VIEW ON ARROW 'B'
TYPICAL 2 PLACES

ONLY TO BE FITTED WHEN LIFTING CELL

FIDUCIAL MARKS AS SHOWN ON ASSY. TC1-031

SECTION 'C-C'

SECTION 'A-A'

SECTION 'B-B'

TYPICAL SECTION THROUGH COVER LATCHER

MIRROR CELL ADAPTOR & COLLIMATING DRIVE. ASSY. TC1.215.

93 Kg

1174 dia.

118-0

14-5 NOMINAL GAP.

265

437.5 TO POLE OF MIRROR

250 nominal.

APPROVED

ASSEMBLY PROCEDURE NUMBER:- TC1.212 ARD

A merger of Clarke Chapman and Reyrolle Parsons

SURFACE FINISH EQUIVALENTS

THIS DRAWING CONFORMS TO B.S. 308

SURFACE FINISH SYMBOLS

✓ MACHINED NOT NECESSARILY MACHINED
✓ MACHINED

WELD SYMBOLS TO BS 499 PART 2 1980

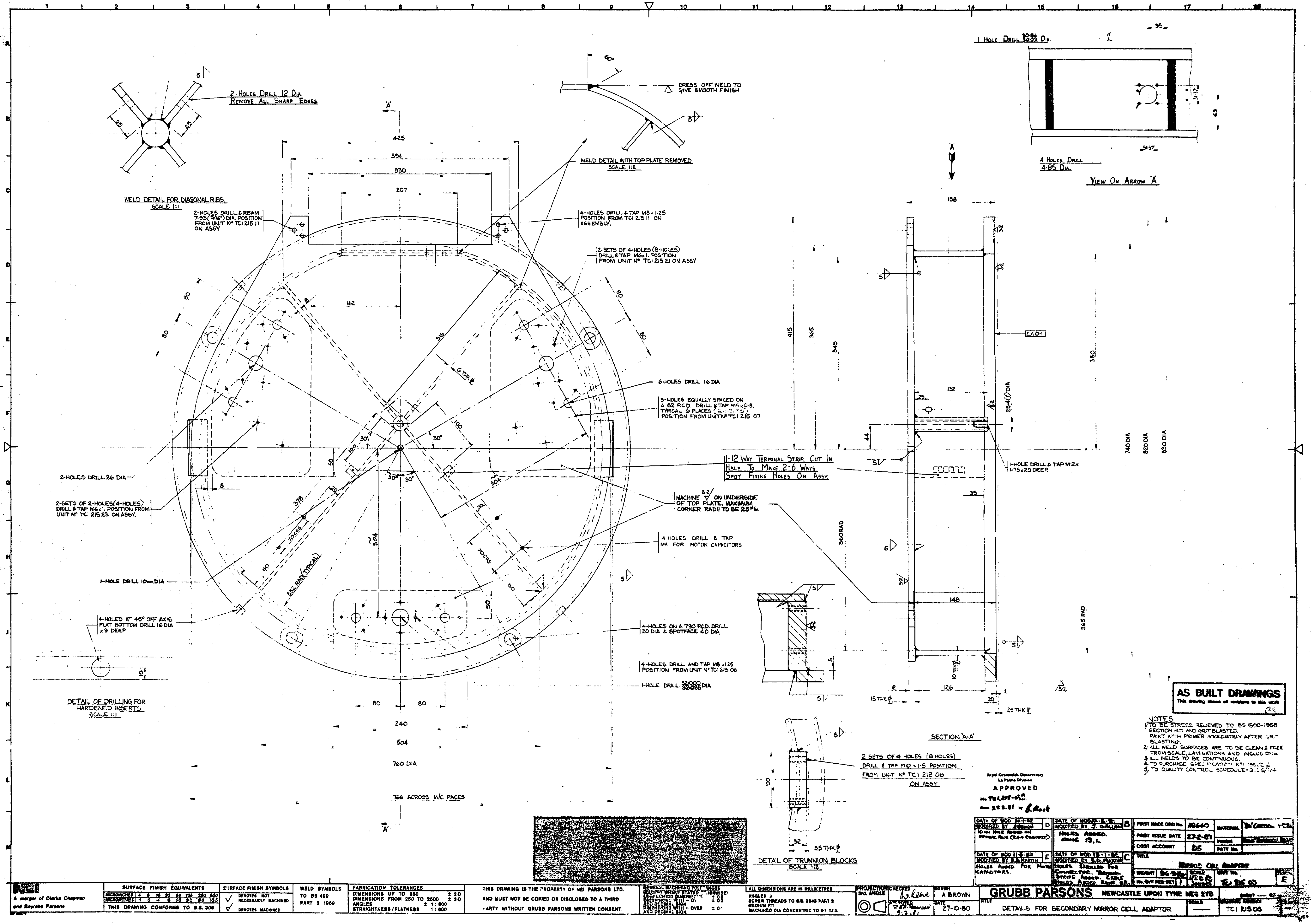
FABRICATION TOLERANCES

DIMENSIONS UP TO 250	± 3·0
DIMENSIONS FROM 250 TO 2500	± 3·0
ANGLES	± 1° 200
STRAIGHTNESS/FLATNESS	1 : 500

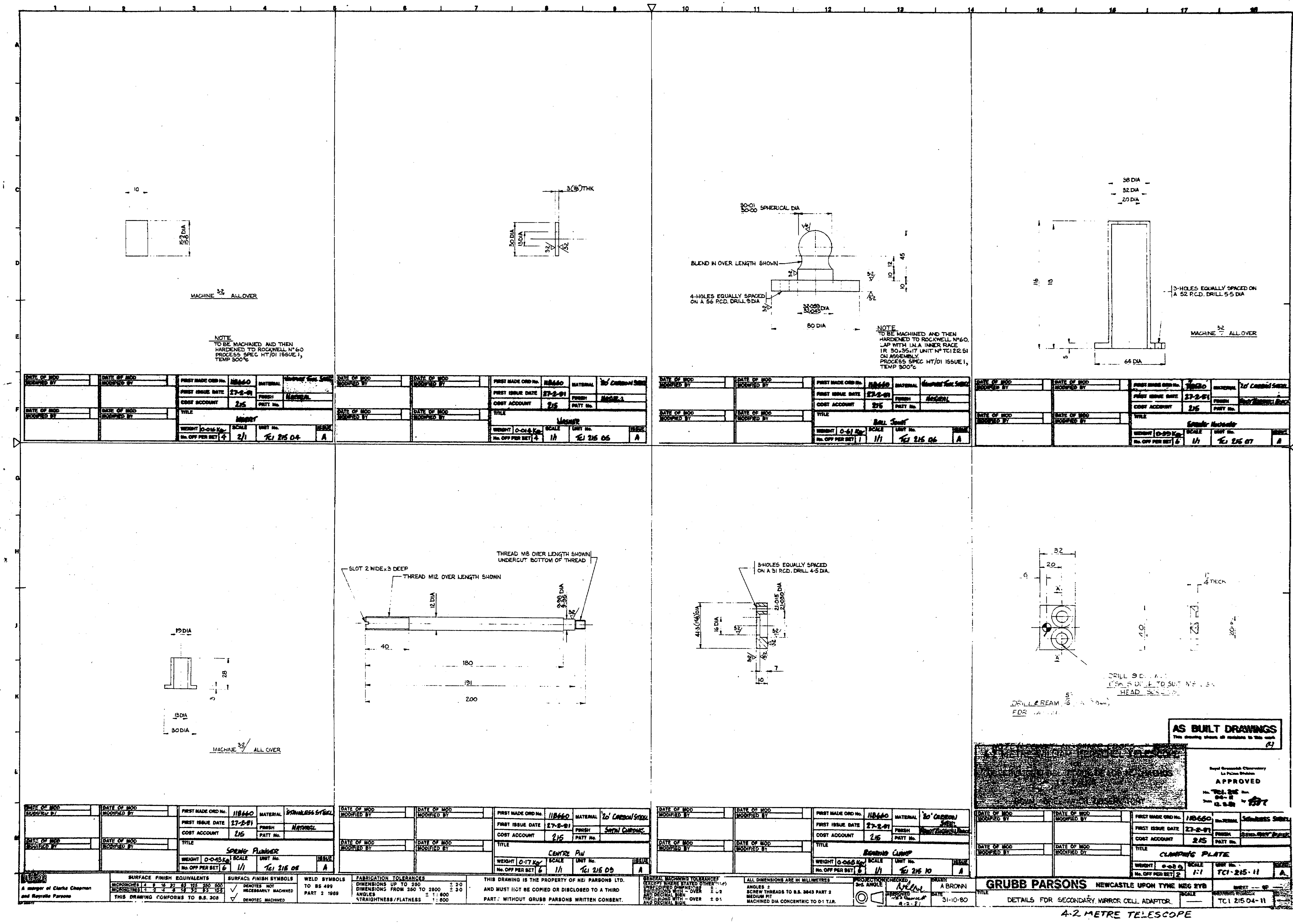
ALL DIMENSIONS ARE IN MILLIMETRES

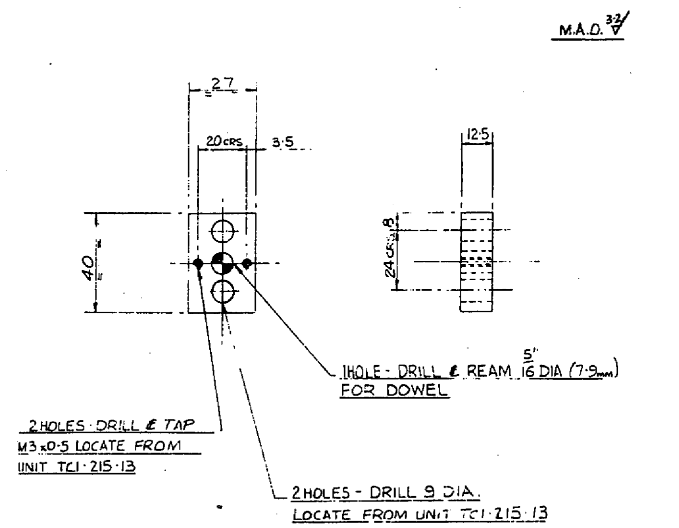
ALL SCREW THREADS TO B.S. 3643 PART 1

UNLESS OTHERWISE STATED

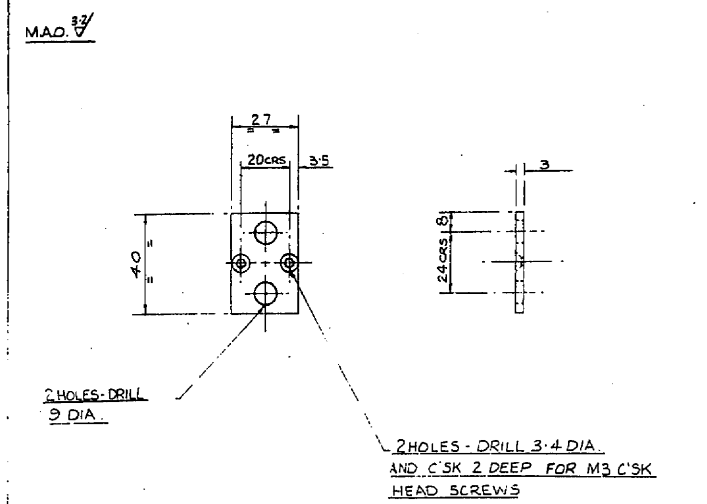


2-HOLES DRILL 12 DIA REMOVE ALL SHARP EDGES.
WELD DETAIL FOR DIAGONAL RIBS. SCALE 1:1
DRESS OFF WELD TO GIVE SMOOTH FINISH
WELD DETAIL WITH TOP PLATE REMOVED SCALE 1:2
1 HOLE DRILL 30.04/30.35 DIA
4 HOLES DRILL 4·85 DIA.
VIEW ON ARROW 'A'
2-HOLES DRILL & REAM 7·93(5/16") DIA. POSITION FROM UNIT Nº TC1 215 11 ON ASSY
4-HOLES DRILL & TAP M8×1·25 POSITION FROM TC1 215 11 ON ASSEMBLY.
2-SETS OF 4-HOLES (8-HOLES) DRILL & TAP M6×1. POSITION FROM UNIT Nº TC1 215 21 ON ASSY
6-HOLES DRILL 16 DIA
3-HOLES EQUALLY SPACED ON A 52 P.C.D. DRILL & TAP M5×0·8. TYPICAL 6 PLACES. POSITION FROM UNIT Nº TC1 215 07
1-12 WAY TERMINAL STRIP, CUT IN HALF TO MAKE 2-6 WAYS. SPOT FIXING HOLES ON ASSY.
1-HOLE DRILL & TAP M12×1·75×20 DEEP
MACHINE ON UNDERSIDE OF TOP PLATE, MAXIMUM CORNER RADII TO BE 25 MM
4 HOLES DRILL & TAP M4 FOR MOTOR CAPACITORS
