Ariel II Engineering Data Analysis

Phase I Report

Volume II of Two Volumes

23 June 1965

Contract No. NAS5-9104

Prepared by

Westinghouse Electric Corporation

Aerospace Division

Baltimore, Maryland

for

Goddard Space Flight Center

Greenbelt, Maryland

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DESCRIPTION OF GRAPHS

I. Composite Orbit Graphs (378)

A composite graph containing 2-4 orbits is presented approximately each 100 orbits. The orbit with the most data was taken as the base orbit. Zero-time for the composite graph is taken from the base orbit and is identified in days, hours and minutes (GMT).

A point-by-point plot of a five-minute interval is included for the signals of Dump Current and Solar Current to show the effects of spin modulation. For these two signals maximum and minimum points were plotted. For all other signals, the points plotted were the values at the five-minute interval. A listing of the composite orbits is provided by Table II.

II. Percent Sunlight Graphs (25)

One plot for each base orbit (except the last two for which insufficient data was available) shows entrance and exit times.

III. 200-Day Graphs (16)

a. One graph for each of the 14 performance parameters shows maximum and minimum points for sunlight (⊡—□) and darkness (○—⊙) for Battery Current. All other parameters are orbit maximum and minimum points regardless of whether in sunlight or darkness.

b. A Percent Sunlight Graph

c. A Spin Rate Graph

IV. Special Purpose Graphs (63)

a. Plots for maximum sunlight (100%) orbits (#409 and #1391), minimum sunlight (62.9% for orbit #2629 and 63.2% for orbit #100), the hottest day, and the coldest day were made using the following combinations:

1. Both ozone temperatures

2. Spectrometer A and upper shelf temperatures

3. Battery and lower shelf temperatures

4. Spectrometer A and lower shelf temperatures

b. Ten-Orbit Thermal Stabilization Graphs, one graph for each temperature.

c. Sunrise, Pure Sunlight, and Sunset Graphs of both Ozone Spectrometer and Broadband Ozone Data. Ordinates are in GSFC frequency printout units. Abscissas are time with the time markers on the left hand edge. Eight pulses make up one complete revolution of the satellite.

d. High Speed (HS) and Low Speed (LS) Galactic Noise Graphs. Ordinates are in GSFC frequency printout units.

HS - Swept oscillator 0.75-3 mc. Sequence numbers refer to 1/6 of range being swept.

LS - Ferrite core antenna tuned to approximately 2 mc.

e. Sample Ozone Spectrometer responses illustrate sensor degradation with time.

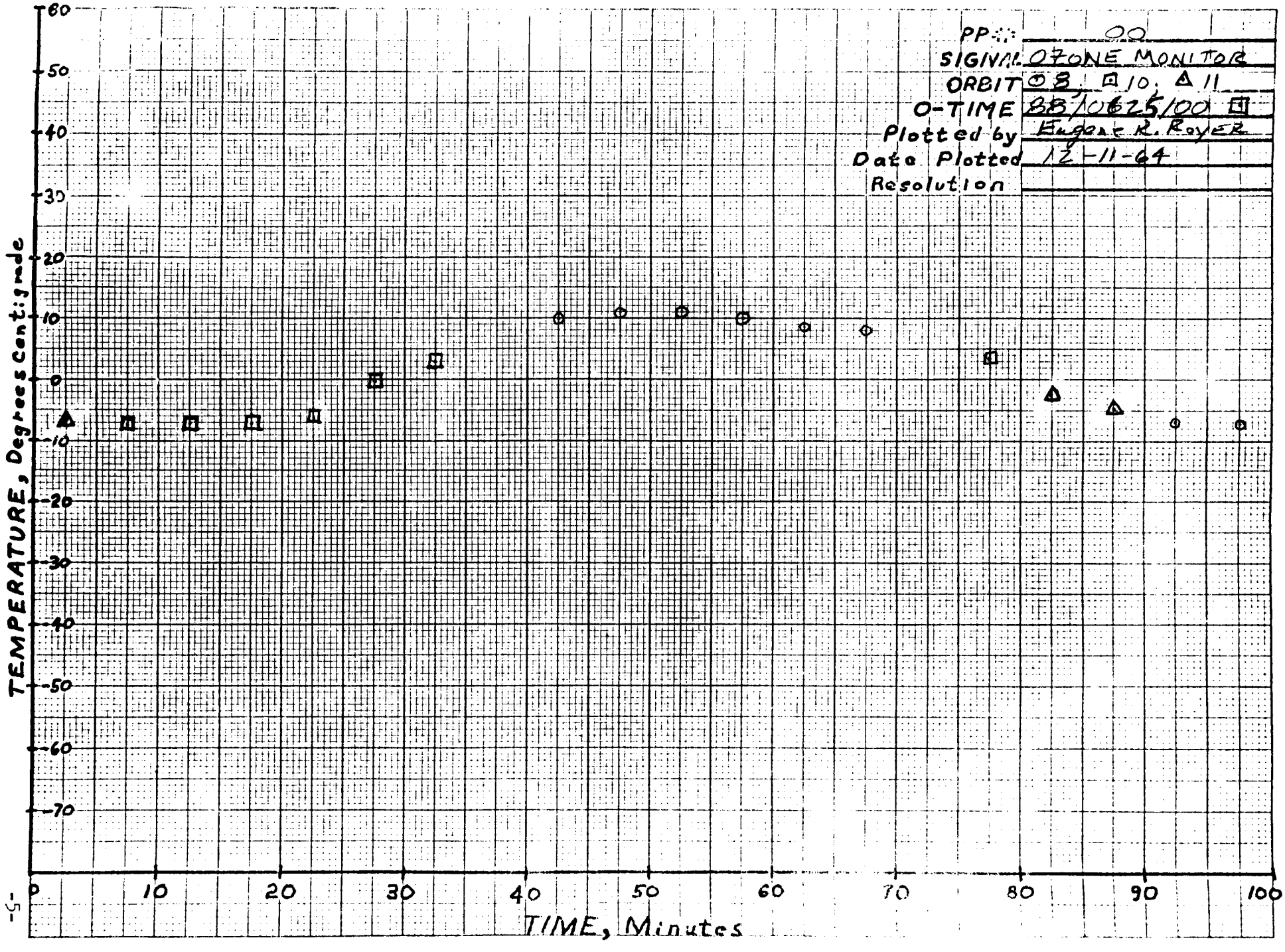
f. Sample Micrometeorite responses show the effects of attitude variations.

TABLE II

COMPOSITE ORBIT LISTING

Base orbit	Composite orbits	Day of Year	Days from Launch*
10	08, 10, 11	88	1
100	100, 106, 107	94	7
190	190, 191, 198	101	14
293	293, 293, 294, 301	107	20
409	409, 415	116	29
515	508, 514, 515, 516	123	36
614	608, 614, 615	130	43
704	704, 710	137	50
815	808, 809, 815	144	57
906	906, 907, 914	151	64
1013	1004, 1005, 1013	158	71
1106	1106, 1116	165	78
1204	1204, 1210	172	85
1391	1391, 1398, 1399	185	98
1503	1503, 1513	193	106
1603	1603, 1610	200	113
1701	1701, 1709, 1710	207	120
1799	1799, 1800, 1807	214	127
1926	1904, 1926	222	135
2002	2002, 2003, 2010	228	141
2109	2101, 2102, 2109	235	148
2222	2213, 2214, 2222	243	156
2320	2311, 2312, 2320	250	163
2432	2425, 2432	258	171
2531	2531, 2536	265	178
2629	2628, 2629	272	185
2706	2706, 2707	277	190

*Launched 27 March 1964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ORBIT ⊙ 8, ⊡ 10, △ 11
O-TIME 88/10625/00 ⊡
Plotted by Eugene R. Royer
Date Plotted 12-11-64
Resolution
TEMPERATURE, Degrees centigrade
60
50
40
30
20
10
0
-10
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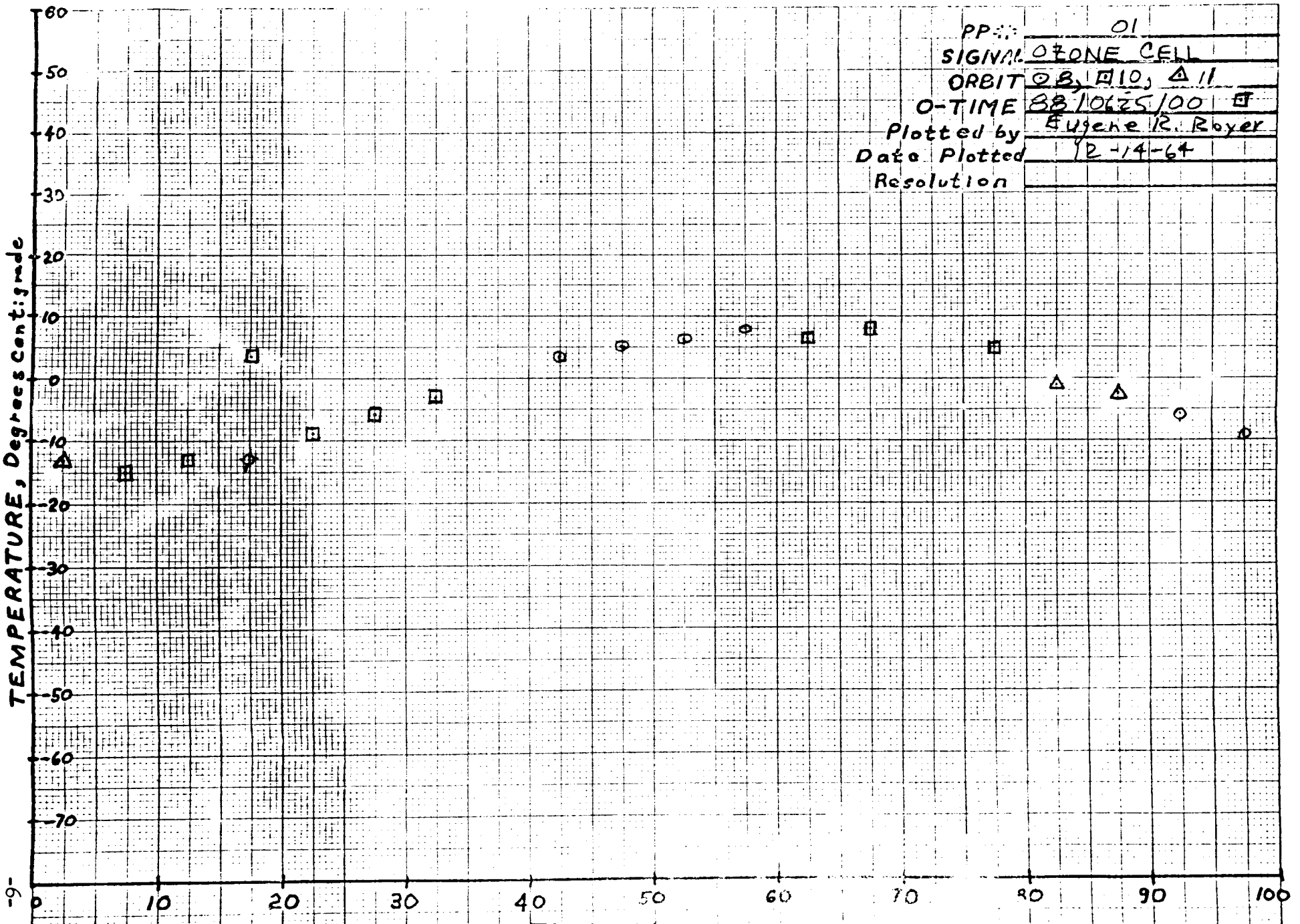
90
100
TIME, Minutes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SIGNAL OZONE CELL
ORBIT ⊙ 8, ⊡ 10, △ 11
O-TIME 88/06/25/00 ⊡
Plotted by Eugene R. Royer
Date Plotted 12-14-64
Resolution
TEMPERATURE, Degrees Centigrade
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50
40
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10
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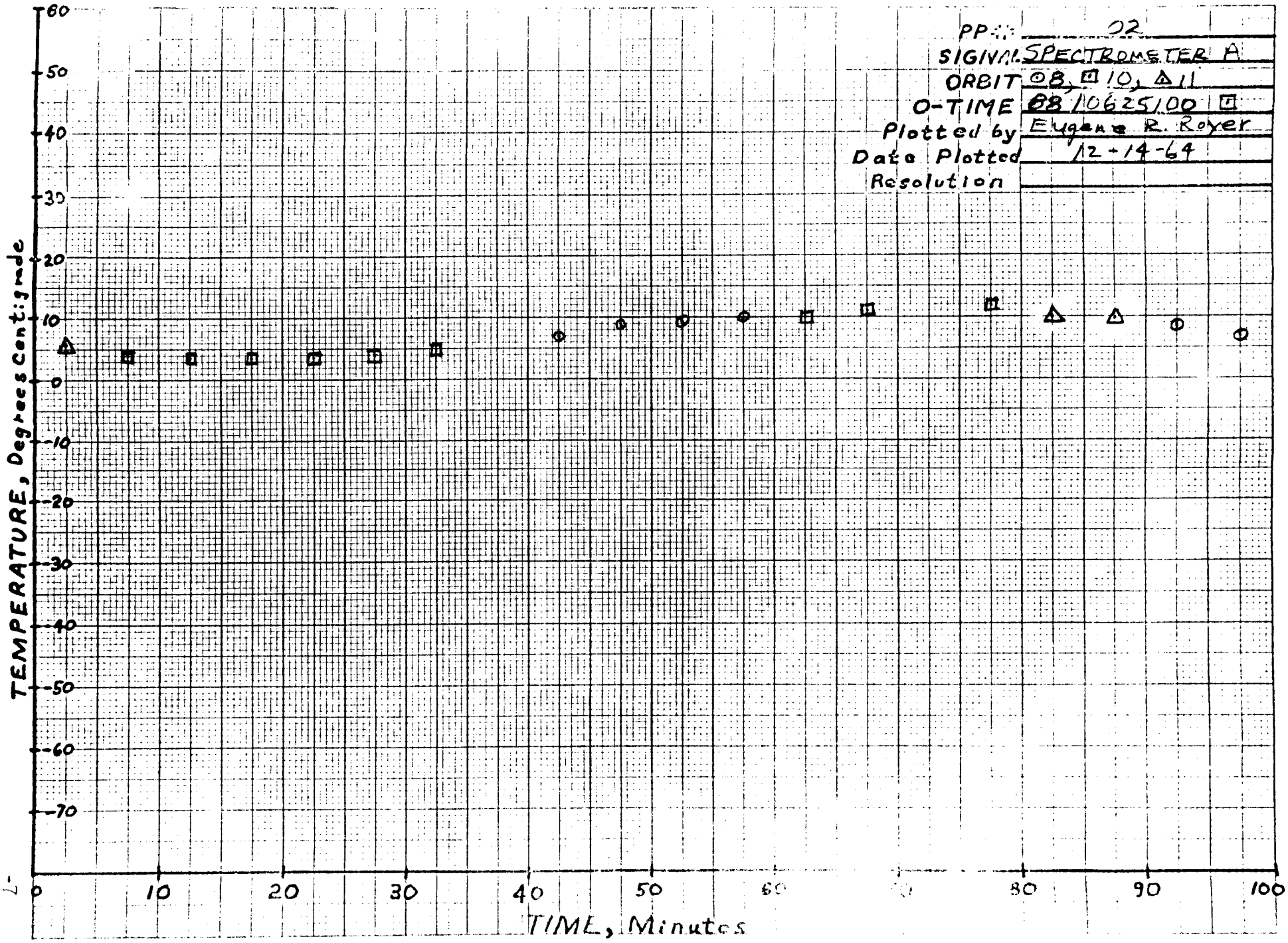
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SIGNAL: SPECTROMETER A
ORBIT: ⊙ 8, ⊡ 10, △ 11
O-TIME: 08/10625/00 ⊡
Plotted by: Eugene R. Royer
Date Plotted: 12-14-64
Resolution:
TEMPERATURE, Degrees centigrade
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-10
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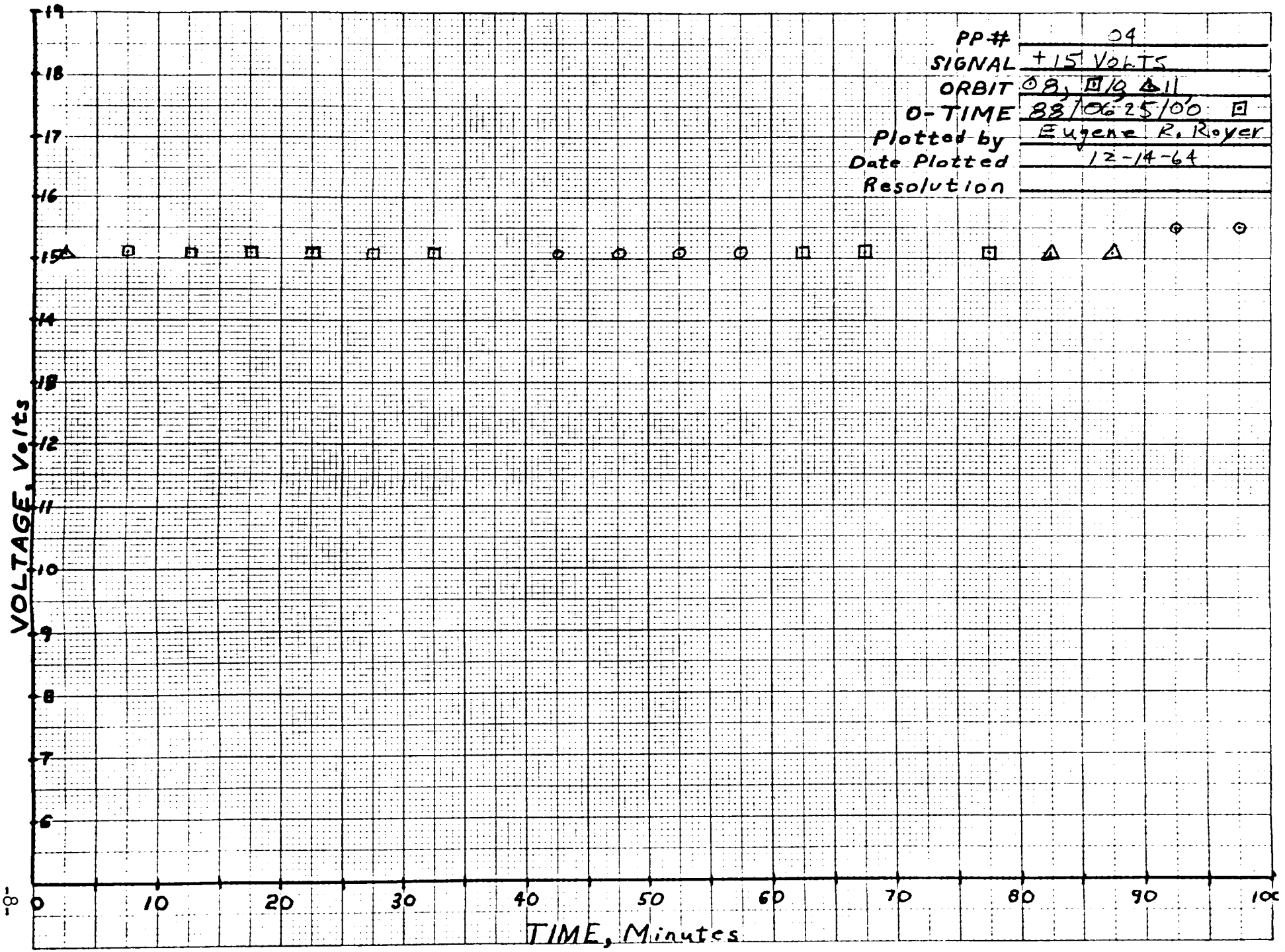
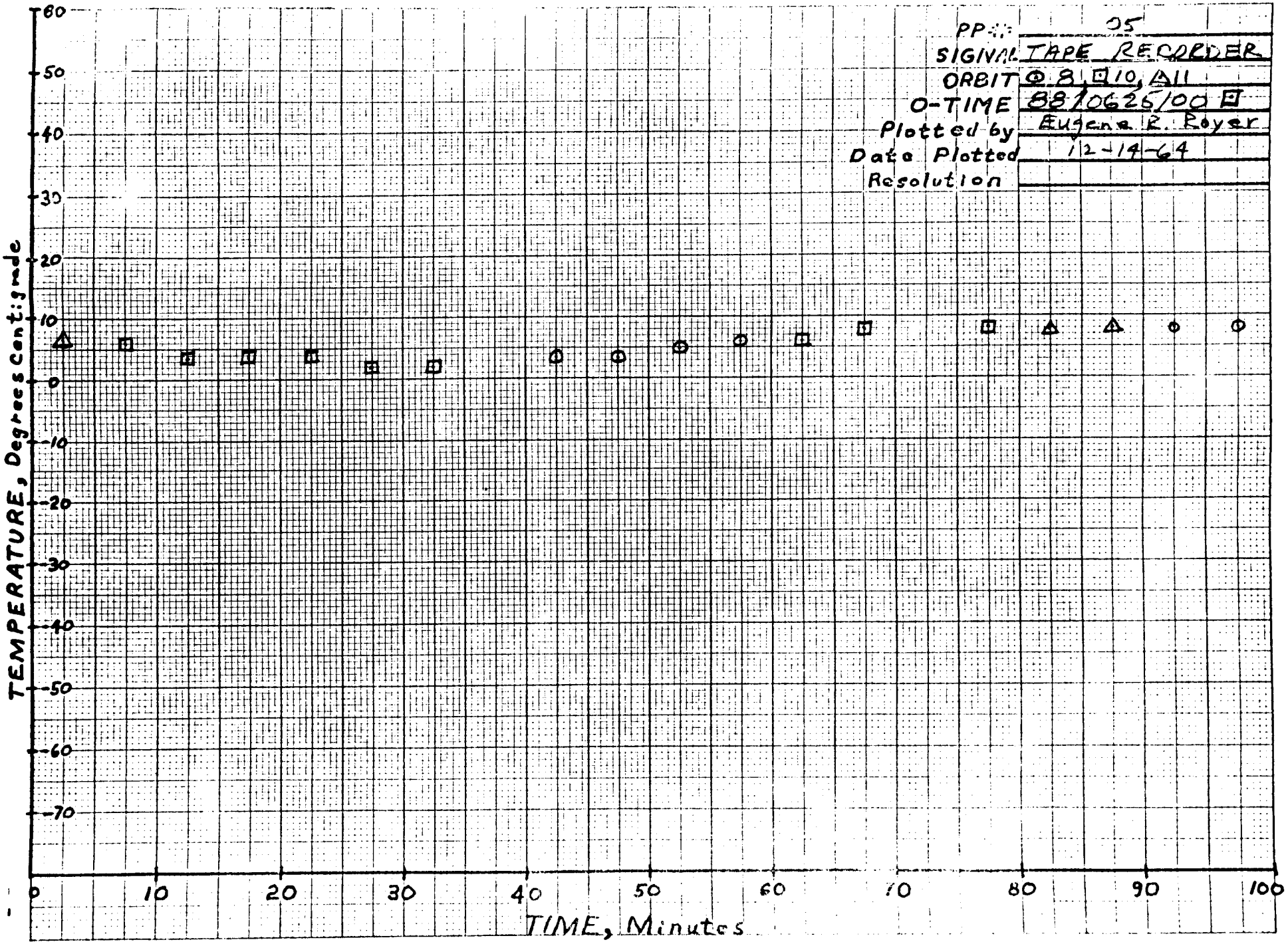
90
100
TIME, Minutes

K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.




PP#: 05
SIGNAL TAPE RECORDER
ORBIT ⊕ 8, ⊡ 10, △ 11
O-TIME 88/0625/00 ⊡
Plotted by Eugene R. Royer
Date Plotted 12-14-64
Resolution
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
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-30
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-60
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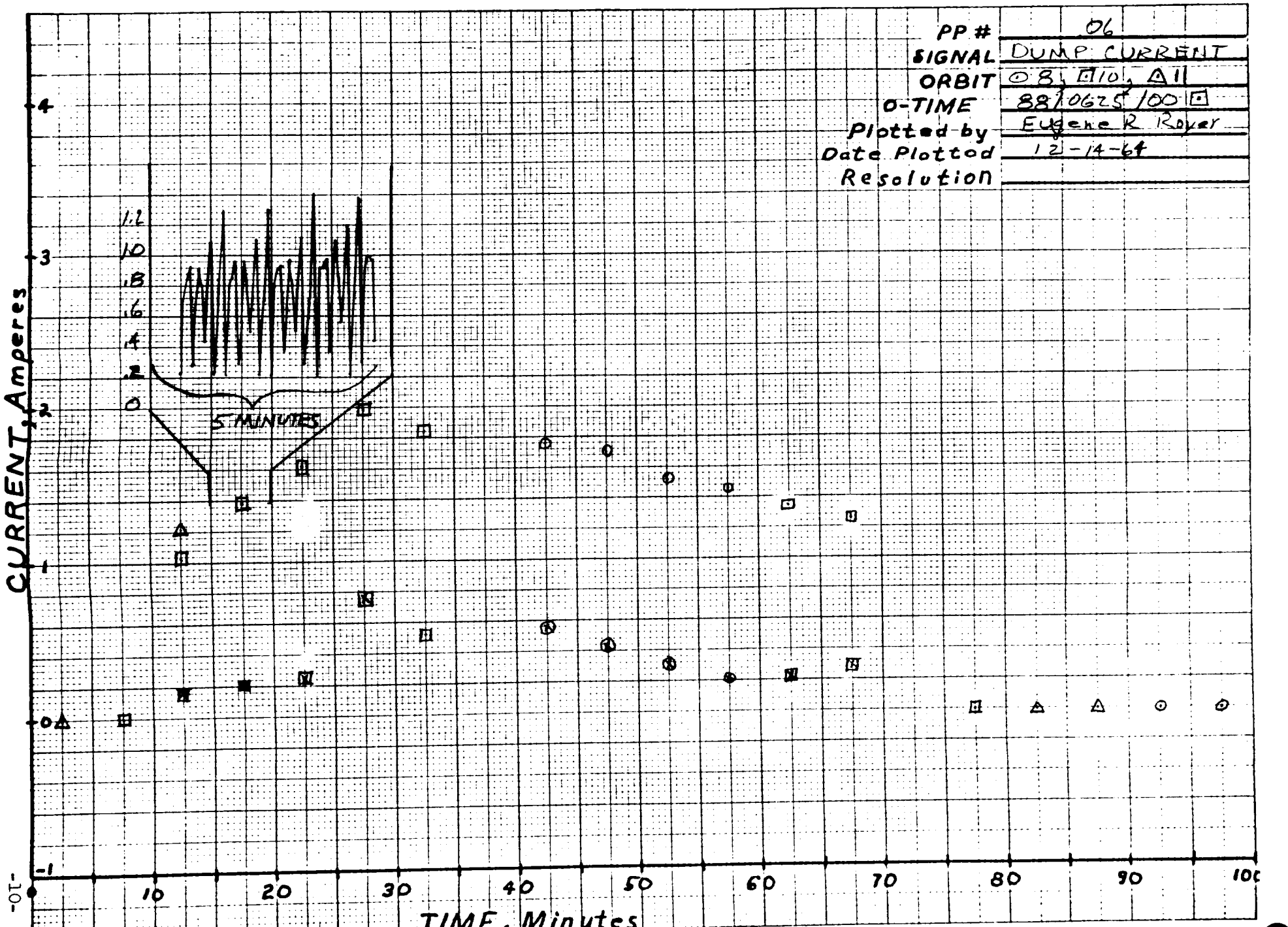
90
100
TIME, Minutes

K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



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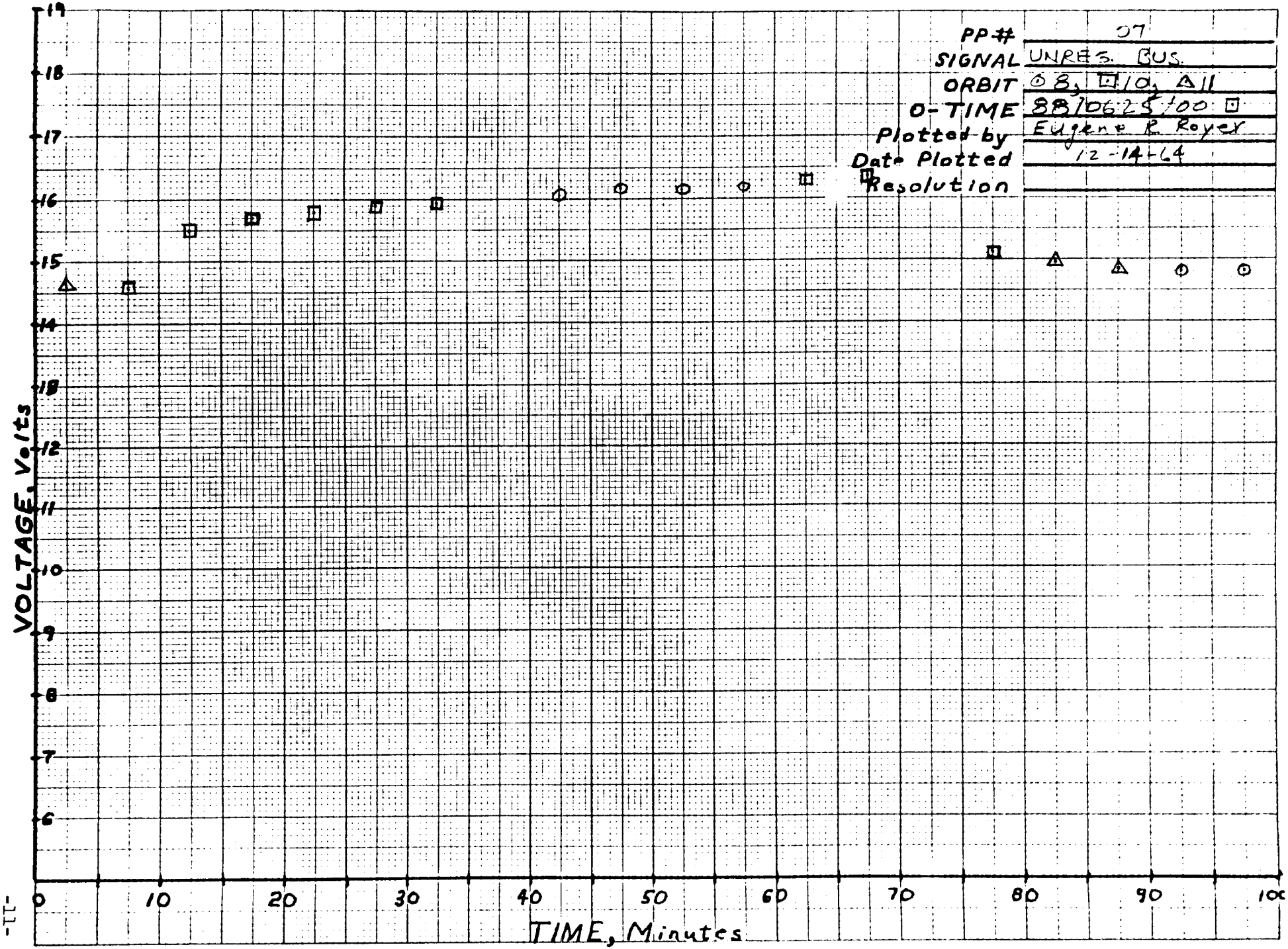

K&E 10 X 10 10 1/2 INCH 46 1472
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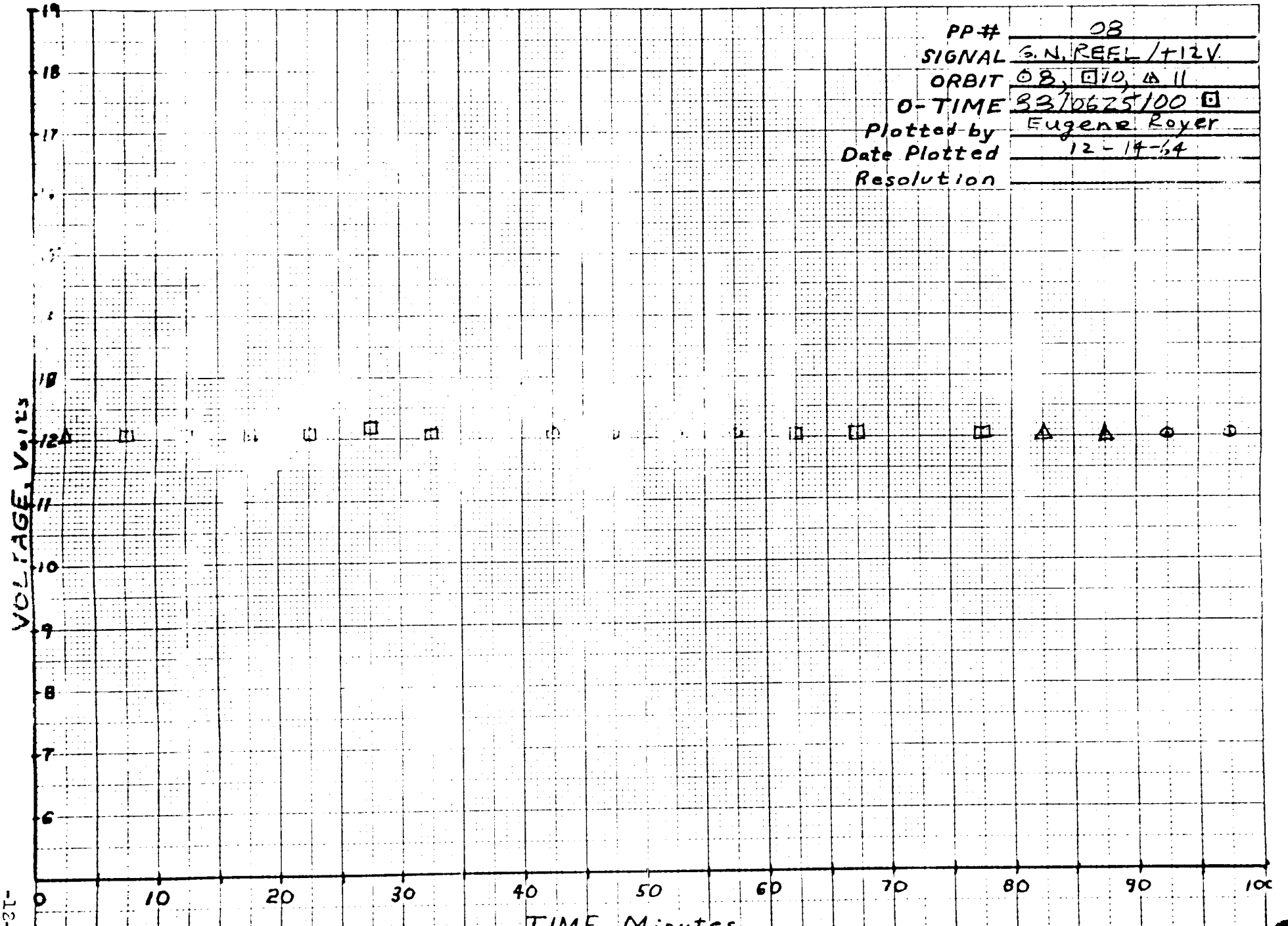
KEUFFEL & ESSER CO.



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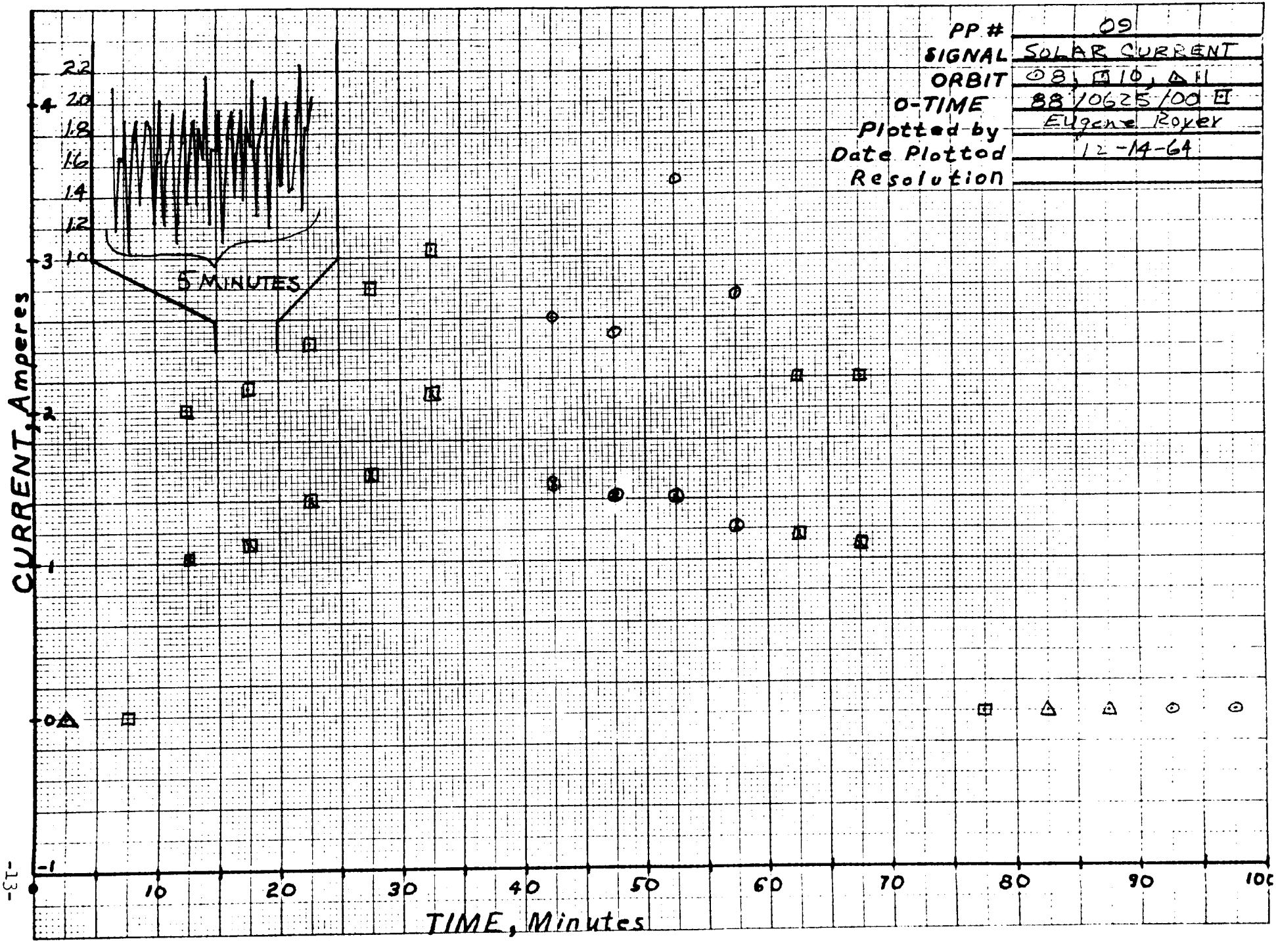
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



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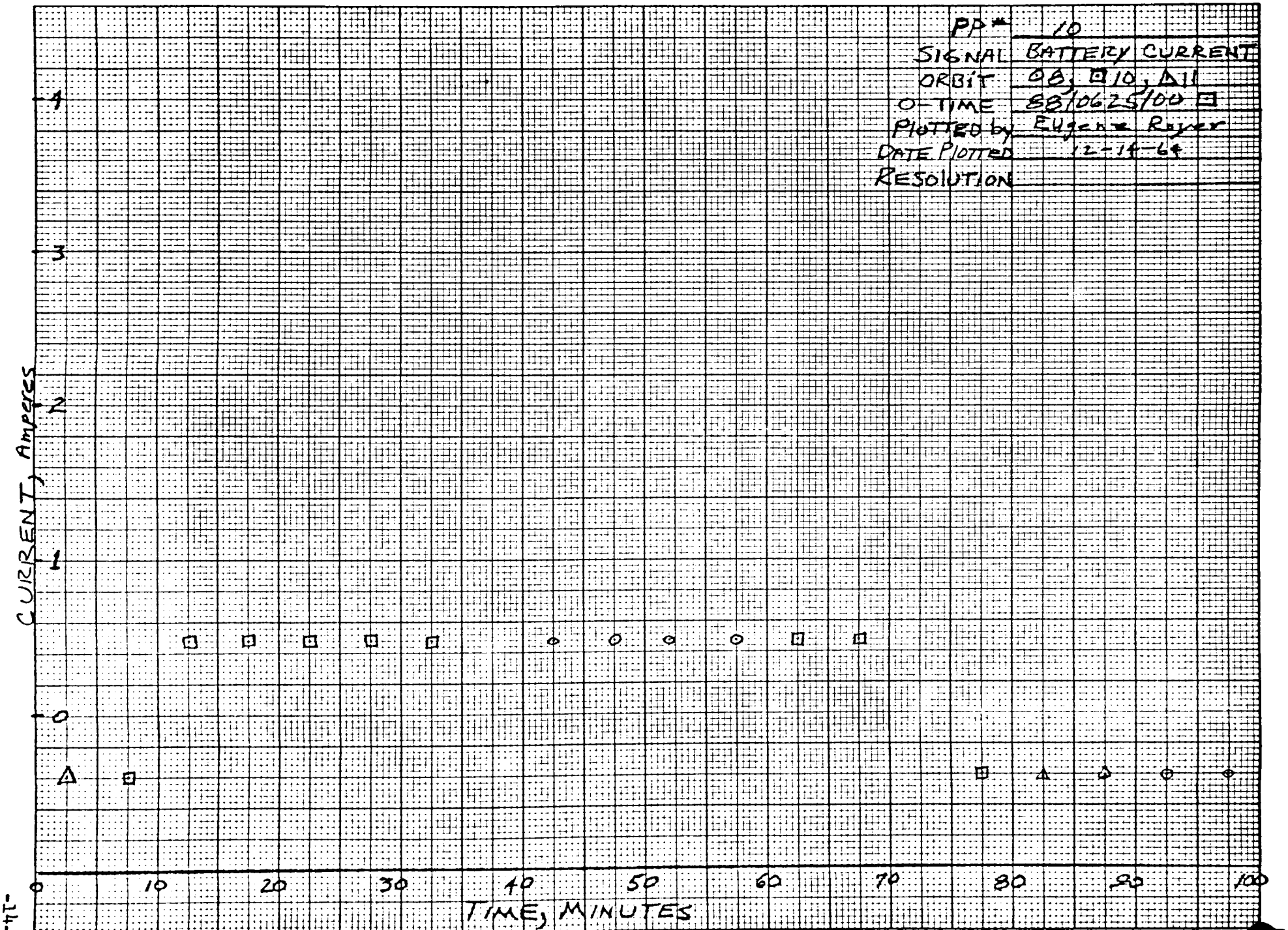
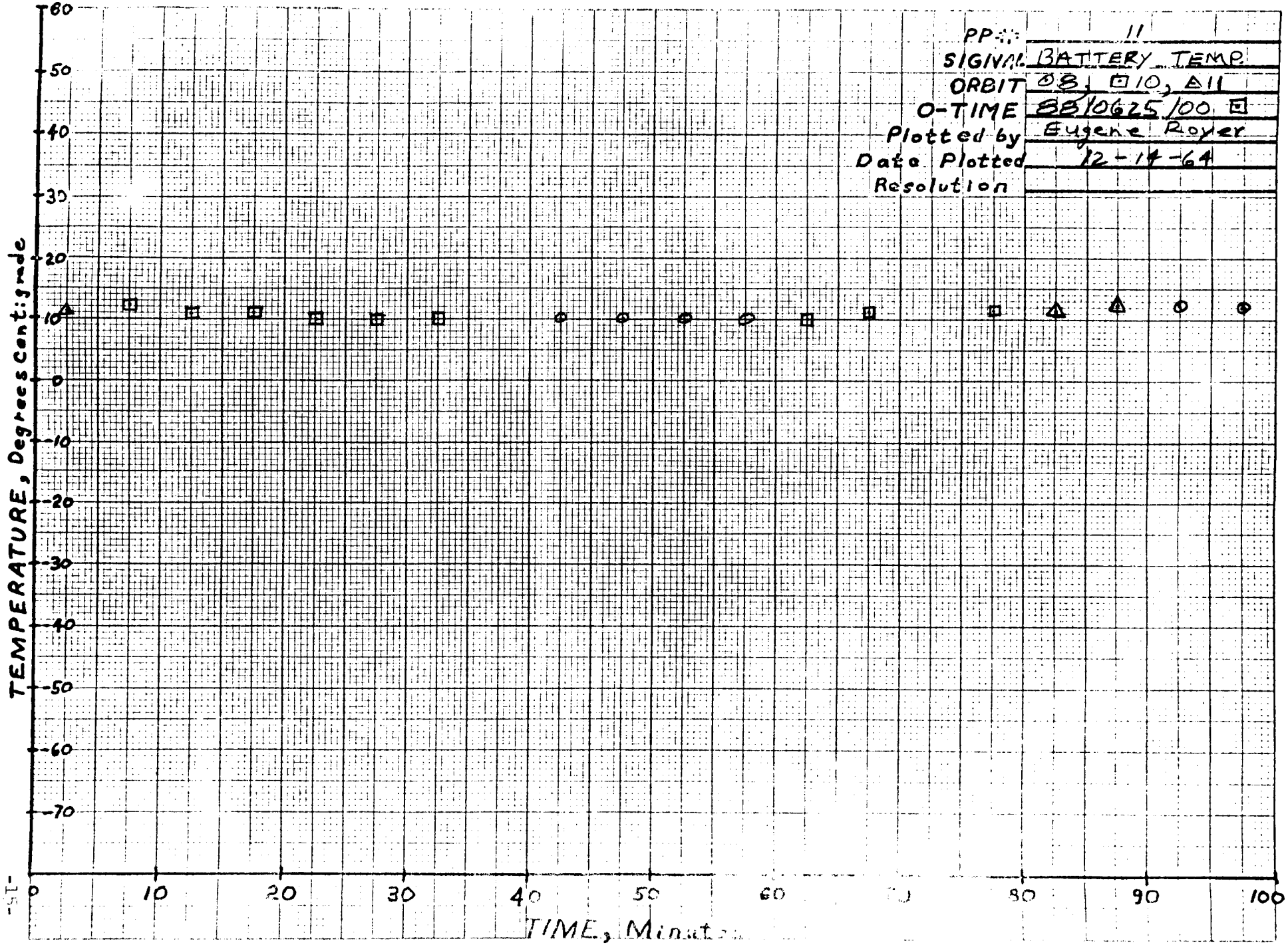
7½ X 10 IN • ALBANENE MADE IN U.S.A.
KEUFFEL & ESSER CO.

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SIGNAL: BATTERY TEMP.
ORBIT: ⊙8, ⊡10, △11
O-TIME: 88/0625/100 ⊡
Plotted by: Eugene Royer
Date Plotted: 12-14-64
Resolution:
TEMPERATURE, Degrees centigrade
60
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-60
-70
0
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40
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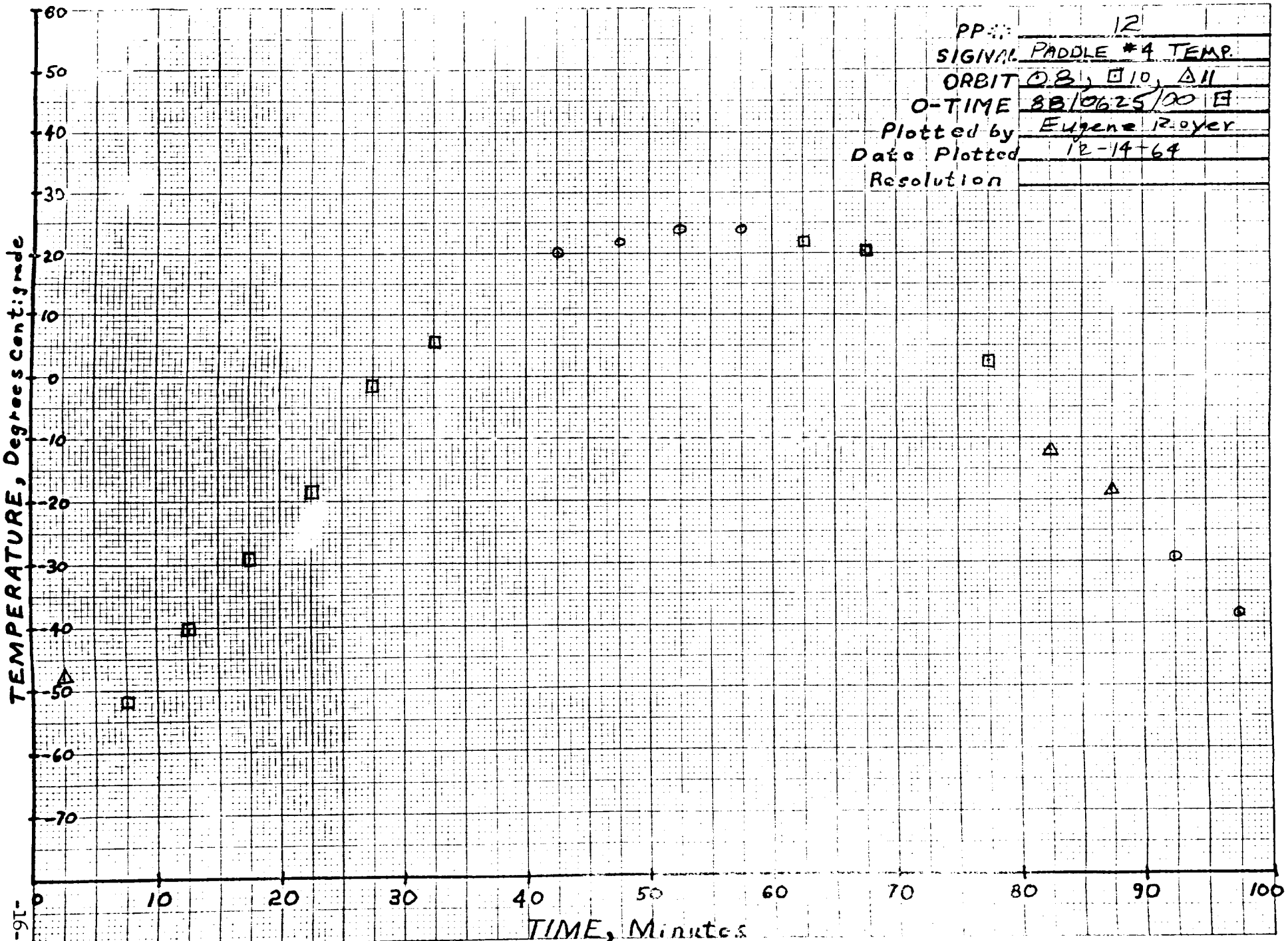
80
90
100
TIME, Minutes


PP: 12
SIGNAL PADDLE #4 TEMP.
ORBIT ⊙8, ⊡10, △11
O-TIME 8B/0625/00 ⊞
Plotted by Eugene Royer
Date Plotted 12-14-64
Resolution
TEMPERATURE, Degrees Centigrade
60
50
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-60
-70
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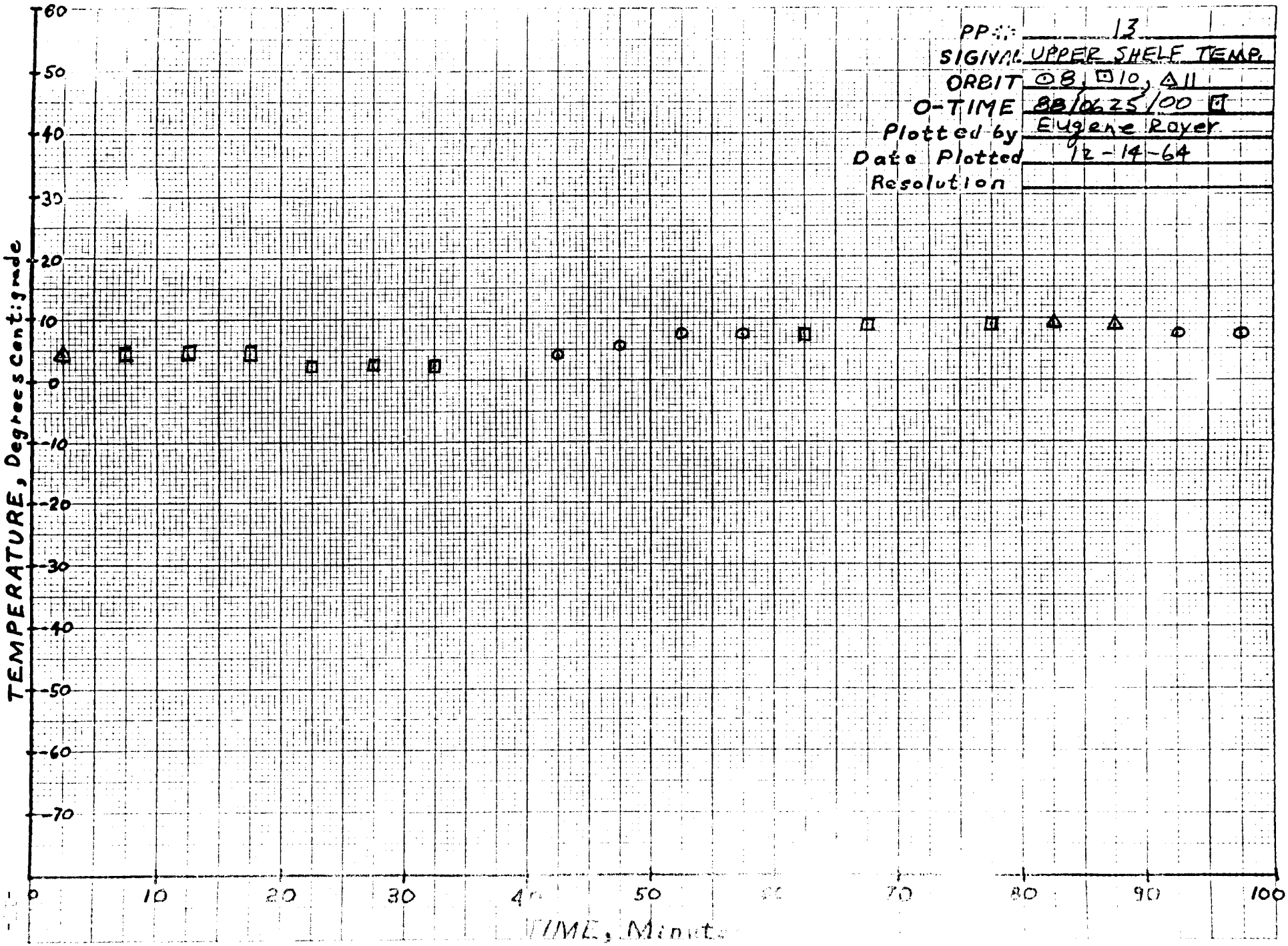
100
TIME, Minutes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SIGNAL UPPER SHELF TEMP.
ORBIT ⊙8, ⊡10, △11
O-TIME 88/0625/00 ⊡
Plotted by Eugene Royer
Date Plotted 12-14-64
Resolution
TEMPERATURE, Degrees Centigrade
60
50
40
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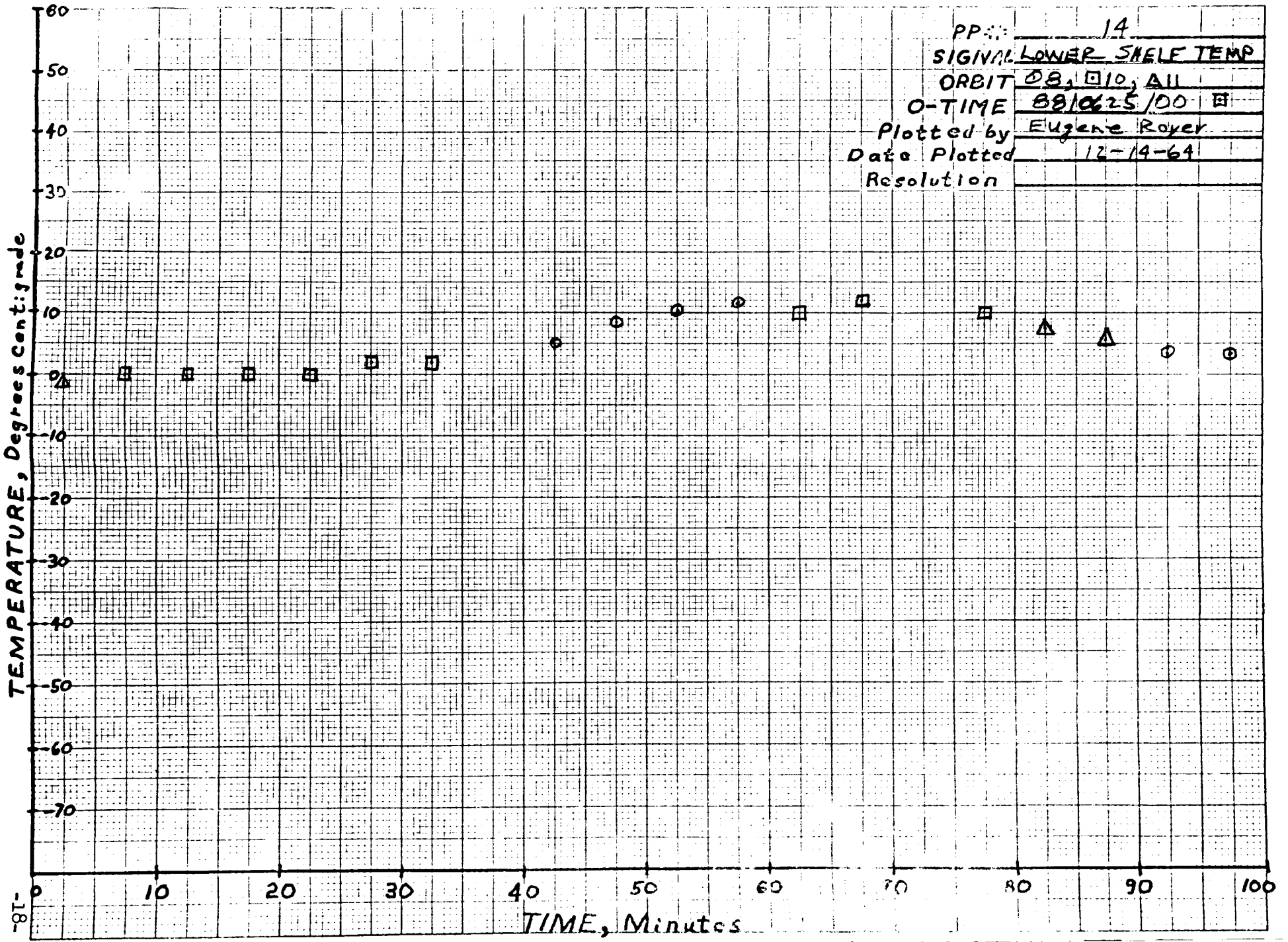
TIME, Minut


PP # 14
SIGNAL LOWER SHELF TEMP
ORBIT ⊙8, ⊡10, △11
O-TIME 88/0625/00 ⊡
Plotted by Eugene Royer
Date Plotted 12-14-64
Resolution
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
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0
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60
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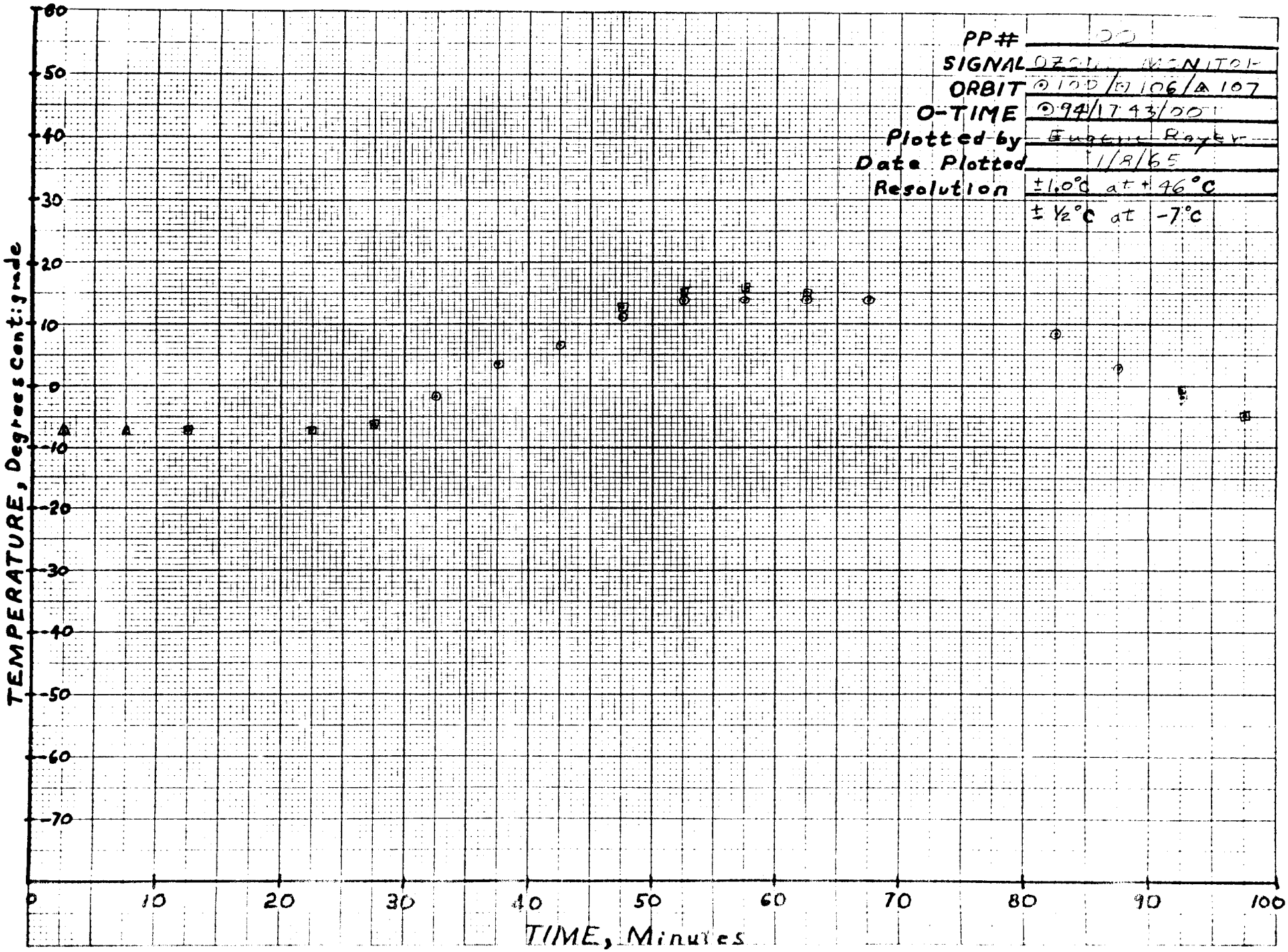
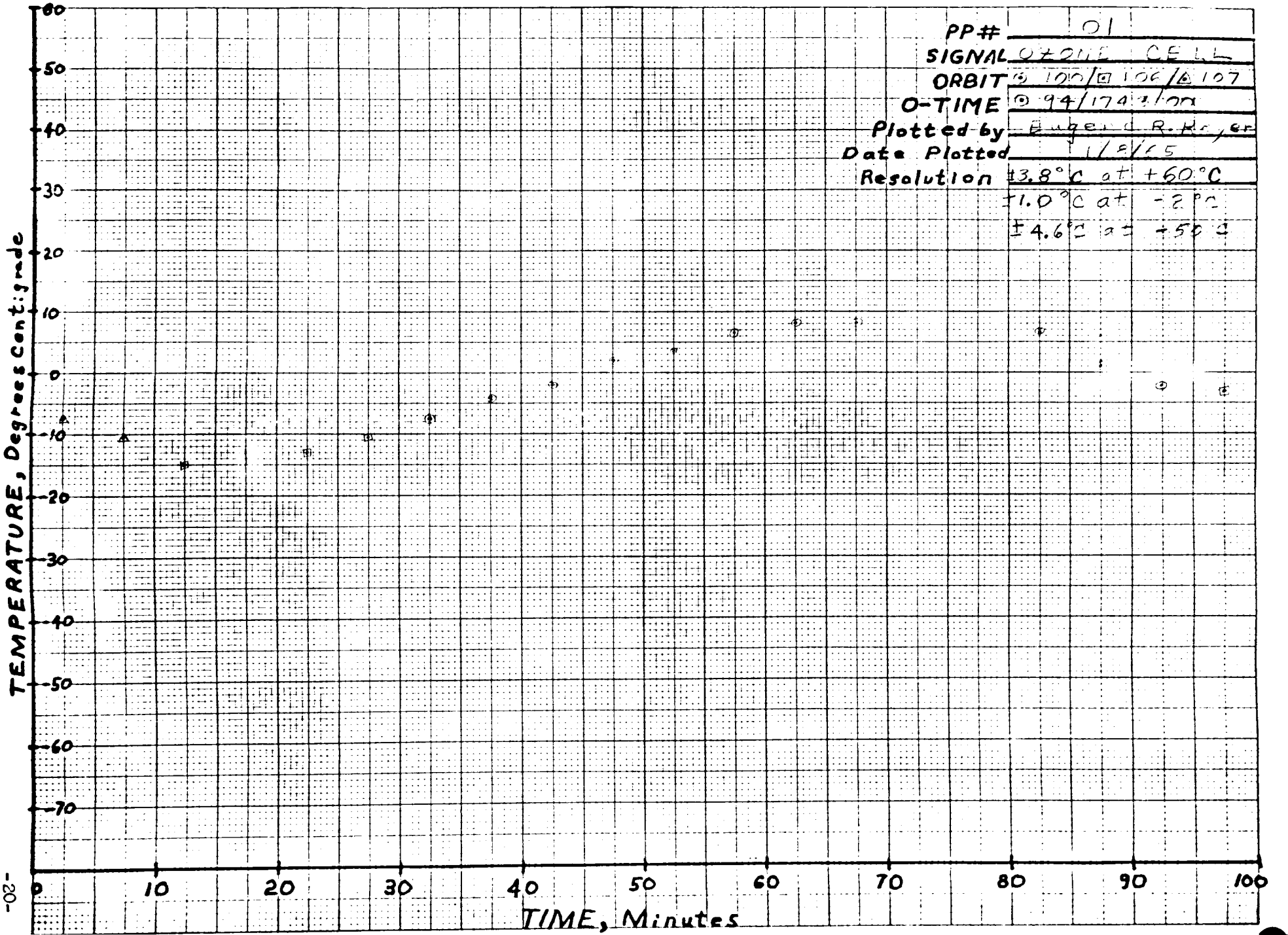
80
90
100
TIME, Minutes

KEUFFEL & ESSER CO.



K+E 10 X 10 TO ½ INCH 46 1472
KEUFFEL & ESSER CO.



