Macromodular Computer Design, Part 2, Volume 06, Printed Circuit Board Outlines and Electronic Package Mechanical Drawings

Computer Systems Laboratory, Washington University

Follow this and additional works at: http://digitalcommons.wustl.edu/bcl_techreports

Recommended Citation
http://digitalcommons.wustl.edu/bcl_techreports/11

This Technical Report is brought to you for free and open access by the Institute for Biomedical Computing at Digital Commons@Becker. It has been accepted for inclusion in Technical Reports by an authorized administrator of Digital Commons@Becker. For more information, please contact engeszer@wustl.edu.
This work has been supported by the Advanced Research Projects Agency of the Department of Defense under Contract SD-302 and by the Division of Research Facilities and Resources of the National Institutes of Health under Grant RR-00396. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the Advanced Research Projects Agency or the U.S. Government.

Computer Systems Laboratory
Washington University
St. Louis, Missouri
COMPLETE MECHANICAL DRAWINGS REGARDING THE MANUFACTURE OF COMPONENTS AND ASSEMBLY SPECIFICATIONS FOR THE MACROMODULAR ELECTRONIC CASES AND PRINTED CIRCUIT BOARD ROUTING DIMENSIONS FOR MACROMODULAR ELECTRONIC ASSEMBLIES ARE GIVEN.
INDEX

PRINTED CIRCUIT BOARD OUTLINES AND LAYOUT GUIDES
PAGES 200.50D2 thru 200.50D48

SINGLE CELL ELECTRONICS CASE
PAGES 200.1-1 thru 200.1-5

DOUBLE CELL ELECTRONICS CASE
PAGES 200.2-1 thru 200.2-5

TRIPLE CELL ELECTRONICS CASE
PAGES 200.3-1 thru 200.3-5

FOUR CELL ELECTRONICS CASE
PAGES 200.4-1 thru 200.4-5

GRILL SUBASSEMBLY
PAGES 200.10-1 thru 200.10-10

SHROUD SUBASSEMBLY
PAGES 200.11-1 thru 200.11-8

ELECTRONIC CASE, METAL PARTS
PAGES 200.12-1 thru 200.12-9
1. RONDED FILLETS CUT WITH 0.025 DIA. ROUTING CUTTER.
2. CUT TWO NOTCHES 0.150 2 DOG DEEP WITH 0.025 DIA. ROUTING CUTTER.

2 ZEROS DATUM REFERENCE HOLES.
GROSS DIA 0.002.
NOTE:

1. CIRCLED NUMBERS refer to number of spaces on 0.050 grid for 4x4 layout master.
2. NO SIGNAL OR POWER PATHS WITHIN 0.050 OF TARGET CENTERS.

PAD SIZES FOR 4X4 ARTWORK
A. TARGET
C. 0.250 D.

NOTE 2
COPPER LIMIT

0.375

PAD CENTER

0.125

0.475

0.75

COPPER LIMIT

1.5625

1.375

2.625

2.50

MACROMODULAR PROJECT

PAD LAYOUT--SHORT MOTHERBOARD
NOTES:
1. CIRCLED NUMBERS (O) REFER TO NUMBER OF SPACES ON GRID (200,500MM) LAYOUT MASTERS.
2. COPPER LIMITS APPLY TO BOTH BLANKED AND ROUTED BOARDS.
3. TARGETS ARE REGISTRATION MARKS DEFINED BY DRAWINGS 200.5005 OR 200.5005.
NOTES:
1. TWO OF THE WIRES COMING OUT OF T2 WILL BE TWISTED TOGETHER. THESE TWO WIRES ARE INSERTED INTO THE TWO HOLES MARKED "8". THE OTHER TWO WIRES ARE INSERTED INTO THE HOLES MARKED "7" AND "9" IN ANY ORDER.
2. L1, L2, AND T2 ARE MOUNTED WITH RTV SILICONE RUBBER BETWEEN THE PACKAGE AND THE PRINTED CIRCUIT BOARD.
3. L2 IS MOUNTED TO PROVIDE MAXIMUM SPACING BETWEEN L2 AND C2.
AMP CONNECTOR
1-202 845-5

EAR OF CONNECTOR ON COMPONENT SIDE OF BOARD
(NO. - THIS DETAIL APPLIES ONLY TO ASSEMBLIES USING CIRCUIT BOARDS WITH PREFIX PTT. FOR BOTTOM MOTHER BOARDS WITH PREFIX PTB, REFER TO DRAWING 200.50D27.)

NOTE: EYELET MUST BE FASTENED IN ROUND HOLE IN P.C. BOARD FIRST - FOR PROPER ALIGNMENT

MALE AMPMODU PINS -85931-5

COMPONENT SIDE

E. B. STIMPSON EYELET A1475 MUST BE PRESSED, NOT STAMPED OR CONNECTOR WILL BREAK

SIGNAL SIDE

NOTE: EYELET MUST BE FASTENED IN ROUND HOLE IN P.C. BOARD FIRST - FOR PROPER ALIGNMENT

COMPONENT SIDE

MACROMODULAR PROJECT

COMPUTER SYSTEMS LABORATORY
WASHINGTON UNIVERSITY
ST. LOUIS, MISSOURI

TITLE TOP MOTHERBOARD CONNECTOR ORIENTATION

MACROMODULAR PROJECT

CHANGE NO. DATE DESCRIPTION

TITLE
COMPUTER SYSTEMS LABORATORY
WASHINGTON UNIVERSITY
ST. LOUIS, MISSOURI

TITLE
MACROMODULAR PROJECT

SIGNAL SIDE
E.B. STIMPSON EYELET
A 1425 MUST BE PRESSED.
NOT STAMPED OR CONNECTOR
WILL BREAK

AMP CONNECTOR
1-202 845-5

EAR OF CONNECTOR ON
 SIGNAL SIDE OF BOARD ON
BOTTOM MOTHERBOARD ONLY.
(NOTE - THIS DETAIL APPLIES
ONLY TO ASSEMBLIES USING
CIRCUIT BOARDS WITH PREFIX
PTB. FOR TOP MOTHERBOARDS
USING PREFIX PTB, REFER TO
DRAWING 200.50D26)

