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Array Experiments
Phase 2
Volume 4

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3/4/68 We will now like to look at the 4^3, 6 Kg, Bare array with smaller Z dim. than before. We must check wall storage for Cols. with small Z. We will first check to see if we can safely load one col. & then see if we can safely wall store it. We will set up a Z-dim. of 3.360 cm.

— Safety Experiment for Loading One Col. —

We will check a safety array of 4 Cols. in a row with 1 6-kg unit per col. If this is safe then we know one col. of 4 6-Kg units is safe.

Eff. Factor Determination — Source = 1.3×10^7 n/s

Background : Eight Cols. with 4 around corner (6 Kg)

T-1 = 51085/60
8514
$\bar{c}_s$ = 14.19

T-2 = 66082/60
1101
$\bar{c}_s$ = 18.35

④ ③ | ② ①

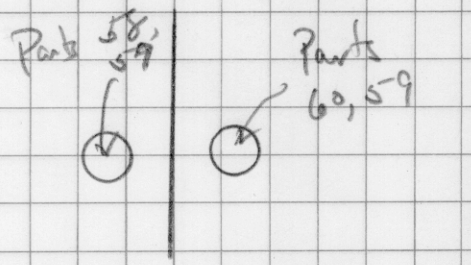
Source holder pos. = 0.0000

STS = 3.360 cm

		T-1	T-2
Col. 1	$\bar{c}_m$	18014/10	20319/10
	$\bar{c}_s$	30.02	33.87
	$\bar{c}_s$-BKg	15.83	15.52
	Eff. Factor	$.821 \times 10^6$	$.888 \times 10^6$
Col. 2	$\bar{c}_m$	16841/10	19632/10
	$\bar{c}_s$	28.07	32.72
	$\bar{c}_s$-BKg	13.88	18.37
	Eff. Factor	$.937 \times 10^6$	$.905 \times 10^6$
	Avg.	$.879 \times 10^6$	$.872 \times 10^6$

3/5/68

Safety Array 1: STS = 3.360 cm
6-Kg

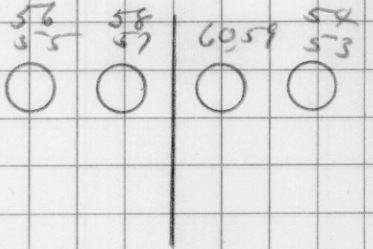


BKg: T-1 = 851.4 T-2 = 1101

Base Rate ≈ 8.041 $\times 10^{-5}$ n/s

Pos.	T-1	Eff. Factor	10^5 n/s	M	T-2	Eff. Factor	10^5 n/s	M
7.957	10387/10	$.987 \times 10^{-6}$	29.23	3.64	13049/10	$.905 \times 10^{-6}$	30.77	3.83
	1038.7				1304.9			
	−851.4				−1101			
	187.3				203.9			
	3.12				3.40			
0.004	10642/10		33.26	4.14	13842/10		36.65	4.56
	1064.2				1384.2			
	−851.4				1101.0			
	212.8				283.2			
	3.55				4.05			

Safety Array 2: STS = 3.360 cm
6 Kg



BKg: T-1 = 851.4 T-2 = 1101

Base Rate ≈ 16.081 $\times 10^{-5}$ n/s

Pos.	T-1	Eff. Factor	10^5 n/s	M	T-2	Eff. Factor	10^5 n/s	M
7.963	13442/10	$.879 \times 10^{-6}$	72.17	4.49	16336/10	$.872 \times 10^{-6}$	77.43	4.81
	1344.2				1633.6			
	−851.4				1101.0			
	492.8				532.6			
	8.21				8.88			

The Scram table keeps dropping from the magnet. We turned the magnet voltage up to 90 to check this out.

We had a problem? The DVM read ≈ 3 mil out the Celtic read ≈ 2 mil out, The DT read ≈ 2 mil out but the table measured 0 at the center, 1.5 mil about half way to the edge, 3 mil at the edge. We could find no reason for the readings. We adjusted all meters to 0 and we will continue. We will put the magnet voltage back to 78 volts.

Pos.	T-1	Eff. Factor	10^5 n/s	M	T-2	Eff. Factor	10^5 n/s	M
0.000	14234/10	$.879\times10^6$	83.77	5.21	16917/10	$.872\times10^6$	85.89	5.34
	1423.4				1691.7			
	-857.4				-1101.9			
	572.0				589.7			
	9.53				9.85			

We will now do Eff. Factor determination for one col. with STS_2 = 3.36 cm CTE_2 = 13.120 cm

Source positions = 35, 85, 135, 185

3/6/68 We got the 2 mils back. I don't understand why the celtic let the table close the 2 mils. We reset to 0.

We will now do Eff. Factors for one col.

Pos.		T-1	T-2
	c/m	15466/10	18303/10
35	c/s	25.78	30.51
	c/s − DKg	11.59	12.16
	Eff. Factor	1.122×10^6	1.069×10^6
85	c/m	15918/10	18764/10
135	c/m	16430/10	19443/10
185	c/m	16221/10	19460/10

		T-1	T-2
Avg.	$\bar{x}_m - Bkg$	749.48	790.75
	$\bar{x}_s$	12.49	13.18
	Eff. Factor	1.041×10^{-6}	$.986 \times 10^{-6}$

We will do the Eff. Factors for the Full Array with $STS_{xy} = 13.421$ cm $STS_z = 3.360$ cm

			T-1	T-2
Col. 9				
Pos	3s		15186/10	19616/10
	8s		15556/10	19746/10
	13s		15531/10	19801/10
	18s		15835/10	20111/10
	Avg.	$\bar{x}_m$	1552.8	1981.9
		$\bar{x}_s$	25.88	33.08
		$\bar{x}_s - Bk_g$	11.69	14.68
		Eff. Factor	1.112×10^{-6}	$.886 \times 10^{-6}$
Col. 10				
Pos.	3s		15571	18655
	8s		16046	18929
	13s		15847	19027
	18s		16120	19446
	Avg	$\bar{x}_m$	1589.6	1901.8
		$\bar{x}_s$	26.49	31.69
		$\bar{x}_s - Bk_g$	12.30	13.34
		Eff. Factor	1.060×10^{-6}	$.975 \times 10^{-6}$

			T-1	T-2
Col. 11				
Pos.	35°		16358 /10	18269 /10
	85°		16491	18355-
	135°		16683	18491
	185°		16971	19438
	Avg	$\bar{y}_m$	1662.6	1863.8
		$\bar{y}_s$	27.71	31.06
		$\bar{y}_s$-Blk	13.52	12.71
		Eff Rate	.962 X 10^6	1.023 X 10^5
Col. 12				
Pos	35°		16825- /10	17615- /10
	85°		17533	17885-
	135°		17168	18020
	185°		17570	18205-
	Avg.	$\bar{y}_m$	1727.4	1800.6
		$\bar{y}_s$	28.79	30.01
		$\bar{y}_s$-Blk	12.60	11.66
		E.F.	.890 X 10^6	1.115 X 10^6
Col. 13				
Pos.	35		15842	20690
	85		16235-	21360
	135		15929	20765-
	185		16417	22039
	Avg.	$\bar{y}_m$	1610.6	2121.4
		$\bar{y}_s$	26.84	35.36
		$\bar{y}_s$-Blk	12.65-	17.01
		E. F.	1.028 X 10^6	.764 X 10^6

			T-1	T-2
Col. 14				
Pos.	35°		16631/10	19884
	85°		16813	20323
	135°		16915	19742
	185°		17120	20731
	Avg.	$\bar{y}_m$	1674.5	2017.0
		s_s	27.91	33.62
		s_s-Beg	13.72	15.27
		E.F.	$.948 \times 10^6$	$.851 \times 10^6$
Col. 15				
Pos	35°		17412	19071
	85°		17769	19712
	135°		17224	19373
	185°		16139	19920
	Avg	$\bar{y}_m$	1763.6	1957.9
		s_s	29.39	32.53
Col. 16		s_s-Beg	15.20	14.18
		E.F.	$.855 \times 10^6$	$.917 \times 10^6$
Col. 16				
Pos	35°		18017	19005
	85°		18500	18595
	135°		17500	18837
	185°		19133	19206
	Avg.	$\bar{y}_m$	1828.8	1891.1
		s_s	30.48	31.52
		s_s-Beg	16.29	13.17
		E.F.	$.798 \times 10^6$	$.987 \times 10^6$

3/8/68

We will now continue the wall storage safety arrays. Bottom Spacing = 25, 25, 10, .5, 4

Safety Array 2: One Col. STS_2 = 3.360 cm.

Vertical: .108 + 3.132 cm = 3.360 cm

Parts: 1, 2, 3, 4, 5, 6, 8, 9

Base Rate: 16.081×10^{-5} n/s

Pos.	T-1	Eff. Factor	10^{-5} n/s	M	T-2	Eff. Factor	10^{-5} n/s	M
0.000	12153/10	1.112×10^{-6}	67.50	4.20	15915/10	$.886 \times 10^{-6}$	72.97	4.51
	1215.3				1591.5			
	- 851.4				1101.0			
	364.1				490.5			
	6.07				8.18			

Safety Array 3: One Col. + reflector (2.5" from Col.) STS_2 = 3.360 cm

Base Rate: 16.081×10^{-5} n/s

Pos.	T-1	Eff. Factor	10^{-5} n/s	M	T-2	Eff. Factor	10^{-5} n/s	M
24.130	11874/10	1.112×10^{-6}	62.27	3.87	15558/10	$.886 \times 10^{-6}$	67.16	4.18
	1187.4				1555.8			
	- 851.4				1101.0			
	336.0				454.8			
	5.60				7.58			
7.940	11950/10		63.72	3.96	15801/10		70.79	4.40
	1195.0				1580.1			
	- 851.4				1101.0			
	343.6				479.1			
	5.73				7.99			

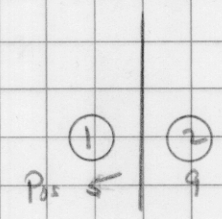
Pos.	T-1	Eff. Factor	10^5 n/s	M	T-2	Eff. Factor	10^5 n/s	M
0.000	11936/10	1.112×10^6	63.38	3.94	15499/10	$.886 \times 10^6$	69.11	4.30
	1193.6				1549.9			
	−851.4				− 1101			
	342.2				448.9			
	5.70				7.80			

Safety Array 4: Two Cols. Pos. 8 & 12 STS_{xy} = 13.421 cm STS_z = 3.36 cm

Lateral: .721 + 12.700 = 13.421 cm

Vertical: .108 + 3.152 cm = 3.360 cm

Parts: Cols 1 + 2



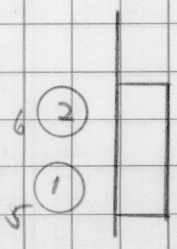
Base Rate: 2 32.5×10^5 n/s

Pos.	T-1	Eff. Factor	10^5 n/s	M	T-2	Eff. Factor	10^5 n/s	M
0.589	18389/10	$.890 \times 10^6$	145.87	4.49	19232/10	1.115×10^6	134.25	4.13
	1838.9				1923.2			
	−851.4				1101.			
	983.5				722.2			
	16.39				12.04			
0.000	19720/10		166.25	5.12	19788/10		163.12	5.02
	1972.0				1978.8			
	−851.4				−1101.0			
	1120.6				877.8			
	18.68				14.63			

Safety Array 5: Two Cols + one reflector (2.5" from Cols)

STS_{xy} = 13.421 cm STS_z = 3.360 cm

Pos.	T-1	Eff. Factor	10^5 n/s	M	T-2	Eff. Factor	10^5 n/s	M
24.130	15360/10	1.086×10^6	123.91	3.81	19269/10	$.931 \times 10^6$	128.20	3.94
	1536.0				1926.9			
	−851.4				−1101.0			
	684.6				825.9			
	11.41				13.77			



Pos.	T-1	Eff. Factor	10^5 1/s	M	T-2	Eff. Factor	10^5 1/s	M
7.978	7835/s	1.086×10^6	125.56	3.99	9671/s	$.931 \times 10^6$	125.13	3.97
	1567.0				1934.2			
	− 851.4				1101.0			
	715.6				833.2			
	11.93				13.87			
0.005	8211/s		143.13	4.40	10054/s		141.14	4.34
	1642.2				2010.8			
	− 851.4				− 1101.0			
	790.8				909.8			
	13.18				15.16			

3/11/68

Safety Array 6: 3 Cols. $STS_{x4} = 13.421$ cm $STS_y = 3.36$ cm

Parts: Cols 1, 2 & 3

Base Rate: ~ 48.75×10^{-5} 1/s

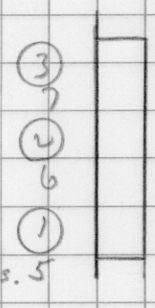
②	①	③
4	8	12

Pos.	T-1	Eff. Factor	10^5 1/s	M	T-2	Eff. Factor	10^5 1/s	M
7.997	26354/10	$.859 \times 10^6$	255.38	5.24	25775/10	1.072×10^6	263.82	5.41
	2635.4				2577.5			
	− 851.4				− 1101.0			
	1784.0				1476.5			
	29.73				24.61			
6.000	28011/10		279.18	5.73	26620/10		278.93	5.72
	2801.1				26620			
	− 851.4				− 1101			
	1949.7				1561.0			
	32.50				26.02			

Safety Array 6 : 3 Cols + 2 reflectors STS_y = 13.421 cm
STS_z = 3.360 cm

Parts : Cols. 1, 2 & 3

Base Rate : ≈ 48.75 $\times 10^{-5}$ n/s



Pos.	T-1	Eff. Factor	10^{-5} n/s	M	T-2	Eff. Factor	10^{-5} n/s	M
29.13	1921 9/10	1.045×10^{6}	186.43	3.82	2263 7/10	$.961 \times 10^{6}$	184.24	3.82
	1921.9				2263.7			
	-851.4				-1101.0			
	1070.5				1162.7			
	17.84				19.38			
2.950	9630/5		187.16	3.84	11600/5		195.28	4.006
	1926.0				2320.0			
	-851.4				-1101			
	1074.6				1219			
	17.91				20.32			
0.000	10181/5		206.39	4.23	11725/5		195.41	4.09
	2036.2				2345.0			
	-851.4				-1101.			
	1184.8				1244.8			
	19.75				20.75			

We can therefore safely store the cols. with STS_z = 3.360 cm in the wall rack.

We will now continue the safety arrays for the next array (STS_g = 3.360) 43, 6 Kg, Bare.

Assembly N-1 : STS_{xy} = 13.421 cm STS_z = 3.360 cm

Lateral : .721 + 12.700 = 13.421 cm

Vertical : .108 + 3.252 = 3.360 cm

Parts : Cols 1, 2, 3 & 4

3	4
7	11
2	1
6	10

Base Rate : ~65.2 $\times 10^5$ m/s

Bkg : T-1 = 851.4 T-2 = 1101.0

Pos.	T-1	Eff. Factor	10^5 m/s	M	T-2	Eff. Factor	10^5 m/s	M
2.984	13784/s	1.011×10^6	321.19	4.93	15763/s	$.9995 \times 10^6$	341.56	5.24
	27578				31526			
	− 851.4				− 1101			
	1906.4				20516			
	31.77				34.19			
0.000	15386/s		375.08	5.75	17252/s		387.81	5.95
	30772				34304			
	− 851.4				− 1101.0			
	2225.8				2329.4			
	37.10				38.82			

Assembly N-2 : (3/11/68)

5	3	4	7
6	2	1	8

Lateral : .721 + 12,700 = 13,421 cm

Vertical : .108 + 3.250 = 3.358 cm

Parts : Cols 1-8, Billets 1-65 less #7

Base Rate. 129.11 $\times 10^5$ m/s

Bkg T-1 851.4 T-2 1101.0

Poo	T-1	Eff Fac	10^5 m/s	M	T-2	Eff Fac	10^5 m/s	M
7,948	37356/s	$.9563 \times 10^6$	1055.1	8.17	40388/s	$.9415 \times 10^6$	1094.8	8.48
	7,471.2				8,077.6			
	− 851.4				110.10			
	6,619.8				6976.6			
	1103.3				116.276			
0.000	43,412/s		1248.2	9.67	46,432/s		1284.4	9.95
	8,682.5				92864			
	− 851.4				− 1101.0			
	7831.1				8185.4			
	1305.2				1364.2			

$\bar{M} = 9.81$

3/12/68

Assembly N-3: STS_{xy} = 26.121 cm STS_3 = 3.360

Lateral : .721 + 25.400 = 26.121

Vertical : .108 + 3.252 = 3.360

Parts : 1-129 less #7

Base Rate : 259.38×10^{-5} n/s

Pos.	T-1	Factor	M	T-2	Factor	M
2.952	11127	6.149×10^{-4}	6.84	11482	6.040×10^{-4}	6.94
.004	11269		6.93	11949		7.22
			1/m = .1443			1/m = .1385
	T/C's		R = 70	#1 = 93		#2 = 99

3/13/68

Assembly N-4: STS_{xy} = 19.771 cm STS_3 = 3.360

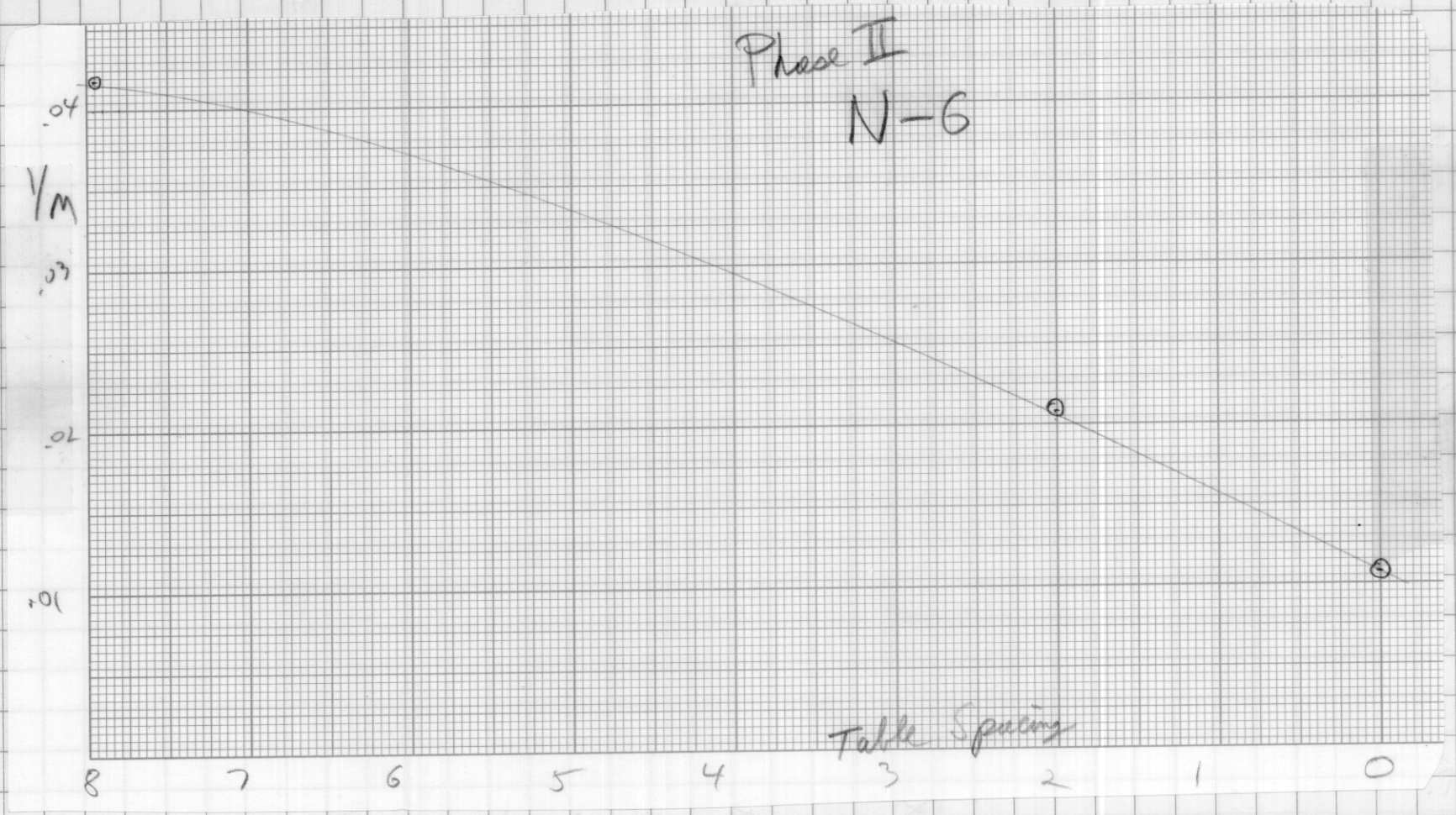
Lateral : .721 + 19.050 = 19.771 cm

Vertical : .108 + 3.252 = 3.360 cm

Parts : 1-129 less # 7

Base Rate : 259.38×10^{-5} n/s

Pos.	T-1	Factor	M	T-2	Factor	M
2.948	13834	6.149×10^{-4}	8.51	14066	6.040×10^{-4}	8.50
.004	15431		9.49	16001		9.66
			1/m = .1054			1/m = .1035
	T/C's		R = 70	#1 = 111		#2 = 102


Phase II
N-6
.04
.03
.02
.01
V/M
8
7
6
5
4
3
2
1
0
Table Spacing

3/14/68

Assembly N-5: STS_{xy} = 15.686 cm STS_{β} = 3.360

Lateral: .721 + 14.965 = 15.686 cm

Vertical: .108 + 3.252 = 3.360 cm

Parts: 1 – 129 less #7

Base Rate: 259.38 $\times 10^{-5}$ r/s

Pos.	T-1	Factor	M	T-2	Factor	M
7.547	22294	6.149×10^{-4}	13.68	23346	6.040×10^{-4}	14.10
.000	33128 ↓ 33348		20.50 $\bar{Y}_m$ = .04878	34104 ↓ 34337		20.74 $\bar{Y}_m$ = .04822

T/C's R = 69 #1 = 89 #2 = 96

3/15/68

Assembly N-6: STS_{xy} = 14.040 cm STS_{β} = 3.360 cm

Lateral: .721 + 13.319 = 14.040 cm

Vertical: .108 + 3.252 = 3.360 cm

Parts: 1 – 129 less #7

Base Rate: 259.38 $\times 10^{-5}$ r/s

Pos.	T-1	Factor	M	T-2	Factor	M
7.952	37751 ↓ 38038	6.149×10^{-4}	23.39	40207 ↓ 40523	6.040×10^{-4}	24.48
						$\bar{M}$ = 23.93

T's: 110, 103, ~70

2.000	76279/1 ↓ 77461	47.63	79872/1 ↓ 81168	49.03	
					$\bar{M}$ = 48.33

P_{50}	T-1	Fact.	M-1	T-2	Fact.	M-2
+.004	144805 ↓ 149124	6.149×10^{-4}	91,700	151538 156275	6.040×10^{-4}	94,39

$\bar{M} = 93,04$

T's: 70, 109, 102

3/19/68

N-6A (Repeat of N-6)

— Everything As before —
(Parts have cooled down some more)

P_{50}	T-1	M-1	T-2	M-2
7,95+	37,934 ↓ 38,224	23.50	40,134 ↓ 40,458	24.44

$\bar{M} = 23,97$, $1/\bar{M}$ .0417

4.000	54,446 ↓ 55045	33.85	57,450 ↓ 58,118	35.10

$\bar{M} = 34.48$, $1/\bar{M} = .0290$

T's 102, 96 and rising

2.000	76,061 ↓ 77,235	47,491	80,131 ↓ 81,436	49.187

$\bar{M} = 48.34$ $1/\bar{M} = .0207$

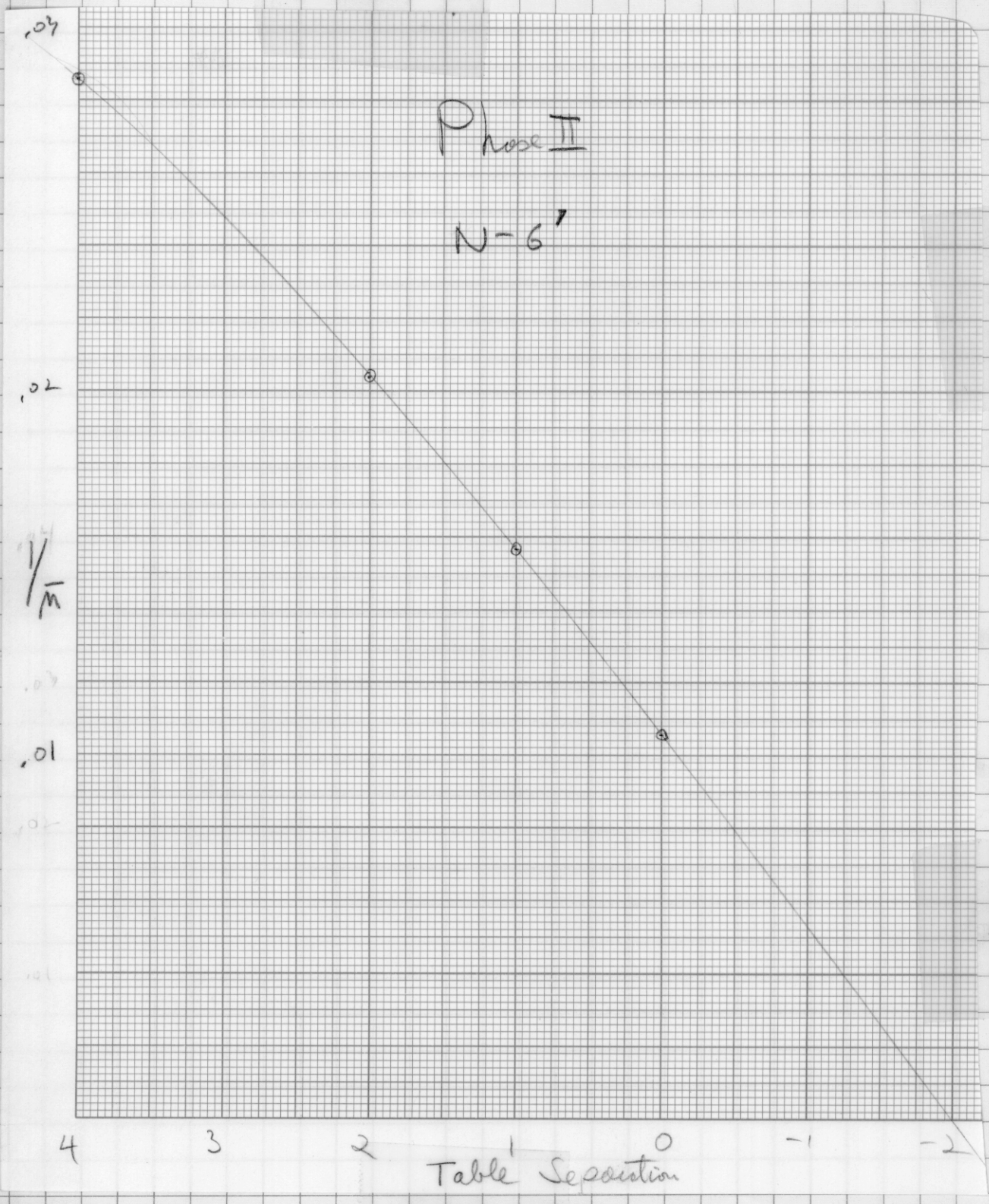
1.000	98,851 ↓ 100,844	62,009	102,872 ↓ 105,032	63,439

$\bar{M} = 62.72$, $1/\bar{M} = .0159$

0.000	144,256 ↓ 148,541	91,338	150,045 ↓ 154,687	93,430

T's, ~ 105,000

$\bar{M} = 92,384$, $1/\bar{M} = .010824$

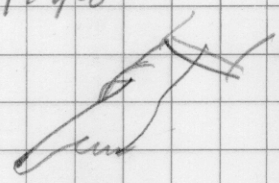

.03
.02
.01
1/M
Phase II
N-6'
4
3
2
1
0
-1
-2
Table Separation

3/19/68

N − 6° $14.040^2 \times 3.36$ a

Lateral .721 + 13.319 = 14.040 cm

Vertical .108 + 3.252 = 3.360 cm



Control Element ON TABLE

Pats: 1-129 less #7

P_{oo}	T-1	Factn	M-1	T-2	Factn	M-2
7.936	38,281	6.149×10^{-4}	23.72	40,690	6040×10^{-4}	24.78
(act out)	↓ 38,576			↓ 41,023		
					$\bar{m} = 24.25$	
4.000	55509		34.516	58012		35.450
(act. out.)	↓ 56,132			↓ 58,692		
					$\bar{m} = 34.983$	
					$1/\bar{m} = .02859$	
2.000	77221		48.227	81245		49.883
(act. out)	↓ 78,431			↓ 82,580	$\bar{m} = 49,055$	
					$1/\bar{m} = .02039$	
1.000	100,491		63.059	105,195		64.903
(act. out)	↓ 102,552			↓ 107,455	$\bar{m} = 63,981$, $1/\bar{m} = .01563$	
0.000	147,276		93.308	153,793		95.838
(act. out)	↓ 151,746			↓ 158,673	$\bar{m} = 94.573$, $1/\bar{m} = .010574$	

$\Delta 1/m = .000250$

To generate another data point for MULFIT, we are going to back up a little for a Multiplication of about 45

3/20/68

N-7 (4^3, 6 Kg Bore, unit cell series) ($14.478^2 \times 3.36$)

Lateral: .721 + 13,757 = 14.478 cm

Vertical: .108 + 3,252 = 3.360 cm

Parts: 1-129 less #7 [CONTROL ELEMENT OFF]

P_∞	T-1	Fact	M-1	T-2	Fact	M-2
7,941	31450 ↓ 31649	6.149×10^{-4}	19,46	32,822 ↓ 33,038	6.040×10^{-4}	19,95
					$\bar{m}$ = 19.71	

-.001	72,692 ↓ 73,764	45,357	75,953 ↓ 77,124	46,583	
	Temps: 118, 113			$\bar{m}$ = 45,970	$1/\bar{m}$ = .021753

N-7' Repeat of above with control element ON!!

[$14.478^2 \times 3.360$]

P_∞	T-1	Factor	M-1	T-2	Factor	M-2
7,950	31,894 ↓ 32,099	6.149×10^{-4}	19.74	33389 ↓ 33,614	6.040×10^{-4}	20.30
					$\bar{m}$ = 20.02	

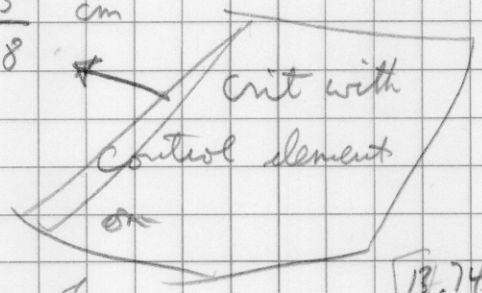
-.00.001	74,060 ↓ 75,173	46,224	77,133 ↓ 78,341	47,318	
				$\bar{m}$ = 46.771	$1/\bar{m}$ .021381

T's: 70, 108, 104

$\Delta 1/\bar{m}$ = .000372

Using the above data we have

MULFIT extrapolation is 13.665 cm
width of control element + .013 cm
13.678



So. IF we want a set-up to give a multiplication of 500 + we should set up to 5.127" [13.743]

IF we set up to 5.125", this should give a multiplication of ~ 660

Array taken down: 2 fixed spaces measured to be 3.254 cm (assumed to be 3.252 cm. They were measured while still warm. After cooling they shrink .001"!!!

3/26/68

We will now begin the Eff. Radar determination for 6Kg, 4² planar array. Source located 15" about table top. $STS_{x,y}$ = 2.997m
Source MRC 8-7

		T-1	T-2
Col. 9	c/m	7907/10 790.7	9163/10 916.3
Col. 10		8182/10 818.2	8855/10 885.5
Col. 11		8591/10 859.1	8456/10 845.6
Col. 12		9184/10 918.4	8049/10 804.9
Col. 13		8742/10 874.2	10851/10 1085.1
Col. 14		9047/10 904.7	9864/10 986.4
Col. 15		9664/10 966.4	9170/10 917.0
Col. 16		10139/10 1013.9	8889/10 888.9

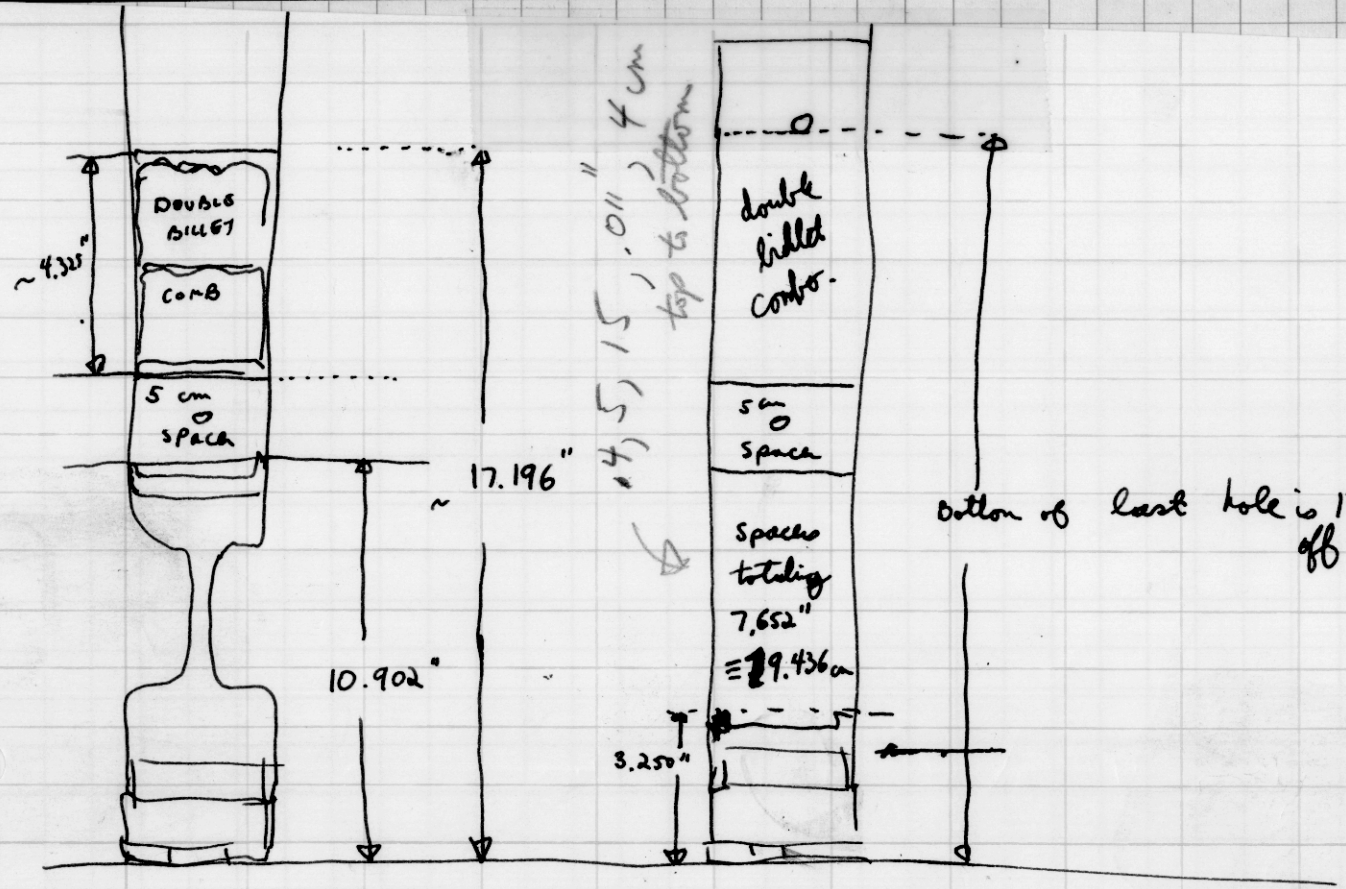
Eff. Factors for

		T-1	T-2
Cols. 6 & 10	c/m	293.7	313.3
	c/s	13.20	15.27
	Eff Factor	.962 x10^{-6}	.883 x10^{-6}
Cols. 6, 7, 10, & 11	c/m	836.7	865.6
	c/s	13.95	14.43
	E.F.	.932 x10^{-6}	.901 x10^{-6}
Cols. 6, 7, 2, 3, 10, 11, 14, 15	c/m	886.1	908.6
	c/s	14.77	15.14
	E.F.	.880 x10^{-6}	.857 x10^{-6}
Full Array	c/m	892.7	911.2
	c/s	14.88	15.19
	E.F.	.874 x10^{-6}	.854 x10^{-6}
Cols 6 & 10	c/m	814.2	885.5
	Bkgd. →	− 3.8	−2.3
	c/m'	810.4	883.2
	c/s	13.51	14.72
	eff Fact.	.962 2x10^{-6}	.8832 x10^{-6}

Base rate

1	2.03 x10^5	5	1.97 x10^5	
2	2.05	6	2.02 x10^5	
3	2.07 x10^5	8	2.01 x10^5	
4	1.99 x10^5	9	2.03 x10^5	
	8.14 x10^5 n/s		8.03 x10^5	

16.17 x10^5



Bottom of Pu will be 33.348 cm from table top

(~13 1/8")

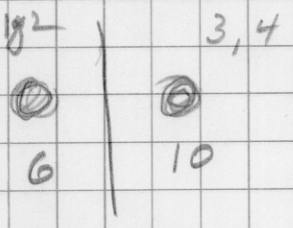
Source Measurements 15" off table

4x4x1, 6 kg brass

Assembly O-1

Safety Assy

Table to Pu: 33.35 cm



Lateral 2.276 + .721 = 2.997 cm

Vertical — none (just one double drilled

Part 1, 2, 3, 4,

Base Rate 8.14×10^5 m/s

Pu	T-1	eff fac	10^5 m/s	M-1	T-2	eff fac	10^5 m/s	M-2
7.958	3,000/10	$.9622 \times 10^6$	31.46	3.86	2,153	$.8832 \times 10^6$	31.35	3.85
	200.0 cpm				215.3 cpm			
	-3.8 bkgd				-2.3 bkgd.			
	196.2 cpm				213.0 cpm			
	3.27 cps				3.55 cps			
+0.008	2250/10		35.48		2482/10		36.19	
	225.0				248.2			
	-3.8		$M_1 = 4.36$		-2.3		$M_2 = 4.44$	
	221.2				245.9			
	3.687 cps				4.098		$\overline{M} = 4.40$	

Assembly 0-2: STS_{xy} = 2.997 cm

Lateral: .721 + 2.276 = 2.997 cm

Vertical: none (just one double billet)

Parts: 1, 2, 3, 4, 5, 6, 8, 9

Base Rate: 14.17×10^5 n/s

5,6	8,9
(7)	(11)
(6)	(10)
1,2	3,4

Pos.	T-1	E. F.	10^5 n/s	M	T-2	E. F.	10^5 n/s	M
7.558	4492/10	$.932 \times 10^6$	69.81	8.32	4880/10	$.901 \times 10^6$	72.71	8.50
	449.2				488.0			
	7.49				8.07			
0.003	6565/10		108.30	6.70	7506/10		112.72	6.97
	656.5				750.6			
	11.62				12.51			

$\overline{M} = 6.84$

3/29/68

Assembly 0-3: STS_{xy} = 2.997 cm (There is a variation in spacing at the top of the Cols. We will check into this) (The Avg. spacing is good)

Lateral: .721 + 2.276 = 2.997 cm

Vertical: none (just one double billet)

Parts: 1 - 17 less #7

Base Rate: ~32.39 $\times 10^5$ n/s

Cols.

