

24 March 61

### Entire Array

Poles per Line	x	Lines	=	Poles
18	x	10	=	180
16	x	8	=	128
14	x	4	=	56
12	x	4	=	48
10	x	2	=	20
6	x	2	=	12
4	x	2	=	8
Total				452

If array is square there would be  
18 poles per line x 32 lines = 576 poles

$$\frac{452}{576} = 78.5\%$$

### Center of Array

Poles per Line	x	Lines	=	Poles
10	x	6	=	60
8	x	6	=	48
6	x	2	=	12
4	x	2	=	8
Total				128

If array is square there would be  
10 poles per line x 16 lines = 160 poles

$$\frac{128}{160} = 80.0\%$$

$$\frac{\text{Entire Array}}{\text{Center of Array}} = \frac{452}{128} = 3.53 \text{ times}$$

added poles for entire array = 452 - 128 = 324 additional.

Increase =  $\frac{324}{128} = 2.53$  times gives 4.0 times pickup area.

(over)

The initial array will have pickup area with radius of  $4 \times 440 = 1760$  feet. Area =  $\pi 1760^2 = 9.74 \cdot 10^6$  sq ft.

There are  $(3.28 \cdot 10^3)^2 = 1.077 \cdot 10^7$  sq ft in one square kilometer.

Array has pickup area of  $\frac{9.74}{10.77} = 0.904$  square kilometer.

25 March 61

An ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$  or  $y = b(1 - \frac{x^2}{a^2})^{1/2}$

where  $a$  and  $b$  are semi-major and semi-minor axis,

On scale of  $1'' = 440'$ ,  $a = 15.5''$ ,  $b = 7\frac{1}{2}''$

$x$	$x^2/a^2$	$(1 - x^2/a^2)$	$(1 - x^2/a^2)^{1/2}$	$y$
2.75	.032	.968	.984	7.38
4.75	.094	.906	.952	7.14
6.75	.190	.810	.900	6.75
8.75	.32	.680	.825	6.18
10.75	.481	.519	.720	5.40
12.75	.676	.324	.569	4.27
13.75	.787	.213	.462	3.47
14.25	.845	.155	.394	2.96
14.75	.906	.094	.307	2.30
15.25	.969	.031	.176	1.32

Full Extension

There will be enough room if drop off the two end lines.

4 April 61

let  $a = 13\frac{1}{2}$ ,  $b = 7\frac{1}{2}$

$x$	$\frac{x^2}{a^2}$	$(1 - \frac{x^2}{a^2})$	$(1 - \frac{x^2}{a^2})^{1/2}$	$xy$
2.75	.042	.958	.979	7.34
4.75	.124	.876	.936	7.02
6.75	.250	.750	.866	6.50
8.75	.420	.580	.762	5.72
10.75	.635	.365	.604	4.53
11.75	.758	.242	.492	3.69
12.75	.892	.108	.329	2.47
13.25	.964	.036	.190	1.42

Three quarter  
extension



29 March 61

Let  $a = 11\frac{1}{2}$ ,  $b = 7\frac{1}{2}$

$x$	$x^2/a^2$	$(1 - x^2/a^2)$	$(1 - x^2/a^2)^{1/2}$	$y$
2.75	.057	.943	.971	7.28
4.75	.171	.829	.910	6.82
6.75	.345	.655	.810	6.07
8.75	.580	.420	.648	4.86
9.75	.720	.280	.529	3.97
10.75	.875	.125	.353	2.65
11.25	.958	.042	.205	1.54

half extension

4 April 1961

Slope of south boundary between (A) and (B)

$$(3300.75 - 2900.25) / 4.5 = 89.0 \text{ ft per unit of } 440 \text{ ft.}$$

Slope of south boundary between (B) and (C)

$$(3570.8 - 3300.75) / 3 = 90.0 \text{ ft per unit of } 440 \text{ ft.}$$

Double size Array in relation to south boundary

North/South Line	0	1W	2W	3W	4W	5W	6W	7W	8W	9W
Center to South Bdry.	3651.8	3607.3	3518.3	3429.3	3340.3	3251.3	3162.3	3073.3	2984.3	2895.3
Required.	3520	3410	3410	3190	2970	2970	2750	2310	1870	990
Excess.	131.8	197.3	108.3	239.3	370.3	281.3	412.3	763.3	1114.3	1905.3

Closest approach is line 2W.

In region of line 4W extended the Clyde river runs about perpendicular to this line at a distance below south boundary of about 0.32 miles (1690 feet) or 575 paces of 3 feet (1725 feet). The average of these is 1708 feet. Thus line 4W extended has a length of  $440 + 2900 + 1708 = 5048$  feet. This will allow  $22\frac{1}{2}$  units of 220 feet with 98 feet left over. at line 4W extended the Clyde bends north in a horseshoe. Therefore, more room is available to east and west of this point without crossing the Clyde.

Clyde slopes west about  $0.11'' = 149$  feet in change which moves center 440 ft to north. Thus new center is 3652 ft north of south boundary and  $6022 + 149 - 4 \times 440 =$  4411 ft east of east bank of Clyde.

BRANCHES:

212-220 ROSSLYN STREET  
WEST MELBOURNE, VIC. -30-1152

40 HILTON ROAD  
HILTON, S.A. -57-5886

CABLE & TELEGRAPHIC ADDRESS:

"AUSQUIN" SYDNEY

TELEPHONE 68-3248  
68-3262

# AUSTIN QUINN PTY. LTD.

IN ASSOCIATION WITH  
CRUISER-BUILT STEEL PRODUCTS PTY. LTD.

MACHINERY MERCHANTS & IMPORTERS

39-45 CREEK STREET, GLEBE  
N.S.W. AUSTRALIA

EJS.MK.

9th December, 1964.

The Secretary,  
Commonwealth Scientific & Industrial Research Organization,  
Tasmanian Regional Laboratory,  
Stowell Avenue,  
HOBART, TASMANIA.

Dear Sir,

ATTENTION MR.GROTE REBER.

We thank you for your letter of the 7th December requesting information on the "PIAB" Dynamometers and in reply are pleased to enclose literature describing these units.

The prices of the type ZL/60, capacity 0 to 300 lb., and the type L/60, capacity 0 to 550 lb. are:-

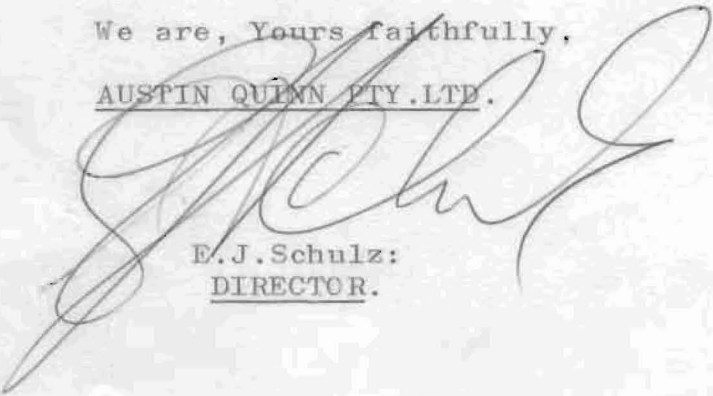
Duty Free	.....	£40
Duty paid	.....	£55

We have both these in stock in Sydney at the present time and can therefore supply at £55 each ex duty paid stock, free on transport Sydney.

Hoping this information will be of interest to you,

We are, Yours faithfully,

AUSTIN QUINN PTY.LTD.

  
E. J. Schulz:  
DIRECTOR.

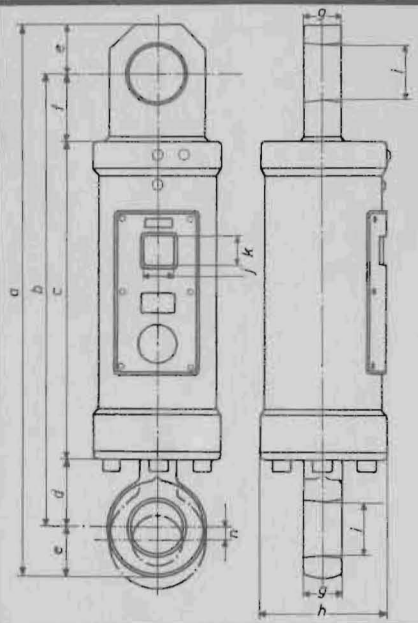
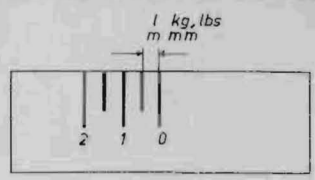


**PIAB DYNAMOMETER**

1 9 6 0

Ritning nr  
Drawing No.  
Zeichnung Nr.  
2040/60

Typ Type	Kapacitet Capacity Kapazität	Egenvikt Deadweight Eigengewicht			Dimensions												
		l mm	m mm	n mm	kg	a mm	b mm	c mm	d mm	e mm	f mm	g mm	h mm	i mm	j x k		
ZK	130 kg	2,5 kg	2	10													
ZL	300 lbs	5 lbs	2	10													
K	250 kg	5 kg	2,2	11													
L	500 lbs	12,5 lbs	5	10	1,8	250	215	159	34	17	23	20	50	17	24 x 20		
A	500 kg	10 kg	2	10													
C	1000 lbs	25 lbs	2,5	9													
B	1000 kg	25 kg	2,5	9													
D	2000 lbs	50 lbs	2,2	8													
M	2000 kg	50 kg	4,5	9	5,4	370	306	209									
N	4000 lbs	100 lbs	4	8					46	32	51	25	86	35			
O	3000 kg	50 kg	3	9	7	392	328	231									
P	6000 lbs	100 lbs	2,5	8													
Q	5000 kg	100 kg	5,5	10	13	405	325	220	50	40	55	30	122	42	26 x 20		
R	10000 lbs	100 lbs	2,5	9													
S	10000 kg	100 kg	3,5	11	24	482	376	245	65	53	65	45	149	58			
T	20000 lbs	200 lbs	3,2	10													
U	20000 kg	200 kg	5	11	60	695	480	275	102	77,5	103	70	228	85			
V	40000 lbs	400 lbs	4,5	10													
G	25000 kg	200 kg	5	14	60	695	480	275	102	77,5	103	70	228	85			
H	50000 lbs	400 lbs	4,5	13													
X	40000 kg	250 kg	3,5	10	95	764	564	311	132	100	121	95	234	115	65 x 23		
Y	80000 lbs	500 lbs	3,2	9													
E	50000 kg	250 kg	3,5	14	115	814	614	361	132	100	121	95	234	115			
F	100000 lbs	500 lbs	3,2	13													

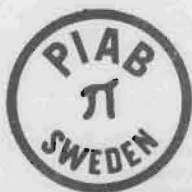


PIAB - dynamometern, data  
The PIAB - dynamometer, data  
Das PIAB - Dynamometer, Daten



All rätt till ändringar förbehålles.  
We reserve the right to alterations.  
Alle Änderungen vorbehalten.

AKTIEBOLAGET PRODUKTIONSMATERIEL  
Rörstrandsgatan 34 · Telefon 24 04 30 växel · Stockholm Va



A type U PIAB dynamometer is used here for load checking a traverse.

**Accuracy**

Every PIAB dynamometer is empirically graduated in a certified tension testing machine (approved accuracy under Swedish standards:  $\pm 1\%$ ). The accuracy is lasting, depending on the robustness of the load-carrying spring and measuring element of the PIAB dynamometer. The springs are so designed that fatigue is practically impossible and it is therefore unnecessary to make a calibration curve at any time during the life of the dynamometer.

Zero setting is easily carried out. (See special instructions.)

**Strength**

The accuracy of the PIAB dynamometer is not affected by rough handling and it can be temporarily subjected to a considerable overload without damage (see Swedish Government Testing Institute's certificate no. 81551). Special dampers permit rapid load alterations from max. to min. and sudden unloading, on tensile tests for example.

