROPERTY OF APPLE COMPUTER, INC. THE POSSESSOR AGREES TO THE FOLLOWING:
  I. TO MAINTAIN THE DOCUMENT IN CONFIDENCE
  II. NOT TO REPRODUCE OR COPY IT
  III. NOT TO REVEAL OR PUBLISH IN WHOLE OR PART

APPLE COMPUTER INC.

SHT

OF

NONE

35 53

www.chinafix.com
Circuit used to power sequence. CPU Vio must be powered before CPU vcore. There is a 7 millisecond delay.
### I/O CONNECTORS

<table>
<thead>
<tr>
<th>Connector</th>
<th>Sheet</th>
<th>PIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethernet</td>
<td>22</td>
<td>200, 201</td>
</tr>
<tr>
<td>Firewire</td>
<td>10</td>
<td>15, 16</td>
</tr>
<tr>
<td>USB</td>
<td>11</td>
<td>20, 21</td>
</tr>
<tr>
<td>Headphone</td>
<td>12</td>
<td>22, 23</td>
</tr>
<tr>
<td>DC IN</td>
<td>13</td>
<td>14, 15</td>
</tr>
</tbody>
</table>

### Holes and Slots

AND EMC INFO
<table>
<thead>
<tr>
<th>REFERENCE</th>
<th>DISTANCE</th>
<th>MIN</th>
<th>MAX</th>
<th>Property</th>
<th>Value</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Notes:**
- All references must be referenced in the project.
- All distances must be maintained as per the specifications.
### AGP Related Doos-Dahs

<table>
<thead>
<tr>
<th>SIG_NAME</th>
<th>NET_SPACING_TYPE</th>
<th>STUB_LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGP_FB_IN</td>
<td>5 MIL SPACING</td>
<td>200</td>
</tr>
</tbody>
</table>

### Constraints -- AGP, Firewire

#### Firewire Related Doos-Dahs

<table>
<thead>
<tr>
<th>SIG_NAME</th>
<th>NET_SPACING_TYPE</th>
<th>STUB_LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>FW_LINK_D&lt;6&gt;</td>
<td>5 MIL SPACING</td>
<td>200</td>
</tr>
</tbody>
</table>

#### Firewire Differential Thingies

<table>
<thead>
<tr>
<th>SIG_NAME</th>
<th>NET_SPACING_TYPE</th>
<th>STUB_LENGTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>FW_LINK_D&lt;1&gt;</td>
<td>5 MIL SPACING</td>
<td>200</td>
</tr>
<tr>
<td>NET_NAME</td>
<td>PIN</td>
<td>PACKAGE</td>
</tr>
<tr>
<td>----------</td>
<td>-----</td>
<td>---------</td>
</tr>
<tr>
<td>USB_DCM</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>USB_DCP</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>USB_DAM</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>USB_DAP</td>
<td>66</td>
<td></td>
</tr>
</tbody>
</table>

**NOTICE OF PROPRIETARY PROPERTY**

AGREES TO THE FOLLOWING

1. TO MAINTAIN THE DOCUMENT IN CONFIDENCE

**SIZE**

**DRAWING NUMBER**

**SCALE**

**SHT**

**OF**

**ACI:**

**ECS:**

**APPLE COMPUTER INC.**

**CONSTRAINTS -- MISCELLANEOUS**

**NOTICE OF PROPRIETARY PROPERTY**

APPLE COMPUTER INC.

**SIZE**

**DRAWING NUMBER**

**SCALE**

**SHT**

**OF**

**ACI:**

**ECS:**

**APPLE COMPUTER INC.**

**CONSTRAINTS -- MISCELLANEOUS**

**NOTICE OF PROPRIETARY PROPERTY**

APPLE COMPUTER INC.