Pos			
(6)	(3)	(4)	(8)
(5)	(1)	(2)	(7)

Pos.	T-1	E. F.	10^5 n/s	M	T-2	E. F.	10^5 n/s	M
7.556	19542/10	$.880 \times 10^6$	281.62	8.86	21103/10	$.859 \times 10^6$	302.11	9.34
	1954.2				2110.3			
	32.57				35.17			

Pos.	T-1	E.F.	10^5 n/s	M	T-2	E.F.	10^5 n/s	M
0.700	8062/2	.880x10⁶	5791.18	18.28	8548/2	.855x10⁶	6110.15	18.87
	4031				4262			
	67.18				71.03			
0.008	10297/2		7555.13	23.35	11028/2		7885.42	24.41
	5148.5				5514			
	85.81				91.90			

$\overline{M}$ = 23.88

$\gamma/\overline{m}$ = .0419

Assembly 0-4: STS x,y = 3.261 cm

Lateral: .721 + 2.540 = 3.261 cm

Vertical: none (6 kg 6'1/4")

Parts: 1 – 17 less #7

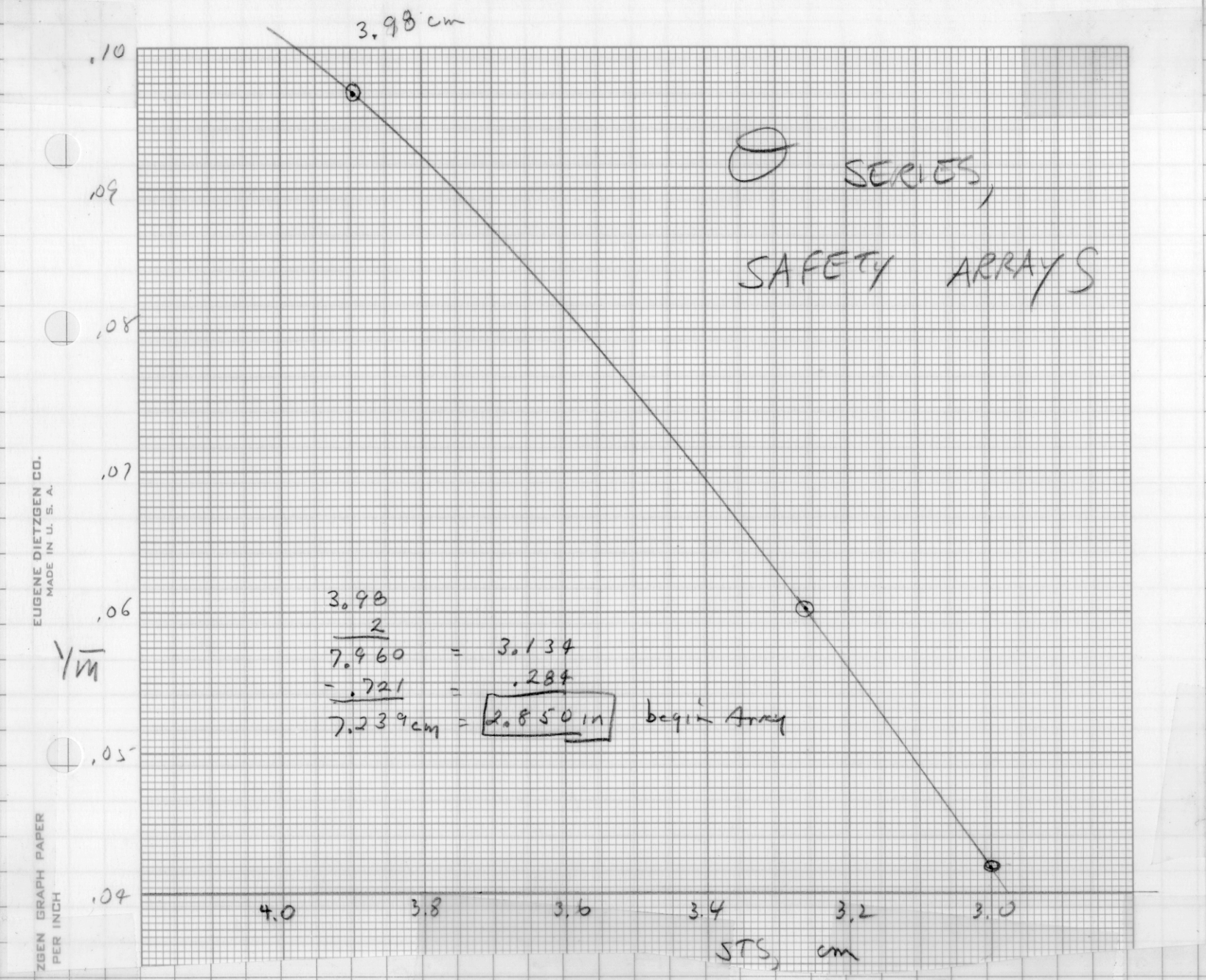
Base Rate: 32.34 x 10^5 n/s

⑥	③	④	⑧
⑤	①	②	⑦

Pos.	T-1	E.F	10^5 n/s	M	T-2	E.F	10^5 n/s	M
7.956	3376/2	.88x10⁶	2475.54	7.65	3826/2	.855x10⁶	2738.85	8.47
	1688				1913			
	28.13				31.88			
0.007	7205/2		5285.35	16.34	7638/2			16.91
	3602.5				3819			
	60.04				63.65			

$\overline{M}$ = 16.63

$\gamma/\overline{m}$ = .0601



θ SERIES,
SAFETY ARRAYS

3.98
2
7.960 = 3.134
- .721 = .284
7.239 cm = 2.850 in begin Array

Assembly 0-5: SIS = 3.854 cm

Lateral: .721 + 3.175 = 3.896 cm

Vertical: none

Parts: 1 - 17 less #7

Basic Rate: 32.34×10^5 n/s

⑥	③	④	⑧
⑤	①	②	⑦

Pos.	T-1.	E.F.	10^5 n/s	M	T-2	E.F.	10^5 n/s	M
2.985	3004/2	$.88 \times 10^6$	220.26	6.81	3043/2	$.858 \times 10^6$	217.76	6.73
	1502				1521			
	25.03				25.35			
0.003	22293/10		327.01	10.1	23940/10		342.74	10.5
	2229.3				2358.0			
	37.16				39.90			

$\overline{M} = 10.3$

$\gamma_M = .0971$

We had previously estimated crit. at 3.00 STS but the above data extrapolates to a ½ table limit at 3.98 cm. Now we have consistently gone crit at a longer spacing than the ½ table limit so the calculated crit of 3.00 is highly suspect. We will begin the array at twice the ½ table limit. The loading sequence is (only bottom billet # given. Top billet is following #

	⑧	⑭	㉜	⑯	
SCRAM	⑤	㉙	㉚	⑭	CONTROL
	③	⑳	㉘	⑫	
	①	⑱	㉖	⑩	

Assembly O-6 STS_{x1} = 7.96

Lateral : .721 + 7.239 = 7.960 cm

Vertical – nil (4 x 4 x 1)

Parts : 1-33 leo #7

Base Rate = ~64.9 $\times 10^5$ in/s (True 65.175 $\times 10^5$ in/s)

Pos	T-1	Eff Fac	10^5 in/s	M-1	T-2	Eff Fac	10^5 in/s	M-2
7.953	10,321/s	.874 $\times 10^6$	300.7	4.63	10,949/s	.856 $\times 10^6$	312.4	4.81
	↓ 3,064				2,190			
	↓ 34,40 ips				36,496 ips			

$\bar{m}$ = 4.72

(T-3 483 4/s)

0.000	11,840/s	344.96	5.32	12,512/s	357.04	5.50
	39.47			41.71		

$\bar{m}$ = 5.41

1/$\bar{m}$ = .1848

(T-3 573.2/s)

Assembly O-7 STS = 5.969 cm

Lateral : .721 + 5.248 = 5.969 cm

Vertical : None (4 x 4 x 1)

Parts : 1-33 less #7

Base Rate : ~64.9 $\times 10^5$ in/s

Pos.	T-1	E.F.	10^5 in/s	M	T-2	E.F.	10^5 in/s	M
7.962	19065/s	.874 $\times 10^6$	409.73	6.31	17541/s	.856 $\times 10^6$	426.29	6.57
	2813				2488.2			
	46.88				41.80			

Pos.	T-1	E.F.	10^5 n/s	M	T-2	E.F.	10^5 n/s	M
		.878x10^5				.856x10^5		

Table Dropped off.

0.004	20905/s	.878x10^5	609.09	9.39	22458/s	.856x10^5	640.80	9.87
	69.69				74.86			

$\bar{M}$ = 9.63

$1/\sqrt{M}$ = .1038

T/C's R-70 #1-88 #2-85

We did not find the problem with table drop off since it did not happen again. We will watch this.

Assembly 0-8: STS_{xy} = 4.973 cm

Lateral: .721 + 4.252 = 4.973 cm

Vertical: None (4x4x1)

Parts: 1-33 less #7

Base Rate: 68.9 x 10^5 n/s

Pos.	T-1	E.F.	10^5 n/s	M	T-2	E.F.	10^5 n/s	M
T.843	19882/s	.878x10^5	580.95	8.95	20981/s	.856x10^5	596.86	9.23
	66.47				69.96			
0.600	42898/s		1249.73	19.26	45838/s		1307.80	20.15
	142.99				152.78			
0.004	52330/s		1524.52	23.49	55580/s		1597.30	24.61
	174.43				184.60			

$\bar{M}$ = 24.05

$1/\sqrt{M}$ = .09158

T/C's R-70 #1-87 #2-88

4/3/68

Assembly 0-9: STB_{xy} = 4.673 cm

Lateral: .721 + 3.952 = 4.673 cm

Vertical: None (4x4x1)

Parts: 1-33 Tars #7

Base Rate: 64.9 x 10^{-5} m/s

Pos.	T-1	E.F.	10^{-5} m/s	M	T-2	E.F.	10^{-5} m/s	M
7.949	9234/2	.874x10^{6}	672.57	10.36	9952/2	.852x10^{6}	709.88	10.94
	76.95				82.93			
1.698	19940/2		1452.33	22.38	21419/2		1527.87	23.54
	166.17				178.49			
0.050	21907/2		3191.15	49.17	23298/2		3323.85	51.21
	365.12				388.30			
0.004	22559/2		3286.07	50.63	24412/2		3482.81	53.67
	375.98				406.87			

$\bar{M}$ = 52.15

$\gamma_{\bar{M}}$ = .01918

T/C's R=70 #1 = 88 #2 = 84

Assembly 0-9': Same as 09 but w/ M regulating element on.

Pos.	T-1	E.F.	10^{-5} m/s	M	T-2	E.F.	10^{-5} m/s	M
7.950	9413/2	.874x10^{6}	(85.57)	10.56	10252/2	.852x10^{6}	731.28	11.27
A=15.328	4706.5				5126			
	78.44				85.43			
1.850	19377/2		1411.34	21.75	20337/2		1450.75	22.35
A=15.328	161.48				169.48			
0.179	40229/2		2930.0	45.15	43040/2		3072.02	47.31
A=15.328	335.24				358.67			

Pos.	T-1	E.F.	10^5 n/s	M	T-2	E.F.	10^5 n/s	M
0.003	23161	.874 x 10^6	3373.81	51.98	24963	.856 x 10^6	3576.39	54.88
A=15.328	386.02				416.05			$\bar{m}$ = 53.83
								$1/\bar{m}$ = .01872
		T/C's	R = 70		#1 = 88			#2 = 85
0.003	24524		3572.30	55.04	26136		3728.78	57.45
A=0.000	408.73				435.60			

4/8/68

Assembly 0-10 : STS x 4 = 4.550 cm

Lateral : .721 + ~~3.829~~ 3.830 = 4.551 = 4.550 cm

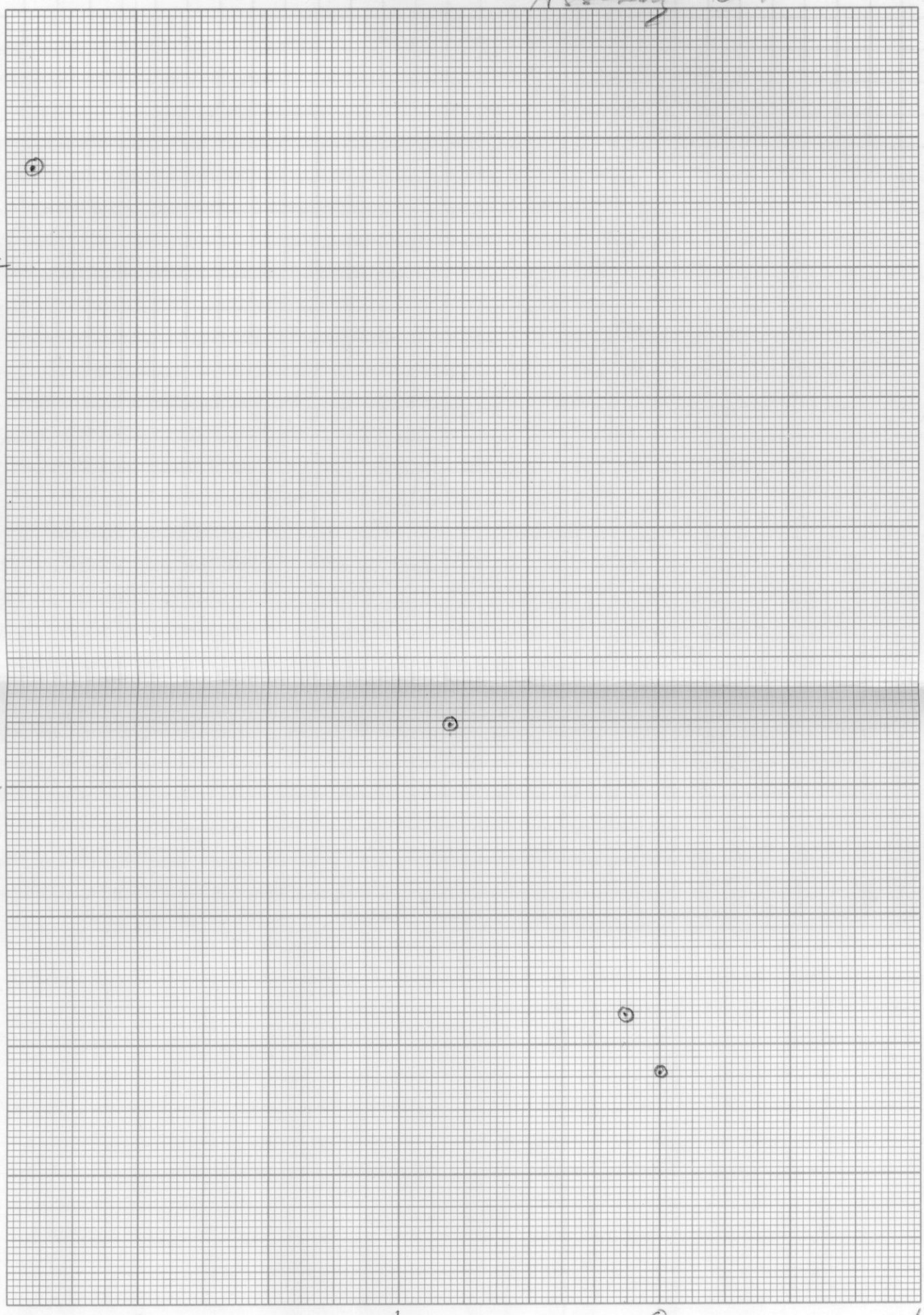
Vertical : None (4 x 4 x 1)

Parts : 1-33 Pass #7 Regulating Element Oy

Beg. Rate : ~ 64.9 x 10^5 n/s

Pos.	T-1	E.F.	10^5 n/s	M	T-2	E.F.	10^5 n/s	M
7.959	9960/2	.874 x 10^5	725.82	11.18	10487/2	.853 x 10^6	748.06	11.53
A=15.333	83.00				87.39			
2.400	9924		1445.60	22.27	10681		1518.12	23.39
A=15.3	165.4				177.35			$\bar{m}$ = 22.83
								$1/\bar{m}$ = .0438
		T/C's	R = 69		#1 = 90			#2 = 90
0.800	19577		2847.32	43.87	20715		2955.38	45.54
A=15.3	325.78				345.25			$\bar{m}$ = 44.71
								$1/\bar{m}$ = .02237
0.130	39019		5728.46	88.27	41035		5986.46	91.63
A=15.3	39326				41681			$\bar{m}$ = 89.95
	655.43				699.68			$1/\bar{m}$ = .01112
		T/C's	R = 69		#1 = 88			#2 = 86
-0.001	48577		7145.39	110.10	51551		7431.19	114.50
A=15.3	49053				52088			$\bar{m}$ = 112.30
	817.55				868.13			$1/\bar{m}$ = .008905

Assembly D-10



M^{-1}

Table Separation cm

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20 X 20 PER INCH

Pos	T-1	E.F.	10^5 n/s	M	T-2	E.R.	10^5 n/s	M
-.001	.54927	.874x10^6	8089.92	12.465	.58311	.856x10^6	8417.48	12.000
Δ=-.003	.53538				.59001			
	925.62				983.35-			

T/C's R = 69 #1 = 88 #2 = 85-

We will remove the regulating element

Assembly 0-10': Same as 0-10 but without the regulating element

Pos.	T-1	E.F.	10^5 n/s	M	T-2	E.F.	10^5 n/s	M
2.960	10041/2	.878x10^6	731.36	11.27	10862/2	.858x10^6	779.85-	11.98
	83.68				90.52			
2.400	9995-		1455.91	22.43	10617		1514.85	23.38
	166.58				176.95-			
.800	19725		2873.48	44.27	21050		3003.10	46.27
	328.75-				350.83			

T/C's R = 69 #1 = 86 #2 = 84

.130	39152		5794.04	88.57	41501		5970.84	92.00
	39460				41848			
	65-7.67				697.47			
-.001	47834		7035.44	108.4	51189		7378.29	113.69
	48298				51717		$\bar{m}$ = 111.05	
	804.97				861.95-		1/$\bar{m}$ = .00900	

T/C's R = 70 #1 = 81 #2 = 84

We will rerun Assembly O-10: Act. On
Original O-10 was suspect due to high temperature

Pos.	T-1	E. F.	10^5 T/s	M	T-2	E. F.	10^5 T/s	M
7.950	10263/2	.878 x 10^6			10927/2	.856 x 10^6		

A = 15.33

T/C's R = 70 #1 = 88 #2 = 84

2.900 20258/2 21504/2
A = 15.3

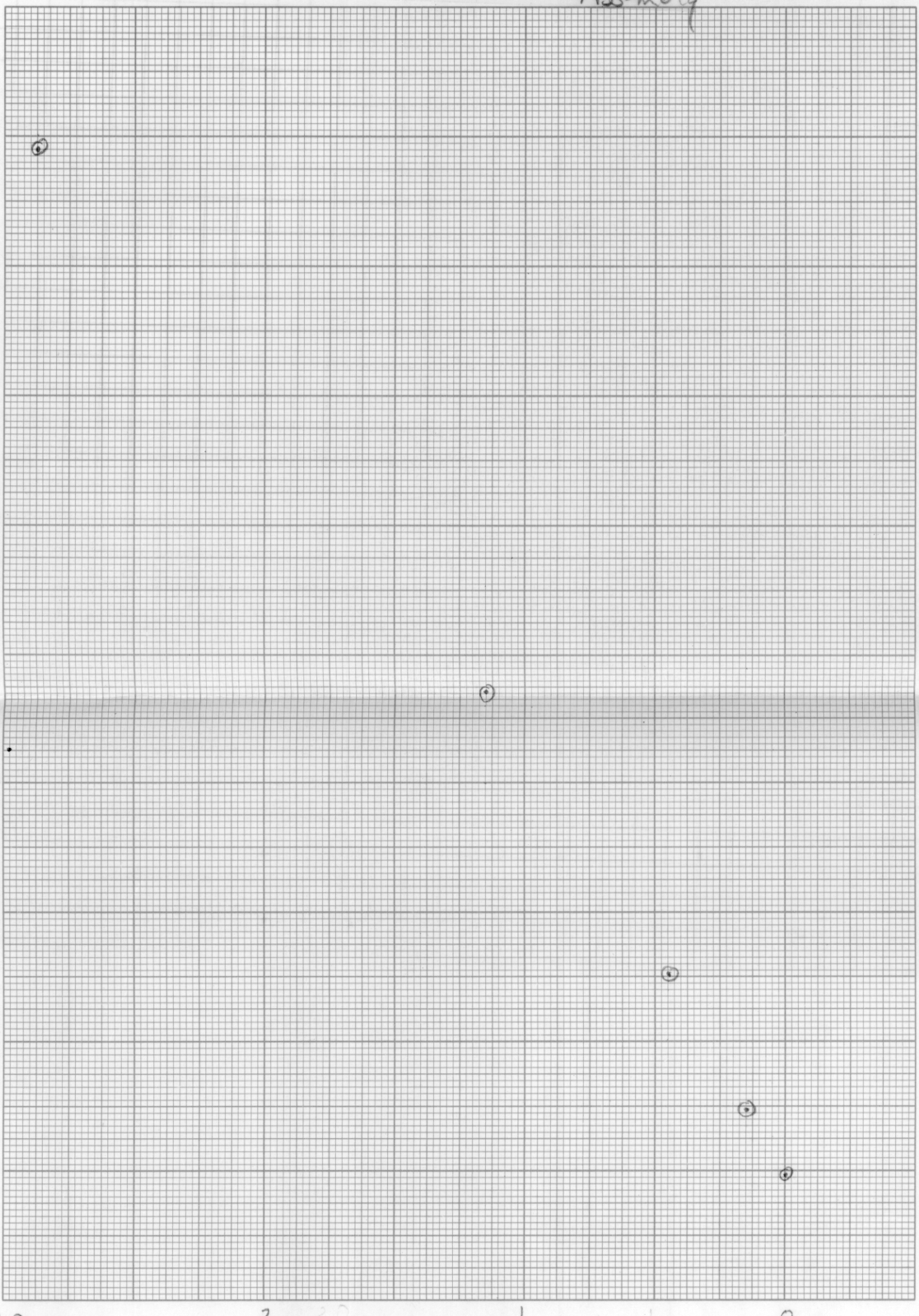
0.800 20153 21379
A = 15.3

T/C's R = 70 #1 = 87 #2 = F3.5

0.130 39843 F2395
A = 15.3

-.001	49549	7289.77	112.32	52582	7581.38	116.82	$\overline{T_m}$ = 114.57
A = 15.3	50044			53140			$\overline{Y_m}$ = .008728
	834.07			885.67			
-.001	55345	8182.41	125.61	59602	8605.62	132.60	
A = .000	55966			60320			
	932.77			1005.33			

Assembly 0-11



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4/5/68

Assembly 0-11 : STSxy = 4.501 cm

Lateral : .721 + 3.780 = 4.501 cm

Vertical : None

Parts : 1-37 / less #7

Base Rate : 64.9 x 10^{-5} 1/s

Pos.	T-1	E.F.	10^{-5} 1/s	M	T-2	E.F.	10^{-5} 1/s	M
7.998	10789/	$.874 \times 10^{-5}$	785.73	12.11	11176/	$.853 \times 10^{-5}$	7971.93	12.28
A = 15.33	89.90				93.13			
2.875	9756/		1421.12	21.90	10479		1895.00	23.08
A = 15.3	162.60				178.65		$\bar{M}$ = 22.47	
							$1/\bar{M}$ = .0445	

T/C's R = 70 #1 = 82 #2 = 88

1.150	18573	2705.47	41.68	19624	2799.72	43.14
A = 15.3	309.55			327.07	$\bar{M}$ = 42.42	
					$1/\bar{M}$ = .0235	
.450	34107	5002.34	77.08	36816	5291.54	81.53
A = 15.3	34341			37090	$\bar{M}$ = 79.31	
	572.35			618.17	$1/\bar{M}$ = .01261	
.150	58288	8590.28	132.36	61387	9020.96	139.00
A = 15.3	58978			62154	$\bar{M}$ = 135.68	
	982.97			1035.85	$1/\bar{M}$ = .00737	
.003	87780	13015.78	200.55	93331	13569.06	209.08
A = 15.3	89353			95110	$\bar{M}$ = 204.82	
	1489.22			1585.17	$1/\bar{M}$ = .00488	

T/C's R = 70 #1 = 80 #2 = 88

Pos	T-1	E.F.	10^5 n/s	M	T-2	E.F.	10^5 n/s	M
.003	110425	$.874 \times 10^6$	164487	253.4	116672	$.858 \times 10^6$	170421	262.59
A=.000	112920				119455			
	1882.				1990.9			

4/8/68

Assembly Ø-12 : $SS_{x,y}$ = 4.475

Lateral : .721 + 3.754 = 4.475

Vertical : None

Parts : 1-33 less #7

Base Rate : 268.9 $\times 10^5$ n/s

Pos.	T-1	E.F.	10^5 n/s	M	T-2	E.F.	10^5 n/s	M
2.553	10622/2	$.874 \times 10^6$	773.66	11.92	11560/2	$.852 \times 10^6$	824.58	12.71
A=15.340	88.52				96.33			
3.000	9893		1441.05	22.20	10655			1525.82 23.51
A=15.34	168.88				178.25			$\bar{M}$ = 22.86
								$Y/\bar{m}$ = .04378

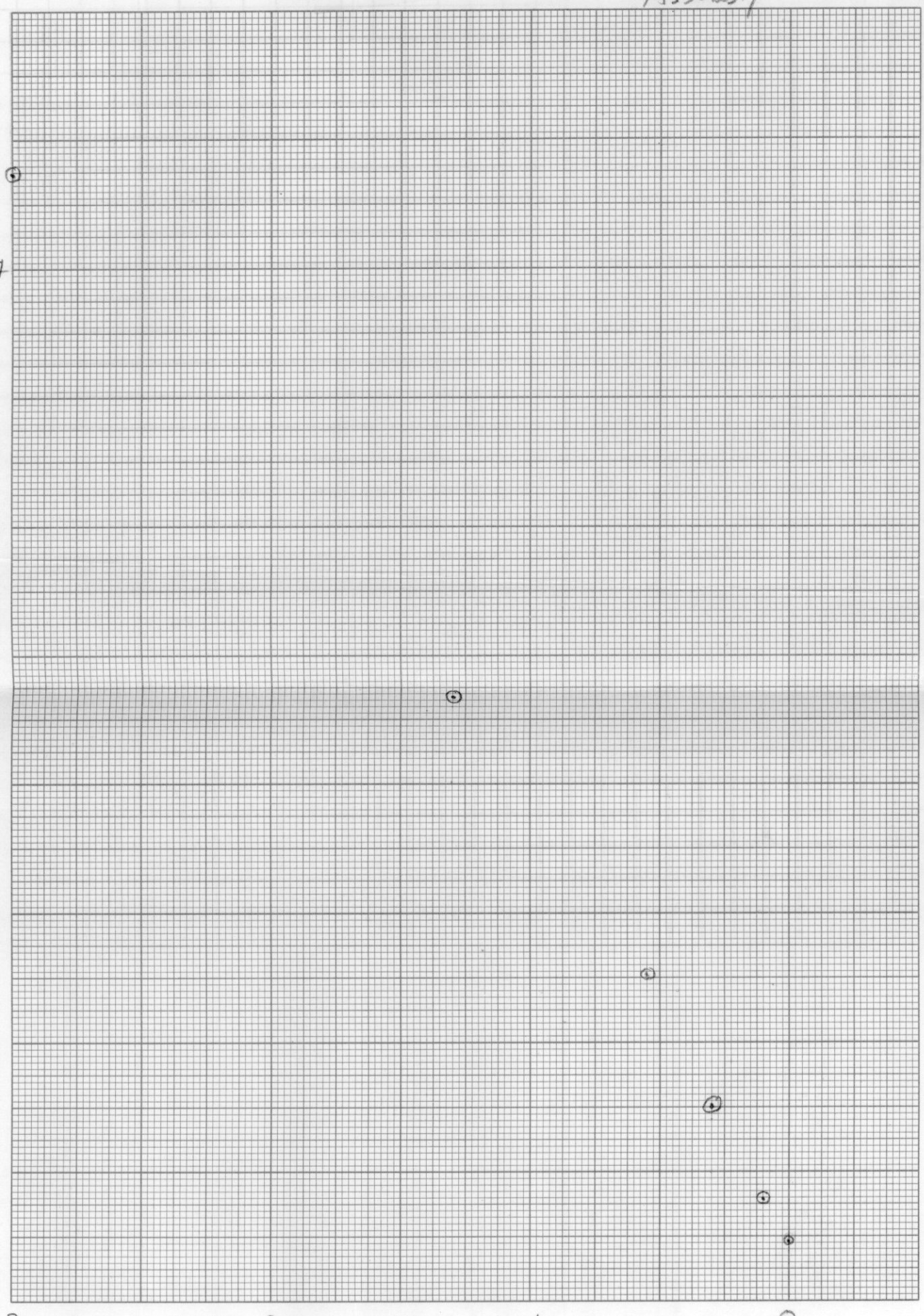
T/C 5 R = 69 H1 = 82 H2 = 83

1.300	18584	2707.04	41.7	19815		2826.84	43.52
A=15.3	309.73			330.25		$\bar{M}$ = 42.64	
						$Y/\bar{m}$ = .02375	

T/C's Level

.600	38483	5007.58	77.11	36348		5223.14	80.42
A=15.3	38377			36611		$\bar{M}$ = 78.82	
	572.95			610.18		$Y/\bar{m}$ = .01269	
.300	57191	8426.85	129.8	60248		8706.38	134.15
A=15.3	57850			61026		$\bar{M}$ = 131.98	
	964.17			1017.1		$Y/\bar{m}$ = .002577	

Assembly 0-12



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Pos.	T-1	E.F.	10^5 m/s	m	T-2	E.F.	10^5 m/s	m
.100	105867	$.879 \times 10^4$	16214.52	2798.4	115278	$.856 \times 10^4$	16435.01	259.90
A=15.3	111313				118003			$\bar{m}$ = 259.62
	1855.21				1966.71			$\gamma_{\bar{m}}$ = .003927
.001	181804		2778.3	423.47	192492		2857.17	440.09
A=15.3	186671				200159			$\bar{m}$ = 431.78
	3149.5				333665			$\gamma_{\bar{m}}$ = .002316
.001	318227		49503.36	762.74	334081		5-1078.56	786.96
1:000	339840				35-7995			$\bar{m}$ = 779.86
	5-664.0				5-966.55			.001291

4/8/68

Assembly 0-13 $XY_{57.5}$ = 4.46

Lateral : .721 + 3.739 = 4.460

Vertical —

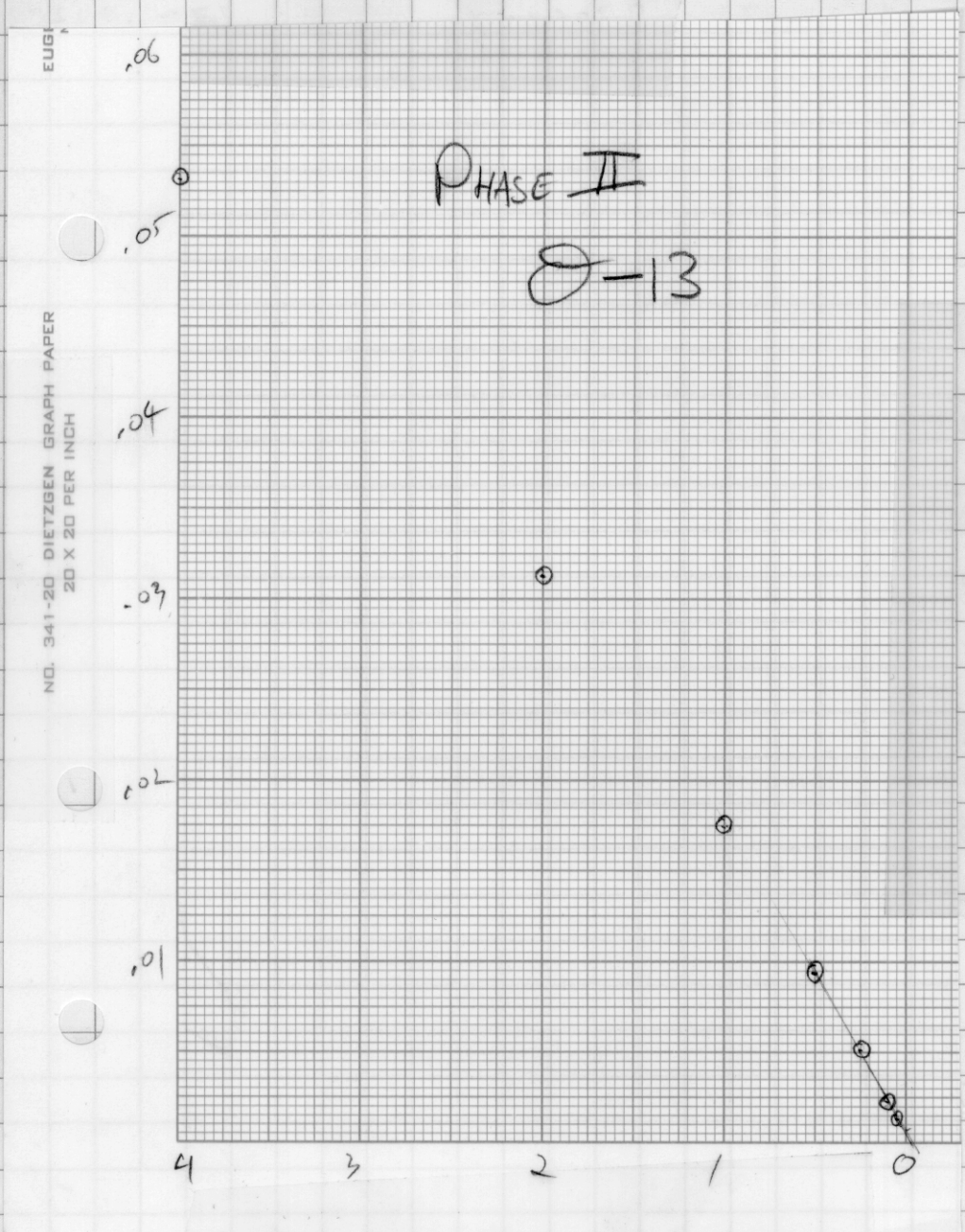
Parts : 1-33 less #7

Base Rate 64.9 $\times 10^5$ m/s

Pos.	T-1	10^5 m/s	M-1	T-2	10^5 m/s	M-2
Tdc 7.959	5393	785.55	12.10	5723	816.45	12.58
Act 15.335	89.88			95.38		
						$\bar{m}$ = 12.34

