

Approved for public release;
distribution is unlimited.

RECEIVED
FFR 08 1999

OST

*Mechanical Design of Hybrid Densitometer
for Laboratory Application*

Los Alamos
NATIONAL LABORATORY

*Los Alamos National Laboratory is operated by the University of California
for the United States Department of Energy under contract W-7405-ENG-36.*

*Edited by Jeff Skiby, Group CIC-1
Prepared by Rita Romero, Group NIS-5*

*This work was supported by the US Department of Energy,
Office of Nonproliferation and National Security, Office of
Safeguards and Security.*

An Affirmative Action/Equal Opportunity Employer

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither The Regents of the University of California, the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by The Regents of the University of California, the United States Government, or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of The Regents of the University of California, the United States Government, or any agency thereof. Los Alamos National Laboratory strongly supports academic freedom and a researcher's right to publish; as an institution, however, the Laboratory does not endorse the viewpoint of a publication or guarantee its technical correctness.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

*Mechanical Design of Hybrid Densitometer
for Laboratory Application*

S.-T. Hsue

P. J. Polk

G. Walton

MECHANICAL DESIGN OF HYBRID DENSITOMETER FOR LABORATORY APPLICATION

by

S. -T. Hsue, P. J. Polk, and G. Walton

ABSTRACT

The hybrid K-edge densitometry (KED) and x-ray fluorescence (XRF) densitometer is a unique nondestructive assay (NDA) technique to determine the concentrations of special nuclear material (SNM) in solutions. The technique is ideally suited to assay the dissolver solutions as well as the uranium and plutonium product solutions from reprocessing plants. It is an important instrument for safeguarding reprocessing; it is also a useful tool in analytical laboratories because of its capability of analyzing mixed solutions of SNM without chemical separation. Figure 1 shows the hardware of an hybrid system developed at Los Alamos.

The hybrid densitometer employs a combination of two complimentary assay techniques: absorption KED and XRF. The KED technique measures the transmission of a tightly collimated photon beam through the sample; it is therefore quite insensitive to the radiation emitted by the sample material. Fission product level of ~ 1 Ci/mL can be tolerated. The technique is insensitive to matrix variation. XRF measures the fluorescent x-rays from the same sample and can be used to determine the ratios of SNM. The technique¹ can be applied to thorium, uranium, neptunium, plutonium, and americium concentration determination. The technique can also be applied to mixed solutions found in nuclear fuel cycle without separation: thorium-uranium, uranium-plutonium, and neptunium-plutonium-amerium.

The design of the hybrid densitometer is shown schematically in Figs. 1 and 2; Fig. 1 shows the top view; Fig. 2 shows the side view. The heart of the design is the sample changer. The sample changer can accommodate a sample tray, which holds up to six samples. The samples can be a 2-cm path length cell, 4-cm path length cell, or a mixture of both sizes. The sample tray is controlled by a "Compumotor" which in turn is controlled by a computer. The absolute position of the sample cell can be reproduced to a standard deviation of 0.02 mm. The sample changer is housed inside square stainless steel tubing which is bolted onto the glove box. The sample cells can be observed during the movement or assay through a leaded glass viewport, as shown in Fig. 3.

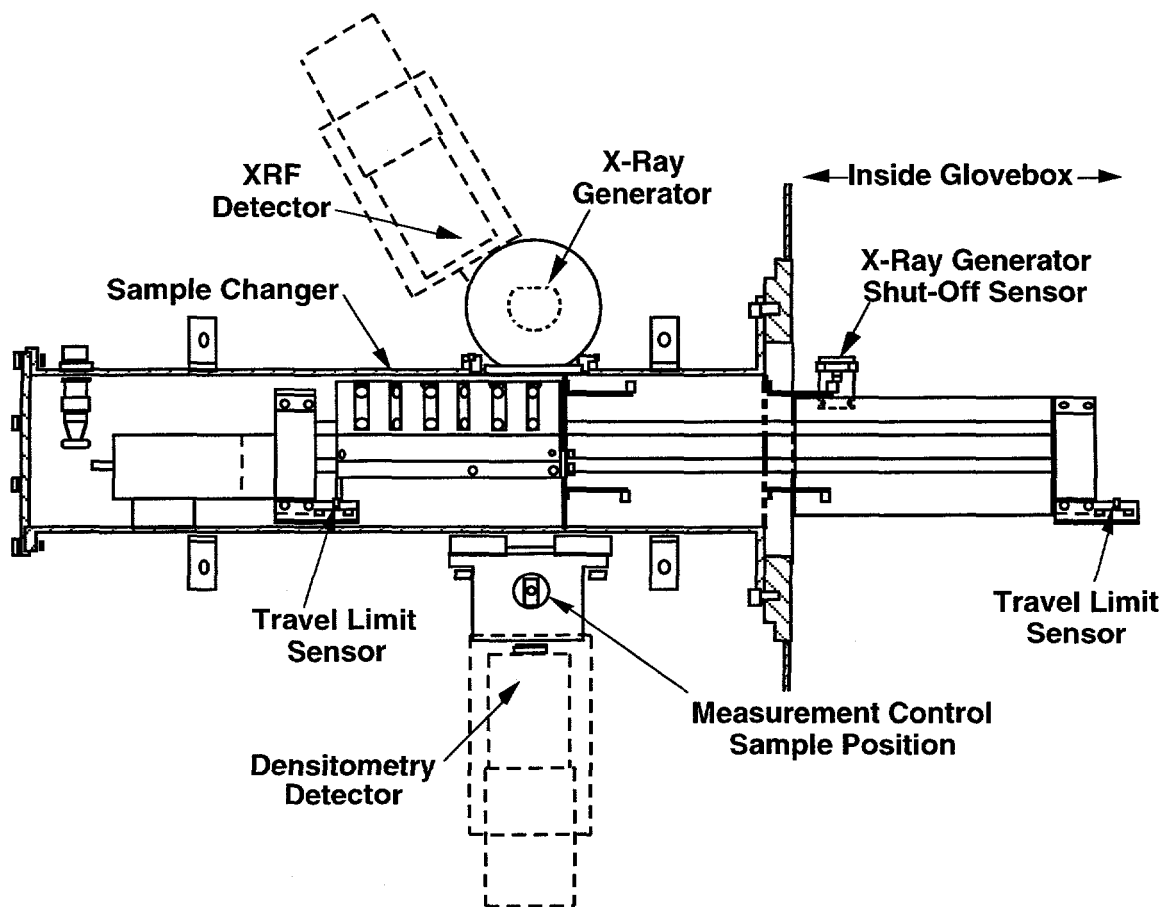


Fig. 1. Top view of schematic design of the hybrid hardware system.

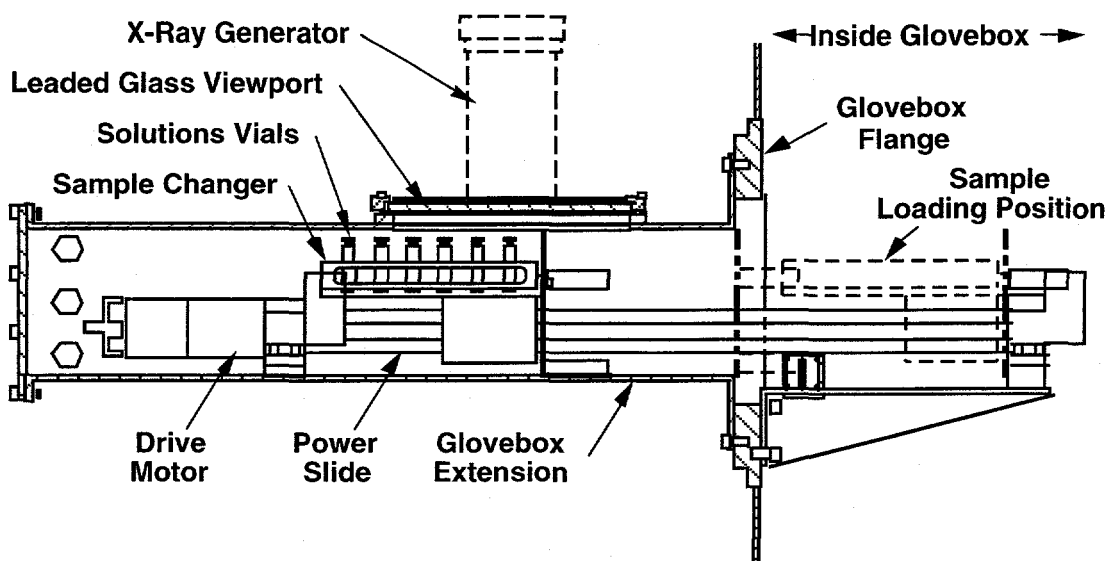


Fig. 2. Side view of schematic design of the hybrid hardware system.

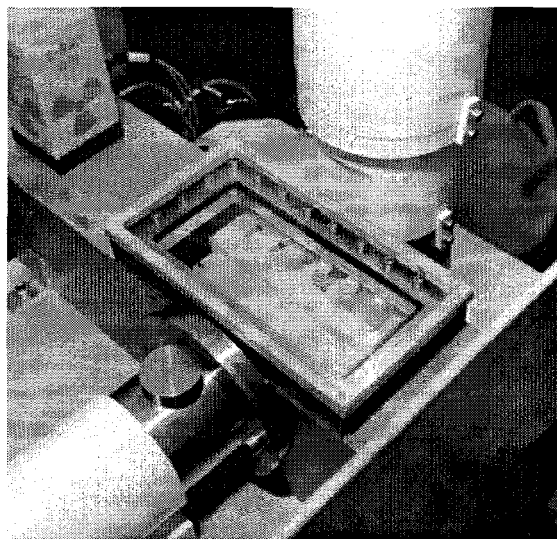
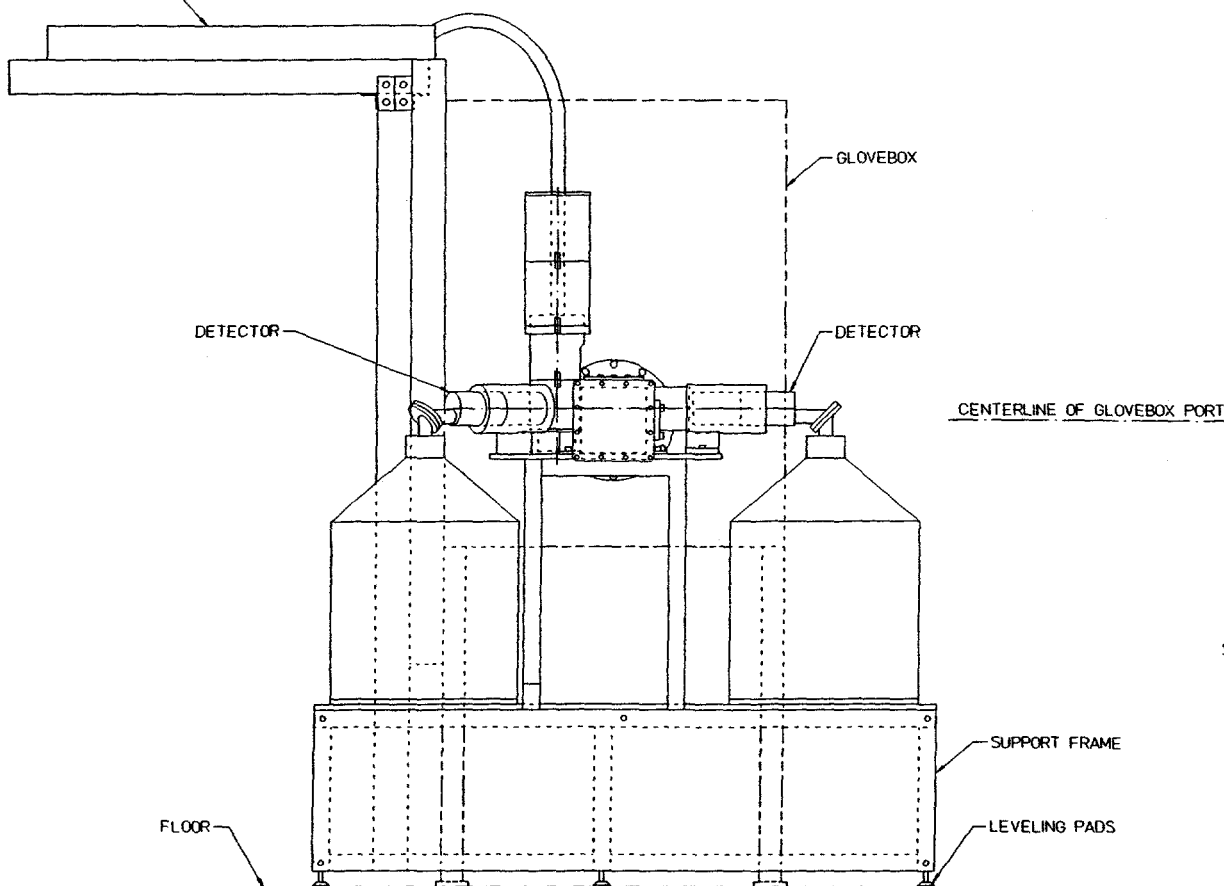
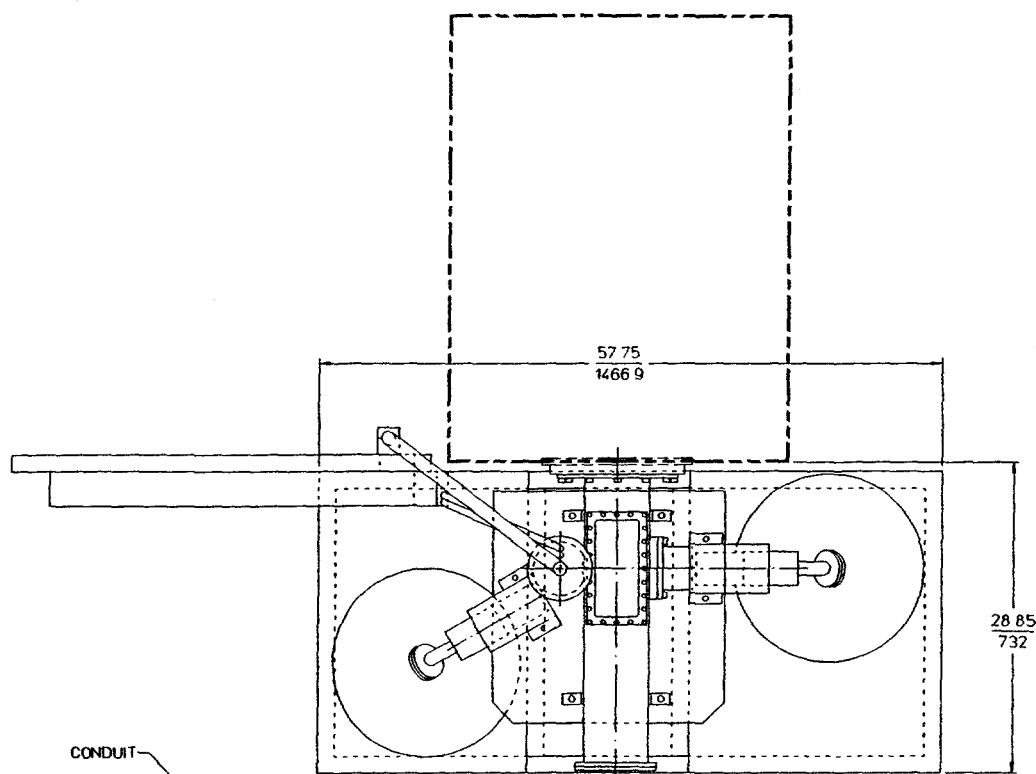


Fig. 3. Photograph of sample and sample tray in the x-ray beam. The vertical cylinder on the left is the housing for the x-ray tube. The horizontal tubing on the right is the KED detector.

REFERENCE

1. H. Ottmar and H. Eberle, "The Hybrid K-Edge/K-XRF Densitometer: Principles - Design - Performance," Kernforschungszentrum Karlsruhe report KfK 4590 (February 1991).



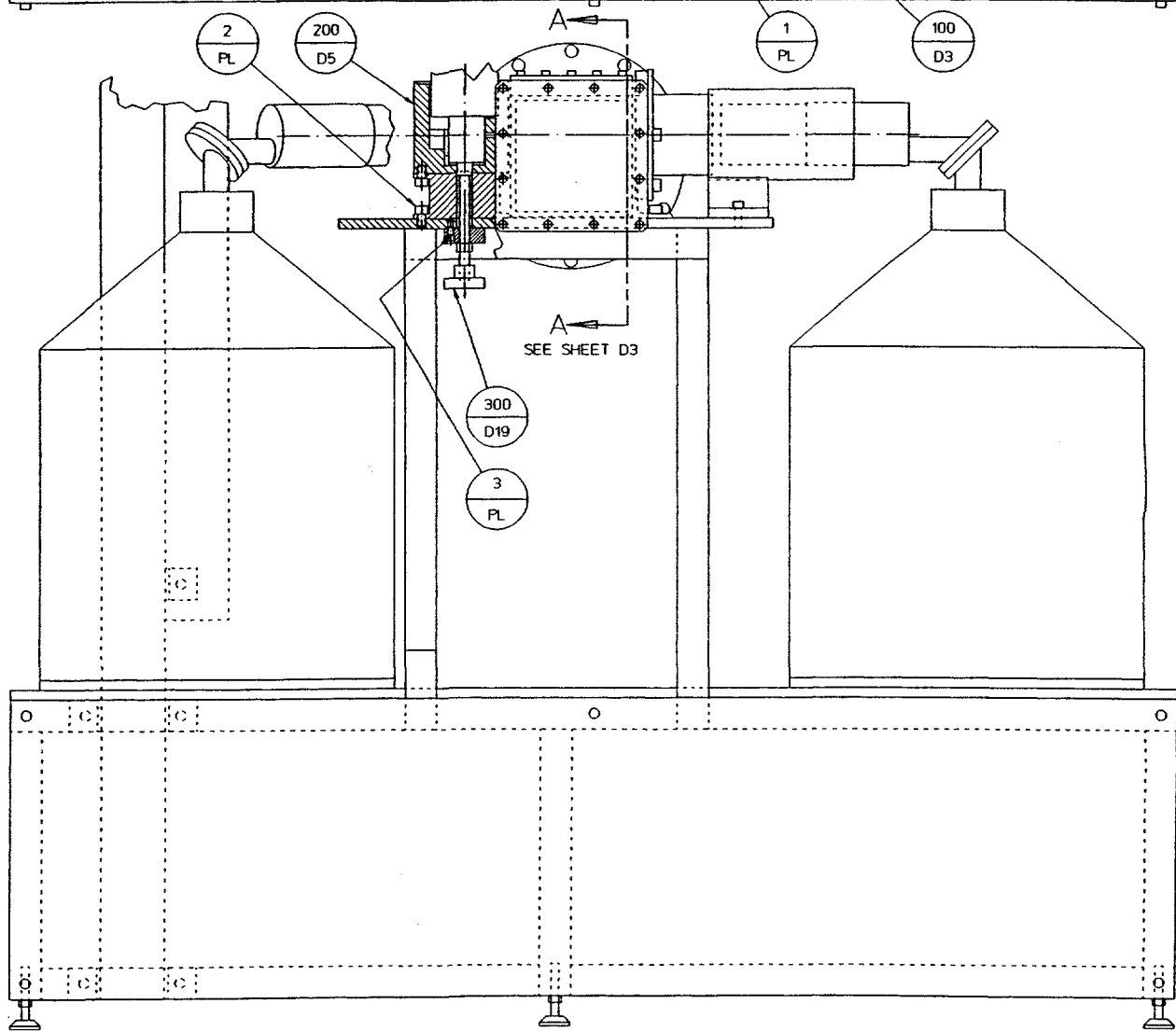
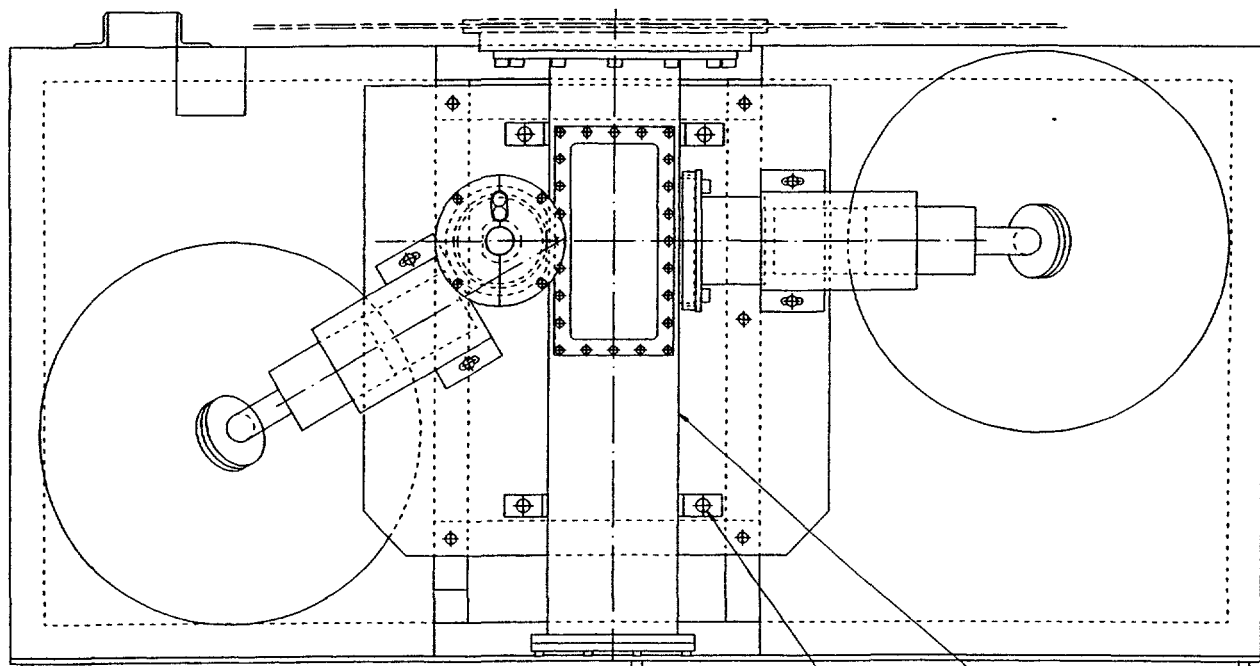
PART NUMBER			PARTS LIST	
PREFIX NUMBER	ITEM NUMBER	NUMBER REQD	DESCRIPTION	
			ASSEMBLY	D1.D2
			SUB-ASSEMBLY 100	D3.D4
			SUB-ASSEMBLY 200	D5
			SUB-ASSEMBLY 300	D19
			SUB-ASSEMBLY 400	D20
			SUB-ASSEMBLY 500	D28

NOTE.

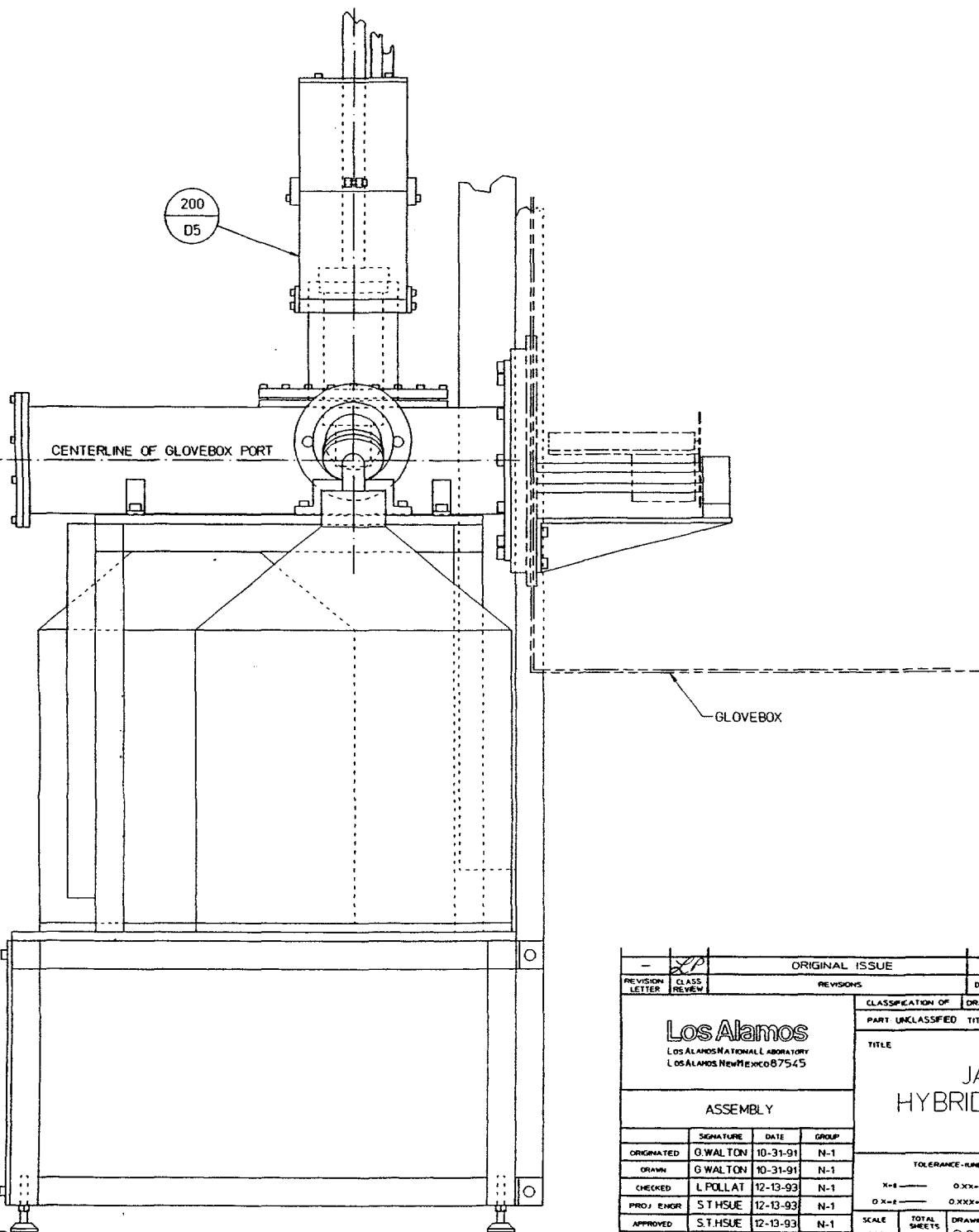
① SEE SHEET D2 FOR ASSEMBLY ENLARGEMENT AND PARTS LIST.

31.50
800

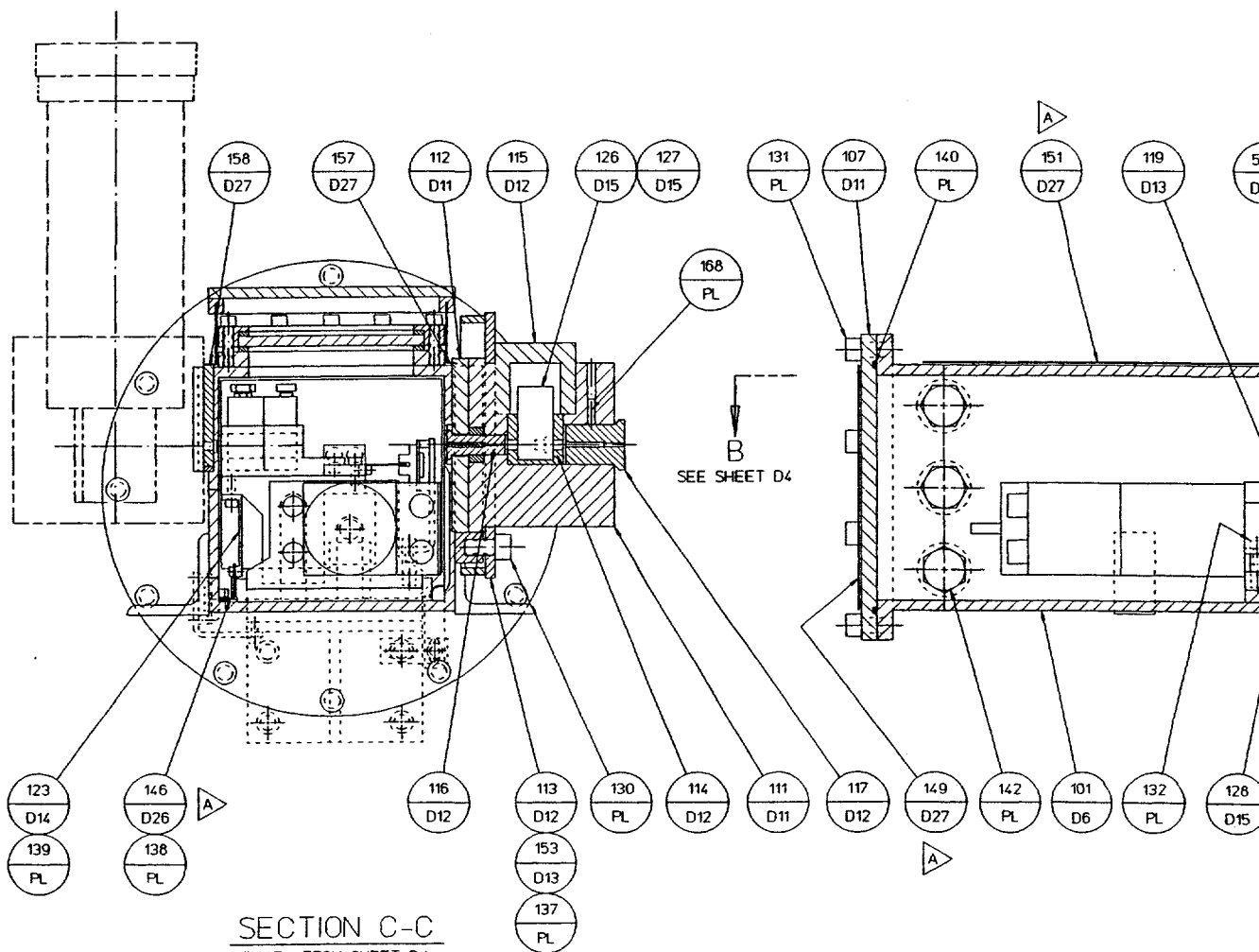
A	REV	ADDED SHEETS D24 THRU D30	7-22-93	WALTON	HSUE	HSUE
—	—	ORIGINAL ISSUE	—	—	—	—
REVISION LETTER	CLASS REVIEW	REVISIONS	DATE	CHANGED BY	CHECKED BY	APPROVED BY
Los Alamos LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS, NEW MEXICO 87545			CLASSIFICATION OF DRAWING: UNCLASSIFIED PART: UNCLASSIFIED TITLE BLOCK: UNCLASSIFIED			
ASSEMBLY			TITLE JAERI HYBRID SYSTEM			
ORIGINATED	G. WALTON	10-31-91	N-1	TOLERANCE: UNLESS OTHERWISE NOTED:		
DRAWN	G. WALTON	10-31-91	N-1	K= ——— 0.XX= ——— ANGULAR= ———		
CHECKED	L. POLLAT	12-13-91	N-1	O.K.= ——— 0.XXX= ——— FINISH= ———		
PROJ. ENGR.	S. T. HSUE	12-13-91	N-1	SCALE	TOTAL SHEETS	DRAWING NO.
APPROVED	S. T. HSUE	12-13-91	N-1	1/8	30	68Y-155787
RELEASED	L. POLLAT	12-13-91	N-1	SHEET NO. 1		



PART NUMBER		PARTS LIST	
PREFIX NUMBER	ITEM NUMBER	NUMBER REQD	DESCRIPTION
	1	4	SCR. SOC HD CAP. STL. M10 X 1.5 X 25MM LONG
	2	3	SCR. SOC HD CAP. STL. M10 X 1.5 X 15MM LONG
	3	3	SCR. SOC HD CAP. STL. M6 X 1 X 20MM LONG