NOTE: EYELET MUST BE
FASTENED IN ROUND HOLE
IN P.C. BOARD FIRST FOR
PROPER ALIGNMENT

COMPONENT SIDE

MALE AMPMODU
PINS =53331-3

SIGNAL SIDE

COMPUTER SYSTEMS LABORATORY
WASHINGTON UNIVERSITY
ST. LOUIS, MISSOURI

MACROMODULAR PROJECT

BOTTOM MOTHERBOARD
CONNECTOR ORIENTATION

<table>
<thead>
<tr>
<th>APPROVED</th>
<th>ENG.</th>
<th>DRAWING NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BY</td>
<td>FOR</td>
<td>DATE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHECKED</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE</td>
</tr>
<tr>
<td>8.9/70</td>
</tr>
</tbody>
</table>
**NOTE:** EYELET MUST BE FASTENED IN ROUND HOLE IN P.C. BOARD FIRST FOR PROPER ALIGNMENT

**NOTE:** THIS DETAIL APPLIES ONLY TO ASSEMBLIES USING CIRCUIT BOARDS WITH PREFIX PTL. FOR MOTHER BOARDS USING PTF, REFER TO DRAWING 200.50029

---

**COMPONENT SIDE**

- AMP CONNECTOR e583464-1
- EAR OF CONNECTOR ON COMPONENT SIDE OF BOARD

**SIGNAL SIDE**

- E.B. STIMPSON EYELET e1425
- MUST BE PRESSED AND NOT STAMPED OR CONNECTOR WILL BREAK

---

**COMPUTER SYSTEMS LABORATORY**

WASHINGTON UNIVERSITY
ST. LOUIS, MISSOURI

**MACROMODULAR PROJECT**

<table>
<thead>
<tr>
<th>CHANGE NO.</th>
<th>DATE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>TITLE</th>
<th>LATERAL MOTHERBOARD CONNECTOR ORIENTATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>APPROVED</td>
</tr>
<tr>
<td></td>
<td>FOR</td>
</tr>
<tr>
<td></td>
<td>DATE</td>
</tr>
<tr>
<td></td>
<td>DRAWN BY</td>
</tr>
<tr>
<td></td>
<td>CHECKED</td>
</tr>
<tr>
<td></td>
<td>DATE</td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>200.50028</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8-9-70</td>
</tr>
</tbody>
</table>
EAR OF CONNECTOR ON COMPONENT SIDE OF BOARD

(NOTE - THIS DETAIL APPLIES ONLY TO ASSEMBLIES USING CIRCUIT BOARDS WITH PREFIX PTF. FOR MOTHER BOARDS USING PTL, REFER TO DRAWING 200.50028)

AMP CONNECTOR #583464-1

E.B. STIMPSON EYELET +A 1425
MUST BE Pressed AND NOT STAMPED OR CONNECTOR WILL BREAK.

NOTE: EYELET MUST BE FASTENED IN ROUND HOLE IN P.C. BOARD FIRST FOR PROPER ALIGNMENT.

COMPONENT SIDE

MACROMODULAR PROJECT

TITLE
FACEPLATE MOTHERBOARD CONNECTOR ORIENTATION

COMPUTER SYSTEMS LABORATORY
WASHINGTON University
ST. LOUIS, Missouri

DRAWING NO. 200.50029

CHECKED MTK 8-9-70

NOTE: This detail applies only to assemblies using circuit boards with prefix PTF. For mother boards using PTL, refer to drawing 200.50028.

Ear of connector on component side of board.

AMP connector #583464-1.

E.B. Stimpson eyelet +A 1425 must be pressed and not stamped or connector will break.

Note: Eyelet must be fastened in round hole in P.C. board first for proper alignment.

Component side.

Macromodular project.
NOTES:
1. Registration holes (two) drill 0.125 ± 0.002
2. Handle mounting holes (three) drill 0.125 ± 0.002
3. Perforated circuit specification PC-1 applies
4. Gold plating of fingers to extend to within 1/8" of this line. Plating should not extend beyond this line.

BEVEL BOARDS AFTER PLATING FINGERS

GOLD PLATE FINGER

DIMENSIONS: ±0.005 U.O.N.
NOTES:
1. REGISTRATION TARGET

USE CHART-PAPER RD-443 OR EQUIVALENT (FIVE PLACES)
2. HANDLE MOUNTING HOLE LOCATIONS (THREE PLACES)
3. COPPER LIMIT FOR TAPING
4. COPPER LIMIT FOR BLANK BOARD OR SPECIAL CIRCUMSTANCES
5. CIRCUIT BOARD SHOWN FROM ETCH SIDE, COMPONENTS MOUNT FROM REVERSE SIDE.
6. DIMENSIONS ARE SHOWN AS
7. NUMBER REFERS TO THE DISTANCE FROM THE ZERO REFERENCE LINE IN UNITS OF 0.005 INCH REFERENCE GRID.

FINGER PLATING LINE

TYP.
NOTES:
1. DO NOT SCALE FROM PRINT.
2. MATERIAL IS T2024-T3 ALUM
3. TOLERANCES ±.005 U.N.
4. MARKED SURFACES TO BE MILLED FLAT.
5. EDGES ARE TO BE FREE OF BURRS.
NOTES
1. DO NOT SCALE FROM PRINT.
2. MATERIAL IS T2024-T3 ALUM.
3. TOLERANCES ±.005 U.O.N.
4. MARKED SURFACES TO BE MILLED FLAT.
5. EDGES ARE TO BE FREE OF BURRS.
NOTE:
SHELL - 9 HOLES 90°, IN LOCATIONS ABDUPE AFTER READING. NO REPLACED MATERIAL AND NOT EXTENDED. NO TRAPEZOIDAL HOLE PERMITTED. AREA OF SHELL 9 NO LARGER THAN 1/2 IN. ABOVE THE ETCHED SURFACE.