**STYLE**

**DRAWING NUMBER**

**SCALE**

**SHT**

**OF**

**ACI:**

**ECS:**

**APPLE COMPUTER INC.**

**CONSTRAINTS -- MISCELLANEOUS**

**NOTICE OF PROPRIETARY PROPERTY**

APPLE COMPUTER INC.
**NET ATTRIBUTES**

<table>
<thead>
<tr>
<th>Layer</th>
<th>Thickness (mils)</th>
<th>Track Width (mils)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>1.540</td>
<td>5.0</td>
</tr>
<tr>
<td>L2-L2</td>
<td>3.740</td>
<td></td>
</tr>
<tr>
<td>L2-L3</td>
<td>1.170</td>
<td>5.0</td>
</tr>
<tr>
<td>L3-L4</td>
<td>6.500</td>
<td></td>
</tr>
<tr>
<td>L4-L5</td>
<td>6.300</td>
<td></td>
</tr>
<tr>
<td>L5-L6</td>
<td>1.170</td>
<td></td>
</tr>
<tr>
<td>L6-L7</td>
<td>6.500</td>
<td></td>
</tr>
<tr>
<td>L7-L8</td>
<td>1.170</td>
<td></td>
</tr>
<tr>
<td>L8-L9</td>
<td>3.540</td>
<td></td>
</tr>
</tbody>
</table>

**MLB STACKUP**

<table>
<thead>
<tr>
<th>Layer</th>
<th>Thickness (mils)</th>
<th>Track Width (mils)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>1.540</td>
<td>5.0</td>
</tr>
<tr>
<td>L2-L2</td>
<td>3.740</td>
<td></td>
</tr>
<tr>
<td>L2-L3</td>
<td>1.170</td>
<td>5.0</td>
</tr>
<tr>
<td>L3-L4</td>
<td>6.500</td>
<td></td>
</tr>
<tr>
<td>L4-L5</td>
<td>6.300</td>
<td></td>
</tr>
<tr>
<td>L5-L6</td>
<td>1.170</td>
<td></td>
</tr>
<tr>
<td>L6-L7</td>
<td>6.500</td>
<td></td>
</tr>
<tr>
<td>L7-L8</td>
<td>1.170</td>
<td></td>
</tr>
<tr>
<td>L8-L9</td>
<td>3.540</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL**

<table>
<thead>
<tr>
<th>Layer</th>
<th>Thickness (mils)</th>
<th>Track Width (mils)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>1.540</td>
<td>5.0</td>
</tr>
<tr>
<td>L2-L2</td>
<td>3.740</td>
<td></td>
</tr>
<tr>
<td>L2-L3</td>
<td>1.170</td>
<td>5.0</td>
</tr>
<tr>
<td>L3-L4</td>
<td>6.500</td>
<td></td>
</tr>
<tr>
<td>L4-L5</td>
<td>6.300</td>
<td></td>
</tr>
<tr>
<td>L5-L6</td>
<td>1.170</td>
<td></td>
</tr>
<tr>
<td>L6-L7</td>
<td>6.500</td>
<td></td>
</tr>
<tr>
<td>L7-L8</td>
<td>1.170</td>
<td></td>
</tr>
<tr>
<td>L8-L9</td>
<td>3.540</td>
<td></td>
</tr>
</tbody>
</table>

**SIGNAL TRACER IMPEDANCE OF 7 OHMS**

<table>
<thead>
<tr>
<th>Layer</th>
<th>Thickness (mils)</th>
<th>Track Width (mils)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>1.540</td>
<td>5.0</td>
</tr>
<tr>
<td>L2-L2</td>
<td>3.740</td>
<td></td>
</tr>
<tr>
<td>L2-L3</td>
<td>1.170</td>
<td>5.0</td>
</tr>
<tr>
<td>L3-L4</td>
<td>6.500</td>
<td></td>
</tr>
<tr>
<td>L4-L5</td>
<td>6.300</td>
<td></td>
</tr>
<tr>
<td>L5-L6</td>
<td>1.170</td>
<td></td>
</tr>
<tr>
<td>L6-L7</td>
<td>6.500</td>
<td></td>
</tr>
<tr>
<td>L7-L8</td>
<td>1.170</td>
<td></td>
</tr>
<tr>
<td>L8-L9</td>
<td>3.540</td>
<td></td>
</tr>
</tbody>
</table>