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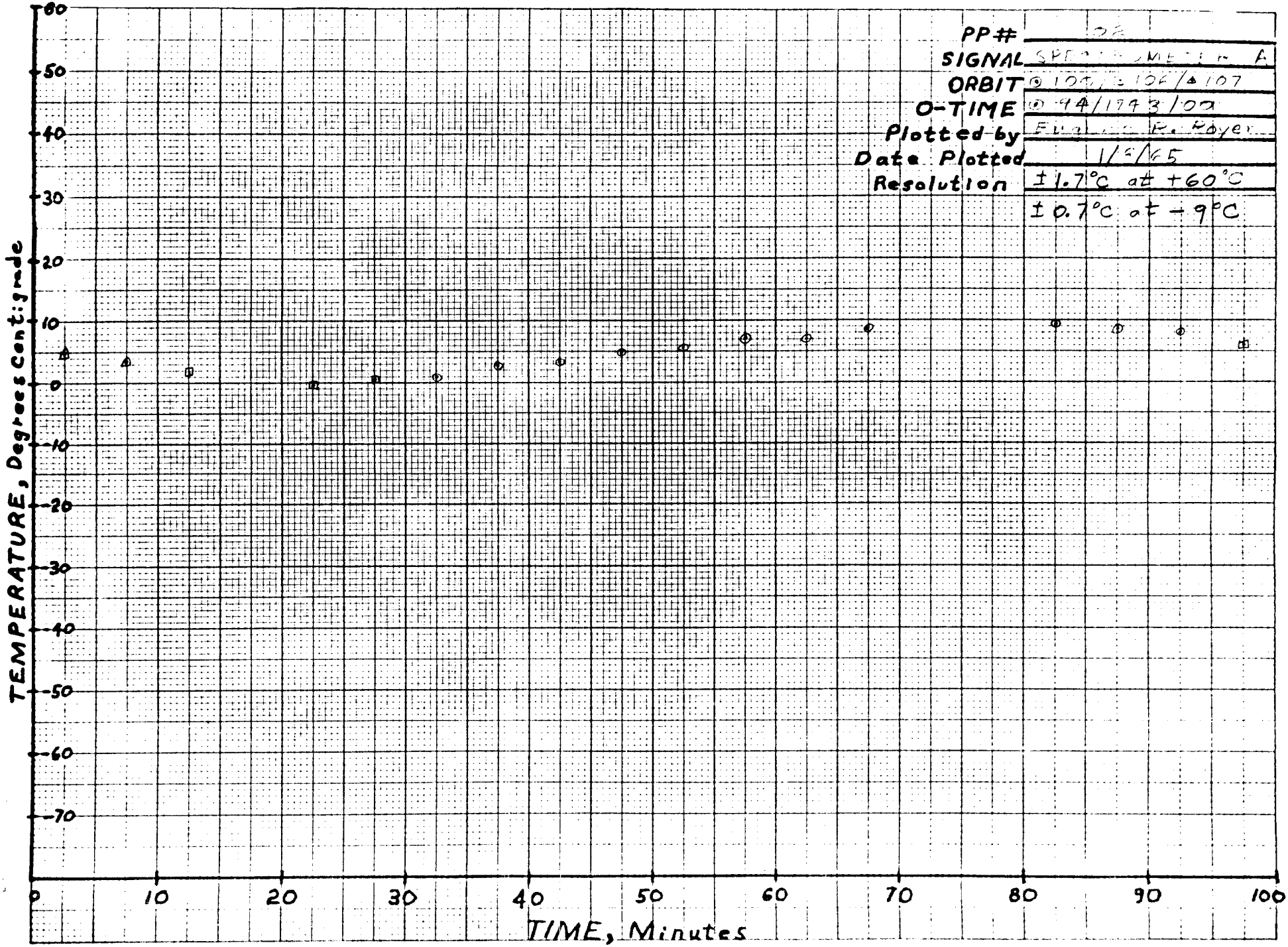
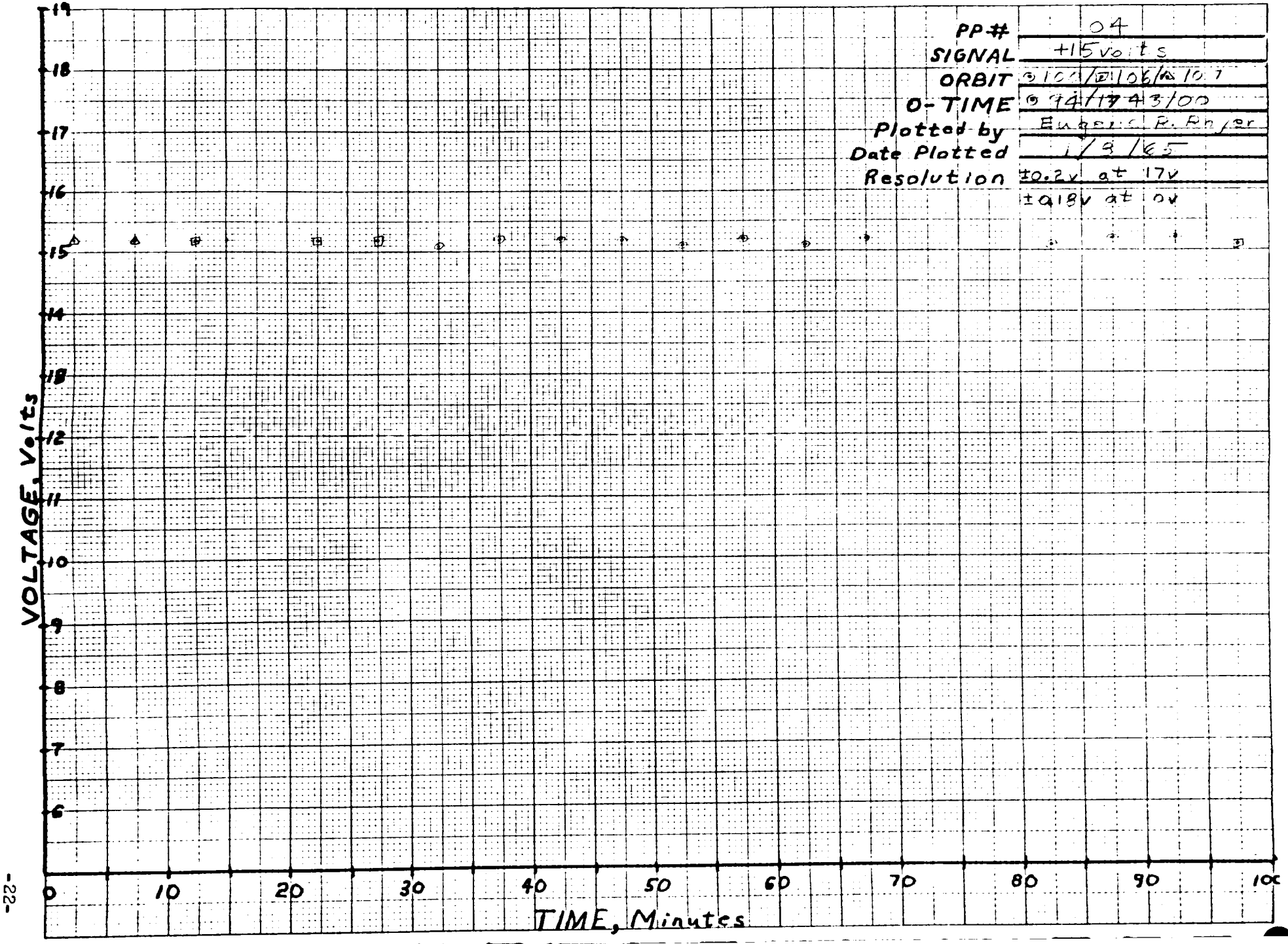
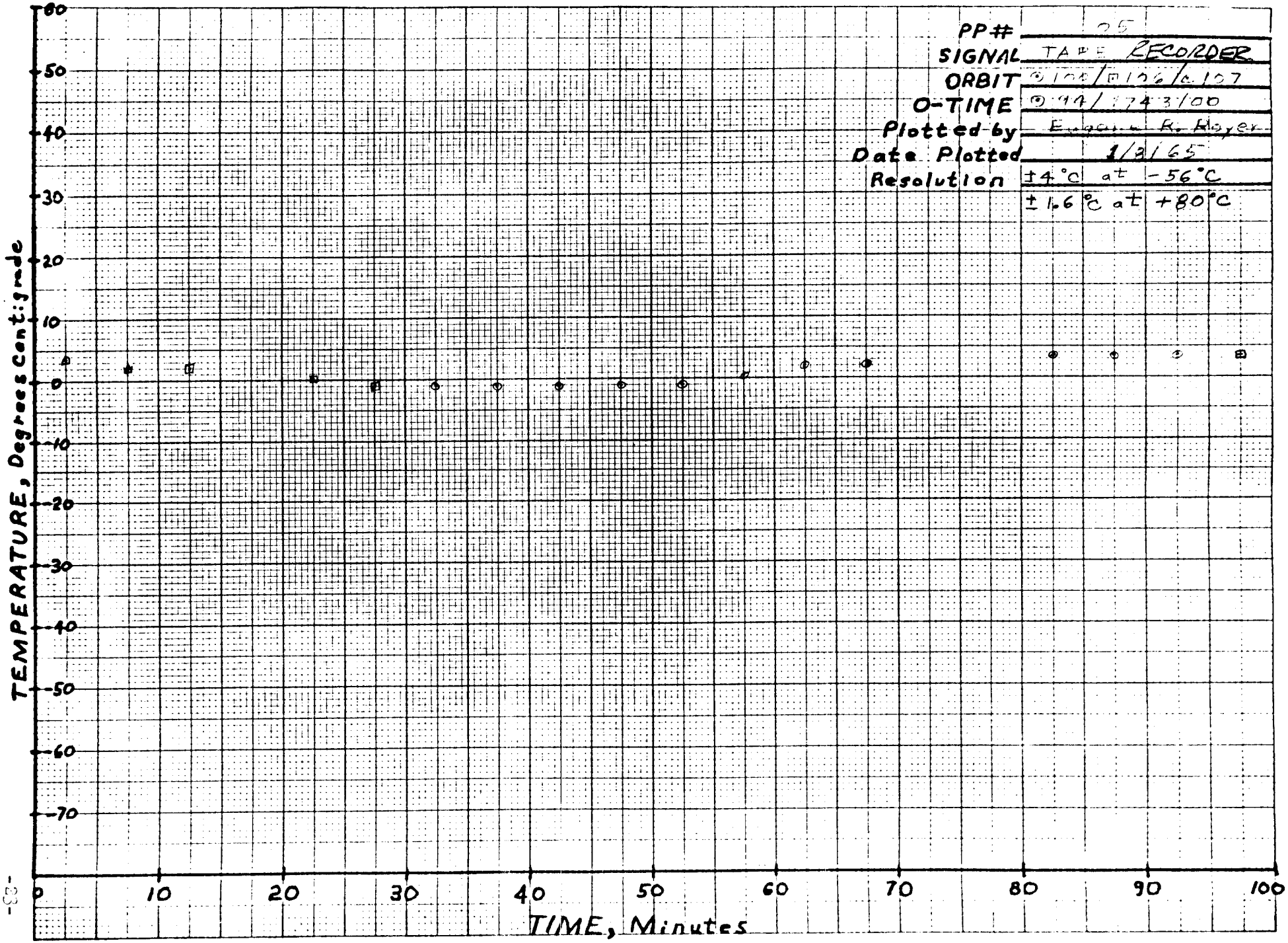


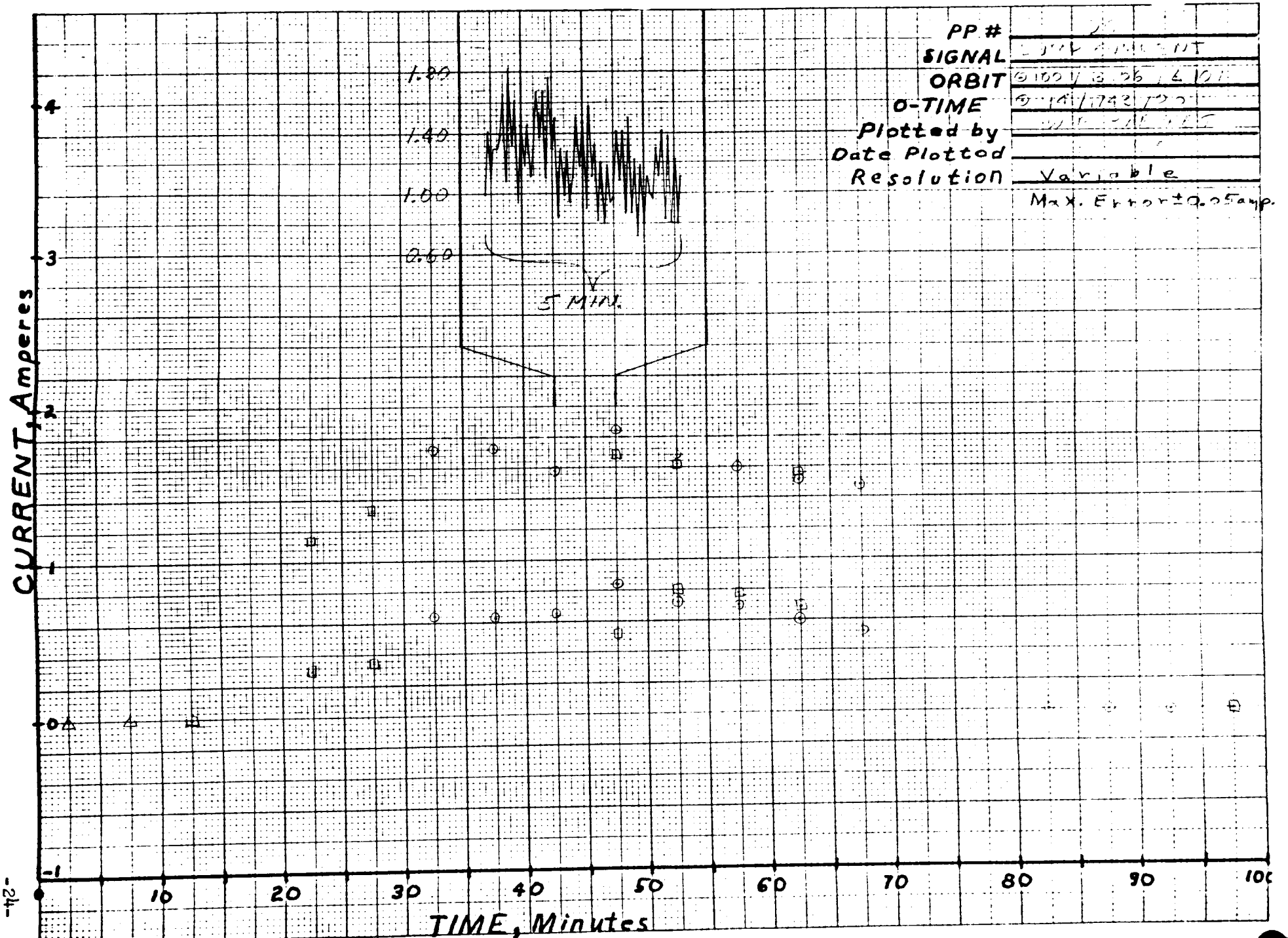
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

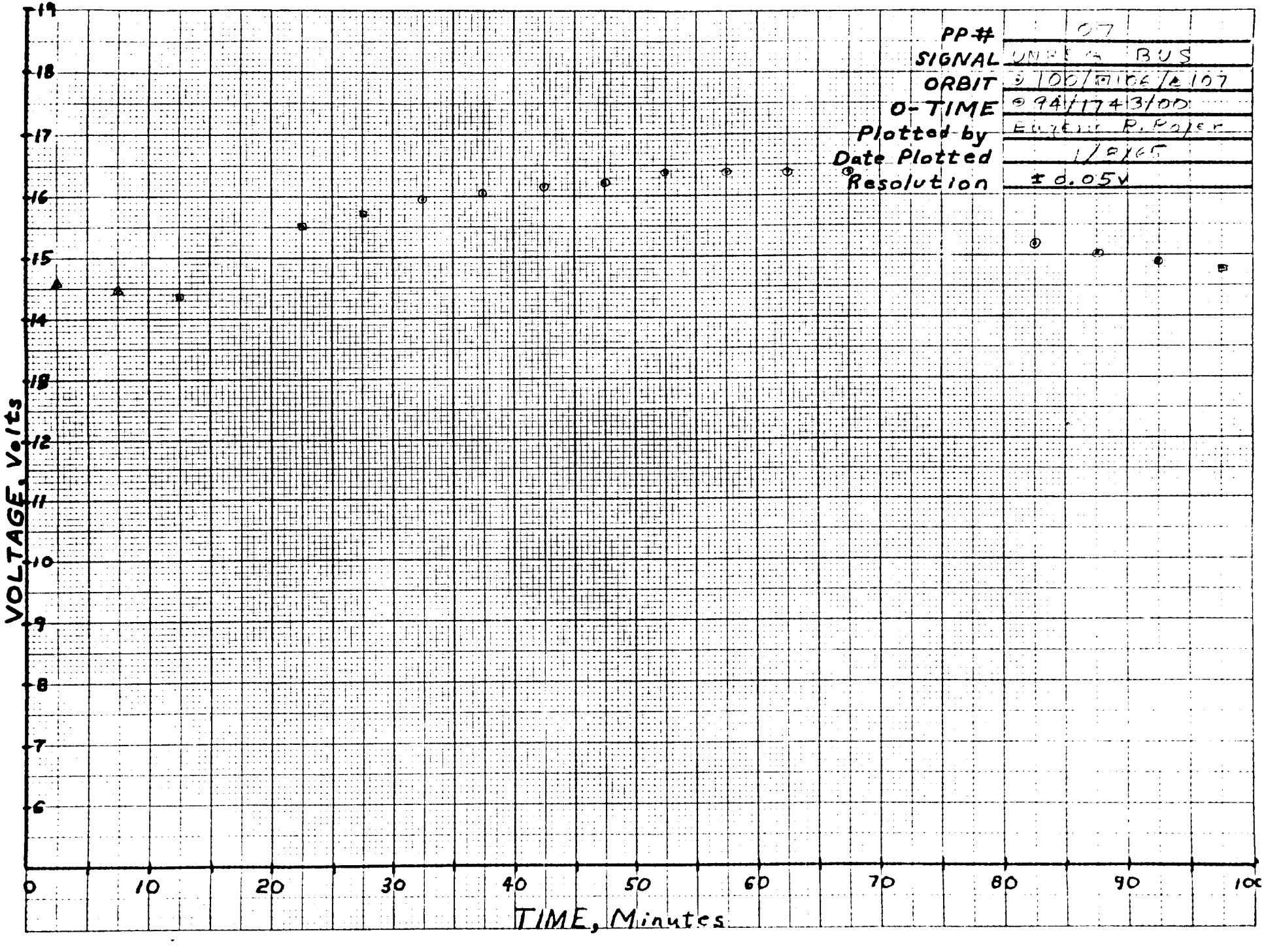


K&E 7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

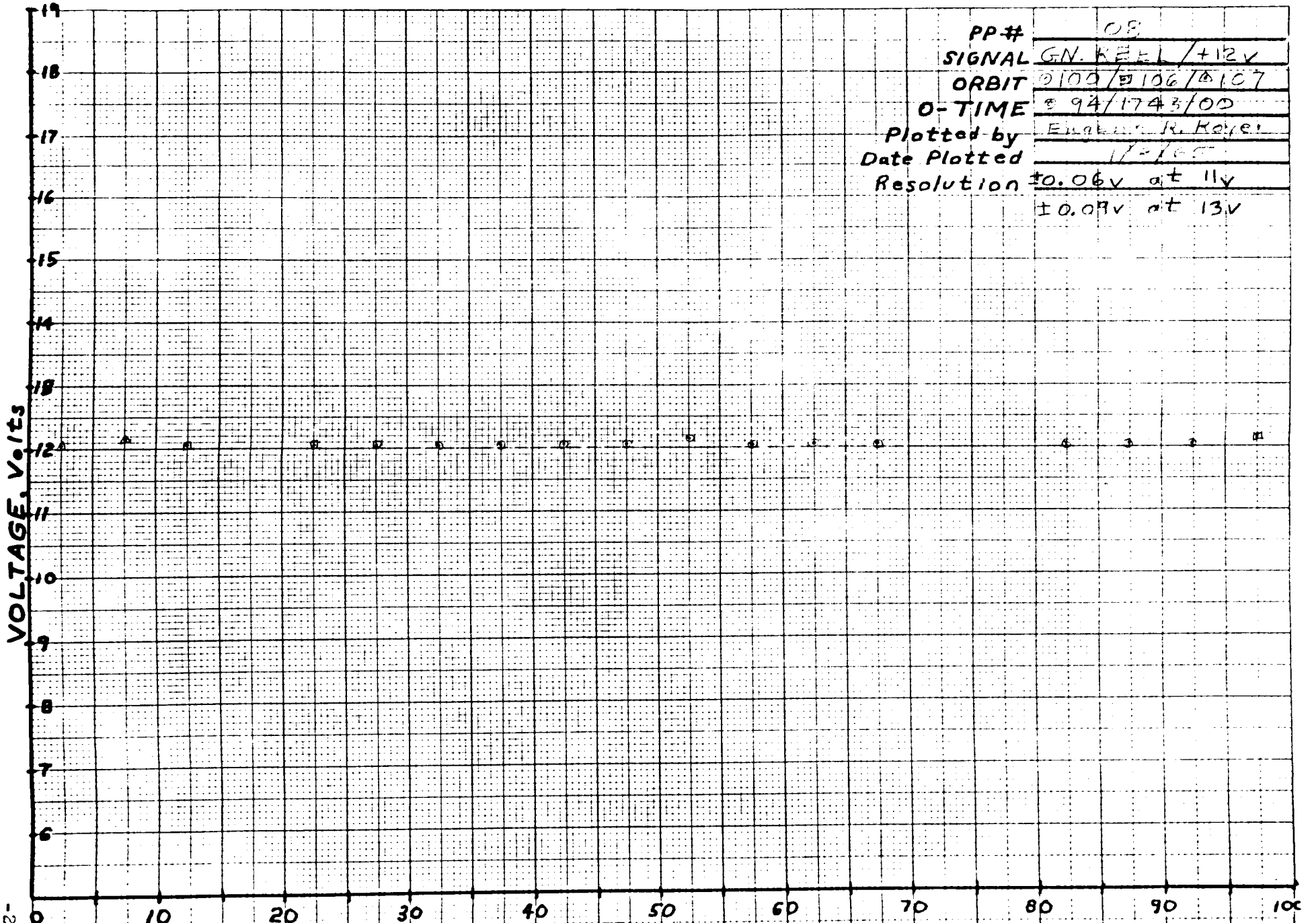


10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

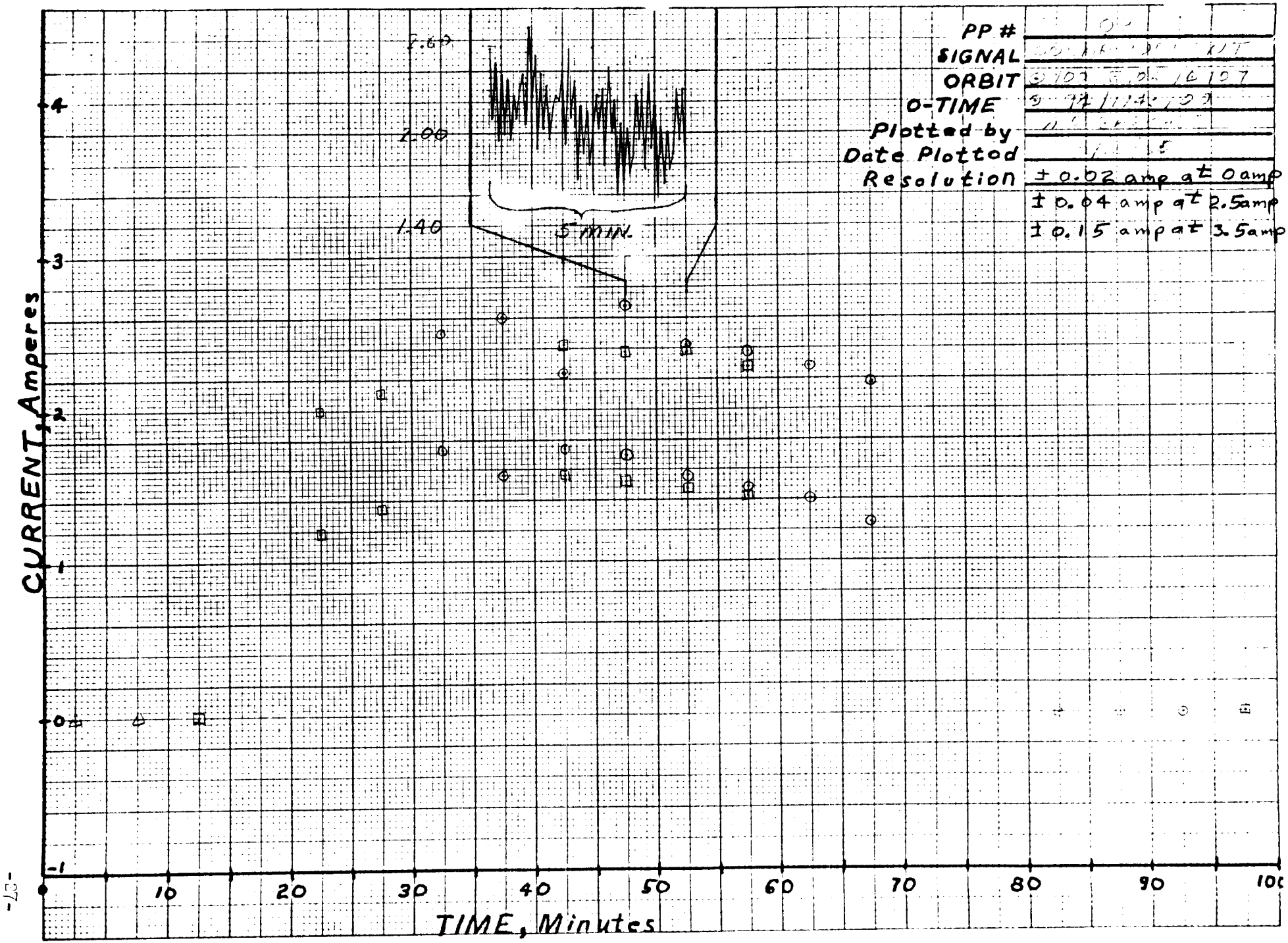



PP # 07
SIGNAL UNREG BUS
ORBIT ⊙ 106/⊡ 106/△ 107
O-TIME ⊙ 94/1743/00
Plotted by Eugene R. Royer
Date Plotted 1/8/65
Resolution ± 0.05V
VOLTAGE, Volts
19
18
17
16
15
14
13
12
11
10
9
8
7
6
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

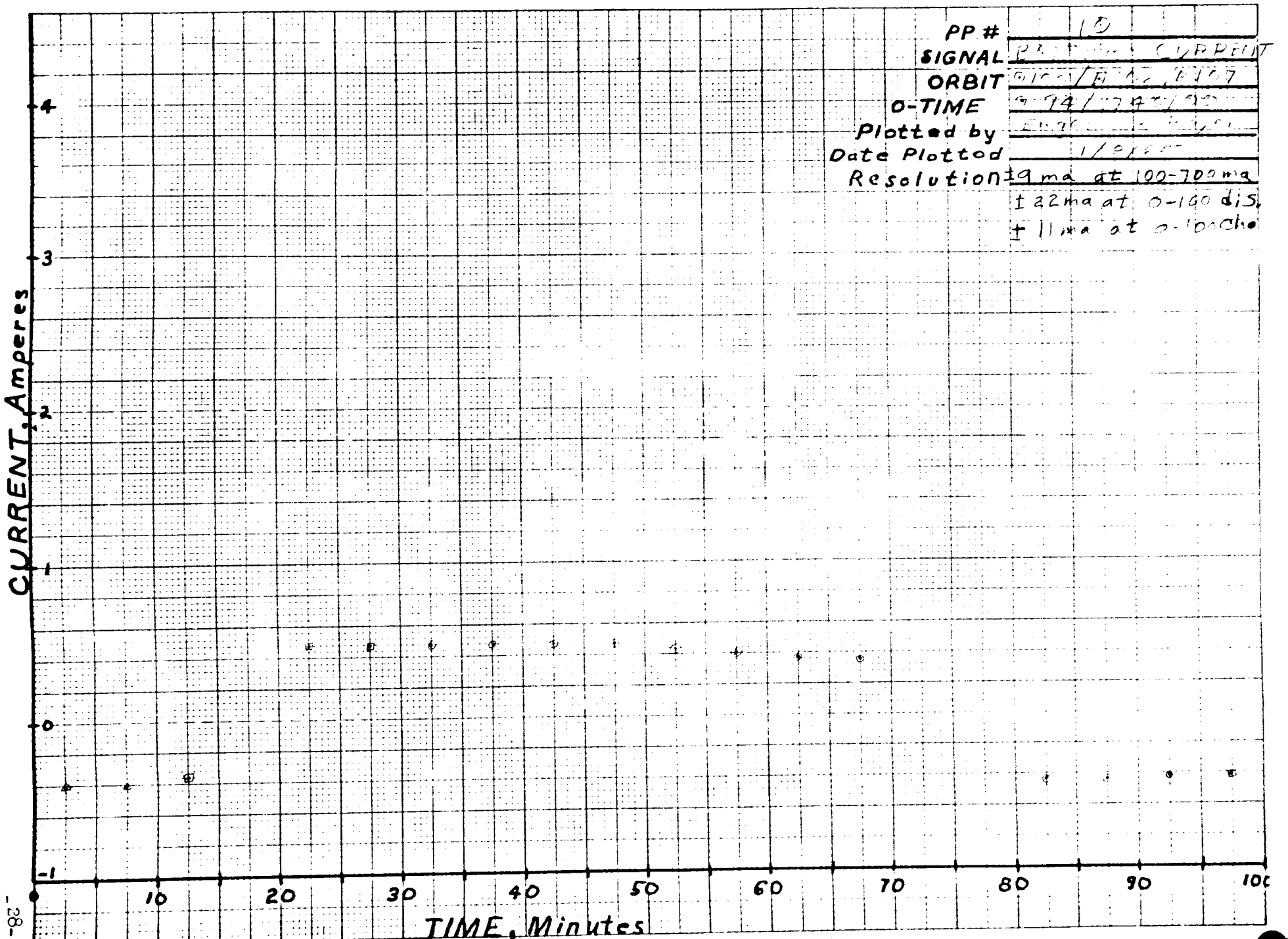
K&E 10 X 10 TO ½ INCH 46 1472
MADE IN U.S.A.
KEUFFEL & ESSER CO.



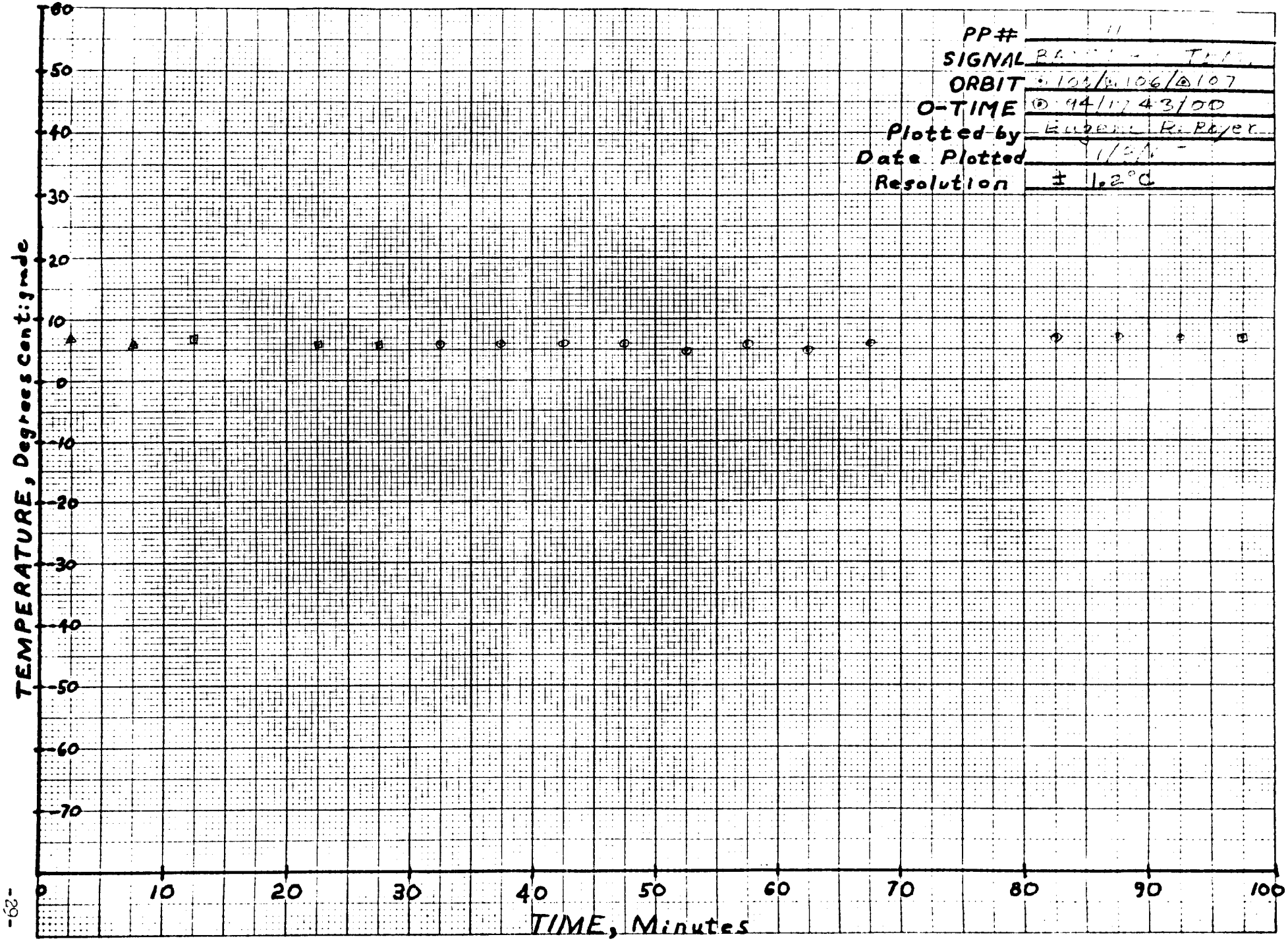
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



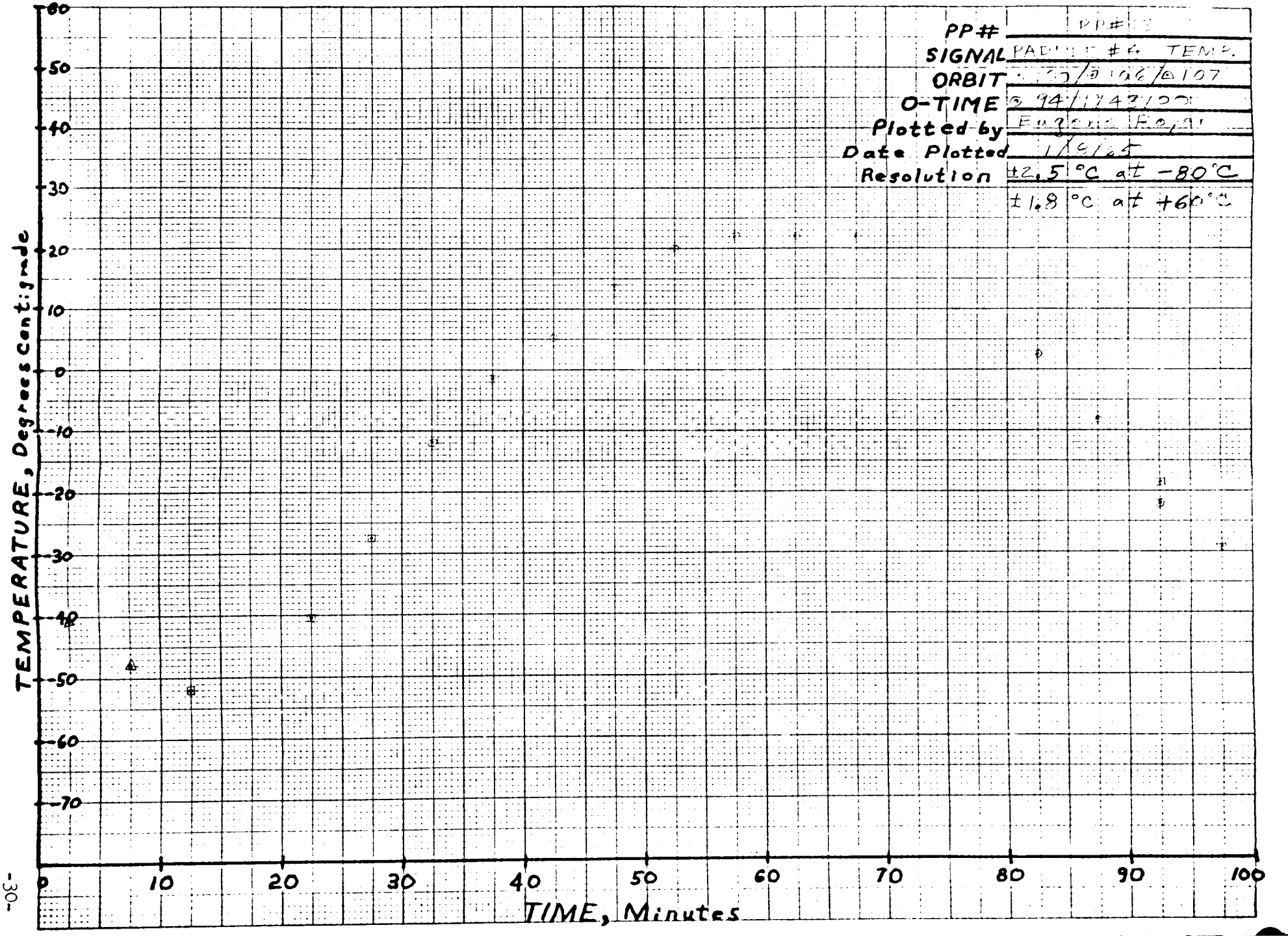
K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



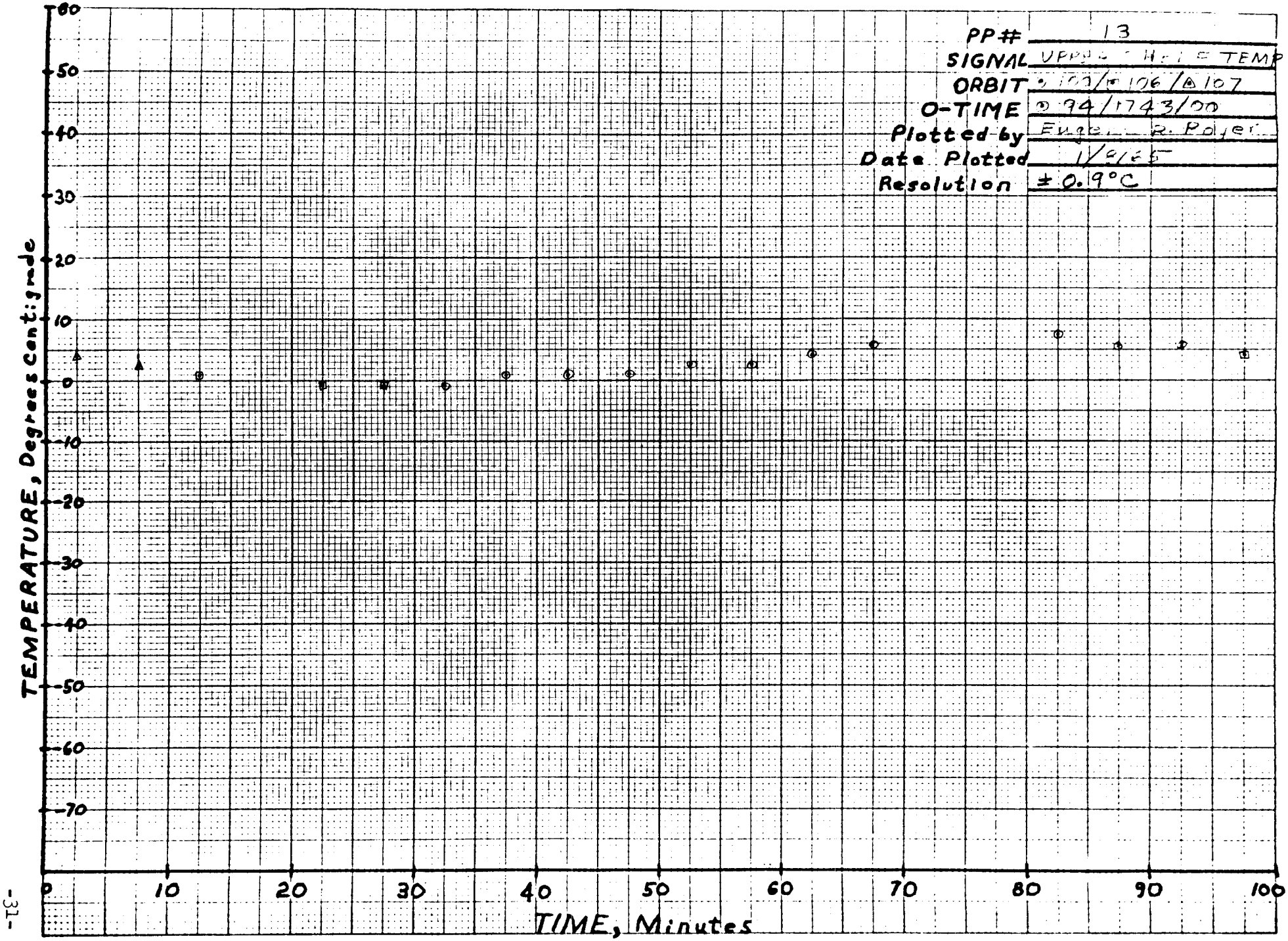
KEUFFEL & ESSER CO.



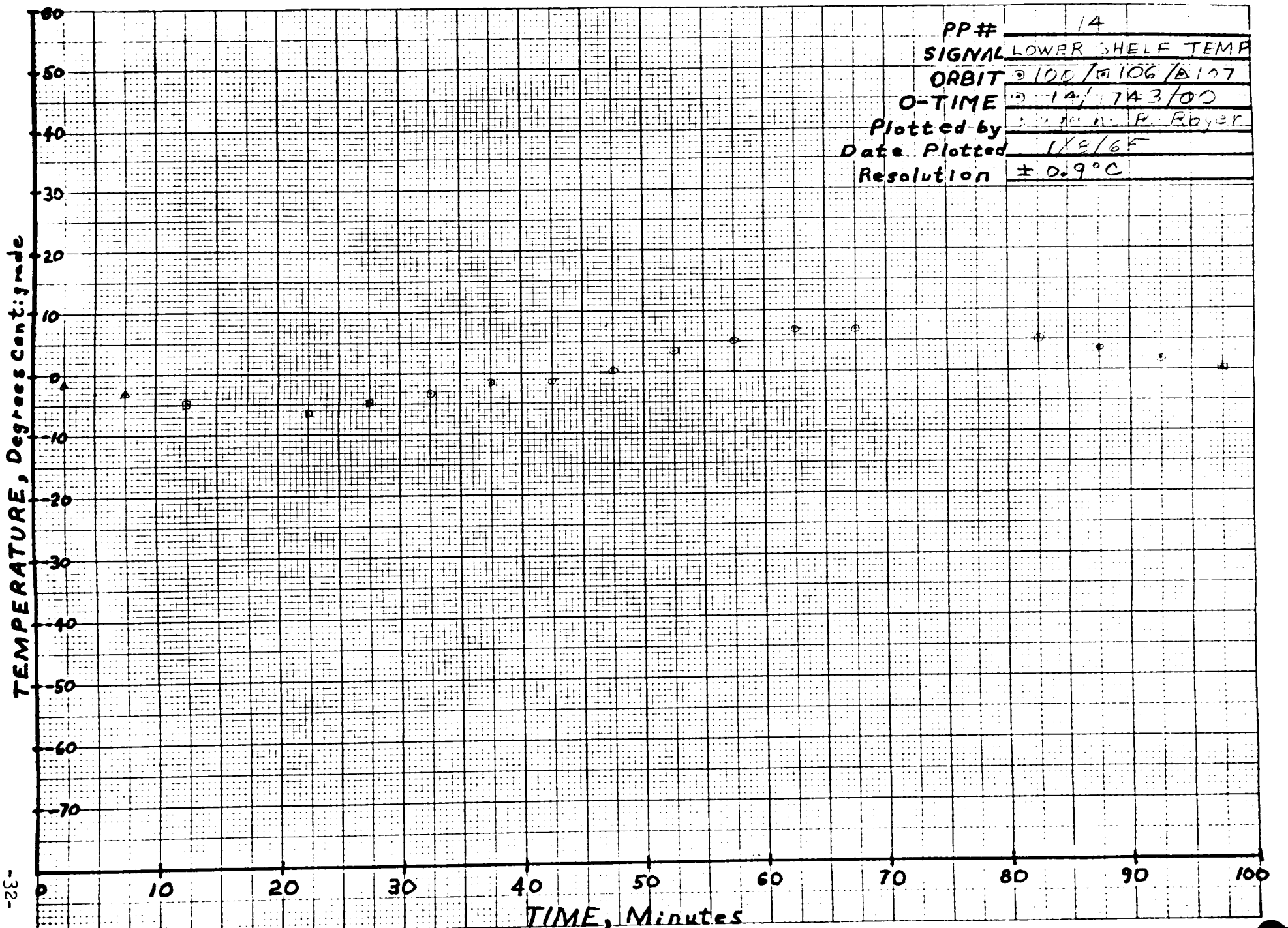
K+E 10 X 10 TO 1/2 INCH 46 1472
7 1/2 X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



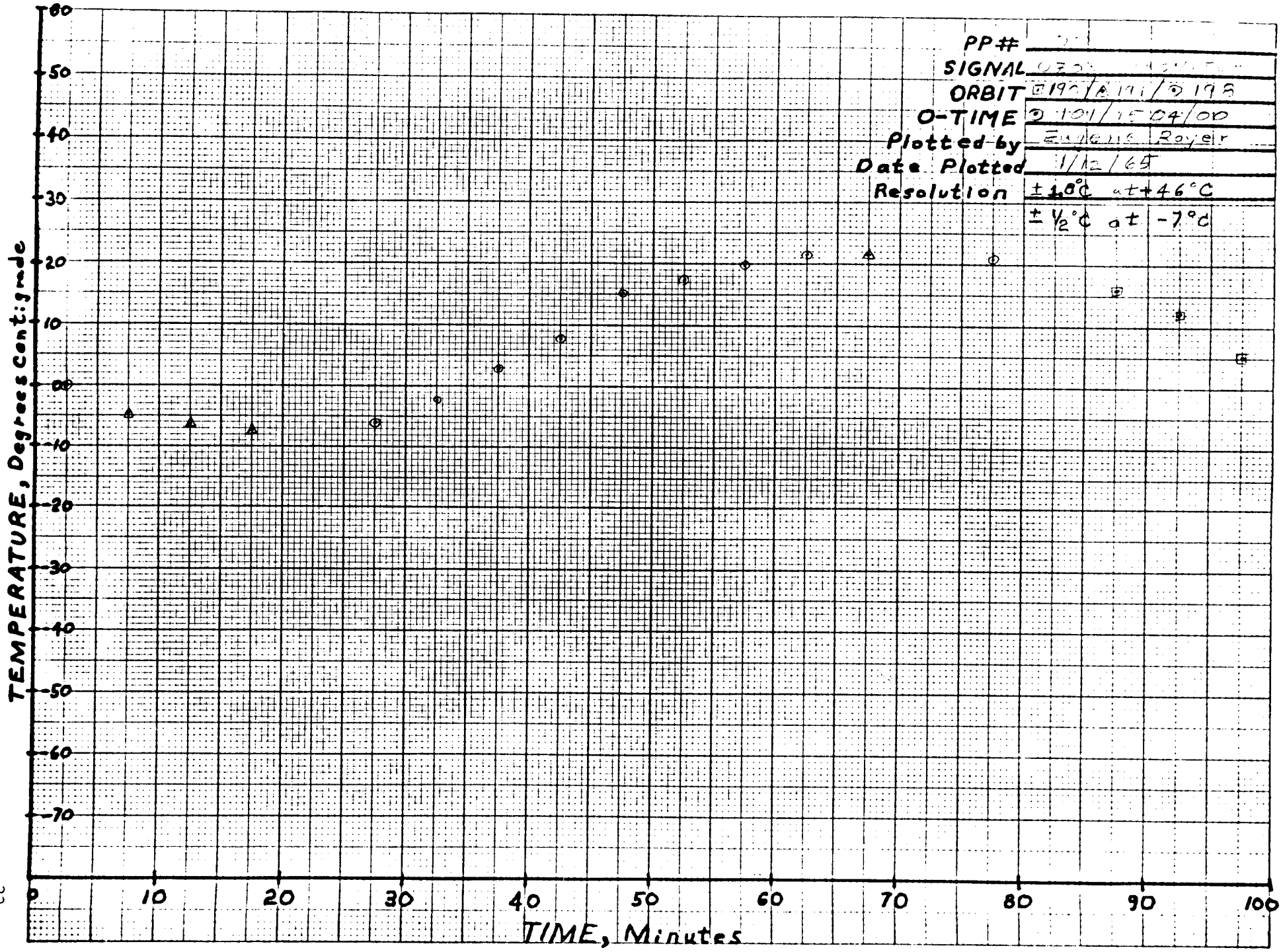
KEUFFEL & ESSER CO.



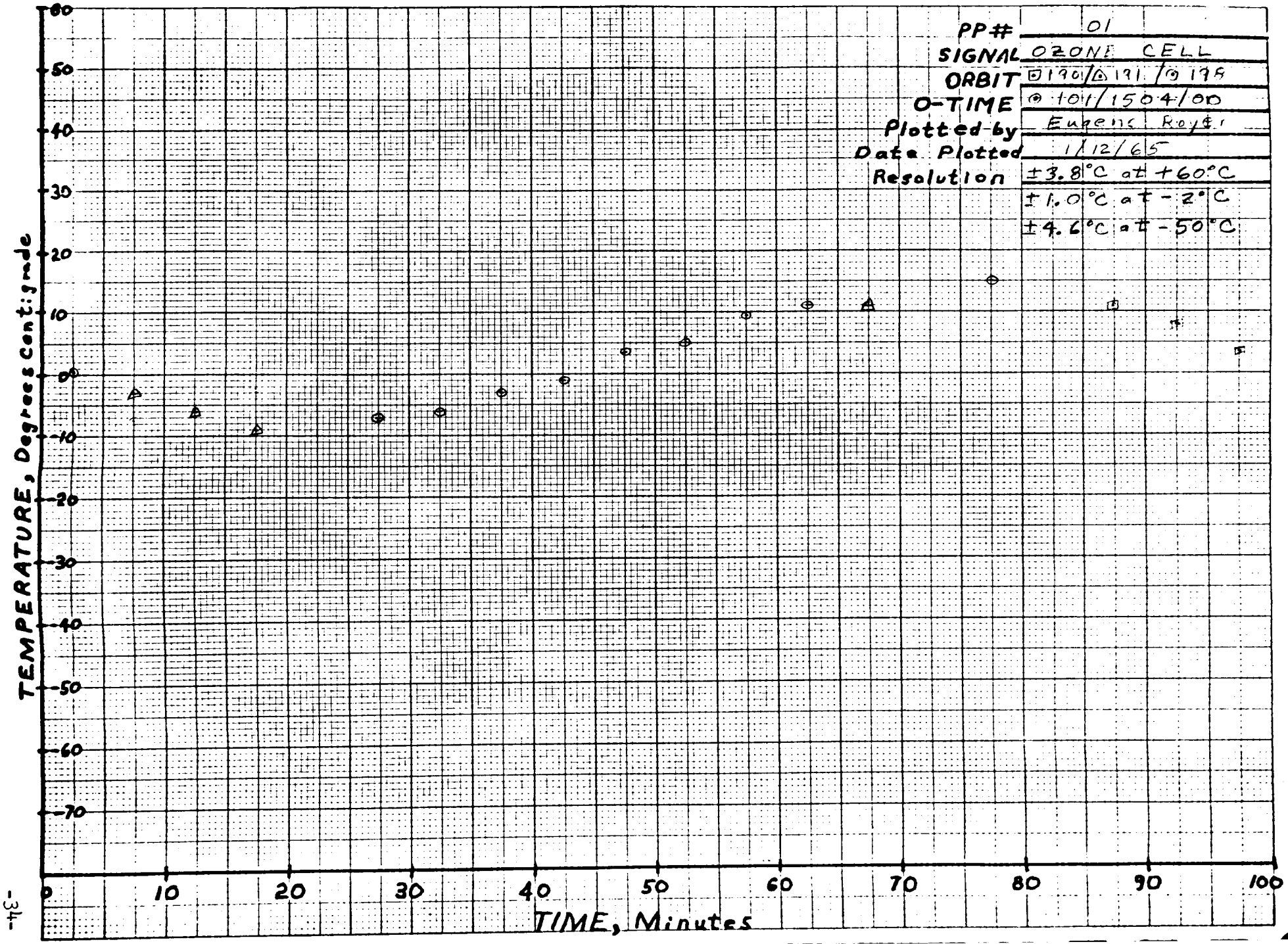
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



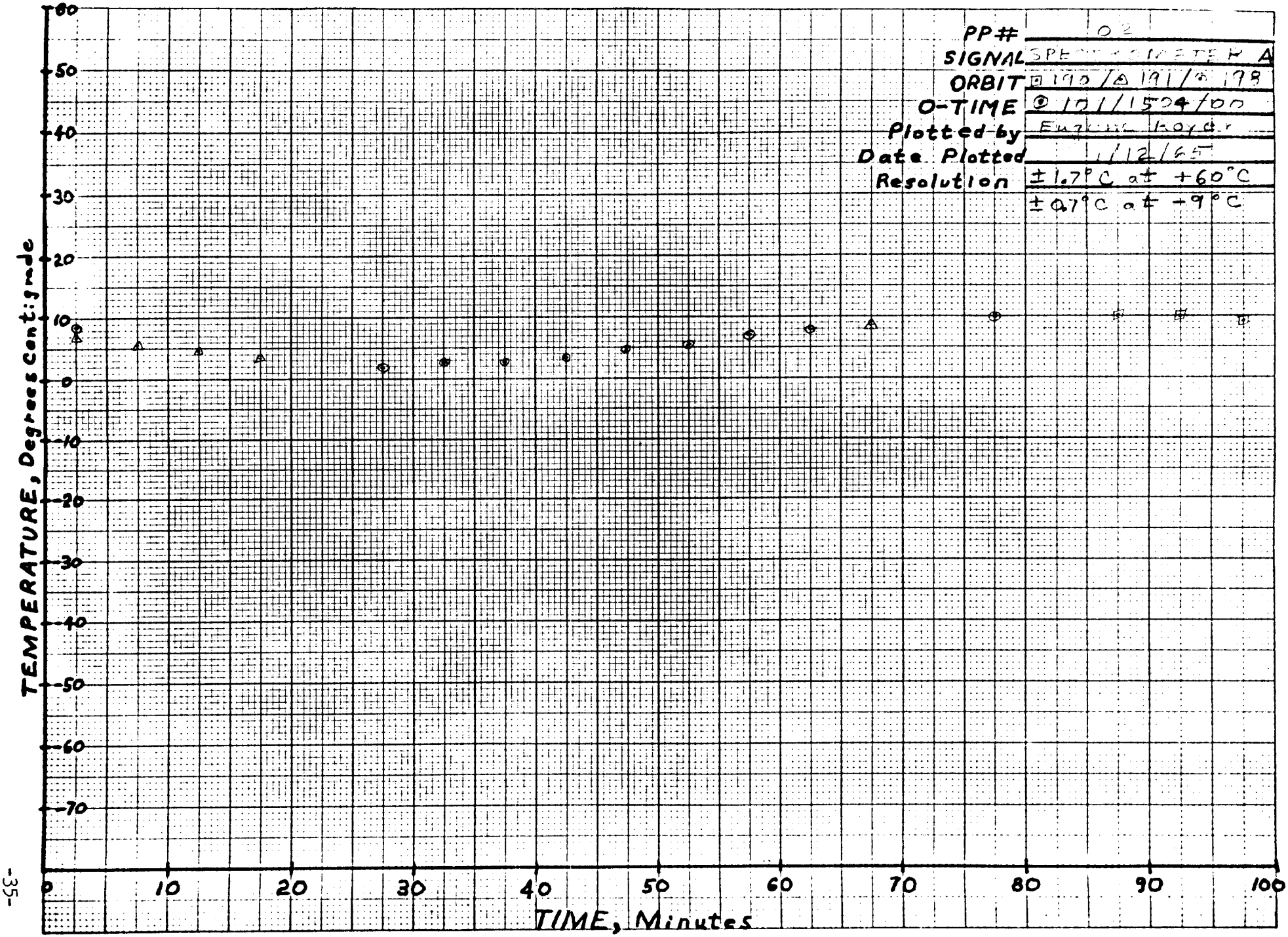
KEUFFEL & ESSER CO.



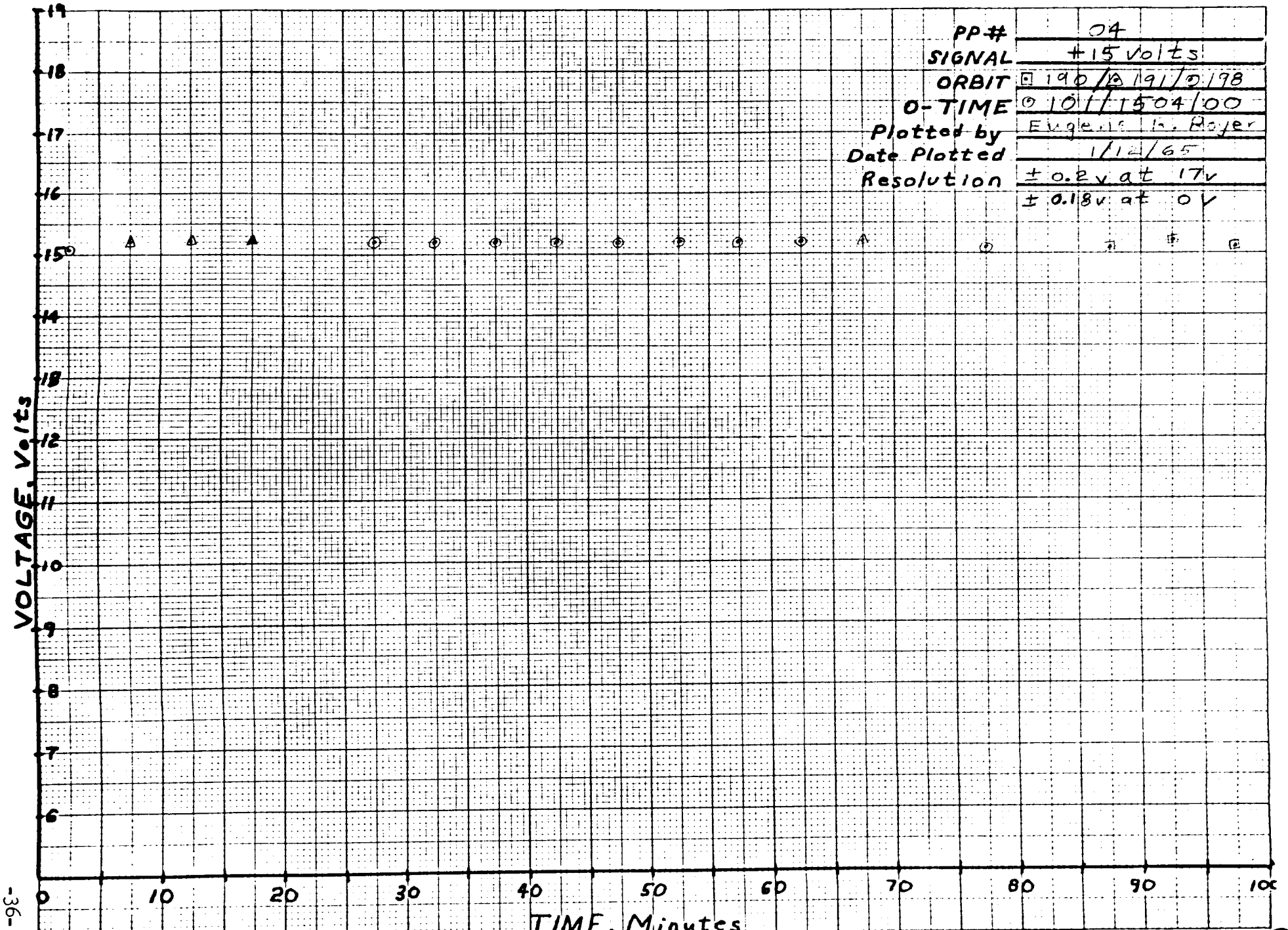
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



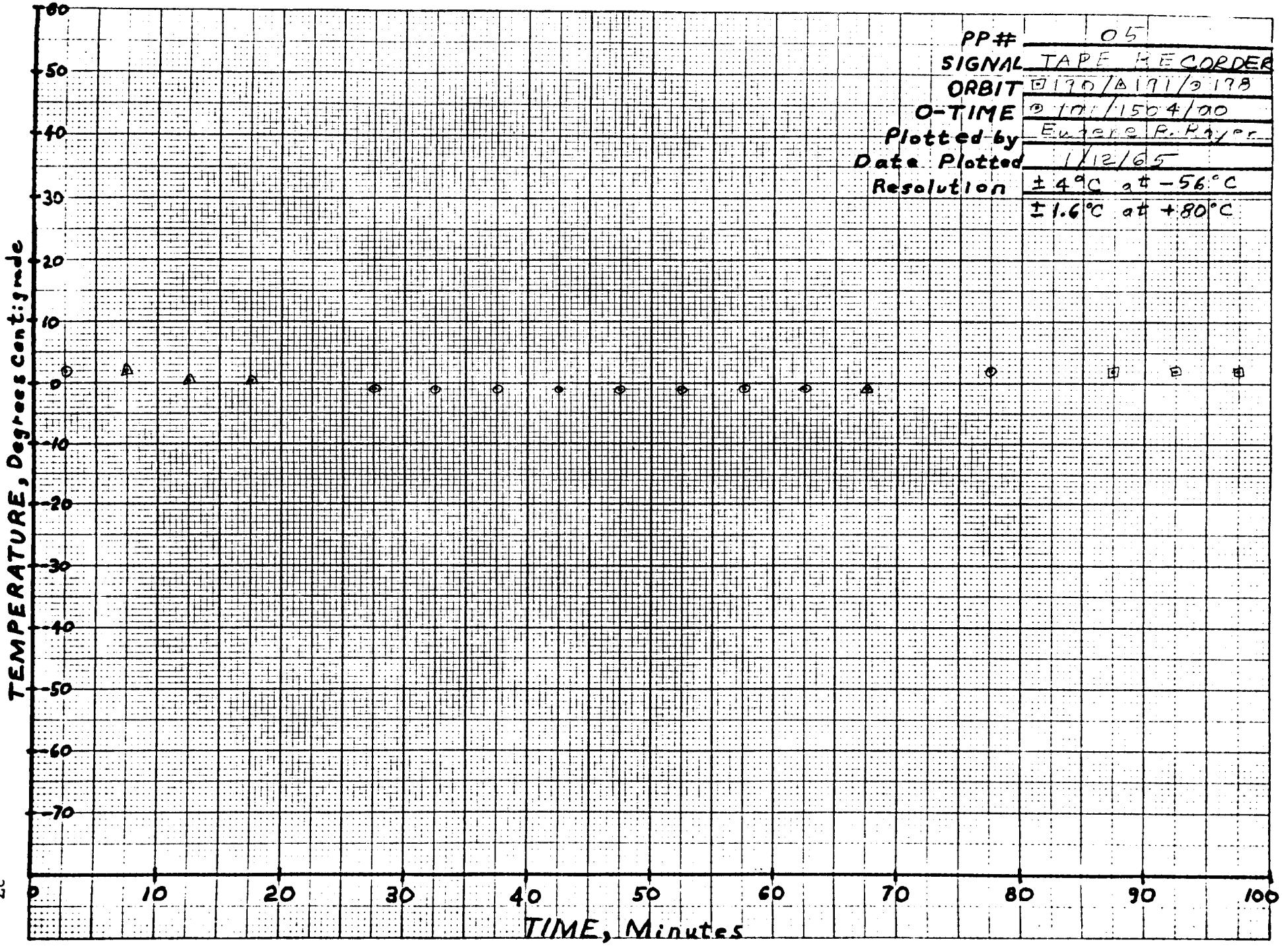
KEUFFEL & ESSER CO.



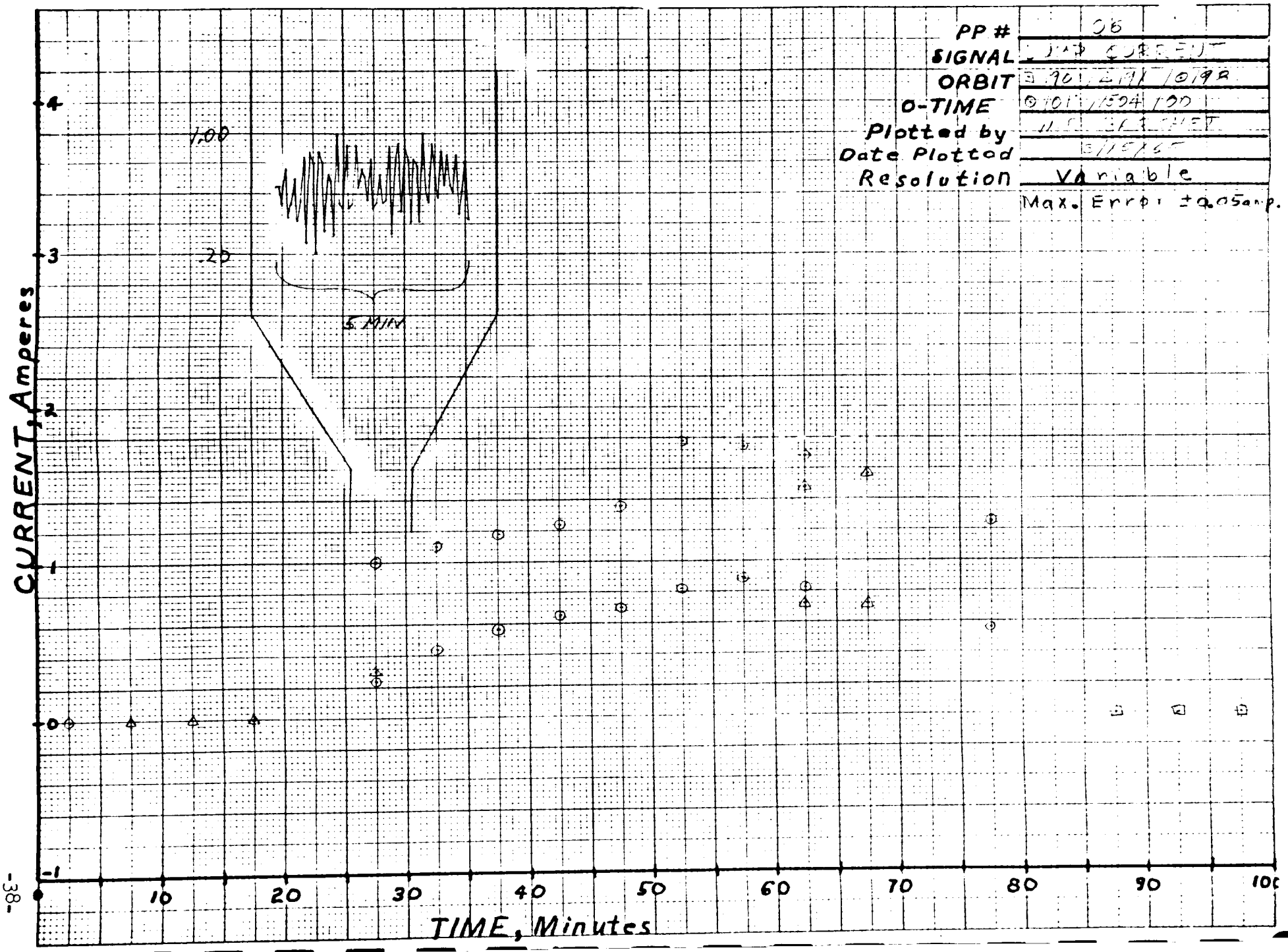
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



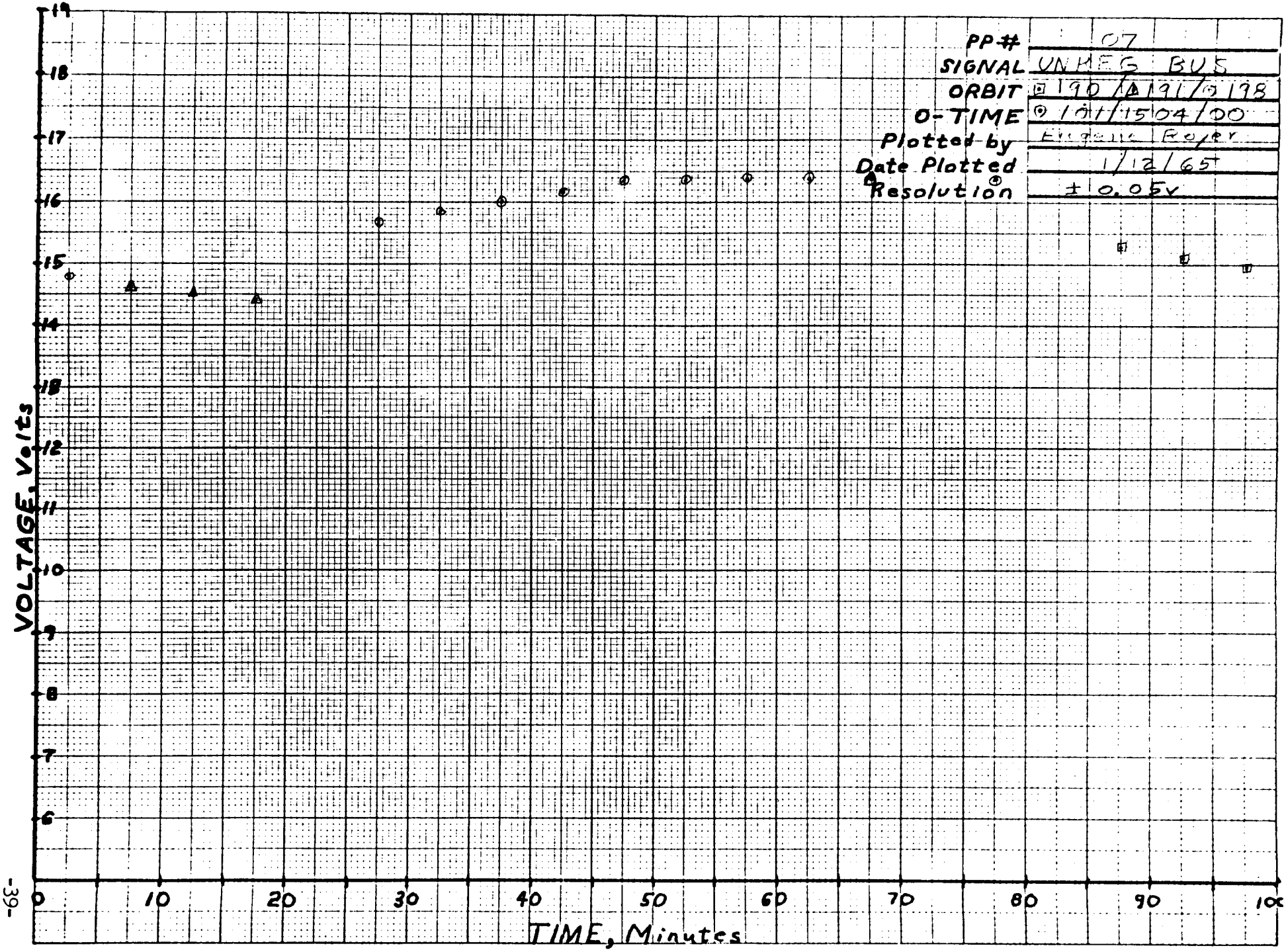
KEUFFEL & ESSER CO.



