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

Computer Systems Laboratory, Washington University

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MACROMODULAR
COMPUTER DESIGN
PART 2
MANUFACTURING DESCRIPTION

VOLUME VI
PRINTED CIRCUIT BOARD OUTLINES AND
ELECTRONIC PACKAGE MECHANICAL DRAWINGS

Technical Report No. 35

FINAL REPORT - FEBRUARY, 1974
CONTRACT SD-302 (ARPA)
COMPUTER SYSTEMS LABORATORY
WASHINGTON UNIVERSITY
ST. LOUIS, MISSOURI
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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
ABSTRACT

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.
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PRINTED CIRCUIT BOARD OUTLINES AND LAYOUT GUIDES
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FOUR CELL ELECTRONICS CASE
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GRILL SUBASSEMBLY
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ELECTRONIC CASE, METAL PARTS
PAGES 200.12-1 thru 200.12-9
GENERAL ALIGNMENT—
MALE HAS TWO SMOOTH SURFACES AND MUST MATE
WITH FEMALE AS SHOWN

MALE 85931-5
FEMALE 85863-4

SECTION "A-A"
MALE PIN IS STAKED IN
DIRECTION OF ARROW

SHOULDERS MUST BE FLUSH
WITH BOARD SURFACE

MALE PIN IS PRESS FIT IN .0036 DIA. HOLE

0.050 MAX.

NOTE UNIDIRECTIONAL CRIMPING OF FEMALE

TYPICAL PAD LAYOUT FOR FEMALE

0.047
0.050
NOTES:
1. BONDED FILLETS CUT WITH 0.125 DIA. ROUTING CUTTER.
2. CUT TWO NOTCHES 0.150 2 DEEP WITH 0.125 DIA. ROUTING CUTTER.

2 ZER0 DATUM REFERENCE HOLES
DIAM DIA 0.002
NOTE:
1. CIRCLED NUMBERS (C) REFER TO NUMBER OF SPACES ON 0.050 GRID FOR 4:1 LAYOUT MASTER.
2. NO SIGNAL OR POWER PATHS WITHIN 0.025 TARGET CENTERS (C).
NOTES:
1. CIRCLED NUMBERS REFER TO NUMBER OF SPACES ON GRID SPACING FOR ELEVENTH MASTER.
2. COPPER LIMITS APPLY TO BOTH BLANKED AND ROUTED BOARDS.
3. TARGETS ARE REGISTRATION MARKS DEFINED BY DRAWINGS 200:5005 OR 200:5005.
NOTE 1: TARGET DETAIL

NOTE 2: DRAWING SCALE IS 1/2, BUT ALL NUMBERS ARE FOR 1/2 LAYOUT.

NOTE 3: 240 DESIGNATED OUTSIDE EDGE OF TARGET (INNER LIMIT).

NOTE 4: ORIENTATION MARK 24-PIN BLOCK LETTER S DESIGNATES CORNER OF BOARD WITH BOARD CONNECTOR MOUNTING HOLE.

48 FINGERS

NOTE 5: TARGET FOR PIN LOCATION IS PAR

NOTE 6: TYPICAL MEASUREMENTS FOR PIN LOCATION IS PAR

NOTE 7: THREE TARGETS TO BE DRILLED 0.063" S. DOW.

NOTE 8: THIS PROJECT IS MACROMODULAR PROJECT

NOTE 9: PILOT BOARD MODEL

NOTE 10: NO DEDICATED TOUCHDOWN.
NOTE 1: CHARGE PINS USED FOR EDGE CONNECTOR PINS ARE 731-0240-1, 731-0240-10, OR EQUIVALENT.

PINS 99G, 0000-02-08-12 TO 731-0240 PINS PLACED AS SHOWN. PINS 99G AND 0000-02-08-12 ARE NOT REQUIRED, DRILL FOR TYPE 19 HOLE.

NOTE 2: PINS OF MOVABLE EDGE CONNECTOR PINS ARE DESIGNATED BY (PIN NUMBER) FACE, WHERE THE PIN NUMBER SPECIFIES LOCATION FROM RIGHT TO LEFT AND THE LETTER A, C, OR D DESIGNATES LOCATION IN THE GM 3D PAGE.

NOTE 3: LINE DESIGNATES OUTMOST EXTENT OF TAKING TOOL (T) LIMITS. TARGETS MAY BE OUTSIDE THIS LINE.

