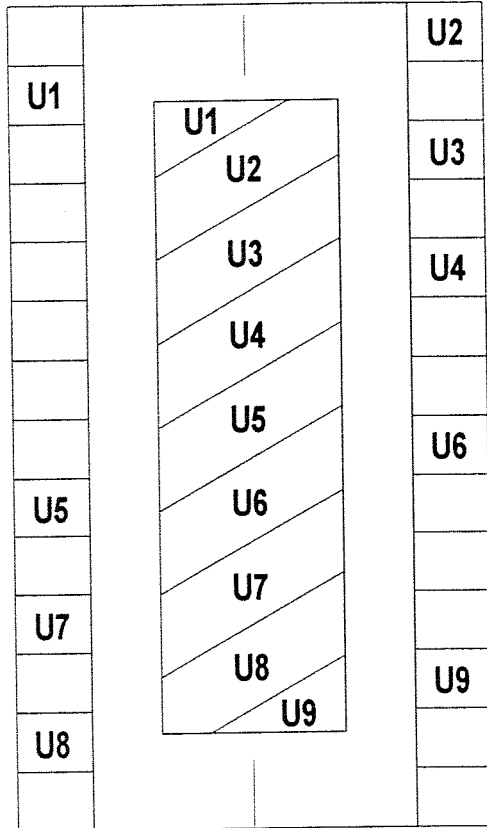
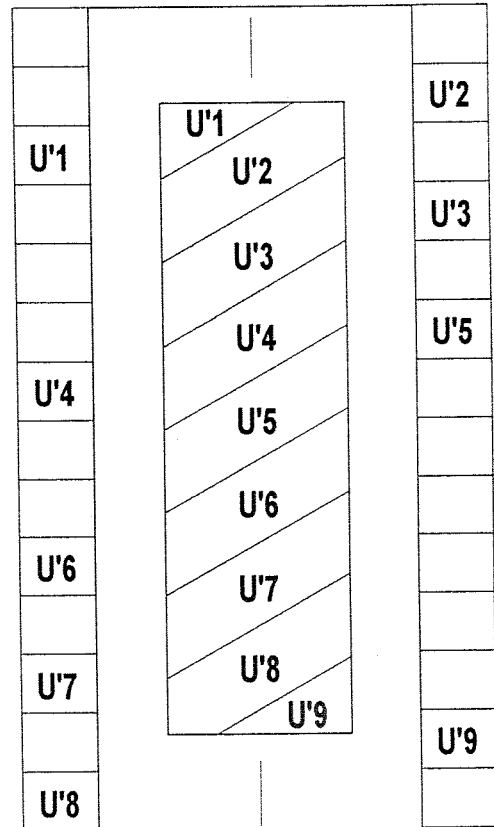


BBC1: 16-WIRE GROUP MAP & AMPLIFIER-DISCRIMINATOR LOCATION LAYOUT

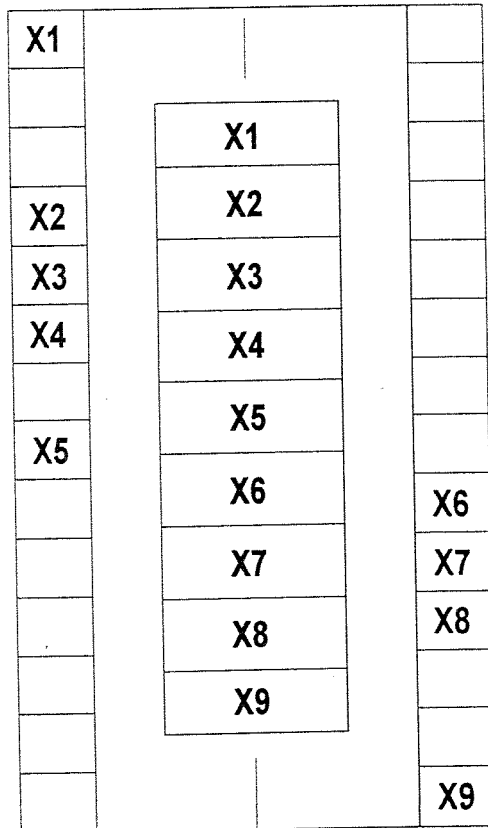
U PLANE



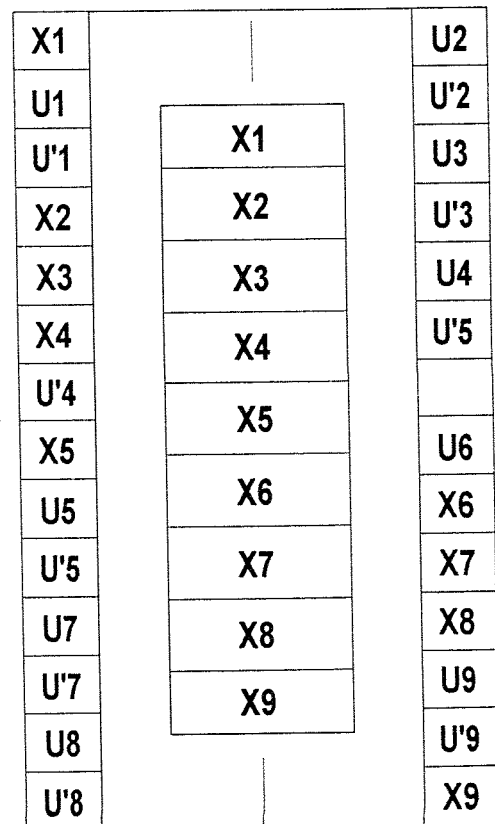
U' PLANE



X PLANE



COMPOSITE



Technical drawing of a rectangular plate with dimensions in inches and centimeters. The drawing includes a central rectangular area and an outer frame, with various dimensions and centerlines indicated.

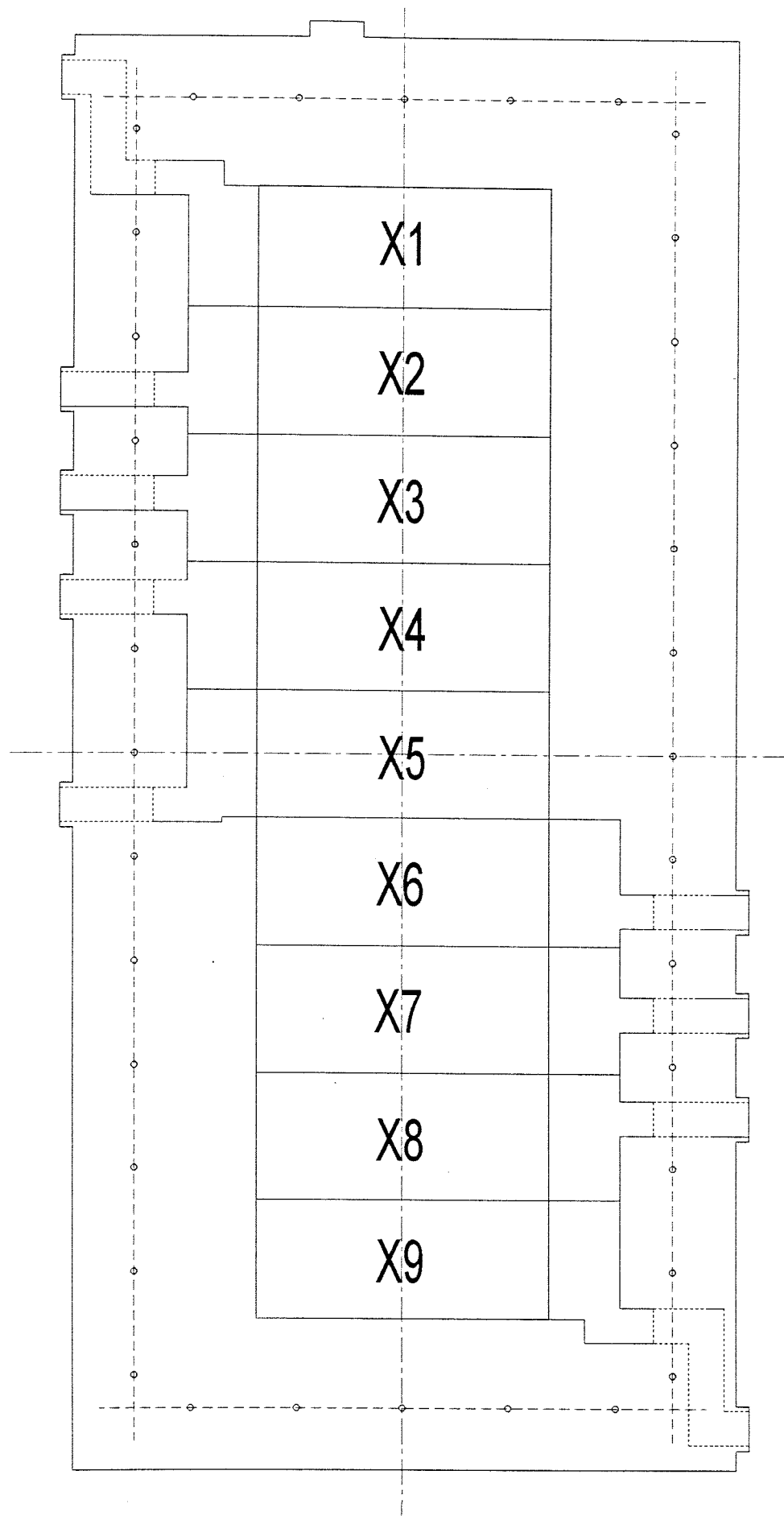
Dimensions:

- Overall width: 32.000" (81.28 cm)
- Overall height: 71.500" (181.6 cm)
- Inner width: 14.174" (36 cm)
- Inner height: 55.905" (142 cm)
- Distance from inner width to centerline: 7.087" (18 cm)
- Distance from inner height to centerline: 27.953" (71 cm)
- Distance from outer width to centerline: 16.000" (40.64 cm)
- Distance from outer height to centerline: 35.375" (89.93 cm)

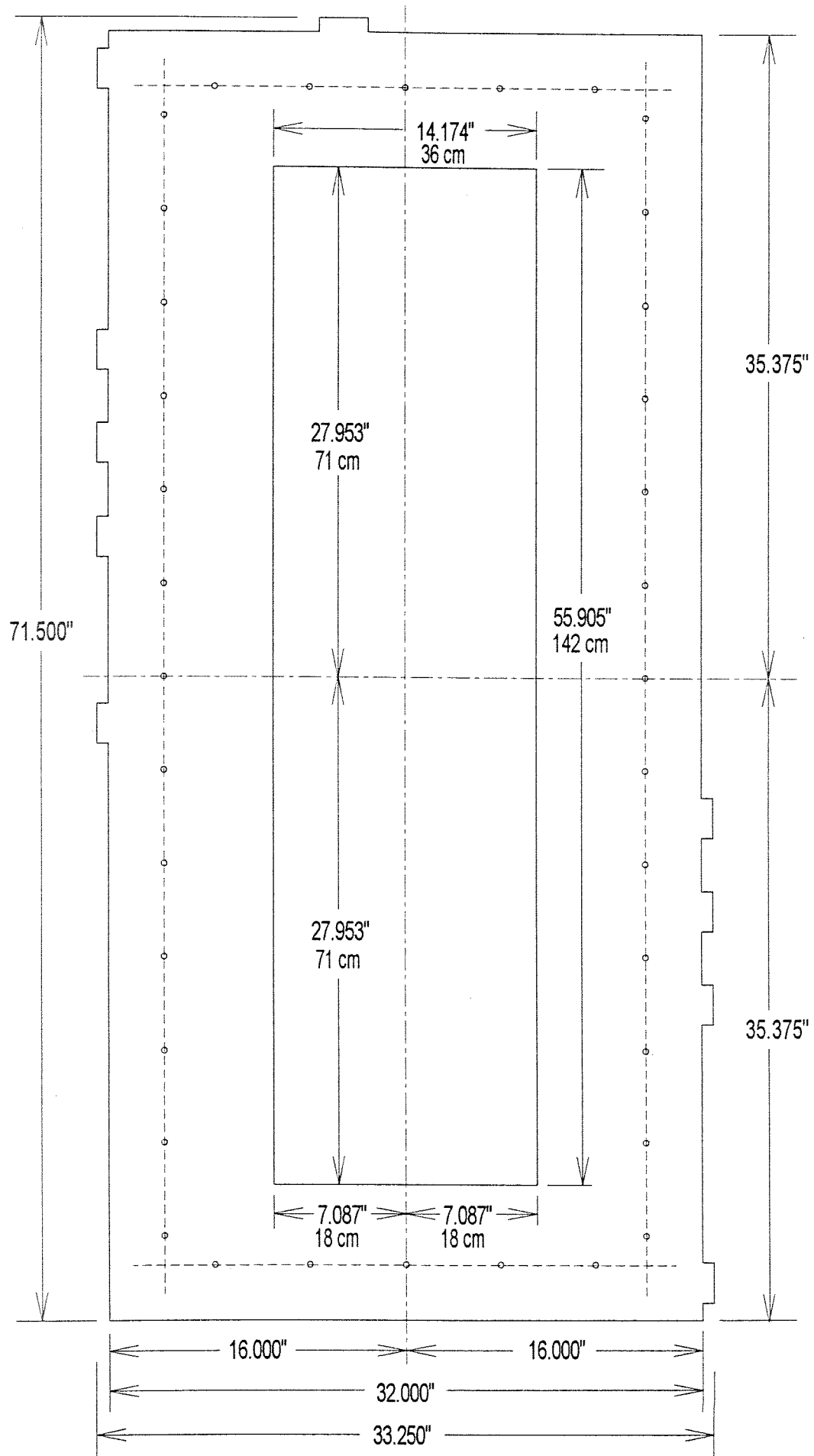
Centerlines:

- Horizontal centerline (indicated by a dashed line with arrows pointing to the center)
- Vertical centerline (indicated by a dashed line with arrows pointing to the center)

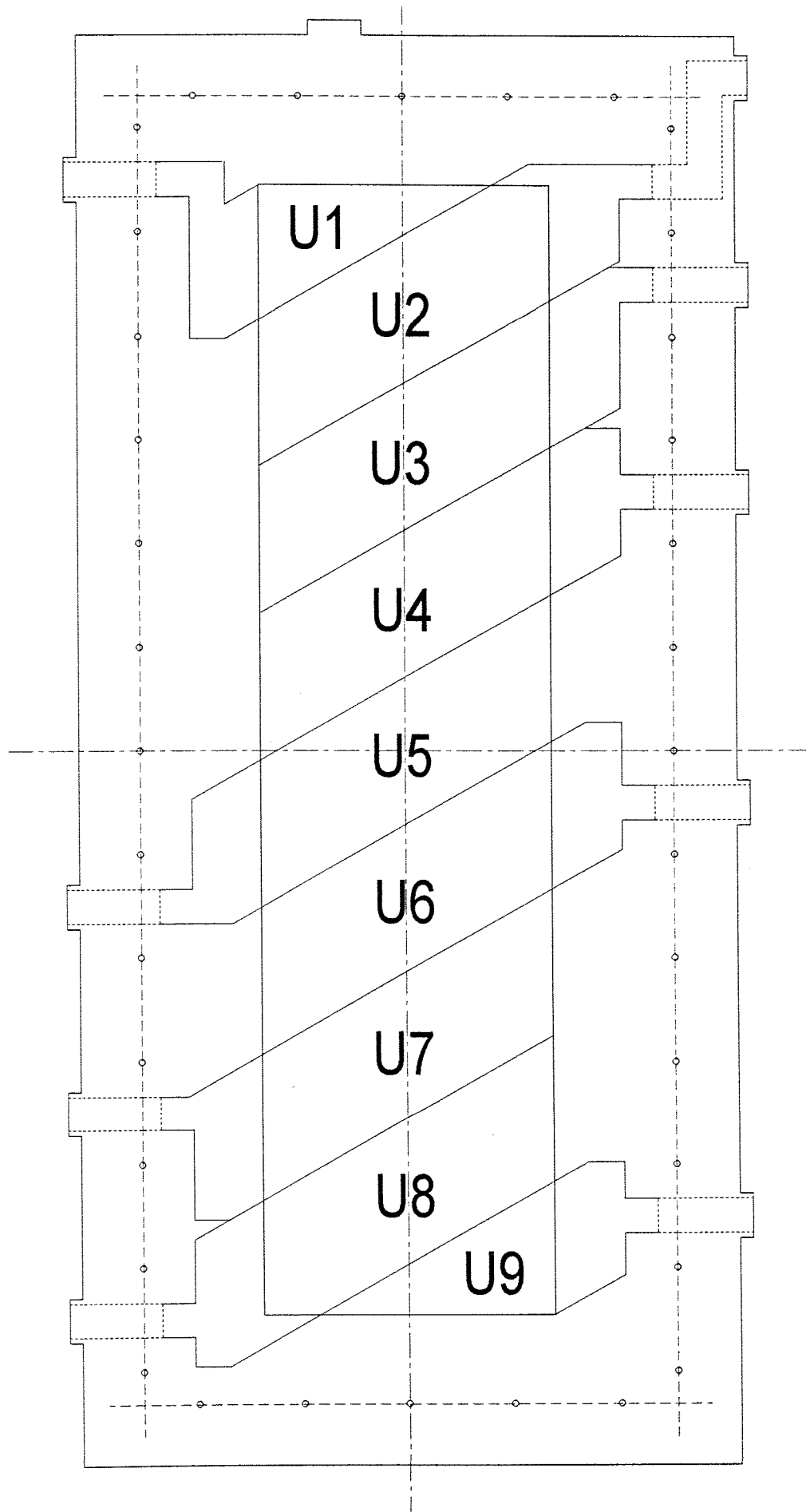
BBC1: X-PLANE SIGNAL TRACE OUTLINE



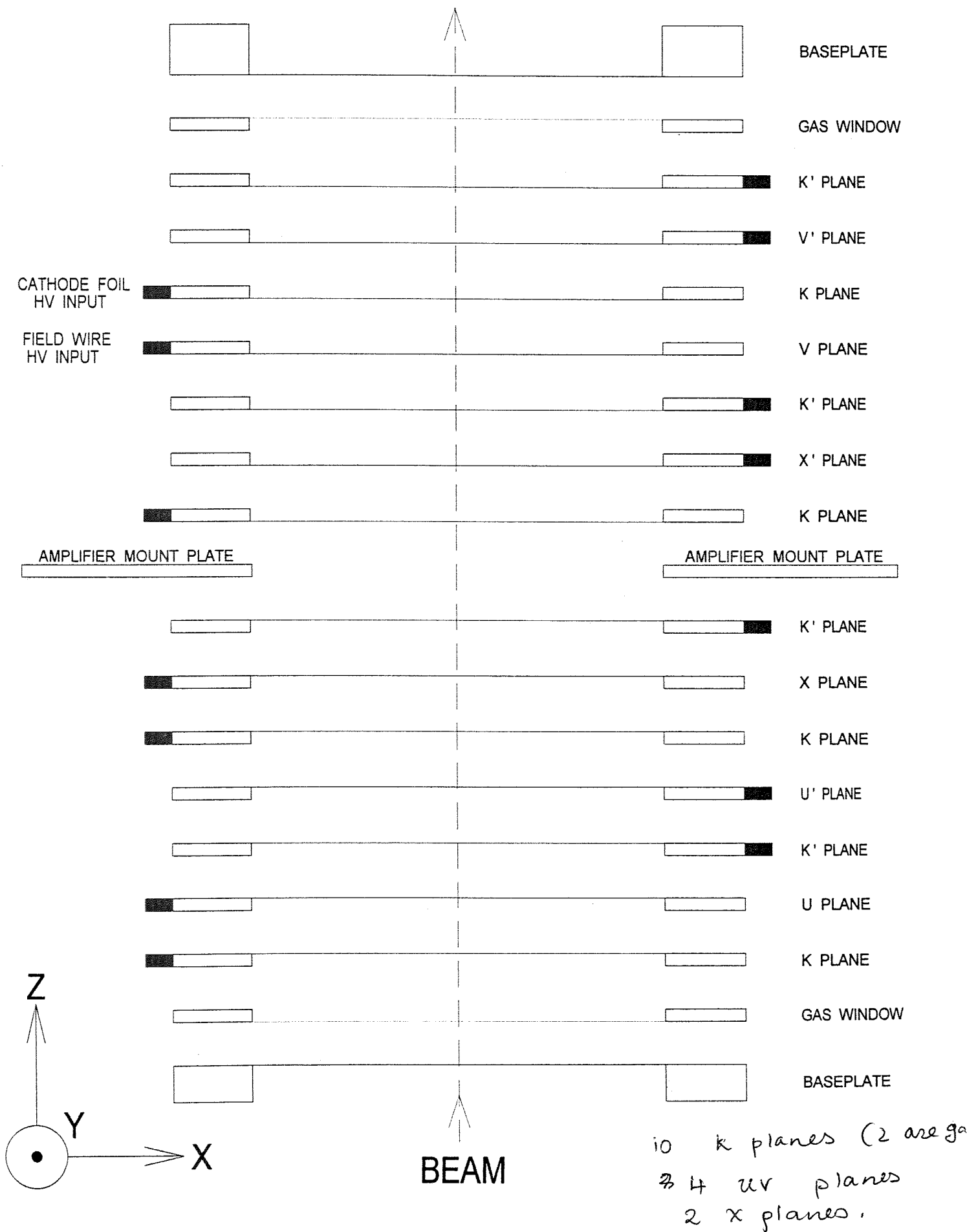
BBC1: X-PLANE DIMENSIONS



BBC1: UV-PLANE SIGNAL TRACE OUTLINE



HKS CHAMBER ASSEMBLY (schematic)

