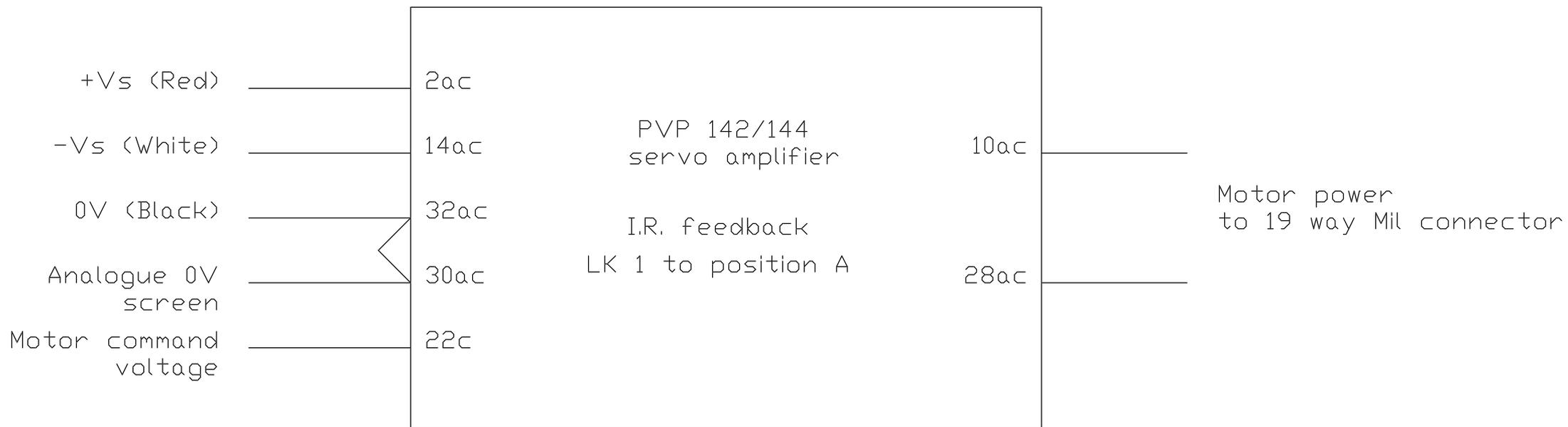
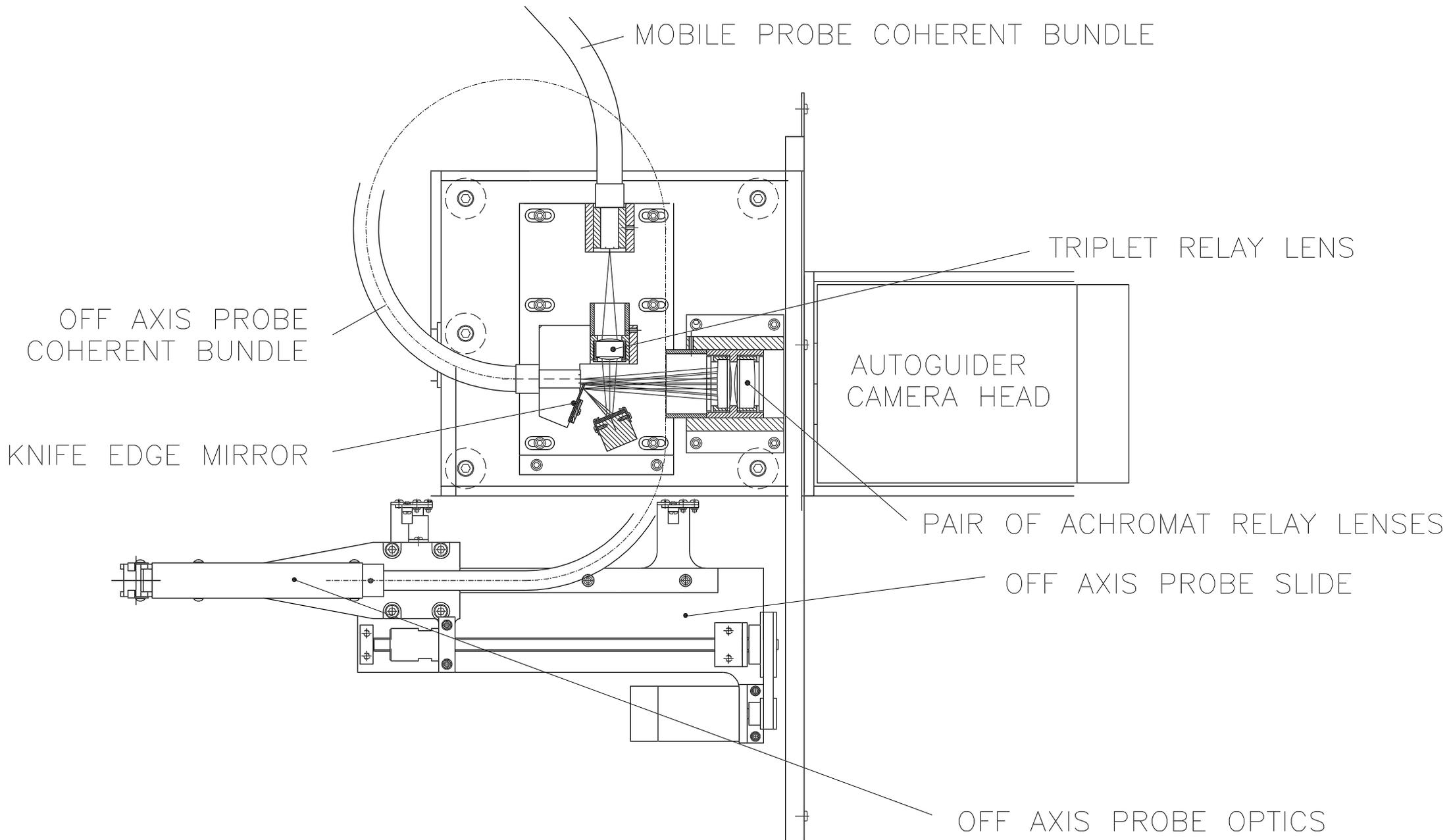