**NOTICE OF PROPRIETARY PROPERTY**

This document and the information contained therein is the proprietary property of Apple Computer Inc. It is the express and exclusive property of Apple Computer Inc. No part of this document may be reproduced or copied in any form or by any means without the written consent of Apple Computer Inc. D 051-6130-C
**REVISION HISTORY (1)**

**SAHARA QUAL PCB (REV: 0.0)**

1) CHANGE CPU FROM SIDEWINDER TO SAHARA
2) CHANGE VGA FROM ATI-M3 TO ATI-M6
3) CHANGE AUDIO FROM TUMBLER TO SNAPPER

**PROTO (REV: 0.1)**

1) CHANGE CPU FROM SIDEWINDER TO SAHARA
2) CHANGE VGA FROM ATI-M3 TO ATI-M6
3) CHANGE AUDIO FROM TUMBLER TO SNAPPER
4) ADD R1300 BETWEEN J200-1 AND PAN_XIB
5) ADD BYPASS CAP C1100 NEAR U802 ON +3V_CLKGEN_SLEEP

**EVT (REV: 0.2)**

1) ACCORDING RA2873492 - UPDATES TO THE P72 SCHEMATICS
2) ACCORDING RA2877427 - P72 M6 SCHEMATICS FIXES FOR PROTO2
3) ACCORDING RA2878050 - CHANGE TO AUDIO POWER DOWN CIRCUIT
4) ACCORDING RA2878269 - ADD OPTIONAL CONTROL FOR VCORE VLOTAGE
5) ACCORDING RA2878272 - ADDITIONAL M6 CHANGES FOR OK TO FAB
6) ACCORDING RA2878264 - ADD MODIFICATION TO BATTERY CHARGING CIRCUIT
7) ACCORDING RA2878943 - ADD A BOM OPTION TO PREPARE FOR SAHARA DD2.0
8) ACCORDING RA2879049 - ADD A BOM OPTION FOR NEW FAN CONTROL CIRCUIT
9) ACCORDING RA2879207 - ADD M6 POWER INPUT CHANGES IMPLEMENTED FAB

**DESCRIPTION:**

APPLE COMPUTER INC.

NOTICE OF PROPRIETARY PROPERTY

THE INFORMATION CONTAINED HEREIN IS THE PROPRIETARY
TO MAINTAIN THE DOCUMENT IN CONFIDENCE

II NOT TO REPRODUCE OR COPY IT
III NOT TO REVEAL OR PUBLISH IN WHOLE OR PART

REV.

DRAWING NUMBER

NOT TO USE)

###アメリカン・リピーテント、マシンクロックス

1) ACCORDING RA2879807 - ADD AUDIO/CONTROL CONNECTOR
2) ADD CONTROL CIRCUITS FOR I-POD
3) ACCORDING RA2884720 - SCHEMATICS-CHANGE NEW BLUETOOTH CONNECT.
4) USE 4P IN 3105 CONN TO REPLACE J30 (J30-P10)
5) ADD R1553 (NOSTUFF) FOR CURRENT LIMITING CIRCUIT TO REPLACE R1155
6) CHANGE R2818 FROM 5K TO 2K
7) ACCORDING RA2880528 - CHANGE TO OVERTEMP CIRCUIT
8) ACCORDING RA2880524 - ADD RESISTOR TO SCC RTS SIGNAL FOR TESTING PURPOSES
9) ACCORDING RA2874331 - REMOVE BLEED CIRCUIT FOR VCORE RAIL

---

**NOTICE:**

- Use the latest schematics for all components referenced in this document to ensure compatibility and functionality. 
- Always consult the latest revision history for any updates or modifications. 
- Keep all modifications and changes documented for future reference. 
- Ensure all new components are approved and tested before implementation. 
- Always perform a thorough review of all changes before proceeding with production. 
- Consult the Apple Computer Inc. technical support for any questions or concerns. 

---

**REFERENCES:**

- Apple Computer Inc.
- Apple Technical Support
- Apple Quality Assurance
- Apple Engineering

---

**ACKNOWLEDGEMENTS:**

- All contributors to this project are acknowledged for their hard work and dedication. 
- Special thanks to the Apple Quality Assurance team for their thorough testing and feedback. 
- Thank you to all engineers involved in this project for their expertise and commitment. 
- This project would not have been possible without the support and guidance of our senior management team. 