T's : 86, 91, (Roomat 70)

4.000	8256			8661			
	8269.6	120463		8676.0	1237.78	19.072	
	137.83		18.561	144.60		$\gamma_{\bar{m}}$ = .05314	
	M_1 = 2.2445	C_1		M_2 = 2.1882	C_2		
2.000	13980		31.45	14693		32.39	
	14011			14736			
						$\gamma_{\bar{m}}$ = .03133	
1.000	24,705		55.73	26,720		59.05	
	24,828			26,863			
						$\gamma_{\bar{m}}$ = .01742	


PHASE II
θ-13
.06
.05
.04
.03
.02
.01
4
3
2
1
0
NO. 341-20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH

Por	T-1	Fact	M-1	T-2	Fact	M-2
.500	46,426 ↓ 46,861	2.2445	105.18	49259 ↓ 49,749	2.1982	109.36

$1/\bar{m} = .09322$

(A = 15,335)

(T-3 22,505 T-4 23,101)

Temps: (82½ 87½ 70)

.250	85,111 86,585	194.34	90,322 91,983	202.21	

$1/\bar{m} = .05044$

(T-3 41,492 T-4 43,214)

.100	190,511 198,057	444.54	291,318 209,763	461.10	

(T-3 94,453 T-4 97,067)

$1/\bar{m} = .02208$

(T's 82½, 87½, 70)

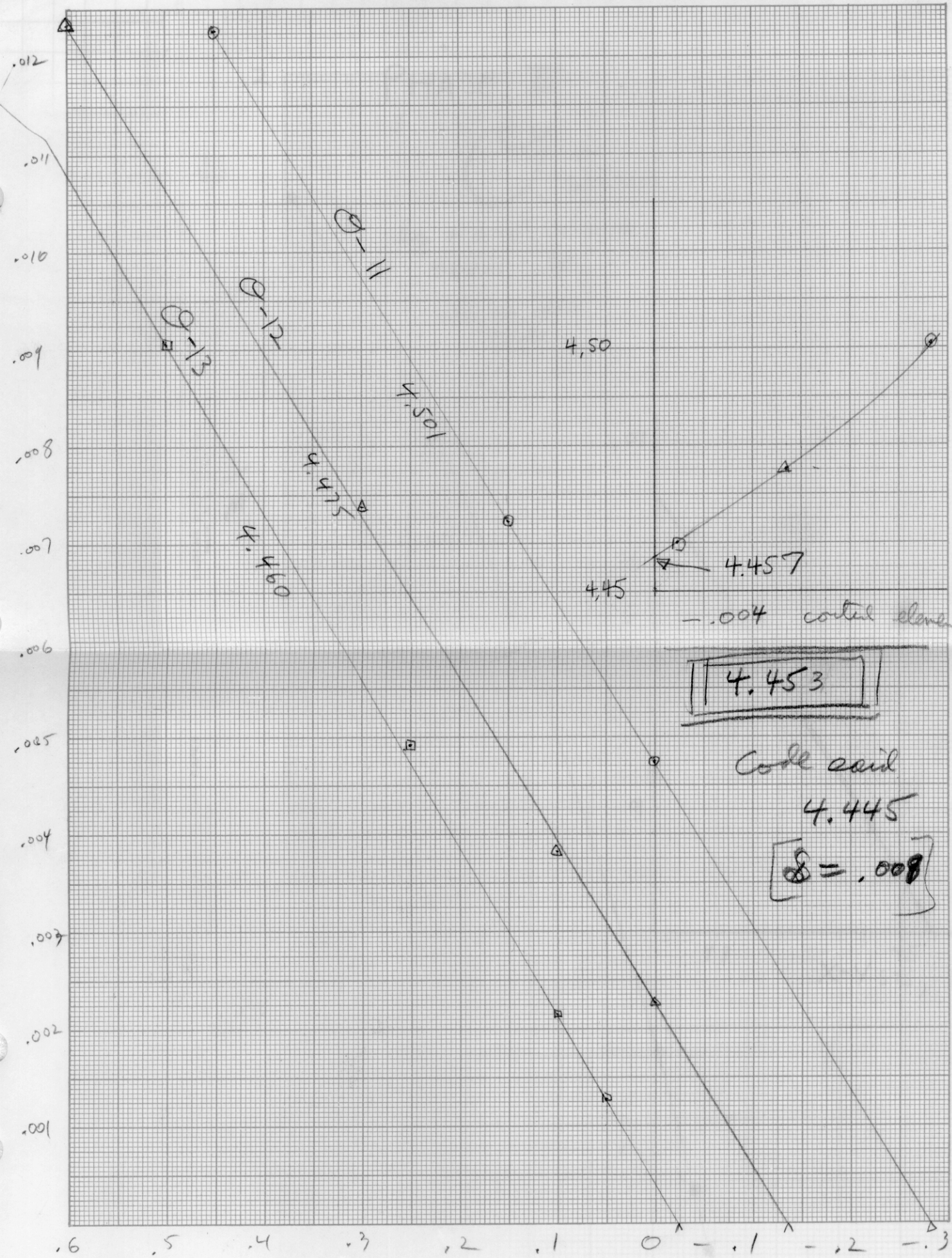
.050	310,204 ~~330,722~~	742.3	325,909 348,633	766.4	

$1/\bar{m} = .01326$

(T-3 153 734 T-4 158,813)

(T's: 82, 87, 70)

Phox II, O series

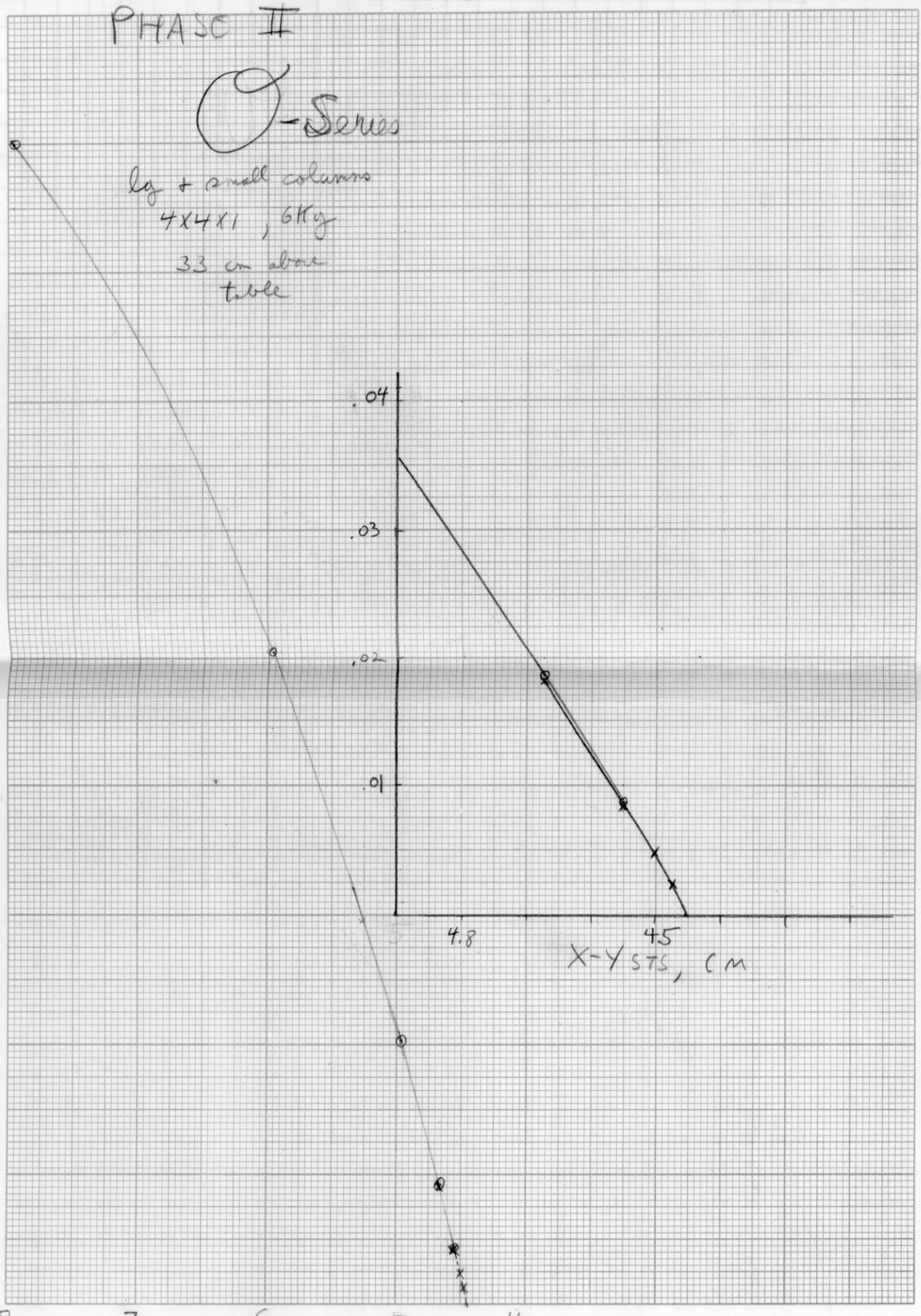


10 X 10 TO THE CM. 358-14
KEUFFEL & ESSER CO. MADE IN U.S.A.

PHASE II

O-Series

leg + small columns
4X4X1, 6Kg
33 cm above table



EUGENE DIETZGEN CO.
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NO. 341-20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH

The Following is a summary of Pertinent Multiplications (The base rate was re-calculated to be 63.175)

Run #	Spacing	T-1	T-1'	M-1	T-2	T-2'	M-2	$\bar{M}$
Θ-6	7.960	11,840/5	2,369	5.462	12,512/5	2504	5.655	5.558
Θ-7	5.969	20,906/5	4,185	9.650	22,458/5	4496	10,153	9,902
Θ-8	4.973	52,330/5	10,488	24.183	55,980/5	11221	25.340	24.762
Θ-9	4.673	22,559	22,661	52.252	24,412	24,532	55.401	53.826
Θ-9'	4.673	23,161	23,269	53.654	24,963	25,088	56.656	55.155
elem on ↗								
Θ-10	4.551	49,549	50,044	115.391	52,582	53,140	120.006	117.699
Θ-10'	4.551	47,834	48,298	111.366	51,189	51,717	116.793	114.079
elem on:	STS= 4.501							
Θ-11	TABLE .450	34,107	34,341	79.183	36,816	37,090	83.760	81.472
	.150	58,288	58,978	135.991	61,387	62,151	140.356	138.174
	.003	87,780	89,353	206.030	93,331	95,110	214.787	210.409
Θ-12	STS= 4.475							
	TABLE: .600	34,143	34,377	79.266	36,344	36,611	82.679	80.973
	.300	57,191	57,850	133.391	60,288	61,026	137.85	135.603
	.100	108,887	111,313	256.666	115,278	118,003	266.486	261.576
	.001	181,804	188,671	435.038	192,492	200,199	452.109	443.574
Θ-13	TABLE .500	46,426	46,861	108.052	49,254	49,749	112.348	110.200
	STS= 4.460 .250	85,111	86,585	199.648	90,322	91,983	207.725	203.687
	.100	190,511	198,057	456.680	201,318	209,763	473.708	465.194
	.050	310,204	330,722	762.579	325,909	348,633	787.313	774.949

CLOSURE WOULD HAVE HAD MULTIPLICATION OF 2.600

FROM RUNS Θ-9, 9' and 10, 10' note that neg. element ON-OFF IS WORTH .000447, .000270 Δk_{eff}

FROM RUNS Θ-11, and Θ-12 note that .026 cm STS = .0025 $\Delta \frac{1}{n}$

∴ Conclude that neg element ≅ .004 cm STS

We are now going to re-run some points with large tubes ↓ substituted for small tubes [] on the two back rows. If there is no significant change in multiplication (i.e, within statistics), we will only do a few points. If there is a significant change, we will re-do the entire assay. The billet placement is the same as on page 25. New factors are in use reflecting the re-tabulated base rate (63.175×10^5 ★).

$M_1 = 2.3058 \times 10^{-3} C_1$, $M_2 = 2.2583 \times 10^{-3} C_2$

★ This was in error: should have been 65.175

Assembly P-1 $\quad XYSTS = 4.55$

Latent: $.721 + 3.830 = 4.551$ [Table to P_2: 33.35 cm]

Parts: 1-33 less #7

Base Rate: 63.175×10^5 n/s

P_∞	T-1	Factor	M-1	T-2	Factor	M-2
7.961	10,663/2 → 5337	2.306×10^{-3}	12.31	11,240/2 → 5626	2.258×10^{-3}	12.71
					$\bar{M} = 12.51$	
2.401	11,176 → 11,201		25.83	11,627 → 11,654		26.32
					$\bar{M} = 26.07$	

[T's 69, 81, 88]

[We have taken out small R.S.* BF$_3$ tubes (RSN-137A) and put big ones (RSN-7A-MG) in Counters 3 + 4

* Reuter Stokes]

P_{Tc}	T-1	Factor	M-1	T-2	Factor	M-2
.800	22997	2.306×10^{-3}	53.27	24732		56.13
	↓ 23103			↓ 24855		
						$\bar{M} = 54.70$
	(T-3 = 67,883			T-4 67959)		
.130	54533		127.13	58,205		132.99
	↓ 55135			↓ 58890		
						$\bar{M} = 130.06$
	(T-3 159,257			158,634)		
-.001	75,665		177.148	79,963		183.514
	↓ 76,827			↓ 81,262		
	(T-3 215 972			215,358)		
	(T's ≈ 69, 83, 90)					$\bar{M} = 180.331$
						$1/\bar{M} = .005545$

Assembly P-1 Regulating Element now on table

Lateral, 4.551 cm, Table to Pa = 33.35 cm

	P_{oa}	T-1		T-2	
T=	7.949	10,655/2	12.14	11,410/2	12.90
A=	15.331	↓ 5363		↓ 5,712	
					$\bar{M} = 12.52$
	(T-3	32,058/2		T-4 32, 31 1/2)	
T= 2.401		11,249	26.00	12,039	27.25+
		↓ 11,274		↓ 12,068	
					$\bar{M} = 26.63$
	(T-3 32,907			T-4 33035)	

P_0	T-1 Factor	M-1	T-2 Factor	M-2
$T = .800$	23,398 2.306×10^{-3}	54.20	25,493	57.86
	23,508		25,624	
				$\bar{M} = 56.03$
	(T-3 69,214		T-4 69,277)	
.130	56,823		60,006	
	57,477	132.53	60,735	137.17
	(T-3 163,969		T-4 163,561)	$\bar{M} = 134.85$
	(T's: 69, 83, 90)			
-.001	78,090	182.92	82,434	189.28
	79,329		83,816	
				$\bar{M} = 186.10$
				$1/\bar{M} = .005373$
	(T-3 223,162		T-4 221,853)	
	(T-3 zone)			

4/10/68

Assembly P-2 $X-Y_{ST} = 4.67$

Σ table to $P_N = 33.35$ cm

Lateral : .721 + 3.952 = 4.673

No Waterfall

Parts out before (No Regulating Element)

Pos.	T-1	Factor	M	T-2	Factor	M
D.925	9810/2	2.306×10^{-3}	11.31	10372/2	2.255×10^{-3}	11.71
	4905			5186		

T-3 = 29535/2 T-4 = 25366/2

T/C's R = 70 #1 = 82.5 #2 = 89.5

2.400	9190	21.19	9601		21.68

T-3 = 26818 T-4 = 27401

T/C's R = 70 #1 = 81 #2 = 87

0.800	15398	35.51	16554		37.38

T-3 = 46720 T-4 = 46785

0.130	25162	58.02	27751		62.66

T-3 = 73581 T-4 = 74092

T/C's R = 70 #1 = 80 #2 = 86

Pos.	T-1	Factor	M	T-2	Factor	M
-0.001	28541	$2,306 \times 10^{-3}$	66.19	30213	2.258×10^{-3}	68.63
	↓ 28705		(.188)	↓ 30395		$\bar{M} = 67.41$
						$1/\bar{M} = .01483$

T-3 = 83545 T-4 = 84213 $\bar{M} = 67.414$

T/C's R = 70 #1 = 79 #2 = 81

4/11/68

Assembly P-3

Lateral : .721 + 4.252 = 4.973

No vertical, Ports as before

Pos	T-1	Factor	M-2	T-2	Factor	M-2
7.966	8373/2	$2,306 \times 10^{-3}$	9.24	8994	$2,258 \times 10^{-3}$	10.18
	~~8403~~/2			9011/2		
	4202			4506		
	↓ 4006			↓ 4510		$\bar{M} = 9.71$
1.601	15117/2		17.45	15710/2		17.77
	7559			7855		
	↓ 7570			↓ 7867		$\bar{M} = 17.61$
.005	23079/2		23.058	24548/2		27.856
	↓ 11566 (com)			↓ 12335 (com)		
						$\bar{M} = 25,457$
						$1/\bar{M} = .03928$

(T-3 = 68650 T-4 (8581)

Temps: 87, 86, 70

Assembly P-4 4/12/68

Lateral : .721 + 5.095 = 5.816

No Vertical (Table to P_∞, 33.35 cm)

Pots as before

P_∞	T-1	Factor	M-1	T-2	Factor	M-2
7.964	15,350/s ↓ 3072	2.306×10^{-3}	7.083	16,244/s ↓ 3251	2.258×10^{-3}	7.342

$\bar{M} = 7.213$

Dropped off just before closure. Will try to determine why.

+.025 (.003" dial) 23,891/s 25,352/s

+.022 (.002" dial intervals) 24,160/s 25,126/s

(Temps: 70, 87½, 87½)

+.020 (.001" dial vertical)

↓ 4781	23,884/s	11.024	25,287/s ↓ 5063	11.433

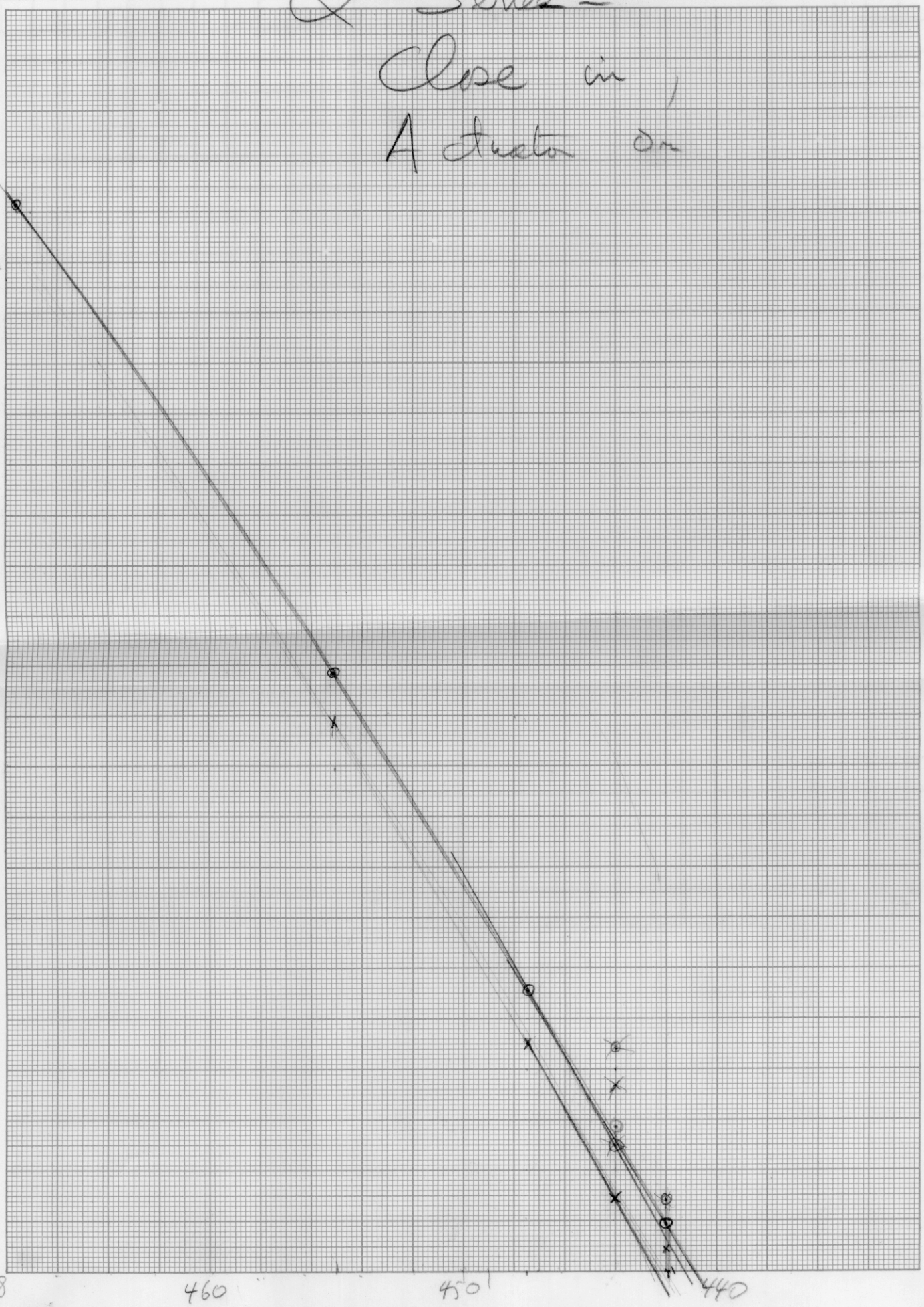
$\bar{M} = 11.228$

(T-3 71,951/s T-4 71,977/s)

Q - Series -

Close in

Adiabat on



10 X 10 TO THE CM. 358-14
KEUFFEL & ESSER CO. MADE IN U.S.A.

We have raised the array 15 cm above the table can still re-run the array. Everything is the same position as before

Assembly Q-1 $XY_{STS} = 5.82$,

Lateral = .721 + 5.095 = 5.816 cm

Z (table to P_{tip}) = 48.35 cm

Parts: 1-33 less #7
Base Rate: 63.175 $\times 10^5$ m/s

P_∞	T-1	Factor	M-1	T-2	Factor	M-2
7,931	14517/5	$2,306 \times 10^{-3}$	6,701	15307/5	$2,258 \times 10^{-3}$	6.92
	2903,4			3061,4		$\bar{M} = 6.81$

[Temperatures: 70, 87, 88]

.001	22,447/5		10,360	23,612/5		10,674
	4489.4			47224		
	4493			4727		$\bar{M} = 10,517$

(T-3 68,052 T-4 67,223)

Assembly Q-2 X-Y scs = 4.97

Lateral = .721 + 4.252 = 4.973 cm

Z (table to pu) = 48.35 cm

Parts & Base Rate same as before

Po	T-1	Factor	M-1	T-2	Factor	M-2
7.937	11,669/3	2.306×10^{-3}	8.98	12,487/3	2.258×10^{-3}	9.40
	3889.7			4162.3		
						$\bar{m} = 9.19$
.999	15039/2		17.37	15891/2		17.97
	7519.5			7946		
	7531			7959		$\bar{m} = 17.67$
.001	19538/2		22.569	20644/2		22.357
	9769			10322		
	9788			10343		
	[Temperature	70, 85, 89]				$\bar{M} = 22.463$

4/16/68

Assembly Q-3

Lateral: .721 + 3.952 = 4.673

Z (table to pu) = 48.35 cm

Parts and Base Rates as before

Po	T-1	M-1	T-2	M-2
7.947	18,661/4	10.77	19488	11.01
	4665.3		4872	
	4670			$\bar{m} = 10.89$

P_{oo}	T-1	Factor	M-1	T-2	Factor	M-2
2.500	15,808 / 2	2.306×10^{-3}	18.255	16,485 / 2	2.258×10^{-3}	18.647
	7,904			8,243		
	7917					$\bar{m} = 18.45$
.400	15,311		35.41	16,228		36.77
	15,358			16,281		
	[Temp = 91, 70]					$\bar{m} = 36.09$
+.001	19,092		45.89	20,744		47.040
	19,871			20,830		
	[T-3 59,325			T-4 58,880]		$\bar{m} = 46.430$

Assembly @ 3

Same as previous except Reg Element Installed

P_{oo}	T-1	M-1	T-2	M-2
7.937	18710/4	10.80	19493/4	11.02
	4,677.5		4,873	$\bar{m} = 10.91$
2.500	15 854/2	18.31	16682/2	18.87
	7927		8341	$\bar{m} = 18.59$
.400	15,380	35.57	16,219	36.75
	15,428		16,272	$\bar{m} = 36.16$
.000	20,274	46.939	21042	47.729
	20,357		21,135	
	[T-3 59,800		T-4 60,253]	$\bar{m} = 47,334$

Temp : 89

Actuate OUT

Assembly Q-4

X-YSTS = 4.55

Latent: .721 + 3.830 = 4.551 cm

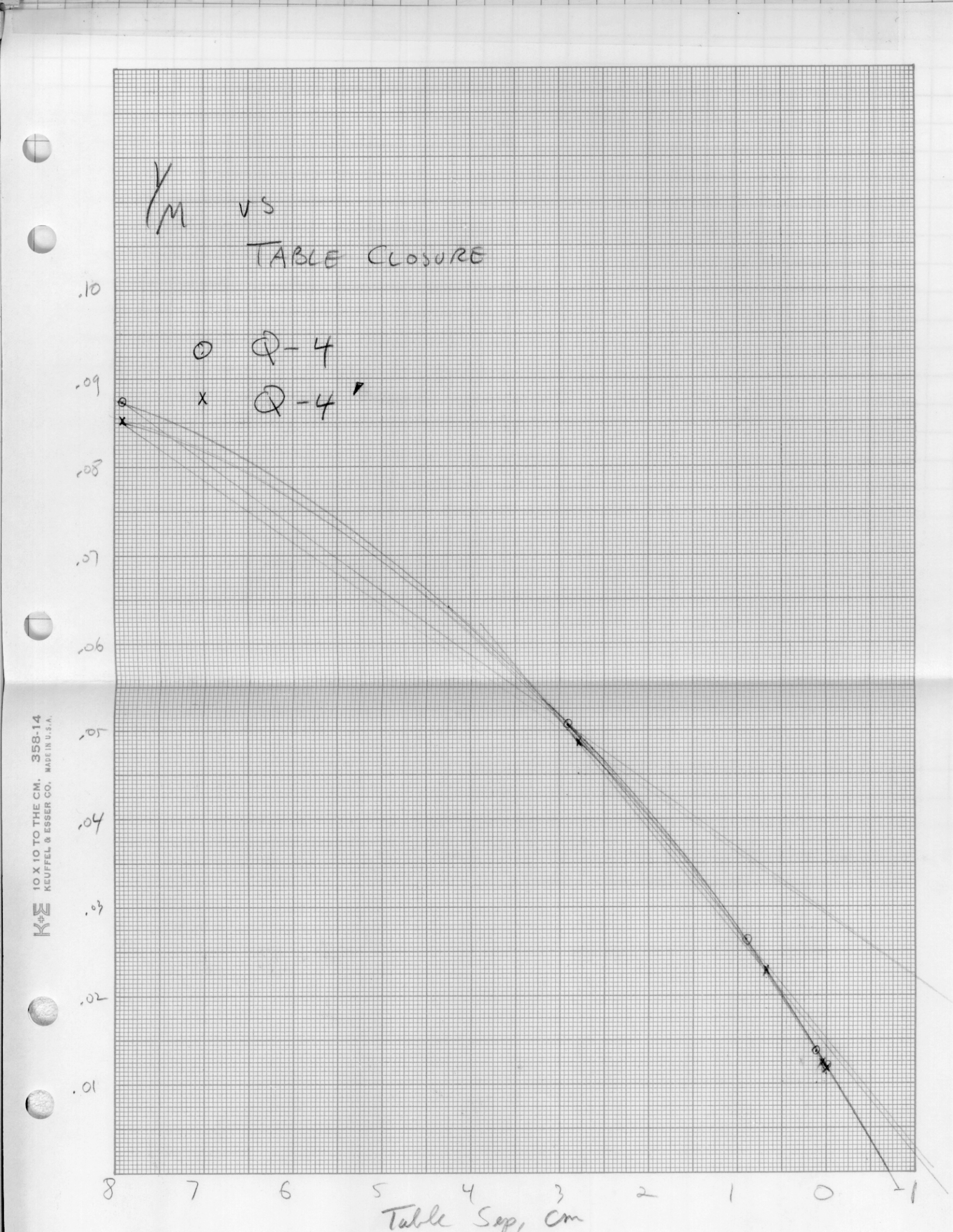
Z (table to P∞ = 48.35 cm)

Pats 1-33 less #7, Base Rate 63.175 x 10^5 M/s

Pos	T-1	Facts	M-1	T-2		
7.935	14611/3	2.306×10^{-3}	11.24	15568/3	2.258×10^{-3}	11.73
	4870			5189		$\bar{M} = 11.48$
2.900	16904/2		19.52	17717/2		20.04
	8452			8859		
	8466			↓ 8874		$\bar{M} = 19.78$
.900	16,233/1		37.55	16963		38.44
	↓ 16,286			↓ 17021		
						$\bar{M} = 38.00$
.102	30789/1		71.43	32515/1		73.91
	30980			32728		
						$\bar{M} = 72.67$
.000	35,857		82.808	37,201		84.641
	↓ 35,913			↓ 37480		$\boxed{\bar{M} = 83.725}$

(T-3: 106 096 T-4: 104689)

(Temps 70, 89, 91)



10 X 10 TO THE CM. 358-14
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Assembly Q-4' XY STS = 4,55

Everything same as before
Except Reg Element on table:

Pos	T-1	Factor	M-1	T-2	Factor	M-2
7.950	1					
[A = 15,327]						

Magnet Voltage adjust inadvertently turned down a little by someone brushing the console & Magnet dropped off. Will Re-Run after lunch

4/18

Re-Run

Pos	T-1	Factor	M-1	T-2	Factor	M-2
7,937	10,111/2	2.306×10^{-3}	11.67	10,465/2	0.258×10^{-3}	11.83
	5,056			5233		$\bar{M} = 11.75$
2,787	17,534/2		20.25	18,405		20.82
	8767			9203		$\bar{M} = 20.54$
.677	37,006/2		42.82	39,368/2		44.59
	18,503			19,684		
	↓ 18,572			↓ 19,746		$\bar{M} = 43.71$
.024	34,620		80.38	36,532		83.11
	34,861			↓ 36,801		
						$\bar{M} = 81.74$

[Temperature: 70, 90, 90]

.000	35,873	83.331	37,655		85.621
A = 15.318	↓ 36,132		↓ 37,941		
T-3	106,558	T-4	105,587		$\bar{M} = 84.476$
T = .000	38,810	90.189	41,220		93.859
A = .000	↓ 39,114		41,562		
T-3	116,191		T-4 115,193		$\bar{M} = 92.024$

Note: The $\Delta \frac{1}{m}$ for reg. el. motion above (.00097) compares well with dust measured Δ (.00102)

Assembly CQ-5

Lateral: .721 + 3,754 = 4.475

Z (table to Pu): 48.35

Control Element is On Table in Usual spot (opposite column # 14)

Parts: 1-33 less #7, Base Rate 63.175×10^{-5} n/s

Po	T-1	Factor	M-1	T-2	Factor	M-2
7.946	10,548/2	2.306×10^{-3}	12.17	11,016/2	2.258×10^{-3}	12.45
A = 15.320	5274			5508		
	↓ 5280			5514		

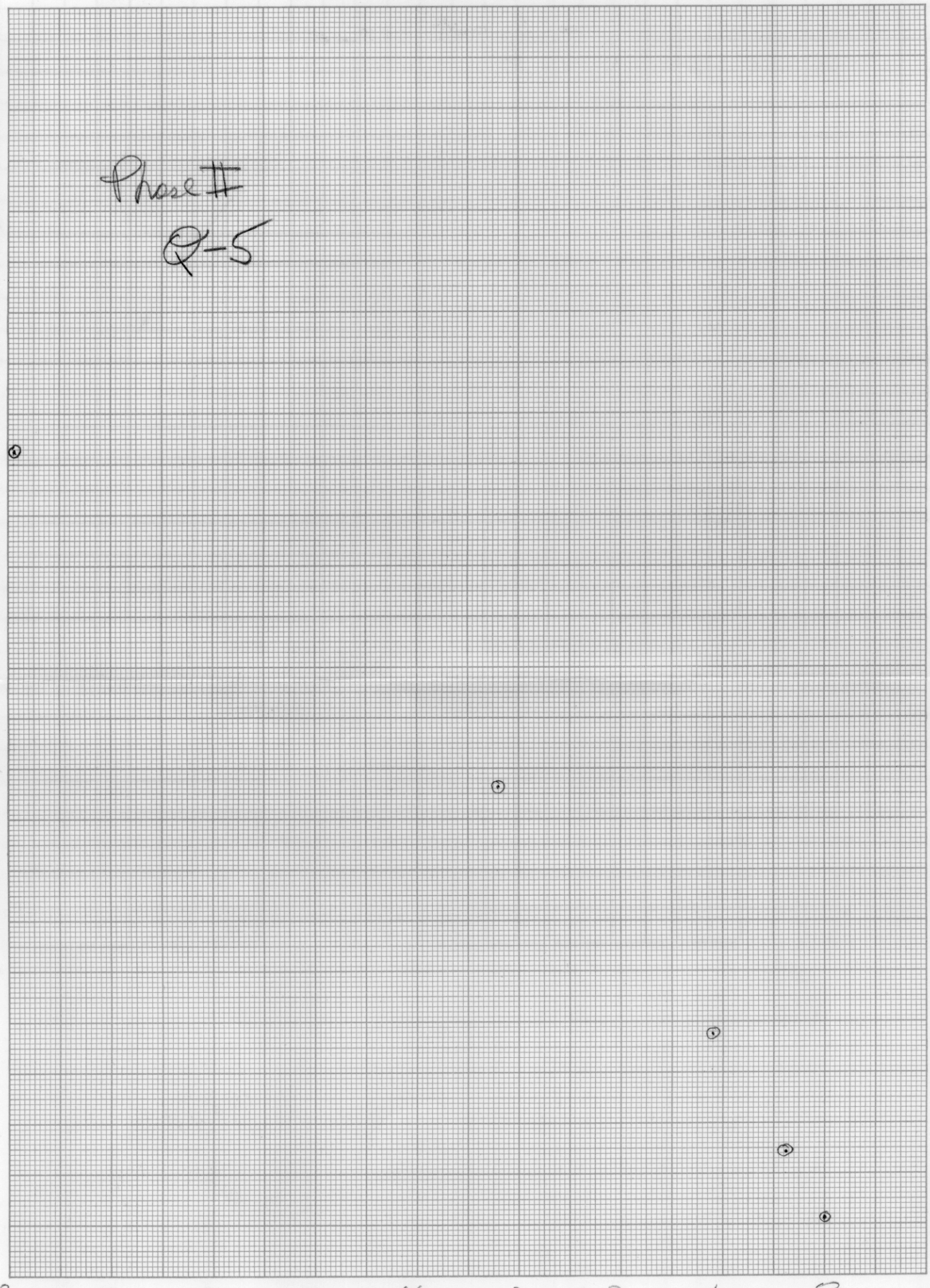
$\bar{m} = 12.31$

$1/\bar{m} = .08123$

3.200	8938	20.61	9280	20.95	
A = 15.32				$\bar{m} = 20.78$	
				$1/\bar{m} = .04812$	
1.100	18562	42.80	19248	41.20	
A = 16.32				$\bar{m} = 42.00$	
				$1/\bar{m} = .023\,81$	
0.375	35141	81.61	36923	83.99	
A = 15.32	↓ 35389		↓ 37158	$\bar{m} = 82.80$	
				$1/\bar{m} = .012077$	
.080	60429	141.06	62821	143.66	
A = 15.3	↓ 61169		↓ 63623	$\bar{m} = 142.36$	
				$1/\bar{m} = .00702$	
.000	75993	177.98	79596	182.63	
A = 15.3	↓ 77166		↓ 80882	$\bar{m} = 180.29$	
				$1/\bar{m} = .005549$	