2-HOLES DRILL 26 DIA
2-SETS OF 2-HOLES (4-HOLES) DRILL & TAP M6×1. POSITION FROM UNIT Nº TC1 215 23 ON ASSY.
1-HOLE DRILL 10mm DIA
352 RAD (TYPICAL)
4-HOLES AT 45° OFF AXIS FLAT BOTTOM DRILL 16 DIA ×3 DEEP
DETAIL OF DRILLING FOR HARDENED INSERTS SCALE 1:1
4-HOLES ON A 790 P.C.D. DRILL 20 DIA & SPOTFACE 40 DIA
4-HOLES DRILL AND TAP M8×1·25 POSITION FROM UNIT Nº TC1 215 06
1-HOLE DRILL 32.000/32.025 DIA
760 DIA
766 ACROSS M/C FACES
740 DIA
820 DIA
830 DIA
360 RAD
365 RAD
SECTION 'A-A'
2 SETS OF 4 HOLES (8 HOLES) DRILL & TAP M10×1·5 POSITION FROM UNIT Nº TC1 212 00 ON ASSY
DETAIL OF TRUNNION BLOCKS SCALE 1:2
AS BUILT DRAWINGS
NOTES
1/ TO BE STRESS RELIEVED TO BS 1500-1958 SECTION 4D AND GRIT BLASTED. PAINT WITH PRIMER IMMEDIATELY AFTER GRIT BLASTING.
2/ ALL WELD SURFACES ARE TO BE CLEAN & FREE FROM SCALE, LAMINATIONS AND INCLUSIONS.
3/ ALL WELDS TO BE CONTINUOUS.
4/ TO PURCHASE SPECIFICATION
5/ TO QUALITY CONTROL SCHEDULE
Royal Greenwich Observatory La Palma Division
APPROVED
HOLES ADDED FOR MOTOR CAPACITORS.
HOLES ADDED.
FIRST ISSUE DATE 27-2-81
COST ACCOUNT DS
PROJECTION 3rd. ANGLE
DRAWN A BROWN
DATE 27-10-80
GRUBB PARSONS NEWCASTLE UPON TYNE NE6 2YB
DETAILS FOR SECONDARY MIRROR CELL ADAPTOR
TC1 215 05
A merger of Clarke Chapman and Reyrolle Parsons
SURFACE FINISH EQUIVALENTS
THIS DRAWING CONFORMS TO B.S. 308
SURFACE FINISH SYMBOLS
DENOTES NOT NECESSARILY MACHINED
DENOTES MACHINED
WELD SYMBOLS TO BS 499 PART 2 1969
FABRICATION TOLERANCES
DIMENSIONS UP TO 250 ± 2.0
DIMENSIONS FROM 250 TO 2500 ± 3.0
ANGLES ± 1 : 500
STRAIGHTNESS/FLATNESS 1 : 500
THIS DRAWING IS THE PROPERTY OF NEI PARSONS LTD. AND MUST NOT BE COPIED OR DISCLOSED TO A THIRD PARTY WITHOUT GRUBB PARSONS WRITTEN CONSENT.
ALL DIMENSIONS ARE IN MILLIMETRES
SCREW THREADS TO B.S. 3643 PART 2
MACHINED DIA CONCENTRIC TO 0·1 T.I.R.