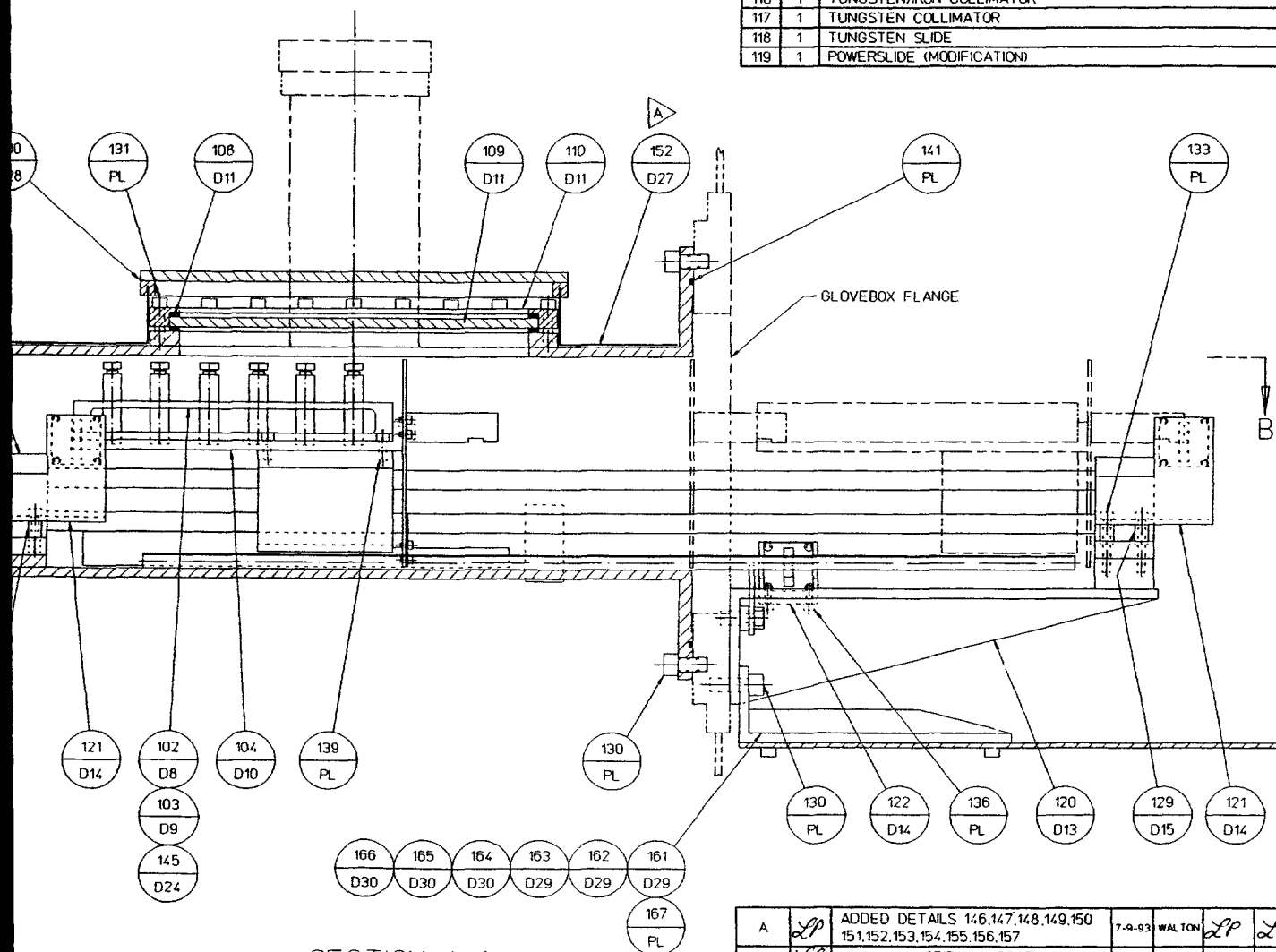


REVISION LETTER		CLASS REVIEW	ORIGINAL ISSUE		DATE	CHANGED BY	CHECKED BY	APPROVED BY
			REVISIONS					
Los Alamos LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS, NEW MEXICO 87545			CLASSIFICATION OF DRAWING UNCLASSIFIED					
			PART UNCLASSIFIED TITLE BLOCK UNCLASSIFIED					
ASSEMBLY			TITLE JAERI HYBRID SYSTEM					
SIGNATURE			DATE	GROUP	TOLERANCE-UNLESS OTHERWISE NOTED			
ORIGINATED			G. WALTON	10-31-91	N-1	X=± 0.XX± ANGULAR±		
DRAWN			G. WALTON	10-31-91	N-1	0.X± 0.XXX± FRESH±		
CHECKED			L. POLLAT	12-13-93	N-1	SCALE		
PROJ. ENGR.			S. THSUE	12-13-93	N-1	TOTAL SHEETS		
APPROVED			S. THSUE	12-13-93	N-1	DRAWING NO.		
RELEASED			L. POLLAT	12-13-93	N-1	SHEET NO.		
						1/4	30	68Y-155787 D 2



SECTION C-C
TAKEN FROM SHEET D4
ROTATED TO UPRIGHT POSITION

PART NUMBER		PARTS LIST	
PREFX NUMBER	ITEM NUMBER	NUMBER REQD	DESCRIPTION
	101	1	POWERSLIDE HOUSING
	102	1	LARGE VIAL TRAY
	103	1	SMALL VIAL TRAY
	104	1	VIAL TRAY SUPPORT
	105	1	X-RAY SHIELD
	106	1	SLIDE HOUSING
	107	1	END CAP
	108	2	VIEWPORT GASKET
	109	1	VIEWPORT LEAD GLASS
	110	1	VIEWPORT RETAINER
	111	1	COLLIMATOR HOUSING
	112	1	TUNGSTEN SHIELDING
	113	1	COLLIMATOR HOUSING SUPPORT CLAMP
	114	1	MEASUREMENT CONTROL VIAL SEAT
	115	1	MEASUREMENT CONTROL VIAL COVER
	116	1	TUNGSTEN/IRON COLLIMATOR
	117	1	TUNGSTEN COLLIMATOR
	118	1	TUNGSTEN SLIDE
	119	1	POWERSLIDE (MODIFICATION)

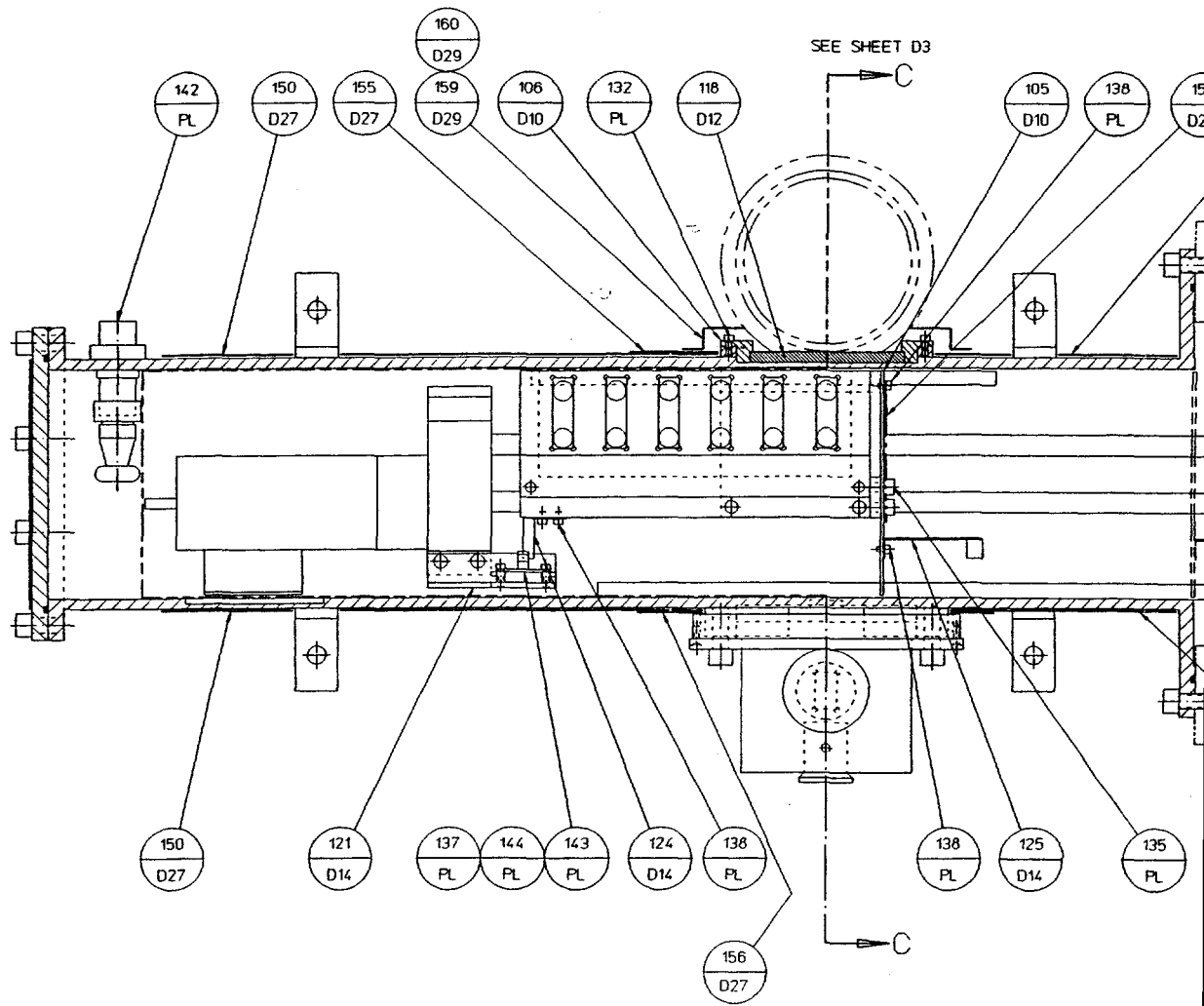


SECTION A-A
TAKEN FROM SHEET D2

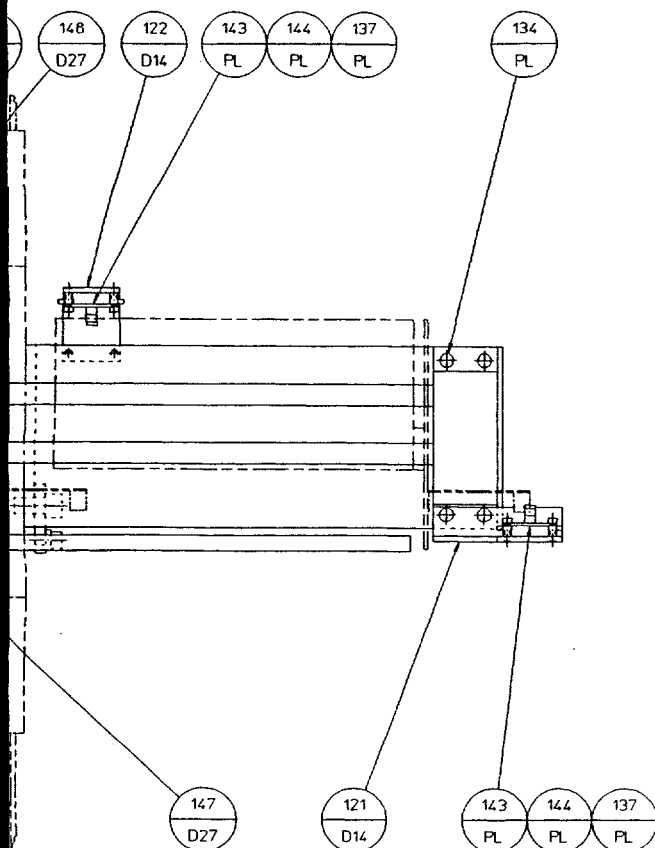
NOTE:

① SEE SHEET D4 FOR CONTINUATION OF SUB-ASSY 100 AND PARTS LIST.

A	LP	ADDED DETAILS 146,147,148,149,150 151,152,153,154,155,156,157	7-9-93	WALTON	LP	LP
	LL	ORIGINAL ISSUE				
REVISION LETTER	CLASS REVIEW	REVISIONS	DATE	CHANGED BY	CHECKED BY	APPROVED BY
Los Alamos LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS, NEW MEXICO 87545		CLASSIFICATION OF DRAWING UNCLASSIFIED PART UNCLASSIFIED TITLE BLOCK UNCLASSIFIED TITLE JAERI HYBRID SYSTEM				
SUB-ASSEMBLY 100		TOLERANCE - UNLESS OTHERWISE NOTED X = ± 0.001 O X = ± 0.0005 ANGLES ± 0.001 FINISH ± 0.001				
ORIGINATED	SIGNATURE	DATE	GROUP	SCALE		
DRAWN	G. WALTON	10-31-91	N-1	TOTAL SHEETS		
CHECKED	L. POLLAT	12-13-91	N-1	DRAWING NO.		
PROJ. ENGR.	S.T. HSUE	12-13-91	N-1	SHEET NO.		
APPROVED	S.T. HSUE	12-13-91	N-1	155787 D 3		
RELEASED	L. POLLAT	12-13-91	N-1	1/2		



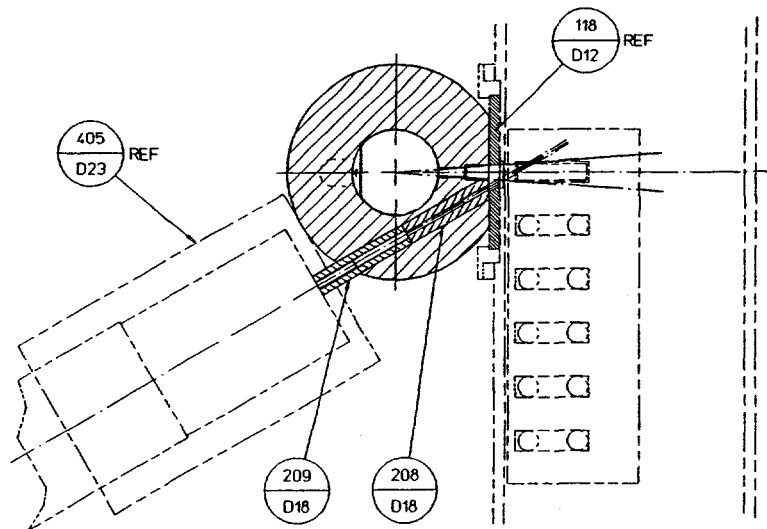
SECTION
TAKEN FROM



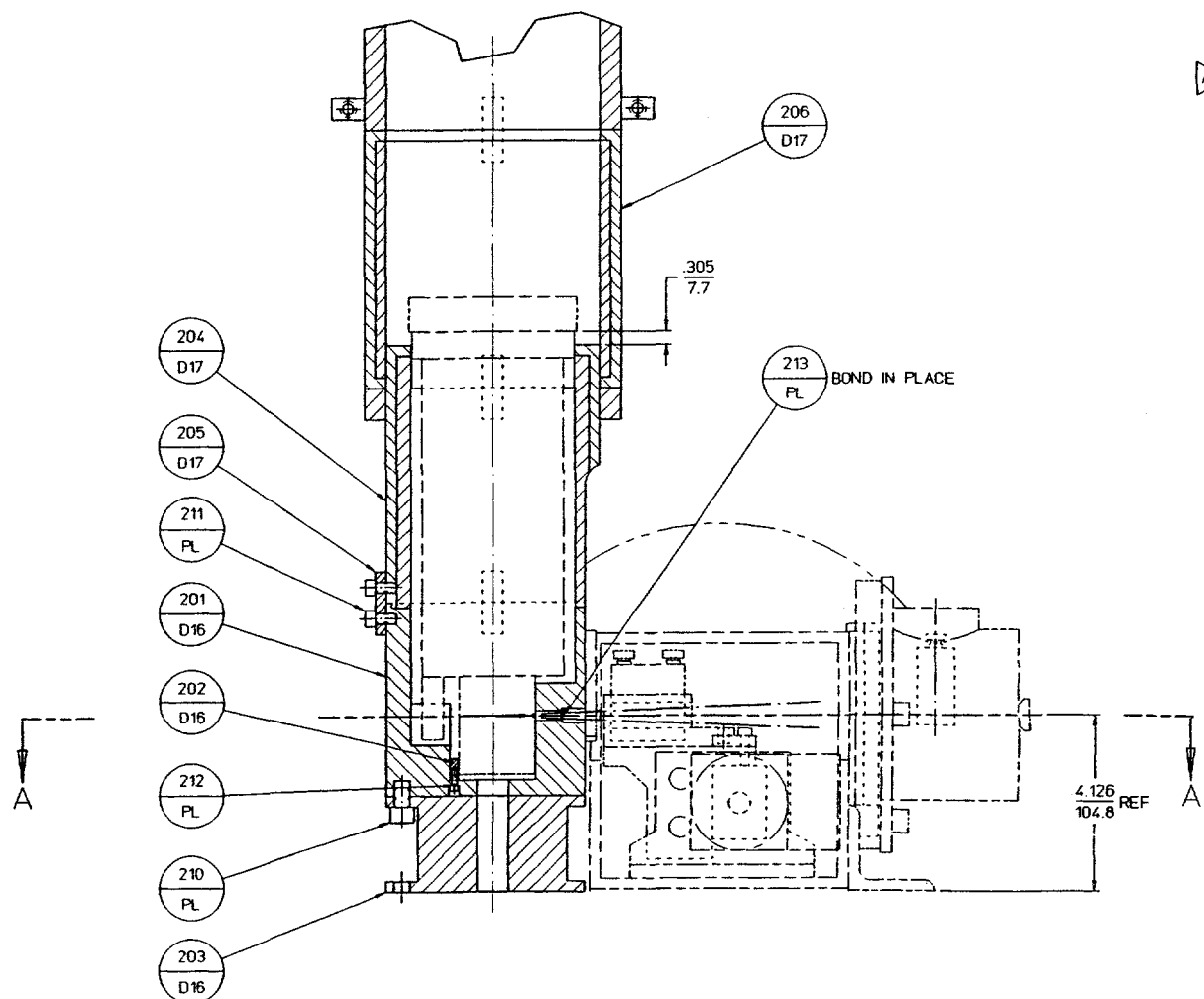
PART NUMBER		PARTS LIST	
PREFIX NUMBER	ITEM NUMBER	NUMBER	DESCRIPTION
	120	1	POWERSLIDE SUPPORT BRACKET
	121	2	SWITCHBOARD MOUNTING BRACKET
	122	1	SWITCHBOARD MOUNTING BRACKET
	123	1	TRIP FLAG SUPPORT BRACKET
	124	1	SWITCHBOARD TRIP FLAG
	125	1	SWITCHBOARD TRIP FLAG
	126	1	FOIL RETAINER
	127	1	FOIL RETAINER PLUG
	128	2	BRACKET STANDOFF
	129	2	BRACKET STANDOFF
	130	19	SCR. SOC HD CAP. SST. M10 X 1.5 X 25MM LONG
	131	36	SCR. SOC HD CAP. SST. M6 X 1 X 20MM LONG
	132	6	SCR. SOC HD CAP. SST. M5 X 8 X 10MM LONG
	133	2	SCR. SOC HD CAP. SST. M5 X 8 X 40MM LONG
	134	2	SCR. SOC HD CAP. SST. M5 X 8 X 20MM LONG
	135	2	SCR. SOC HD CAP. SST. M6 X 1 X 5MM LONG
	136	2	SCR. SOC HD CAP. SST. M4 X 7 X 10MM LONG
	137	14	SCR. SOC HD CAP. SST. M3 X 5 X 10MM LONG
	138	8	SCR. SOC HD CAP. SST. M3 X 5 X 5MM LONG
	139	4	SCR. SOC HD CAP. SST. 10-32 X .50 LONG
	140	1	O-RING, NEOPRENE, 5.859 ID X 1.39 WALL, PARKER NO 2-257
	141	1	O-RING, NEOPRENE, 9.234 ID X 1.39 WALL, PARKER NO 2-271
	142	3	CONNECTOR
	143	3	SWITCHBOARD
	144	12	STANDOFF
	145	1	COMBINATION VIAL TRAY
	146	1	TRIP FLAG
	147	1	SHIELDING
	148	1	
	149	2	
	150	1	
	151	1	
	152	1	SHIELDING
	153	1	TUNGSTEN RING
	154	1	SHIELDING
	155	1	SHIELDING
	156	2	SHIELDING
	157	2	SHIELDING
	158	2	SHIELDING
	159	1	SHIELD (RIGHT HAND)
	160	1	SHIELD (LEFT HAND)
	161	1	SHROUD SUPPORT BRACKET
	162	1	SHROUD HINGE BRACKET
	163	1	SHROUD HINGE
	164	1	LEXAN SHROUD
	165	1	PIVOT STOP
	166	1	SHROUD HANDLE
	167	17	SCR. SOC HD CAP. SST. M6 X 1 X 15MM LONG
	168	1	SCR. SOC SET. STL. M5 X 8 X 10 MM LONG

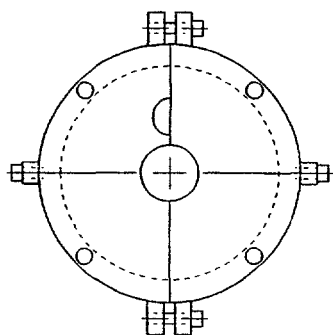
N B-B
SHEET D3

ORIGINAL ISSUE				DATE				CHANGED BY				CHECKED BY				APPROVED BY			
REVISION LETTER	CLASS REVIEW	REVISIONS																	
CLASSIFICATION OF		DRAWING UNCLASSIFIED																	
PART UNCLASSIFIED		TITLE BLOCK UNCLASSIFIED																	
TITLE		JAERI HYBRID SYSTEM																	
SUB-ASSEMBLY 100																			
ORIGINATED	G WALTON	DATE	10-31-91	GROUP	N-1														
DRAWN	G WALTON	DATE	10-31-91	GROUP	N-1														
CHECKED	L POLLAT	DATE	12-13-91	GROUP	N-1														
PROJ ENGR	S THSUE	DATE	12-13-91	GROUP	N-1														
APPROVED	S THSUE	DATE	12-13-91	GROUP	N-1														
RELEASED	L POLLAT	DATE	12-13-91	GROUP	N-1														
TOLERANCE-RULES OTHERWISE NOTED																			
X=1						O.XX=1						ANGULAR=1							
O.X=1						O.XXX=1						FINISH=							
SCALE		TOTAL SHEETS		DRAWING NO		SHEET NO.													
1/2		1		68Y-155787		D 4													



SECTION A-A





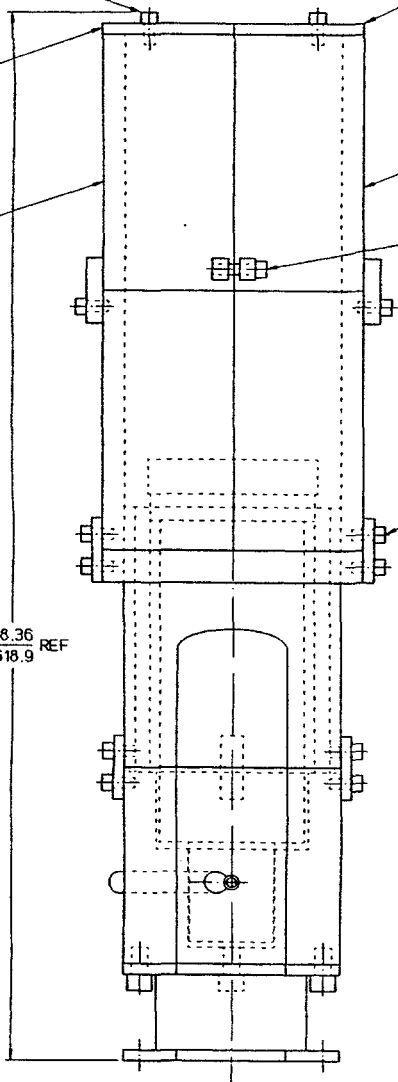
217
D18
A

214
D25
A

216
PL

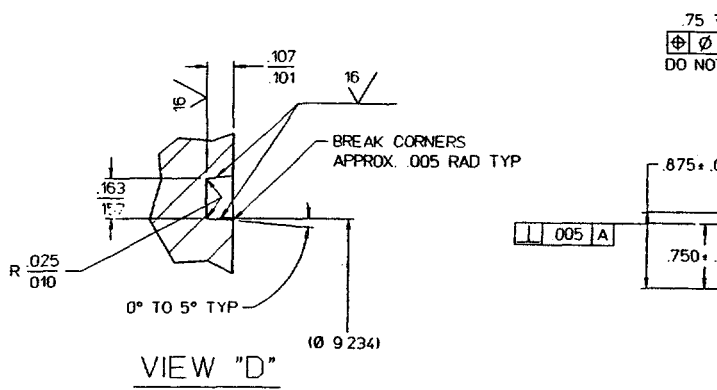
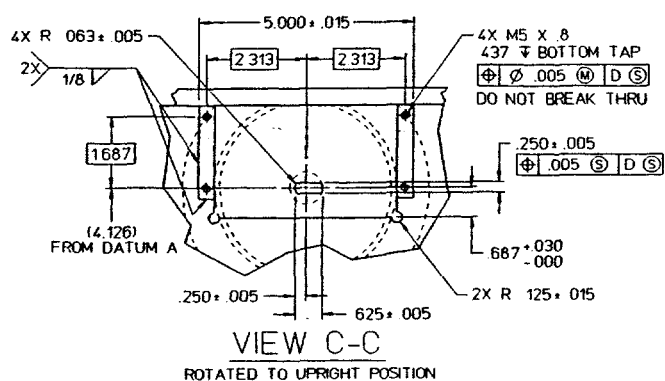
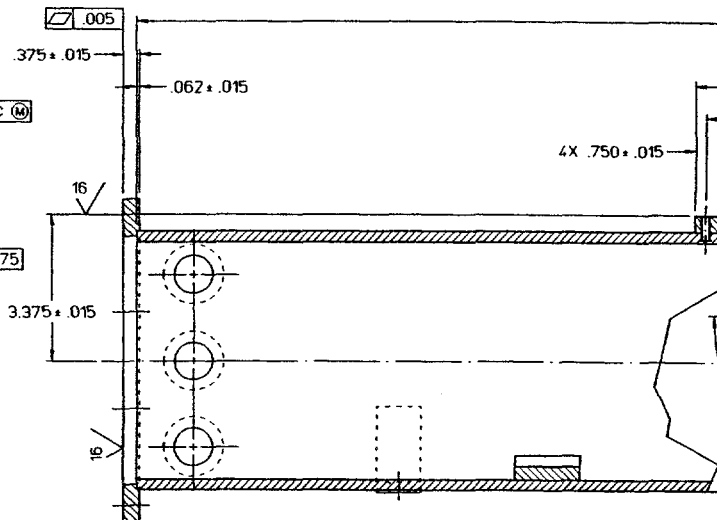
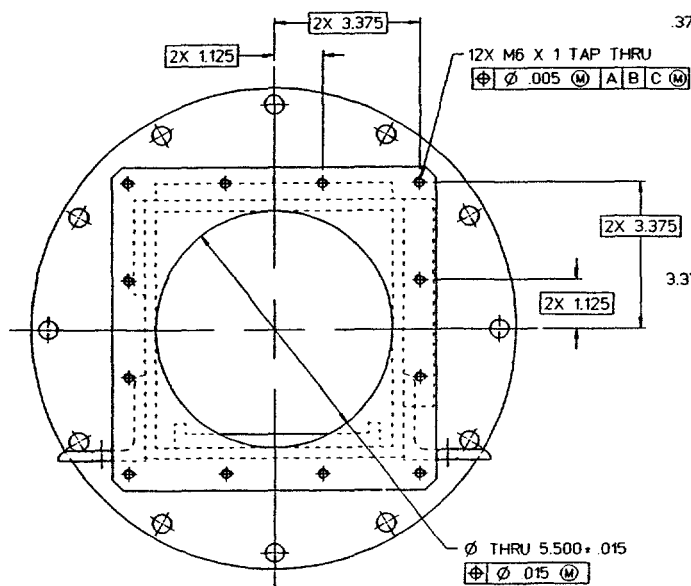
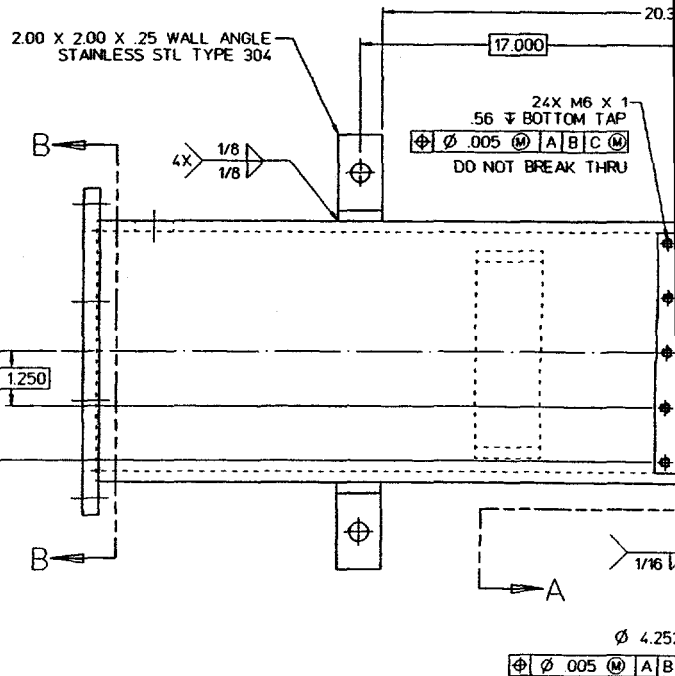
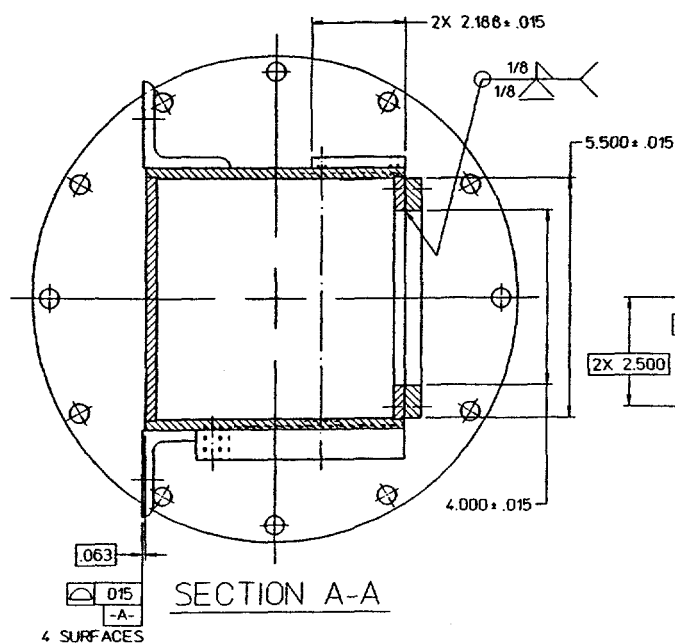
211
PL