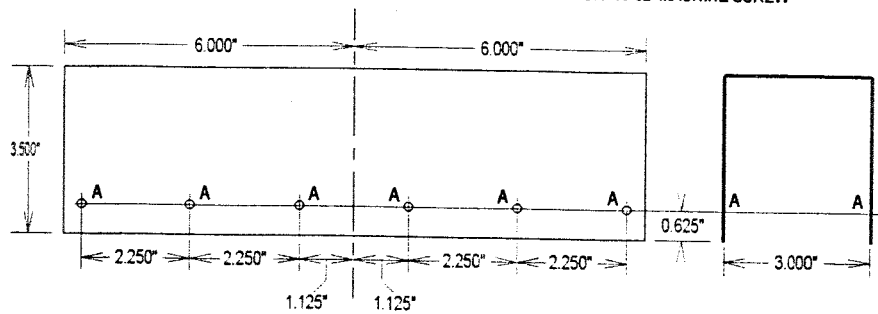


HV PROTECTIVE SHIELD

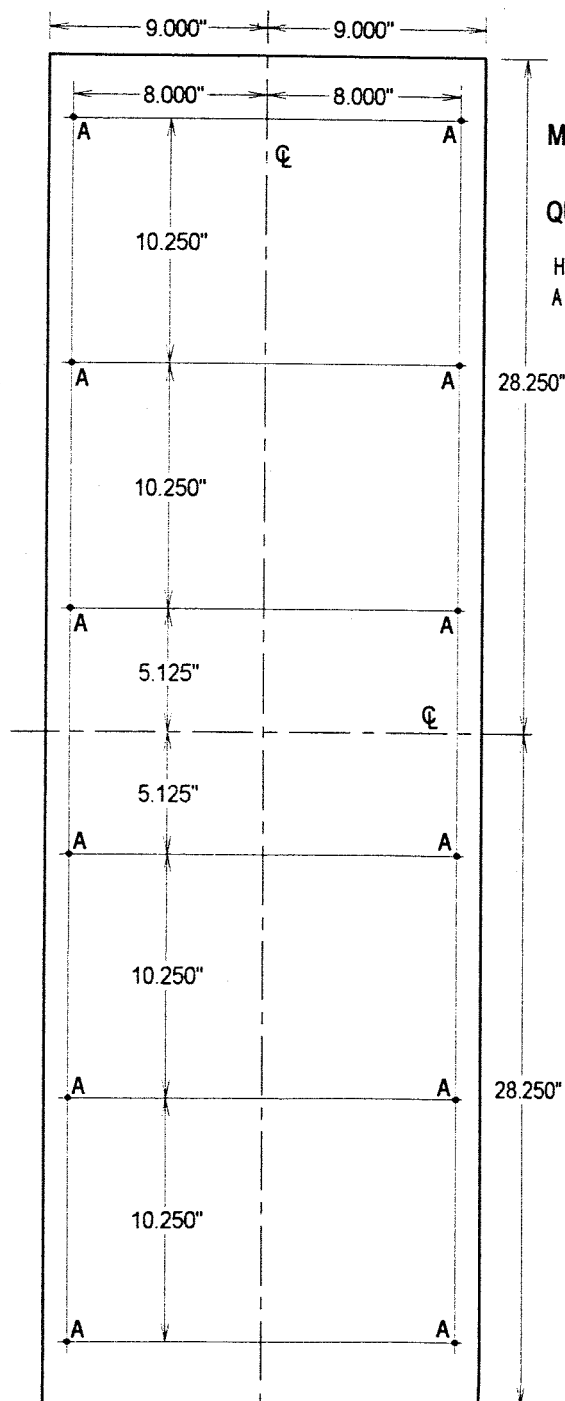
MATERIAL: .040" ALUMINUM SHEET

QUANTITY REQUIRED: 2

HOLE SPECIFICATIONS: A = CLEARANCE FOR 10-32 MACHINE SCREW



PROTECTIVE CHAMBER WINDOW COVER



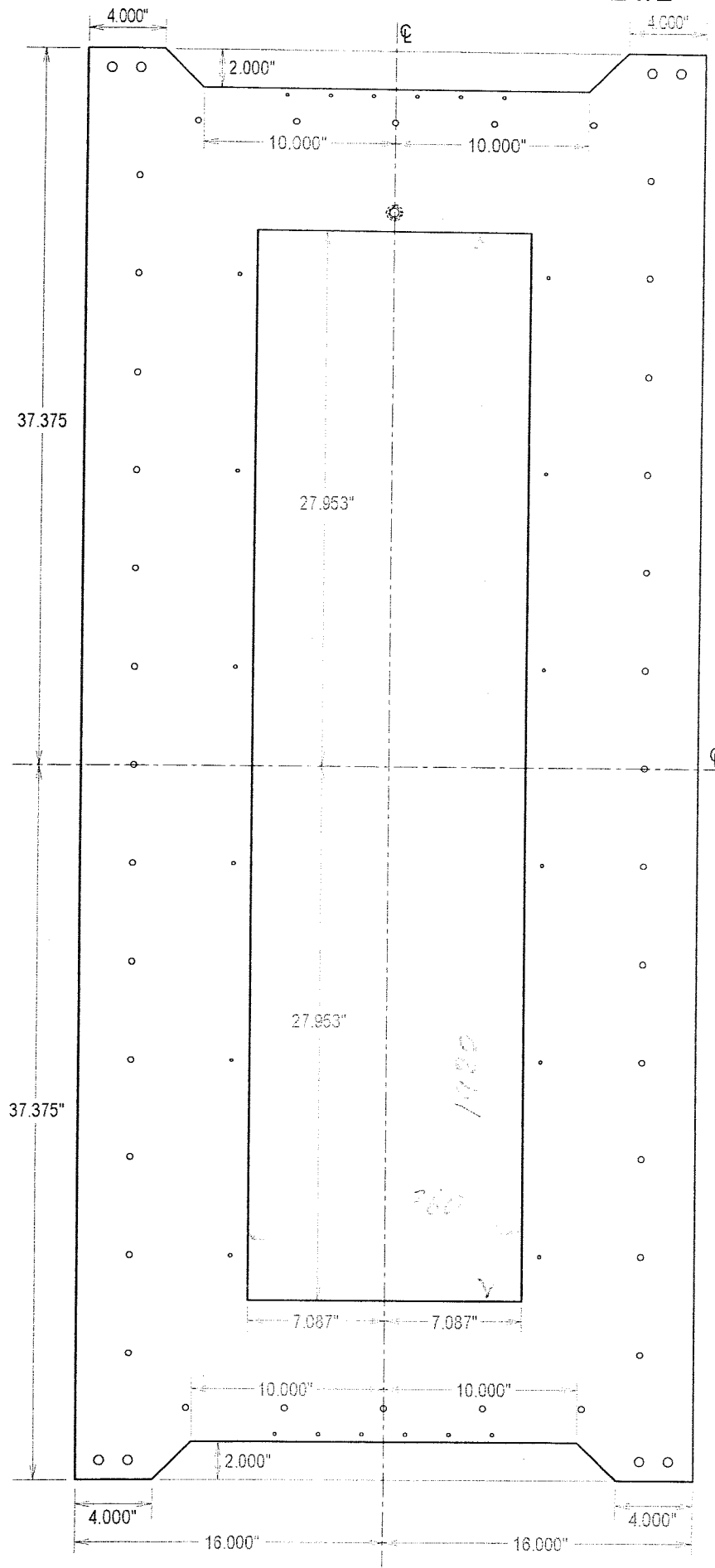
MATERIAL: ALUMINUM OR
PLASTIC SHEET

QUANTITY REQUIRED: 2

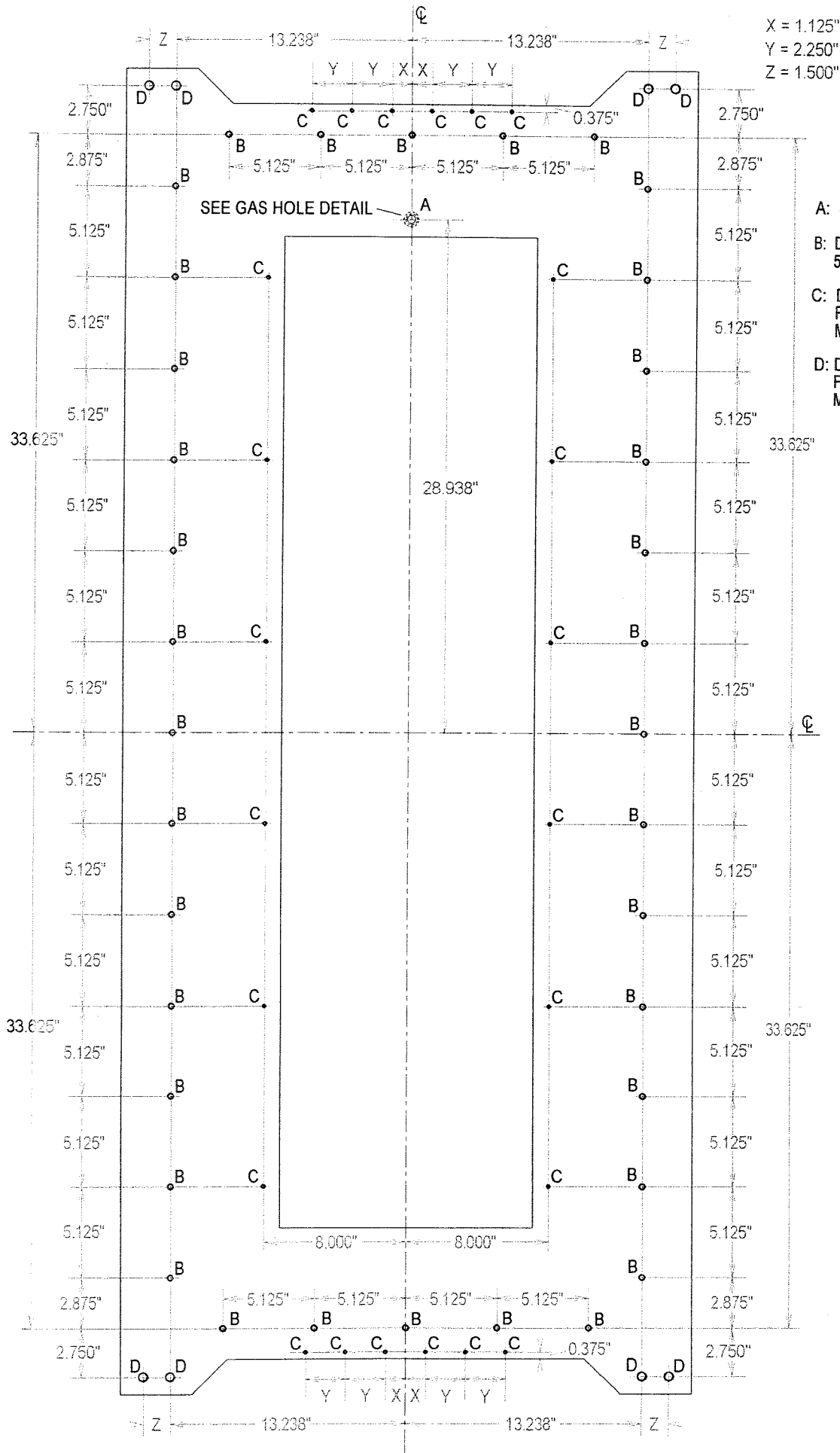
HOLE SPECIFICATIONS:
A = CLEARANCE FOR 10-32
MACHINE SCREW

BBC 1 BASEPLATE : DIMENSIONS

MATERIAL: 1/2" THICK ALUMINUM PLATE

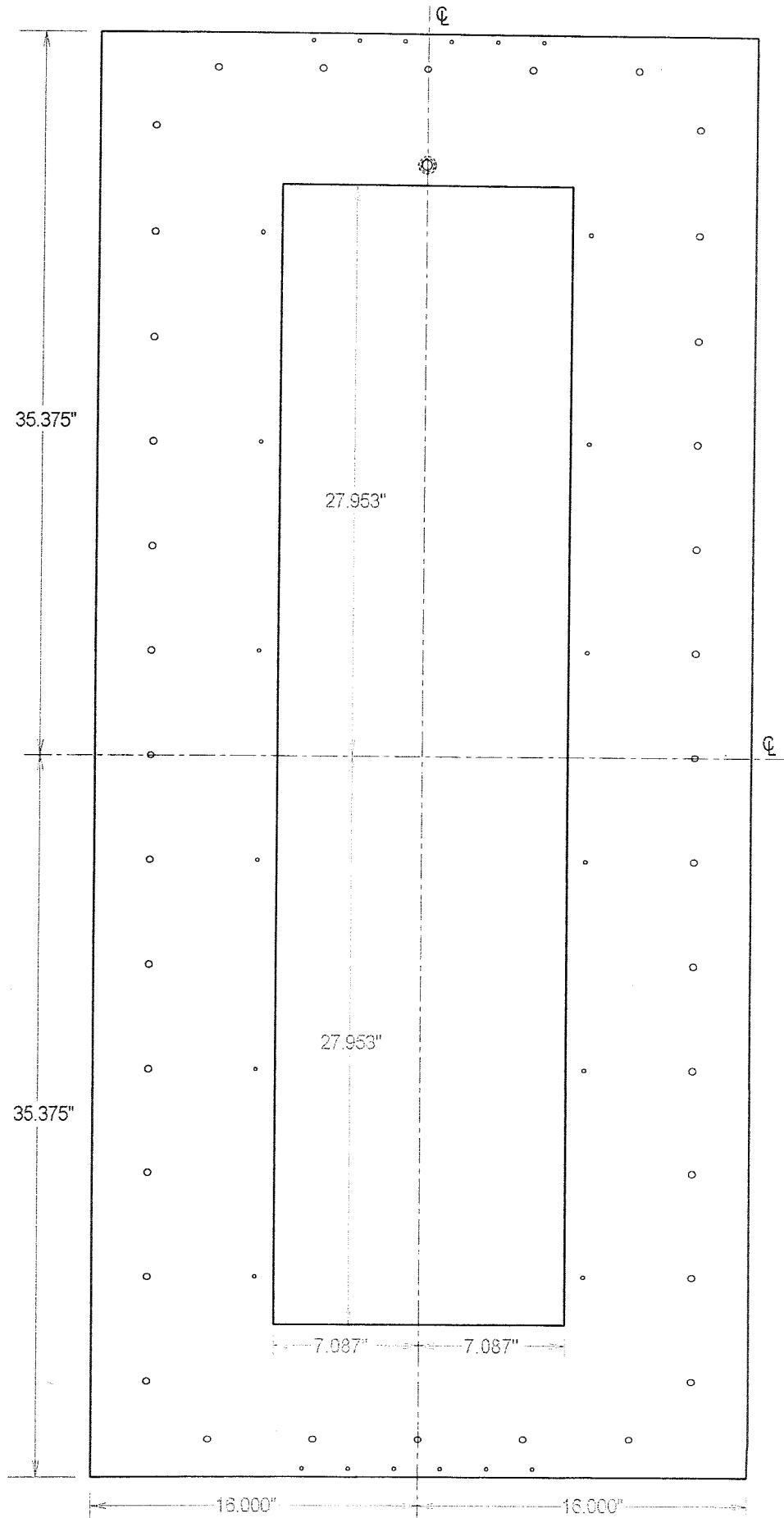


BBC 1 BASEPLATE: HOLE SPECIFICATIONS

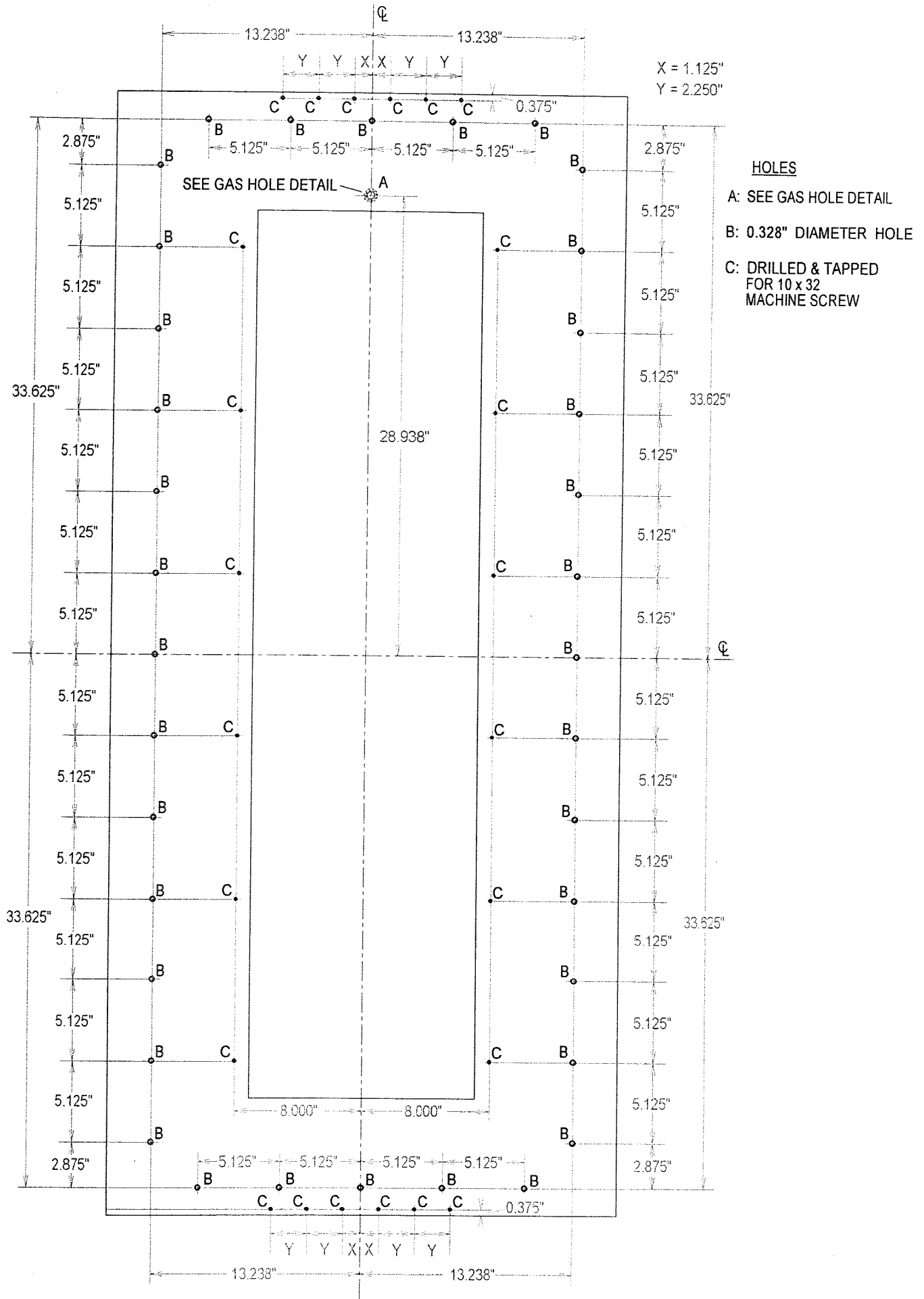


BBC 1 ENDPLATE : DIMENSIONS

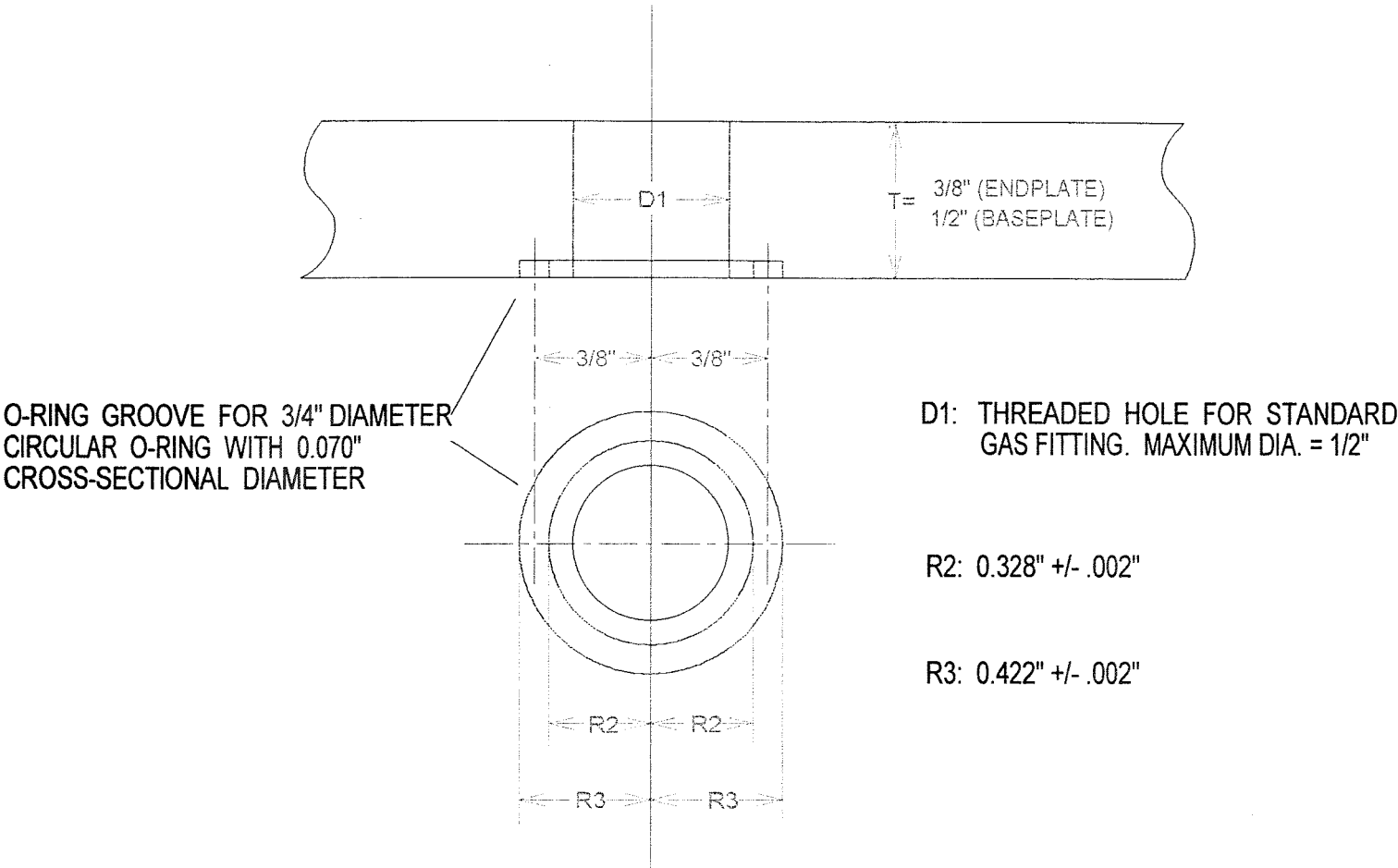
MATERIAL: 3/8" THICK ALUMINUM PLATE



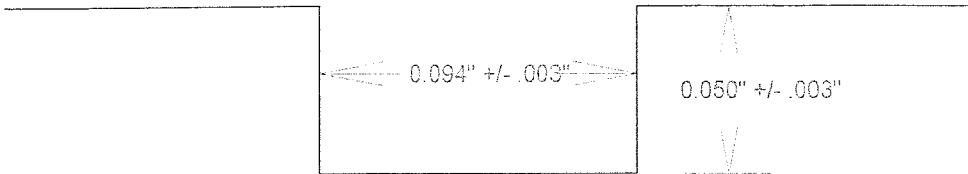
BBC 1 ENDPLATE : HOLE SPECIFICATIONS



BASEPLATE & ENDPLATE: GAS HOLE DETAIL



O-RING GROOVE CROSS-SECTION



ALIGNMENT PIN DRILLING TEMPLATE

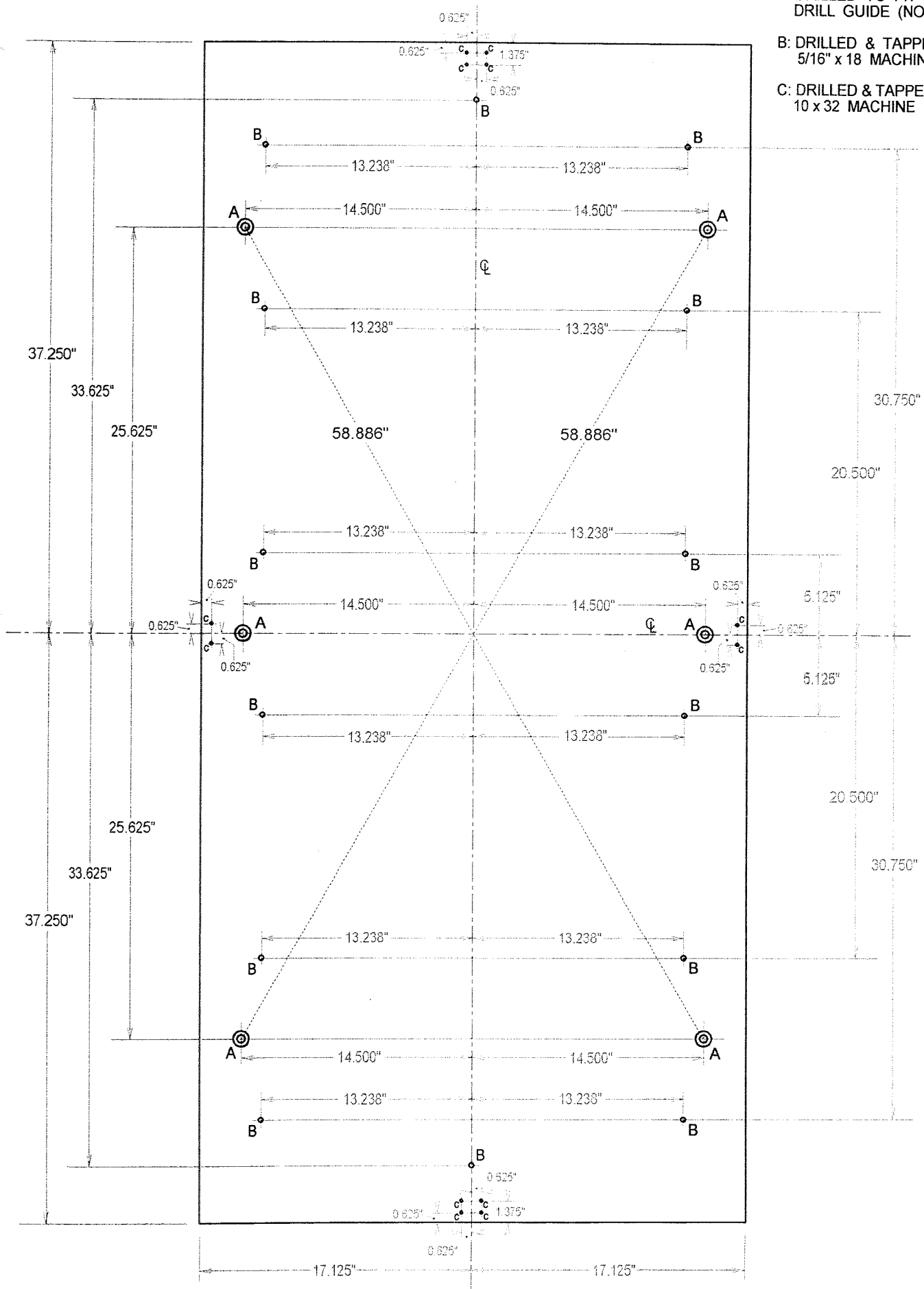
MATERIAL: 1/2" THICK ALUMINUM PLATE

HOLE SPECIFICATIONS

A: DRILLED TO FIT 1/2" ID
DRILL GUIDE (NO HEAD)

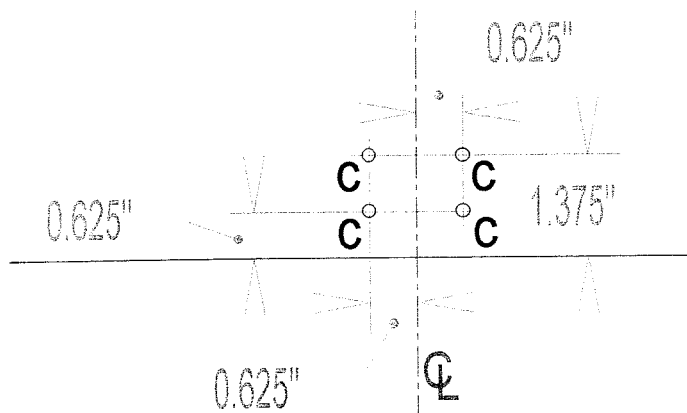
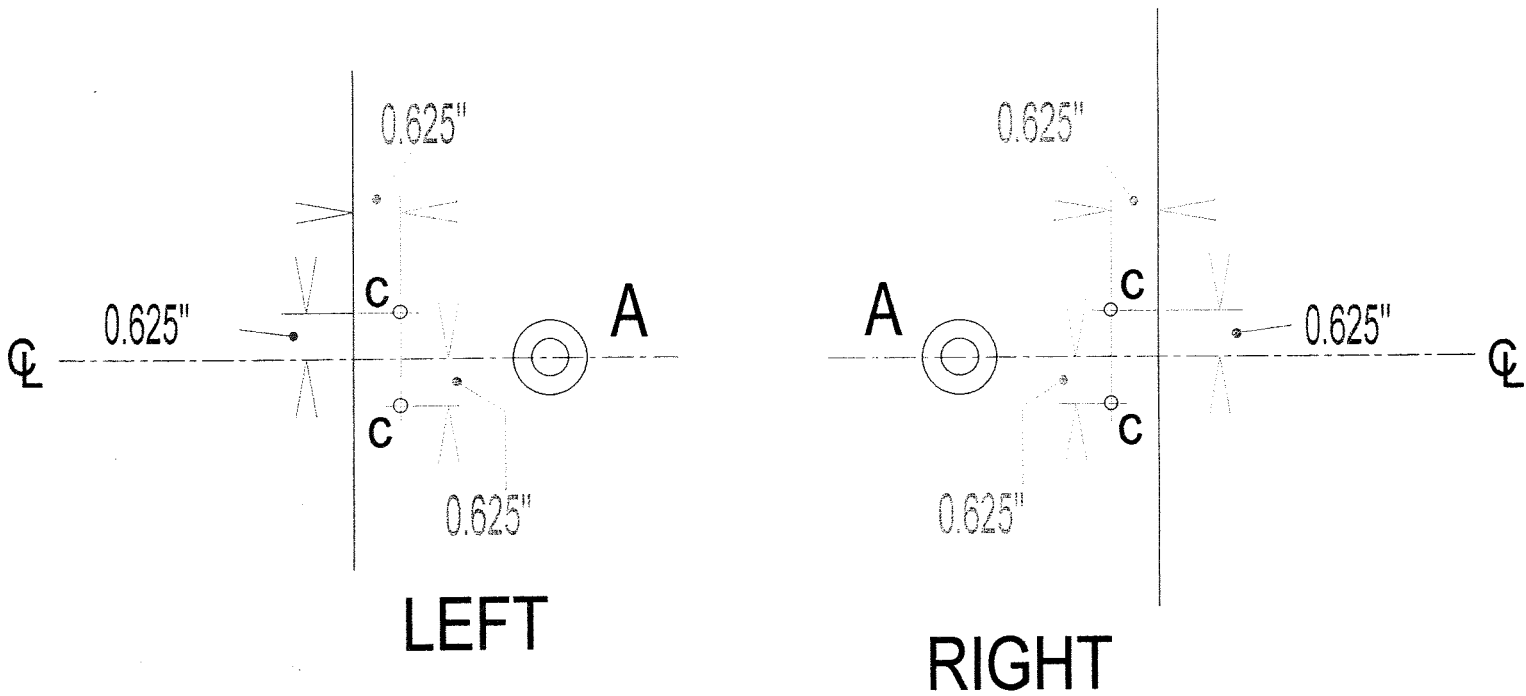
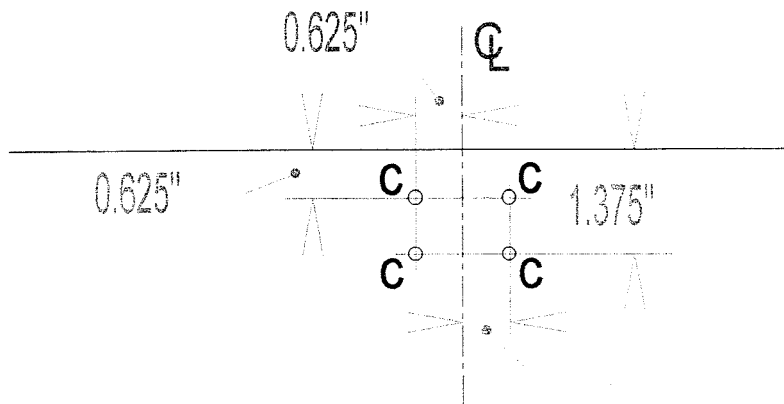
B: DRILLED & TAPPED FOR
5/16" x 18 MACHINE SCREW

C: DRILLED & TAPPED FOR
10 x 32 MACHINE SCREW



ALIGNMENT PIN DRILLING TEMPLATE: DETAIL

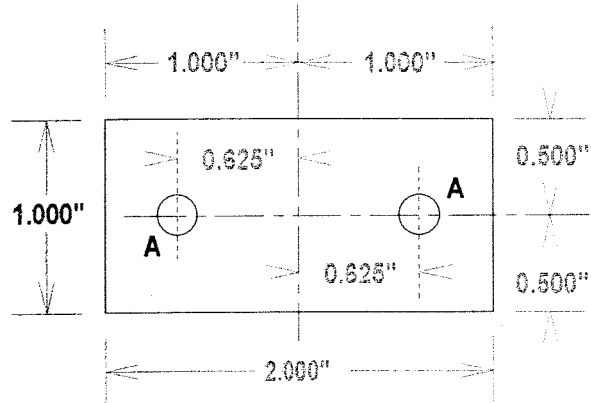
TOP



BOTTOM

ALIGNMENT TAB

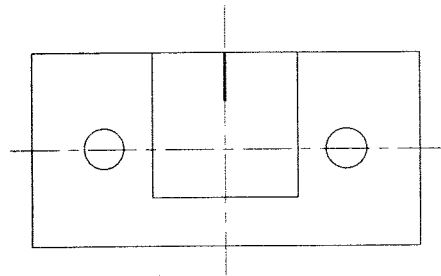
MATERIAL: 1/8" THICK ALUMINUM



HOLE A: 0.210" DIAMETER

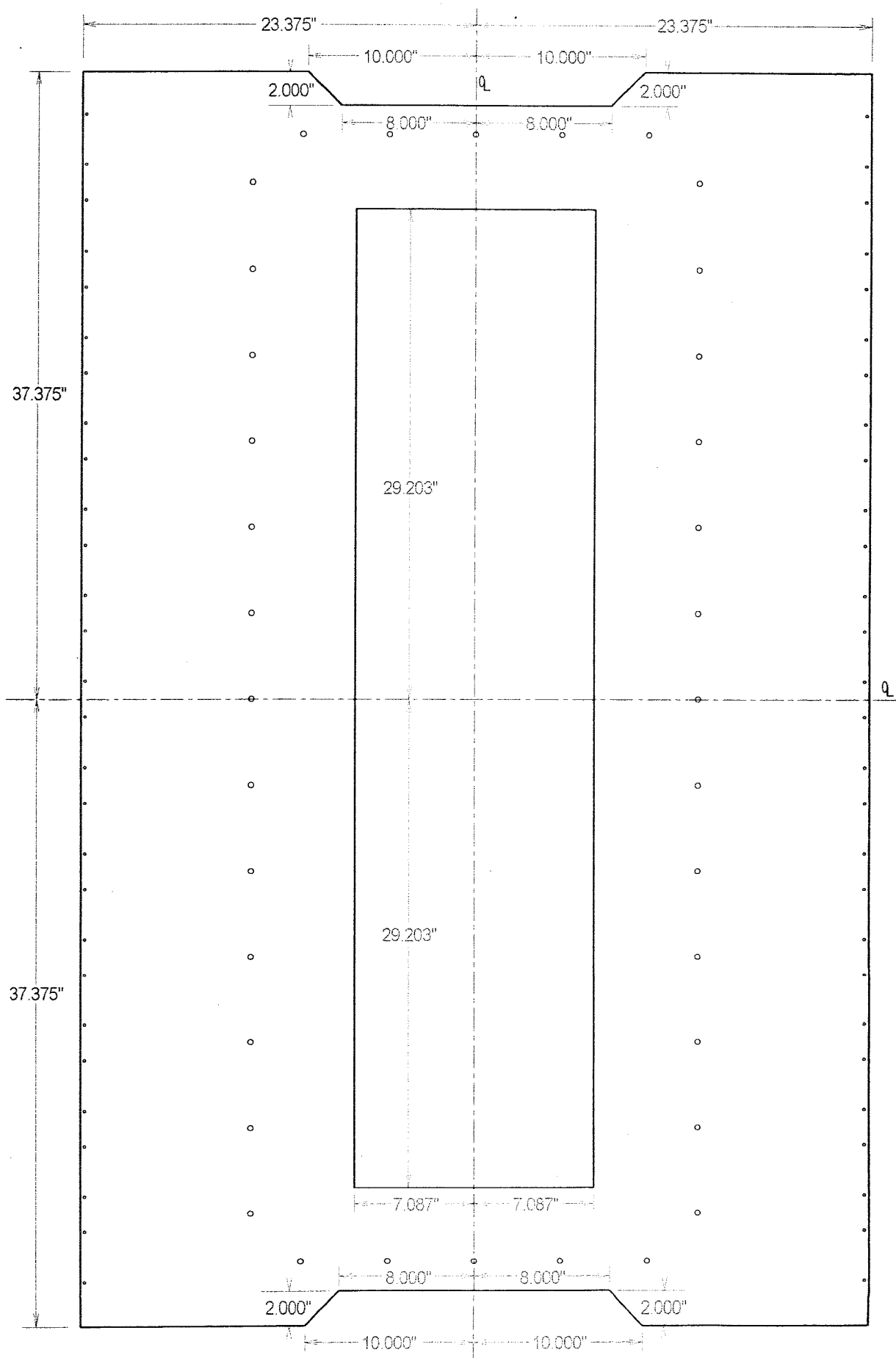
CLEARANCE FOR 10/32
MACHINE SCREW + 0.025"