T-3 = 220226

T-4 = 219658



10 X 10 TO THE CM. 358-14
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Pos.	T-1	Factor	M	T-2	Factor	M
0.000	93057	2.306×10^{-3}	218.64	97515	2.258×10^{-3}	224.57
A=0.00	98821			99454		$\bar{m}$ = 221.61
						$\gamma_{\bar{m}}$ = .004512

T-3 = 266618 T-4 = 264169

4/22/68

Assembly Q-6 $X - \gamma_{S.T.} = 4.44$

Lateral: .721 + 3.719 = 4.440

Z table to p_m = 48.35 cm

Part: I-33 less #7, Base Rate = 63.175

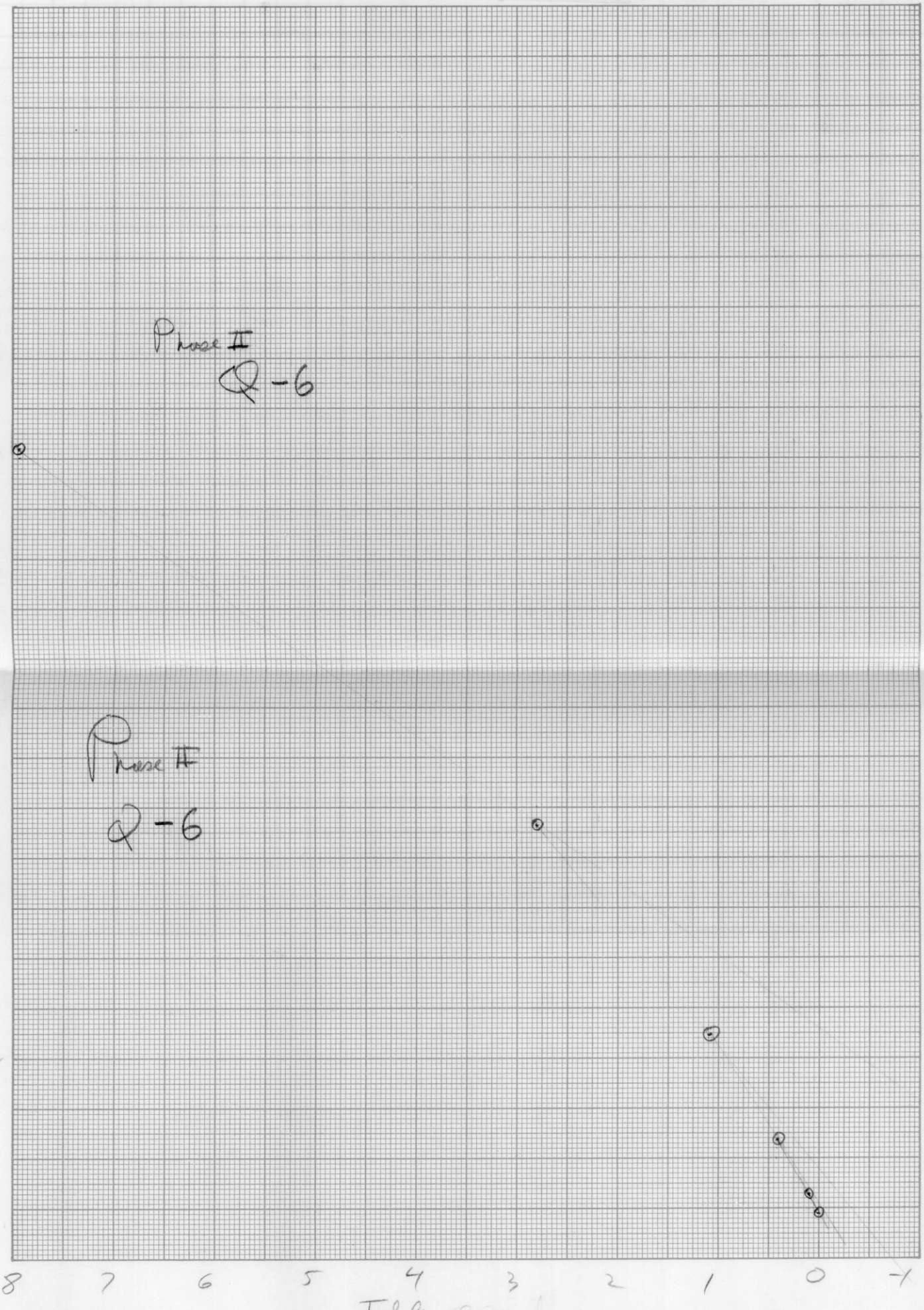
Actuator on table in zero position

ACTUATOR OUT

Pos	T-1	Factor	M-1	T-2	Factor	M-2
7.946	10,592/2	2.306×10^{-3}	12.23	11,032/2	2.258×10^{-3}	12.47
	5,296			5,516		
	5,302			5520		$\bar{m}$ = 12.35
2.800	9843/1		22.74	10,396/1		23.53
	9862			10,418		$\bar{m}$ = 23.13
1.100	19,182/1		44.40	20,033		45.42
	19,255			20,114		$\bar{m}$ = 44.910
						$1/\bar{m}$ = .02227
0.430	35,731		82.98	37,287		84.84
	35,988			37,567		$\bar{m}$ = 83.91
						$1/\bar{m}$ = .01192
.100	66,215		154.72	69,718		159.67
	67,103			70,704		$\bar{m}$ = 157.20
						$1/\bar{m}$ = .00636
-.008	90,591		230.58	95,334		219.48
(D104 PD=0)	92,263			97,187		$\bar{m}$ = 225.03
						$1/\bar{m}$ = .00444

ACTUATOR = 15,135

(T-3 = 260,562 T4=259,205)



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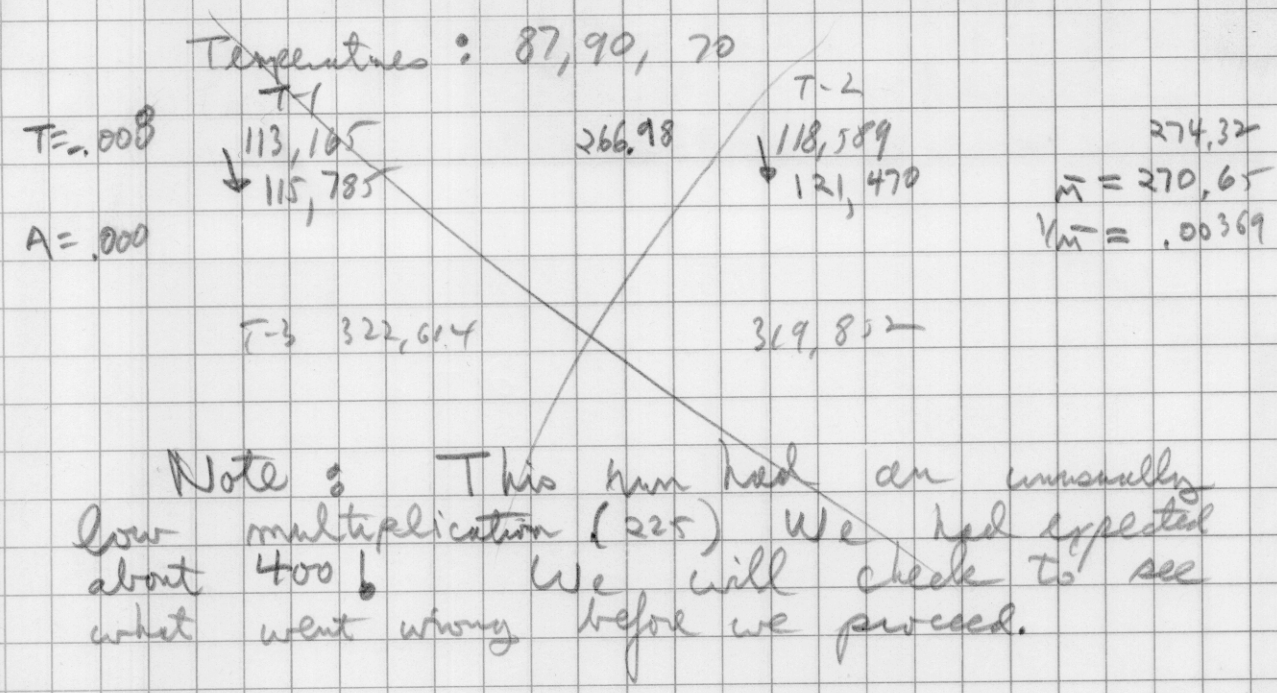
Tentatives: 87, 90, 70



Note: This run had an unusually low multiplication (225) We had expected about 400. We will check to see what went wrong before we proceed.

4/23/68

H. Finn goofed in the layout

There was an error in the beam spacing on the control table. This was corrected and the array will be re-run.

Assembly 0-6: STS_{xy} = 4.44 cm

Lateral: .721 + 3.719 = 4.440 cm

z table to P_a = 48.35 cm

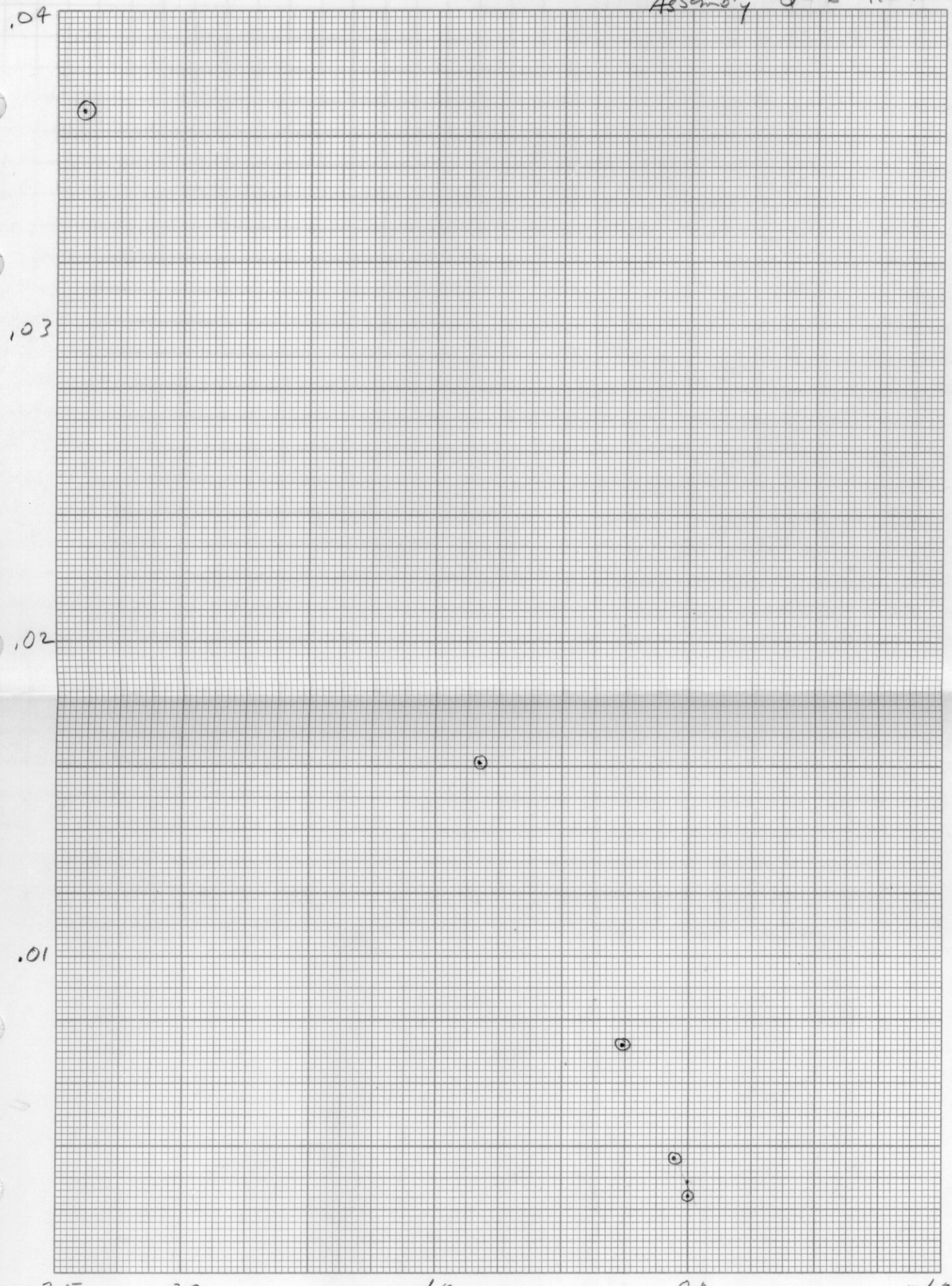
Parts: 1-33 less #7

Base Rate: 63.175 $\times 10^5$ n/s

Act. on table

Pos.	T-1	Factor	M	T-2	Factor	M
7.995	10797/2	2.306×10^{-3}	12.39	11427/2	2.258×10^{-3}	12.90
A=15.333	5373.5			5713.5		
2.901	11572		26.69	12226		27.61
A=15.3					$\bar{M}$ =	27.15
					$1/\bar{M}$ =	.03683

Phase Assembly Q-6 RE-RUN



M^{-1}

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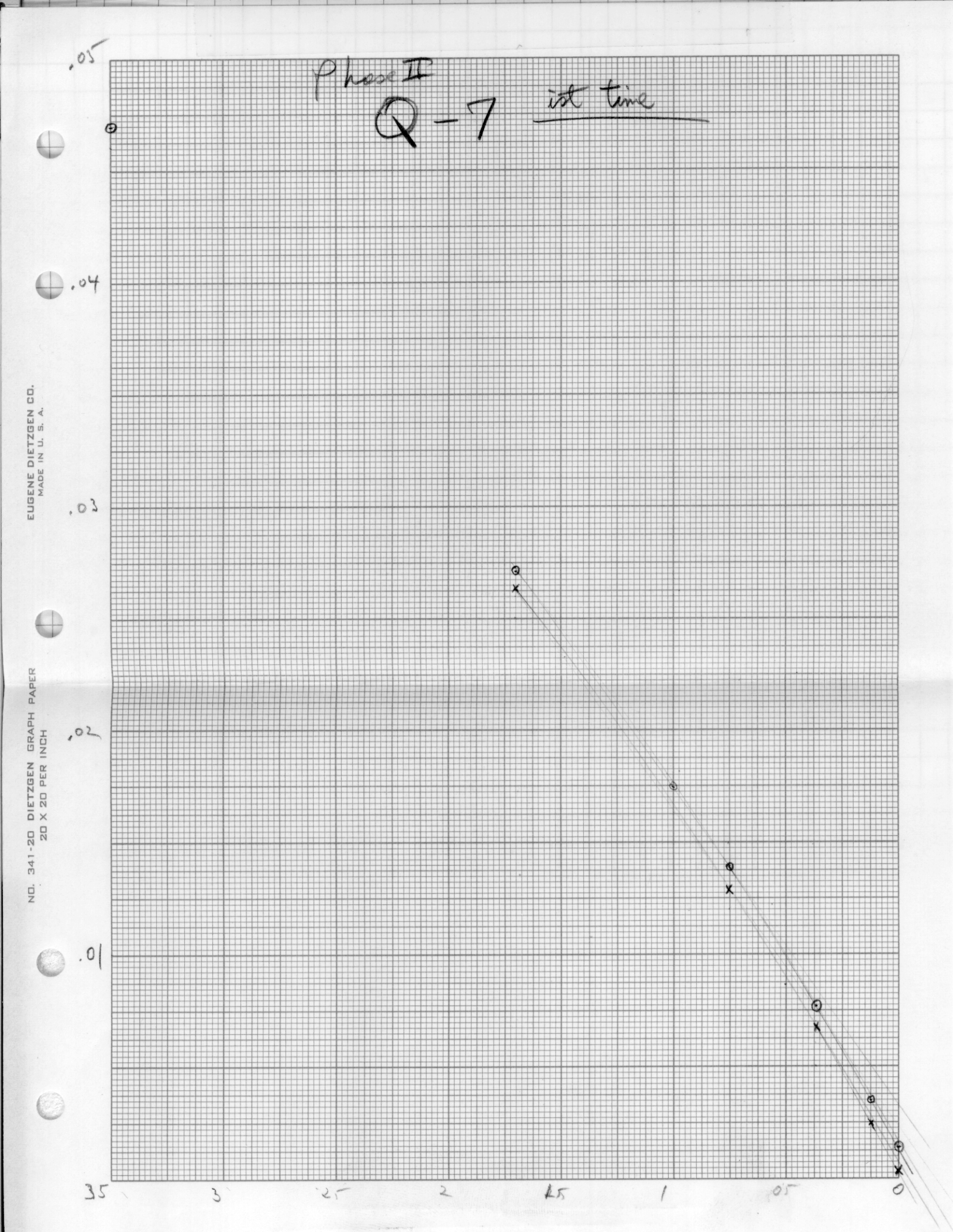
Pos	T-1	Factor	M	T-2	Factor	M
.825	26653	2.306×10^{-3}	61.44	27763	2.258×10^{-3}	62.69
A = 15.333						$\bar{m}$ = 62.08
	T/C's	R = 69		#1 = 825	#2 = 86	$1/\bar{m}$ = .01611
.266	58680		136.52	61277		140.09
A = 15.333	59375			62040		$\bar{m}$ = 138.51
						$1/\bar{m}$ = .00722
.064	115517		272.68	121089		280.01
A = 15.333	118248			124009		$\bar{m}$ = 276.38
						$Y\bar{m}$ = .003618
0.000	165478		395.65	173793		406.57
A = 15.333	171574			180059		$\bar{m}$ = 401.11
						$Y\bar{m}$ = .002493
	T-3 = 458416			T-4 = 458409		
0.000	275801		673.15	287406		688.55
A = 0.005	291918			304940		$\bar{m}$ = 680.85
						$Y\bar{m}$ = .001469



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4/24/68

Assembly Q-7 STS_{x-y} = 4.42

Lateral: .721 + 3.698 = 4.419 cm

(Z table to P_u = 48.35)

Parts: 1-33 less #7, Base Rate: 63.175 x 10^5 N/s

P_u	T-1	Factor	M-1	T-2	Factor	M-2
T= 7,950	10,994 /2	2.306x10^{-3}	12,69	11,304/2	2.258x10^{-3}	12,78
A= 15,337	5497			5652		
	5503			5658		$\bar{m}$ = 12,73
						$1/\bar{m}$ = .07855
T= 3,500	18,219/2		21.05	19,071/2		21.58
A= 15.34	9,110			9536		$\bar{m}$ = 21.31
	9,127			9554		$1/\bar{m}$ = .04693
T= 1,700	15,743/1		36,415	16,479/1		37,336
A= 15.34	15,793			16,533		$\bar{m}$ = 36,876
						$1/\bar{m}$ = 0 2712
T= 1,700	16,329/1		37.774	16,913		38,233
A= 0 (0.8)	16,382			16,970		$\bar{m}$ = 37,998
						$1/\bar{m}$ = .02632
T= .751	30,865		71,611	31,884		72,467
A= 15,34	31,057			32,089		$\bar{m}$ = 72, 039
						$1/\bar{m}$ = .01388
T= .751	32,949		76.479	34,919		79,411
A= 0 (.001)	33,168			35,164		$\bar{m}$ = 77.945
						$1/\bar{m}$ = .01283
T= .370	54,852		127.880	57,272		130,837
A= 15.34	55,460			57,936		$\bar{m}$ = 129,358
						$1/\bar{m}$ = .00773

	T-1	Factor	M-1	T-2	Factor	M-2
T=.370	62,308	2.306×10^{-3}	145.482	66,171	2.258×10^{-3}	151,437
A=0(.005)	↓ 63,094			↓ 67,058		

$\bar{m} = 148.460$

$1/\bar{m} = .00674$

T=.124	120,522	284.762	125,176		289.945
A=15.33	↓ 123,498		↓ 128,391		

$\bar{m} = 287.353$

$1/\bar{m} = .00348$

T=.124	166 442	349.994	175555	410.882
A=(.005)	↓ 172,174		↓ 181,943	

$\bar{m} = 403.940$

$1/\bar{m} = .00248$

(T-3 = 460 782 T-4 = 456 963)

Temperatures: 70, 79, 88

T=.009	283,256	291,678
A=15.333		
(Dial Inc=.000)		

(T-3=731, 557 T-4 725,413)

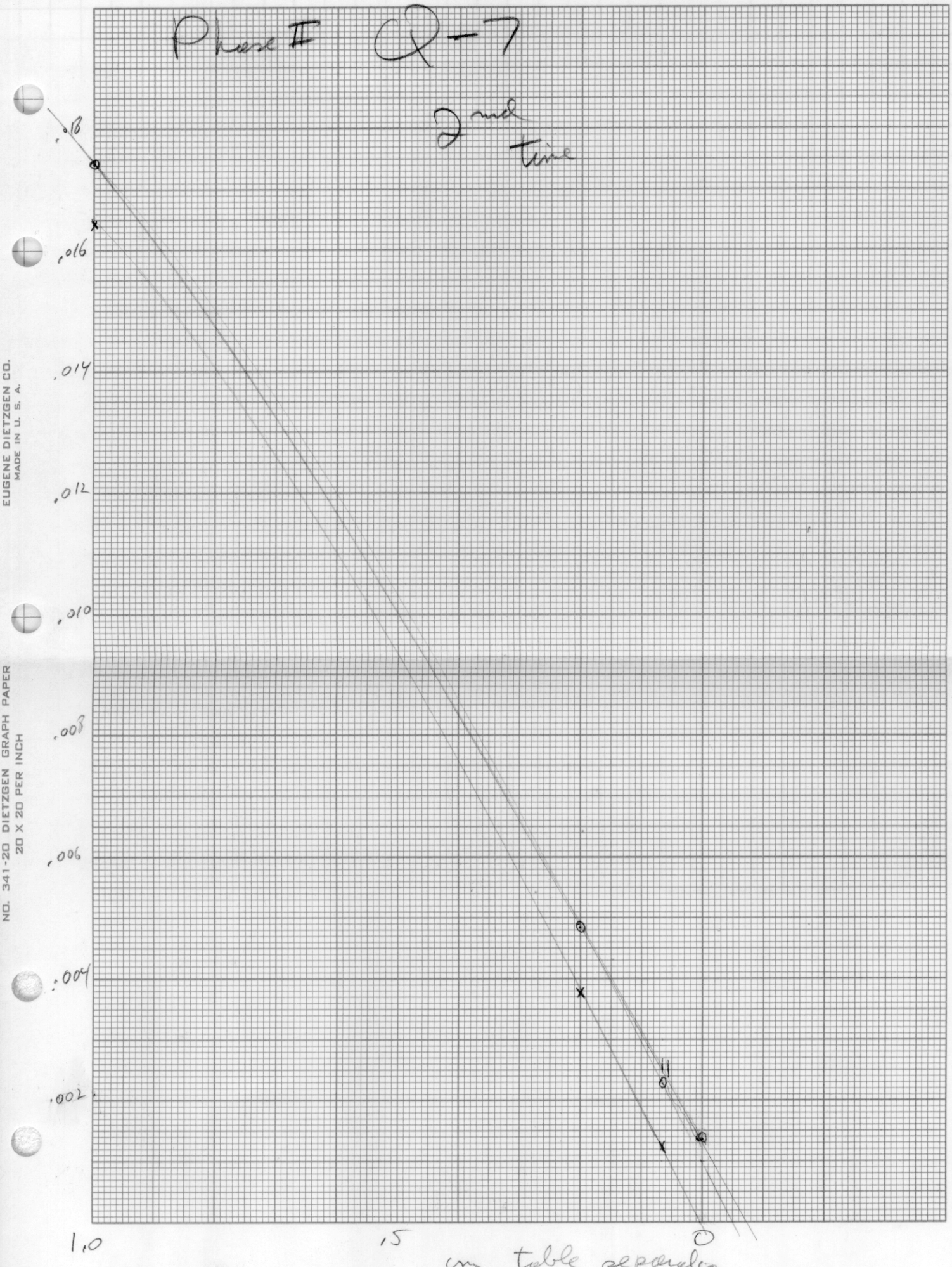
We backed out & toole a "hum" at the full in position

T=.001	287,211	702.61	298,659	717.31
(Dial Inc=-001)	↓ 304,714		↓ 317,631	$\bar{m} = 709.96$
A=15.337				$1/\bar{m} = .00141$

(T-3 737, 613 731, 898)

T=.001	878,236	2,456.5	863,847	2,358.3
A=0(.005)	↓ 1,065,398	$1/m_i = .0004$	1,044,264	$1/m = .00042$

T3, = 1604786 1581751



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There was an error in Assembly Q-2 which was determined to be the spacing between the top beams on the control table on the east side. This was corrected. We will now re-run.

4/25/68

Assembly Q-1: STS_{xy} = 4.42 cm 4/25/68

Lateral: .721 × 3.698 = 4.449 cm

(Z table to P_4 = 48.35)

Parts = 1-33 less #7

Basekote = 63.175 $\times 10^{-5}$ 1/s

Pos.	T-1	Factor	M	T-2	Factor	M
2.939	11021/2	2.306×10^{-3}	12.71	11813/2	2.258×10^{-3}	13.01
A=15,329	5510.5			5906.5		
T= 3,600	17704/2		20.45	18751/2		21.21
A= 15,33	8852			9376		
T=1.000	24,440		56.63	25,649		58.22
A= 15,329	24,561			25,781		
					$\bar{M}$ = 57.43	
					$1/\bar{M}$ = .01741	
T=1.000	25936		60.11	27146		61.64
A= 0(.005)	26071			27295	$\bar{M}$ = 60.88	
					$1/\bar{M}$ = .01642	
T= .200	87,287		204.84	91,375		210.19
A= 15.33	88,838			93076		
					$\bar{M}$ = 207.52	
					$1/\bar{M}$ = .00482	
T= .200	110,797		261.27	116,392		269.11
A= 0(.005)	113,308			119,166	$\bar{M}$ = 265.19	
					$1/\bar{M}$ = .00377	

		T-1		T-2	
T =	.065	182,062	435.66	190,193	446,50
A =	15,33	188,941		197714	

$\bar{M} = 441.08$

$1/\bar{M} = .002267$

T =	1.065	319 067	785,85	331 924	802,88
A =	0(.004)	↓ 340814		355524	

$\bar{M} = 794,36$

$1/\bar{M} = .001259$

T =	.000	297813	730,18	308,684	742,97
A =	15,33	316674		↓ 328996	

$\bar{M} = 736,58$

$1/\bar{M} = .00136$

We ran the actuator in hopeing to go critical but the recorder trace heeled over the other way

---

4/26/58

We are going to re-run the assay (with no changes) to see if not running the control actuator in-and-out affects the final multiplication.

Q-7

A. before

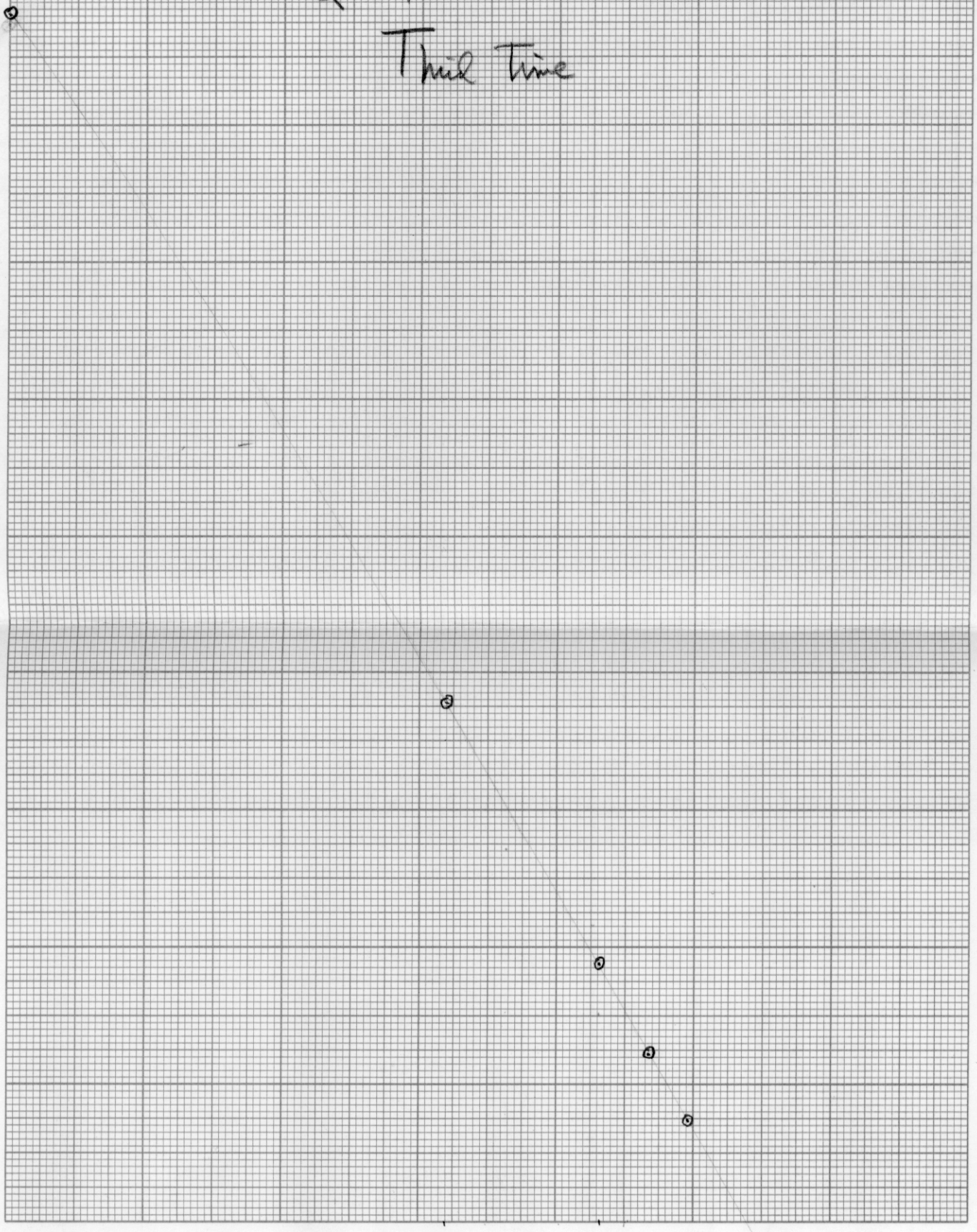
$STS_{x-y} = 4.419$ cm

P_∞	T-1	M-1	T-2	M-2	$\bar{M}$
7,946	11102/2	12.81	11596/2	13.11	12,96
A=out	↓ 5557		↓ 5805		
2,600	↓ 22764/2	26,30	23574/2	26,68	26,49
	↓ 11408		↓ 11815		
1,000	↓ 24,254/1	56,20	25,623/1	58,16	57,18
	↓ 24,372		25,755		

.02

Q-7

Third Time



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1.000

Table Closed, Gr

We had a period of zero when we had stabilized at ~.4 cm and waiting for the neutron level to reach its maximum value. There was no reason it should have screamed except for electronic noise. We will try again.

Repeat Reading

Actuator is out

P_{os}	T-1		T-2		
7.956	11027		11580		
2.601	22587		23791		
		n-1		n-2	$\bar{n}$
1.000	24,171 ↓ 24,288	56.00	25,281 ↓ 25,409	57.38	56.69
					$1/\bar{n} = .01764$
.360	55919 ↓ 56551	130.40	58633 ↓ 59,329	133.98	132.19
					$1/\bar{n} = .00756$
T=.136	110,853 ↓ 113 367	261.90	117,058 ↓ 119864	270.69	266.04
T=.065	170 507 ↓ 176,526	407.03	179,295 ↓ 185,964	414.96	$1/\bar{n} = .00376$
					$\bar{n} = 411.00$
					$1/\bar{n} = .00243$
	[T-3 462940]		[T-4 466183]		
	(Temps: 71, 80, 89)				
T= .608 (closed, Pin Indic @ -.07)	272912 ↓ 288,667	665.61	284113 ↓ 301229	680.27	$\bar{n} = 672.94$
					$1/\bar{n} = .00149$
	[T-3 707,128]		[T-4 700832]		

5/1/68

Assembly Q-8: STS$_{xy}$ = 8.419 cm No actuator

Actual: .721 + 3.698 = 4.419 cm

(z table to P_4 =

Parts = 1-33 less #7

Basic Rate = $63.175^{-} \times 10^{-5}$ 1/s

Pos.	T-1	Factor	M	T-2	Factor	M
2.550	9242/2	2.306×10^{-3}	11.17	9571/2	2.258×10^{-3}	10.81
	#842			47855		
1.745	10334		23.85	10748		24.27
.348	20596		47.79	21143		47.74
0.009	28056		64.65	29282		66.12

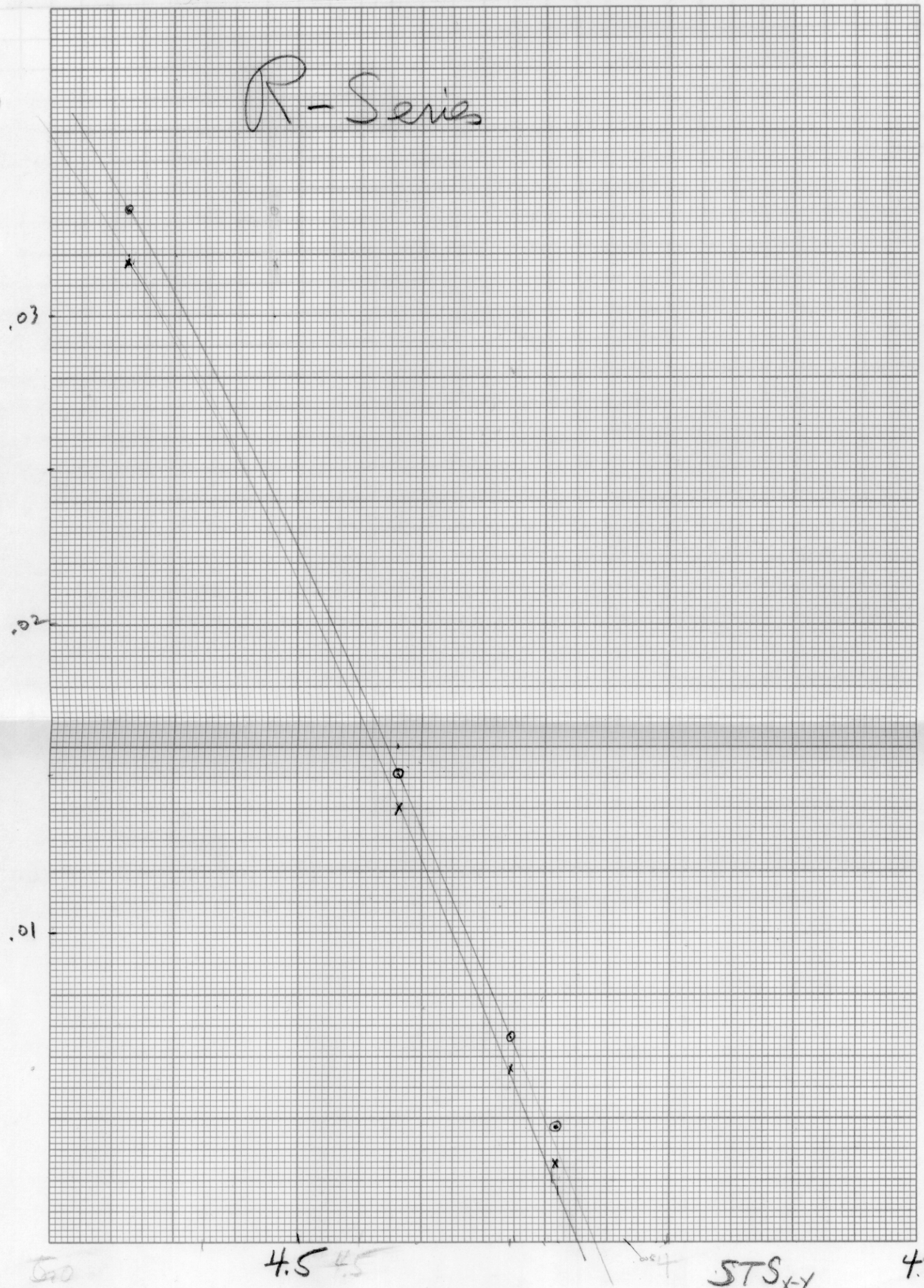
$\bar{m}$ = 65.39 $\frac{1}{m}$ = .01529

T/C's R = 70 #1 = 87 #2 = 92

This point removed (R-2)

We will now place TC actuator on & re-run

Pos.	T-1	Factor	M	T-2	Factor	M
2.955	9318/2	2.306×10^{-3}	10.73	9612/2	2.258×10^{-3}	10.85
A = 15.329	4659			4806		
1.504	11181		25.78	11688		26.39
A = 15.3						
.200	23203		53.51	24554		55.44
A = 15.3						
.009	28473		65.66	29707		67.08
A = 15.3						$\bar{m}$ = 66.37
						$\frac{1}{m}$ = .01507
	T/C's	Room = 70		#1 = 87	#2 = 91	
.009	30500		70.33	31792		71.67
A = .006		T-3 = 90268		T-4 = 86117		



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R- Series: Another point in Plane 4^2 array
table height variation

We have raised the array 65 cm to a total of 113.35 cm above the table. (Counters too).
We will begin the array with a multiplication of about 50.

