FINAL PROJECT REPORT

CIE -14

Fall 2014 Semester

by: Clem Kaddiddlehopper

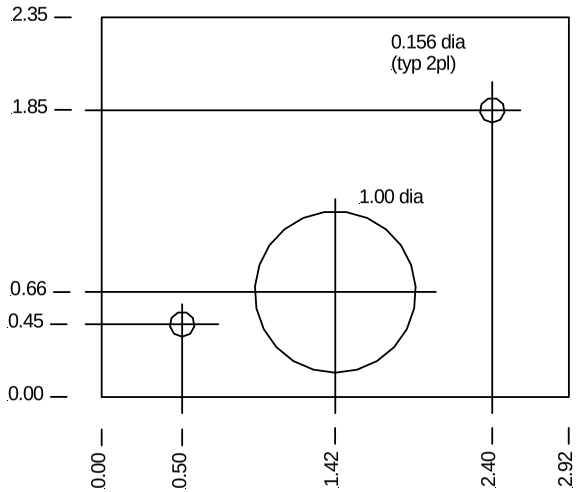
Drawing # 6622-8102 Rev: B
26 Aug 14

Sierra College CIE-14 Top Drawing

Drawing # 6622-0900 Rev: E
Print Date: 28-Aug-05
Last Changed: 30-Aug-04

CIE-14 Basic Power Supply Project

Drawing # 6622-	Extension	Rev or Date	Drawing Name	If most recent ECO, X here	Last ECO & Section(s)
8102	DOC	B	Cover Sheet		
0900	XLS	D	Top Drawing (PS14-0900)	x	PS14-8201
0700s1	SKF	C	Meter Hole Dimensions	x	PS14-8201
1100s1	SKF	A	Faceplate Screen		
1200s1	SKF	A	Rear Chassis Screen		
2200s1	SKF	D	Main Chassis, Front View (Basic)	x	PS14-8201
2200s2	SKF	B	Main Chassis, Right Side		
2200s3	SKF	B	Main Chassis, Back Through Front		
2200s4	SKF	B	Main Chassis, Bottom View		
2250s1	SKF	C	Bend Drawing, Chassis (Basic)	x	PS14-8201
2251s1	SKF	A	Bend Drawing, Cover		
2201s1	SKF	B	Cover, Front View		
2201s2	SKF	B	Cover, Top View		
2201s3	SKF	B	Cover, Right Side		
2900	CKT	B	Schematic Drawing Conventions		
2901	CKT	A	Chassis & PCB Interconnect (Basic)		
4200s1	SKF	B	Assembly, Main Chassis Front (Basic)		
4200s2	SKF	B	Assembly, Main Chassis Side		
4200s3	SKF	B	Assembly, Main Chassis Back Through Front		
4200s4	SKF	B	Assembly, Bottom View		
5801	BOM	A	PC Board Bill Of Materials (Basic)		
5801	NET	A	PC Board Netlist (Export To Layout, Basic)		
5801	CKT	A	PC Board Schematic (Basic)		
6801	PCB	A	PC Board Artwork & Layout (Basic)		
6801	LOG	A	PC Board Artwork Log File (Basic)		
6801	DRC	A	PC Board Artwork Design Rules Check (Basic)		
8101	DOC	A	Parts Function Description		
*	MDB		Assembly Parts Tree (*) Not a document, drawing # 9-PS14-SP02		

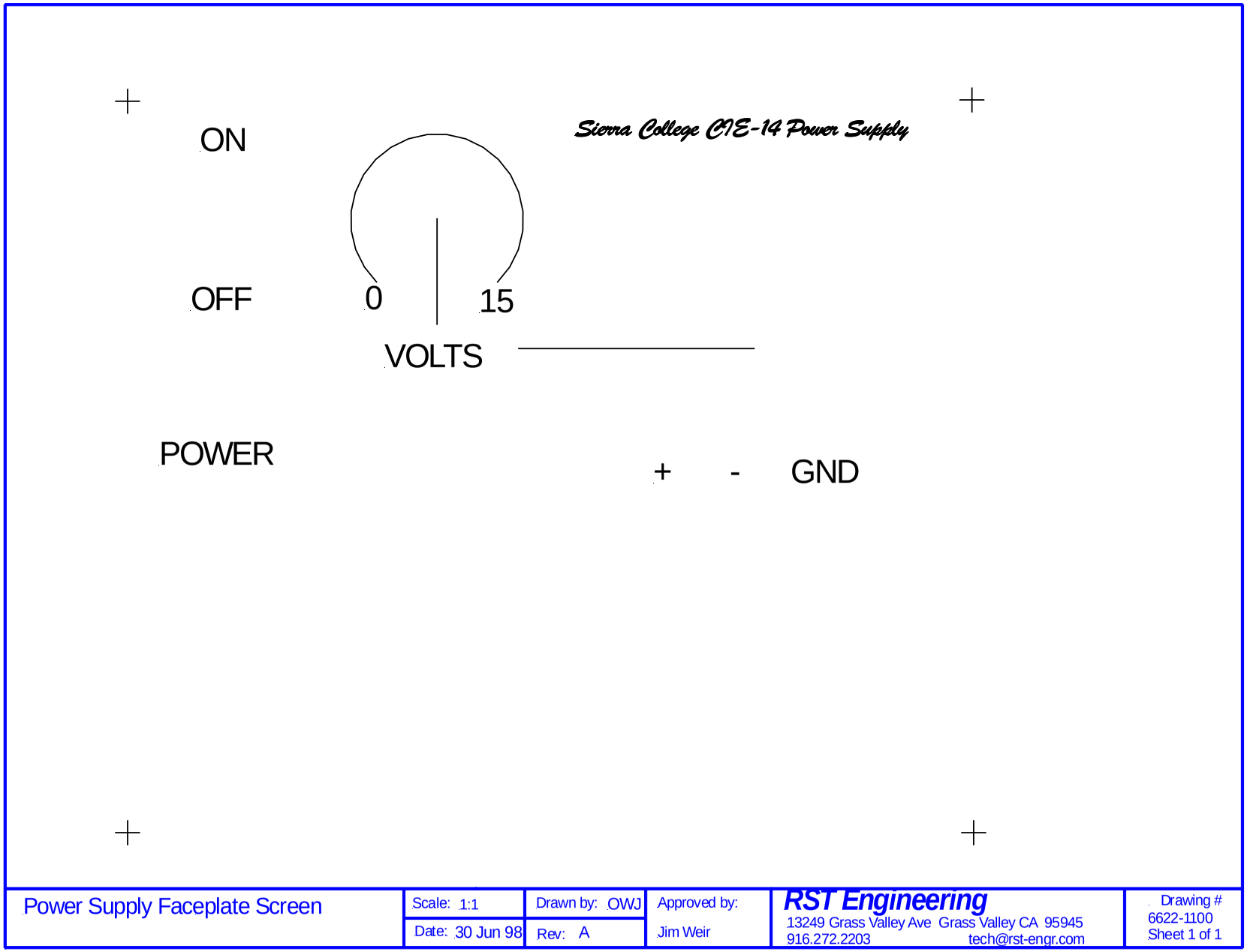


FRONT VIEW

NOTES:

1. Dimensions in inches.
2. Meter is Radio Shack 22-410.

Meter Hole Dimensions		
Scale: 1:1	Approved by: Jim Weir	Drawn by: OWJ
Date: 30 Aug 04		Rev: C
RST Engineering 13993 Downwind Court Grass Valley CA 95945 530.272.2203 tech@rst-engr.com		Drawing # 6622-0700 sheet 1 of 1


Sierra College CIE-14 Power Supply
ON
OFF
0
15
VOLTS
POWER
+
-
GND
Power Supply Faceplate Screen
Scale: 1:1
Date: 30 Jun 98
Drawn by: OWJ
Rev: A
Approved by:
Jim Weir
RST Engineering
13249 Grass Valley Ave Grass Valley CA 95945
916.272.2203
tech@rst-engr.com
Drawing #
6622-1100
Sheet 1 of 1

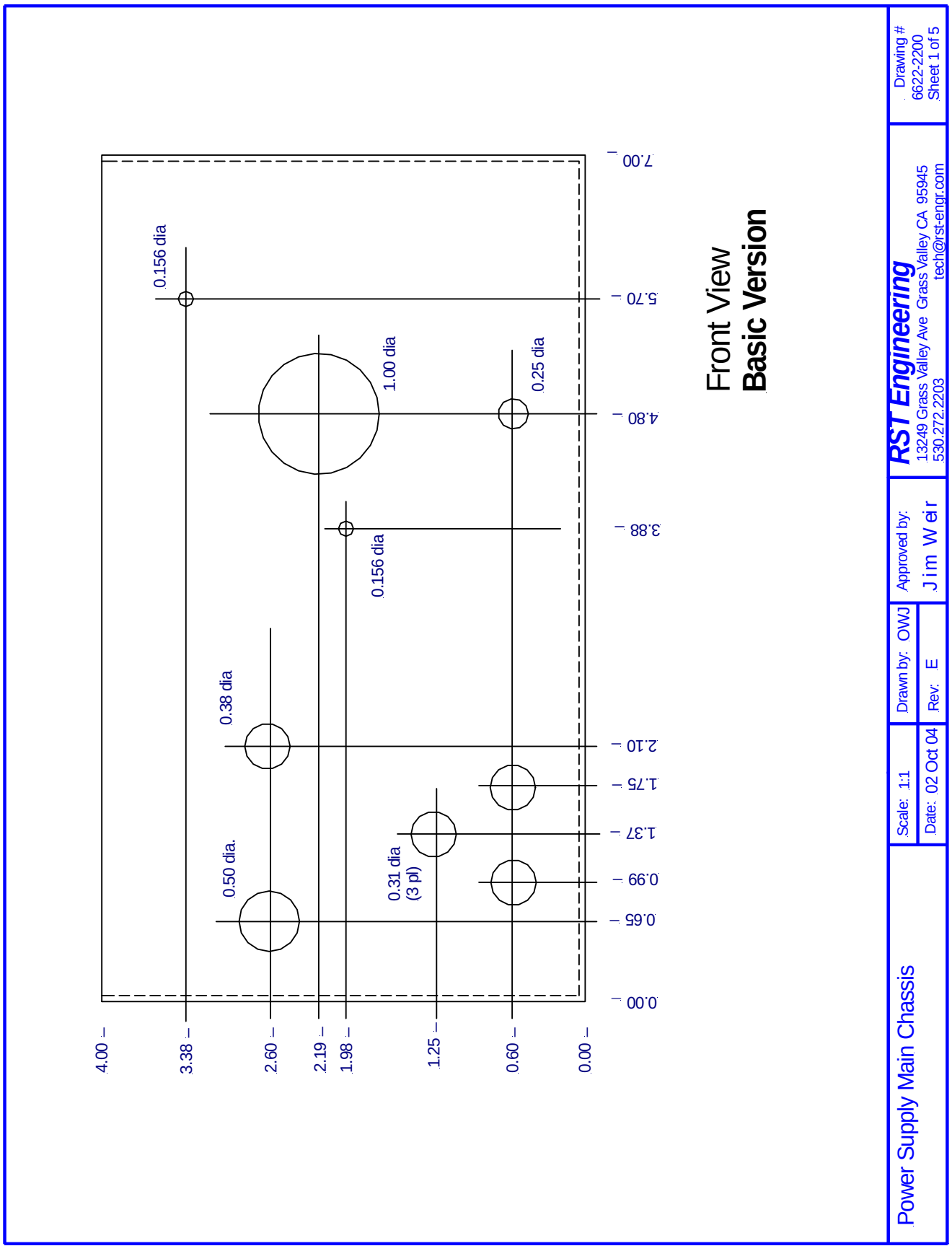
Lab Regulated Power Supply
0-15 volts DC @ 1.5 amperes