MACHINE 3.2 ALL OVER
NOTE
TO BE MACHINED AND THEN HARDENED TO ROCKWELL N°60 PROCESS SPEC HT/01 ISSUE 1, TEMP 300°C
3(1/8)THK
30 DIA
13 DIA
SPHERICAL DIA
BLEND IN OVER LENGTH SHOWN
4-HOLES EQUALLY SPACED ON A 56 P.C.D. DRILL 9 DIA
80 DIA
NOTE
TO BE MACHINED AND THEN HARDENED TO ROCKWELL N°60, LAP WITH I.N.A INNER RACE IR 30×35×17 UNIT N° TC1 212 51 ON ASSEMBLY. PROCESS SPEC HT/01 ISSUE 1, TEMP 300°C
38 DIA
32 DIA
20 DIA
3-HOLES EQUALLY SPACED ON A 52 P.C.D. DRILL 5·5 DIA
MACHINE 3.2 ALL OVER
64 DIA
FIRST MADE ORD No. 118660
FIRST ISSUE DATE 27-2-81
COST ACCOUNT 215
TITLE Insert
WEIGHT 0·016 Kg
No. OFF PER SET 4
SCALE 2/1
UNIT No. TC1 215 04
ISSUE A
TITLE Washer
UNIT No. TC1 215 05
TITLE Ball Joint
UNIT No. TC1 215 06
TITLE Spider Mechanism
UNIT No. TC1 215 07
19 DIA
13 DIA
30 DIA
MACHINE 3.2 ALL OVER
SLOT 2 WIDE×3 DEEP
THREAD M12 OVER LENGTH SHOWN
THREAD M8 OVER LENGTH SHOWN UNDERCUT BOTTOM OF THREAD
12 DIA
40
180
191
200
3-HOLES EQUALLY SPACED ON A 31 P.C.D. DRILL 4·5 DIA.
16 DIA
7
10
32
20
40
AS BUILT DRAWINGS
APPROVED
MATERIAL STAINLESS STEEL
TITLE SPRING PLUNGER
UNIT No. TC1 215 08
MATERIAL '20' CARBON STEEL
TITLE CENTRE PIN
UNIT No. TC1 215 09
TITLE BENDING CLAMP
UNIT No. TC1 215 10
TITLE CLAMPING PLATE
UNIT No. TC1-215-11
SURFACE FINISH EQUIVALENTS
THIS DRAWING CONFORMS TO B.S. 308
SURFACE FINISH SYMBOLS
WELD SYMBOLS TO BS 499 PART 2 1980
FABRICATION TOLERANCES
THIS DRAWING IS THE PROPERTY OF NEI PARSONS LTD. AND MUST NOT BE COPIED OR DISCLOSED TO A THIRD PARTY WITHOUT GRUBB PARSONS WRITTEN CONSENT.
ALL DIMENSIONS ARE IN MILLIMETRES
DRAWN A BROWN
DATE 31-10-80
GRUBB PARSONS NEWCASTLE UPON TYNE NE6 2YB
TITLE DETAILS FOR SECONDARY MIRROR CELL ADAPTOR.
TC1 215 04-11
4·2 METRE TELESCOPE



FIRST MADE ORD No.	11B660
FIRST ISSUE DATE	27-2-81
UNIT ACCOUNT	215
TITLE	BLOCK
WEIGHT	0.1
No. OFF PER SET	1
SCALE	1:1
UNIT No.	TC1-215-12
ISSUE	A



FIRST MADE ORD No.	11B660
MATERIAL	STAINLESS STEEL
FIRST ISSUE DATE	27-2-81
UNIT ACCOUNT	215
TITLE	SPRING CLAMPING PLATE
No. OFF PER SET	1
SCALE	1:1
UNIT No.	TC1-215-13
ISSUE	A

TC1 215 14 ONWARDS FOLLOWS ON ANOTHER SHEET A BROWN 27-2-81

[redacted]

AS BUILT DRAWINGS

APPROVED

A merger of Clarke Chapman and Reyrolle Parsons

SURFACE FINISH EQUIVALENTS — THIS DRAWING CONFORMS TO B.S. 308

SURFACE FINISH SYMBOLS: ✓ DENOTES NOT NECESSARILY MACHINED; ∇ DENOTES MACHINED

WELD SYMBOLS TO BS 499 PART 2 1980

FABRICATION TOLERANCES: DIMENSIONS UP TO 250 ± 2.0; DIMENSIONS FROM 250 TO 2500 ± 3.0; ANGLES ± 1 : 600; STRAIGHTNESS/FLATNESS 1 : 600

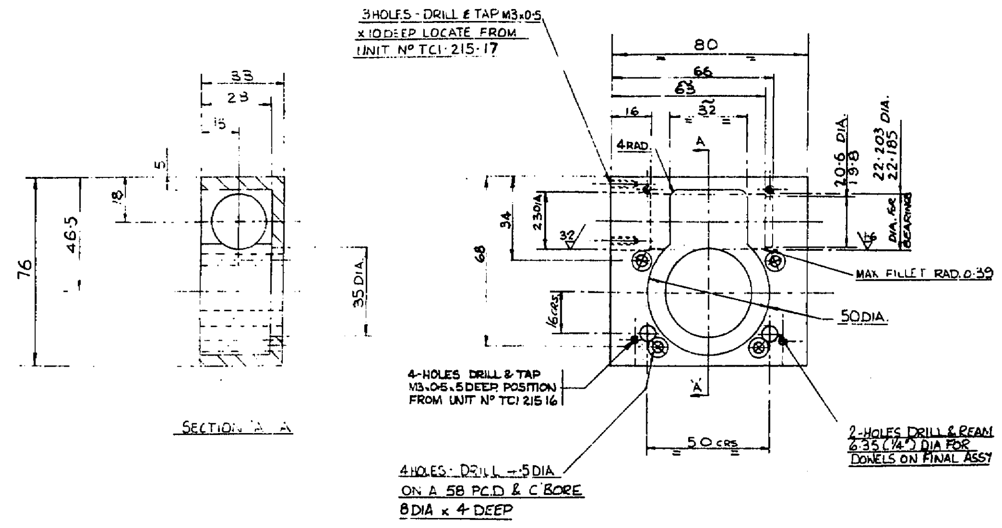
GENERAL MACHINING TOLERANCES (EXCEPT WHERE STATED OTHERWISE)

ALL DIMENSIONS ARE IN MILLIMETRES. SCREW THREADS TO B.S. 3643 PART 2. MEDIUM FIT. MACHINED DIA CONCENTRIC TO 0.1 T.I.R.