SEE FACING PAGE 62

Assembly R-1 STS_{xy} = 4.64

Lateral: .721 f B,917 = 4.638

z, table to pu = 113.4, Pats, 1-33 less #7

Poo	T-1	Factn	M-1	T-2	Factn	M-2
7,959	8,073 /2	$2,306 \times 10^{-3}$	9,32	8,282 /2	2.258×10^{-3}	91,13
	4038			4141		
.451	10 862/1		25.10	10,987/1		24,87
	↓ 10,886			11,011		$\bar{M}$ = 24,98
+ .009	12,852		29,710	13,270		30.047
	↓ 12,885			13,305		$\bar{M}$ = 29,878

[T-338,393 T-V 36,554]

Temperature: 70, 88, 88

R-1' Actuator ON

Poo					
7,947	8,167 /2		9,42	8,392	9,48
					$\bar{M}$ = 9,45
1.000	8900/1		20,56	9349/1	21,15
	↓ 8916			↓ 9366	$\bar{M}$ = 20,85
.009	13,080		30,238	13,071	29.595
	↓ 13,114			↓ 13,105	$\bar{M}$ = 29,917
					1/$\bar{M}$ = .03343

Act, out

[Temp: 70,87] (T-3 39079 T-4 37,300)

T=.009 A=.003

T-1: 13,497 → 13,534 — 31.207

T-2: 14,061 → 14,101 — 31,844

$\bar{m}$ = 31.525

$V_{\bar{m}}$ = .03172

5/11/68 — 40,352 — 38,366

Assembly R-2 : STS x-y = 4.42

Lateral : .721 + 3,698 = 4.419 [Σ table to P_w = 113,4]

Parts : 1-33 less #7, Base Rate 63.175 x 10^5 m/s

P_{oo}:	T-1	Factor	M-1	T-2	Factor	M-2
7,950	9242/2 4842	2,306 x 10^{-3}	11.17	9511/2 4785	2,258 x 10^{-3}	10,81
1.745	10334		23.83	10748		24.27
.348	20,596		47.49	21143		47,74
.009	28,036		64.65	29282		61,12

Temps: 70, 87, 92

R-2' — Actuator on —

↑ Actuator OUT ↓	P_{oo}	T-1	M-1	T-2	M-2
	7,955	9318/2 4659	10.73	9612 4806	10,85
	1.504	11181	25,78	12688	26,39
	.200	23203	53,51	24554	55,44
	.009	28473	65,66	29707	67,08

$\bar{m}_{11}$ = 66.37

$\bar{m}$ = .01507

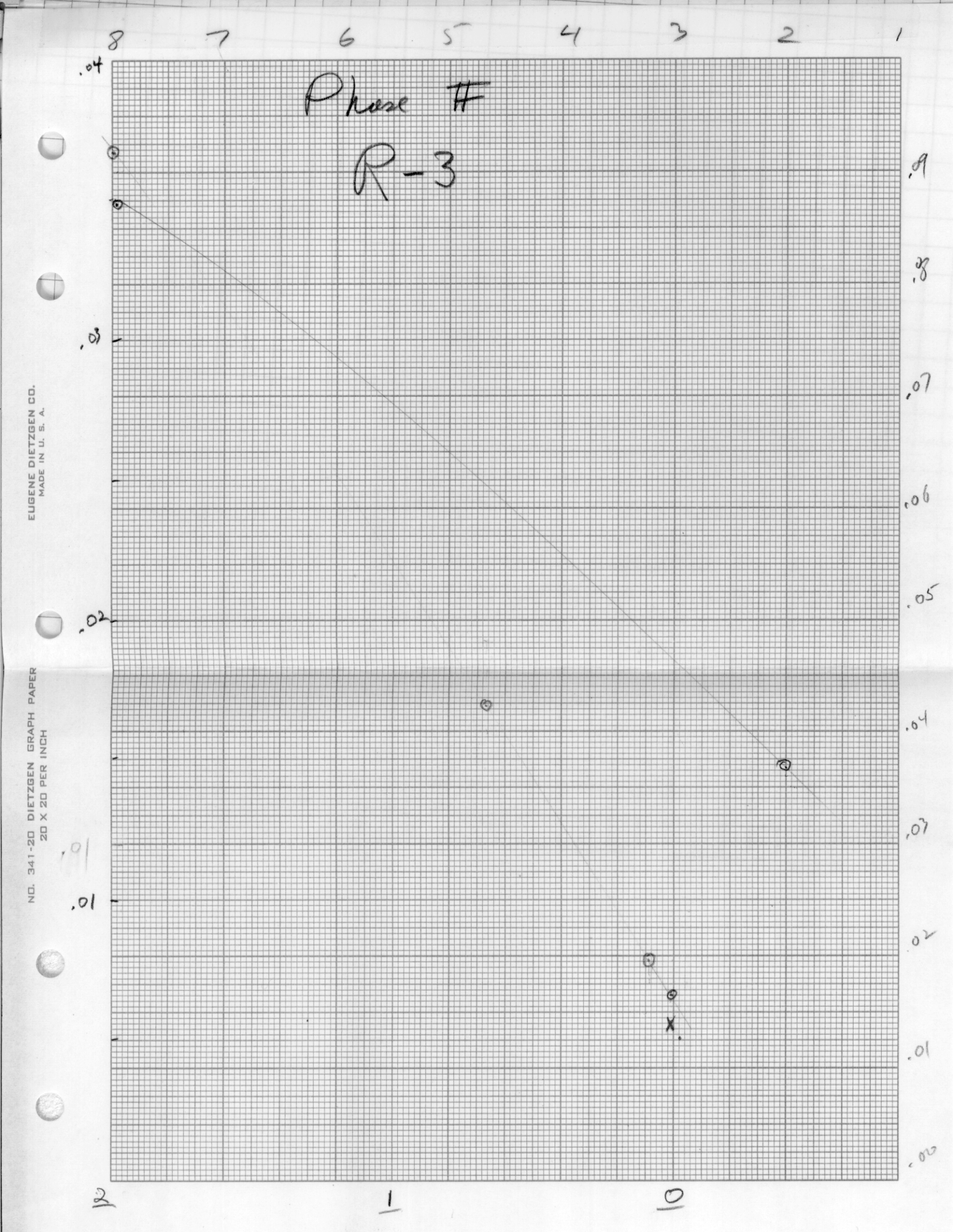
Temps: 70, 87, 91

TABLE = .009 — 30,500 — 70.33 — 31,742 — 71,67

Act = .006 (IN) — $\bar{m}$ = 71.00

[T-3 = 90,268, T-4 = 86,117)

$V_{\bar{m}}$ = .01402


8
7
6
5
4
3
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.04
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.07
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.04
.03
.02
.01
.02
2
1
0
Phase II
R-3
EUGENE DIETZGEN CO.
MADE IN U. S. A.
NO. 341-20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH

Assembly R-3 , STS_{x-y} = 4.33

Lateral : .721 + 3,607 = 4,328 cm

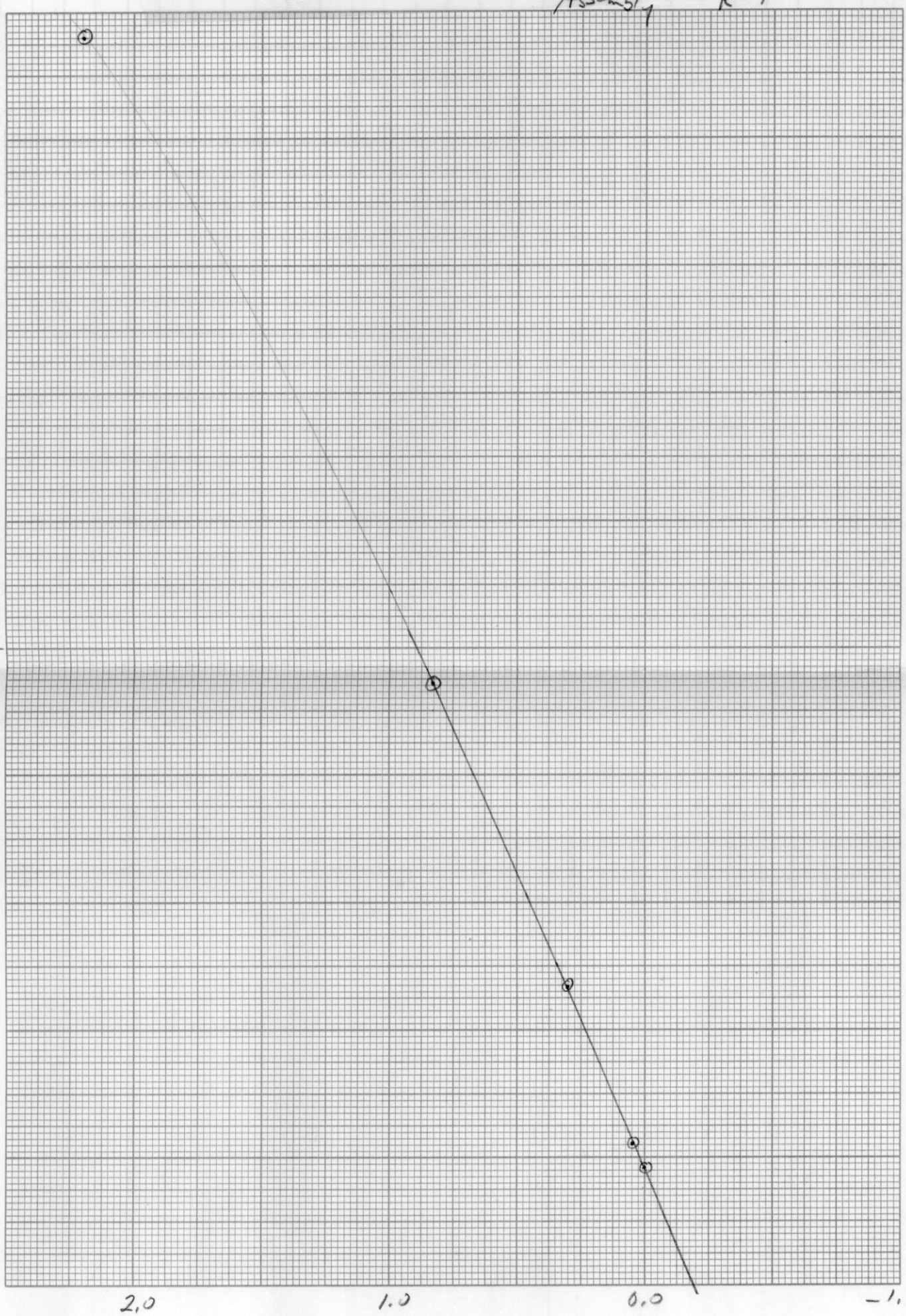
Parts: 1-33 less #7, Base Rate 63,175 x 10^5 m/s

→ ACTUATOR IS ON ←

Actuator Out

Pos:	T-1	Factor	M-1	T-2	Factor	M-2
7.959	9845/2	2.306×10^{-3}	11,36	10,259/2	2.258×10^{-3}	11,60
	4923			5130		$\bar{m}$ = 11,48
	4928			5135		$1/\bar{m}$ = .08711
1.998	11,675		26,98	12,134		27,47
	↓ 11,702			↓ 12164		$\bar{m}$ = 27,22
						$1/\bar{m}$ = .03674
.667	23,990	55,58		24,636		55.91
	↓ 24,106			↓ 24758		
						$\bar{m}$ = 55,75
						$1/\bar{m}$ = .01794
.086	54,086	126,08		56,797		129,74
	↓ 54,678			↓ 57,450		$\bar{m}$ = 127.91
						$1/\bar{m}$ = .00782
	[Temps : 70, 87, 90]					
.009	64,042	149,584		66,843		152,998
	↓ 64,873			↓ 67,749		$\bar{m}$ = 151,291
	[T-3 186,195			T-4 177,465]		$1/\bar{m}$ = .00661
T = .019	75588	176,97		78,357		179,77
Δ = .002	↓ 76748			↓ 79,604		$\bar{m}$ = 178.37
						$1/\bar{m}$ = .00561
	T-3 217,205			T-4 207,514		

Assembly R-4



EUGENE DIETZGEN CO.
MADE IN U. S. A.

NO. 341-20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH

5/8/68

Assembly R-4 : STS_{xy} = 4.292 cm

Lateral: .721 + 3.571 = 4.292 cm

Parts : 1-33 less #7

Base Rate: 63.175 $\times 10^5$ #/s

Actuator 04

Pos.	T-1	Factor	M	T-2	Factor	M
7.993	9420/2	2.306×10^{-3}	10.84	9801/2	2.258×10^{-3}	11.07
A=15.329	4710			4901		
2.200	21770/2		25.10	22957/2		25.92
A=15.3	10885			11478	$\bar{M}$ = 25.51	$1/\bar{M}$ = .0392
.830	22793		52.56	23760		53.65
A=15.3					$\bar{M}$ = 53.11	$1/\bar{M}$ = .01883
.300	45583		105.85	47326		107.89
A=15.3	↓ 45501			↓ 47780	$\bar{M}$ = 106.87	$1/\bar{M}$ = .00936
.050	95672		224.92	98775		227.54
A=15.3	↓ 97535			↓ 100770	$\bar{M}$ = 226.23	$1/\bar{M}$ = .00442
T/C's		R = 70		#1 = 86		#2 = 90
.009	113209		267.09	117211		271.00
A=15.3	↓ 115826			↓ 120019	$\bar{M}$ = 269.05	$1/\bar{M}$ = .00372
	T-3 = 328566			T-4 = 318,162		
.009	↓ 161280		384.32	↓ 166856		389.78
A=.000	↓ 166663			↓ 172621	$\bar{M}$ = 387.05	$1/\bar{M}$ = .00258
T/C's		R = 70		#1 = 86		#2 = 89

NOTE !!

IN AN EFFORT TO DISCOVER WHY THE MULTIPLICATION IN THE PRECEEDING RUN WAS NOT EXACTLY AS PREDICTED, A VERY CAREFUL TABLE RE-CHECK WAS MADE AN IT WAS DISCOVERED THAT THE PART IN COLUMN #7 WAS 5 cm too HIGH; A 15 cm spacer was found in place of a 10 cm spacer. This mistake was traced to the physicist-in-charge who had set the spacers.

(We will re-run with an S-rems designation.)

NOTHING WAS FOUND TO ACCOUNT FOR THE FACT WE DIDN'T HIT THE PREDICTION.

Assembly S-1 : $XY_{STS} = 4.64$

Latend : .721 + 3.919 = 4.638

Z table to P_{tt} = 113.4

Pots: 1-33 less #7 [NO ACTUATOR]

Base Rate: 63,175 $\times 10^5$ m/s

Pos:	T-1	Factor	M-1	T-2	Factor	M-2
7.958	12,685/3 → 4228 → 4232	2.306×10^{-3}	9.76	13,059/3 → 4353 → 4357	2.258×10^{-3}	9.61
1.300	19,339/2 → 9670 → 9689		22.34	20,118/2 → 10,059 → 10,079		22.76
.009	18256/1 → 18,323		42.249	19110/1 → 19,183		43.321

Tempo: 69,82½,77

$\bar{m} = 42.785$

$1/\bar{m} = .02337$

T-3 56914 T-4 53711

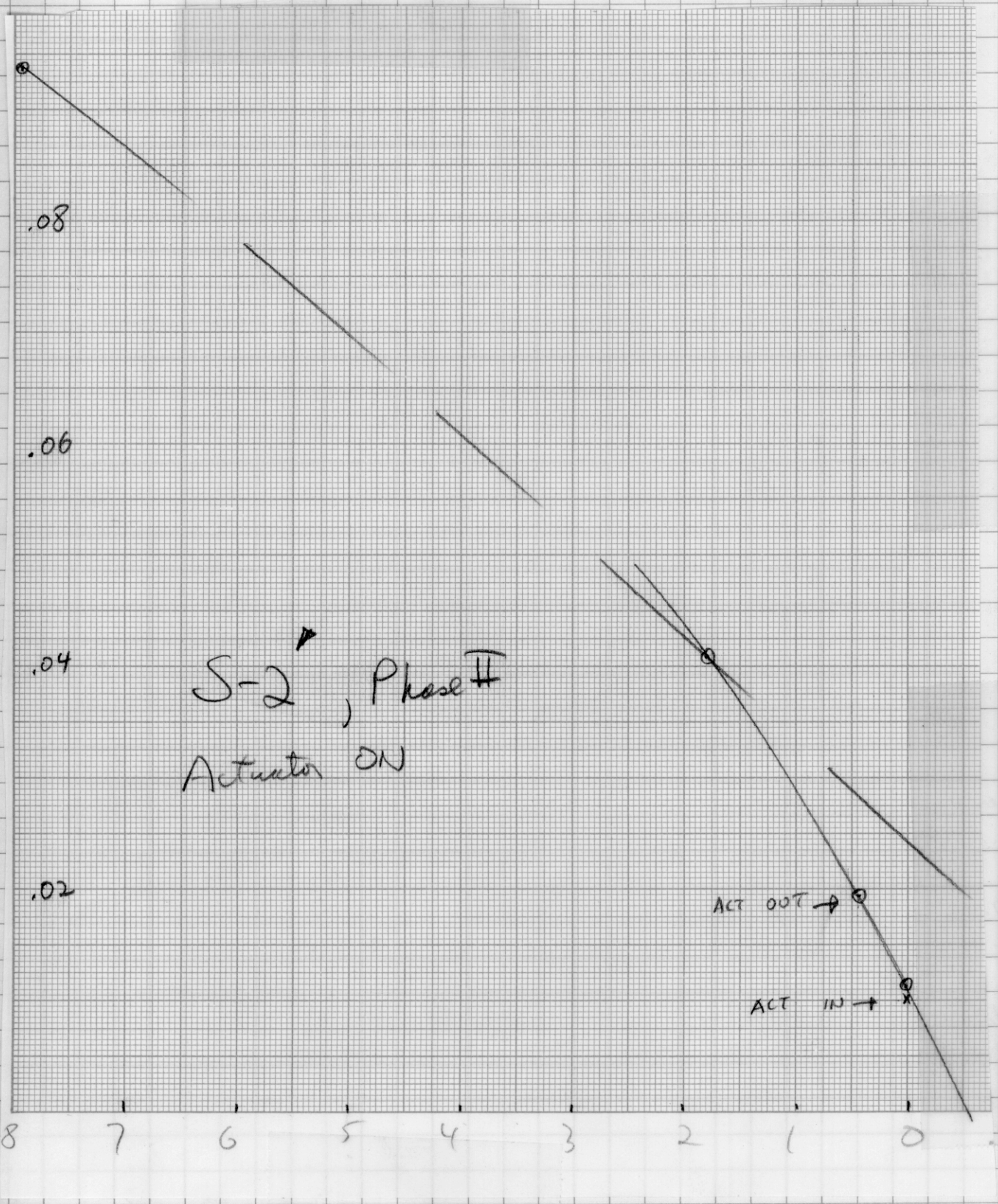
Assembly S-1': Actuator Placed On

Pos.	T-1	Factor	M-1	T-2	Factor	M-2
7.957	12786/3 → 4262	2.306×10^{-3}	9.83	13013/3 → 4338	2.258×10^{-3}	9.80
A = 15.334						
1.300	19758/2 → 9879		22.78	20348/2 → 10174		22.97
A = 15.3						
.009	18615/1 → 9308		42.93	19407/1 → 9704		43.82
A = 15.3						

$\bar{m} = 43.38$

$1/\bar{m} = .02305$

T-3 = 56647 T-4 = 54738


.08
.06
.04
.02
S-2, Phase II
Actuator ON
ACT OUT
ACT IN
8
7
6
5
4
3
2
1
0

Pos.	T-1	Factor	M	T-2	Factor	M
.009	19476	2.306×10^{-3}	45.37	20529	2.258×10^{-3}	44.35
A=.000						$\bar{M} = 45.86$
						$1/\bar{M} = .02181$

T-3 = 5 5 7 4 3 T-4 = 5 7 4 4 5

May 10, 1968

Assembly S-2" X-Y = 4.50

Lateral : .721 + 3.780 = 4,501

Z table to P_u = 113.4

Parts: 1-33 less #7

Base Rate : 63.175 $\times 10^5$ m/s

→ Actuator is ON ←

↑ ACTUATOR ↓ (15,337 (out))

Pos:	T-1	Factor	M-1	T-2	Factor	M-2
7.944	13850/3 ↓4617 ↓4622	2.306×10^{-3}	10,66	14196/3 ↓4732 ↓4735	2.258×10^{-3}	10,69 $\bar{M} = 10.67$ $1/\bar{M} = .09372$
1,799	20911/2 10,456 10,478		24,16	21956/2 10978 11002		24,85 $\bar{M} = 24.50$ $1/\bar{M} = .04082$
.450	21964/1 22061		50,87	22853/1 22958		51,85 $\bar{M} = 51,36$ $1/\bar{M} = .01947$
.009	37749/1 ↓38036		87,70	39,282/1 ↓39,593		89,41 $\bar{M} = 88,55$ $1/\bar{M} = .01129$

(T-3 114 704 T-4 108872)

[Temps 70, 84, 81½]

Act -.003	Table .009				
	41,936 ↓42,291	97,51	43,152 ↓43,528		98.30 $\bar{M} = 97.91$, $1/\bar{M} = .010213$

(T-3 125 454 T-4 121,007)

Assembly S-2

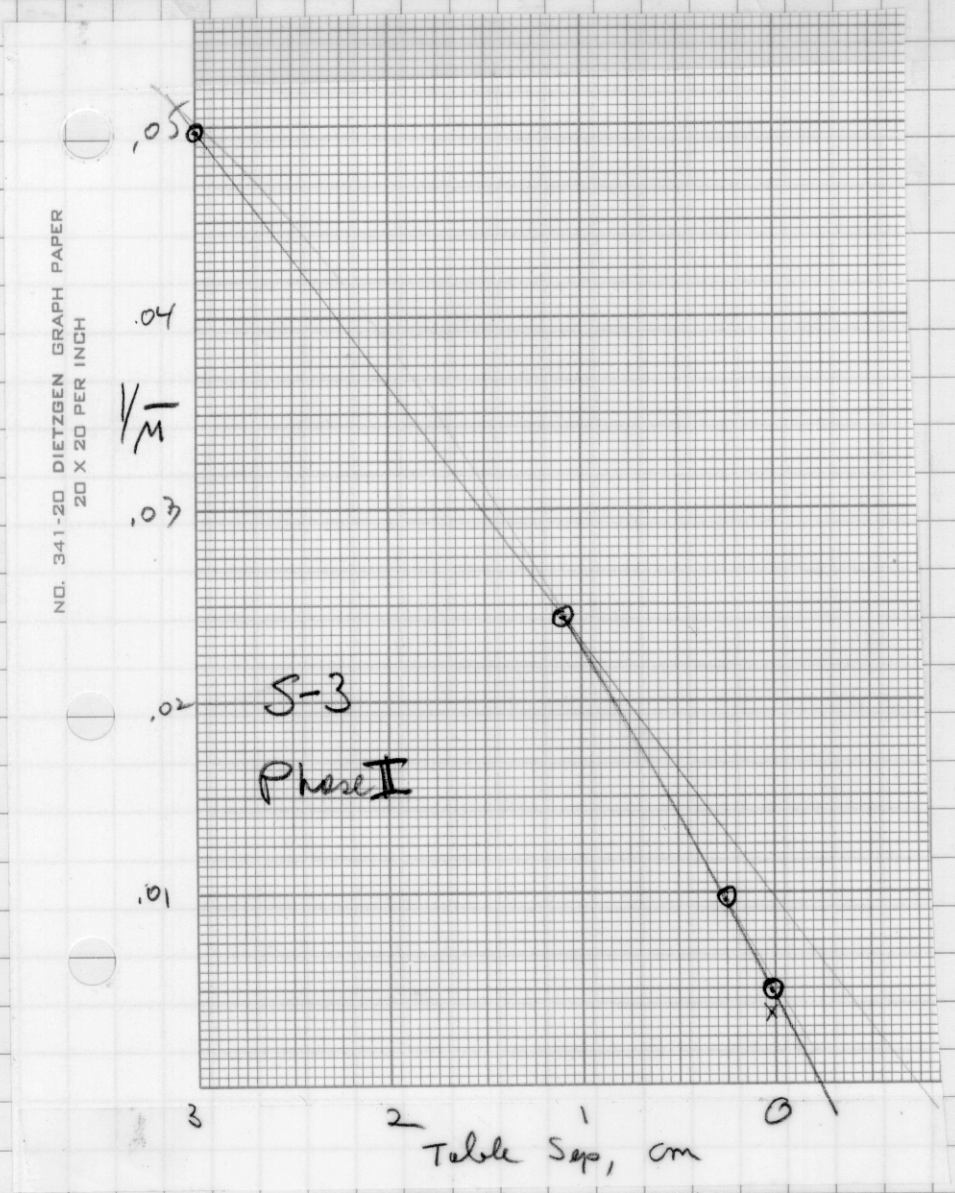
Same as S-2' but actuator off

P_{oo}	T-1	Facta	M-1	T-2	Factb	M-2
7.958	13367 /3	2.306×10^{-6}	10.27	14150 /3	2.258×10^{-6}	10.65
	4455.7			4716.7		
1.800	21323/2		24.59	21889/2		24.71
	10662			10945		
0.450	21757		50.17	22912		51.74
0.00	37523		87.18	38770		88.23
	37807			39075		

$\bar{M} = 87.71$

$1/\bar{m} = .0114$

T-3 = 113,591 T-4 = 108,929


NO. 341-20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH
.05
.04
1/M
.03
.02
.01
S-3
Phase II
3
2
1
0
Table Sep, cm

(4^2 planar array) May 13, 1968

Assembly S-3 $X\text{-}Y_{STS} = 4.43$ cm

Lateral : .721 + 3.708 = 4.429

Table to Pu Σ = 113.4

Pats : 1-33 less #7

Base Rate : 63.175 x 10^5 n/s

P_{oo}	T-1	Facto	M-1	T-2	Facto	M-2
T = 7,951	9609/2	2.306×10^{-3}	11.09	9914/2	2.258×10^{-3}	11.24
(A=out)	4805			4957		
	↓ 4810			↓ 4962		$\bar{M} = 11.15$
						$1/\bar{M} = .08969$
T = 3,000	17405/2		20.10	17,799/2		20.13
A = out	8703			8899		
	↓ 8718			↓ 8915		$\bar{M} = 20.12$
						$1/\bar{M} = .04970$
T = 1.100	17,582/1		40.68	18,307/1		41.49
A = out	↓ 17,644			↓ 18,374		
				$\bar{M} = 41.09$, $1/\bar{M} = .02433$		
T = .260	44,713 ↓		104.03	46,149 ↓		105.19
A = out	(15,336) 45,116			46,579		$\bar{M} = 104.61$, $1/\bar{M} = .00956$
T = IN (.009)*	87,998		206.54	91,167		209.71
A = .007(15,336)	↓ 89,575			↓ 92,860		$\bar{M} = 208.12$
						$1/\bar{M} = .00480$

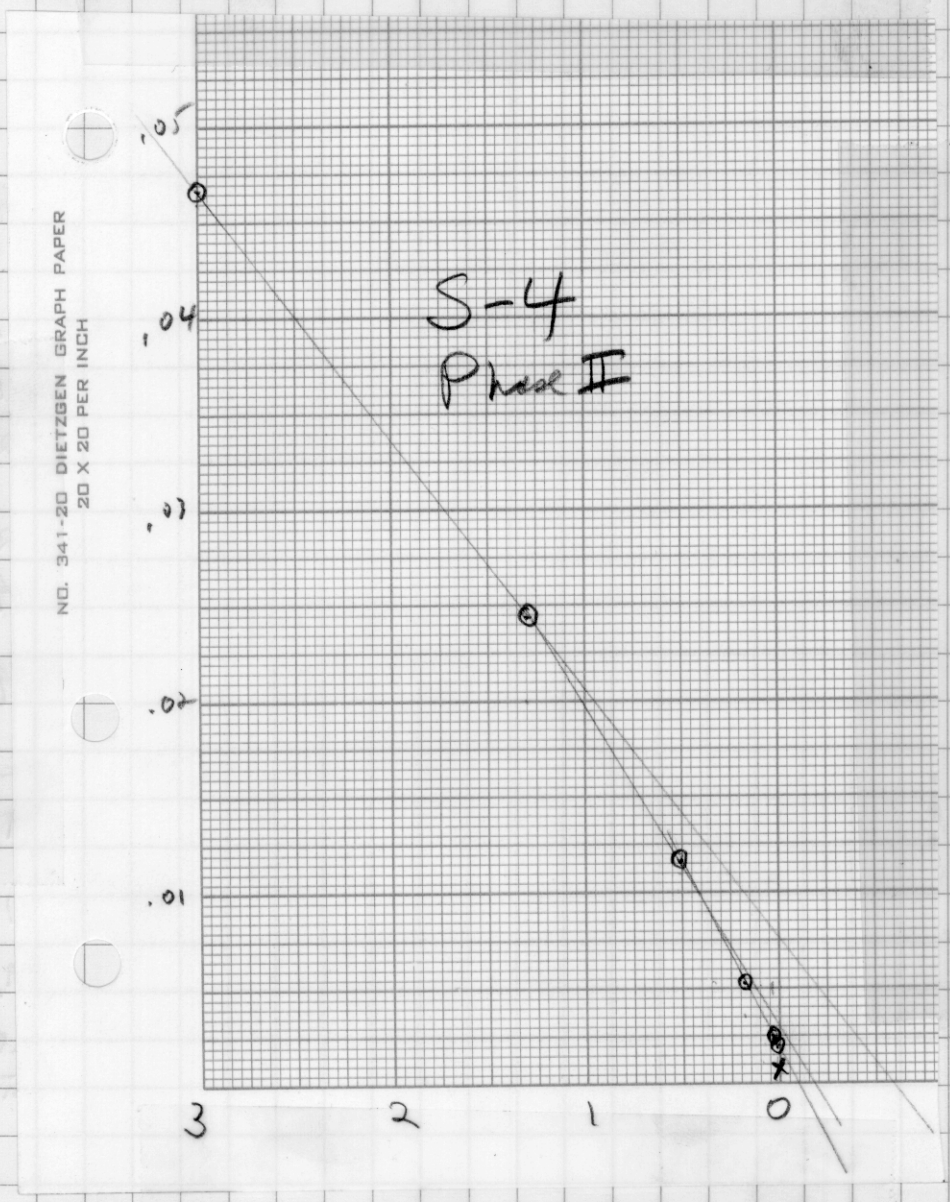
Temps 70, 92, 88

(T-3 256,559 T-4 245,907

T = IN (.009)*	113,579	267.98	116,906	270.33
A = IN (.000	↓ 116,219		↓ 119,705	$\bar{M} = 269.15$
				$1/\bar{M} = .003715$

T-3 = 324,151 T-4 311209

(* Dial indicator shows 0)


NO. 341-20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH
.05
.04
.03
.02
.01
3
2
1
0
S-4
Phase II

May 14, 1968

Assembly S-4 X-Y STS = 4.40 cm

Lateral: .721 + 3.678 = 4.399

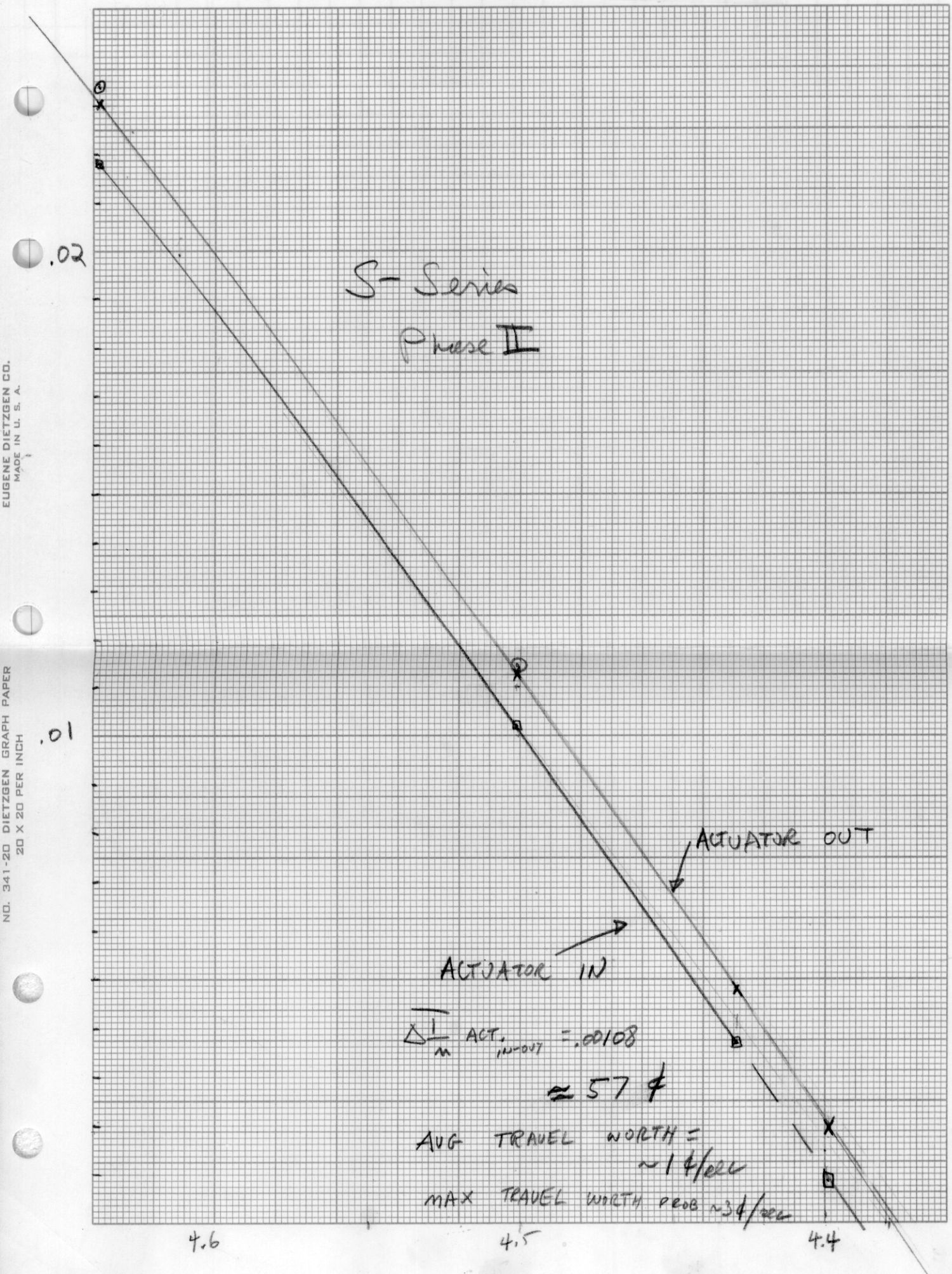
Table to Pu z = 113.4

Parts: 1-33 less #7

Base Rate: 63.175 x 10³ n/s

Poo	T-1	Facto	M-1	T-2	Facto	M-2
T = 7.935	9944/2	2.306x10⁻³	11.48	10442/2	2.258x10⁻³	11.80
A = OUT	4972			5221		$\bar{m}$ = 11.64
	↓4977			↓5226		1/$\bar{m}$ = .08591
T = 3.000	18312/2		21.15	19158/2		21.67
A = OUT	9156			9579		$\bar{m}$ = 21.41
	↓9173			↓9597		1/$\bar{m}$ = .04671
T = 1.300	17527/1		40.56	18189		41.23
A = OUT	↓17589			18255		$\bar{m}$ = 40.89
						1/$\bar{m}$ = .02446
T = 0.520	37029/1		86.02	38460/1		87.53
A = OUT	↓37305			↓38758		$\bar{m}$ = 86.77
						1/$\bar{m}$ = .01152
T = 0.180	80596/1		188.88	83681/1		192.19
A = OUT	81916			85106		$\bar{m}$ = 190.54
						1/$\bar{m}$ = .00525
T = .031 cm	180,003/1		430.55	187,578		440.12
(DIAL IND SAYS .011")	↓186,725			↓194,890		$\bar{m}$ = 435.34
A = OUT						1/$\bar{m}$ = .02297
T = .009 cm	213,172/1		513.42	221,557/1		523.54
[0.I = .009]	↓222664			↓231829		$\bar{m}$ = 518.48
	[T-3 = 578,309			T-4 553,053]		1/$\bar{m}$ = .001929

[Temperatures: 69, 89, 83]



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NO. 341-20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH

	T-1	M-1	T-2	M-2
T= 009	452,197	1,146.35	458,827	1,140,87
A= .005 (IN)	↓497,160		↓505,188	
				$\bar{m}$ = 1,143.61
	T-3 1,061121		T-4 1,019698	$1/\bar{m}$ = .000874

Assembly S-5 STS_{x-y} = 4.39

Lateral : .721 + 3.668 = 4.389 cm

⇒ Table to Pw = 113.4

Parts : 1-33 less # 7

Base Rate : 63.175 x 10^{-5} m/s

Pos:	T-1	Factor	M-1	T-2	Factor	M-2
T= 7,959	10050/2	2.306×10^{-3}	11.60	10359/2	2.258×10^{-3}	11,71
A= 15,332 (OUT)	5025			5180		$\bar{m}$ = 11,65
	5030			↓5185		$1/\bar{m}$ = .08584
T= 3,000	18647/2		21,54	19418/2		21,97
A= OUT	9326			9709		$\bar{m}$ = 21,75
	↓9343			↓9728		$1/\bar{m}$ = .04598
T= 1,241	↓19067/1		45,71	↓19966/1		45,27
A= OUT	↓19823			↓20046		$\bar{m}$ = 45,49
						$1/\bar{m}$ = .02198
T= 0,530	40679		94,57	42366		96,49
A= OUT	↓41013			42728		$\bar{m}$ = 9553
						$1/\bar{m}$ = .01047
T= .220	↓90503		212,53	↓95512		219,80
	↓92171			↓97372		$\bar{m}$ = 216,21
						$1/\bar{m}$ = .00462
T= .090	212,957		512,88	219,683		518,91
	↓222,430			↓229,779		$\bar{m}$ = 515,89
						$1/\bar{m}$ = .001938

Uniformly increasing straight line with table closed and A d at at 2.8 cm.