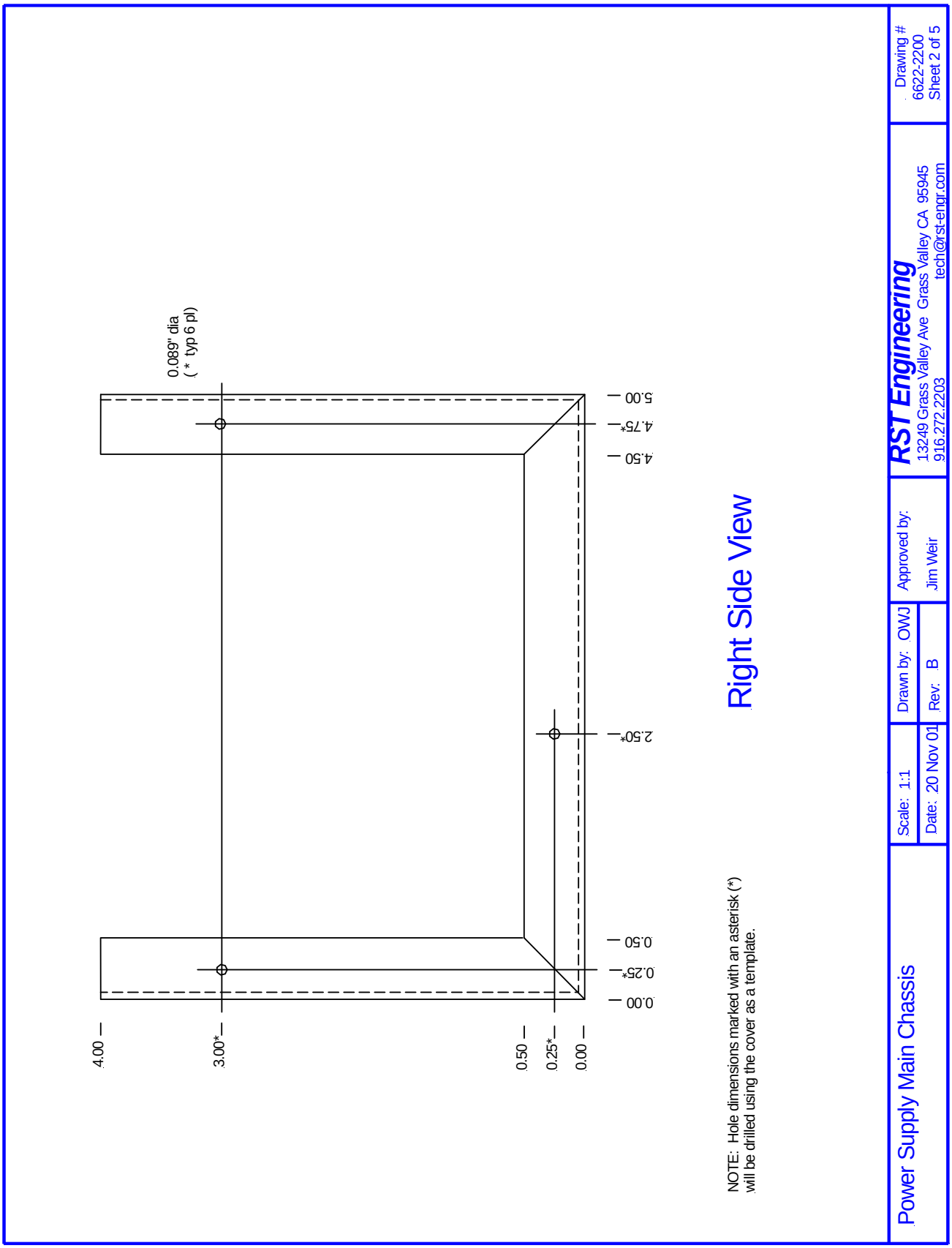
CIE-14 Summer '98
20 July 1998 jw

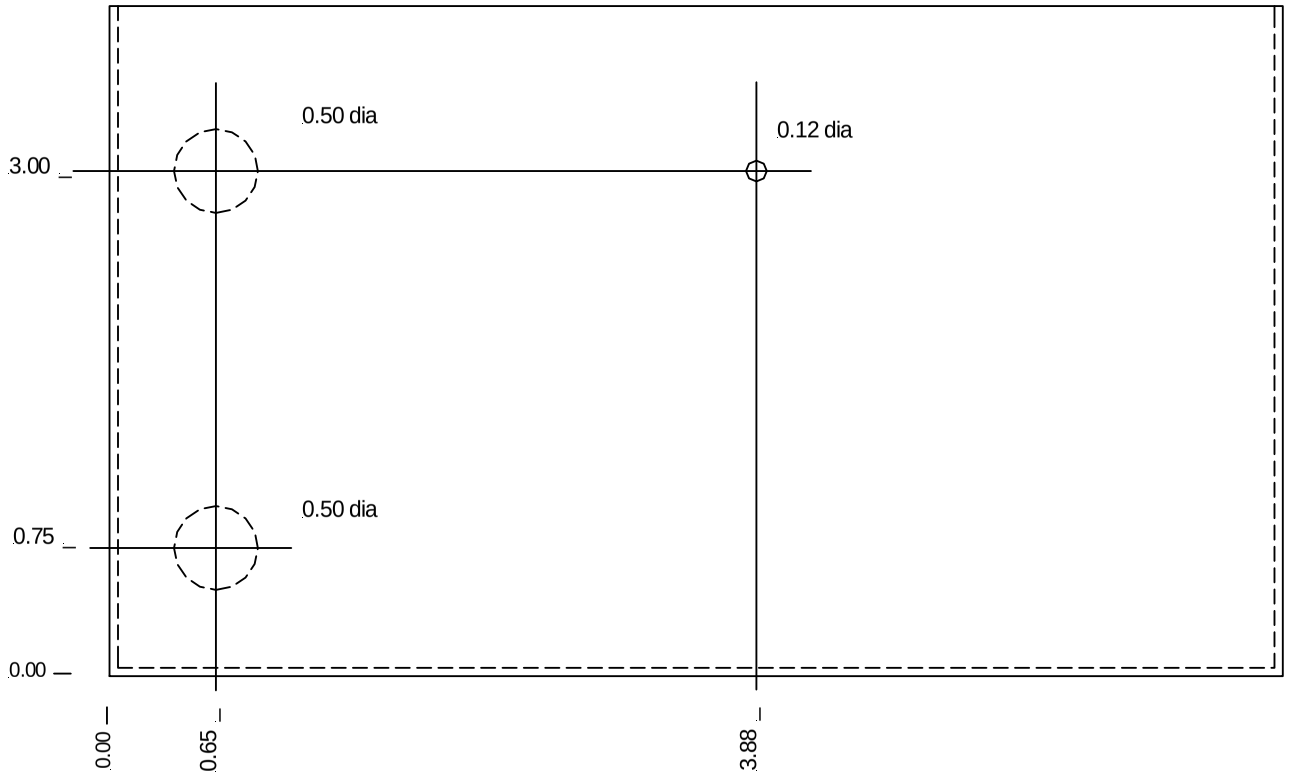
Fuse
Type 3AG
0.25 amp
Slo-Blo

110 VAC
60 Hz
15 w
1 ph

Power Supply Rear Panel Screen	Scale: 1:1 Date: 30 Jun 98	Drawn by: OWJ Rev: A	Approved by: Jim Weir	**RST Engineering** 13249 Grass Valley Ave Grass Valley CA 95945 916.272.2203 tech@rst-engr.com	Drawing # 6622-1200 Sheet 1 of 1