Since it is *totally enclosed* and fitted with a well-guarded window of heavy acrylic plastic, the instrument will resist all types of external mechanical damage as well as damp and dust etc.

The dynamometer withstands relatively high temperatures and neither is it affected by low temperature. The outside parts are smooth zinc coated and plate finished which gives the instrument extremely good corrosion protection, the internal parts being safeguarded by a temperature-resistant, anti-rust oil. Further protection is obtained by zinc-plating the inside of the casing.

**Shape**

The PIAB dynamometer, with its acknowledged elegant appearance and shape, is tactile and characterised by its small outside dimensions, low weight and minimal working length.

**Material and manufacture**

High grade material is used throughout the PIAB dynamometer. The load-carrying parts are of normalised 0.35 % carbon steel, and the spring of shot peened alloy spring steel.

Manufacture is carried out with the greatest precision and under strict control. The PIAB dynamometer is recommended by the Swedish Workers Safety Board (certificate of 11 March, 1954).

**Accessories and Special Models**

All types of PIAB dynamometers can be connected in parallel with a special yoke to obtain double capacity.

Tension testing apparatus using the PIAB dynamometer as a measuring instrument are standard products for 0-2 000 or 0-20 000 lbs.

The 4 000 lbs. size and above can be equipped with a remote reading instrument or max. load signal.

Other special models supplied to order.

**Signal and Distant Reading**

The larger models of PIAB dynamometers from the types M and N, upwards, can be fitted to order with a signal device or distant reading instrument. Such equipment has been in great demand and there are several alternatives to choose from.

**Questions and answers**

**What is a dynamometer?**

A dynamometer is, as known, an instrument for the measurement of mechanical force or for checking weight.

**What is a PIAB-dynamometer?**

The Swedish-made PIAB dynamometer is a completely new type. It is designed by a Swedish engineer and patented in most countries.

**What is the range of use for the PIAB-dynamometer?**

The PIAB dynamometer has a wide range of use due to its many valuable qualities. Here are some examples:

- Checking stretch in lines or wires.
- Material testing, such as tensile, load tests etc.
- Inspecting and checking elevators and lifting equipment, suspension and fastening devices and other components.
- Continuous service for avoiding overloads on elevators, electric hoists, cranes, uprooting machines etc.
- Measuring the force in various types of spring system, such as recoil and other springs, expansion joints, pipe bends and similar arrangements, etc.

Counterpoising tensioning devices for various purposes.

Dead pull testing for cars, tractors, trucks, boats etc.

Weighing in cases where the dynamometer scale is satisfactory and if calibrated equipment is not specified.

The PIAB dynamometer can also be incorporated in machine constructions, for example: testing apparatus, rolling mills, presses, transporters or other locations where acting mechanical force is to be measured.

**Who needs the PIAB-dynamometer and what for?**

Workshop personnel, for testing, checking, inspecting etc. Designers and others for practical testing and collating of made calculations.

Buyers, test and laboratory engineers for checking the physical properties of various materials etc., for example rubber, textiles, wood, plastic, metal and other products which do not warrant special test rigs.

Safety engineers and inspectors, for checking elevator and lifting equipment, etc. Every crane, electric hoist and similar should have a built-in PIAB dynamometer for continuous check that overloading does not occur.

Stock and stores personnel for weight checking when officially adjusted equipment is not called for.

Linesmen for measuring the stretch of cable lines, stay wires, supporting cables and etc.



### Tension Testing Apparatus

The tension testing apparatus are now in production. The two sizes 0—2 000 lbs. and 0—20 000 lbs. are manufactured.

Both appliances fill the need for tension testing equipment when large and expensive machines would be uneconomical but tests on materials and constructional details must be carried out. It is most applicable for testing wires, lines, strops, hooks, shackles, welded or plain test specimens, springs, plastic or rubber components, belts, joints, special constructions etc.

Another essential advantage is that the dynamometer can easily be uncoupled and used for other purposes.

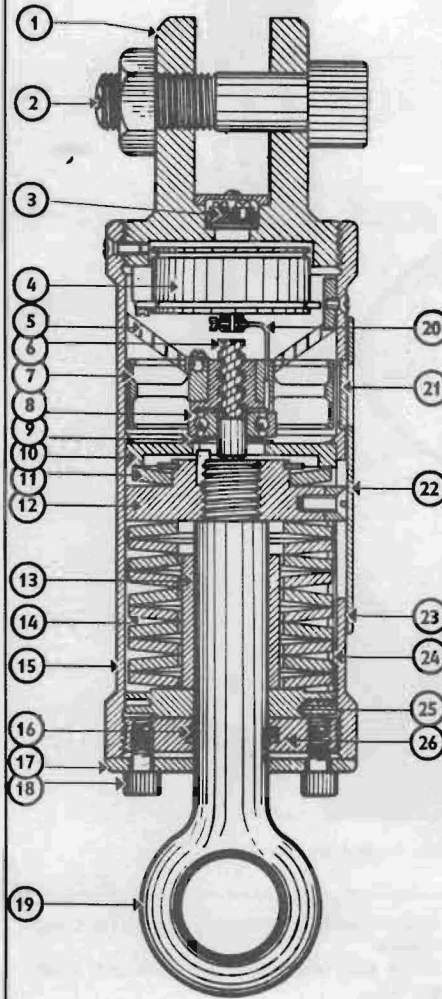
This design of tension testing apparatus is easily transportable, takes up little space and is particularly inexpensive.

The supplied information is preliminary and we reserve the right to make alterations.

The many inquiries from Swedish and foreign customers regarding new sizes and models of the PIAB dynamometer and tension testing appliances have largely contributed to a speed up in production. We can now offer the described instruments and appliances with relatively short delivery times. Here we have made only a very short survey but further information on prices, delivery times, special equipment etc. can be obtained

### Zeroing instructions

With each PIAB dynamometer zeroing instructions are supplied.



The PIAB dynamometer, sectional drawing.

### Index (See sketch!)

1. Fastener
2. Fixing screw
3. Connection terminal board (for distance reading or overload signal)
4. El. remote potentiometer (for distance reading)
5. Torsion spring
6. Stem
7. Dial wheel
8. Ball bearing
9. Bearer washer
10. Base
11. Secondary spring
12. Piston
13. Stop bushing
14. Washer spring
15. Case
16. Packing
17. Lockwasher
18. Initial adjustment
19. Pull rod with ring
20. Carrier for distance reading
21. Dial window
22. Name plate
23. Packing
24. Guide spring
25. Guide spring holder
26. Adjustable base (for zeroing)

3, 4 and 20 are not standard.

### Guarantee

The factory guarantees an accuracy of  $\pm 1,5\%$  with the exception of the first 10% of the scale under the following conditions:

- that the dynamometer is adapted without being exposed to bevelling load or great torsion stress
- that it is correctly zeroed
- that reading is done under increasing load.

Besides, the dynamometer is guaranteed to resist occasional overloadings with 100% of its maximum value without the accuracy being influenced. The security against breaking is 3 times the maximum value of the dynamometer.

The GOVERNMENT TESTING INSTITUTE  
Stockholm, Sweden

Client: AB Piab, Stockholm  
Object tested: 1 dynamometer  
Received for testing: Feb. 8, 1954

NATURE OF TEST: tensile load

Test No. 203789

The object tested was the 1.000 kg dynamometer described in accompanying advertising literature. The dynamometer was marked "No. B 154, 1.000 kg, PIAB, SWEDEN".

The Government Testing Institute was requested to load the dynamometer to rupture in accordance with instructions from the client. The test was made in the presence of representatives of the client.

RESULTS

The dynamometer was mounted in a tension testing machine with attachments supplied by the client: a link for the forked upper end and a forked schackle for the eye in the lower end. Two 3/8" steel bolts, which according to the client are the kind shipped with the dynamometer, were used to mount it in the machine.

The dynamometer was read under a series of load increments:

Load (kg)	Dynamometer reading (kg)
0	0
100	100
200	200
300	300
400	400
500	500
600	600
700	700
800	800
900	900
1000	1000
0	0



The load was then increased again. When a load of 4.600 kg had been reached, the machine was once more unloaded completely; the dynamometer reading was then 25 kg.

The client now zeroed the dynamometer, and the dynamometer was calibrated.

Load (kg)	Dynamometer reading (kg)
0	0
500	510
1000	1005

The load was then increased again. At a load of 6.150 kg, the mounting bolt in the upper, forked dynamometer attachment sheared off.

To allow continuing the test, the upper end of the dynamometer with the forked attachment was mounted in a "double-forked" fixture which was made for this purpose. This offered four shear faces to the bolt, instead of two, as before. The lower end of the dynamometer was clamped direct in the jaws of the testing machine.

The load was then increased again. Rupture occurred at a load of 8.000 kg.

The forked upper end of the dynamometer is threaded into the cylindrical steel casing of the instrument. At the threaded end, the casing spread, allowing the threaded end to slip out without damaging the threads.

Summary

At a load of 6.150 kg, one of the mounting bolts sheared off. This bolt thus proved to be the weakest part of the dynamometer.

Since the dynamometer is recommended for a load of 1.000 kg, the safety factor can therefore be taken as 600 per cent.

No serious damage was caused by overloading the dynamometer to 4.600 kg. Only a slight readjustment was required, after the load of 4.600 kg, for the instrument to function again as intended.

The Government Testing Institute is not aware whether the dynamometer tested is representative of the average product of this manufacturer.

Stockholm, Sweden, February 23, 1954  
The GOVERNMENT TESTING INSTITUTE

(signed) Moje Bergström

Lennart Pehrson

General agents for the PIAB dynamometer:  
AB PRODUKTIONSMATERIEL  
Stockholm Va, Sweden

7th December, 1964.

T. K. Steanes & Sons Pty. Ltd.,  
418 Military Road,  
MOSMAN...N.S.W.

Dear Sirs,

Please send descriptive literature, prices  
and availability information about your tension gauges.  
Full scale indication of 500 lbs. would be most  
desirable.

Yours faithfully,

Grote Reber.

GR:JEG

Austin Quinn Pty. Ltd.,  
39-45 Greek Street,  
GLEBE...N.S.W.

George Salter & Co. A/sia Pty. Ltd.,  
342 Kent Street,  
SYDNEY...N.S.W.





# W. J. MANUFACTURING CO. LTD.

418 MILITARY ROAD, MOSMAN, SYDNEY, N.S.W.

In Replying Please

Quote Ref. No.....WRS:KE.....

December 11, 1964.

Mr. Grote Reber,  
C.S.I.R.O.,  
Tasmanian Regional Laboratory,  
Stowell Avenue,  
HOBART. TASMANIA.

Dear Mr. Reber,

We thank you for your letter of December 7 and, in response to your request, we have much pleasure in herewith enclosing the literature on Dillon Force Gauges.

We stock most of the large range of Dillon instruments as well as repairing, recalibrating and load-testing same.

In respect to prices, we would mention that the prices listed in the bulletins are ex Works only and do not, therefore, take into account freight, duty and landing charges. We should be pleased to quote you for any specific instrument you have in mind on a delivered free-into-store basis, C.S.I.R.O., Hobart.

Meantime, we await the favour of your further advices.

Yours faithfully,  
W. J. MANUFACTURING CO. LTD.

A handwritten signature in cursive script that reads 'W. R. Scott'.

W. R. SCOTT, Manager  
General Engineering Division.

# J. W. WEDDERBURN & SONS PTY. LTD.



TELEPHONES:  
6 1 3 6 1 4  
2 6 2 4 8 5  
6 1 3 0 5 0  
ESTABLISHED 1896

SCALES FOR ALL REQUIREMENTS

SALES, SERVICE, HIRE

INDUSTRIAL, SCIENTIFIC, LABORATORY, COMMERCIAL & RETAIL WEIGHING EQUIPMENT  
DIAL CRANE SCALES, COUNTING MACHINES, COIN CALCULATING MACHINES, FOOD SLICERS

WWW/KW

73 LIVERPOOL STREET  
S Y D N E Y

23rd December, 1964.