NOTE 4: TARGET DETAIL

NOTE 5: TARGET DETAIL

NOTE 6: TARGET DETAIL

NOTE 7: TARGET DETAIL

NOTE 8: TARGET DETAIL
Figure 1: Diagram showing the layout for a project. The diagram includes notes and labels indicating specific details such as pin numbers, row designations, and target locations. The notes provide instructions for constructing or analyzing the layout, including dimensions and reference points.
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 1-202845-5

EAR OF CONNECTOR ON COMPONENT SIDE OF BOARD

NOTE - THIS DETAIL APPLIES ONLY TO ASSEMBLIES USING CIRCUIT BOARDS WITH PREFIX PTB. FOR BOTTOM MOTHERBOARDS WITH PREFIX PTB, REFER TO DRAWING 200.50D27.

E.B. STINSON EYELET 1A1475 MUST BE Pressed, NOT STAMPED OR CONNECTOR WILL BREAK

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

COMPONENT SIDE SIGNAL SIDE

MALE AMPMODU PINS 85931-5

MACROMODULAR PROJECT
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 PTT, REFER TO
DRAWING 200.50D26)

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

E.A.R. OF CONNECTOR ON
COMPONENT SIDE OF BOARD.

AMP CONNECTOR
#583464-1

MALE AMPMODU
#85931-5

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

SIGNAL SIDE

COMPONENT SIDE

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ST. LOUIS, MISSOURI
MACROMODULAR PROJECT

LATERAL MOTHERBOARD
CONNECTOR ORIENTATION

DRAWING NO.
200.50028

CHECKED 1/10

DATE 8-9-70
E.A.R. 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)

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

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

AMP CONNECTOR 
@583464-1

MALE AMPMODU PINS - Z5931-5

COMPONENT SIDE

SIGNAL SIDE

COMPUTER SYSTEMS LABORATORY
WASHINGTON UNIVERSITY
ST. LOUIS, MISSOURI

MACROMODULAR PROJECT

FACEPLATE MOTHERBOARD
CONNECTOR ORIENTATION

200.50029
NOTE 1

NOTE 2

NOTE 1

NOTE 2

NOTE 4

GOLD PLATE FINGERS

BEVEL BOARDS AFTER PLATING FINGERS

DIMENSIONS: ± .005 U.O.N.

NOTES:
1. REGISTRATION HOLES (TWO) DRILL 0.125 ± 0.002
2. HANDLE MOUNTING HOLES (THREE) TCHL 0.125 ± 0.002
3. PARTED 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.
NOTES:
1. REGISTRATION TARGET

USE CHART-PAC Razor-111 OR
EQUIVALENT (TWO 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
   
   NUMBER REFERS TO
   THE DISTANCE FROM THE ZERO
   REFERENCE LINE IN UNITS OF
   0.100 INCH REFERENCE GRID.

FINGER PLATING LINE

10-30-70 SEE E.C.O. 0071

COMPUTER SYSTEMS LABORATORY
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ST. LOUIS, MISSOURI

MACROMODULAR PROJECT

LAYOUT GUIDE FOR PLUG-IN BOARD

DATE DESCRIPTION

DATE

DATE
MATERIAL: .250 DELRIN
DIMENSIONS: ±.005

CHAMFER 45° X .015
45° CHAMFER

2.750
.625
.500
.250
.125

.040 D
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.
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.

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WASbington University
ST. LOUIS, MISSOURI

MACROMODULAR PROJECT

PIN ALIGNMENT TOOL #003

CHANGE NO. DATE DESCRIPTION

انية

COMMENTS

DRAWING NO. 200.500.D34

APPROVED BY

DATE

ST.

FOR

DATE

DRAWN BY

CHECkED

DATE

10-13-70
NOTE:
M6HOLE IN LOCATIONS
MARKED AFTER BOARD, NORMAL
INTERFACES WILL NOT EXTEND MORE
THAN 1/2" BENEATH FREE EDGE OF PT100-
BOARD 26 ABOVE THE ETCHED SURFACE
OF PT100-0.
NOTES:
1. REGISTRATION TARGET

FINGER PLATING LINE

USES CHART-PACK 3AV-111 OR EQUIVALENT (TWO PLACES)
2. HANDLE MOUNTING HOLE LOCATIONS
   THREE PLACES
3. COPPER LIMITS FOR TAPING
4. COPPER LIMIT
5. CIRCUIT BOARD SHOWN FROM ETCH SIDE, COMPONENTS
   MOUNTED FROM REVERSE SIDE
6. DIMENSIONS ARE SHOWN AS
   LENGTHS REFER TO
   THE DISTANCE FROM THE ZERO
   REFERENCE LINE IN UNITS OF
   0.000 INCH REFERENCE GRID.
THE DOWN HOLE
DRILL 0.083 ± 0.003 PLACES

CLEARANCE HOLE 0.095 ± 0.003 PD

ALL DIMENSIONS
1.005 ± 0.003

2 ZERO SATIN REFERENCE HOLES 0.083 DIA. ± 0.003

0.00 (in.)