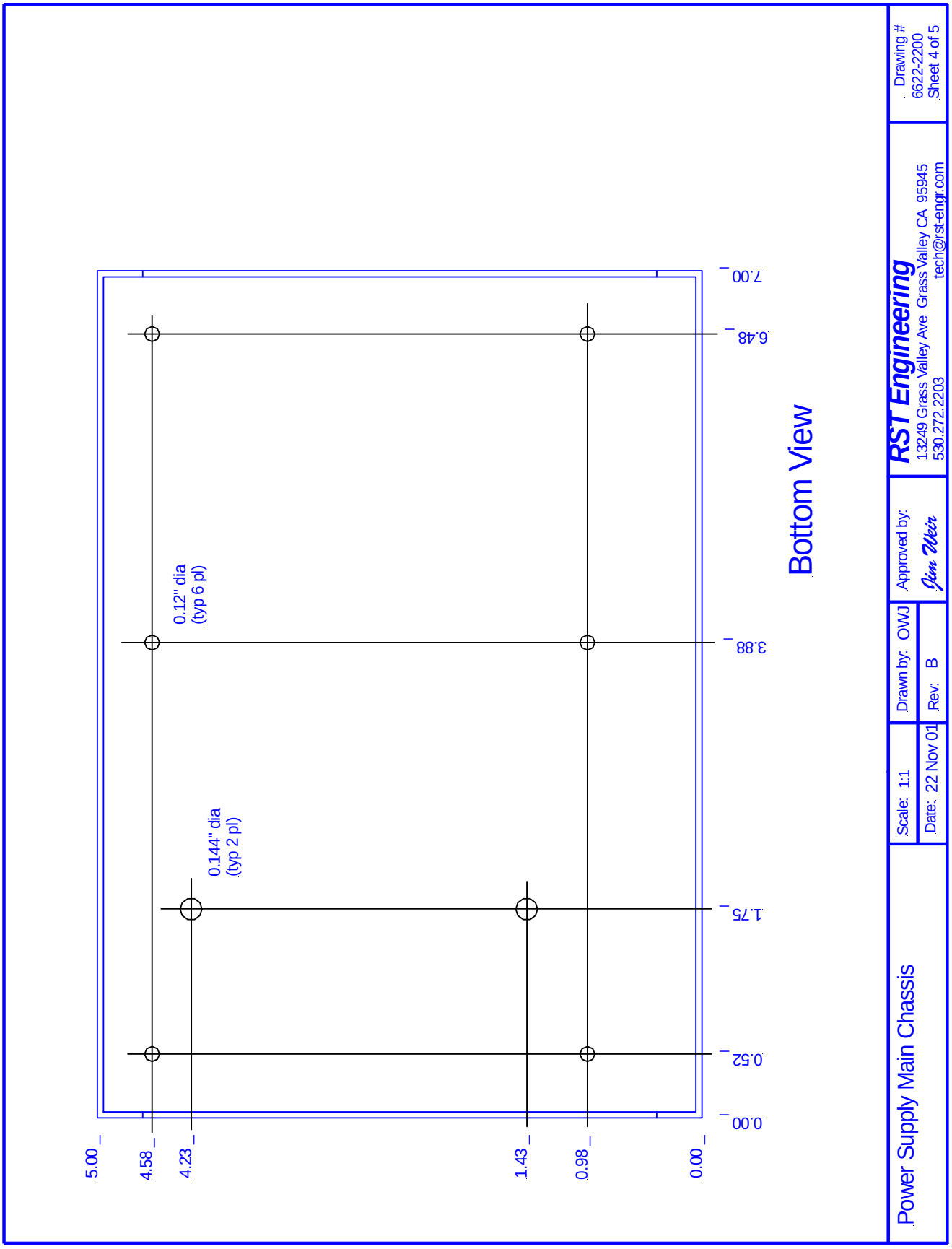

Front View
Basic Version
0.156 dia
1.00 dia
0.25 dia
0.156 dia
0.38 dia
0.50 dia.
0.31 dia
(3 pl)
7.00
5.70
4.80
3.88
2.10
1.75
1.37
0.99
0.65
0.00
4.00
3.38
2.60
2.19
1.98
1.25
0.60
0.00
RST Engineering
13249 Grass Valley Ave Grass Valley CA 95945
530.272.2203
tech@rst-engr.com
Approved by:
Jim Weir
Drawn by: OWJ
Rev: E
Scale: 1:1
Date: 02 Oct 04
Power Supply Main Chassis
Drawing #
6622-2200
Sheet 1 of 5

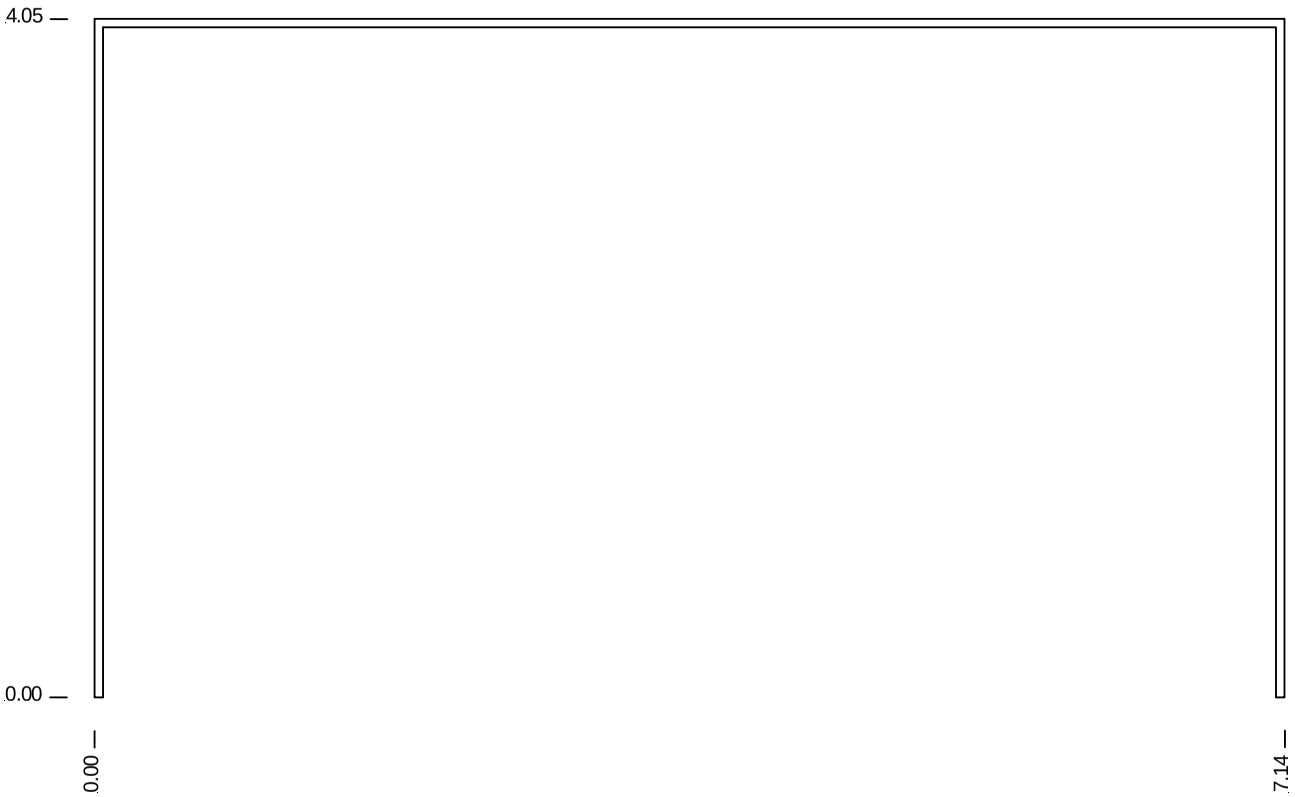

0.089" dia
(* typ 6 pl)
5.00
4.75*
4.50
2.50*
0.50
0.25*
0.00
4.00
3.00*
0.50
0.25*
0.00
Right Side View
NOTE: Hole dimensions marked with an asterisk (*)
will be drilled using the cover as a template.
Power Supply Main Chassis
Scale: 1:1
Date: 20 Nov 01
Drawn by: OWJ
Rev: B
Approved by:
Jim Weir
RST Engineering
13249 Grass Valley Ave Grass Valley CA 95945
916.272.2203
tech@rst-engr.com
Drawing #
6622-2200
Sheet 2 of 5