COMPUTER SYSTEMS LABORATORY
WASHINGTON UNIVERSITY
ST. LOUIS, MISSOURI

MACROMODULAR PROJECT

CHANNEL INTERCONNECTION
CIRCUIT BOARD ASSEMBLY

DATE: 11-21-70

S. S. 2000 EDBW

RECEIVED

MACROMODULAR PROJECT

CHANNEL INTERCONNECTION
CIRCUIT BOARD ASSEMBLY

DATE: 11-21-70

S. S. 2000 EDBW

RECEIVED
2 ZERO DATUM REFERENCE HOLES
D0.05 DIA. ± 0.002

NOTES:
1. ROUNDED FILLETS CUT WITH 0.025 DIA.
   ROUTING CUTTER
2. CUT TWO NOTCHES 0.010 x 1.000 DEEP
   WITH D0.05 DIA. ROUTING CUTTER
3. CUT OFF MEMORY DATA REGISTERS 4 SENSE
   AND BOARD 55% 511 X 6200 HIGHERS
   FROM RIGHT HAND TARGET AFTER ROUTING.
MINIMUM BORDER .200
4 SIDES

DRILL NO. 42
2 HOLES
ALL OTHER HOLES
TYPE "B"

.225 MAX.

GOLD PLATE BELOW LINE -
SEE SPECIFICATION PC-1

COMPUTER SYSTEMS LABORATORY
WASHINGTON UNIVERSITY
ST. LOUIS, MISSOURI

MACROMODULAR PROJECT
TITLE
FUNCTION CALLER CABLE
P.C BOARD PRODUCTION GUIDE

RJA PROD 7-3-73
DRAWN BY
MAC

RJA
CHECKED
DATE
7-3-73
**DRILL NO. 42 2 HOLES DIMENSION BOARD**

<table>
<thead>
<tr>
<th>DIMENSION A</th>
<th>BOARD NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>.200</td>
<td>WCL0211</td>
</tr>
<tr>
<td>.400</td>
<td>WCL0213</td>
</tr>
</tbody>
</table>

**MATERIAL: 1/16 DOUBLE SIDED P.C. STOCK**

**ALL DIMENSIONS ±.005 U.O.N.**

**CHAMFER .050 x 45°**
- 4 P.L.C.

**CHAMFER 1/8 x 45°**
- 4 Corners

**COMPUTER SYSTEMS LABORATORY**

**WASHINGTON UNIVERSITY**

**ST LOUIS, MISSOURI**

**MACROMODULAR PROJECT**

**TITLE:** FUNCTION CALLER CABLE

**P.C. BOARD - ROUTING DIMENSIONS**

**DRAWING NO:** 200.50048

**DRAUGHTED BY:** MAC

**CHECKED BY:** JKA

**DATE:** 7-3-73

**APPROVED BY:** RJA
<table>
<thead>
<tr>
<th>PAGE</th>
<th>TITLE</th>
<th>CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>200.1-1</td>
<td>TITLE PAGE</td>
<td>A</td>
</tr>
<tr>
<td>200.1-2</td>
<td>PARTS LIST</td>
<td>A</td>
</tr>
<tr>
<td>200.1-3</td>
<td>SINGLE CELL CASE - DESCRIPTION</td>
<td>A</td>
</tr>
<tr>
<td>200.1-4</td>
<td>SINGLE CELL COVER SUB ASSEMBLY</td>
<td></td>
</tr>
<tr>
<td>200.1-5</td>
<td>SINGLE CELL CASE ASSEMBLY</td>
<td></td>
</tr>
</tbody>
</table>

**CHG. E.C.O. DATE APPR CHG. E.C.O. DATE APPR CHG. E.C.O. DATE APPR**

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>DATE</th>
<th>APPR</th>
<th>ISSUE</th>
<th>DATE</th>
<th>APPR</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4-1-71</td>
<td></td>
<td>0181</td>
<td>5-19-71</td>
<td>DKO</td>
</tr>
</tbody>
</table>

MACROMODULAR SYSTEMS PROJECT
# SINGLE CELL ELECTRONICS CASE
## PARTS LIST

<table>
<thead>
<tr>
<th>QTY</th>
<th>C.S.L. DOC.</th>
<th>PART</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>200.12-4</td>
<td>COVER PLATE</td>
</tr>
<tr>
<td>1</td>
<td>200.12-5</td>
<td>GUIDE PLATE PAIR</td>
</tr>
<tr>
<td>1</td>
<td>200.12-5</td>
<td>PLUG BRACKET PAIR</td>
</tr>
<tr>
<td>1</td>
<td>200.10</td>
<td>GRILL SUB ASSEMBLY</td>
</tr>
<tr>
<td>1</td>
<td>200.11</td>
<td>SHROUD SUB ASSEMBLY</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>1/8 x .086 DIA. SHALLOW OVAL HEAD NICKEL PLATED STEEL RIVETS</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>#2-56 x 3/16 FLATHEAD SOCKET CAP SCREWS</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>#5-40 x 1/4 FLATHEAD SOCKET CAP SCREWS</td>
</tr>
</tbody>
</table>

**CHG | E.C.O | DATE | APPR  | CHG | E.C.O | DATE | APPR  | CHG | E.C.O | DATE | APPR**

**ISSUE**

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>DATE</th>
<th>APPR</th>
<th>CHG</th>
<th>E.C.O</th>
<th>DATE</th>
<th>APPR</th>
<th>CHG</th>
<th>E.C.O</th>
<th>DATE</th>
<th>APPR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4-1-71</td>
<td>RJA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MACROMODULAR SYSTEMS PROJECT**

200.1-2
SINGLE CELL ELECTRONICS CASE - DESCRIPTION

The single cell electronics case is a protective metal shell that houses printed circuit boards and associated components and provides mechanical alignment for engagement of electrical connectors. In addition, the geometry of the case serves as ducting to allow air flow over electronic components housed therein.

The single cell case is made from four sub-assemblies - the cover, grill, shroud, and bracket pair. The cover and grill are assembled together prior to insertion of printed circuit boards while the shroud and bracket pair are assembled with the boards being loaded into the case.