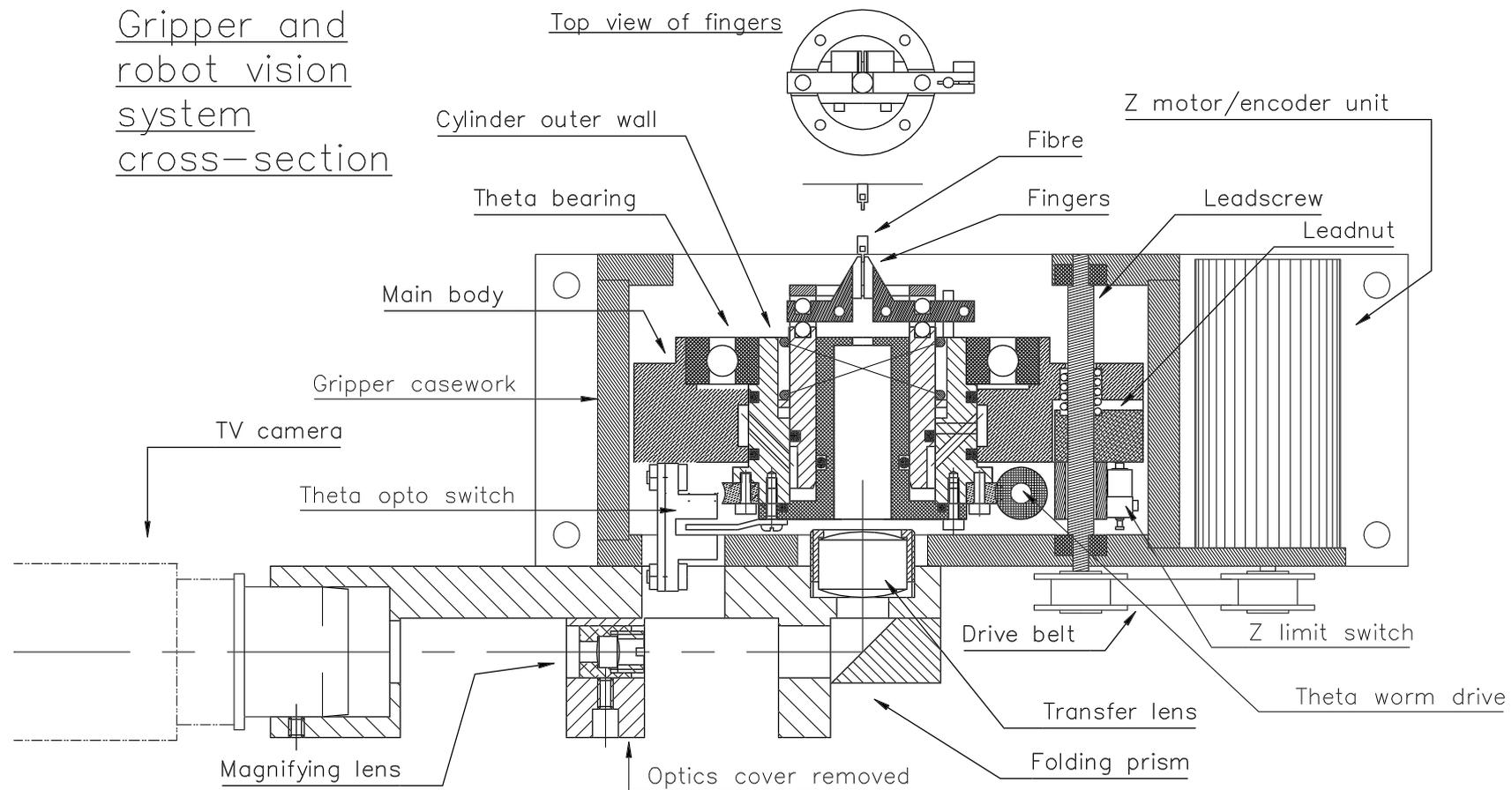
Figure 4 Power amplifier connections

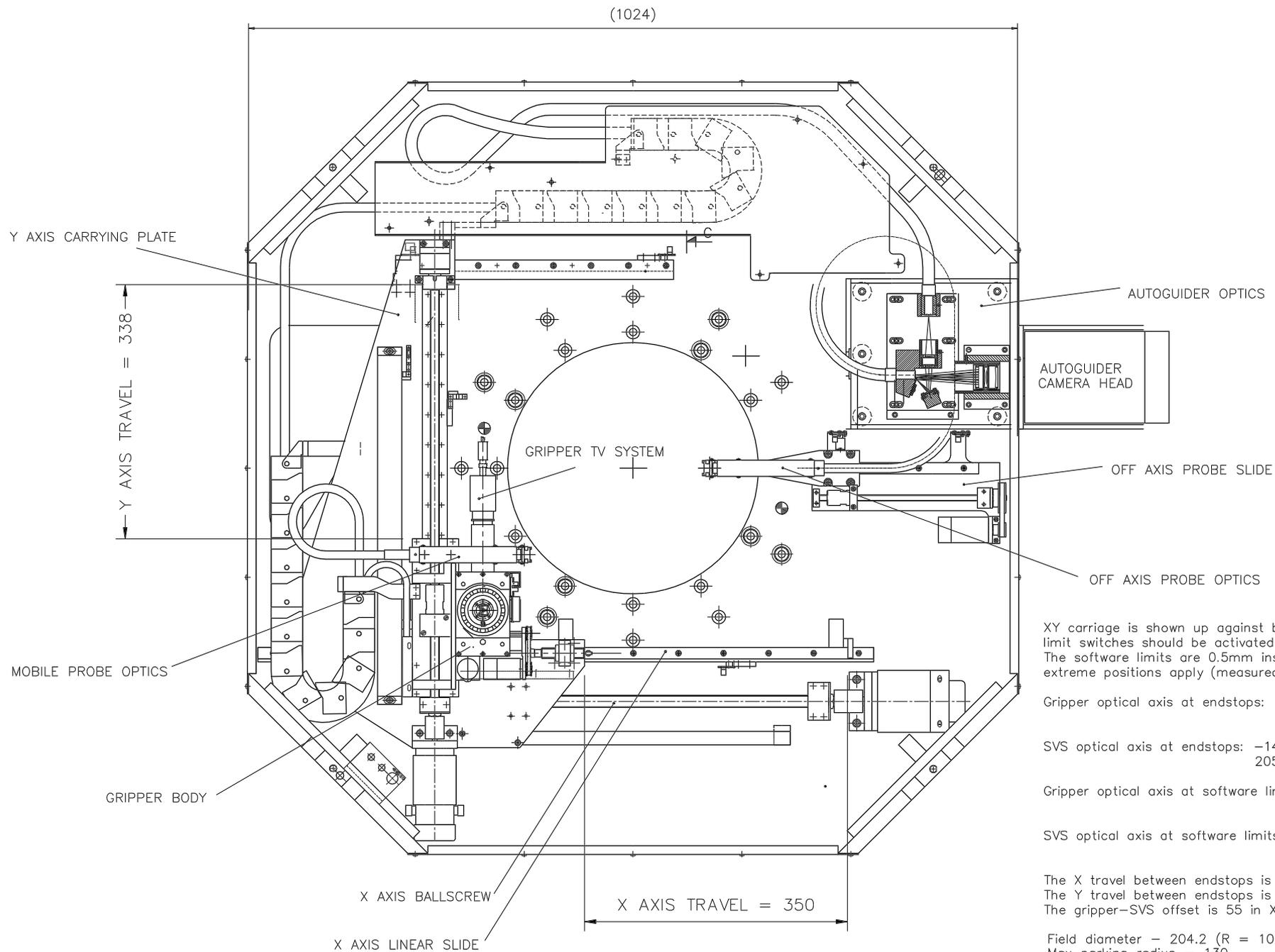


1. Pins 30ac and 32ac must be connected
2. Pins 22c and 30ac are a miniature coax cable from the 10 way Mil connector



Gripper and robot vision system cross-section





XY carriage is shown up against bottom left end stops. In operation the limit switches should be activated 10mm before the endstops are reached. The software limits are 0.5mm inside the limit switches. The following extreme positions apply (measured from the instrument centre).

Gripper optical axis at endstops: -200,-189 bottom left
150,149 top right

SVS optical axis at endstops: -145,-115 bottom left
205,223 top right

Gripper optical axis at software limits: -189.5,-178.5 bottom left
139.5,138.5 top right

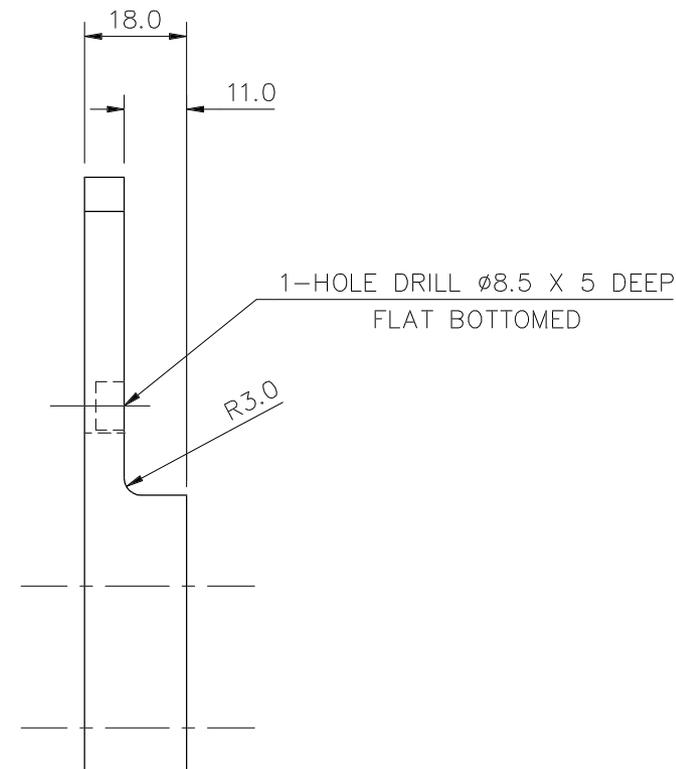
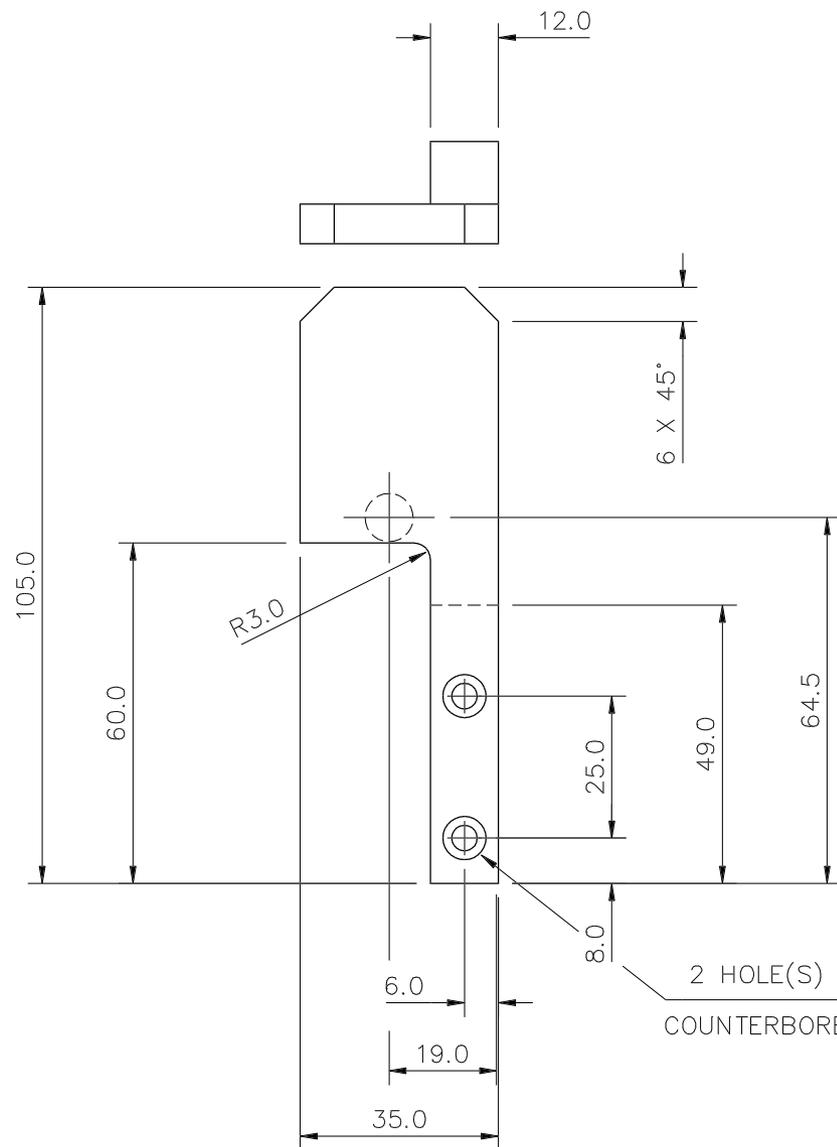
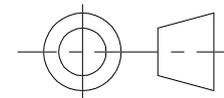
SVS optical axis at software limits: -134.5,-104.5 bottom left
194.5,212.5 top left

The X travel between endstops is 350
The Y travel between endstops is 338
The gripper-SVS offset is 55 in X and 74 in Y

Field diameter - 204.2 (R = 102.1)
Max parking radius - 130

DO NOT SCALE

THIRD ANGLE PROJECTION

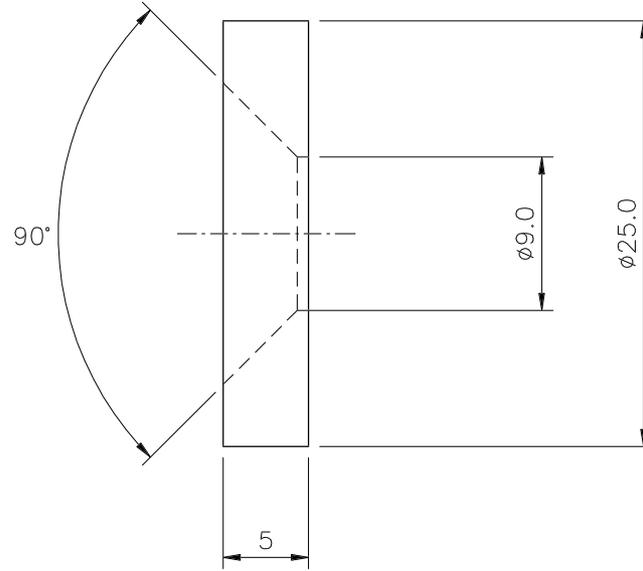
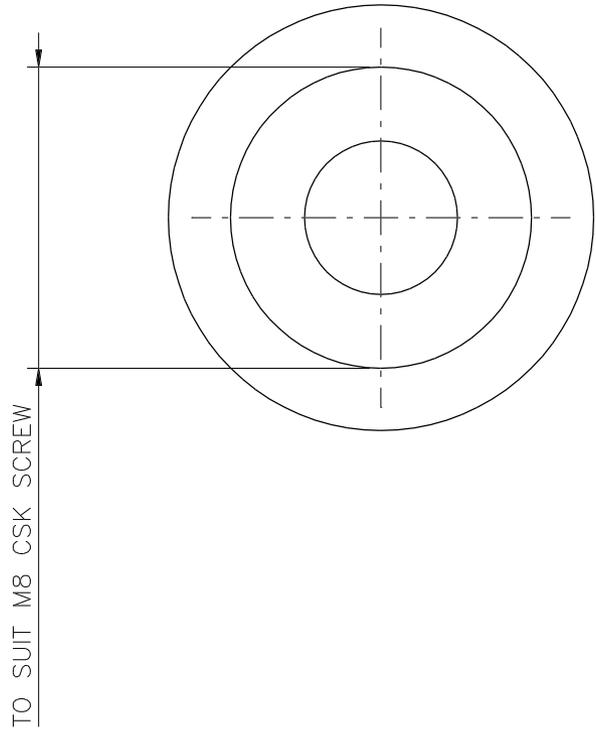
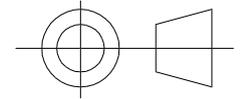