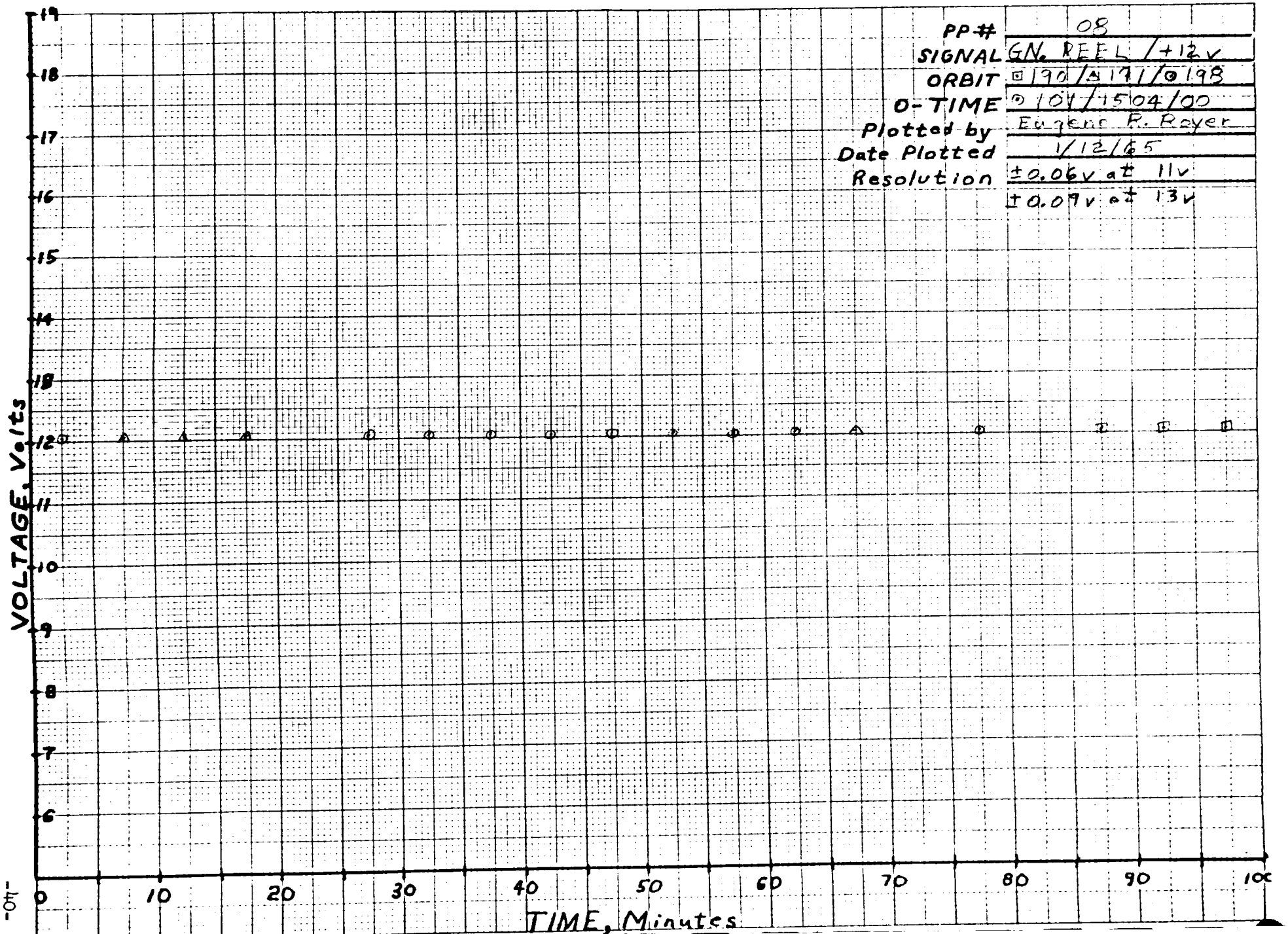
10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



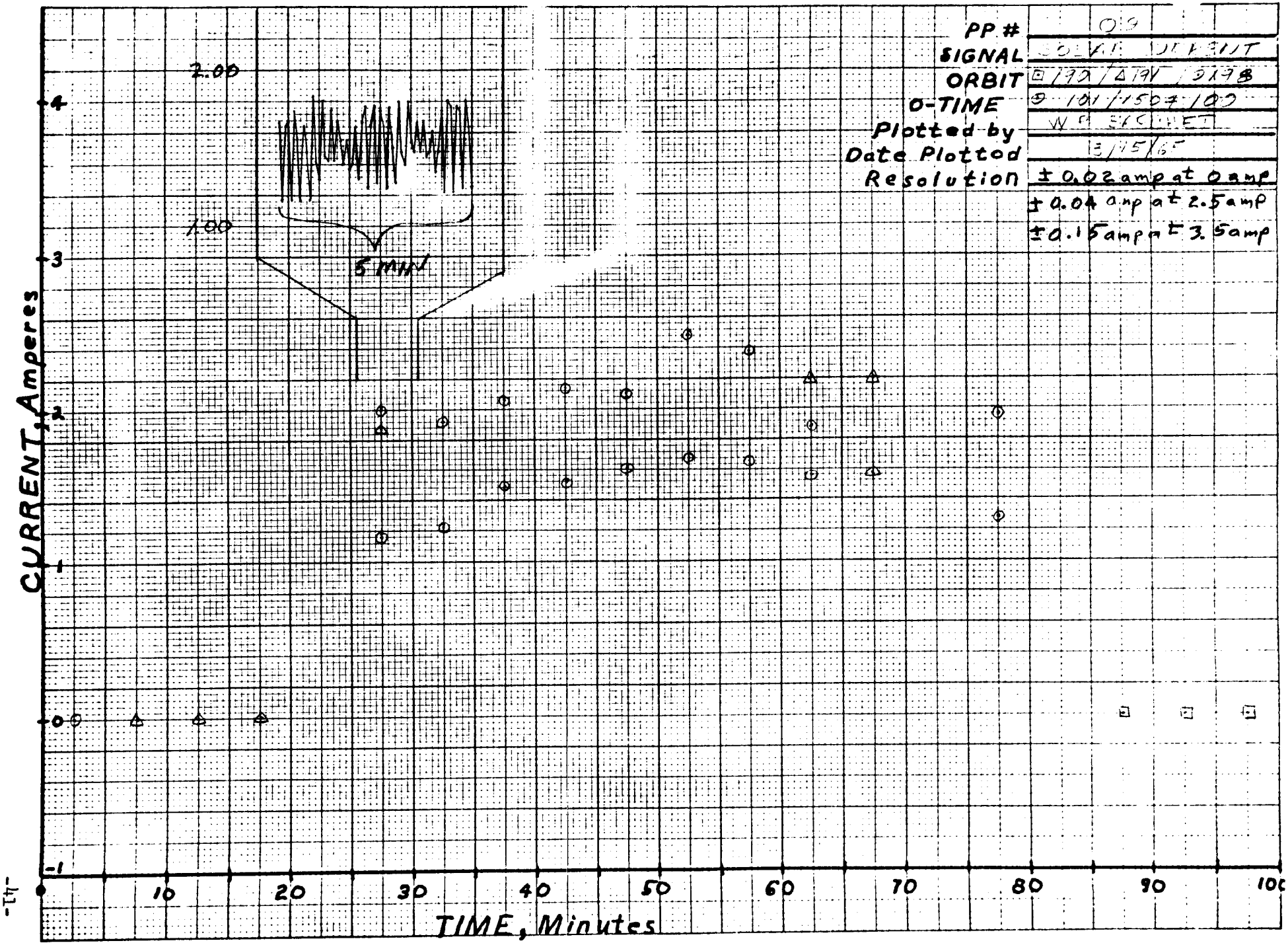
KEUFFEL & ESSER CO.



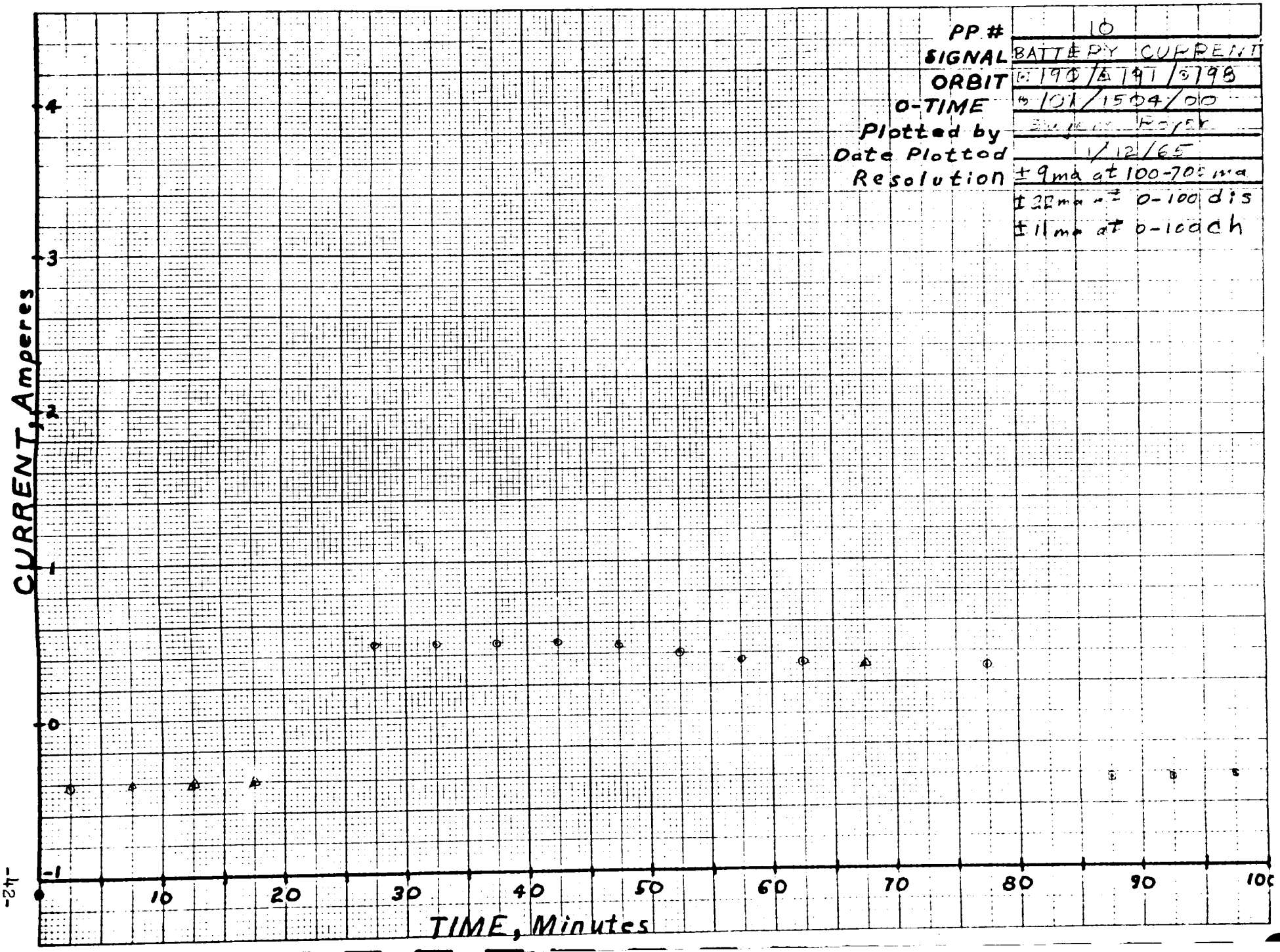
K&E 10 X 10 TO 1/2 INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



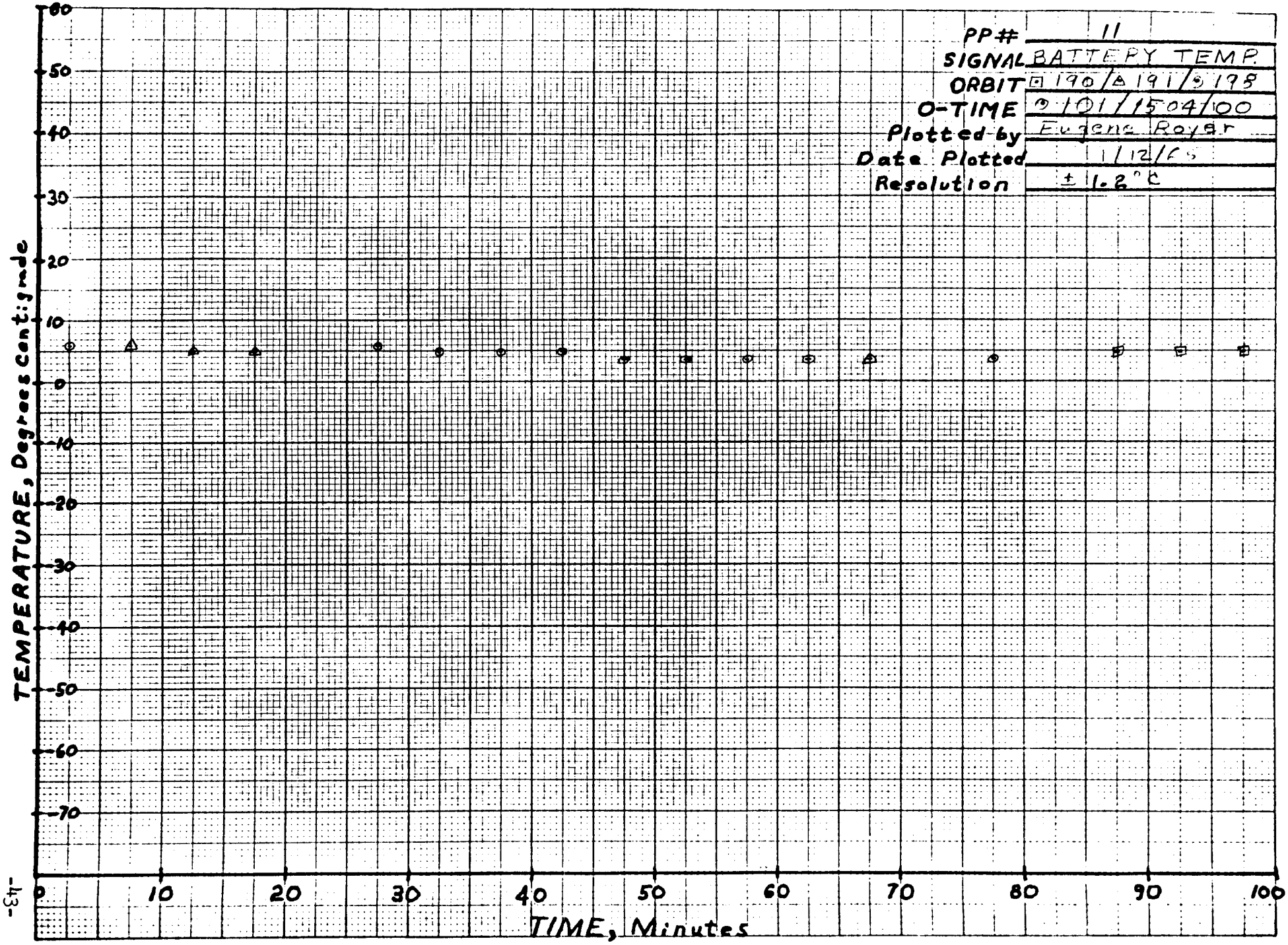
K+E 7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



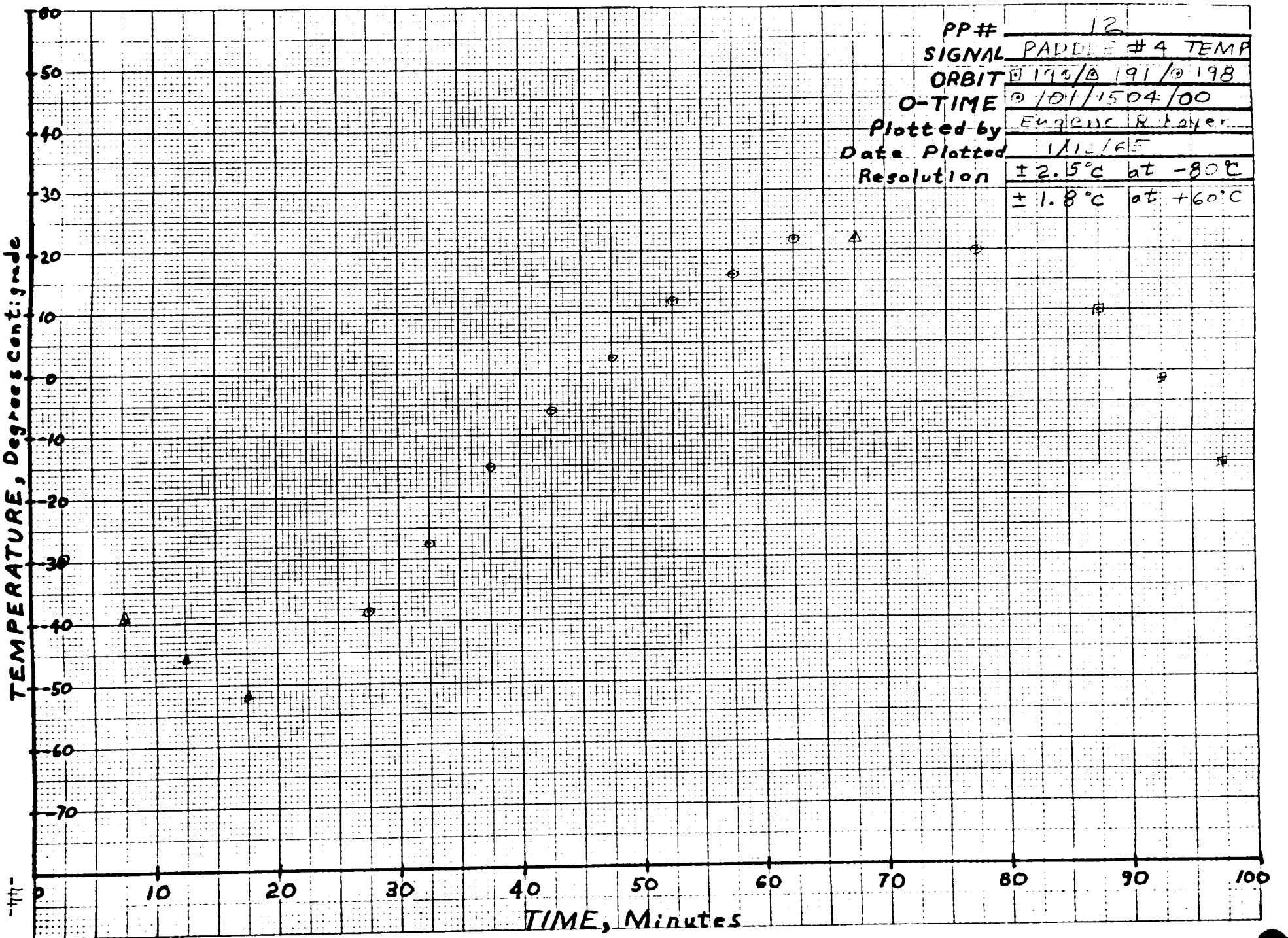
10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO

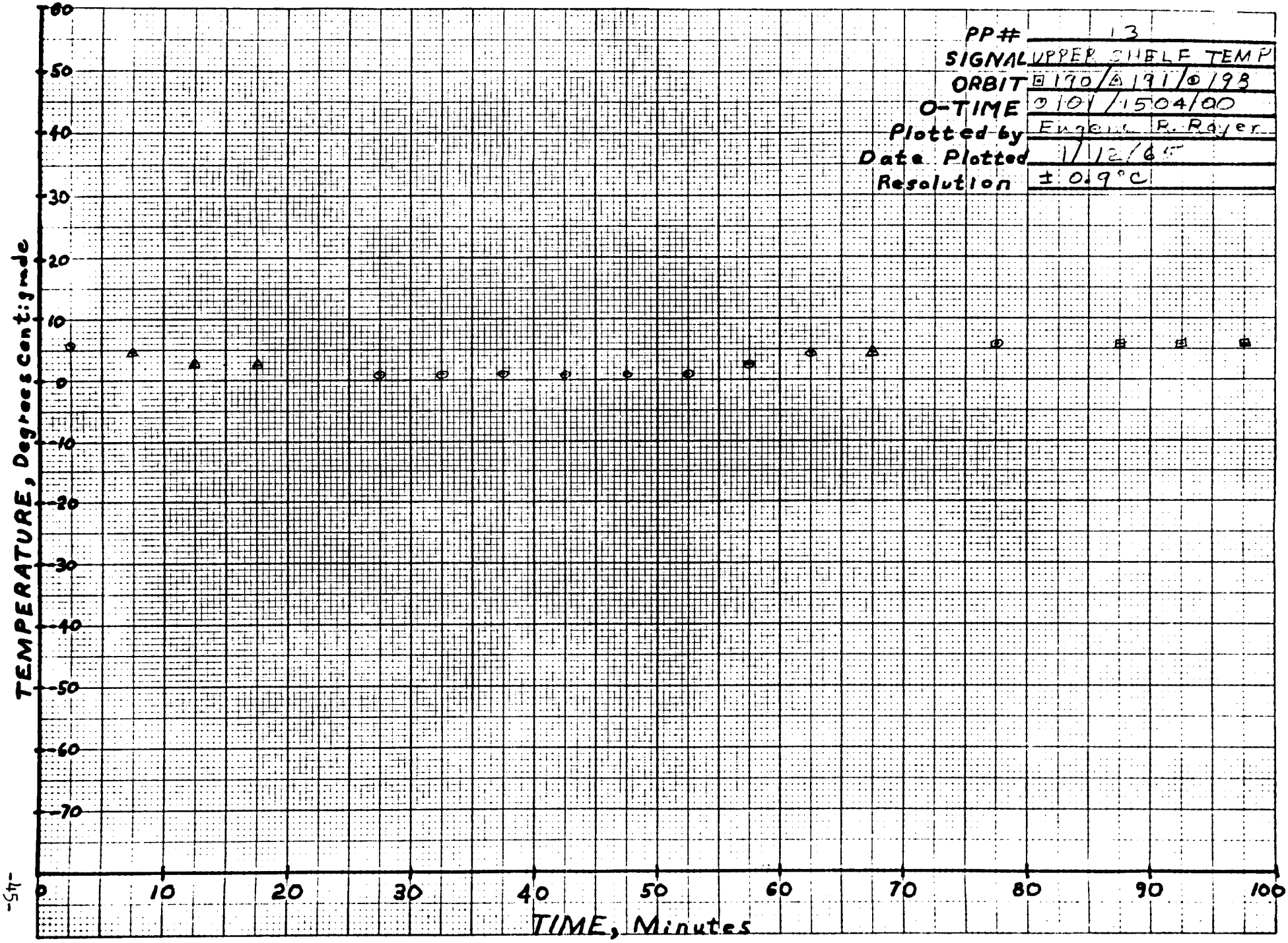


KEUFFEL & ESSER CO.

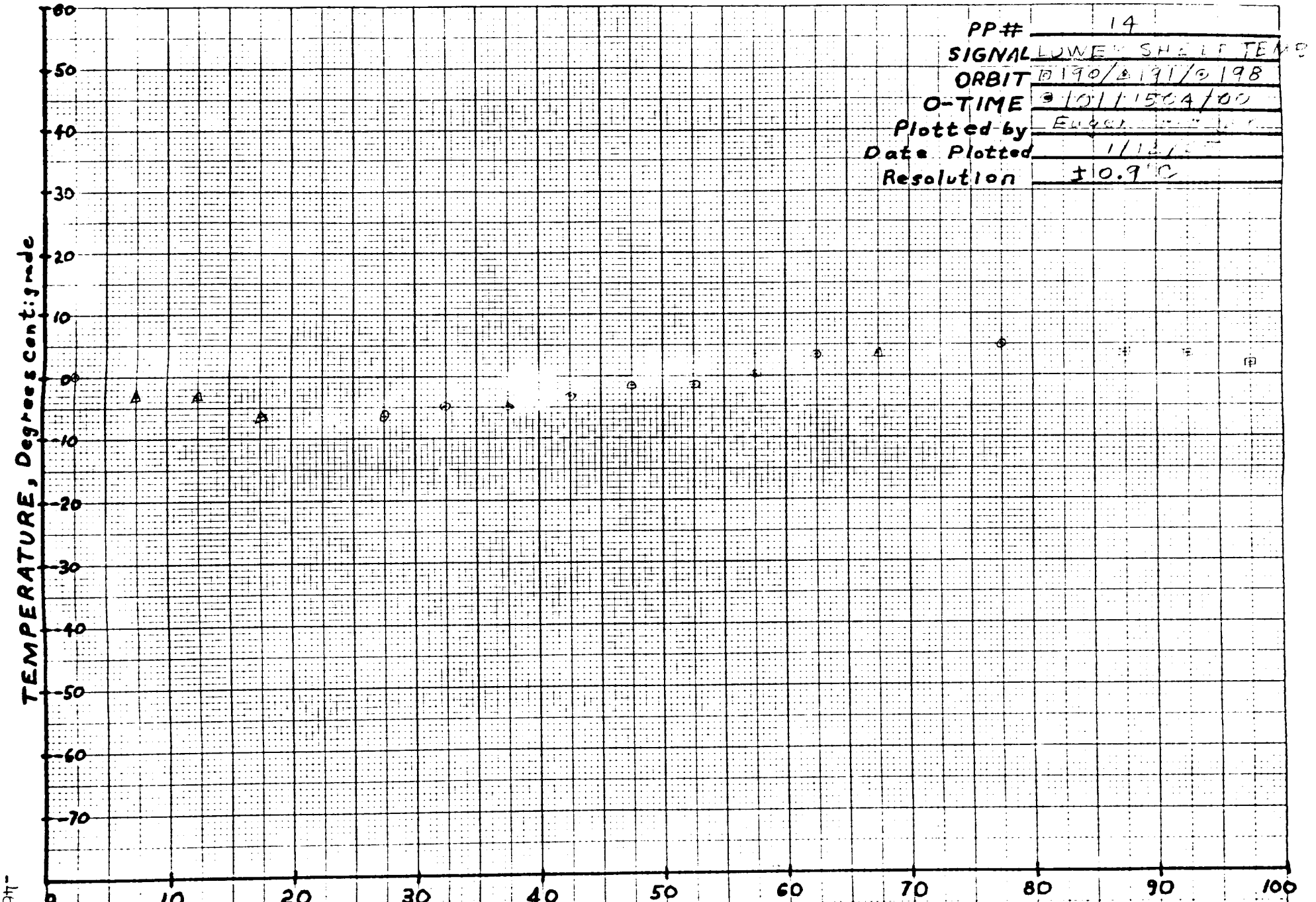


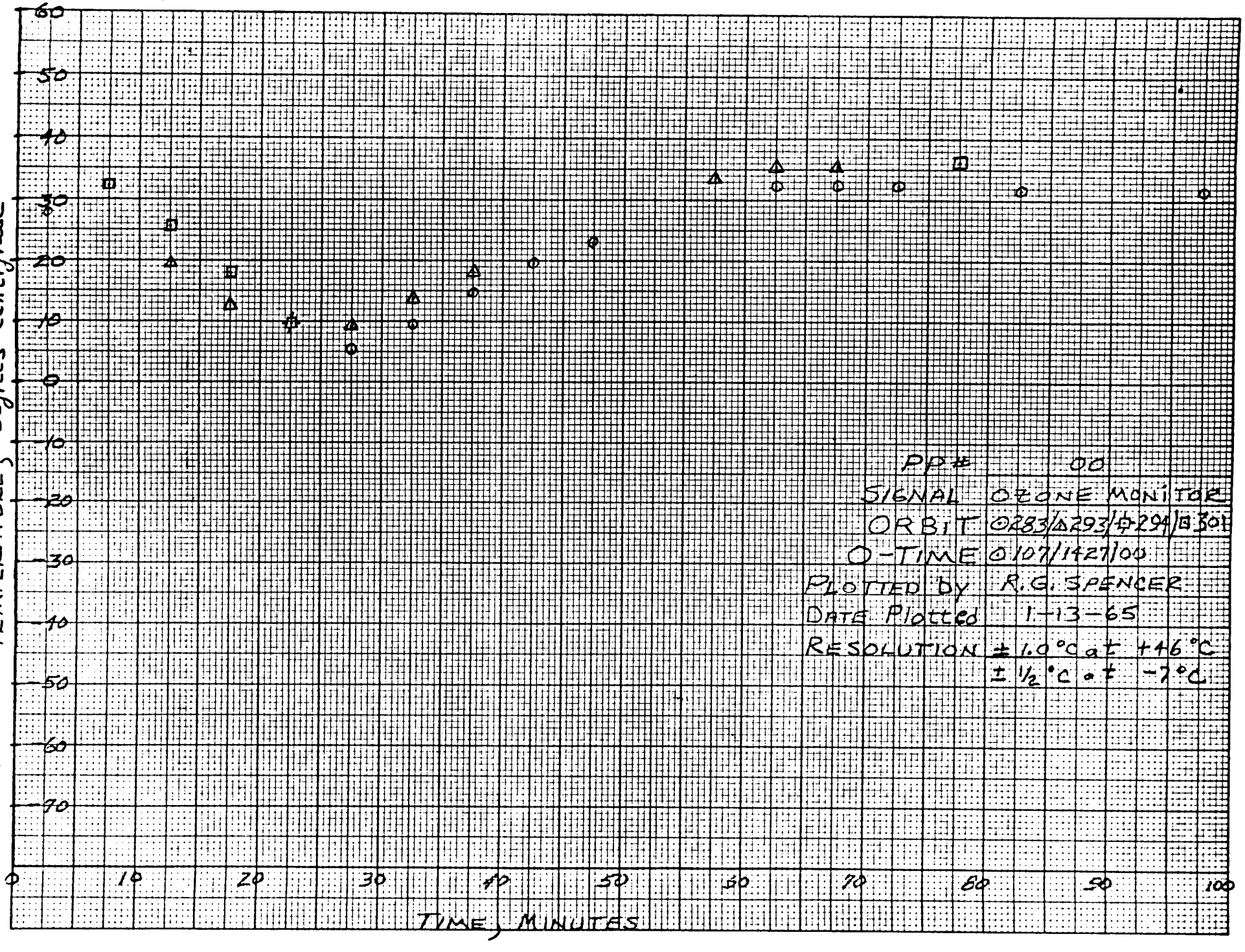
K+E 10 X 10 TO ½ INCH 46 1472
KEUFFEL & ESSER CO.



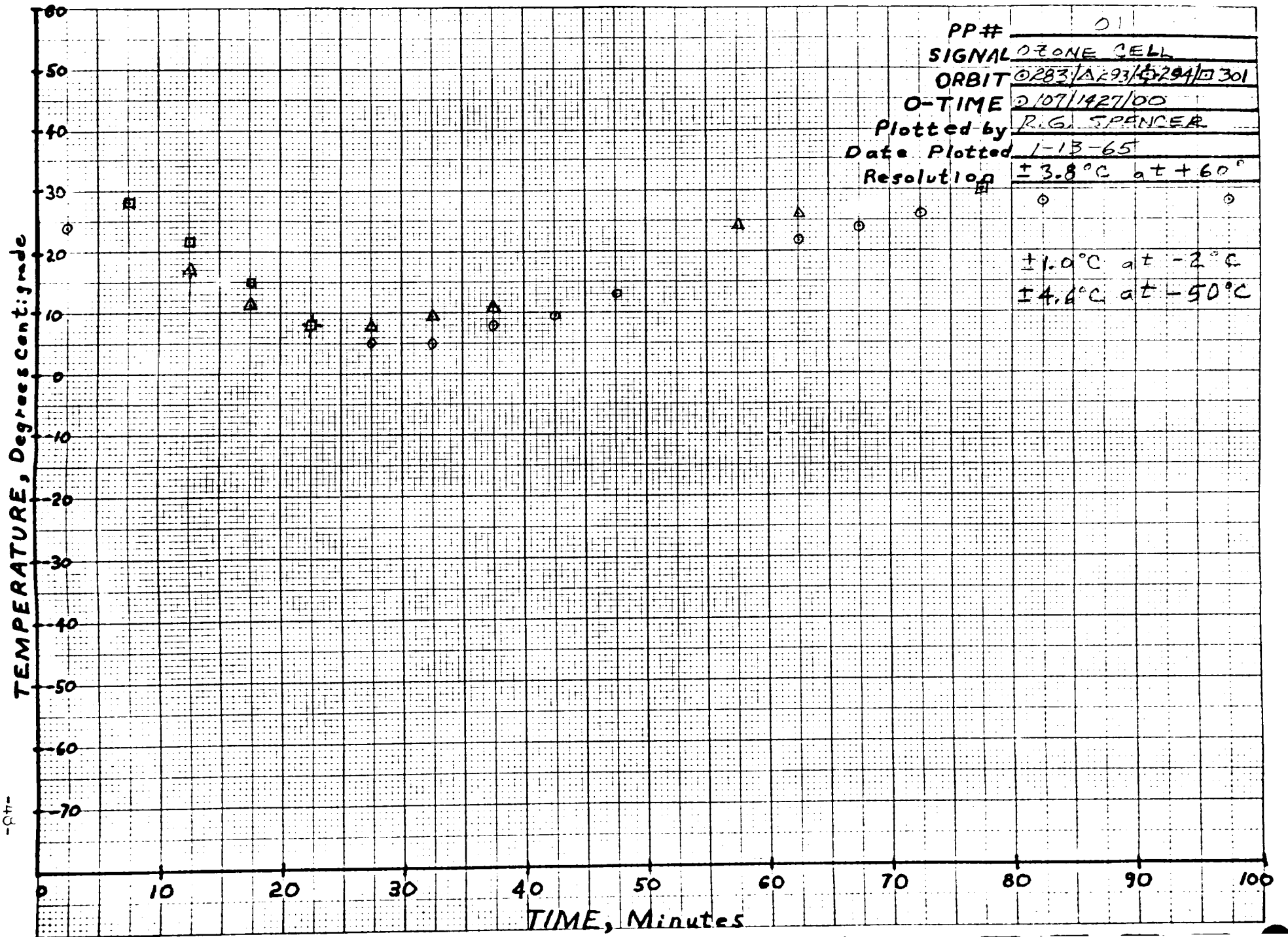

PP# 13
SIGNAL UPPER SHELF TEMP
ORBIT ⊡190/△191/⊙193
O-TIME ⊙101/1504/00
Plotted by Eugene R. Rayer
Date Plotted 1/12/65
Resolution ± 0.9°C
TEMPERATURE, Degrees centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

K+E 10 X 10 TO ½ INCH 46 1472
KEUFFEL & ESSER CO.

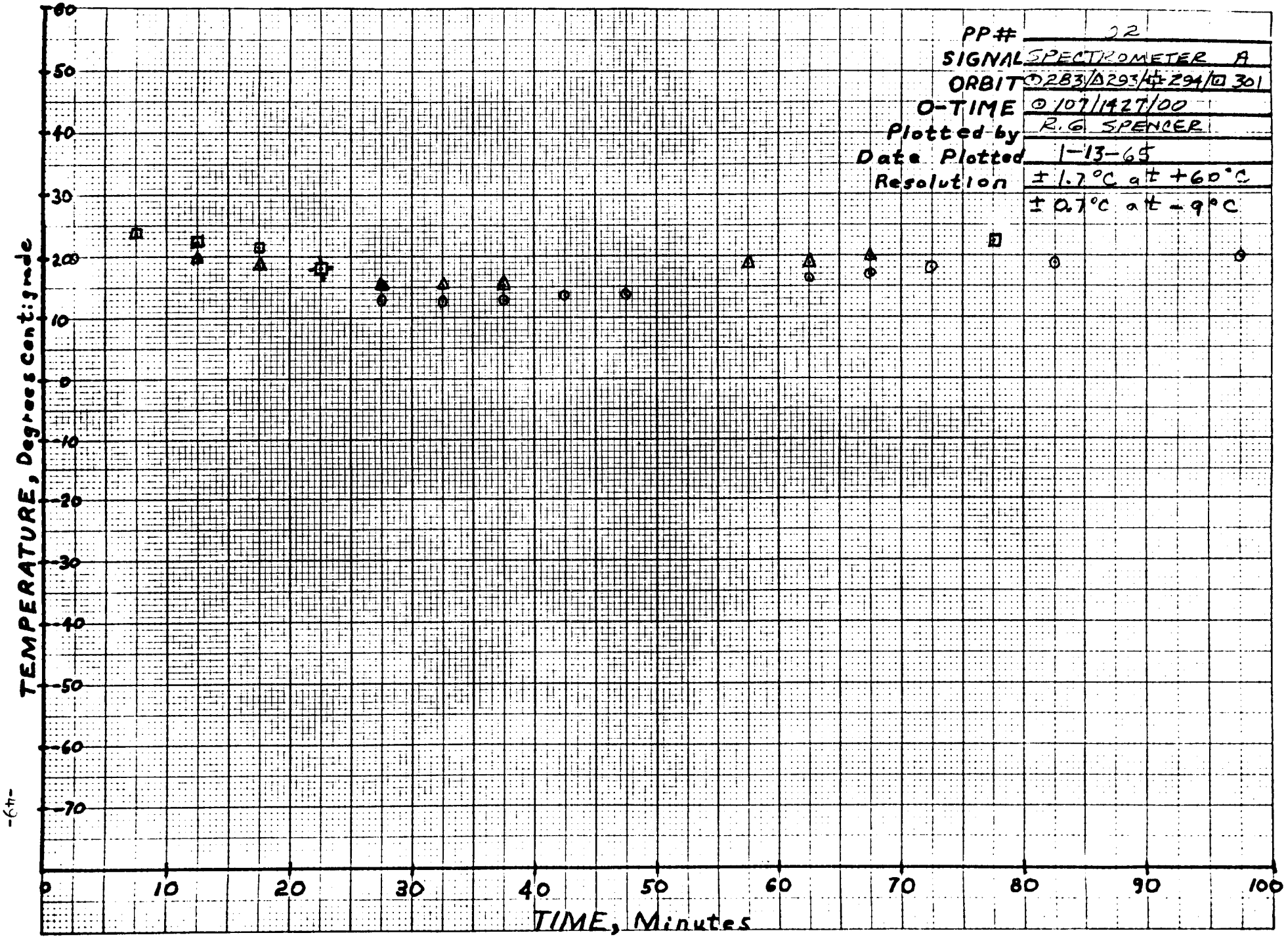



TEMPERATURE, Degrees centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, MINUTES
PP# 00
SIGNAL OZONE MONITOR
ORBIT ⊙283/△293/+294/□301
O-TIME ⊙107/1427/00
PLOTTED BY R.G. SPENCER
DATE Plotted 1-13-65
RESOLUTION ± 1.0°C at +46°C
± ½°C at -7°C

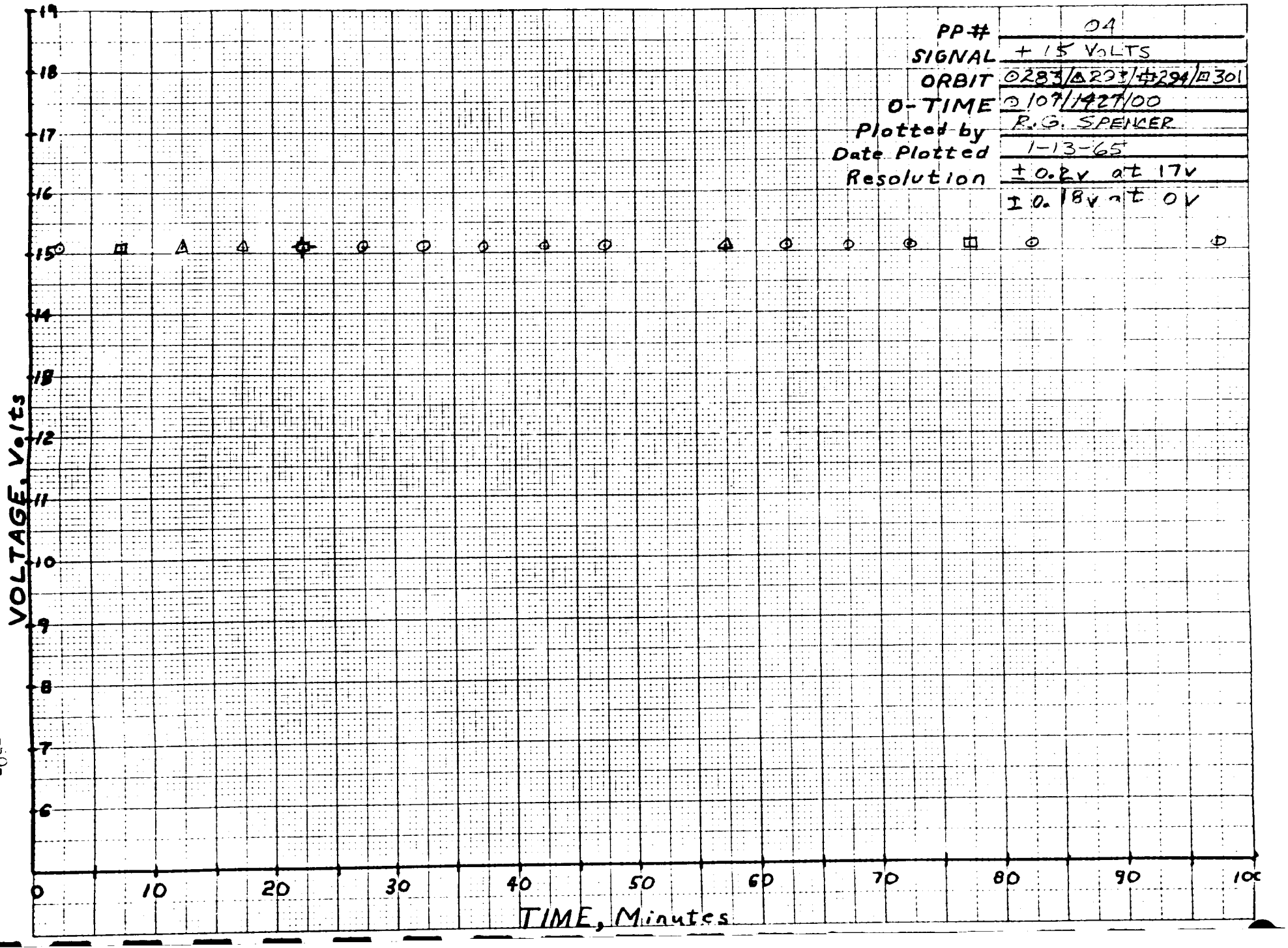
K+E 10 X 10 TO ½ INCH 46 1472
KEUFFEL & ESSER CO.



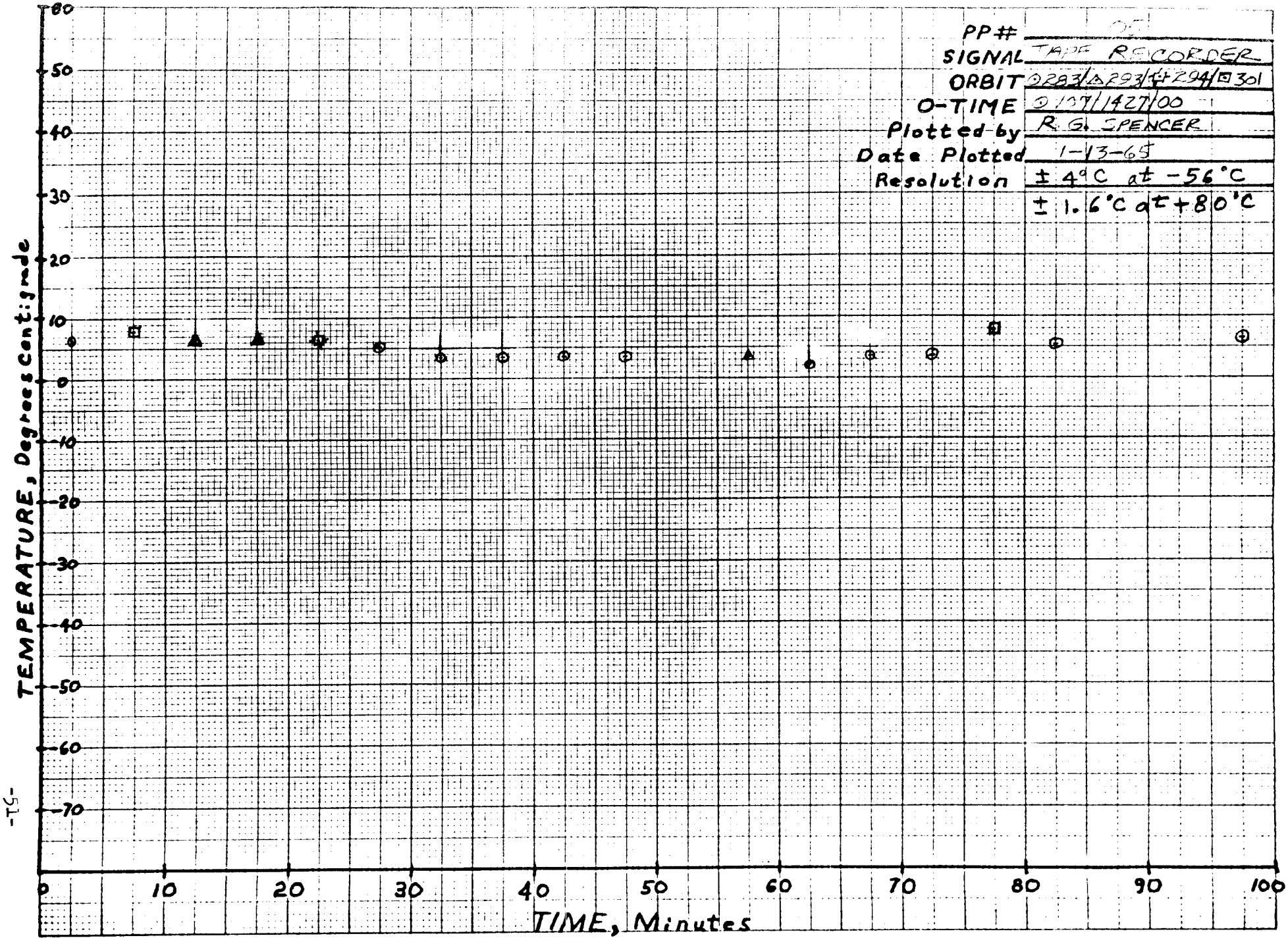
KEUFFEL & ESSER CO.



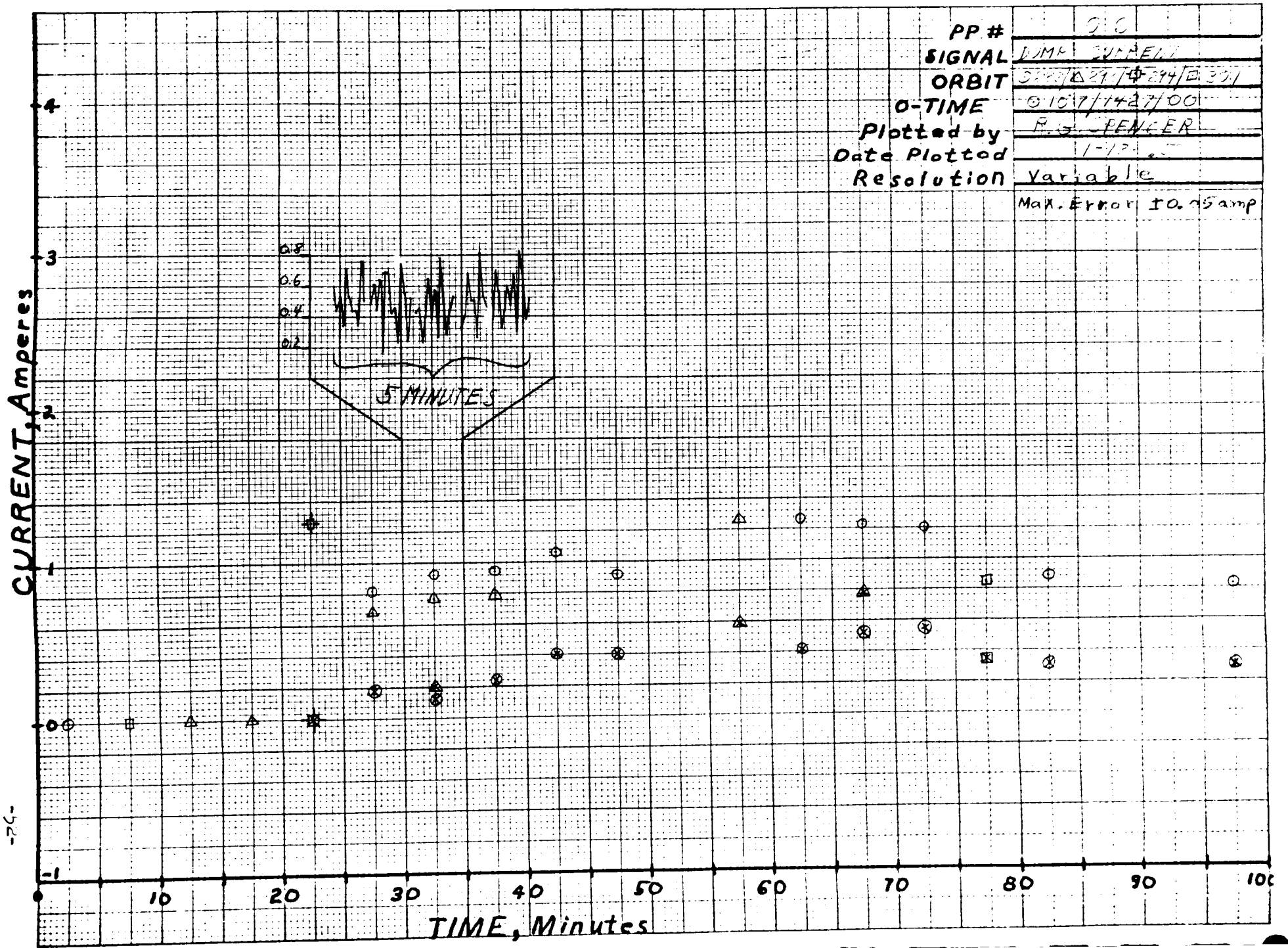
K&E 10 X 10 TO ½ INCH 46 1472
MADE IN U.S.A.
KEUFFEL & ESSER CO.

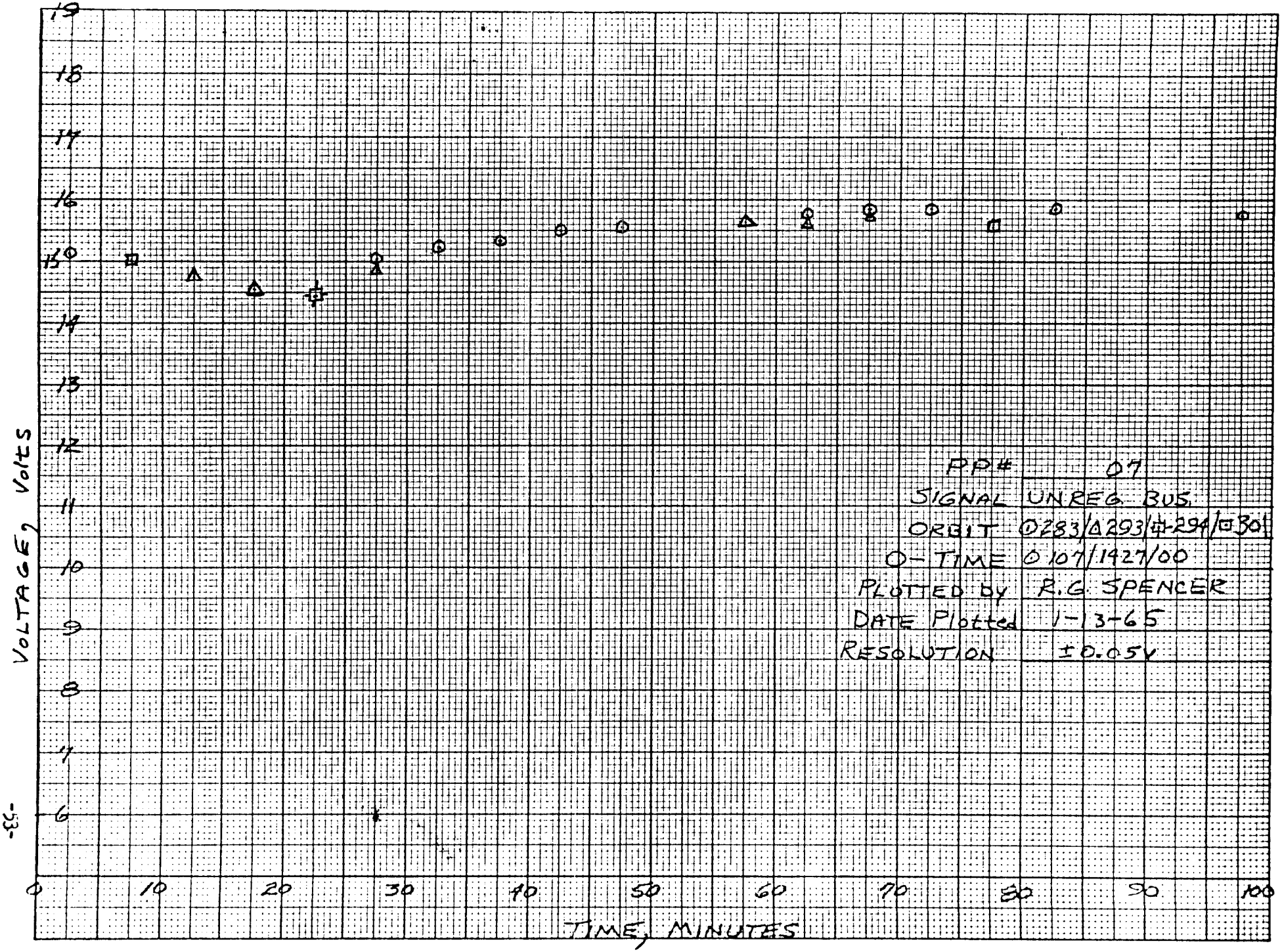


KEUFFEL & ESSER CO.

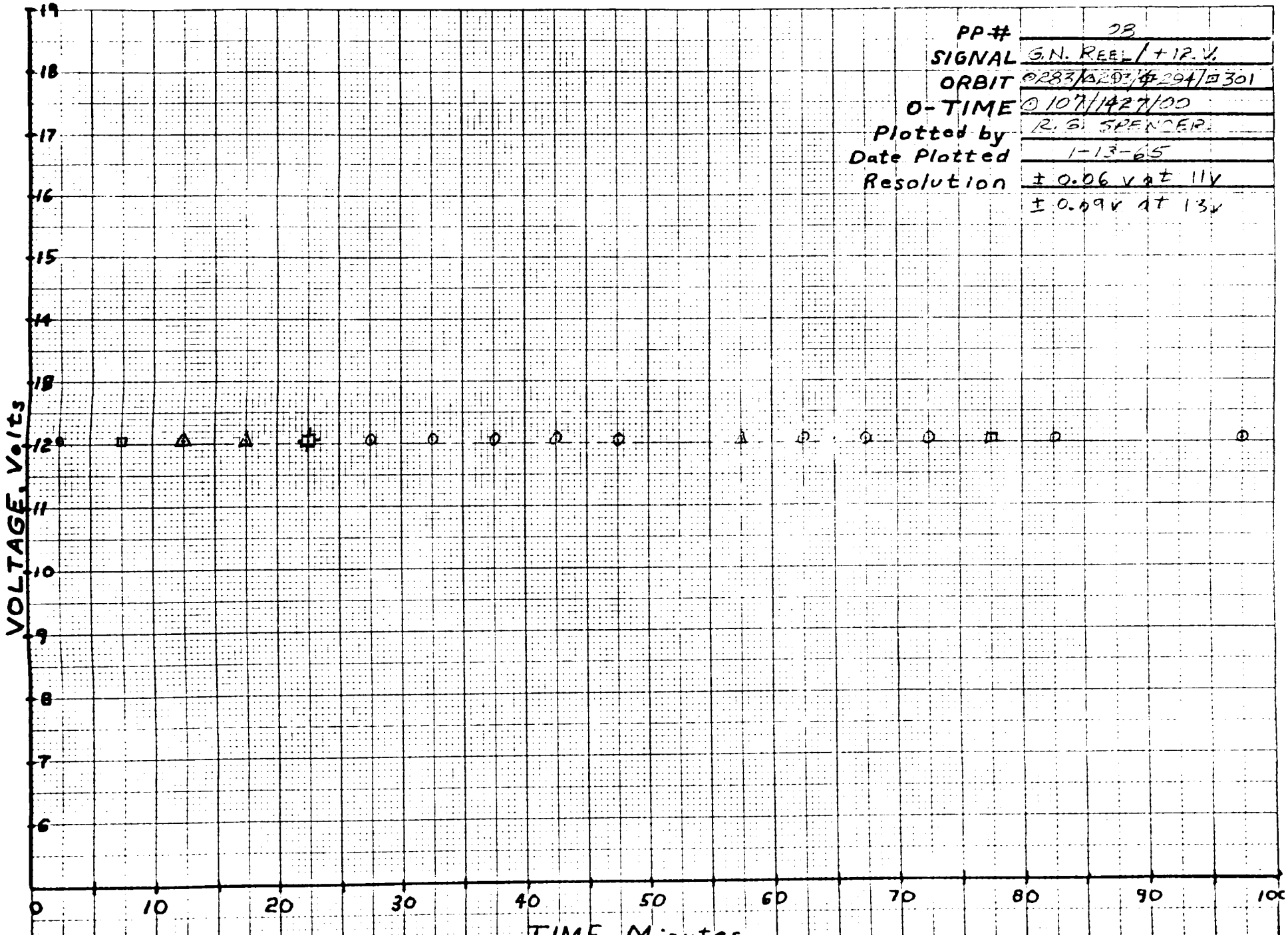


K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

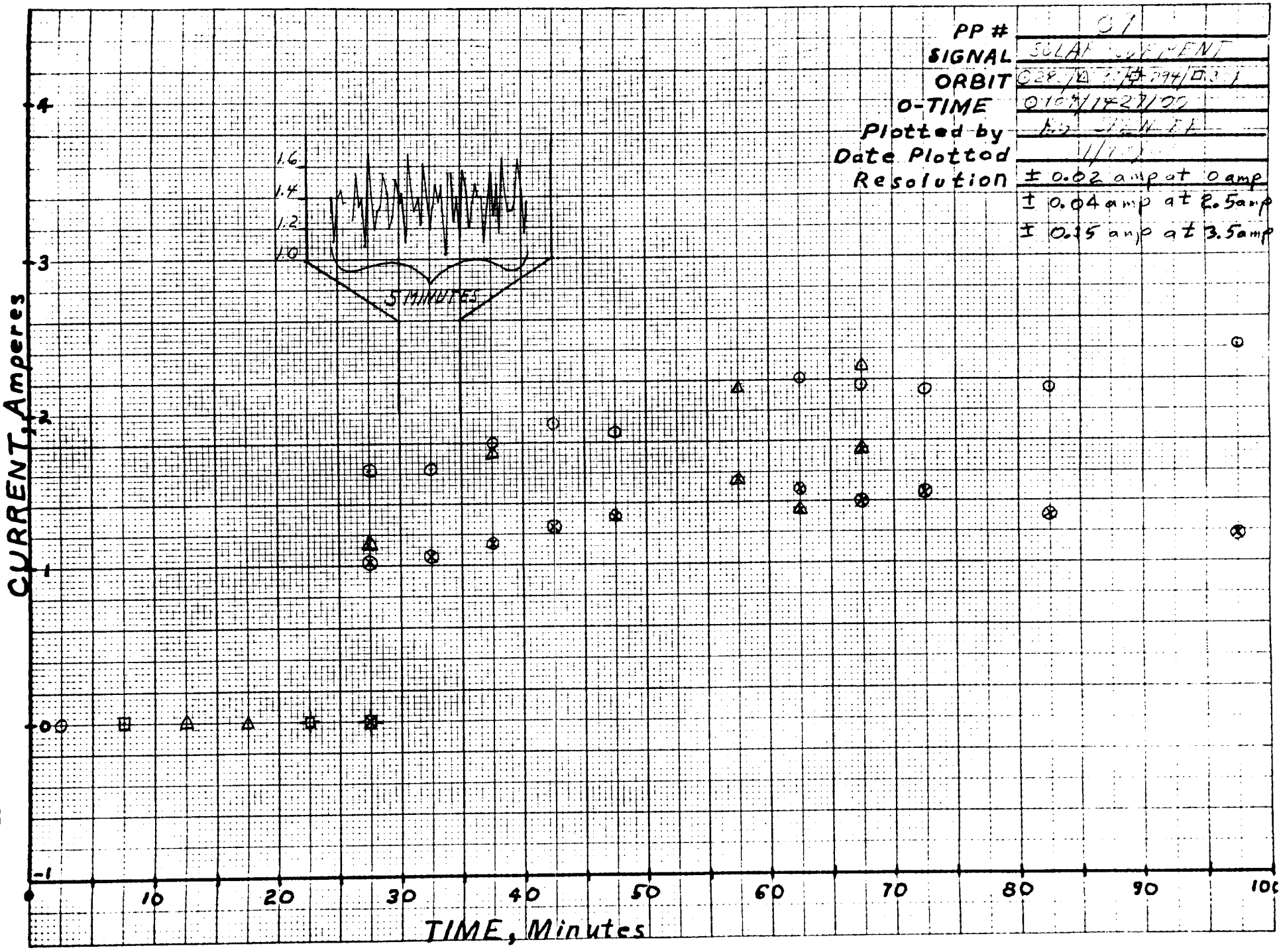



PP# 07
SIGNAL UNREG. BUS.
ORBIT ⊙283/△293/⊕294/⊡301
O-TIME 0107/1427/00
PLOTTED by R.G. SPENCER
DATE Plotted 1-13-65
RESOLUTION ±0.05V
VOLTAGE, Volts
TIME, MINUTES
19
18
17
16
15
14
13
12
11
10
9
8
7
6
0
10
20
30
40
50
60
70
80
90
100

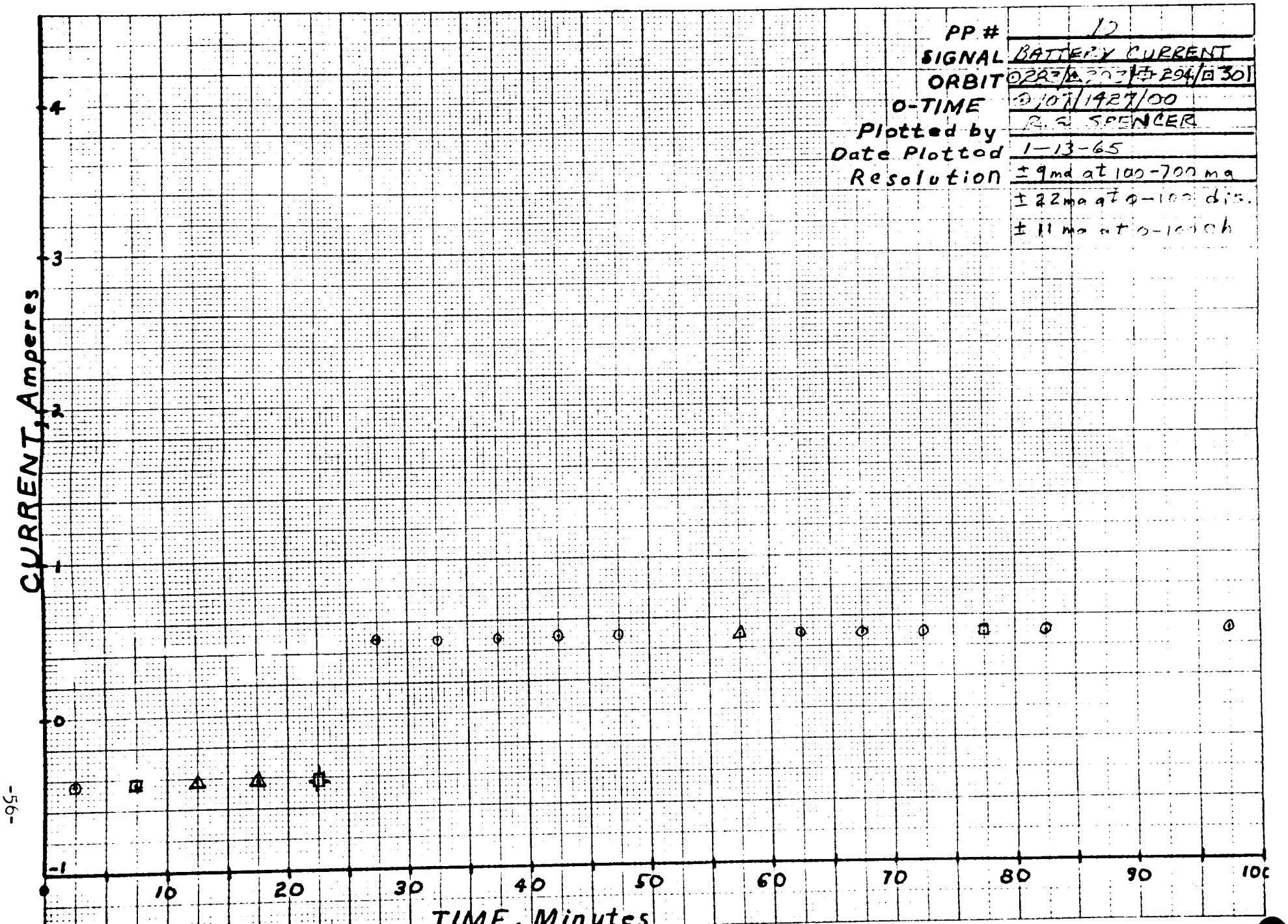
K&E 10 X 10 TO 1/2 INCH 46 1472
MADE IN U.S.A.
KEUFFEL & ESSER CO.