Page no's. 200.1-4 and 200.1-5 are a set of mechanical drawings and illustrations describing components and assembly of the single cell electronics case. All tolerances and specifications relating to the case must be adhered to in order to produce acceptable assemblies. The manufacturer must assure himself that these requirements can be met by analyzing component and assembly documentation, his tooling, and characteristics of his production processes.
SIDE VIEW

COVER PLATE 200.12-4

LH GUIDE PLATE 200.12-5

COVER PLATE 200.12-4

RIVETS (FLUSH INSIDE & OUTSIDE)

GUIDE PLATE PAIR 200.12-5

COVER PLATE 200.12-4

FRONT END VIEW

COMPUTER SYSTEMS LABORATORY
WASHINGTON UNIVERSITY
ST. LOUIS, MISSOURI

MACROMODULAR PROJECT

TITLE
SINGLE-CELL CASE SUB-ASSEMBLY

ISSUE 3-11-7 R V A

DATE
DESCRIPTION

200.1-4

200.1-4

DRAFT

REVISED 9-11-69

PROD. 4-7-71

WILL NOT

PLC
# Double Cell Electronics Case

## Title Page

<table>
<thead>
<tr>
<th>PAGE</th>
<th>TITLE</th>
<th>CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>200.2-1</td>
<td>TITLE PAGE</td>
<td>A</td>
</tr>
<tr>
<td>200.2-2</td>
<td>PARTS LIST</td>
<td></td>
</tr>
<tr>
<td>200.2-3</td>
<td>DOUBLE CELL CASE - DESCRIPTION</td>
<td>A</td>
</tr>
<tr>
<td>200.2-4</td>
<td>DOUBLE CELL COVER SUB ASSEMBLY</td>
<td></td>
</tr>
<tr>
<td>200.2-5</td>
<td>DOUBLE CELL CASE ASSEMBLY</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHG.</th>
<th>E.C.O.</th>
<th>DATE</th>
<th>APPR</th>
<th>CHG</th>
<th>E.C.O.</th>
<th>DATE</th>
<th>APPR</th>
<th>CHG</th>
<th>E.C.O.</th>
<th>DATE</th>
<th>APPR</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISSUE</td>
<td></td>
<td>4-1-71</td>
<td>PJA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>0182</td>
<td>5-19-71</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Computer Systems Laboratory: Washington University**

---

200.2-1
# DOUBLE CELL ELECTRONICS CASE
## PARTS LIST

<table>
<thead>
<tr>
<th>QTY.</th>
<th>C.S.L. DOC.</th>
<th>PART</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>200.12-4</td>
<td>COVER PLATE</td>
</tr>
<tr>
<td>2</td>
<td>200.12-5</td>
<td>GUIDE PLATE PAIR</td>
</tr>
<tr>
<td>1</td>
<td>200.12-7</td>
<td>DOUBLE CELL FILLER STRIP PAIR</td>
</tr>
<tr>
<td>2</td>
<td>200.12-6</td>
<td>PLUG BRACKET PAIR</td>
</tr>
<tr>
<td>2</td>
<td>200.10</td>
<td>GRILL SUB ASSEMBLY</td>
</tr>
<tr>
<td>2</td>
<td>200.11</td>
<td>SHROUD SUB ASSEMBLY</td>
</tr>
<tr>
<td>24</td>
<td></td>
<td>1/8 x .086 DIA SHALLOW OVAL HEAD NICKEL PLATED STEEL RIVETS</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>#2-56 x 3/16 FLATHEAD SOCKET CAP SCREWS</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>#5-40 x 1/4 FLATHEAD SOCKET CAP SCREWS</td>
</tr>
</tbody>
</table>

**MACROMODULAR SYSTEMS PROJECT**

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>DATE</th>
<th>APPR.</th>
<th>CHG</th>
<th>E.C.O</th>
<th>DATE</th>
<th>APPR.</th>
<th>CHG</th>
<th>E.C.O</th>
<th>DATE</th>
<th>APPR.</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-1-71</td>
<td>RJA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

200.2-2
DOUBLE CELL ELECTRONICS CASE - DESCRIPTION

The double cell electronics case is a protective metal shell that houses printed circuit boards and associated components and provides mechanical alignment for engagement of electrical connectors. In addition, the geometry of the case serves as ducting to allow air flow over electronic components housed therein.

The double cell case is made from four sub-assemblies - the cover, grill, shroud, and bracket pair. The cover and grill are assembled together prior to insertion of printed circuit boards while the shroud and bracket pair are assembled with the boards being loaded into the case.

Page no's. 200.2-4 and 200.2-5 are a set of mechanical drawings and illustrations describing components and assembly of the double cell electronics case. All tolerances and specifications relating to the case must be adhered to in order to produce acceptable assemblies. The manufacturer must assure himself that these requirements can be met by analyzing component and assembly documentation, his tooling, and characteristics of his production processes.
GRILL SUB-ASSEMBLY
200.10

COVER PLATE
200.12-4

PLUG BRACKET
200.12-6

FILLER STRIP
DOUBLE CELL CASE
200.12-7

SHROUD SUB-ASSEMBLY
200.11

COVER PLATE
200.12-4

GUIDE PLATE
200.12-5

PLUG BRACKET SCREW

GRILL SCREW
# TRIPLE CELL ELECTRONICS CASE

<table>
<thead>
<tr>
<th>PAGE</th>
<th>TITLE</th>
<th>CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>200.3-1</td>
<td>TITLE PAGE</td>
<td>A</td>
</tr>
<tr>
<td>200.3-2</td>
<td>PARTS LIST</td>
<td></td>
</tr>
<tr>
<td>200.3-3</td>
<td>TRIPLE CELL CASE – DESCRIPTION</td>
<td>A</td>
</tr>
<tr>
<td>200.3-4</td>
<td>TRIPLE CELL COVER SUB ASSEMBLY</td>
<td></td>
</tr>
<tr>
<td>200.3-5</td>
<td>TRIPLE CELL CASE ASSEMBLY</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHG.</th>
<th>E.C.O.</th>
<th>DATE</th>
<th>APPR</th>
<th>CHG.</th>
<th>E.C.O.</th>
<th>DATE</th>
<th>APPR</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISSUE</td>
<td></td>
<td>4-1-71</td>
<td>RJA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>0183</td>
<td>5-19-71</td>
<td>DNO</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MACROMODULAR SYSTEMS PROJECT