C.S.I.R.O.,  
Tasmanian Regional Laboratories,  
Stowell Avenue,  
HOBART TASMANIA.

Attention Mr. Grote Reber.

Dear Sir,

Your Enquiry to George Salter (Aust) Pty.Ltd. has been handed to us, in our capacity as distributors, and we have much pleasure in forwarding illustration, specifications and prices of the undermentioned Weighing Equipment:-

1 only Trade Circular Balance No. 285T.  
Capacity 600 lb. x 2 lb. divisions.  
15" diameter dial.  
Overall length including top suspension ring and bottom weighing hook 35".  
PRICE ..... £115.0.0  
Plus 12½% Sales Tax if applicable.  
Packing and freight extra.  
Delivery immediate.

As we are not quite clear as to the type of machine you require we are enclosing leaflets covering a general range of Salter Weighing Equipment. Should you require information regarding alternative types please do not hesitate to contact us and we would be most happy to supply quotation by return mail.

Yours faithfully,  
J. W. WEDDERBURN & SONS PTY. LTD.

THE ONLY WEIGH

## TRADE CIRCULAR BALANCE

Approved by the Board of Trade



### TRADE CIRCULAR BALANCE No. 285T

Robust construction for industrial use in factory or warehouse. Large easily read white dial with dust-excluding Perspex cover.

Fitted with 3" internal dia. top ring for suspension from hoist, and 'S' hook for load carrying. Shock absorbers are fitted to minimise risk of damage caused by sudden application or release of loads.

Sealed oil dashpots can be fitted for quicker weighing, as an optional extra.

A temperature compensating device is fitted.


Alternative fittings (to 600 lb. and 10 cwt. sizes) are No. 1 Flat Pan or No. 5 Frame, as illustrated on Page 44.

Plugged ready for stamping.

### NON-TRADE CIRCULAR BALANCE No. 285

Similar to No. 285T, but **without** temperature compensating device. A tare adjust screw is fitted allowing light containers to be used and weighing to commence at zero.

	Graduated	Dial Size	Net. Wet. with hook	Length
No. 285T	600 x 2 lb.	15"	50 lb.	35"
	10 cwt. x 4 lb.	15"	56 lb.	36"
	20 cwt. x 7 lb.	15"	64 lb.	36"
No. 285	300 x 1 kg	38 cm	23 kg	89 cm
	500 x 2 kg	38 cm	25 kg	91 cm
	1000 x 5 kg	38 cm	29 kg	91 cm

J. W. WEDDERBURN & SONS 

73 LIVERPOOL ST. SYDNEY  
MA 3614 BA 2485 MA 3050

### DYNAMOMETERS OR TESTING MACHINES

FOR TESTING THE TENSION OF OVERHEAD CABLES, ETC.

No. 128



This dynamometer is fitted with a second finger which remains at the point of maximum strain and is returned by hand to zero for the next test.

The No. 128 is not for breaking tests, and customers are advised to detail the conditions under which the instrument is to be used when sending enquiries.

To Indicate	Diam. of Dial	Distance between Loops	Nett Weight
10 cwt. x 7 lb.	7"	10"	7 lb.
20 cwt. x 14 lb.	8"	11"	9 lb.
40 cwt. x 28 lb.	10"	13"	16 lb.
60 cwt. x 28 lb.	12"	17"	27 lb.
80 cwt. x 56 lb.	12"	17"	27 lb.
120 cwt. x 56 lb.	14"	18½"	
500 kg x 5 kg	17.79 cm	25.39 cm	3.1 kg
1000 kg x 10 kg	20.31 cm	27.93 cm	4.1 kg
2000 kg x 20 kg	25.39 cm	33.01 cm	7.3 kg
3000 kg x 20 kg	30.47 cm	43.17 cm	12.3 kg
4000 kg x 25 kg	30.47 cm	43.17 cm	12.3 kg

These machines can be supplied marked in tons, short-tons (2,000 lb.), or lb. if required.



L13

# SALTER

## TUBULAR COMPRESSION & PUSH-PULL BALANCES



Tubular Compression

### TUBULAR COMPRESSION BALANCE

Used to establish pressure in various applications — e.g., aircraft controls; motor-car door catches.

Clear graduations stamped on tubular, lacquered brass barrel.

Available in a wide range of graduations, in either lb. or kg., e.g., 1-lb. x ¼-oz. up to 100-lb. x 2-lb.

(100 x 2 g up to 50 kg. x 1 kg.)

### PUSH-PULL BALANCE

Designed to test *both* tension and compression.

Used extensively by manufacturers in a wide range of industries, e.g., teleprinters; aircraft controls.

A maximum indicator can be fitted to balances for horizontal load applications.

Clear graduations stamped on nickel-plated, brass barrel.

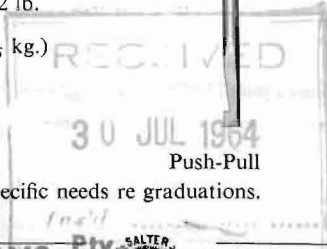
Available in a wide range of graduations, in either lb. or kg., e.g., 4 oz. x ¼ oz. up to 100 lb. x 2 lb.


(100 g. x 5 g. up to 3 kg. x 1/10 kg.)



Push-Pull

N.B.—Customers are invited to enquire for their specific needs re graduations. We will then advise how these can be met.



J. W. WEDDERBURN & SONS Pty. Ltd. 

Small 6" pulley x  $\frac{3}{8}$ "

From	Price	Tool	Total	Unit
National Vulcanized Fibre	1.75	42.00		2,03
Polymer Corp	4.75			4,75
Taylor	1.52			1,52
Spaulding	Make over tool			-
Insulation Fabricators	1.51			1,51
General Electric	Suggests 2013 trolite			-
Fibre Fabricators	1.75			1,75
Laminated Sheet Products	1.78			1,78
Penn Fibre	-			-
Rexolite	-			-
Continental Diamond	1.93			1,93
Formica	-			-
Durham	7.80			7,80

Large 8" Pulley x  $\frac{1}{2}$ "  $\left(\frac{8^2}{6^2}\right) \frac{1}{\frac{3}{8}} = 2.37$  times volume of material.

✓ Taylor	2.19 times	3.10	35.00	23¢ ea	3,33
✓ Fibre Fabricators	2.43 times	4.25			4,25
✓ Laminated Sheet Prod.	2.05 times	3.61			3,61
✓ National	1.67 times	3.07	47.00	31¢	3,38
✓ Aqua Sportman					2,95
✓ Franklin					4,71
✓ Insulation Fabricators	2.35 times	3.55			3,55
✓ Ambrom	Paper base	3.18	45.00	30¢	paper 3,48
	cloth base	4.00	45.00	30¢ ea	canvas 4,30
✓ Spaulding		5.57	40.00	27¢ ea	5,84
✓ Continental Diamond Fibre	1.81 times	3.50			3,50

Agua Sportsman Inc.

5938 Carthage Court

Cincinnati 12, Ohio



Packing Ticket

**AQUA SPORTSMAN, INC.**

2518 LESLIE AVE., NORWOOD  
CINCINNATI 12, OHIO

No 20147

DATE 10/28/60

SOLD TO RESEARCH CORPORATION

OUR No. 7647

ADDRESS 405 LEXINGTON AVE.

YOUR No. Letter 10/11

NEW YORK 17, NEW YORK

SHIP VIA Eastern Motor Dispatch

SHIP TO RESEARCH-COTTRELL, INC. ATTN: GROTE REBER

P. PD. COL. \_\_\_\_\_

ADDRESS FINDERNE PLANT, BOUND BROOK, NEW JERSEY

W. B. No. \_\_\_\_\_

QUANTITY	Description	AMOUNT	
155	GRADE 2013 TEXTOLITE PULLEYS - 8" X 3/4 ID X 1/2" thick		
	with formed groove around circumference per sketch		

Shipment \_\_\_\_\_ Case No. \_\_\_\_\_ Gross \_\_\_\_\_ Tare \_\_\_\_\_ Net \_\_\_\_\_

ALL CLAIMS FOR SHORTAGE, DEFECTIVE MATERIAL OR WORKMANSHIP, REPLACEMENTS, ETC., MUST BE PRESENTED WITHIN TEN DAYS FROM RECEIPT OF MATERIAL, ACCOMPANIED BY INSPECTION TAG ENCLOSED WITH SHIPMENT.





TAYLOR FIBRE CO., NORRISTOWN, PA.

DATE  
September 9, 1960

TO • National Radio Astronomy Observatory  
 • P.O. Box 2  
 • Green Bank, West Virginia  
 • Attention: Mr. Grote Reber

ADDRESS REPLY TO: P.O. Box 563 - Far Hills Branch  
 Dayton 19, Ohio  
 PHONE: AX-3-9605

We are pleased to submit the following quotation per your inquiry (Letter)  
 dated 9/1/60

Taylor Canvas Phenol Laminate, Grade C, Natural  
 8" O.D. x 3/4" I.D. x 1/2" thick  
 QUANTITY: 150 pcs.

..... \$ 3.10 each  
 PLUS \$35.00 partial tool charge

MINIMUM CHARGE:

\$25.00

DELIVERY

4 weeks

PRICES ARE: F. O. B. Norristown, Pa., Freight allowed on shipments of 100# & over.

Orders based on this quotation are subject to acceptance at our home office.

TERMS: NET 30 DAYS

THESE PRICES ARE ON THE BASIS OF OUR RECEIVING AN ORDER FOR THE SPECIFIED QUANTITIES FOR SHIPMENT AT ONE TIME.

Very truly yours,

Taylor Fibre Co.

By Wm. S. McClellan, Jr.  
 Wm. S. McClellan, Jr.  
 District Manager

# QUOTATION



**NATIONAL**  
**VULCANIZED FIBRE CO.**  
WILMINGTON 99, DELAWARE

National Radio Astronomy Observatory  
P. O. Box 2  
Green Bank, West Virginia

DATE 8-10-60

Att: Grote Reber

YOUR INQUIRY NO.

DATED 8-4-60

Natural Grade C-535 canvas base Phenolite Pulley per sketch dated July 29th and having O.D. of 8" and fabricated from 1/2" stock;

Quantity 100 - 200 pcs.....\$3.07 each  
Setup charge each release..... 7.00  
Tool Charge.....40.00

Note: Your note regarding the price on our quotation of July 27th should be \$2.03 on a capitalized tool charge basis is correct.

DELIVERY: 5 to 6 weeks

This quotation subject to conditions printed on reverse side.

Respectfully submitted,

**NATIONAL VULCANIZED FIBRE CO.**

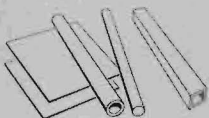
100 lbs. and over fob Mill full freight allowed.

F. O. B. Under 100 lbs. fob Mill.

BY W. E. McNabb

TERMS: NET 30 DAYS. NO CASH DISCOUNT  
WEM:fs

W. E. McNabb, Sales Dept.



**NATIONAL VULCANIZED FIBRE**  
**PHENOLITE**  
Laminated PLASTIC  
IN SHEETS, RODS, TUBES,  
SPECIAL SHAPES, FABRICATED PARTS



FOIL CLAD LAMINATES



MATERIALS HANDLING RECEPTACLES



VUL-COT WASTEBASKETS



TEXTILE BOBBINS



# CONTINENTAL-DIAMOND FIBRE CORPORATION

A SUBSIDIARY OF THE *DuPont* COMPANY • NEWARK, DELAWARE

**ADDRESS REPLY TO**  
1621 Superior Building  
815 Superior Avenue, N. E.  
CLEVELAND 14, OHIO  
Phones: CHerry 1-5220-1-5221

National Radio Astronomy Observatory  
Post Office Box 2  
Green Bank, West Virginia

DATE September 28, 1960

Att: Mr. Grote Reber

YOUR INQUIRY: Ltr. of 9/1/60

Ref: Our Est. 3-4266-0

## QUOTATION

We thank you for your inquiry and are pleased to quote as follows:

Pulley per hand drawn sketch dated August 30, 1960 made from Natural LDC. (Copy of sketch attached.)