Power Supply Main Chassis
Back Seen Through Front

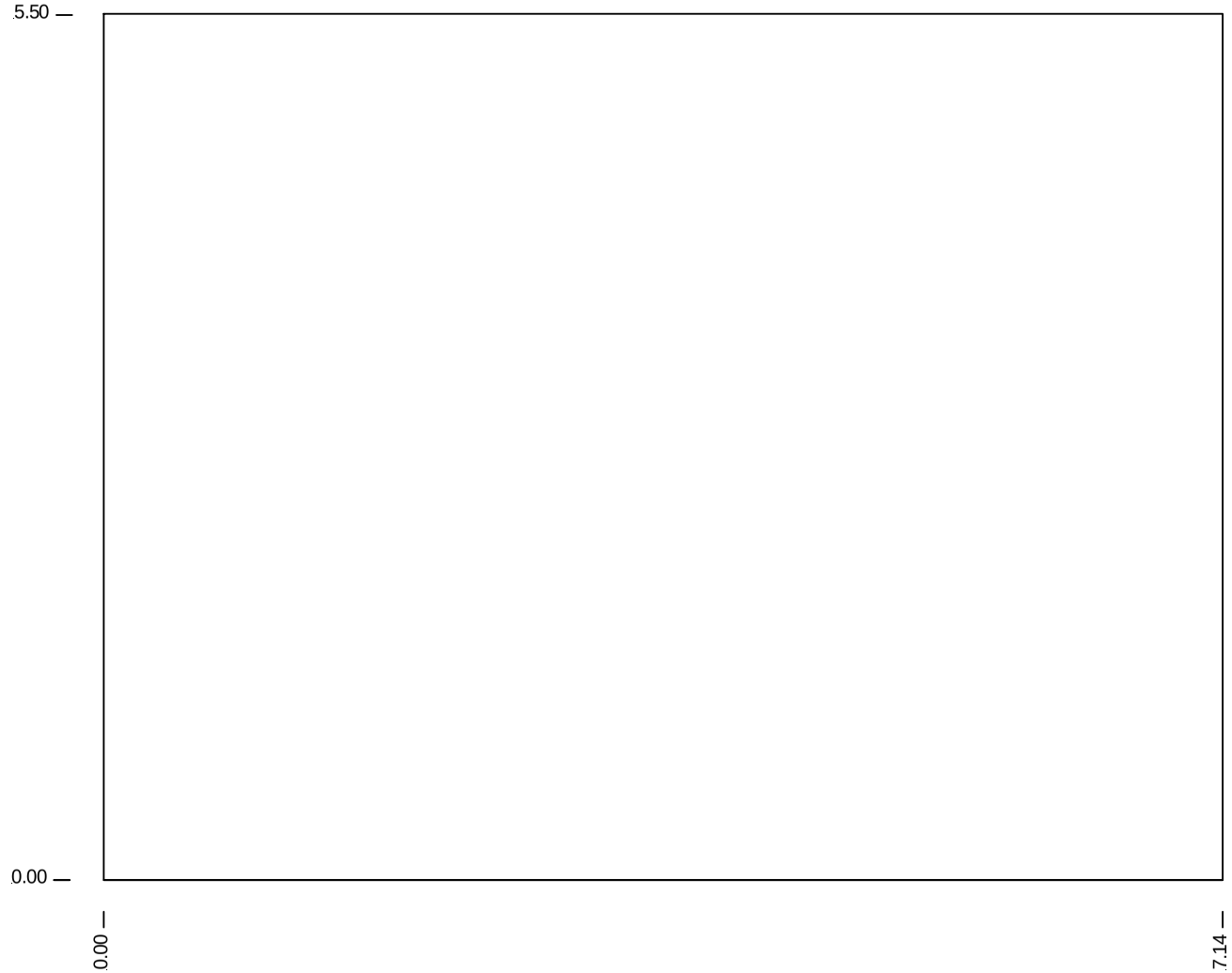
Power Supply Main Chassis	Scale: 1:1	Drawn by: OWJ	Approved by:	**RST Engineering**	Drawing #
	Date: 02 Oct 04	Rev: C	Jim Weir	13249 Grass Valley Ave Grass Valley CA 95945 530.272.2203 tech@rst-engr.com	6622-2200 Sheet 3 of 5


Bottom View
0.12" dia
(typ 6 pl)
0.144" dia
(typ 2 pl)
5.00
4.58
4.23
1.43
0.98
0.00
7.00
6.48
3.88
1.75
0.52
0.00
Power Supply Main Chassis
Scale: 1:1
Date: 22 Nov 01
Drawn by: OWJ
Rev: B
Approved by:
RST Engineering
13249 Grass Valley Ave Grass Valley CA 95945
530.272.2203
tech@rst-engr.com
Drawing #
6622-2200
Sheet 4 of 5



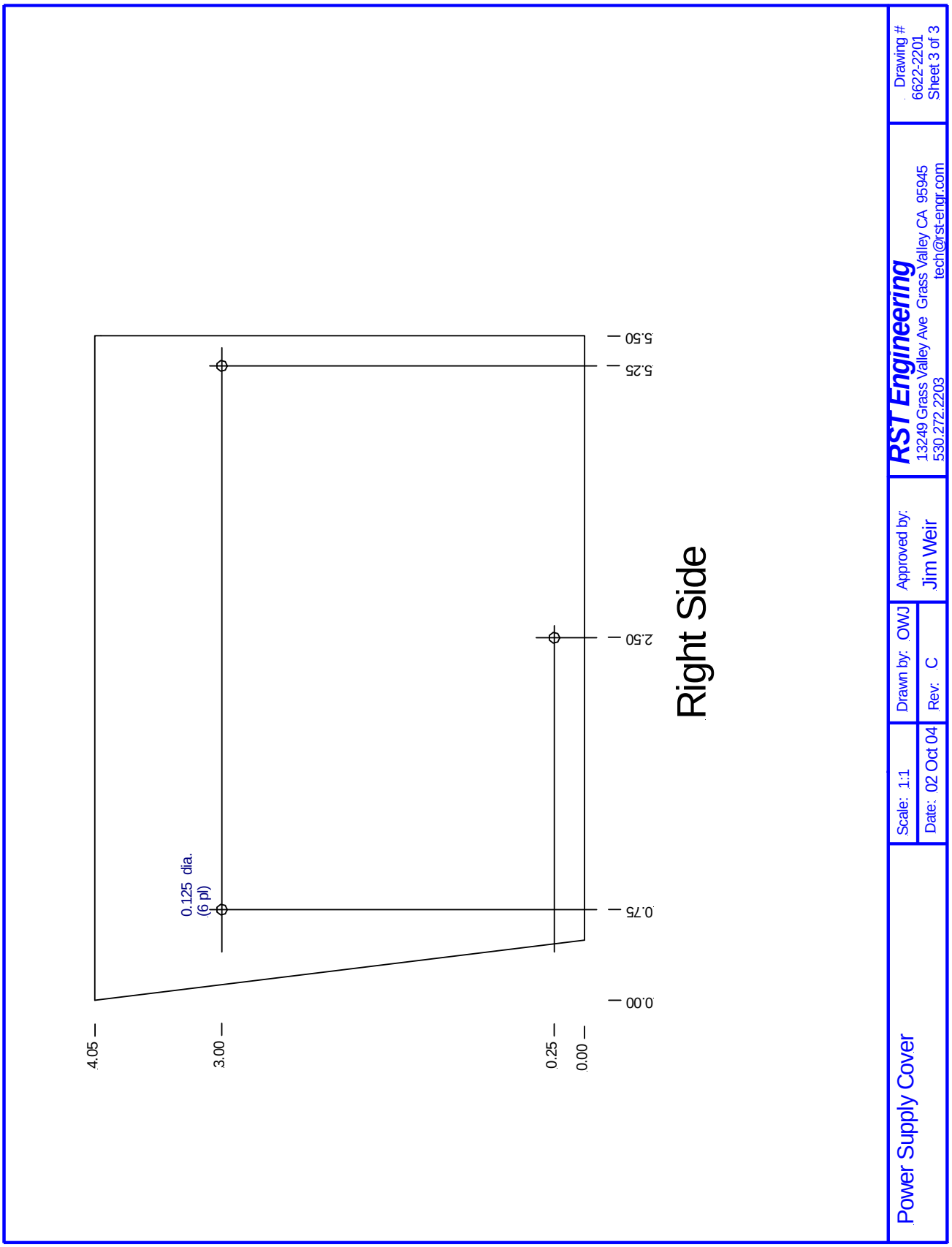
Front View

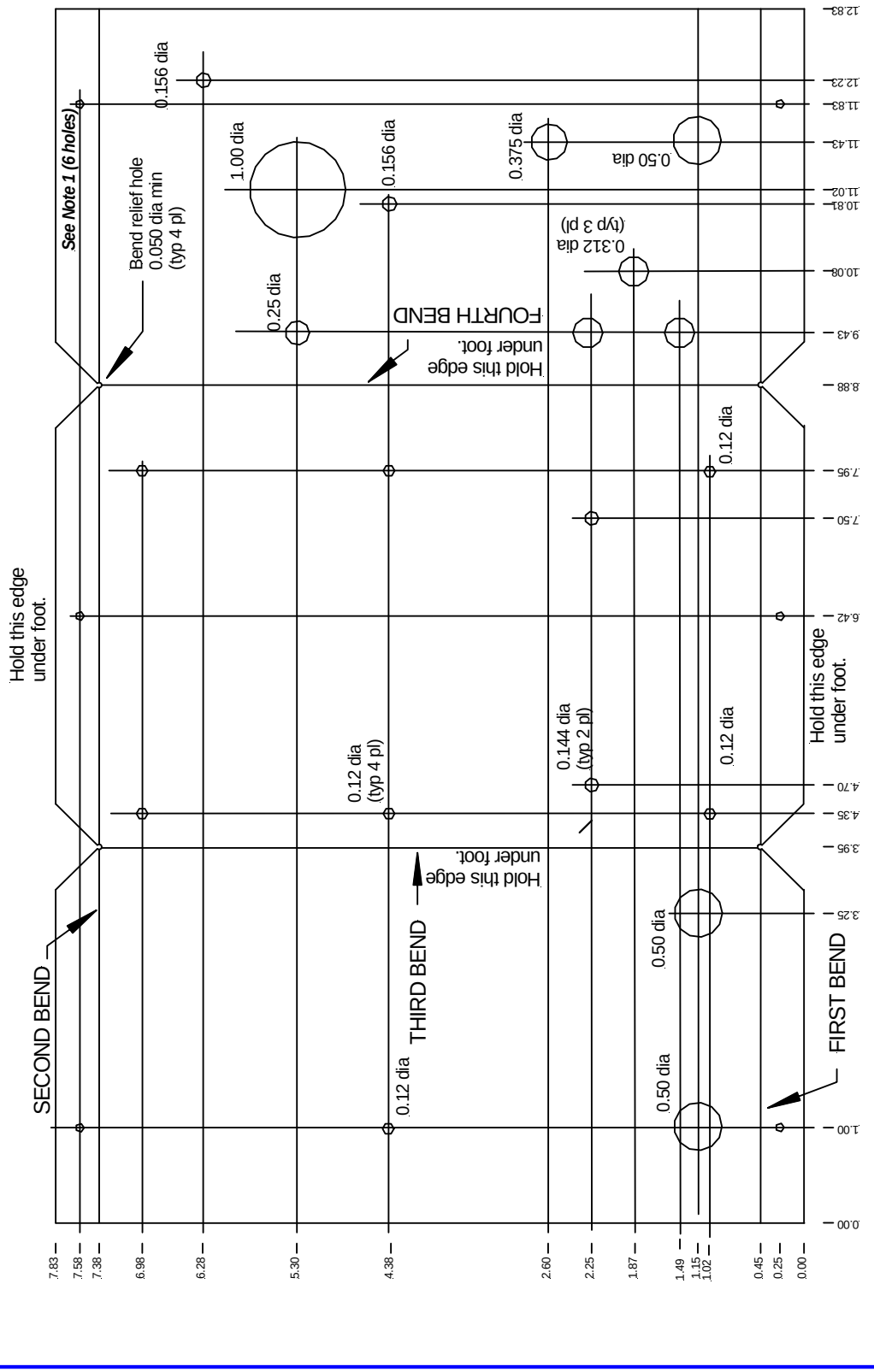
Power Supply Cover	Scale: 1:1	Drawn by: OWJ	Approved by:	RST Engineering	Drawing #
	Date: 28 Aug 05	Rev: C	Jim Weir	13249 Grass Valley Ave Grass Valley CA 95945 530.272.2203 tech@rst-engr.com	6622-2201 Sheet 1 of 3