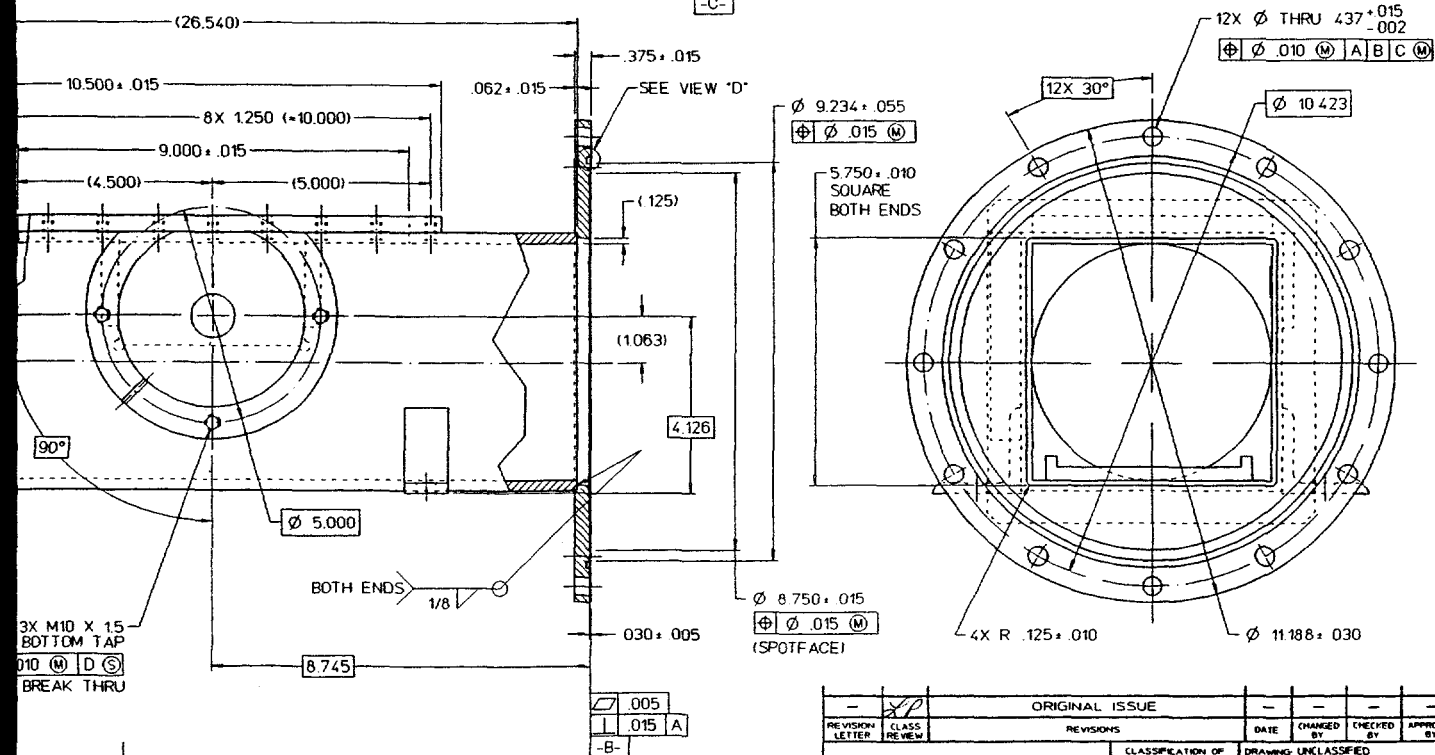
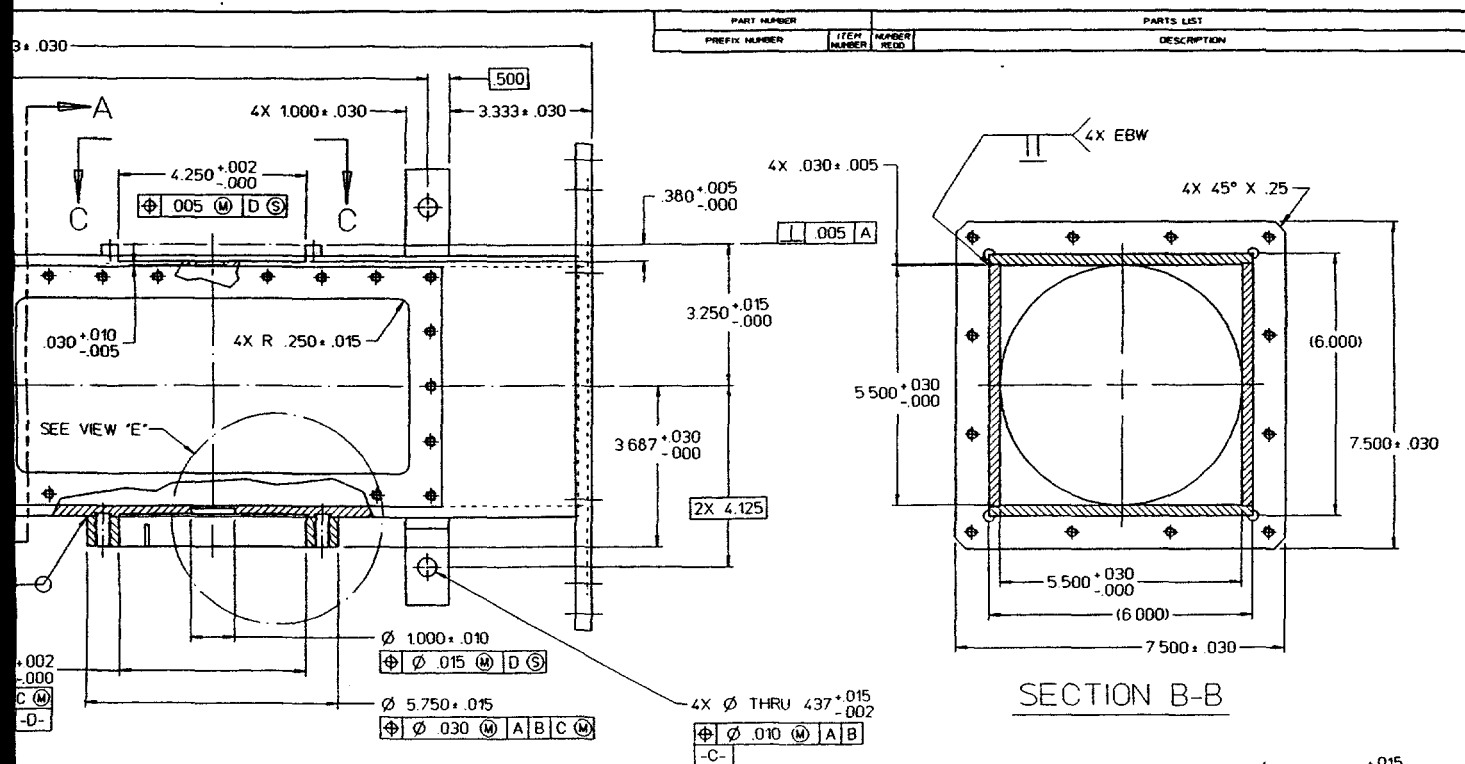
18.36
618.9 REF



PART NUMBER		PARTS LIST	
PREFX NUMBER	ITEM NUMBER	NUMBER REQD	DESCRIPTION
	201	1	TUNGSTEN HOUSING
	202	1	WEDGE
	203	1	BASE SUPPORT
	204	1	X-RAY GENERATOR SHIELD (BOTTOM)
	205	1	TIE BARS
	206	2	X-RAY GENERATOR SHIELD (MIDDLE)
	207	2	CABLE AND HOSE RETAINER
	208	1	COLLIMATOR (FRONT)
	209	1	COLLIMATOR (REAR)
	210	3	SCR. SOC HD CAP. STL. M10 X 15 X 15MM LONG
	211	14	SCR. SOC HD CAP. STL. M6 X 1 X 10MM LONG
	212	1	SCR. SOC HD CAP. STL. M3 X .5 X 10MM LONG
	213	1	CADMIUM SHT. .030 THK X .35 DIA
	214	1	X-RAY GENERATOR SHIELD (TOP)
	215	1	X-RAY GENERATOR SHIELD (TOP)
	216	2	SCR. SOC HD CAP. STL. M6 X 1 X 20MM LONG
	217	1	CABLE AND HOSE RETAINER

A		SP		ADDED DETAILS 214, 215 AND 217		7-9-92		WALTON		SP		SP	
-		-		ORIGINAL ISSUE		-		-		-		-	
REVISION LETTER	CLASS REVIEW	REVISIONS				DATE	CHANGED BY	CHECKED BY	APPROVED BY				
Los Alamos LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS, NEW MEXICO 87545						CLASSIFICATION OF DRAWING UNCLASSIFIED							
						PART UNCLASSIFIED TITLE BLOCK UNCLASSIFIED							
SUB-ASSEMBLY 200						TITLE JAERI HYBRID SYSTEM							
SIGNATURE		DATE		GROUP		TOLERANCE-UNLESS OTHERWISE NOTED:							
ORIGINATED		G. WALTON		10-31-91		N-1		X=± O.XX=± ANGULAR=±					
DRAWN		G. WALTON		10-31-91		N-1		O.XX=± O.XXX=± FINISH=					
CHECKED		L. POLLAT		12-13-91		N-1		SCALE TOTAL SHEETS DRAWING NO. SHEET NO.					
PROJ. ENGR		S. HSUE		12-13-91		N-1		1/2		68Y-155787		D 5	
APPROVED		S. HSUE		12-13-91		N-1							
RELEASED		L. POLLAT		12-13-91		N-1							





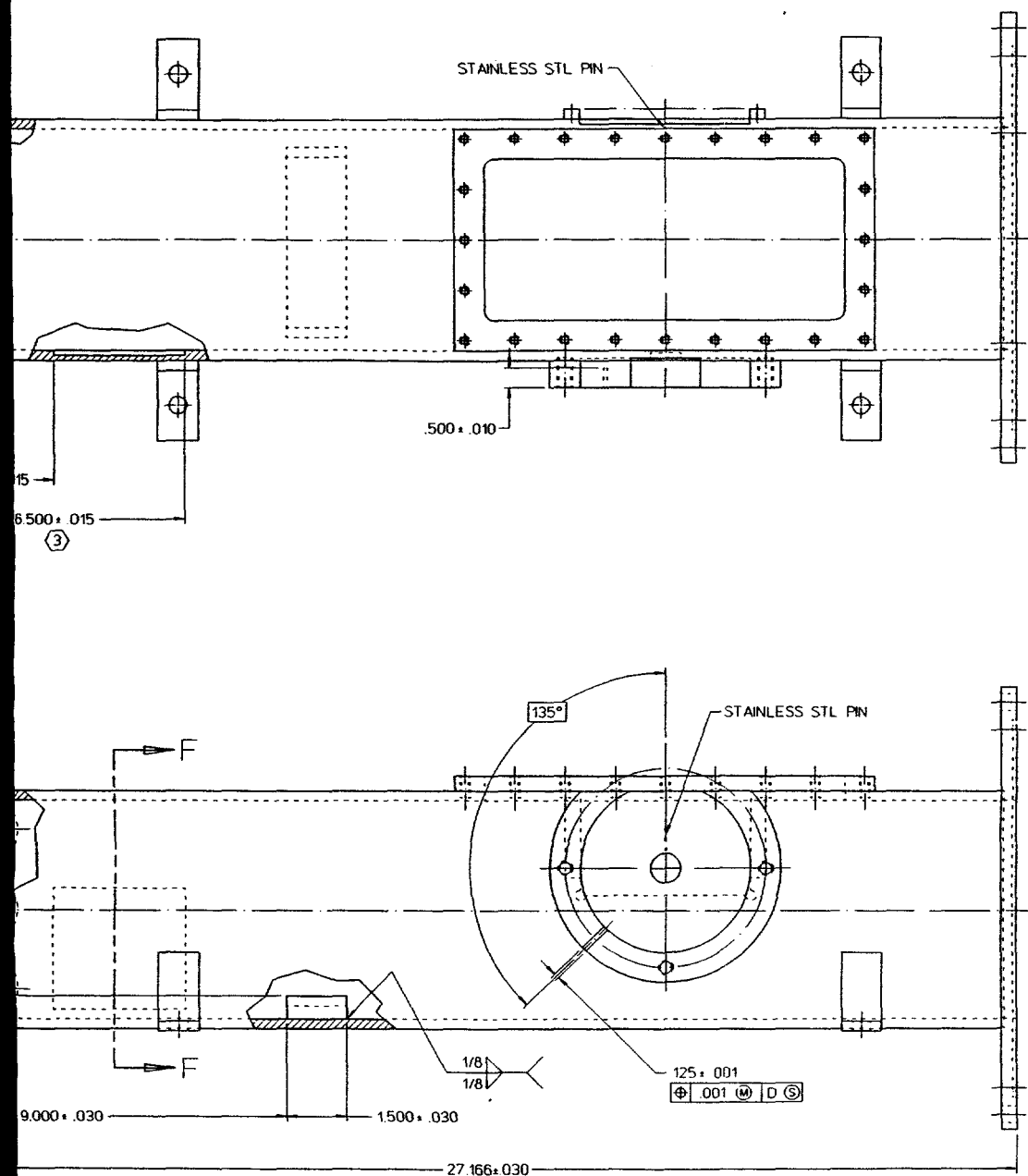
VIEW "E"

ORIGINAL ISSUE				REVISIONS				DATE				CHANGED BY				CHECKED BY				APPROVED BY											
REVISION LETTER				CLASS				DATE				CHANGED BY				CHECKED BY				APPROVED BY											
Los Alamos								CLASSIFICATION OF DRAWING UNCLASSIFIED								PART UNCLASSIFIED TITLE BLOCK UNCLASSIFIED															
LOS ALAMOS NATIONAL LABORATORY								TITLE								JAERI															
LOS ALAMOS NEW MEXICO 87545								HYBRID SYSTEM																							
PART 101 POWERSLIDE HOUSING								TOLERANCE-UNLESS OTHERWISE NOTED																							
MATL SST TYPE 304								X ± .005								O.XX ± .005								ANGULAR ± .005							
RECD ONE								O.X ± .005								O.XXX ± .005								FINISH ± .005							
ORIGINATED				SIGNATURE				DATE				GROUP				SCALE				TOTAL SHEETS				DRAWING NO				SHEET NO			
DRAWN				G. WALTON				5-22-91				N-1				1/2				68Y-155787				D 6							
CHECKED				L. POLLAT				12-13-91				N-1																			
PROJ. ENGR.				S.T. HSUE				12-16-91				N-1																			
APPROVED				S.T. HSUE				12-16-91				N-1																			
RELEASED				L. POLLAT				12-13-91				N-1																			



- SECTION F-F

PART NUMBER			PARTS LIST	
PREFIX NUMBER	ITEM NUMBER	NUMBER REQD	DESCRIPTION	



PERFORMED

TUBING IS

THE END FLANGE

ON ARE BASIC.

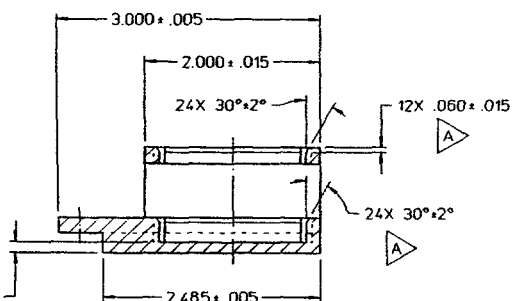
0.6

GENERAL NOTES (UNLESS OTHERWISE NOTED)

1. ALL DIMENSIONS IN INCHES
2. BREAK ALL SHARP EDGES
3. CSK 8° ALL TAPPED HOLES TO MAJOR DIAMETER
4. CSK 8° x .030 DEEP ALL DRILLED HOLES
5. DIMENSIONING & POSITIONAL TOLERANCING PER AMS Y29.130-1987
6. WELDING SYMBOLS PER ANSIS A2.4-76
7. SURFACE TEXTURE PER AMS B46.1-1978

A	SP	ADDED SST STL LOCATOR PIN	2-6-93	WALTON	SP	SP
REVISION LETTER	DATE	REVISION	DATE	CHANGED BY	CHECKED BY	APPROVED BY
—	—	ORIGINAL ISSUE	—	—	—	—
CLASSIFICATION OF DRAWING: UNCLASSIFIED			PART: UNCLASSIFIED TITLE BLOCK: UNCLASSIFIED			
Los Alamos LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS NEW MEXICO 87545			TITLE JAERI HYBRID SYSTEM			
PART 101 POWERSLIDE HOUSING MATL SST TYPE 304 RECD ONE			TOLERANCE-UNLESS OTHERWISE NOTED X=.1 — 0.XX=.1 — ANGULAR=.1 — 0.XX=.1 — 0.XXX=.1 — FINISH—			
ORIGINATED	G.WALTON	7-10-91	N-1	SCALE	TOTAL SHEETS	DRAWING NO.
DRAWN	G.WALTON	7-10-91	N-1	1/2	7	68Y-155787
CHECKED	L.POLLAT	12-13-91	N-1			
PROD. ENGR.	S.THSUE	12-13-91	N-1			
APPROVED	S.THSUE	12-13-91	N-1			
RELEASED	L.POLLAT	12-13-91	N-1			

PART NUMBER			PARTS LIST	
PREFIX NUMBER	ITEM NUMBER	NUMBER REQD	DESCRIPTION	



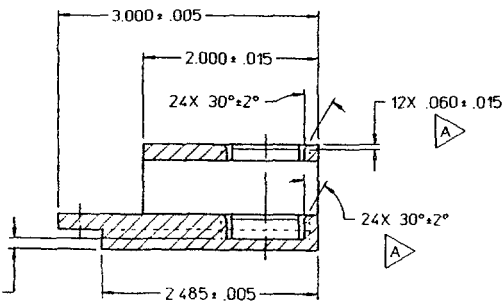
SECTION A-A

L TRAY
(WHITE)

- GENERAL NOTES: UNLESS OTHERWISE NOTED
1. ALL DIMENSIONS IN INCHES
 2. BREAK ALL SHARP EDGES
 3. CSK .87" ALL TAPPED HOLES TO MAJOR DIAMETER
 4. CSK .87" ± .000 DEEP ALL DRILLED HOLES
 5. DIMENSIONING & POSITIONAL TOLERANCING PER ASME Y14.5M-1992
 6. WELDING SYMBOLS PER AWS/AAS Z40.1-1976
 7. SURFACE TEXTURE PER AMS 846.1-1976

A	LP	ADDED CHAMFERS	8-4-93	WALTON	LP	LP
ORIGINAL ISSUE						
REVISION LETTER	CLASS REVIEW	REVISIONS	DATE	CHANGED BY	CHECKED BY	APPROVED BY
Los Alamos			CLASSIFICATION OF DRAWING UNCLASSIFIED			
LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS, NEW MEXICO 87545			PART UNCLASSIFIED TITLE BLOCK UNCLASSIFIED			
PART 102			TITLE JAERI HYBRID SYSTEM			
ORIGINATED	G. WALTON	6-10-91	N-1	TOLERANCE-UNLESS OTHERWISE NOTED		
DRAWN	G. WALTON	6-10-91	N-1	X=.1 .0XX=.1 ANGULAR=.1		
CHECKED	L. POLLAT	12-13-91	N-1	O X=.1 .0XXX=.1 FINISH=		
PROD. ENGR.	S. THSUE	12-13-91	N-1	SCALE TOTAL SHEETS DRAWING NO. SHEET NO.		
APPROVED	S. THSUE	12-13-91	N-1	NOTED 68Y-155787 D 8		
RELEASED	L. POLLAT	12-13-91	N-1			

PART NUMBER			PARTS LIST	
PREFIX NUMBER	ITEM NUMBER	NUMBER REQD	DESCRIPTION	

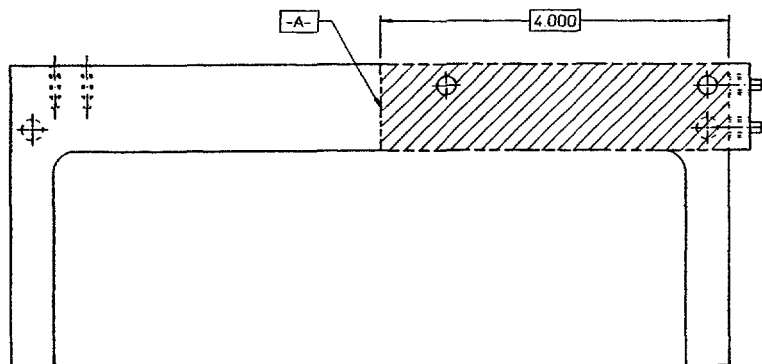


SECTION A-A

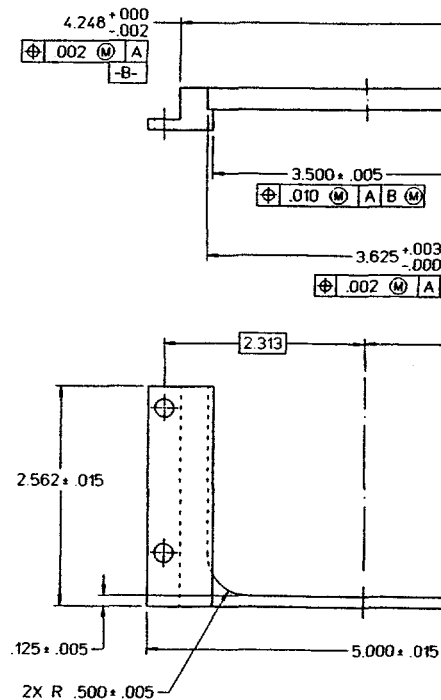
TRAY

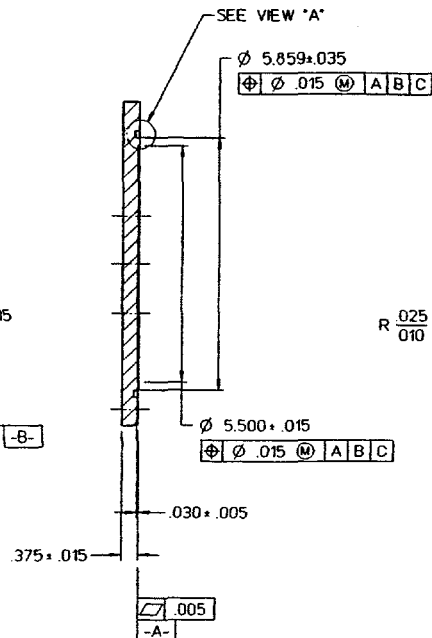
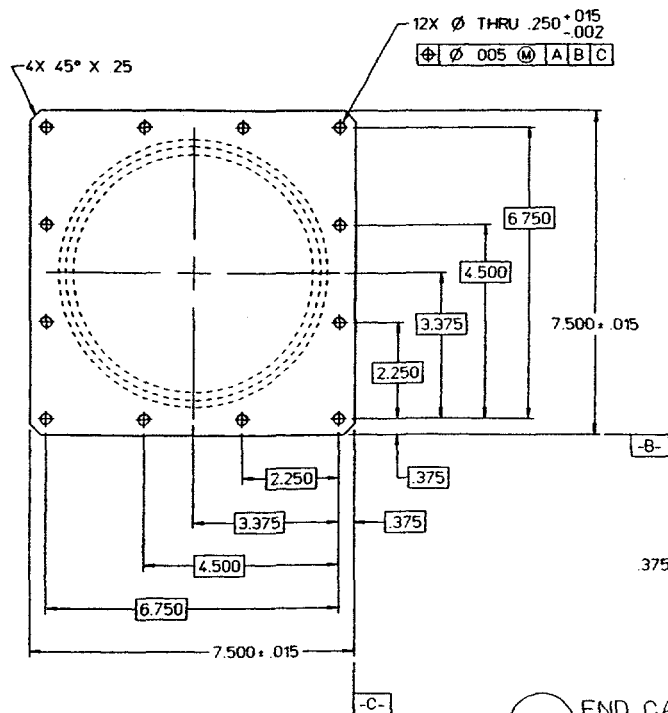
(WHITE)

A	XP	ADDED CHAMFERS	8-4-93	WALTON	XP	XP
ORIGINAL ISSUE						
REVISION LETTER	CLASS REVIEW	REVISIONS	DATE	CHANGED BY	CHECKED BY	APPROVED BY
Los Alamos LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS, NEW MEXICO 87545			CLASSIFICATION OF: DRAWING UNCLASSIFIED PART UNCLASSIFIED TITLE BLOCK UNCLASSIFIED			
PART 103			TITLE JAERI HYBRID SYSTEM			
GENERAL NOTES (UNLESS OTHERWISE NOTED) 1. ALL DIMENSIONS IN INCHES 2. BREAK ALL SHARP EDGES 3. CSK .07" ALL TAPPED HOLES TO MAJOR DIAMETER 4. CSK .07" x .030 DEEP ALL DRILLED HOLES 5. DIMENSIONING & POSITIONAL TOLERANCING PER ANSI Y14.5M-1987 6. WELDING SYMBOLS PER ANSI A5.7-76 7. SURFACE TEXTURE PER ANSI B46.1-1978			TOLERANCE-UNLESS OTHERWISE NOTED: X=.1 .0XX=.1 ANGULAR=.1 0.X=.2 0.XXX=.1 FINISH=			
SCALE TOTAL SHEETS NOTED 68Y-155787			DRAWING NO. 68Y-155787 SHEET SIZE NO. 9			

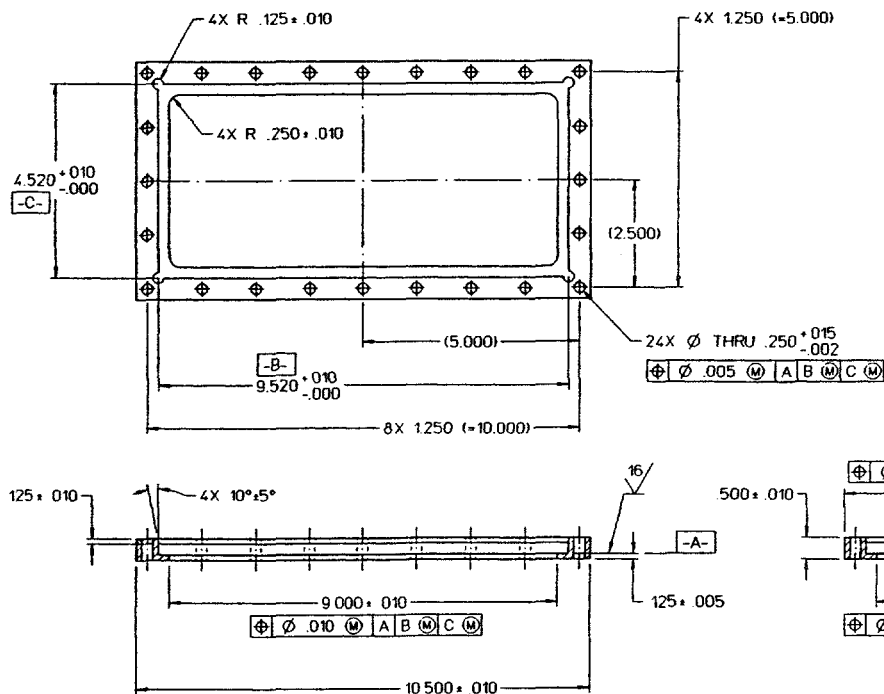


VIAL TRAY SUPPORT
MATL: STAINLESS STL TYPE 304
SCALE 1/1
READ ONE

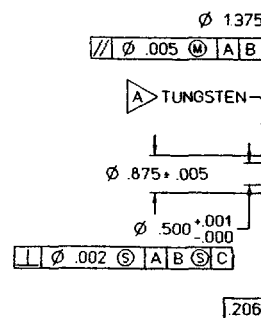


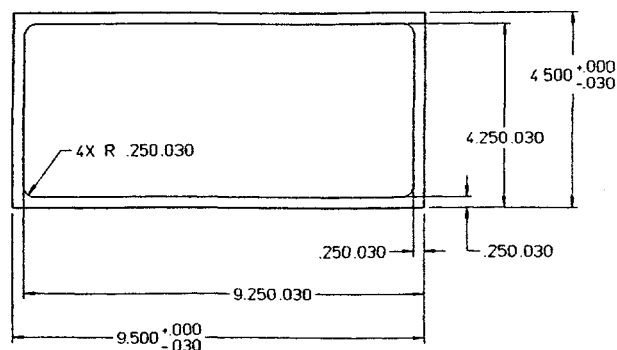


107 END CAP
MATL. STAINLESS STL TYPE 304
RECD. ONE
SCALE: 1/2

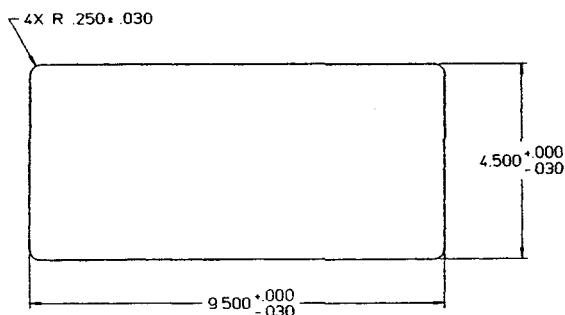


110 VIEWPORT RETAINER
MATL. STAINLESS STL TYPE 304
RECD. ONE
SCALE: 1/2



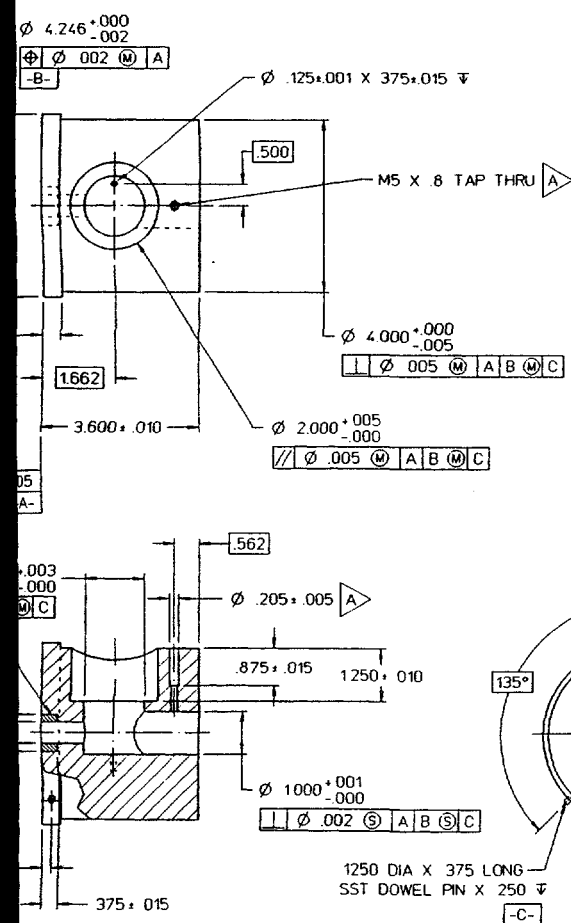


108 VIEWPORT GASKET
MATL RUBBER, NEOPRENE, 1/8 STOCK
REOD. 2
SCALE 1/2



109 VIEWPORT LEAD GLASS
MATL. LEAD GLASS, 1/4 THICK
REQD. ONE
SCALE: 1/2

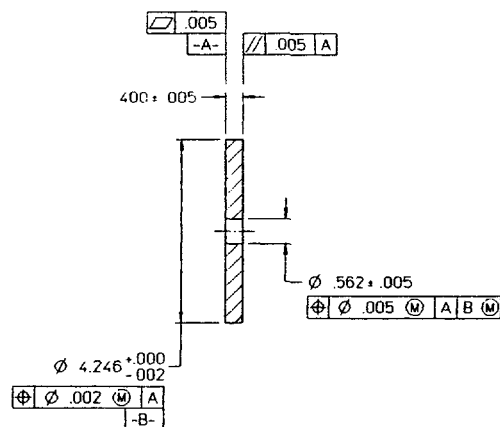
NOTE. LEAD GLASS CAN BE PURCHASED FROM TA-55 STOCK
AND CUT TO SIZE BY NETUSCHIL GLASS COMPANY
LOCATED IN LOS ALAMOS



111 COLLIMATOR HOUSING
MATL STAINLESS STL TYPE 304
REOD ONE
SCALE 1/2

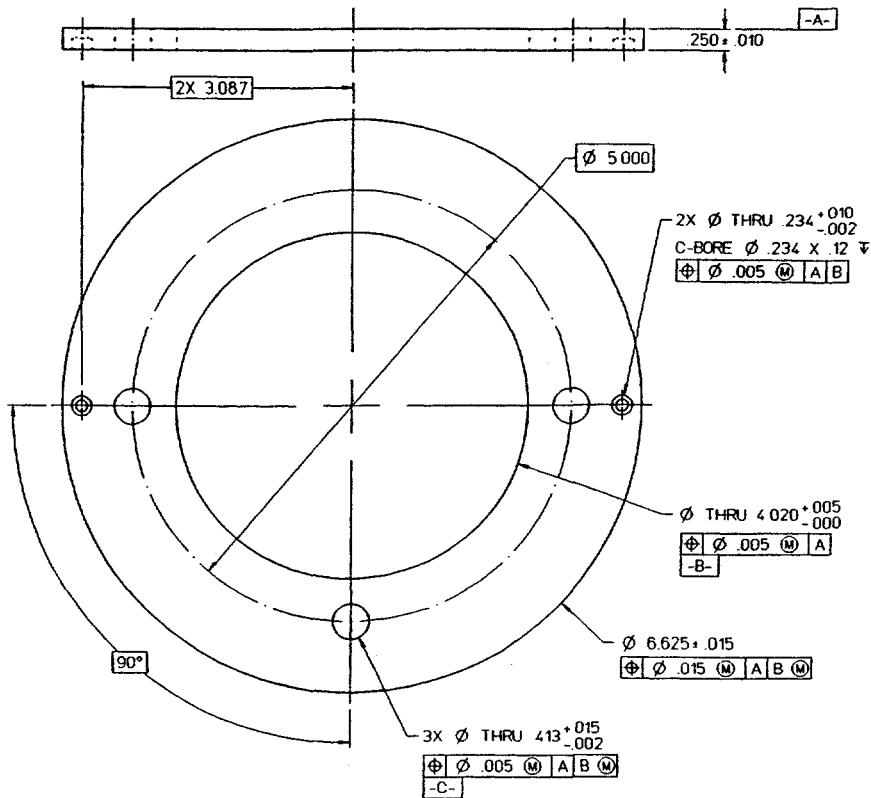
GENERAL NOTES: (UNLESS OTHERWISE NOTED)

- 1 ALL DIMENSIONING IN INCHES
- 2 BREAK ALL SHARP EDGES
- 3 CSK .02" ALL TAPPED HOLES TO MAJOR DIAMETER
- 4 CSK .07" x .030 DEEP ALL DRILLED HOLES
- 5 DIMENSIONING & POSITIONAL TOLERANCING PER ANSI Y14.5M-1987
- 6 WELDING SYMBOLS PER ANS/AWS A7.4-76
- 7 SURFACE TEXTURE PER ANSI B46.1-1978

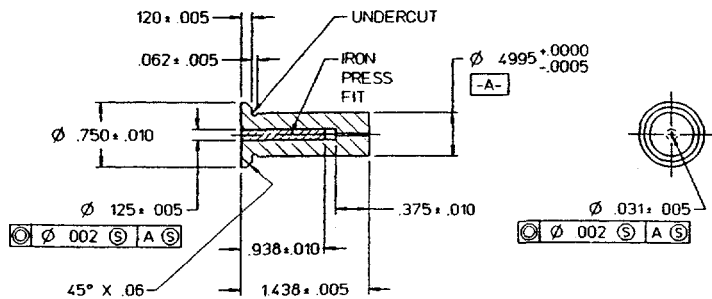


112 SHIELDING
MATL MACHINABLE TUNGSTEN
READ ONE
SCALE: 1/2

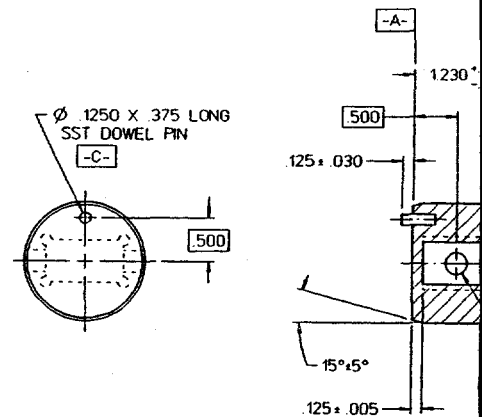
A	LP	ADDED TUNGSTEN INSERT ADDED .205 C-BORE & M5 TAP		7-21-93	WALTON	LP	LP		
—	LP	ORIGINAL ISSUE		—	—	—	—		
REVISION LETTER	CLASS REVIEW	REVISIONS		DATE	CHANGED BY	CHECKED BY	APPROVED BY		
Los Alamos LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS NEW MEXICO 87545				CLASSIFICATION OF				DRAWING UNCLASSIFIED	
				PART UNCLASSIFIED				TITLE BLOCK UNCLASSIFIED	
				TITLE				JAERI HYBRID SYSTEM	
				PARTS				107,108,109,110,111,112	
SIGNATURE		DATE		GROUP					
ORIGINATED		G.WALTON		7-31-91		N-1			
DRAWN		G.WALTON		7-31-91		N-1			
CHECKED		L.POLLAT		12-13-91		N-1			
PROJ ENGR		S.T.HSUE		12-13-91		N-1			
APPROVED		S.T.HSUE		12-13-91		N-1			
RELEASED		L.POLLAT		12-13-91		N-1			
TOLERANCE UNLESS OTHERWISE NOTED:									
X = _____ 0.XX = _____ ANGULAR = _____ O X = _____ 0.XXX = _____ FINISH = _____									
SCALE		TOTAL SHEETS		DRAWING NO		SHEET NO			
NOTED				68Y-155787		SIZE 11 ® 11			