200.3-1
### TRIPLE CELL ELECTRONICS CASE
#### PARTS LIST

<table>
<thead>
<tr>
<th>QTY</th>
<th>C.S.L. DOC.</th>
<th>PART</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>200.12-4</td>
<td>COVER PLATE</td>
</tr>
<tr>
<td>3</td>
<td>200.12-5</td>
<td>GUIDE PLATE PAIR</td>
</tr>
<tr>
<td>1</td>
<td>200.12-8</td>
<td>TRIPLE CELL FILLER STRIP PAIR</td>
</tr>
<tr>
<td>3</td>
<td>200.12-6</td>
<td>PLUG BRACKET PAIR</td>
</tr>
<tr>
<td>3</td>
<td>200.10</td>
<td>GRILL SUB ASSEMBLY</td>
</tr>
<tr>
<td>3</td>
<td>200.11</td>
<td>SHROUD SUB ASSEMBLY</td>
</tr>
<tr>
<td>36</td>
<td></td>
<td>1/8 x .086 DIA SHALLOW OVAL HEAD NICKEL PLATED STEEL RIVETS</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>#2-56 x 3/16 FLATHEAD SOCKET CAP SCREWS</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>#5-40 x 1/4 FLATHEAD SOCKET CAP SCREWS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHG</th>
<th>E.C.O</th>
<th>DATE</th>
<th>APPR</th>
<th>CHG</th>
<th>E.C.O</th>
<th>DATE</th>
<th>APPR</th>
<th>CHG</th>
<th>E.C.O</th>
<th>DATE</th>
<th>APPR</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISSUE</td>
<td></td>
<td>4-1-71</td>
<td>RJA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MACROMODULAR SYSTEMS PROJECT

200.3-2
TRIPLE CELL ELECTRONICS CASE - DESCRIPTION

The triple cell electronics case is a protective metal shell that houses printed circuit boards and associated components and provides mechanical alignment for engagement of electrical connectors. In addition, the geometry of the case serves as ducting to allow air flow over electronic components housed therein.

The triple cell case is made from four sub-assemblies - the cover, grill, shroud, and bracket pair. The cover and grill are assembled together prior to insertion of printed circuit boards while the shroud and bracket pair are assembled with the boards being loaded into the case.

Page no's. 200.3-4 and 200.3-5 are a set of mechanical drawings and illustrations describing components and assembly of the triple cell electronics case. All tolerances and specifications relating to the case must be adhered to in order to produce acceptable assemblies. The manufacturer must assure himself that these requirements can be met by analyzing component and assembly documentation, his tooling, and characteristics of his production processes.
# FOUR CELL ELECTRONICS CASE

<table>
<thead>
<tr>
<th>PAGE</th>
<th>TITLE</th>
<th>CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>200.4-1</td>
<td>TITLE PAGE</td>
<td>A</td>
</tr>
<tr>
<td>200.4-2</td>
<td>PARTS LIST</td>
<td></td>
</tr>
<tr>
<td>200.4-3</td>
<td>FOUR CELL CASE – DESCRIPTION</td>
<td>A</td>
</tr>
<tr>
<td>200.4-4</td>
<td>FOUR CELL COVER SUB ASSEMBLY</td>
<td></td>
</tr>
<tr>
<td>200.4-5</td>
<td>FOUR CELL CASE ASSEMBLY</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHG.</th>
<th>E.C.O.</th>
<th>DATE</th>
<th>APPR</th>
<th>CHG.</th>
<th>E.C.O.</th>
<th>DATE</th>
<th>APPR</th>
<th>CHG.</th>
<th>E.C.O.</th>
<th>DATE</th>
<th>APPR</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISSUE</td>
<td></td>
<td>4-1-71</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>0184</td>
<td>5-19-71</td>
<td>DAO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MACROMODULAR SYSTEMS PROJECT

200.4-1
# FOUR CELL ELECTRONICS CASE
## PARTS LIST

<table>
<thead>
<tr>
<th>QTY</th>
<th>C.S.L. DOC.</th>
<th>PART</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>200.12-4</td>
<td>COVER PLATE</td>
</tr>
<tr>
<td>4</td>
<td>200.12-5</td>
<td>GUIDE PLATE PAIR</td>
</tr>
<tr>
<td>1</td>
<td>200.12-9</td>
<td>FOUR CELL FILLER STRIP PAIR</td>
</tr>
<tr>
<td>4</td>
<td>200.12-6</td>
<td>PLUG BRACKET PAIR</td>
</tr>
<tr>
<td>4</td>
<td>200.10</td>
<td>GRILL SUBASSEMBLY</td>
</tr>
<tr>
<td>4</td>
<td>200.11</td>
<td>SHROUD SUB ASSEMBLY</td>
</tr>
<tr>
<td>48</td>
<td></td>
<td>1/8 x .086 DIA. SHALLOW OVAL HEAD NICKEL PLATED STEEL RIVETS</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>#2-56 x 3/16 FLATHEAD SOCKET CAP SCREWS</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>#5-40 x 1/4 FLATHEAD SOCKET CAP SCREWS</td>
</tr>
</tbody>
</table>

---

**CHG** | **E.C.O** | **DATE** | **APPR** | **CHG** | **E.C.O** | **DATE** | **APPR** | **CHG** | **E.C.O** | **DATE** | **APPR**
---|----|--------|-------|----|--------|-------|--------|----|--------|-------|--------
ISSUE | | 4-1-71 | RJA   | | | | | | | |
FOUR CELL ELECTRONICS CASE - DESCRIPTION

The four cell electronics case is a protective metal shell that houses printed circuit boards and associated components and provides mechanical alignment for engagement of electrical connectors. In addition, the geometry of the case serves as ducting to allow for air flow over electronic components housed therein.

The four cell case is made from four sub-assemblies - the cover, grill, shroud, and bracket pair. The cover and grill are assembled together prior to insertion of printed circuit boards while the shroud and bracket pair are assembled with the boards being loaded into the case.