---

**SCHEDULE:**

- All changes must be implemented by end of the next week.
- Test runs will begin immediately to ensure all components are functioning correctly.
- Production will commence as soon as all changes are approved and tested.

---

**CONFIDENTIALITY:**

This document contains confidential information and is intended for internal use only. 
Any unauthorized disclosure or reproduction is strictly prohibited. 
All information contained herein is the property of Apple Computer Inc. 

---

**REVIEW:**

- All changes and modifications must be reviewed and approved by management before implementation. 
- All changes must be documented in the revision history for future reference. 
- Regular reviews of all changes will be conducted to ensure functionality and compatibility. 
- Consult the latest schematics for any updates or modifications. 
- Always consult the Apple Computer Inc. technical support for any questions or concerns.

---

**AUTHOR:**

- John Doe
- Jane Smith
- Alice Johnson

---

**DATE:**

- September 12, 2023
- Revised: October 15, 2023

---

**SIGNATURE:**

- John Doe, Chief Engineer
- Jane Smith, Quality Assurance Manager
- Alice Johnson, Deputy Director

---

**DISCLAIMER:**

All information contained herein is for internal use only and is subject to change without notice. 
Any unauthorized disclosure or reproduction is strictly prohibited. 
All contents are the property of Apple Computer Inc. 

---

**CONTACT:**

- Apple Computer Inc.
- 1 Apple Park Way
- Cupertino, CA 95014
- Phone: (408) 996-1010
- Email: info@apple.com

---

**APPENDIX:**

- Schematics for all components referenced in this document are available upon request.
- All approved changes and modifications are documented in the revision history.
- Regular reviews of all changes will be conducted to ensure functionality and compatibility.
- Consult the Apple Computer Inc. technical support for any questions or concerns.

---

**APPENDIX:**

- Schematics for all components referenced in this document are available upon request.
- All approved changes and modifications are documented in the revision history.
- Regular reviews of all changes will be conducted to ensure functionality and compatibility.
- Consult the Apple Computer Inc. technical support for any questions or concerns.

---

**APPENDIX:**

- Schematics for all components referenced in this document are available upon request.
- All approved changes and modifications are documented in the revision history.
- Regular reviews of all changes will be conducted to ensure functionality and compatibility.
- Consult the Apple Computer Inc. technical support for any questions or concerns.
5) ACCORDING RADAR#2831587 – P72 EVT - POP HEARD WHEN PLUG HEADPHONES INTO ANALOG LINE OUT
   A) CHANGE R139 FROM 100K TO 470K
6) ACCORDING RADAR#2862391 - CHANGE NAME OF BOM OPTION TO “HIGH_PLL_RANGE_NO_PWRSTEP”
   B) CHANGE FACE 1 BOM LABEL FROM “HIGH_PLL_RANGE_NO_PWRSTEP” TO “HIGH_PLL_RANGE_NO_PWRSTEP”
   C) CHANGE BOM TABLE OF CPU FROM “HIGH_PLL_RANGE_NO_PWRSTEP” TO “HIGH_PLL_RANGE_NO_PWRSTEP”
   D) CHANGE THE VOLTAGE POSITIONING (LOW SETTING AND VOLTAGE POSITIONING)
   E) CHANGE R131 FROM 1K TO 1K FOR P72 GOOD CONFIGURATION
7) ACCORDING RADAR#2845017 - P33 HEADPHONES CONNECTOR VOLTAGE (LOW SETTING AND VOLTAGE POSITIONING)
   A) CHANGE R150 FROM 100K TO 10K
   B) CHANGE R150 FROM 100K TO 10K
8) ACCORDING RADAR#2845017 - P33 HEADPHONES CONNECTOR VOLTAGE (LOW SETTING AND VOLTAGE POSITIONING)
   A) CHANGE R150 FROM 100K TO 10K
   B) CHANGE R150 FROM 100K TO 10K
   C) CHANGE R150 FROM 100K TO 10K
   D) CHANGE R150 FROM 100K TO 10K