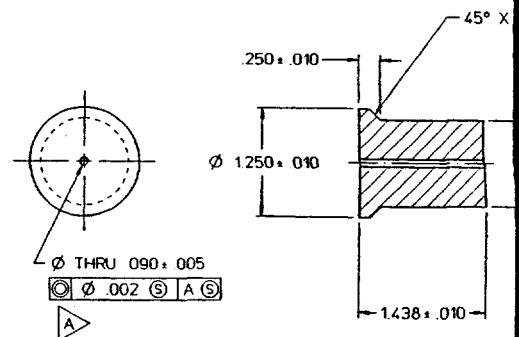
113 COLLIMATOR HOUSING SUPPORT CLAMP
MATL: MACHINABLE TUNGSTEN
REOD: ONE
SCALE: 1/1



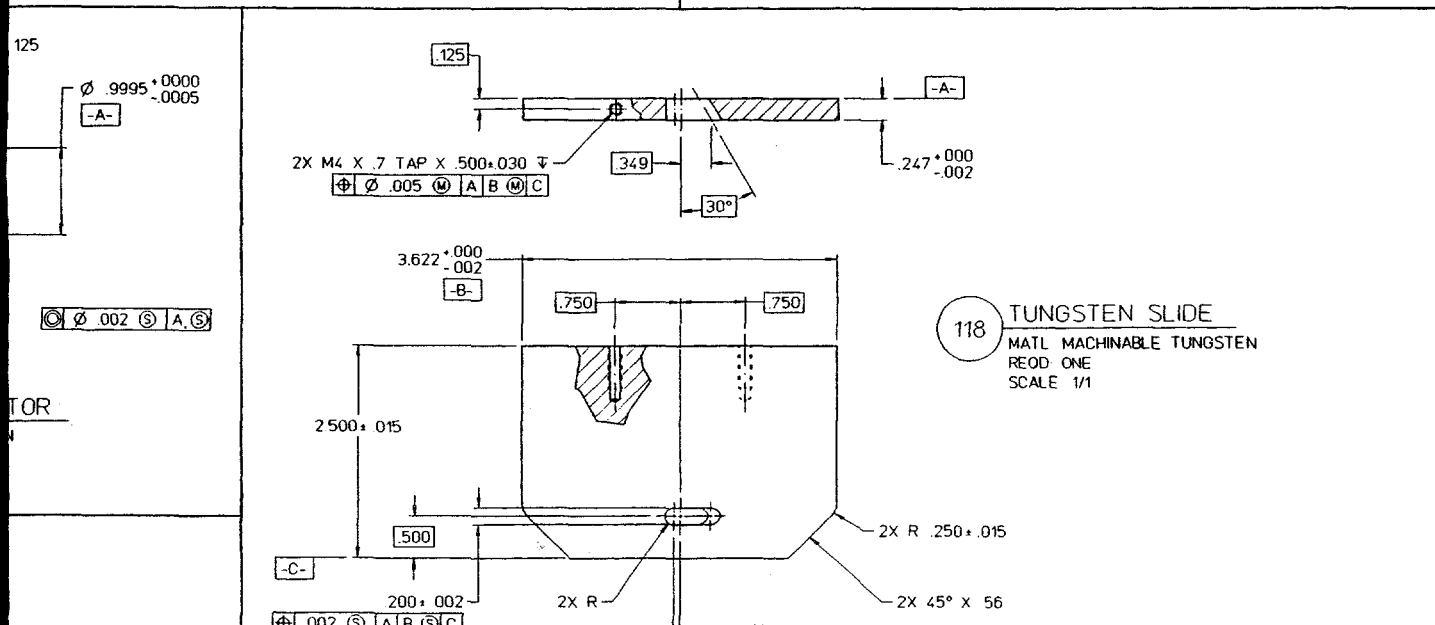
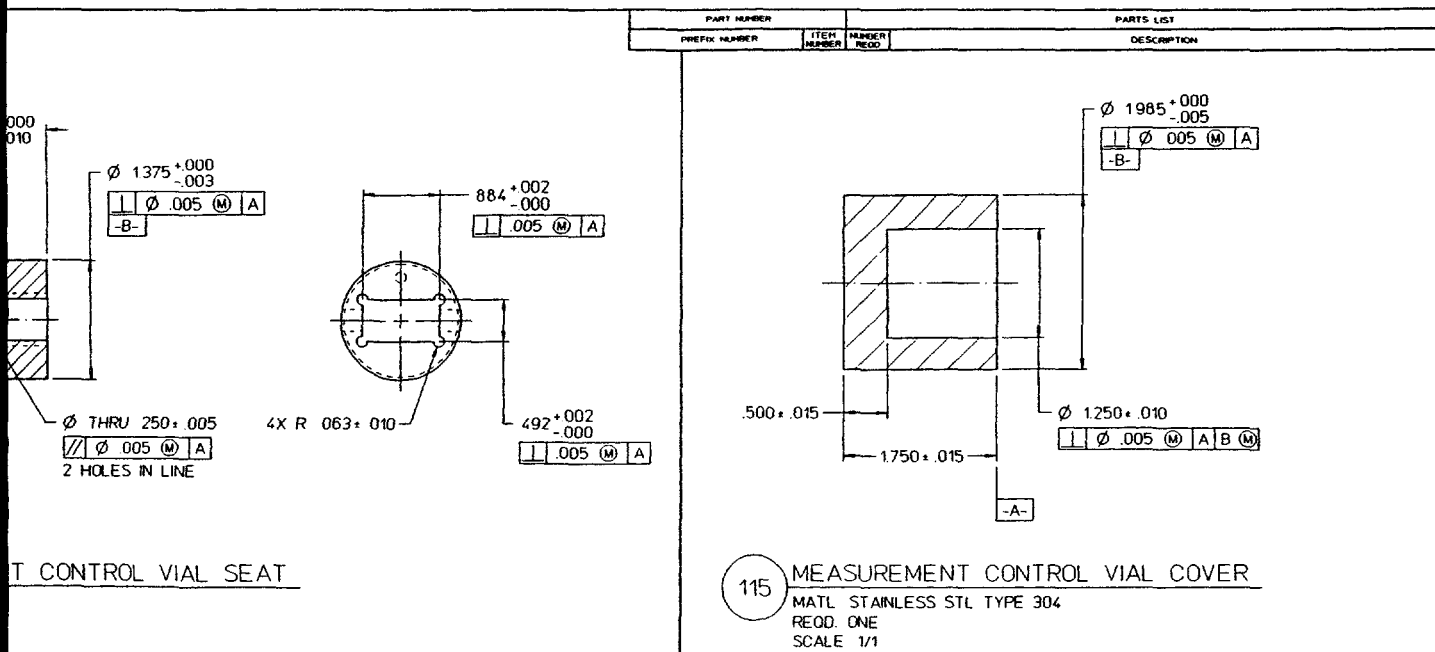
116 TUNGSTEN/IRON COLLIMATOR
MATL: MACHINABLE TUNGSTEN AND IRON
REOD: ONE
SCALE: 1/1



114 MEASUREMENT
MATL: DELFIN
REOD: ONE
SCALE: 1/1



117 TUNGSTEN COLLIMATOR
MATL: MACHINABLE TUNGSTEN
REOD: ONE
SCALE: 1/1

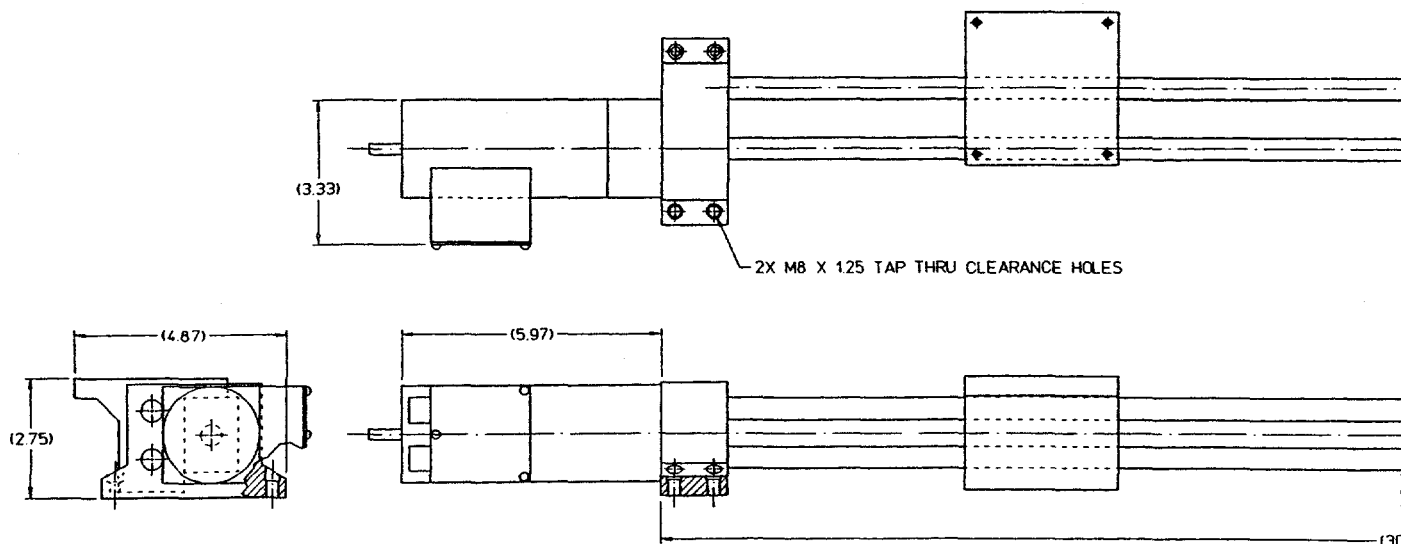


A	LP	REMOVED 125 Ø C-BORE IN PART 117 HOLE DIA WAS .030 IN PART 117		11-20-92	G.WALTON	LP	LP
		PART 113 MATERIAL CHANGED FROM .50 THK ALUMINUM TO 25 THK TUNGSTEN					
-	LP	ORIGINAL ISSUE		-	-	-	-
REVISION LETTER	CLASS REVIEW	REVISIONS		DATE	CHANGED BY	CHECKED BY	APPROVED BY
Los Alamos LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS NEW MEXICO 87545				CLASSIFICATION OF DRAWING: UNCLASSIFIED PART: UNCLASSIFIED TITLE BLOCK: UNCLASSIFIED TITLE: JAERI HYBRID SYSTEM			
PARTS 113, 114, 115, 116, 117, 118							
ORIGINATED	G.WALTON	DATE	8-7-91	GROUP			
DRAWN	G.WALTON	DATE	8-7-91	N-1			
CHECKED	L.POLLAT	DATE	12-13-91	N-1			
PROJ. ENGR	S.T.HSUE	DATE	12-13-91	N-1			
APPROVED	S.T.HSUE	DATE	12-13-91	N-1			
RELEASED	L.POLLAT	DATE	12-13-91	N-1			

TOLERANCE-UNLESS OTHERWISE NOTED:
 X=.2 O.XX=.2 ANGULAR=.2
 O.X=.2 O.XXX=.2 FINISH=

SCALE: NOTED TOTAL SHEETS: 68Y-155787 DRAWING NO: D SIZE: 12

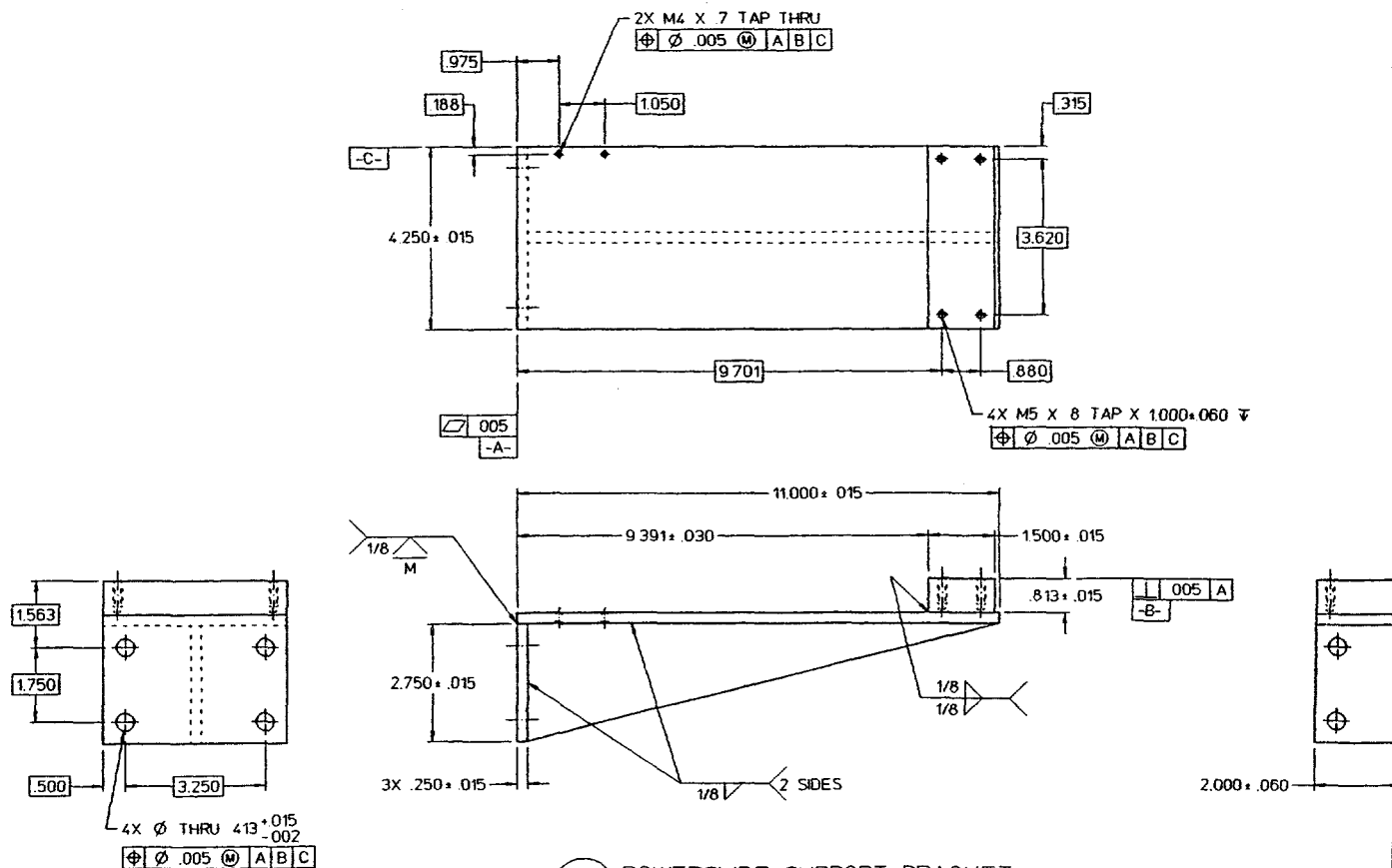
- GENERAL NOTES- UNLESS OTHERWISE NOTED:
1. ALL DIMENSIONS IN INCHES
 2. BREAK ALL SHARP EDGES
 3. CSK .02" ALL TAPPED HOLES TO MAJOR DIAMETER
 4. CSK .02" x .030 DEEP ALL DRILLED HOLES
 5. DIMENSIONS & POSITIONAL TOLERANCING PER ANSI Y14.5M-1982
 6. WELDING SYMBOLS PER ANSI A9.4-76
 7. SURFACE TEXTURE PER ANSI B46.1-1978



119

POWERSLIDE (MODIFICATION)

MATL. POWERSLIDE 2CC TWIN SHAFT WEB SYSTEM
PART NO 2CC-08-OVA-FA-L30, THOMSON IND.
RECD ONE
SCALE: 1/2

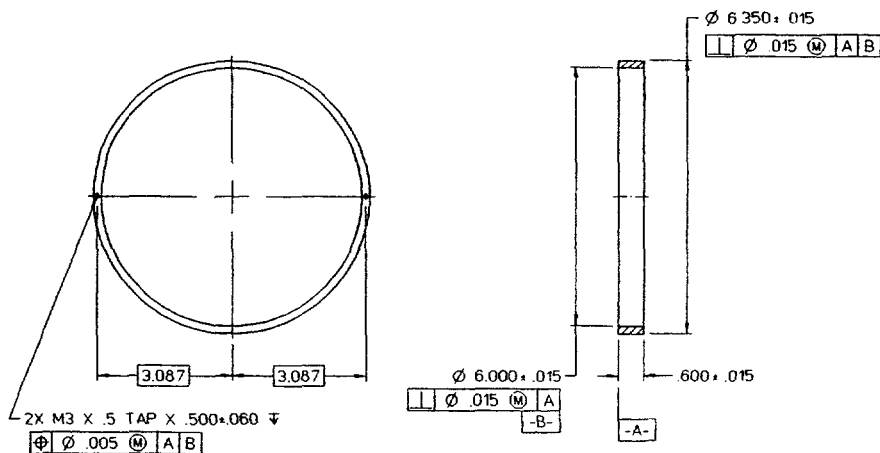


120

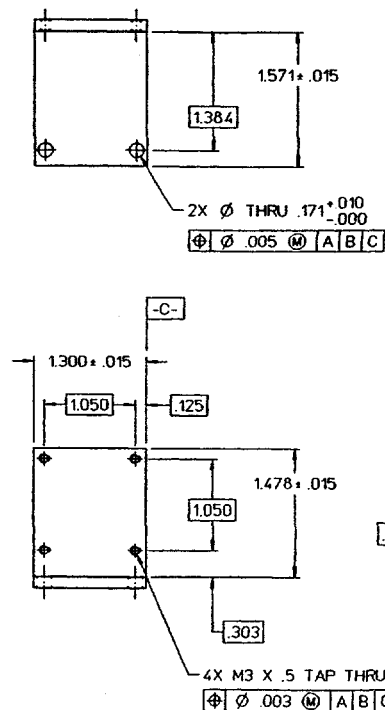
POWERSLIDE SUPPORT BRACKET

MATL. STAINLESS STL TYPE 304
RECD ONE
SCALE: 1/2

PART NUMBER		PARTS LIST	
PREFIX NUMBER	ITEM NUMBER	DESCRIPTION	

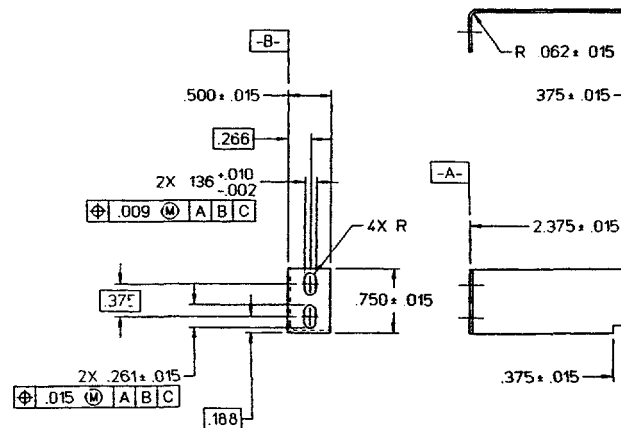


A	XP	ADDED PART 153		7-21-93	WALTON	XP	XP																					
—	XP	ORIGINAL ISSUE		—	—	—	—																					
REVISION LETTER	CLASS REVIEW	REVISIONS		DATE	CHANGED BY	CHECKED BY	APPROVED BY																					
Los Alamos LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS NEW MEXICO 87545				CLASSIFICATION OF																								
				PART UNCLASSIFIED																								
				DRAWING UNCLASSIFIED																								
				TITLE BLOCK UNCLASSIFIED																								
				TITLE																								
				JAERI HYBRID SYSTEM																								
								TOLERANCE-RUNLESS OTHERWISE NOTED																				
								X = 1/16" 0.XX = 1/32" ANGULAR ± .005" 0.X = 1/64" 0.XXX = 1/128" FINISH: _____																				
PARTS 119,120,153				SCALE																								
<table><tr><td>SIGNATURE</td><td>DATE</td><td>GROUP</td></tr><tr><td>ORIGINATED</td><td>G WALTON 8-16-91</td><td>N-1</td></tr><tr><td>DRAWN</td><td>G WALTON 8-16-91</td><td>N-1</td></tr><tr><td>CHECKED</td><td>L POLLAT 12-13-91</td><td>N-1</td></tr><tr><td>PROJ ENGR</td><td>S THSUE 12-13-91</td><td>N-1</td></tr><tr><td>APPROVED</td><td>S THSUE 12-13-91</td><td>N-1</td></tr><tr><td>RELEASED</td><td>L POLLAT 12-13-91</td><td>N-1</td></tr></table>				SIGNATURE	DATE	GROUP	ORIGINATED	G WALTON 8-16-91	N-1	DRAWN	G WALTON 8-16-91	N-1	CHECKED	L POLLAT 12-13-91	N-1	PROJ ENGR	S THSUE 12-13-91	N-1	APPROVED	S THSUE 12-13-91	N-1	RELEASED	L POLLAT 12-13-91	N-1	TOTAL SHEETS			
SIGNATURE	DATE	GROUP																										
ORIGINATED	G WALTON 8-16-91	N-1																										
DRAWN	G WALTON 8-16-91	N-1																										
CHECKED	L POLLAT 12-13-91	N-1																										
PROJ ENGR	S THSUE 12-13-91	N-1																										
APPROVED	S THSUE 12-13-91	N-1																										
RELEASED	L POLLAT 12-13-91	N-1																										
				DRAWING NO																								
				68Y-155787																								
				SHEET NO																								
				13																								



MATL: STAINLESS STL TYPE 304
REOD: 2
SCALE 1/1

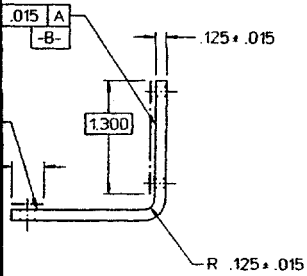
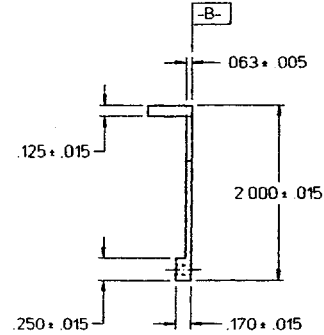
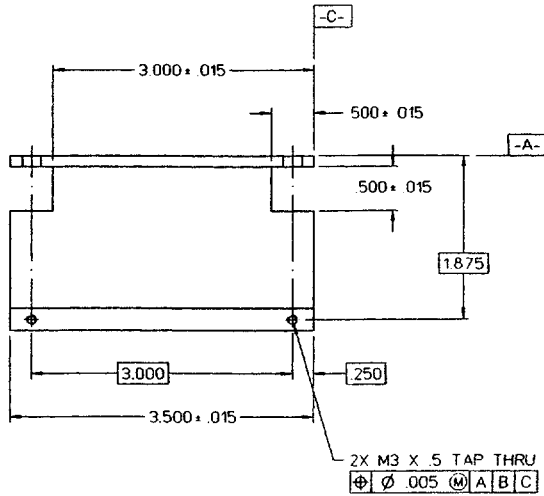
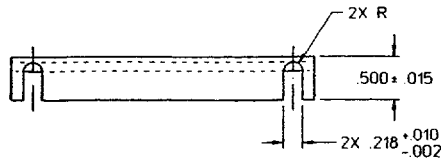
MATL: STAINLESS STL TYPE 304
 REOD: ONE
 SCALE: 1/1



MATL: STAINLESS STL SHT, TYPE 316, .031 STK
 REOD: ONE
 SCALE: 1/1

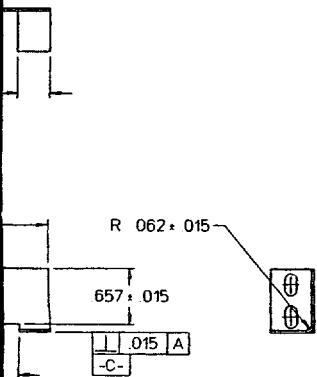
MATL. STAINLESS STL SHT.
REOD. ONE
SCALE 1/1

PART NUMBER			PARTS LIST	
PREF NUMBER	ITEM NUMBER	RECD	DESCRIPTION	



A 123 TRIP FLAG SUPPORT BRACKET
 MATL STAINLESS STL TYPE 304
 RECD: ONE
 SCALE: 1/1

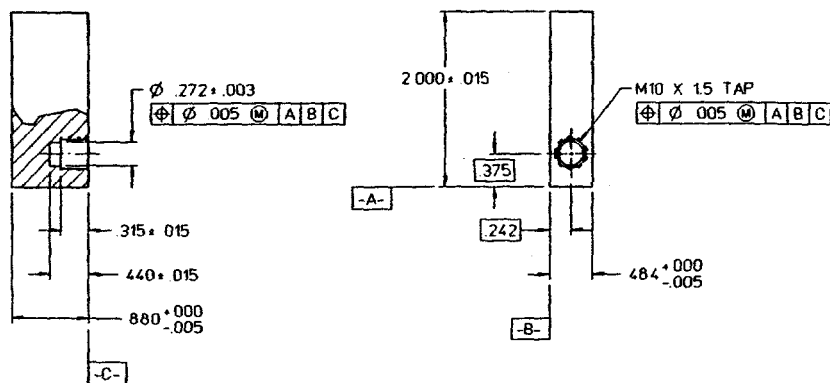
BRACKET (X-RAY)



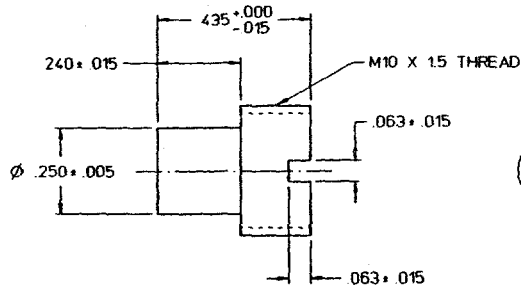
FLAG
 TYPE 316, .031 STK

A	LP	DETAIL 123 CHANGED FROM A TRIP FLAG TO A TRIP FLAG SUPPORT BRACKET	11-10-92	WALTON	LP	LP
—	LP	ORIGINAL ISSUE	—	—	—	—
REVISION LETTER	CLASS REVIEW	REVISIONS	DATE	CHANGED BY	CHECKED BY	APPROVED BY
Los Alamos LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS, NEW MEXICO 87545			CLASSIFICATION OF DRAWING: UNCLASSIFIED PART: UNCLASSIFIED TITLE BLOCK: UNCLASSIFIED TITLE: JAERI HYBRID SYSTEM			
PARTS 121, 122, 123, 124, 125						
ORIGINATED	G. WALTON	8-20-91	N-1			
DRAWN	G. WALTON	8-20-91	N-1			
CHECKED	L. POLLAT	12-13-91	N-1			
PROJ. ENGR	S. THSUE	12-13-91	N-1			
APPROVED	S. THSUE	12-13-91	N-1			
RELEASED	L. POLLAT	12-13-91	N-1			
TOLERANCE - UNLESS OTHERWISE NOTED: X = ± .005 D.XX = ± .002 ANGULAR = ± .005 D.X = ± .001 D.XXX = ± .0005 FINISH =						
SCALE	TOTAL SHEETS	DRAWING NO.	SHEET NO.			
NOTED		68Y-155787	14			

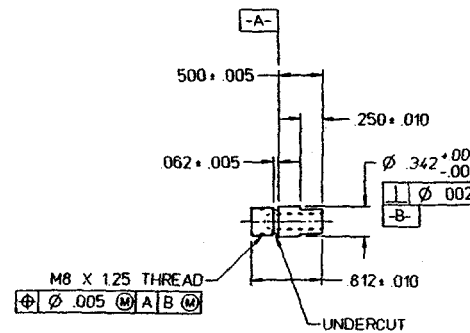
- GENERAL NOTES (UNLESS OTHERWISE NOTED):
1. ALL DIMENSIONS IN INCHES
 2. BREAK ALL SHARP EDGES
 3. CSK .02" ALL TAPPED HOLES TO MAJOR DIAMETER
 4. CSK .02" X .030 DEEP ALL DRILLED HOLES
 5. DIMENSIONING & POSITIONAL TOLERANCING PER AMS 100-000
 6. WELDED SYMBOLS PER AWS/AAS A7.4-76
 7. SURFACE TEXTURE PER AMS B60.1-97B



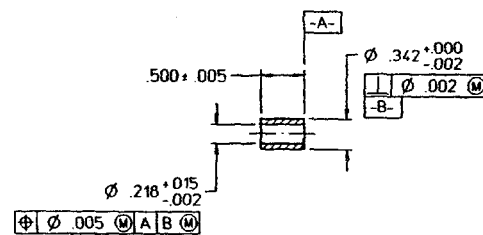
126 FOIL RETAINER
MATL: DELRIN
REOD: ONE
SCALE: 1/1



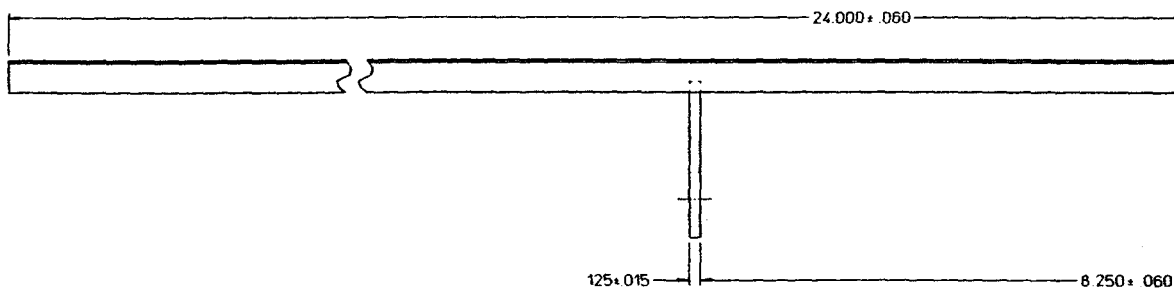
127 FOIL RETAINER PLUG
MATL: DELRIN
REOD: ONE
SCALE: 4/1



128 BRACKET STANDOFF
MATL: STAINLESS
REOD: 2
SCALE: 1/1



129 BRACKET STANDOFF
MATL: STAINLESS STL TYPE 304
REOD: 2
SCALE: 1/1

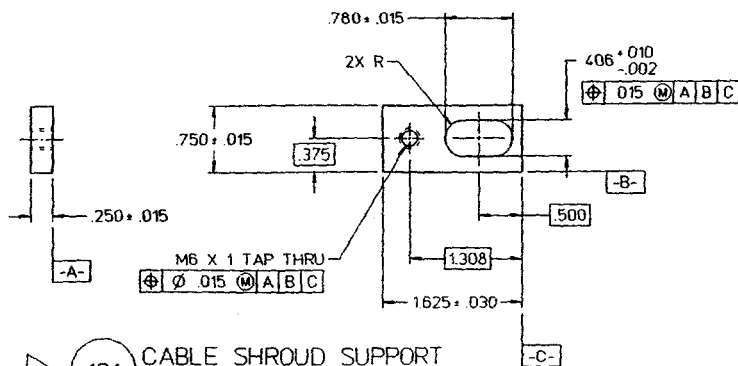


130 CABLE SHROUD
MATL: STAINLESS STL TYPE 304 & NOTED
REOD: ONE
SCALE: 1/1

Q A

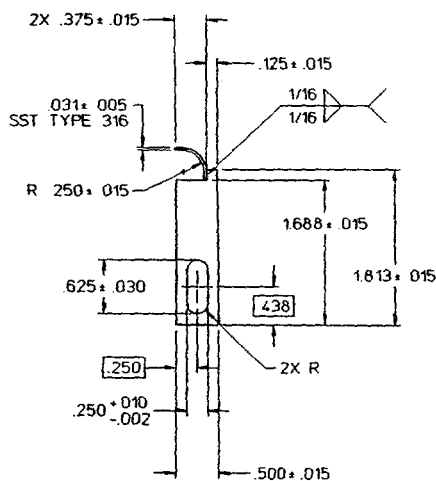
282 ± .005
M5 X 8 TAP X 500 ± .030
Ø .005 Q A B Q