DRG. TITLE:		DETAIL OF END STOP RIGHT HAND	
SCALES:	1:1	ASTRONOMICAL INSTRUMENTATION GROUP DURHAM UNIVERSITY, PHYSICS DEPARTMENT SCIENCE LABS, SOUTH ROAD, DURHAM, DL1 3LE TEL. (091) 374 2107 & 2108	
DRG. TYPE:	PARTS	THIS DRAWING IS THE PROPERTY OF THE ASTRONOMICAL INSTRUMENTATION GROUP, DURHAM UNIVERSITY, PHYSICS DEPT. IT MUST NOT BE COPIED OR LENT WITHOUT THE CONSENT OF THE INSTRUMENTATION GROUP	DRG. SIZE A3
DRAWN BY:	AJ		
DATE	09/04/91	DRAWING No.	AF2\BPS-09
Quantity: 1 OFF		REV.	B

ALL DIMENSIONS IN MM UNLESS OTHERWISE STATED			
IMPLIED TOLERANCES		Material:	
X (OVER 100) ±0.20		AL ALLOY	
X (UP TO 100) ±0.1		Quantity: 1 OFF	
X.X ±0.10			
X.XX ±0.05			
B	LENGTH & THICKNESS ALTERED	GD	20/01/93
ISSUE	REVISION	DRN	DATE

DO NOT SCALE

THIRD ANGLE PROJECTION

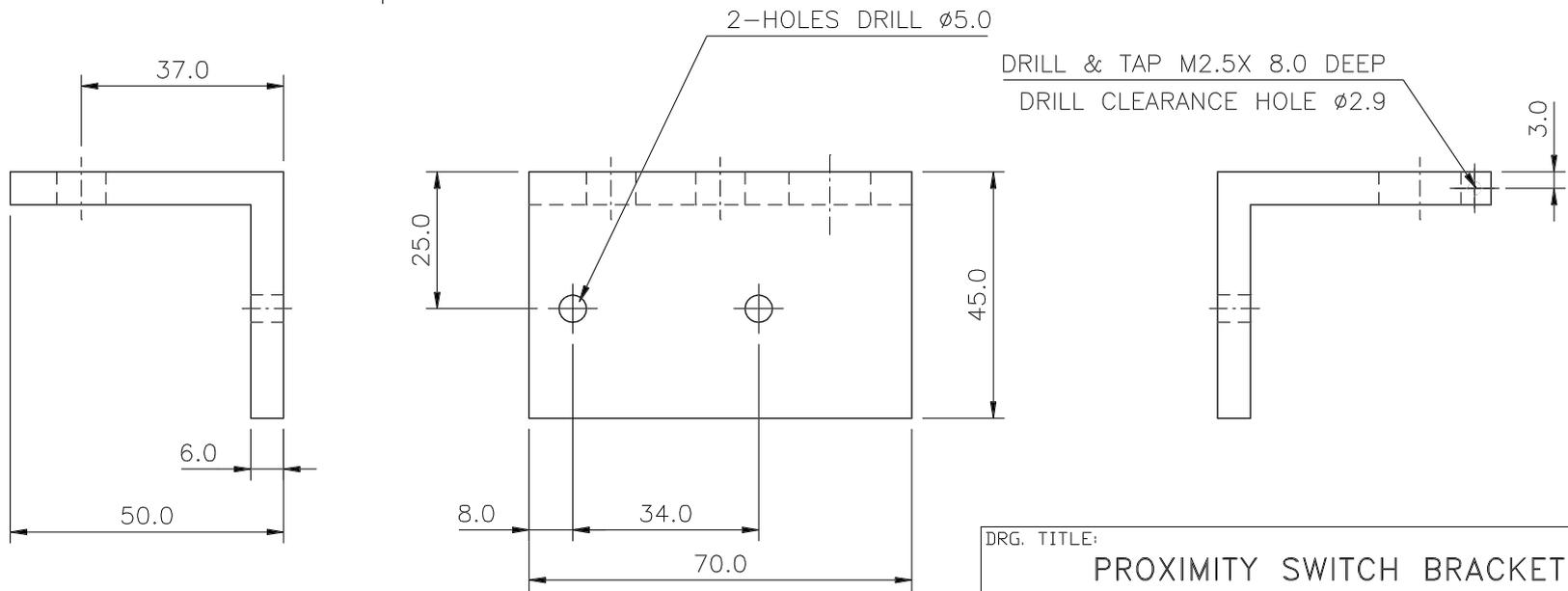
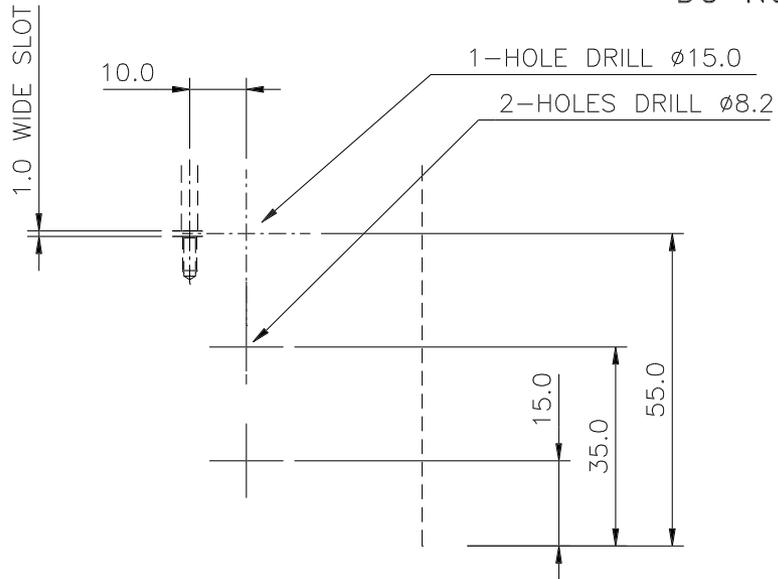
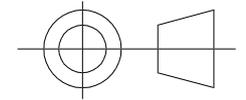


DRG. TITLE:		WASHER AF2 DOWELS	
SCALES:	3:1	ASTRONOMICAL INSTRUMENTATION GROUP DURHAM UNIVERSITY, PHYSICS DEPARTMENT SCIENCE LABS, SOUTH ROAD, DURHAM, DHI 3LE TEL. (091) 374 2107 & 2108	
DRG. TYPE:	PARTS	THIS DRAWING IS THE PROPERTY OF THE ASTRONOMICAL INSTRUMENTATION GROUP, DURHAM UNIVERSITY, PHYSICS DEPT. IT MUST NOT BE COPIED OR LENT WITHOUT THE CONSENT OF THE INSTRUMENTATION GROUP	DRG. SIZE A3
DRAWN BY:	G.D		
DATE	7/9/94	DRAWING No.	AF2\BPS-17
			REV. A

				ALL DIMENSIONS IN MM UNLESS OTHERWISE STATED
				IMPLIED TOLERANCES X (OVER 100) ± 0.20 X (UP TO 100) ± 0.1 X.X ± 0.10 X.XX ± 0.05
				Material: ST STEEL
				Quantity: 2 OFF
ISSUE	REVISION	DRN	DATE	

DO NOT SCALE

THIRD ANGLE PROJECTION

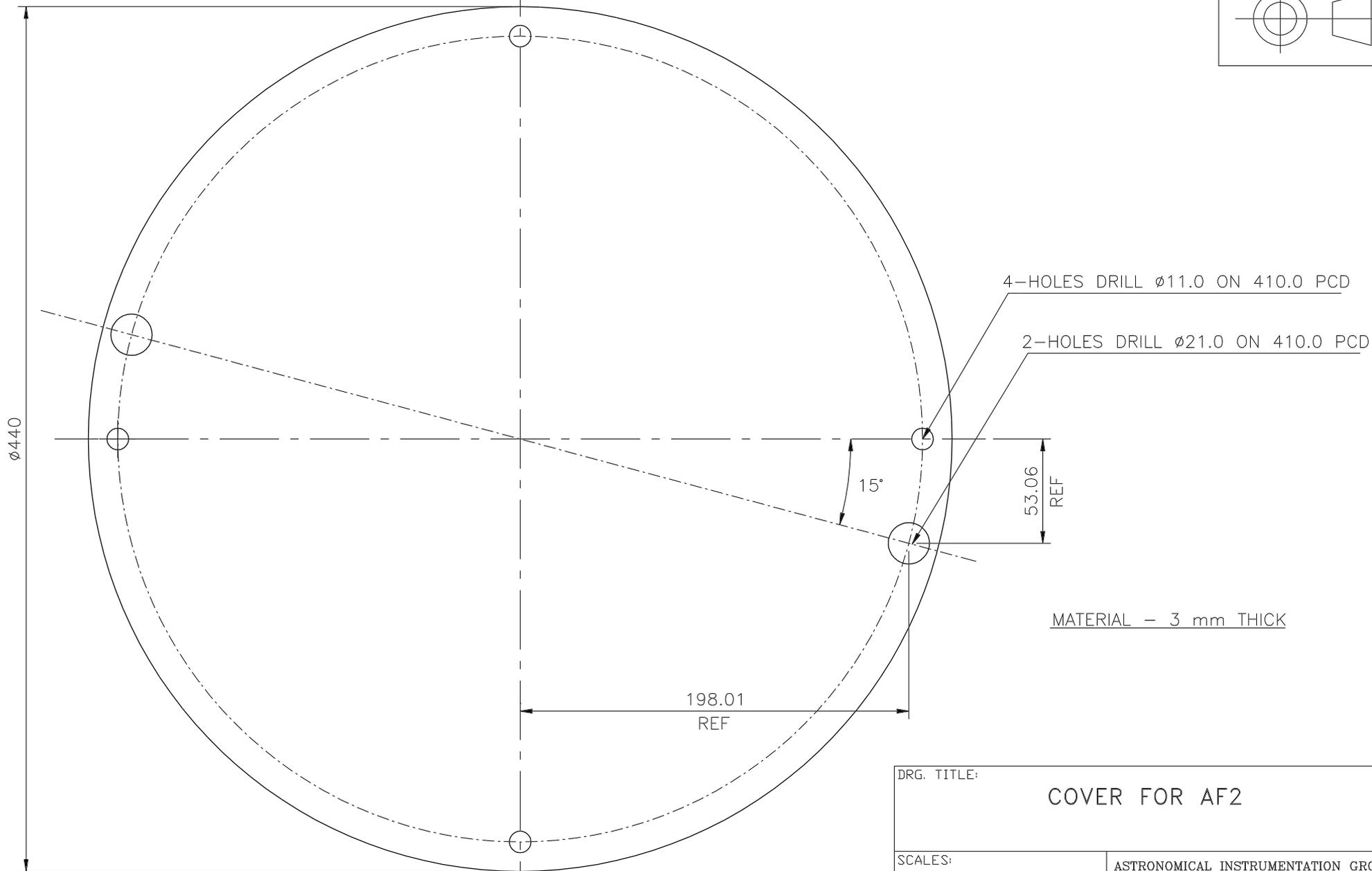
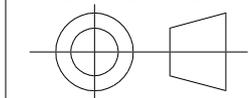