ALIGNMENT TAB WITH ATTACHED FIDUCIAL MARKER



AMPLIFIER-DISCRIMINATOR SUPPORT PLATE: DIMENSIONS

MATERIAL: 1/8" THICK FR4 OR G10 SHEET OR
NON-CONDUCTING EQUIVALENT

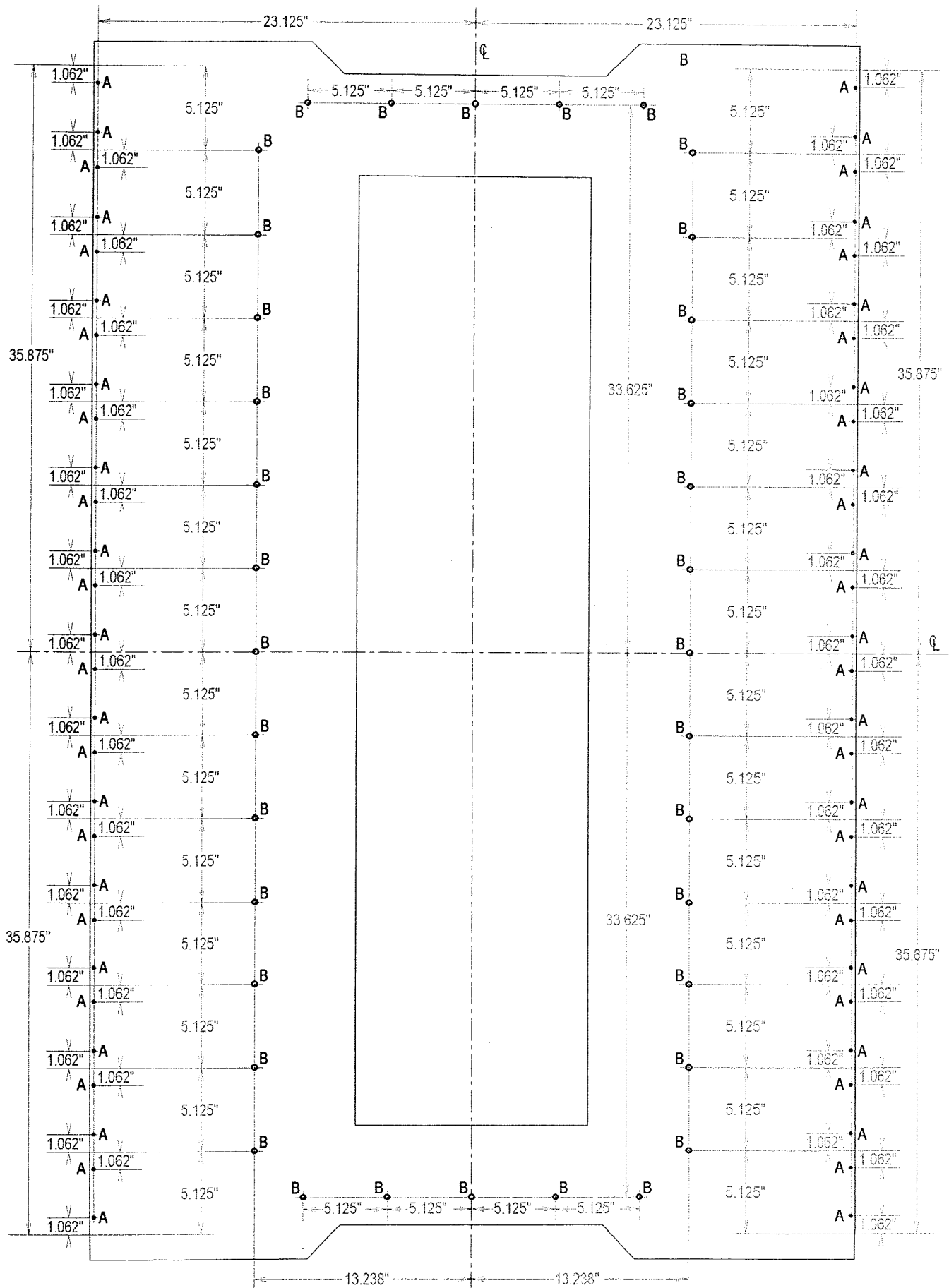


AMPLIFIER-DISCRIMINATOR SUPPORT PLATE: HOLE SPECIFICATIONS

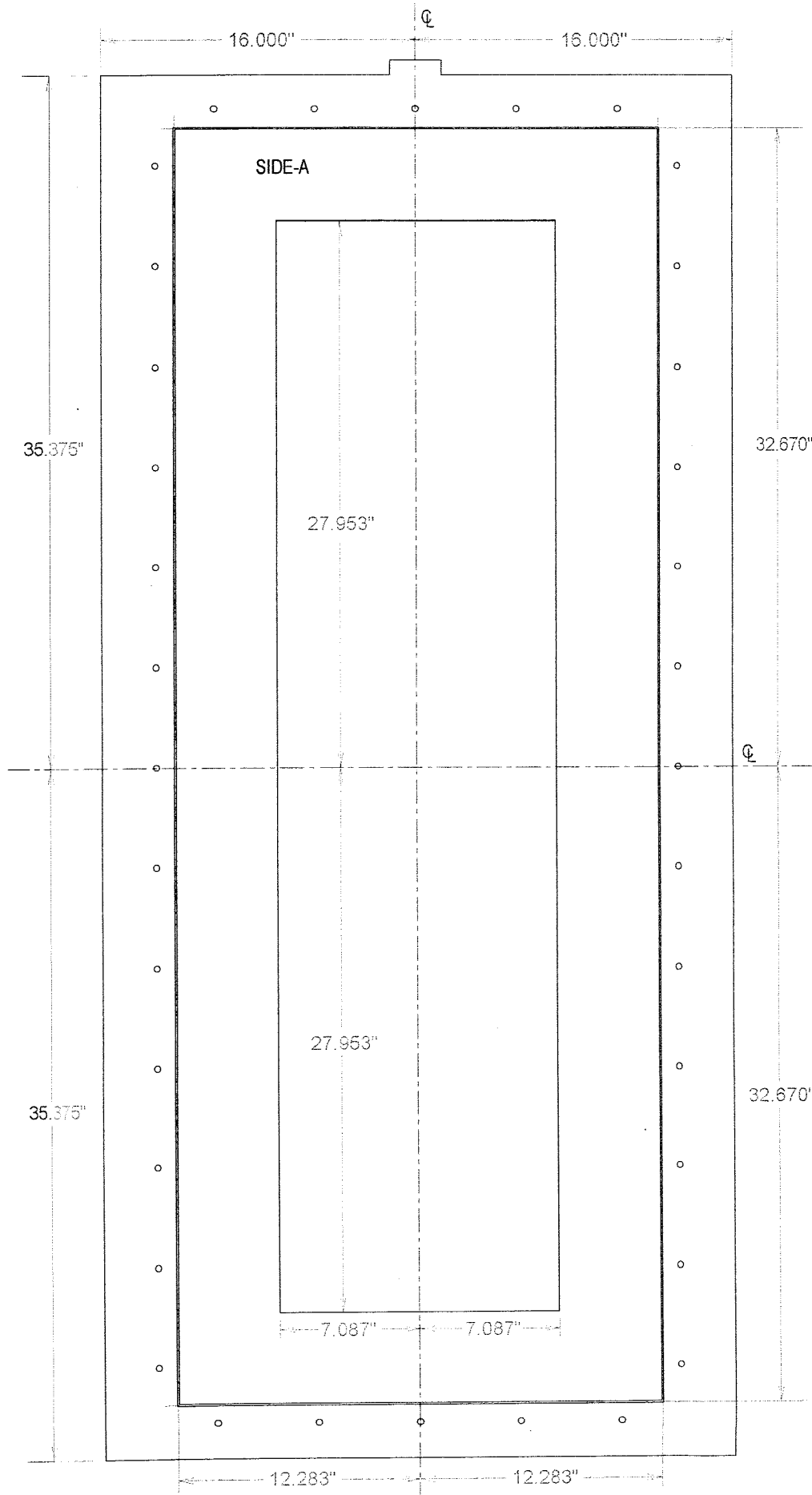
HOLES

A: CLEARANCE FOR 8-32 MACHINE SCREW

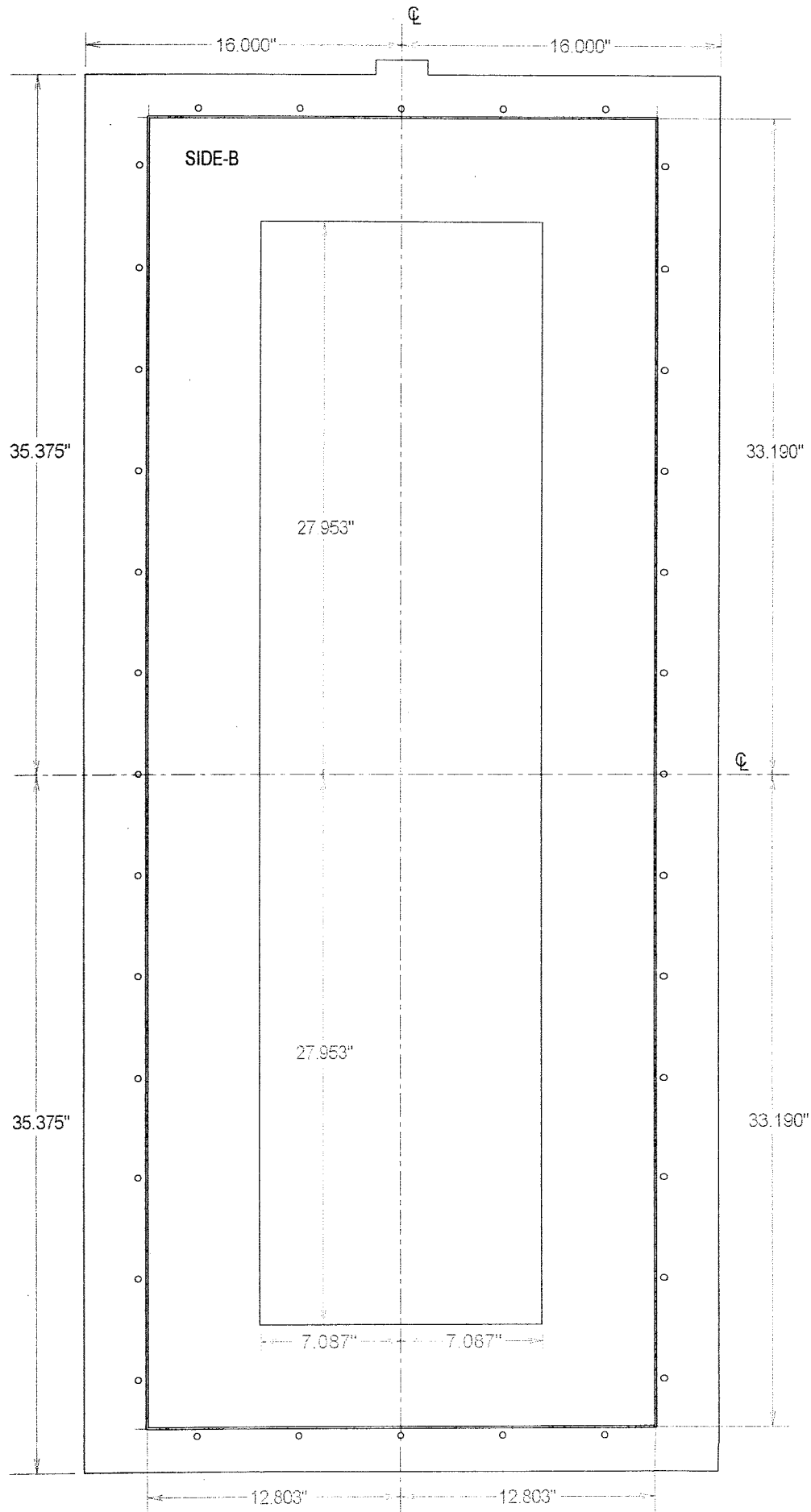
B: 0.328" DIAMETER



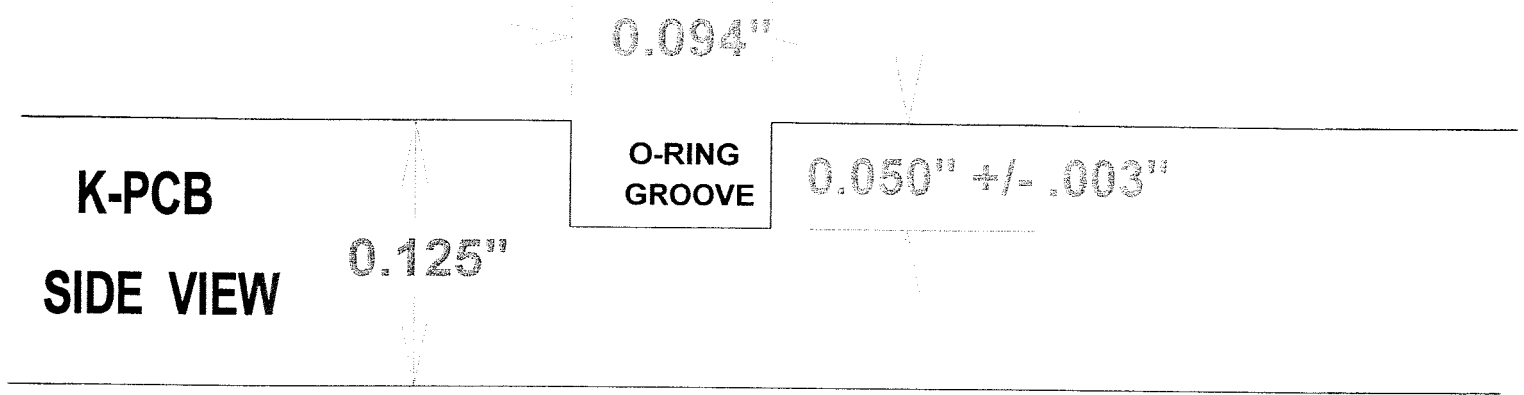
K-PLANE PCB SIDE-A O-RING GROOVE CENTER-LINE DIMENSIONS



K-PLANE PCB SIDE-B O-RING GROOVE CENTER-LINE DIMENSIONS

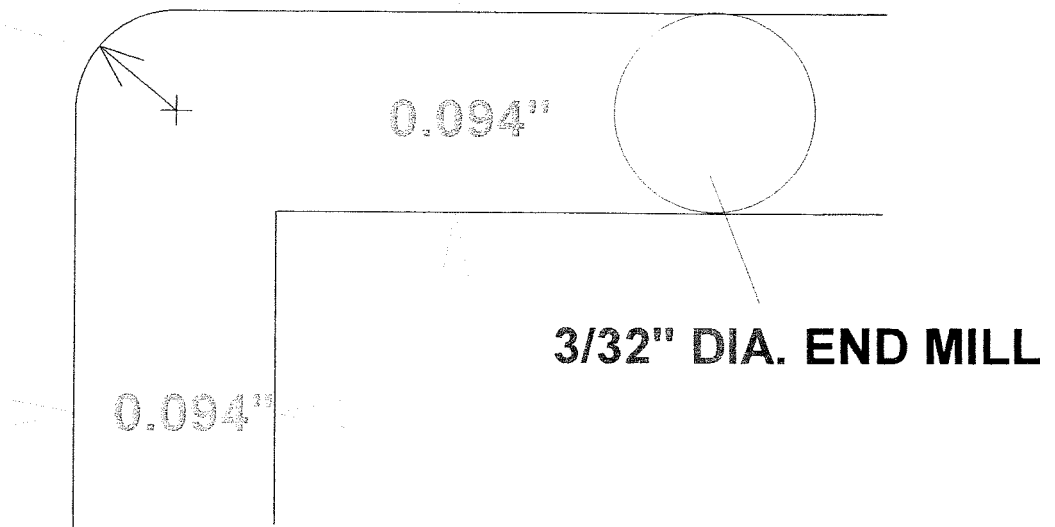


O-RING GROOVE DETAIL

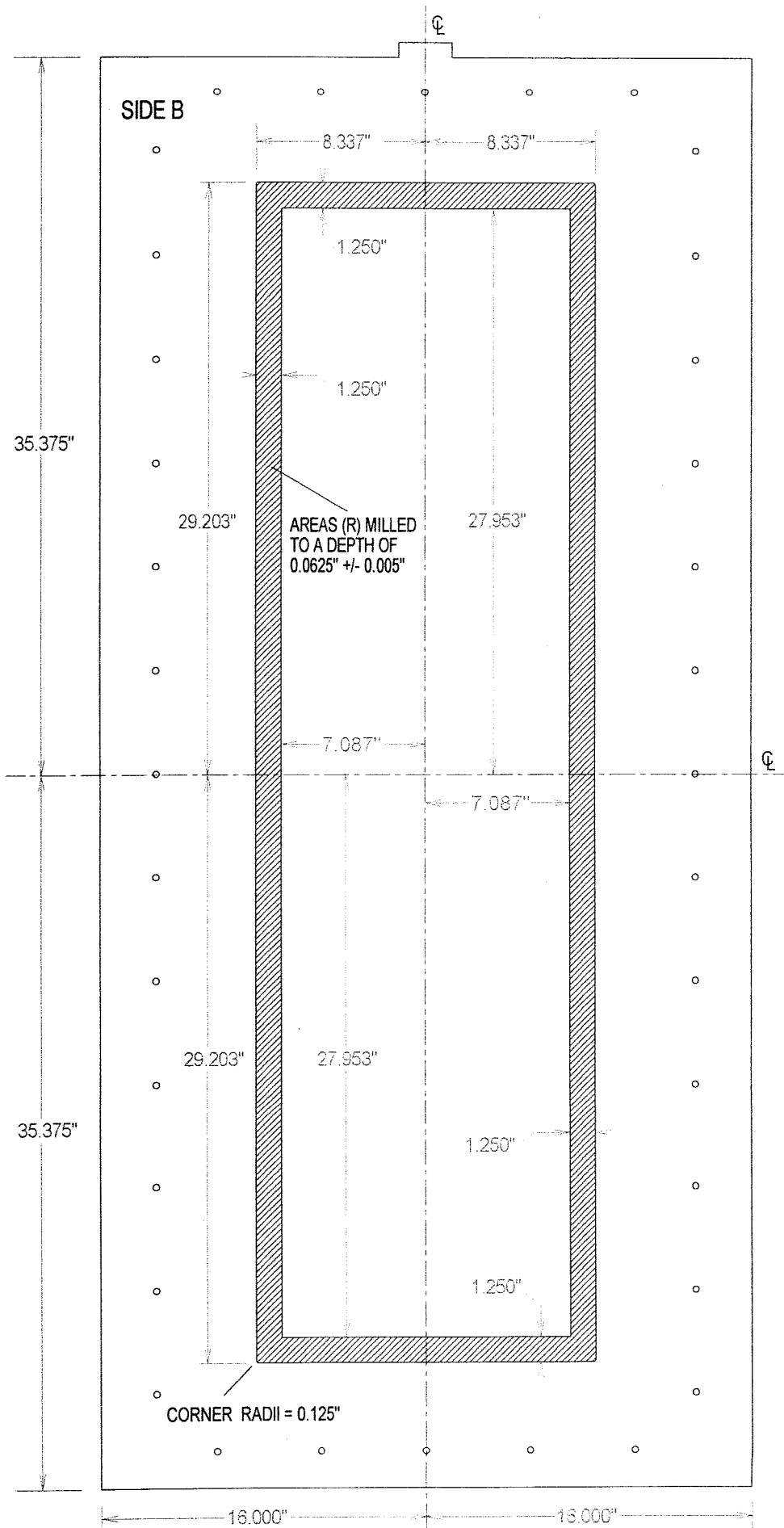


corner radius
 $r = 0.047"$

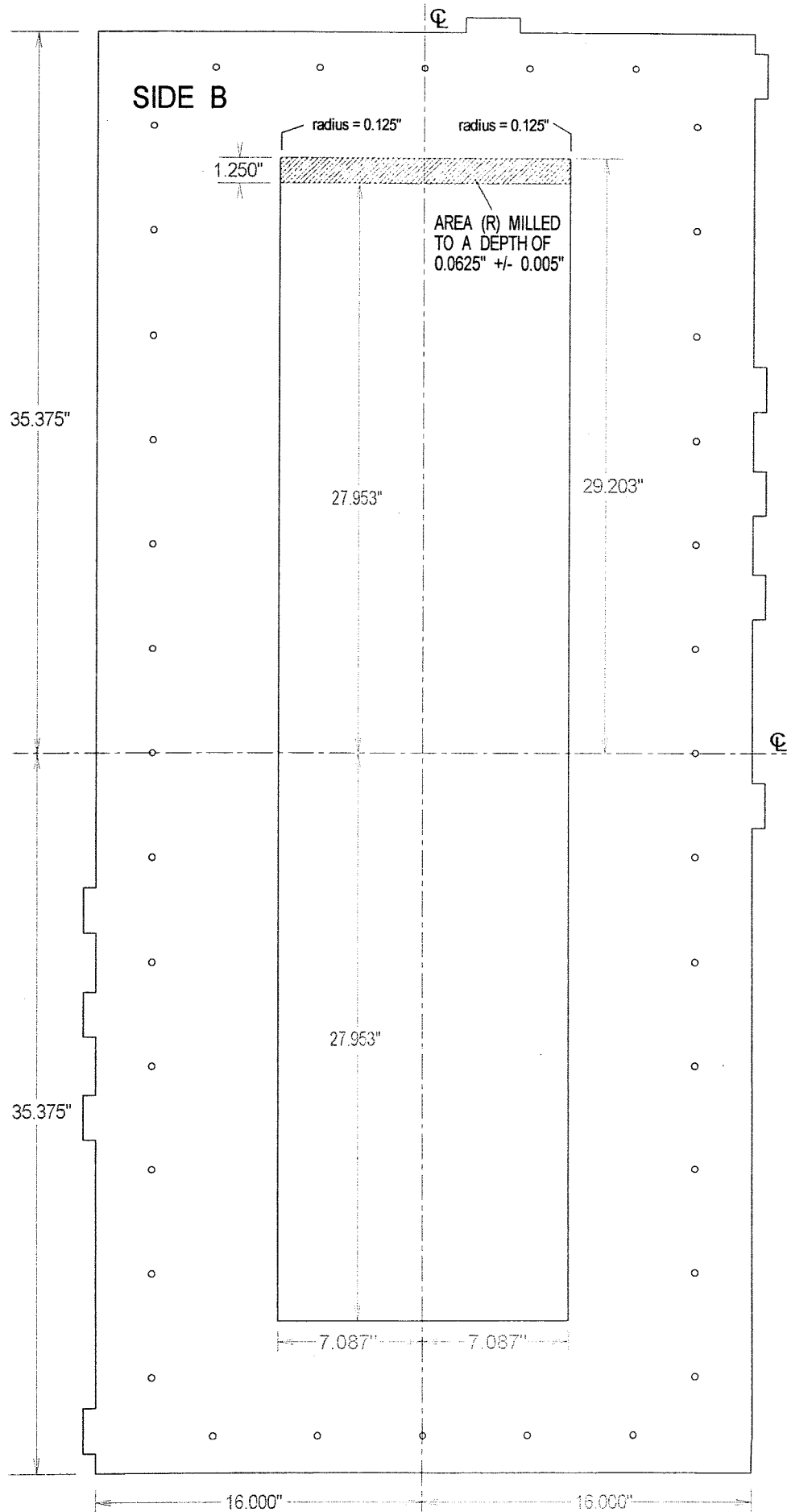
K-PCB
TOP VIEW



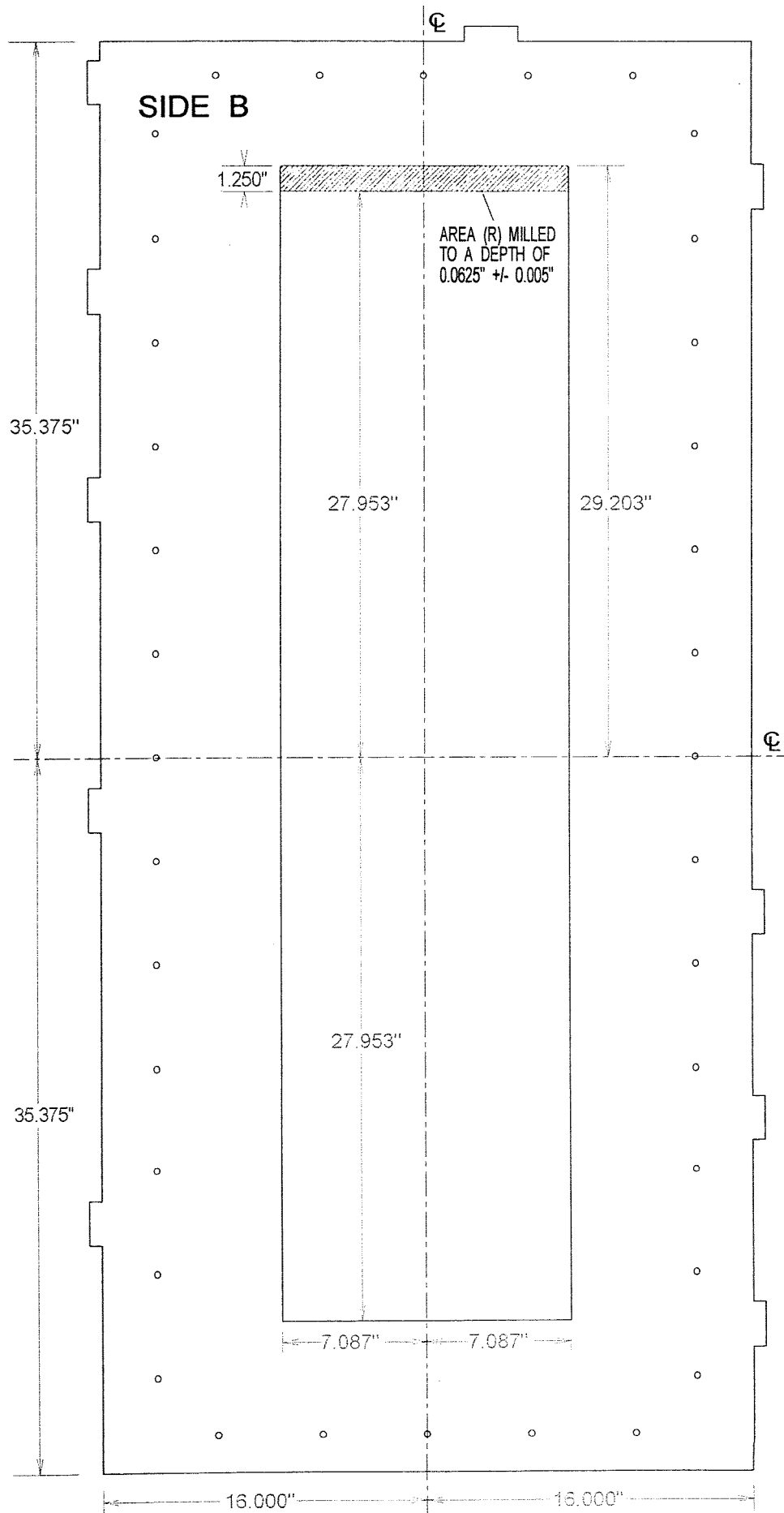
K-PLANE PCB SIDE B: RELIEVED AREAS - R
(R is SHADED AREAS)