Top View

Power Supply Cover	Scale: 1:1	Drawn by: OWJ	Approved by:	**RST Engineering**	Drawing #
	Date: 28 Aug 05	Rev: C	Jim Weir	13249 Grass Valley Ave Grass Valley CA 95945 530.272.2203 tech@rst-engr.com	6622-2201 Sheet 2 of 3


Right Side
0.125 dia.
(6 pl)
5.50
5.25
2.50
0.75
0.00
4.05
3.00
0.25
0.00
Power Supply Cover
Scale: 1:1
Date: 02 Oct 04
Drawn by: OWJ
Rev: C
Approved by:
Jim Weir
RST Engineering
13249 Grass Valley Ave Grass Valley CA 95945
530.272.2203
tech@rst-engr.com
Drawing #
6622-2201
Sheet 3 of 3



NOTES:
1. Before drilling the 6 cover mounting holes 0.089 diameter, fabricate the cover and then mark these holes using the cover as the template.
2. Material 5052H32 0.050 thick.
3. Drill/punch all holes FIRST, then cut the notches SECOND, then bend THIRD. Note order of bends. All bends are UP (away from sheet).

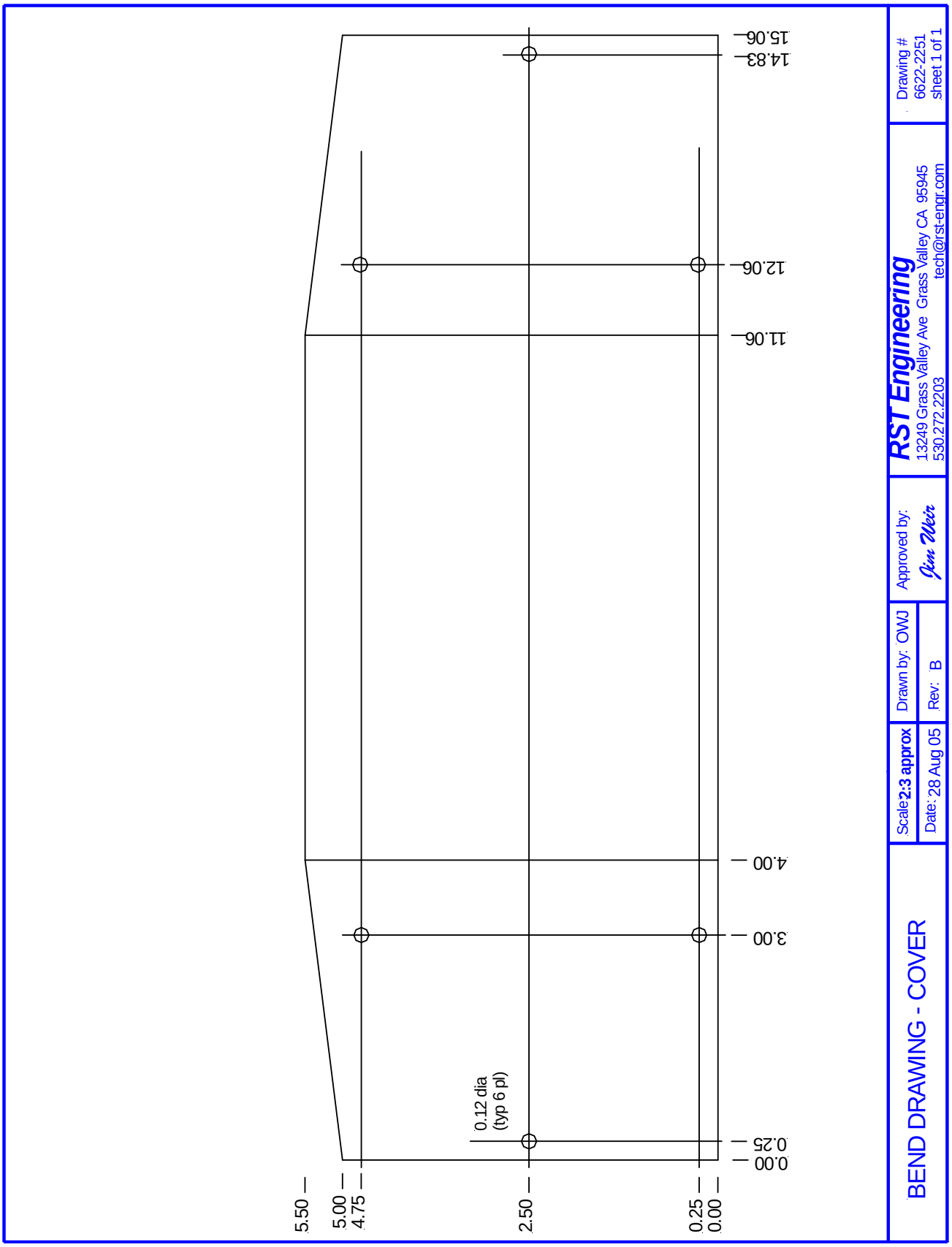
BEND DRAWING
BASIC CHASSIS

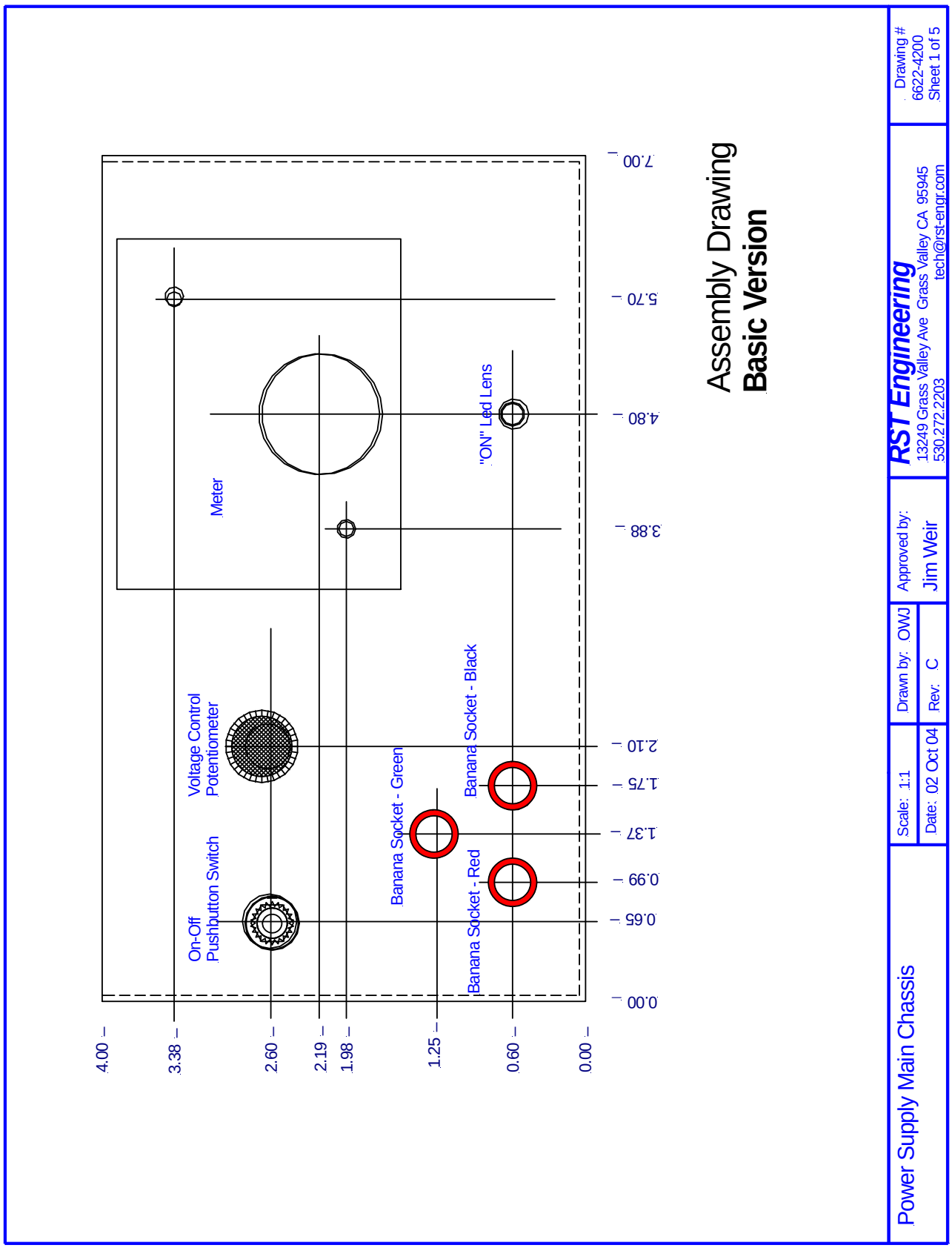
Scale:2:3 approx | Drawn by: OWJ | Approved by: Jim Weir