DRG. TITLE:		PROXIMITY SWITCH BRACKET	
SCALES:	1:1	ASTRONOMICAL INSTRUMENTATION GROUP DURHAM UNIVERSITY, PHYSICS DEPARTMENT SCIENCE LABS, SOUTH ROAD, DURHAM, DH1 3LE TEL. (091) 374 2107 & 2108	
DRG. TYPE:	PARTS	THIS DRAWING IS THE PROPERTY OF THE ASTRONOMICAL INSTRUMENTATION GROUP, DURHAM UNIVERSITY, PHYSICS DEPT. IT MUST NOT BE COPIED OR LENT WITHOUT THE CONSENT OF THE INSTRUMENTATION GROUP	DRG. SIZE A3
DRAWN BY:	G.D		
DATE	22/02/94	DRAWING No.	AF2\BPS-16
		REV.	A

ISSUE	REVISION	DRN	DATE	ALL DIMENSIONS IN MM UNLESS OTHERWISE STATED	Material:
				IMPLIED TOLERANCES	AL ALLOY
				X (OVER 100) ± 0.20	Quantity: 1 OFF
				X (UP TO 100) ± 0.1	
				X.X ± 0.10	
				X.XX ± 0.05	

DO NOT SCALE

THIRD ANGLE PROJECTION



DRG. TITLE:		COVER FOR AF2	
SCALES:	1:2	ASTRONOMICAL INSTRUMENTATION GROUP DURHAM UNIVERSITY, PHYSICS DEPARTMENT SCIENCE LABS, SOUTH ROAD, DURHAM, DH1 3LE TEL. (091) 374 2107 & 2108	
DRG. TYPE:	PARTS	THIS DRAWING IS THE PROPERTY OF THE ASTRONOMICAL INSTRUMENTATION GROUP, DURHAM UNIVERSITY, PHYSICS DEPT. IT MUST NOT BE COPIED OR LENT WITHOUT THE CONSENT OF THE INSTRUMENTATION GROUP	DRG. SIZE A3
DRAWN BY:	G.D		
DATE	15/9/94	DRAWING No.	AF2\BPS-15
		REV.	A

ISSUE	REVISION	DRN	DATE

ALL DIMENSIONS IN MM UNLESS OTHERWISE STATED

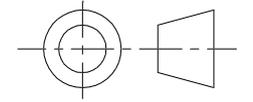
IMPLIED TOLERANCES
 X (OVER 100) ± 0.20
 X (UP TO 100) ± 0.1
 X.X ± 0.10
 X.XX ± 0.05

Material:
POLYCARBONATE

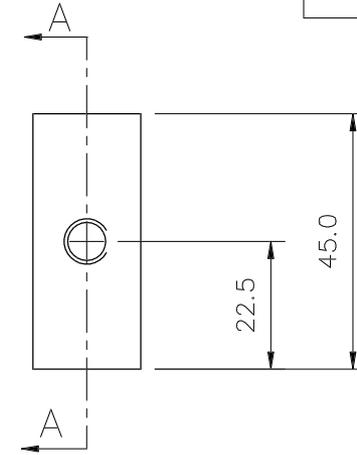
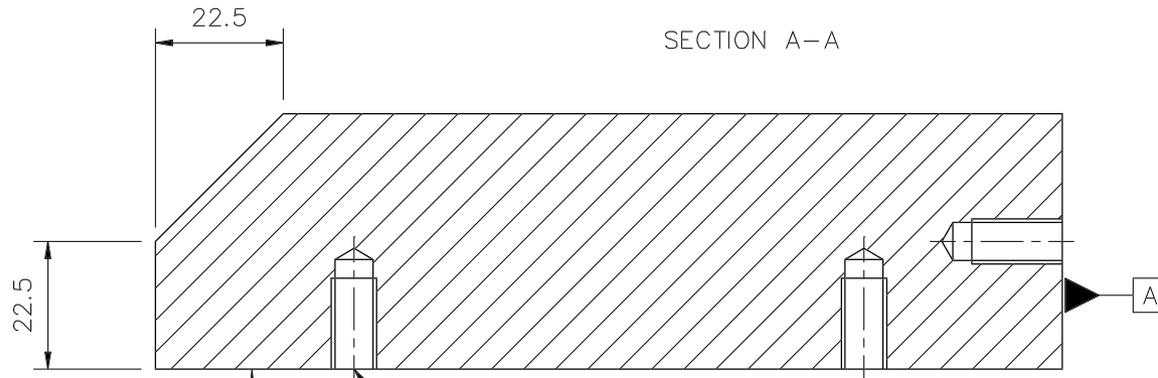
Quantity: 1 OFF

DO NOT SCALE

THIRD ANGLE PROJECTION

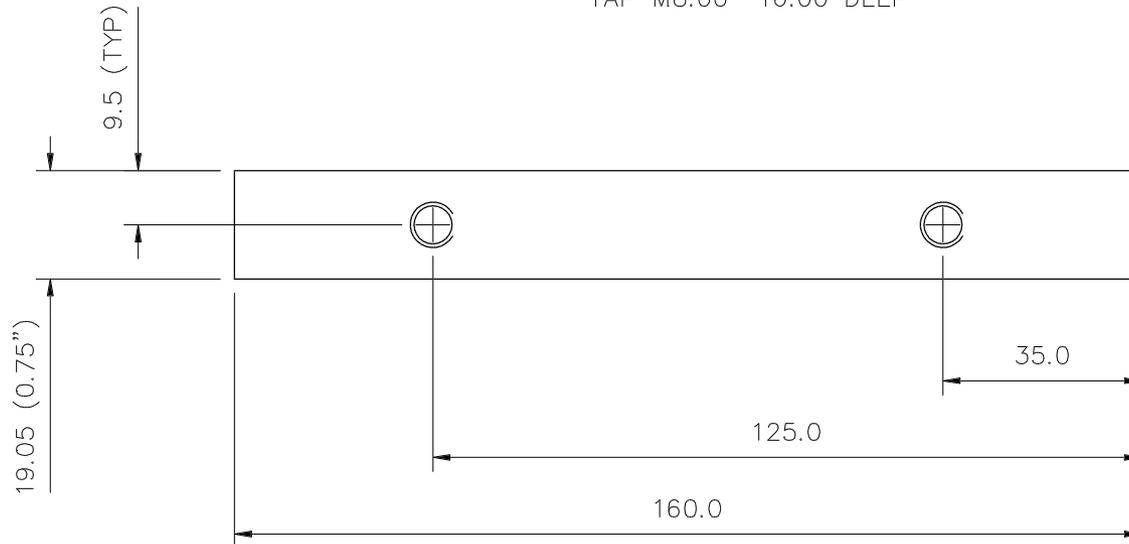


SECTION A-A



⊥ 0.03 A

3 HOLE(S) DRILL 6.70 19.35 DEEP
TAP M8.00 16.00 DEEP



FINISH - SIDES MACHINED N7

DRG. TITLE:		GUSSET PLATE	
SCALES:	1:1	ASTRONOMICAL INSTRUMENTATION GROUP DURHAM UNIVERSITY, PHYSICS DEPARTMENT SCIENCE LABS, SOUTH ROAD, DURHAM, DH1 3LE TEL. (091) 374 2107 & 2108	
DRG. TYPE:	PARTS	THIS DRAWING IS THE PROPERTY OF THE ASTRONOMICAL INSTRUMENTATION GROUP, DURHAM UNIVERSITY, PHYSICS DEPT. IT MUST NOT BE COPIED OR LENT WITHOUT THE CONSENT OF THE INSTRUMENTATION GROUP	DRG. SIZE A3
DRAWN BY:	G.D		DRAWING No.
DATE	17/01/92	AF2\BPS-13	REV. A

ALL DIMENSIONS IN MM UNLESS OTHERWISE STATED

IMPLIED TOLERANCES
X (OVER 100) ±0.20
X (UP TO 100) ±0.1
X.X ±0.10
X.XX ±0.05

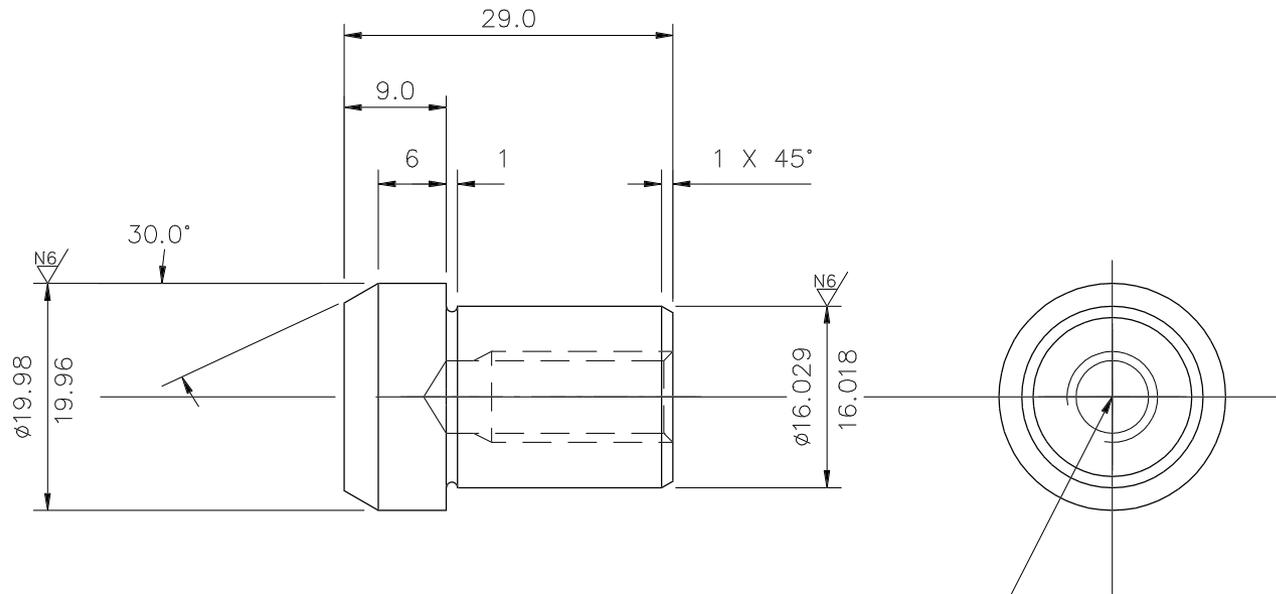
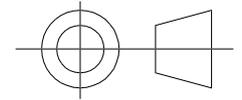
Material:
AL TOOL PLATE