0.00 (in.)

0.00 (in.)

0.00 (in.)

0.00 (in.)

0.00 (in.)

0.00 (in.)

0.00 (in.)

0.00 (in.)

0.00 (in.)

0.00 (in.)
MINIMUM BORDER .200
4 SIDES

DRILL NO. 42
2 HOLES

.225 MAX.

ALL OTHER HOLES
TYPE "B"

GOLD PLATE BELOW LINE -
SEE SPECIFICATION PC-1

------------------------

COMPUTER SYSTEMS LABORATORY
WASHINGTON UNIVERSITY
ST. LOUIS, MISSOURI

MACROMODULAR PROJECT

FUNCTION CALLER CABLE
P.C BOARD PRODUCTION GUIDE

TITLE

APPROVED
BY
RJA

FOR
PROD
7-3-73

DATE

DRAWN BY
MAC

CHECKED

DATE
7-3-73

RJA

DRAWING NO.
200.50D47

CHANGE NO. DATE DESCRIPTION


RJA

ENG
MLP
DRILL NO. 42  2 HOLES

DIMENSION | BOARD NUMBER
---|---
.200 | WCL0211
.400 | WCL0213

MATERIAL: 

\[ \frac{1}{16} \text{ DOUBLE SIDED P.C. STOCK} \]

ALL DIMENSIONS ± .005 U.O.N.

CHAMFER .050 x 45°
4 PL.C.

CHAMFER \( \frac{1}{8} \times 45° \)
4 CORNERS

COMPUTER SYSTEMS LABORATORY
WASHINGTON UNIVERSITY
ST. LOUIS, MISSOURI

MACROMODULAR PROJECT

FUNCTION CALLER CABLE
P.C. BOARD - ROUTING DIMENSIONS

RJA  7-3-73
Drawing by
MCP  7-3-73
## Title Page

### Single Cell Electronics Case

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**MACROMODULAR SYSTEMS PROJECT**
### SINGLE CELL ELECTRONICS CASE

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<td>2</td>
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<td>#2-56 x 3/16 FLATHEAD SOCKET CAP SCREWS</td>
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**ISSUE**

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**APPR.**

RJA

**MACROMODULAR SYSTEMS PROJECT**

200.1-2
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.
## DOUBLE CELL ELECTRONICS CASE

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200.2-1
### DOUBLE CELL ELECTRONICS CASE
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**CHG E.C.O DATE APPR.**

| ISSUE | 4-1-71   | RJA |

**MACROMODULAR SYSTEMS PROJECT**

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.
COVER PLATE 200.2-4

LH OXIDE PLATES 200.2-5

RIVETS (FLUSH INSIDE & OUTSIDE)

FILLER STRIP 200.2-1
# TRIPLE CELL ELECTRONICS CASE

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MACROMODULAR SYSTEMS PROJECT
# TRIPLE CELL ELECTRONICS CASE
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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

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MACROMODULAR SYSTEMS PROJECT

200.4-1
## FOUR CELL ELECTRONICS CASE
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| ISSUE | 4-1-71 | RJA |

MACROMODULAR SYSTEMS PROJECT

200.4-2
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.
## GRILL SUBASSEMBLY

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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.
FINISH: CSL SPEC. MF3
VERTICAL FIN
MAT'L: .030 ALUM-6061
FINISH: CSL SPEC MF 2

SCALE 2:1
DRILL .098 D 2 HOLES

- .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

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WASHINGTON UNIVERSITY
ST. LOUIS, MISSOURI

MACROMODULAR PROJECT

TITLE

END FIN

APPROVED

ENGINEER

DRAWN BY

CHECKED

DATE

DRAWING NO.

RJA

4-7-71

18-01

200.10-6

RJA 9-7-68
HORIZONTAL FIN

MAT'L: .030 ALUM.-6064
FINISH: CSL SPEC. MF2

SCALE 2:1

-0.050X45° CHAMFER TYP.

0.065/0.070 TYP.