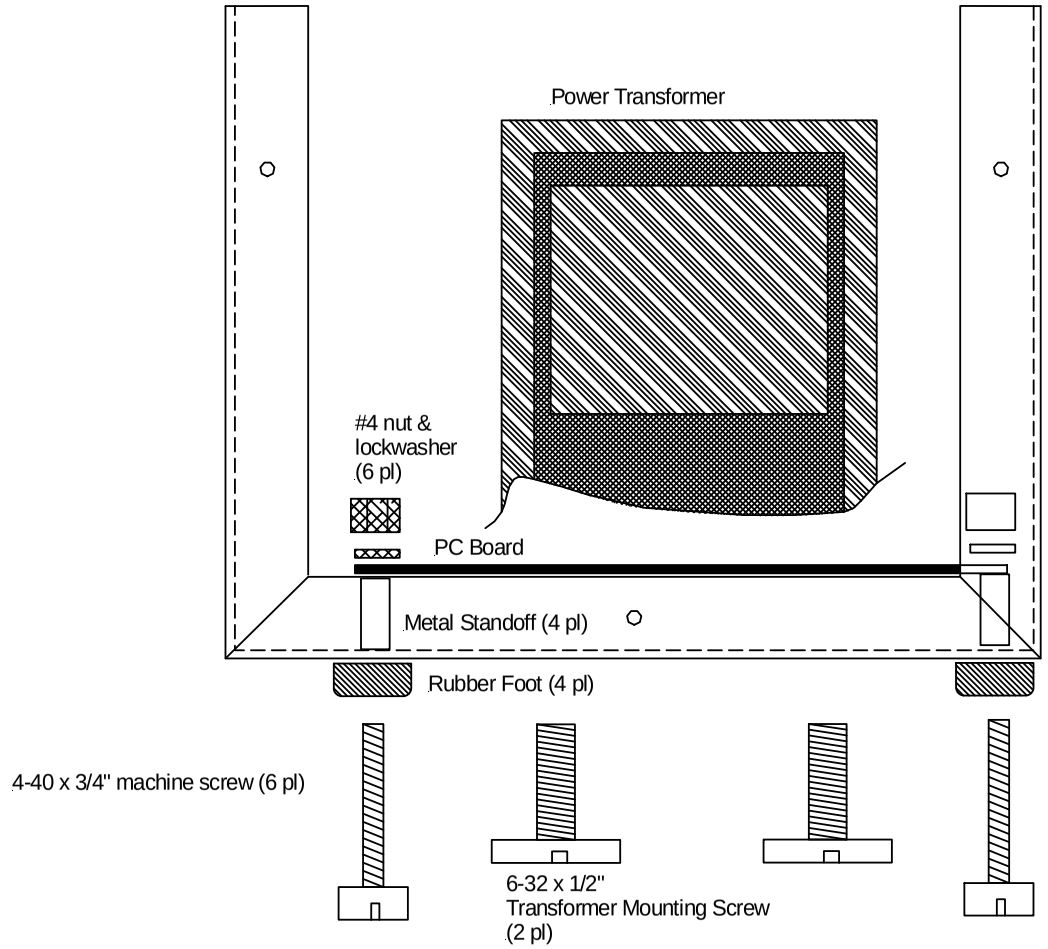
Date: 02 Oct 04 | Rev: E

RST Engineering
13249 Grass Valley Ave Grass Valley CA 95945
530.272.2203 tech@rst-engr.com

Drawing # 6622-2250
sheet 1 of 1

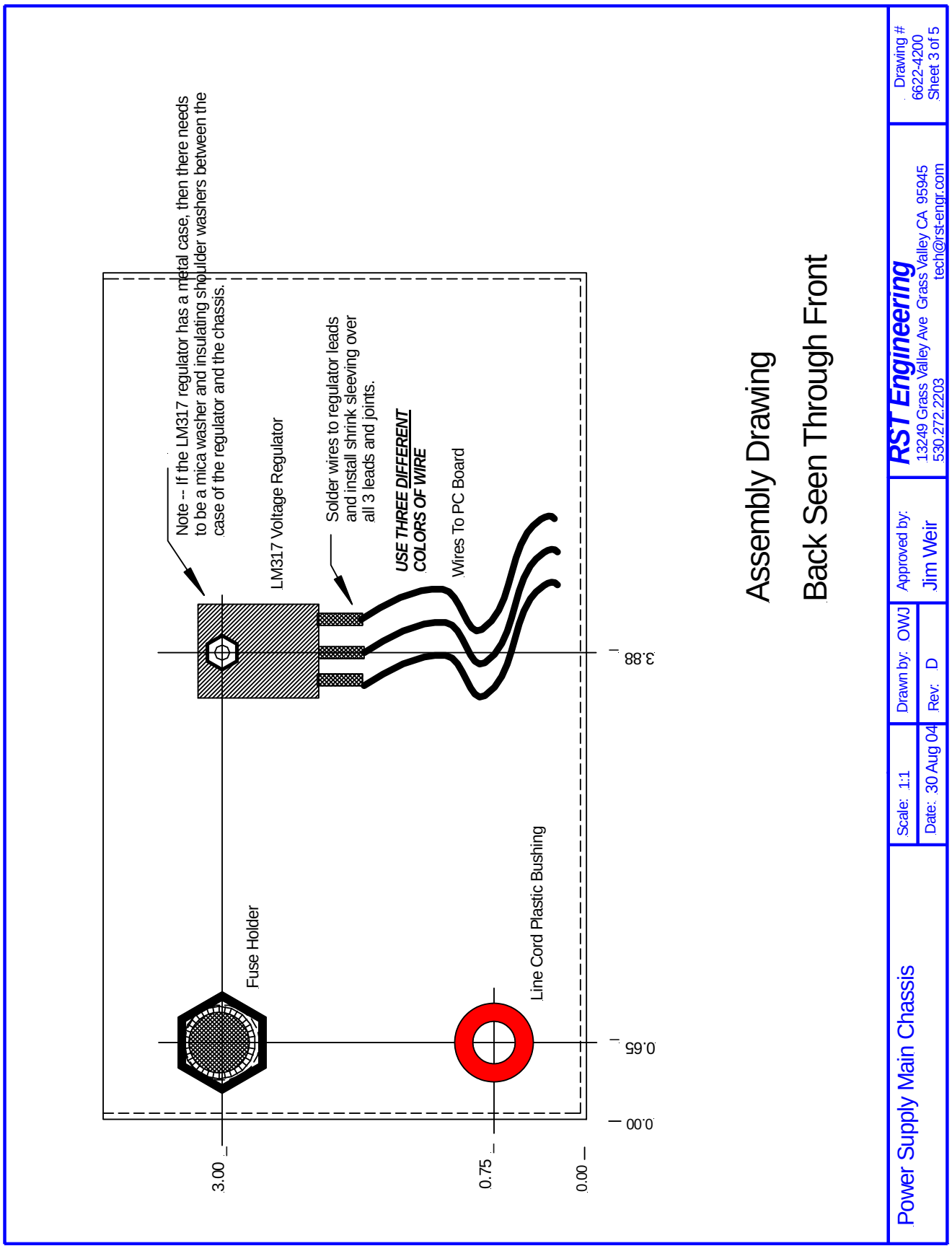

BEND DRAWING - COVER
Scale 2:3 approx
Date: 28 Aug 05
Drawn by: OWJ
Rev: B
Approved by: Jim Klein
RST Engineering
13249 Grass Valley Ave Grass Valley CA 95945
530.272.2203
tech@rst-engr.com
Drawing # 6622-2251
sheet 1 of 1
15.06
14.83
12.06
11.06
4.00
3.00
0.25
0.00
0.12 dia (typ 6 pl)
5.50
5.00
4.75
2.50
0.25
0.00