PROJECTION 3rd. ANGLE

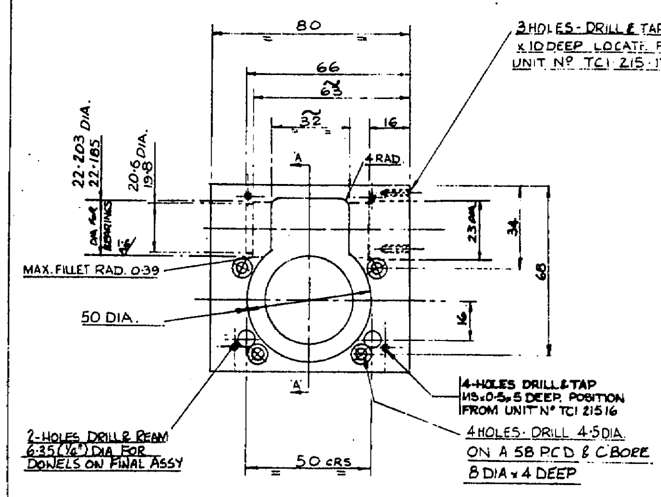
DRAWN	N. MANN
DATE	12-11-80
TITLE	DETAILS FOR SECONDARY MIRROR CELL ADAPTOR
SCALE	-
DRAWING NUMBER	TC1-215-12-13

GRUBB PARSONS NEWCASTLE UPON TYNE NE6 2YB



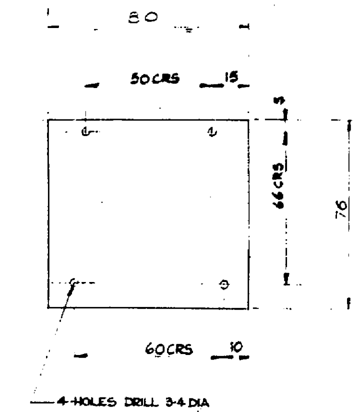
M.O.A 3.2 EXCEPT WHERE STATED

FIRST MADE ORD No. 118660	MATERIAL	20 CARBON STEEL
FIRST ISSUE DATE 27-2-81	FINISH	
COST ACCOUNT 215	PATT No.	
TITLE	GEARBOX BODY	
WEIGHT 0·264 kg	SCALE 1:1	UNIT No. TC1-215-14 ISSUE B

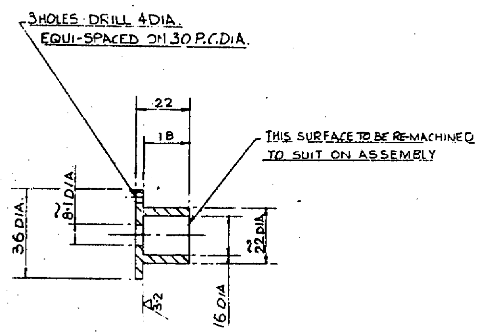


M.O.A 3.2 EXCEPT WHERE STATED

FIRST MADE ORD No. 118660	MATERIAL	20 CARBON STEEL
FIRST ISSUE DATE 27-2-81	FINISH	
COST ACCOUNT 215	PATT No.	
TITLE	GEARBOX BODY	
WEIGHT 0·264 kg	SCALE 1:1	UNIT No. TC1-215-15 ISSUE B

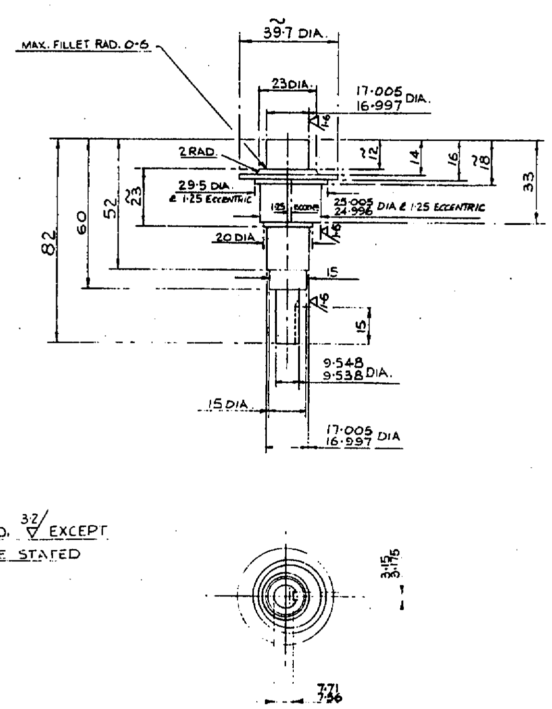


FIRST MADE ORD No. 118660	MATERIAL	
FIRST ISSUE DATE 27-2-81	FINISH	
COST ACCOUNT 215	PATT No.	
TITLE	GEARBOX COVER	
WEIGHT	SCALE 1:1	UNIT No. TC1-215-16 ISSUE B



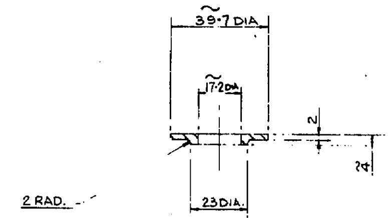
M.O.A 3.2

FIRST MADE ORD No. 118660	MATERIAL	20 CARBON STEEL
FIRST ISSUE DATE 27-2-81	FINISH	
COST ACCOUNT 215	PATT No.	
TITLE	GEARBOX END CAP	
WEIGHT 0·05 kg	No. OFF PER SET 2	SCALE 1:1	UNIT No. TC1-215-17 ISSUE A



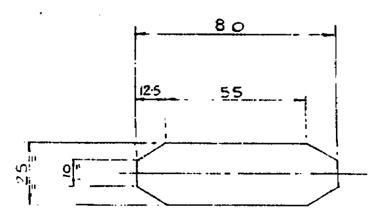
M.A.O. 3.2 EXCEPT WHERE STATED

FIRST MADE ORD No. 118660	MATERIAL	20 CARBON STEEL
FIRST ISSUE DATE 27-2-81	FINISH	NATURAL
COST ACCOUNT 215	PATT No.	
TITLE	ECCENTRIC SHAFT	
WEIGHT 0·16 kg	No. OFF PER SET 2	SCALE 1:1	UNIT No. TC1-215-18 ISSUE A



M.A.O 3.2

FIRST MADE ORD No. 118660	MATERIAL	20 CARBON STEEL
FIRST ISSUE DATE 27-2-81	FINISH	NATURAL
COST ACCOUNT 215	PATT No.	
TITLE	GREASE SEAL	
WEIGHT	No. OFF PER SET 2	SCALE 1:1	UNIT No. TC1-215-19 ISSUE A