~100 sec period at act. - full in will ck. μμA paper for read period.

leveled off with act at 1.287 cm at 1.25×10^{-7} amps on μμA.

at this point (~ 13½ watts) our R.A.M. heads read:

	VICTOREEN	TRACER LAB
# 1	.7 R/h	1 —
2	1.3 R/h	2 —
3	1.1 R/h	3 —
4	1.5 R/h	4 —
5	.4 R/h	5 1 R/h

5/15/68

We will re-run assembly Φ-7 to check the odd point. The Tubs were lowered!

Assembly Φ-7 Re-run: STS_{xy} = 4.419 cL

Pos.	T-1	Factor	M	T-2	Factor	M
7.928	10993/2	2.306×10^{-3}	12.68	11454/2	2.255×10^{-3}	12.97
A=15.331	5496.5			5742.0		
2.600	11229		25.89	11965		27.02
A=15.3						
1.000	24807		57.20	25890		58.46
A=15.3						
.360	59433		138.70	62161		142.12
A=15.3	↓ 60149			↓ 62941		
.137	128308		303.68	133759		310.34
A=15.3	↓ 131692			↓ 137442		
T/C's	R=69		#1=84		#2=87	
.065	219183		528.59	228321		540.23
A=15.3	↓ 229222			↓ 239254		
.009	429686		1070.18	435539		1077.28
A=15.3	↓ 464086			↓ 477093		

$\bar{m}$ = 1073.73

$1/\bar{m}$ = .000931

5/14/68

We will now re-run assembly Q-6 to see if it reproduces.

Assembly Q-6 : Re-run : STS_{xy} = 4.490 cm

Pos.	T-1	Factor	M	T-2	Factor	M
2.939	10780/h	2.306×10^{-3}	12.43	11360/2	2.458×10^{-3}	12.83
A=15.325	5390			5680		
2.401	11697		24.97	12136		27.40
A=15.3						
.825	26098		60.18	27343		61.74
A=15.3						
.266	57867		135.01	60648		138.62
A=15.3	58546			61391		
.064	112358		265.06	118200		273.34
A=15.3	114984			121054		

T/C's R = 69 #1 = 88 #2 = 84

0.009	144832	343.56	152254		354.60
A=15.3	149157		157043	$\bar{M}$ = 349.28	
				$Y_{\bar{M}}$ = .00286	

T-3 = 405447 T-4 = 400858

.009	220401	225153
A=15.3		

The closure point mult. was 12.8% lower than the first run but the rest of the points were only ~2% lower. We will think about this.

5/17/68

We will re-run Assembly Q-6 again for another check.

Assembly Q-6 2nd Re-run : ST_{xy} = 9,840 cm

Pos.	T-1	Factor	M	T-2	Factor	M
7.947	10827/2	2.306×10^{-3}		11224/2	2.258×10^{-3}	
A=15.329						
2.401	Scram during scale change of system					
A=15.329						

We will begin again

Pos.	T-1	Factor	M	T-2	Factor	M
7.952	10919/2	2.306×10^{-3}		11388/2	2.258×10^{-3}	
A=15.329						
2.401	11555			11942		
A=15.3						
.825	25884			27192		
A=15.3						
.266	56901			59212		
A=15.3						
.064	111057			116067		
A=15.3						
.009	142987			149468		
A=15.3						

T/C's R = 69 #1 = 88 #2 = 84

Looks the same as 5/16/68 we will therefore re-run assembly Q-5.

5/20/68

We are going to deviate for a ½ day to take picture. We have loaded the upper part of the column with Mock He for a simulated 4^3 picture. The spacing between bases is 5½" (at a 2.85" spacing the full closed multiplication was 5.4)

Fast Stop Count

T-1 1727/1 T-2 1768/1 ($M < 4$)

5-22-68

We will continue the P-Series which was discontinued at M ≈ 180 Page 37

Assembly P-5: $S\bar{S}_{xy}$ = 4.520 cm

Lateral: .721 + 3.799 = 4.520 cm

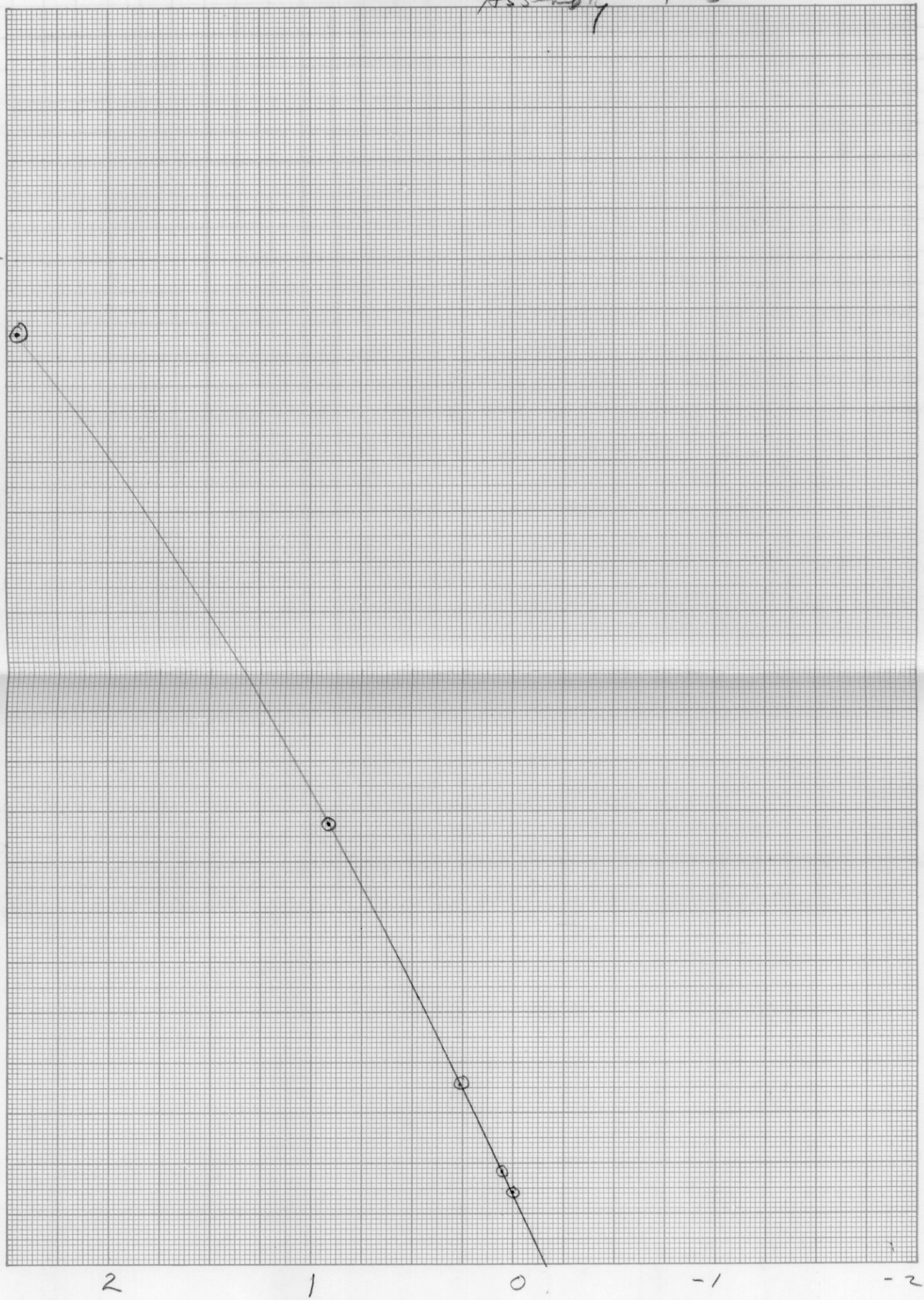
Table to P_4 = 33.35 cm

Parts: 1-33 less #7

Base Rate = 63.175 x 10^{-5} n/s

Pos	T-1	Factor	M	T-2	Factor	M
7.957	11038/2	2.306×10^{-3}	12.73	11316/2	2.258×10^{-3}	12.78
A = 15.325	5519			5658		
2.961	11612		26.78	12077		27.27
A < 15.325				$\bar{M}$ = 27.03		$\frac{1}{M}$ = .03700

Assembly P-5



10 X 10 TO THE CM. 358-14
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Pos.	T-1	Factor	M	T-2	Factor	M
.913	21107	2.306×10^{-3}	55.55	26033	2.258×10^{-3}	58.78
A=15.					$\bar{M}$ =	57.19
					$Y_{\bar{m}}$ =	.01748
.261	58224		135.84	62174		142.08
A=15.	58907			62924	$\bar{M}$ =	138.96
					$Y_{\bar{m}}$ =	.007196
.065	112705		265.88	118561		275.16
A=15.	115299			121861	$\bar{M}$ =	270.52
					$Y_{\bar{m}}$ =	.003697
.009	143671		341.09	151198		352.08
A=15.	147916			155906	$\bar{M}$ =	346.57
					$Y_{\bar{m}}$ =	.002885
.009	218208		526.13	229505		583.15
A=.003	225155			240546	$\bar{M}$ =	534.68
					$Y_{\bar{m}}$ =	.001870

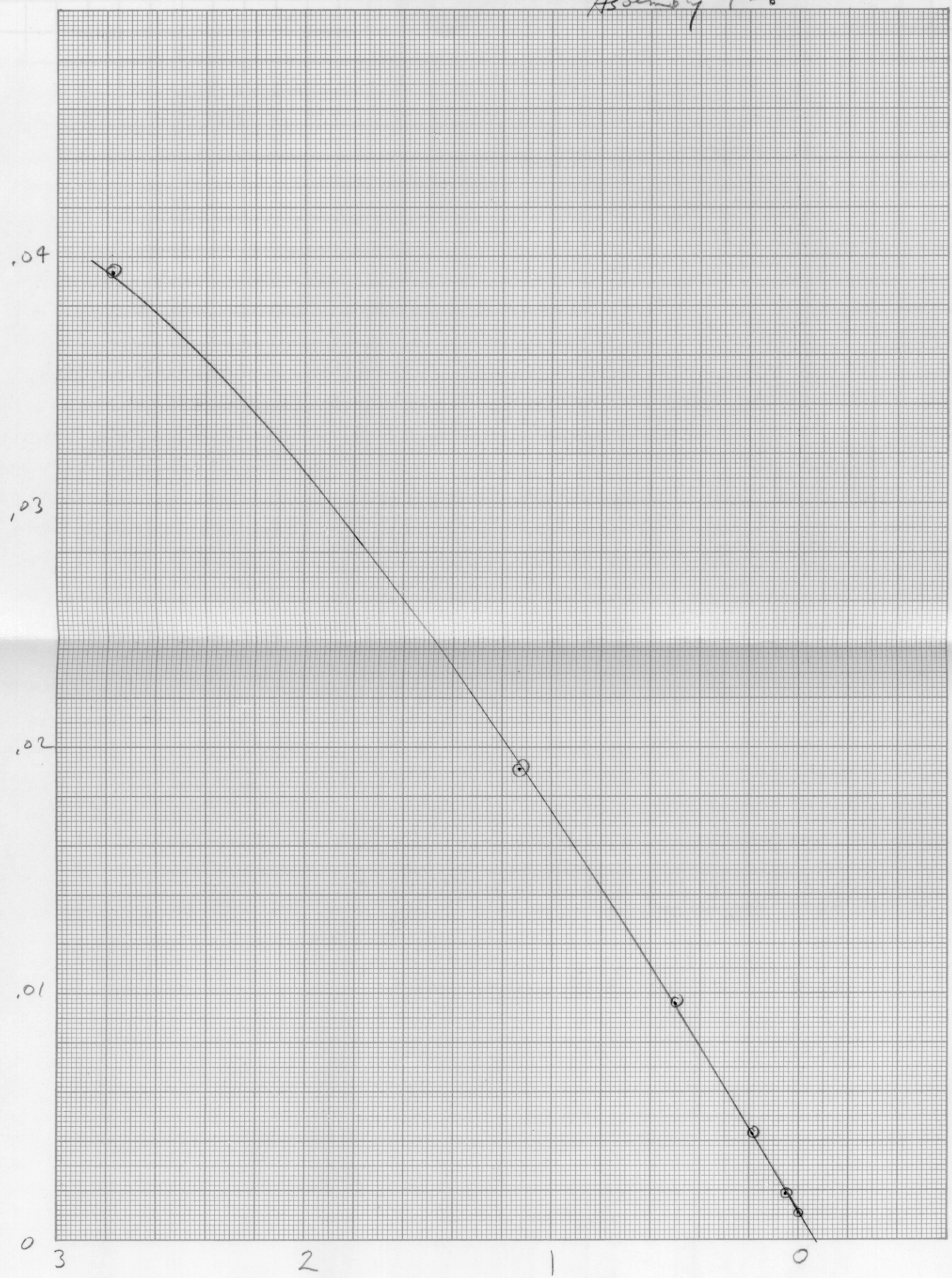
T/C's R= 70 #1=81 #2=84

Assembly P-6: STS_{xy} = 4.505 cm

Lateral: .721 + 3.784 = 4.505 cm

Pos.	T-1	Factor	M	T-2	Factor	M
7.944	11054/2	2.306×10^{-3}	12.75	11728/2	2.258×10^{-3}	13.24
15.329	5527			5864		
2.775	10815		24.94	11518		26.01
A=15.3					$\bar{M}$ = 25.47	$Y_{\bar{m}}$ = .03926
1.125	22255		51.32	23656		53.42
A=15.3					$\bar{M}$ =	52.37
					$Y_{\bar{m}}$ =	.01909

Assembly P-6



K&E 10 X 10 TO THE CM. 358-14
KEUFFEL & ESSER CO. MADE IN U.S.A.

P=5	T-1	Factor	M	T-2	Factor	M
.500	43509	2.306×10^{-3}	102.15	46462	2.254×10^{-3}	105.90
A=15.3	47299			48298		$\bar{M}$ = 104.02
						$1/\bar{M}$ = .00961
.190	86994		227.36	102427		236.12
A=15.3	98597			104570		$\bar{M}$ = 231.74
						$1/\bar{M}$ = .00432
.050	218090		525.84	229053		542.03
A=15.3	228032			240047		$\bar{M}$ = 533.83
						$1/\bar{M}$ = .001873
.009	356396		884.9	369558		901.05
A=15.3	383757			398047		$\bar{M}$ = 892.87
						$1/\bar{M}$ = .001120

T-3 = 777726 T-4 = 866948

R = 69 #1 = 85 #2 = 82

5/23/68

We will have lower the planer array as low as we can which is 28.35 cm

Assembly T-1 : STS_{xy} = 5.901

Lateral: .721 + 5.080 = 5.901 cm

Z Table to Pu = 28.35 cm

Parts: 1-33 less #7

Base Rate: 63.175×10^{-5} n/s

Pos.	T-1	Factor	M	T-2	Factor	M
7.945	9424/3 3741	2.306×10^{-3}	7.24	9796/3 3265	2.258×10^{-3}	7.37
0.011	10235/2 5117.5		11.80	10863/2 5431.5		12.25

$\bar{M}$ = 12.03

$Y_{\bar{M}}$ = .0831

T/C's K = 69 #1 = 81 #2 85

5/24/68

Assembly T-2: STS_{xy} = 4.973 cm

Lateral: .721 + 4.252 = 4.973 cm

Z Table to Pu = 28.35 cm

Parts: 1-33 less #7

Base Rate: 63.175×10^{-5} n/s

Pos.	T-1	Factor	M	T-2	Factor	M
2.127	13035/3 4345	2.306×10^{-3}	10.02	13814/3 4603.7	2.258×10^{-3}	10.40

Pos.	T-1	Factor	M	T-2	Factor	M
1.213	16222/2 9111	2.306×10^{-3}	21.61	19255/2 9627.5	2.254×10^{-3}	21.78
.011	14142		32.61	15030		33.94

$\bar{m} = 33.28$ $1/\bar{m} = .03005$

T/C's R = 70 #1 = 80 #2 = 87

5/27/68

Assembly T-3: $STS_{xy} = 4.766$ cm

Lateral: .721 + 4.045 = 4.766 cm

Z Table to Pa = 28.35 cm

Parts: 1-33 less #7

Base Rate: 63.105×10^{-5} g/s

Pos.	T-1	Factor	M	T-2	Factor	M
2.942	14849/3 4949.7	2.306×10^{-3}	11.41	15887/3 5295.7	2.253×10^{-3}	11.96
2.000	16238		23.61	10858		24.52
.400	21246		48.99	22286		50.32
.010	30910 31103		71.72	32234 32442	$\bar{m} = 72.99$	73.25 $1/\bar{m} = .0138$

T-3 = 91053 T-4 = 85585

T/C's R = 70 #1 = 87 #2 = 78

The actuator was placed on the table

Assembly T-3': Act. On

Pos.	T-1	Factor	M	T-2	Factor	M
7.935	10265/2	2.306×10^{-3}	11.84	10581/2	2.258×10^{-3}	11.95
A 15.323	5132.5			5250.5		
2.000	10523		24.27	10984		24.80
A = 15.323						
.900	21278		48.07	22725		51.31
A = 15.3						
0.000	31719		73.61	33345		76.06
A = 15.3	↓ 31520			↓ 33685		$\bar{m}$ = 74.84
						$Y_{\bar{m}}$ = .01336

T-3 = 93186 T-4 = 92434

T/t's R = 70 #1 = 86 #2 = 78

0.000	37380	78.83	36028		81.98
A = .008	↓ 37619		↓ 36289		

5/29/68

Assembly T-4: STx_y = 4.683 cm

Lateral: .721 + 3.962 = 4.683

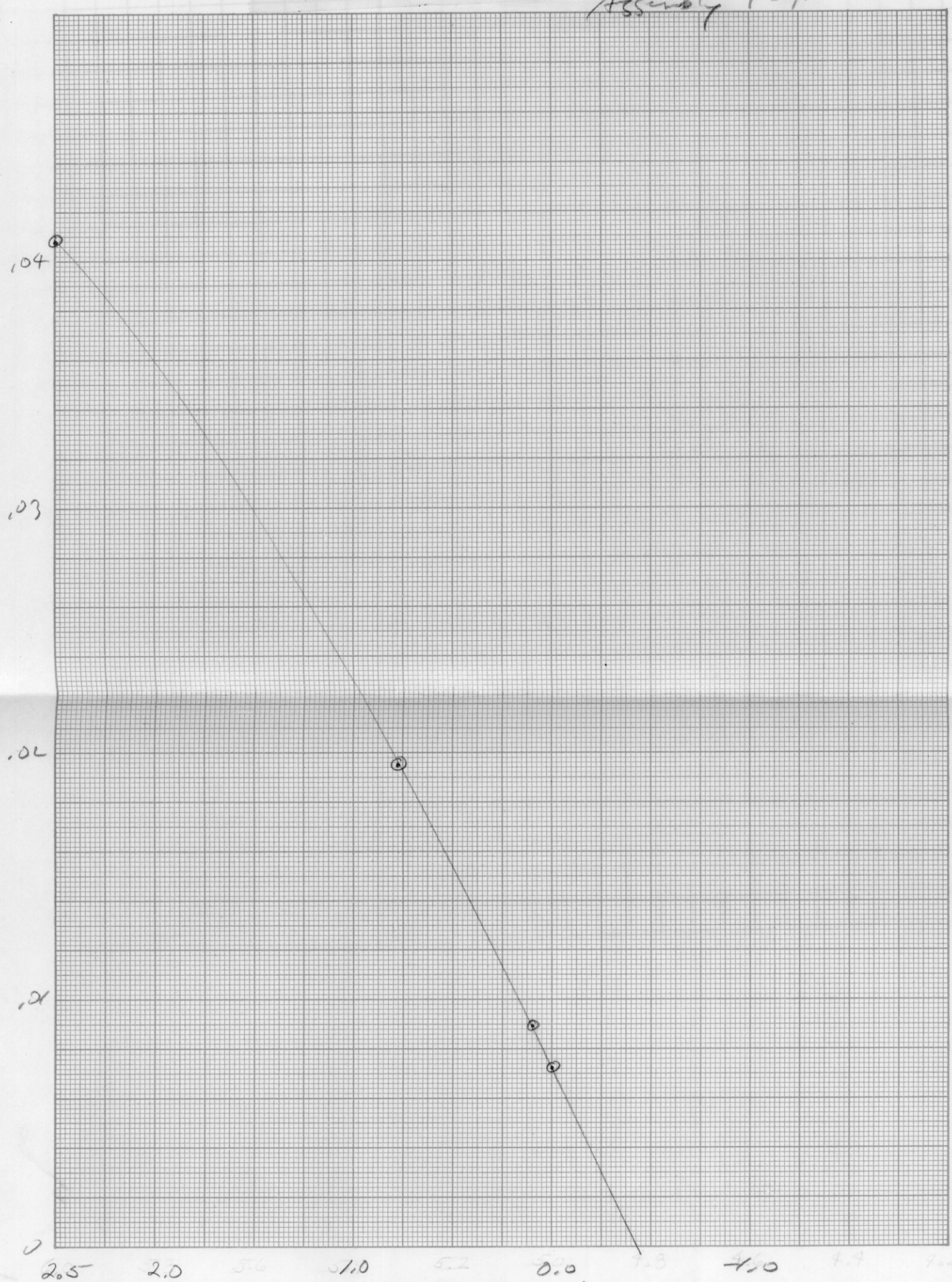
Z table to Pc = 28.35 cm

Parts 1-33 less #7

Base Rd: 63.175 $\times 10^{-5}$ m/s

Pos.	T-1	Factor	M	T-2	Factor	M
7.937	10498/2	2.304×10^{-3}	12.10	11212/2	2.254×10^{-3}	12.66
A = 15.323	5249			5606		
2.500	10528		24.28	10976		24.78
A = 15.3						$\bar{m}$ = 29.53
						$Y_{\bar{m}}$ = .0408

Assembly T-9



K&E 10 X 10 TO THE CM. 358-14
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Table Synoptic

Pos.	T-1	Factor	M	T-2	Factor	M
.725	21733	2.306×10^{-3}	50.12	23230	2.258×10^{-3}	52.45
A=15.3						$\bar{M}$ = 51.24
						$Y/\bar{m}$ = .0198
.101	47427		110.42	50032		114.11
A=15.3	47882			50537		$\bar{M}$ = 112.26
						$Y/\bar{m}$ = .00808
.000	58279		135.57	61678		140.55
A=15.3	58515			62442		$\bar{M}$ = 138.44
						$Y/\bar{m}$ = .00722

T-3 = 168822 T-4 = 166689

T/C's R = 71 #1 = 85 #2 = 86

.000	66984		156.56	71161		163.00
A=0.008	67894			72186		$\bar{M}$ = 159.78
						$Y/\bar{m}$ = .00626

6/3/68

Assembly T-5: STS_{xy} = 4.633

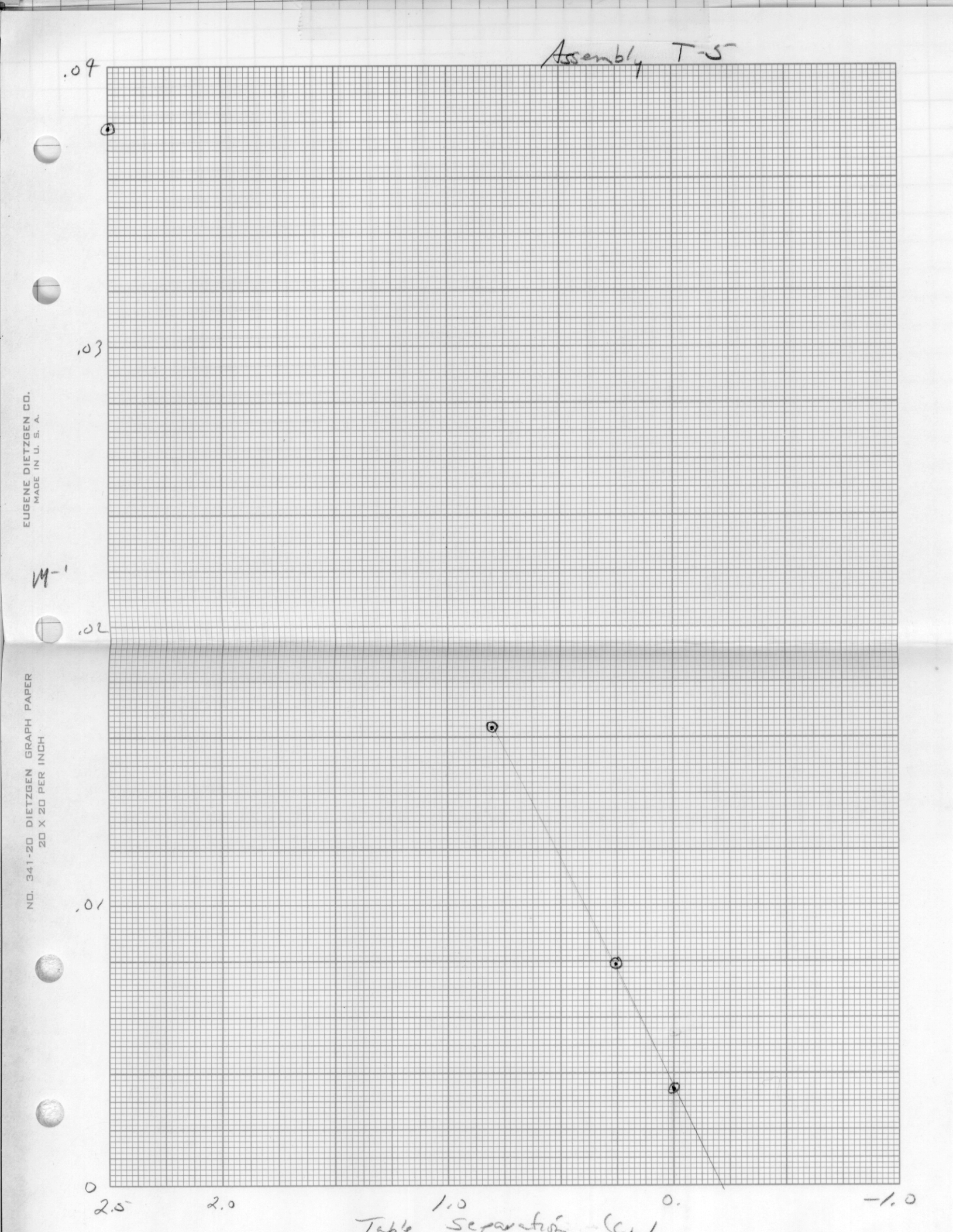
Lateral: .721 + 3.912 = 4.633

Z tabs to Pu = 28.35 cm

Parts 1-33 less #7

Base Rate: 63.175×10^{-5} T/S

Pos.	T-1	Factor	M	T-2	Factor	M
7.943	10812/2	2.306×10^{-3}	12.97	11492/2	2.258×10^{-3}	12.97
A=15.312	5406			5746		
2.500	11196		25.82	11997		27.09
A=15.3						$\bar{M}$ = 26.45
						$Y/\bar{m}$ = .0378
.800	26047		60.06	27689		62.52
A=15.3						$\bar{M}$ = 61.29
						$Y/\bar{m}$ = .01632


Assembly T-5
.04
.03
.02
.01
0
M⁻¹
2.5
2.0
1.0
0.
−1.0
Table separation (cm)
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20 X 20 PER INCH

Pos	T-1	Factor	m	T-2	Factor	m
.260	53023	2.306×10^{-3}	123.58	56620	2.258×10^{-3}	129.31
A = 15.3	↓ 53591			↓ 57267		

$\bar{m} = 126.44$

$\gamma_{\bar{m}} = .00791$

.000	119855		283.18	127269		298.89
A = 15.3	↓ 122802			↓ 130599		$\bar{m} = 285.04$
						$\gamma_{\bar{m}} = .00346$

T-3 = 336351 T-4 = 333493

T/C's R = 70 #1 = 84 #2 = 90

.000	169539	409.68	178537		418.06
A = 0.003	↓ 175488		↓ 185146		$\bar{m} = 411.37$
					$\gamma_{\bar{m}} = .00243$

6/4/68

Assembly T-6: $STS_{xy} = 9.61\Omega$

Latch: .721 + 3.891 = 4.61Ω

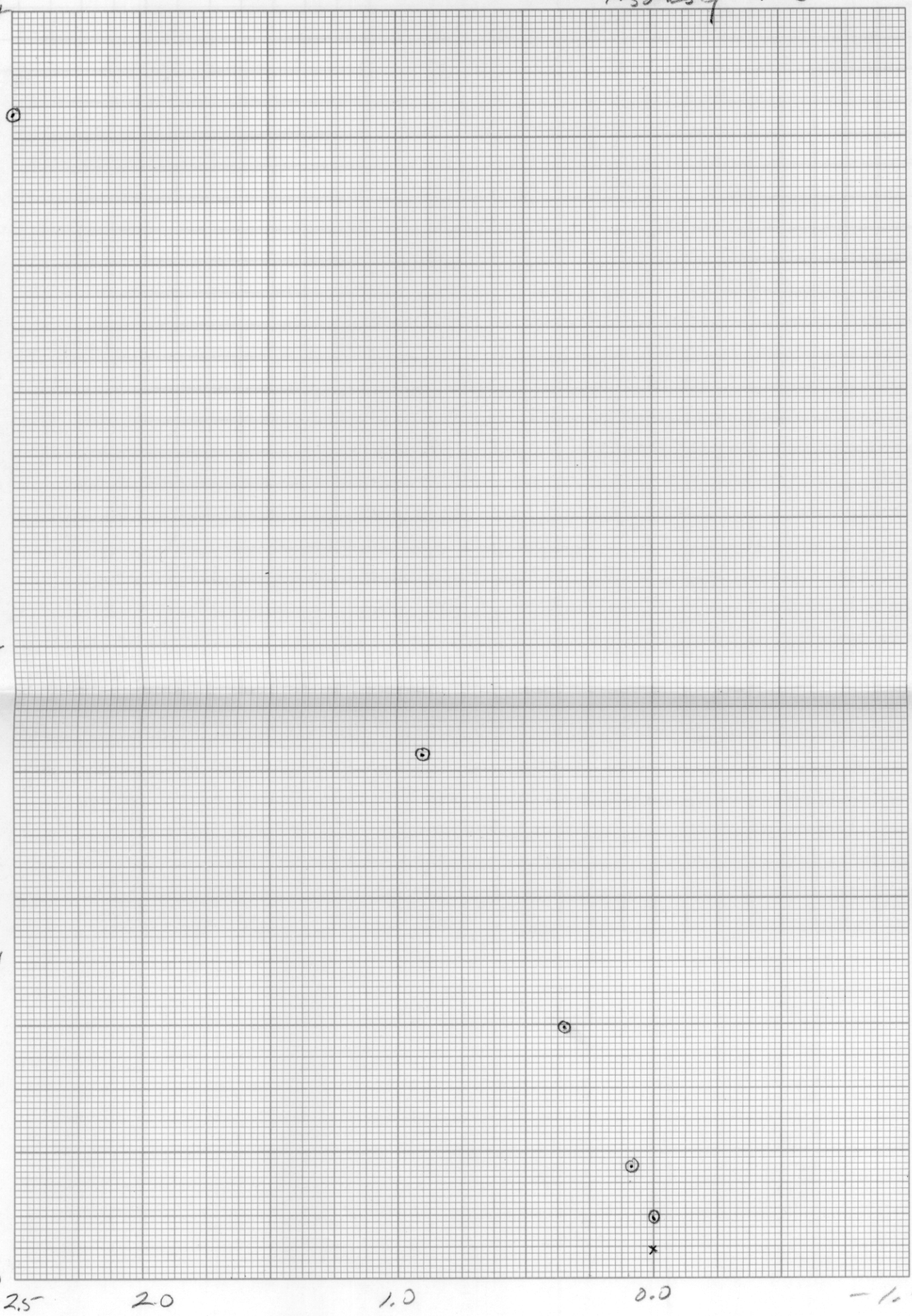
Z table to P_n = 28.35 cm

Parts 1-33 less #7

Base Rate: 63.175×10^{-5} Ω/s

Pos.	T-1	Factor	m	T-2	Factor	m
7.937	110372	2.306×10^{-3}	12.73	11616/2	2.258×10^{-3}	13.11
A = 15.310	55184.5			5808.		
2.500	11579		26.56	12396		27.88
A = 15.3						$\bar{m} = 27.22$
						$\gamma_{\bar{m}} = .03674$
.900	25856		59.63	27277		61.59
A = 15.3						$\bar{m} = 60.61$
						$\gamma_{\bar{m}} = .01650$

Assembly T-6



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Pos.	T-1	Factor	M	T-2	Factor	M
.350	535-43	2.306	124.81	56477	2.258	128.58
A = 15.3	5-8122			57162		$\bar{m}$ = 126.90
						$\gamma/\bar{m}$ = .00788
.090	117566		277.63	124850		289.19
A = 15.3	120355			128051		$\bar{m}$ = 283.39
						$\gamma/\bar{m}$ = .00353
.000	210675		507.17	221473		523.27
A = 15.3	219534			231739		$\bar{m}$ = 515.22
						$\gamma/\bar{m}$ = .001941

T-3 = 561190 T-4 = 560785

T/C's R = 71 #1 = 85 #2 = 88

.000	429630	1083.83	445384		1104.05
A = .003	470003		488944		$\bar{m}$ = 1093.54
					$\gamma/\bar{m}$ = .000914

6/5/68

Assembly T-7: STS_{xy} = 4.586 cm

Lateral: .721 + 3.865 = 4.586 cm

Z table to Pu = 28.35 cm

Part I 1-33 less #7

Base Rate: 63.175×10^{-5} n/s

Pos.	T-1	Factor	M	T-2	Factor	M
7.937	112794/2	2.306×10^{-3}	13.00	118562/2	2.258×10^{-3}	13.39
A = 15.310	56397			59281		
2.700	114579		26.42	121822		27.51
A = 15.3						$\bar{m}$ = 26.97
						$\gamma/\bar{m}$ = .03708
1.04	260579		60.09	275178		62.14
A = 15.3						$\bar{m}$ = 61.11
						$\gamma/\bar{m}$ = .01636

Assembly T-2

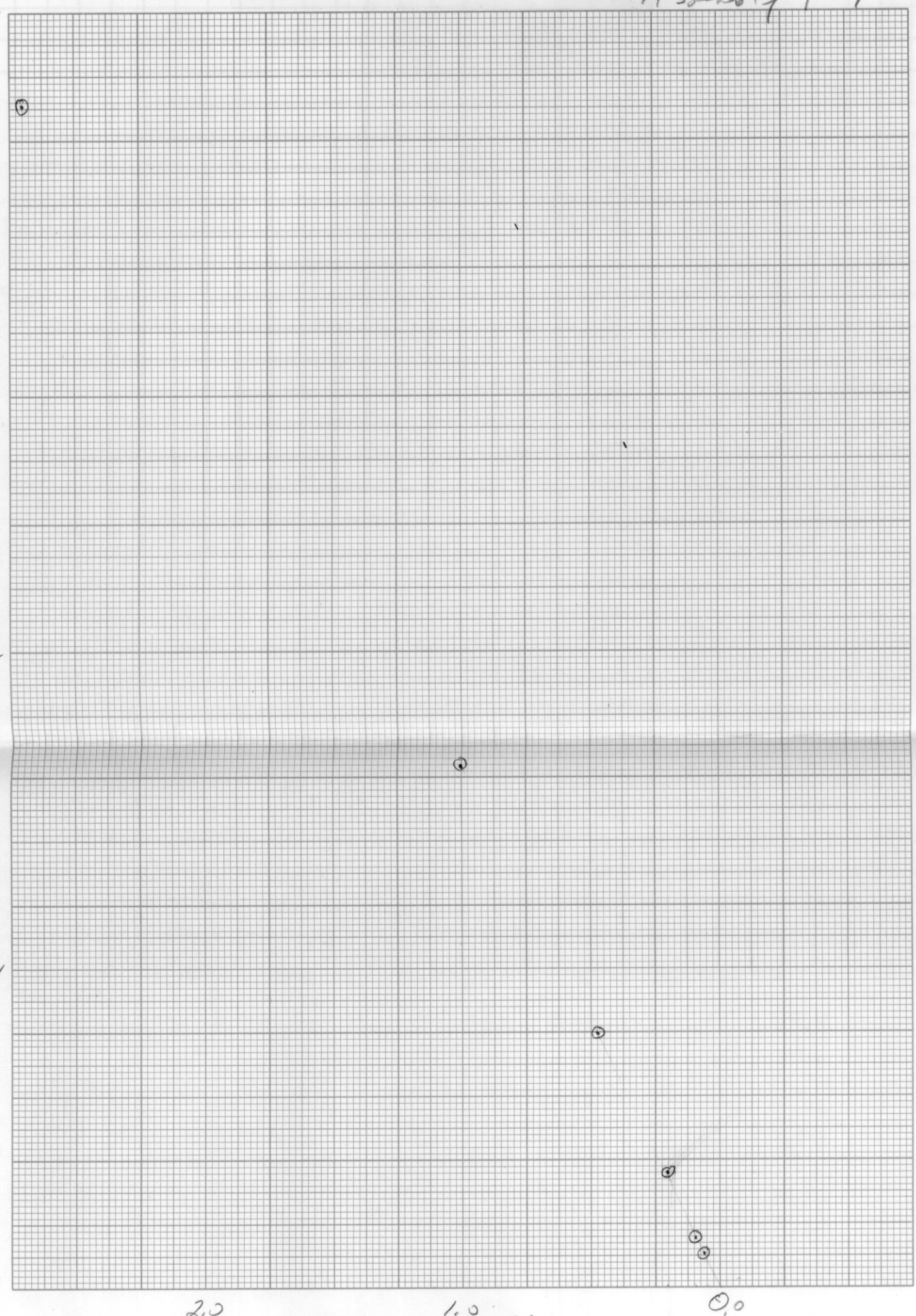

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Table Separation

Pos.	T-1	Factor	M	T-2	Factor	M
.475	52670	2.306×10^{-3}	122.75	55927	2.258×10^{-3}	127.71
A = 15.3	53229			56560		
					$\bar{m}$ =	125.23
					$X_{\bar{m}}$ =	.00759
.210	115569		272.80	121916		282.17
A = 15.3	118301			124965	$\bar{m}$ =	277.49
					$1/\bar{m}$ =	.003604
.095	255-281		620.38	268508		640.70
A = 15.3	269028			283745	$\bar{m}$ =	630.54
					$1/\bar{m}$ =	.001586
.060	373177		929.92	388061		945.56
A = 15.3	403240			420707	$\bar{m}$ =	939.94
					$1/\bar{m}$ =	.001064

T/C's | R = 70 #1 = 84 #2 = 85

6/18/68

We will now add 35 cm to the height above table. Table to Pu is now 63.35 cm
We also added new cds. & bases @ pos. 1-5.