Page no's. 200.4-4 and 200.4-5 are a set of mechanical drawings and illustrations describing components and assembly of the four cell electronics case. All tolerances and specifications relating to the case must be adhered to in order to produce acceptable assemblies. The manufacturer must assure himself that these requirements can be met by analyzing component and assembly documentation, his tooling, and characteristics of his production processes.
### PAGE TITLE CHANGE

<table>
<thead>
<tr>
<th>PAGE</th>
<th>TITLE</th>
<th>CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>200.10-1</td>
<td>TITLE PAGE</td>
<td>B</td>
</tr>
<tr>
<td>200.10-2</td>
<td>PARTS LIST</td>
<td>B</td>
</tr>
<tr>
<td>200.10-3</td>
<td>GRILL SUB ASSEMBLY - DESCRIPTION</td>
<td></td>
</tr>
<tr>
<td>200.10-4</td>
<td>GRILL SUB ASSEMBLY</td>
<td></td>
</tr>
<tr>
<td>200.10-5</td>
<td>VERTICAL FIN</td>
<td></td>
</tr>
<tr>
<td>200.10-6</td>
<td>END FIN</td>
<td>A</td>
</tr>
<tr>
<td>200.10-7</td>
<td>HORIZONTAL FIN</td>
<td></td>
</tr>
<tr>
<td>200.10-8</td>
<td>TIE BRACKET</td>
<td></td>
</tr>
<tr>
<td>200.10-9</td>
<td>TRIM STRIP</td>
<td></td>
</tr>
<tr>
<td>200.10-10</td>
<td>LOCK STRIP</td>
<td></td>
</tr>
</tbody>
</table>

### ISSUE HISTORY

<table>
<thead>
<tr>
<th>CHG.</th>
<th>E.C.O.</th>
<th>DATE</th>
<th>APPR</th>
<th>CHG.</th>
<th>E.C.O.</th>
<th>DATE</th>
<th>APPR</th>
<th>CHG.</th>
<th>E.C.O.</th>
<th>DATE</th>
<th>APPR</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISSUE</td>
<td></td>
<td>3-31-71</td>
<td>RJA</td>
<td>A</td>
<td>0248</td>
<td>1-24-72</td>
<td>RJA</td>
<td>B</td>
<td>0251</td>
<td>2-1-72</td>
<td>RJA</td>
</tr>
</tbody>
</table>

MACROMODULAR SYSTEMS PROJECT
## GRILL SUBASSEMBLY
### PARTS LIST

<table>
<thead>
<tr>
<th>QTY</th>
<th>C.S.L. DOC.</th>
<th>PART</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>200.10-5</td>
<td>VERTICAL FIN</td>
</tr>
<tr>
<td>2</td>
<td>200.10-6</td>
<td>END FIN</td>
</tr>
<tr>
<td>7</td>
<td>200.10-7</td>
<td>HORIZONTAL FIN</td>
</tr>
<tr>
<td>2</td>
<td>200.10-8</td>
<td>TIE BRACKET</td>
</tr>
<tr>
<td>2</td>
<td>200.10-9</td>
<td>TRIM STRIP</td>
</tr>
<tr>
<td>2</td>
<td>200.10-10</td>
<td>LOCK STRIP</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>3/32 DIA. x 9/32 FLATHEAD BLACK ANODIZED ALUMINUM RIVETS</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>3/32 DIA. x 5/32 FLATHEAD BLACK ANODIZED ALUMINUM RIVETS</td>
</tr>
</tbody>
</table>

### CHG E.C.O. DATE APPR

<table>
<thead>
<tr>
<th>CHG</th>
<th>E.C.O.</th>
<th>DATE</th>
<th>APPR</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISSUE</td>
<td>—</td>
<td>3-31-71</td>
<td>RJA</td>
</tr>
<tr>
<td>B</td>
<td>0251</td>
<td>2-1-72</td>
<td>RJA</td>
</tr>
</tbody>
</table>

**MACROMODULAR SYSTEMS PROJECT**

200.10-2
The grill sub-assembly described in this document is used in various numbers, in the assembly of the four types of electronics cases. The number of grills required for a particular case is equal to the name of the case type i.e. a single cell case would require one grill sub-assembly while a four cell case would require four grills.

The grill serves three main functions - it provides mechanical protection and support for circuit boards housed within an electronics case and allows air flow through the case to convectively cool electronic components.

Page no's. 200.10-4 through 200.10-10 are a complete set of mechanical drawings and illustrations fully describing components and assembly of the grill. Each drawing contains tolerance specifications relating to the various parts. All tolerances and specifications contained herein must be adhered to in order to produce acceptable assemblies. The manufacturer must assure himself that these requirements can be met by analyzing components and assembly documentation, his tooling and characteristics of his production processes.
VERTICAL FIN
MAT'L: .030 ALUM-6061
FINISH: CSL SPEC MF 2
SCALE 2:1
DRILL .098 D 2 HOLES

0.015 X 45° CHAMFER (2 PLACES)

#43 DRILL 2 HOLES

.050 X 45° CHAMFER (2 PLACES)

END FIN
.062 ALUM-6061
FINISH: CSL SPEC. MF2
SCALE 2:1
HORIZONTAL FIN
MAT'L: 0.030 ALUM.-6064
FINISH: CSL SPEC. MF 2

SCALE 2:1

ISSUE 3-31-71 RJA

CHANGE NO. DATE DESCRIPTION

COMPUTER SYSTEMS LABORATORY
WASHINGTON UNIVERSITY
ST. LOUIS, MISSOURI

MACROMODULAR PROJECT

HORIZONTAL FIN

APPROVED ENG. DRAWING NO.

WAC 200 10-7

PROD. 4-7-71 DRAWN BY
WPL

RJA 8-31-68 CHECKED
TIE BRACKET

.062 ALUM.-6061
FINISH CSL SPEC MF 2
SCALE 2:1

#43 DRILL (2 PLACES)

.020 X 45° CHAMFER BOTH SIDES

DRILL & TAP FOR 2-56

.098

.102

.069

.0573

.0670

.080

ISSUE 3-31-71 RJA

CHANGE NO. DATE DESCRIPTION

COMPUTER SYSTEMS LABORATORY
WASHINGTON UNIVERSITY
ST. LOUIS, MISSOURI

MACROMODULAR PROJECT

TIE BRACKET

APPROVED ENG. WAC DRAWING NO.