NOTE: ALL SHARP EDGES TO BE REMOVED

AS BUILT DRAWINGS

APPROVED

FIRST MADE ORD No. 118660	MATERIAL	
FIRST ISSUE DATE 27-2-81	FINISH	
COST ACCOUNT 215	PATT No.	
TITLE	ECCENTRIC MUFF COUPLING	
WEIGHT	No. OFF PER SET 2	SCALE 1:1	UNIT No. TC1-215-20 ISSUE A

A merger of Clarke Chapman and Reyrolle Parsons

SURFACE FINISH EQUIVALENTS — THIS DRAWING CONFORMS TO B.S. 308

SURFACE FINISH SYMBOLS: ✓ DENOTES NOT NECESSARILY MACHINED; ✓ DENOTES MACHINED

WELD SYMBOLS TO BS 499 PART 2 1969

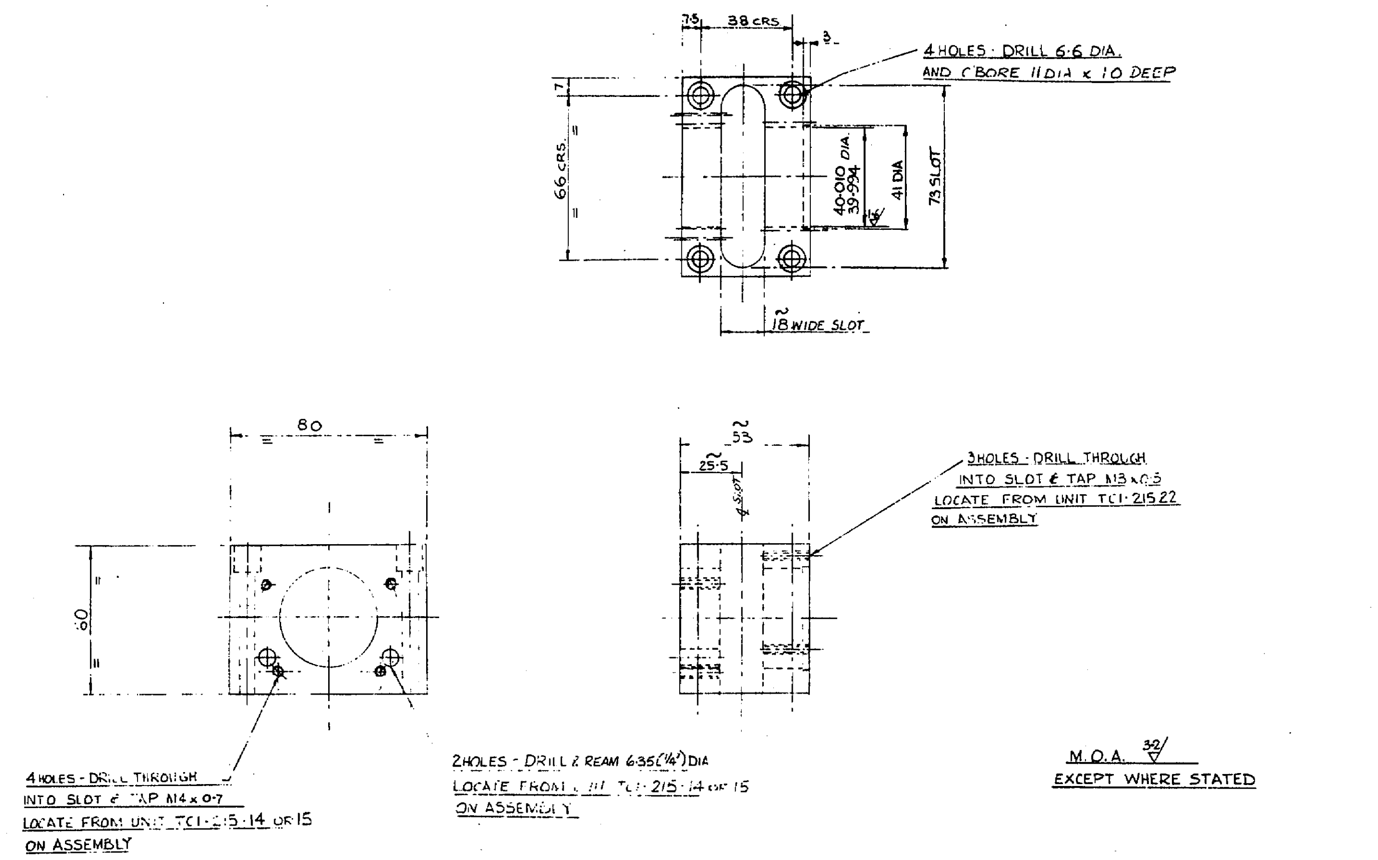
FABRICATION TOLERANCES: DIMENSIONS UP TO 250 ± 2·0; DIMENSIONS FROM 250 TO 2500 ± 3·0; ANGLES ± 1:800; STRAIGHTNESS/FLATNESS 1:800

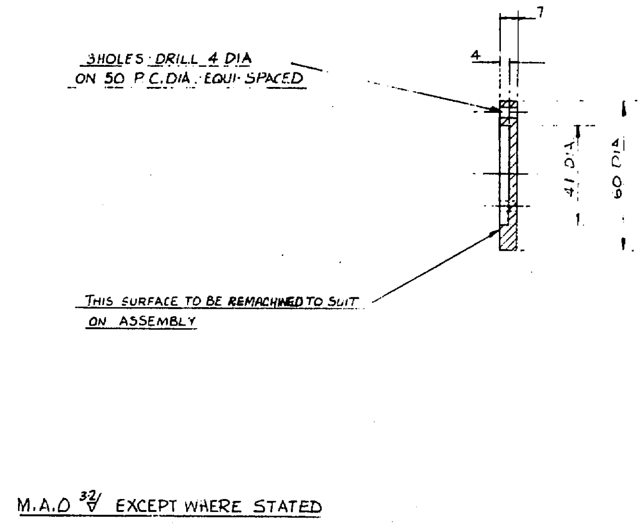
ALL DIMENSIONS ARE IN MILLIMETRES. ANGLES ±. SCREW THREADS TO B.S. 3643 PART 2 MEDIUM FIT. MACHINED DIA CONCENTRIC TO 0·1 T.I.R.