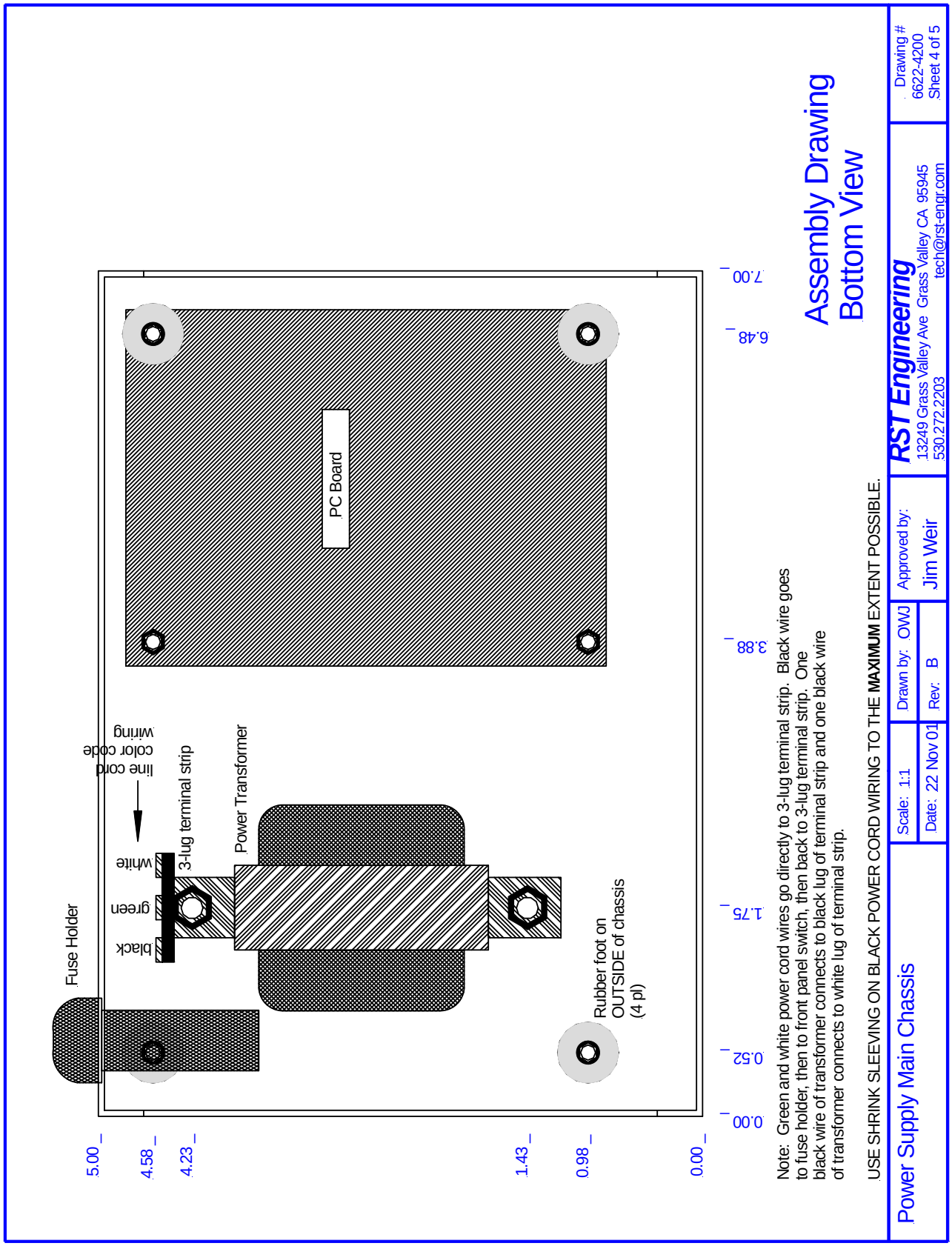

Assembly Drawing
Basic Version
Power Supply Main Chassis
Scale: 1:1
Date: 02 Oct 04
Drawn by: OWJ
Rev: C
Approved by:
Jim Weir
RST Engineering
13249 Grass Valley Ave Grass Valley CA 95945
530.272.2203
tech@rst-engr.com
Drawing # 6622-4200
Sheet 1 of 5
Meter
"ON" Led Lens
Voltage Control Potentiometer
On-Off Pushbutton Switch
Banana Socket - Green
Banana Socket - Black
Banana Socket - Red
7.00
5.70
4.80
3.88
2.10
1.75
1.37
0.99
0.65
0.00
4.00
3.38
2.60
2.19
1.98
1.25
0.60
0.00



Assembly Drawing
Right Side View

Power Supply Main Chassis	Scale: 1:1	Drawn by: OWJ	Approved by:	**RST Engineering**	Drawing #
	Date: 20 Nov 01	Rev: B	Jim Weir	13249 Grass Valley Ave Grass Valley CA 95945	6622-4200
				916.272.2203 tech@rst-engr.com	Sheet 2 of 5


Assembly Drawing
Back Seen Through Front
Note -- If the LM317 regulator has a metal case, then there needs to be a mica washer and insulating shoulder washers between the case of the regulator and the chassis.
LM317 Voltage Regulator
Solder wires to regulator leads and install shrink sleeving over all 3 leads and joints.
USE THREE DIFFERENT COLORS OF WIRE
Wires To PC Board
Fuse Holder
Line Cord Plastic Bushing
3.00
0.75
0.00
3.88
0.65
0.00
Power Supply Main Chassis
Scale: 1:1
Date: 30 Aug 04
Drawn by: OWJ
Rev: D
Approved by:
Jim Weir
RST Engineering
13249 Grass Valley Ave Grass Valley CA 95945
530.272.2203
tech@rst-engr.com
Drawing # 6622-4200
Sheet 3 of 5

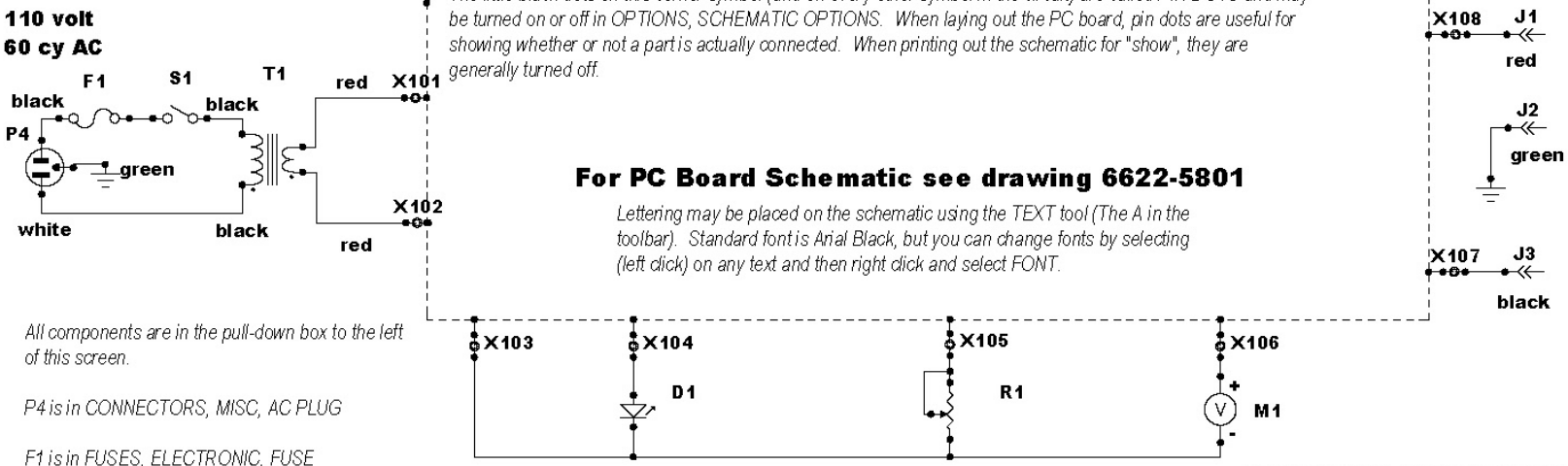

Assembly Drawing
Bottom View
RST Engineering
13249 Grass Valley Ave Grass Valley CA 95945
530.272.2203
tech@rst-engr.com
Power Supply Main Chassis
Scale: 1:1
Date: 22 Nov 01
Drawn by: OWJ
Rev: B
Approved by:
Jim Weir
Drawing # 6622-4200
Sheet 4 of 5
USE SHRINK SLEEVING ON BLACK POWER CORD WIRING TO THE MAXIMUM EXTENT POSSIBLE.
Note: Green and white power cord wires go directly to 3-lug terminal strip. Black wire goes to fuse holder, then to front panel switch, then back to 3-lug terminal strip. One black wire of transformer connects to black lug of terminal strip and one black wire of transformer connects to white lug of terminal strip.
Fuse Holder
line cord color code wiring
3-lug terminal strip
Power Transformer
PC Board
Rubber foot on OUTSIDE of chassis (4 pl)
black
green
white
0.00
0.52
1.75
3.88
6.48
7.00
0.00
0.98
1.43
4.23
4.58
5.00

This corner is kind of a "dummy" part that we use because this is a schematic package and not a drafting package. Wherever you have a line of any sort, Circuitmaker thinks it is a wire. You must have a place to solder the wire, so we have a dummy terminal called DRAFTING, MECHANICAL, ULH CORNER to let us draw our box.

This "box" is actually drawn with the WIRE tool, the (+) symbol in the toolbar. Circuitmaker thinks it is a wire.

To show this box as a dotted line, hold down the ALT key while drawing the box.

The little black dots on this corner symbol (and on every other symbol in the circuit) are called PIN DOTS and may be turned on or off in OPTIONS, SCHEMATIC OPTIONS. When laying out the PC board, pin dots are useful for showing whether or not a part is actually connected. When printing out the schematic for "show", they are generally turned off.



Lettering may be placed on the schematic using the TEXT tool (The A in the toolbar). Standard font is Arial Black, but you can change fonts by selecting (left click) on any text and then right click and select FONT.

All components are in the pull-down box to the left of this screen.

P4 is in CONNECTORS, MISC, AC PLUG

F1 is in FUSES, ELECTRONIC, FUSE

S1 is in SWITCHES, TOGGLE, SPST SWITCH

T1 is in TRANSFORMERS, COUPLED INDUCTORS, TRANSFORMER. Note that you will have to right-click twice before placing the transformer to get it into the correct configuration (secondary windings on the right of the transformer)

D1 is a light-emitting diode that you will find in TRANSISTORS AND DIODES, DIODE, LIGHTED, and then pick any one of the RED Models at the bottom of the column.

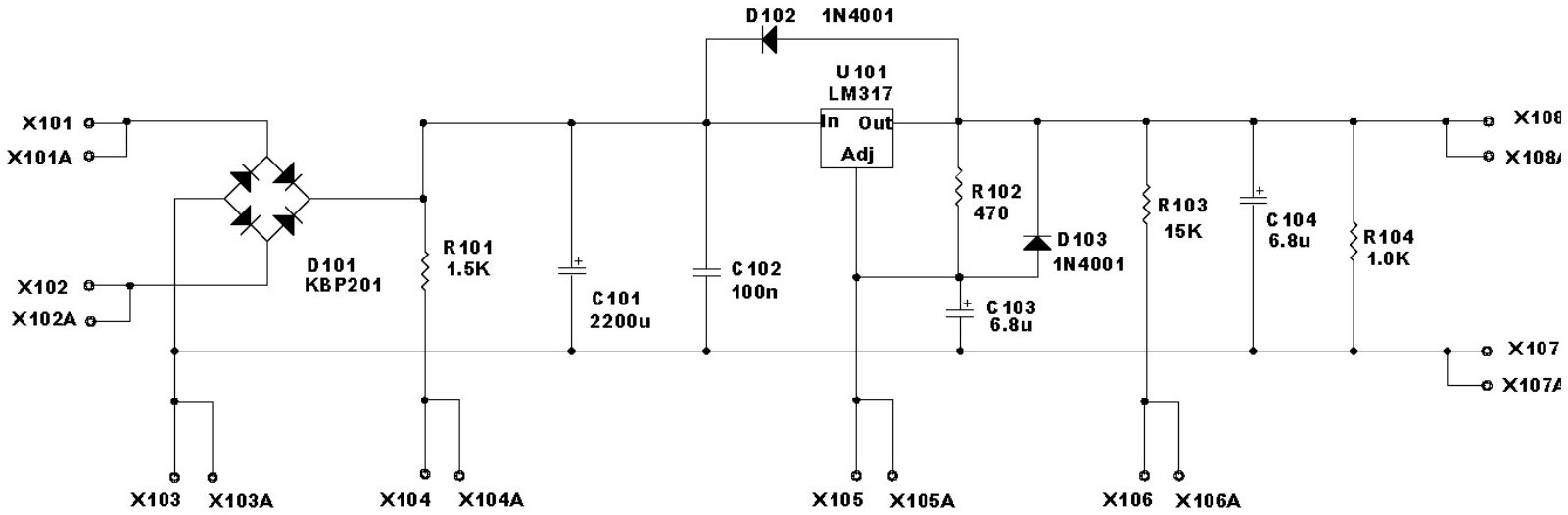
R1 is a RESISTORS, PANEL MOUNT, PANLPOT, 2K.