X-PLANE PCB SIDE B: RELIEVED AREA - R
(R is SHADED AREA)

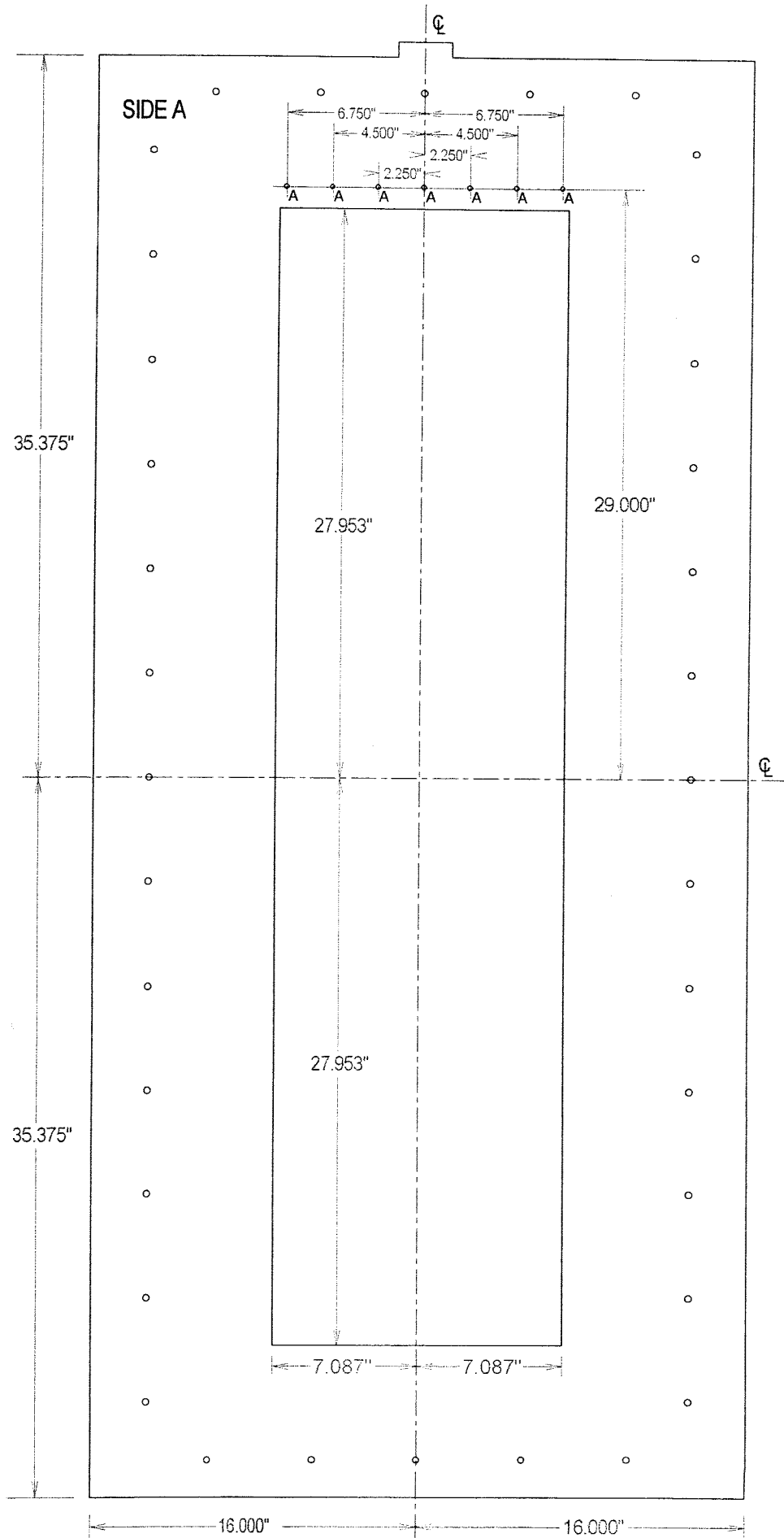


UV-PLANE PCB SIDE B: RELIEVED AREA - R
(R is SHADED AREA)



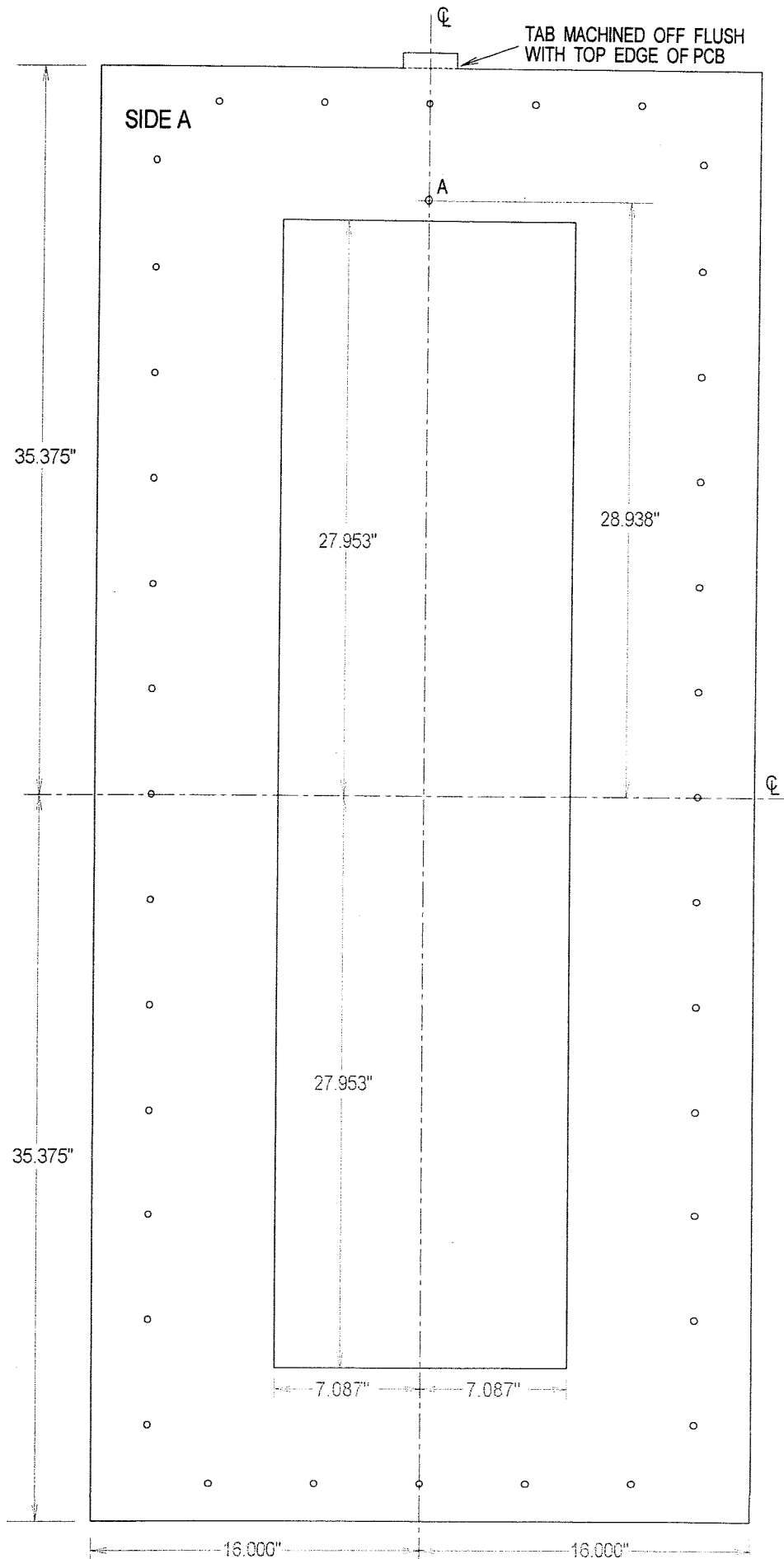
K-PLANE PCB SIDE A: GAS HOLES

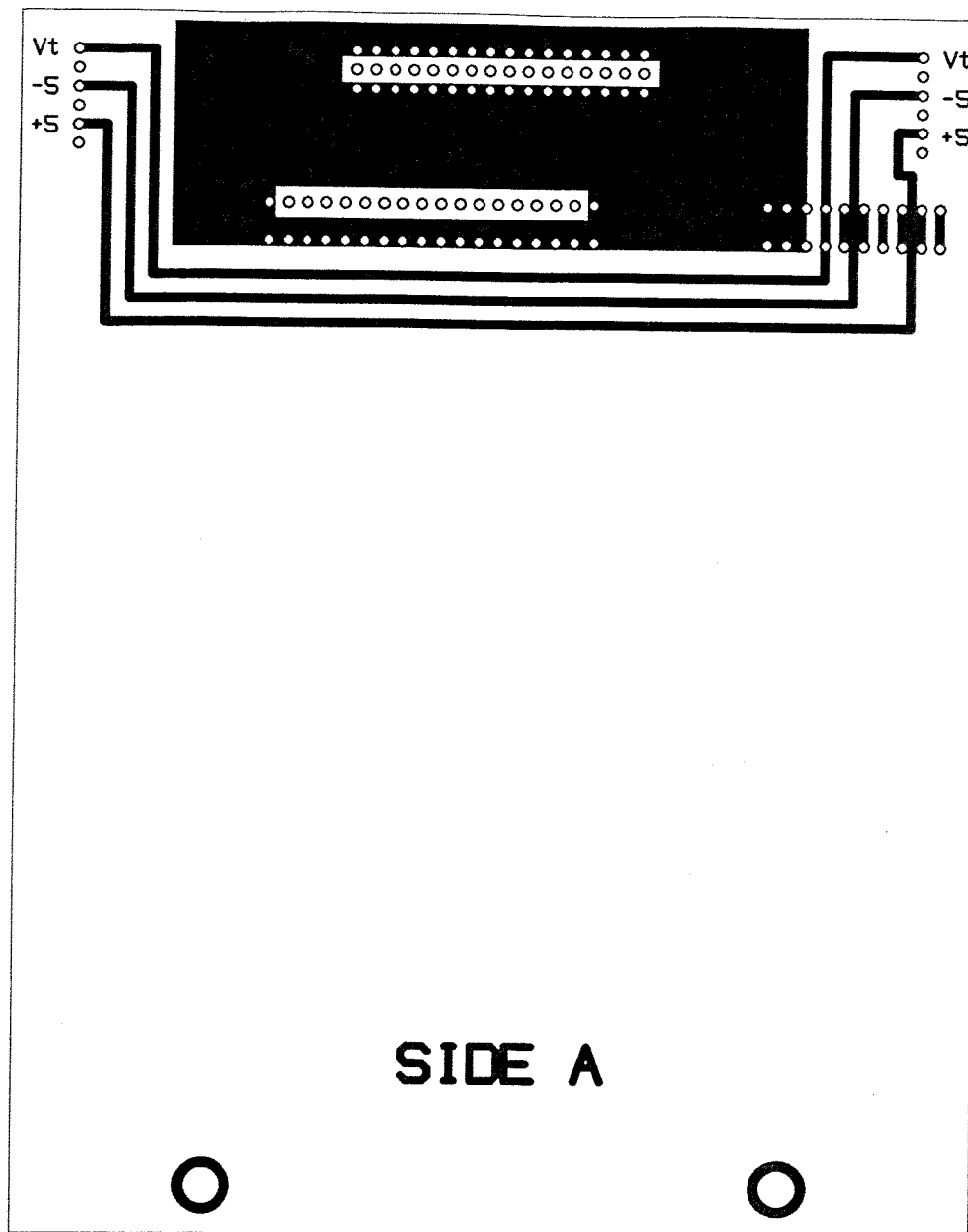
HOLE SPECIFICATION: A = 0.250" DIA.



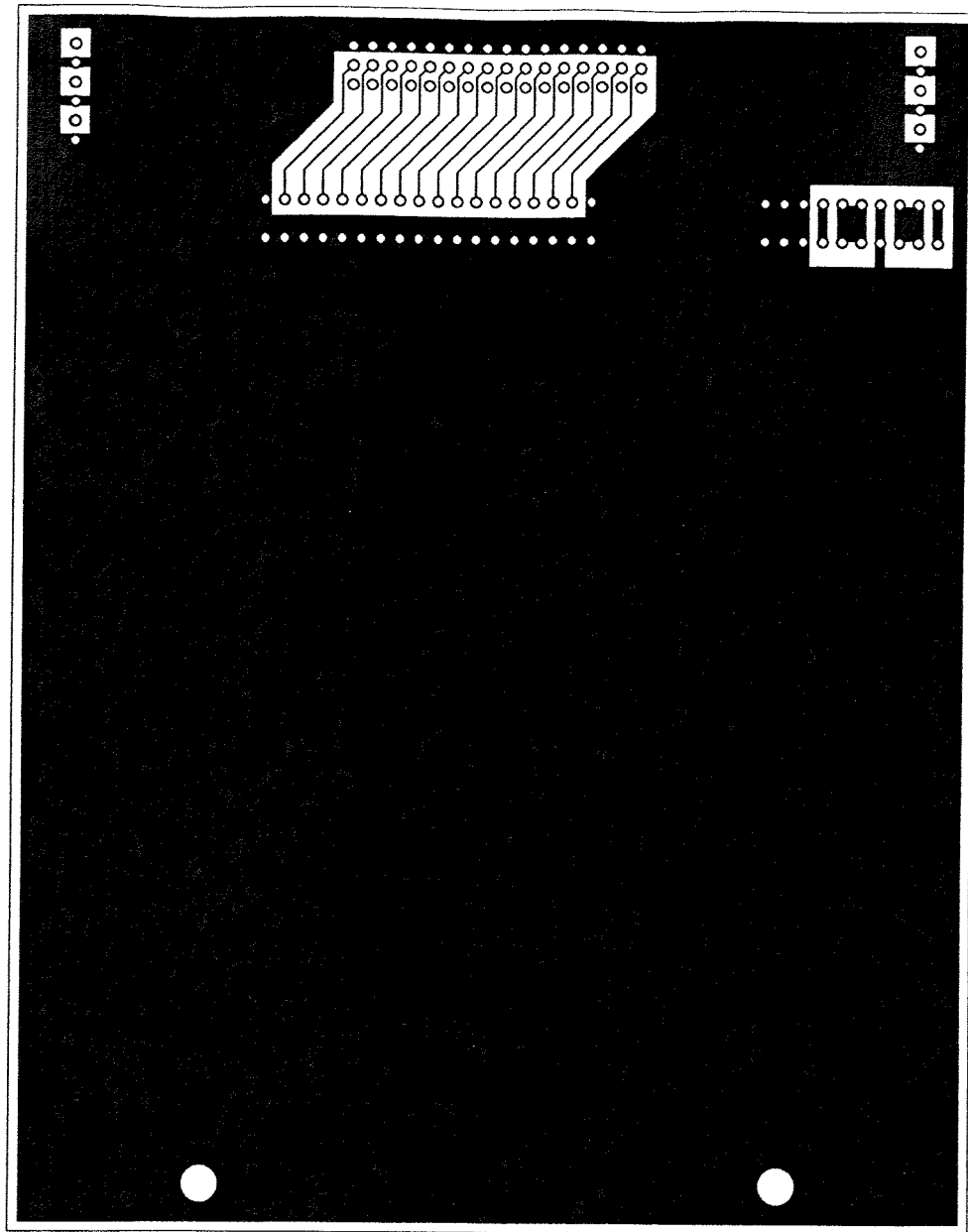
K-PLANE PCB SIDE A: GAS WINDOW MODIFICATION

HOLE SPECIFICATION: A = 0.375" DIA.



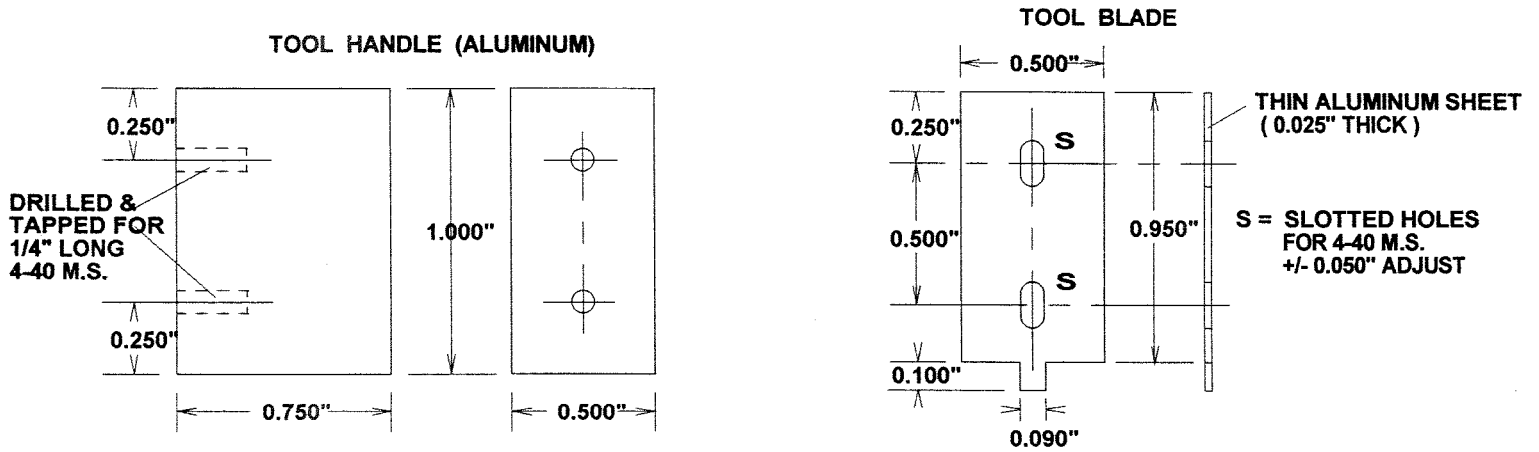
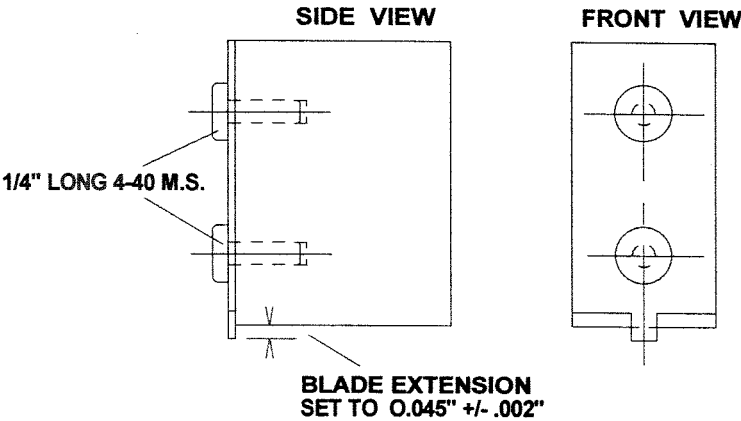


ADAPTER PCB - SIDE A

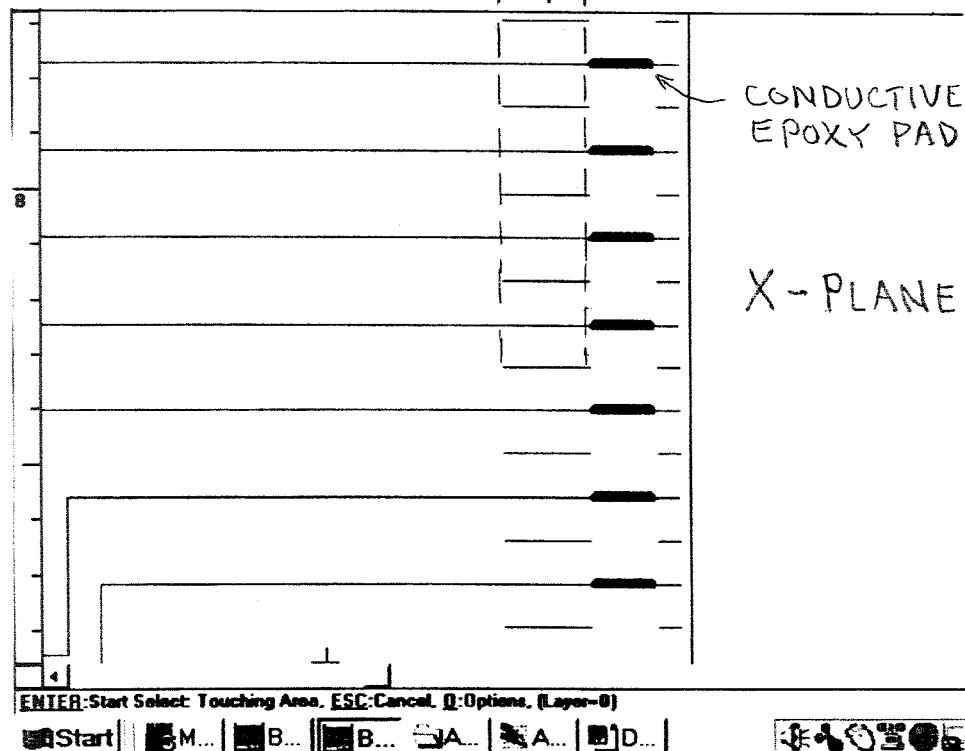
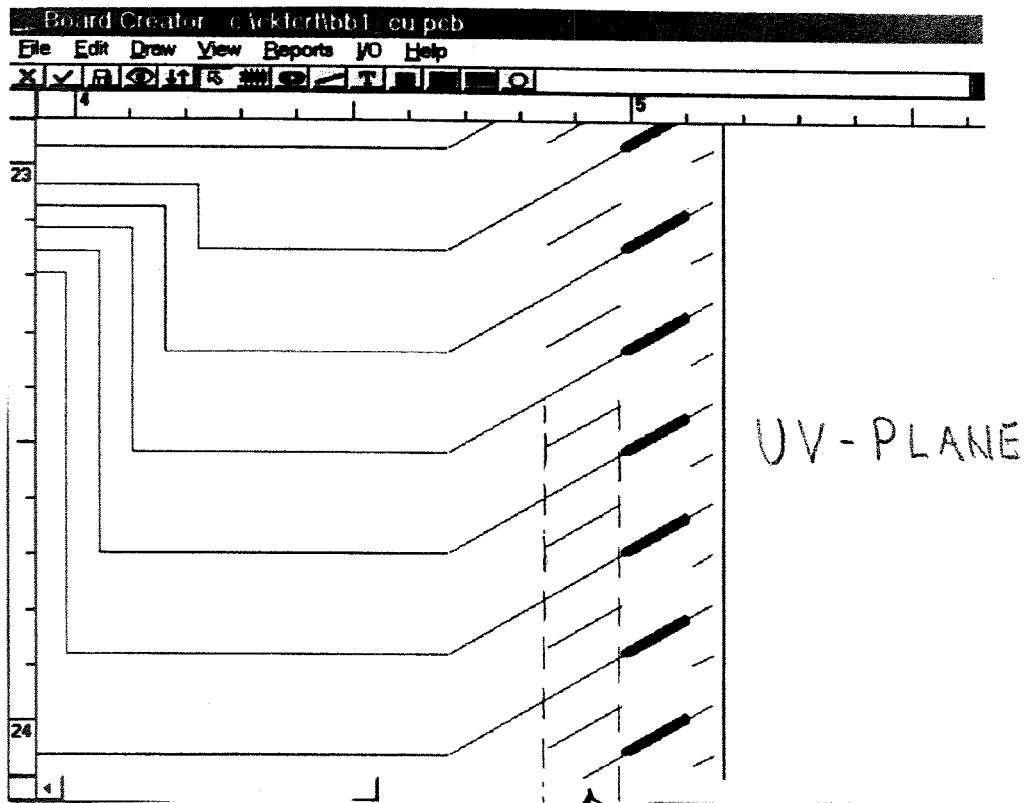


ADAPTER PCB - SIDE B

O-RING EPOXY SIZING TOOL

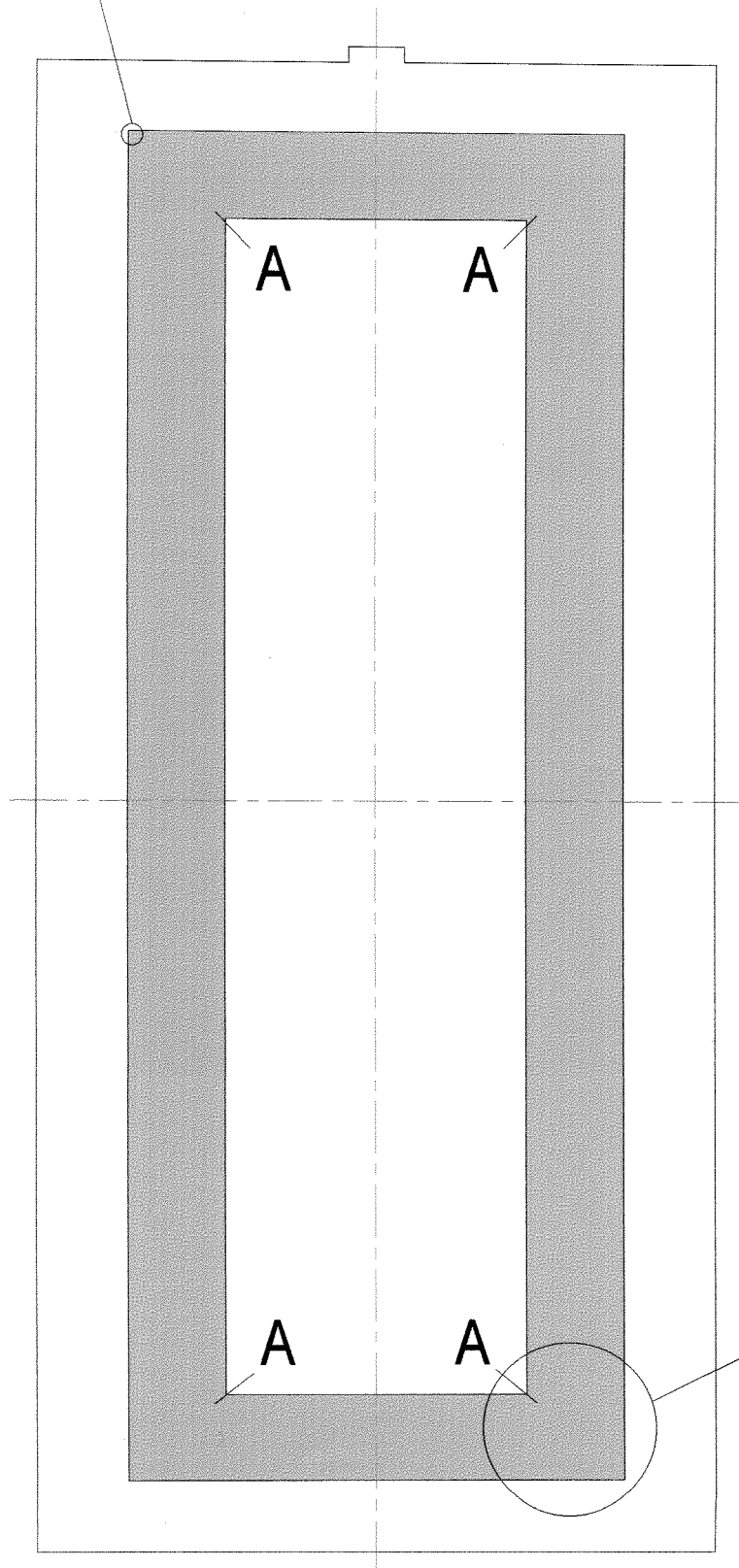
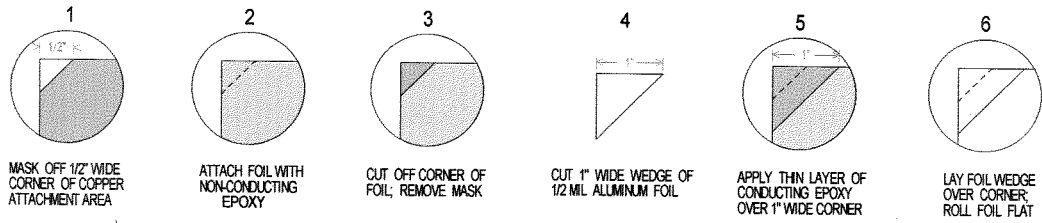