Assembly U-1 : $STS_{x,y}$ = 5.901 cm

Lateral : .721 + 5.080 = 5.901 cm

Z table to Pu = 63.35 cm

Parts : 1-33 less #7

Base Rate : 63.175 $\times 10^{-5}$ m/s

Pos	T-1	Factor	M	T-2	Factor	M
1.942	11348/4	2.306×10^{-3}	6.54	11840/4	2.258×10^{-3}	6.72
	2831			2972.5		

Pos.	T-1	Factor	M	T-2	Factor	M
0.000	12623/3	2.306×10^{-3}	9.70	13685/3	2.258×10^{-3}	10.30
	4207.7			4561.66		

T/C's R = 70 #1 = 90 #2 = 84

6/19/68

Assembly U-2 : STS_{xy} = 9.765" cm

Lateral : .721 + 9.045" = 9.765" cm

Z table to Pa = 63.35" cm

Parts : 1-33 less #7

Base Rate : 63.175" $\times 10^{-5}$ T/S

Actuator On

Pos.	T-1	Factor	M	T-2	Factor	M
7.987	12377/3	2.306×10^{-3}	9.51	13935/3	2.258×10^{-3}	10.11
A = 15.36	4125.7			4478.3		
1.100	17764/2		20.14	19090/2		21.55
A = 15.3	8732			9545"		
0.000	26482/2		30.53	28535/2		32.22
A = 15.3	13241			14267.5	$\bar{m}$ = 31.38	
0.000	13776		31.77	14838	$\gamma_{\bar{m}}$ = .0319	33.50
A = 0.000						

R = 70 #1 = 85 #2 = 87

We will now remove the actuator + re-run

Pos.	T-1	Factor	M	T-2	Factor	M
7.929	12366/3 4122	2.306×10^{-3}	9.51	13224/3 4408	2.258×10^{-3}	9.95
1.100	17513/2 8756.5		20.19	19237/2 9618.5		21.72
-.001	13291		30.65	14372		32.45

6/20/68

Assembly U-3: STS_{xy} = 4.612 cm

Extend: .721 + 3.891 = 4.612 cm

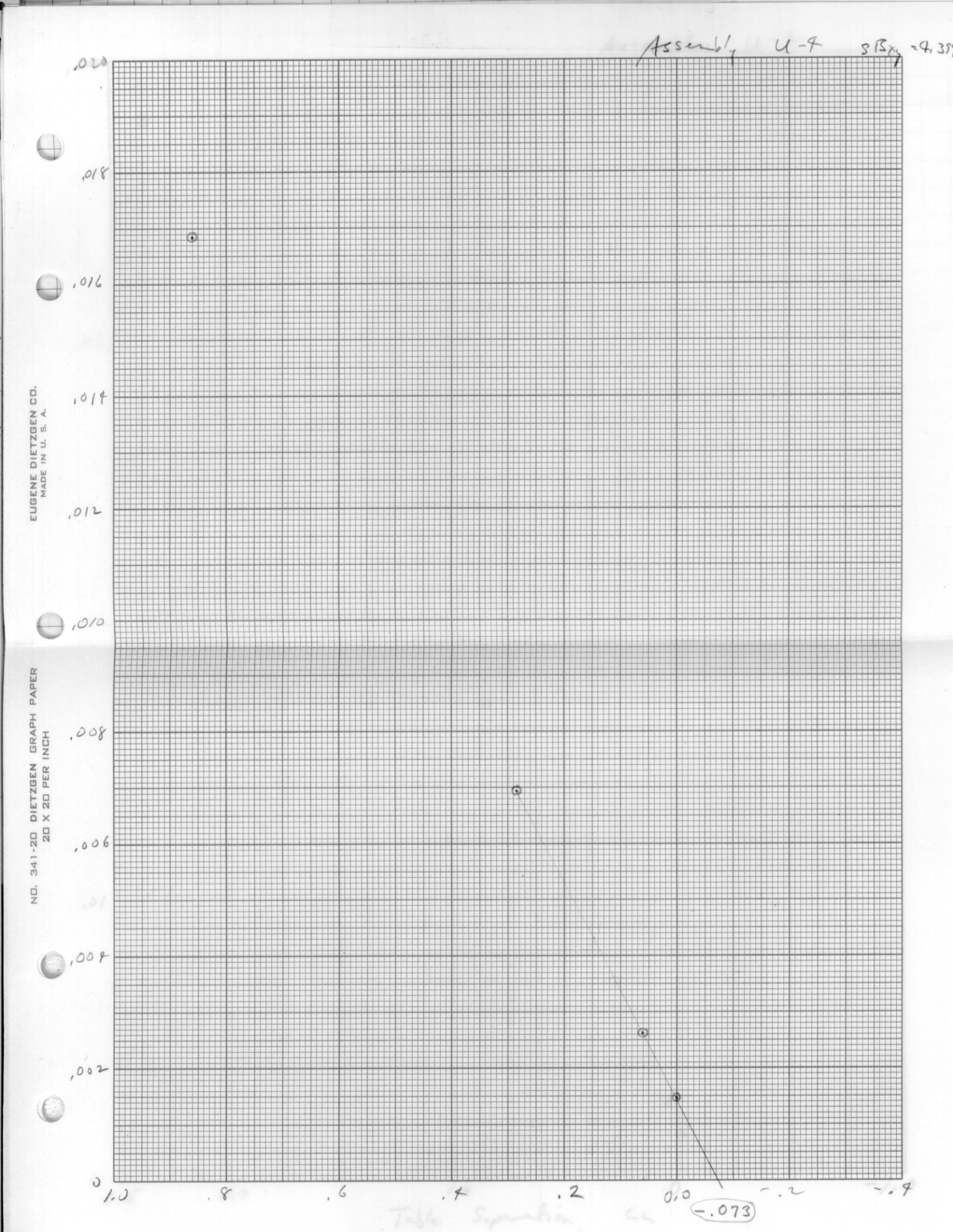
Z table to Pu = 63.35 cm

Parts: 1-33 less #7

Base Rate: 63.175 $\times 10^{-5}$ n/s

Actuator on

Pos.	T-1	Factor	M	T-2	Factor	M
7.937 A = 15.313	8779/2 4389.5	2.306×10^{-3}	10.12	9746/2 4873	2.258×10^{-3}	11.00
1.400 A = 15.3	19777/2 9888.5		22.80	22470/2 11235		25.39
					$\bar{M}$ = 24.09 γ_M = .0415	
.055 A = 15.3	19518		45.04	21583		49.64
					$\bar{M}$ = 47.32 γ_M = .02113	


Assembly U-4 SBxy = 4.35
.020
.018
.016
.014
.012
.010
.008
.006
.004
.002
0
1.0
.8
.6
.4
.2
0.0
-.2
-.4
-.073
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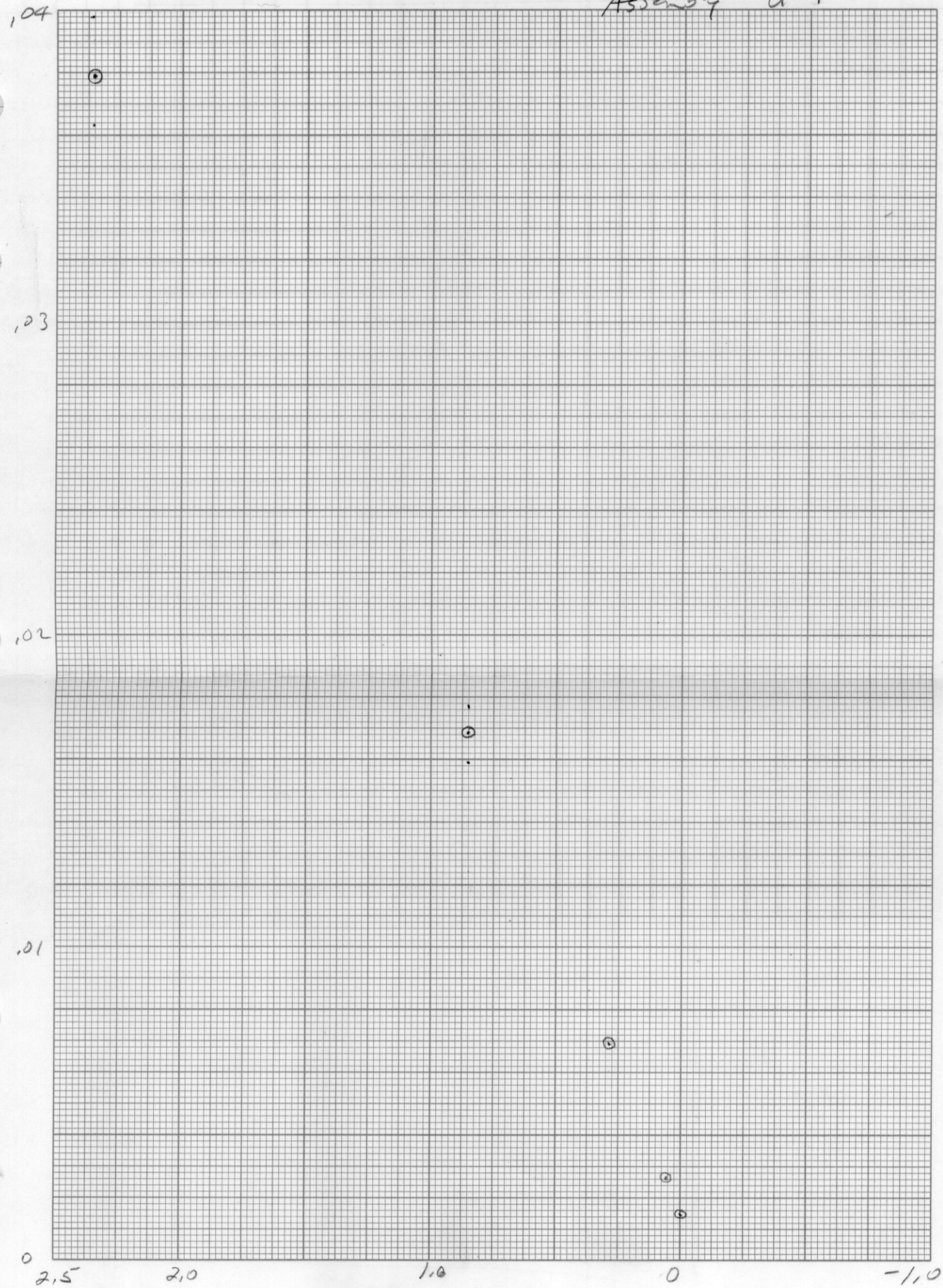
Assembly U-4



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Pos.	T-1	Factor	m	T-2	Factor	m
-.001	20714	2.306×10^{-3}	47.77	23319	2.258×10^{-3}	52.65
A=15.3					$\bar{m}^2$ =	50.21
					$\gamma\bar{m}^2$ =	.01991
	T/C's		69	87		87
-.001	21720		50.09	24587		55.93
A = 0.000						

6/21/68

Assembly 4-4; $STS_{x,y}$ = 4.399 cm

Lateral: .721 + 3.678 = 4.399 cm

Z Table to Pu = 63.35 cm

Parts 1-33 less #7

Base Rate: 63.175×10^{-5} rad/s

Actuator On

Pos	T-1	Factor	m	T-2	Factor	m
7.947	9939/2	2.306×10^{-3}	11.46	11329/2	2.258×10^{-3}	12.78
A=15.313	4969.5			5662		
2.364	10903		25.14	12215		27.58
A=15.3					$\bar{m}$ =	26.36
					$\gamma\bar{m}$ =	.03798
.861	24448		56.38	27755		62.76
A=15.3			γm = .01774		γm =	.01593
					$\gamma\bar{m}$ =	.01684
.285	↓ 58243		135.88	↓ 66605		152.82
A=15.3	58926.5			67502.7		
					$\bar{m}$ =	144.15
					$\gamma\bar{m}$ =	.00694

Pos.	T-1	Factor	M	T-2	Factor	M
.060	152574	2.306×10^{-3}	368.83	172155	2.258×10^{-3}	402.57
A=15.3	↓ 158210		$\bar{y}_m = .00274$	↓ 178288		$\bar{y}_m = .002484$
						$\bar{y}_{\bar{m}} = .002612$
	T/C's	R= 20		#1= 87		#2= 82
.000	264907		645.06	296860		712.64
A=15.3	↓ 279732			↓ 315607		
						$\bar{m} = 678.85$
						$\bar{y}_{\bar{m}} = .001473$

Assembly 4-5: $S\bar{S}_{xy}$ = 4.380 cm

Lateral: .721 + 3.659 = 4.380 cm

Z table to P_n = 63.35 m

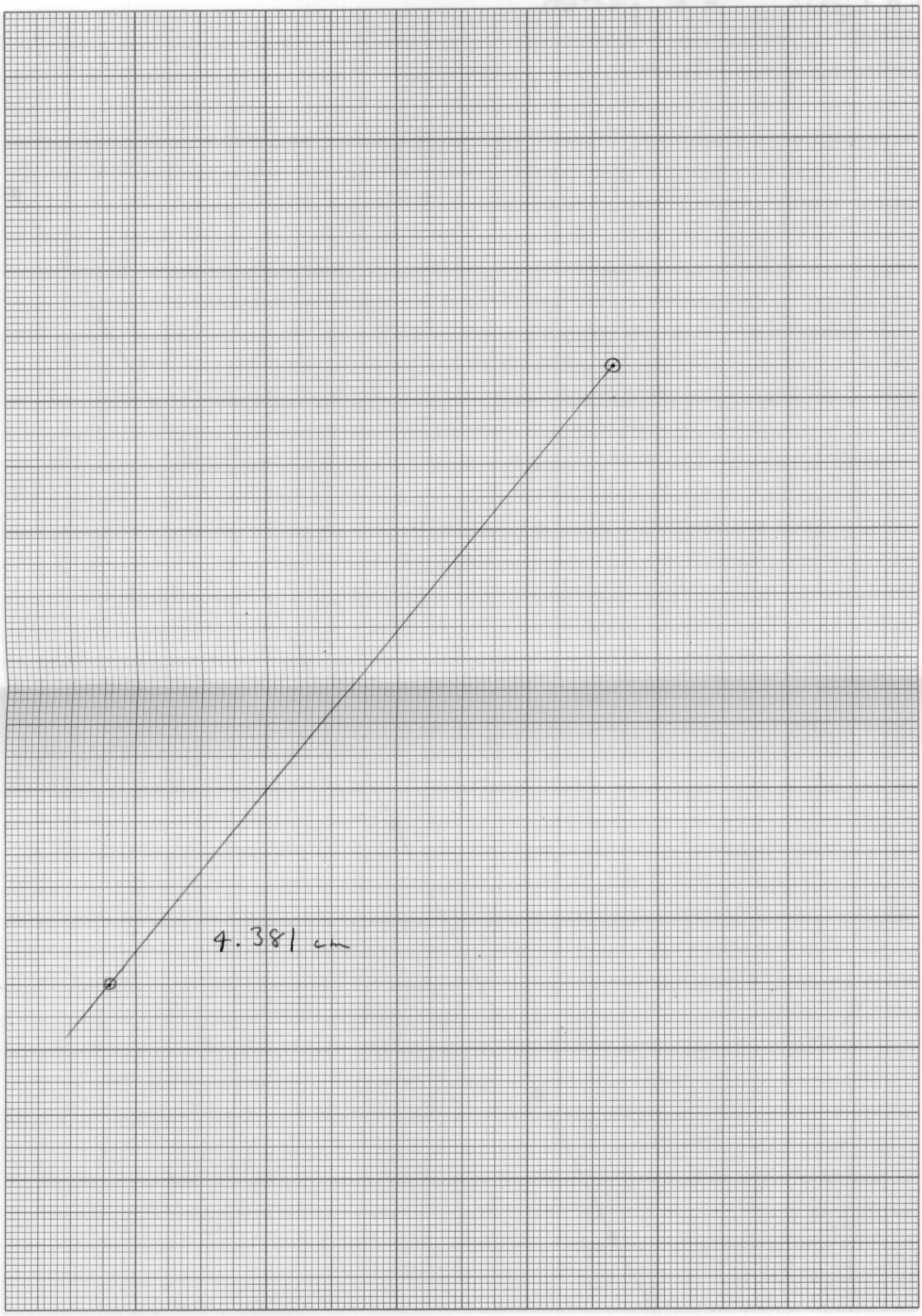
Parts 1-33 less #7

Base Refl: 63.175 $\times 10^{-5}$ m/s

Actuator On

Pos.	T-1	Factor	M	T-2	Factor	M
7.937	10127	2.306×10^{-3}	11.68	11259	2.258×10^{-3}	12.76
A=15.312	5063.5			5649.5		
2.350	11547		26.63	12593		29.11
A=15.3						$\bar{m} = 27.87$
						$\bar{y}_{\bar{m}} = .03588$
.980	23707		54.67	27112		61.22
A=15.3						$\bar{m} = 57.94$
						$\bar{y}_{\bar{m}} = .01726$
.400	54090		126.09	61693		140.92
A=15.3	↓ 54681			↓ 62411		$\bar{m} = 133.51$
						$\bar{y}_{\bar{m}} = .00749$

U series



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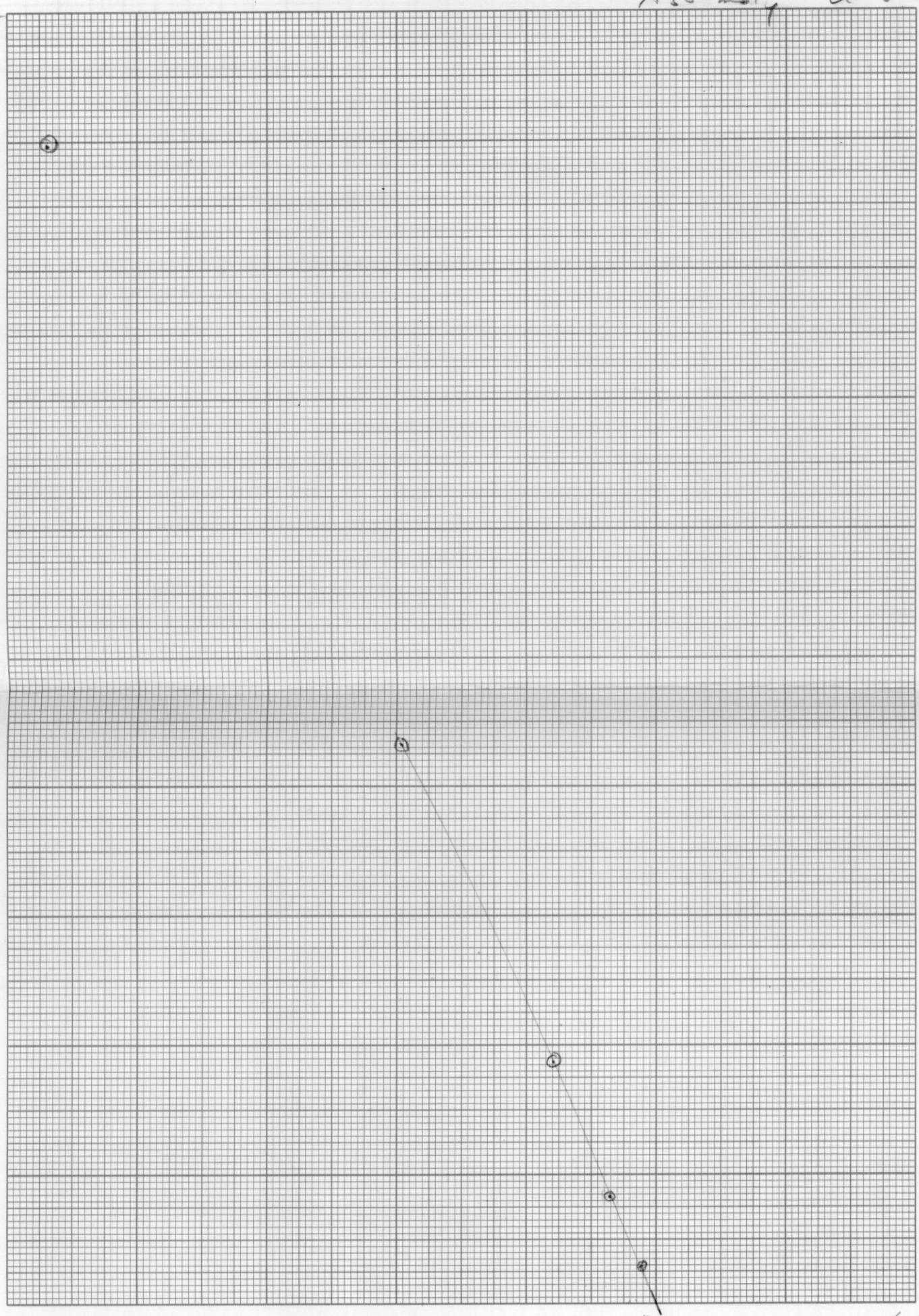
NO. 341-20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH

Assembly U-5



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Pos	T-1	Factor	M	T-2	Factor	M
#180	120258	2.304×10^{-3}	284.23	135735	2.258×10^{-3}	315.02
A=15.3	123258			139515		$\bar{m}$ = 299.63
						$\gamma_{\bar{m}}$ = .003337
.065	327580		808.35	367210		
A=15.3	350570			396258		899.84
						$\bar{m}$ = 851.60
						$\gamma_{\bar{m}}$ = .001174
T/C S	70			81		89

6/25/68

All Pu has been removed from C-Vault

60 Minute Backgrounds:

T-1	T-2	T-3	T-4
314	192	62	44

These are up ~40% from the last time we took background with the vault clean, but since our counters are 8 times more efficient this is real good.

Blank Page

3^3, 6 Kg Series

1) NO MODERATOR

Density Analog of 4^3 + single part guess interpolates to $V_{CRIT} = 2,570\ cm^3$

∴ cube is ~ 13.70 cm on a side.

If we set internal space + 2 heat sinks at 1.500", this gives us a CTC$_Z$ of 13.678 cm and guess of

$\underline{\underline{STS}}_{xy}$ (CRIT) is 7.182 cm

which corresponds to base-to-base of 2.544". ∴ We will do efficiency factor determination and 1st safety exp. at Base-to-Base = 2.500"

(STS = 7.071, CTC = 13.596)

Since we have already proved single column of 4 - 6 Kg pairs at CTC = 13.12 is "OK" to Hand-assemble, we can proceed without further ado.

If we have bottom parts spaced up from bottom of column with 70.4 cm of spacers, then

Pu to table will be $27.691 + 70.400 + \underbrace{(25+25+15+5+.4)}_{\text{H.S.}} + \underbrace{.635}_{\text{Con bottom}} + .087 = 98.813$

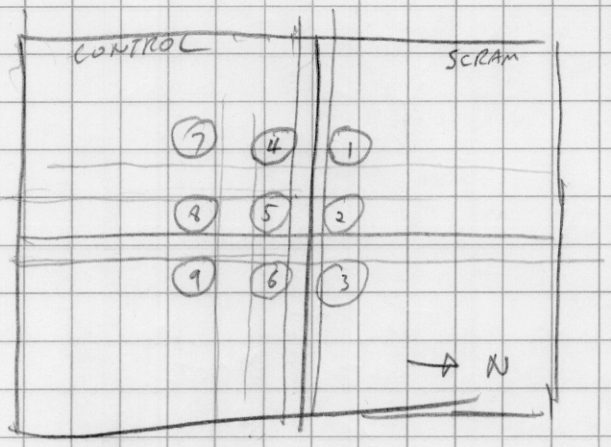
and table to Pu $\underline{\underline{Q}}$ will be $98.813 + 13,678 + 4.889 = 117.371$

($\frac{1}{3} \times 9.760$)

($\underline{\underline{Q}}$'s from last 5 full arrays averaged 117.37 cm)

Source Positions for 13.678 cm CTC

are 89, 110, 131 (26 "/100, ¢ @ 110)



1, 4
5, 2
6, 3
} are Symmetric

	T-1	T-2	Column averages after subtracting BKgd, CPM T-1	T-2
Col 4				
89	6383/10	8273/10		
110	6533/10	8296/10	645.14	827.23
131	6595/10	8344/10		
Col 5				
89	6750/10	7950/10		
110	6912/10	8077/10	684.07	785.40
131	7017/10	7831/10		
Col 6				
89	7151/10	7260/10		
110	7336/10	7436/10	715.34	730.13
131	7130/10	7304/10		
Col 7				
89	7466/10	9479/10		
110	7642/10	9562/10	739.50	754.83
131	7234/10	9760/10		
Col 8				
89	7770/10	8999/10		
110	7993/10	8993/10	784.97	892.90
131	7943/10	8811/10		

Col. Avg's, cont.

Col 9	T-1	T-2	T-1	T-2
89	8320/10	8346/10		
110	8454/10	8435/10	826.34	840.77
131	8173/10	8538/10		

Column Averages, C.P.S.
(1=4, 2=5, 3=6)

Column	T-1	T-2
1	10.752	13,787
2	11,401	13.090
3	11,922	12,169
4	10.752	13.782
5	11.401	13,090
6	11,922	12.169
7	12,325	12.581
8	13.083	14.882
9	13.772	14.013

Position Averages

Combs.	T-1 [CPS]	T-2
(1)(2)	11.401	13,090
(8)(5)(2)	11,962	13,687
(4)(5)(6)(1)(2)(3)	11.358	13.015
(1)(2)(3)(4)(5)(6)(7)(8)(9)	11,926	13,285

Efficiency Factors

T-1	T-2
1.140×10^6	$.993 \times 10^6$
1.0868×10^6	$.9498 \times 10^6$
1.1446×10^6	$.9988 \times 10^6$
1.0900×10^6	$.9785 \times 10^6$

Base Rates

# Columns	# Ballot	Base Rate (assuming consecutive loading)
2	12	$2,427 \times 10^6$
3	18	3660×10^6
6	36	$7,316 \times 10^6$
9	54	10.901×10^6

On 6/27 We Re-Count a Column and Find counts are down 1¼ %

So We will Raise efficiency factors accordingly.

Assembly V-1

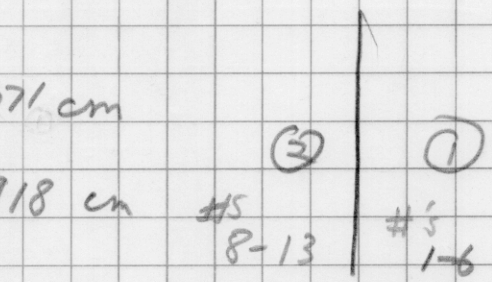
STS$_{x-y}$ = 7.07

Lateral : .721 + 6.350 = 7.071 cm

Vertical .108 + 3.810 = 3.918 cm

Parts 1-13 less #7

Base Rate : 2.427×10^6



Pos:	T-1	Eff Fac	10^6 m/s	M-1	T-2	E.F.	10^6 m/s	M-2
		1.154×10^6	11.16	4.60		1.005×10^6	11.21	4.62
7.951	1170/2				1354/2			
	585				672			
	-5				-3			
	580				669			
	9.667				11.150			
.000	3369/5				3961/5		13,216	5,445
	673.8		12.853	5.296	792.2			
	-5.3				3.2			
	668.3				789.0			
	11.138				13.150			

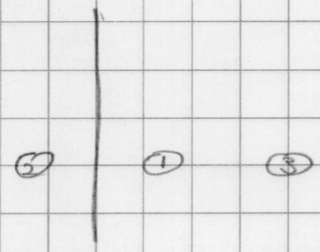
$\bar{M} = 5.37$

6/28

Assembly V-2 STS = 7.07

Lateral : .721 + 6.350 = 7.071 cm

Vertical : .108 + 3.810 = 3.918 cm



Pots : 1 – 19 less #7

Base Rate 3.66×10^{0} m/s

Pos:	T-1	Eff Fac	10^{0} m/s	M-1	T-2	E.F.	10^{6} m/s	M-2
7,952	2237/2	1.1004×10^{6}	20,416	5.58	2604/2	.9617 $\times 10^{6}$	20,818	5.69
	1118.5				1302.0			
	-5.3				3.2			
	1113.2				1298.8			
	18.553				21.647			
								$\bar{M} = 5.63$
,000	6322/5		23.09	6.31	7260/5		24.83	6.78
	1264.4				1552			
	-5.3				-3			
	1259.1				1549			
	20.98				25.82			
								$\bar{m} = 6.54$

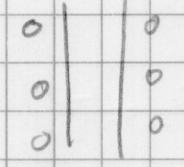
Assembly V-3 STS = 7.09

Lateral .721 + 6.350 = 7.071 cm

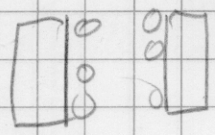
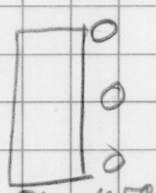
Vertical .108 + 3.810 = 3.918 cm

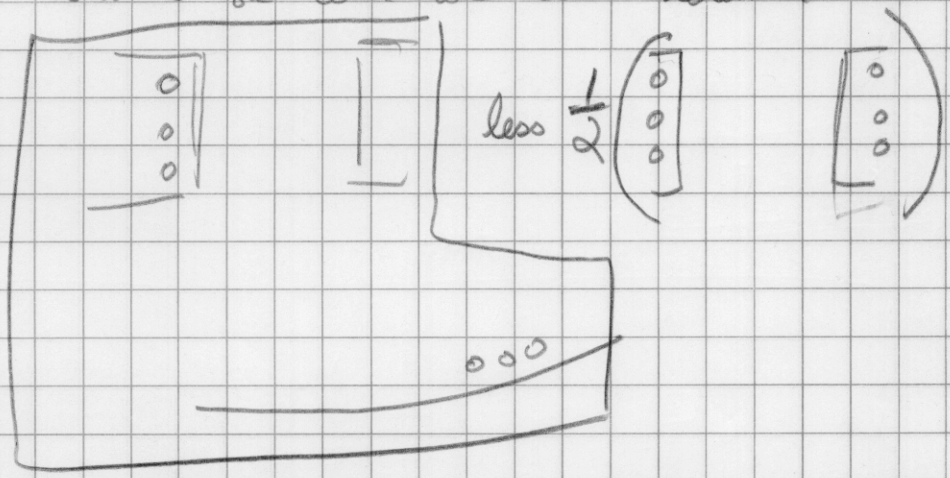
Pots : 1 – 37 less #7

Base Rate : 7.316×10^{6}



Pos	T-1	Eff Fac	10^{0} m/s	M-1	T-2	EF	10^{6} m/s	M-2
7,943	5489/2	1.1589×10^{6}	52,907	7.23	6348/	1.0113	53,444	7.31
	2744.5				3174			
	5.3				-3.2			
	2739.2				3170.8			
	45,653				52,847			$\bar{M} = 7.27$
000.	29004/5		111.941	15,130	33870/5		114.122	15,599
	5800.8				6774.0			
	5.3				-3.2			
	5795.5				6770.8			$m = 15,450$
	96.592				112.847			

Our next step will be to check the multiplication of the $\frac{1}{2}(\frac{7}{3})$ table just finished with a body simulator at each side. The configuration we want to look at is  but first we must check the multiplication of  . To this end we will put 3 columns on a wall & replace them with a single body simulator. The count-rate due to 3 columns on a wall we will determine as equal to



The assumption is, of course, that there is no interaction between tables of an open array and that for a symmetric loading, each table contributes equally to the measured count-rate. Note that efficiency factors are not going to enter into the computation.