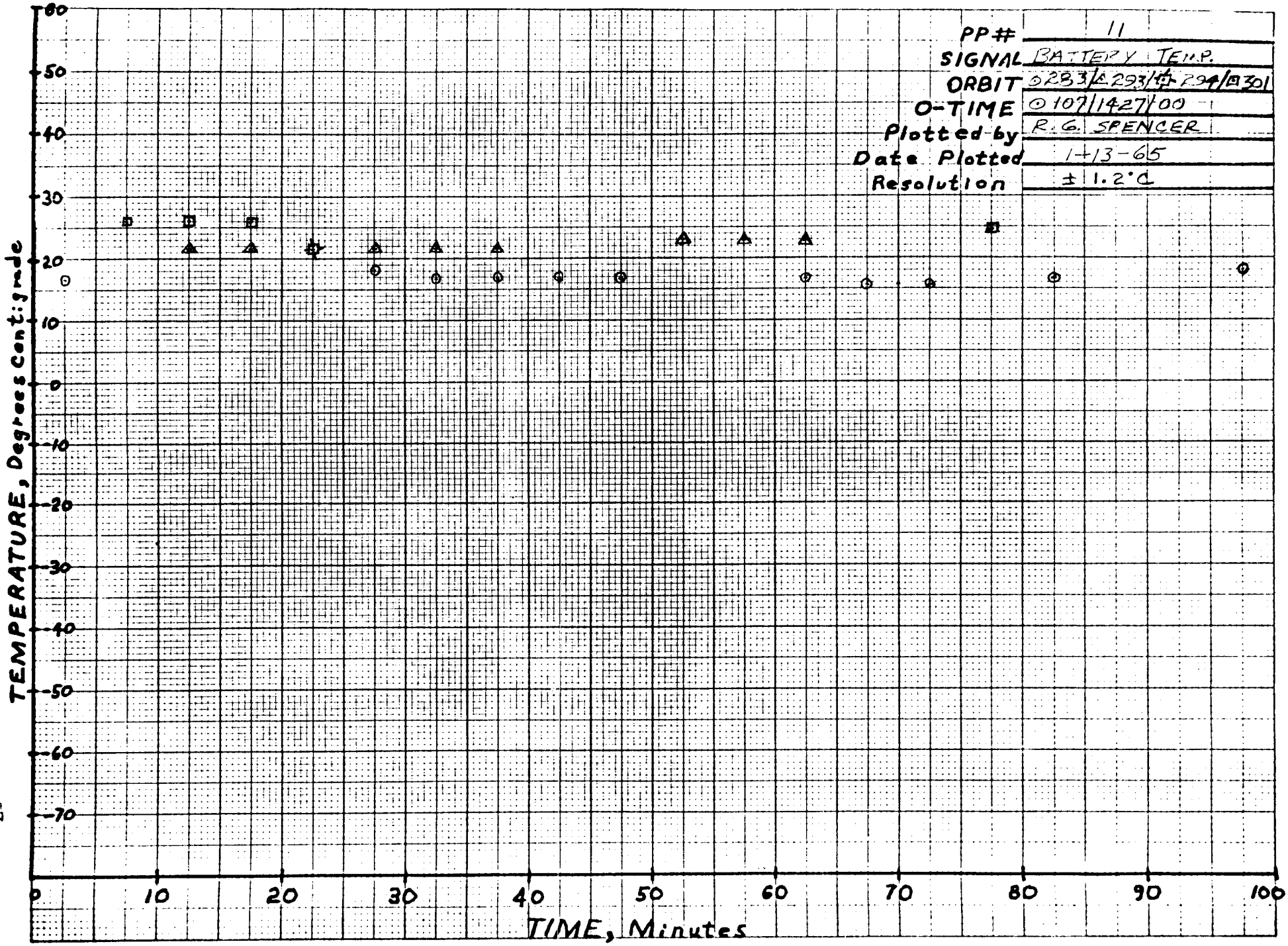
KEUFFEL & ESSER CO.



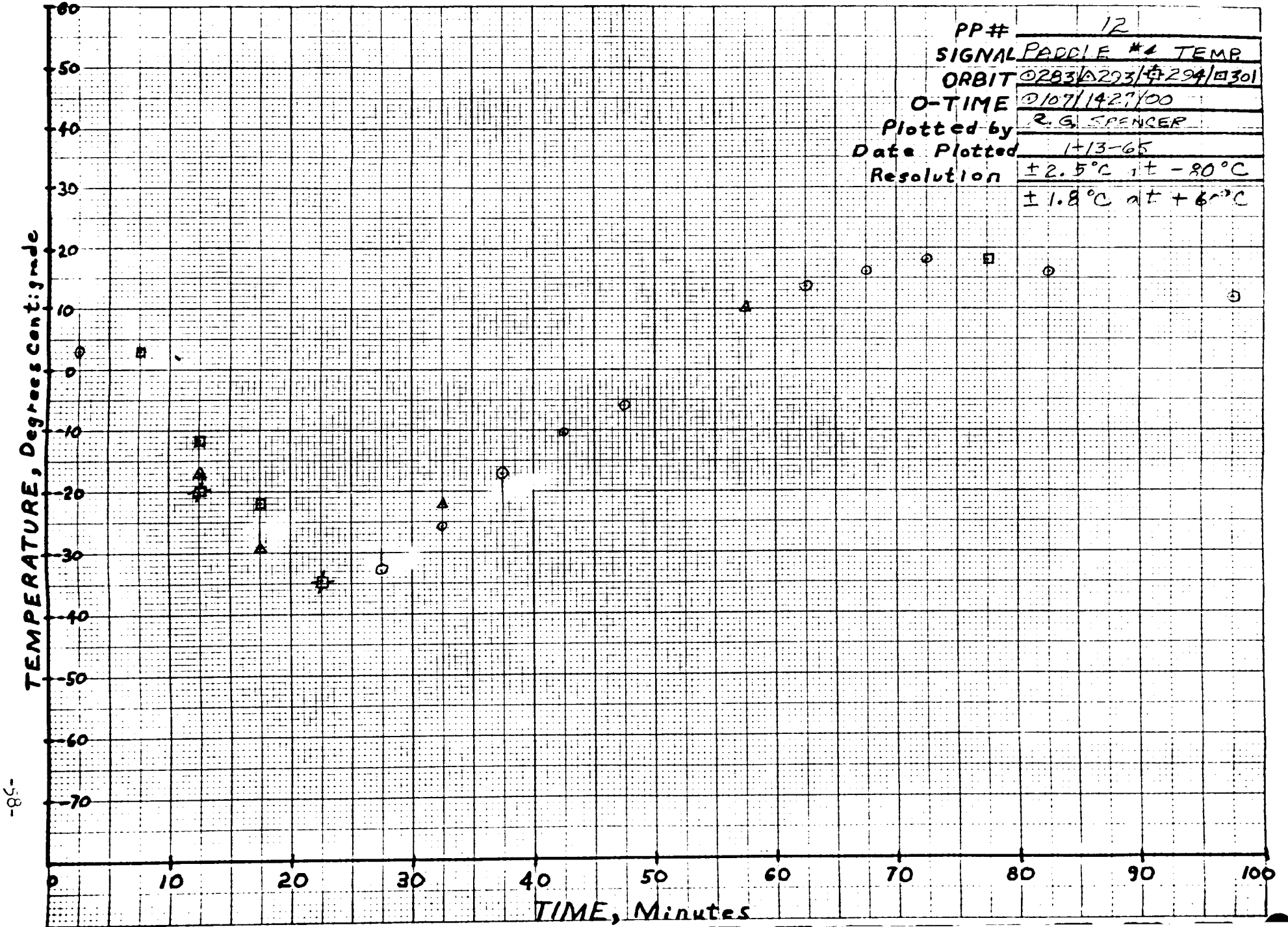
10 X 10 TO ½ INCH 46 1472
KEUFFEL & ESSER CO.



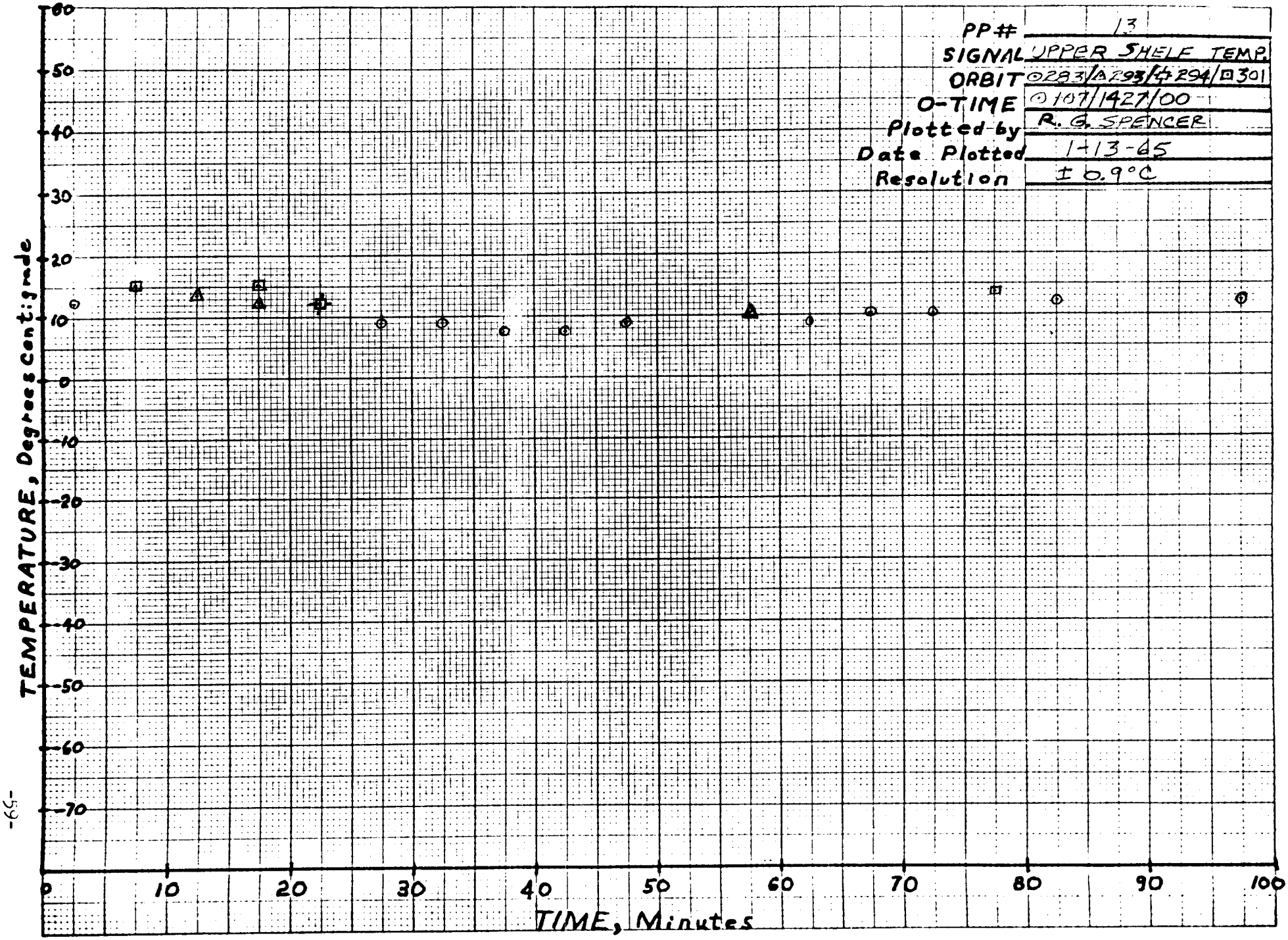
KEUFFEL & ESSER CO.



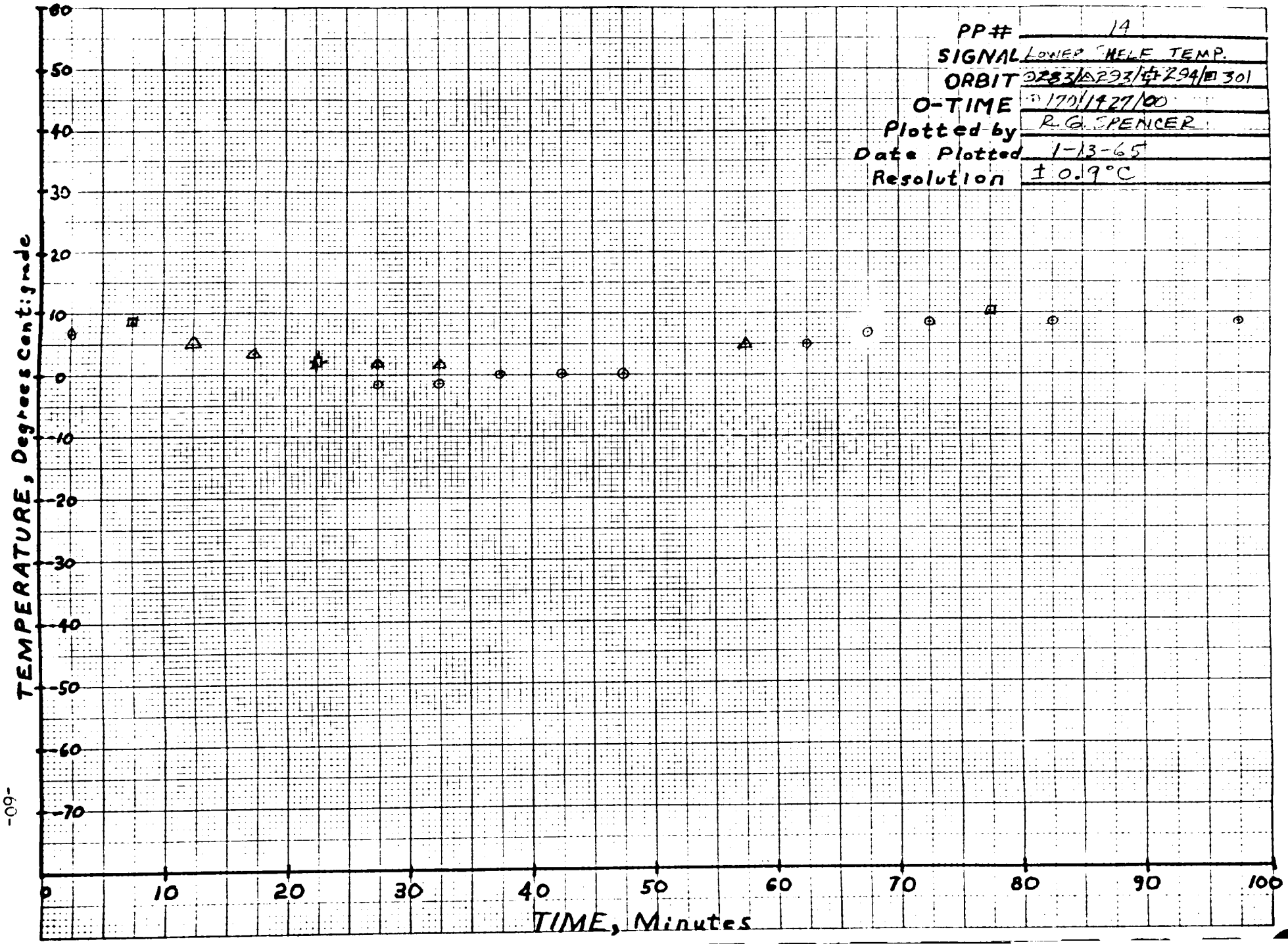
K&E 10 X 10 TO ½ INCH 46 1472
KEUFFEL & ESSER CO.



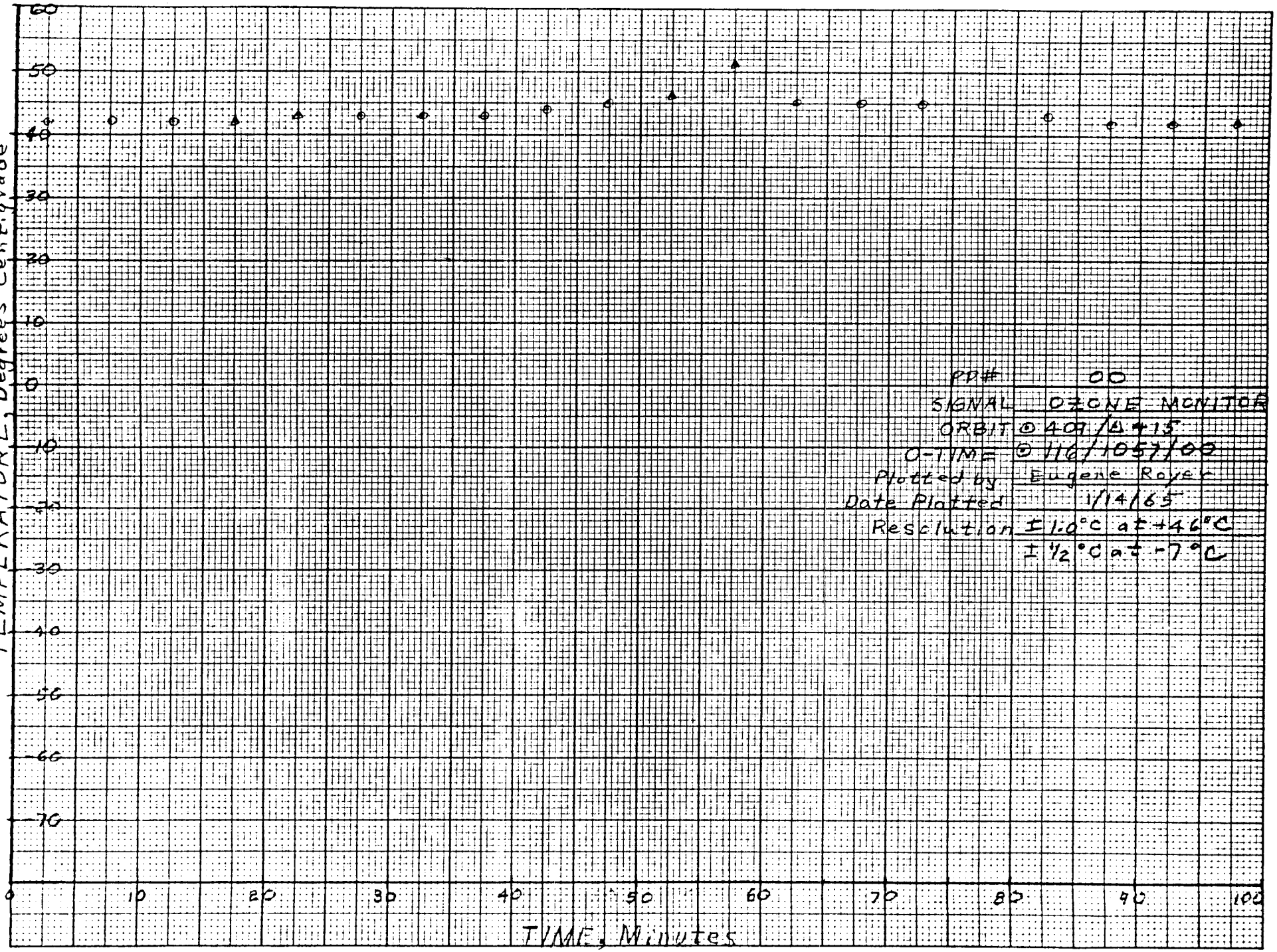
KEUFFEL & ESSER CO.

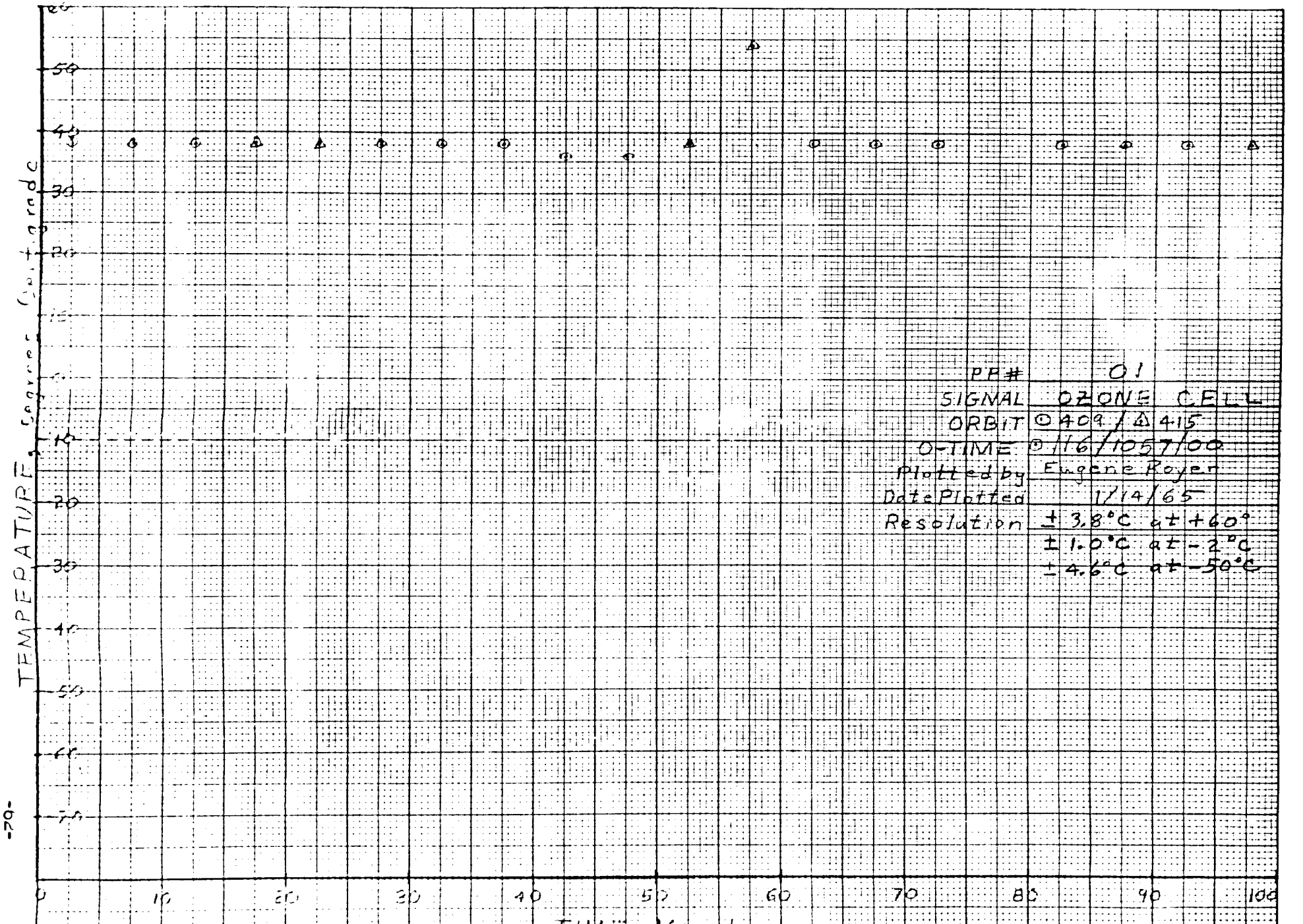


10 X 10 TO 1/2 INCH 46 1372
KEUFFEL & ESSER CO.

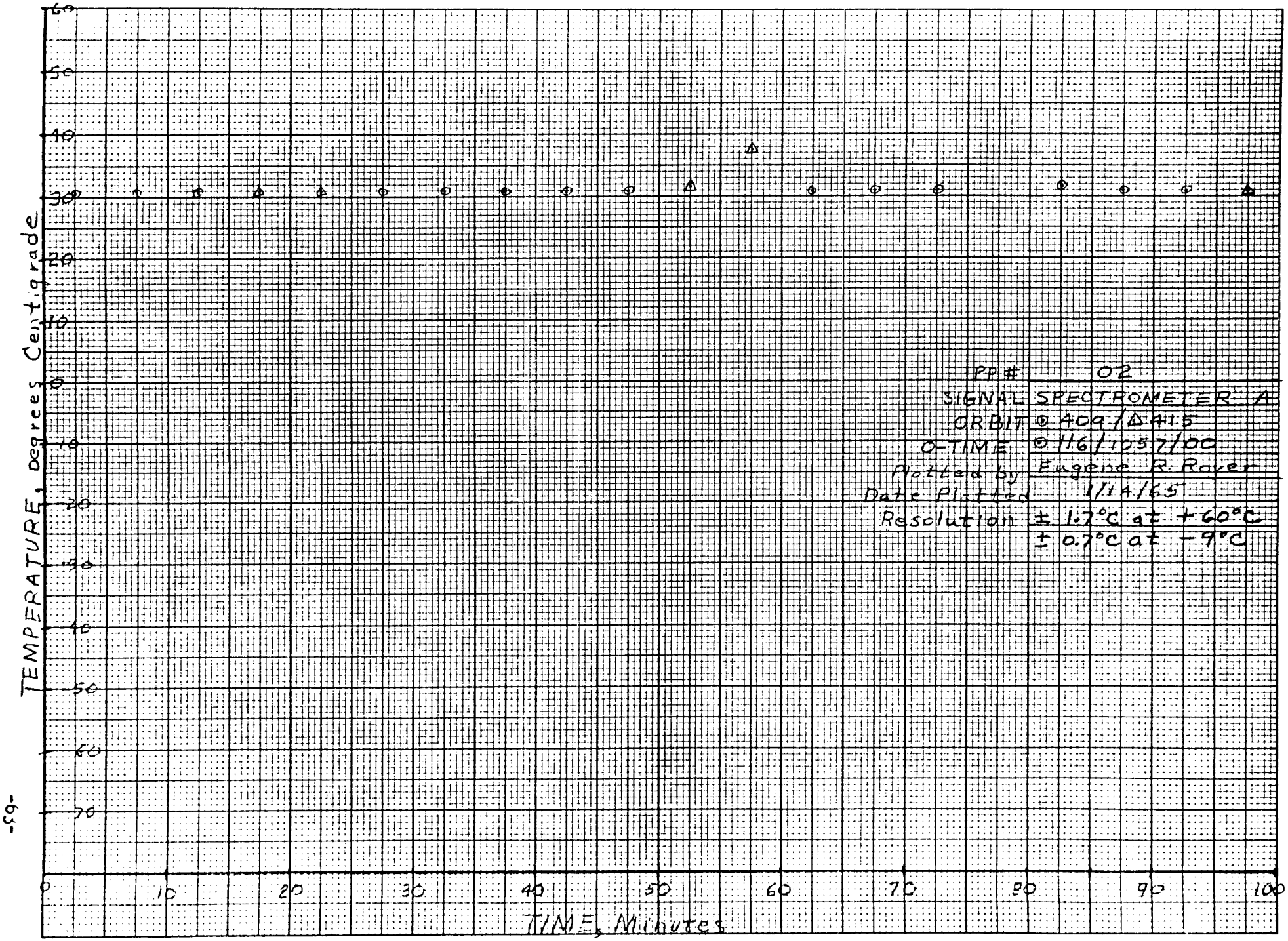


KEUFFEL & ESSER CO.

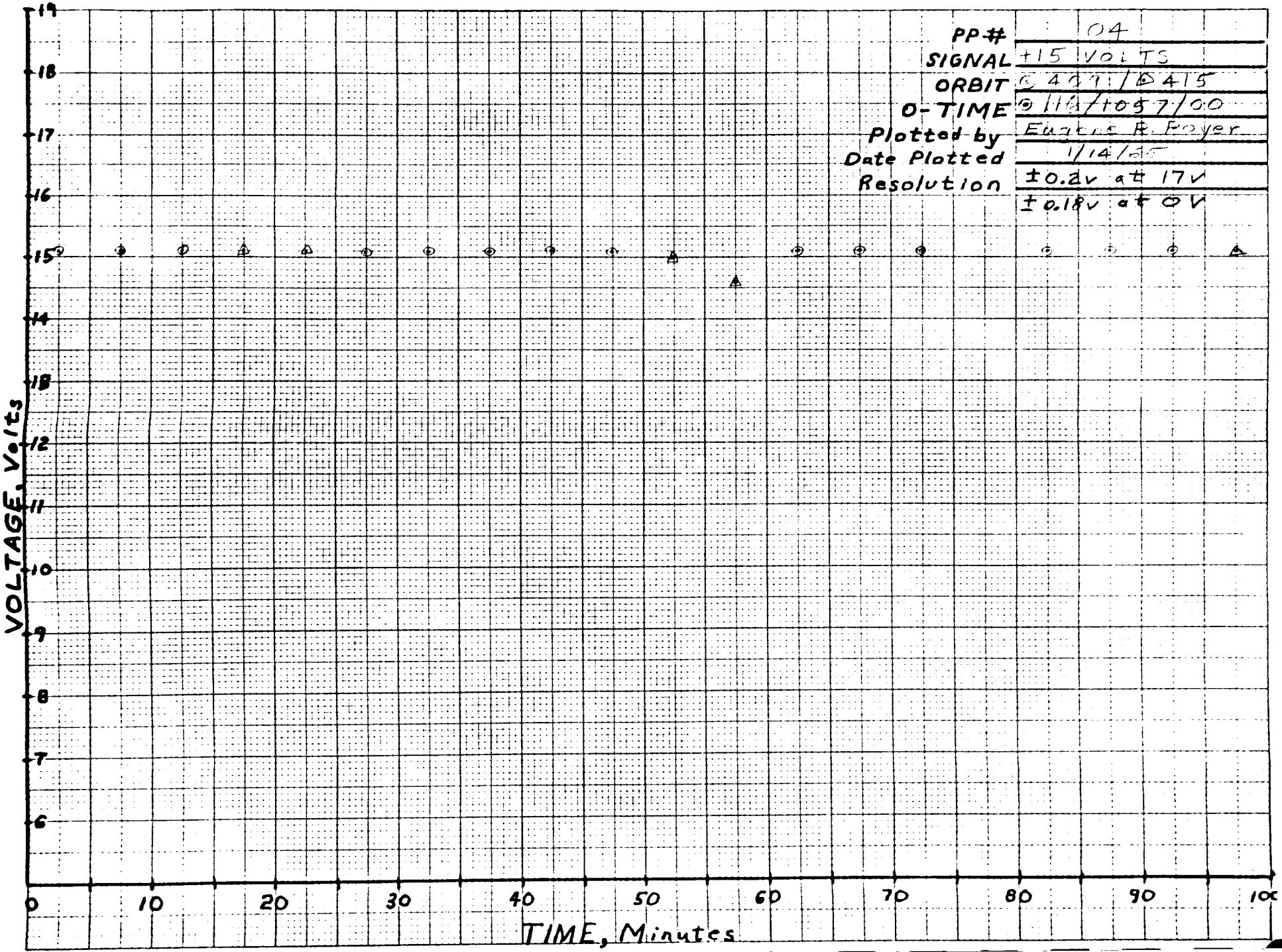



TEMPERATURE, degrees Centigrade
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
PP#
01
SIGNAL
OZONE CELL
ORBIT
409 / 415
O-TIME
116/1057/00
Plotted by
Eugene Royer
Date Plotted
1/14/65
Resolution
± 3.8°C at +60°
± 1.0°C at -2°C
± 4.6°C at -50°C

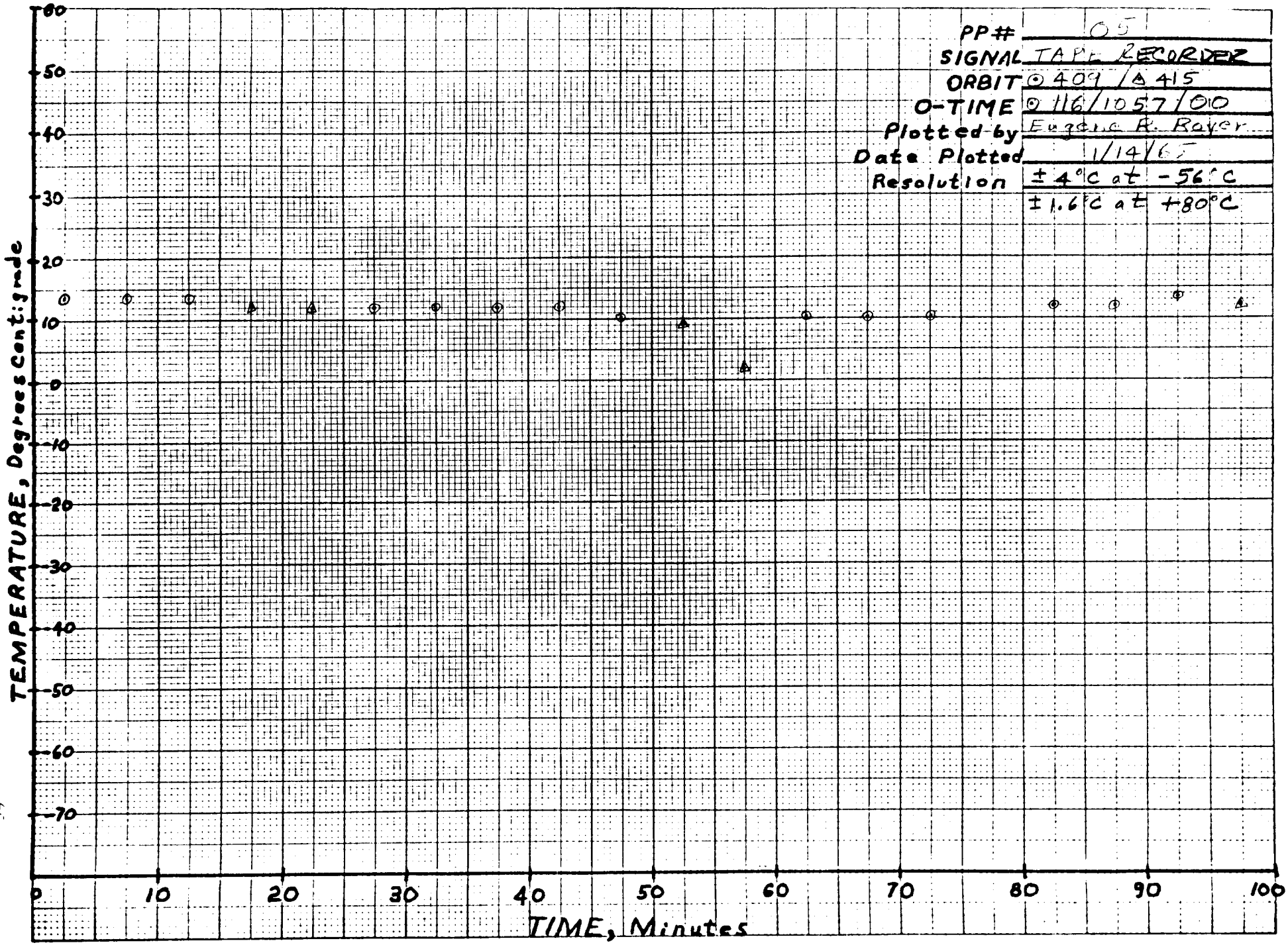
KEUFFEL & ESSER CO.



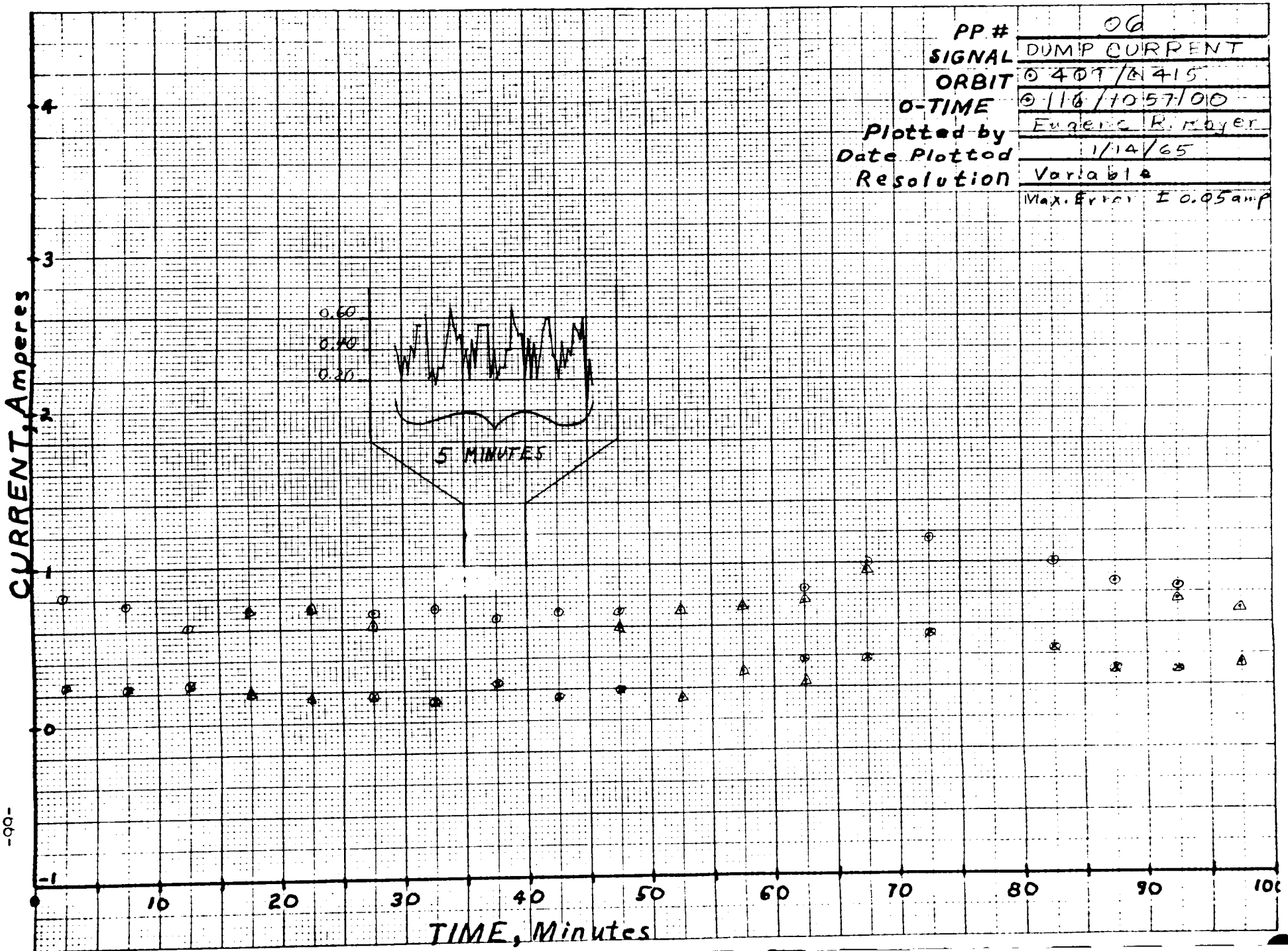
K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



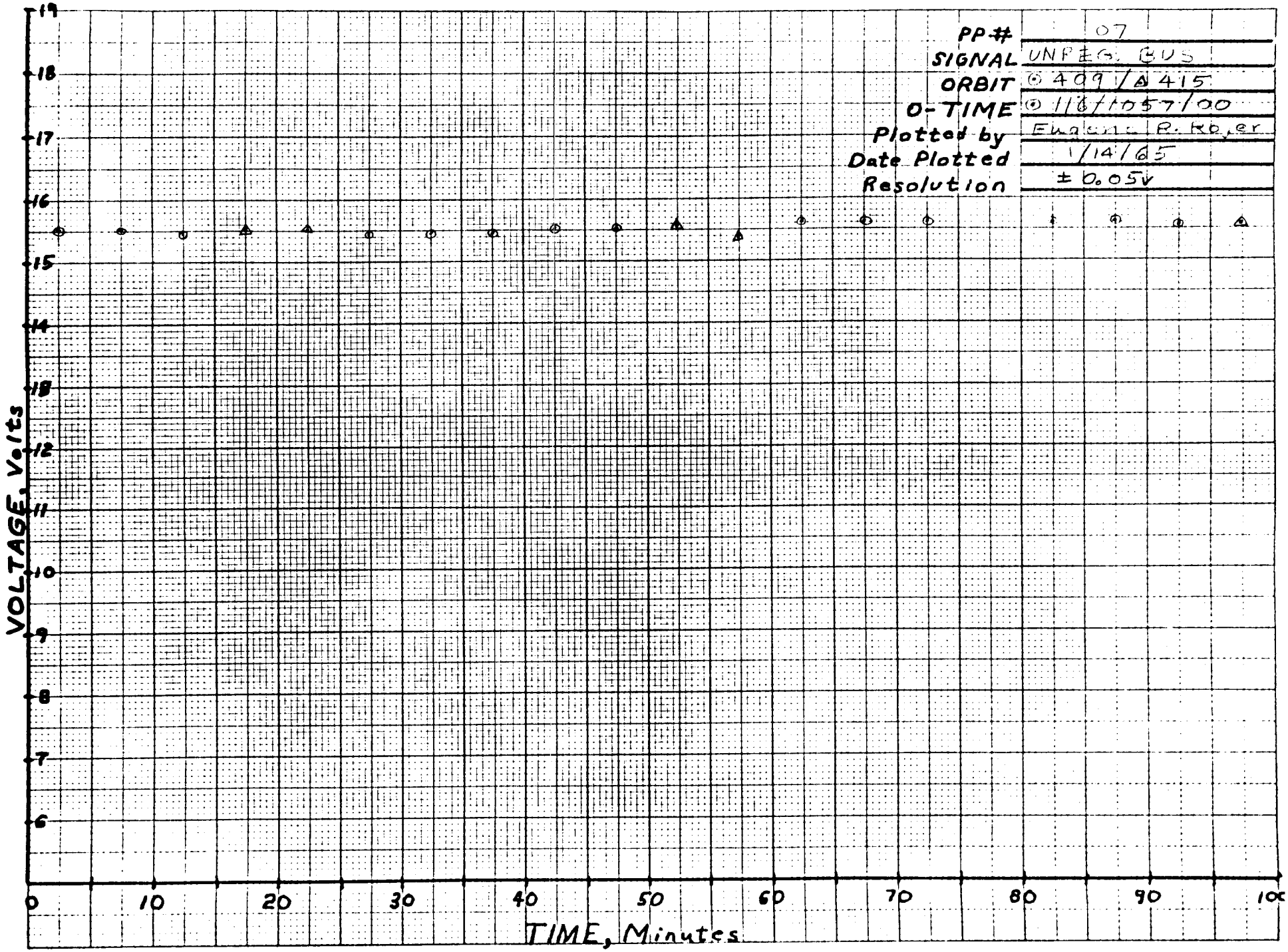
KEUFFEL & ESSER CO.



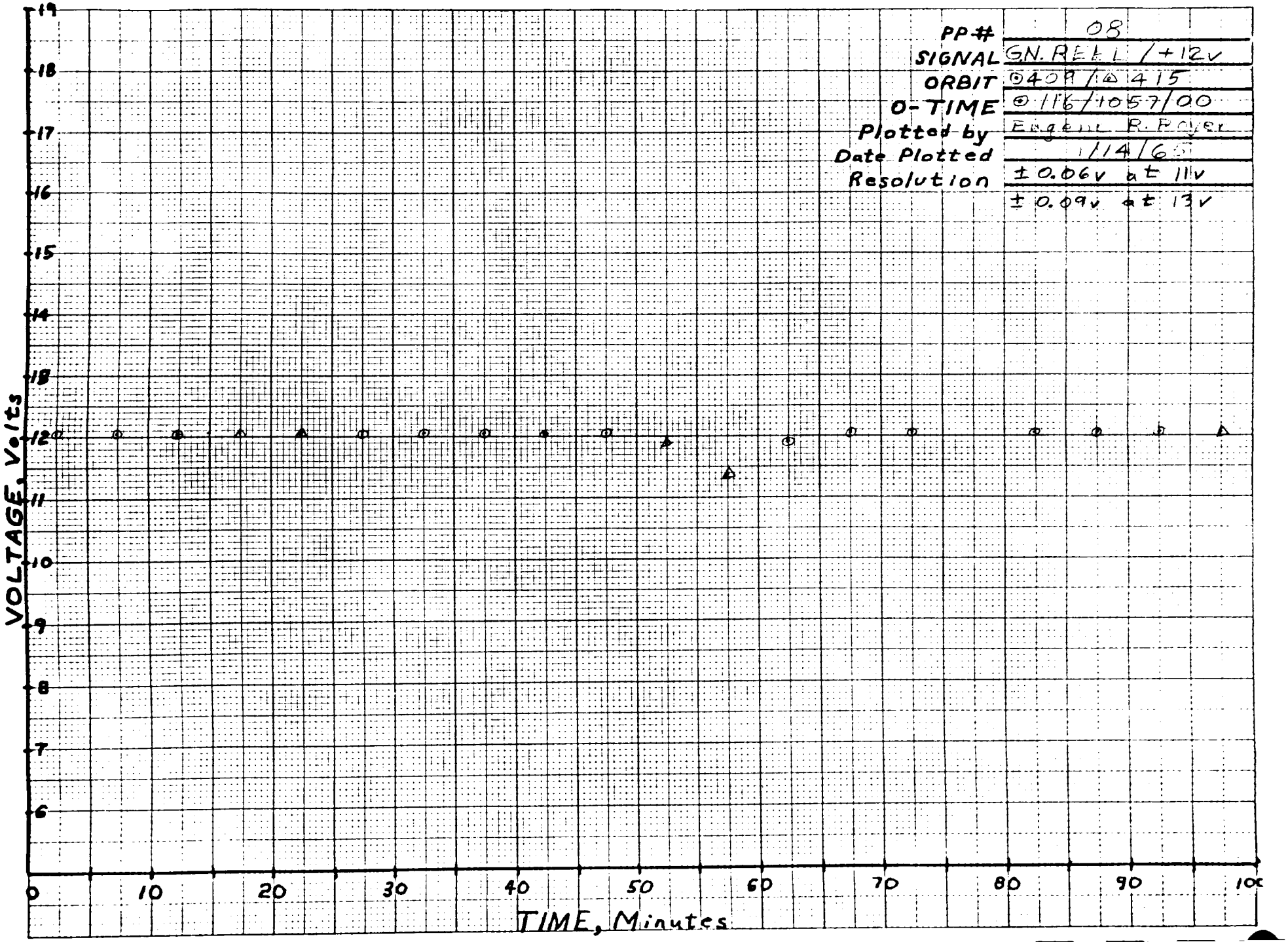
K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

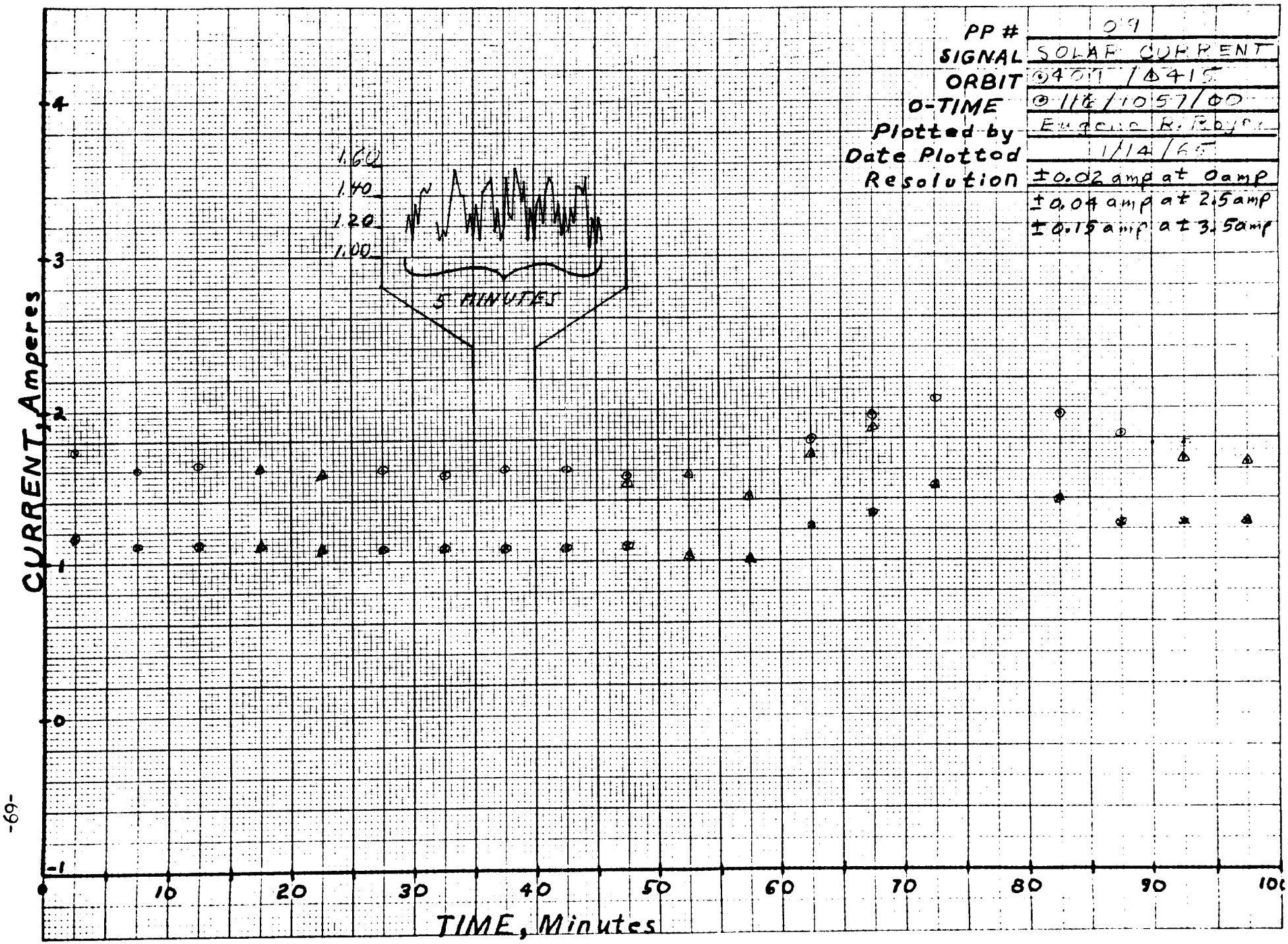


KEUFFEL & ESSER CO.

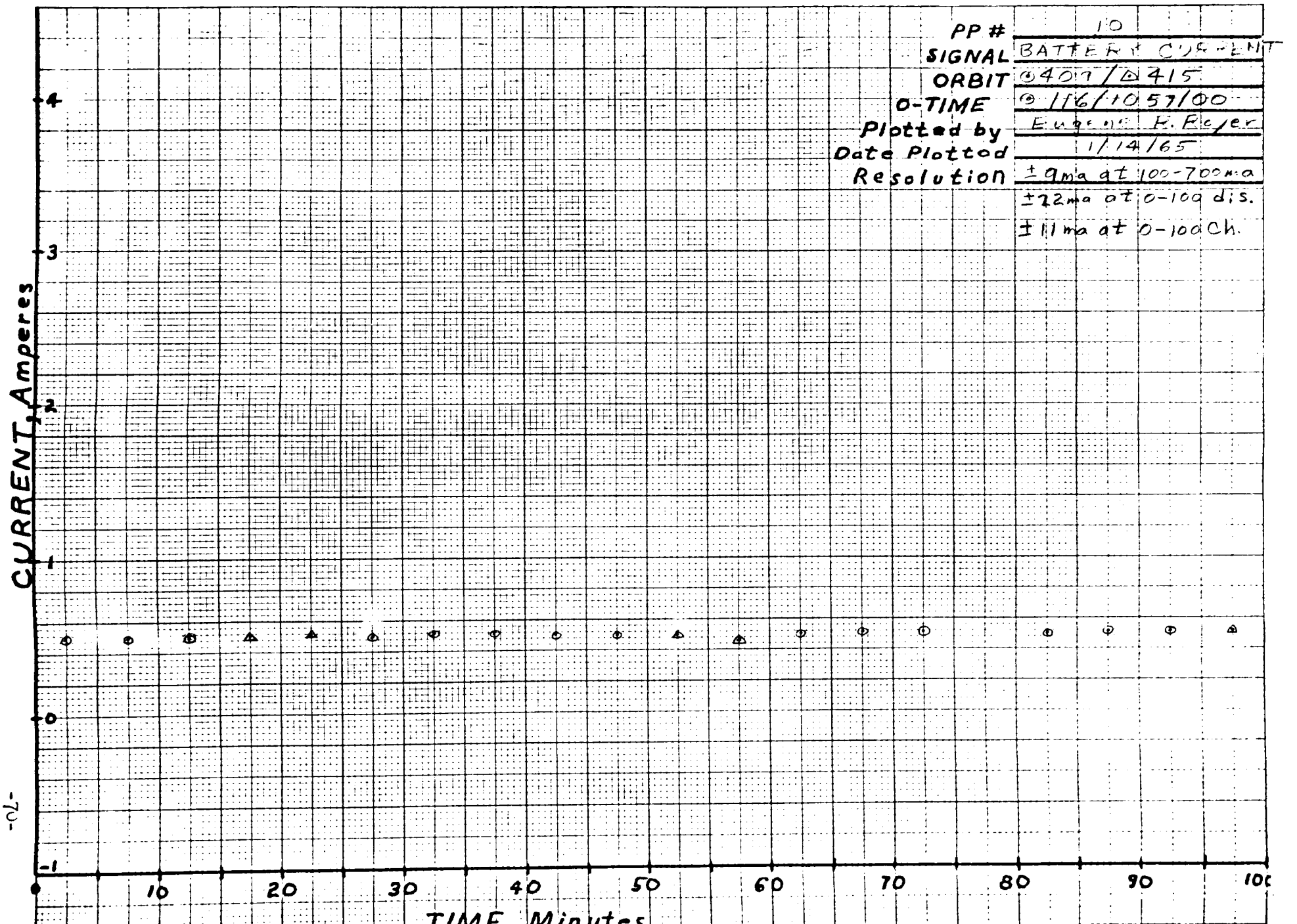


K+E 10 X 10 TO 1/2 INCH 46 1472
7 1/2 X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

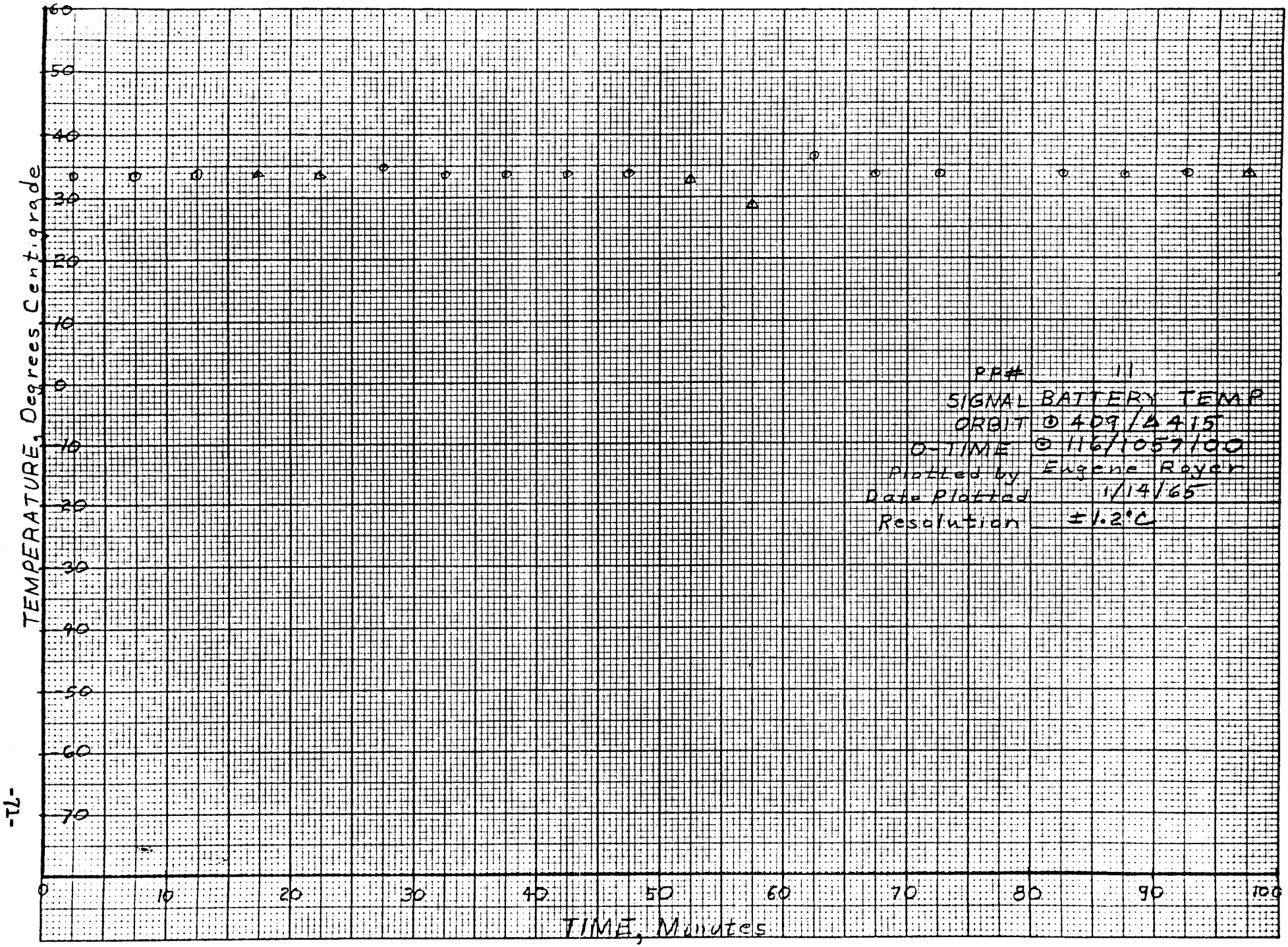



PP # 09
SIGNAL SOLAR CURRENT
ORBIT ⊙407 / △415
O-TIME ⊙ 116/1057/00
Plotted by Eugene R. Boyer
Date Plotted 1/14/65
Resolution ±0.02 amp at 0 amp
±0.04 amp at 2.5 amp
±0.15 amp at 3.50 amp
1.60
1.40
1.20
1.00
5 MINUTES
CURRENT, Amperes
4
3
2
1
0
-1
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

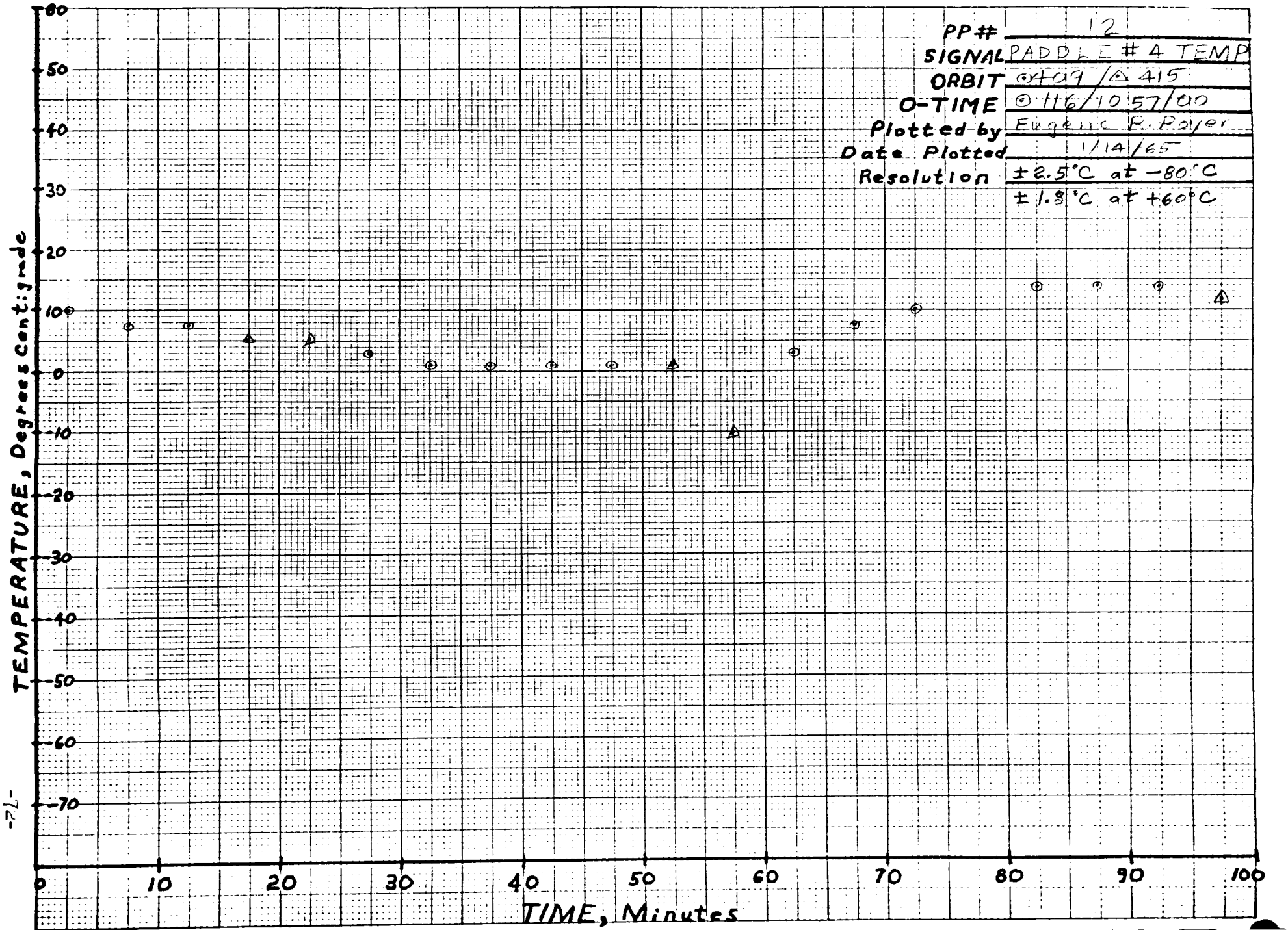
K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



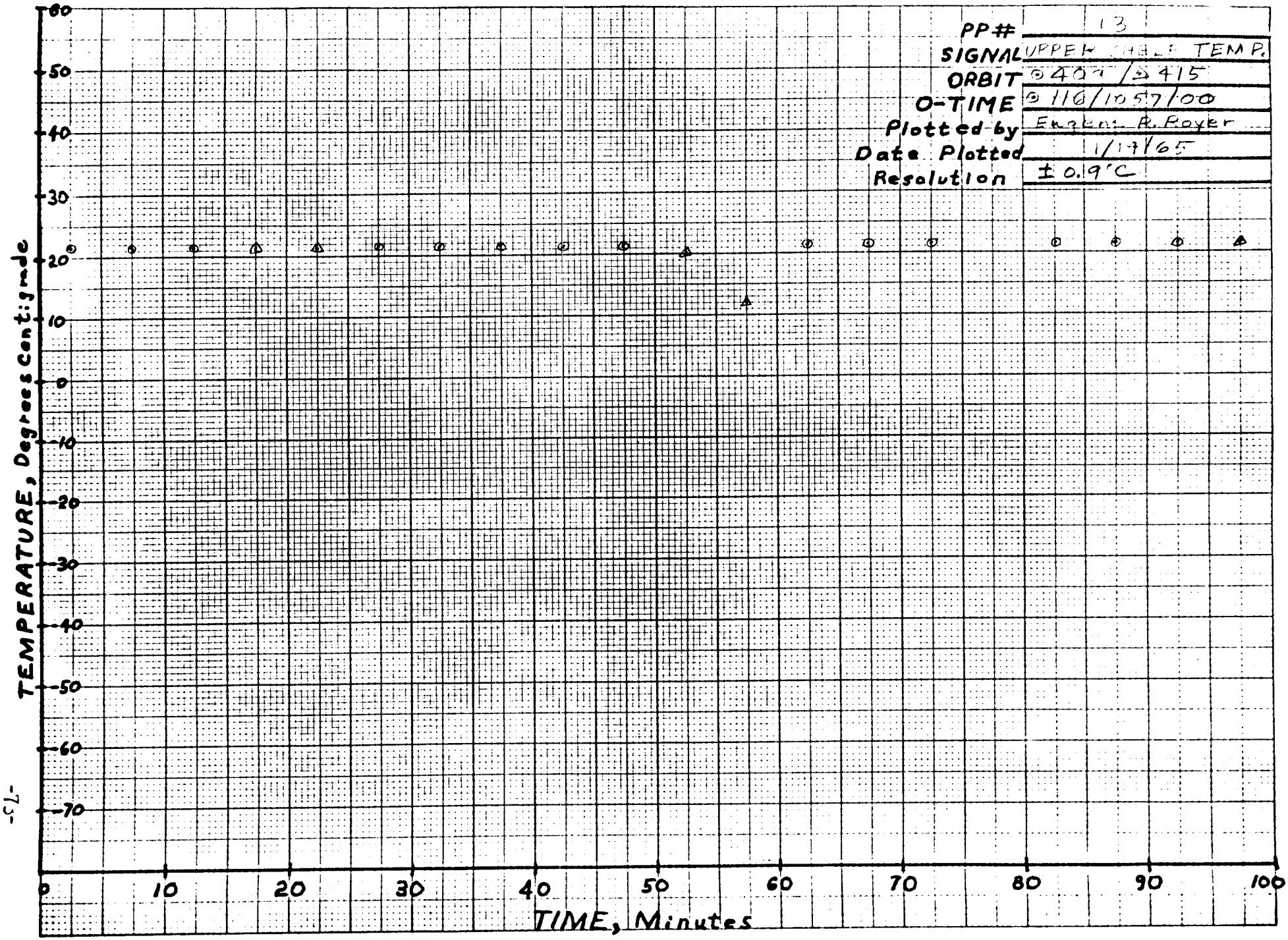
KEUFFEL & ESSER CO.



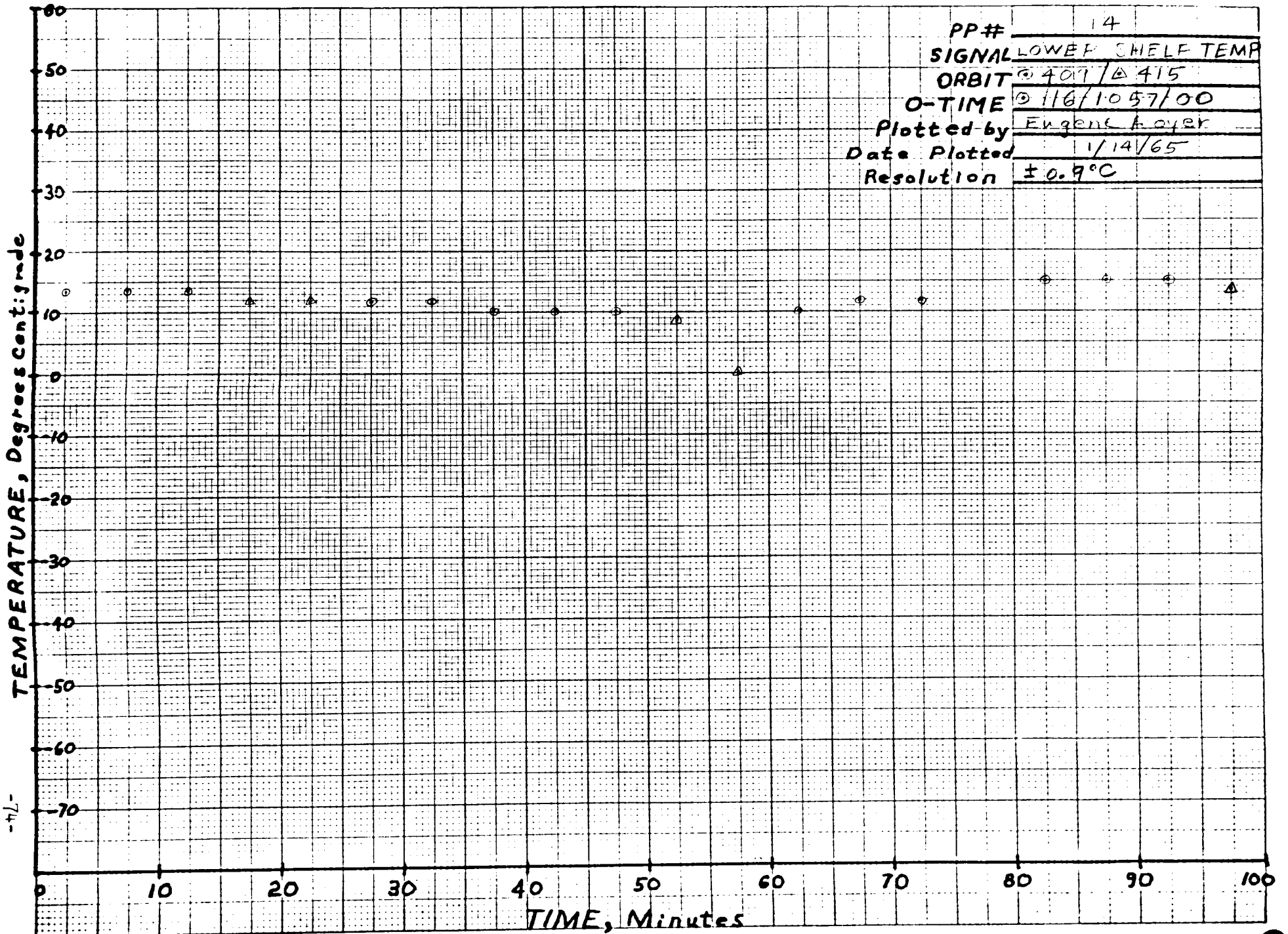
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES
KEUFFEL & ESSER CO.