ANDOFF
STL TYPE 304

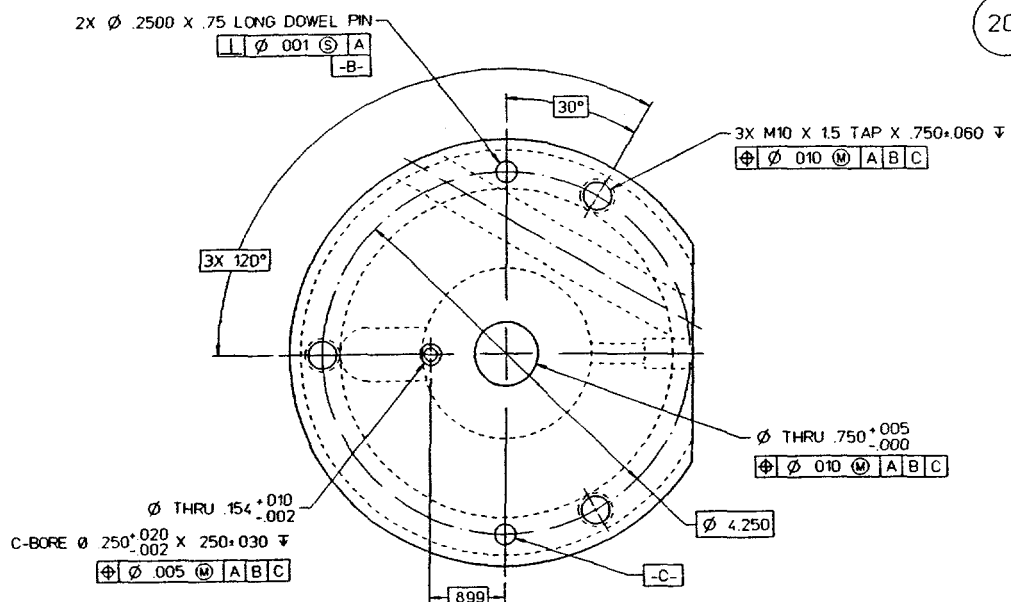
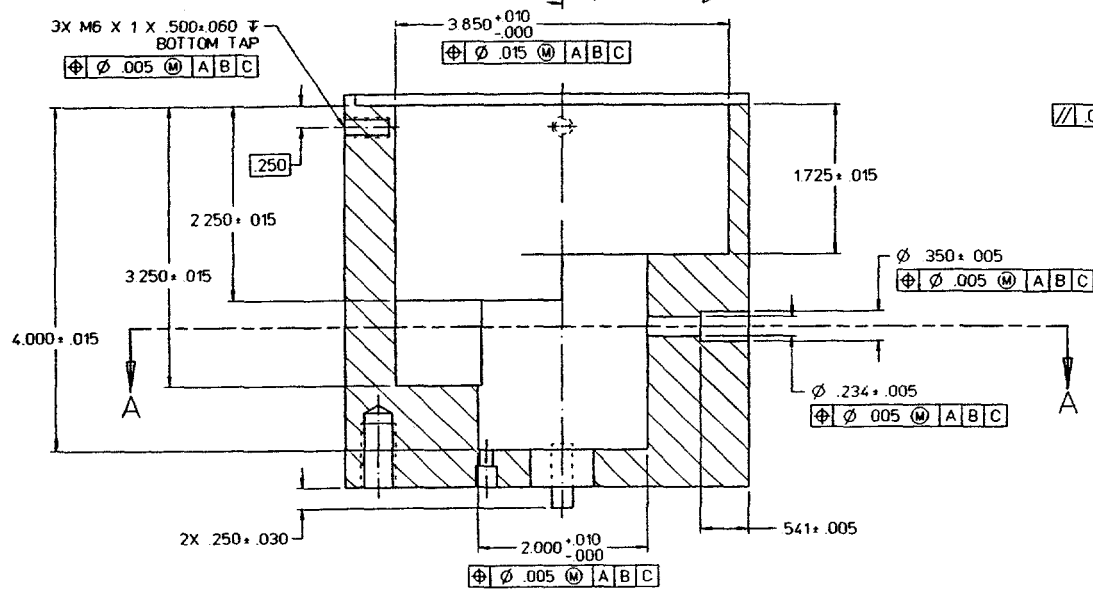
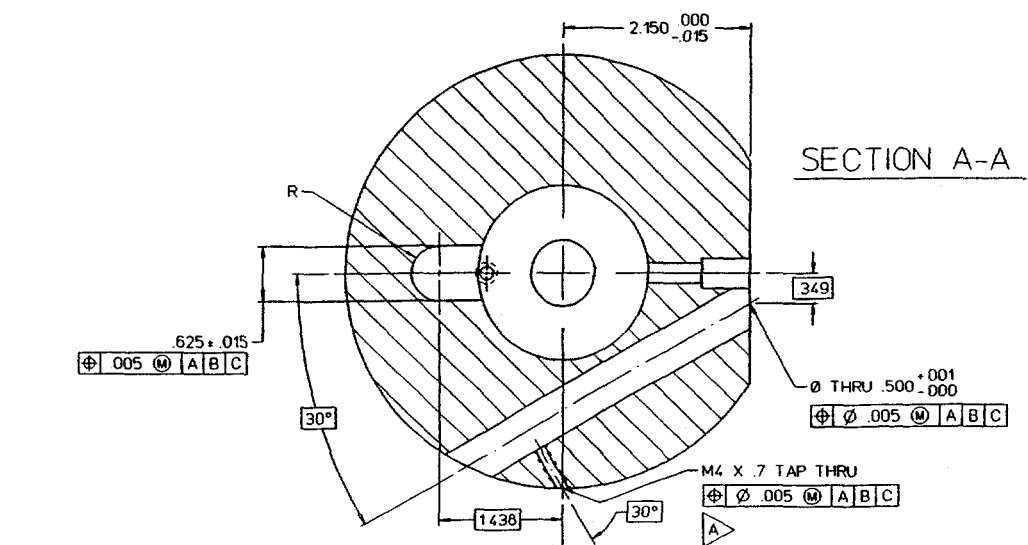


131 CABLE SHROUD SUPPORT
MATL STAINLESS STL TYPE 304
RECD ONE
SCALE 1/1

A



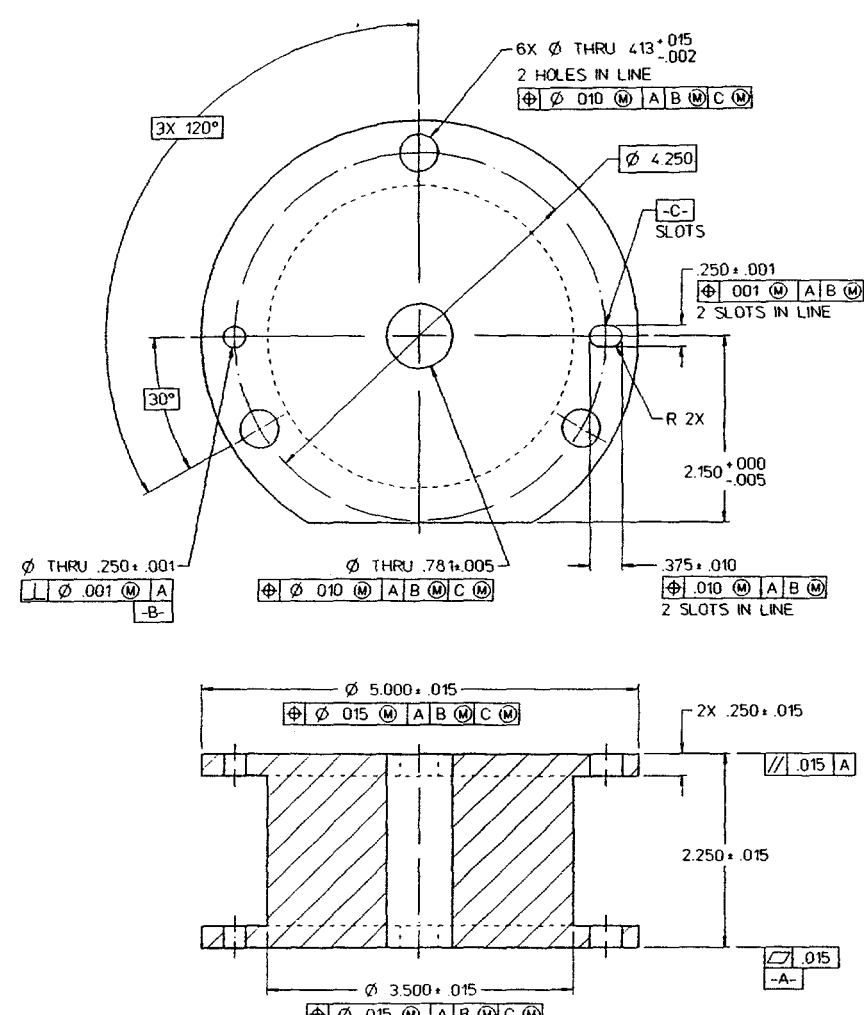
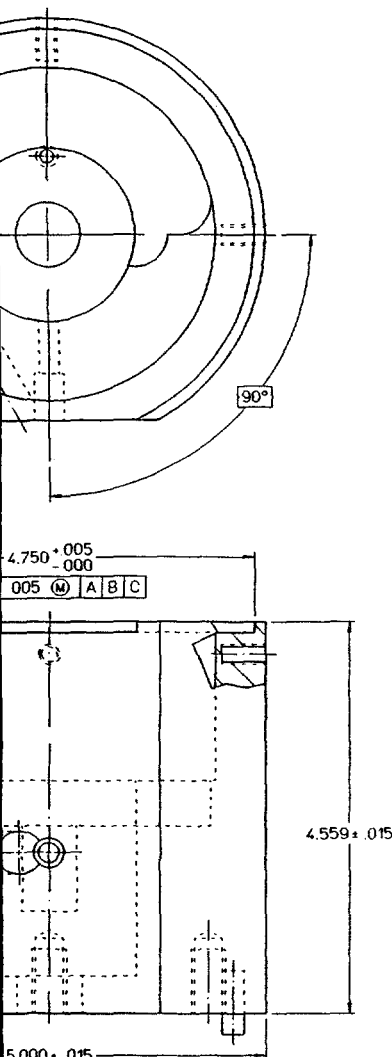
A	XP	ADDED DETAILS 130 AND 131	8-4-92	WALTON	XP	LP
-	XP	ORIGINAL ISSUE	-	-	-	-
REVISION LETTER	CLASS REVIEW	REVISIONS	DATE	CHANGED BY	CHECKED BY	APPROVED BY
Los Alamos LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS, NEW MEXICO 87545			CLASSIFICATION OF DRAWING UNCLASSIFIED			
PARTS 126, 127, 128, 129, 130, 131			PART UNCLASSIFIED TITLE BLOCK UNCLASSIFIED			
JAERI HYBRID SYSTEM			TITLE			
GENERAL NOTES (UNLESS OTHERWISE NOTED)			TOLERANCE UNLESS OTHERWISE NOTED			
1. ALL DIMENSIONS IN INCHES			X ± .005			
2. BREAK ALL SHARP EDGES			0.005 ± .005			
3. CSK 8° BY ALL TAPPED HOLES TO MAJOR DIAMETER			ANGULAR ± .005			
4. CSK 8° x .030 DEEP ALL DRILLED HOLES			FINISH			
5. DIMENSIONING & POSITIONAL TOLERANCING PER ANSI Y14.5M-1997			SCALE			
6. WELDING SYMBOLS PER ANSI/AWS A2.4-76			TOTAL SHEETS			
7. SURFACE TEXTURE PER ANSI B46.1-1978			DRAWING NO. 68Y-155787			
			SHEET NO. 15			
ORIGINATED	G. WALTON	9-11-91	N-1			
DRAWN	G. WALTON	9-11-91	N-1			
CHECKED	L. POLLAT	12-13-91	N-1			
PROJ ENGR	S. THSUE	12-13-91	N-1			
APPROVED	S. THSUE	12-13-91	N-1			
RELEASED	L. POLLAT	12-13-91	N-1			



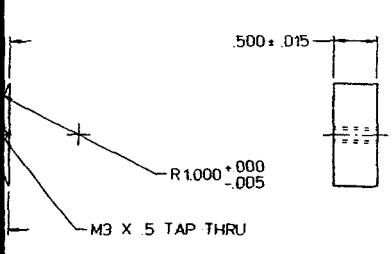
201 TUNGSTEN HOUSING
 MATL. MACHINABLE TUNGSTEN
 REQD. ONE
 SCALE: 1/1

200^{+0.005}

100



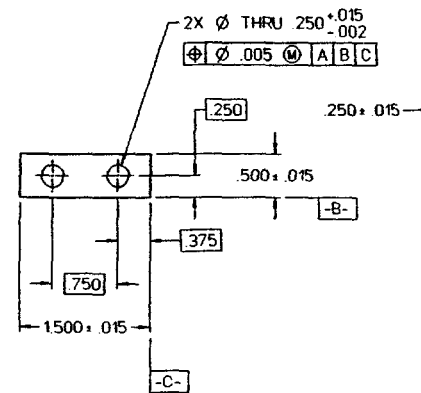
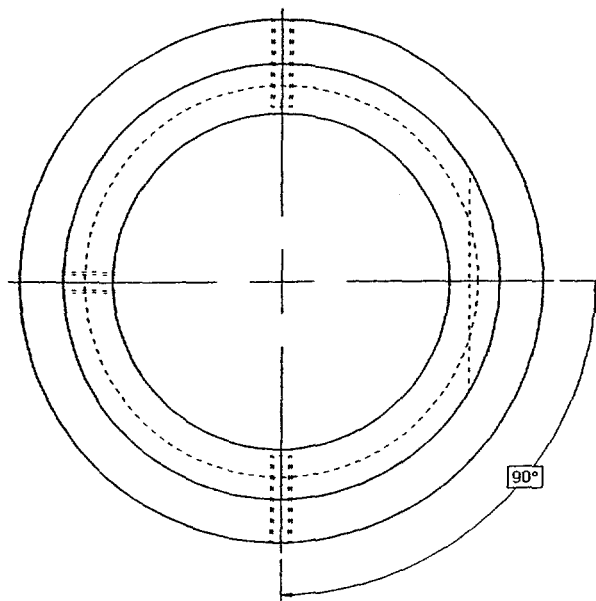
203 BASE SUPPORT
MATL ALUMINUM 6061-T6
REDD: ONE
SCALE: 1/1



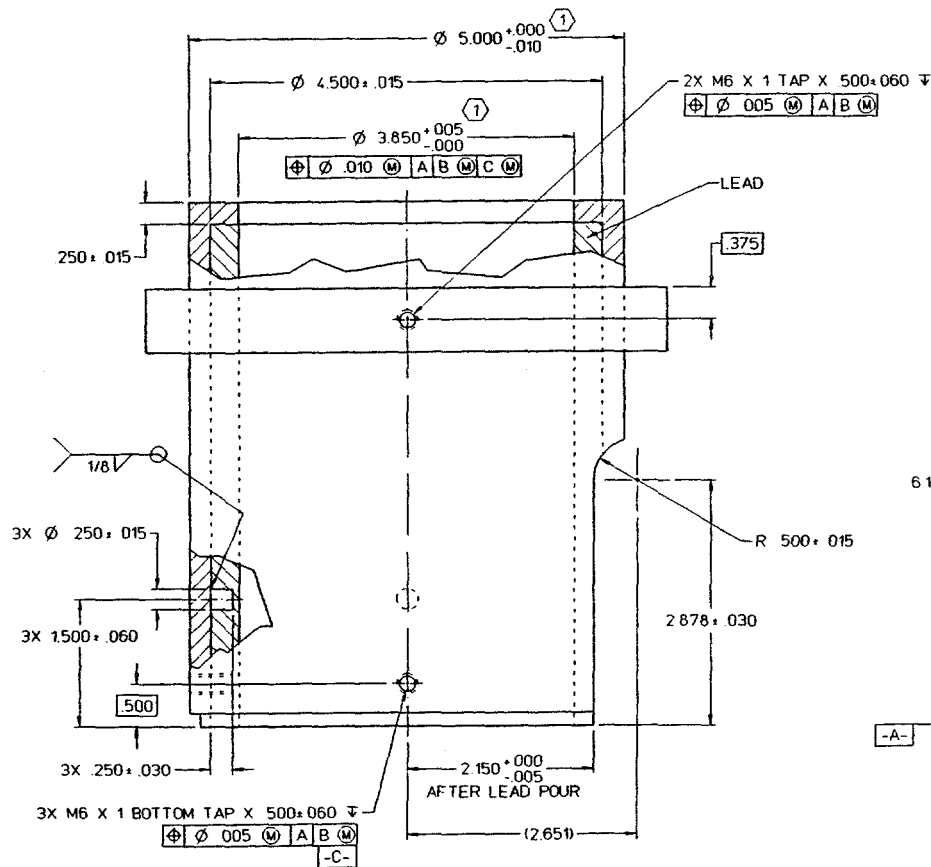
202 WEDGE
MATL: STAINLESS STL TYPE 304
REDD: ONE
SCALE: 1/1

- GENERAL NOTES (UNLESS OTHERWISE NOTED)
1. ALL DIMENSIONS IN INCHES
 2. BREAK ALL SHARP EDGES
 3. CSK .07" X .030 DEEP ALL TAPPED HOLES TO MAJOR DIAMETER
 4. CSK .07" X .030 DEEP ALL DRILLED HOLES
 5. DIMENSIONING & POSITIONAL TOLERANCING PER ASME Y14.5M-1992
 6. WELDING SYMBOLS PER ANSI A3.7-76
 7. SURFACE TEXTURE PER AMS 627-1-97B

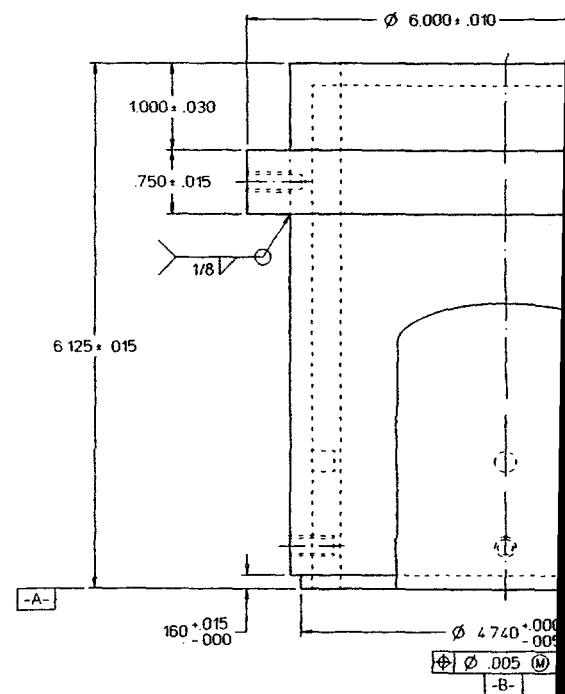
A	LP	375 RADIUS ADDED M4 X .7 TAPPED HOLE ADDED	7-21-93	WALTON	LP	LP
-	LP	ORIGINAL ISSUE	-	-	-	-
REVISION LETTER	CLASS REVIEW	REVISIONS	DATE	CHANGED BY	CHECKED BY	APPROVED BY
Los Alamos NATIONAL LABORATORY USALANS New Mexico 87545			CLASSIFICATION OF DRAWING UNCLASSIFIED PART: UNCLASSIFIED TITLE BLOCK: UNCLASSIFIED TITLE JAERI HYBRID SYSTEM			
PART 201,202,203			TOLERANCE (UNLESS OTHERWISE NOTED)			
ORIGINATED	G. WALTON	8-23-91	N-1	X=2	0.XX=2	ANGULAR=2
DRAWN	G. WALTON	8-23-91	N-1	0.XX=2	0.XX=2	FINISH=
CHECKED	L. POLLAT	12-13-91	N-1	SCALE	TOTAL SHEETS	DRAWING NO.
PROJ. ENGR.	S.T. HSUE	12-13-91	N-1	NOTED	68Y-155787	SHEET NO.
APPROVED	S.T. HSUE	12-13-91	N-1			16
RELEASED	L. POLLAT	12-13-91	N-1			



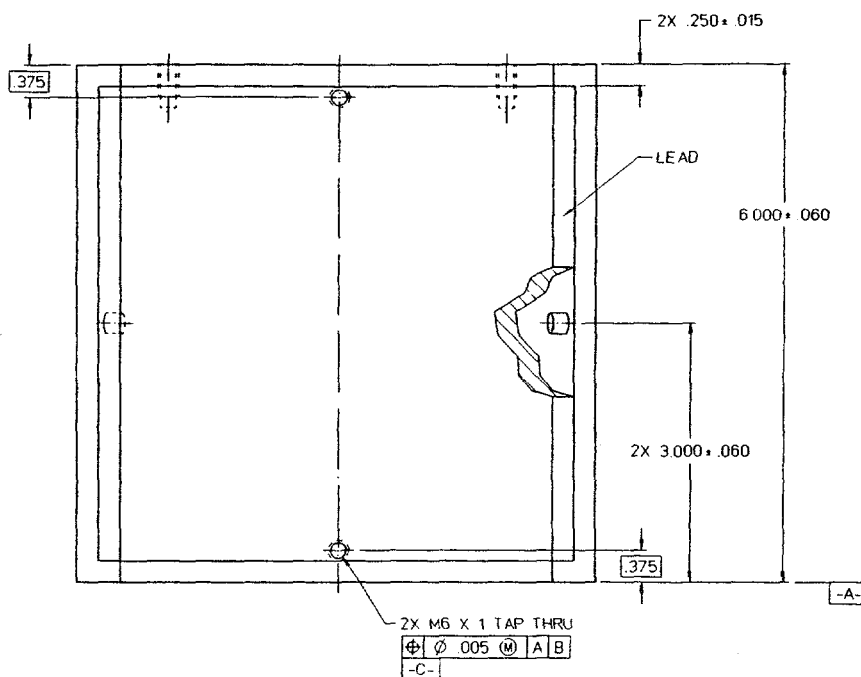
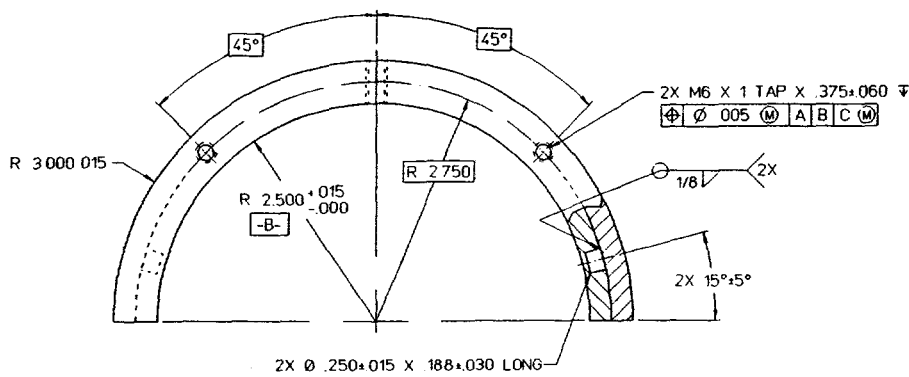
② 205 TIE BARS
MATL: ALUMINUM 6061-T6
REOD: 5
SCALE: 1/1



② 204 X-RAY GENERATOR SHIELD (BOTTOM)
MATL: ALUMINUM 6061-T6 & LEAD (POURED)
REOD: ONE
SCALE: 1/1



PART NUMBER			PARTS LIST		
PREFIX NUMBER	ITEM NUMBER	NUMBER	DESCRIPTION		



② 206 X-RAY GENERATOR SHIELD (MIDDLE)
 MATL ALUMINUM 6061-T6 & LEAD(POURED)
 RECD. 2
 SCALE 1/1

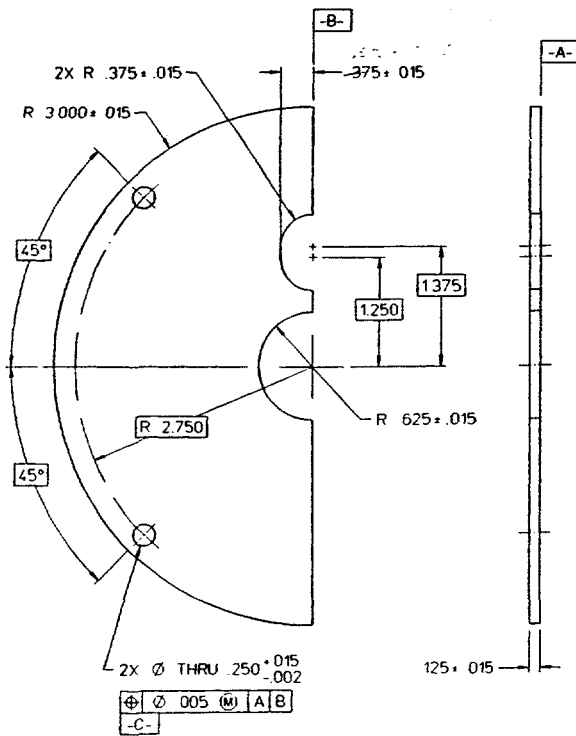
NOTE

- ON PART 101 (X-RAY HEAD SUPPORT SHIELD) THE TOLERANCE OF THE DIA'S NOTED APPLY TO A ONE INCH SECTION STARTING FROM THE TOP OF THE PART THE REMAINDER OF THE DIA'S CAN BE STOCK SIZE
- PAINT USING #RAL9001 DRYLAC POWDER COATING.

GENERAL NOTES UNLESS OTHERWISE NOTED

- ALL DIMENSIONS IN INCHES
- BREAK ALL SHARP EDGES
- CSK .87" ALL TAPPED HOLES TO MAJOR DIAMETER
- CSK .87" X .030 DEEP ALL DRILLED HOLES
- OVERSIZING & POSITIONAL TOLERANCING PER AMS Y14.5M-1987
- WELDING SYMBOLS PER AWS A2.4-76
- SURFACE TEXTURE PER AMS B46.1-1976

ORIGINAL ISSUE							
REVISION	CLASS	REVIEW	REVISIONS	DATE	CHANGED BY	CHECKED BY	APPROVED BY
Los Alamos LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS, NEW MEXICO 87545				CLASSIFICATION OF DRAWING: UNCLASSIFIED PART UNCLASSIFIED TITLE BLOCK UNCLASSIFIED			
PART 204.205.206				TITLE JAERI HYBRID SYSTEM			
GENERAL NOTES UNLESS OTHERWISE NOTED				TOLERANCE UNLESS OTHERWISE NOTED			
1. ALL DIMENSIONS IN INCHES 2. BREAK ALL SHARP EDGES 3. CSK .87" ALL TAPPED HOLES TO MAJOR DIAMETER 4. CSK .87" X .030 DEEP ALL DRILLED HOLES 5. OVERSIZING & POSITIONAL TOLERANCING PER AMS Y14.5M-1987 6. WELDING SYMBOLS PER AWS A2.4-76 7. SURFACE TEXTURE PER AMS B46.1-1976				SCALE: 1/1 TOTAL SHEETS: 17 DRAWING NO: 68Y-155787 SHEET NO: 17			
REVISIONS				SCALE: 1/1 TOTAL SHEETS: 17 DRAWING NO: 68Y-155787 SHEET NO: 17			
REVISIONS				SCALE: 1/1 TOTAL SHEETS: 17 DRAWING NO: 68Y-155787 SHEET NO: 17			



207 CABLE AND HOSE RETAINER
MATL: MACHINABLE TUNGSTEN
REOD: ONE
SCALE: 1/1

M10 X 1.5 X .562 ± .030 ∇ BOTTOM TAP

Ø .005 (M) (A) (M)

Ø THRU .102 ± .005

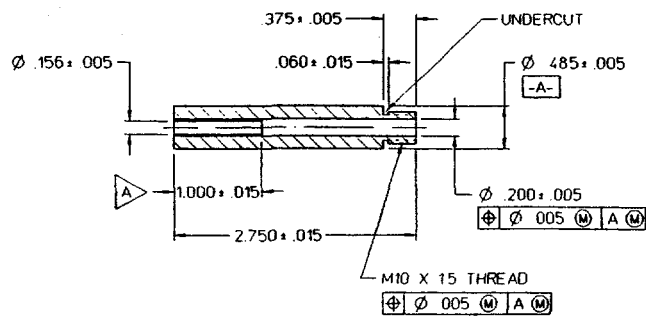
Ø .005 (M) (A) (M)

Ø .4995 ± .0000 / -.0005
-A-

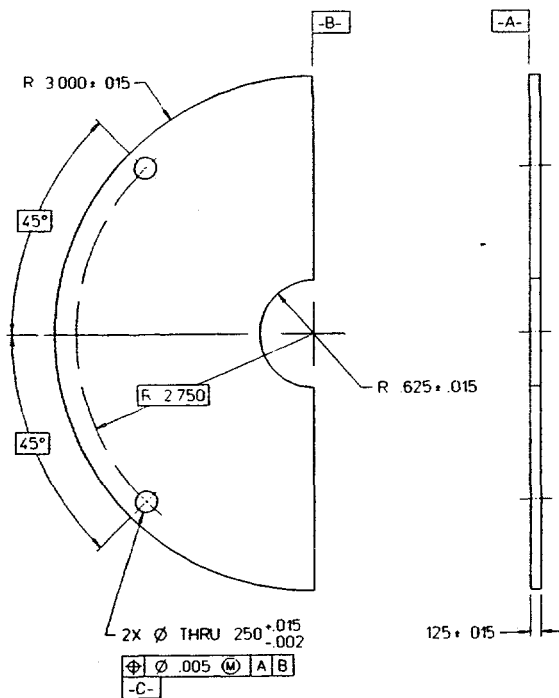
2.332 ± .005
(2.043)

Ø .005 (A)

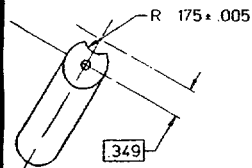
208 COLLIMATOR (FRONT)
MATL: MACHINABLE TUNGSTEN
REOD: ONE
SCALE: 1/1



209 COLLIMATOR (REAR)
MATL: MACHINABLE TUNGSTEN
REOD: ONE
SCALE: 1/1

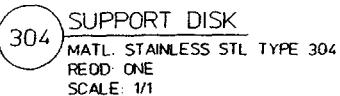
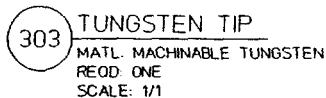
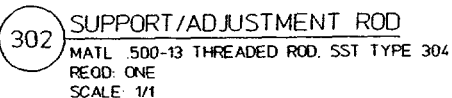
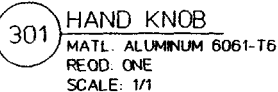


217 CABLE AND HOSE RETAINER
MATL: MACHINABLE TUNGSTEN
REOD: ONE
SCALE: 1/1

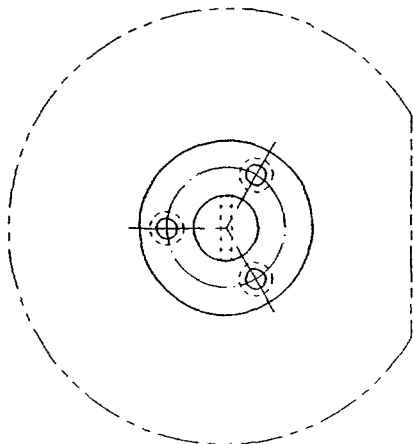


PART NUMBER			PARTS LIST	
PREFIX NUMBER	ITEM NUMBER	NUMBER REQD	DESCRIPTION	

A	LP	ADDED TUNGSTEN SLEEVE TO 209	11-19-92	WALTON	LP	LP
		ADDED DETAIL 217				
-	LP	DETAIL 207 MATERIAL CHANGED FROM 25 THK C1018 TO 125 TH TUNGSTEN	-	-	-	-
		ORIGINAL ISSUE				
REVISION LETTER	CLASS REVIEW	REVISIONS	DATE	CHANGED BY	CHECKED BY	APPROVED BY
Los Alamos			CLASSIFICATION OF DRAWING: UNCLASSIFIED			
LO: LOS ALAMOS NATIONAL LABORATORY			PART UNCLASSIFIED TITLE BLOCK UNCLASSIFIED			
LC: LOS ALAMOS NEW MEXICO 87545			TITLE			
PARTS 207.208.209.217			JAEPI HYBRID SYSTEM			
GENERAL NOTES (UNLESS OTHERWISE NOTED)			TOLERANCE-UNLESS OTHERWISE NOTED:			
1. ALL DIMENSIONS IN INCHES	SIGNATURE	DATE	GROUP	XXX	XXX	ANALYST
2. BREAK ALL SHARP EDGES	ORIGINATED	G. WALTON	8-28-91	N-1	XXX	FINISH
3. CSK .875" ALL TAPPED HOLES TO MAJOR DIAMETER	DRAWN	G. WALTON	8-28-91	N-1		
4. CSK .625" x .030 DEEP ALL DRILLED HOLES	CHECKED	L. POLLAT	12-13-91	N-1		
5. DIMENSIONING & POSITIONAL TOLERANCING PER ASME Y14.5M-1992	PROJECT ENGINEER	S. THSUE	12-13-91	N-1		
6. WELDING SYMBOLS PER ANSI A2.4-76	APPROVED	S. THSUE	12-13-91	N-1		
7. SURFACE TEXTURE PER ANSI B46.1-1978	PLATE ASSEMBLY	L. POLLAT	12-13-91	N-1		
			SCALE NOTED	TOTAL SHEETS	DRAWING NO.	SHEET NO.
					68Y-155787	18