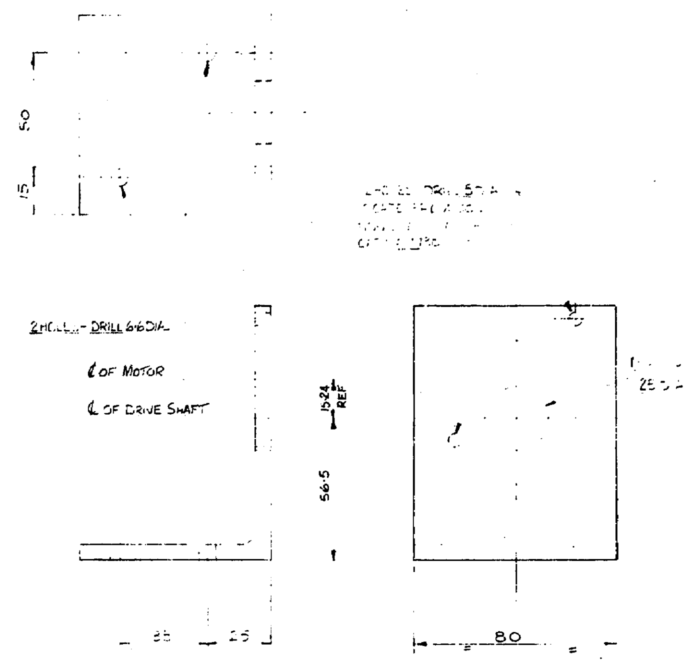
PROJECTION 3rd ANGLE — DRAWN N. MANN — DATE 27-10-80

GRUBB PARSONS NEWCASTLE UPON TYNE NE6 2YB

TITLE: DETAILS FOR 4·2m COLLIMATING DRIVE — TC1-215 14 - 20



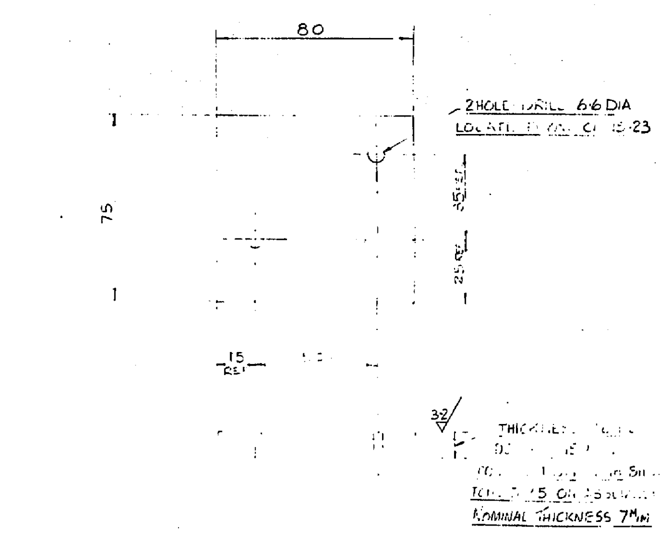


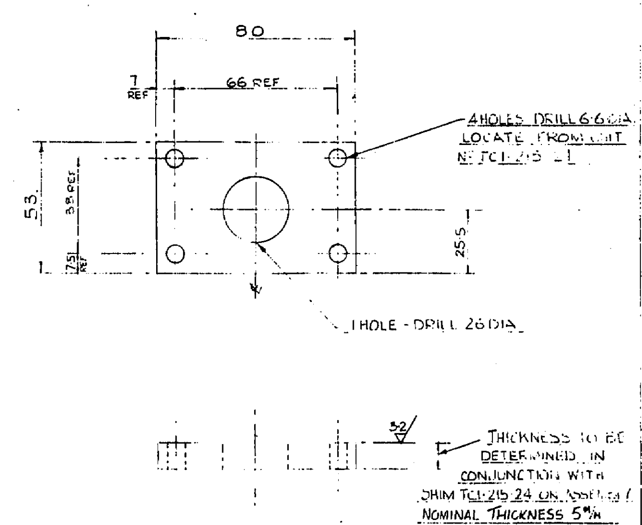


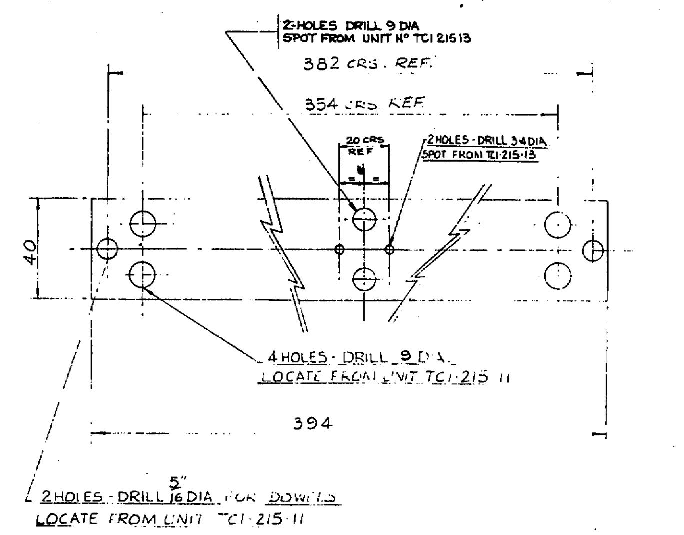
DATE OF MOD / MODIFIED BY	DATE OF MOD / MODIFIED BY	FIRST MADE ORD No.	118660	MATERIAL	'20' Carbon Steel
		FIRST ISSUE DATE	27-2-81	FINISH	
		COST ACCOUNT	215	PATT No.	
		TITLE	ECCENTRIC HOUSING		
		WEIGHT 1·1 Kg. No. OFF PER SET 2	SCALE 1:1	UNIT No. TCI·215·21	ISSUE A

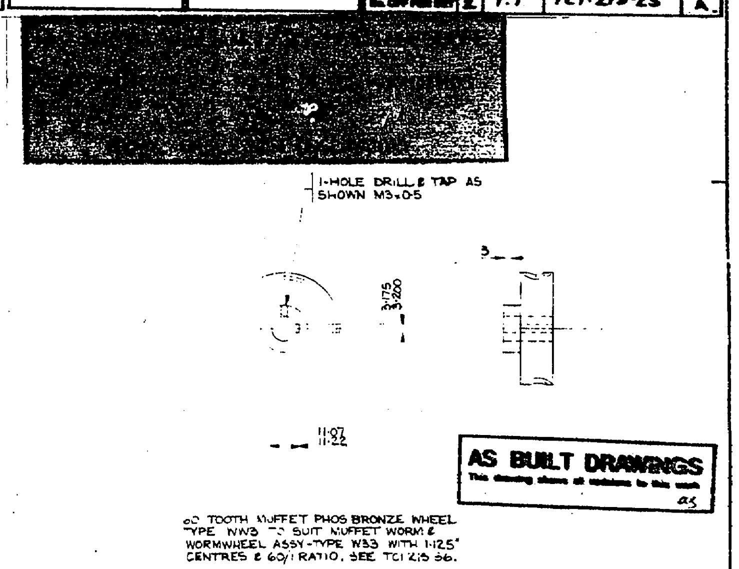
DATE OF MOD / MODIFIED BY	DATE OF MOD / MODIFIED BY	FIRST MADE ORD No.	118660	MATERIAL	'20' Carbon Steel
		FIRST ISSUE DATE	27-2-81	FINISH	
		COST ACCOUNT	215	PATT No.	
		TITLE	CAP		
		WEIGHT 0·13 Kg. No. OFF PER SET 2	SCALE 1:1	UNIT No. TCI·215·22	ISSUE A

DATE OF MOD / MODIFIED BY	DATE OF MOD / MODIFIED BY	FIRST MADE ORD No.	118660	MATERIAL	AL. ALLOY
		FIRST ISSUE DATE	27-2-81	FINISH	
		COST ACCOUNT	215	PATT No.	
		TITLE	BRACKET		
		WEIGHT 0·08 Kg. No. OFF PER SET 2	SCALE 1:1	UNIT No. TCI·215·23	ISSUE A









Royal Greenwich Observatory
La Palma Division
APPROVED
No. TCI.215.26 Iss. B
Date 27.2.81 by R.Black

Royal Greenwich Observatory
La Palma Division
APPROVED
No. TCI.215 21-27
Date 10.2.81