Shipment of 150 ..... \$3.50 each

Tool charge ..... \$35.00 rebatable. See reverse side of this quotation for explanation of rebatable tool clause.

If we can be of any further service, please do not hesitate to contact us at our Cleveland Office.

CONTINENTAL DIAMOND FIBRE CORP.

DELIVERY: 3 to 4 weeks after receipt of an order.

CONTINENTAL-DIAMOND FIBRE CORPORATION

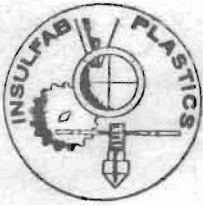
See reverse side for terms and conditions of this quotation.

*W R Ryan*  
Cleveland Manager

SALES SERVICE DEPARTMENT

WRR:ivb

Manufacturers and Fabricators of Electrical Insulation, Molded and Laminated Plastics



# INSULATING FABRICATORS, INC.

SOUTHERN DIVISION

*Over 35 Years in the Plastics Industry*

P. O. Box 4277

834 HAYNE STREET, SPARTANBURG, SOUTH CAROLINA

National Radio Astronomy Observatory  
P. O. Box 2  
Green Bank, West Virginia

REFERENCE 5-0205-0

September 19, 1960

Attention: Mr. Grote Reber

Re: Letter Inquiry 9/1/60

Gentlemen:

In reply to your recent request for prices, we are pleased to quote as follows:

Pulleys, per Revised Sketch dated 8/30/60, NEMA thickness tolerance, and groove to be referenced from one side of plate

Qty. 150 pcs.

\$ 3.55 each

Terms net 30 days, F.O.B. Spartanburg, S. C.  
Delivery: 2-3 wks. after receipt of order

We await your favorable consideration.

Very truly yours,

*J. C. Mullis*  
INSULATING FABRICATORS, INC.

JEMullis/qs

DISTRIBUTORS AND FABRICATORS OF

LAMINATED

{ PHENOLIC  
MELAMINE  
SILICONE  
EPOXY

TEFLON • NYLON • PLEXIGLAS • FIBRE • KEL F • DELRIN • LEXAN  
POLYSTYRENE • MYCALEX • REXOLITE • POLYETHYLENE • POLYESTER

AND  
OTHER  
THERMOPLASTICS

CREDIT - Regular terms for concerns carrying approved ratings in Dun & Bradstreet and Mercantile credit agencies. Subject to the approval of our Credit Department, we will ship on "open account", if not rated, upon receipt of trade and bank references. All other orders must be accompanied by check or money order, or can be shipped C. O. D.

QUOTATION

NORwood 7-3500

*Laminated* SHEET PRODUCTS CORPORATION  
 FABRICATOR and DISTRIBUTOR OF PLASTIC MATERIALS

BOX 390 NORWOOD, MASS.

September 7, 1960

National Radio Astronomy Observatory  
 Post Office Box 2  
 Green Bank, West Virginia

Your Reference Quote #7-106

Att: Mr. Grote Reber

Dated Aug. 9, 60

Gentlemen:

We thank you for your inquiry and are pleased to quote prices as follows:

ITEM	DESCRIPTION	QUANTITY	PRICE
1.	GRADE 262 PULLY WHEEL 8" O.D. x 3/4" I.D. x 1/2" thick with groove per sketch	150/pcs.	\$3.61/ea.

Minimum Order \$5.00

Terms: Net 30 Days

F. O. B. OUR PLANT

Approximate Delivery After Receipt of Order — .....

Acceptance: This quotation is subject to acceptance within 20 days and supersedes all previous quotations.

In reply please refer to our estimate No. 9-014

Very truly yours,

*Laminated* SHEET PRODUCTS CORPORATION  
 By *Martin J. Foley*  
 Martin J. Foley

**FIBRE****FABRICATORS CO.**  
INCORPORATED

4540 WEST ADDISON STREET • CHICAGO 41, ILLINOIS • AVenue 2-4545

**Bakelite • Nylon • Teflon • Electrical Insulating Specialties**

September 7, 1960

National Radio Astronomy Observatory  
Post Office Box 2  
Green Bank, West Virginia  
Attention: Mr. Grote Reger

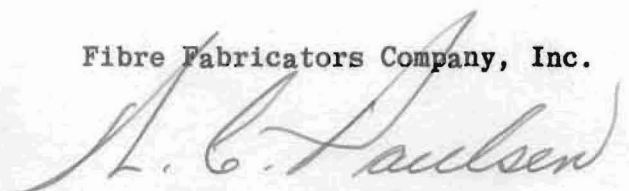
Gentlemen:

We appreciate the opportunity to submit the following quotation for your approval:

PART NUMBER	
DESCRIPTION	8" OD X 1/2 Canvas Pulley Wheel
QUANTITIES	
PRICE	\$4.25/ea.
SET UP CHARGE FOR EACH RELEASE	
TOOL CHARGES	
TERMS	1% 10 F.O.B. Chicago
DELIVERY	Approx 10 Days
REMARKS	Quoted using canvas phenolic

We shall be pleased to furnish any additional information you may desire.

Fibre Fabricators Company, Inc.





# THE AUBURN MANUFACTURING COMPANY

MANUFACTURERS OF



GASKETS AND PACKINGS

Pease Avenue and Stack Street

MIDDLETOWN, CONNECTICUT

Telephone: Diamond 6-6631

To: National Radio Astronomy Observatory,  
Post Office Box 2  
Green Bank, West Virginia

Attn: Mr. Grote Reber

Quotation

No. 3586

Date: September 26, 1960

Your Inquiry: 9-2-60

Gentlemen:

Thank you for your above inquiry. We are glad to submit the following proposal to cover the material you have specified.

Part No.	Article and Description	Quantity	Price
	Phenolic Pulley Wheels Canvas base grade - color natural	150 pcs.	4.00 each net Plus partial toolage on initial order \$45.00
	same as above except made of XX Paper base natural	150 pcs.	3.18 each net Plus partial toolage on initial order \$45.00

Please note - we would recommend enlarging the .040" radius to eliminate the bursting vector. We recommend a tolerance of  $-.000" + .010"$



Delivery Schedule:

4-6 weeks

DIES: Die charges are made on new items or on changes in specifications to partly cover labor and material costs. Dies remain our property and are maintained by us.

F. O. B. our Plant, Middletown, Conn.

Terms: 1% 10 days. Net 30 days.

Conditions: Unless otherwise stated, quotation is for immediate acceptance and prices are predicated on producing at one time in the quantity quoted upon. Orders for smaller quantities are subject to higher price.

We trust the above is the information required and look forward to receiving your order.

Very truly yours,

THE AUBURN MANUFACTURING COMPANY

By  .....

M. B. Weiner

# FRANKLIN FIBRE-LAMITEX CORP.

SHEETS, RODS, TUBES  
AND FABRICATED PARTS



*Laminated Plastics · Hard Vulcanized Fibre*



MAIN OFFICE & MILLS  
WILMINGTON, DELAWARE

NEW YORK OFFICE AND WAREHOUSE  
129 LAFAYETTE STREET  
TELEPHONE CANAL 6-4376

September 15, 1960

National Radio Astronomy Observatory  
Post Office Box 2  
Green Bank, West Virginia

Attention: Mr. Grote Reber

Gentlemen:

In reply to your letter dated September 2, 1960 we wish to advise that we believe our Natural Grade L Linen Lamitex will best suit your needs. We, therefore, take pleasure in submitting our quotation as follows:

Pulley, 8" diameter x 1/2" thick x 3/4" centerhole,  
complete per drawing submitted, from Natural Grade L  
Linen Lamitex Sheet.  
Lot of 150 Pcs.....\$4.71/each  
" " 161 Pcs.....\$4.40/each

Terms - Net 30 days F.O.B. - Wilmington, Delaware  
Delivery - 4 to 5 weeks

Enclosed please find our latest Engineering Data Book for your guidance.

A sample of the material we propose to furnish is being sent under separate cover.

We thank you for the opportunity to quote and hope we may be of service to you in this requirement.

Very truly yours,

FRANKLIN FIBRE-LAMITEX CORPORATION  
New York Office

  
R. F. ROBERTS

(Enclosure)  
RFR/MQ



VULCANIZED FIBRE  
SPAULDITE  
(LAMINATED PHENOLIC)  
ARMITE  
(THIN INSULATION)  
SPAULDO  
(MOTOR INSULATION)

# QUOTATION



FIBRE BOARD  
SPAULDING T  
(TRANSFORMER BOARD)  
MATERIALS HANDLING  
EQUIPMENT  
(TRUCKS, BOXES,  
TRAYS, BARRELS, ETC.)

## SPAULDING FIBRE COMPANY, INC.

MANUFACTURERS OF  
INDUSTRIAL PLASTICS IN SHEETS, RODS AND TUBES  
AND PARTS MADE TO YOUR SPECIFICATIONS

PHONE: BALDWIN 3-2286  
136 SOUTH LUDLOW STREET  
DAYTON 2, OHIO

G. F. ANDERSON, MANAGER

September 21, 1960

National Radio Astronomy Observatory  
Post Office Box 2  
Green Bank, West Virginia

Attention: Mr. Grote Reber

Gentlemen:

In reply to your letter of September 2, 1960, we are pleased to quote as follows:

LG Natural Spauldite Pulley per  
Drawing dated 8/30/60

150 @ \$5.57 each

Partial Tool Charge \$40.00

If we can be of further assistance, please contact us.

Yours very truly,

SPAULDING FIBRE CO., INC.