Quantity: 4 OFF

ISSUE	REVISION	DRN	DATE

DO NOT SCALE

THIRD ANGLE PROJECTION



1 HOLE(S) DRILL 6.8 X 20 DEEP
TAP M8.0 X 16.0 DEEP

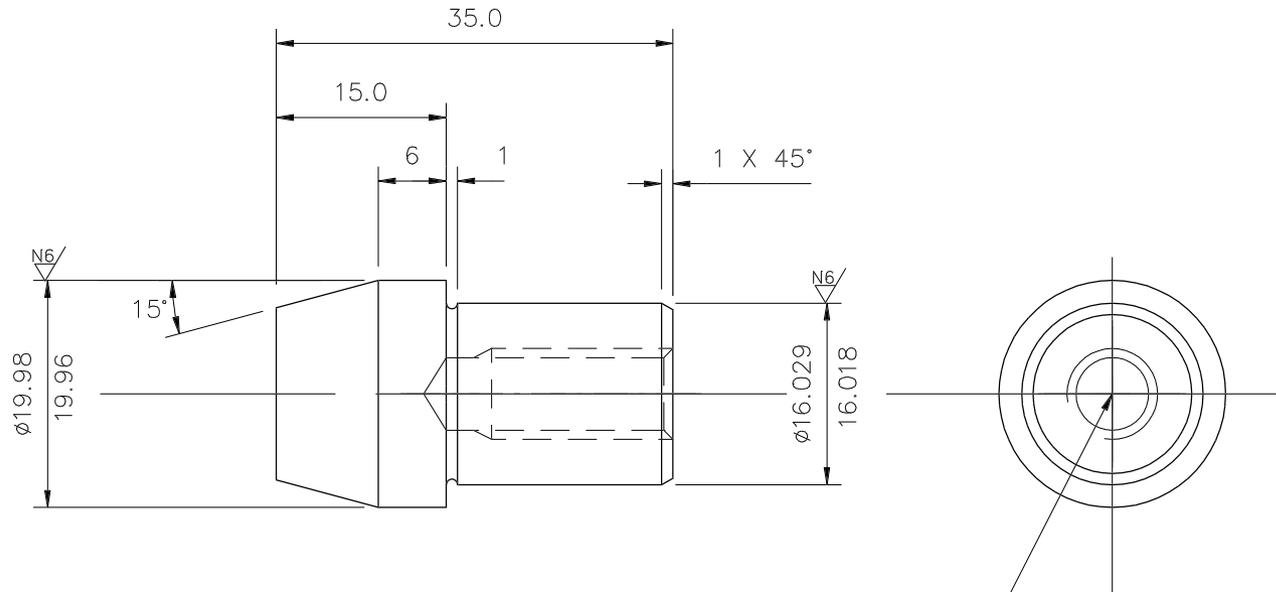
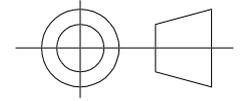
FINISH – GROUND WHERE INDICATED THUS ∇_{N6}

DRG. TITLE:		DOWEL	
SCALES:	2:1	ASTRONOMICAL INSTRUMENTATION GROUP DURHAM UNIVERSITY, PHYSICS DEPARTMENT SCIENCE LABS, SOUTH ROAD, DURHAM, DL1 3LE TEL. (091) 374 2107 & 2108	
DRG. TYPE:	PARTS	THIS DRAWING IS THE PROPERTY OF THE ASTRONOMICAL INSTRUMENTATION GROUP, DURHAM UNIVERSITY, PHYSICS DEPT. IT MUST NOT BE COPIED OR LENT WITHOUT THE CONSENT OF THE INSTRUMENTATION GROUP	DRG. SIZE A3
DRAWN BY:	G.D		
DATE	14/10/91	DRAWING No.	REV. A
		AF2\BPS-12	

ALL DIMENSIONS IN MM UNLESS OTHERWISE STATED			
IMPLIED TOLERANCES			
		X (OVER 100) ±0.20	Material: ST STEEL
		X (UP TO 100) ±0.1	
		X.X ±0.10	
		X.XX ±0.05	
ISSUE	REVISION	DRN	DATE
			Quantity: 1 OFF

DO NOT SCALE

THIRD ANGLE PROJECTION



1 HOLE(S) DRILL 6.80 X 20 DEEP
TAP M8.0 X 16.0 DEEP

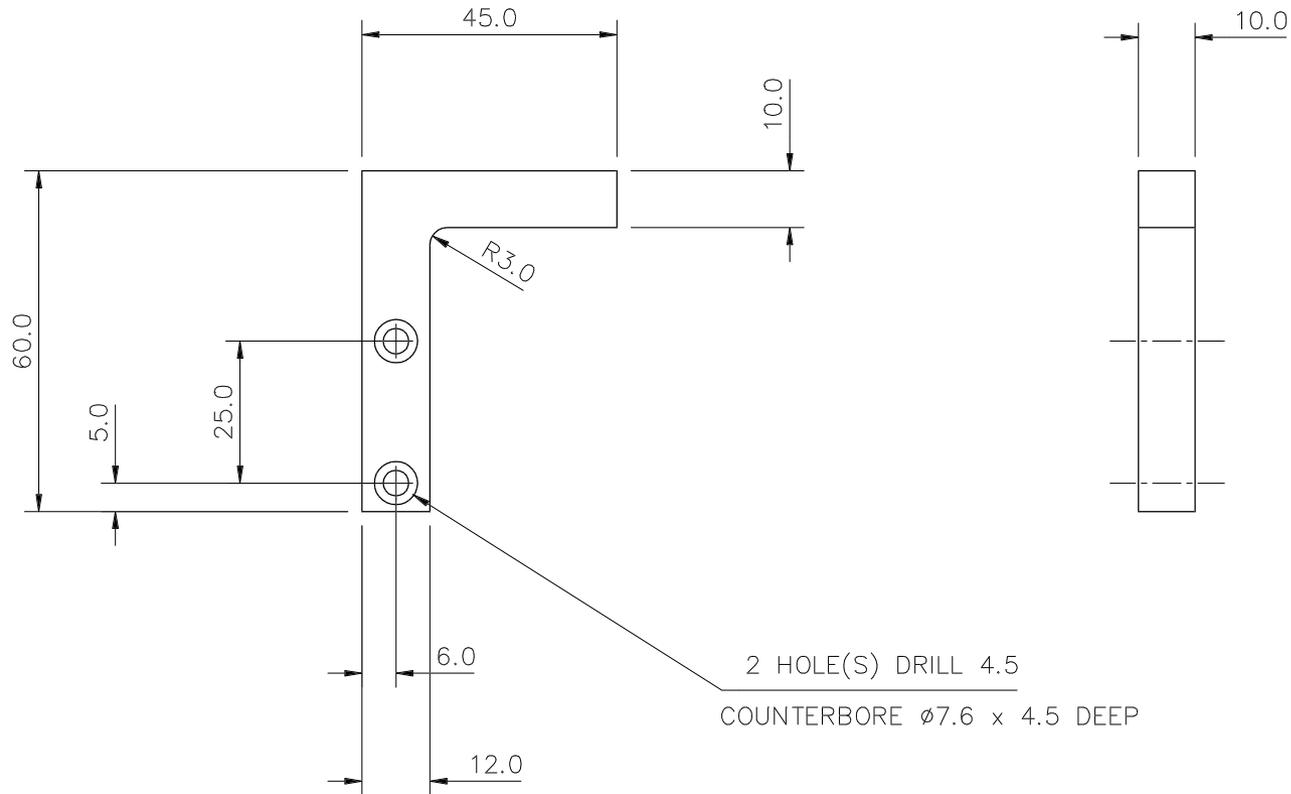
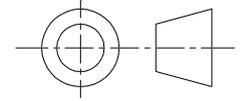
FINISH - GRIND WHERE INDICATED THUS ∇ ^{N6}

DRG. TITLE:		DOWEL	
SCALES:	2:1	ASTRONOMICAL INSTRUMENTATION GROUP DURHAM UNIVERSITY, PHYSICS DEPARTMENT SCIENCE LABS, SOUTH ROAD, DURHAM, DL1 3LE TEL. (091) 374 2107 & 2108	
DRG. TYPE:	PARTS	THIS DRAWING IS THE PROPERTY OF THE ASTRONOMICAL INSTRUMENTATION GROUP, DURHAM UNIVERSITY, PHYSICS DEPT. IT MUST NOT BE COPIED OR LENT WITHOUT THE CONSENT OF THE INSTRUMENTATION GROUP	DRG. SIZE A3
DRAWN BY:	G.D		DRAWING No.
DATE	14/10/91	AF2\BPS-11	REV. A

ISSUE	REVISION	DRN	DATE	ALL DIMENSIONS IN MM UNLESS OTHERWISE STATED	Material:
				IMPLIED TOLERANCES	ST STEEL
				X (OVER 100) ±0.20	Quantity: 1 OFF
				X (UP TO 100) ±0.1	
				X.X ±0.10	
				X.XX ±0.05	

DO NOT SCALE

THIRD ANGLE PROJECTION



2 HOLE(S) DRILL 4.5
COUNTERBORE ϕ 7.6 x 4.5 DEEP

DRG. TITLE:		DETAIL OF END STOP LEFT HAND	
SCALES:	1:1	ASTRONOMICAL INSTRUMENTATION GROUP DURHAM UNIVERSITY, PHYSICS DEPARTMENT SCIENCE LABS, SOUTH ROAD, DURHAM, DL1 3LE TEL. (091) 374 2107 & 2108	
DRG. TYPE:	PARTS	THIS DRAWING IS THE PROPERTY OF THE ASTRONOMICAL INSTRUMENTATION GROUP, DURHAM UNIVERSITY, PHYSICS DEPT. IT MUST NOT BE COPIED OR LENT WITHOUT THE CONSENT OF THE INSTRUMENTATION GROUP	DRG. SIZE A3
DRAWN BY:	AJ		DRAWING No.
DATE	09/04/91	AF2\BPS-10	REV. A