PROD. 4-7-7
DRAWA BY PLL

CHECKED RJA DATE 9-7-68
43 DRILL (040) & C'SINK .160 X 82°
4 HOLES FOR 3/32 RIVET - 3/32 LONG
FLAT HEAD-NICKEL PLATED STEEL

TRIM STRIP
.040 - 6061 ALUM.
FINISH: CSL SPEC. MF 2
SCALE 2:1

ISSUE 3-31-71 R J A

COMPUTER SYSTEMS LABORATORY
WASHINGTON UNIVERSITY
ST. LOUIS, MISSOURI

MACROMODULAR PROJECT

TRIM STRIP

UPDATES

CHANGE
DATE
DESCRIPTION

WAC

ISSUE

TRIM STRIP

PHASE

PROD.

4-7-71

PLL

DATE

R J A 9-7-68
LOCK STRIP
MATL: .062 ALUM-6061
FINISH: CSL SPEC. MF 2
SCALE 2:1

#43 DRILL 4 PLACES
## SHROUD SUBASSEMBLY

<table>
<thead>
<tr>
<th>PAGE</th>
<th>TITLE</th>
<th>CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>200.11-1</td>
<td>TITLE PAGE</td>
<td>ISSUE</td>
</tr>
<tr>
<td>200.11-2</td>
<td>PARTS LIST</td>
<td></td>
</tr>
<tr>
<td>200.11-3</td>
<td>SHROUD SUB ASSEMBLY – DESCRIPTION</td>
<td></td>
</tr>
<tr>
<td>200.11-4</td>
<td>SHROUD SUB ASSEMBLY</td>
<td></td>
</tr>
<tr>
<td>200.11-5</td>
<td>SHROUD COLLAR</td>
<td></td>
</tr>
<tr>
<td>200.11-6</td>
<td>SLIDE PAIR</td>
<td></td>
</tr>
<tr>
<td>200.11-7</td>
<td>KEY STOP</td>
<td></td>
</tr>
<tr>
<td>200.11-8</td>
<td>LEFT AND RIGHT HANDED SHROUD SUB ASSEMBLY</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHG.</th>
<th>E.C.O.</th>
<th>DATE</th>
<th>APPR</th>
<th>CHG</th>
<th>E.C.O.</th>
<th>DATE</th>
<th>APPR</th>
<th>CHG</th>
<th>E.C.O.</th>
<th>DATE</th>
<th>APPR</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISSUE</td>
<td>0167</td>
<td>3-31-71</td>
<td>RJA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MACROMODULAR SYSTEMS PROJECT
<table>
<thead>
<tr>
<th>QTY</th>
<th>C.S.L. DOC.</th>
<th>PART</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>200.11-5</td>
<td>SHROUD COLLAR</td>
</tr>
<tr>
<td>1</td>
<td>200.11-6</td>
<td>SLIDE PAIR</td>
</tr>
<tr>
<td>1</td>
<td>200.11-7</td>
<td>KEY STOP</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>.086 DIA. x.125 GRIP SHALLOW OVAL HEAD ALUMINUM RIVETS</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>.086 DIA. x.165 GRIP SHALLOW OVAL HEAD ALUMINUM RIVETS</td>
</tr>
</tbody>
</table>

**Changes**

<table>
<thead>
<tr>
<th>CHG</th>
<th>E.C.O</th>
<th>DATE</th>
<th>APPR</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISSUE</td>
<td>0167</td>
<td>3-31-71</td>
<td>RJA</td>
</tr>
</tbody>
</table>

MACROMODULAR SYSTEMS PROJECT

200.11-2
SHROUD SUB-ASSEMBLY - DESCRIPTION

The shroud sub-assembly described in this document is used in conjunction with the four basic types of electronic cases and serves two primary functions - it provides mechanical protection for connector pins and acts as a keying mechanism to prevent insertion of connector pins into incompatible electrical mating with other macromodular elements. Shroud sub-assemblies may be either left handed or right handed, depending upon the position of the key. (See photo's illustrating these two types on page 200.11-8).

Page no's. 200.11-4 through 200.11-7 are a complete set of mechanical drawings and illustrations fully describing components and assembly of the shroud. Each drawing contains tolerance specifications relating to the various parts. All tolerances and specifications contained herein must be adhered to in order to produce acceptable assemblies. The manufacturer must assure himself that these requirements can be met by analyzing component and assembly documentation, his tooling and characteristics of his production processes.
LEFT HAND ASSEMBLY SHOWN

KEY STOP
200.11-7

SHROUD COLLAR
200.11-5

SHROUD SLIDE PAIR
200.11-6

RIVET

0.102
0.110

ISSUE
AJL-77
E.C.O 0167 RJA

DATE
DESCRIPTION

COMPUTER SYSTEMS LABORATORY
WASHINGTON UNIVERSITY
ST. LOUIS, MISSOURI

MACROMODULAR PROJECT

TITLE
SHROUD SUB-ASSEMBLY

DRAWN
R. A. 9-9-69

FOR
DATE
DRAWN
MARY
PL.

