POWER SUPPLY SPECIFICATIONS

There follows the design specification and list of items for a complete set of replacements for the power supplies ordered from J. J. Mothelfer, Winding Laboratories, 111 Albermarle St., Trenton, N. J.

Four items are involved in all but two of the power supplies. These are:

(I) plate transformer

(II) interphase transformer

(III) filter choke

(IV) filament transformer

The specifications for these items are given below.

Each of the four items is to be insulated for 2000 volts test. All loads are to be ungrounded. Class A insulation is to be used. The supplies are to be designed for a 50 degrees centigrade rise.

(I) A 60 cycle plate transformer, with a delta three phase primary to operate from a 240 volt a-c line. Primary taps to give a plus and minus one per cent adjustment at one end and a plus and minus three per cent adjustment at the other end of each phase. These percentages are very approximate, that is, no attempt is to be made to wind fractional turns. For the supplies with secondary voltages of less than 60 volts, the primary taps should give approximately a plus and minus 1 volt adjustment and a plus and minus 3 volt- adjustment at the secondary.

The secondary consists of six coils, to be connected in double-wye. each coil giving the r.m.s. voltage from line to neutral specified in column 4 of Table I. The primary and secondary KVA ratings of each transformer are specified in columns 2 and 3 of Table I.

The plate transformer and interphase transformer are to give an over-all regulation as specified in column 5 of Table I.

All plate transformers are to be provided with terminal strips.

(II) A 160 cycle interphase transformer, of one of the seven types specified in Table II. The KVA rating of each half is specified in column 1. Column 2 gives the r.m.s. voltage to be applied from end to center. Column 3 gives the current the

Table III

D-C Filter Chokes (Different Types)

	(1) Maximum d-c Current (amperes)	(2) D-C Resistance in ohms	(3) Inductance in millihenries at maximum d-c current	(4) Mothelfer Winding Labs. Number	(5) Quantity Used
No. 1	38.4	0.1	8	1954	1
No. 2	32.0	0.05	12.5	1983	4
No. 3	19.2	0.05	12.5	1959	7
No. 4	10.0	0.2	50	1990	2
No. 5	6.0	0.1	25	1965	5
No. 6	7.5	1.0	100	1949	1
No. 7	20.0	0.1	20	1940	1
No. 8	30.0	0.025	0.25	2057	1
No. 9	13.0	0.1	10	1989	1
No. 10	19.0	0.1	25	1871	1

Table IV

Filament Transformer (Different Types)

(1) Wattage	(2) Mothelfer Winding Labs. Number	(3) Quantity Used
100*	1951	12
150	1956	6
360	1939	6

* This transformer, as designed and constructed by the Mothelfer Winding Laboratories, will safely handle 150 watts.

In addition, there is one transformer for the 2 supply, designed according to the following specifications:

Table V

Primary winding to operate at 240 volts, single phase with two taps on one end of the coil. One tap is to give an adjustment of 42 1/2 per cent and the other an adjustment of a-2 1/2 per cent. There are to be two secondary windings, one for the

winding is to be designed to carry. Column 4 gives the 160 cycle exciting current which is not to be exceeded when the voltage of column 2 is applied to one-half the coil. Column 5 gives the d-c resistance (in ohms) of both coils in series.

(III) A 360 cycle filter choke, of one of the six types specified in Table III. Column 1 gives the maximum direct current, column 2 the d-c resistance in ohms, and column 3 the inductance in millihenries at the maximum d-c current.

(IV) A 60 cycle filament transformer, single phase, with a 240 volt primary with plus and minus 2.5 per cent taps in the primary winding. The secondary winding is to give 2.5 volts and is to be center tapped. The filament transformer is to be one of three ratings, 100 watts, 150 watts, and 360 watts.

All items are to be replacement items, and are to be identical in design with those already purchased, except for plate transformers H and I, which did not quite come up to original design specification, and hence, must be redesigned. One item of each kind is to be purchased under this order.

Table I: - Plate Transformers (Different Types)

(1) Model	(2) Primary KVA	(3) Secondary KVA	(4) Secondary Voltage from Line to Neutral	(5) % Regulation	(6) Mothelfer Winding Laboratories Number
A	9.2	13.0	240	4	2001
B	1.6	2.3	125	4	2000
C	0.7	1.0	85	2	1961
D	1.0	1.5	38	2	1966
E	1.2	1.7	55	2	1967
F	4.25	6.0	173	2	1974
G	1.6	2.3	215	3	1978
J	0.4	0.6	55	2	1977
K	0.7	1.0	38	2	1961
L	1.5	2.1	60	2	1962
M	2.5	3.7	64	2	1981
N	3.2	4.6	85	2	1983
O	0.8	1.2	34	2	1966
P	2.1	3.0	155	2	1944
Q	0.6	0.9	77	2	1967
R	0.5	0.7	65	2	1995
S	0.5	0.7	47	2	1993
T	2.2	323	200	4	1996
U	0.5	0.8	200	4	1948
V	2.1	3.0	55	4	2002
W	1.5	2.2	160	4	2003
X	0.4	0.6	25	2	1952
Y	Identical with X				
AA	0.4	0.6	64	2	1946
BB	1.2	1.6	173	4	1985
CC	Identical with BB				

Quantity of Plate Transformers Used: 1 each, except 2 of X (1952) and 2 of BB (1985)

filament and one for the plate. The filament winding is to deliver two amperes at 4.75 volts and is to be center tapped. The plate winding is to deliver 65 volts at 30 milliamperes and is to be designed to carry 40 milliamperes; it is also to be center tapped. Every coil is to be isolated from ground and insulated for 2000 volts test. Class A insulation is to be used. The transformer is to be designed for a 40 degree centigrade rise.

Total of items ordered

Plate transformers as described in Table I	26
Interphase transformers as described in Table II	9
D. C. Filter chokes, as described in Table III	6
Filament transformer, " " " " IV	1
Special transformer " " " " V	1
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Note: The designs on the following two plate transformers were changed when replacements were ordered, since the original transformers failed to meet specifications. At rated load current they had a temperature rise as measured on the outside of the coils of 50° C; the rise inside must have been at least 60° C.

H	5.1	7.2	165	2	1975
I	8.6	12.5	165	4	1937-A

These replacement plate transformers were designed so as to have the same mounting dimensions. An increase in height of as much as 2 1/2 inches was allowed. The original design specification called for a centigrade rise of 50°, which according to practice is the rise inside the coils. These transformers were redesigned so as to meet this specification.

Table II

Interphase Transformers (Different Types)

No.	(1) KVA	(2) Voltage from End to Center	(3) Current in each Half (amperes)	(4) Exciting Current (amperes)	(5) Total d-c Resistance (ohms)	(6) Mothelfer Winding Labs. Number	(7) Quantity Used
1	.6	36	16	0.3	.09	1947	3
2	2.0	100	20	0.5	.10	1988	2
3	.85	85	10	0.1	.05	1985	7
4	.45	65	5	0.1	.10	1999	6
5	.08	32	2.5	0.05	.10	1946	5
6	.9	70	12.5	0.3	.05	1960	1
7	.09	85	1.0	0.05	1.0	1987	1
8	.3	76	2.5	.2	.25	2002	2
9	.72	76	9.5	.2	.05	1872	1

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UNIVERSITY OF PENNSYLVANIA

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MATERIAL | FINISH | SCALE

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Approved by:

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