ALL DIMENSIONS IN MM UNLESS OTHERWISE STATED

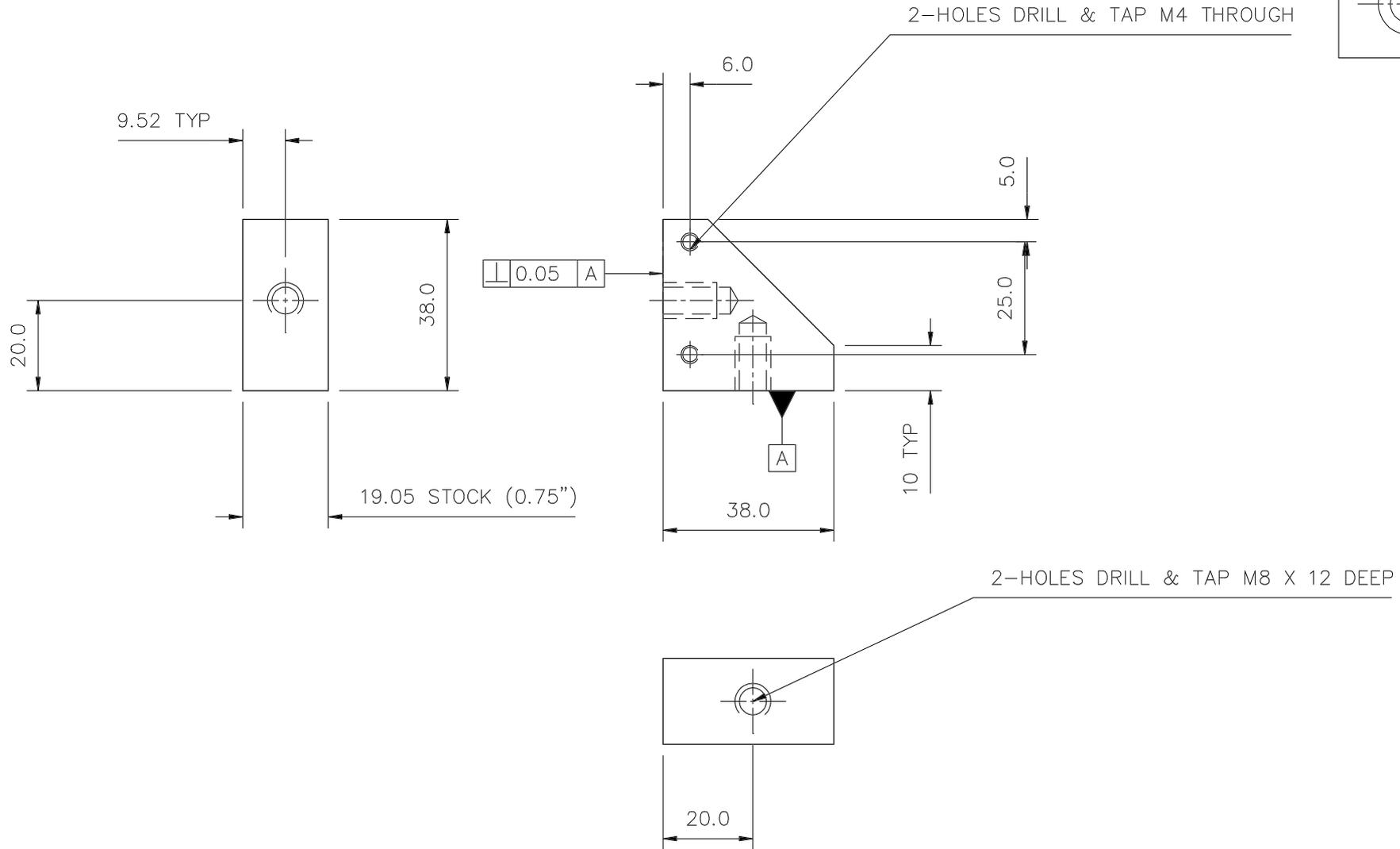
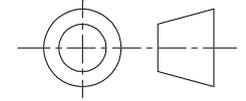
IMPLIED TOLERANCES
X (OVER 100) \pm 0.20
X (UP TO 100) \pm 0.1
X.X \pm 0.10
X.XX \pm 0.05

Material:
ALUMINIUM
Quantity: 1 OFF

ISSUE	REVISION	DRN	DATE

DO NOT SCALE

THIRD ANGLE PROJECTION

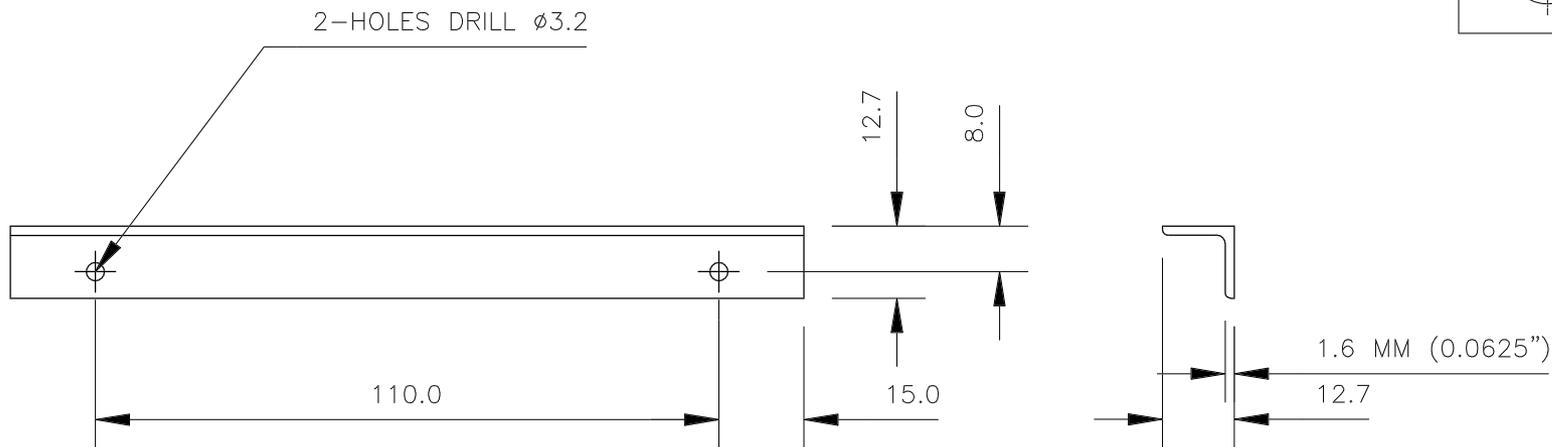
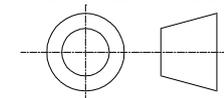


DRG. TITLE:		GUSSET PLATE	
SCALES:		1:1	ASTRONOMICAL INSTRUMENTATION GROUP DURHAM UNIVERSITY, PHYSICS DEPARTMENT SCIENCE LABS, SOUTH ROAD, DURHAM, DL1 3LE TEL. (091) 374 2107 & 2108
DRG. TYPE:		PARTS	THIS DRAWING IS THE PROPERTY OF THE ASTRONOMICAL INSTRUMENTATION GROUP, DURHAM UNIVERSITY, PHYSICS DEPT. IT MUST NOT BE COPIED OR LENT WITHOUT THE CONSENT OF THE INSTRUMENTATION GROUP
DRAWN BY:		AJ/GD	
DATE:		15/02/91	DRAWING No.
		AF2\BPS-08	DRG. SIZE A3
			REV. A

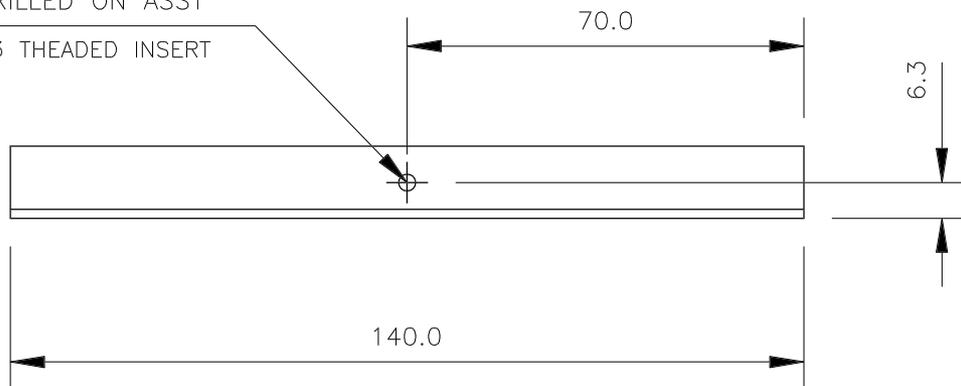
ALL DIMENSIONS IN MM UNLESS OTHERWISE STATED			
IMPLIED TOLERANCES		Material:	
X (OVER 100) ±0.20		ALUMINIUM	
X (UP TO 100) ±0.1			
X.X ±0.10			
X.XX ±0.05			
ISSUE	REVISION	DRN	DATE
		Quantity: 3 OFF	