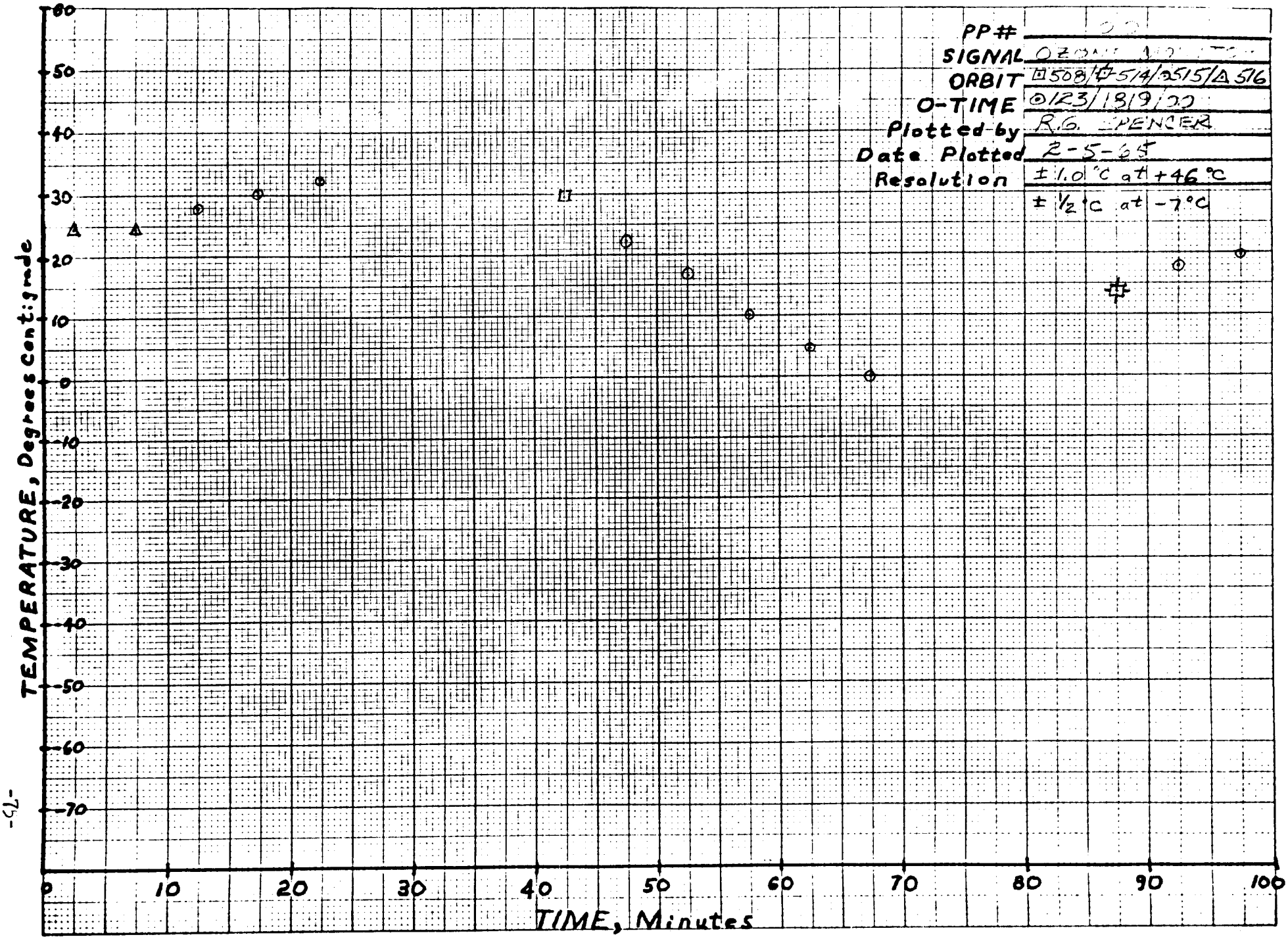
KEUFFEL & ESSER CO.



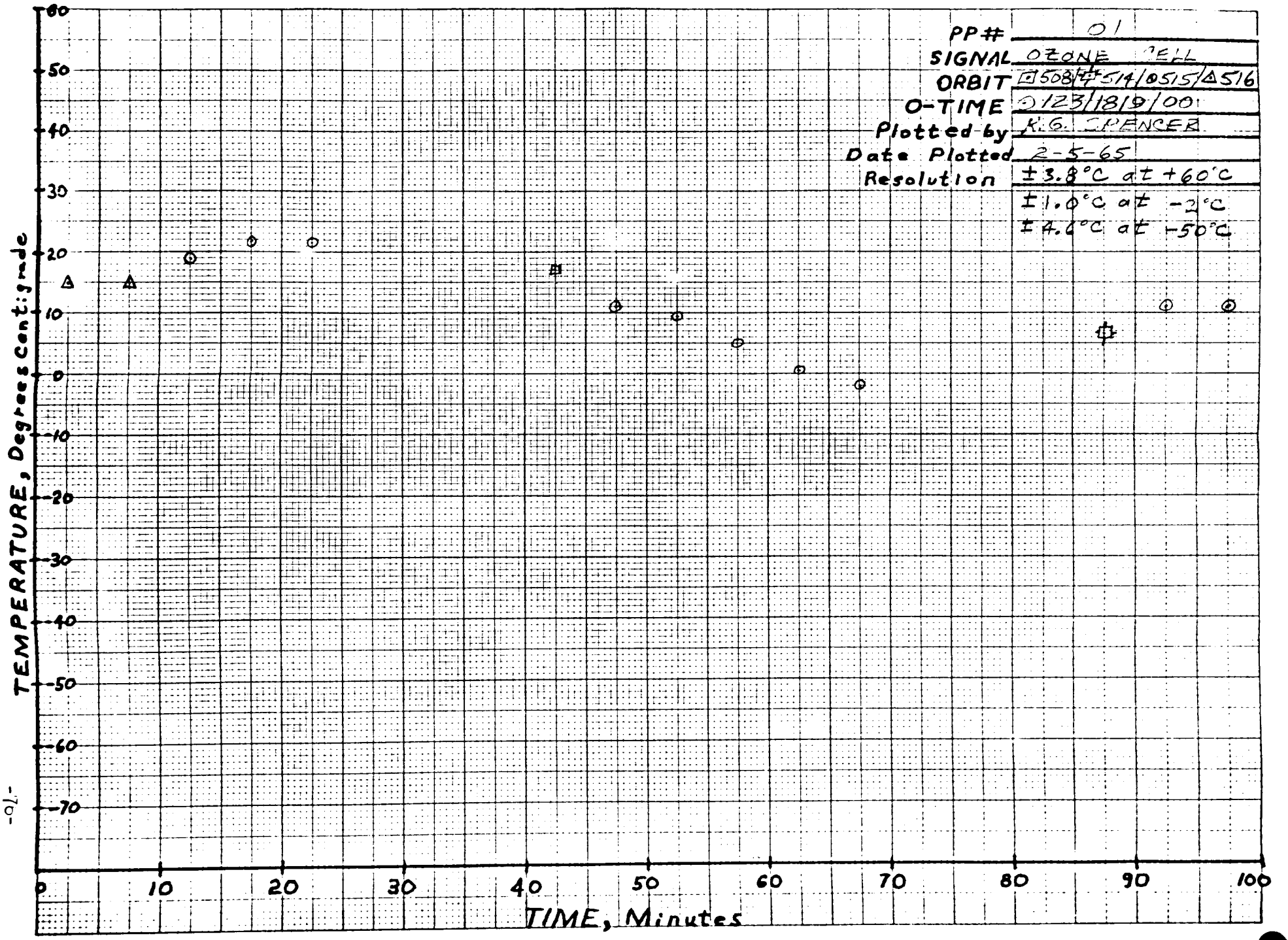
K+E 10 X 10 TO ½ INCH 46 1472
KEUFFEL & ESSER CO.

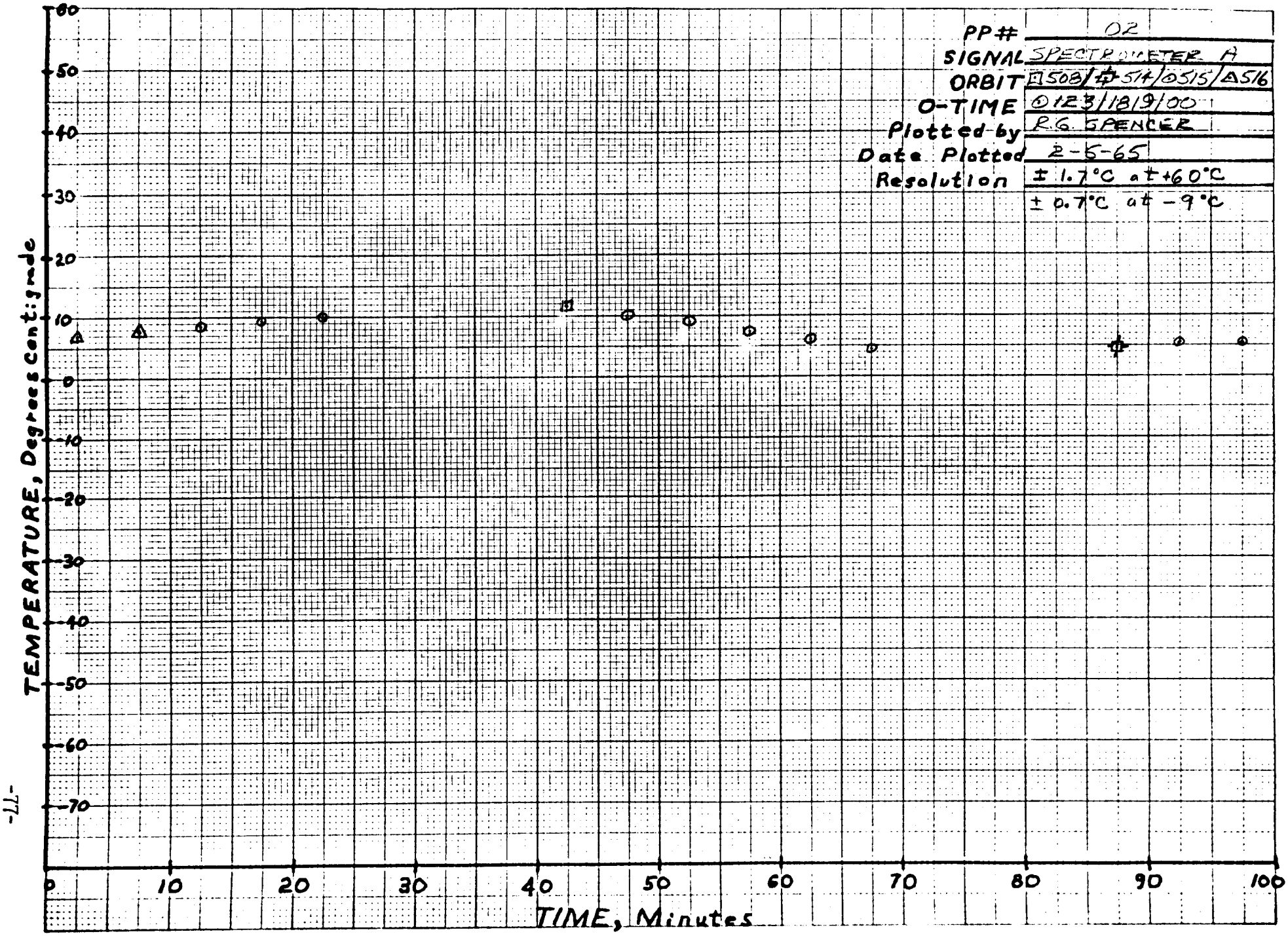


KEUFFEL & ESSER CO.

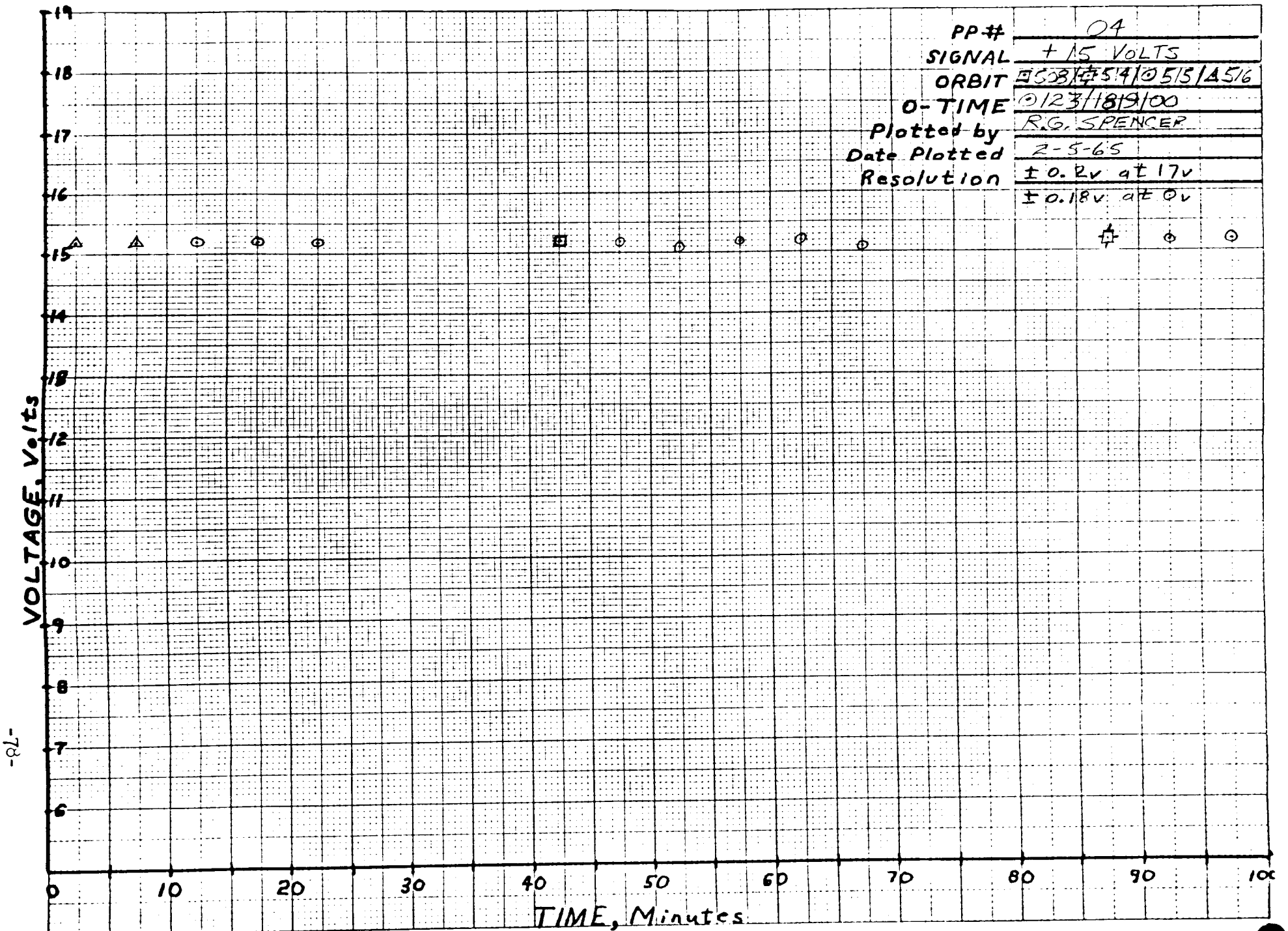


K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

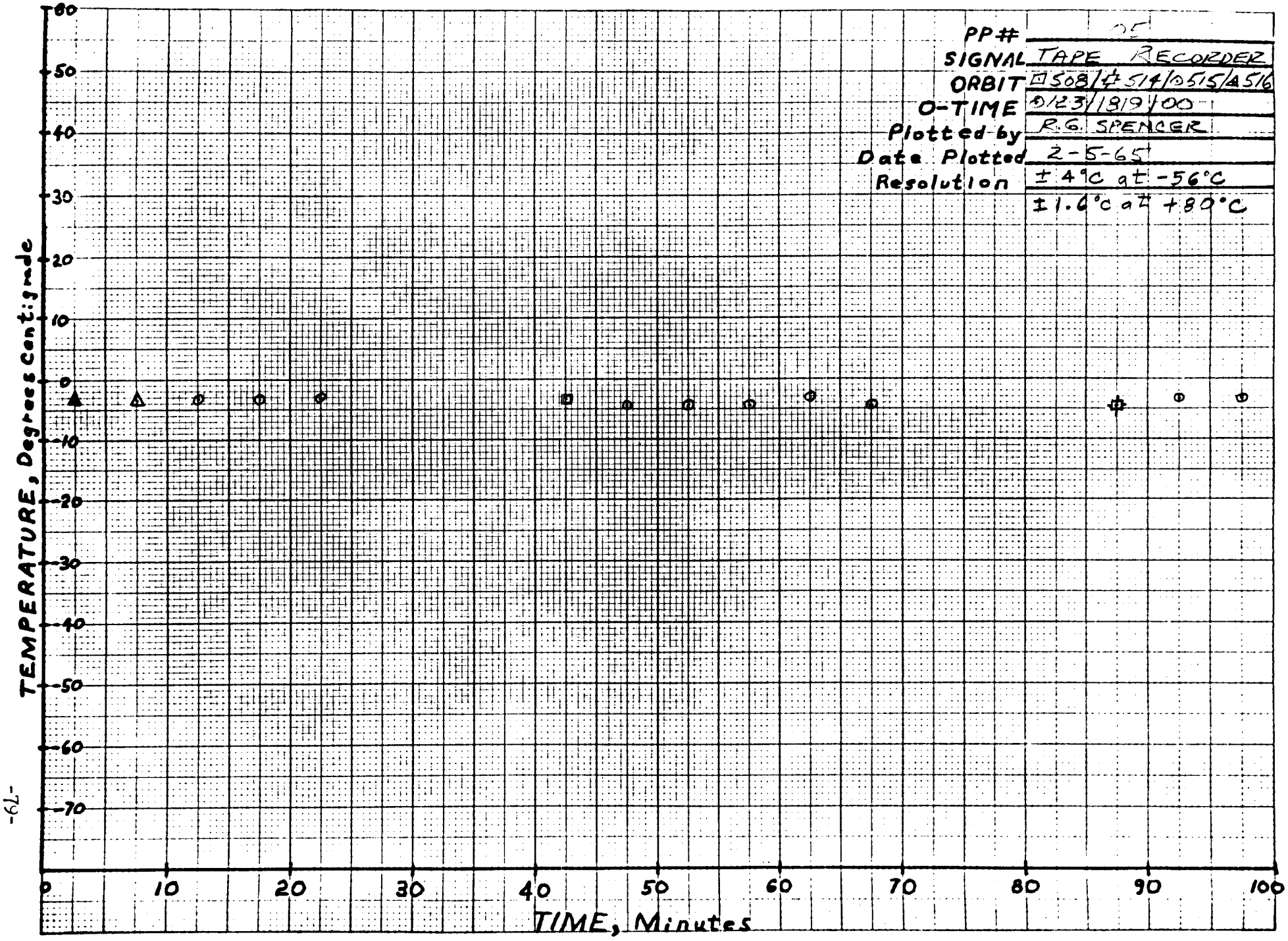



PP# 02
SIGNAL SPECTROMETER A
ORBIT □508/#514/○515/△516
O-TIME ○123/1819/00
Plotted by R.G. SPENCER
Date Plotted 2-5-65
Resolution ± 1.7°C at +60°C
± 0.7°C at -9°C
TEMPERATURE, Degrees centigrade
80
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

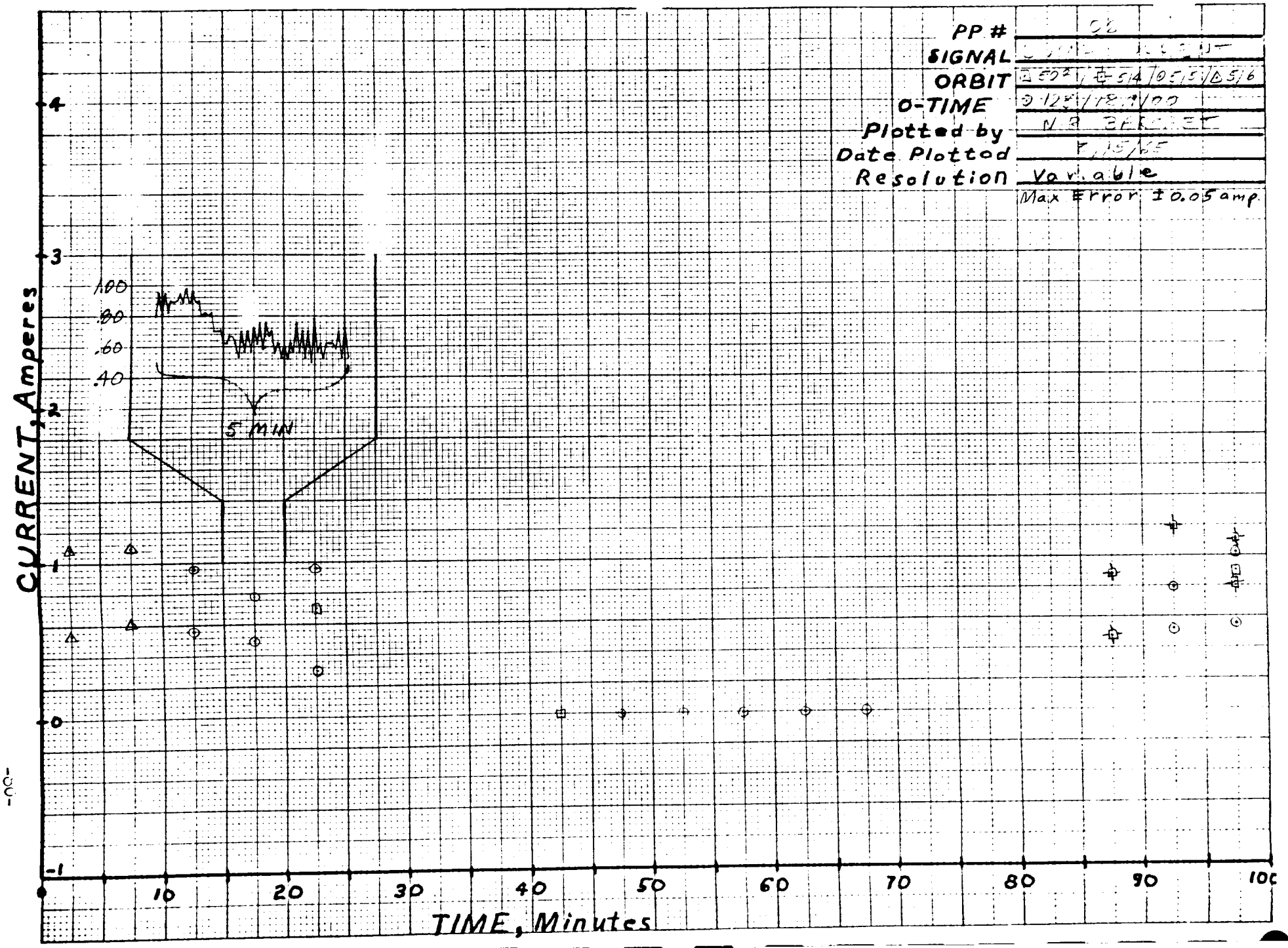
K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

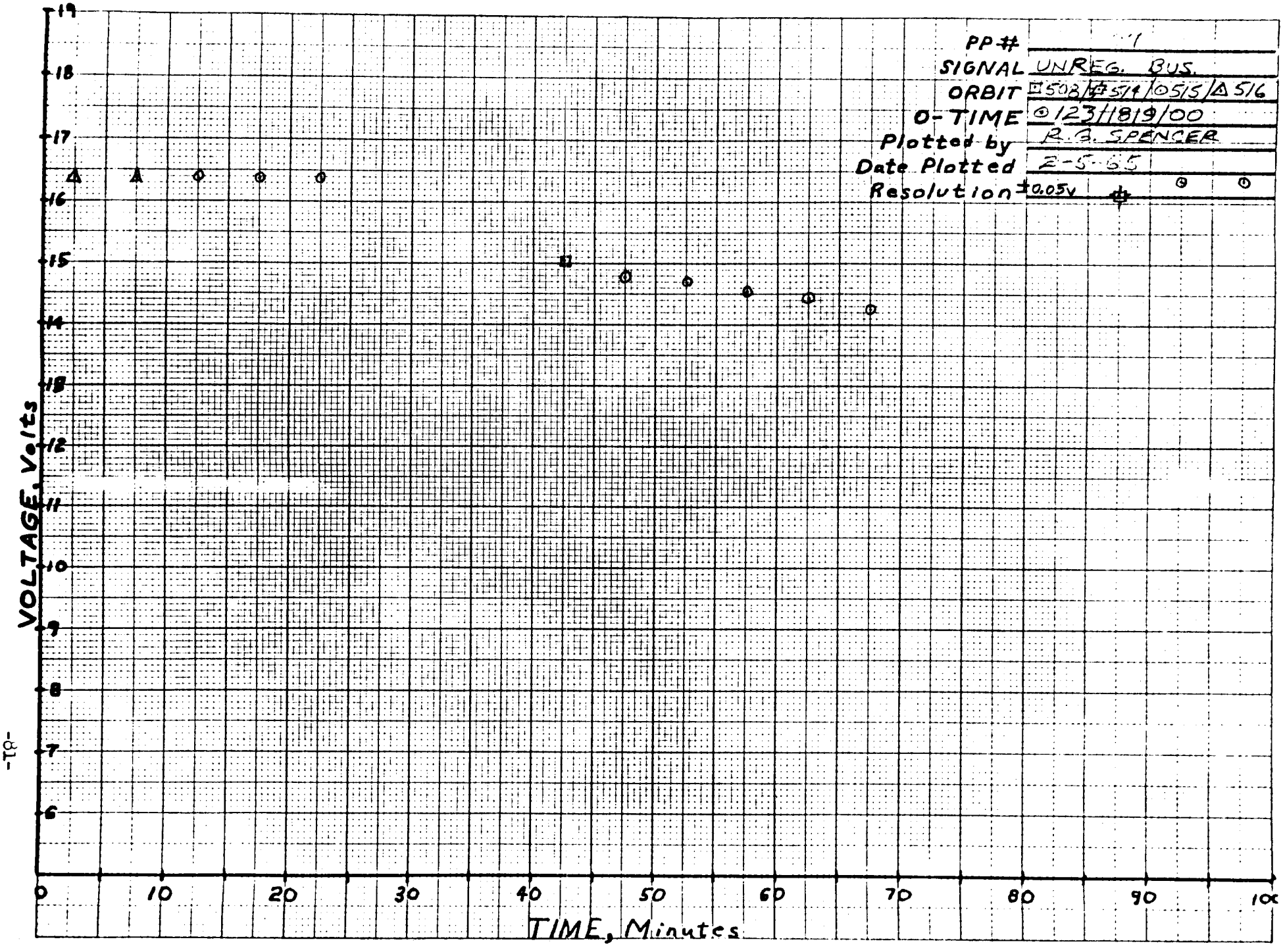


KEUFFEL & ESSER CO.

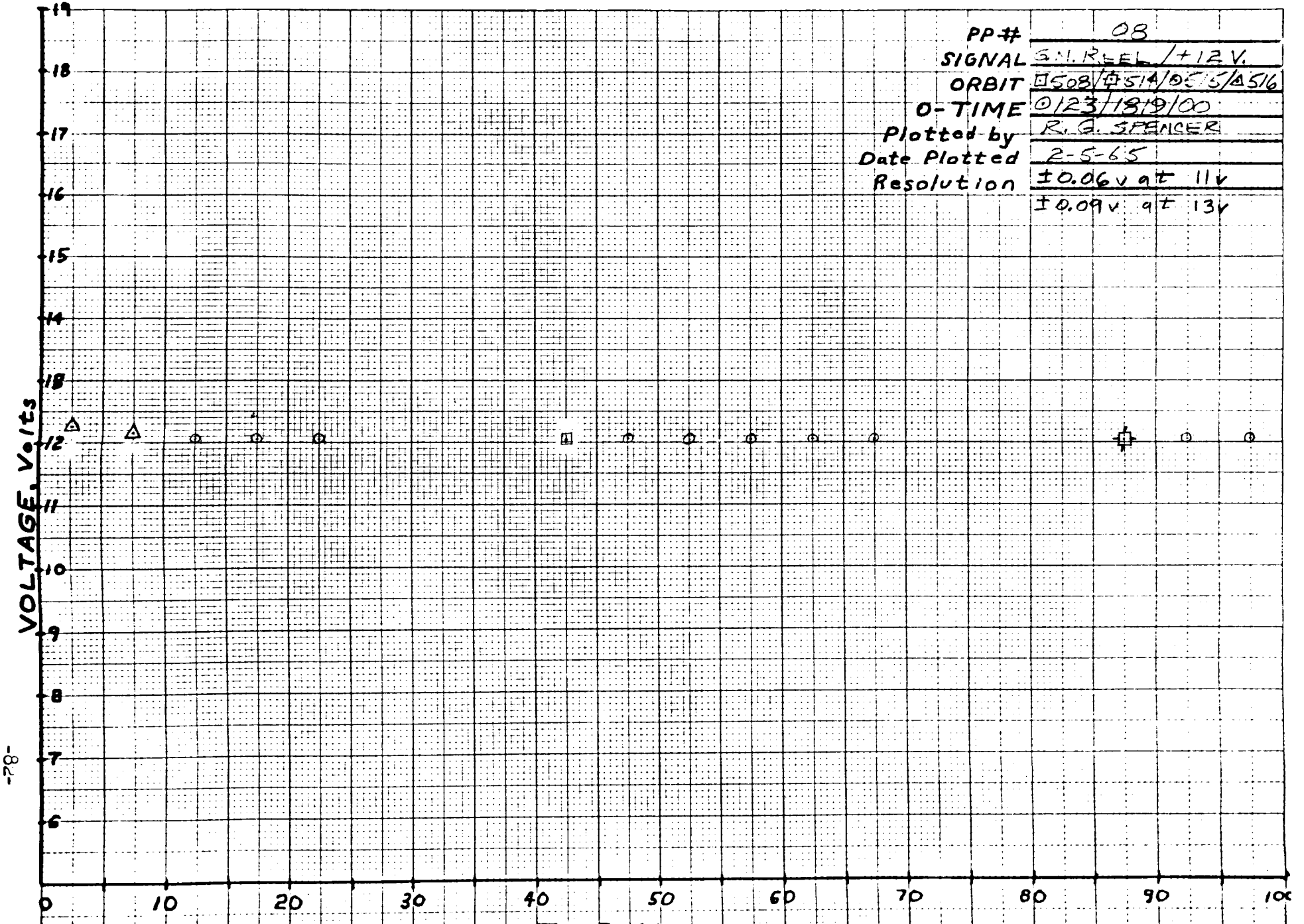


K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

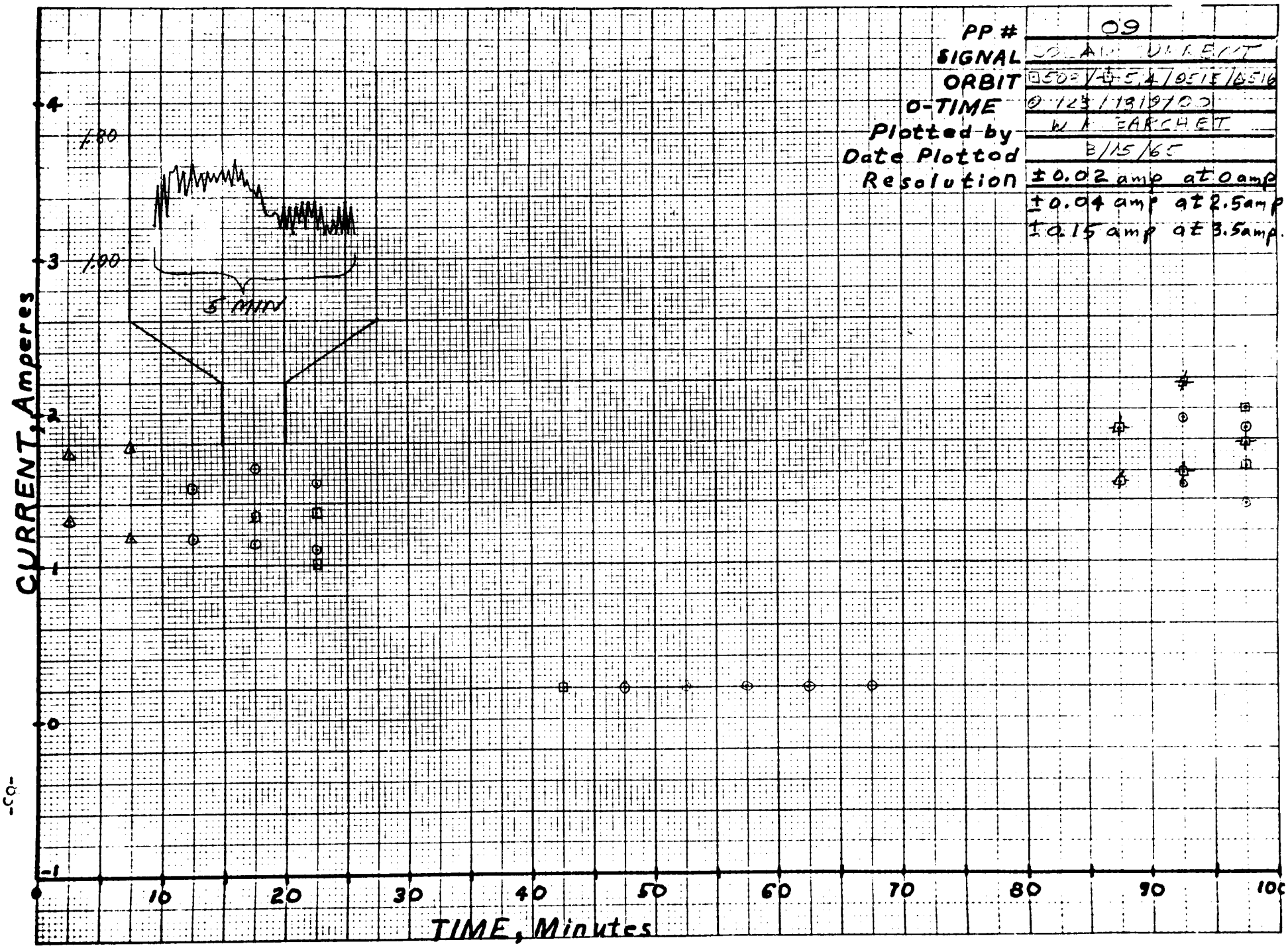



PP #
SIGNAL UNREG. BUS.
ORBIT ⊡508/⊕514/⊙515/△516
O-TIME ⊙123/1819/00
Plotted by R.G. SPENCER
Date Plotted 2-5-65
Resolution ±0.05v
VOLTAGE, Volts
19
18
17
16
15
14
13
12
11
10
9
8
7
6
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

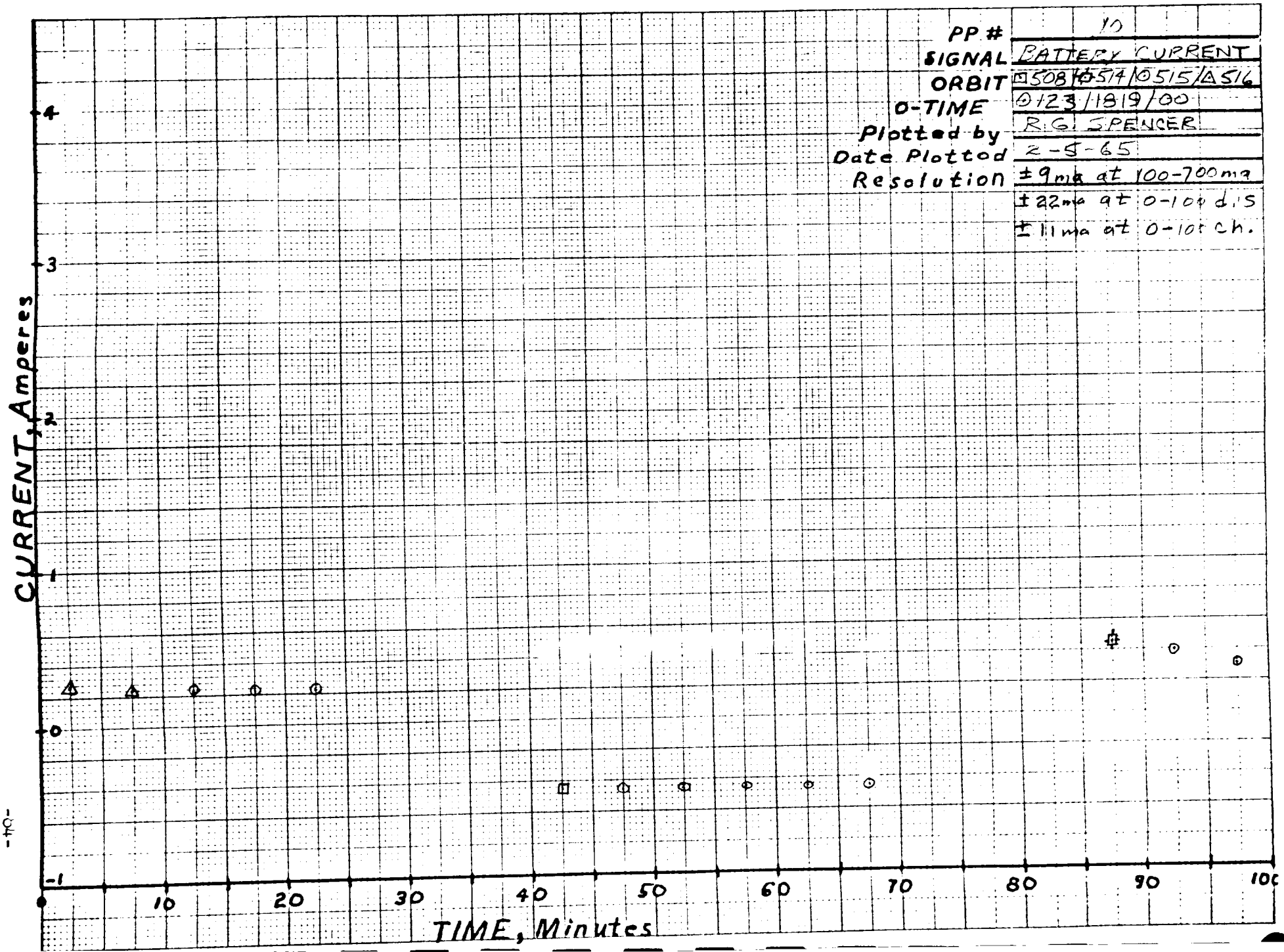
K&E 10 X 10 TO ½ INCH 46 1472
KEUFFEL & ESSER CO. MADE IN U.S.A.

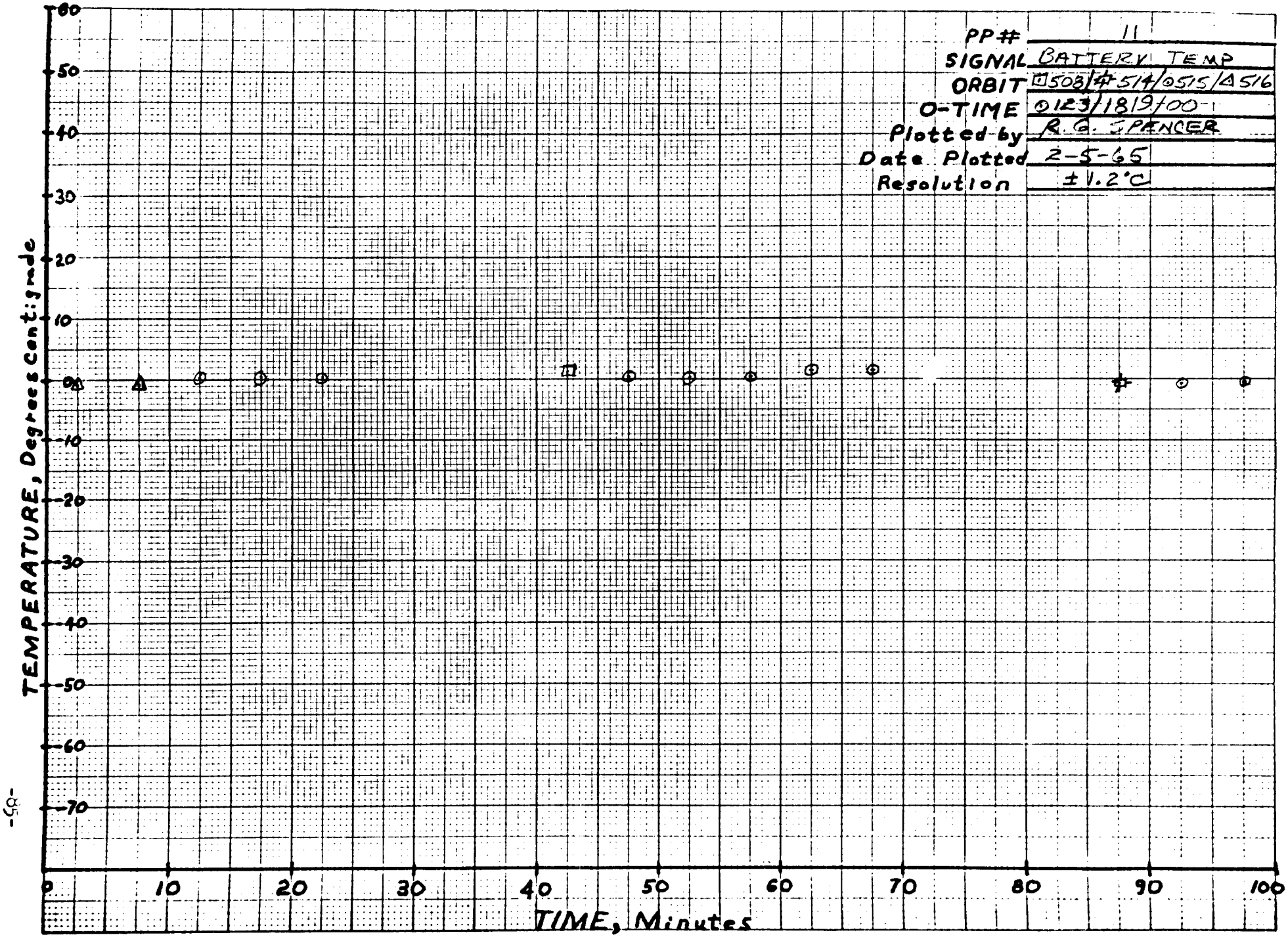


KEUFFEL & ESSER CO.

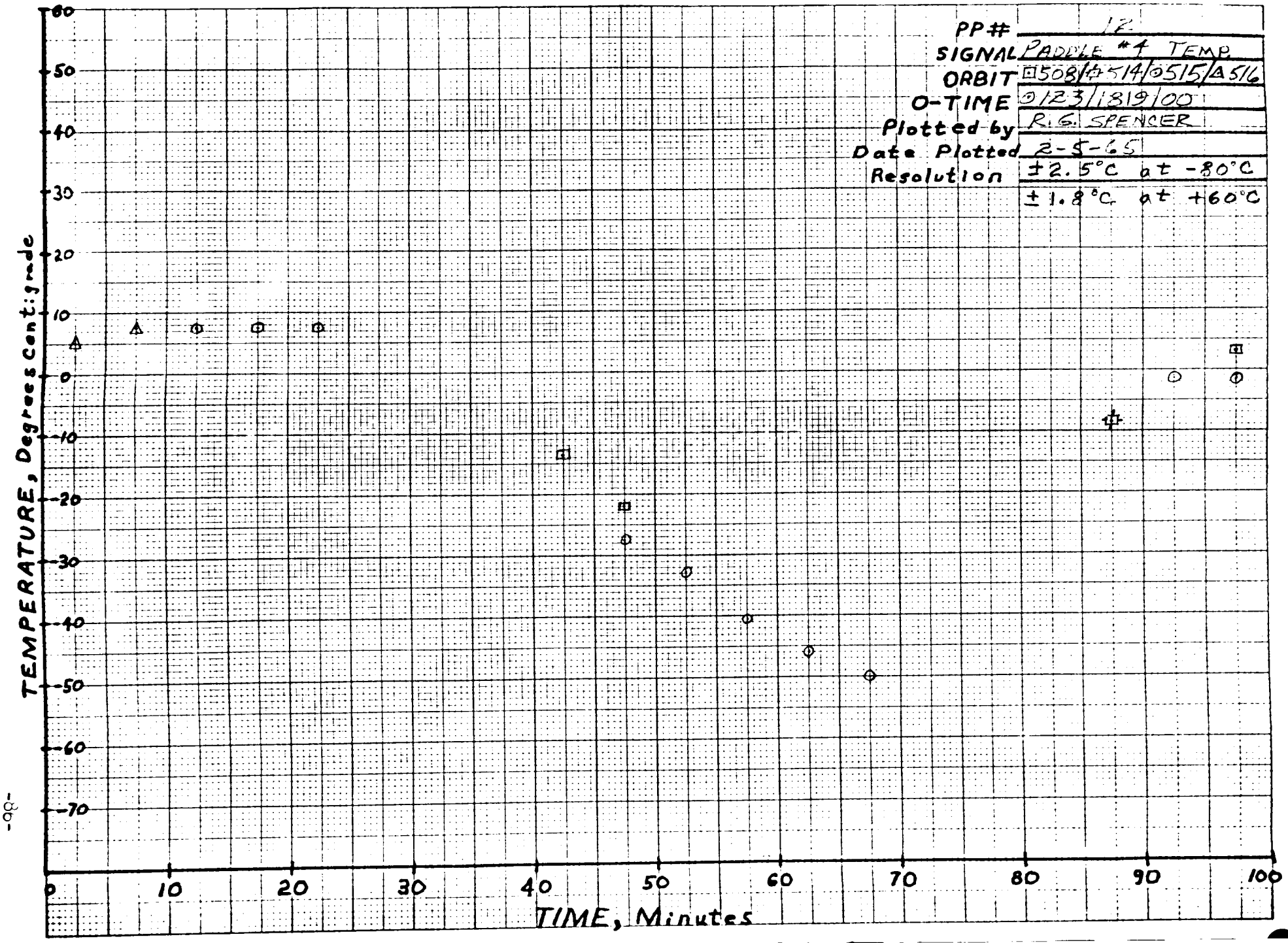


K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

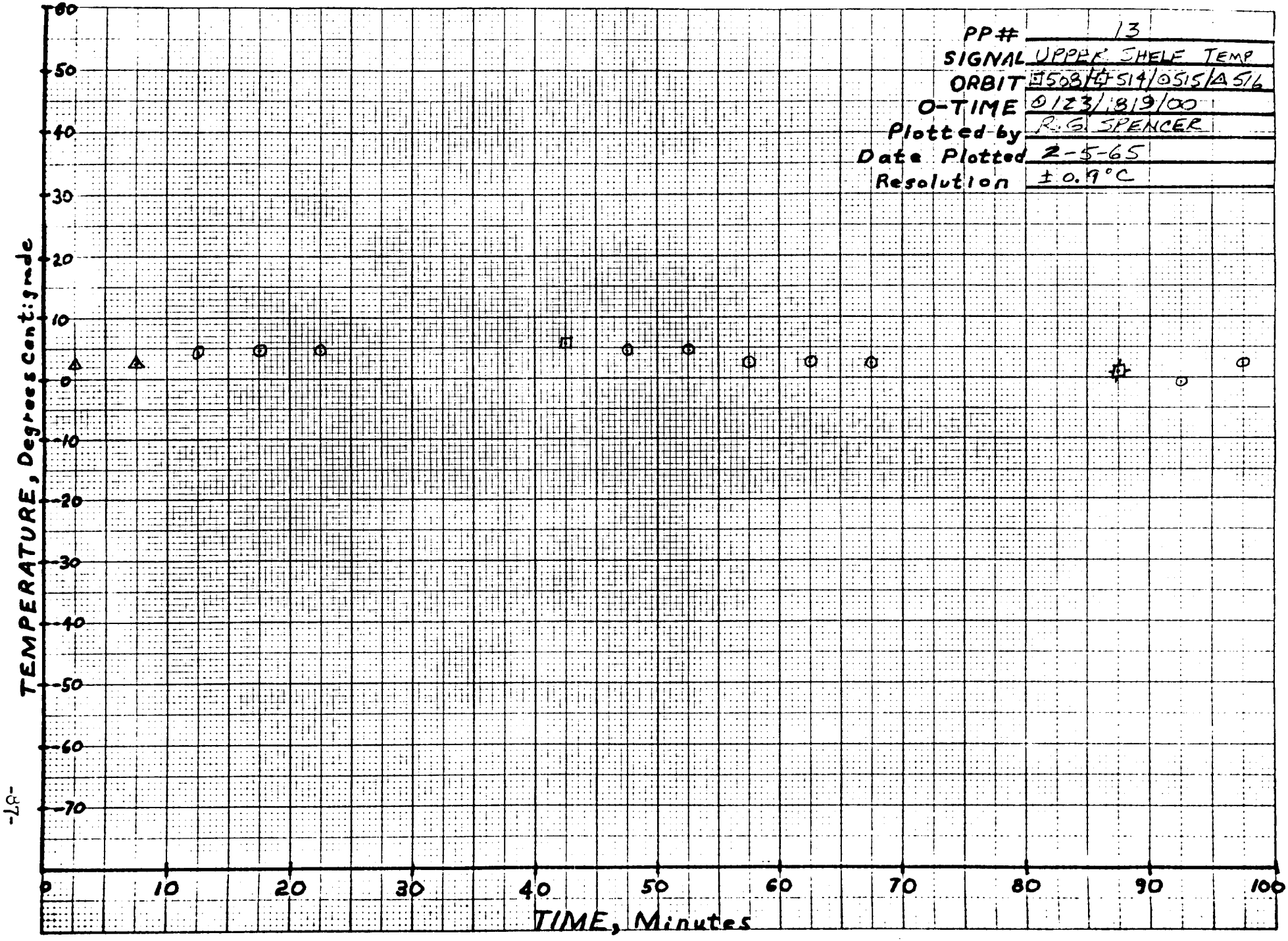



PP# 11
SIGNAL BATTERY TEMP
ORBIT □503/#514/○515/△516
O-TIME ○123/1819/00
Plotted by R. G. SPENCER
Date Plotted 2-5-65
Resolution ±1.2°C
TEMPERATURE, Degrees Centigrade
80
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

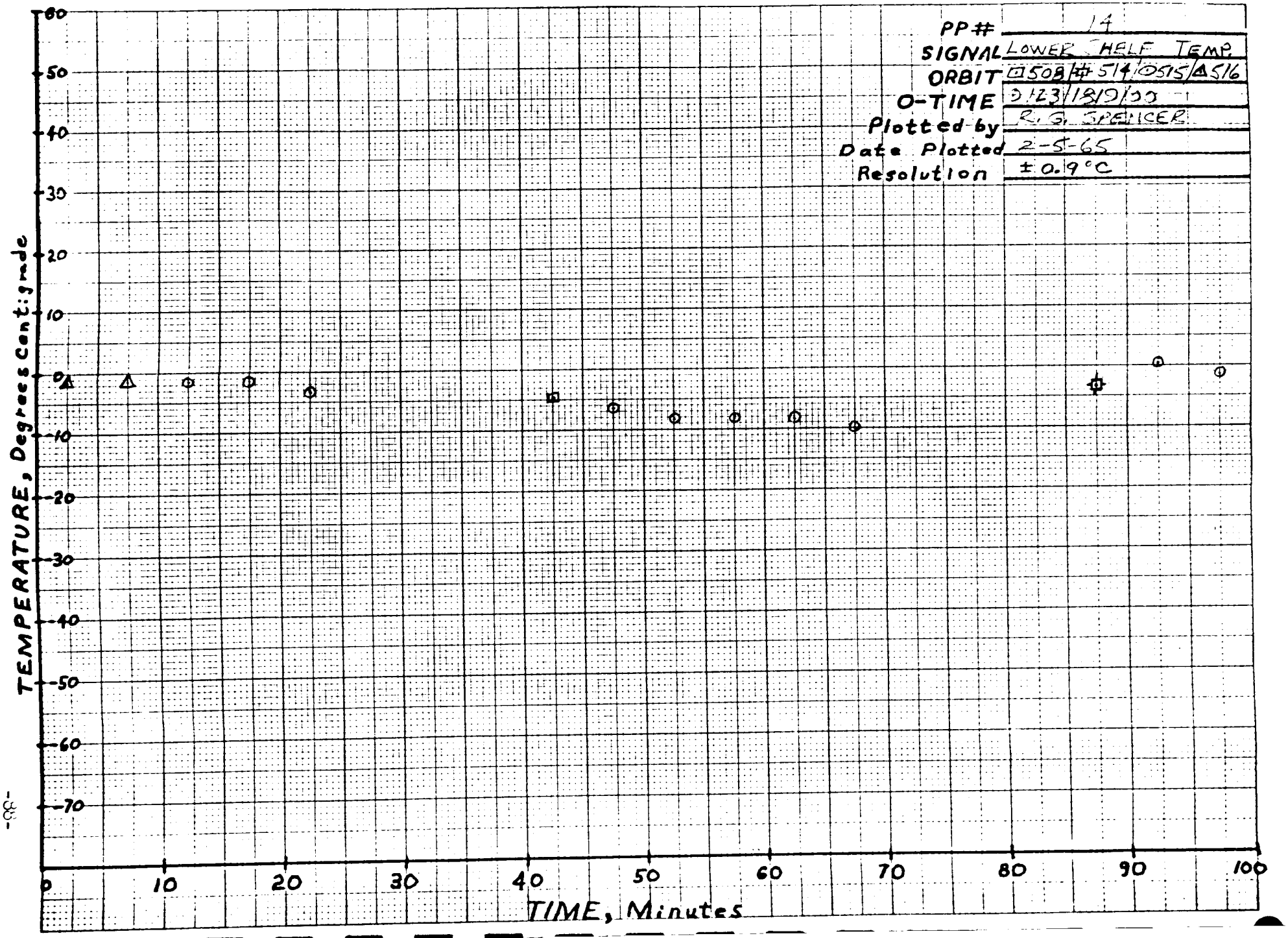
KEUFFEL & ESSER CO.



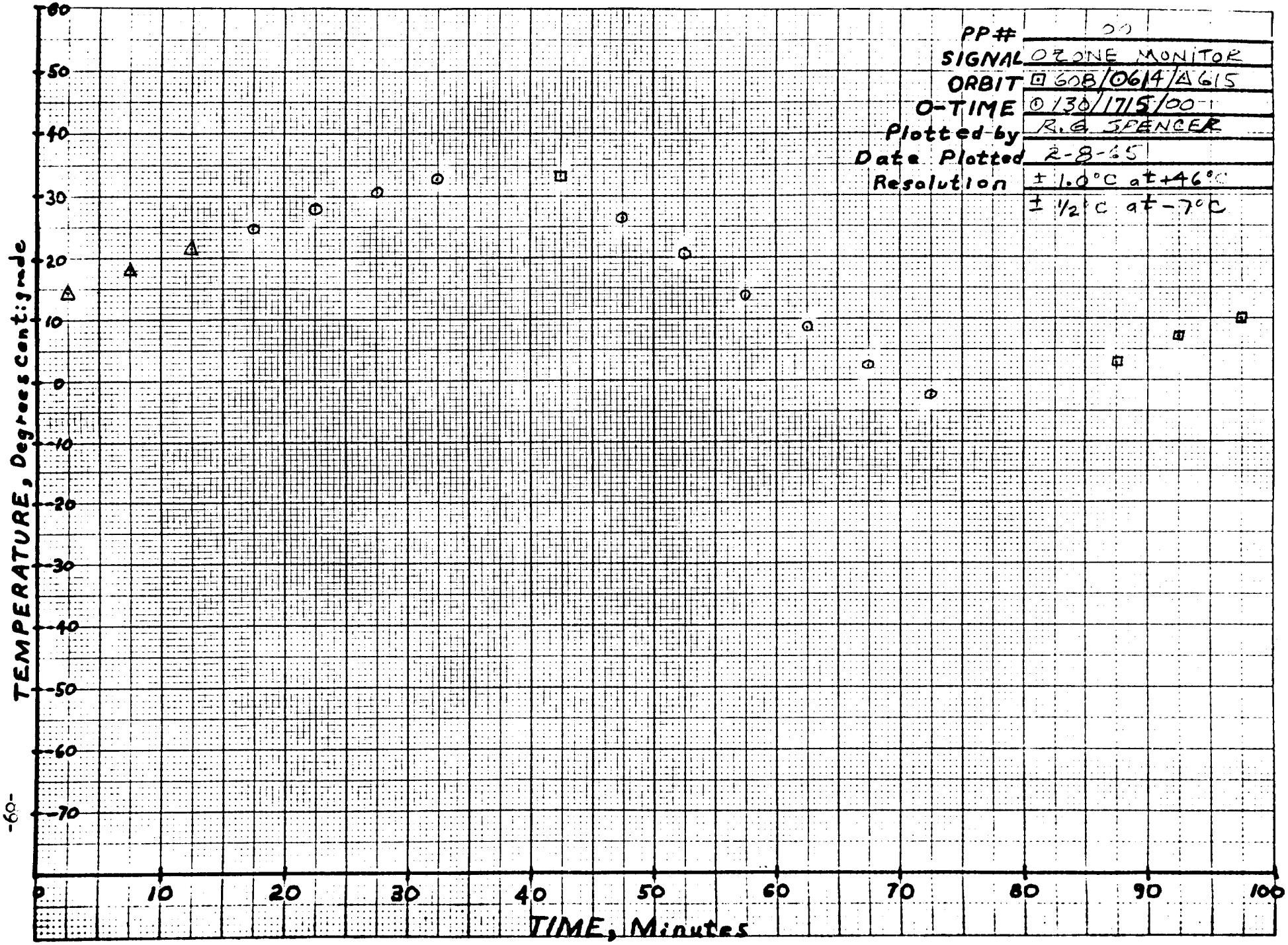
KEUFFEL & ESSER CO.



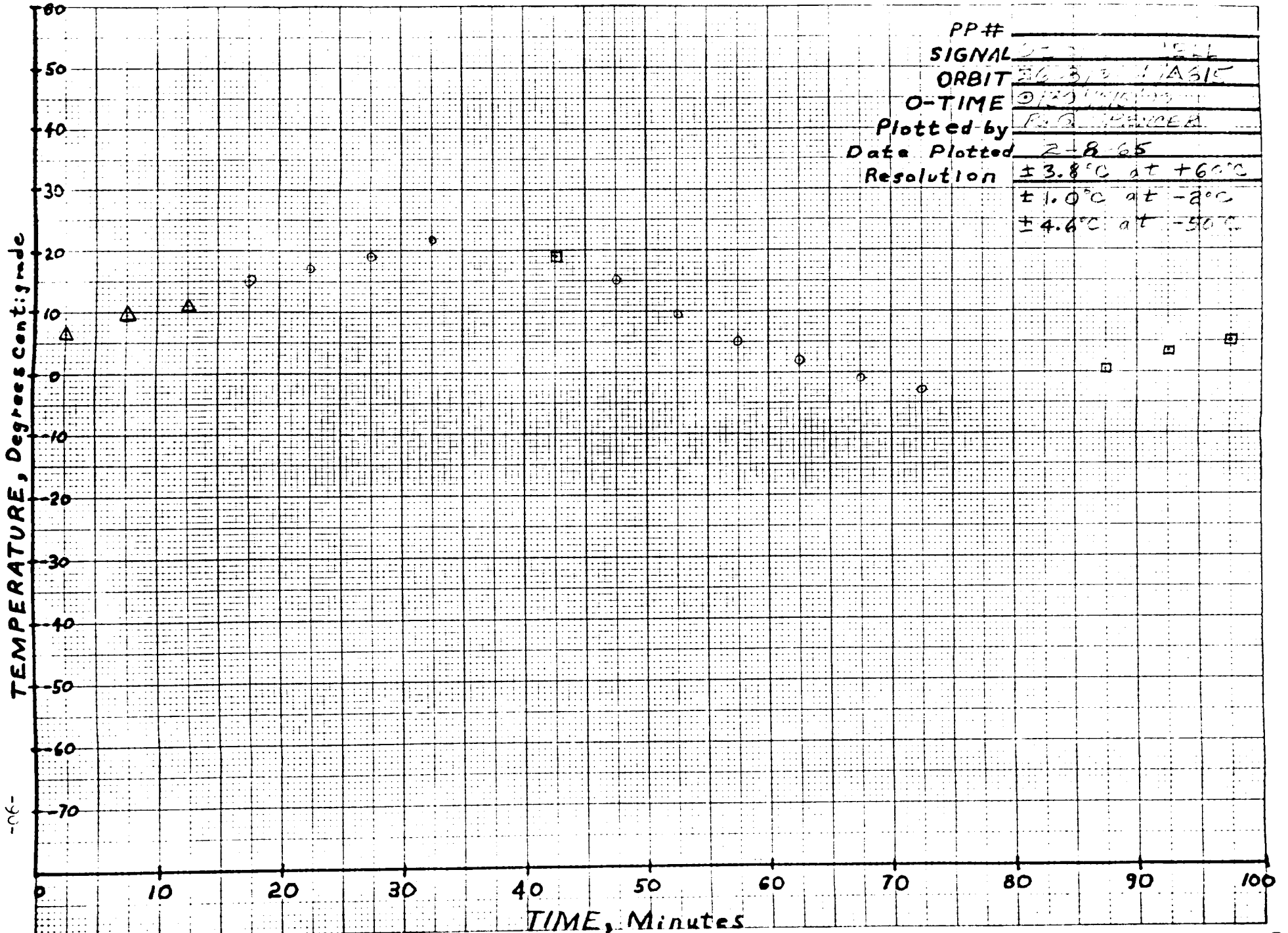
K+E 10 X 10 TO ½ INCH 46 1472
KEUFFEL & ESSER CO.



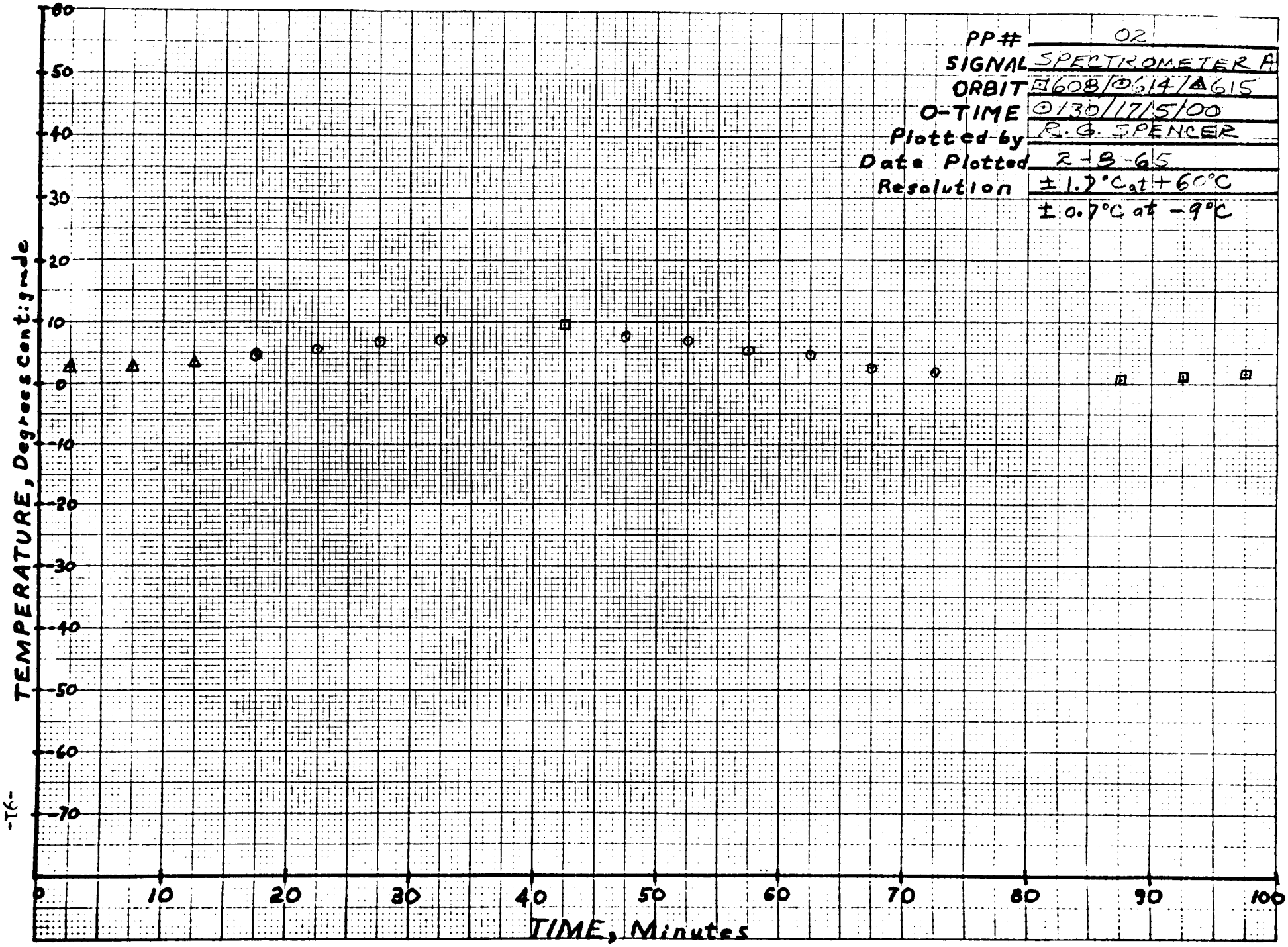
KEUFFEL & ESSER CO.