200.11-4
MAT'L: 3003-H14 ALUM .062 STOCK  
FINISH: CSL SPEC MFI  
DIMENSIONS: ±.005 U.O.N.
MATERIAL: 6061-T6 ALUMINUM

TWO REQUIRED

ONE RIGHT HAND
ONE LEFT HAND

TOLERANCES ±0.005 UNLESS OTHERWISE SPECIFIED

FINISH - CSL SPEC. MFI
**MAT'L**: .040 SS  
**DIMENSIONS**: ± .005 U.O.N.
<table>
<thead>
<tr>
<th>PAGE</th>
<th>TITLE</th>
<th>CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>200.12-1</td>
<td>TITLE PAGE</td>
<td>ISSUE</td>
</tr>
<tr>
<td>200.12-2</td>
<td>PARTS LIST</td>
<td></td>
</tr>
<tr>
<td>200.12-3</td>
<td>ELECTRONIC CASE METAL PARTS – DESCRIPTION</td>
<td></td>
</tr>
<tr>
<td>200.12-4</td>
<td>COVER PLATE</td>
<td></td>
</tr>
<tr>
<td>200.12-5</td>
<td>GUIDE PLATE PAIR</td>
<td></td>
</tr>
<tr>
<td>200.12-6</td>
<td>PLUG BRACKET PAIR</td>
<td></td>
</tr>
<tr>
<td>200.12-7</td>
<td>DOUBLE CELL FILLER STRIP PAIR</td>
<td></td>
</tr>
<tr>
<td>200.12-8</td>
<td>TRIPLE CELL FILLER STRIP PAIR</td>
<td></td>
</tr>
<tr>
<td>200.12-9</td>
<td>FOUR CELL FILLER STRIP PAIR</td>
<td></td>
</tr>
</tbody>
</table>

----|--------|--------|------|-----|--------|--------|------|-----|--------|--------|------|
ISSUE| --     | 3-31-71| JRA  |     |        |        |      |     |        |        |      |

MACROMODULAR SYSTEMS PROJECT
# ELECTRONIC CASE

## METAL PARTS

### PARTS LIST

<table>
<thead>
<tr>
<th>QTY</th>
<th>C.S.L. DOC.</th>
<th>PART</th>
</tr>
</thead>
<tbody>
<tr>
<td>200.12-4</td>
<td></td>
<td>COVER PLATE</td>
</tr>
<tr>
<td>200.12-5</td>
<td></td>
<td>GUIDE PLATE PAIR</td>
</tr>
<tr>
<td>200.12-6</td>
<td></td>
<td>PLUG BRACKET PAIR</td>
</tr>
<tr>
<td>200.12-7</td>
<td></td>
<td>DOUBLE CELL FILLER STRIP PAIR</td>
</tr>
<tr>
<td>200.12-8</td>
<td></td>
<td>TRIPLE CELL FILLER STRIP PAIR</td>
</tr>
<tr>
<td>200.12-9</td>
<td></td>
<td>FOUR CELL FILLER STRIP PAIR</td>
</tr>
</tbody>
</table>

## Change Log

<table>
<thead>
<tr>
<th>CHG.</th>
<th>E.C.O.</th>
<th>DATE</th>
<th>APPR.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISSUE</td>
<td></td>
<td>3-31-71</td>
<td>RJA</td>
</tr>
</tbody>
</table>

MACROMODULAR SYSTEMS PROJECT

200.12-2
ELECTRONICS CASE METAL PARTS - DESCRIPTION

The metal parts described in this document relate to the electronics cases. These parts are common to all the case types but may differ in quantity between the types. In the assembly of any case two cover plates and one filler strip pair are required. These parts form the top, bottom and sides of a case. The guide plate and plug bracket pair, on the otherhand, are required in numbers equal to the name of the case type i.e. a single cell unit would require one guide plate and plug bracket while a four cell case would require four pair of each.

The function of the guide plate, as its name would imply, is to provide alignment for engagement of electrical connectors contained in the plug bracket pair when the case and associated electronics is brought into mating with compatible macro-mo

Page no's. 200.12-4 through 200.12-9 are a complete set of mechanical drawings and illustrations fully describing the electronics case metal parts. Each drawing contains tolerance specifications relating to the various parts. All tolerances and specifications contained herein must be adhered to in order to produce acceptable assemblies. The manufacturer must assure himself that these requirements can be met by analyzing component and assembly of documentation, his tooling and characteristics of his production processes.

<table>
<thead>
<tr>
<th>ISSUE</th>
<th>DATE</th>
<th>R JA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6-6-71</td>
<td></td>
</tr>
</tbody>
</table>
GUIDE PLATE
ONE RIGHT HAND &
ONE LEFT HAND REQ'D.
MAT'L. 0.100" 6061-T6 ALUM.
FINISH: CSL SPEC. MM

HOLE SCHEDULE
A" DRILL & COUNTERSINK FOR "2-56
B" #42 DRILL & COUNTERBORE 0.166 DIA X 0.040 DEEP
O" DRILL & COUNTERSINK FOR "S-40

BREAK CORNERS .020
PLUG SUPPORT BRACKET
TWO REQ'D - ONE RIGHT HAND
- ONE LEFT HAND
MAT'L: 0.250 x 0.500 STOCK
6061-T6 ALUMINUM
FINISH: CSL SPEC. MFI

0.030 x 45° CHAMBERS
NO. 43 DRILL C'SINK 0.160 DIA X 82° 6 PLCS

DIA CLEARANCE 0.96 FOR NO 2-56

MAT'L: .040 ALUM 6061-T6
FINISH: CSL SPEC MFI
1 L.H. & 1 R.H. REQ'D. PER CASE
NO 43 DRILL
C'SINK .160 DIA X 82°
12 PLACES

.096 DIA CLEARANCE FOR 2-56 2 HOLES

MAT'L: .040 A.LUM 6061-T6
FINISH: CSL SPEC MFI
1 L.H. & 1 R.H. REQ'D. PER CASE
MAT'L: .040 ALUM 6061-T6
FINISH: CSL SPEC MF1
1 L.H. & R.H. REQ'D PER CASE
PRINTED CIRCUIT BOARD OUTLINES AND ELECTRONIC PACKAGE MECHANICAL DRAWINGS

Final Report 4/1/65 through 12/31/73

Robert J. Arnzen, Editor

February, 1974

DOD (ARPA) Contract SD-302

ARPA Project Code No. 655

Volume VI of Part 2

Technical Report No. 35

Distribution of this document is unlimited.

Complete mechanical drawings regarding the manufacture of components and assembly specifications for the macromodular electronic cases and printed circuit board routing dimensions for macromodular electronic assemblies are given.
<table>
<thead>
<tr>
<th>KEY WORDS</th>
<th>LINK A</th>
<th>LINK B</th>
<th>LINK C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macromodule Printed Circuit Boards</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Macromodule Electronics Case</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Macromodule Circuit Board Outline</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>