DO NOT SCALE

THIRD ANGLE PROJECTION



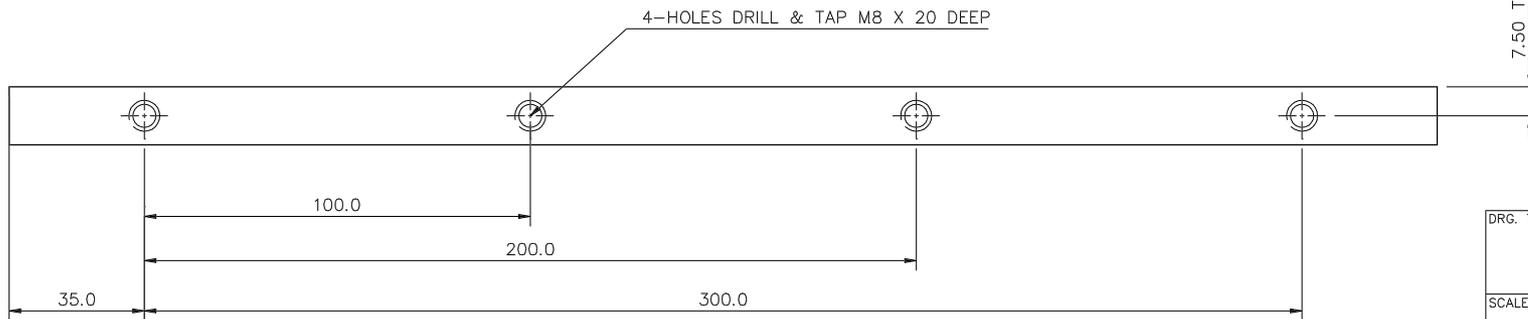
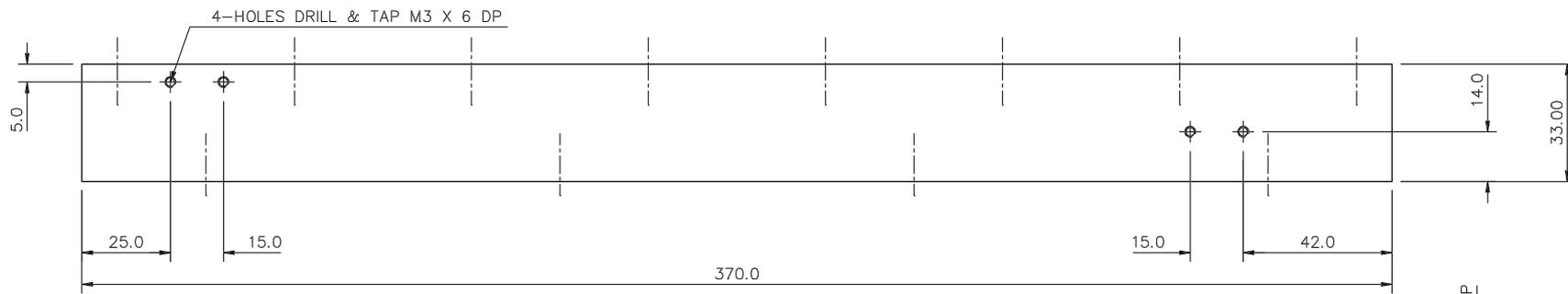
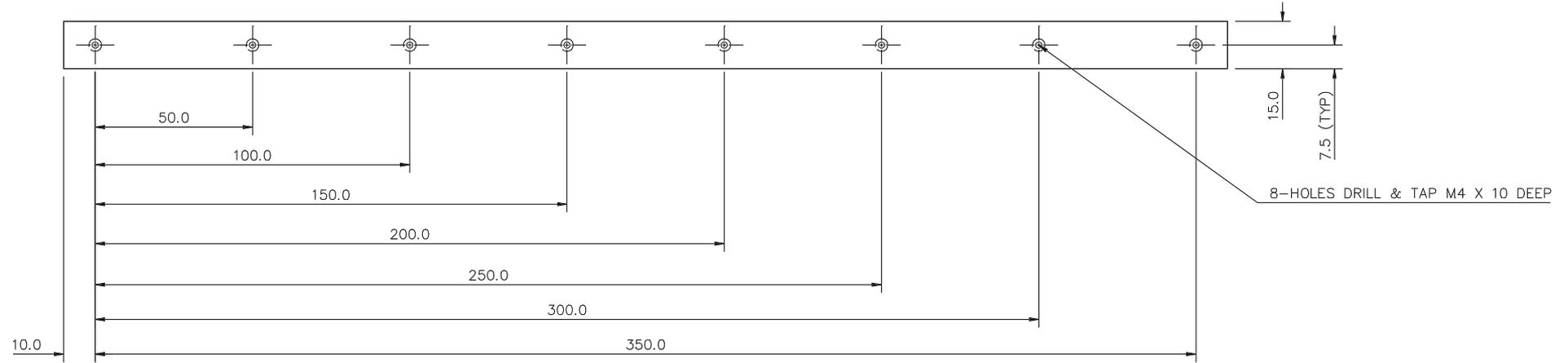
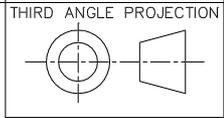
I-HOLE DRILLED ON ASSY
TO SUIT M3 THEADED INSERT



DRG. TITLE:		COVER SUPPORT BRACKET	
SCALES:		1:1	ASTRONOMICAL INSTRUMENTATION GROUP DURHAM UNIVERSITY, PHYSICS DEPARTMENT SCIENCE LABS, SOUTH ROAD, DURHAM, DL1 3LE TEL. (091) 374 2107 & 2108
DRG. TYPE:		PARTS	THIS DRAWING IS THE PROPERTY OF THE ASTRONOMICAL INSTRUMENTATION GROUP, DURHAM UNIVERSITY, PHYSICS DEPT. IT MUST NOT BE COPIED OR LENT WITHOUT THE CONSENT OF THE INSTRUMENTATION GROUP
DRAWN BY:		JW	
DATE:		27/06/91	DRAWING No.
		AF2\BPS-07	REV. SIZE
			A3
			REV. A

ALL DIMENSIONS IN MM UNLESS OTHERWISE STATED			
IMPLIED TOLERANCES			
X (OVER 100) ±0.20			
X (UP TO 100) ±0.1			
X.X ±0.10			
X.XX ±0.05			
Material:		ALUMINIUM	
Quantity:		4 OFF	
ISSUE	REVISION	DRN	DATE

DO NOT SCALE



DRG. TITLE: **PINCH RAIL SUPPORT**

SCALES: **1:1**
 DRG. TYPE: **PARTS**
 DRAWN BY: **AJ/GD**

ASTRONOMICAL INSTRUMENTATION GROUP
 DURHAM UNIVERSITY, PHYSICS DEPARTMENT
 SCIENCES LABS, SOUTH ROAD, DURHAM, DL1 3LE
 TEL. (091) 374 2107 & 2108

THIS DRAWING IS THE PROPERTY OF THE ASTRONOMICAL INSTRUMENTATION GROUP, DURHAM UNIVERSITY, PHYSICS DEPT. IT MUST NOT BE COPIED OR LENT WITHOUT THE CONSENT OF THE INSTRUMENTATION GROUP.

DATE: **15/02/91**

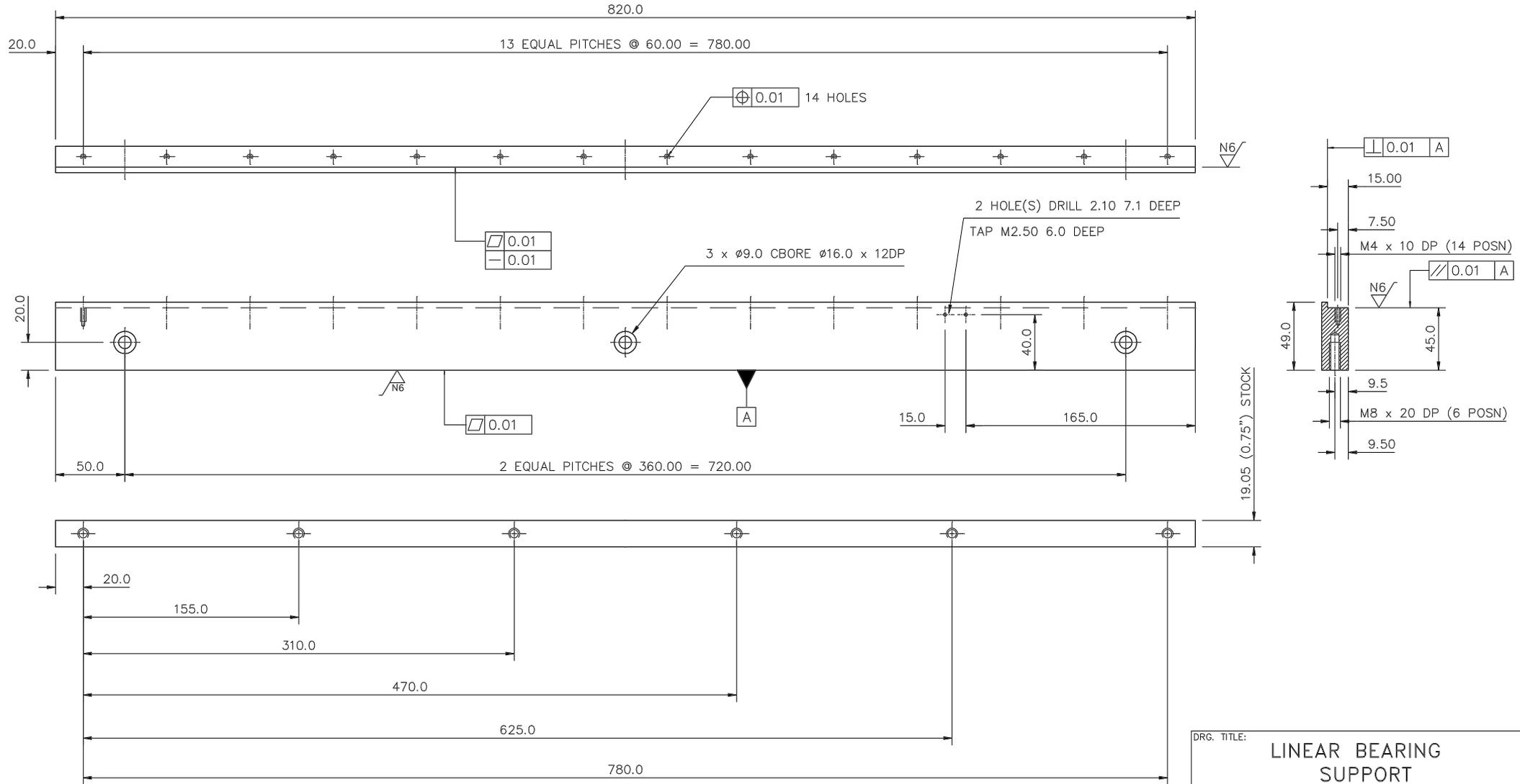
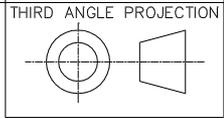
DRAWING No. **AF2\BPS-06** REV. **C**

ISSUE	REVISION	DRN	DATE	ISSUE	REVISION	DRN	DATE
C	2-M3 HOLES ADDED	GD	02/03/92				
B	2-M3 HOLES ADDED FOR OPTO SWITCH	GD	12/12/91				

ALL DIMENSIONS IN MM UNLESS OTHERWISE STATED
 IMPLIED TOLERANCES
 X (OVER 100) ±0.20
 X (UP TO 100) ±0.1
 X.X ±0.10
 X.XX ±0.05