WIRE ATTACHMENT EPOXY AREAS

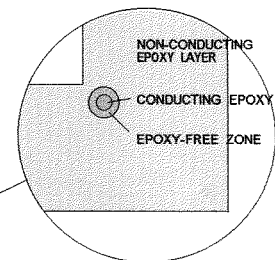


CONDUCTIVE EPOXY FOIL ELECTRICAL CONNECTIONS

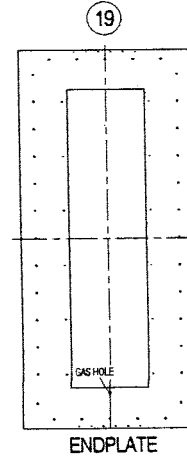
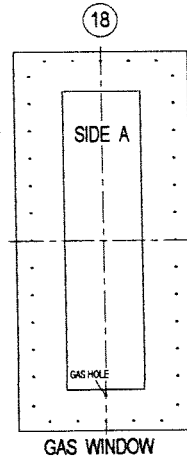
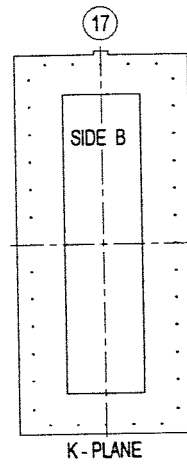
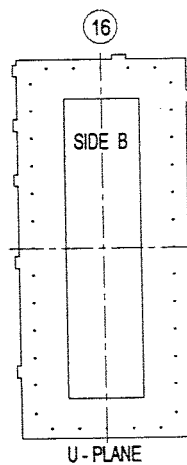
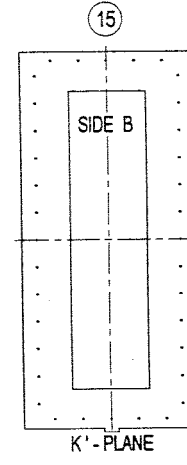
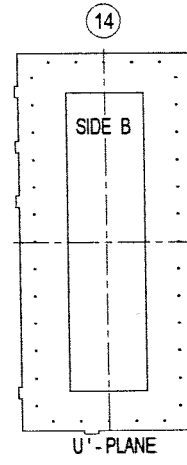
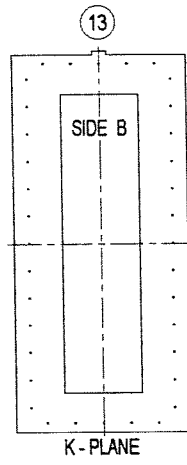
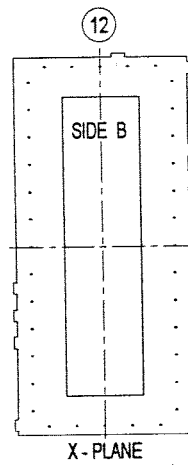
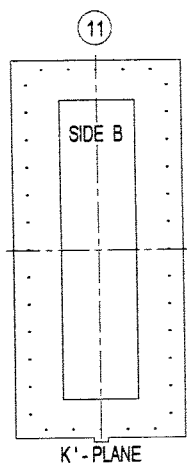
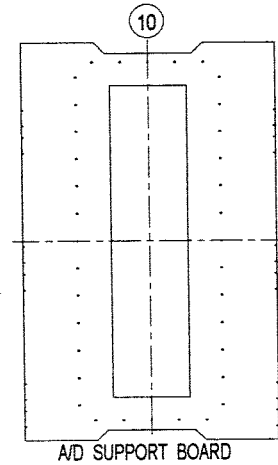
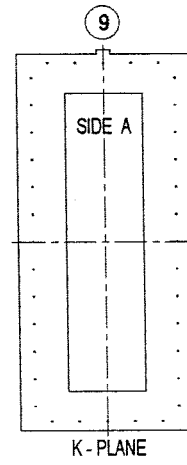
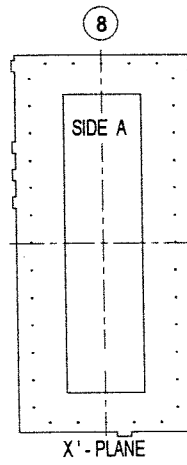
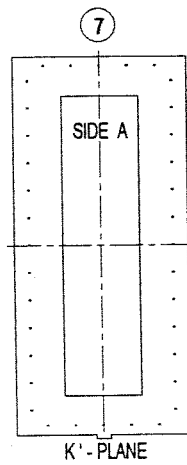
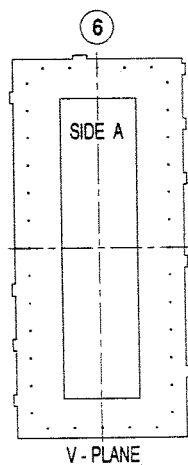
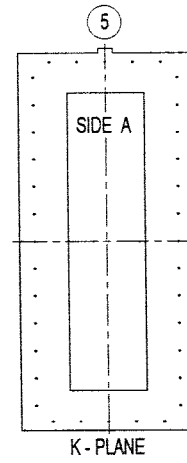
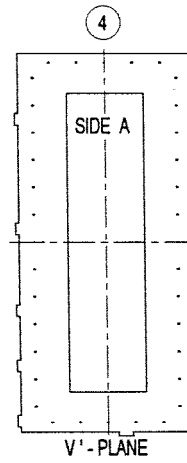
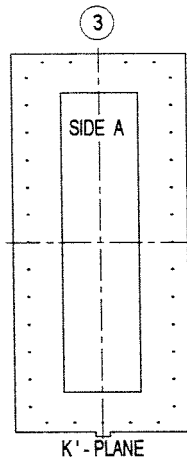
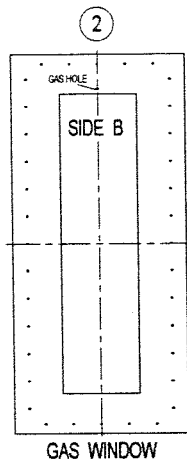
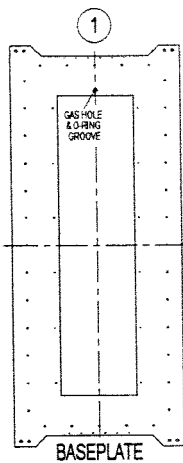
STEPS IN ELECTRICALLY CONNECTING OUTER FOIL SURFACE



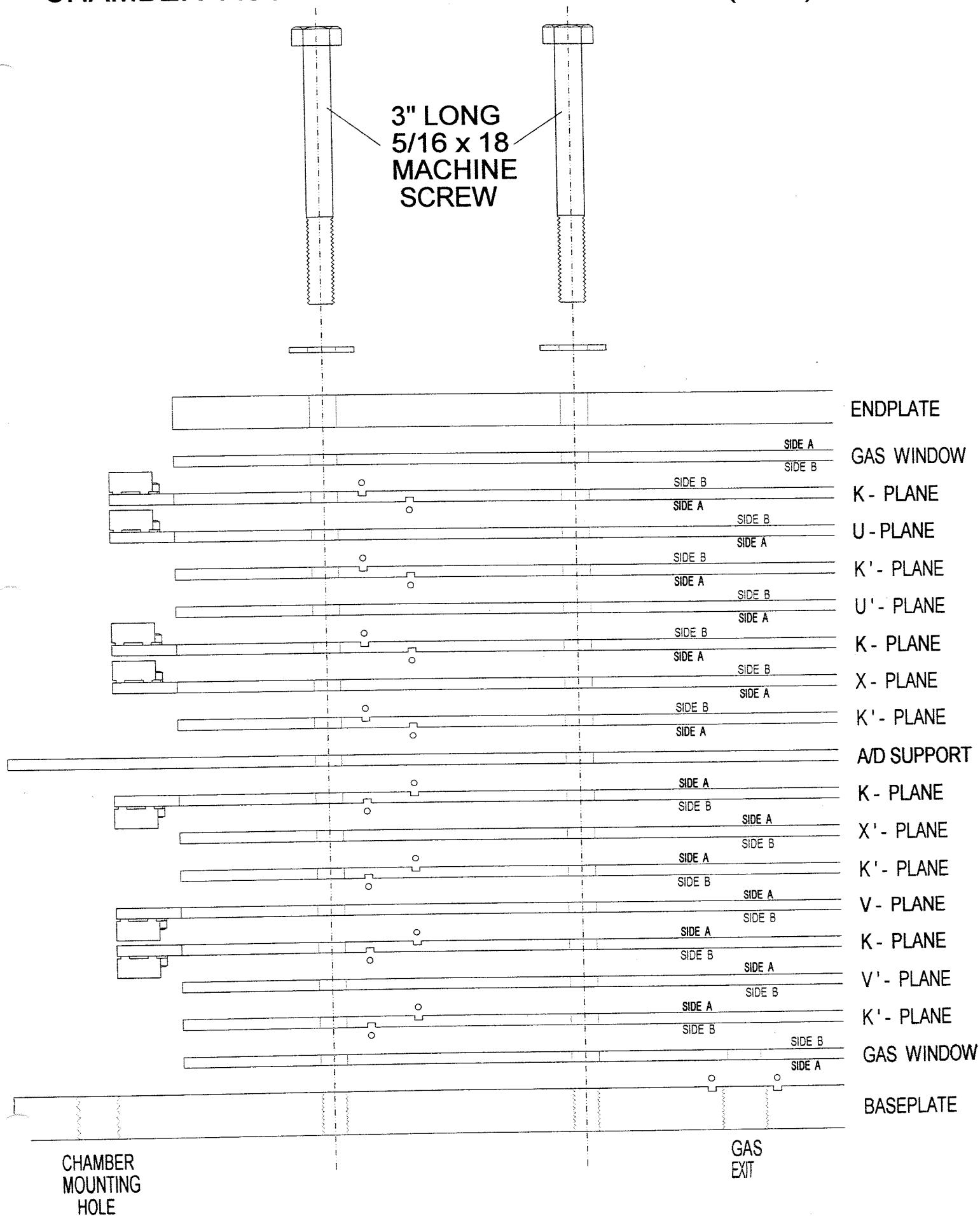
ELECTRICAL CONNECTION OF INNER FOIL SURFACE



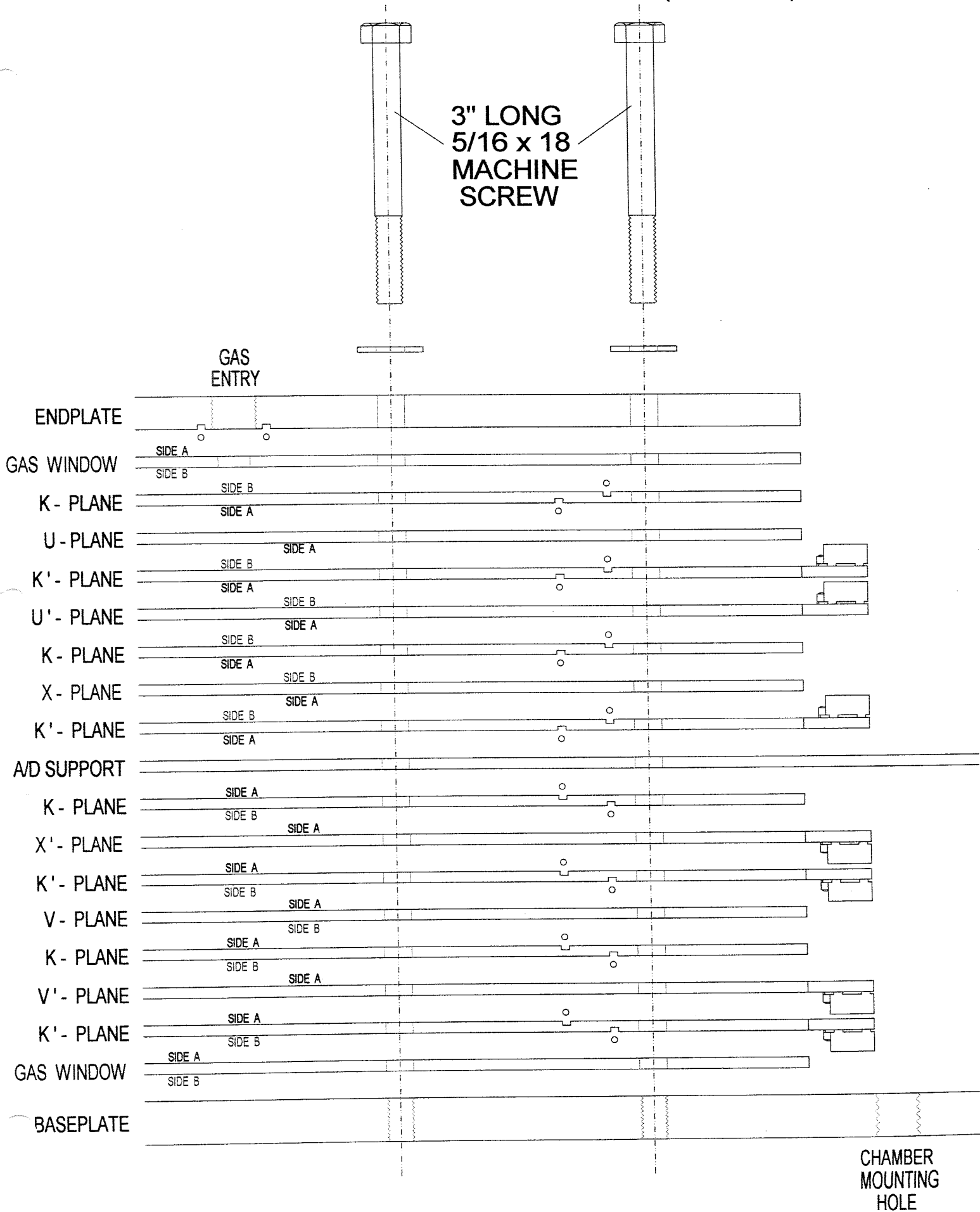
BBC CHAMBER ASSEMBLY SEQUENCE



CHAMBER ASSEMBLY DRAWING: END #1 (TOP) VIEW

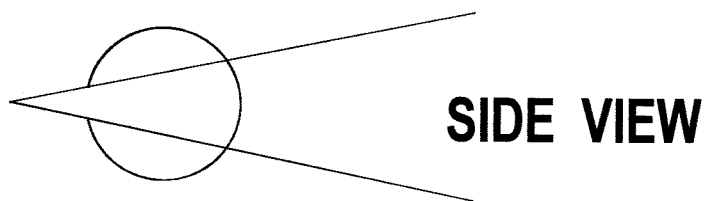
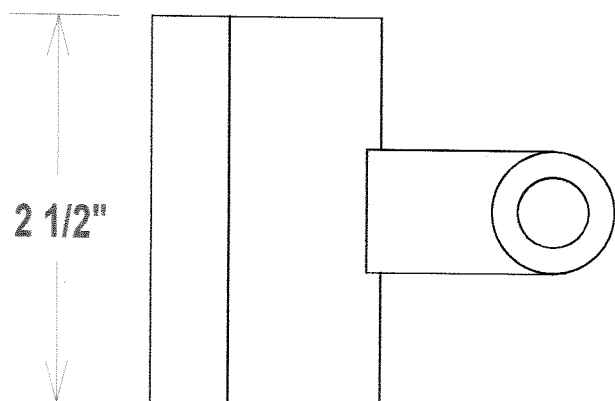


CHAMBER ASSEMBLY DRAWING: END #2 (BOTTOM) VIEW



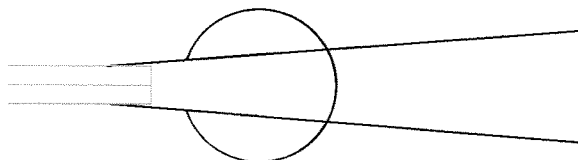
**STANDARD TYPE OF SPRING CLAMP USED TO CLAMP
PAIRS OF PCB'S TOGETHER DURING CHAMBER ASSEMBLY
(AVAILABLE FROM OFFICE SUPPLY STORES)**

TOP VIEW

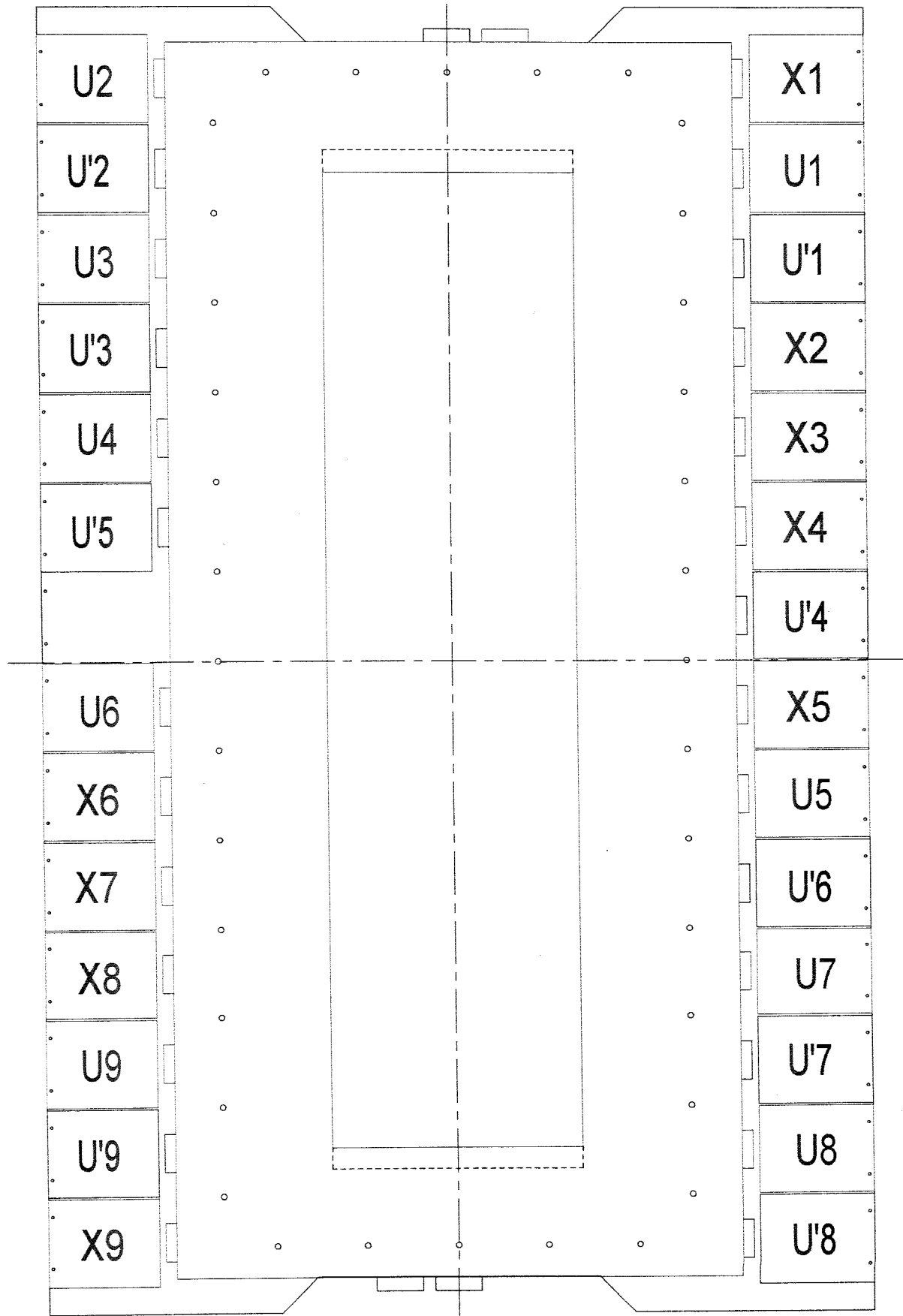


SIDE VIEW

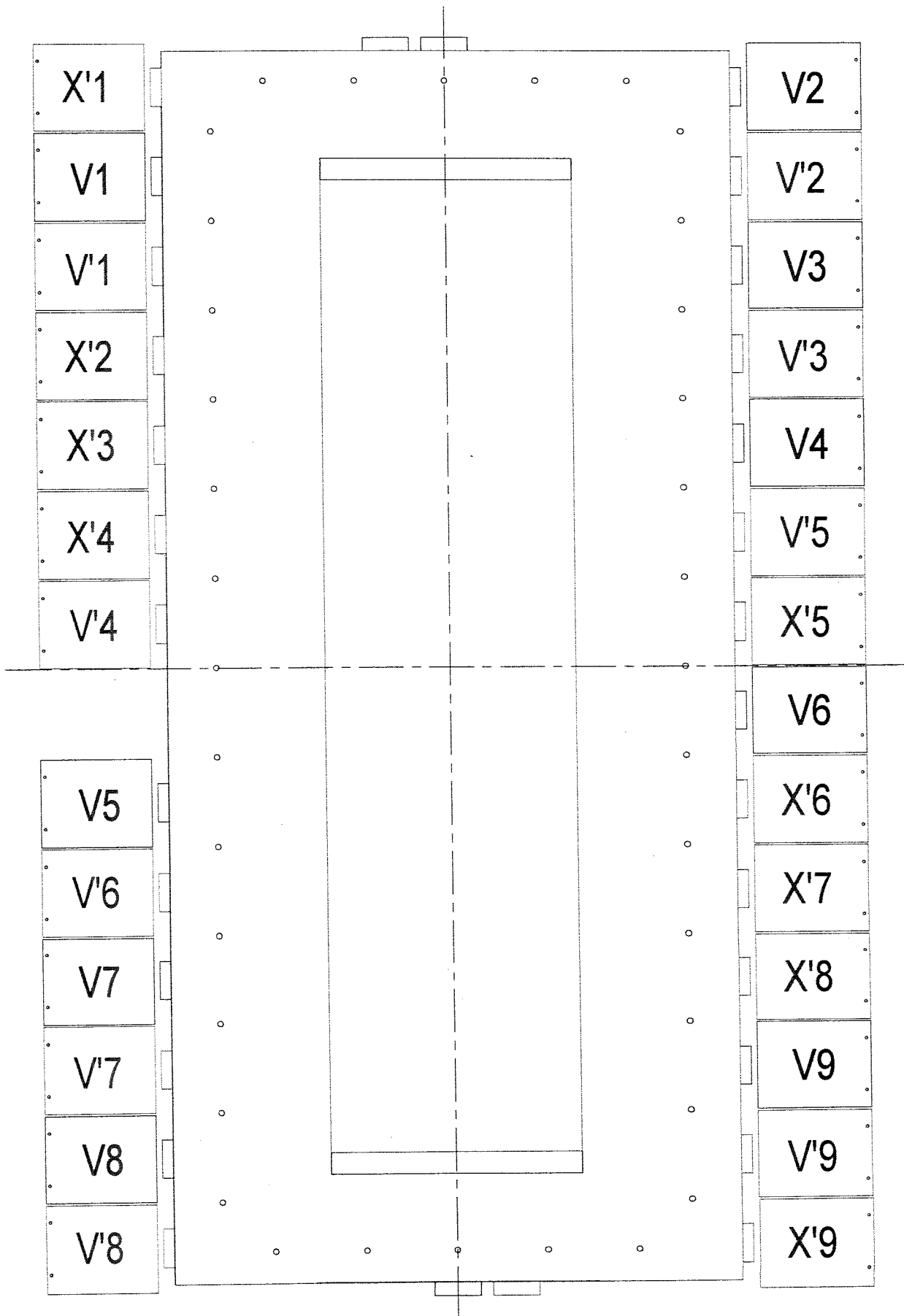
**TWO PCB'S EDGE-CLAMPED
DURING CHAMBER ASSEMBLY**



FRONT CHAMBER ASSEMBLY
U, U', X PLANES & ADAPTER CARDS
AND A/D SUPPORT BOARD
(LOOKING DOWNSTREAM WITH BEAM)



REAR CHAMBER ASSEMBLY
X', V, V' PLANES & ADAPTER CARDS
(LOOKING DOWNSTREAM WITH BEAM)

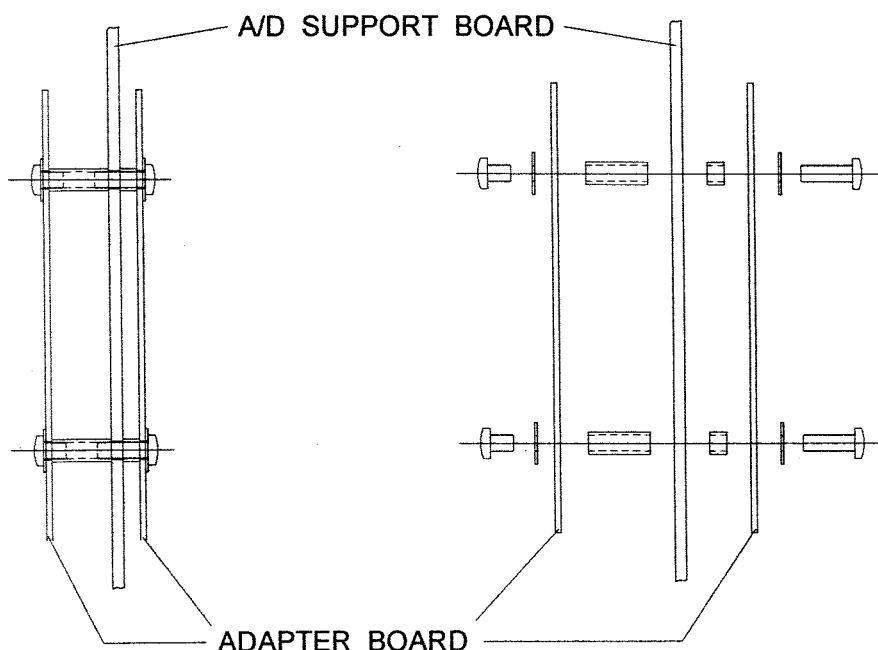


ADAPTER BOARD MOUNTING ASSEMBLY

(SEE ACCOMPANYING DESCRIPTION)

ASSEMBLED
VIEW

EXPLODED
VIEW



SPACERS (8-32 THREAD)

LENGTH

3/16"  A

7/16"  B

11/16"  C

CHAMBER REAR

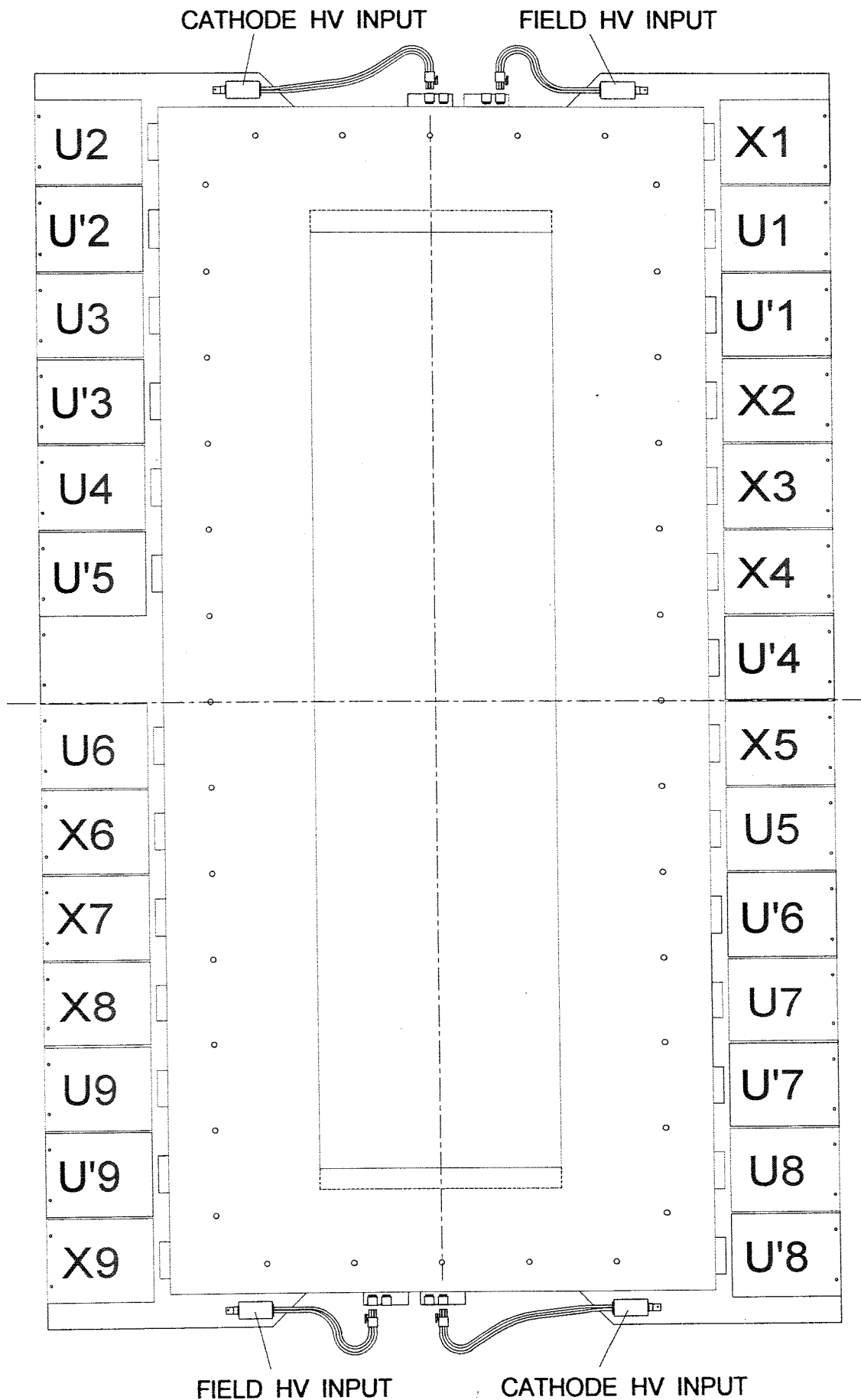
A/D SLOT	SCREW LENGTH	ADAPTER CARD #	SPACER TYPE
L1	5/8"	X'1	A
L2	7/8"	V'1	B
L3	1 1/8"	V'1	C
L4	5/8"	X'2	A
L5	5/8"	X'3	A
L6	5/8"	X'4	A
L7	3/8"	V'4	C
L8	1/2"	UNUSED	NONE
L9	1/4"	V'5	B
L10	3/8"	V'6	C
L11	1/4"	V'7	B
L12	1 1/8"	V'7	C
L13	7/8"	V'8	B
L14	3/8"	V'8	C
R1	1/4"	V'2	B
R2	1 1/8"	V'2	C
R3	7/8"	V'3	B
R4	3/8"	V'3	C
R5	1/4"	V'4	B
R6	3/8"	V'5	C
R7	5/8"	X'5	A
R8	1/4"	V'6	B
R9	5/8"	X'6	A
R10	5/8"	X'7	A
R11	5/8"	X'8	A
R12	7/8"	V'9	B
R13	1 1/8"	V'9	C
R14	5/8"	X'9	A