L. H. Hopper,  
Office Manager

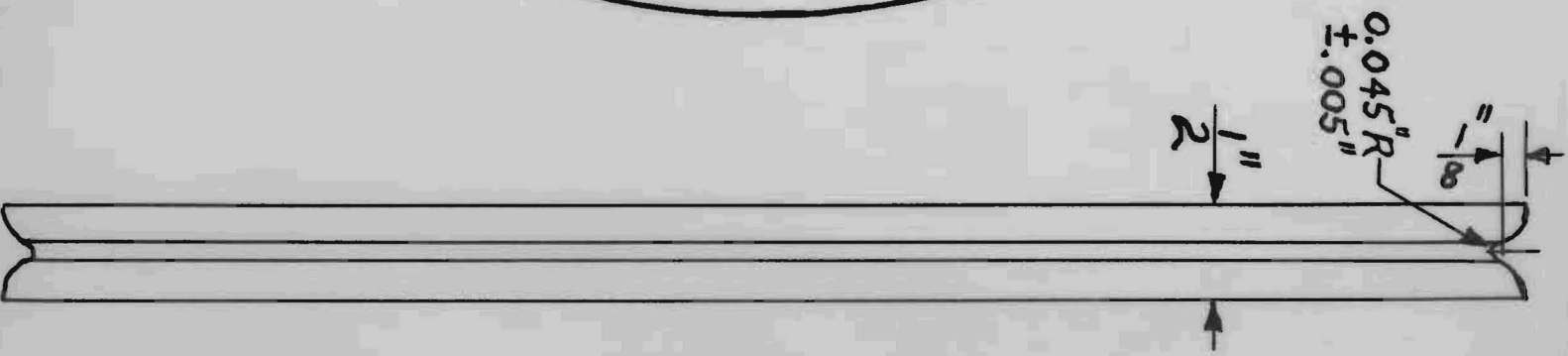
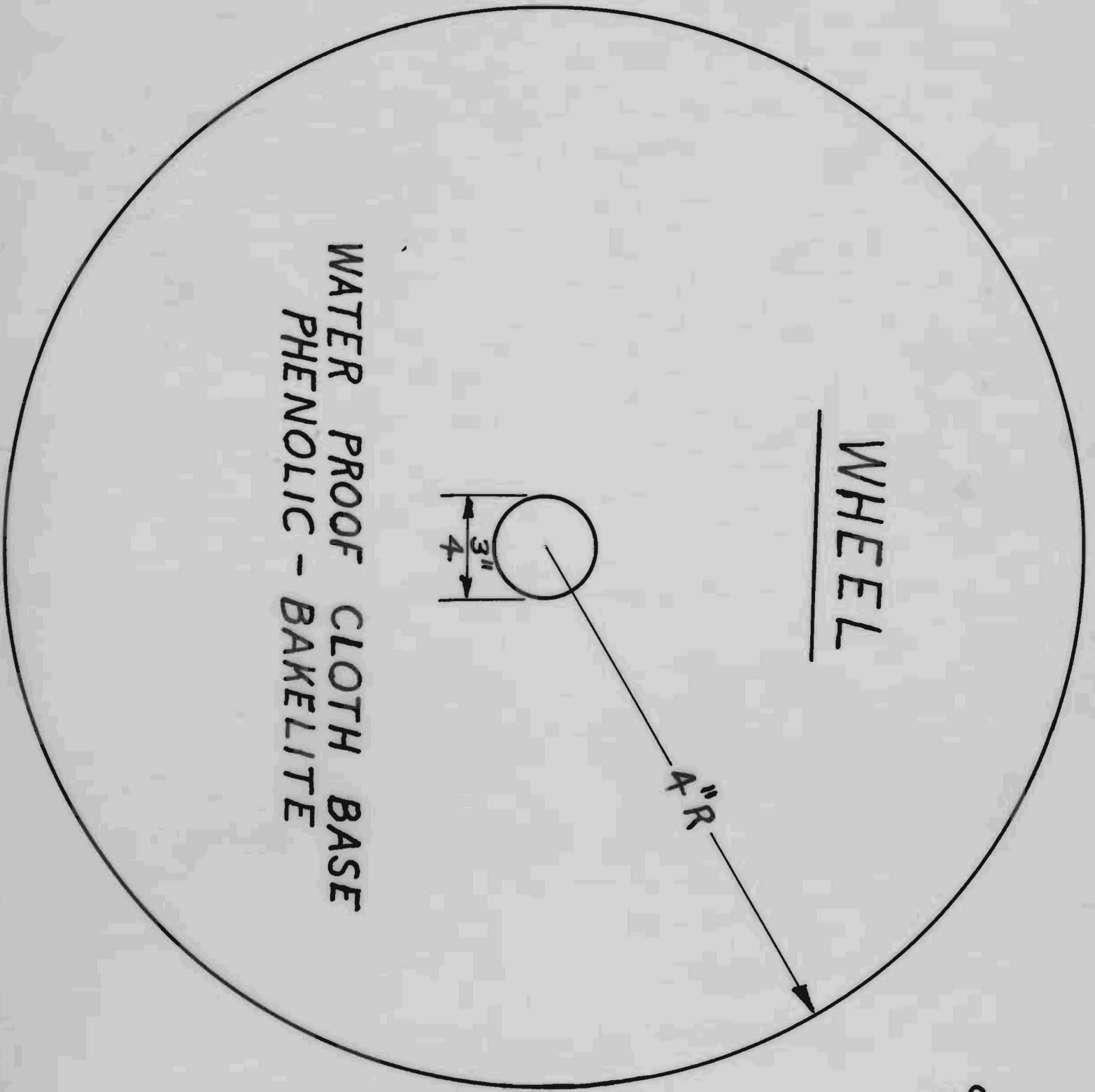
LHH:jb

cc: K. R. Oliver

TERMS: SEE REVERSE SIDE

THE ABOVE QUOTATION IS SUBJECT TO IMMEDIATE ACCEPTANCE.

SPAULDING FIBRE COMPANY, INC.

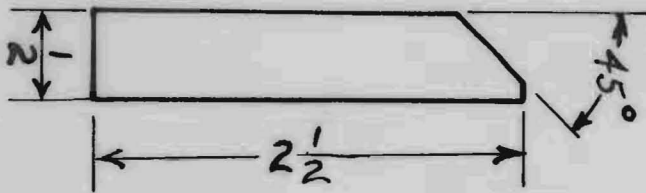
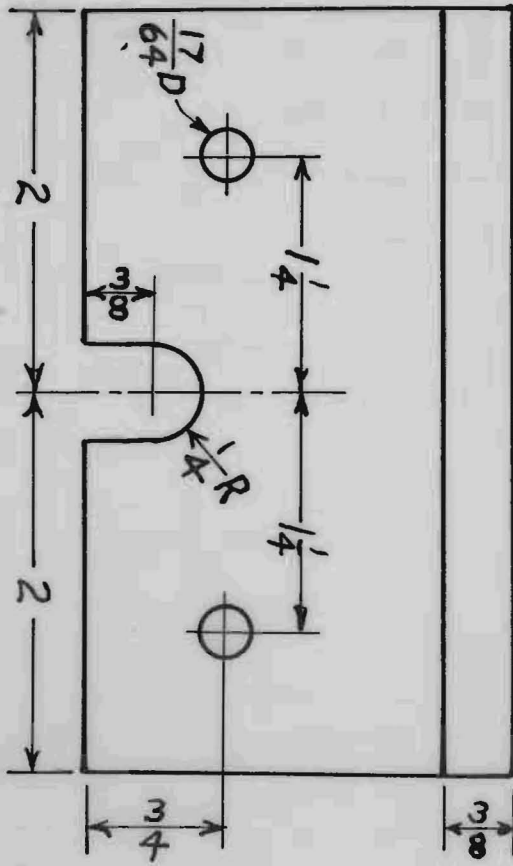


Plates $\frac{1}{2} \times 1\frac{1}{2} \times 3\frac{1}{2}$ 

Aqua Sporteman		.63
Laminated Sheet Products	59¢ + 4¢ tool	.63
National Vul. Fibre	35¢ + 9¢ tool	.44
Fibre Fabricators		.53
Taylor	60¢ + 24¢ tool	.84

Extra plates on hand at Boothwell = 6 on 28/7/62

# GUIDE



5 Aug 67

# Antenna Poles

Lines	Poles	Product
1, 32	2	4
2, 31	6	12
3, 30	8	16
4, 5, 28, 29	10	40
6, 7, 26, 27	12	48
8, 9, 10, 11, 22, 23, 24, 25	14	112
12, 13, 14, 15, 16, 17, 18, 19, 20, 21	16	160
	<b>Total</b>	<b>392</b>

Less the existing array

- 96  


---

**Net 296**

## End Poles

32 lines times two ends  
 Less the existing array

64  
 - 32  


---

**Net 32**

New Poles 296 + 32 =

**Total 328**

5/8/62

Transmission Line Posts

Lines	Posts	Product
1, 32	12	24
2, 3, 30, 31	8	32
4, 5, 6, 7, 26, 27, 28, 29.	12	96
8 thru 25	14	252
	<u>Total</u>	<u>404</u>
Less the existing array		
9, 10, 23, 24	4	16
11 thru 22	6	<u>72</u>
		- 88
	<u>Net</u>	<u>316</u>

Truss Posts

(32 + 33) 2 =	<u>Total</u>	<u>130</u>
Less the existing array		- 66
(16 + 17) 2 =	<u>Net</u>	<u>64</u>

5/8/62

## Ground Rods.

$\frac{3}{8}$ " dia x 6 ft long with 6 ft pigtail

One for each Pole

328

$\frac{3}{8}$ " dia x 6 ft long with  $1\frac{1}{2}$  ft pigtail

One for each transformer in E/W lines

~~318?~~

One for each line truss

16

One for each post between trusses

?

Two for each end truss 2x2

4

Total 328

5 Aug 62

## Antenna Pulleys

Two on each antenna pole = $392 \times 2 =$	784	
Existing array $96 \times 2 = 192$	} = less	- 212
Extras 20		
		572
Spare		8
		<hr/>
	Total	580

## End Pulleys

One on each end pole = $64 \times 1 =$	64	
Existing array = $32 \times 1 = 32$	} = less	-
Extras ?		
		4
Spare		<hr/>
	Total	



5/8/62

15/7/61

7 reels copperweld .080 extra high tensile  
strength wire on hand, \$ 41.46 per cwt.

19/2/62

7 more reels

14 total reels received.

2 reels left over

12 reels used

Enlarged antenna requires  $3 \times 12 = 36$  reels more wire,

2 extra less one on hand

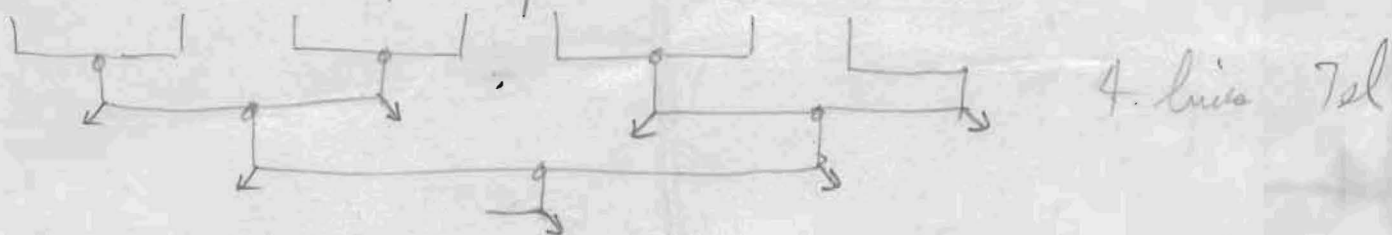
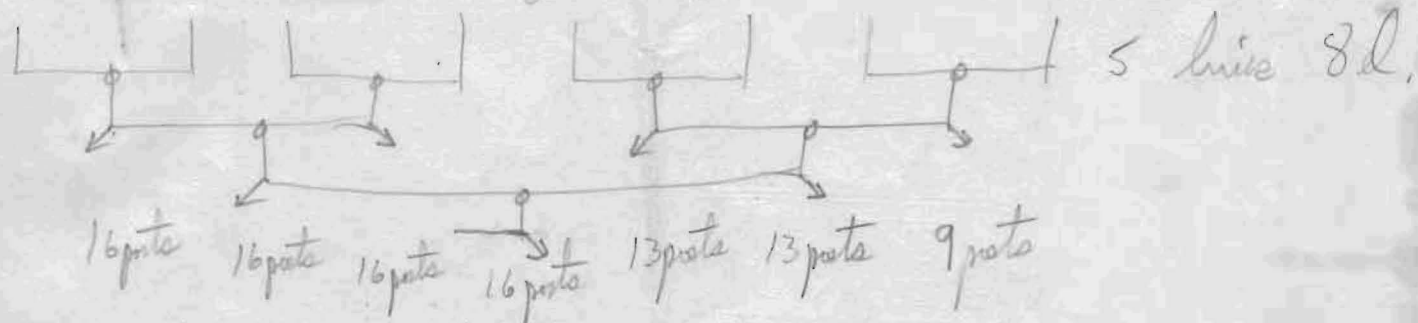
+ 1

Required additional wire

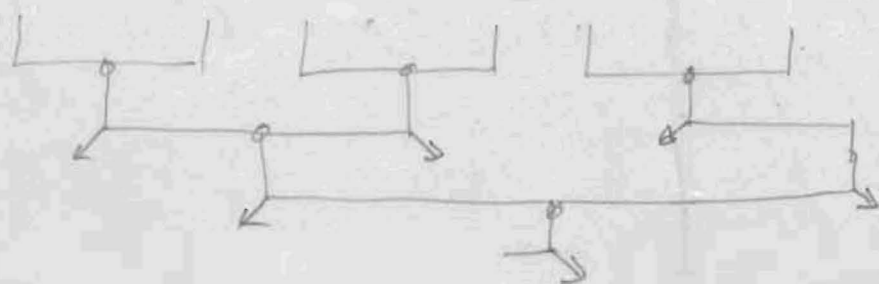
37 reels

Four reels were stolen late in June. These had  
about one full reel of wire on them.  
There are nine empty & one full reel at Bottswell

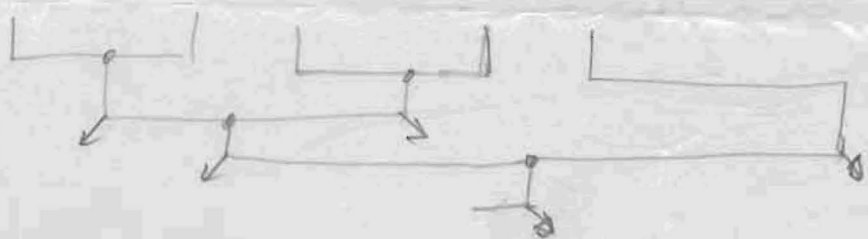
Transmission lines on 1/4 of array.