DATE OF MOD / MODIFIED BY	DATE OF MOD / MODIFIED BY	FIRST MADE ORD No.	118660	MATERIAL	'20' Carbon Steel
		FIRST ISSUE DATE	27-2-81	FINISH	
		COST ACCOUNT	215	PATT No.	
		TITLE	MOTOR SHIM.		
		WEIGHT 0·3 Kg. No. OFF PER SET 2	SCALE 1:1	UNIT No. TCI·215·24	ISSUE A

DATE OF MOD / MODIFIED BY	DATE OF MOD / MODIFIED BY	FIRST MADE ORD No.	118660	MATERIAL	'20' Carbon Steel
		FIRST ISSUE DATE	27-2-81	FINISH	
		COST ACCOUNT	215	PATT No.	
		TITLE	ECCENTRIC SHIM.		
		WEIGHT 0·2 Kg. No. OFF PER SET 2	SCALE 1:1	UNIT No. TCI·215·25	ISSUE A

DATE OF MOD / MODIFIED BY	DATE OF MOD 11-3-81 / MODIFIED BY	FIRST MADE ORD No.	118660	MATERIAL	STAINLESS STEEL
	B	FIRST ISSUE DATE	27-2-81	FINISH	
		COST ACCOUNT	215	PATT No.	
		TITLE	FLEXIBLE STRIP		
		WEIGHT	SCALE 1:1	UNIT No. TCI·215·26	ISSUE B
		No. OFF PER SET 2			

DATE OF MOD / MODIFIED BY	DATE OF MOD / MODIFIED BY	FIRST MADE ORD No.		MATERIAL	See Remarks
		FIRST ISSUE DATE	27-2-81	FINISH	
		COST ACCOUNT	215	PATT No.	
		TITLE	Modification to Hardware		
		WEIGHT No. OFF PER SET 1	SCALE 1/1	UNIT No. TCI 215 27	

A merger of Clarke Chapman and Reyrolle Parsons

SURFACE FINISH EQUIVALENTS								
MICROINCHES	4	8	16	32	63	125	250	500
MICROMETRES	·1	·2	·4	·8	1·6	3·2	6·3	12·5

THIS DRAWING CONFORMS TO B.S. 308

SURFACE FINISH SYMBOLS: √ DENOTES NOT NECESSARILY MACHINED; ∇ DENOTES MACHINED

WELD SYMBOLS TO BS 499 PART 2 1969

FABRICATION TOLERANCES
DIMENSIONS UP TO 250 ± 2·0
DIMENSIONS FROM 250 TO 2500 ± 3·0
ANGLES ± 1 : 600
STRAIGHTNESS/FLATNESS 1 : 600

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GENERAL MACHINING TOLERANCES (EXCEPT WHERE STATED OTHERWISE)
UNSPECIFIED DIMENSIONS WITH - ONE DECIMAL SIGN ± 0·2
DIMENSIONS WITH - OVER ONE DECIMAL SIGN ± 0·1

ALL DIMENSIONS ARE IN MILLIMETRES
ANGLES ±
SCREW THREADS TO B.S. 3643 PART 2 MEDIUM FIT
MACHINED DIA CONCENTRIC TO 0·1 T.I.R.

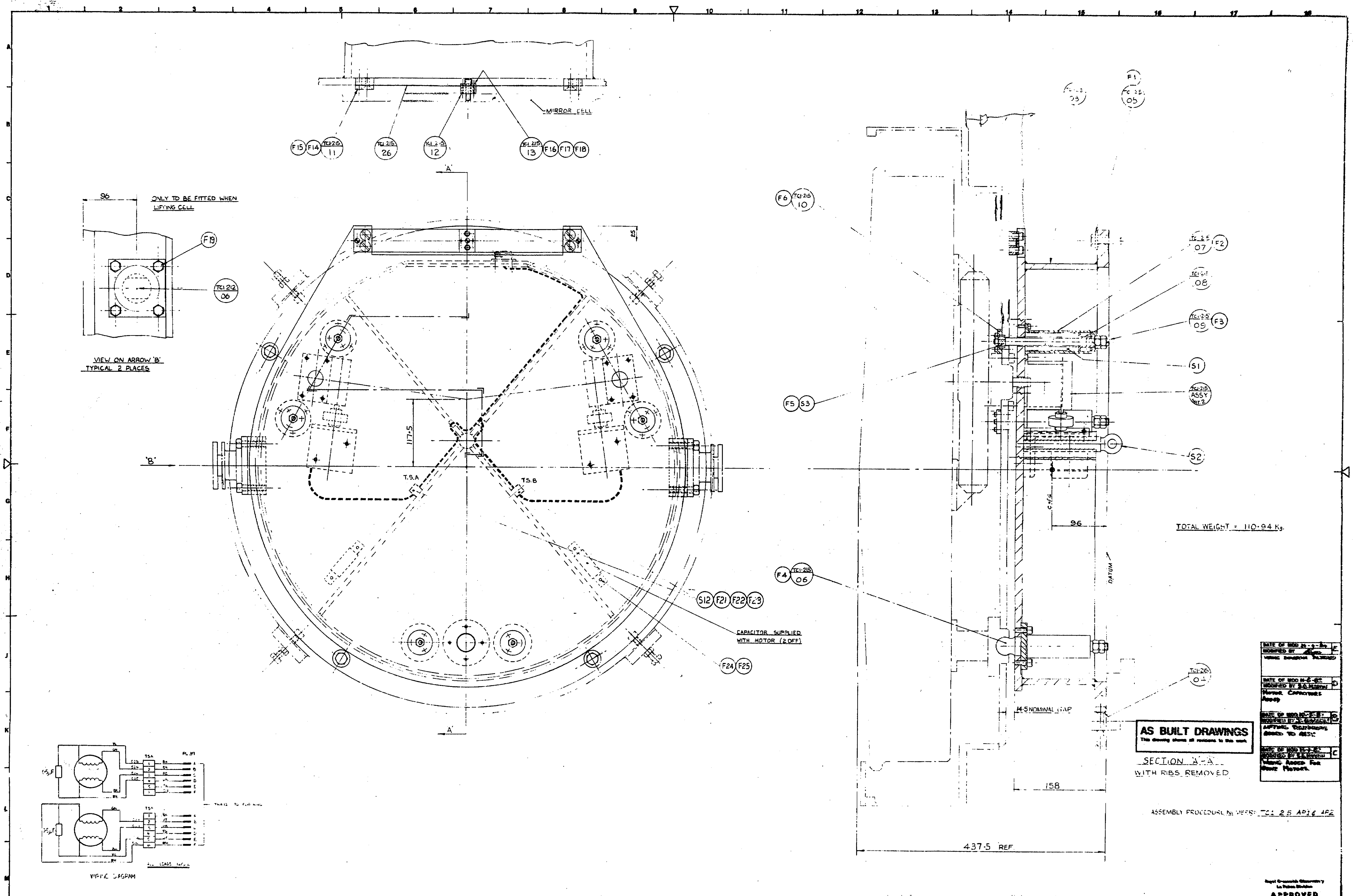
PROJECTION 3rd ANGLE | CHECKED | DRAWN N. MANN | DATE 28-10-80