	T-1	T-2	T-3	T-4
=	63 824/30	75513/30	168000/3	167111/30
		37756	84000	83, 555
∴ =	31412			

	T-1	T-2	T-3	T-4
⁰⁰⁰/₀₀₀ =	39,123	49,351	126311	112243
∴ ⁰⁰⁰/₀₀₀ =	7,211/30	11,595/30	42,311/30	28,688/30
OR:	240.37 cpm	386.50 cpm	1,410,37 cpm	956,27 cpm

7/2/68

Trouble with Air Cond in C Vault.
10 ton unit out,

[Traced to bad: Fuse, Transformer, Relay Coil]

This led to abnormally hi Table Sniffer counts, checked out by H.C. to be
a) NO PLUTONIUM } OK to run
b) Radon ½ life }

Assembly V-4 STS = 7.07 cm

Lateral + Vertical as before
Base Rate 3.66×10^6 n/s

Ro	T-1	Eff Fac	10^6 n/s	T-2	Eff Fac	10^6 n/s
7,933	11902/10	$1,1589 \times 10^6$	18.345	14748/10	1.0113×10^6	18,343
	1190.2 cpm			1474.8 cpm		
	− 240.4 Bkgd	$M_1 = 5.01$		− 386.5 Bkgd	$M_2 = 5.01$	
	949,8 cpm			1088.3 cpm		
	15,830 cps			18,138 cps		

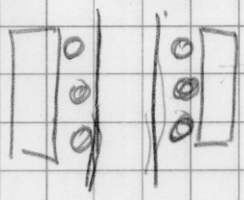
Ro					
	16,364/10	26,97	19,914/10	27.05	
	1636.4		1991.4		
	−240,4	$M_1 = 7,37$	− 386,5	$M_2 = 7,39$	
	1396,0		1604.9		
	23,27		26,75		

$\bar{M} = 7.38$

So we can load ⌐¬ on one table

Assembly V-5, STS = 7.07 on 7/3/68

Lateral = .721 + 6.350 = 7.071
Vertical = .108 + 3.810 = 3.918
Ports: 1 – 37 less #7, Burn Rate = 7.316×10^{6}



P_∞	T-1	Eff Fac	10^6 n/s	M_1	T-2	E.F.	10^6 n/s	M_2
22.049	32,089/3	1.1589×10^{6}	206.594	28.239	38,513/3	1.0113×10^{6}	216.385	29.577
	10,696				12,838			
	178.267				213.967			

$\bar{M} = 28.91$

18.282 cm!	38,805/2	374.767	51.226	46,298/2		390.177	53.332
	19,403			23,149			
	32.3.383			385.817			

$\bar{M} = 52.28$

Tempo: 101, 97, 70

is UNSAFE to Hand-load on 1 table !!!

Factor 1 : 2.640×10^{-3}
Factor 2 : 2.304×10^{-3}

We are going to Re-Run V-3 to Ck the Multiplication at the 22.05 + 18.28 cm points WITHOUT BODY SIMULATOR

P_∞	T-1	M-1	T-2	M-2
22.047	6391/3	5.62	7539/3	5.79

$\bar{M} = 5.70$

18.282	4404/2	5.81	5198/2	5.98

$\bar{M} = 5.90$

Notice the Remarkable effect of the body-simulator!!

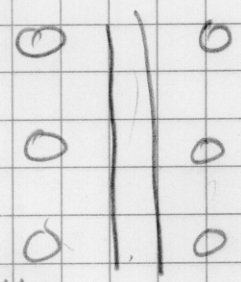
We are going to back out + try a bigger spacing!

Assembly V-6, STS = 8,34

Lateral: .721 + 7.62 = 8,341

Vertical: .108 + 3.810 = 3,918

Parts: 1-37 less #7, Base Rate: $7,376 \times 10^6$



Pos	T-1		Factor	M-1	T-2		Factor	M-2
7,932	22,972/10	2297.2	2.64×10^{-3}	6.065	27,230/10	2723	2.304×10^{-3}	6,274

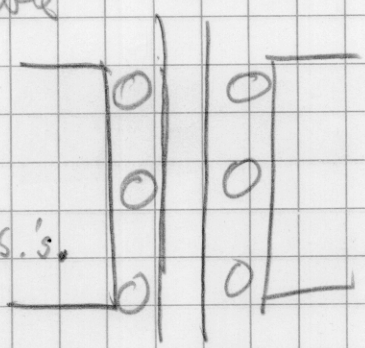
$\bar{m} = 6.169$

0.001	T-1			9.663	21,113/5		9.729
	18,303/5	3660.6				4222.6	

$\bar{m} = 9,696$

T's: 69, 94, 97

We will Now Run with Body - Simulators on Table



V-7

Everything as before except B.S.'s.

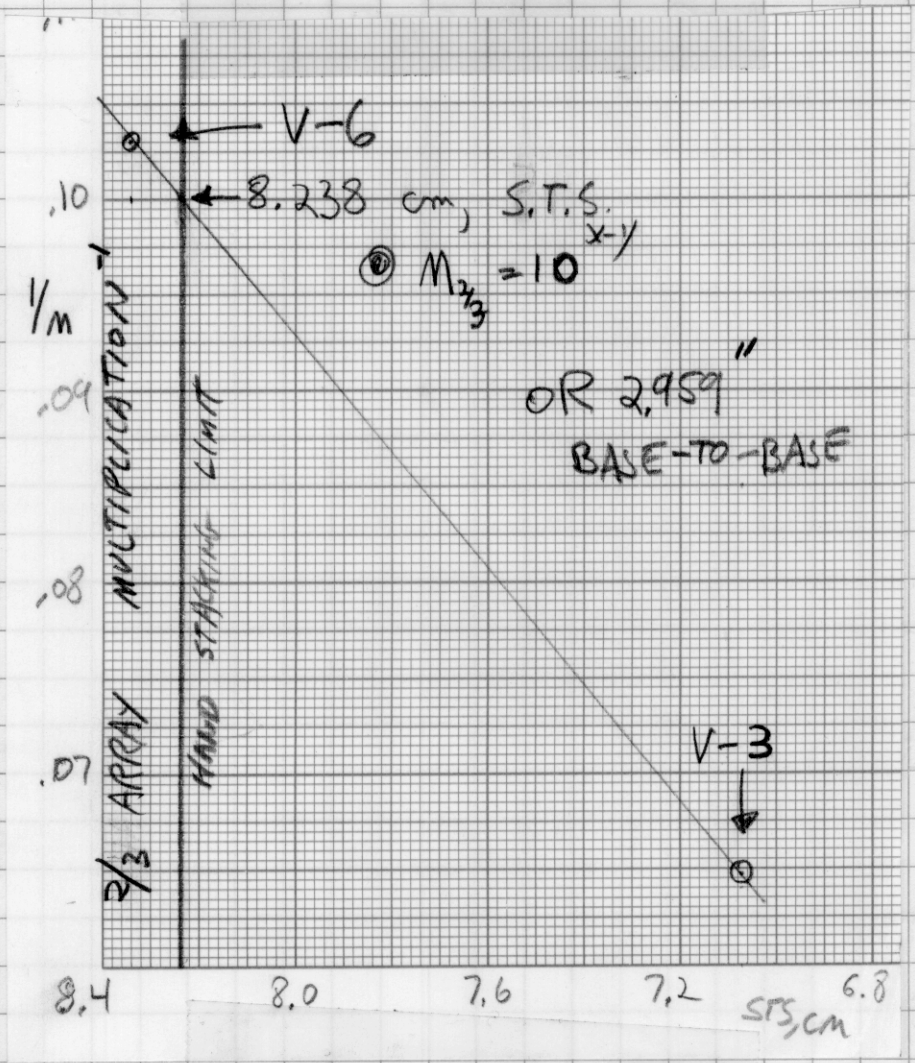
Pos	T-1			T-2			M-2
16,702	20,104/2	10,052	26,54	24,324/2	12162		28,02

$\bar{m} = 27.28$

13,251	41,881/2	20,941	55.284	50,430/2	25,215	58,095

$\bar{m} = 56,69$

RESULTS OF SAFETY MEASUREMENTS



7/8/68

Preliminary Safety Measurements are over, & indicate safety limit on hand loading is 2.96" BASE-TO BASE

Also extreme care must be taken to avoid 2-M on Close Body Reflection. (Our Rules prohibit this & we must observe them)

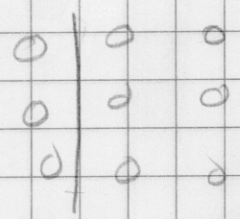
7/9/68

FIRST FOUR ARRAY MEAS.

V-8 STS = 14.7 cm

Lateral : .721 + 13,970 = 14.691 cm

Vertical .108 + 3,810 = 3,918 cm



Parts: 1-55 less #7, Base Rate: 10.901×10^6 m/s

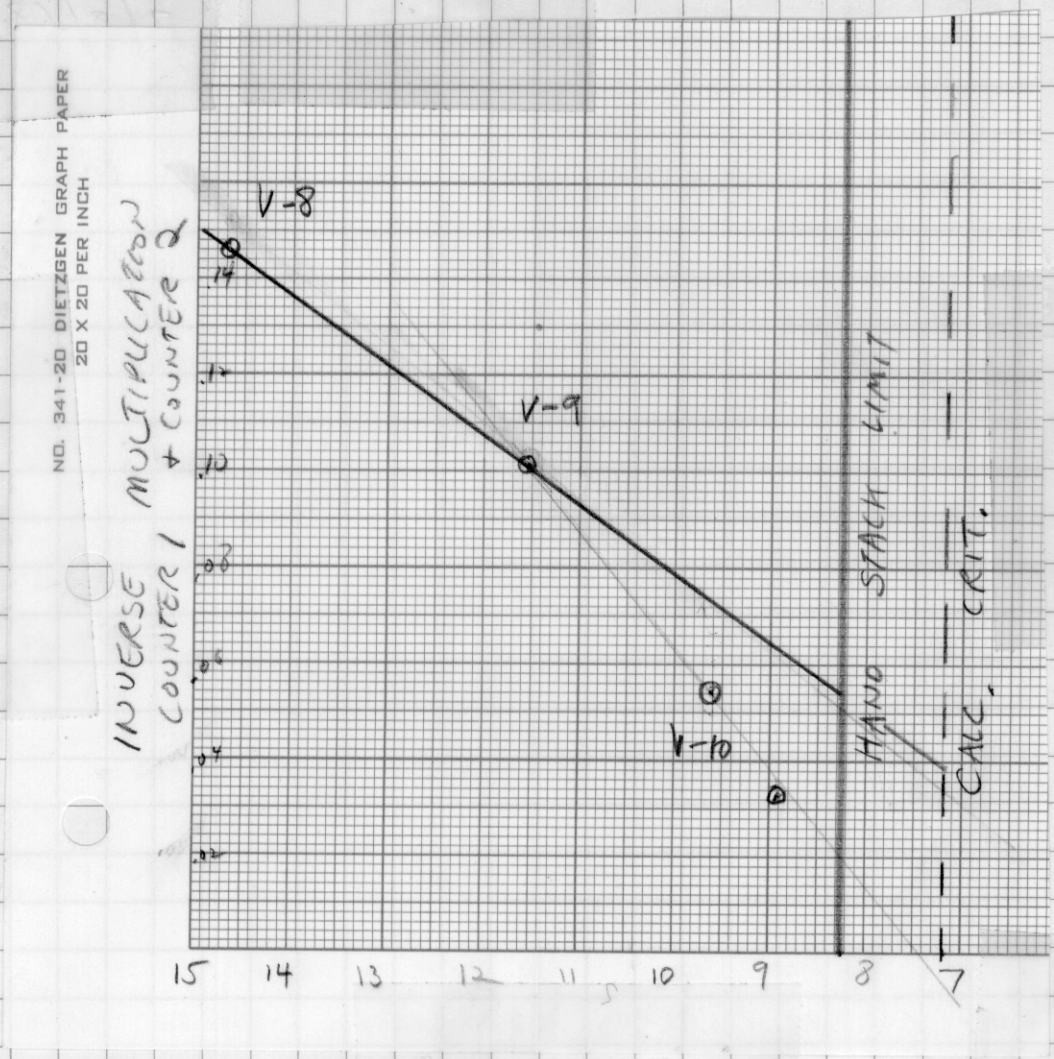
Pos	T-1	Eff Fac	10^6 m/s	M-1	T-2	Eff Fac	10^6 m/s	M-2
7,934	7,149/2	1.1036×10^6	65.752	6.032	8286/2	$.9903 \times 10^6$	68.410	6.276
	3,575 cpm				4143 cpm			
	59.58 cps				69.05 cps			

note Factor #1 = 1.687×10^{-3} (cpm x FACTOR = M)

Factor #2 = 1.515×10^{-3}

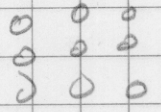
0.000	7,920/2		6.681	9,253/2	7.009
	3960			4627	$\bar{M} = 6.845$

$1/\bar{M} = .1461$


NO. 341-20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH
INVERSE MULTIPLICATION
COUNTER 1 + COUNTER 2
V-8
V-9
V-10
HAND SCALE LIMIT
CALC. CRIT.
15
14
13
12
11
10
9
8
7

7/10/68

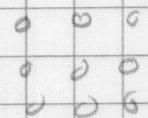
Assembly V-9 STS = 11.52



Lateral: .721 + 10,795 = 11,516
Vertical: .108 + 3,810 = 3,918

Parts: 1-55 less #7, Base Rate 10.9×10^{6} m/s

P_{so}	T-1	Factor	M-1	T-2	Factor	M-2
T, 939	9057/2	1.687×10^{-3}	7,64	10843/2	1.515×10^{-3}	8,21
	4528.5			5422		$\bar{M} = 7,92$
0.000	11390/2		9,560	13468/2		10.20
	5695			6734		
				$\bar{M} = 9.881$		$Y\bar{M} = .1012$



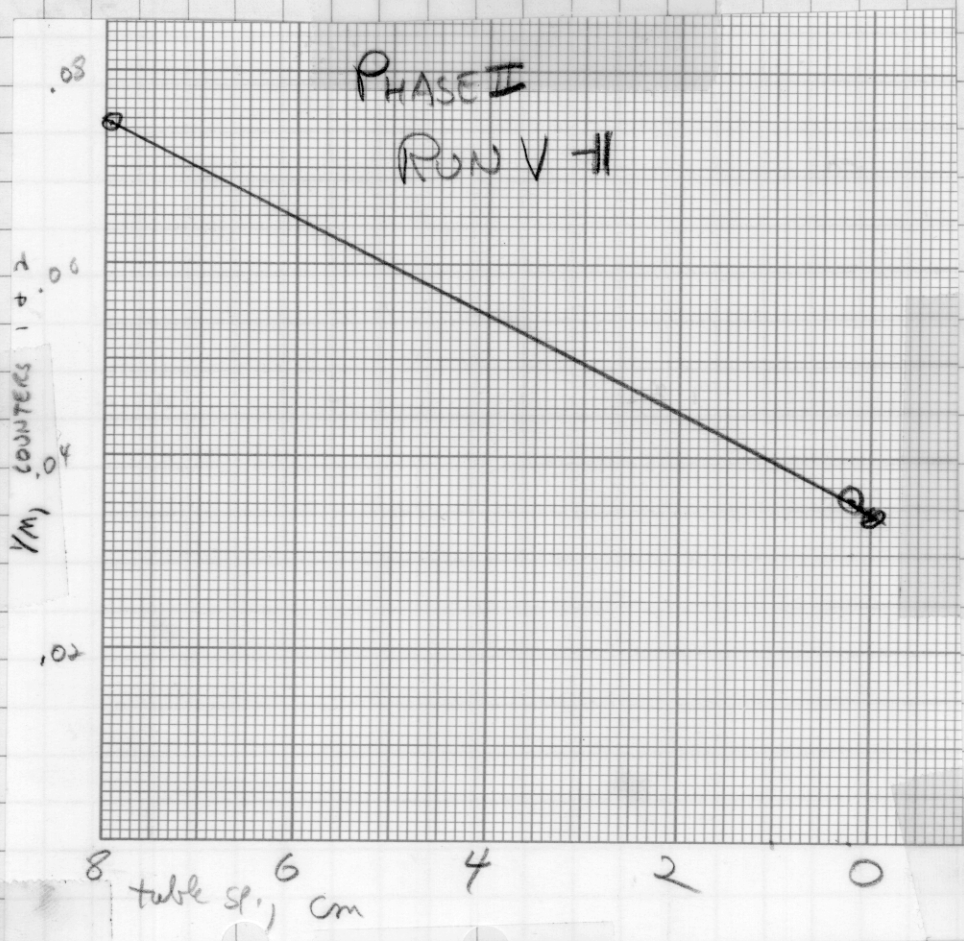
Assembly V-10 STS = 9.61

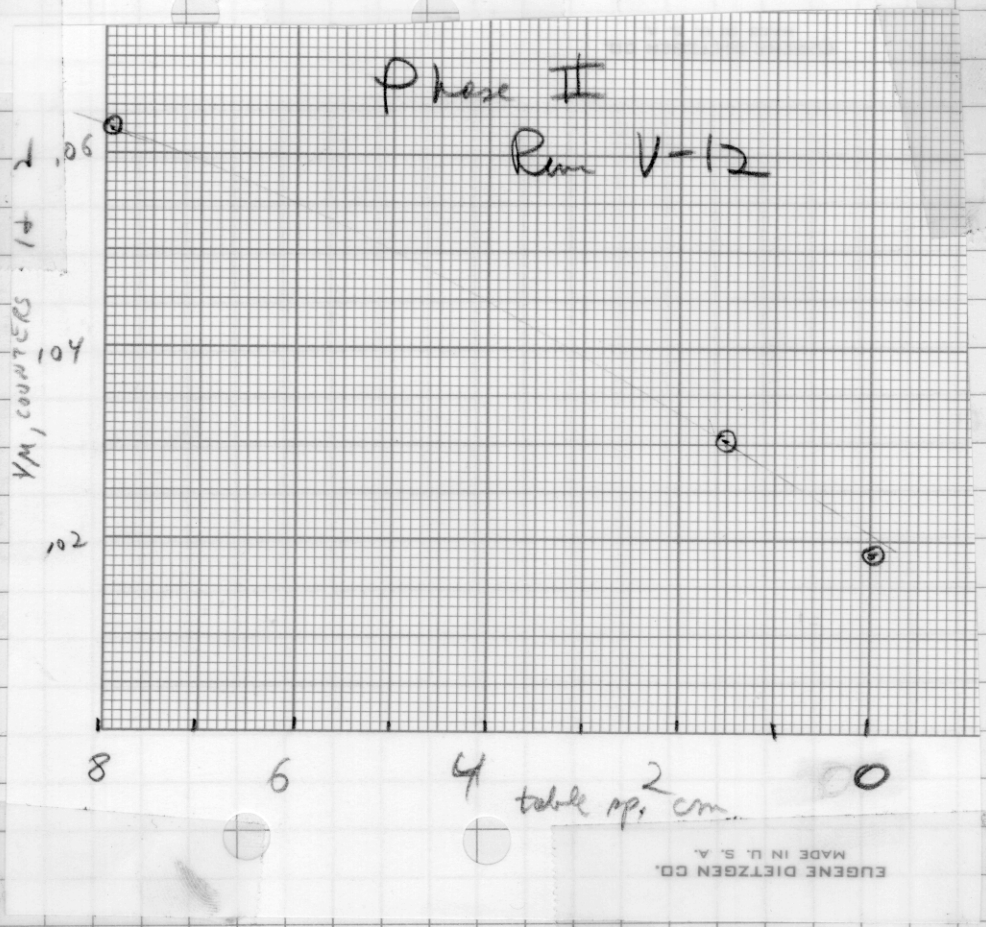
Lateral: .721 + 8,890 = 9.611
Vertical: .108 + 3,810 = 3,918

P_{so}	T-1		T-2	
7,930	12,653/2	9,830	14,930/2	11,309
	5,827		7,465	$\bar{M} = 10.57$
0.001	21,173/2	17,860	24,634/2	18.660
	10,587		12,317	$\bar{M} = 18.260$

Temps: 70, (Room) 95, 107

$1/\bar{M} = .0548$





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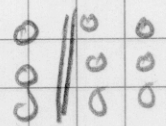
7/11/68

Assembly V-11 STS = 8.93



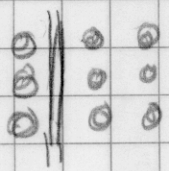
Lateral: .721 + 8.204 = 8.925
Vertical: .108 + 3.810 = 3.918

Pads: 1-55 Iso # 7, Base Rate: 10.9×10^{-6} m/s

Poo.	T-1	Factor	M-1	T-2	Factor	M-2
7.934	15409/2	1.687×10^{-3}	13.00	18,130/2	1.515×10^{-3}	13.73
	7705			9065		$\bar{m} = 13.36$ $1/\bar{m} = .0749$
.200	16185		27.30	19231		29.13
						$\bar{m} = 28.22$ $1/\bar{m} = .0354$
0.001	34368/2		28.989	40443/2		30,636
	17184			20,222		
						$\bar{m} = 29,813$
						$1/\bar{m} = .0335$

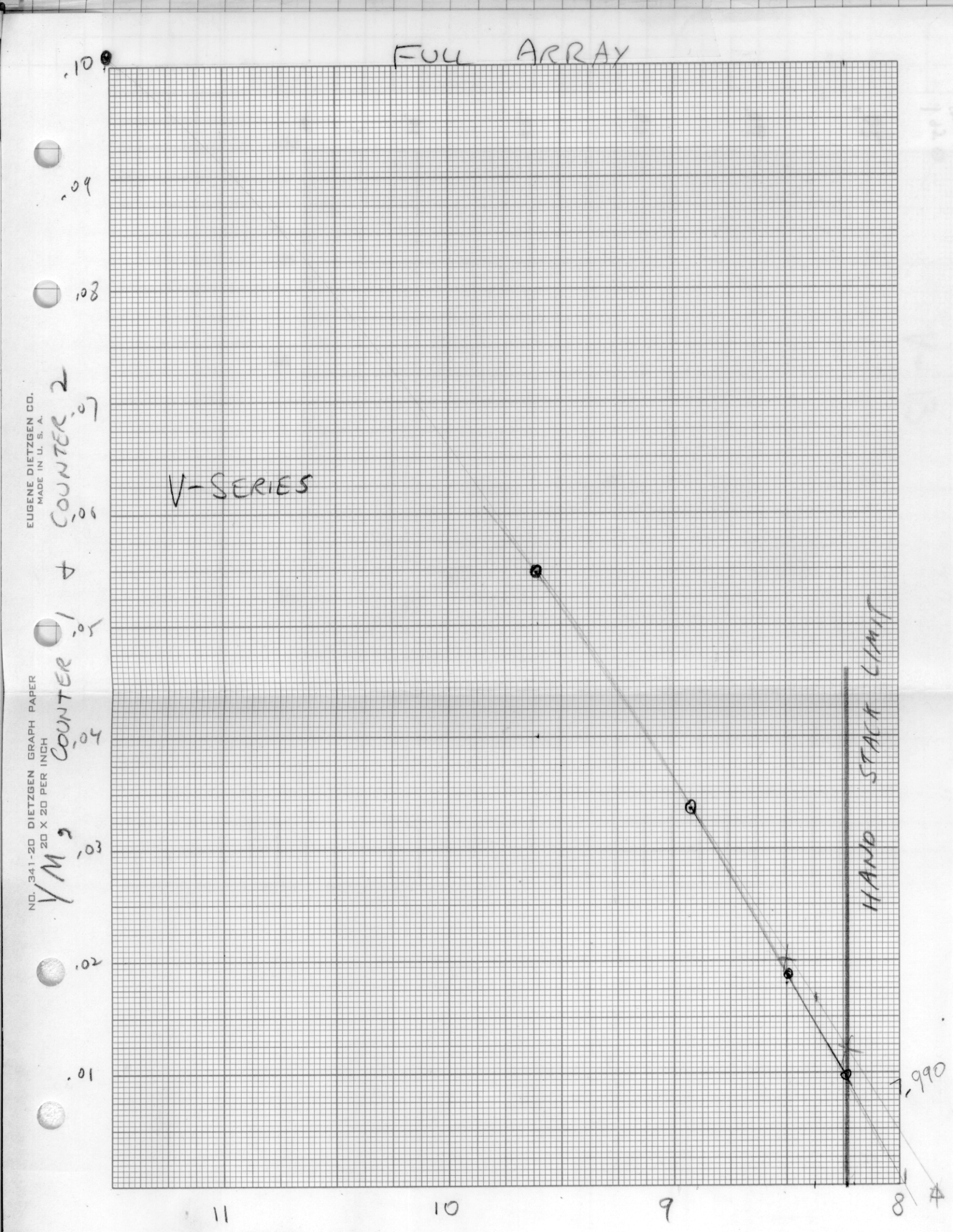
7/12/68

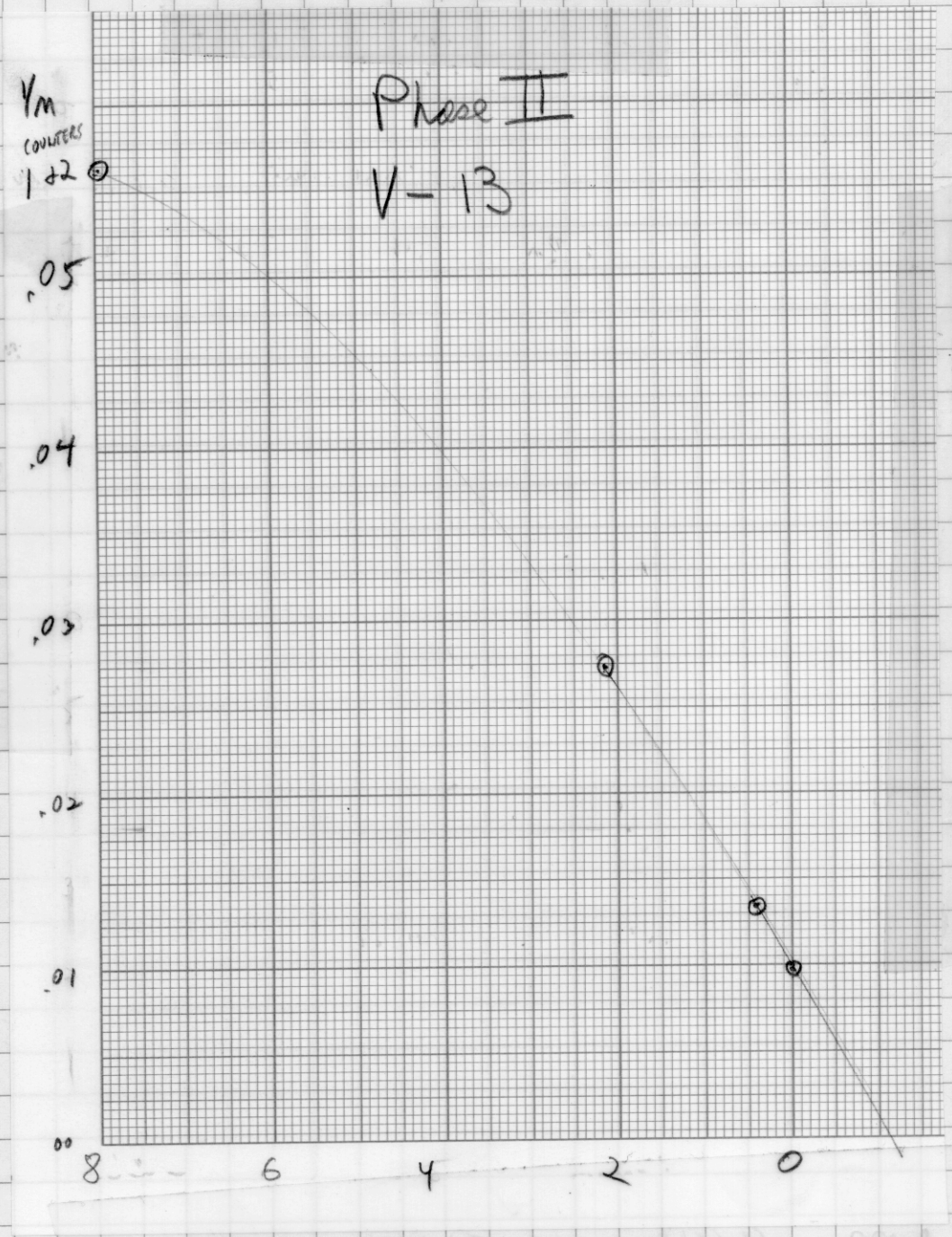
Assembly V-12 x-y S.T.S. = 8.5



Lateral: .721 + 7.777 = 8.498
Vertical .108 + 3.810 = 3.918 cm

Poo:	T-1	M-1	T-2	M-2
7.945	9244	15.59	10813	16.38
				$\bar{m} = 15.99$ $1/\bar{m} = .0625$
1,500	18467	31.15	22080	33.451
				$\bar{m} = 32.30$ $1/\bar{m} = .0310$
0.000	61,661/2	52,012	72,167/2	55,046
	30,831		36,334	
				$\bar{m} = 53.529$
				$1/\bar{m} = .01868$


FULL ARRAY
.10
.09
.08
.07
.06
.05
.04
.03
.02
.01
V-SERIES
1/M² COUNTER 1 & COUNTER 2
HAND STACK LIMIT
7,990
11
10
9
8
EUGENE DIETZGEN CO.
MADE IN U. S. A.
NO. 341-20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH


Phase II
V-13
Ym
COULTERS
1 & 2
.05
.04
.03
.02
.01
.00
8
6
4
2
0

Assembly V-13 STS = 8.24

Lateral .721 + 7,518 = 8.239
Vertical .108 + 3.810 = 3.918

Parts: 1-55 less #7, base rate: 10.9×10^{6} n/s

Pos	T-1	Fact	Th-1	T-2	Fact	M-2
7,449	10246/1	1.687×10^{-3}	17,285	12063/1	1.515×10^{-3}	18,275
						$\bar{M} = 17,78$
						$1/\bar{m} = .05624$
2,150	21091		35,582	24808		37,584
						$\bar{m} = 36,58$
						$1/\bar{m} = .0273$

Temps 70, 94, 82

.400	42983		72,512	70609	76,602
					$\bar{m} = 74.59$
					$1/\bar{m} = .0134$
0.000	119,658/2		100,931	140,236/2	106,229
	59,829			70,118	
					$\bar{m} = 103,580$
					$1/\bar{m} = .009655$

Temps: 71, 94, 83

1/m curve vs STS preliminary indication of crit is ~7,990 on STS x/y

or 14,515 on CTC

MOLFIT GIVES 7,980
Array Fit Gives 7.978

$V = 2,88 \times 10^{3}$ liters
UNIT CELL

GO ON TO Next Page

7/15/68

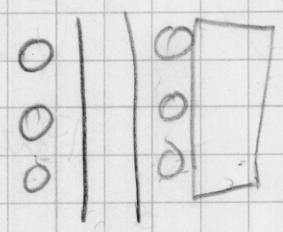
Assembly V-14 STS = 8.24 on

Lateral + Vertical same as last run

Base Rate $7,316 \times 10^6$

1 row of columns has been removed from central tube + replaced by body simulator (touching columns)

(OK to do this from run V-14)



This should tell us the width of a single body-sim. on a M=10 array of base units.

P_{ai}	T-1	Eff Fac	10^6 n/s	M_1	T-2	Eff Fac	10^6 n/s	M_2
7,946	10,878/2	1.159×10^6	100.43	13,73	12,961/2	1.011×10^6	102.69	14.04
	5439				6481			
	− 240 *				− 387 *			$\bar{m} = 13,88$
	5199				6094			
	86.65	$(M_1 = 2,641 \times 10^{-3} C_1)$			101,57	$(M_2 = 2,304 \times 10^{-3} C_2)$		

* From page 94

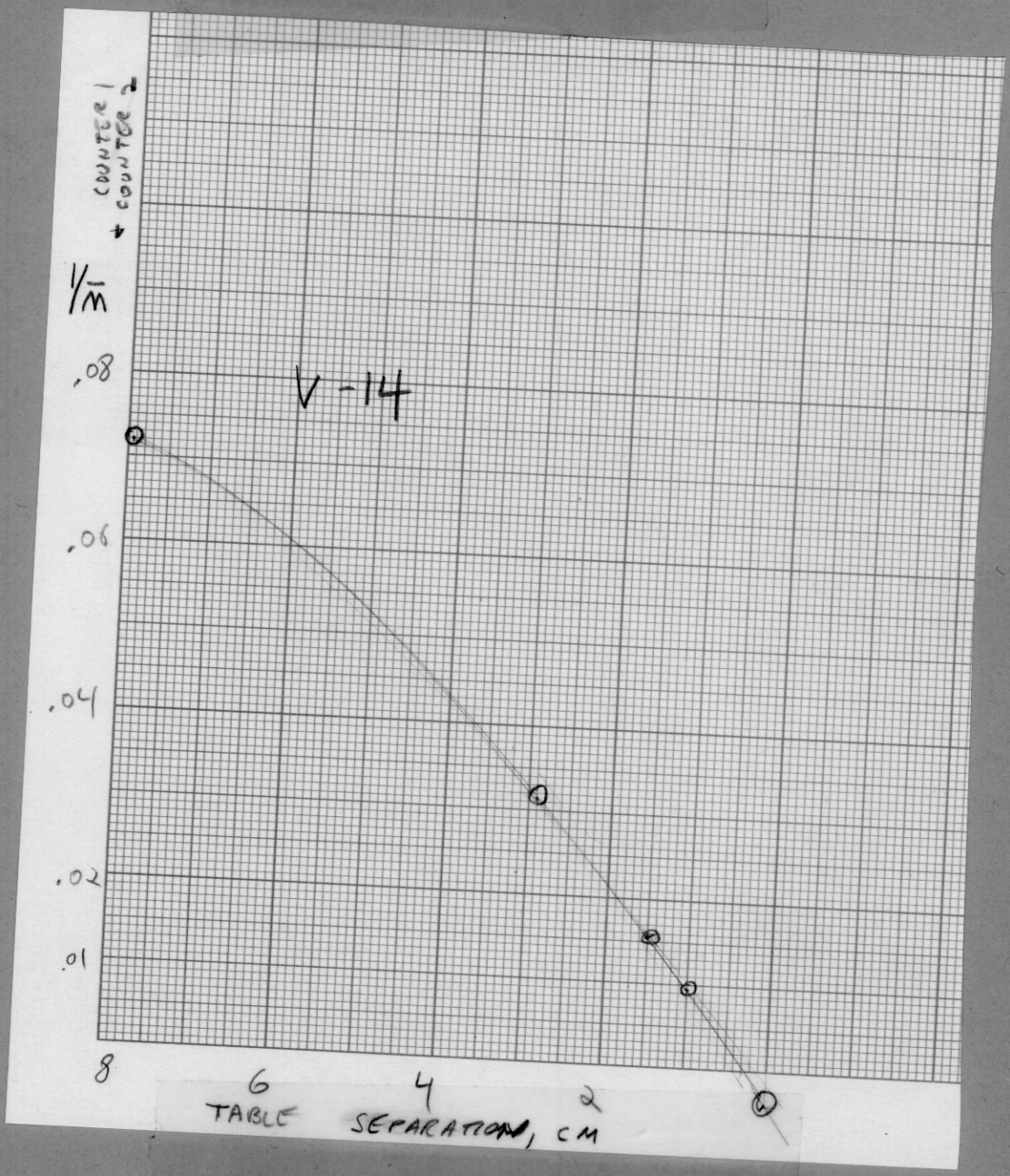
2,900	12,273/1		31.78		14,178/1			31,77
	− 240				− 387			$\bar{m} = 31,78$
	12,033				13791			
1.500	24,075/1		62,95		28,310/1		64,33	
	−240				−387			$\bar{m} = 63,64$
	23,835				27,923			
1.000	40,042		105.12		46,616		106.51	
	−240				−387			$\bar{m} = 105.81$
	39,802				46,229			

Assembly V-15 STS = 8,24 As before except NO SIMULATOR

(1 row-ck of M=10)

P_{00}	T-1	M-1	T-2	M-2
7,946	5321/2	6,39	6410/2	6.49
	2661 → 2421		3205 → 2818	$\bar{m} = 6,44$
0,000	40285/10	10.00	48149/10	10.20
	3788 cpm		4428 cpm	

$\bar{m} = 10.10$


V-14
1/M
.08
.06
.04
.02
.01
8
6
4
2
0
TABLE SEPARATION, CM
COUNTER 1
COUNTER 2