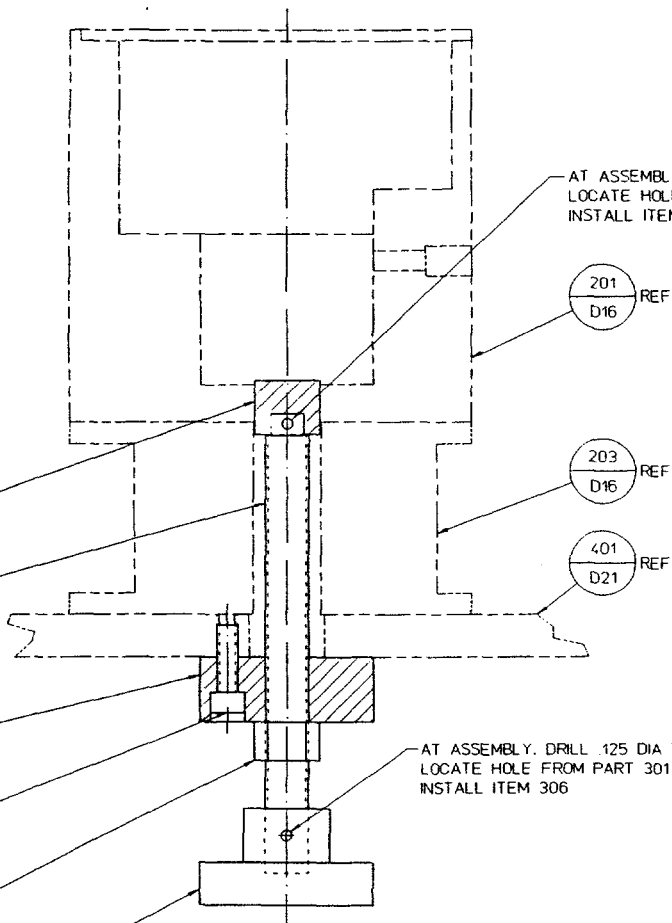


303
302
304
REF 307
PL
A 308
PL
301



PART NUMBER		PARTS LIST	
PREFIX NUMBER	ITEM NUMBER	NUMBER REQD	DESCRIPTION
	301	1	HAND KNOB
	302	1	SUPPORT/ADJUSTMENT ROD
	303	1	TUNGSTEN TIP
	304	1	SUPPORT DISK
	305	1	SPIROL PIN, SST, .125 DIA X .50 LONG, C.E.M. WEST INC.
	306	1	SPIROL PIN, SST, .125 DIA X 100 LONG, C.E.M. WEST INC.
	307	3	SCR. SOC HD CAP, STL, M6 X 1.0 X 20MM LONG
	308	1	NUT, HEX, SST, .500-13 UNC

A

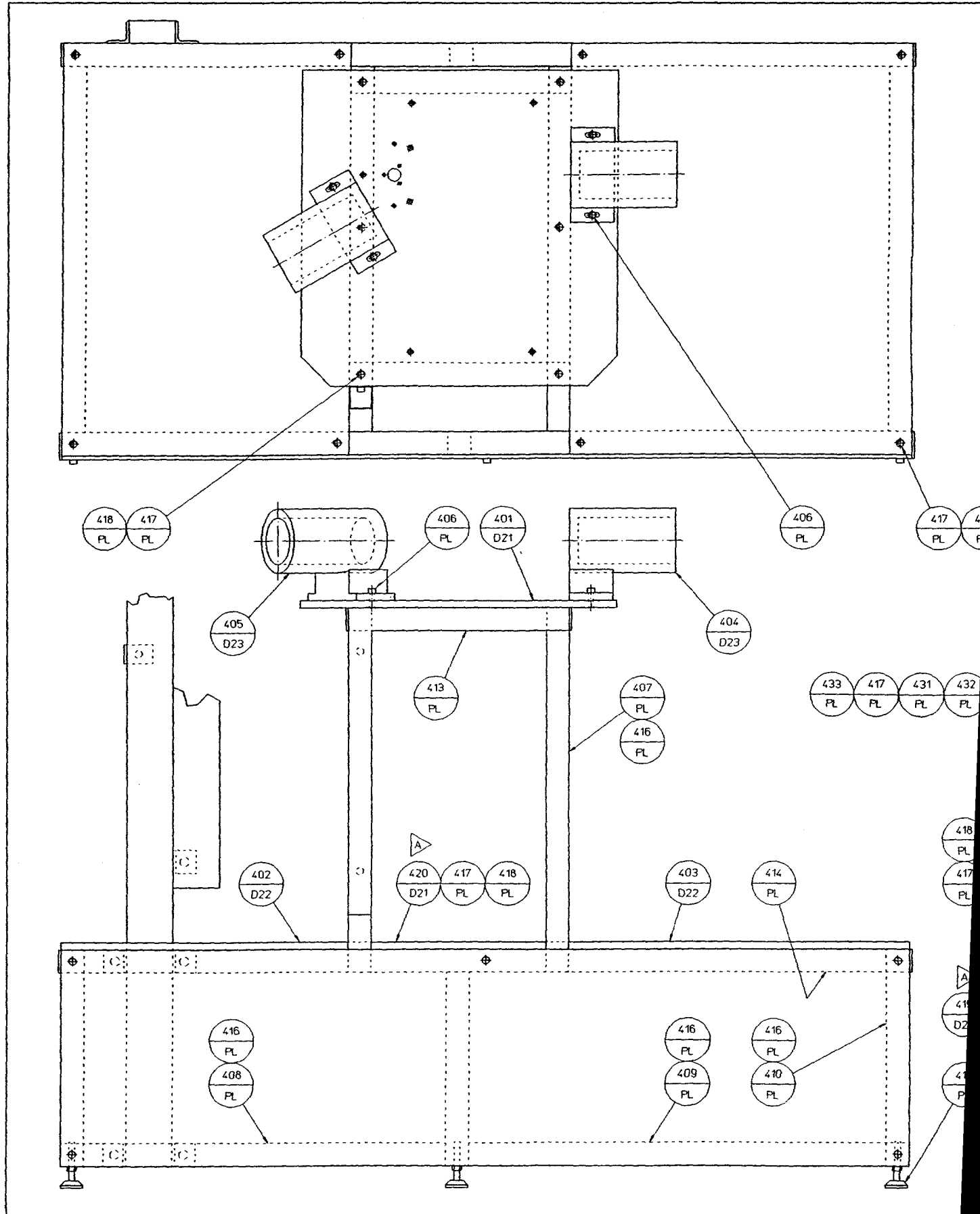


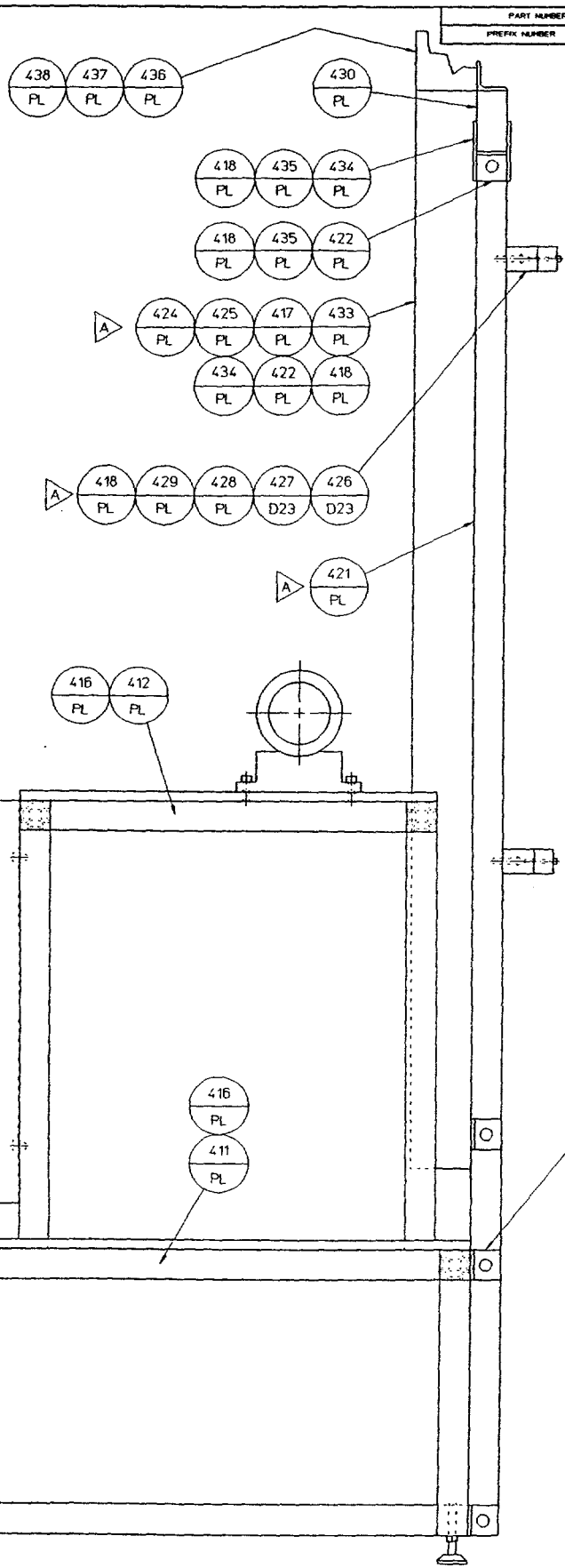
GENERAL NOTES (UNLESS OTHERWISE NOTED)

1. ALL DIMENSIONS IN INCHES
2. BREAK ALL SHARP EDGES
3. CSK .875" ALL TAPPED HOLES TO MAJOR DIAMETER
4. CSK .875" x .030 DEEP ALL DRILLED HOLES
5. DIMENSIONING & POSITIONAL TOLERANCING PER ANSI Y14.5M-1987
6. WELDING SYMBOLS PER AWS A2.4-76
7. SURFACE TEXTURE PER ANSI B46.1-1978

A	ADDED HEX NUT	2-7-82	WALTON	SP	SP
—	ORIGINAL ISSUE	—	—	—	—
REVISION LETTER	CLASS REVIEW	DATE	CHANGED BY	CHECKED BY	APPROVED BY
SIGNATURE		DATE	GROUP		
ORIGINATED		G. WALTON	10-21-91	N-1	
DRAWN		G. WALTON	10-21-91	N-1	
CHECKED		L. POLLAT	12-13-91	N-1	
PROJ. ENGR.		S. T. HSUE	12-13-91	N-1	
APPROVED		S. T. HSUE	12-13-91	N-1	
RELEASED		L. POLLAT	12-13-91	N-1	

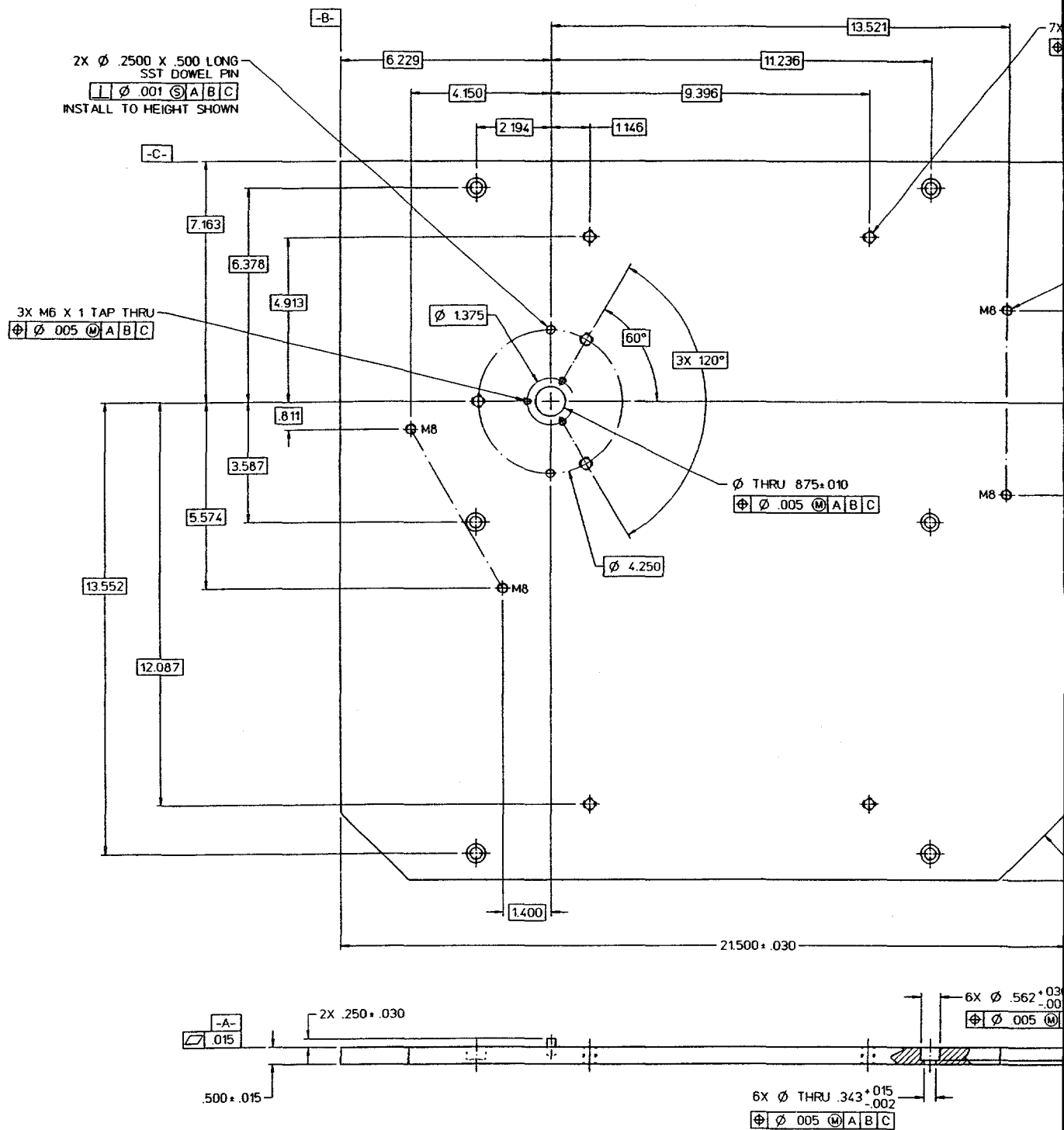
CLASSIFICATION OF		DRAWING UNCLASSIFIED	
PART UNCLASSIFIED		TITLE BLOCK UNCLASSIFIED	
TITLE			
JAERI HYBRID SYSTEM			
SUB-ASSEMBLY 300 PARTS 301, 302, 303, 304, 305, 306, 307			
TOLERANCE UNLESS OTHERWISE NOTED			
X ± .005		X ± .005	
X ± .005		X ± .005	
SCALE	TOTAL SHEETS	DRAWING NO.	SHEET NO.
NOTED	68Y-155787	19	19





PART NUMBER		PARTS LIST	
PREF. NUMBER	ITEM NUMBER	NUMBER REQ.	DESCRIPTION
	401	1	X-RAY GENERATOR SUPPORT PLATE
	402	1	DEWAR SUPPORT PLATE
	403	1	DEWAR SUPPORT PLATE
	404	1	DETECTOR SHIELD
	405	1	DETECTOR SHIELD
	406	4	SCR. SOC HD CAP. STL. M8 X 125 X 25MM LONG
	407	4	PROFILE 40 X 40 LIGHT X 21.80 LONG. ITEM PRODUCTS INC.
	408	2	PROFILE 40 X 40 LIGHT X 24.64 LONG. ITEM PRODUCTS INC.
	409	2	PROFILE 40 X 40 LIGHT X 28.39 LONG. ITEM PRODUCTS INC.
	410	6	PROFILE 40 X 40 LIGHT X 13.29 LONG. ITEM PRODUCTS INC.
	411	6	PROFILE 40 X 40 LIGHT X 24.86 LONG. ITEM PRODUCTS INC.
	412	2	PROFILE 40 X 40 LIGHT X 18.36 LONG. ITEM PRODUCTS INC.
	413	2	PROFILE 40 X 40 LIGHT X 15.00 LONG. ITEM PRODUCTS INC.
	414	2	PROFILE 40 X 40 LIGHT X 57.75 LONG. ITEM PRODUCTS INC.
	415	6	KNUCKLE FOOT 40. M10 X 80. NO. 21-D12. ITEM PRODUCTS INC.
	416	36	UNIVERSAL FASTENING SET. NO. 20-004. ITEM PRODUCTS INC.
	417	23	SCR. SOC HD CAP. STL. M8 X 125 X 15MM LONG
	418	29	T-SLOT NUT, M8, NO. 20-058. ITEM PRODUCTS INC.
	419	1	FRONT GUARD
	420	1	COVER
	421	1	PROFILE. 40 X 80 LIGHT X 72.00 LONG. ITEM PRODUCTS INC.
	422	8	ANGLE ELEMENT 40. #22-141. ITEM PRODUCTS INC.
	423	8	SCR. FLAT HD SOC. STL. M8 X 16MM LONG
	424	1	SUPPORT PROFILE 80. 56.00 LONG. #15-081-1. ITEM PRODUCTS INC.
	425	1	SUPPORT PROFILE 80. 56.00 LONG. #15-080-1. ITEM PRODUCTS INC.
	426	2	CABLE CLAMP (BASE)
	427	2	CABLE CLAMP
	428	2	SCR. BUTTON HD. SOC. STL. M8 X 125 X 30MM LONG
	429	4	SCR. SOC HD CAP. STL. #10-24 UNC X 150 LONG
	430	1	PROFILE. 40 X 80 LIGHT X 39.00 LONG. ITEM PRODUCTS INC.
	431	2	SUPPORT PROFILE 40. 21.00 LONG. #15-040. ITEM PRODUCTS INC.
	432	2	WALL PROFILE 40. 21.00 LONG. #15-042. ITEM PRODUCTS INC.
	433	3	WALL PROFILE 80. 56.00 LONG. #15-082-1. ITEM PRODUCTS INC.
	434	4	CONNECTION ELEMENT 40. FLAT. #22-140. ITEM PRODUCTS INC.
	435	10	SCREW. FLAT HD. M8 X 125 X 16MM LONG
	436	1	SUPPORT PROFILE 80. 39.00 LONG. #15-081-1. ITEM PRODUCTS INC.
	437	1	SUPPORT PROFILE 80. 39.00 LONG. #15-080-1. ITEM PRODUCTS INC.
	438	3	WALL PROFILE 80. 39.00 LONG. #15-082-1. ITEM PRODUCTS INC.

A	LP	ADDED PARTS 419,421,422,424,425 426,427,431,432,433,434	7-21-93	WALTON	LP	LP
-	LP	ORIGINAL ISSUE	-	-	-	-
REVISION LETTER	CLASS REVIEW	REVISIONS	DATE	CHANGED BY	CHECKED BY	APPROVED BY
Los Alamos LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS, NEW MEXICO 87545			CLASSIFICATION OF: DRAWING UNCLASSIFIED PART UNCLASSIFIED TITLE BLOCK UNCLASSIFIED			
SUB-ASSEMBLY 400			TITLE JAERI HYBRID SYSTEM			
ORIGINATED	G WALTON	10-31-91	TOLERANCE UNLESS OTHERWISE NOTED:			
DRAWN	G WALTON	10-31-91	X=1 0.XX=1 ANGULAR=1			
CHECKED	L POLLAT	12-13-91	0.XX=1 FINISH=			
PROJ. ENGR	S T HSUE	12-13-91	SCALE	TOTAL SHEETS	DRAWING NO	SHEET NO.
APPROVED	S T HSUE	12-13-91	1/4		68Y-155787	20
RELEASED	L POLLAT	12-13-91				



401

X-RAY GENERATOR SUPPORT PLATE

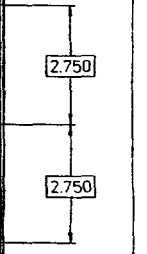
MATL: ALUMINUM TOOLING PLATE

SCALE: 1/2

REOD: ONE

M10 X 15 TAP THRU
 $\phi .005$ (M) A B C

4X M8 X 125 TAP THRU
 $\phi .005$ (M) A B C

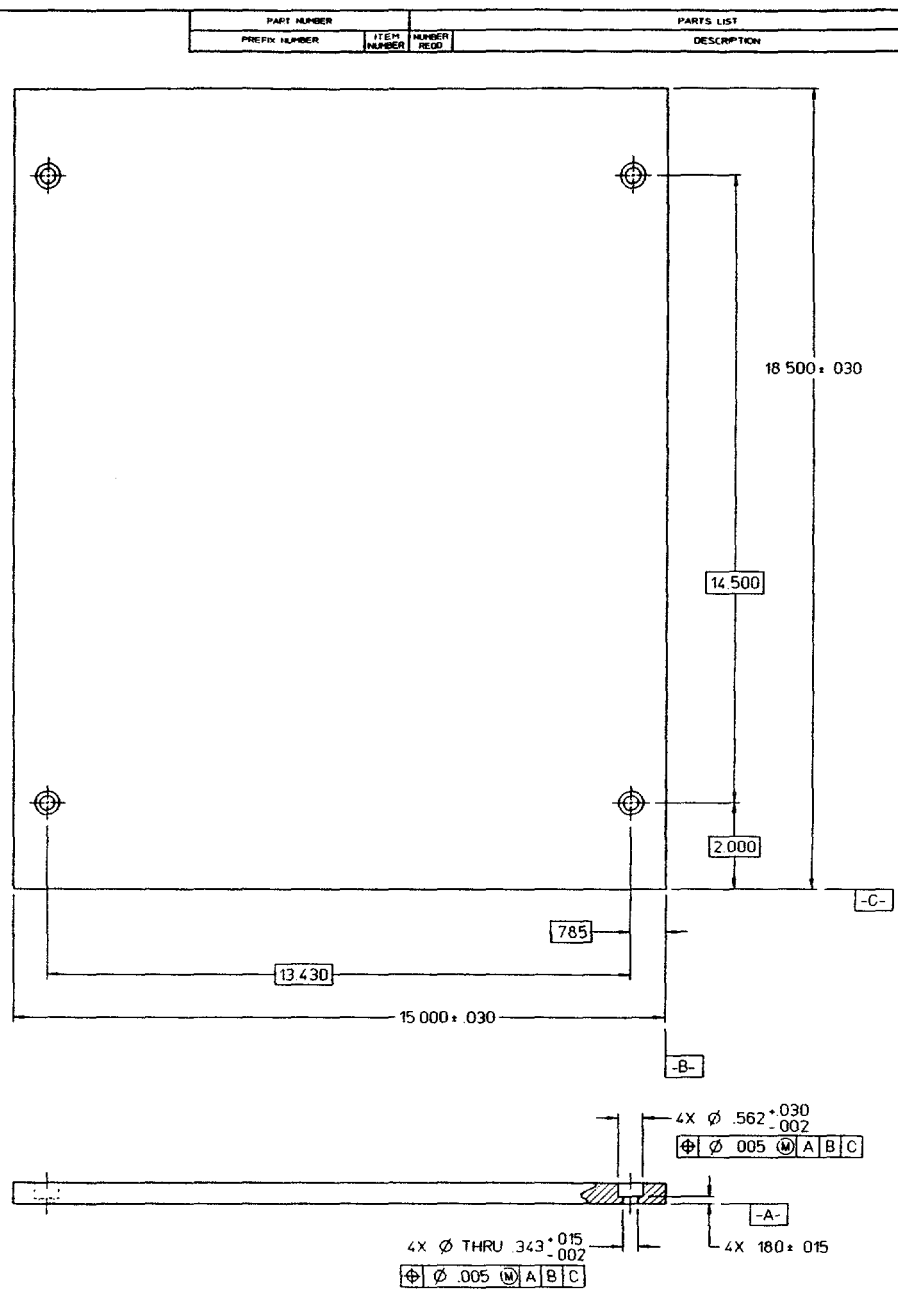


21.500 ± .030

2X 45° X 2.00

A B C

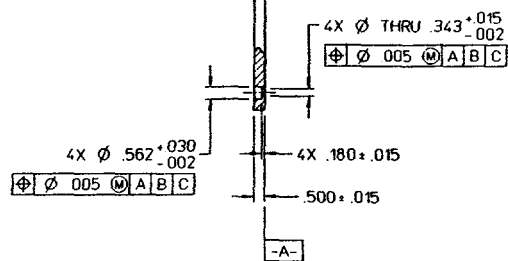
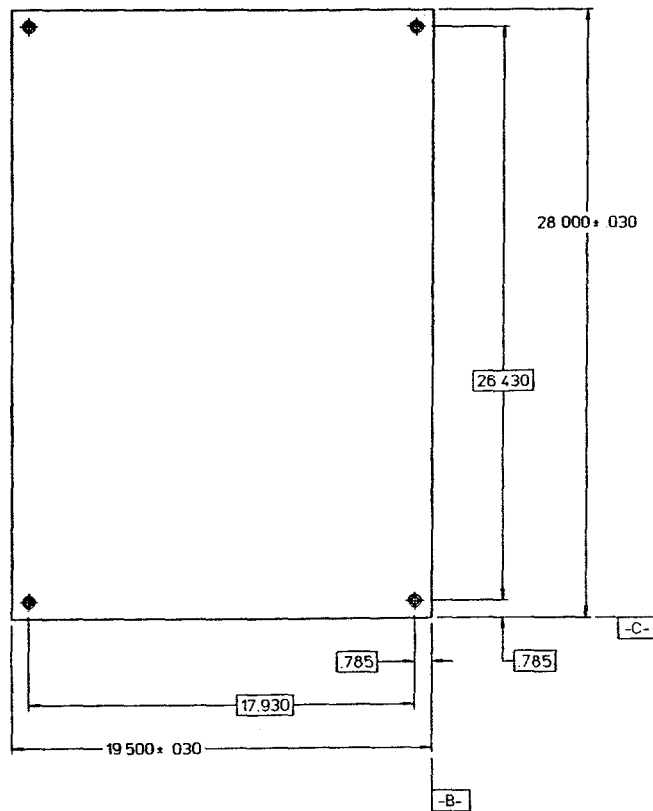
6X 180 ± .010



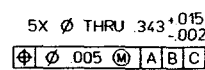
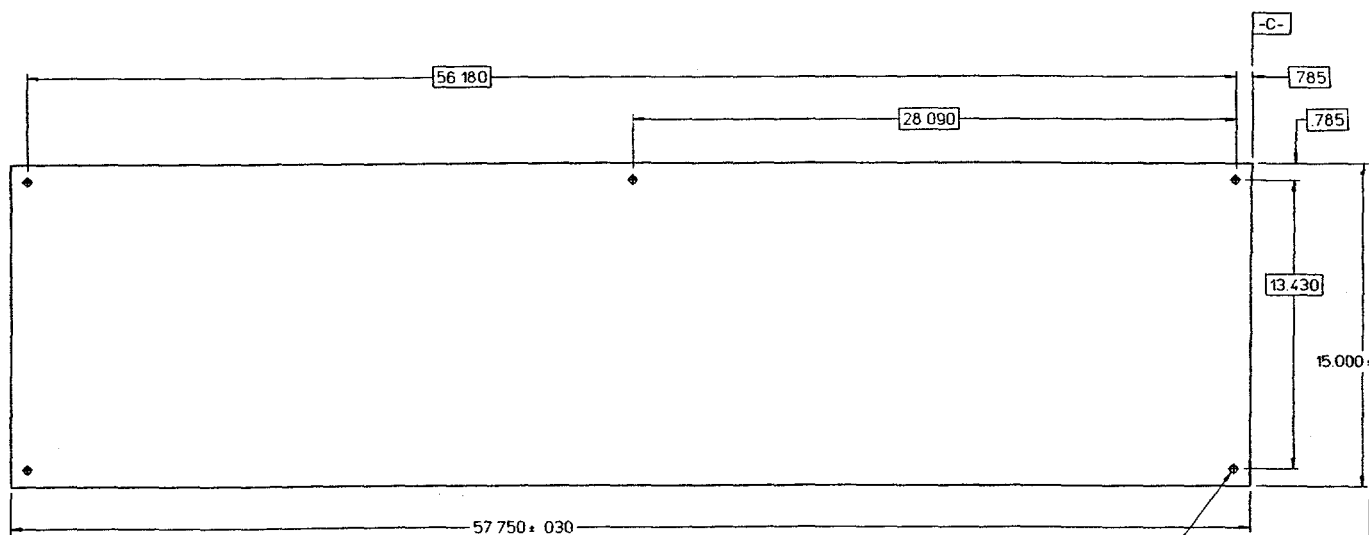
COVER
 420
 MATL. ALUMINUM 6061-T6
 SCALE: 1/2
 REOD: ONE

- GENERAL NOTES: UNLESS OTHERWISE NOTED
1. ALL DIMENSIONS IN INCHES
 2. BREAK ALL SHARP EDGES
 3. CSK .87" ALL TAPPED HOLES TO MAJOR DIAMETER
 4. CSK .87" X .030 DEEP ALL DRILLED HOLES
 5. DIMENSIONING & POSITIONAL TOLERANCING PER AMS Y14.5M-1992
 6. WELDING SYMBOLS PER AWS/AAS Z47-76
 7. SURFACE TEXTURE PER AMS B40.1-1978

A		XP		ADDED PART 420		7-6-93		WALTON		XP		XP	
-		XP		ORIGINAL ISSUE		-		-		-		-	
REVISION LETTER	CLASS REVIEW	REVISIONS				DATE	CHANGED BY	CHECKED BY	APPROVED BY				
Los Alamos LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS NEW MEXICO 87545						CLASSIFICATION OF DRAWING UNCLASSIFIED PART UNCLASSIFIED TITLE BLOCK UNCLASSIFIED TITLE JAERI HYBRID SYSTEM							
						PART 401.420							
						TOLERANCE-UNLESS OTHERWISE NOTED X=.0005 O.XX=.0005 ANGULAR=.0005 O.XX=.0005 O.XXX=.0005 FINISH=							
ORIGINATED	G. WALTON	10-22-91	N-1		SCALE		TOTAL SHEETS	DRAWING NO.		SHEET NO.		21	
CHECKED	L. POLLAT	12-13-91	N-1		NOTED			68Y-155787					
PROJ. ENGR.	S. THSUE	12-13-91	N-1										
APPROVED	S. THSUE	12-13-91	N-1										
RELEASED	L. POLLAT	12-13-91	N-1										



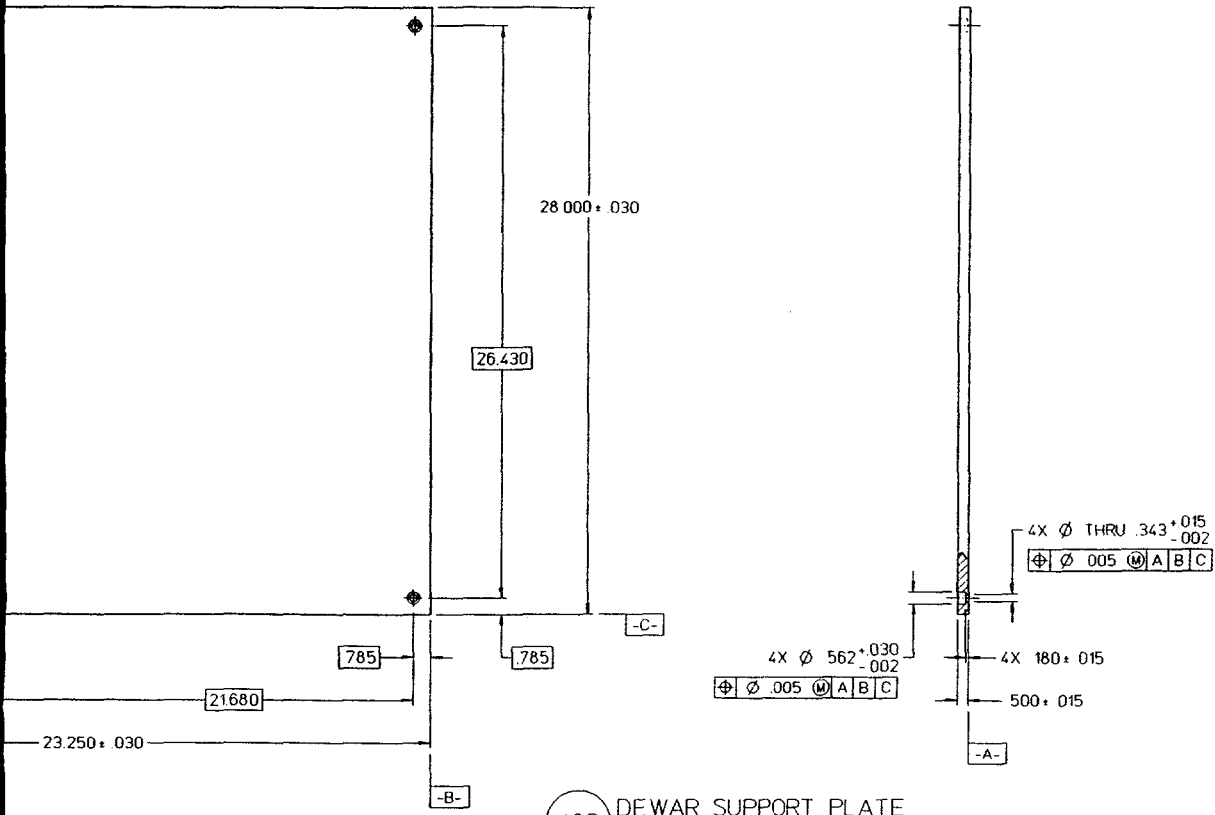
402 DEWAR SUPPORT PLATE
MATL ALUMINUM 6061-T6
SCALE: 1/4
REQD ONE



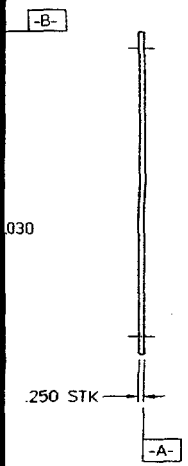
419 FRONT SHIELD
MATL ALUMINUM 6061-T6
SCALE: 1/4
REQD ONE

NOTE: PART 419 IS TO BE PAINTED WITH #RAL9001 DRYL

PART NUMBER			PARTS LIST	
PREFIX NUMBER	ITEM NUMBER	NUMBER REQD	DESCRIPTION	



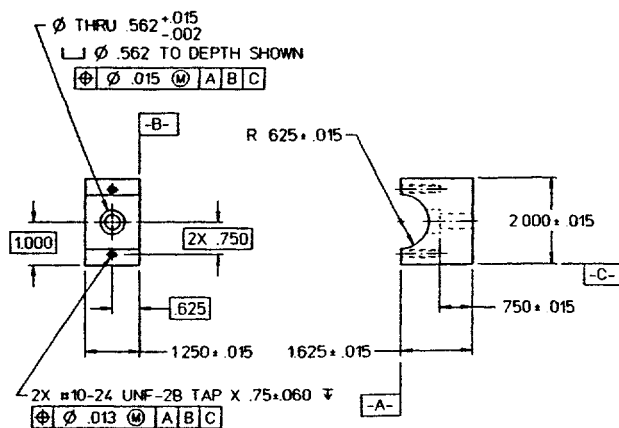
403 DEWAR SUPPORT PLATE
MATERIAL ALUMINUM 6061-T6
SCALE: 1/4
RECD ONE



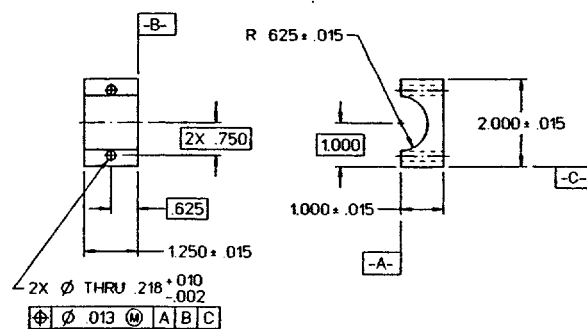
POWDER COATING.