0.030/0.040 11 SLOTS ON .360 CENTERS

4.275
4.285

0.0432

0.170

0.180

0.070

0.095 TYP.

0.675

0.680

COMPUTER SYSTEMS LABORATORY
WASHINGTON UNIVERSITY
ST. LOUIS, MISSOURI

MACROMODULAR PROJECT

TITLE
HORIZONTAL FIN

DRAWN BY

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CHECKED

RJA

DATE
8-31-68
TIE BRACKET -
0.062 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

0.098
0.102

TIE BRACKET

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WASHINGTON UNIVERSITY
ST. LOUIS, MISSOURI
MACROMODULAR PROJECT

TIE BRACKET

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. 4-7-71 DRAWN BY PLL

CHECKED RJA DATE

9-7-71

9-7-68
43 DRILL (.040) & C'SINK .160 X .82°
4 HOLES FOR \( \frac{3}{16} \) RIVET - \( \frac{3}{16} \) LONG
FLAT HEAD-NICKEL PLATED STEEL

TRIM STRIP
.040 - 6061 ALUM.
FINISH: CSL SPEC. MF2
SCALE 2:1
LOCK STRIP
MATL: .062 ALUM-6061
FINISH: CSL SPEC. MF 2
SCALE 2:1
### SHROUD SUBASSEMBLY

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MACROMODULAR SYSTEMS PROJECT
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.
SECTION A-A

MAT'L: 3003-H14 ALUM .062 STOCK
FINISH: CSL SPEC MF1
DIMENSIONS: ±.005 U.O.N.
MAT'L. 6061-T6 ALUMINUM
TWO REQ'D.
ONE RIGHT HAND
ONE LEFT HAND
TOLERANCES ±0.005 UNLESS
OTHERWISE SPECIFIED
FINISH-CSL SPEC. MF1
DRILL #41
2 HOLES

MAT'L: .040 SS
DIMENSIONS: ± .005 U.O.N.
# ELECTRONIC CASE

## METAL PARTS

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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 other hand, 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-modular elements.

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.

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200.12-3
SIDE VIEW: CORNER DETAIL

END VIEW: CORNER DETAIL

MAT'L: .040 ALUM.-6061
FINISH: CSL SPEC. MF1

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ST. LOUIS, MISSOURI

MACROMODULAR PROJECT

COVER PLATE

APPROVED:㎜PROD. 4-7-71
DRAWN: R.L. SULLIVAN
ISSUE: 3-31-71  M.J.A

200.12-4
GUIDE PLATE
ONE RIGHT HAND &
ONE LEFT HAND REQ'D.
MAT'L. 0.100" 6061-T6 ALUM.
FINISH: CSL SPEC. MF1

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

BREAK CORNERS .020
PLUG SUPPORT BRACKET
TWO REQ'D - ONE RIGHT HAND
- ONE LEFT HAND
MATL: 0.250 x 0.500 STOCK
6061-T6 ALUMINUM
FINISH: CSL SPEC. MF1

0.030 x 45° CHAMBERS

0.250 0.262 0.267 0.287 0.307 0.314 0.318 0.484 1.751 1.747

0.095 0.085 0.220 0.210 0.100 0.090

0.096 0.170 0.180 0.186 0.170

DR & TAP
FOR #5-40
(TWO PLACES)

COMPUTER SYSTEMS LABORATORY
WASHINGTON UNIVERSITY
ST. LOUIS, MISSOURI

MACROMODULAR PROJECT

PLUG BRACKET PAIR

WAC PROD. 4-7-71
PLUG BRACKET PAIR

APPROVED

WAC 200.12-6

ISSUE 3-31-71 R.J.A.

MACROMODULAR PROJECT

WAC 5-5-69
NO 43 DRILL 
C'SINK .160 DIA X 82° 
12 PLACES

.096 DIA CLEARANCE 
FOR 2-56 2 HOLES

MAT'L: .040 ALUM 6061-T6
FINISH: CSL SPEC MFI
1 L.H. & 1 R.H. REQ'D. PER CASE

COMPUTER SYSTEMS LABORATORY
WASHINGTON UNIVERSITY
ST. LOUIS, MISSOURI

MACROMODULAR PROJECT

FILLER STRIP PAIR
THREE CELL CASE
MAT'L: .040 ALUM 6061-T6
FINISH: CSL SPEC MFI
1 L.H. & R.H. REQ'D PER CASE

COMPUTER SYSTEMS LABORATORY
WASHINGTON UNIVERSITY
ST. LOUIS, MISSOURI

MACROMODULAR PROJECT

TITLE
FILLER STRIP PAIR
FOUR CELL CASE

CHANGE
CHANGE
DATE
CHANGE
DATE
DESCRIPTION

ISSUE
CHANGE
DATE
DESCRIPTION

DRAFT
DRAWN
CHECKED
PRINTED
DATE

RJA
3-31-71

RJA
3-23-71

RJA
3-23-71

RJA
200.12-9

RJA
3-23-71
PRINTED CIRCUIT BOARD OUTLINES AND ELECTRONIC PACKAGE MECHANICAL DRAWINGS

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>
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<tbody>
<tr>
<td>Macromodule Printed Circuit Boards</td>
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<tr>
<td>Macromodule Electronics Case</td>
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<tr>
<td>Macromodule Circuit Board Outline</td>
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