CHAMBER FRONT

ADAPTER SUPPORT BOARD

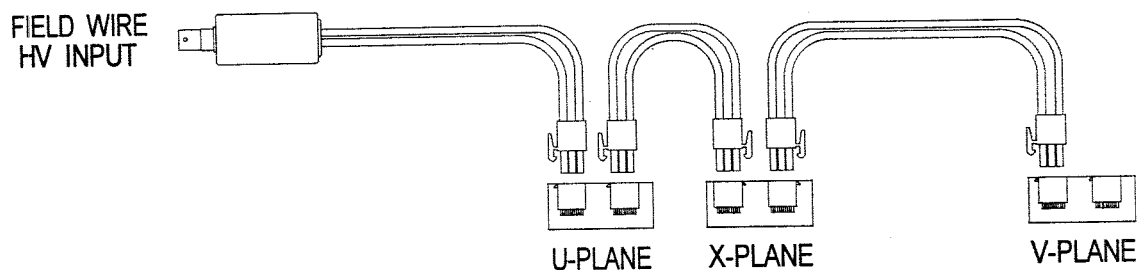
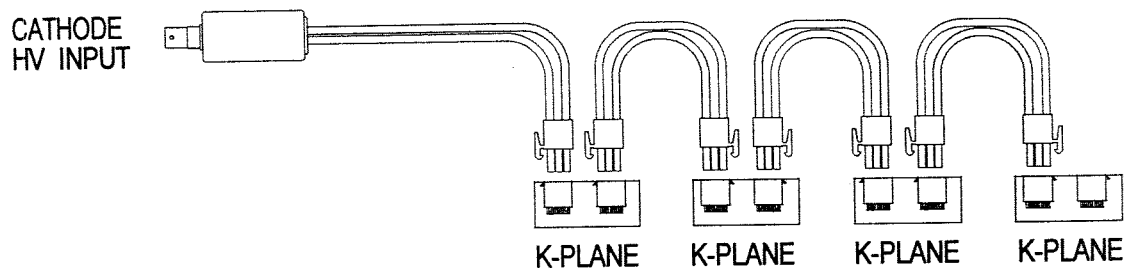
SPACER TYPE	ADAPTER CARD #	SCREW LENGTH	A/D SLOT
C	U'2	3/8"	L1
B	U'2	1/4"	L2
C	U'3	3/8"	L3
B	U'3	1/4"	L4
C	U'4	3/8"	L5
B	U'5	1/4"	L6
NONE	UNUSED	1/2"	L7
C	U'6	3/8"	L8
A	X'6	5/8"	L9
A	X'7	5/8"	L10
A	X'8	5/8"	L11
C	U'9	3/8"	L12
B	U'9	1/4"	L13
A	X'9	5/8"	L14
A	X'1	5/8"	R1
C	U'1	3/8"	R2
B	U'1	1/4"	R3
A	X'2	5/8"	R4
A	X'3	5/8"	R5
A	X'4	5/8"	R6
B	U'4	1/4"	R7
A	X'5	5/8"	R8
C	U'5	3/8"	R9
B	U'6	1/4"	R10
C	U'7	3/8"	R11
B	U'7	1/4"	R12
C	U'8	3/8"	R13
B	U'8	1/4"	R14

FRONT CHAMBER ASSEMBLY SHOWING FIELD & CATHODE HV INPUTS

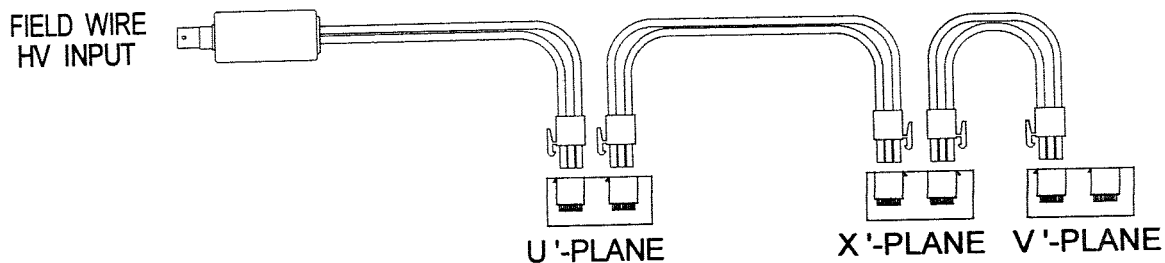
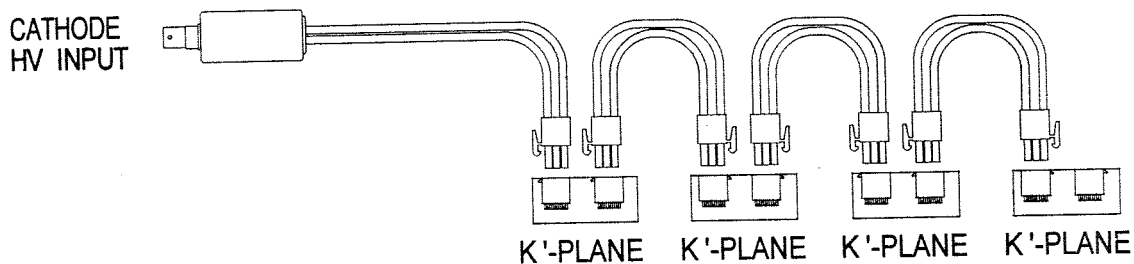


HV CABLING SCHEMATIC

HV CABLING: END #1 (TOP)



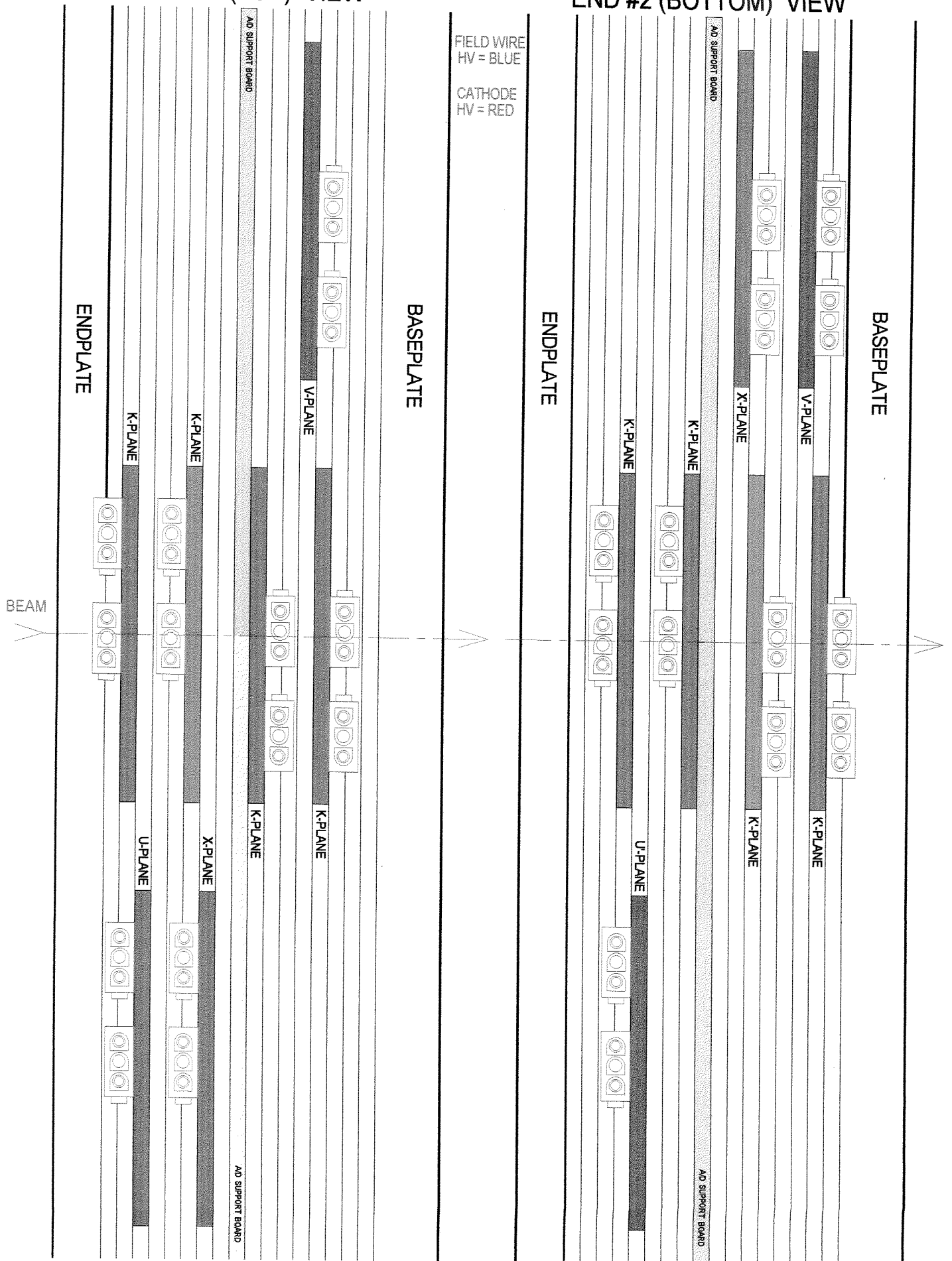
HV CABLING: END #2 (BOTTOM)



CHAMBER FIELD WIRE & CATHODE HV INPUTS (SCALE = 1:1)

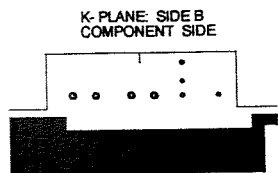
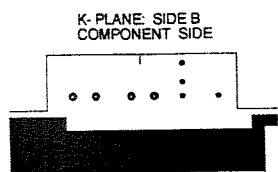
END #1 (TOP) VIEW

END #2 (BOTTOM) VIEW

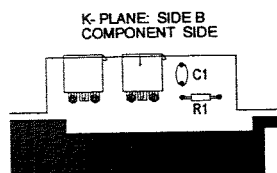


HV COMPONENTS

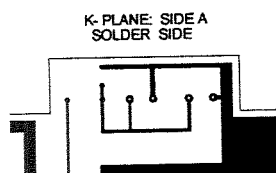
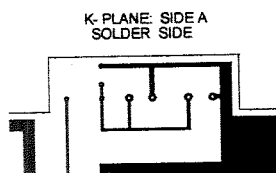
HV TABS: K-PLANE



HV TRACES SHOWN IN RED

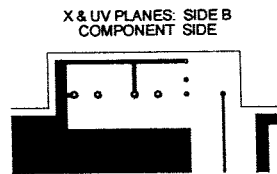
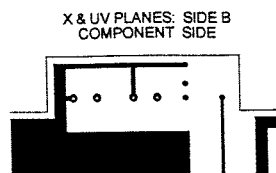


R1: 1.0 MEGOHM, 1/4 WATT
C1: 0.001 uF, 3 KV

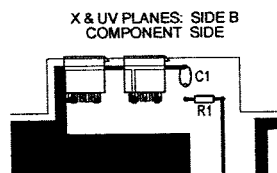


HV TRACES SHOWN IN RED

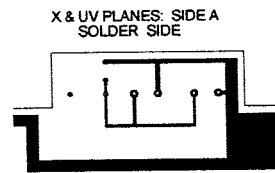
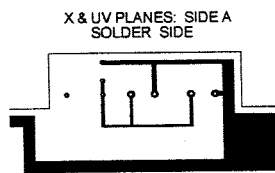
HV TABS: X & UV PLANES



HV TRACES SHOWN IN RED

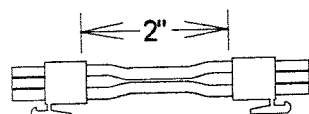
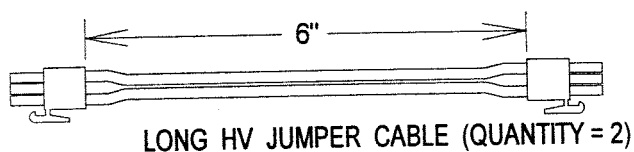
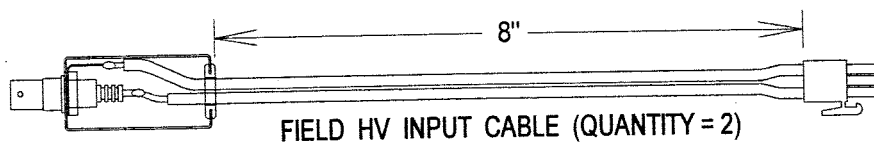
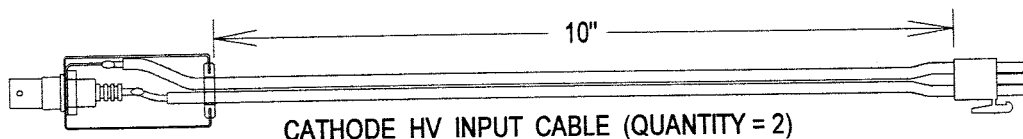
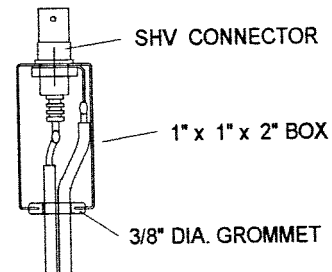


R1: 1.0 MEGOHM, 1/4 WATT
C1: 0.001 uF, 3 KV



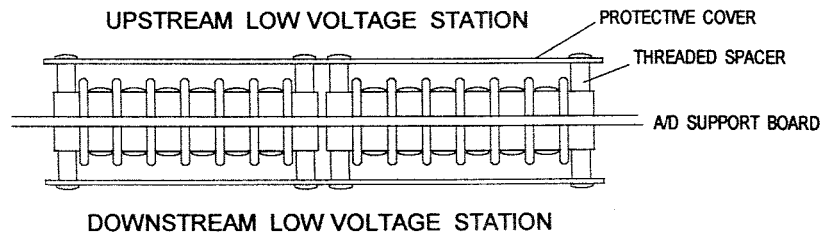
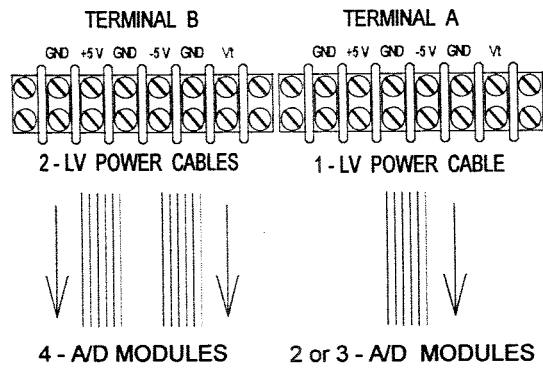
HV TRACES SHOWN IN RED

HV ADAPTER BOX

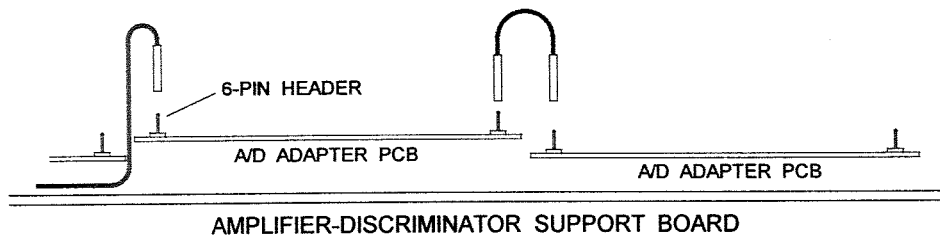


LOW VOLTAGE POWER AND A/D BIAS DISTRIBUTION COMPONENTS

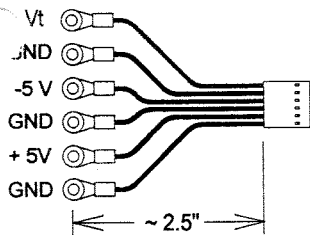
LOW VOLTAGE POWER AND A/D BIAS INPUTS



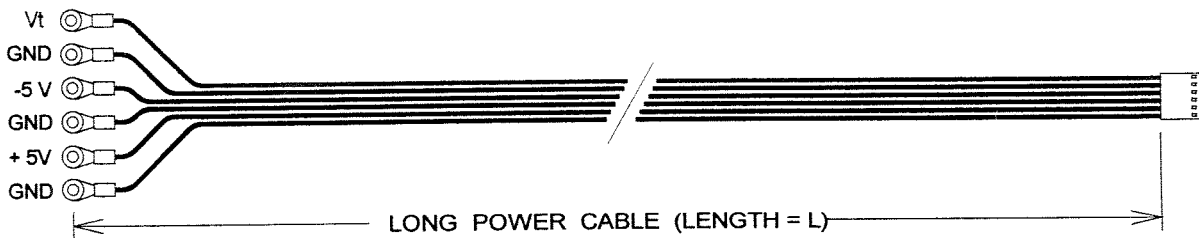
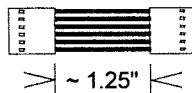
LOW VOLTAGE POWER AND CHAMBER BIAS CONNECTIONS TO A/D ADAPTER PCB'S



SHORT POWER CABLE



JUMPER POWER CABLE



POWER CABLE LIST

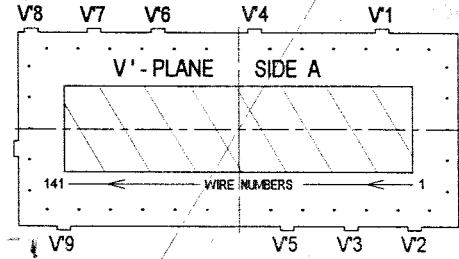
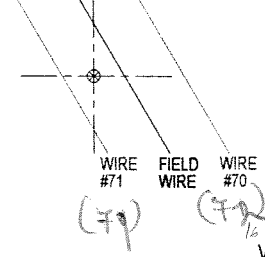
POWER CABLE TYPE	ESTIMATED LENGTH	QUANTITY REQUIRED
JUMPER	1.25"	30
SHORT	2.5"	8
LONG - A	16"	2
LONG - B	21"	8
LONG - C	27"	2
LONG - D	32"	6

WIRE PLANE GEOMETRY

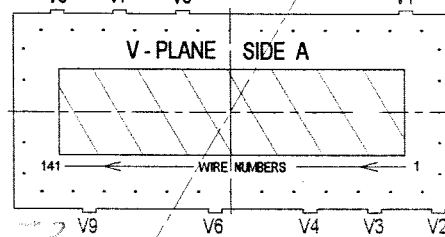
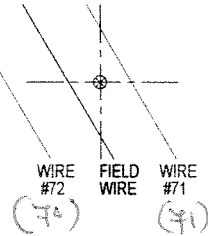
GREEN: A/D CHANNEL # INCREASES WITH INCREASING WIRE #
RED: A/D CHANNEL # DECREASES WITH INCREASING WIRE #

pair
#17 is always ground

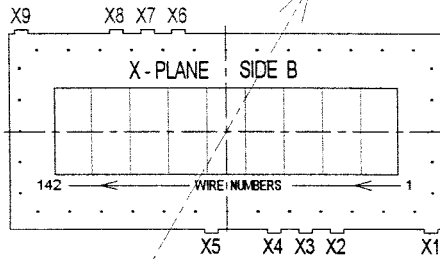
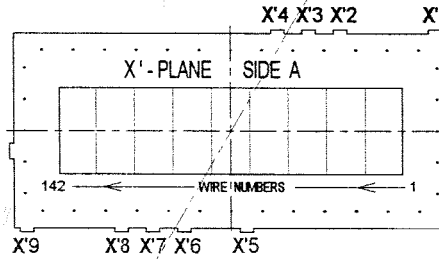
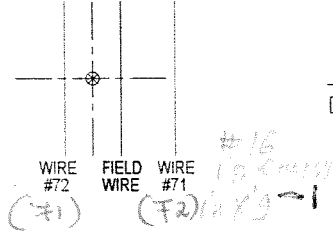
V'-PLANE CENTERPOINT



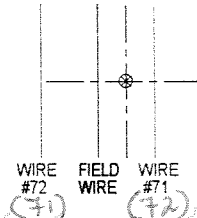
V-PLANE CENTERPOINT



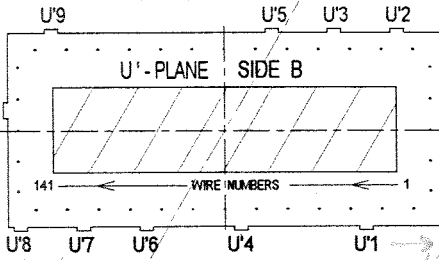
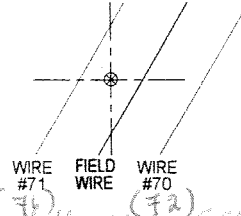
X'-PLANE CENTERPOINT



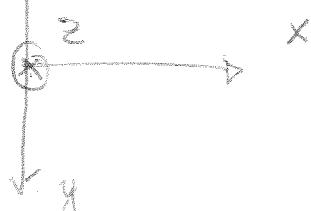
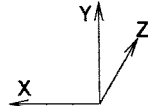
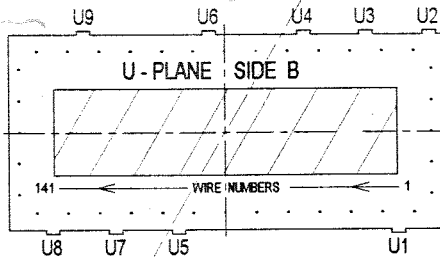
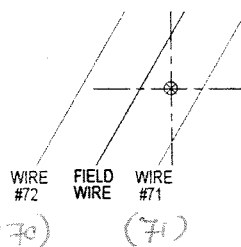
X-PLANE CENTERPOINT



U'-PLANE CENTERPOINT



U-PLANE CENTERPOINT



BEAM

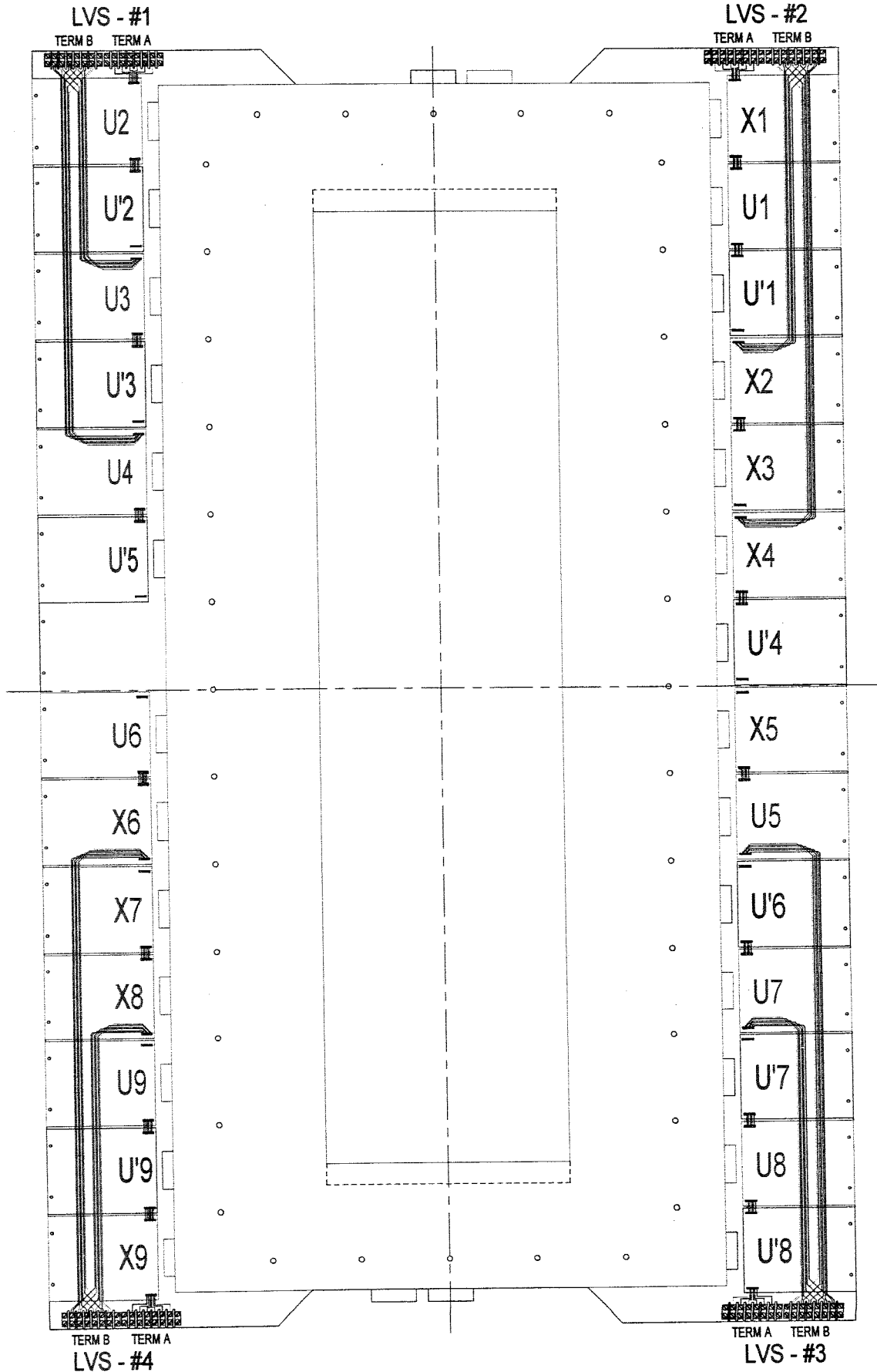
U'9
16 chan
is empty

chan 123-16

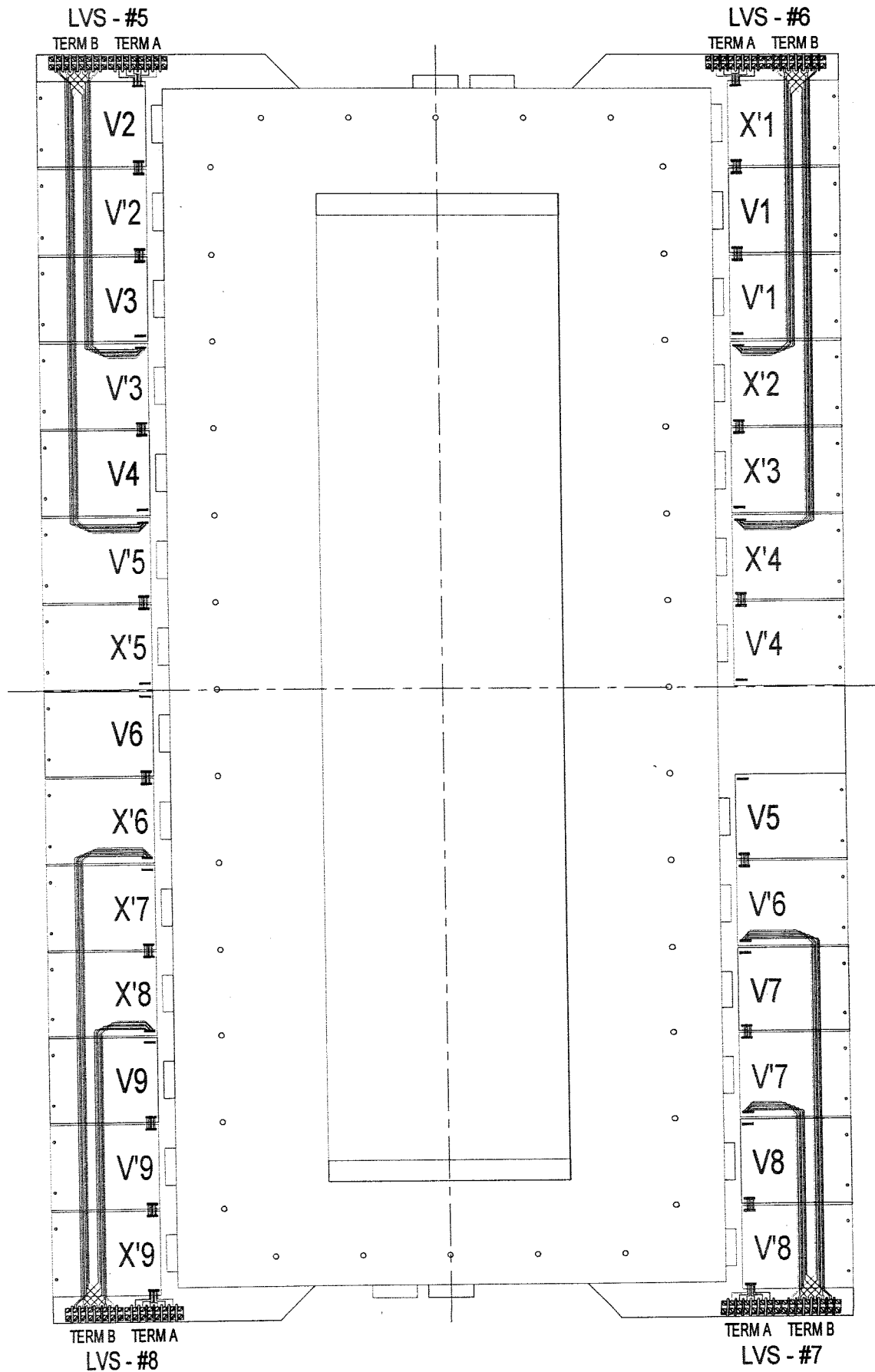
16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1