A	ADDED PART 419	7-5-93	WALTON	Rece	Rece
-	ORIGINAL ISSUE	-	-	-	-
REVISION LETTER	CLASS REVIEW	DATE	CHANGED BY	CHECKED BY	APPROVED BY
Los Alamos		CLASSIFICATION OF DRAWING: UNCLASSIFIED			
LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS, NEW MEXICO 87545		PART UNCLASSIFIED TITLE BLOCK UNCLASSIFIED			
PARTS 402.403.419		TITLE JAERI HYBRID SYSTEM			
TOLERANCE-UNLESS OTHERWISE NOTED					
X=0 D.XX=0 ANGULAR=0 O.X=0 O.XXX=0 FINISH=					
SCALE		TOTAL SHEETS		DRAWING NO	
NOTED		NOTED		68Y-155787	
SHEET NO.		22		D	

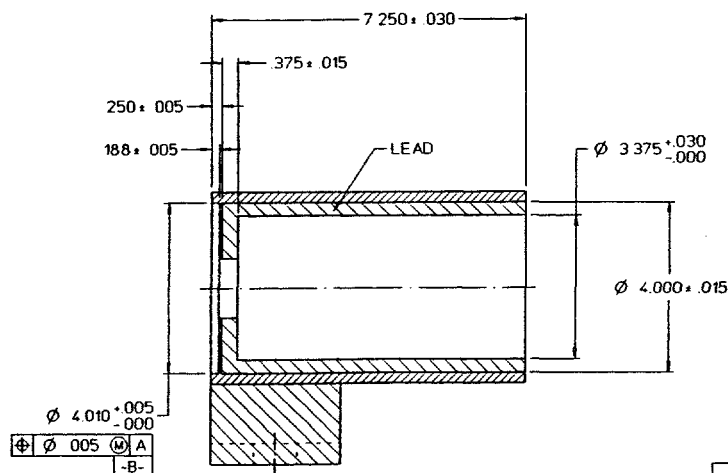
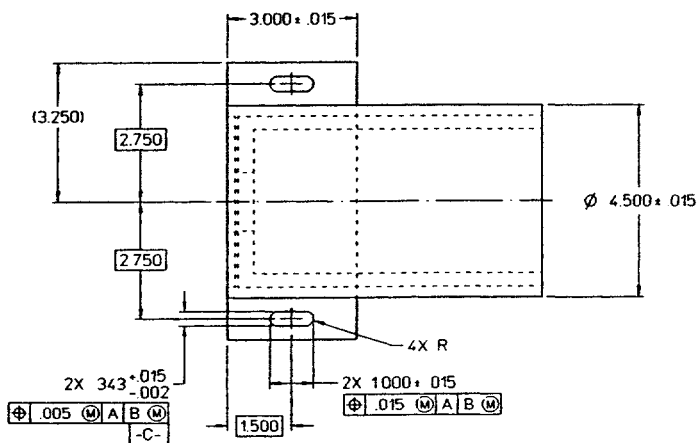
- GENERAL NOTES UNLESS OTHERWISE NOTED
1. ALL DIMENSIONS IN INCHES
 2. BREAK ALL SHARP EDGES
 3. DRILL ALL TAPPED HOLES TO MAJOR DIAMETER
 4. DRILL 0.030 DEEP ALL DRILLED HOLES
 5. DIMENSIONING & POSITIONAL TOLERANCING PER ASME Y14.5-1997
 6. WELDING SYMBOLS PER ANSI A9.4-1976
 7. SURFACE TEXTURE PER ANSI B46.1-1973



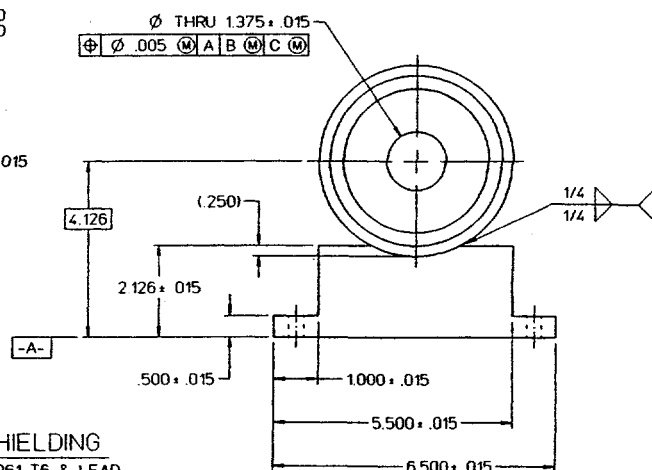
426 CABLE CLAMP (BASE)
MATL. ALUMINUM 6061-T6
SCALE: 1/2
REOD: 2



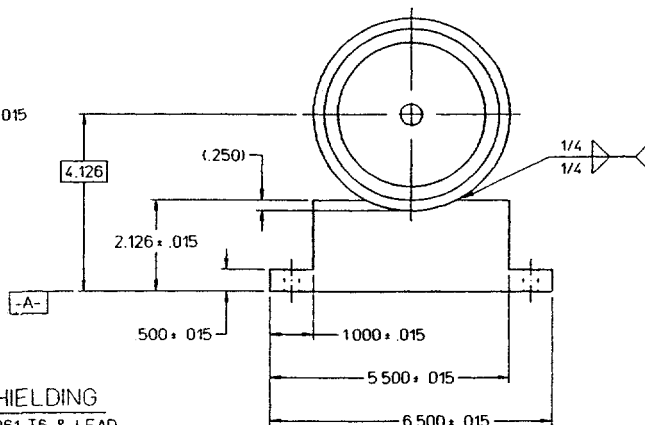
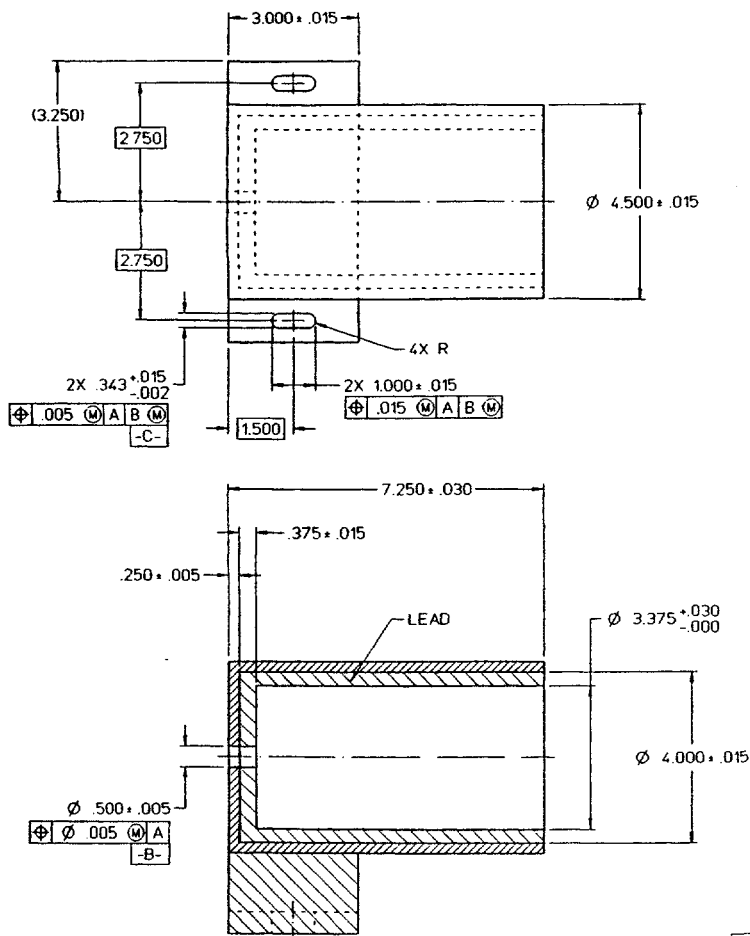
427 CABLE CLAMP
MATL: ALUMINUM 6061-T6
SCALE: 1/2
REOD: 2



404 DETECTOR SHIELDING
MATL. ALUMINUM 6061-T6 & LEAD
SCALE: 1/2
REOD: ONE



PART NUMBER			PARTS LIST		
PREFIX NUMBER	ITEM NUMBER	NUMBER REQD	DESCRIPTION		



405 DETECTOR SHIELDING
MATL ALUMINUM 6061-T6 & LEAD
SCALE 1/2
REQD ONE

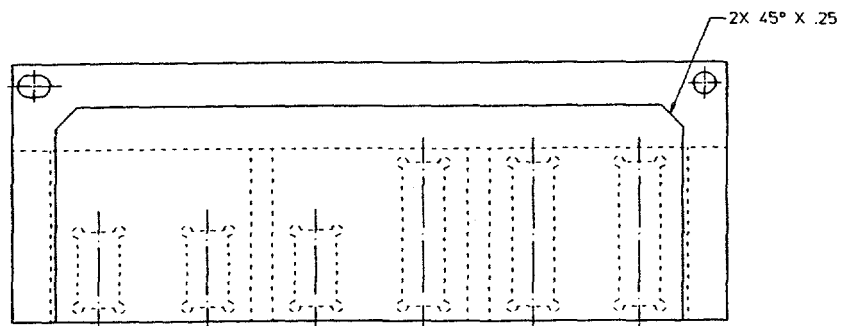
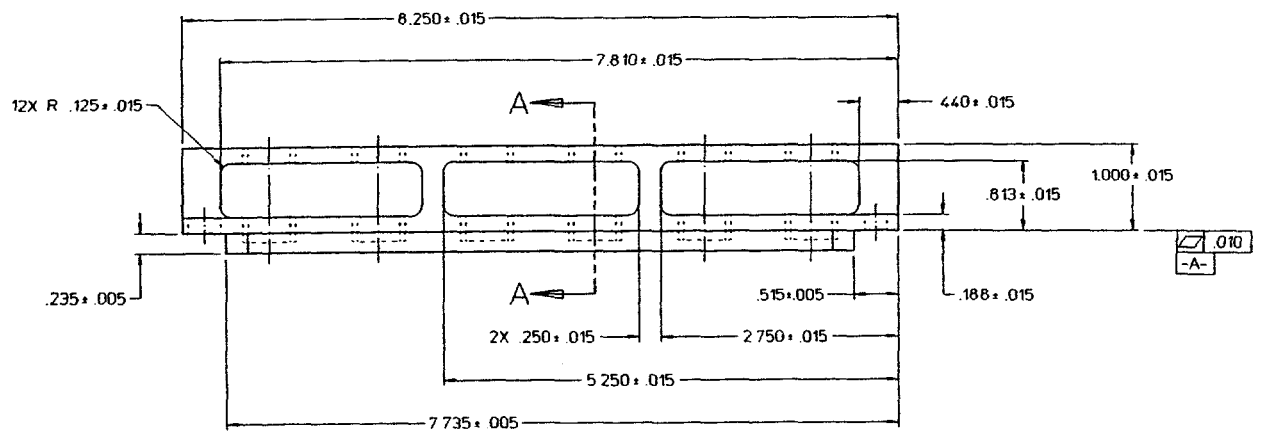
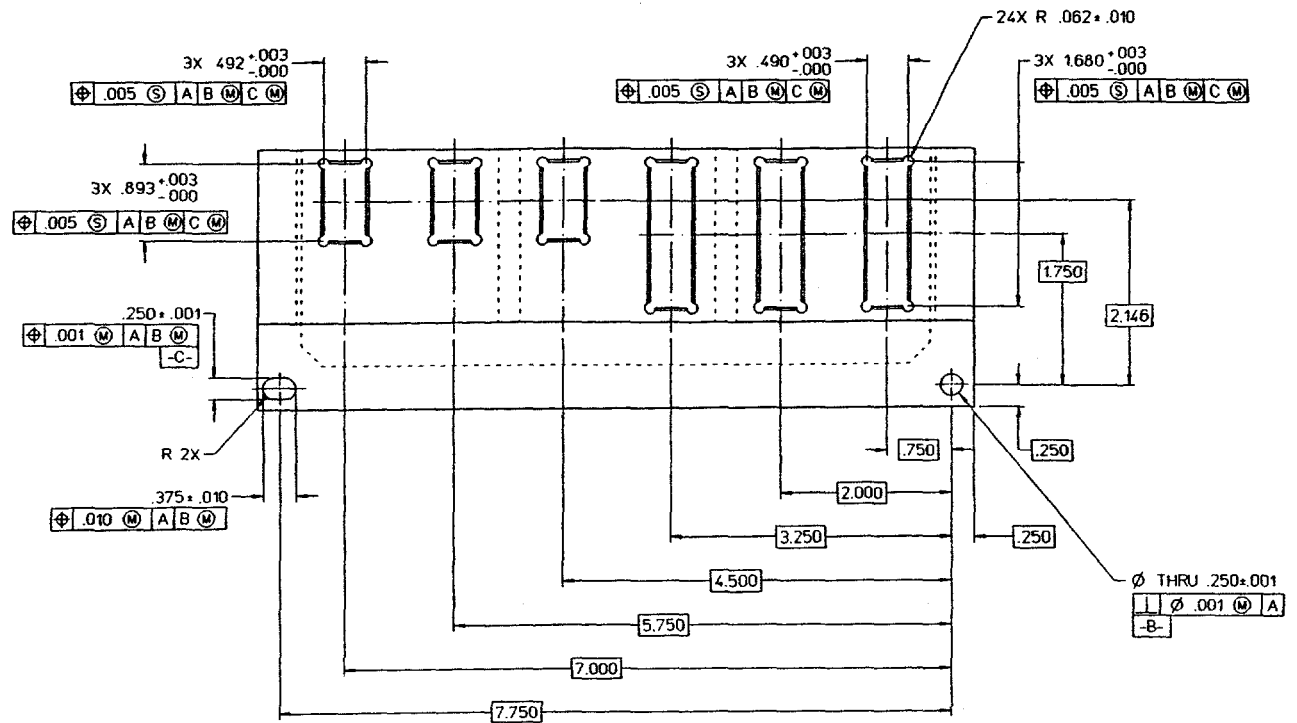
NOTE:

- PARTS 404 AND 405 ARE TO BE PAINTED WITH #RAL 9001 DRYLAC POWDER COATING

GENERAL NOTES - UNLESS OTHERWISE NOTED

- ALL DIMENSIONS IN INCHES
- BREAK ALL SHARP EDGES
- CSK .07" ALL TAPPED HOLES TO MAJOR DIAMETER
- CSK .07" x .030 DEEP ALL DRILLED HOLES
- DIMENSIONING & POSITIONAL TOLERANCING PER ANSI Y14.5M-1992
- WELDING SYMBOLS PER ANSI A2.4-76
- SURFACE TEXTURE PER ANSI B46.1-1978

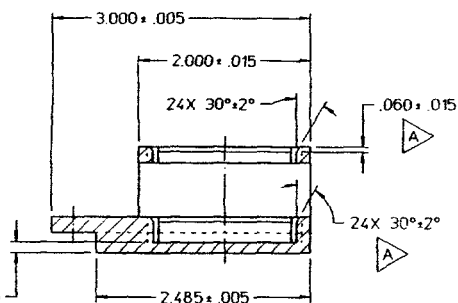
ORIGINAL ISSUE							
REVISION LETTER	CLASS REVIEW	DATE	CHANGED BY	CHECKED BY	APPROVED BY		
Los Alamos LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS, NEW MEXICO 87545				CLASSIFICATION OF PART UNCLASSIFIED TITLE BLOCK UNCLASSIFIED			
PARTS 404, 405, 426, 427				TITLE JAERI HYBRID SYSTEM			
ORIGINATED	G. WALTON	10-25-91	N-1	TOLERANCE - UNLESS OTHERWISE NOTED			
DRAWN	G. WALTON	10-25-91	N-1	X=1 0.XX=1 ANGULAR=1			
CHECKED	L. POLLAT	12-13-91	N-1	0.X=1 0.XXX=1 FINISH=			
PROJ ENGR	S.T.HSUE	12-13-91	N-1	SCALE TOTAL SHEETS DRAWING NO. SHEET NO.			
APPROVED	S.T.HSUE	12-13-91	N-1	NOTED 68Y-155787 D 23			
RELEASED	L. POLLAT	12-13-91	N-1				



145

COMBINA
MATL DELIN
SCALE 1/1
REOD: ONE

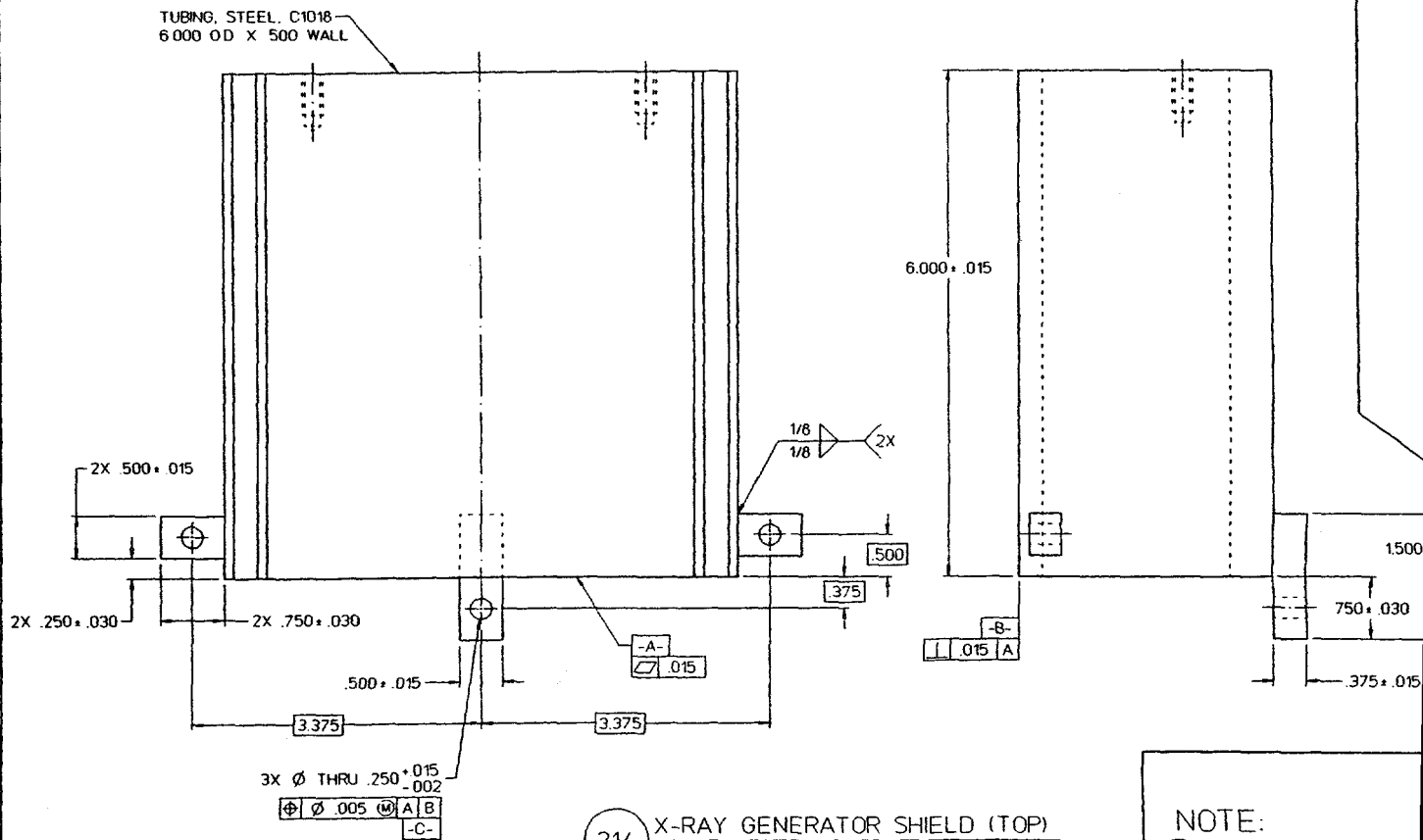
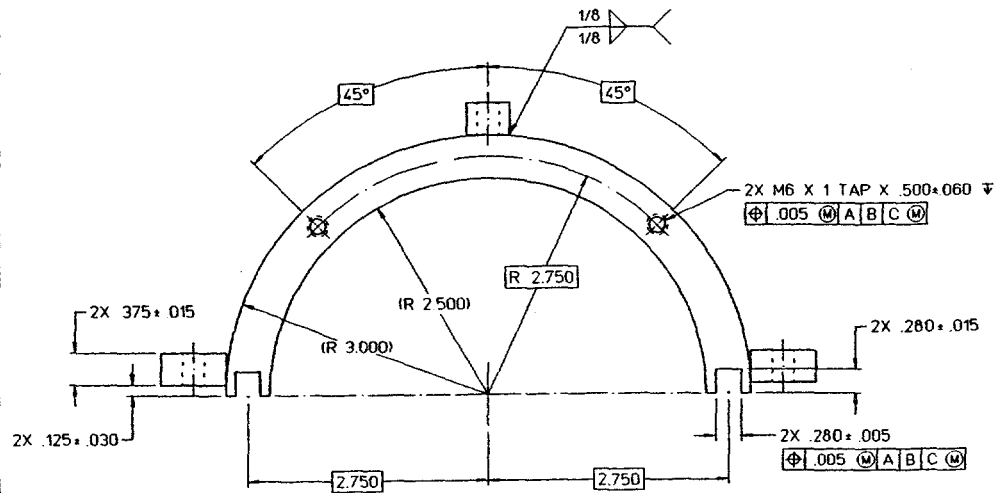
PART NUMBER			PARTS LIST		
PREFIX NUMBER	ITEM NUMBER	NUMBER REQD	DESCRIPTION		



SECTION A-A

ON VIAL TRAY
(WHITE)

A	XP	ADDED CHAMFERS	8-4-93	WALTON	XP	XP
-	XP	ORIGINAL ISSUE	-	-	-	-
REVISION LETTER	CLASS REVIEW	REVISIONS	DATE	CHANGED BY	CHECKED BY	APPROVED BY
Los Alamos LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS, NEW MEXICO 87545			CLASSIFICATION OF PART UNCLASSIFIED TITLE BLOCK UNCLASSIFIED			
PART 145			TITLE JAERI HYBRID SYSTEM			
GENERAL NOTES (UNLESS OTHERWISE NOTED) 1. ALL DIMENSIONS IN INCHES 2. BREAK ALL SHARP EDGES 3. CSK .02" ALL TAPPED HOLES TO MAJOR DIAMETER 4. CSK .02" x .030 DEEP ALL DRILLED HOLES 5. DIMENSIONING & POSITIONAL TOLERANCING PER ANSI Y14.5M-1987 6. WELDING SYMBOLS PER ANSI A2.4-76 7. SURFACE TEXTURE PER ANSI B46.1-1978			TOLERANCE (UNLESS OTHERWISE NOTED) X ± .005 0.XX ± .005 ANGULAR ± .005 0.X ± .005 0.XXX ± .005 FINISH ± .005			
ORIGINATED	G. WALTON	3-5-92	N-1	SCALE	TOTAL SHEETS	DRAWING NO.
DRAWN	G. WALTON	3-5-92	N-1	NOTED		68Y-155787
CHECKED	L. POLLAT	12-13-91	N-1			
PROJ. ENGR.	S. T. HSUE	12-13-91	N-1			
APPROVED	S. T. HSUE	12-13-91	N-1			
RELEASED	L. POLLAT	12-13-91	N-1			
						SHEET NO. 24



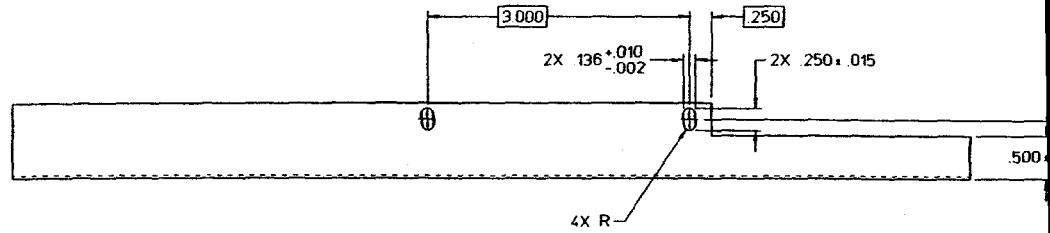
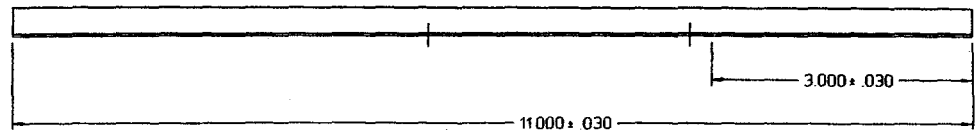
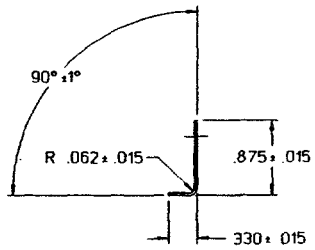
214

X-RAY GENERATOR SHIELD (TOP)

MATL. CARBON STEEL, C1018 AND NOTED
 RECD: ONE
 SCALE: 1/1

NOTE:

① PARTS 214 AND 215 ARE



146

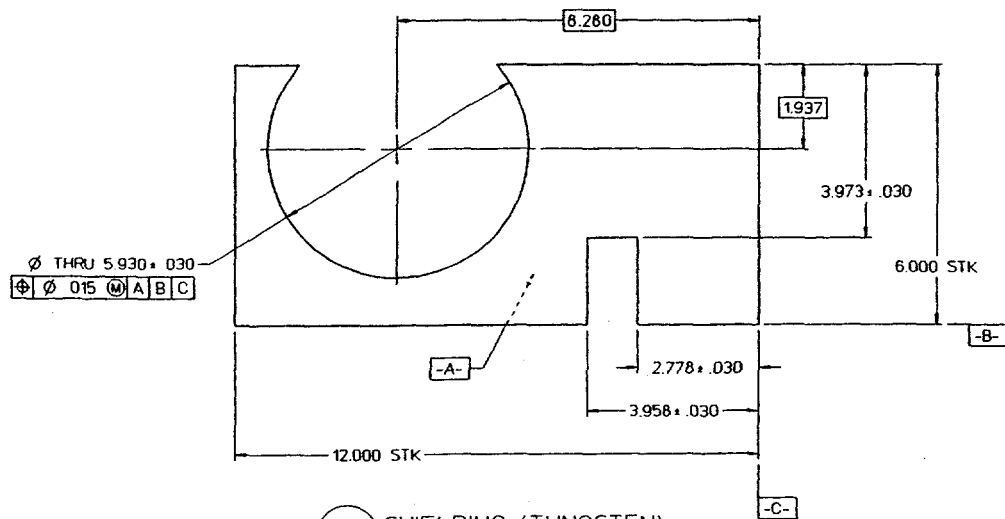
SWITCHBOARD TRIP FLAG

MATL. STAINLESS STL SHT. TYPE 316. 031 STK
REOD. ONE
SCALE. 1/1

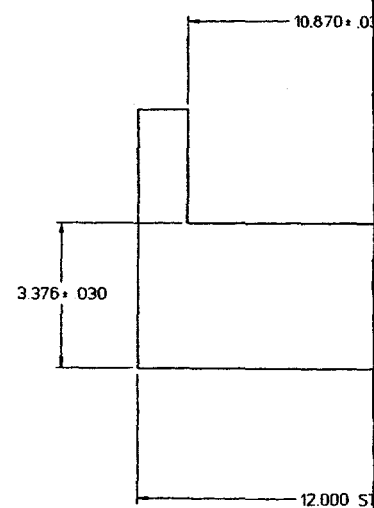
015 685

PART NUMBER			PARTS LIST	
PREFIX NUMBER	ITEM NUMBER	NUMBER RECD	DESCRIPTION	

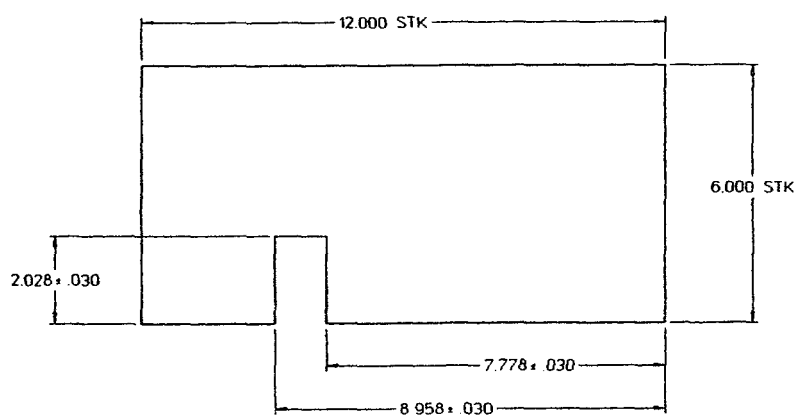
—		SP		ORIGINAL ISSUE		—		—		—		—	
REVISION LETTER	CLASS REVIEW	REVISIONS				DATE	CHANGED BY	CHECKED BY	APPROVED BY				
Los Alamos LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS NEW MEXICO 87545						CLASSIFICATION OF DRAWING UNCLASSIFIED							
						PART UNCLASSIFIED TITLE BLOCK UNCLASSIFIED							
						TITLE							
PART 146						JAERI HYBRID SYSTEM							
GENERAL NOTES: UNLESS OTHERWISE NOTED 1. ALL DIMENSIONS IN INCHES 2. BREAK ALL SHARP EDGES 3. CSK .875" ALL TAPPED HOLES TO MAJOR DIAMETER 4. CSK .937" x .030 DEEP ALL DRILLED HOLES 5. DIMENSIONING & POSITIONAL TOLERANCING PER ANSI Y14.5M-1992 6. WELDING SYMBOLS PER ANSI/ASME A2.4-76 7. SURFACE TEXTURE PER ANSI B46.1-1978						TOLERANCE UNLESS OTHERWISE NOTED							
						X=.2 ——— D.XX=.1 ——— ANGULAR=.1 ———							
						O X=.2 ——— D.XXX=.1 ——— FINISH ———							
						SCALE TOTAL DRAWING NO SHEET							
NOTED	SHEETS	68Y-155787		D		26							
ORIGINATED	O. WALTON	11-6-92	N-1										
DRAWN	O. WALTON	11-6-92	N-1										
CHECKED	L. POLLAT	11-6-92	N-1										
PROJ ENGR	S. T. HSUE	11-6-92	N-1										
APPROVED	S. T. HSUE	11-6-92	N-1										
RELEASED	L. POLLAT	11-6-92	N-1										