M1 is a POWER SUPPLIES, LINEAR, V SOURCE.

X101 through X108 are the tie points on the PC board for wires coming out to these panel mounted components. Note that all the panel mounted components are numbered between 1 and 99, while the tie points (being on the PC board) are 100-199 series numbers.

This is the title block. You can access the title block by going to OPTIONS, SCHEMATIC, TITLE BLOCK.

CIE-14 Power Supply Basic Drawing Conventions	
Chassis Wiring Diagram	
Rev C	**ID** 6622-2900
Date: 30 Aug 04	**Page: 1 of 1**



In the actual layout of the PC board, we use the CONNECTORS, ACTIVE, IN-OUT (and not the other PCB connector pin IN&OUT) for X101-108. These points will show up as wire holes on the actual PCB layout.

X101A-X108A are also wire holes, but these are test wire holes. When the PC board is etched and the parts are put on the board, we will connect these points to a text fixture to "prove" the board before wiring it into your chassis. This saves an immense amount of grief in troubleshooting the boards.

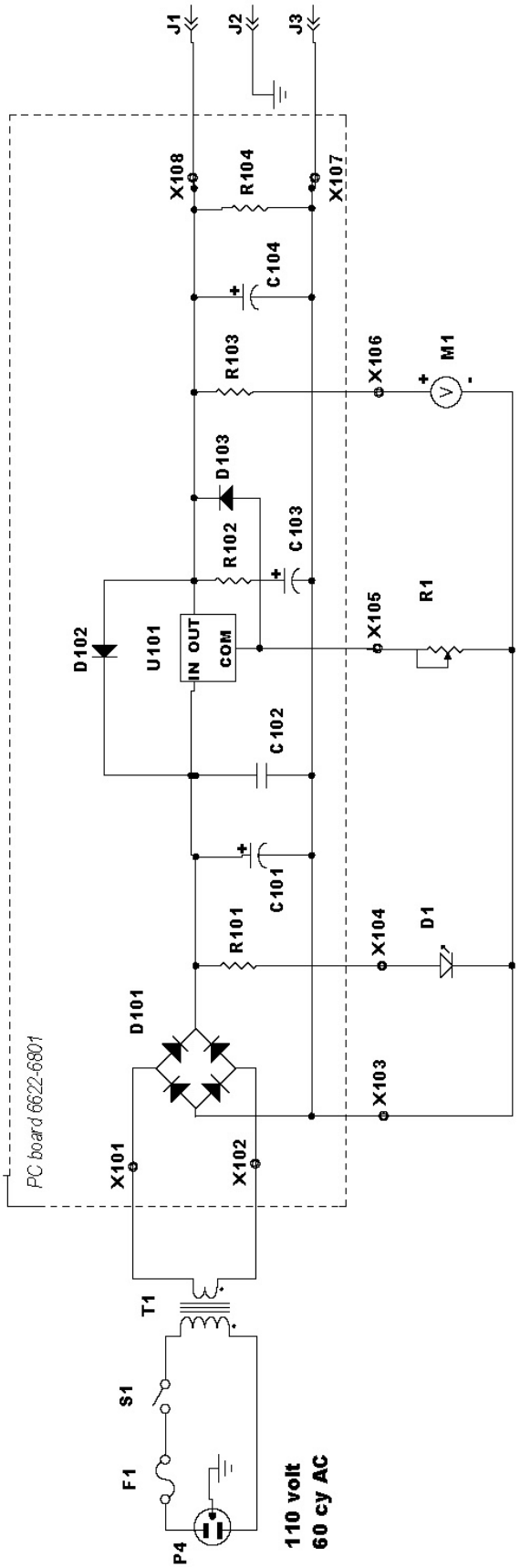
PARTS SELECTION

All C parts will be found in CAPACITORS
*C101 is POLAR, ELECAXI, 2200u (be sure to use the **50 volt** version)*
C102 is PLASTIC, MYLAR, 100n
C103 & 104 are POLAR, ELECRAD, 4.7u

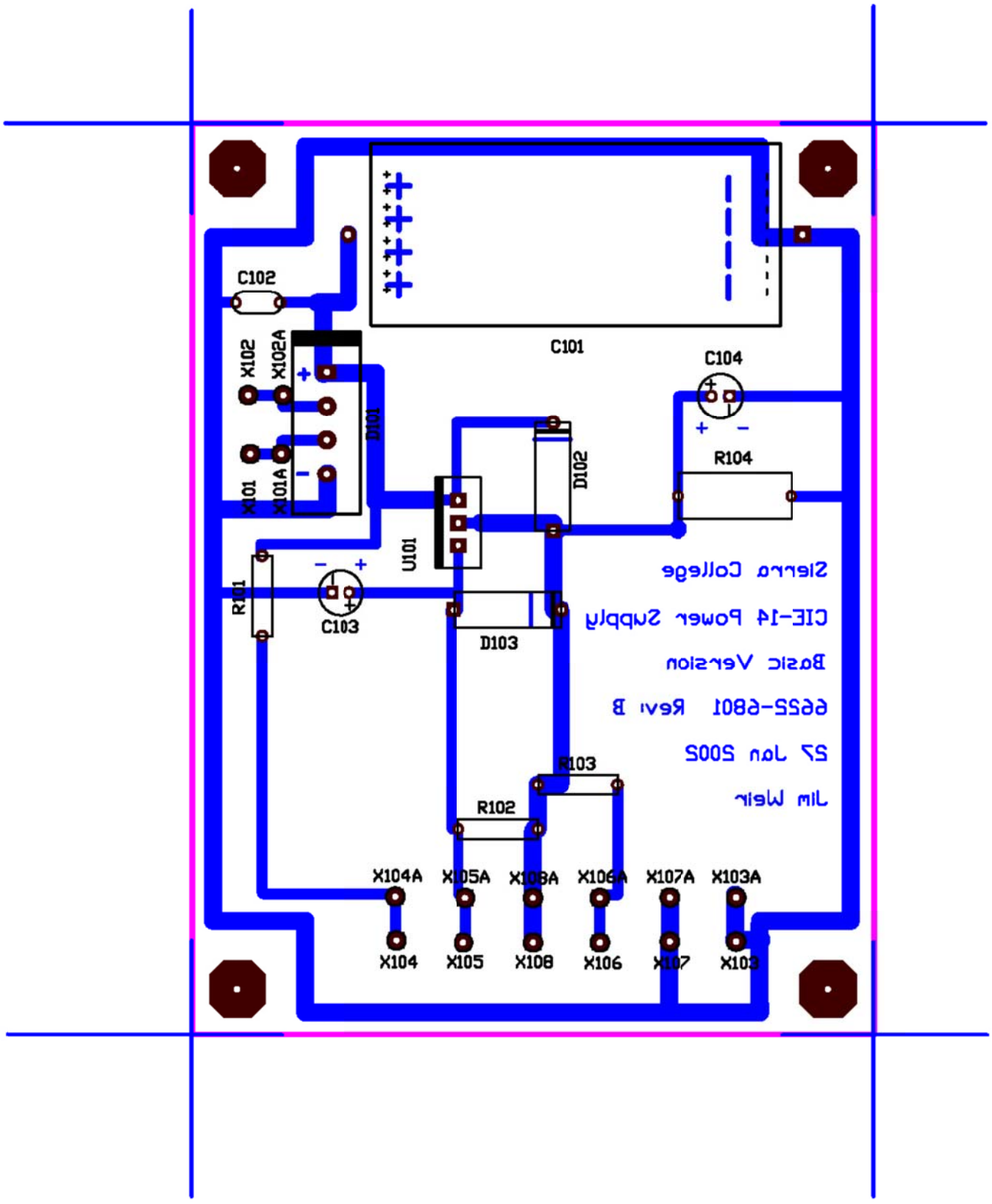
All D parts will be found in TRANSISTORS & DIODES, DIODE
D101 is FWBRIDGE, KBP201
D102 & 103 are RECTIFIR, 1N4002

All R parts will be found in RESISTORS, FIXED CARBON FILM
R101 is QWATT, 1.5K
R102 is QWATT, 470
R103 is QWATT, 15K
R104 is 1WATT, 1.0K

CIE14 Power Supply (Basic) **PC Board Components** **(Makes PCB 6622-6801)**	
Rev **A**	**ID** **6622-5801**
Date: 26 Feb 01	**Page: 1 of 2**



CIE14 Power Supply (Basic) Chassis & PCB Interconnect		
Rev A	ID 6622-2901	
Date: 22 Nov 01		Page: 1 of 1


C102
X102
X102A
X101
X101A
D101
C101
C104
R104
D102
U101
R101
C103
D103
R103
R102
X104A
X105A
X108A
X106A
X107A
X103A
X104
X105
X108
X106
X107
X103
Sierra College
CIE-14 Power Supply
Basic Version
6622-6801 Rev B
27 Jan 2002
Jim Weir