Material: **AL ALLOY**
 Quantity: 1 OFF

DO NOT SCALE

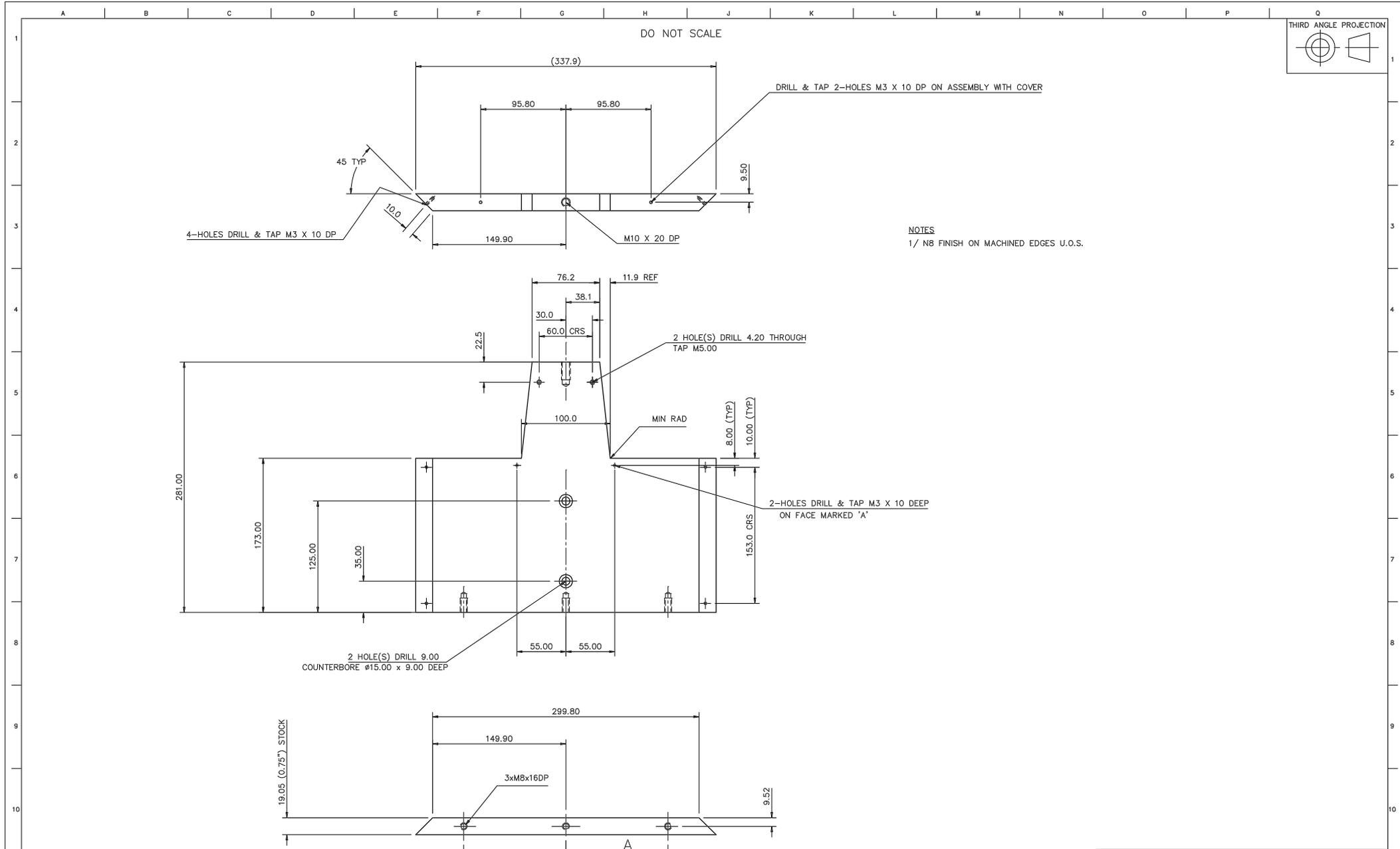


DRG. TITLE:		LINEAR BEARING SUPPORT	
SCALES:	1:2	ASTRONOMICAL INSTRUMENTATION GROUP DURHAM UNIVERSITY, PHYSICS DEPARTMENT SCIENCE LABS, SOUTH ROAD, DURHAM, DH1 3LE TEL. (091) 374 2107 & 2108	
DRG. TYPE:	PARTS	THIS DRAWING IS THE PROPERTY OF THE ASTRONOMICAL INSTRUMENTATION GROUP, DURHAM UNIVERSITY, PHYSICS DEPT. IT MUST NOT BE COPIED OR LENT WITHOUT THE CONSENT OF THE INSTRUMENTATION GROUP.	
DRAWN BY:	AJ/G.D	DRG. SIZE:	A2
DATE:	15/02/91	DRAWING No.:	AF2\BPS-05
Material:		REV.:	C
AL ALLOY		Quantity: 1 OFF	

ISSUE	REVISION	DRN	DATE	ISSUE	REVISION	DRN	DATE
C	49 DIMENSION WAS 50	GD	17/02/92				
B	2 - M2.5 HOLES MOVED 40 DIM WAS 20	GD	13/12/91				

ALL DIMENSIONS IN MM UNLESS OTHERWISE STATED

IMPLIED TOLERANCES
 X (OVER 100) ±0.20
 X (UP TO 100) ±0.1
 X.X ±0.10
 X.XX ±0.05



NOTES
1/ N8 FINISH ON MACHINED EDGES U.O.S.

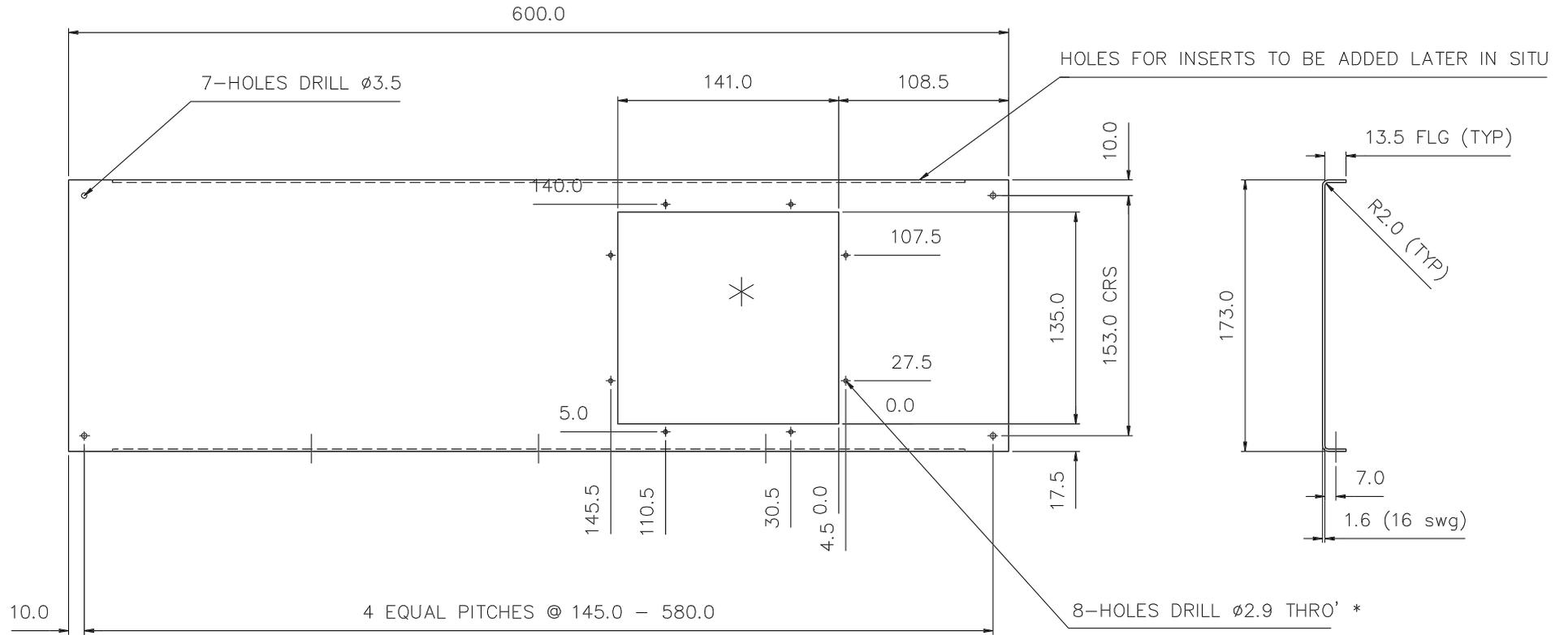
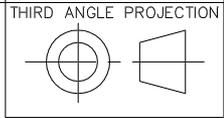
DRG. TITLE: CORNER SUPPORT		ASTRONOMICAL INSTRUMENTATION GROUP DURHAM UNIVERSITY, PHYSICS DEPARTMENT SCIENCE LABS, SOUTH ROAD, DURHAM, DH1 1TA TEL: (0191) 274 2107 & 2108	
SCALES: 1:2 & 2:1	DRG. TYPE: PARTS	THIS DRAWING IS THE PROPERTY OF THE ASTRONOMICAL INSTRUMENTATION GROUP, DURHAM UNIVERSITY, PHYSICS DEPT. IT MUST NOT BE COPIED OR LENT WITHOUT THE CONSENT OF THE INSTRUMENTATION GROUP.	
DRAWN BY: AJ/GD		DRG. SIZE: A1	REV.
DATE: 27/06/91	Quantity: 4 OFF	DRAWING No. AF2\BPS-04	B

ALL DIMENSIONS IN MM UNLESS OTHERWISE STATED									
IMPLIED TOLERANCES									
X (OVER 100) ±0.20									
X (UP TO 100) ±0.1									
X.X ±0.10									
X.XX ±0.05									
Material: AL TOOL PLATE									
Quantity: 4 OFF									
B	76.2 & 38.1 DIMS WERE 25 & 50, 2-M3 HOLES ADDED, 2 Ø9 C-BORED	G4	GD	28.01.92					
ISSUE	REVISION	GRID	DRN	DATE	ISSUE	REVISION	GRID	DRN	DATE

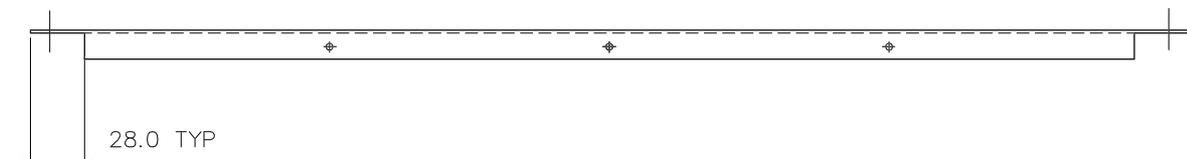
DO NOT SCALE

NOTES

1/ REMOVE ALL BURRS & SHARP EDGES



* NOTE - REQUIRED IN ONLY ONE SIDE PLATE



DRG. TITLE:		SIDE COVER	
SCALES:	1:2	ASTRONOMICAL INSTRUMENTATION GROUP DURHAM UNIVERSITY, PHYSICS DEPARTMENT SCIENCE LABS, SOUTH ROAD, DURHAM, DL1 3LE TEL. (091) 374 2107 & 2108	
DRG. TYPE:	PARTS	THIS DRAWING IS THE PROPERTY OF THE ASTRONOMICAL INSTRUMENTATION GROUP, DURHAM UNIVERSITY, PHYSICS DEPT. IT MUST NOT BE COPIED OR LENT WITHOUT THE CONSENT OF THE INSTRUMENTATION GROUP.	
DRAWN BY:	AJ/GD	DRAWING No. A2	
DATE	14/02/91	AF2\BPS-03	
		REV.	C

ISSUE	REVISION	DRN	DATE	ISSUE	REVISION	DRN	DATE
C	FLANGE ADDED TO BOTTOM OF COVER	GD	14/01/92				
B	13.5 DIMENSION WAS 10	GD	7/11/91				

ALL DIMENSIONS IN MM UNLESS OTHERWISE STATED

IMPLIED TOLERANCES
 X (OVER 100) ±0.20
 X (UP TO 100) ±0.1
 X.X ±0.10
 X.XX ±0.05

Material:
16 SWG AL
 Quantity: 4 OFF