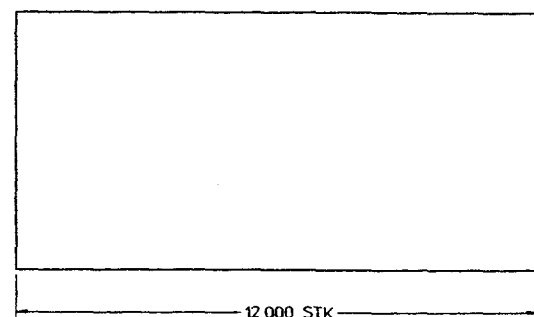
147 SHIELDING (TUNGSTEN)
MATL: TUNGSTEN SHEET, .030 THK
REOD: ONE
SCALE: 1/2



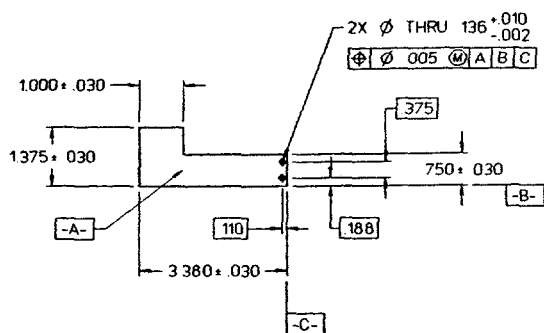
148 SHIELDING (TUNGSTEN)
MATL: TUNGSTEN SHEET, .030 THK
REOD: ONE
SCALE: 1/2



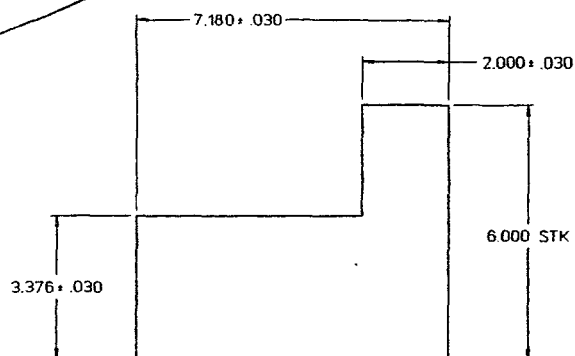
150 SHIELDING (TUNGSTEN)
MATL: TUNGSTEN SHEET, .030 THK
REOD: 2
SCALE: 1/2



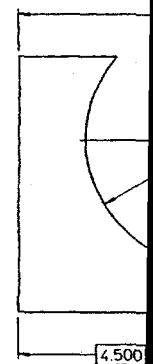
151 SHIELDING (TUNGSTEN)
MATL: TUNGSTEN SHEET, .030 THK
REOD: ONE
SCALE: 1/2



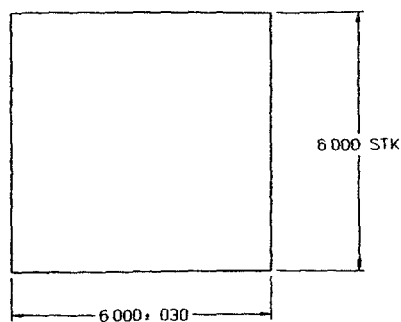
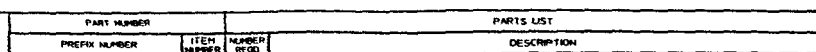
154 SHIELDING (TUNGSTEN)
MATL: TUNGSTEN SHEET, .030 THK
REOD: 2
SCALE: 1/2



155 SHIELDING (TUNGSTEN)
MATL: TUNGSTEN SHEET, .020 THK
REOD: ONE
SCALE: 1/2



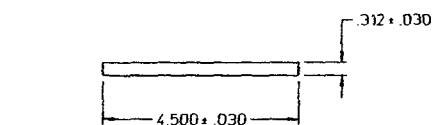
156 SHIELDING (TUNGSTEN)
MATL: TUNGSTEN SHEET, .020 THK
REOD: ONE
SCALE: 1/2



149

MATL TUNGSTEN SHEET. 030 THK
 REOD: ONE
 SCALE: 1/2

NG (TUNGSTEN)
GSTEN SHEET, 030 THK



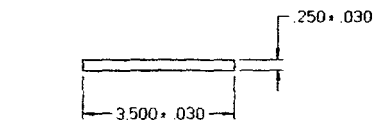
A

157

MATL: TUNGSTEN SHEET, .020 THK
REQD: 2
SCALE: 1/2

152

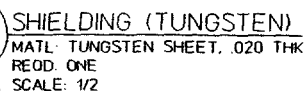
MATL: TUNGSTEN SHEET, .030 THK
RECD: ONE
SCALE: 1/2



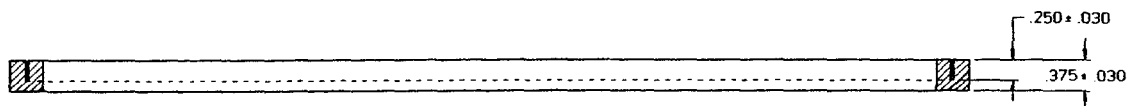
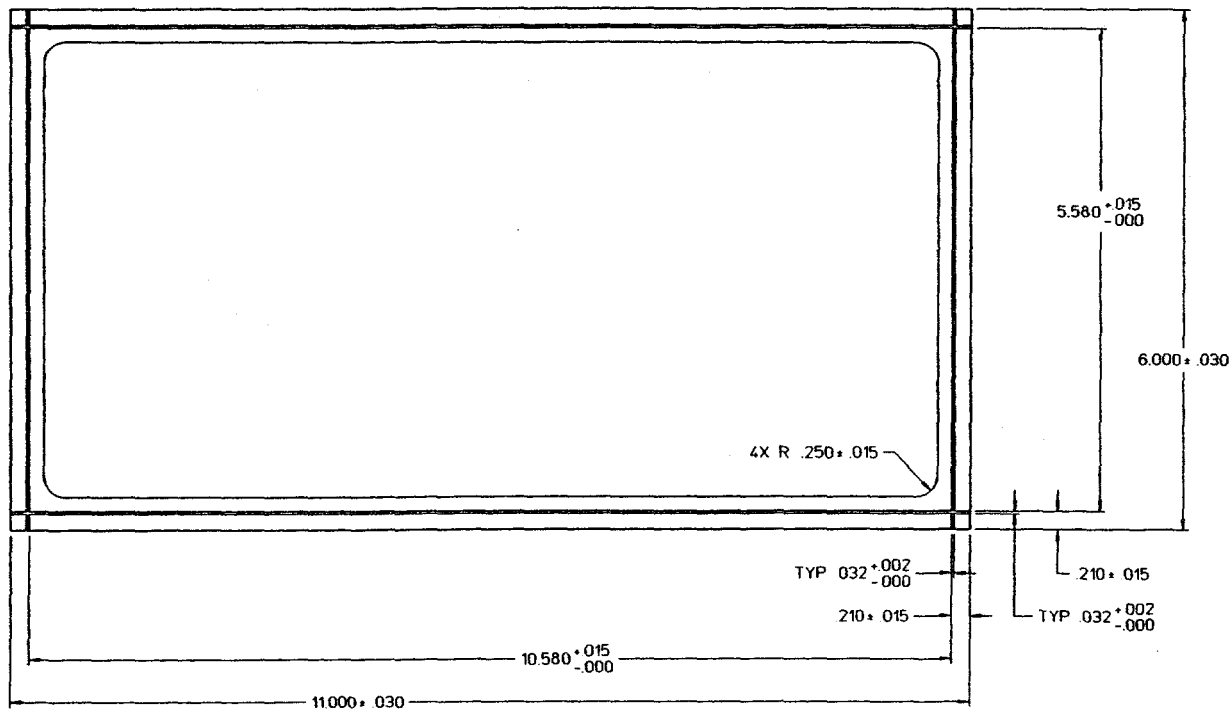
$\triangleleft$

158

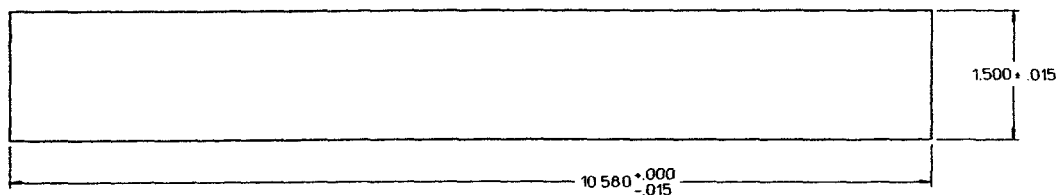
MATL TUNGSTEN SHEET, .020 THK
REQD. 2
SCALE: 1/2



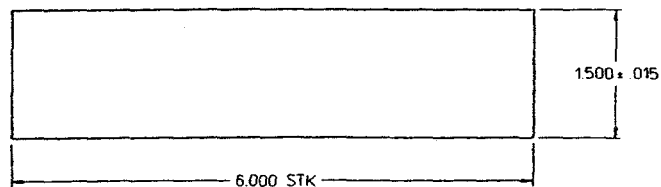
A	SP	ADDED PARTS 153,154,155 AND 156		8-4-93	WALTON	SP	SP
—	SP	ORIGINAL ISSUE		—	—	—	—
PREVIEW LETTER	CLASS REVIEW	REVISIONS		DATE	CHANGED BY	CHECKED BY	APPROVED BY
Los Alamos LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS NEW MEXICO 87545				CLASSIFICATION OF			
				DRAWING UNCLASSIFIED			
				PART UNCLASSIFIED		TITLE BLOCK UNCLASSIFIED	
				TITLE			
JAERI HYBRID SYSTEM							
PARTS 147,148,149,150,151,152,154 155,156,157,158							
	SIGNATURE	DATE	GROUP				
ORIGINATED	G.WALTON	11-18-92	N-1				
DRAWN	G.WALTON	11-18-92	N-1				
CHECKED	L.POLLAT	11-11	N-1				
PROJ. ENGR	S.T.HSUE	11-18-92	N-1				
APPROVED	S.T.HSUE	11-18-92	N-1				
RELEASED	L.POLLAT	11-18-92	N-1				
				TOLERANCE—UNLESS OTHERWISE NOTED			
				K=± _____ D.XXX=± _____ ANGLES—°—'—" _____			
				Q X=± _____ FINISH= _____			
SCALE		TOTAL SHEETS		DRAWING NO		SHEET NO.	
1/2				68Y-155787		SIZE: 27 D 27	



501 SUPPORT RING
MATL: ALUMINUM 6061-T6
REOD: ONE
SCALE: 1/1



502 RING SHIELD
MATL: TUNGSTEN SHEET, .030 THK
REOD: 2
SCALE: 1/1



503 RING SHIELD
MATL: TUNGSTEN SHEET, .030 THK
REOD: 2
SCALE: 1/1

PART NUMBER			PARTS LIST	
PREFIX NUMBER	ITEM NUMBER	NUMBER REQD	DESCRIPTION	

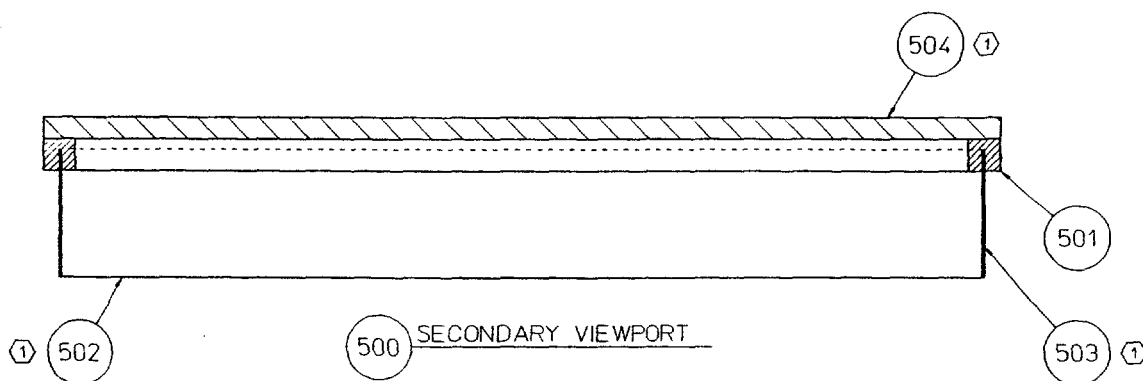
L EDGES AND CORNERS

NOTE: LEAD GLASS CAN BE PURCHASED FROM TA-55 STOCK AND CUT TO SIZE BY NETUSCHIL GLASS COMPANY LOCATED IN LOS ALAMOS.

6 000 ± .030

504 VIEWPORT LEAD GLASS
MATL LEAD GLASS, 1/4 THK
REQD. ONE
SCALE: 1/1

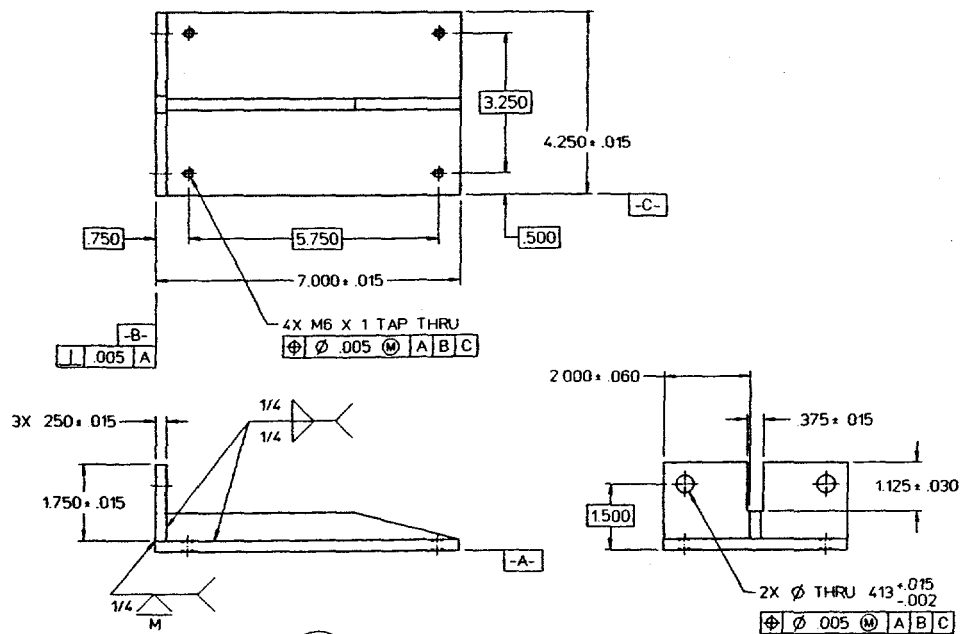
11 000 ± .030



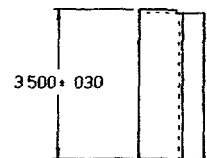
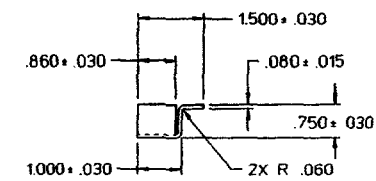
NOTE:

- ① PARTS 502, 503 AND 504 ARE TO BE MOUNTED TO PART 501 WITH EPOXY ADHESIVE OR EQUIVALENT.

REVISION LETTER		CLASS REVIEW		ORIGINAL ISSUE				REVISIONS				DATE	CHANGED BY	CHECKED BY	APPROVED BY
Los Alamos LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS, NEW MEXICO 87545				CLASSIFICATION OF DRAWING: UNCLASSIFIED											
SUB-ASSEMBLY 500 PARTS 501, 502, 503, 504				PART UNCLASSIFIED TITLE BLOCK UNCLASSIFIED											
				TITLE JAERI HYBRID SYSTEM											
GENERAL NOTES - UNLESS OTHERWISE NOTED				TOLERANCE - UNLESS OTHERWISE NOTED											
1. ALL DIMENSIONS IN INCHES				X ± .005											
2. BREAK ALL SHARP EDGES				O .XX ± .005											
3. CSK .02" ALL TAPPED HOLES TO MAJOR DIAMETER				ANGLE .AR ± .005											
4. CSK .02" x .030 DEEP ALL DRILLED HOLES				O .XX ± .005											
5. DIMENSIONS & POSITIONAL TOLERANCING PER ANSI Y14.5M-1987				FRESH ± .005											
6. WELDING SYMBOLS PER ANSI A2.4-76				SCALE TOTAL SHEETS DRAWING NO. SHEET NO.											
7. SURFACE TEXTURE PER ANSI B46.1-1978				NOTED 68Y-155787 D 28											
ORIGINATED	G. WALTON	11-30-92	N-1												
DRAWN	G. WALTON	11-30-92	N-1												
CHECKED	L. POLLAT	11-30-92	N-1												
PROJ. ENGR.	S. T. HSUE	11-30-92	N-1												
APPROVED	S. T. HSUE	11-30-92	N-1												
RELEASED	L. POLLAT	11-30-92	N-1												

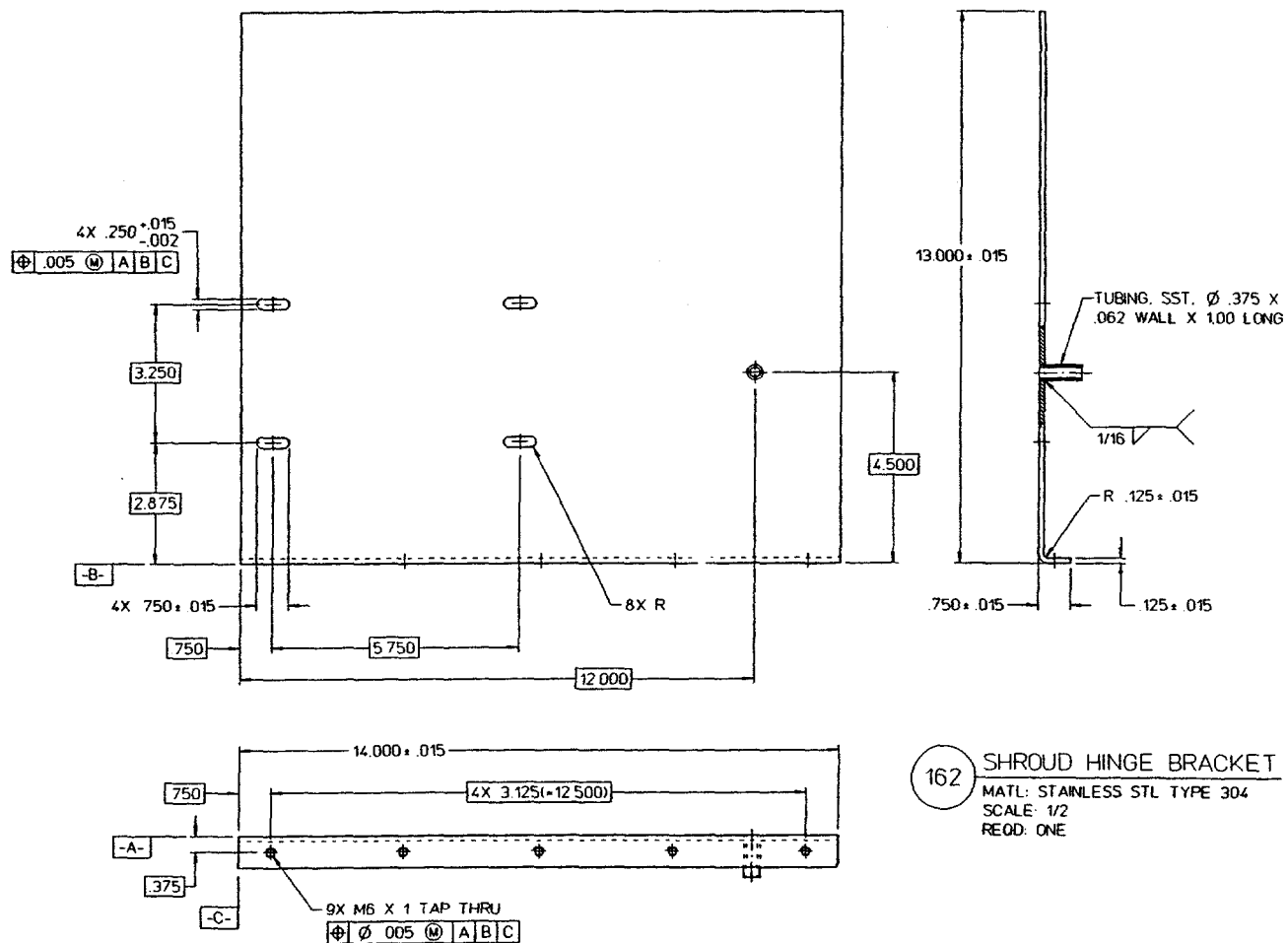


161 SHROUD SUPPORT BRACKET
 MATL. STAINLESS STL TYPE 304
 SCALE: 1/2
 REOD. ONE



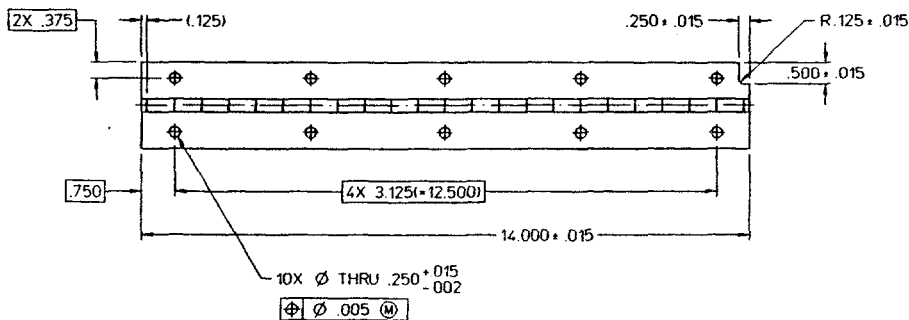
159 SHIELD (RIGHT HAND)
 MATL: TIN
 SCALE: 1/2
 REOD. ONE

160 SHIELD (LEFT HAND)
 MATL: TIN
 SCALE: 1/2
 REOD. ONE



162 SHROUD HINGE BRACKET
 MATL: STAINLESS STL TYPE 304
 SCALE: 1/2
 REOD. ONE

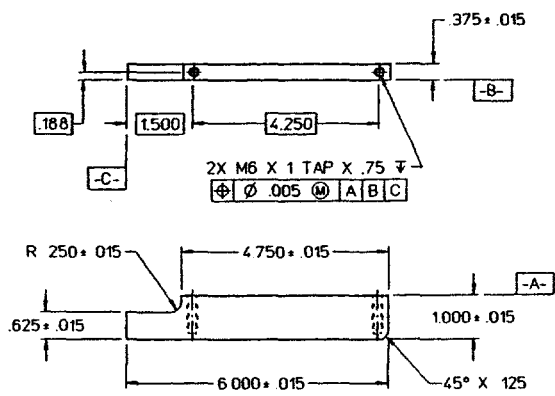
PART NUMBER			PARTS LIST	
PREFIX NUMBER	ITEM NUMBER	NUMBER RECD	DESCRIPTION	



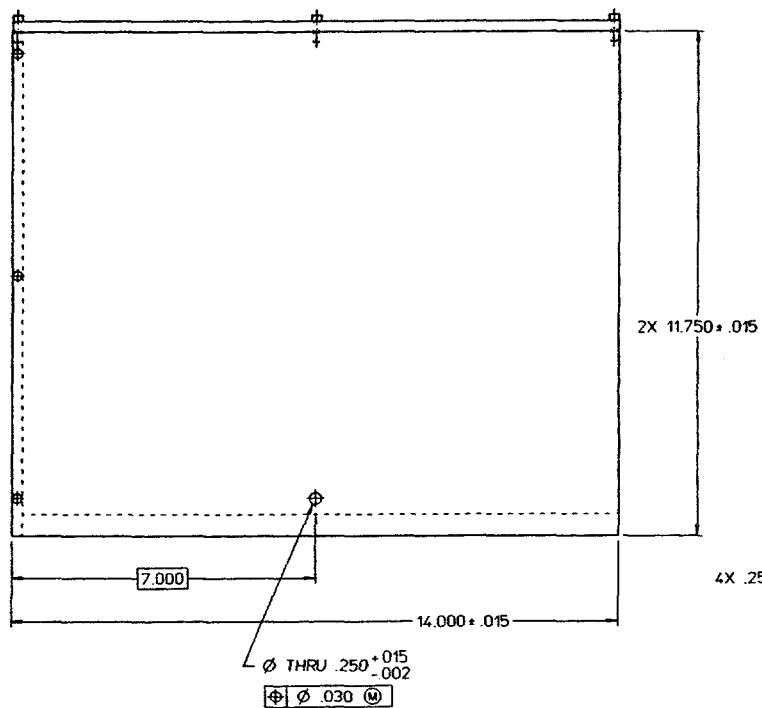
163 SHROUD HINGE
MATL HINGE, STAINLESS STL TYPE 304
2.00 WIDE WITH .187 DIA PIN
SCALE: 1/2
RECD: ONE

ORIGINAL ISSUE		DATE		CHANGED BY	CHECKED BY	APPROVED BY
REVISION LETTER	CLASS REVIEW	REVISIONS				
Los Alamos LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS, NEW MEXICO 87545		CLASSIFICATION OF DRAWING: UNCLASSIFIED				
PARTS 159,160,161,162,163		PART UNCLASSIFIED TITLE BLOCK UNCLASSIFIED				
TITLE JAERI HYBRID SYSTEM						
TOLERANCE-UNLESS OTHERWISE NOTED						
X ± .001 0.XX ± .001 ANGULAR ± .001						
0.X ± .001 0.XXX ± .001 FINISH						
SCALE	TOTAL SHEETS	DRAWING NO.	SHEET NO.			
NOTED		68Y-155787	D 29			

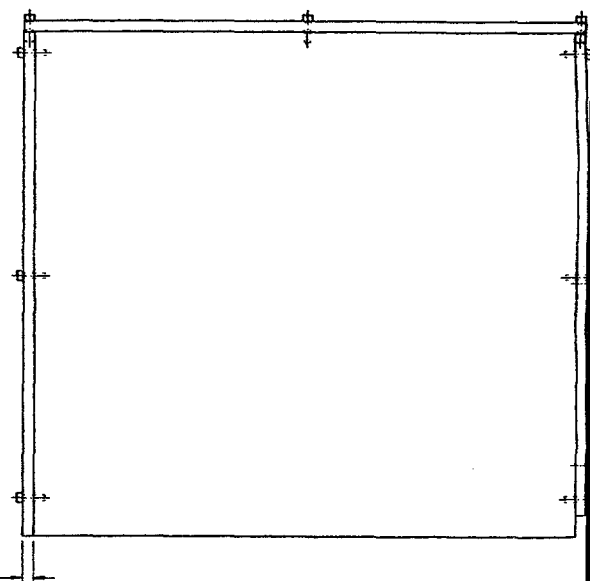
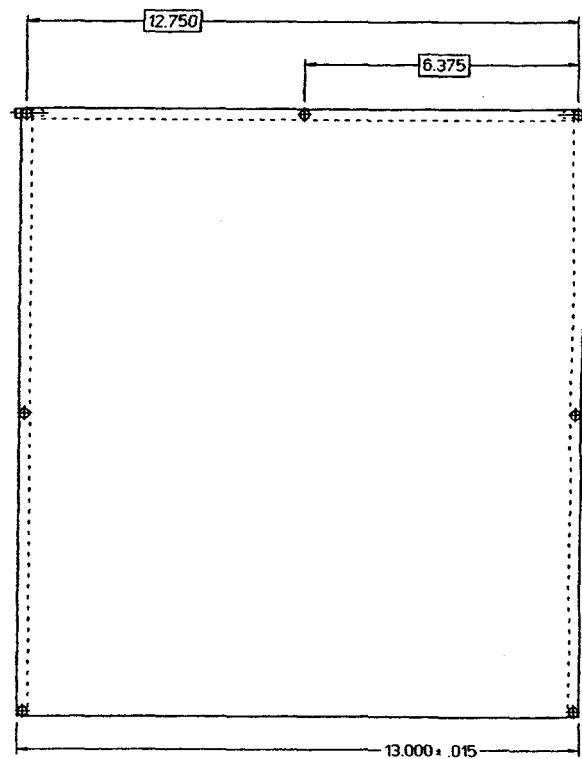
- GENERAL NOTES: (UNLESS OTHERWISE NOTED)
1. ALL DIMENSIONS IN INCHES
 2. BREAK ALL SHARP EDGES
 3. CSK .02" ALL TAPPED HOLES TO MAJOR DIAMETER
 4. CSK .02" x .030 DEEP ALL DRILLED HOLES
 5. DIMENSIONING & POSITIONAL TOLERANCING PER ANSI Y14.5M-1987
 6. WELDING SYMBOLS PER AWS A2.4-76
 7. SURFACE TEXTURE PER ANSI B46.1-1978



165 PIVOT STOP
 MATL. STAINLESS STL TYPE 304
 SCALE: 1/2
 REDO: ONE

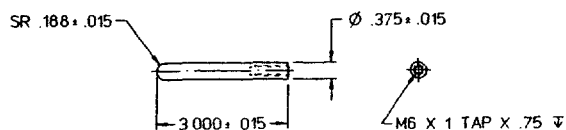


164 LEXAN SHROUD
 MATL LEXAN POLYCARBONATE, .25 THK
 SCALE: 1/2
 REDO: ONE

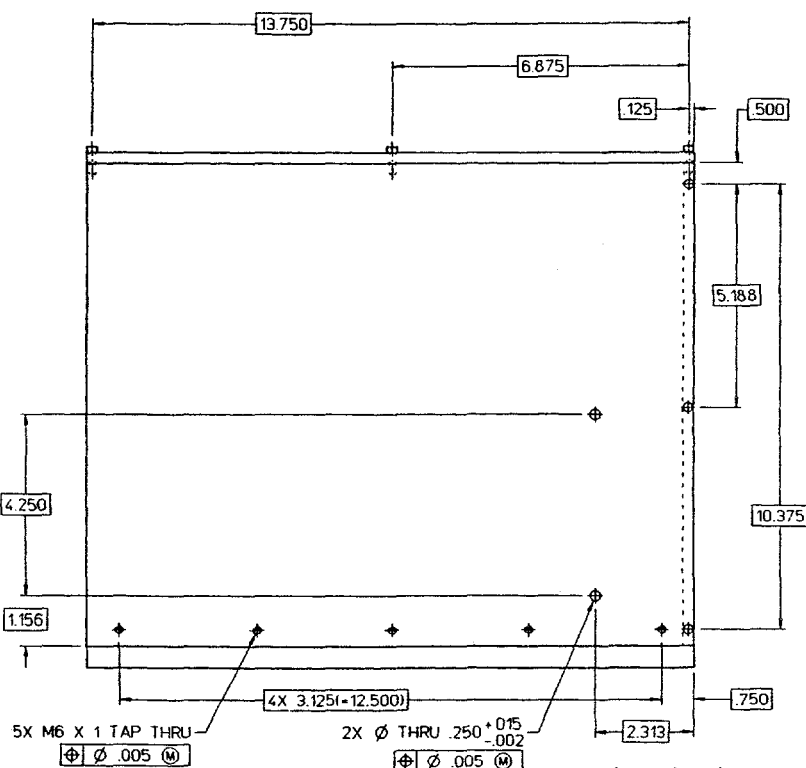


125

13X M3 X 5 X 15mm LONG
SST SOC HD CAP SCR



166 SHROUD HANDLE
MATL: STAINLESS STL TYPE 304
SCALE: 1/2
REDO: ONE



ORIGINAL ISSUE				REVISIONS			
REVISION LETTER	CLASS REVIEW	DATE	CHANGED BY	DATE	CHANGED BY	CHECKED BY	APPROVED BY
Los Alamos LOS ALAMOS NATIONAL LABORATORY LOS ALAMOS NEW MEXICO 87545				CLASSIFICATION OF DRAWING UNCLASSIFIED			
PART 164,165,166				PART: UNCLASSIFIED TITLE BLOCK UNCLASSIFIED			
TITLE JAERI HYBRID SYSTEM				TOLERANCE - UNLESS OTHERWISE NOTED			
GENERAL NOTES - UNLESS OTHERWISE NOTED: 1. ALL DIMENSIONS IN INCHES 2. BREAK ALL SHARP EDGES 3. CSK 8° ALL TAPPED HOLES TO MAJOR DIAMETER 4. CSK 6° x .030 DEEP ALL DRILLED HOLES 5. DIMENSIONS & POSITIONAL TOLERANCES PER AND Y14.5M-1997 6. WELDING SYMBOLS PER ANSI/A2.4-76 7. SURFACE TEXTURE PER AND D40.1-1978				X=1 0.3X=1 ANGULAR=1 0.3X=1 0.3X=1 FINISH=			
SCALE NOTED				TOTAL SHEETS 68Y-155787			
NOTED				SHEET NO. 30			