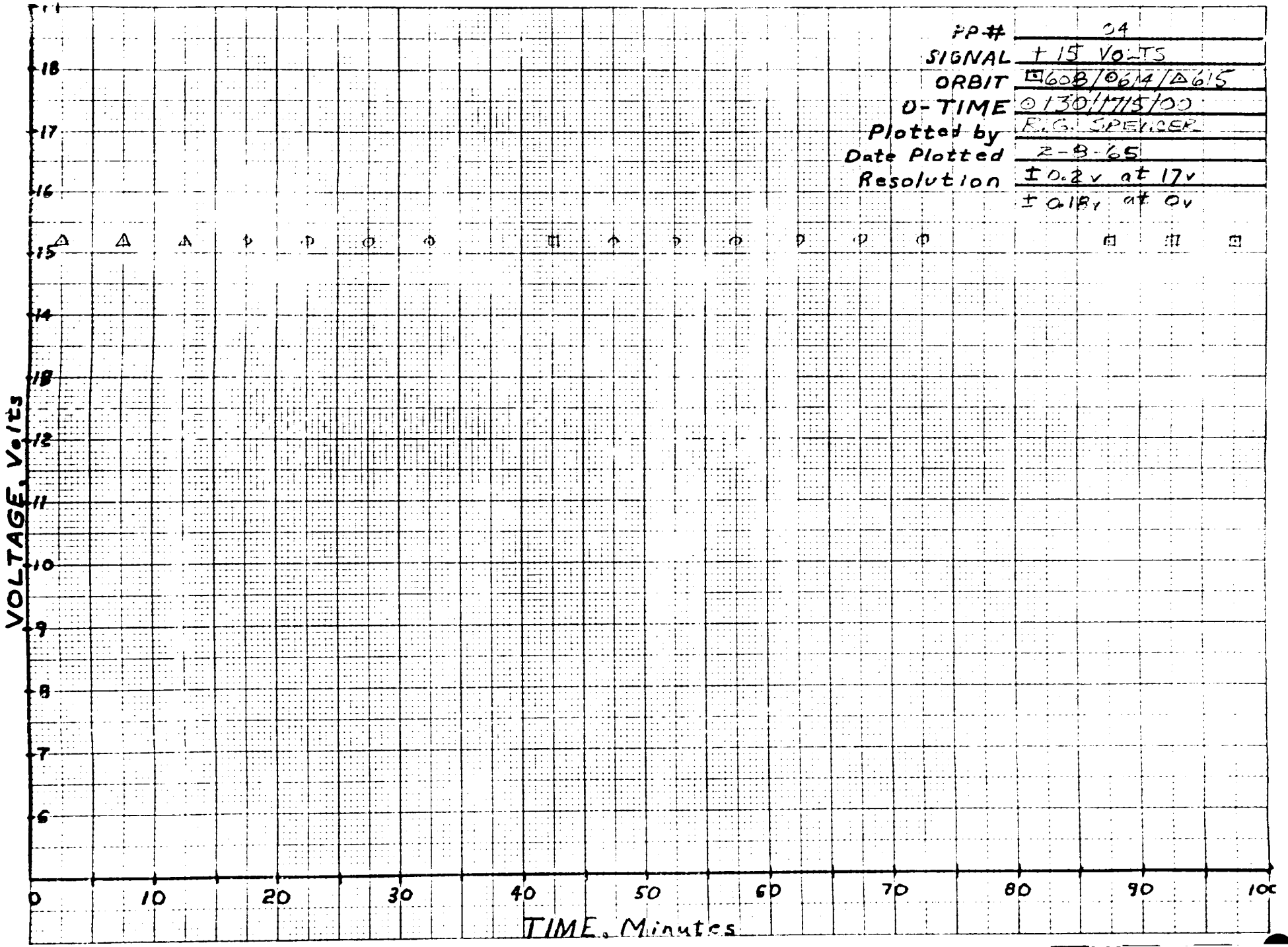
10 X 10 TO ½ INCH 46 1472



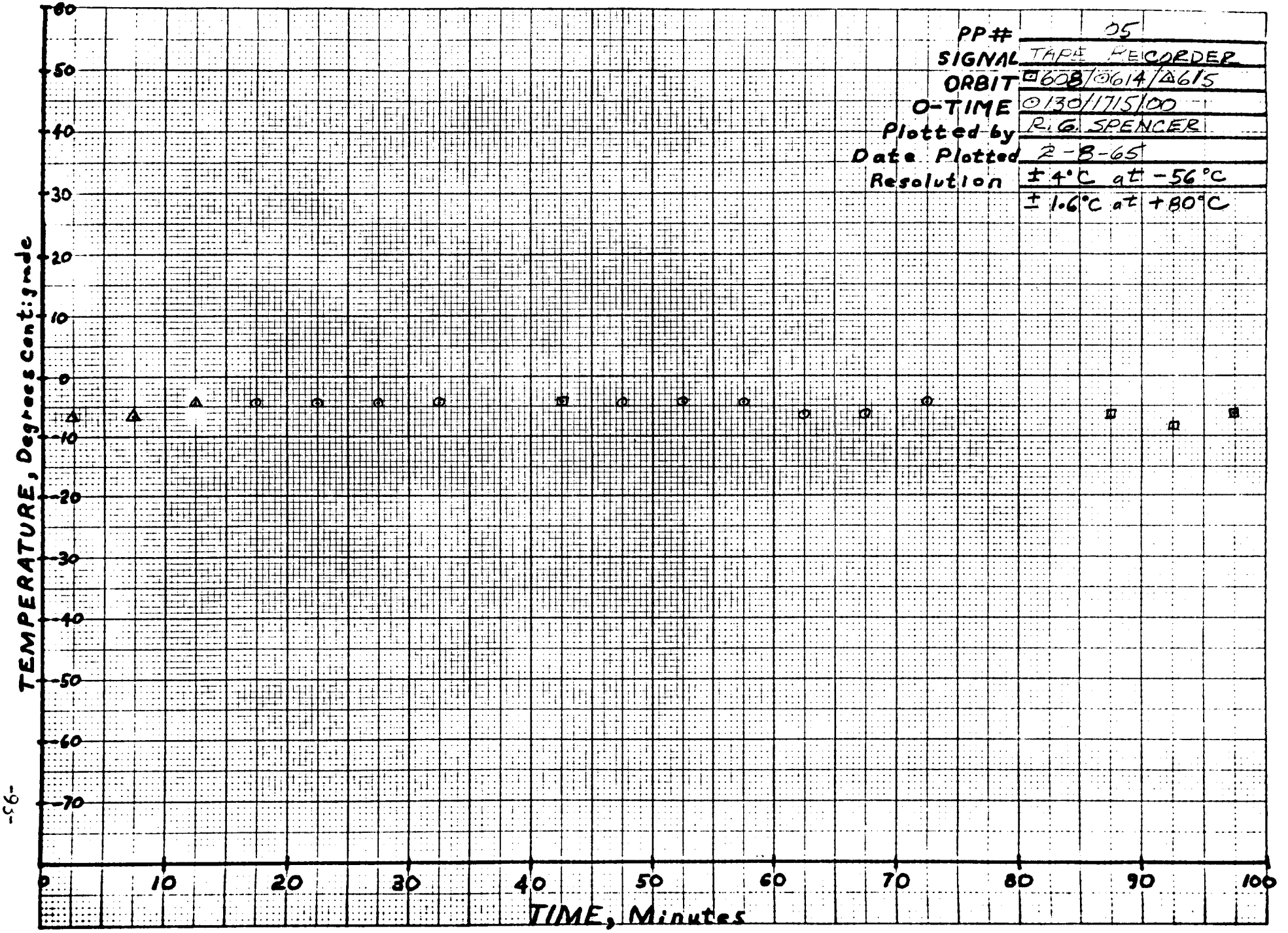
KEUFFEL & ESSER CO.



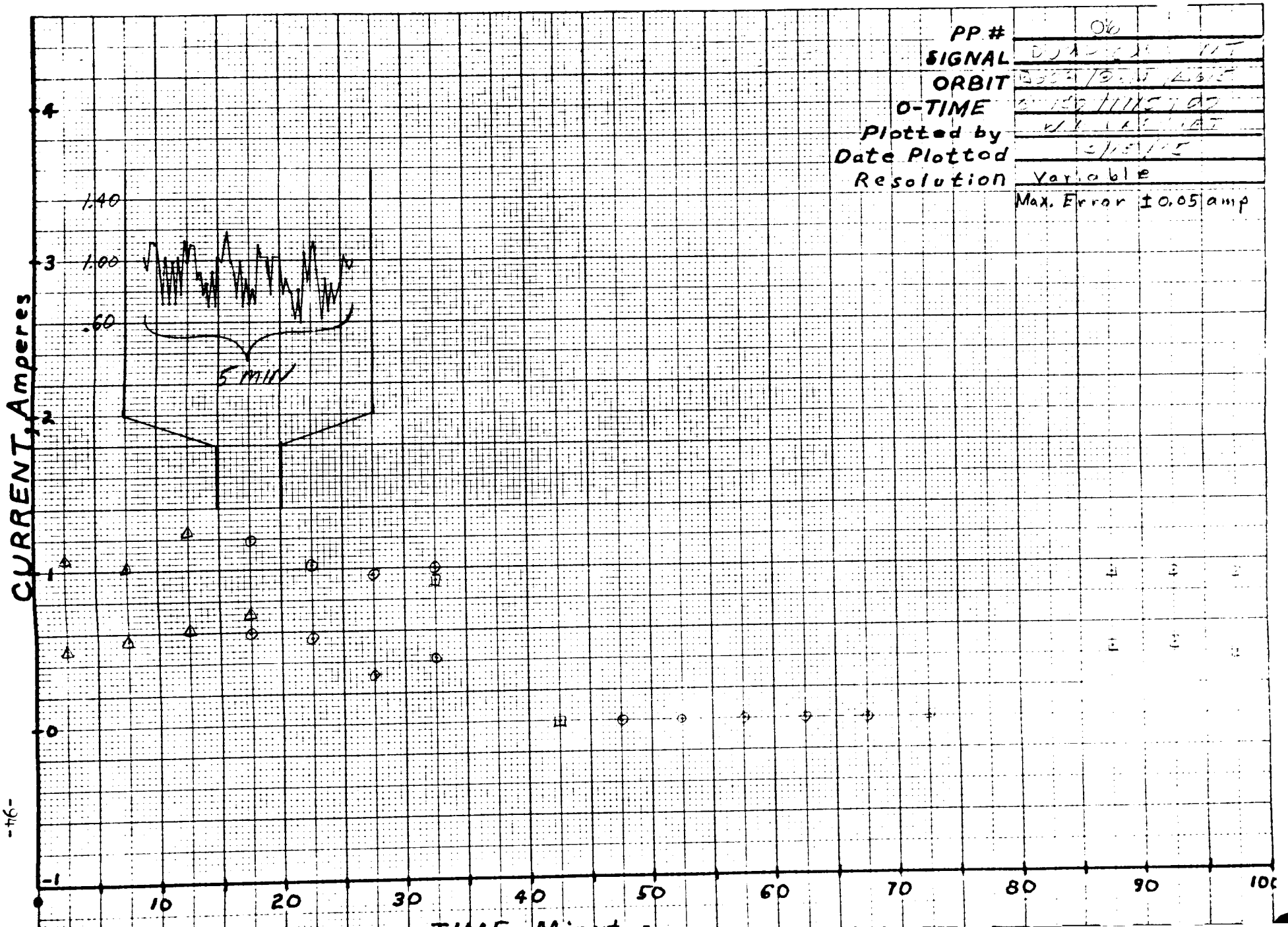
10 X 10 TO 1/2 INCH 46 1472
KEUFFEL & ESSER CO.



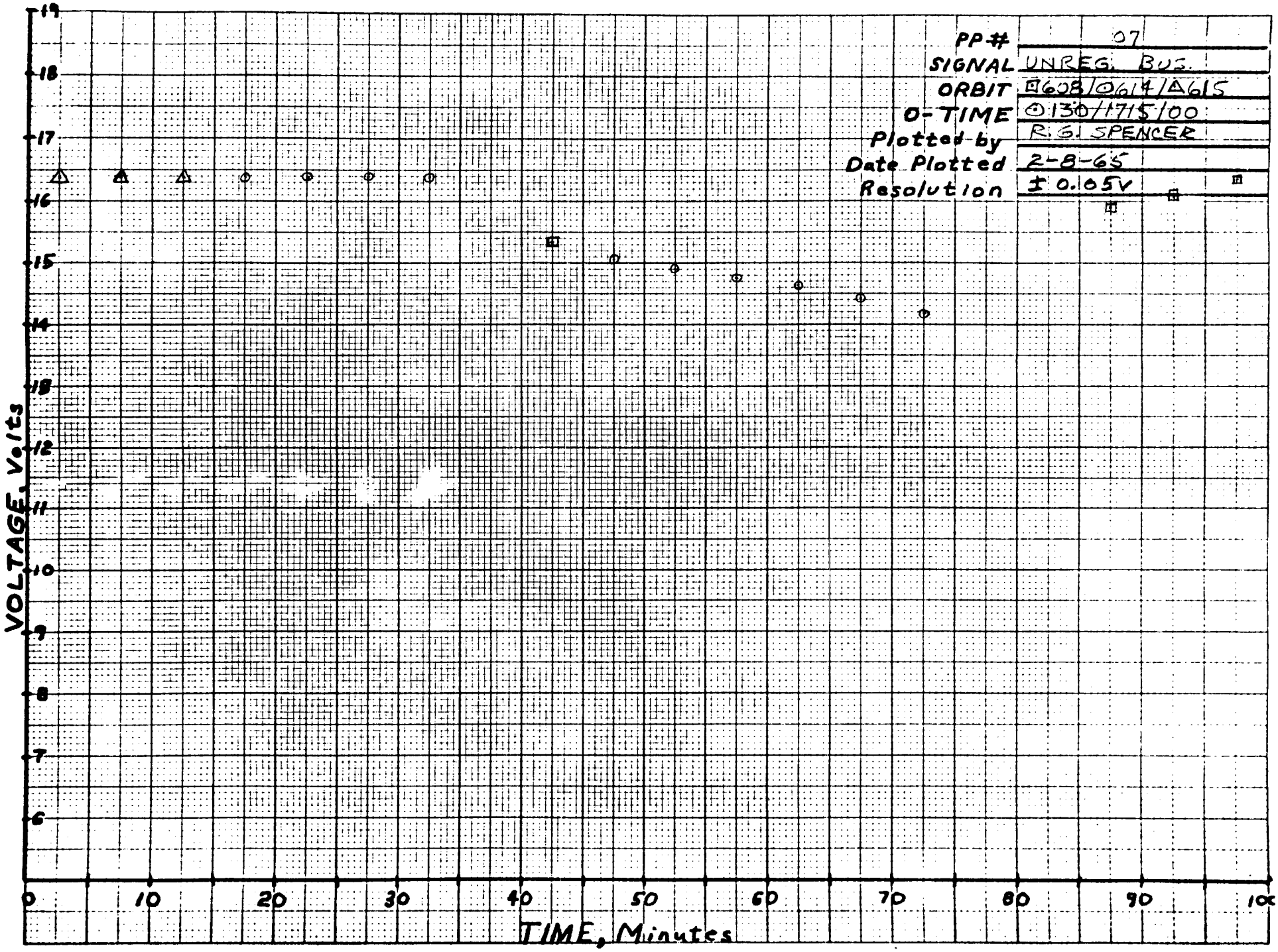
KEUFFEL & ESSER CO.



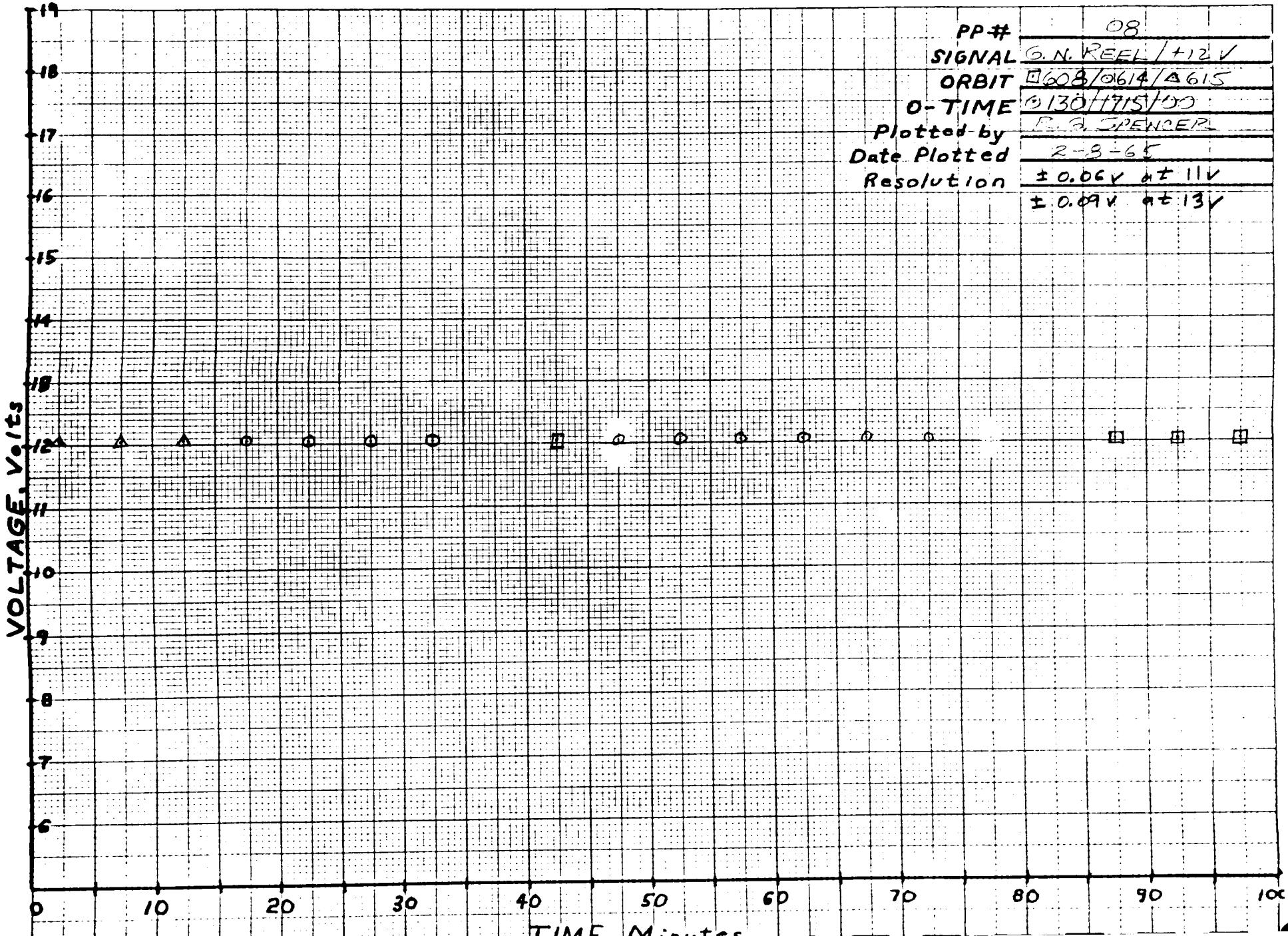
K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

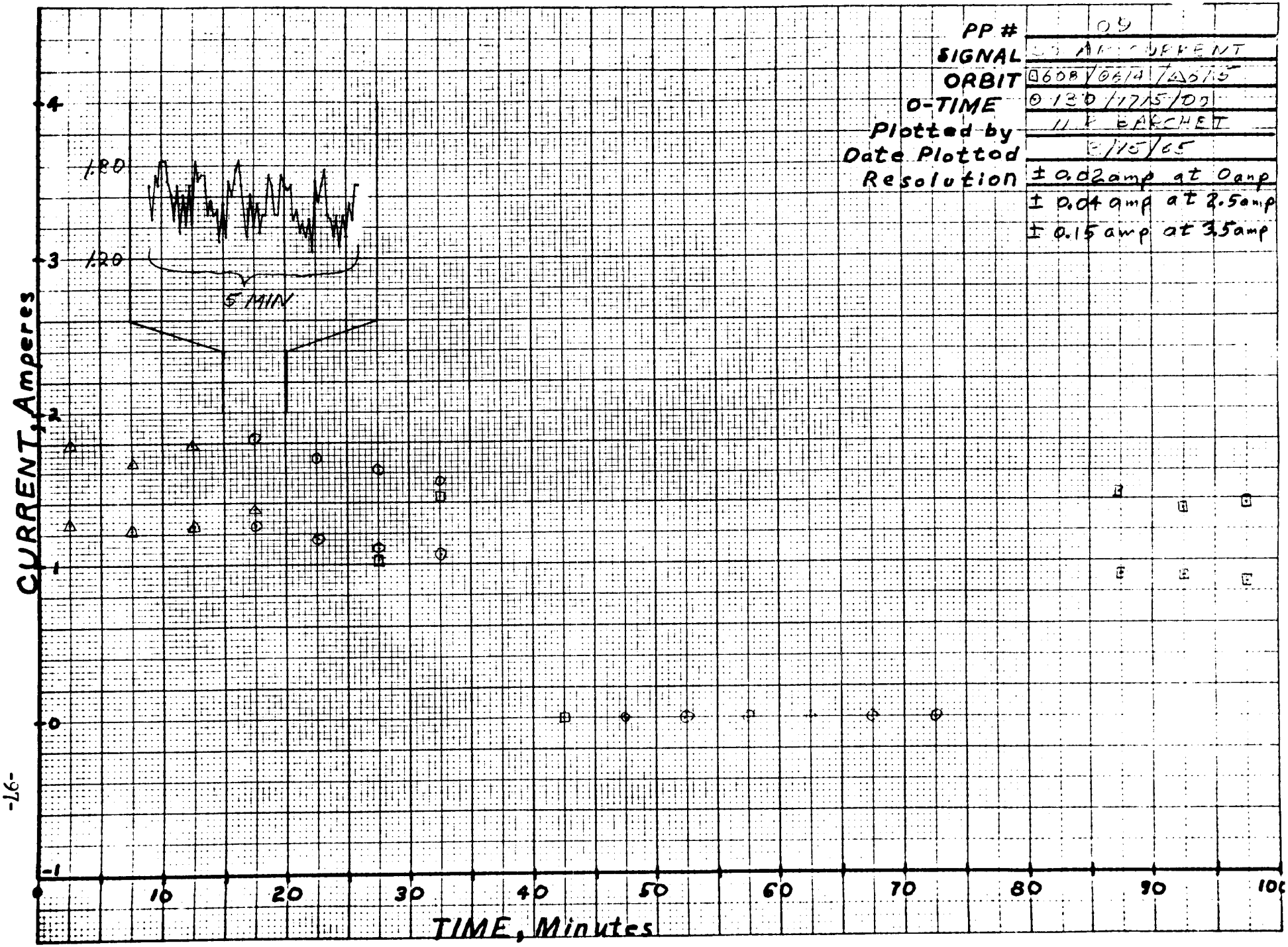


KEUFFEL & ESSER CO.

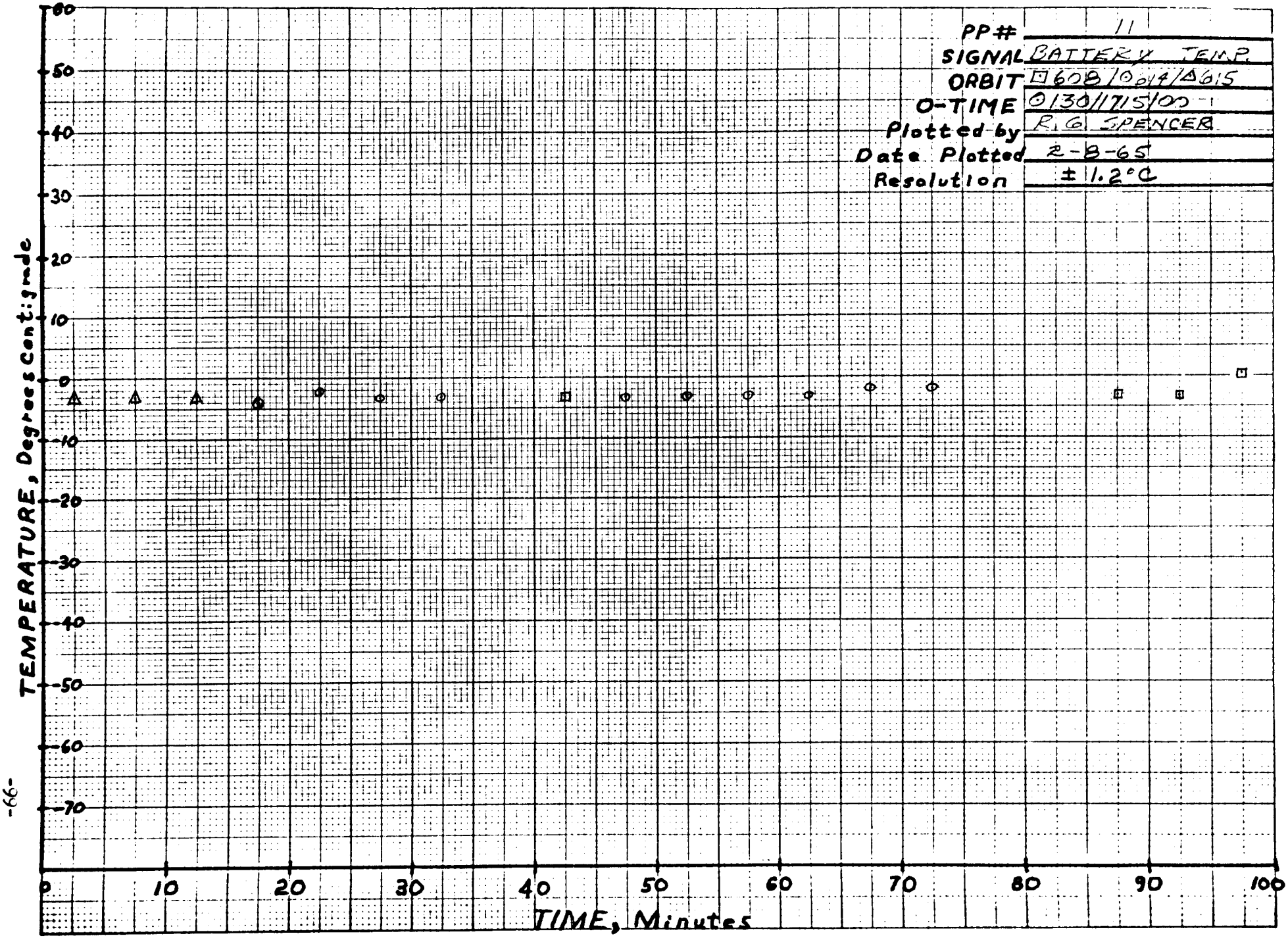


K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

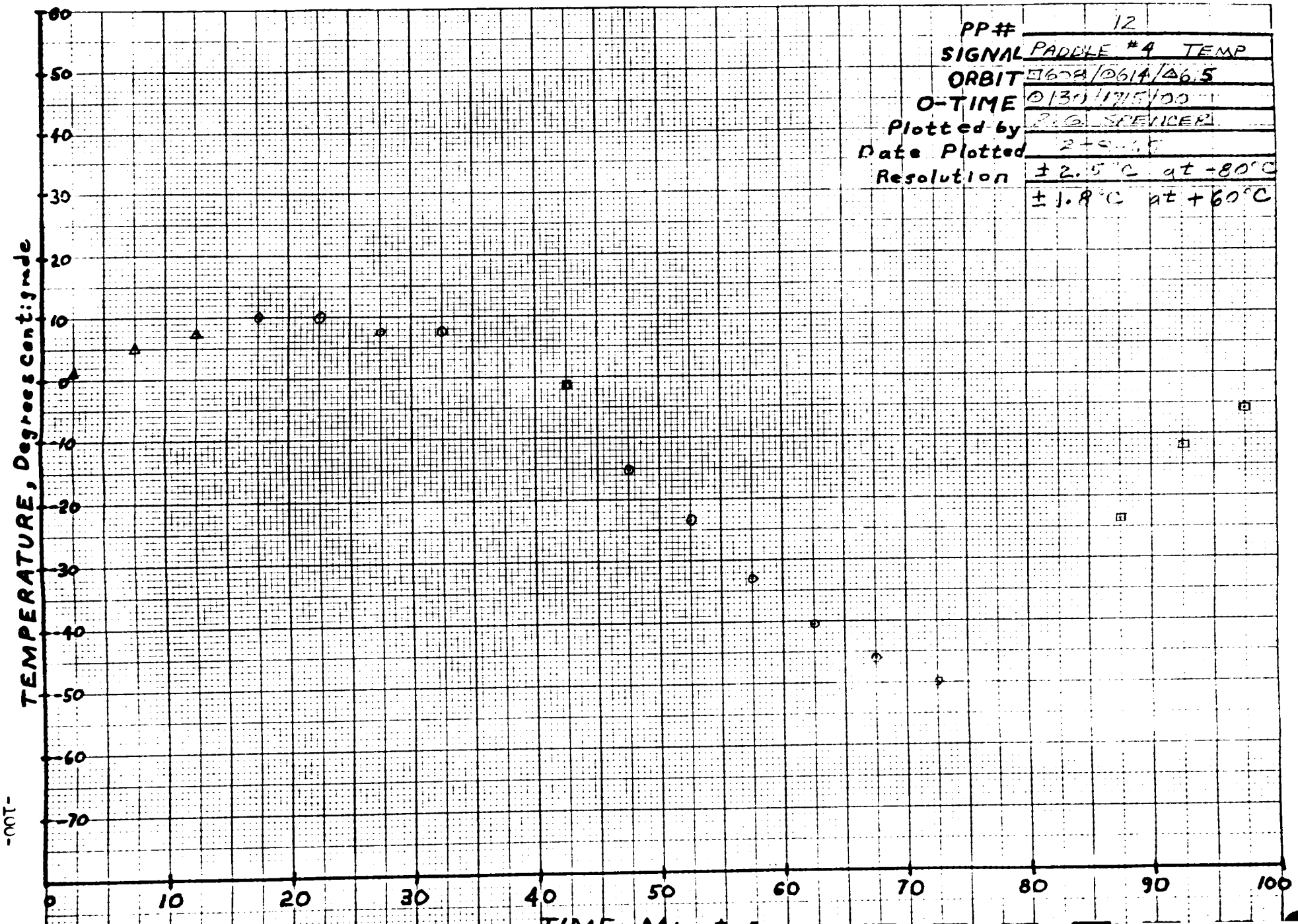



PP # 09
SIGNAL
ORBIT
O-TIME
Plotted by
Date Plotted
Resolution ± 0.02amp at 0amp
± 0.04 amp at 2.5amp
± 0.15 amp at 3.5amp
1.80
1.20
5 MIN
CURRENT, Amperes
TIME, Minutes
4
3
2
1
0
-1
10
20
30
40
50
60
70
80
90

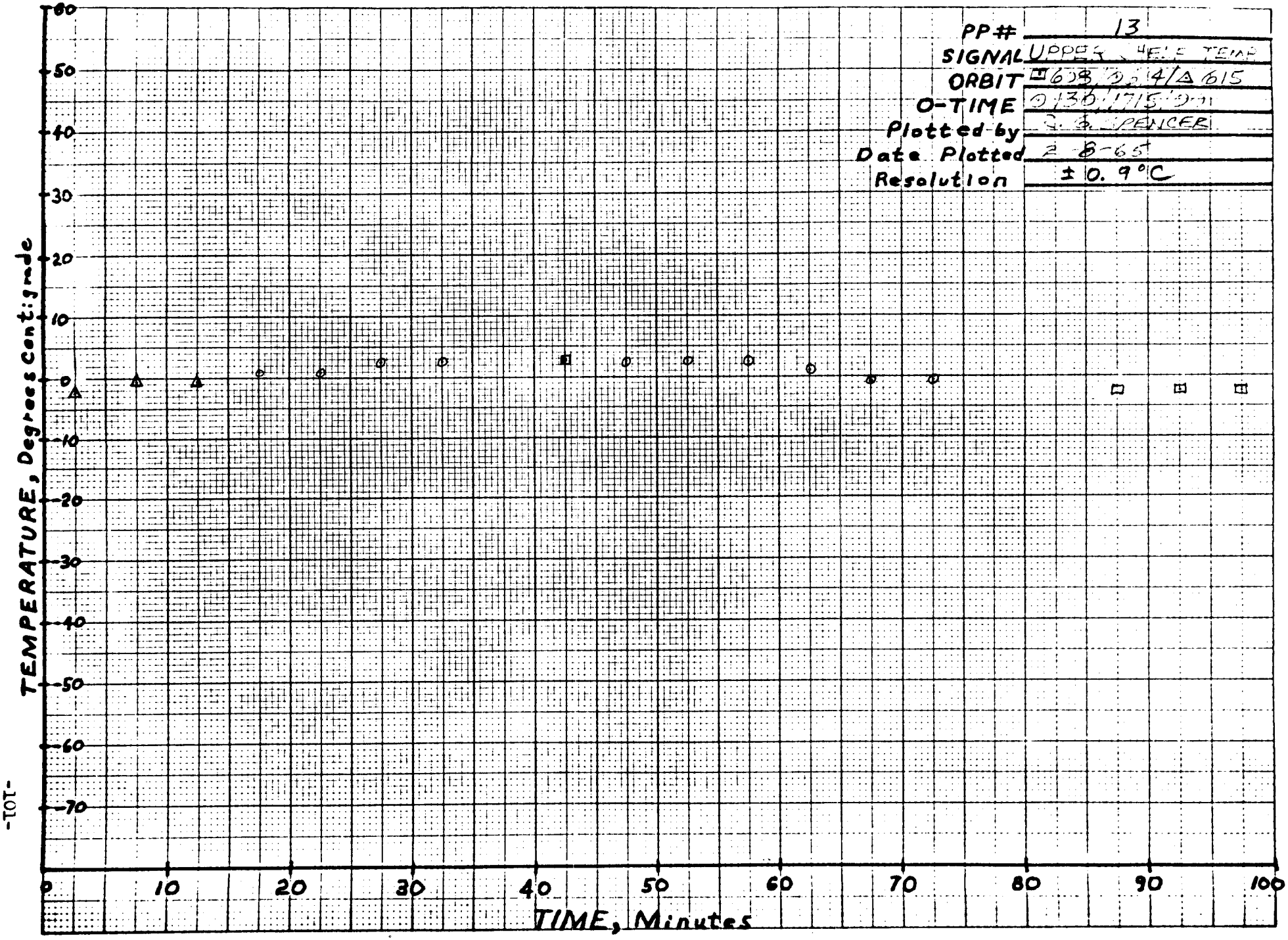
KEUFFEL & ESSER CO.



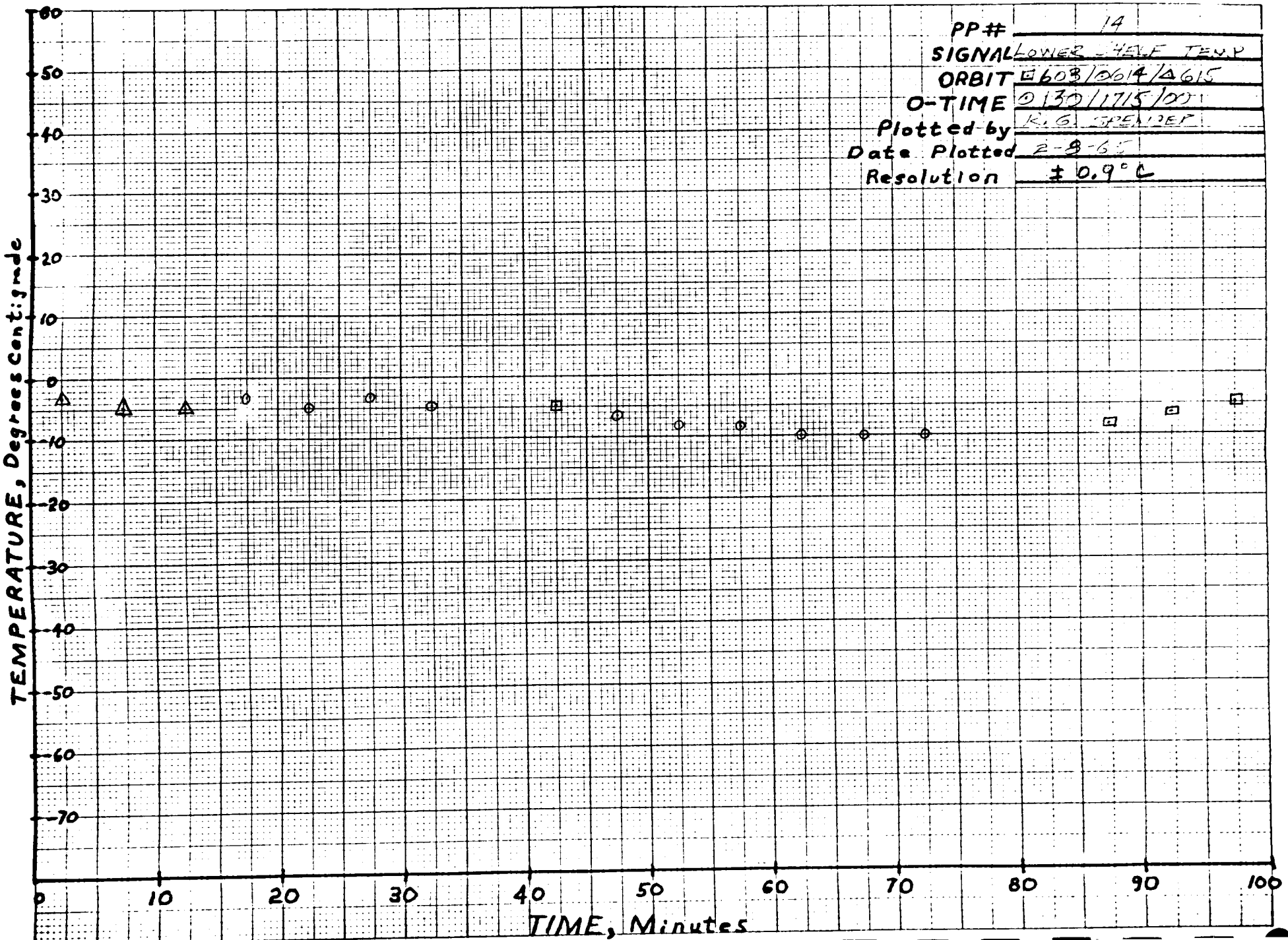
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



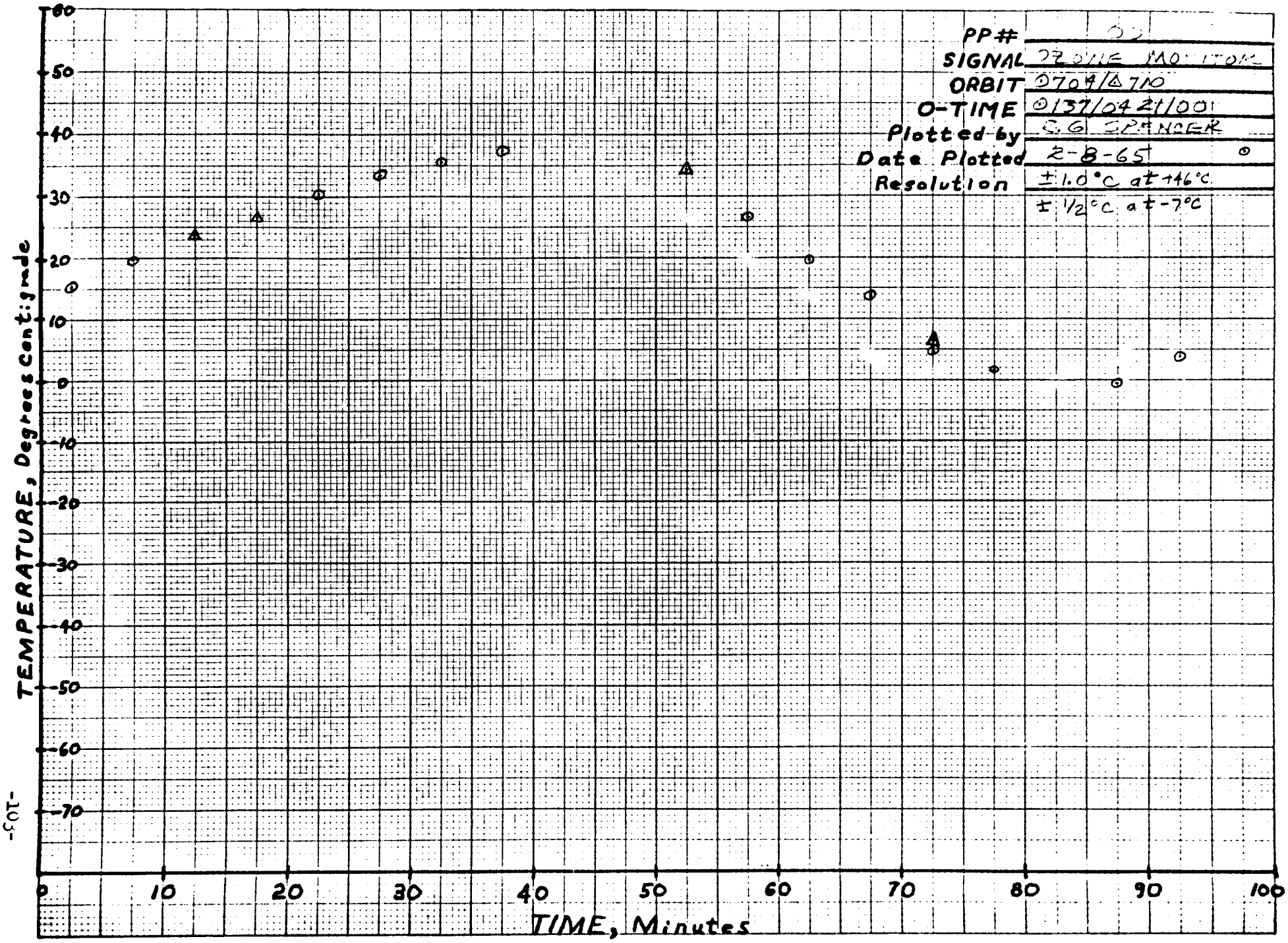
KEUFFEL & ESSER CO.



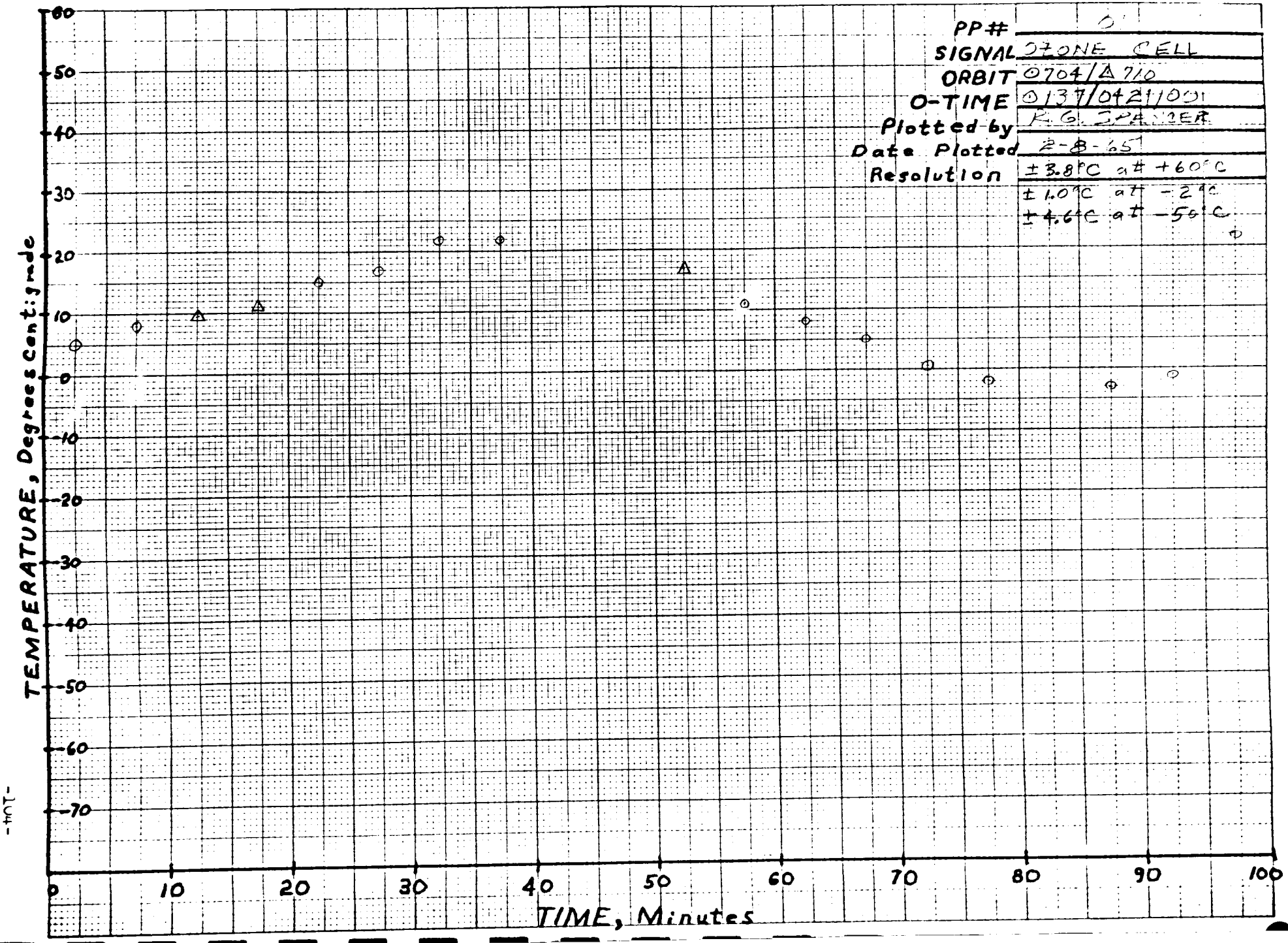
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



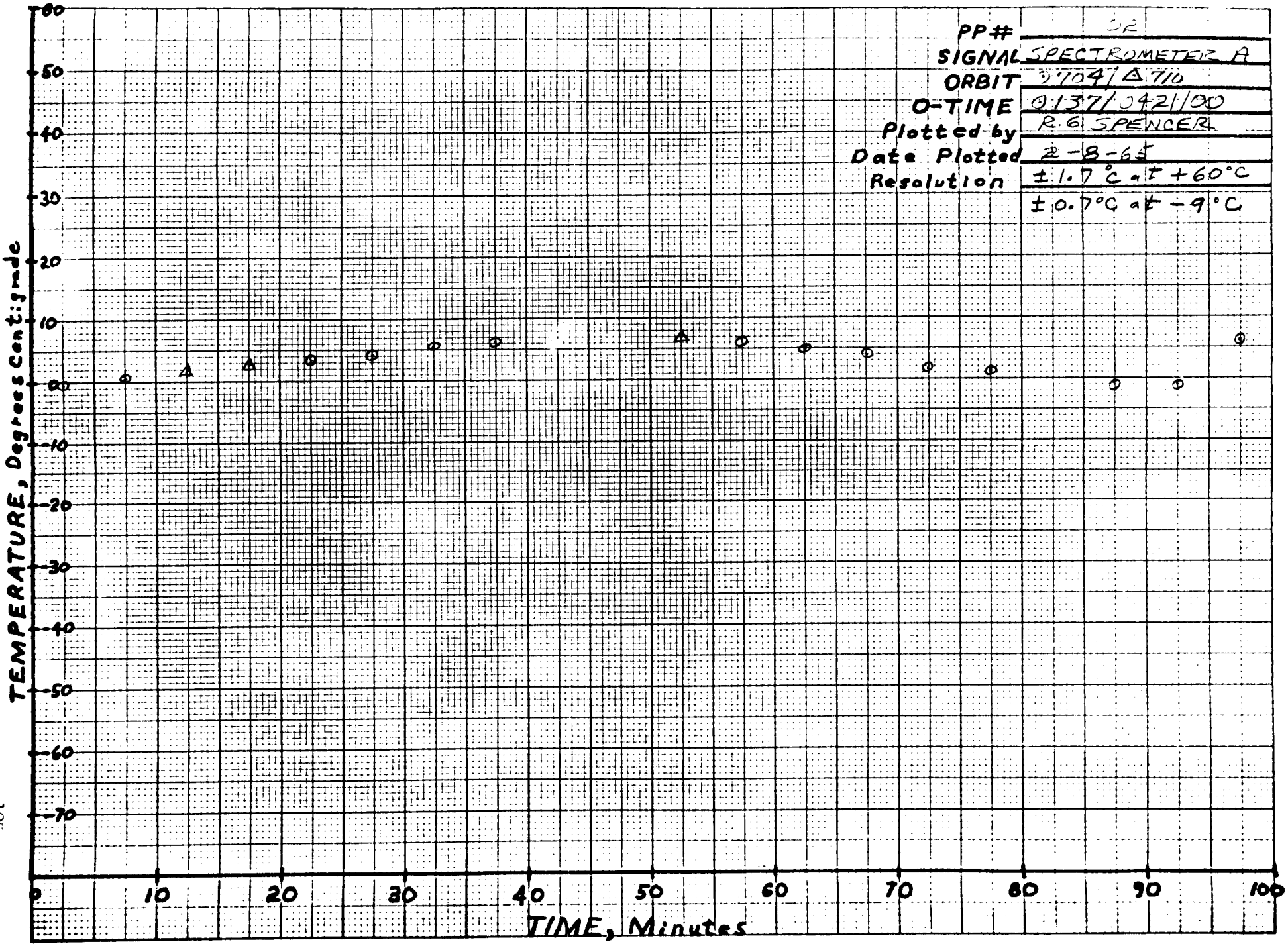
KEUFFEL & ESSER CO.



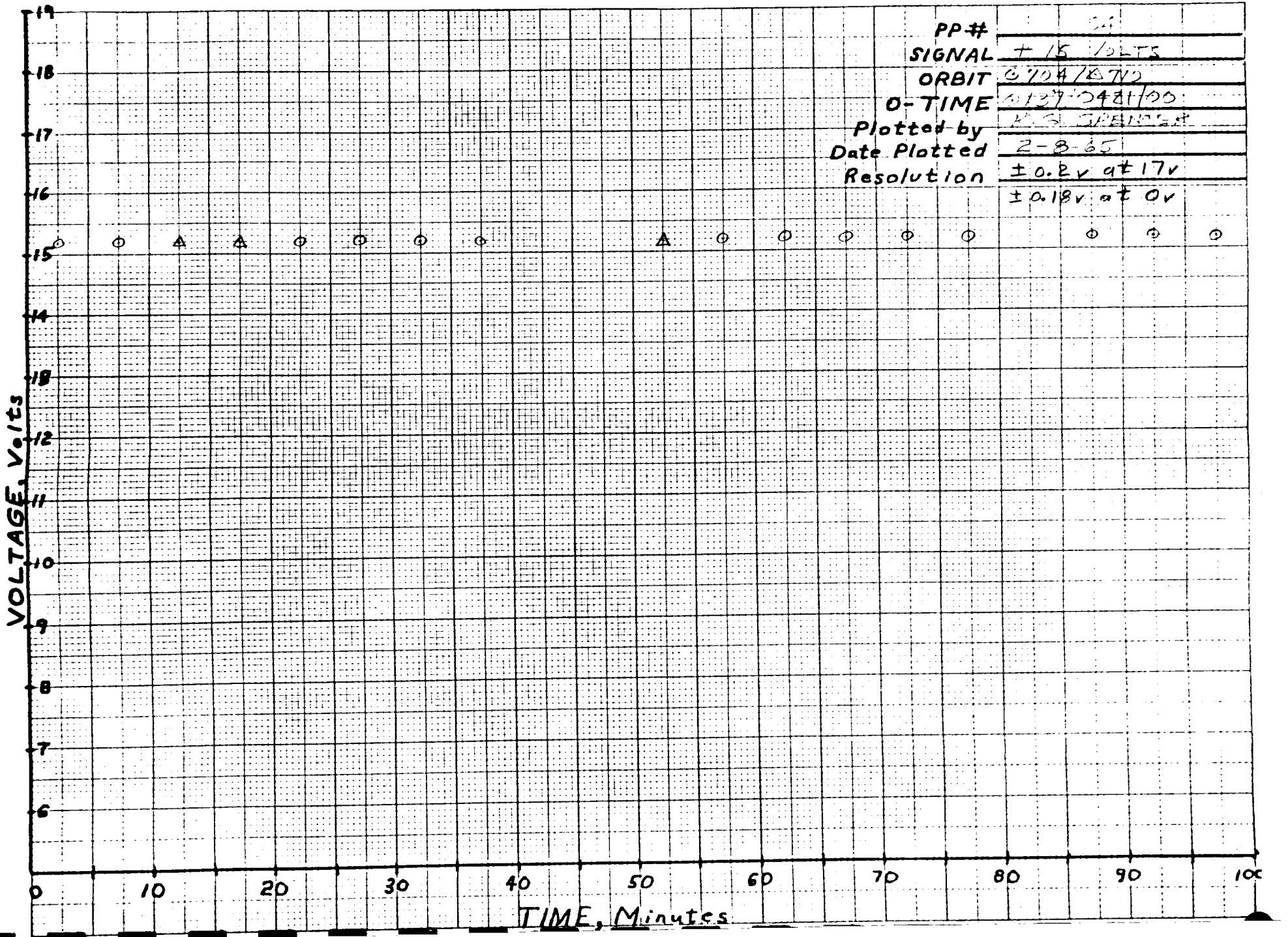
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



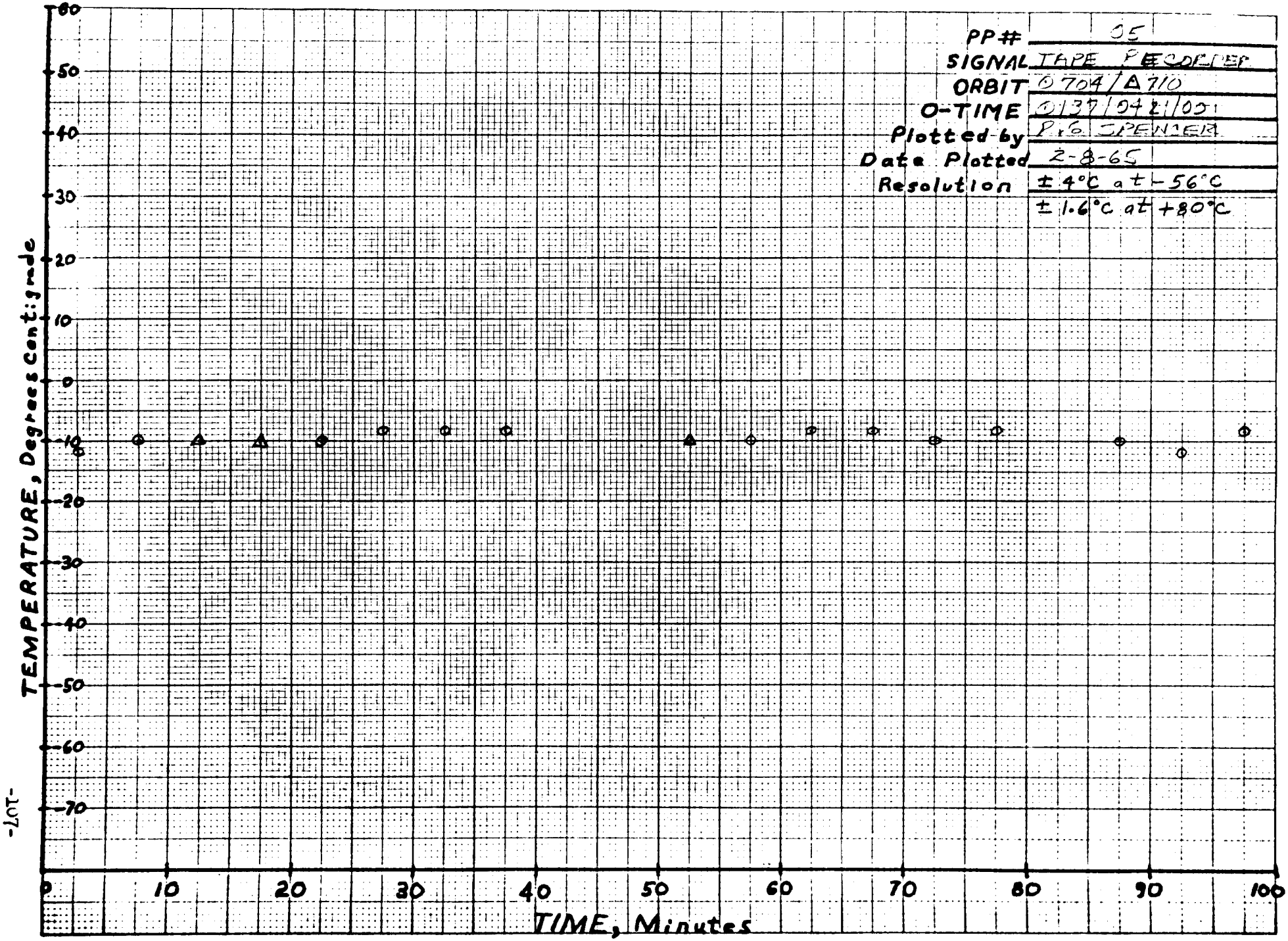
KEUFFEL & ESSER CO.



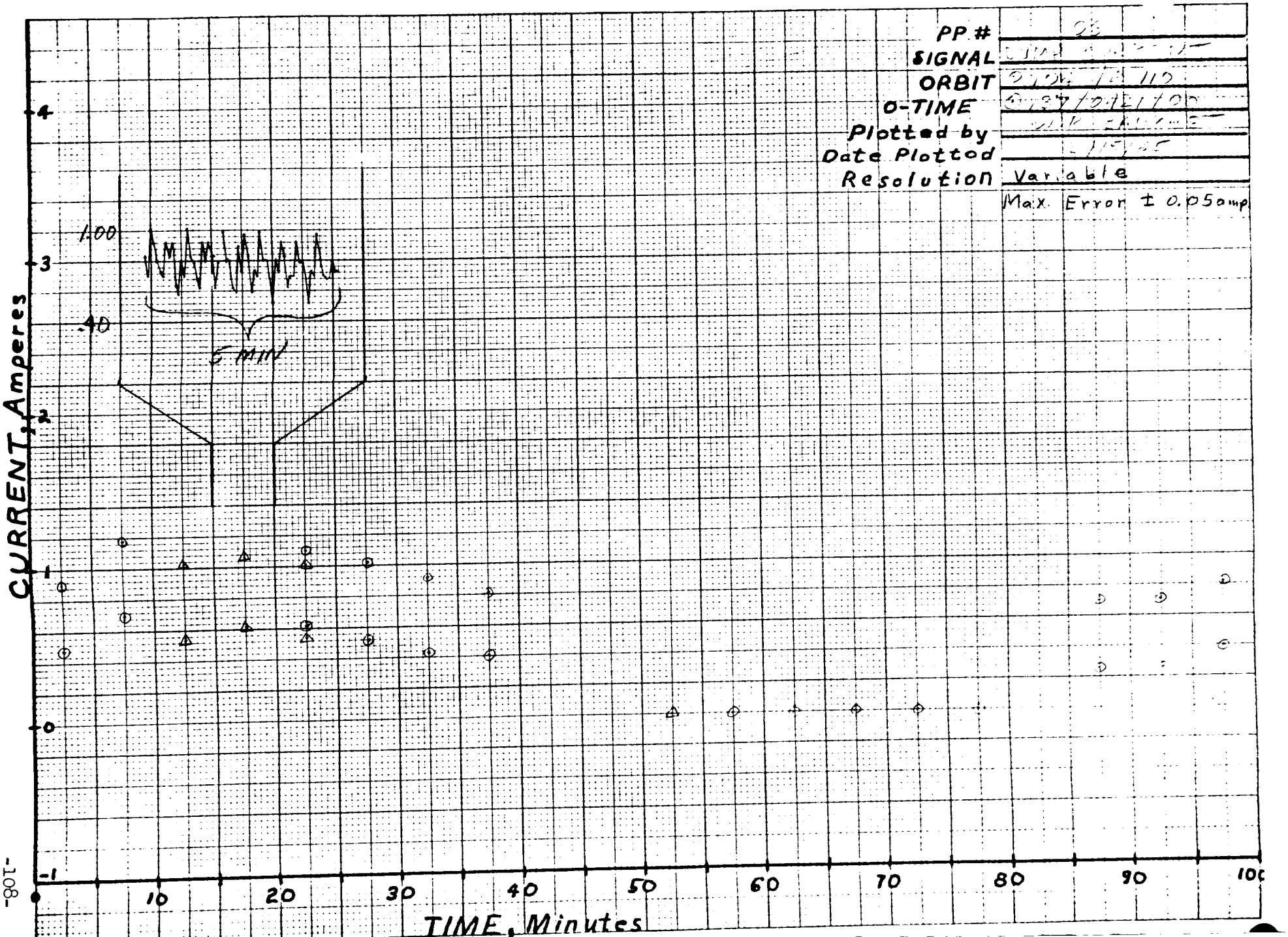
K+E 10 X 10 TO 1/2 INCH 46 1472
7 1/2 X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



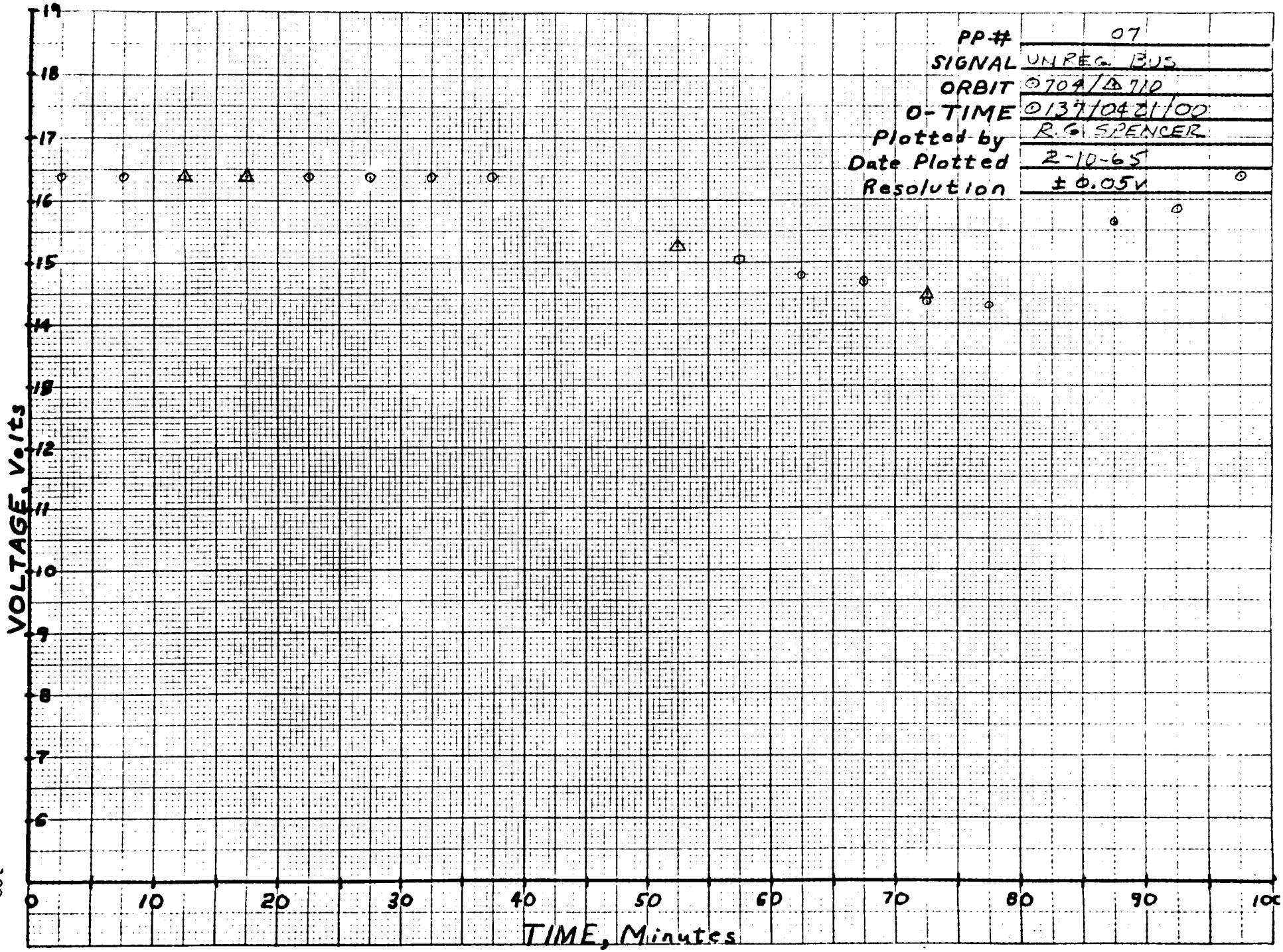
KEUFFEL & ESSER CO.



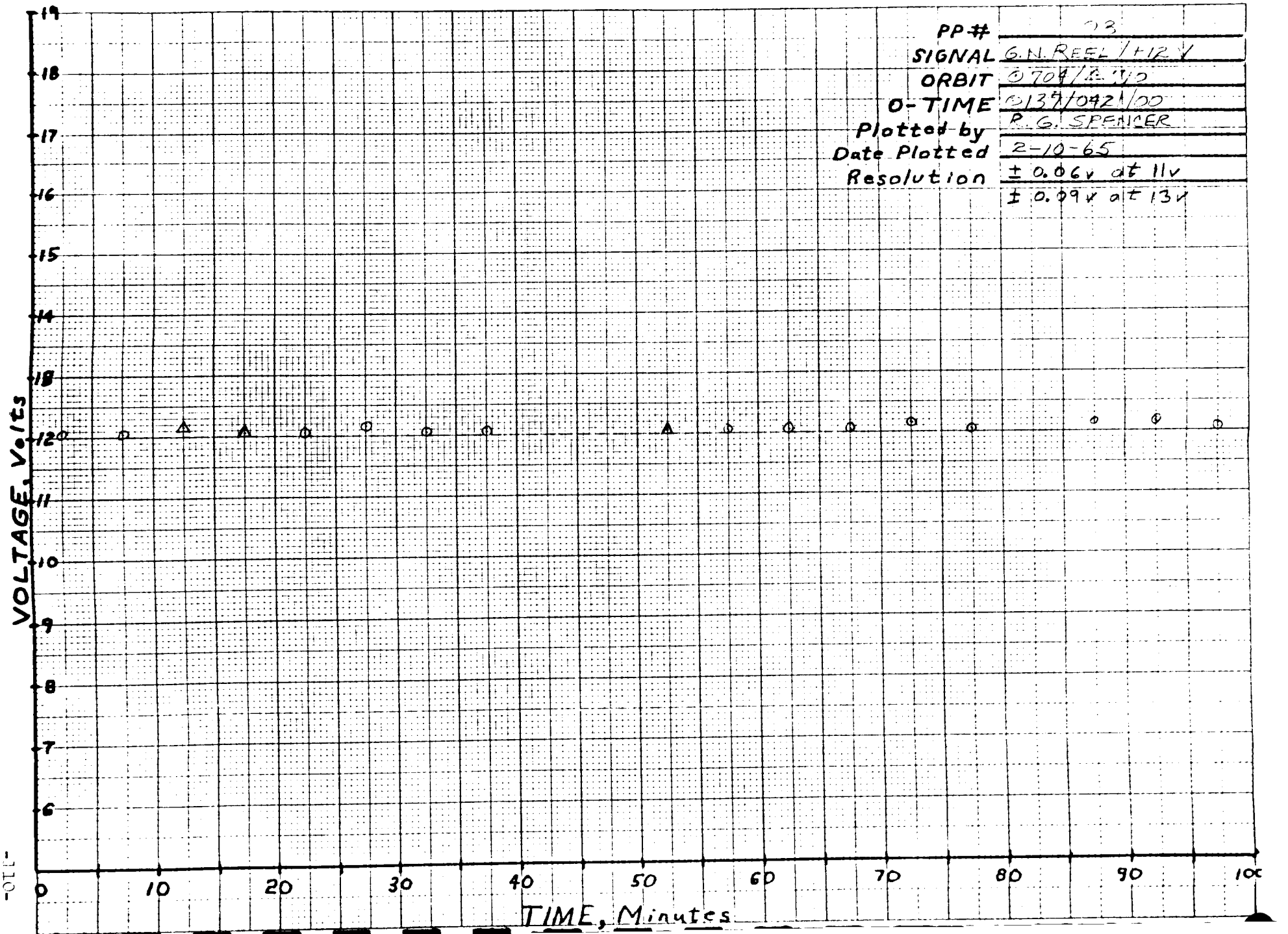
K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



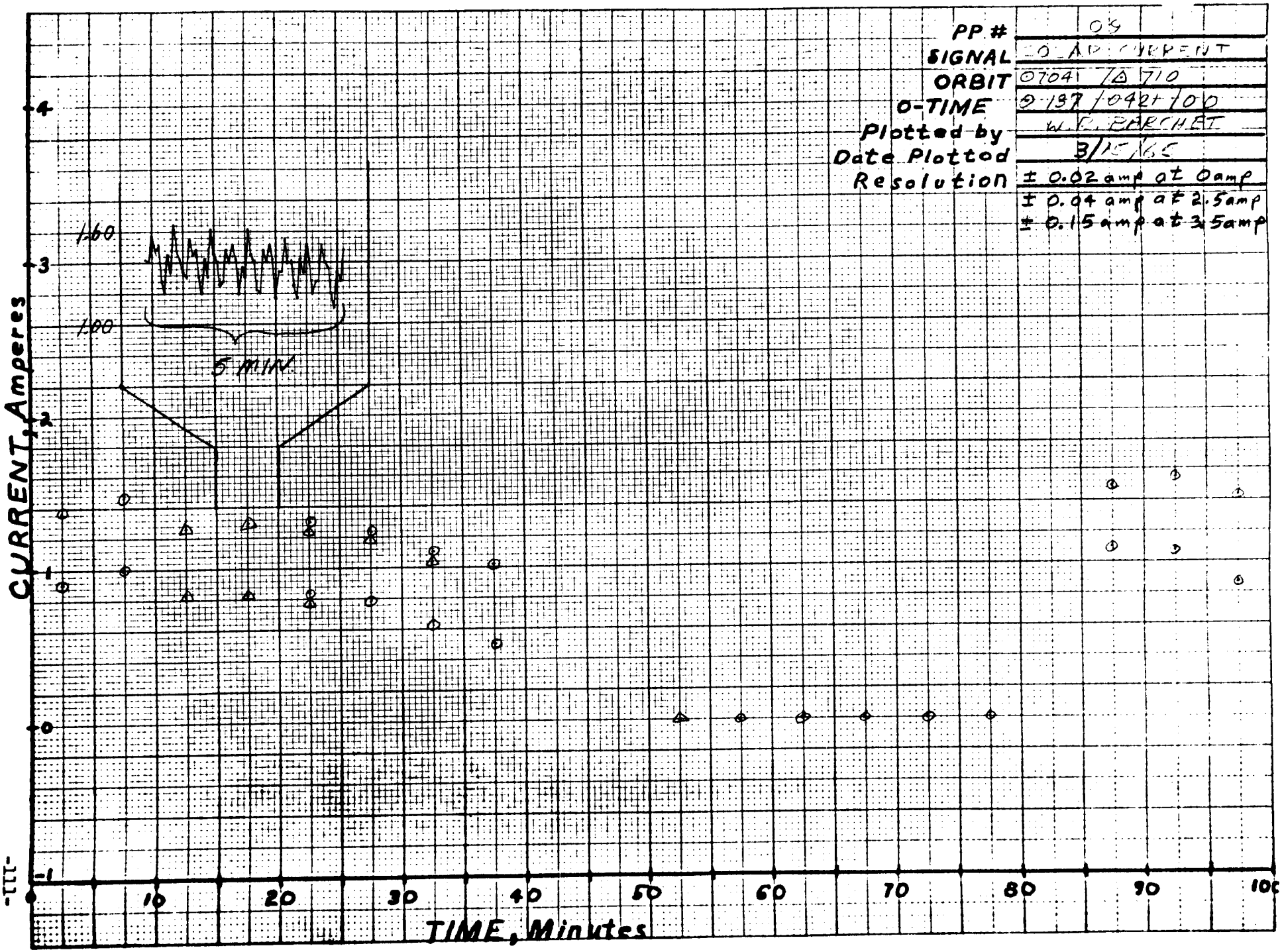
KEUFFEL & ESSER CO.