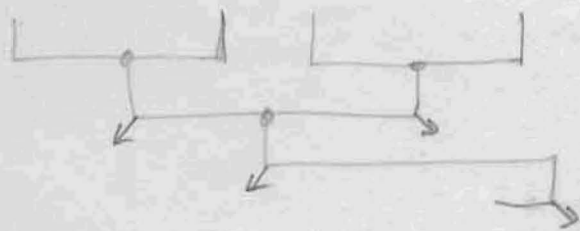
4 lines 7el



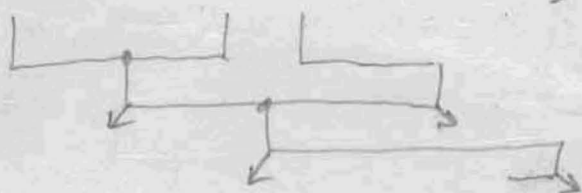
2 lines 6el



2 lines 5el



1 line 4el

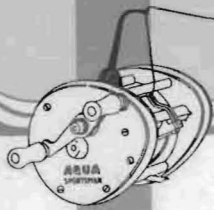


1 line 3el



1 line 1el

15 lines



# Aqua Sportsman Inc.

NORWOOD CINCINNATI 12, OHIO

October 21, 1960

Research Corporation  
405 Lexington Avenue  
New York 17, New York

Attn: Charles H. Schauer

Dear Mr. Schauer:

This will acknowledge your letter of October 11th covering an order for 150 Grade 2013 Textolite Pulleys per sketch at a quoted price of \$2.95 each. This order has been entered and will be billed at this price, shipment to be made in approximately ten days to two weeks per your instructions.

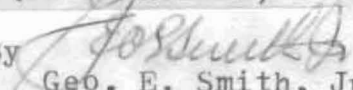
As we were writing this order up, we noted that we had made an error in our material costs on same, and we ask that you will indicate on your records for future use that unless there is some unforeseen change in material costs, future shipments will be priced at \$3.92 each instead of the \$2.95 quoted.

We sincerely regret that we must take this action, but we think you can readily understand that while we are assuming responsibility for our quotation on the first order, we would not want to repeat and continue losing money on the order.

Very truly yours,

AQUA SPORTSMAN, INC.

By

  
Geo. E. Smith, Jr.

GES/mh

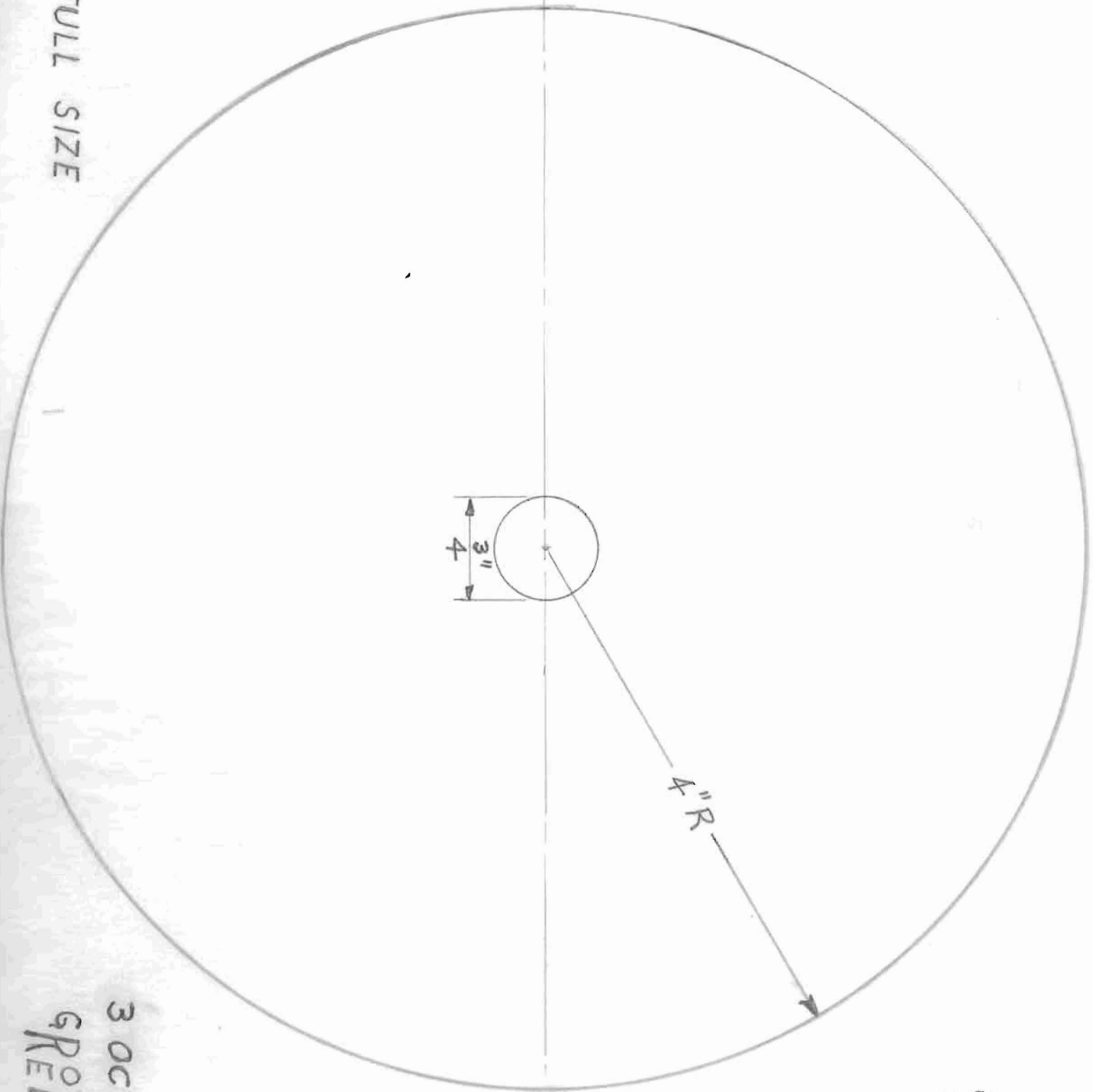
Manufacturers of

AQUA SPORTSMAN Casting Reel  
BLACK JEWEL Roll Stamp Dispenser

Instrument Parts  
Radio Coil Forms  
BEACON · LITE — The Modern Yard, Garden or Beach Light

Parts Fabricated from All Types  
of Plastic—Rod, Tube or Sheet Stock

FULL SIZE



3 OCT 60  
GROTFE  
REBLER



FROM

# National Vulcanized Fibre Co.

WILMINGTON 99, DELAWARE, U. S. A.

POSTMASTER: THIS PACKAGE MAY BE OPENED FOR POSTAL INSPECTION IF NECESSARY.  
CONTENTS: MDSE. RETURN POSTAGE GUARANTEED.

# National Vulcanized Fibre Co.

WILMINGTON 99, DELAWARE, U. S. A.



CONSIGNEE TO BELOW  
ATTN. GROTE REBER

ORDER NO.

SOLD TO NATIONAL RADIO ASTRONOMY OBSERVATORY  
POST OFFICE BOX 2  
GREEN BANK, WEST VIRGINIA

N.V.F. ORDER NO. <b>PS-9190-288</b>	CUST. ORDER NO.	CLASS <b>134</b>
CONSIGNEES ORDER & REQ. NO.	CUSTOMER REQ. NO.	
ROUTING <b>PP</b>		DISTRICT <b>61-25</b>

Packer <b>FF</b>	
B/L No.	Inspector

Date Shipped <b>10-7-60</b>	Partial or Complete <b>C</b>	Shipped From <b>Kennett Sq., Pa.</b>
--------------------------------	---------------------------------	---

ITEM	QUANTITY ORDERED	DESCRIPTION
1	1 PC	NAT. 1/2" C-535 PHENOLITE SHEET, 12" x 12"
<i>Very nice material. We should have purchased this</i>		
PACKING LIST		

Quantity Shipped	Shipping Weights		Shipping Data Units and Kind
	Net	Gross	
<b>1 piece</b>	<b>3-1/2</b>	<b>5</b>	<b>1 pkg.</b>

Lot 1090

1350 ac

204-1-2  
E.M.  
Stevens  
Par.

278

50-72-13

125/2

J. E. Prismall

Lessee

1-4-51

Lot 1046

3500 ac

J. H. Addison

Lessee

1-10-48

EPHRAIM CR

252 B ac

rb/n

Lessee

1-4-43

U Lot 1017 D

500-0-0

E

H

A

V

200 ac

150 0 0

140  
14

31-3-21

1917

Portion of Lot 872

500 ac

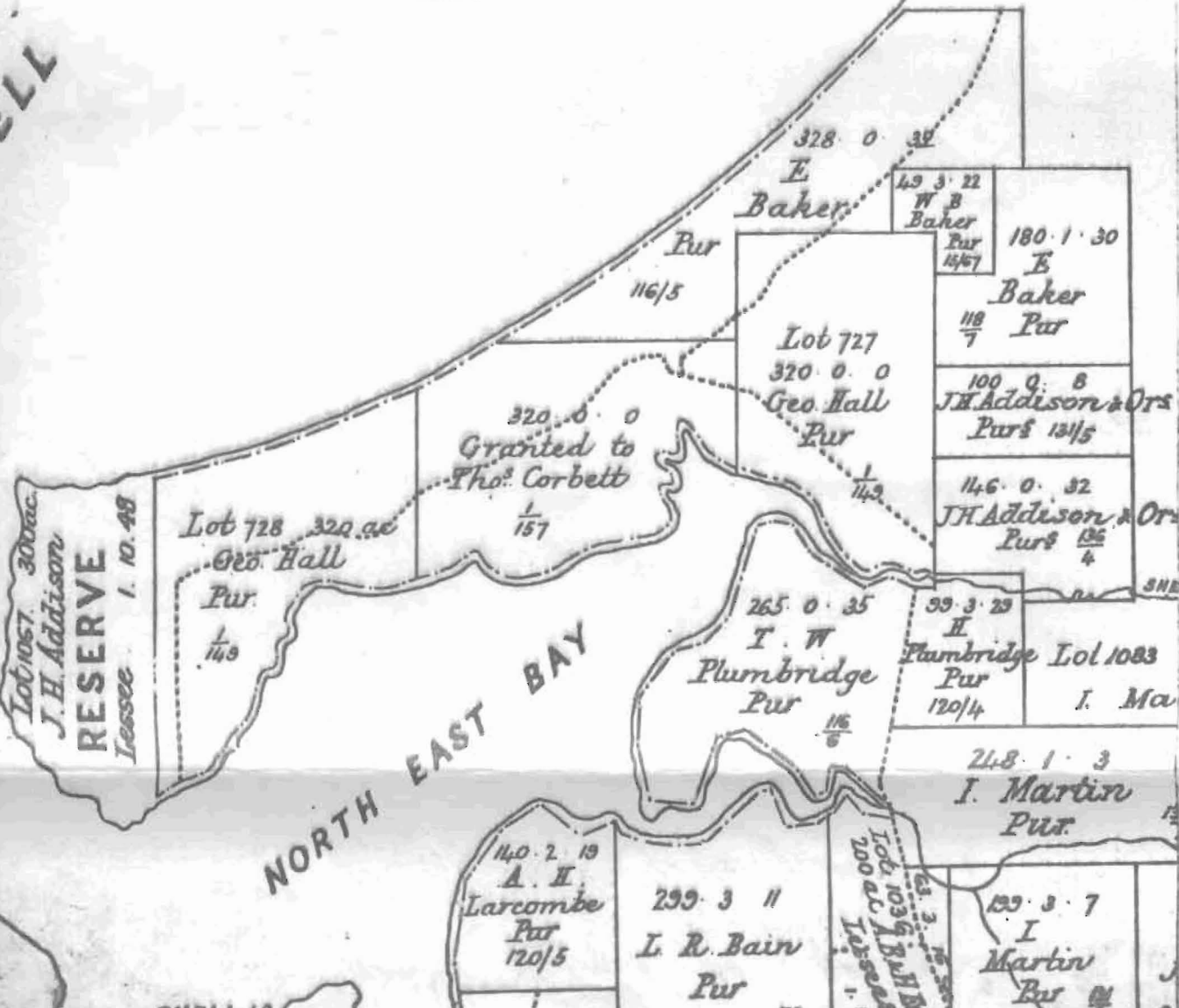


T  
R  
A

277

LITTLE BADGER HEAD

ORELL



NORTH EAST BAY

SMELL 19



# GOODYEAR BATTERIES FOR CESSNA AIRCRAFT



**MR. MALCOLM CHISHOLM,** Manager of The Australian Land Clearing Services Pty. Ltd., is probably doing as much as any-

body at this moment towards the development of primary industry in Central Queensland. Recently his two Le Tourneau

G 40 machines, each weighing 52 tons, cleared away brigalow scrub at Moura, in the vicinity of one of the world's largest coal deposits.