U'1
16
#16 is empty

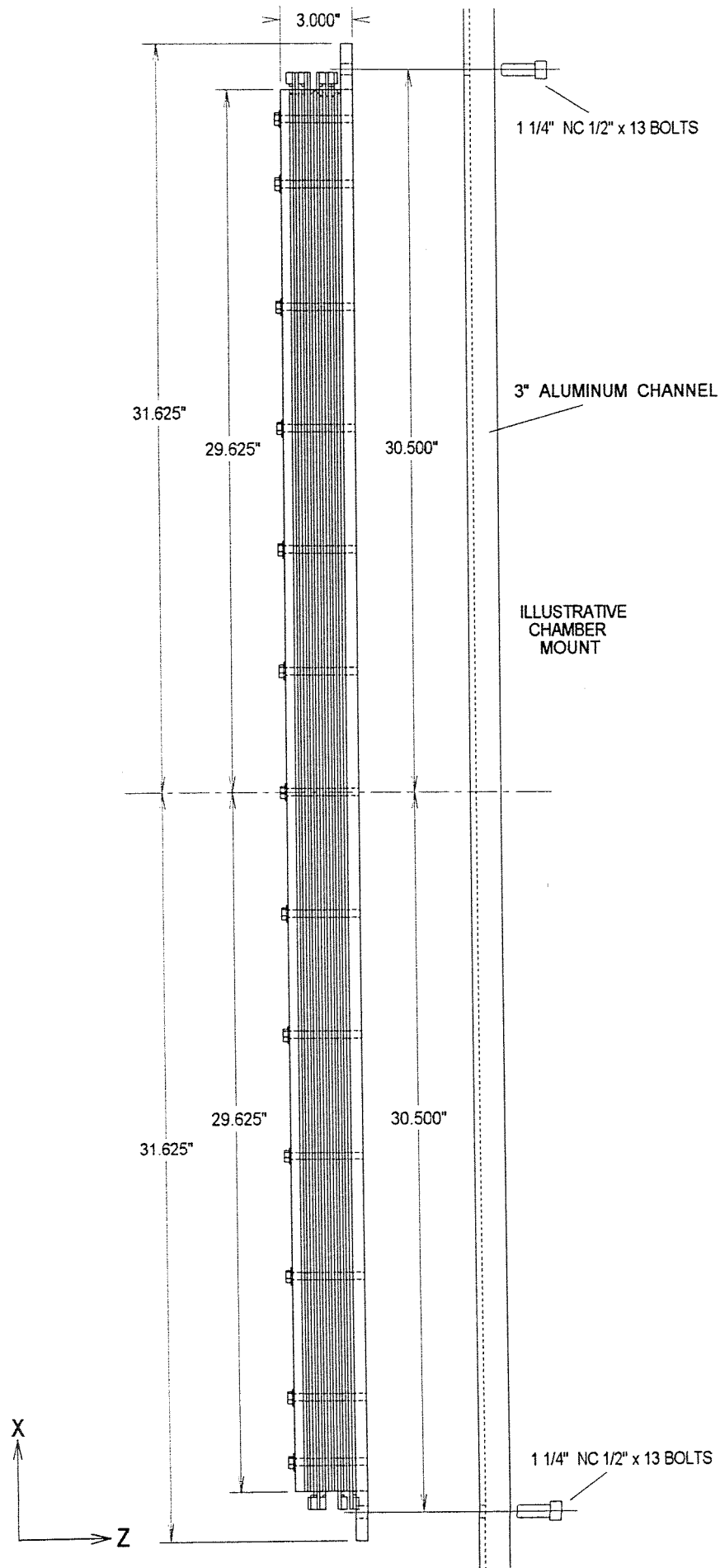
LOW VOLTAGE DISTRIBUTION SCHEMATIC FOR U, U' and X PLANE AMPLIFIER-DISCRIMINATORS FRONT CHAMBER VIEW (LOOKING DOWNSTREAM WITH BEAM)



LOW VOLTAGE DISTRIBUTION SCHEMATIC FOR
X', V and V' PLANE AMPLIFIER-DISCRIMINATORS
REAR CHAMBER VIEW
(LOOKING UPSTREAM TOWARD BEAM)