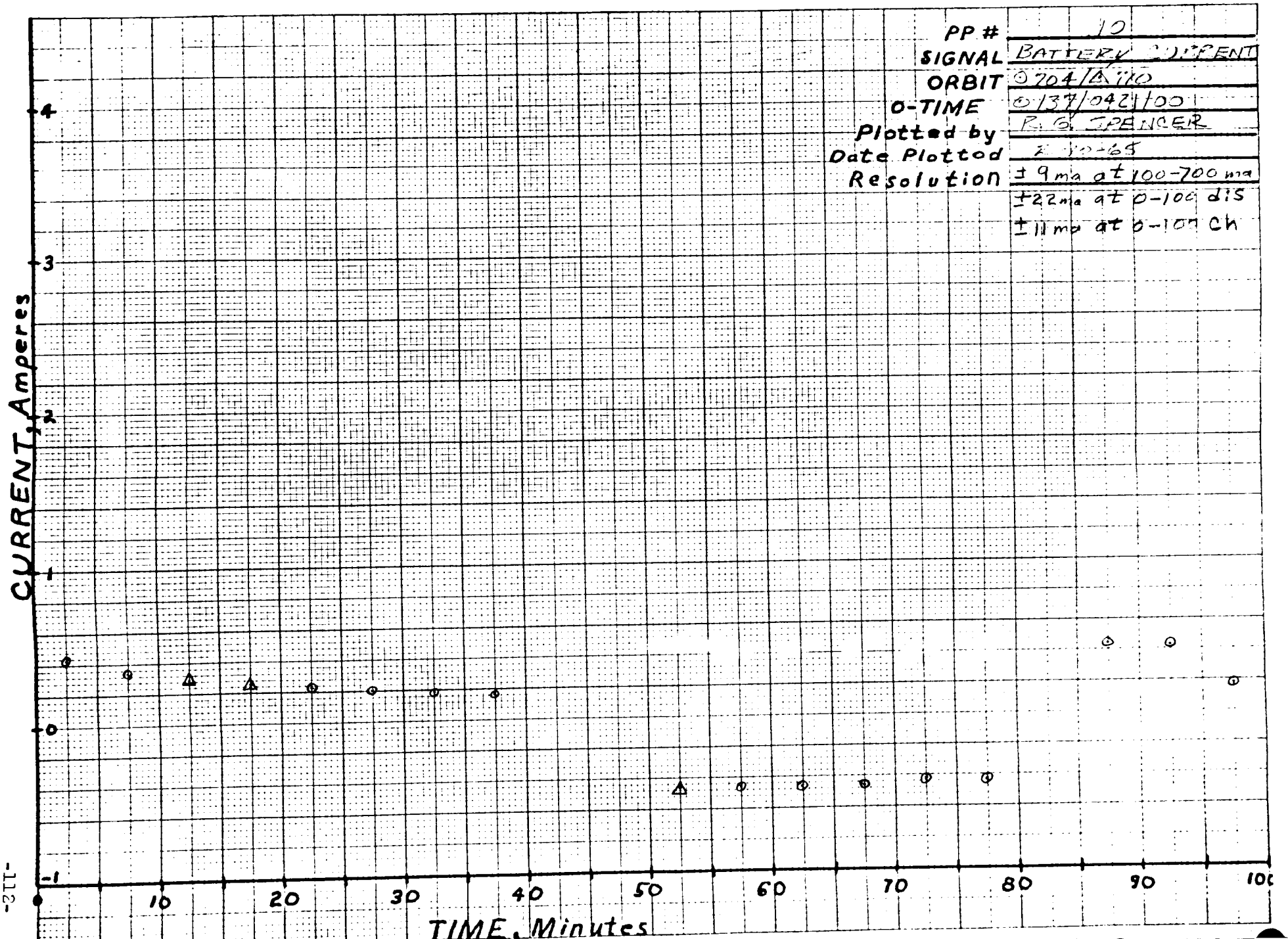
K&E 10 X 10 TO ½ INCH 46 1472
MADE IN U.S.A.
KEUFFEL & ESSER CO.

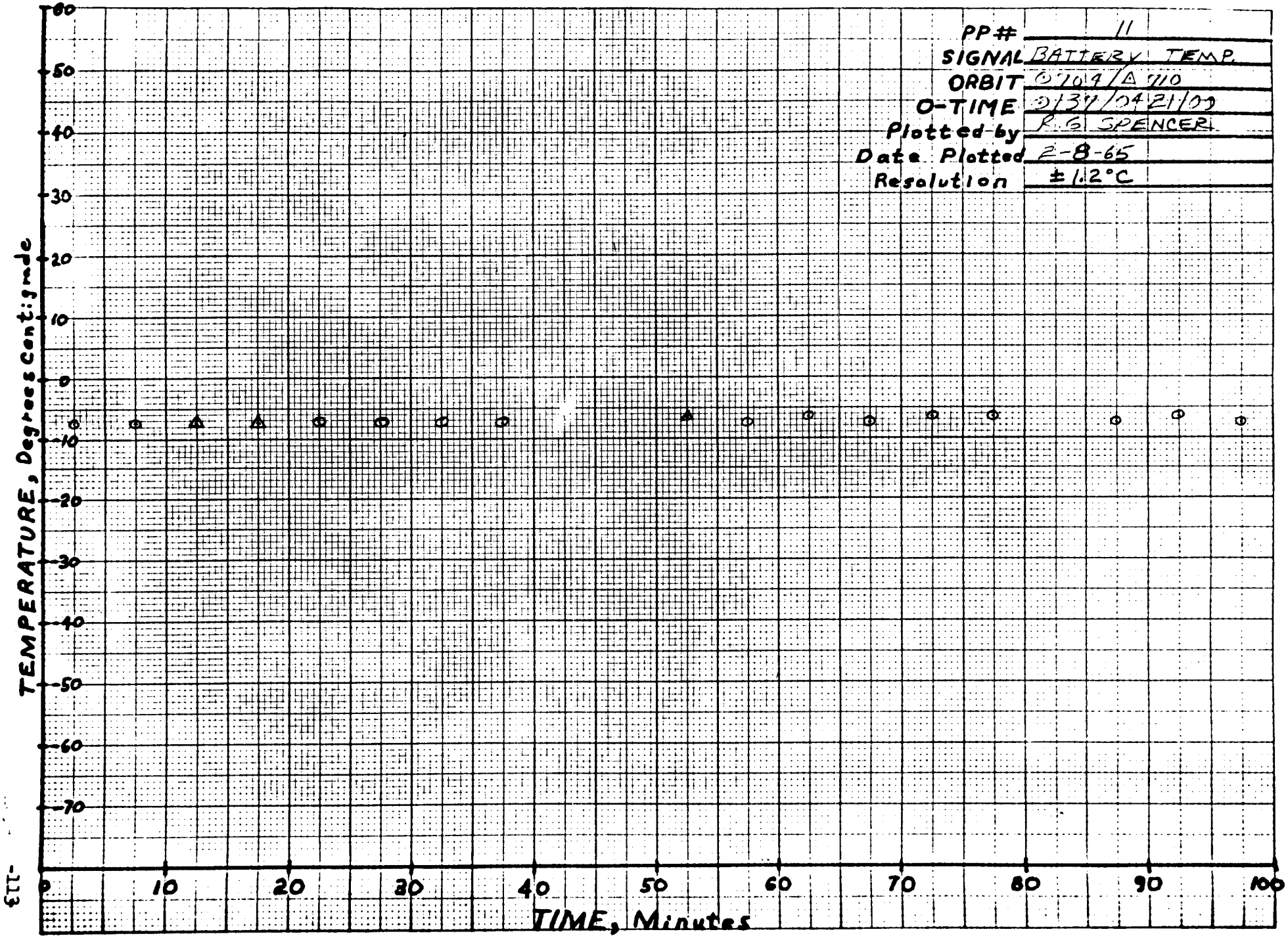


K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

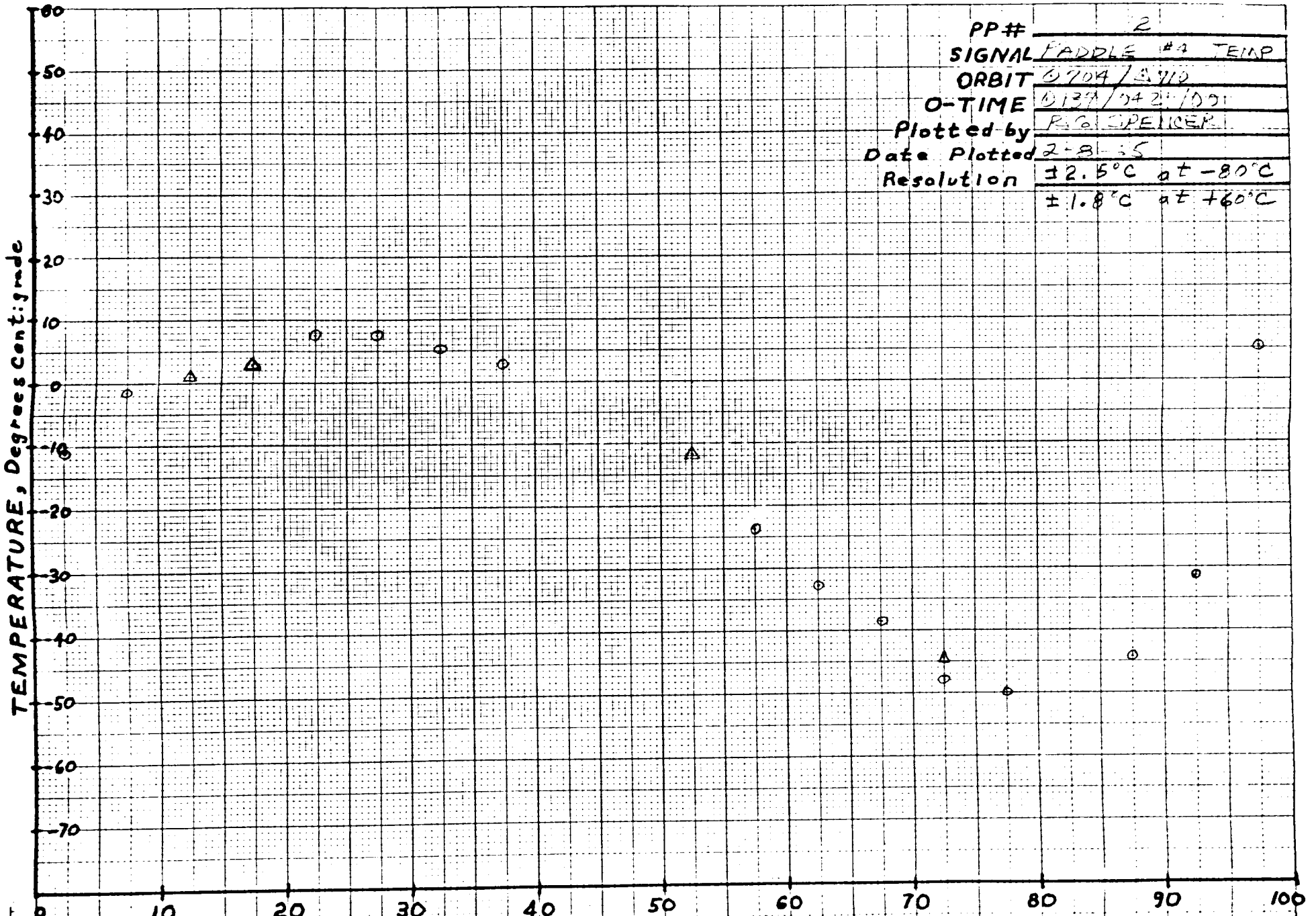


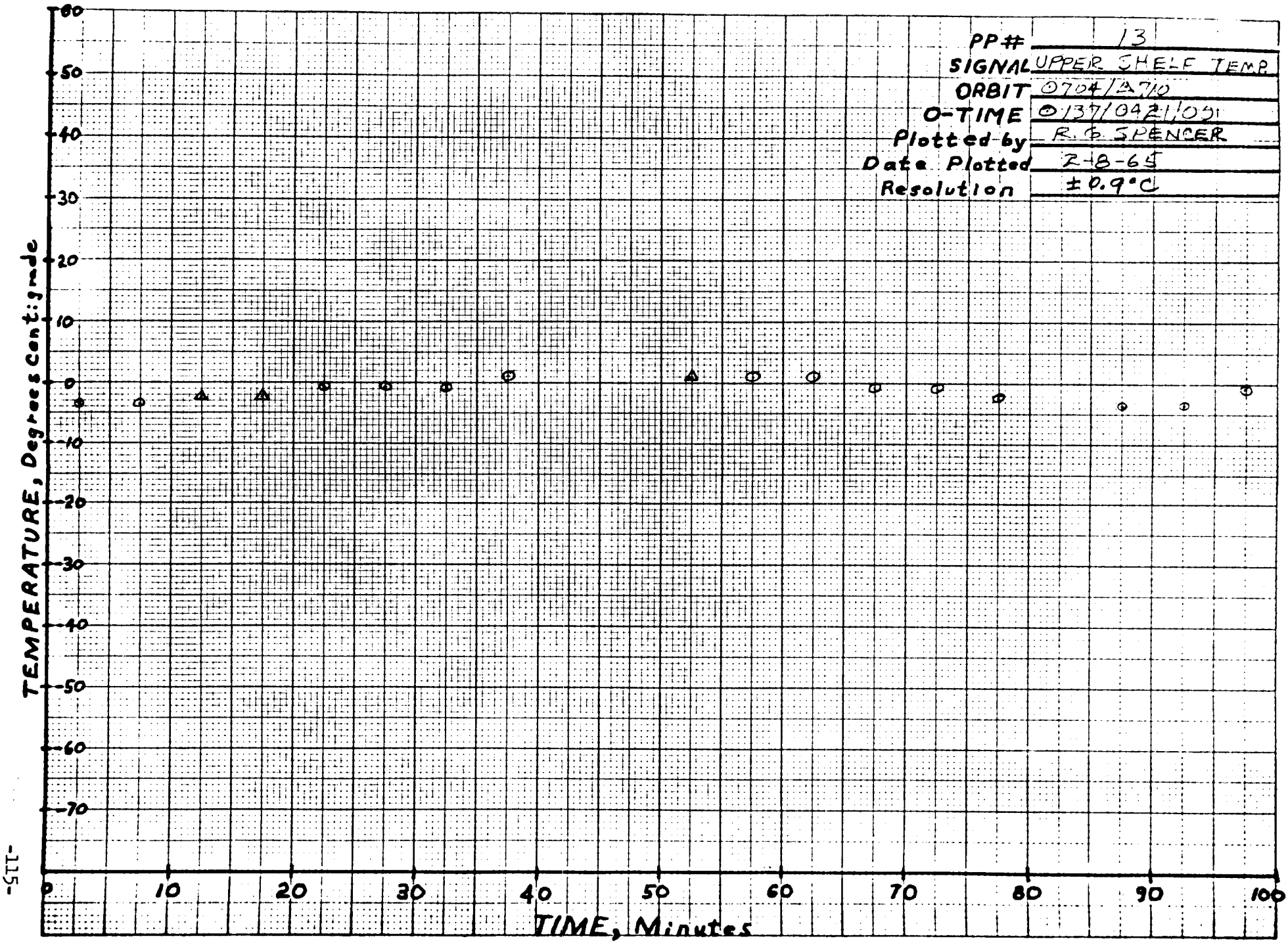
K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



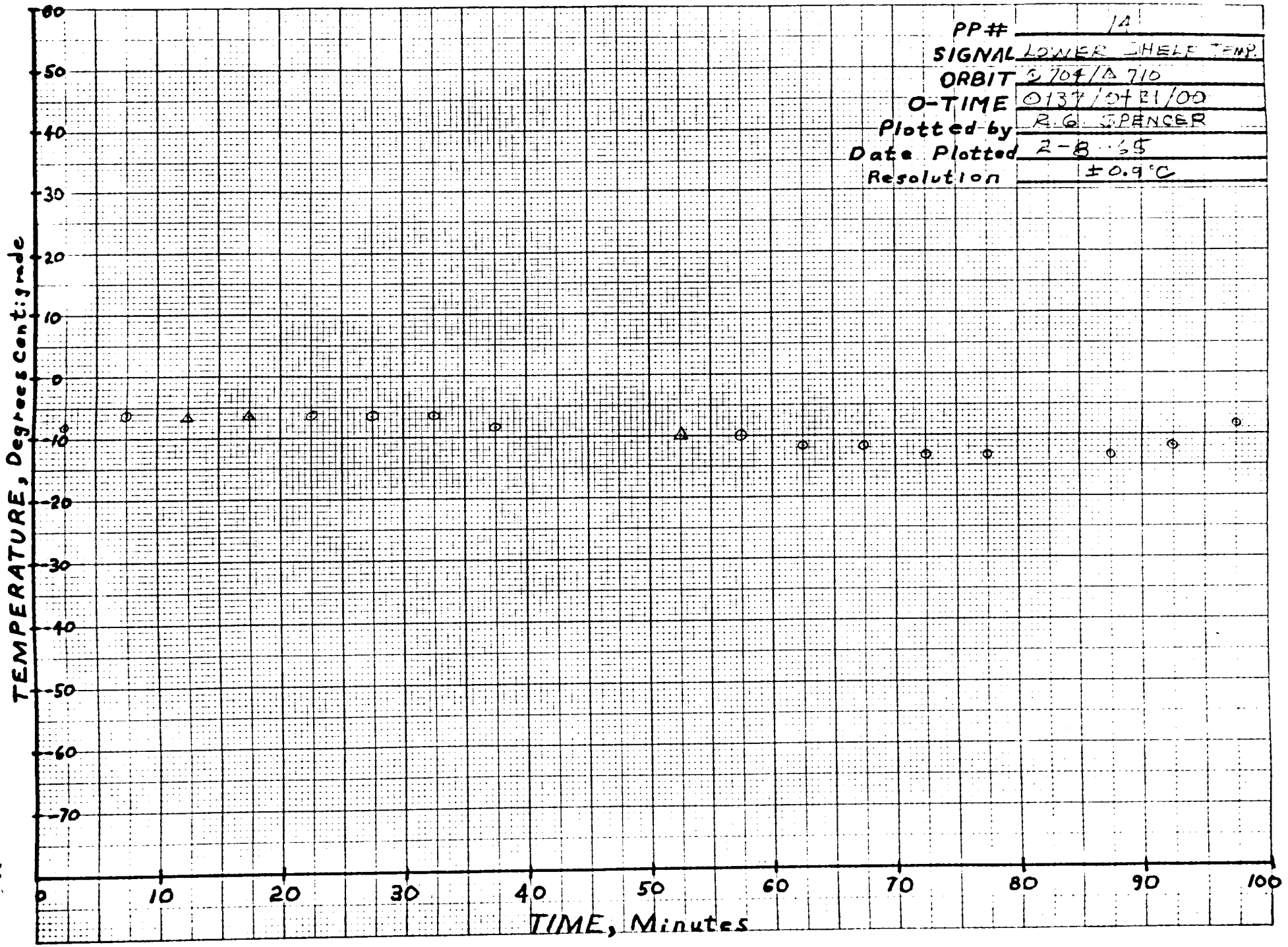

PP# 11
SIGNAL BATTERY TEMP.
ORBIT ⊙704/△710
O-TIME ⊙137/0421/00
Plotted by R.G. SPENCER
Date Plotted 2-8-65
Resolution ±1.2°C
TEMPERATURE, Degrees Centigrade
80
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

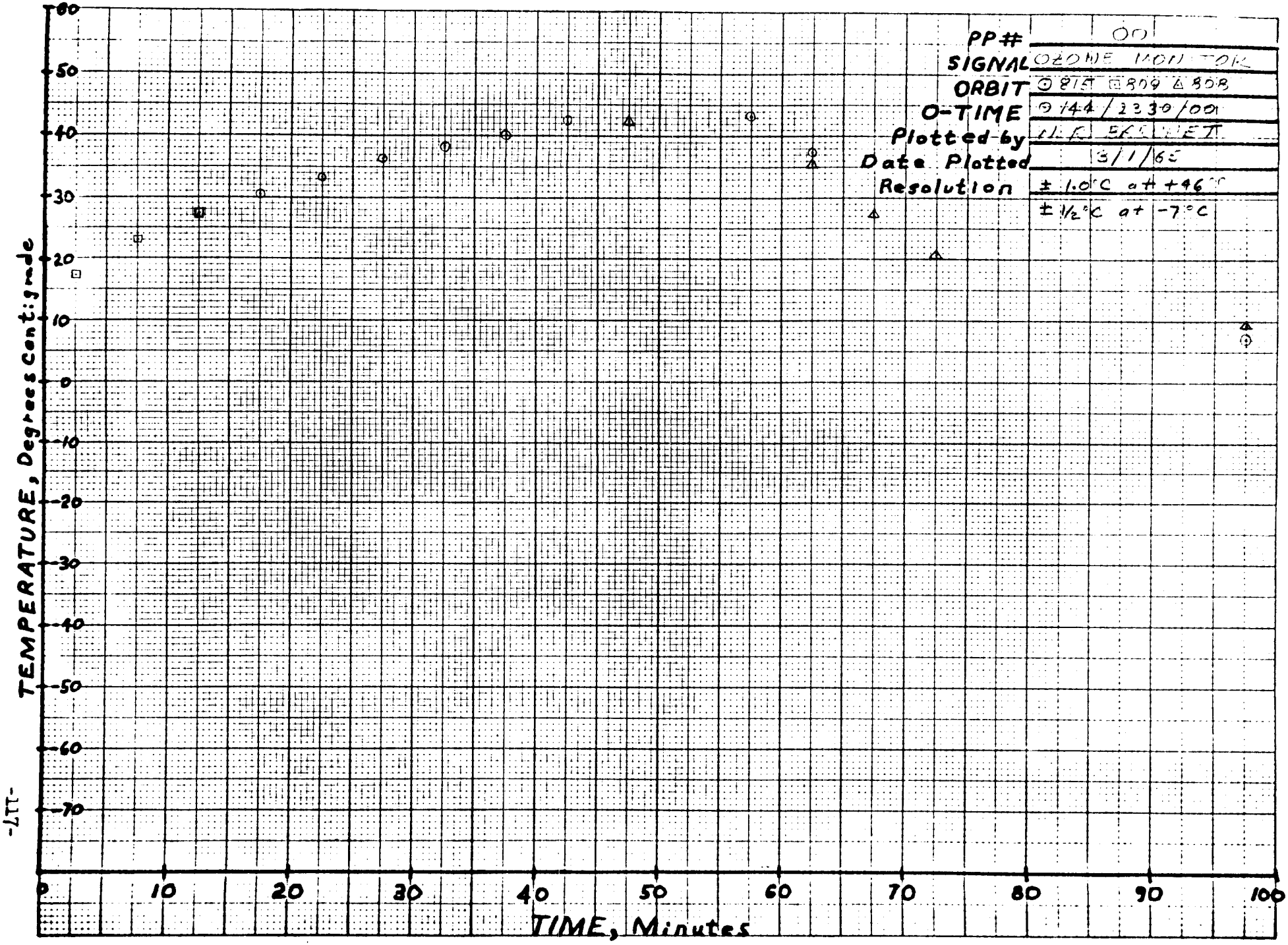



PP# 13
SIGNAL UPPER SHELF TEMP
ORBIT 0704/A710
O-TIME 0137/0421/09
Plotted by R. G. SPENCER
Date Plotted 2-8-65
Resolution ±0.9°C
TEMPERATURE, Degrees centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

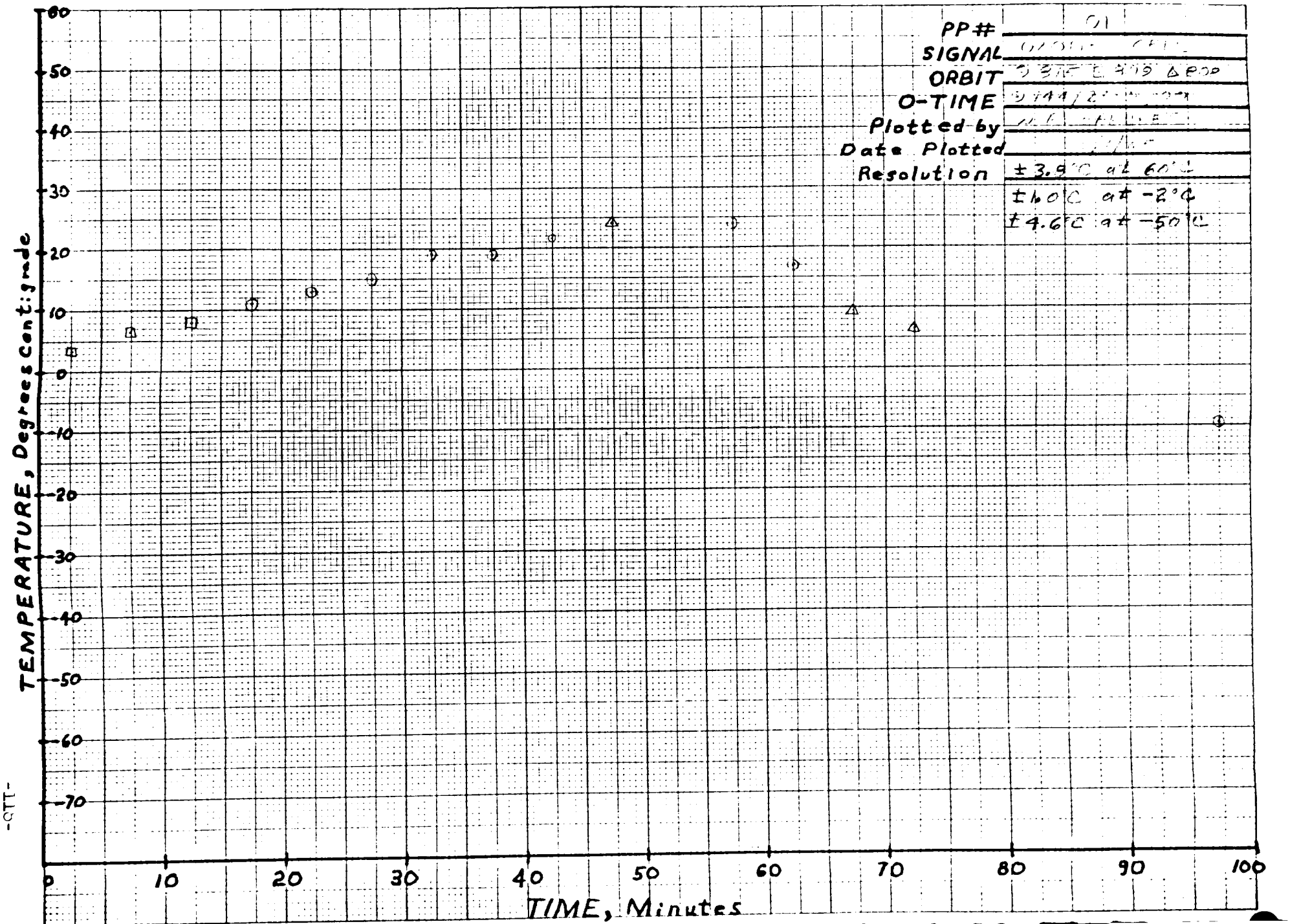
KEUFFEL & ESSER CO.



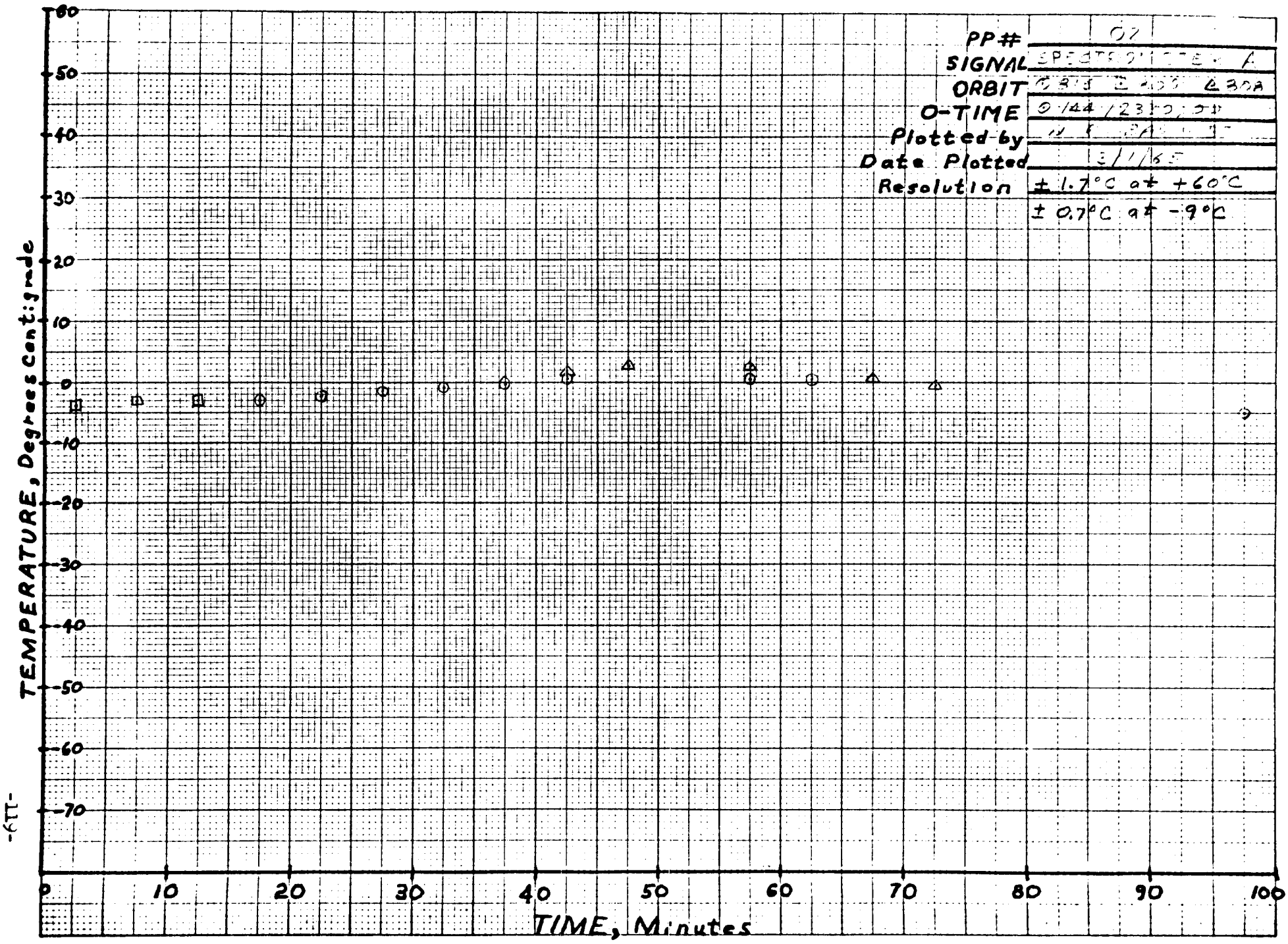
KEUFFEL & ESSER CO.



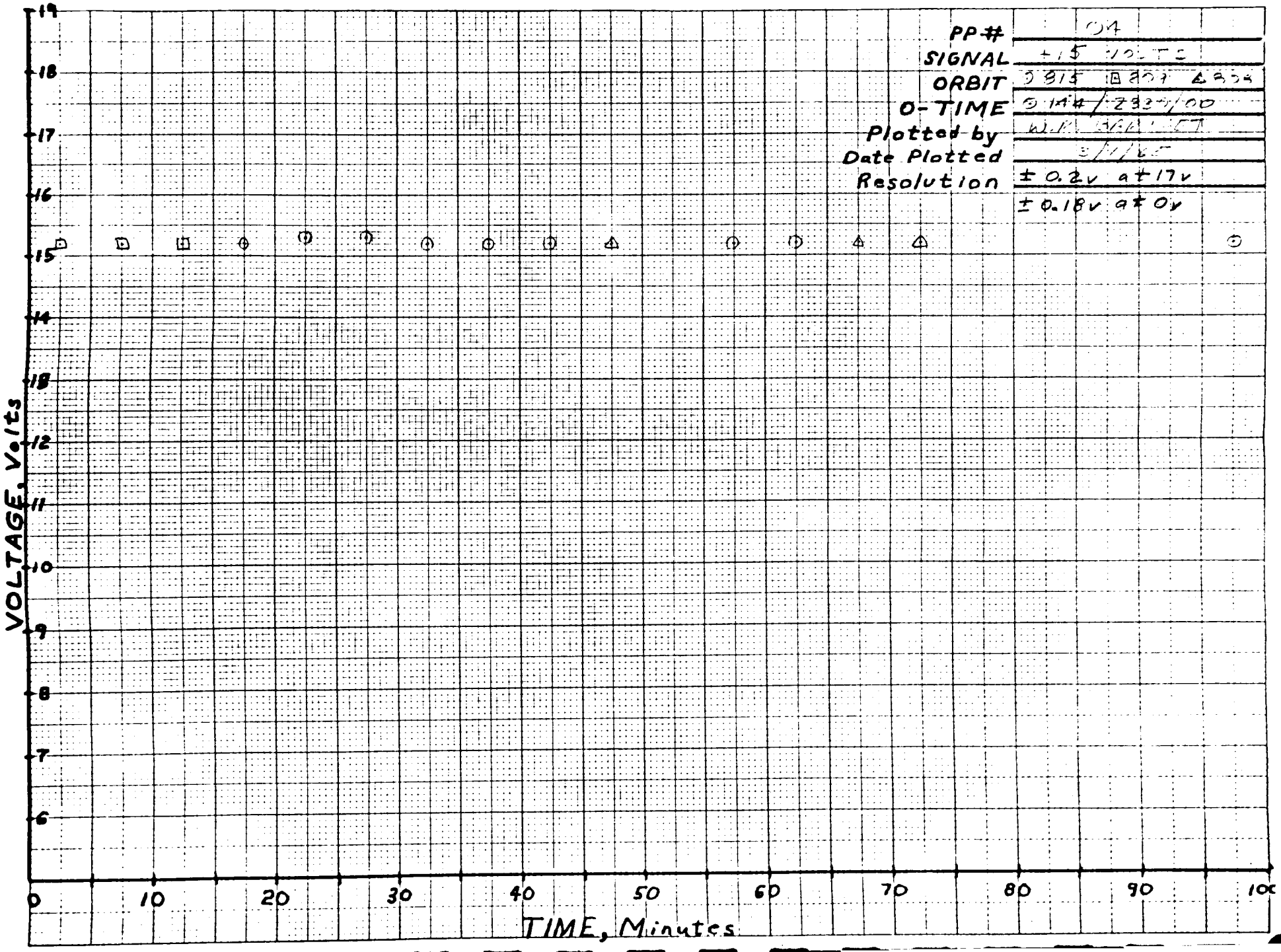
K+E 10 X 10 TO ½ INCH 46 1472
KEUFFEL & ESSER CO.



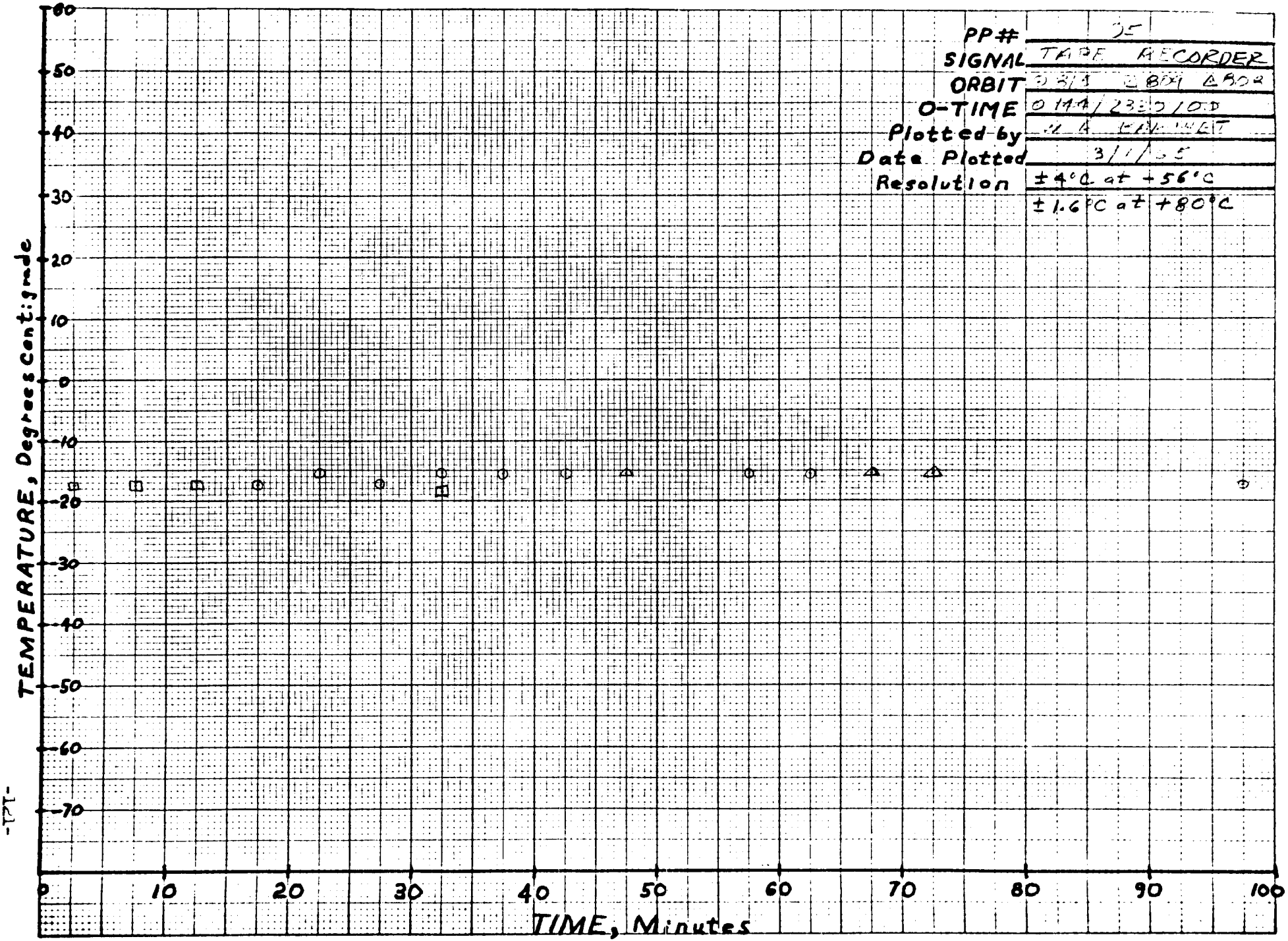
KEUFFEL & ESSER CO.



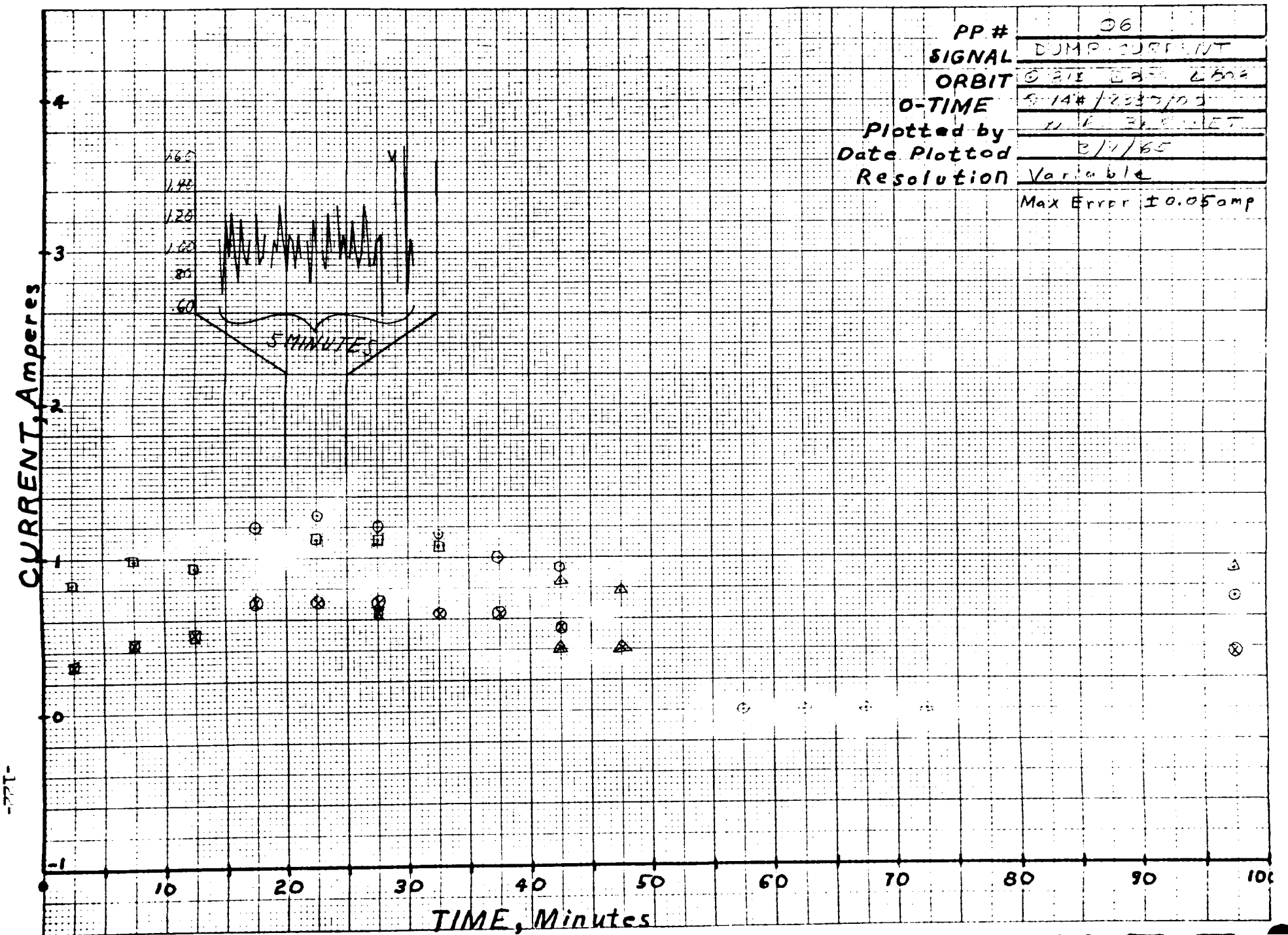
K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



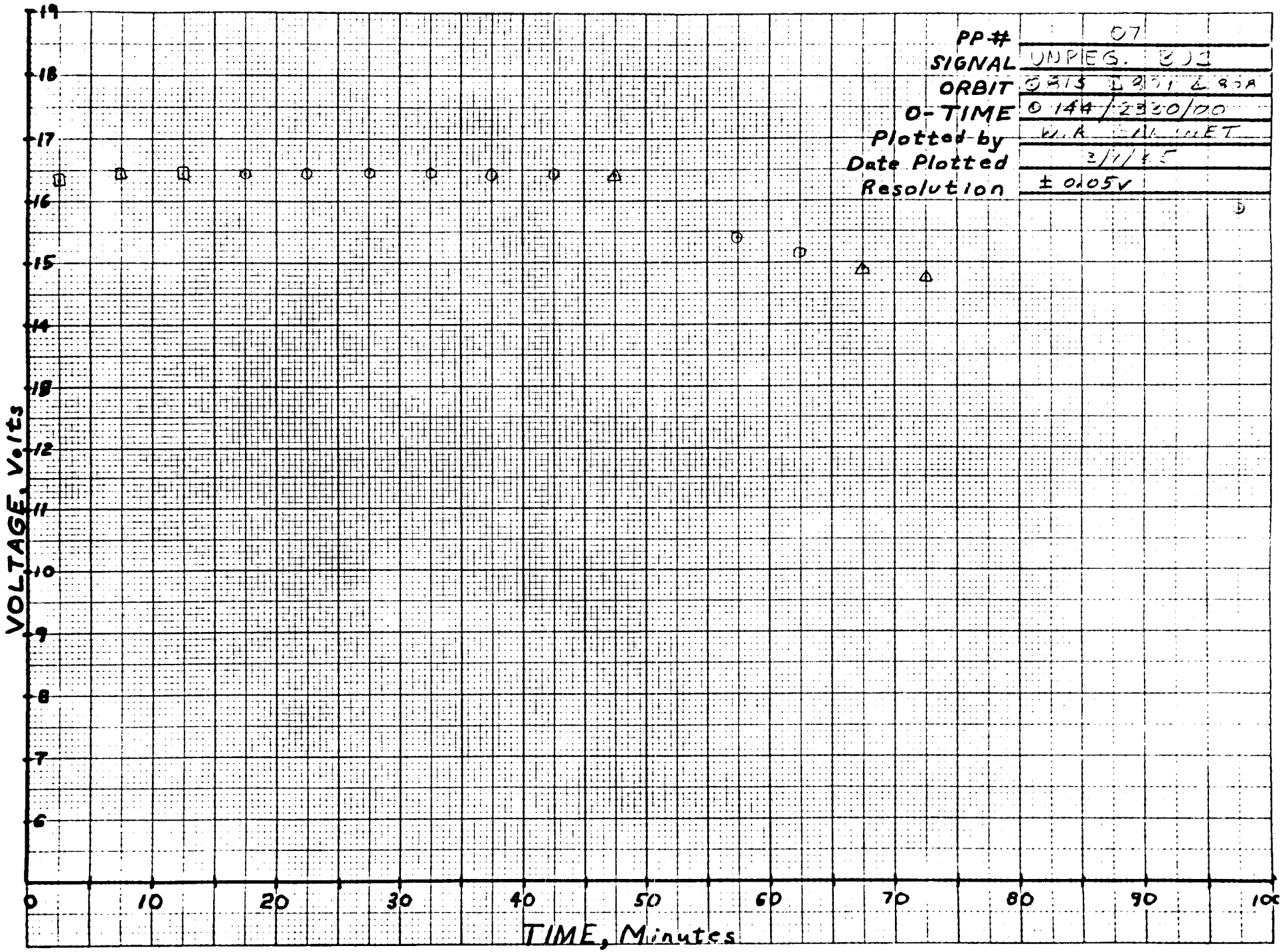
KEUFFEL & ESSER CO.



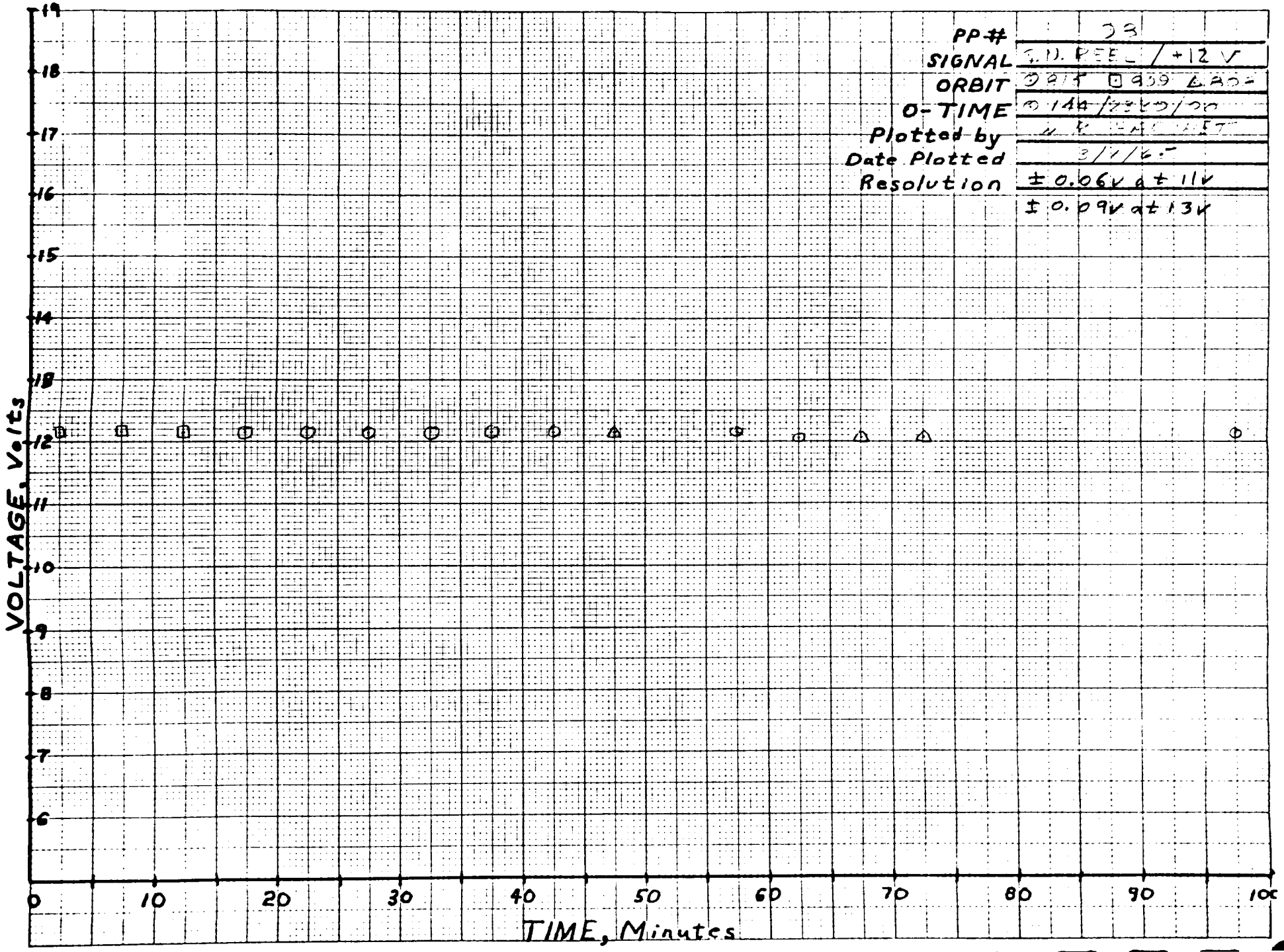
K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



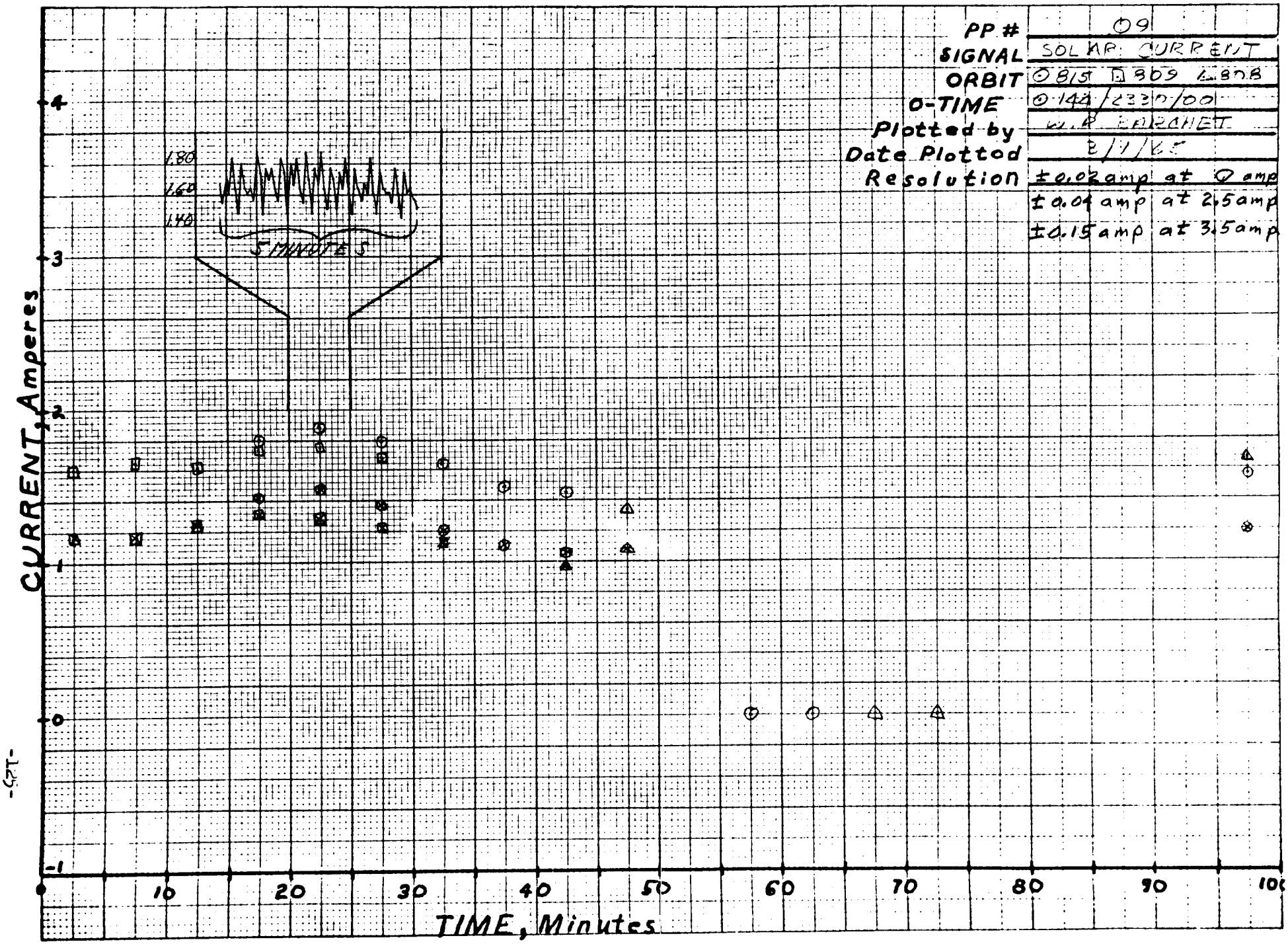
K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



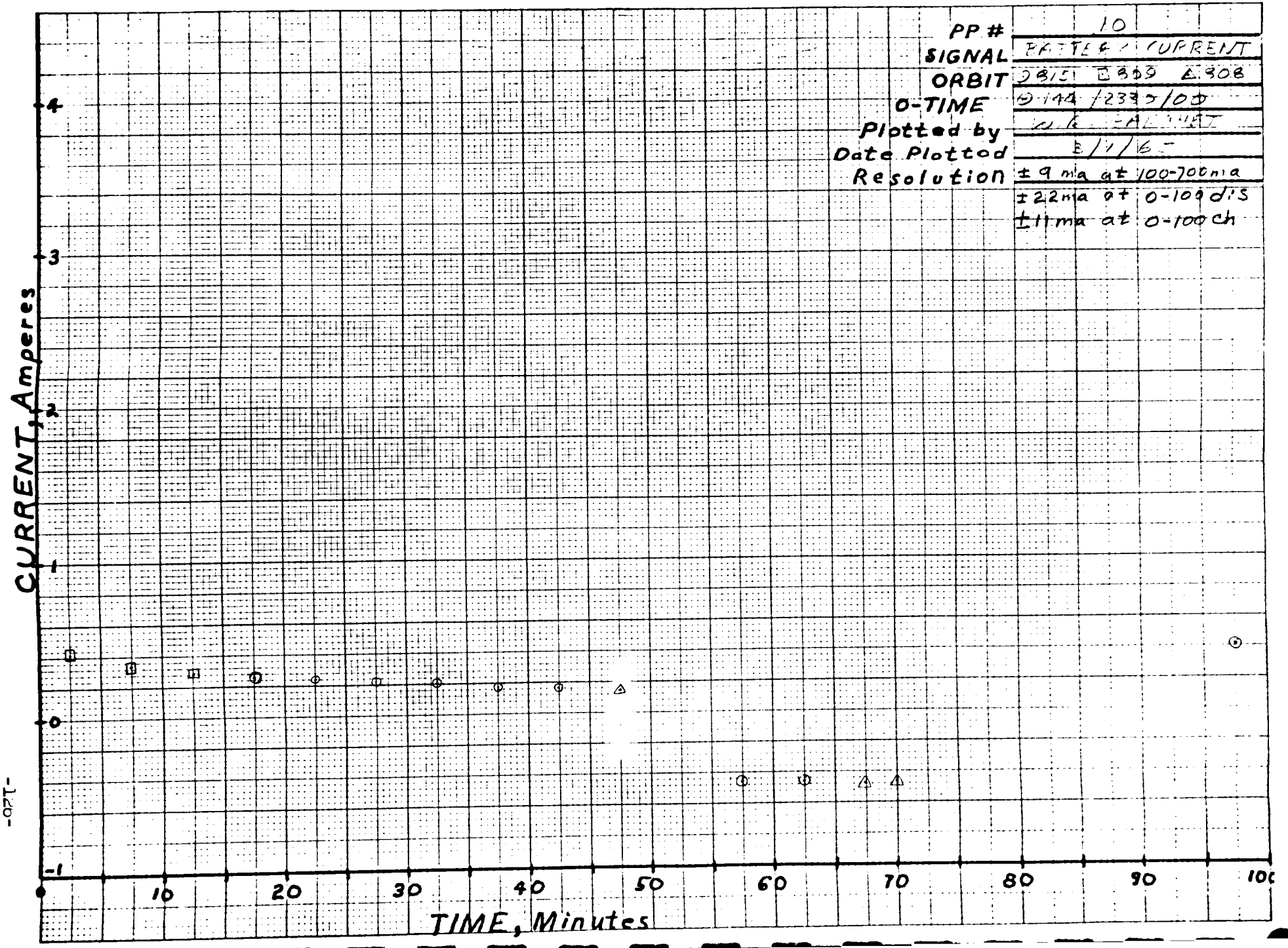
K&E 10 X 10 TO 1/2 INCH 46 1472
7 1/2 X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



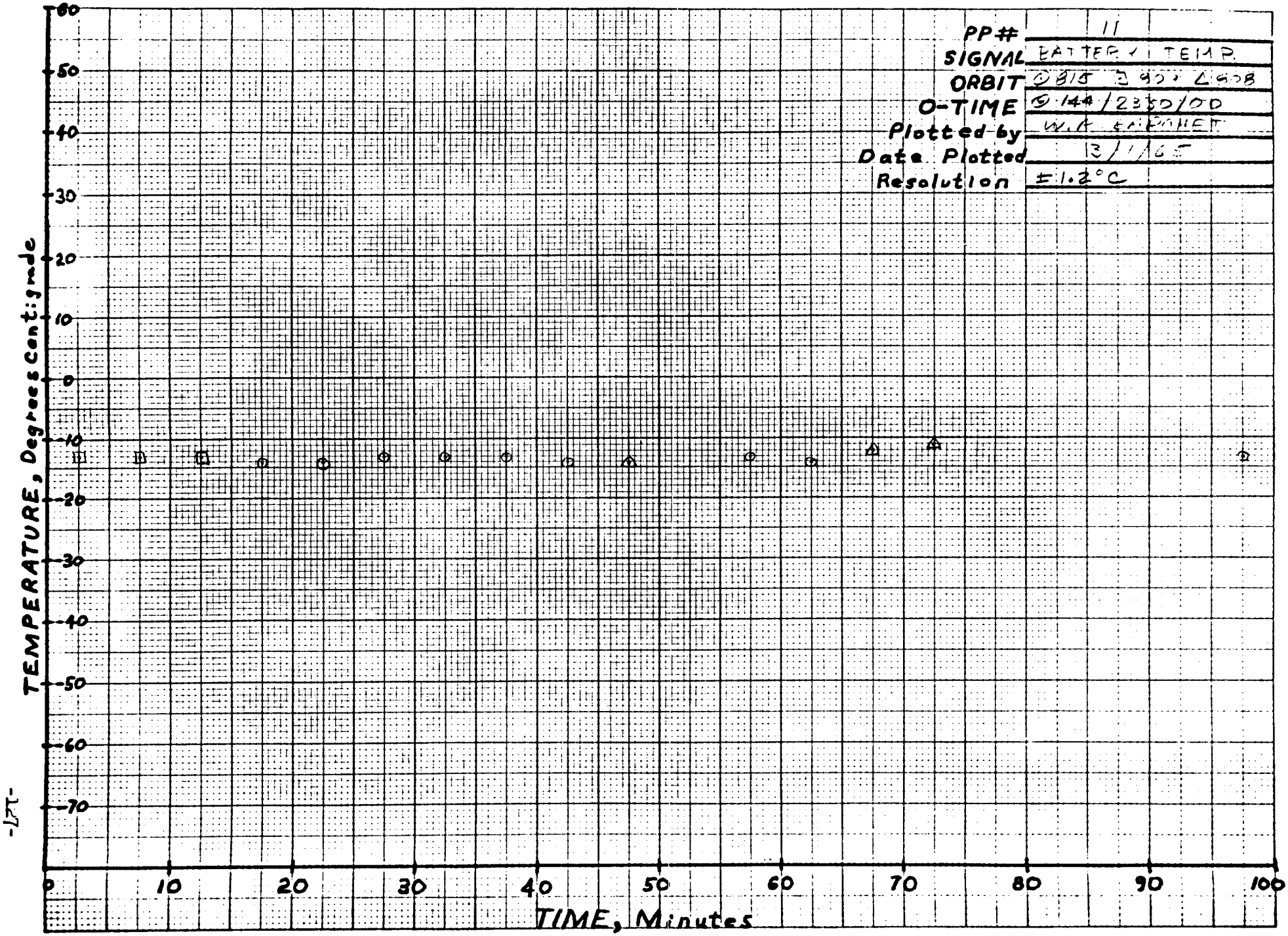
K&E 10 X 10 TO 1 INCH 7½ X 10 INCHES MADE IN U.S.A. KEUFFEL & ESSER CO.