The machines are so massive that, after pushing a tree down, they move over it, breaking the timber into small splinters, which are left to decay and enrich the soil.

Fast, efficient land clearing of this kind gives arable land to farmers in a relatively short time.

Mr. Chisholm considers time one of his most valuable assets. He travels in his own Cessna aircraft, which takes him from Rockhampton to Moura and back in just about an hour. By road the trip would take a full day.

"The Cessna is a great time-saver," says Mr. Chisholm. "But all would be lost if I were held up in Rockhampton for the want of spare parts. The Goodyear people with their friendly and fast service, coupled with sound advice, are playing a big part in helping me to work to schedule. Goodyear products have proved thoroughly dependable in this difficult part of the country."

Picture, above, shows the front-page headline in Rockhampton's Morning Bulletin, featuring the Moura land-clearing feat. Inset is Rockhampton Motor Tyre Service Manager J. L. Peachey (left) handing over one of four Goodyear batteries for Mr. Chisholm's Cessna aircraft.

## Cortina Wins National Title On Goodyear Blue Streak Tyres

**A** FORD factory-entered Cortina which set the motor racing world buzzing with its victorious debut at Calder Raceway, Melbourne, followed up its success by winning its class and gaining fourth outright placing in the Australian Touring Car Championship at Mallala in South Australia.

Harry Firth, who operates the Automotive Specialists business of H. & N. Firth, Auburn, Victoria, tuned and drove the Cortina. He requested that the vehicle should be fitted with Goodyear 5.20 13 Blue Streak sports car special T5 tyres.

Mr. Firth gave the following reasons for choosing the Goodyear sports car special T5 tyres.

- Best road-holding tyres for race work that he has ever used—especially under wet conditions.
- The T5s enabled him to get off the mark quicker and brake more rapidly.
- Wear is excellent—as proved again by the Mallala race, after which, half the tread depth still remained.

In business, Harry Firth calls on Malvern Tyre Service for all tyre requirements.

*Mr. Harry Firth in his Cortina.*



# Salesmanship Needs Showmanship



1. If the customer wants to try the time-honoured layman's kicking test, let him, but then explain to him what the real test of a Goodyear tyre is—rigid inspection during construction and road tests of the severest kind.

2. Make the tyre come alive for the customer by getting it off the rack and into his hands. Urge him to bounce it, flex it, twist it, squeeze it and to get the "feel" of the tyre. Getting the customer "into the act" will enhance your chances to sell.



TO the average customer, a Goodyear Tyre looks basically the same as the competitive brands he has seen at tyre dealers or service stations.

And chances are his tyre quality knowledge is limited to a periodic kick of the tyres on his car. What this time-honoured test proves is unknown, but it has been passed on from one motoring generation to the other.

Customer "ignorance" makes tyre selling a real challenge. To overcome buyer's resistance, which is often based on mere hearsay, and even "superstitions", you must **PUT SHOWMANSHIP IN YOUR SALESMANSHIP** — a high level, completely believable kind of showmanship.

By its very nature a tyre reposing on a display rack is a rather drab, lifeless piece of merchandise. It can, however, be made "to come to life" for the customer. For example, the next time you start your sales talk take an Imperial Nylon out of the rack and get it into the customer's hands.

Urge him to bounce it, flex it, twist it, squeeze it and even smell it! Yes, smell it—there's something pleasing about the smell of a new tyre.

While he's doing these things talk up and sell the advantages of Goodyear tyres — rugged 3-T Nylon cord construction — extra tread rubber — cooler running — tread design that gives greater gripping power—and the many other features and benefits.

Then persuade him "to get into the act" with any other of our tyres. He'll immediately notice that there is a big difference in the two tyres when he performs the same tests that he did with the Imperial Nylon. Underscore the advantages of one over the other.

At this point, if you have succeeded in putting on a lively, interesting performance, the customer is primed for Step Five of the Five Steps To A Tyre Sale. Keep your sights high and ask for the sale.

Why not link showmanship with your salesmanship? All it takes is a little imagination and a large dose of enthusiasm. It can help you achieve untold plus sales.

3. Sell the advantages of Goodyear Tyres while the customer is examining the merchandise. Point out and let him see for himself the outstanding construction features. This will keep his interest and give your salesmanship a chance to shine.



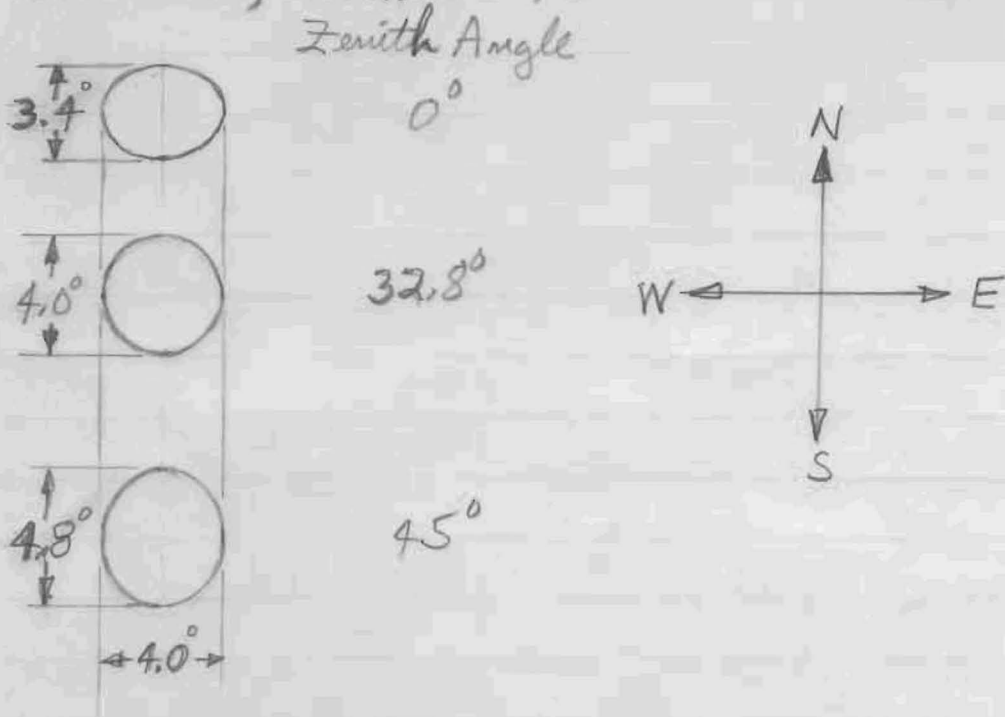
4/12/64

# Aperture Shape

According to analysis of 17/5/64 the array is to operate from  $0^\circ$  to  $45^\circ$  zenith angle. A kind of aberration will cause beam to broaden out in N/S direction when off zenith. It is caused by shortened projected aperture of array. Maximum beam width is  $1/\cos 45^\circ = 1.414$  times zenith beam width. This may be divided evenly as  $(1.414)^{1/2} = 1.190$  elongation E/W when beam is at  $0^\circ$  and 1.190 elongation N/S when beam is at  $45^\circ$ . Beam will be circular at  $\theta = \cos^{-1}(1/1.190) = \cos^{-1}0.84 = 32.8^\circ$  from zenith. Thus  $a = 1.190b$ ; where  $a$  and  $b$  are semi N/S and semi E/W axis of elliptical aperture.

The E/W aperture will be 16 wavelengths. Thus the N/S aperture will be  $1.190 \times 16 = 19$  wavelengths

The beam will be  $4^\circ$  E/W  $\times$   $3.4^\circ$  N/S at  $0^\circ$ ,  $4^\circ \times 4^\circ$  at  $32.8^\circ$ ,  $4^\circ \times 4.8^\circ$  at  $45^\circ$ .





Equation of boundary of active region 9/12/64

Ellipse  $\frac{x^2}{b^2} + \frac{y^2}{a^2} = 1$  or  $\frac{a^2 b^2}{b^2 \sin^2 \theta + a^2 \cos^2 \theta} = r^2$