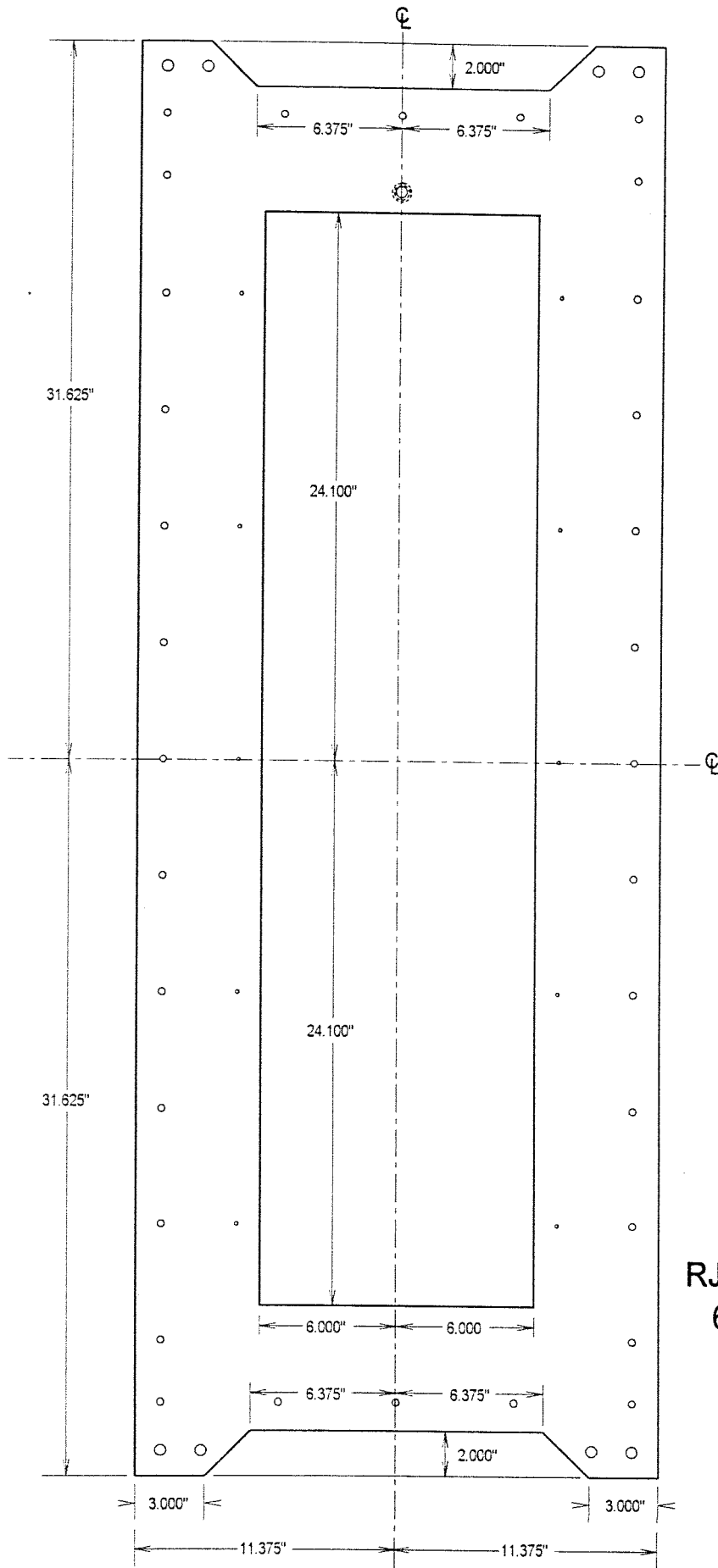


HKS CHAMBER - TOP VIEW



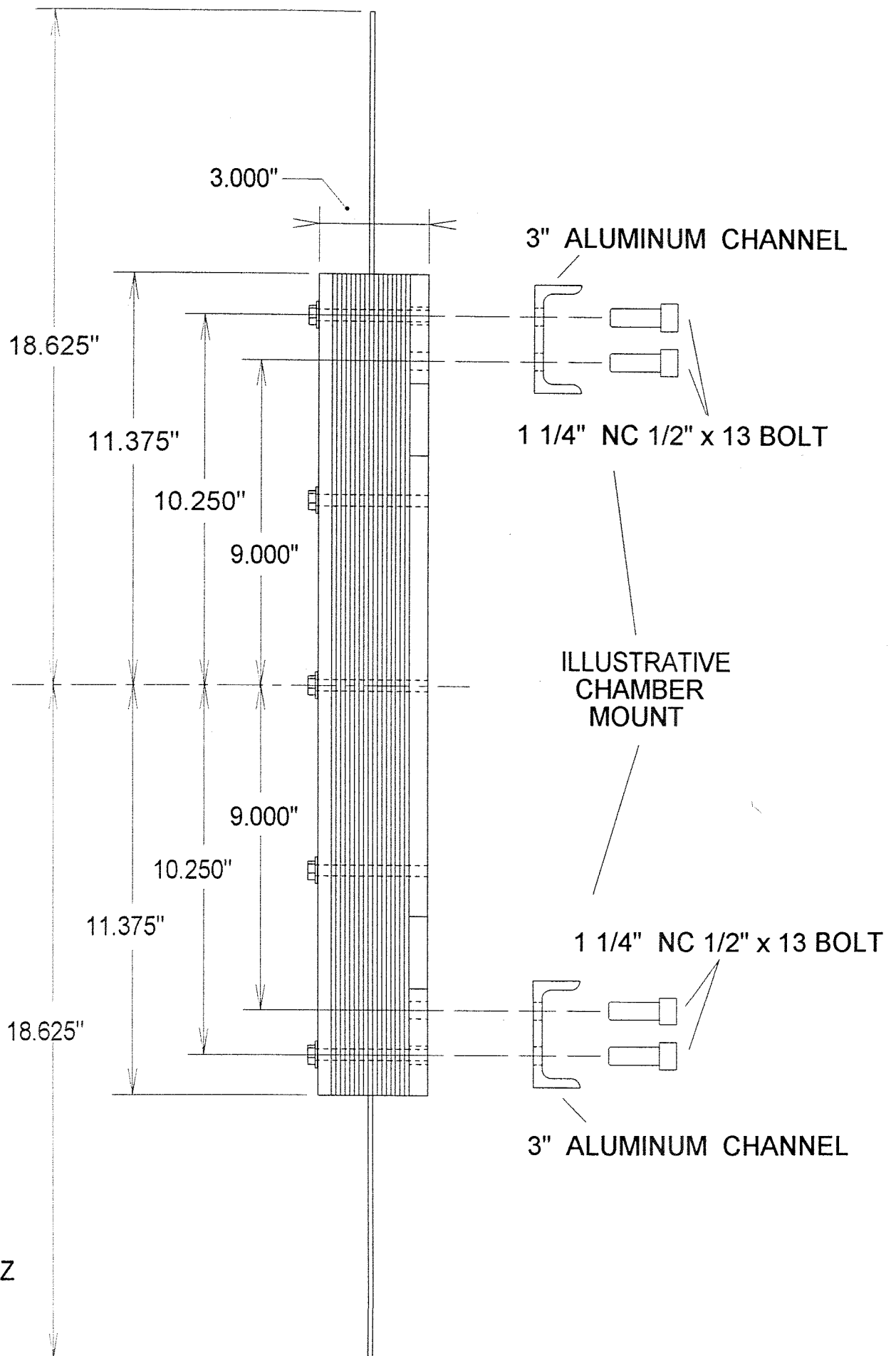
BASEPLATE: DIMENSIONS

MATERIAL - 1/2" THICK ALUMINUM PLATE



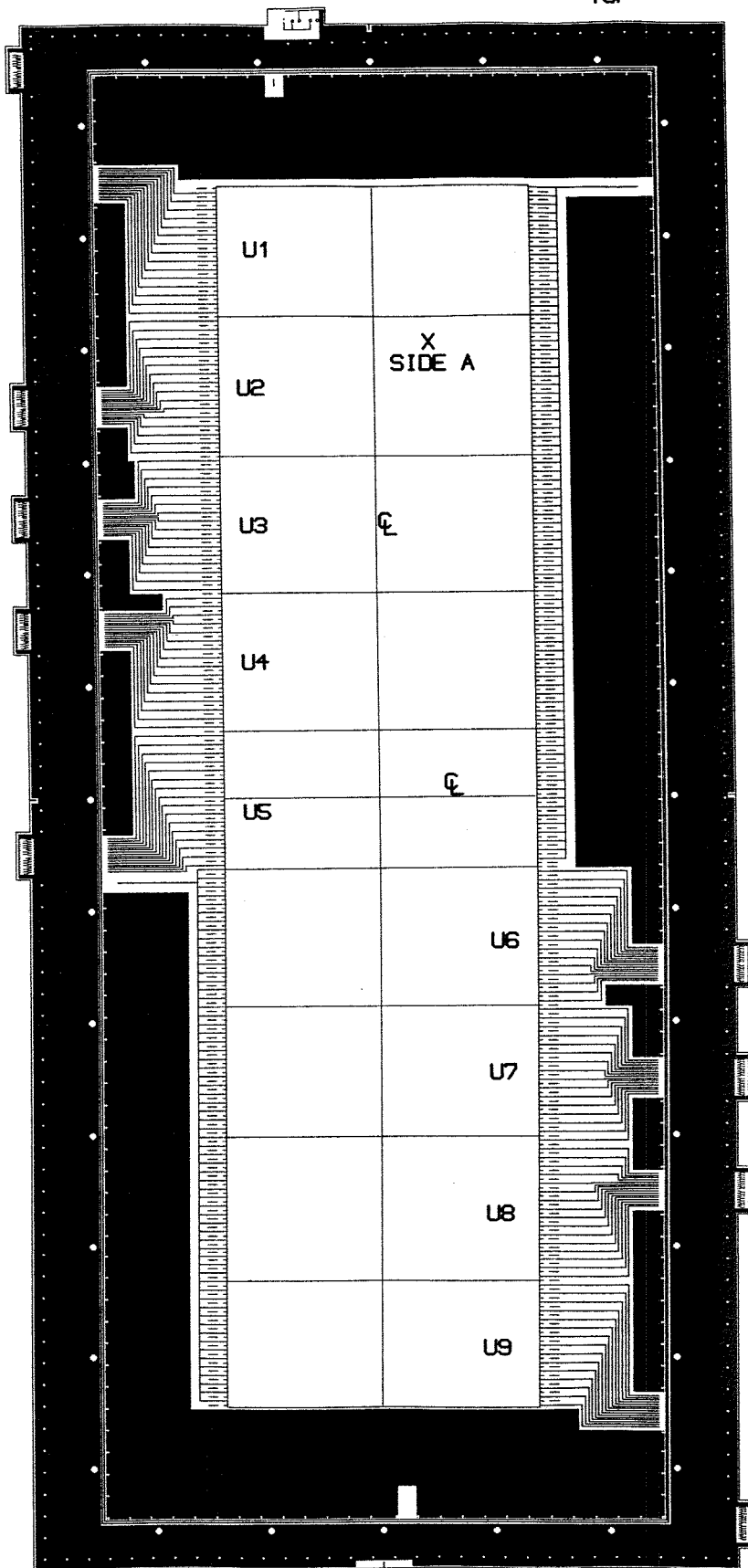
RJ SUTTER
6/20/02

HKS CHAMBER - SIDE VIEW



X-PLANE - SIDE A

TOP

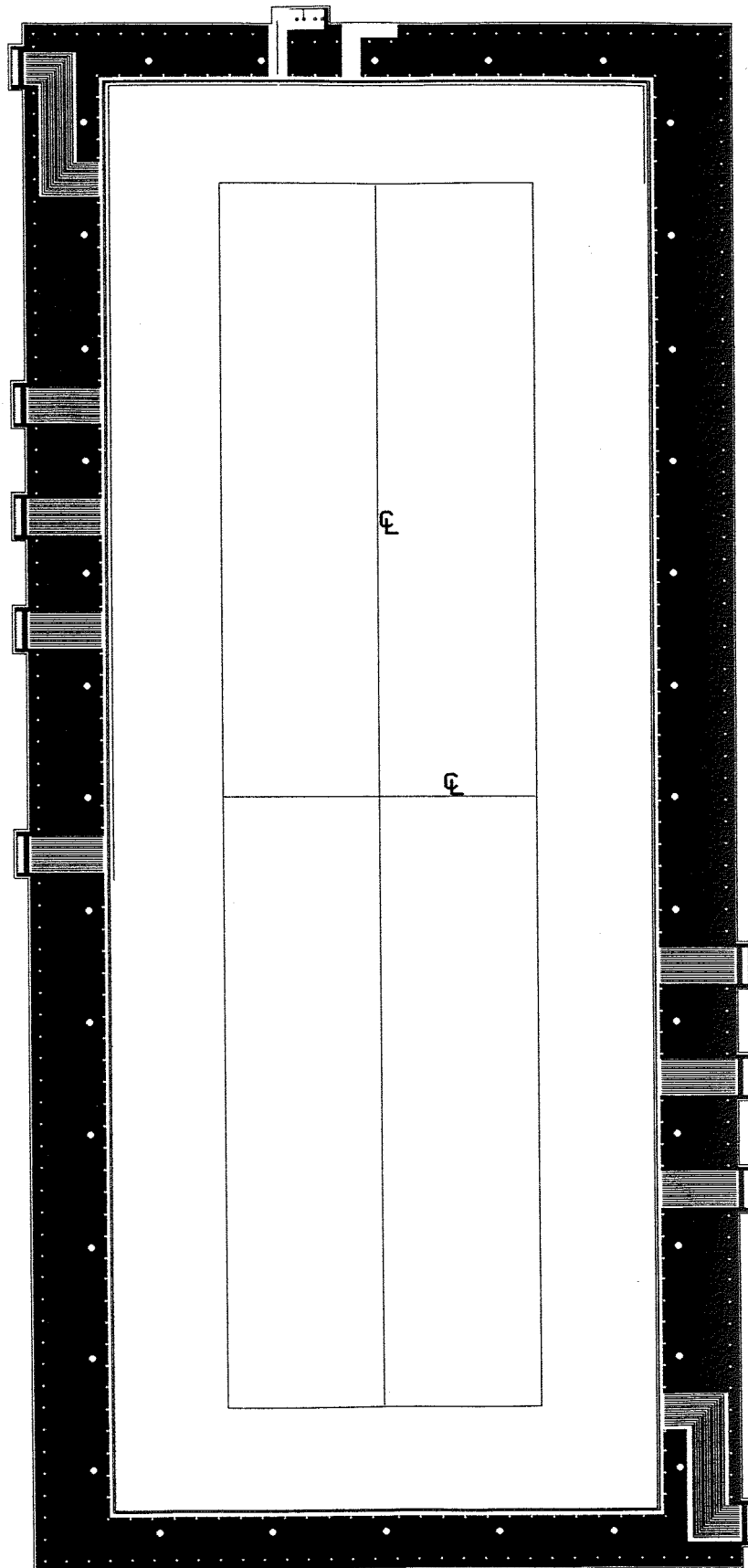


X-PLANE - SIDE A

BOTTOM

X-PLANE - SIDE B

TOP

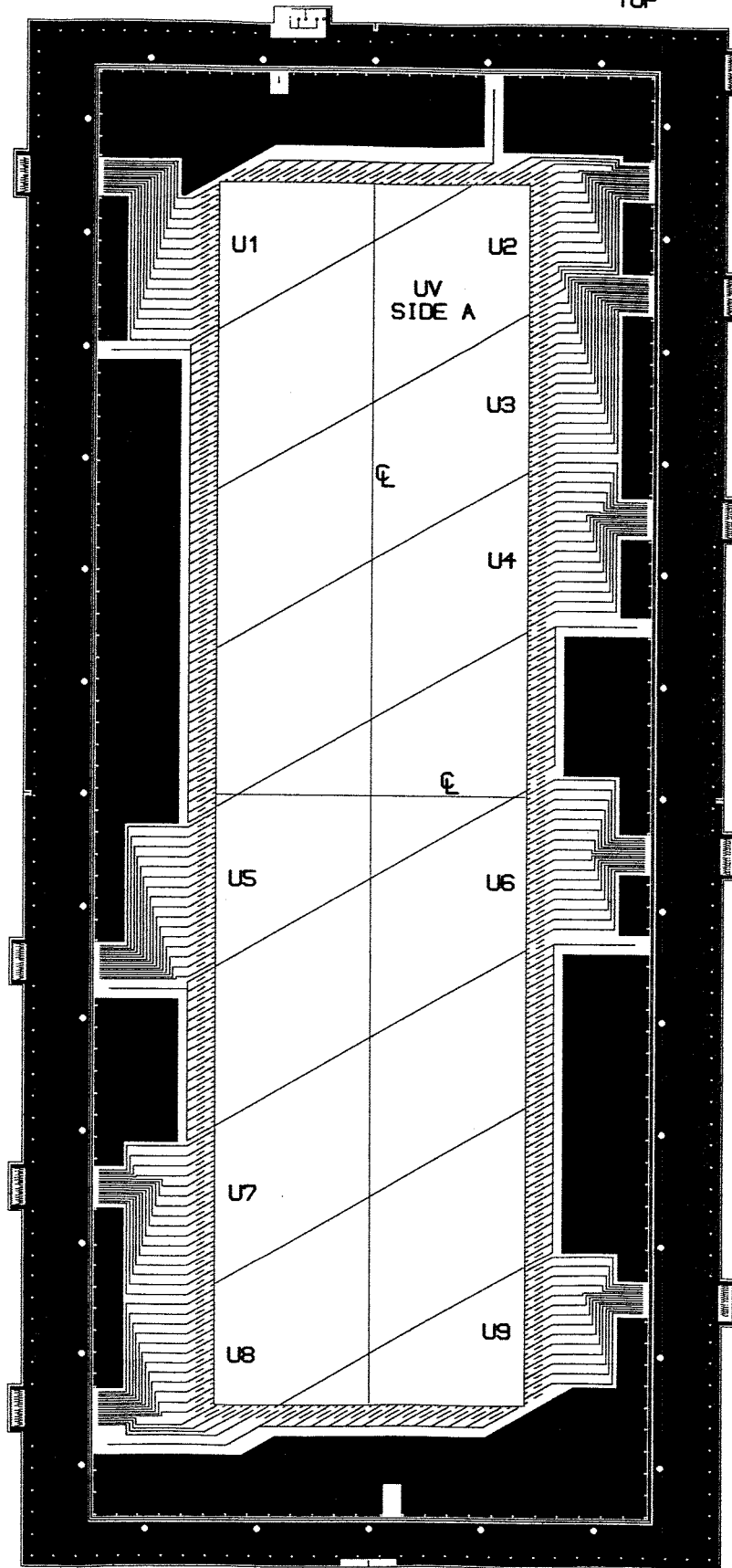


X-PLANE - SIDE B

BOTTOM

UV PLANE - SIDE A

TOP

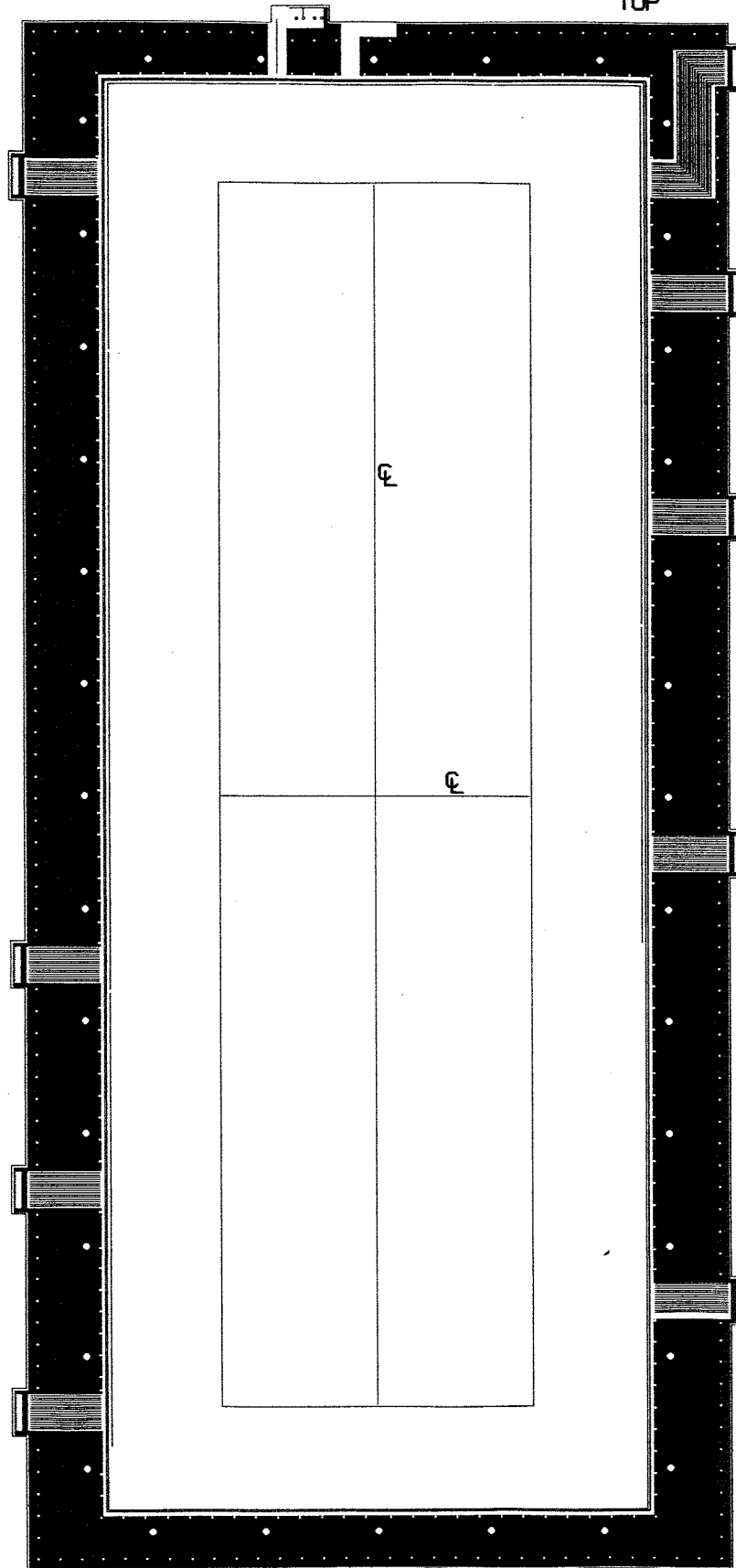


UV PLANE - SIDE A

BOTTOM

UV PLANE - SIDE B

TOP

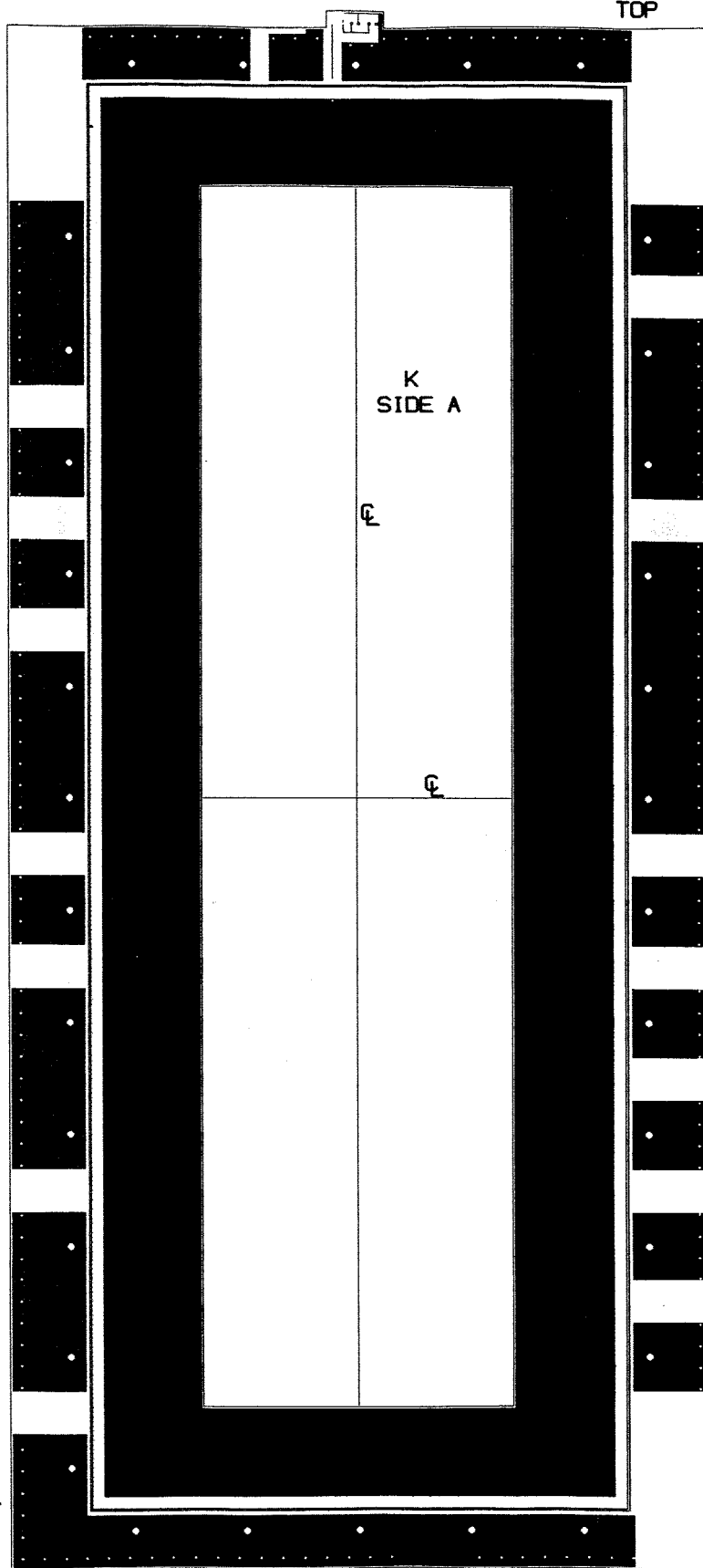


UV PLANE - SIDE B

BOTTOM

K PLANE - SIDE A

TOP

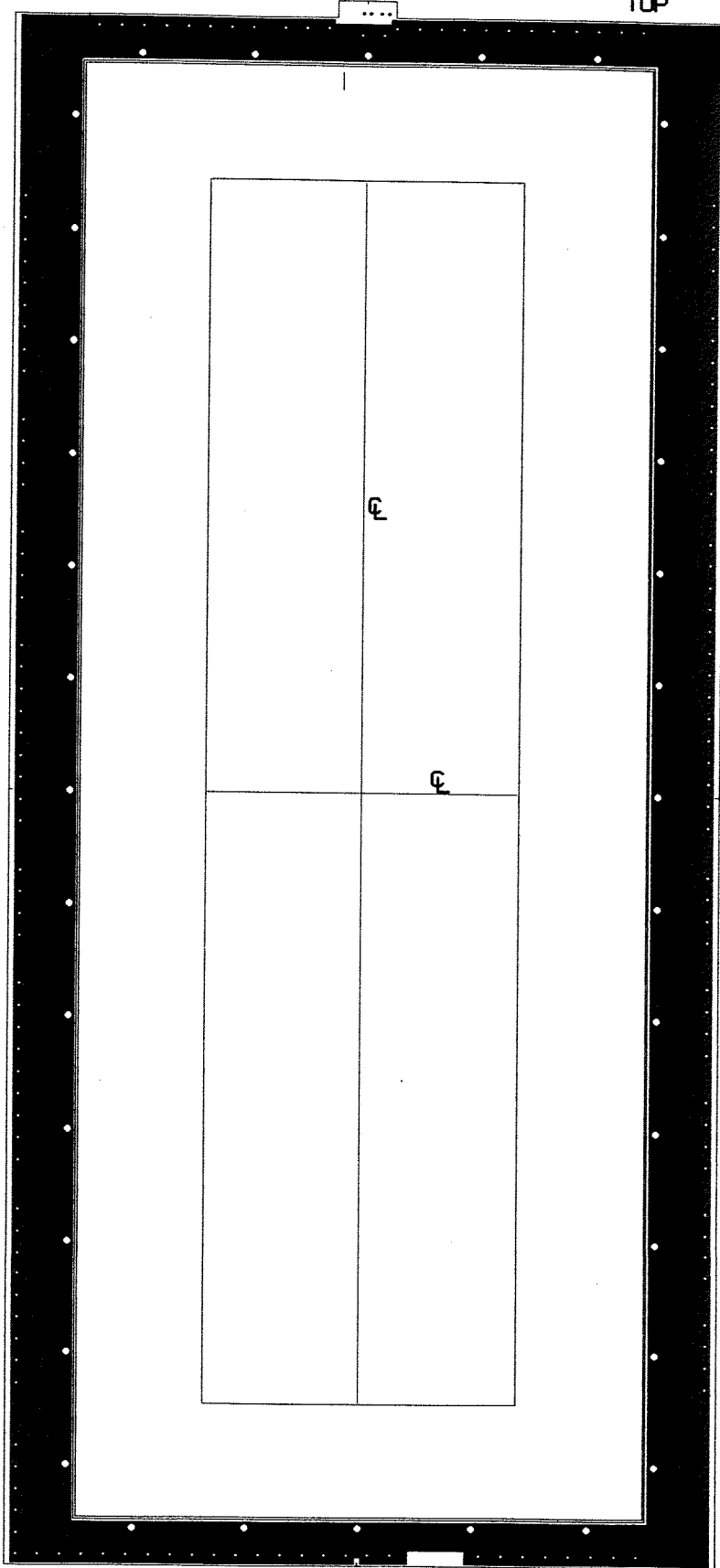


K PLANE - SIDE A

BOTTOM

K PLANE - SIDE B

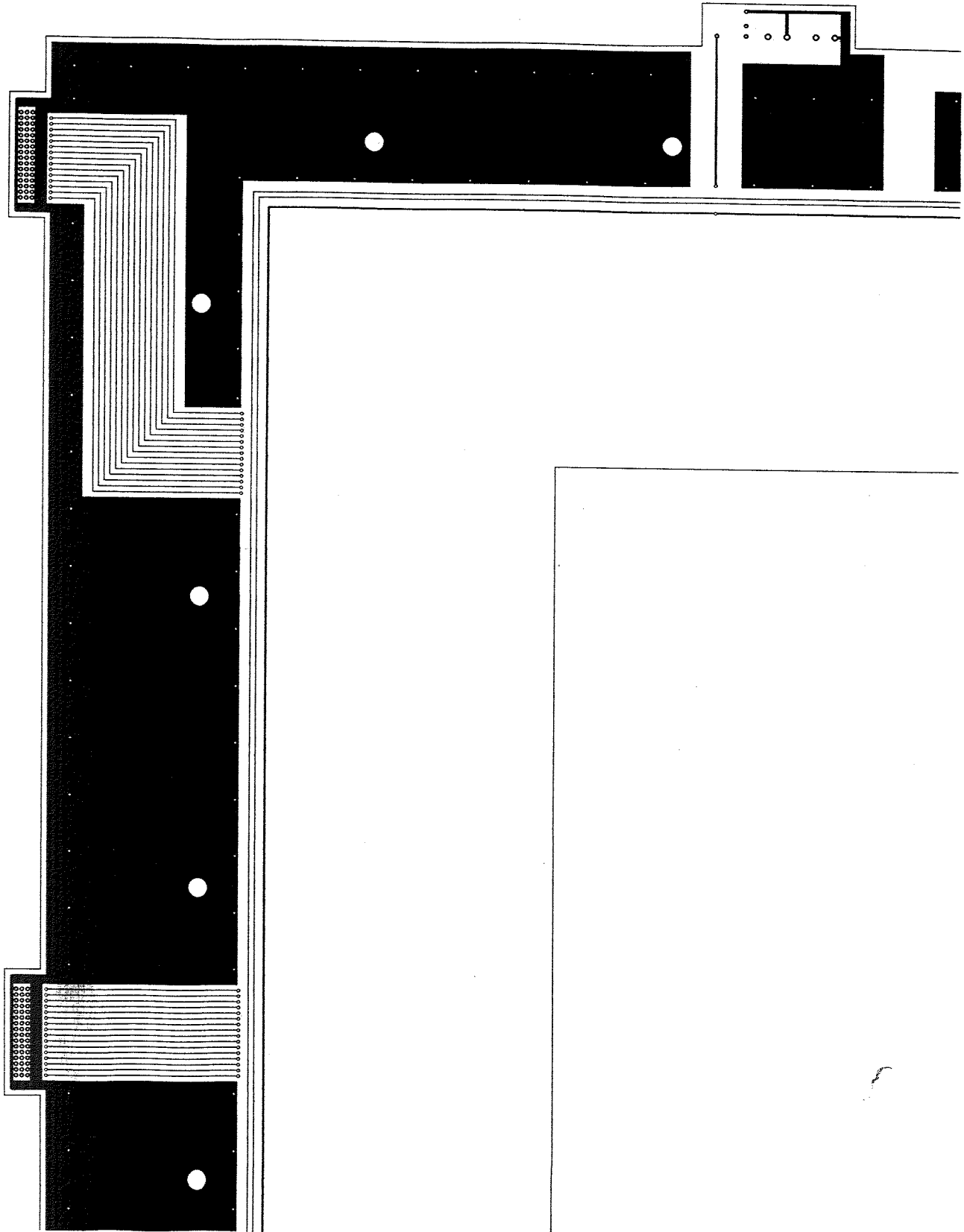
TOP



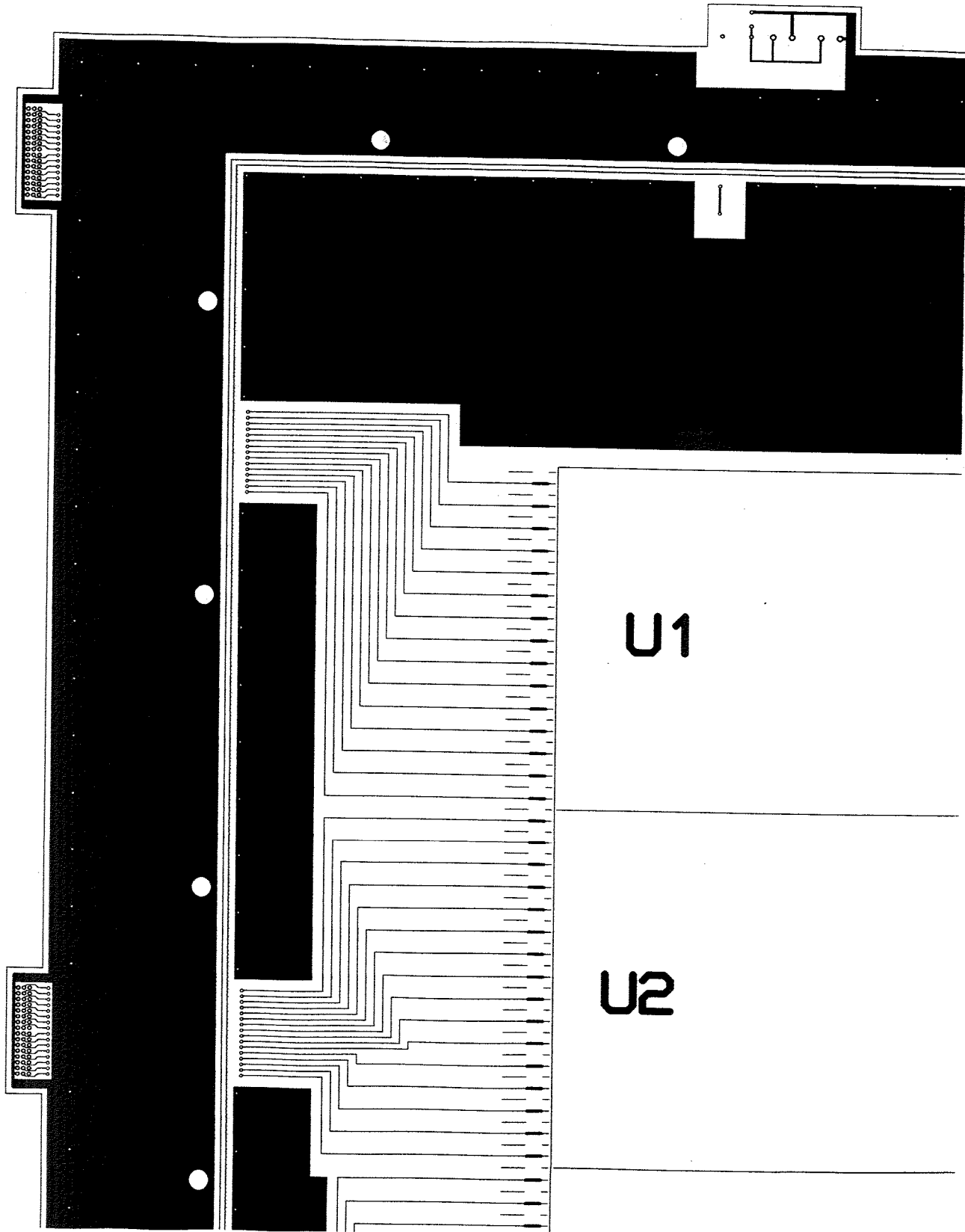
K PLANE - SIDE B

BOTTOM

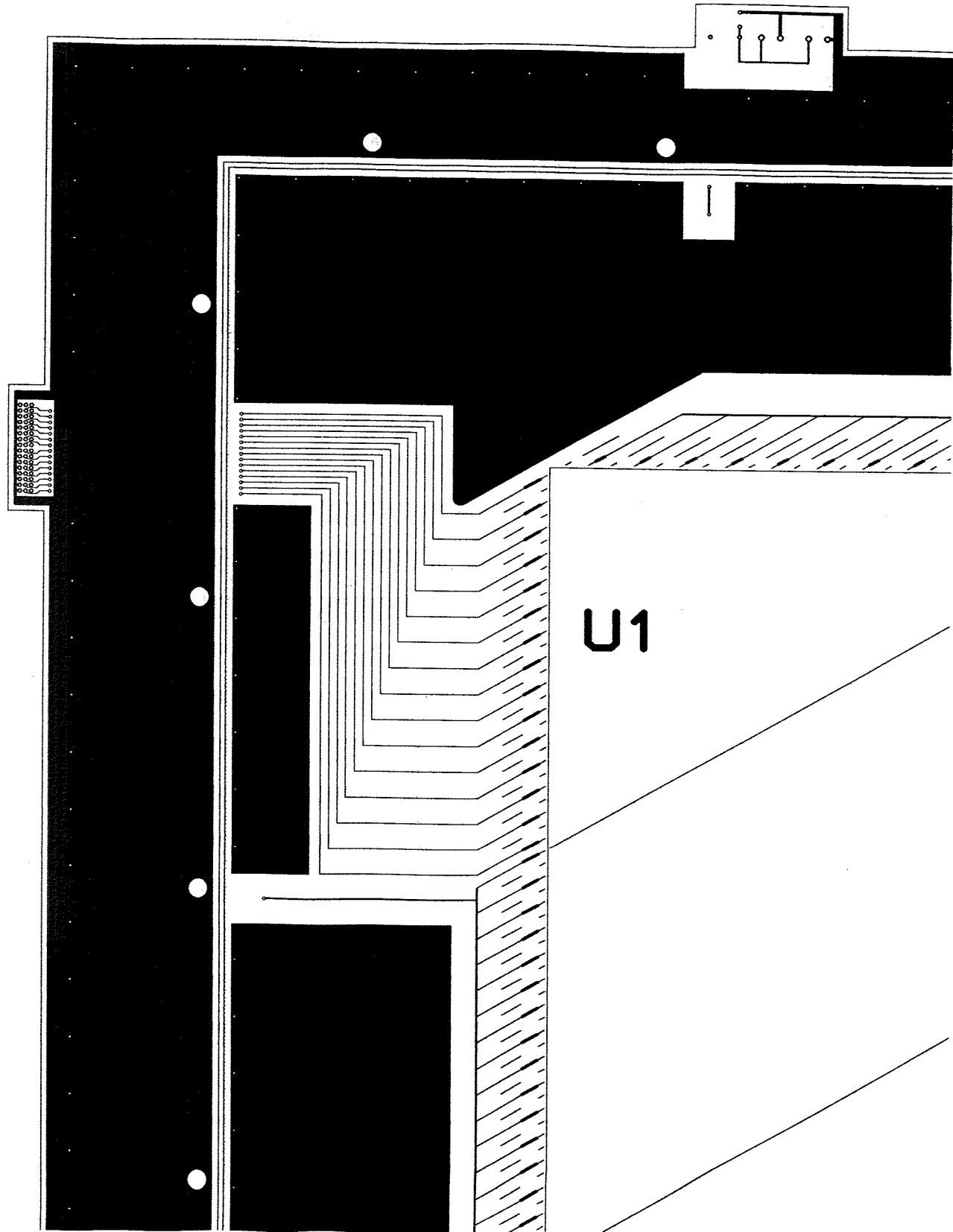
X-PLANE -



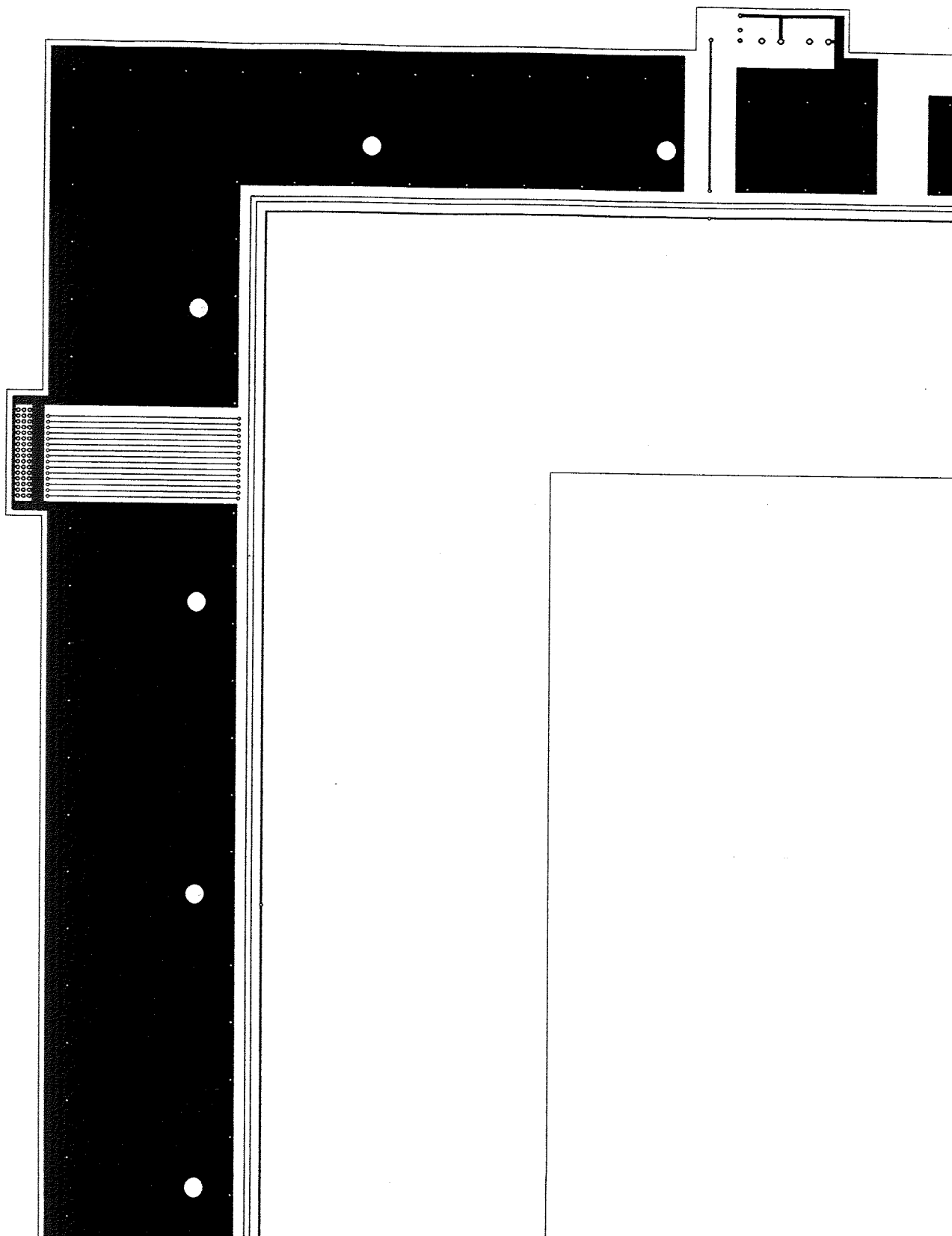
X-PLANE

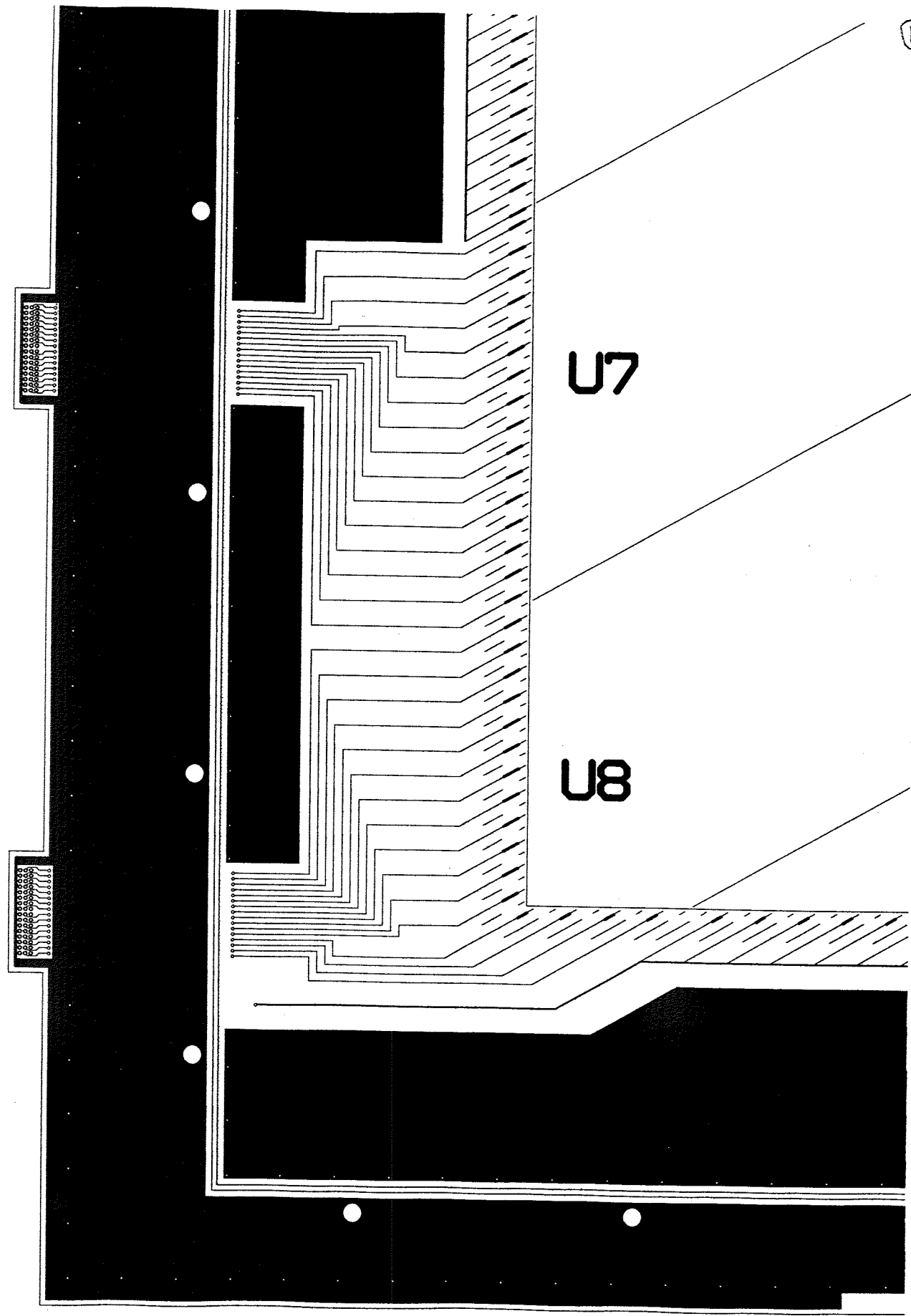


UV PLANE



UV PLANE

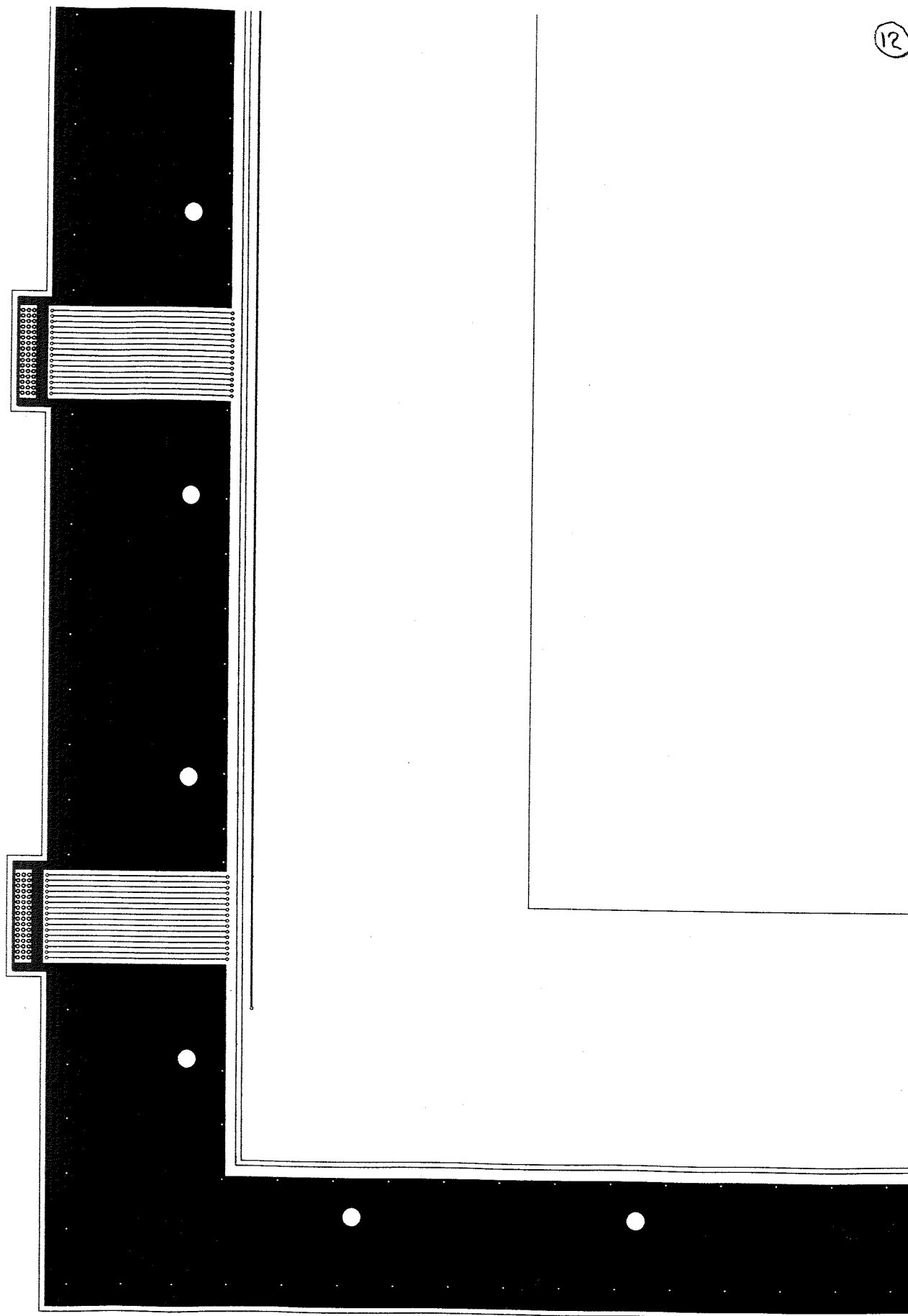




U7

U8

UV PLANE



UV PLANE .