GRUBB PARSONS NEWCASTLE UPON TYNE NE6 2YB

TITLE DETAILS FOR 4·2m COLLIMATING DRIVE

DRAWING NUMBER TCI 215 21 - 27

4·2 METRE TELESCOPE



AS BUILT DRAWINGS

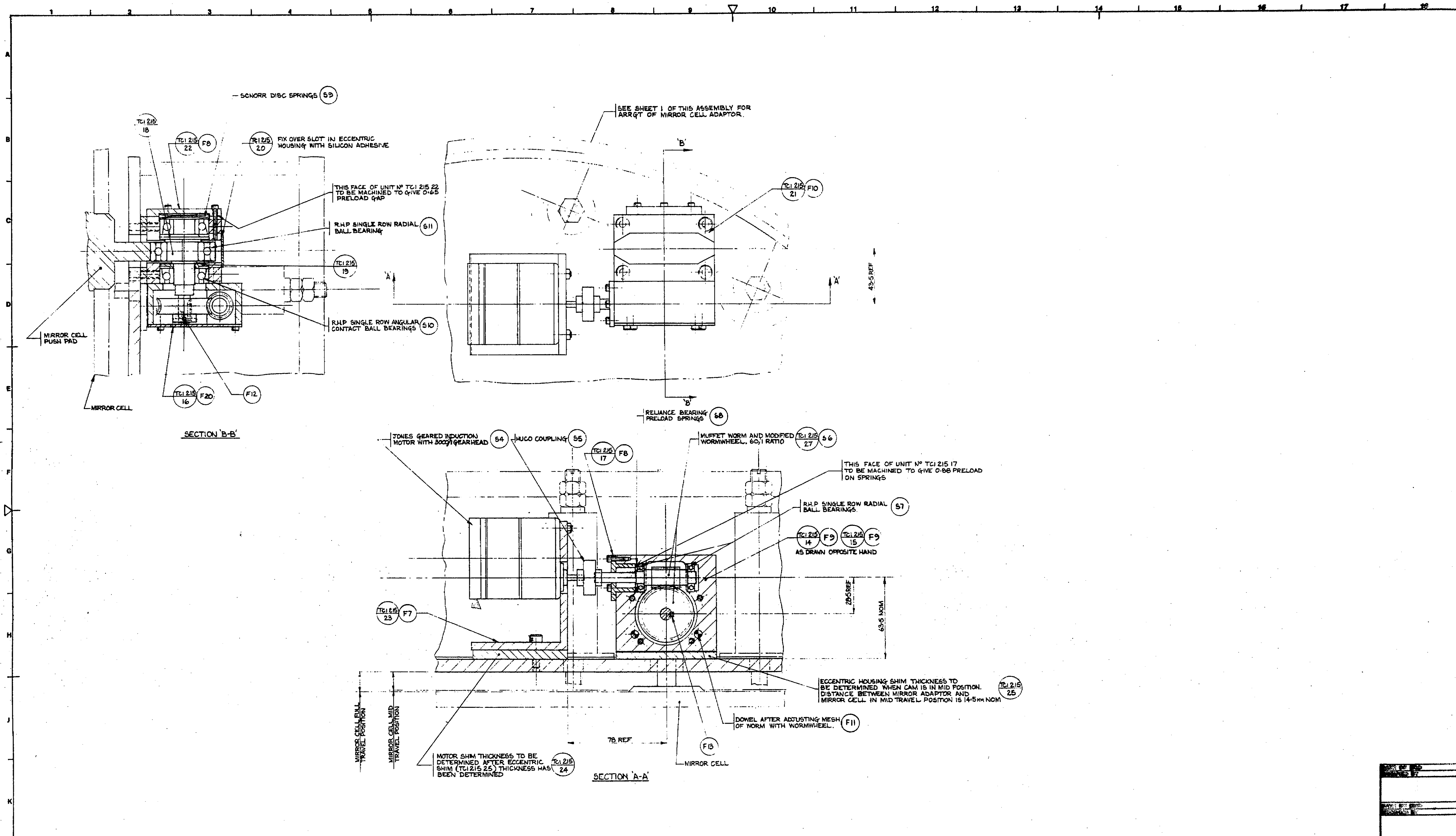
ASSEMBLY PROCEDURE REFERS: TCI 215 AP16 4F2

CIRCUIT DIAGRAM Nº ED160

APPROVED

4·2 METRE TELESCOPE

Firm	A merger of Clarke Chapman and Reyrolle Parsons
Surface finish equivalents	This drawing conforms to B.S. 308
Surface finish symbols	✓ Denotes not necessarily machined; ▽ Denotes machined
Weld symbols	To BS 499 Part 2 1969
Fabrication tolerances	Dimensions up to 250 ± 2·0; Dimensions from 250 to 2800 ± 3·0; Angles ± 1:600; Straightness/Flatness 1:600
Notice	This drawing is the property of NEI Parsons Ltd. and must not be copied or disclosed to a third party without Grubb Parsons written consent.
Dimensions	All dimensions are in millimetres
Projection	3rd angle
Drawn	N. MANN
Date	7·11·80.
Company	GRUBB PARSONS NEWCASTLE UPON TYNE
Title	ASSY. OF SECONDARY M. CELL ADAPTOR AND COLLIMATING DRIVE
Issue	2
Drawing No.	TCI-215



NOTES
1/ MESH OF WORM TO WORMWHEEL IS TO BE ADJUSTED ON ASSEMBLY BY MOVING WORM HOUSING RELATIVE TO CAM HOUSING, TO GIVE MINIMUM CLEARANCE. (TARGET CLEARANCE TO BE LESS THAN 0·012M/M)
2/ ONE COLLIMATING DRIVE ASSY AS DRAWN – ONE OFF OPPOSITE HAND.

AS BUILT DRAWINGS
This drawing shows all revisions to this work.

APPROVED

4·2 METRE TELESCOPE

SURFACE FINISH EQUIVALENTS	SURFACE FINISH SYMBOLS	WELD SYMBOLS	FABRICATION TOLERANCES
MICROINCHES 4 8 16 32 63 125 250 500 / MICROMETRES 1 2 4 8 16 32 63 125	✓ DENOTES NOT NECESSARILY MACHINED; ✓ DENOTES MACHINED	TO BS 499 PART 2 1980	DIMENSIONS UP TO 250 ± 2·0; DIMENSIONS FROM 250 TO 2500 ± 3·0; ANGLES ± 1 : 600; STRAIGHTNESS / FLATNESS 1 : 600
THIS DRAWING CONFORMS TO B.S. 308			

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GENERAL MACHINING TOLERANCES (EXCEPT WHERE STATED OTHERWISE) UNSPECIFIED DIMENSIONS ± 0·5; DIMENSIONS WITH – OVER AND DECIMAL SIGN ± 0·2; DIMENSIONS WITH – OVER AND DECIMAL SIGN ± 0·1

ALL DIMENSIONS ARE IN MILLIMETRES. ANGLES ±. SCREW THREADS TO B.S. 3643 PART 2 MEDIUM FIT. MACHINED DIA CONCENTRIC TO 0·1 T.I.R.

PROJECTION 3rd. ANGLE | CHECKED | APPROVED 4.2.81 | DRAWN A BROWN | DATE 12-11-80

GRUBB PARSONS NEWCASTLE UPON TYNE NE6 2YB

TITLE: ASSEMBLY OF SECONDARY MIRROR CELL ADAPTOR AND COLLIMATING DRIVE.

SCALE 1/1 | SHEET 2 OF | TC1 215