Using methods of 25/3/61  $b = 7.75$  and  $a = 9.25$   
 $b^2 = 60.0$

$y = a(1 - x^2/b^2)^{1/2}$

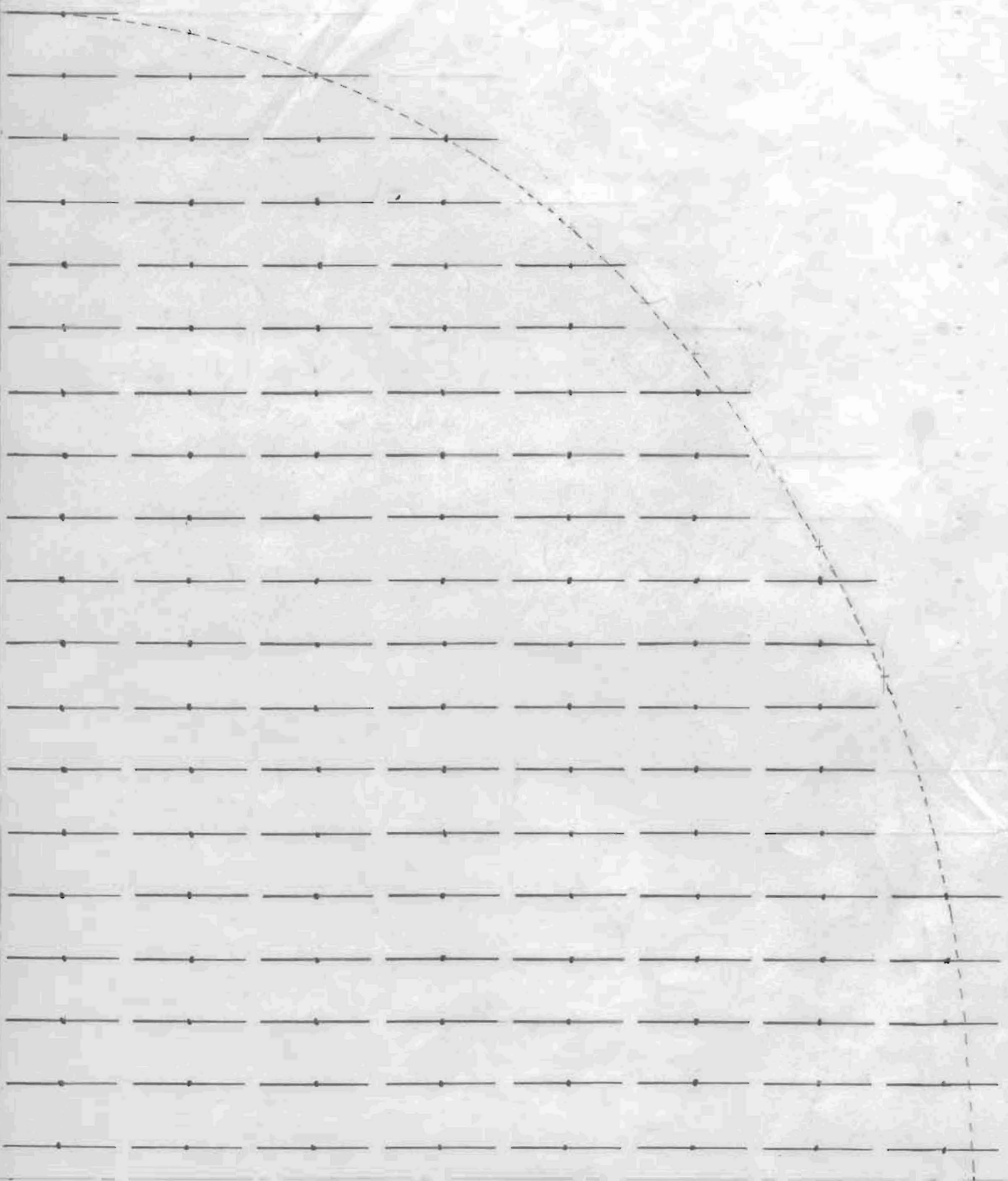
X	$X^2/b^2$	$(1 - X^2/b^2)$	$(-)^{1/2}$	Y
0	0	1	1	9.25
.5	.0042	.9958	.998	9.23
1.5	.0375	.9625	.981	9.08
2.5	.1041	.8959	.946	8.76
3.5	.2040	.7960	.892	8.25
4.5	.3370	.6630	.814	7.53
5.5	.5040	.4960	.705	6.52
6.5	.7080	.2920	.544	5.00
7.0	.8160	.1840	.429	3.97
7.5	.9380	.0620	.250	2.31
7.75	1.0000	0	0	0

Each quarter of array contains:

5 lines of 8 = 40	5 lines of 7 = 35
5 lines of 7 = 35	5 lines of 7 = 35
3 lines of 6 = 18	3 lines of 6 = 18
2 lines of 5 = 10	2 lines of 6 = 12
2 lines of 4 = 8	2 lines of 4 = 8
1 line of 3 = 3	1 line of 4 = 4
1 line of 1 = 1	1 line of 6 = 6
<u>19 lines</u>	<u>19 lines</u>
115 active	118 posts
19 end	
Total 134 poles	

$\frac{115}{134} = .86$  efficiency.

4/12/64

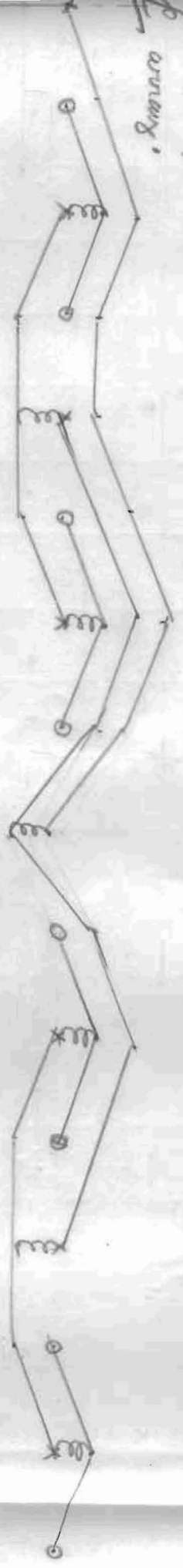


Pole, X = port,  $\circ$  = anchor

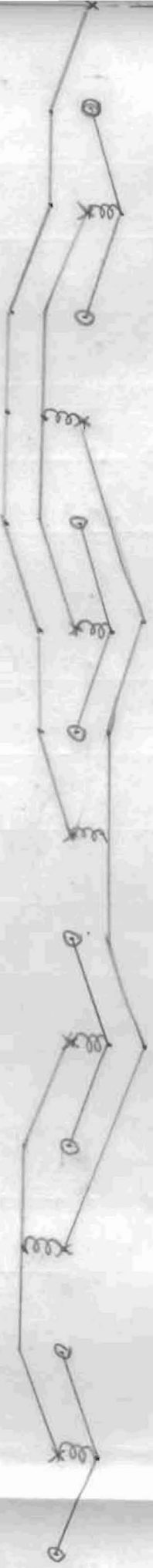
Full wire layout

8/12/64

to carry



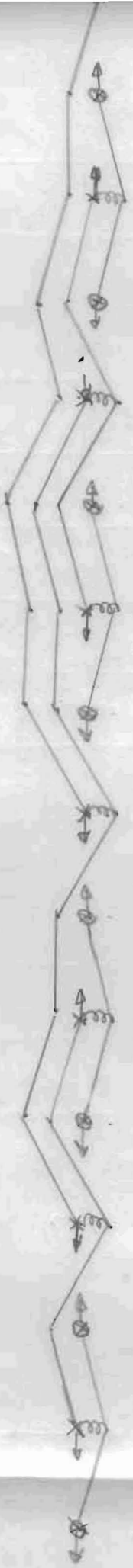
6-1/0  
3-1/1  
3-2/0  
1-2/1  
1-3/0  
14



6-1/0  
3-1/1  
3-2/0  
2-2/1  
14

Best design on north side of all poles in clear,

15 anchors, 15 stays, 7 ports, 7 boxes

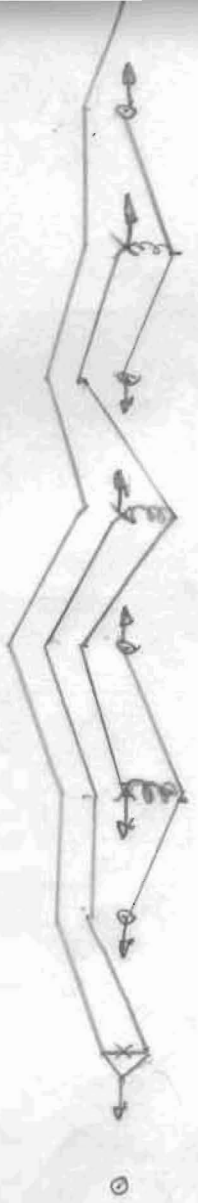


6-1/0  
3-1/1  
3-2/0  
1-2/1  
14

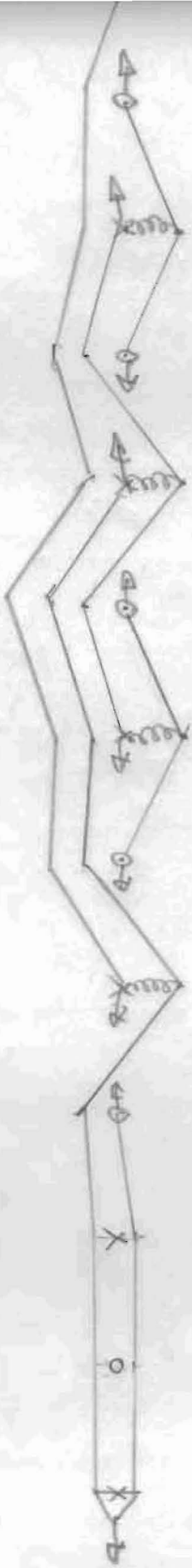


6-1/0  
3-1/1  
3-2/0  
2/1  
14

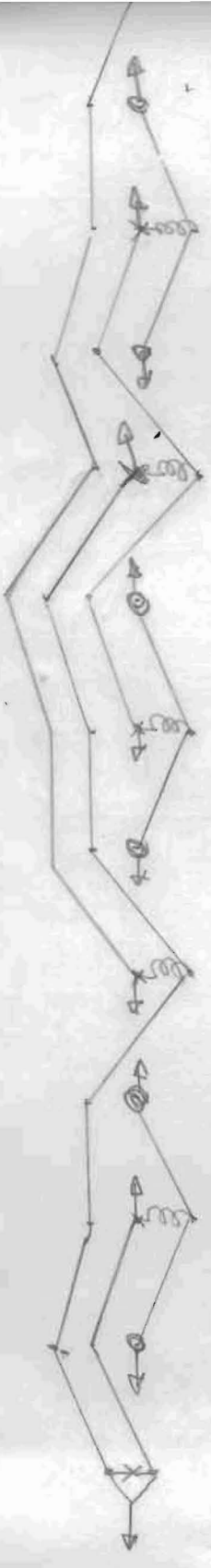
8/12/64



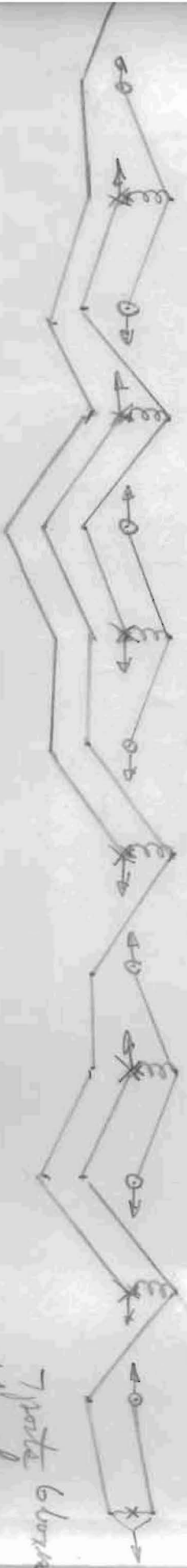
8 vertices  
9 staves  
4 paths  
3 boxes



10 vertices  
11 staves  
6 paths  
4 boxes



12 vertices  
13 staves  
6 paths  
5 boxes



15 vertices  
16 staves  
7 paths  
6 boxes

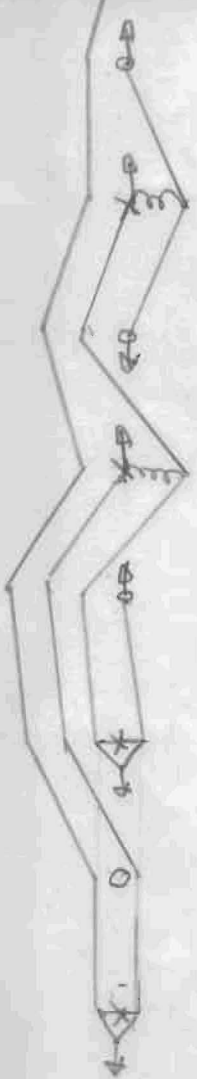
1 - 1/2 / 1/2	12 vertices
1 - 1/0	1 - 1/2 / 1/2
2 - 1/1	3 - 1/0
2 - 2/0	3 - 1/1
1 - 2/1	3 - 2/0
1 - 3/0	1 - 2/1
8 vertices	1 - 3/0
3 - 1/2 / 1/2	1/2 vertices
3 - 1/0	1 - 1/2 / 1/2
2 - 1/1	5 - 1/0
2 - 2/0	3 - 1/1
1 - 2/1	3 - 2/0
1 - 3/0	1 - 2/1
10 vertices	1 - 3/0
11 staves	14 vertices
6 paths	1 - 3/0
4 boxes	14 vertices





2 anukura  
3 ataya  
6 pata

7 - 2 1/2  
1 - 1/0  
8 anukura



7 anukura  
9 ataya  
4 pata  
2 kaxa

2 - 2 1/2  
1 - 1/2 / 2 1/2  
2 - 1/0 / 1  
1 - 2/0  
1 - 3/0  
8 anukura