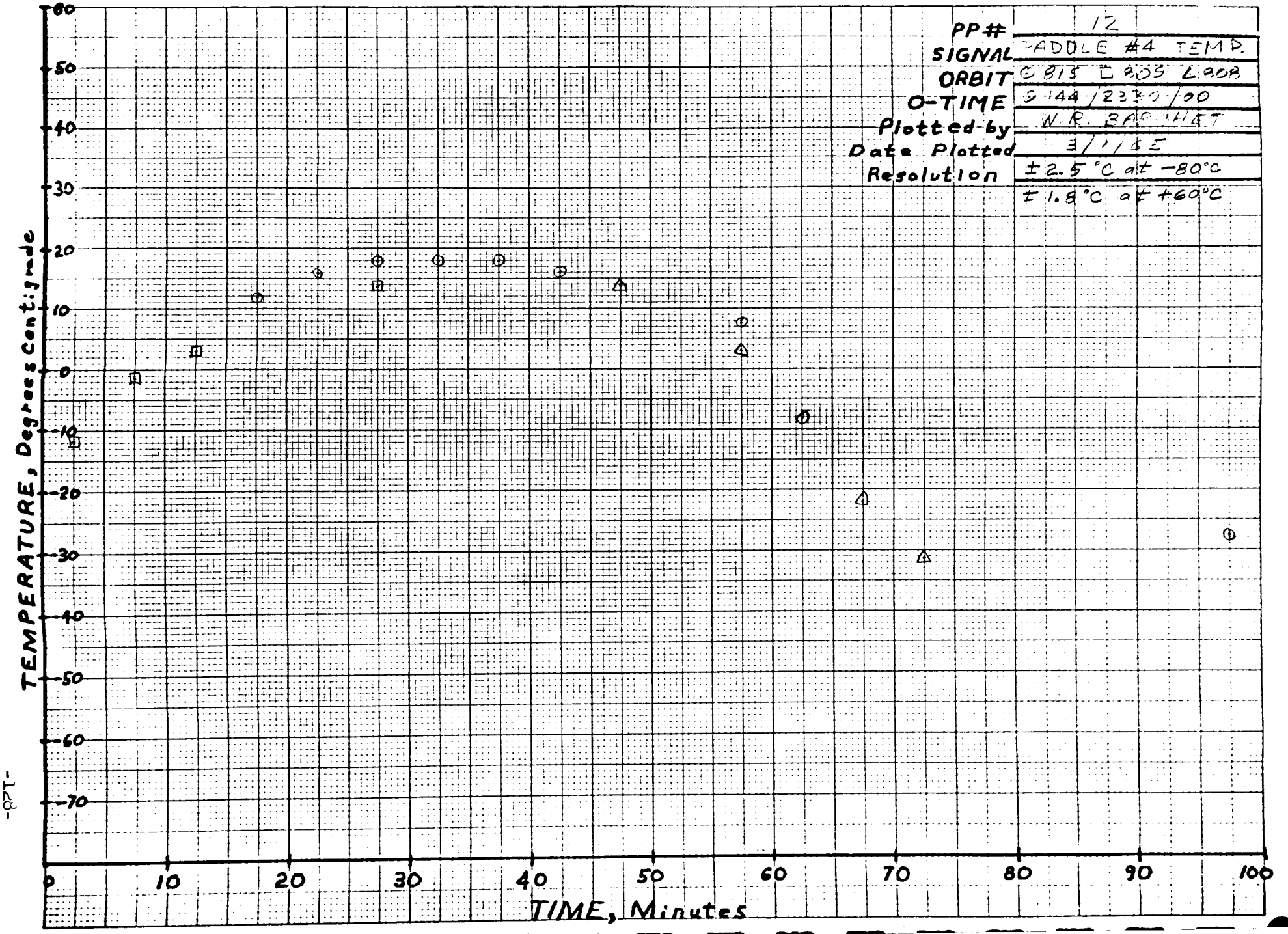
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



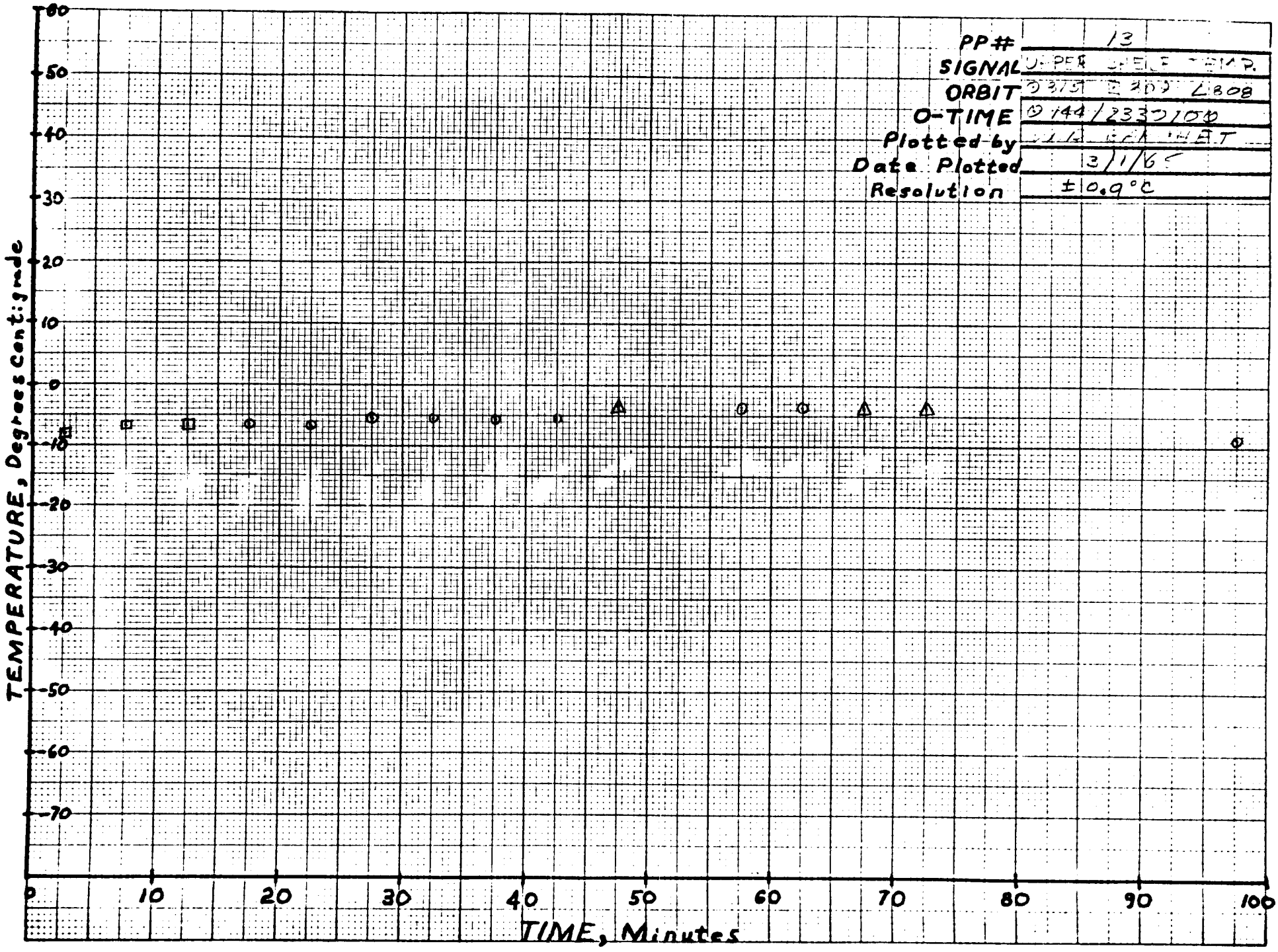
K&E 10 X 10 TO THE INCH 147
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



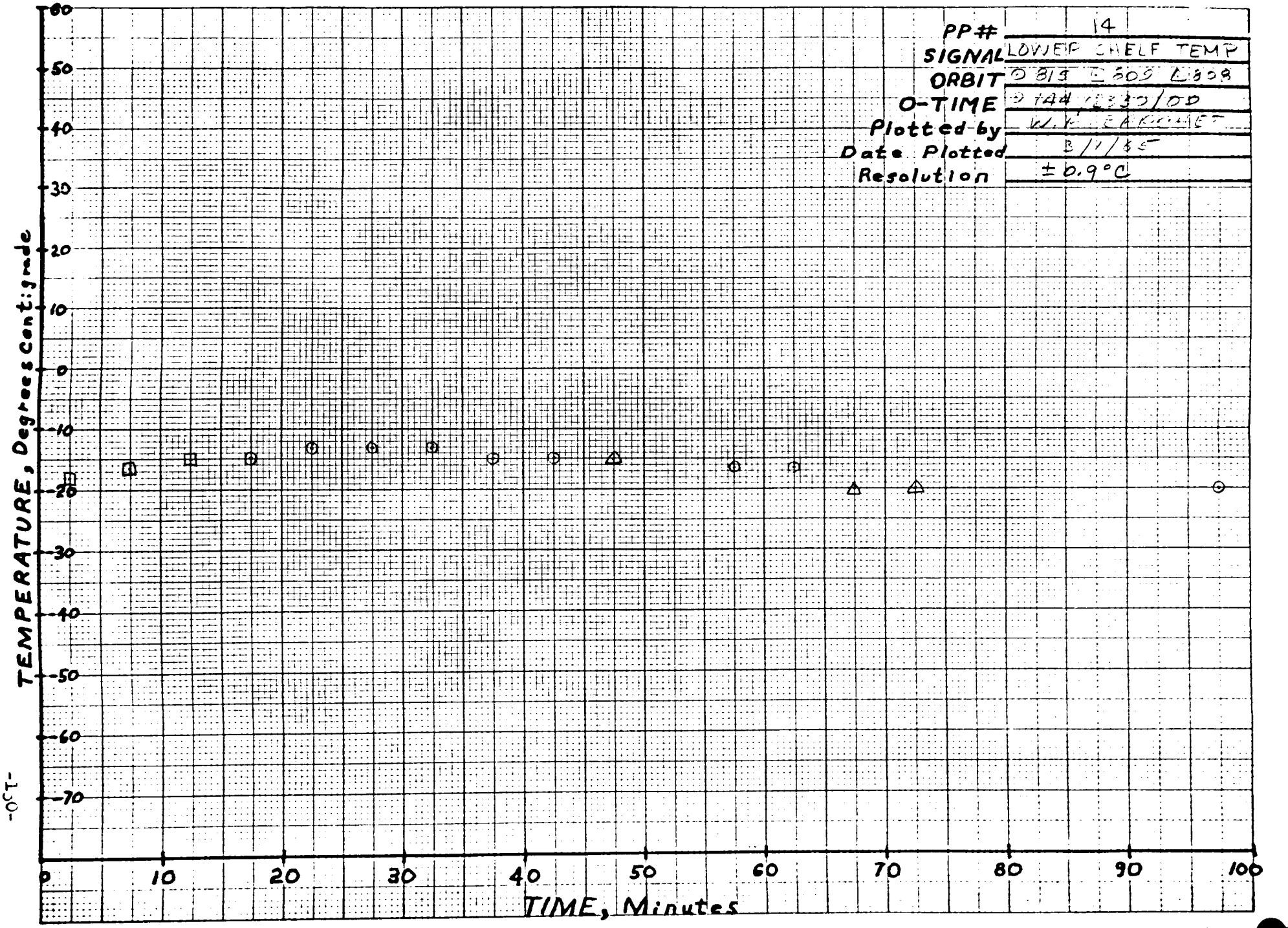
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



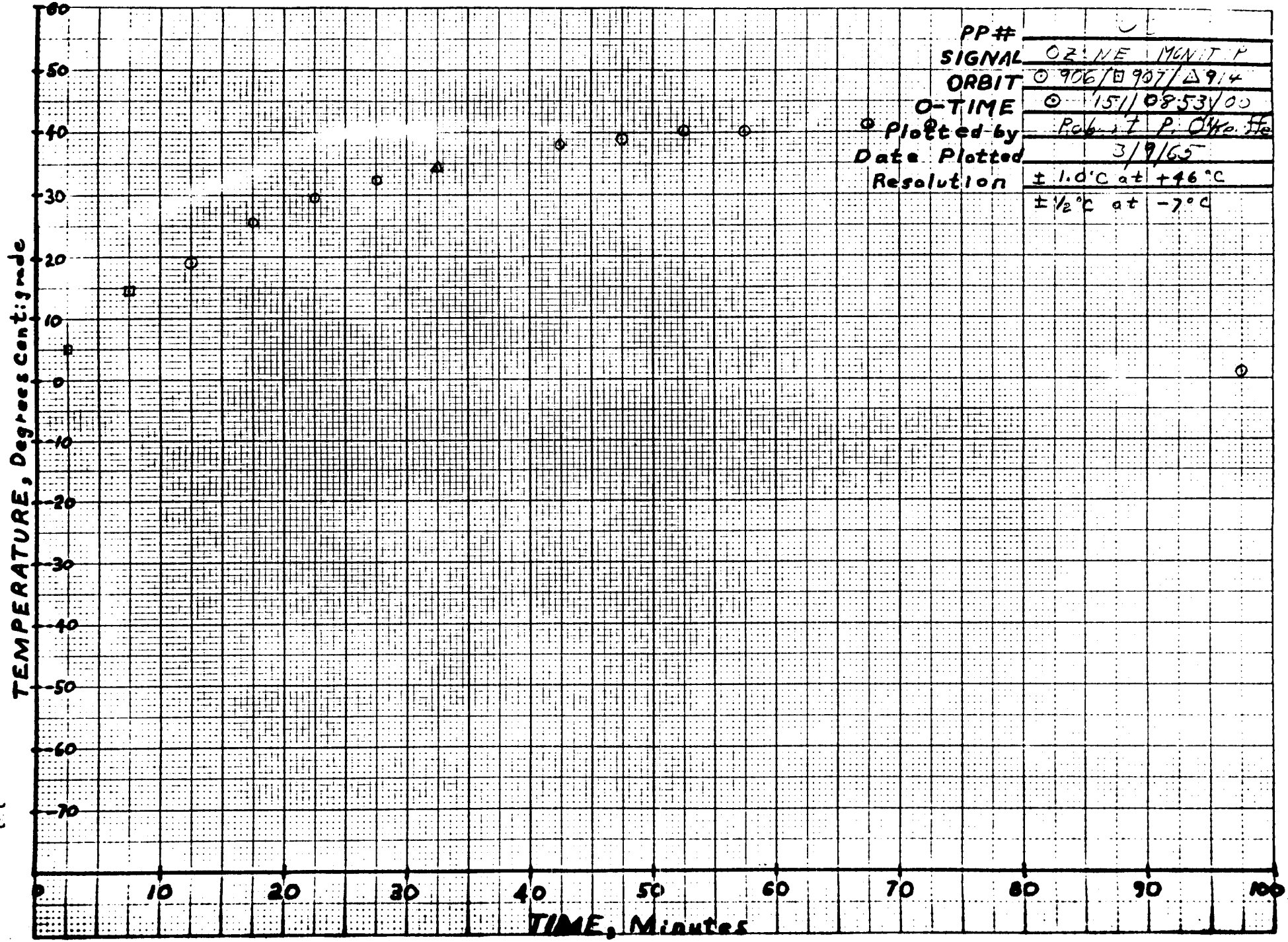
KEUFFEL & ESSER CO.



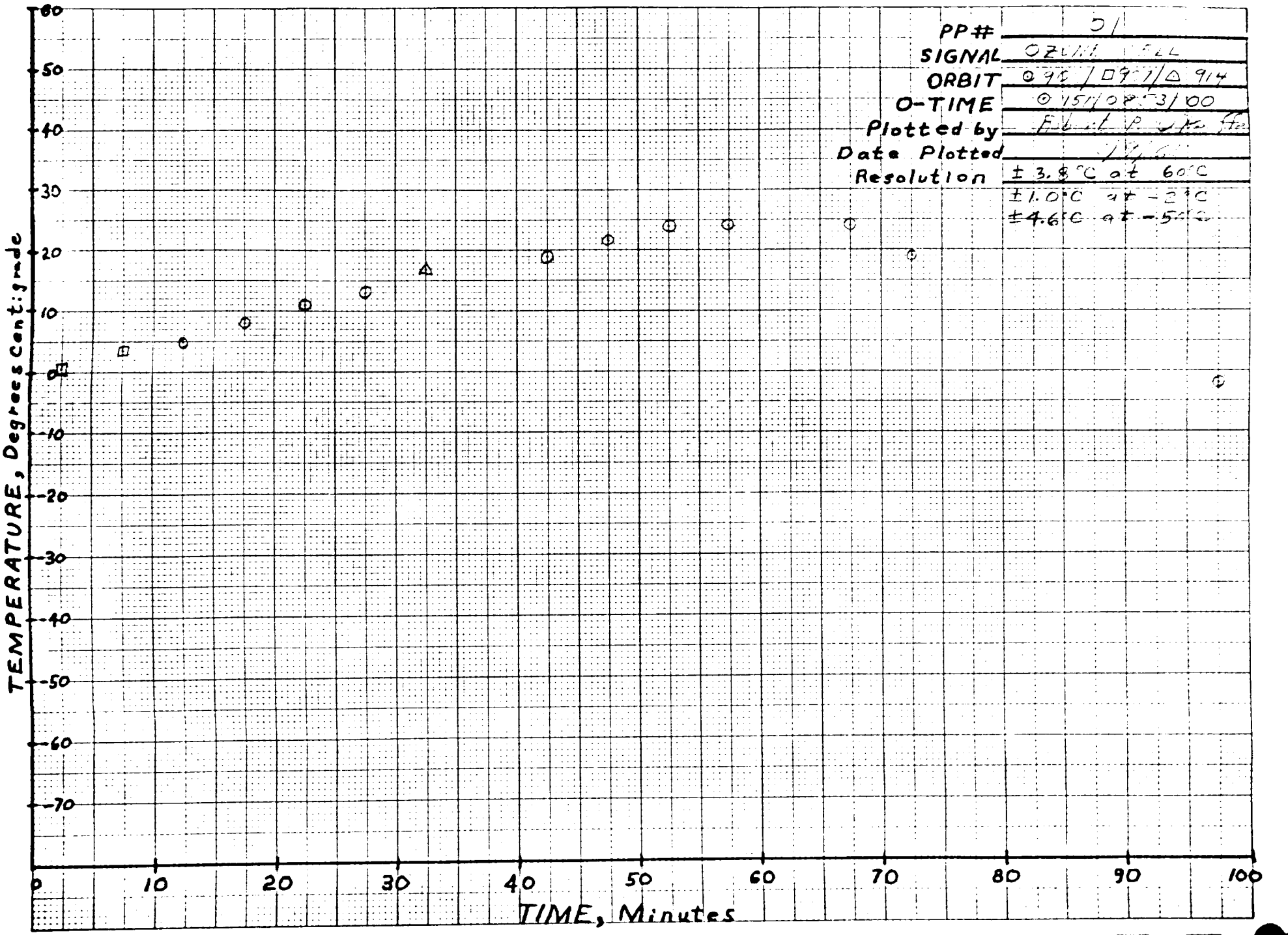
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



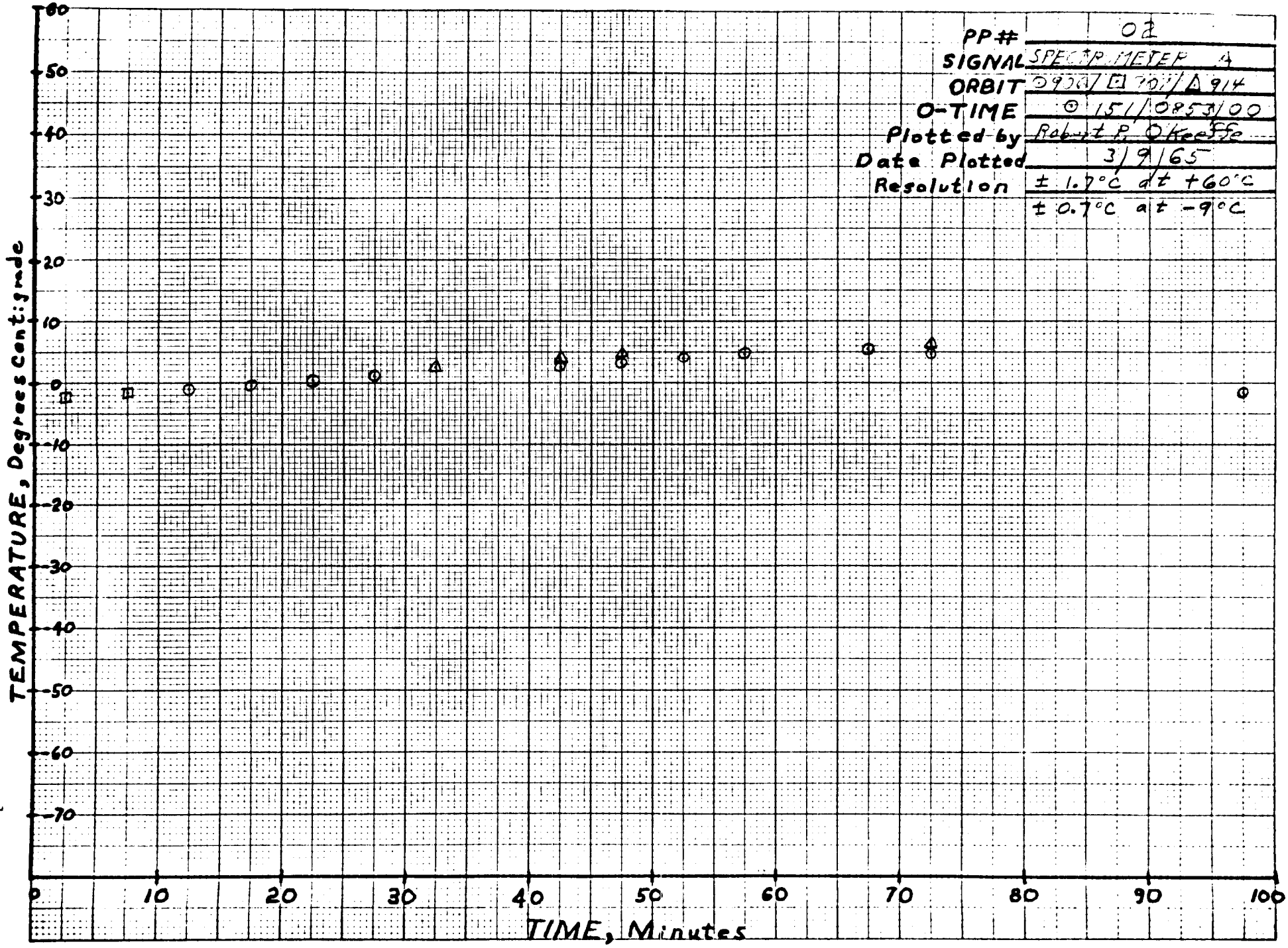
KEUFFEL & ESSER CO.



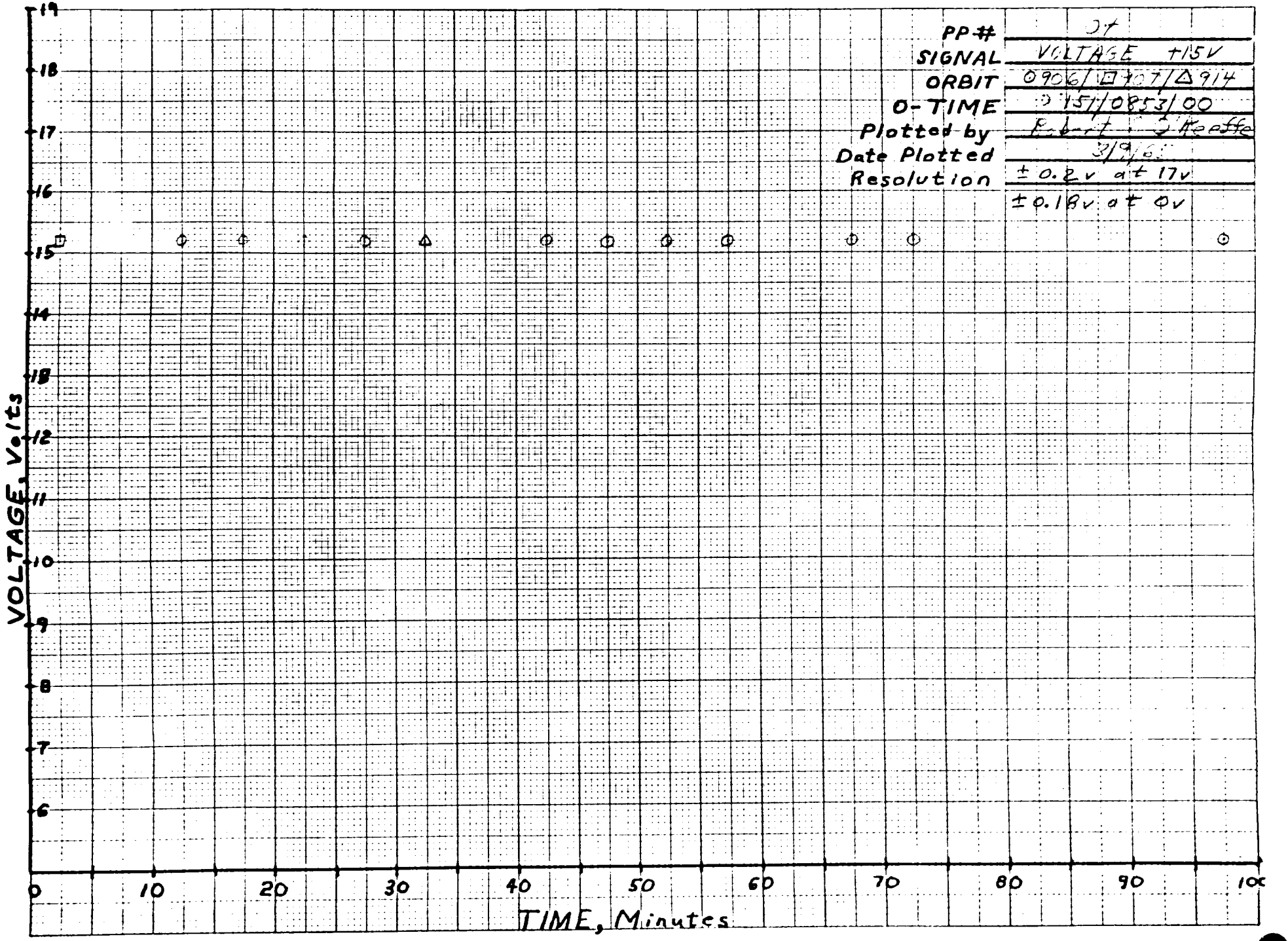
K&E 10 X 10 TO ½ INCH 46 1472
KEUFFEL & ESSER CO.



KEUFFEL & ESSER CO.



K&E 10 X 10 TO 1/2 INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



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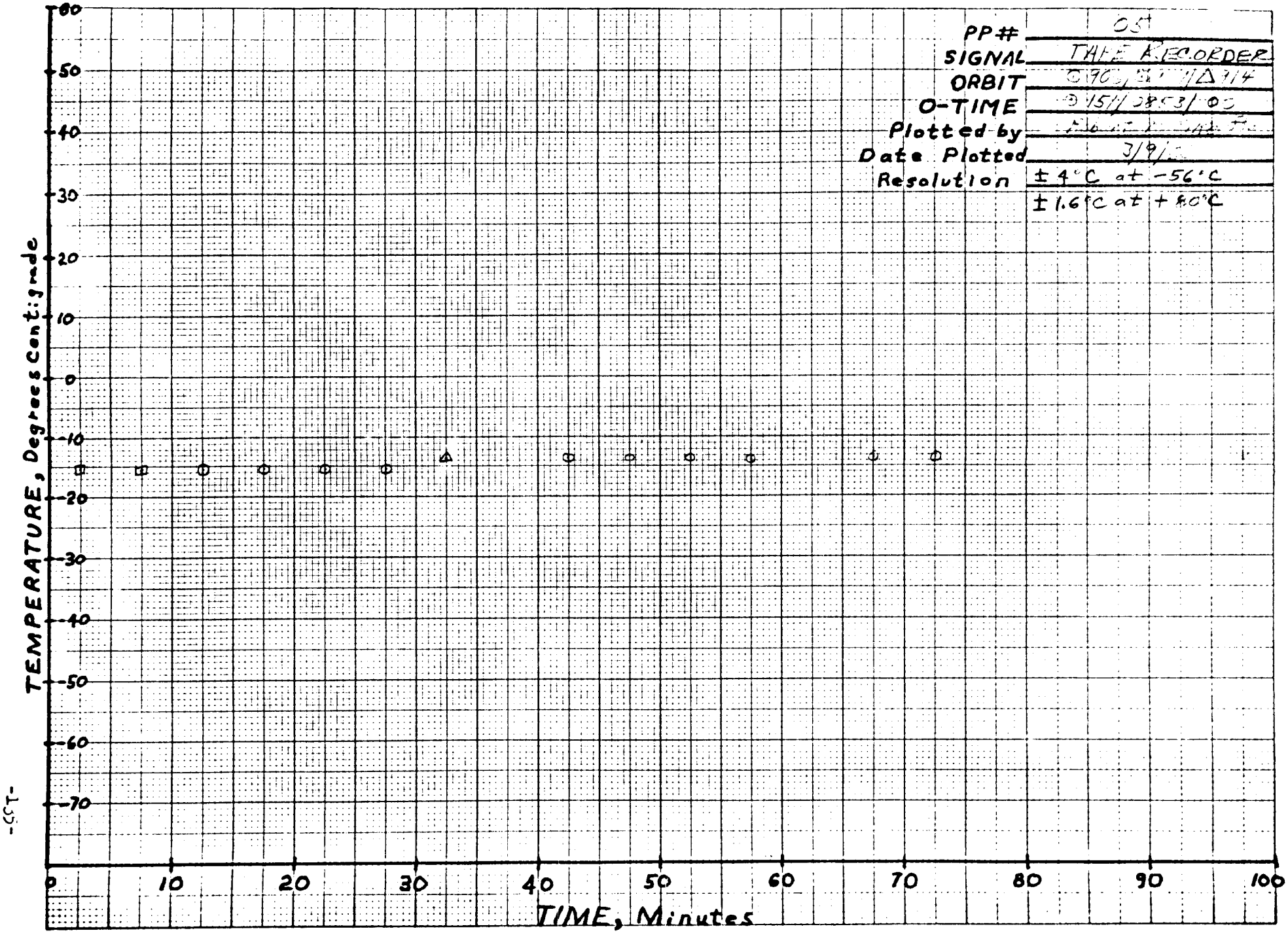
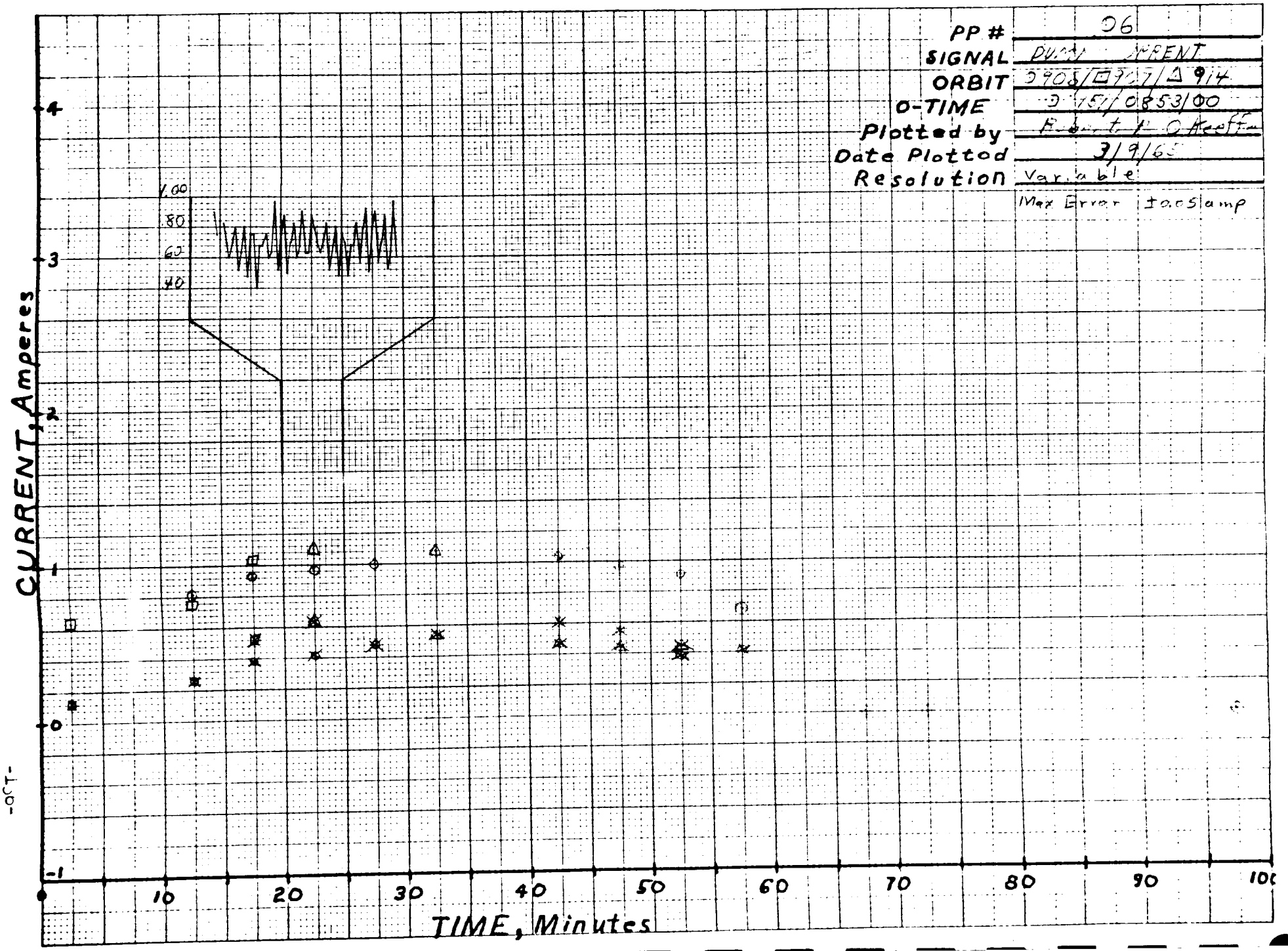


10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



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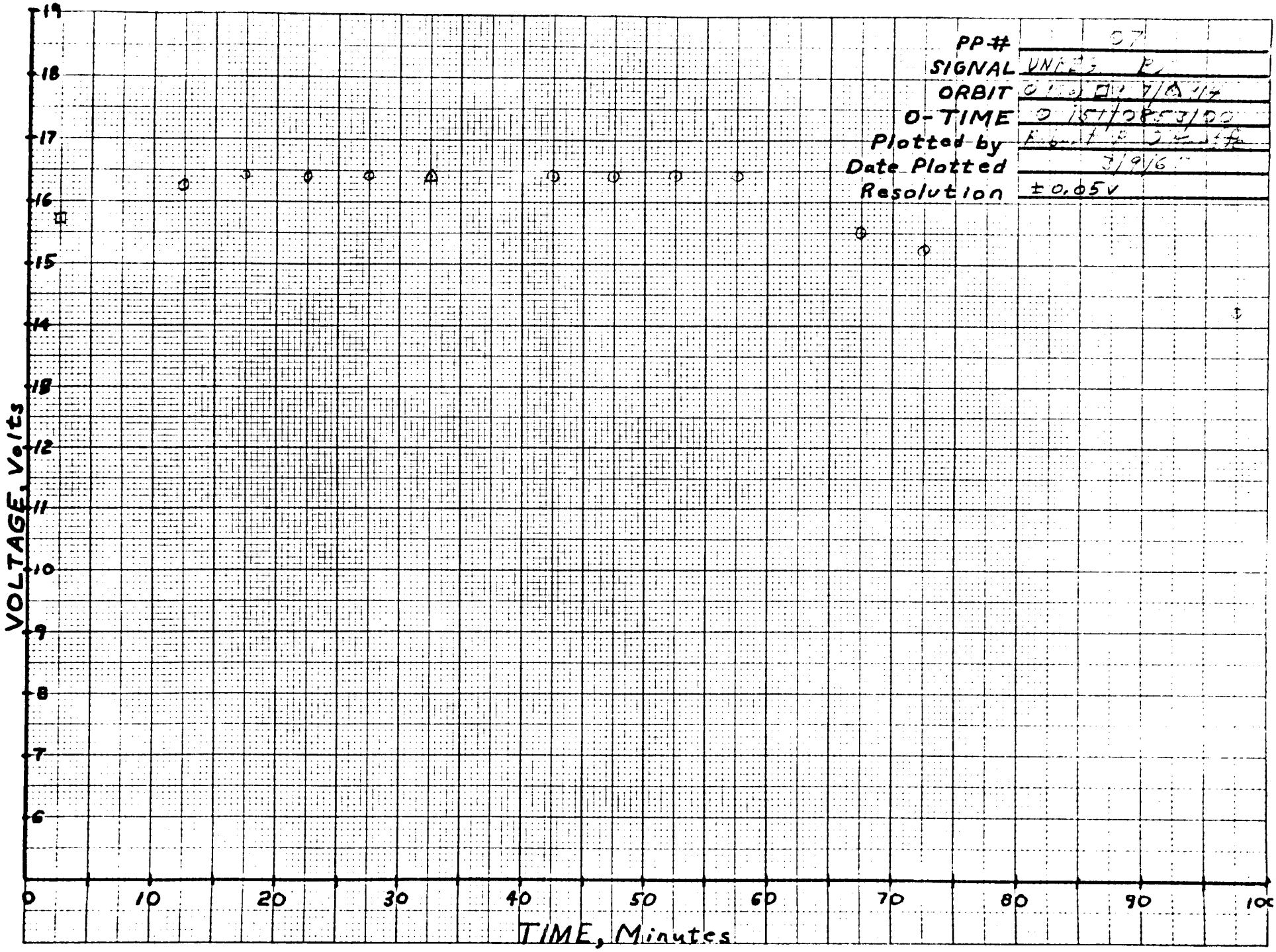
KEUFFEL & ESSER CO.



K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
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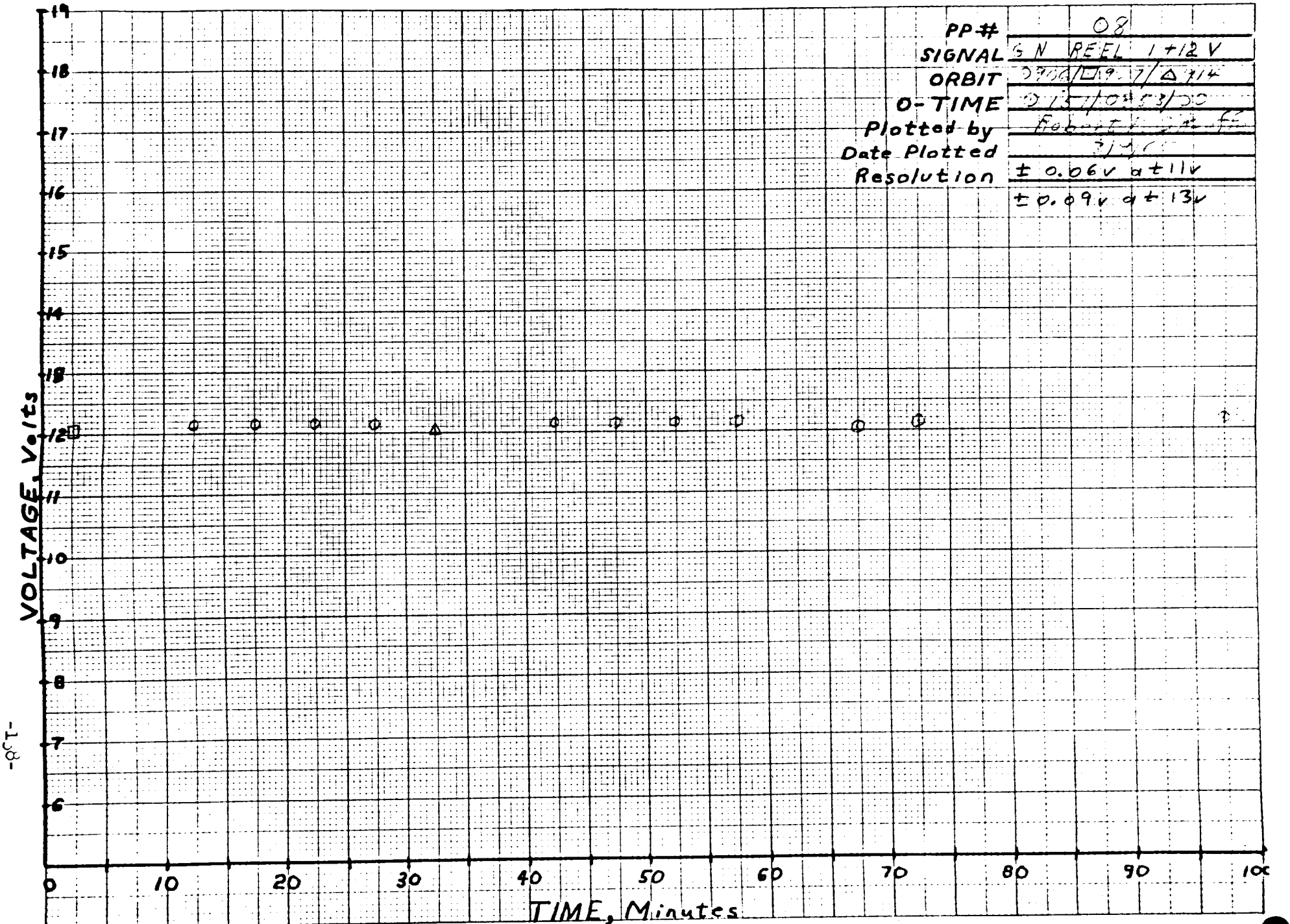

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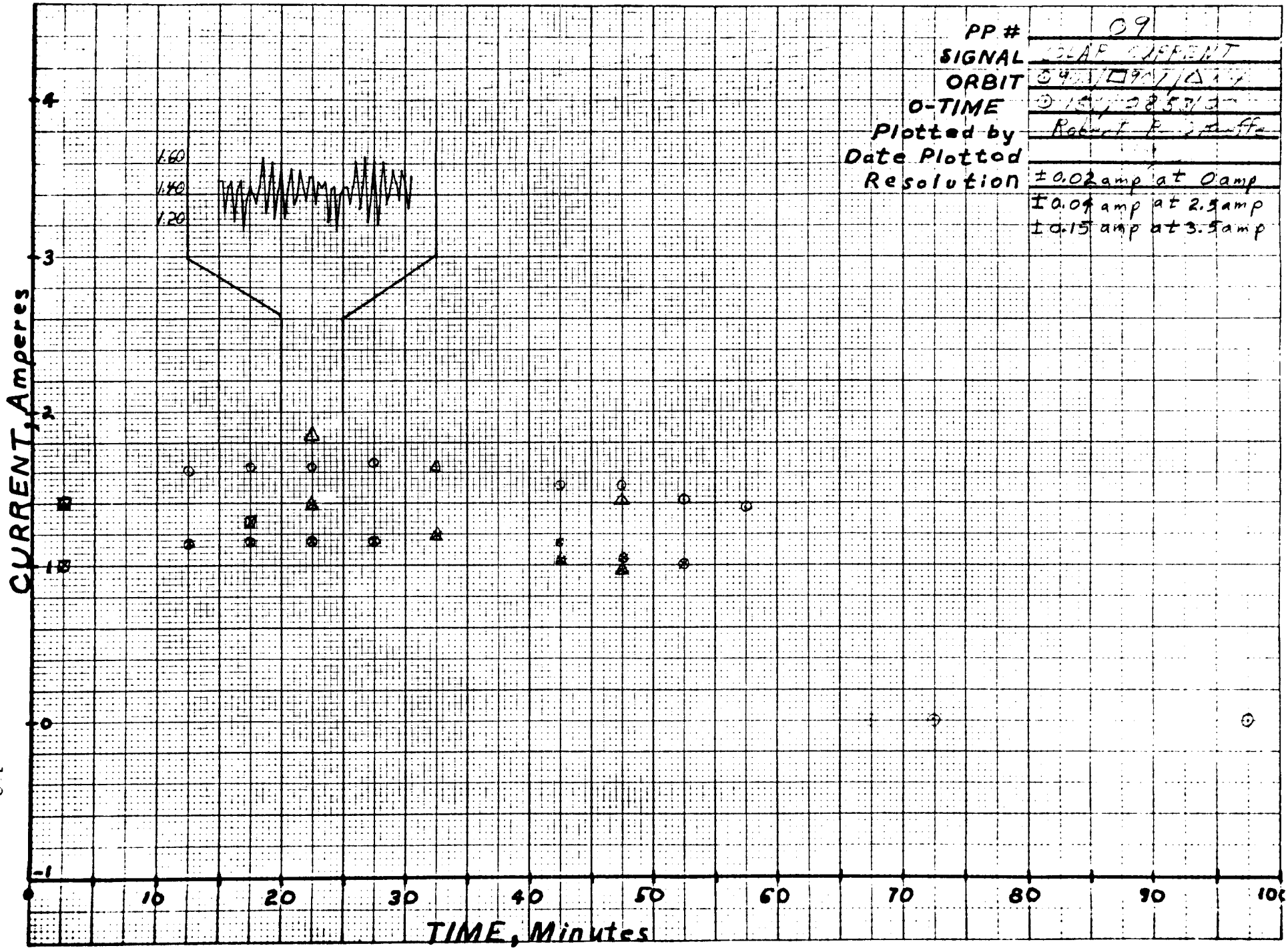
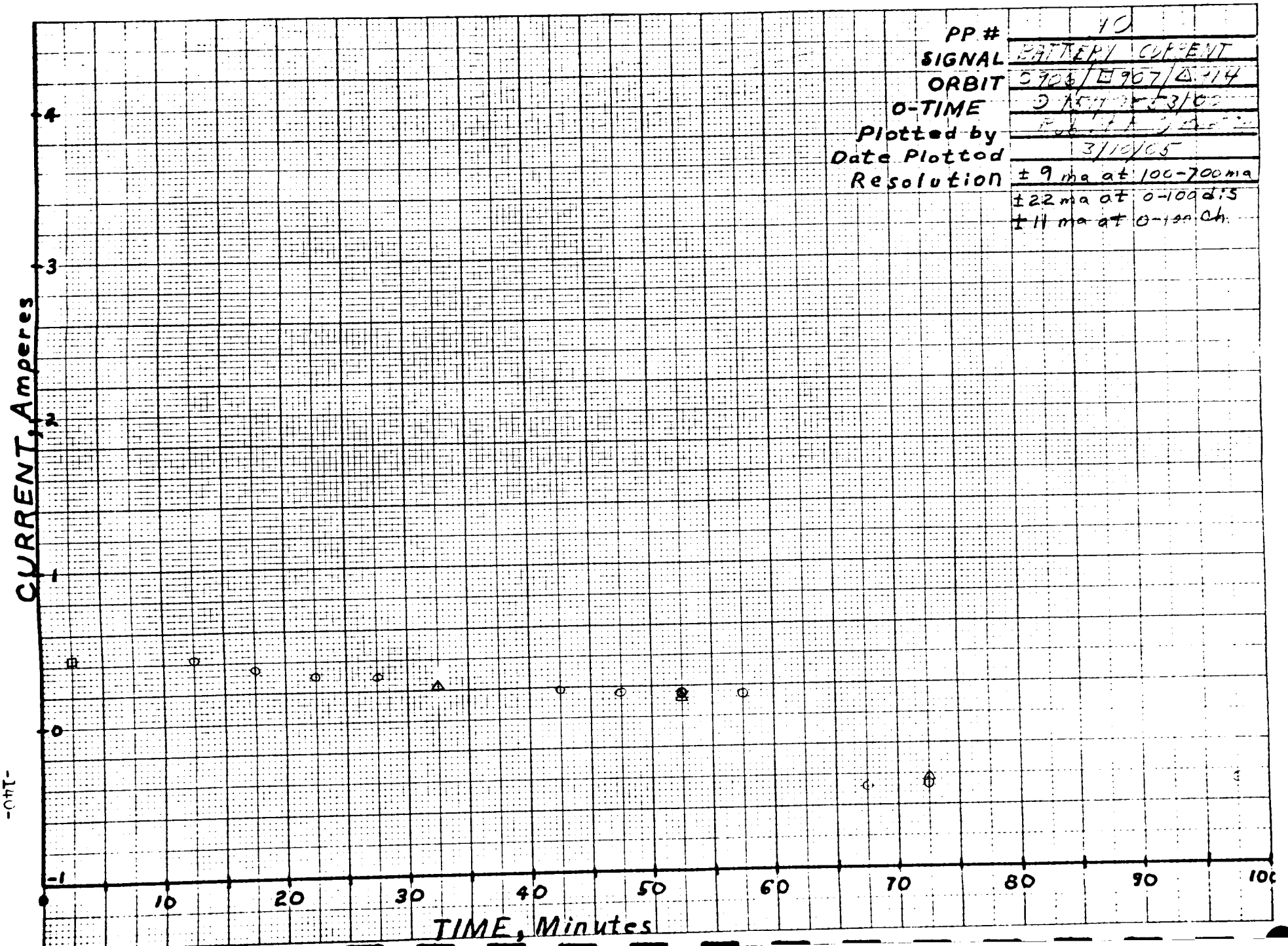


K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
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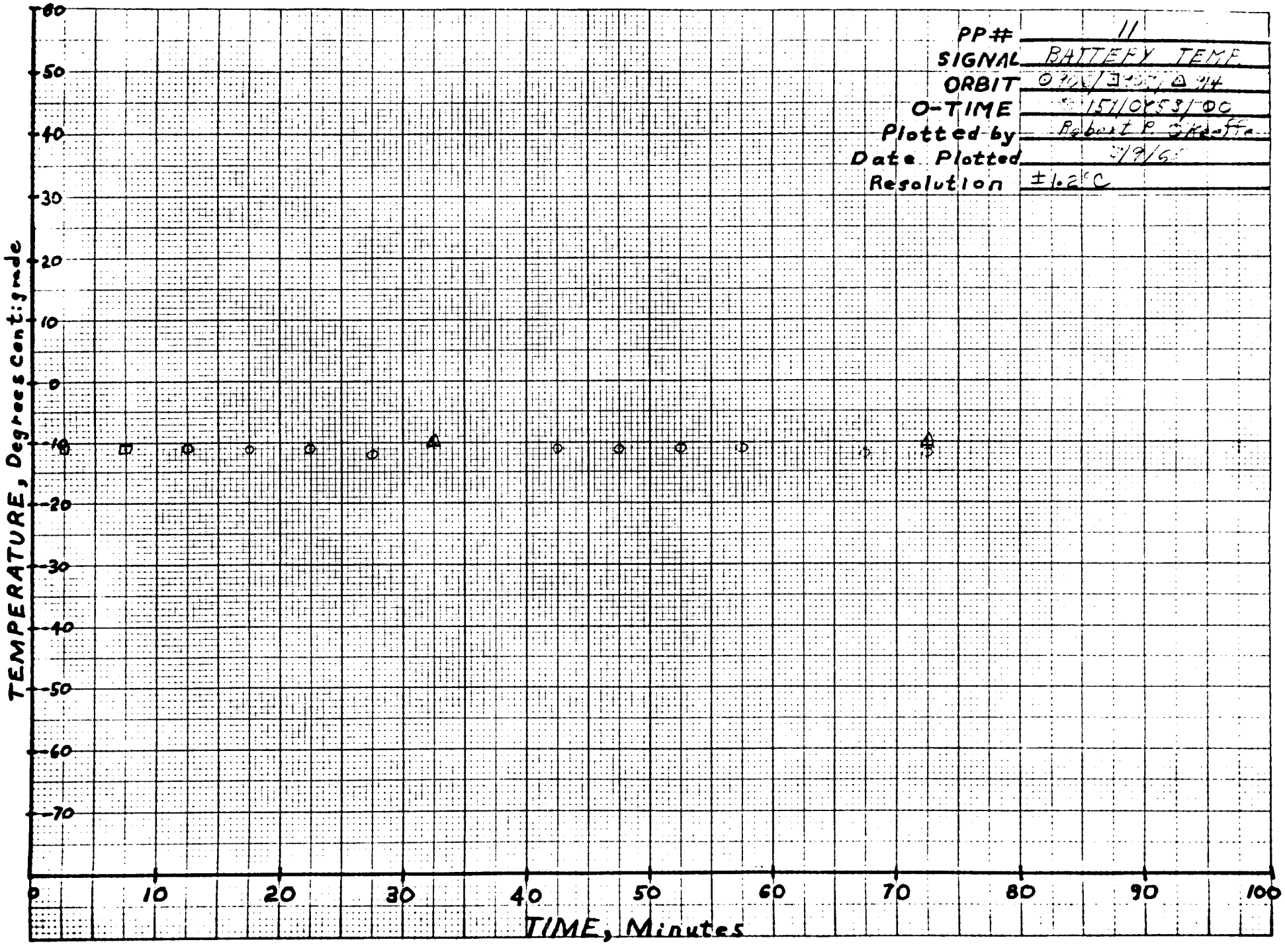

K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
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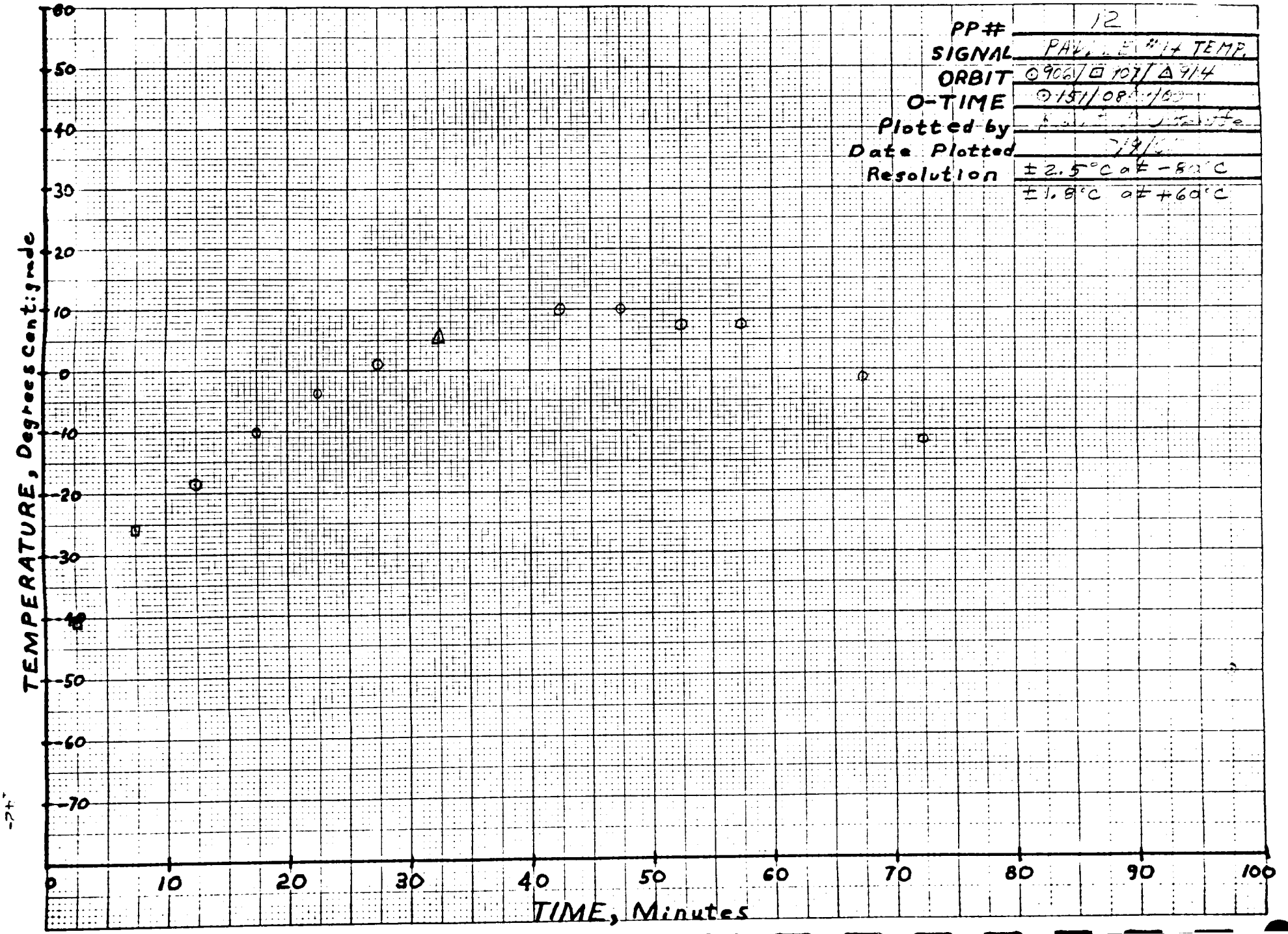

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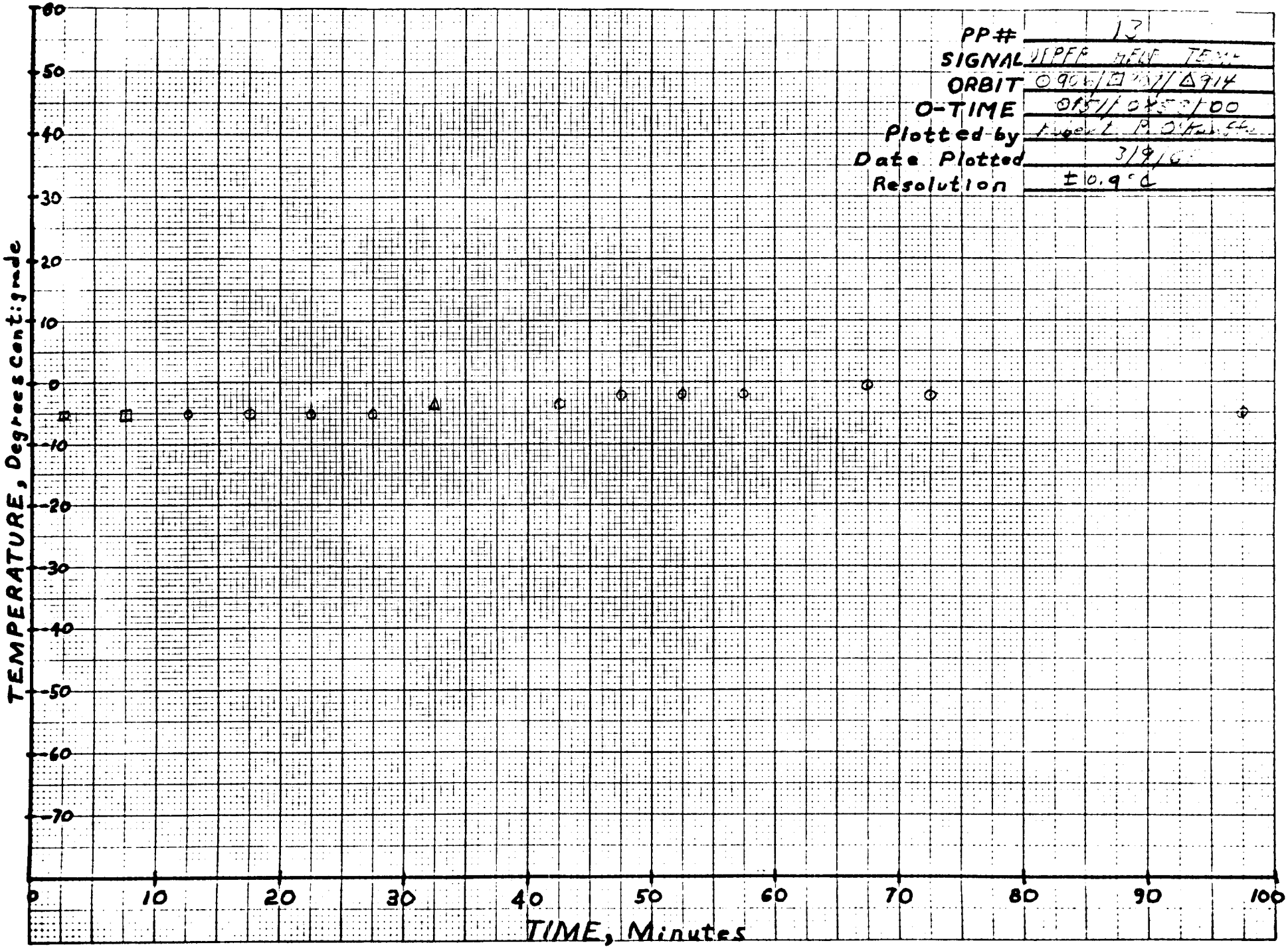
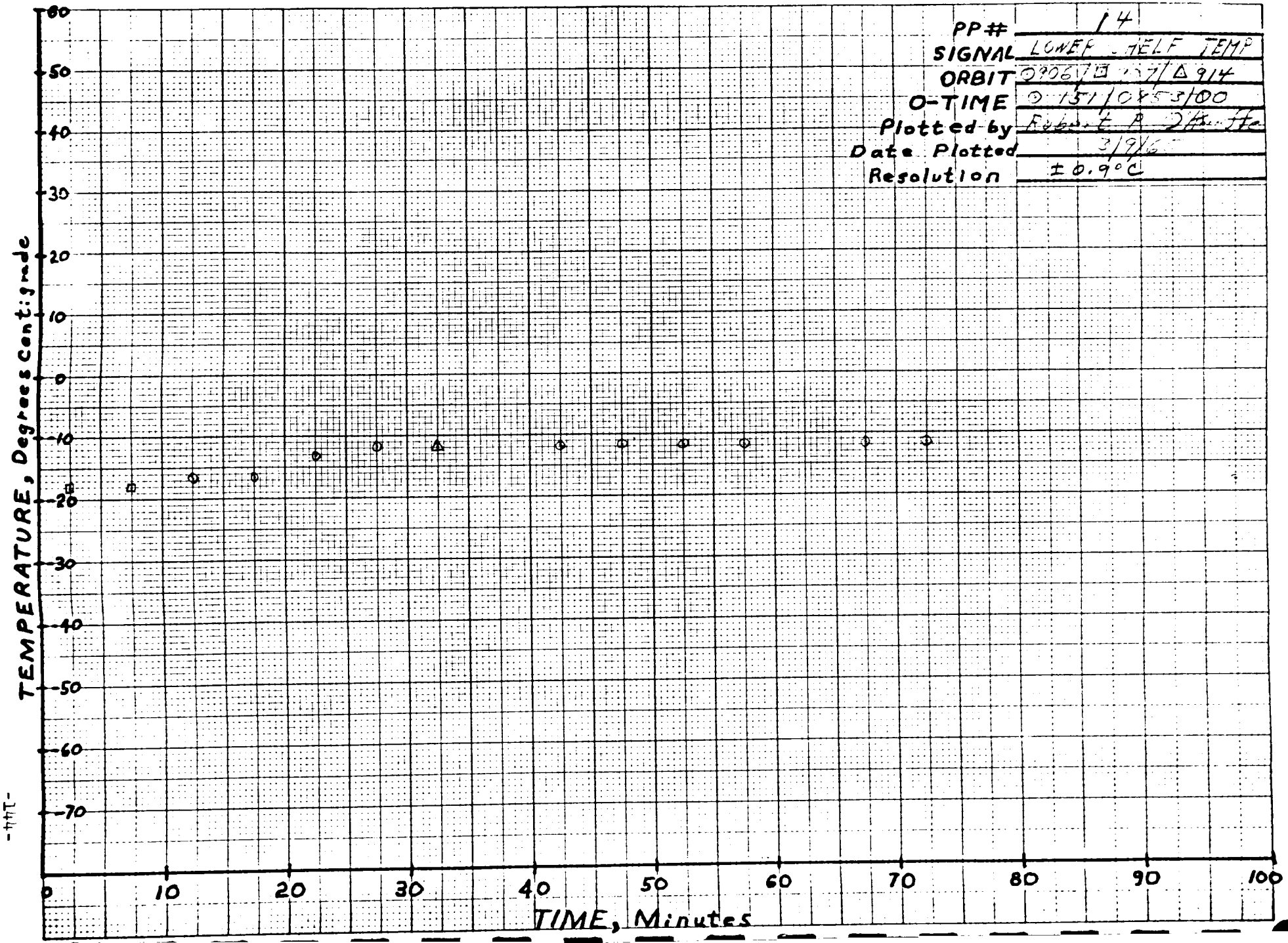


K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



K+E 10 X 10 TO ½ INCH 46 1472
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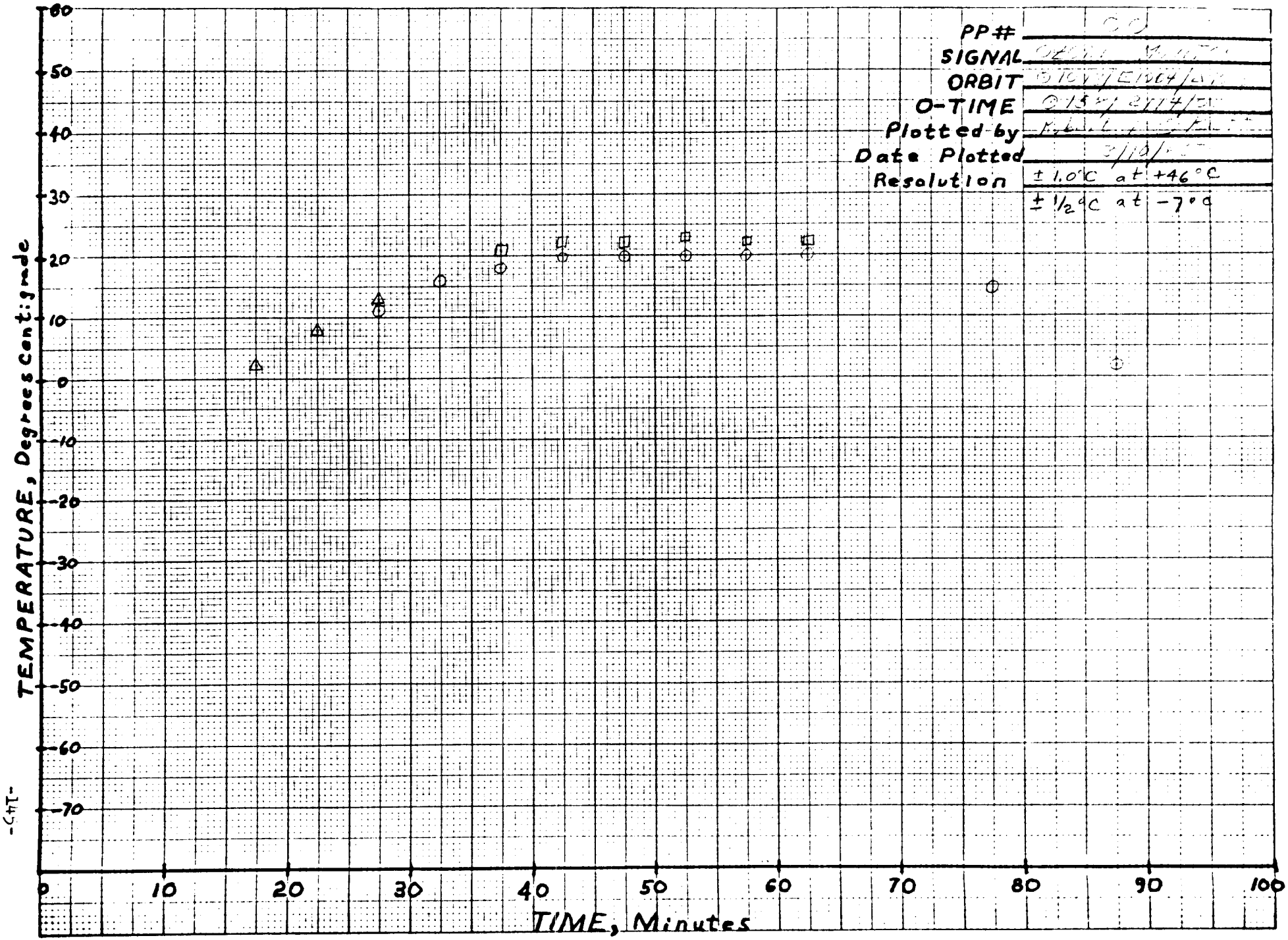
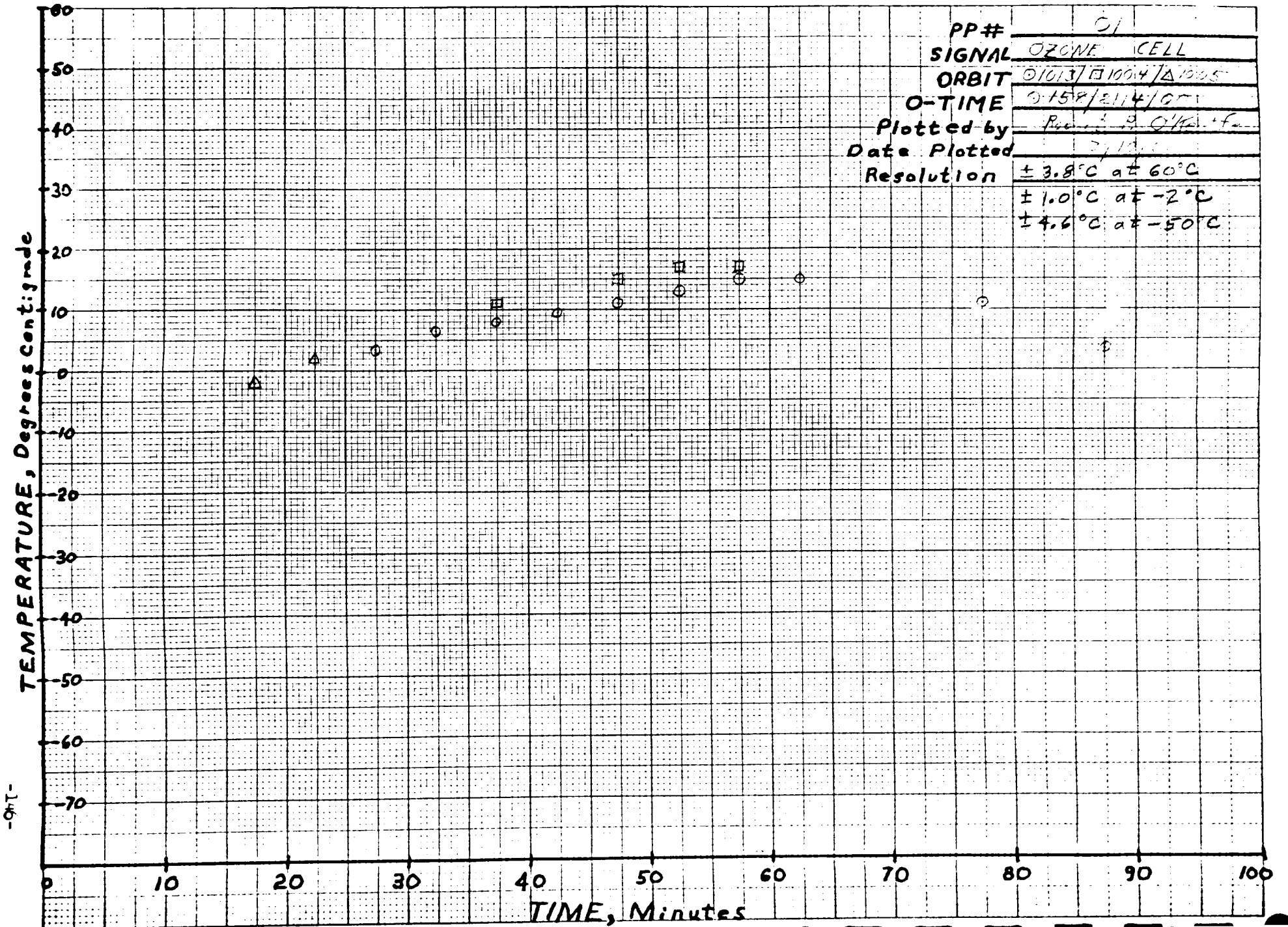
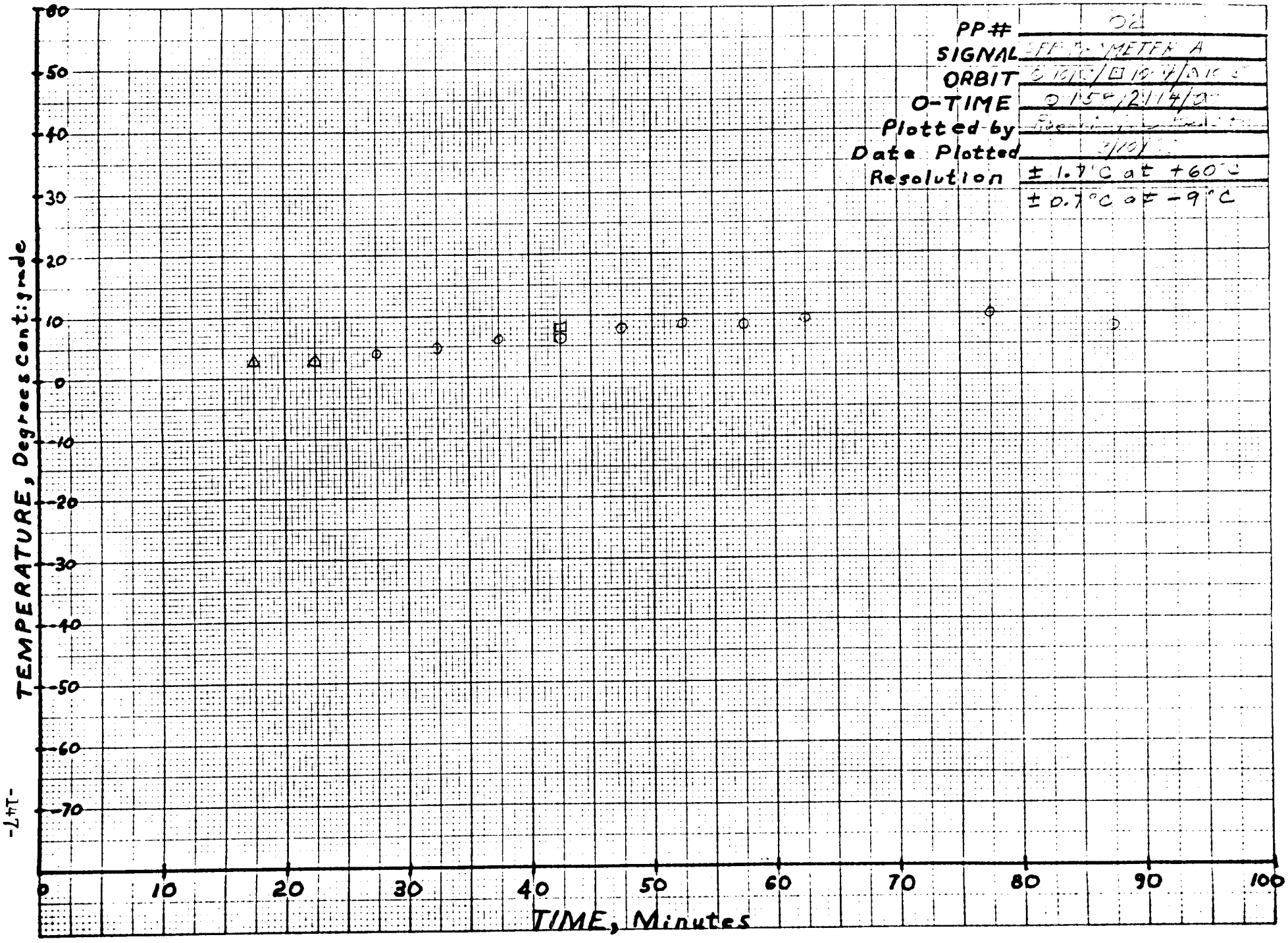


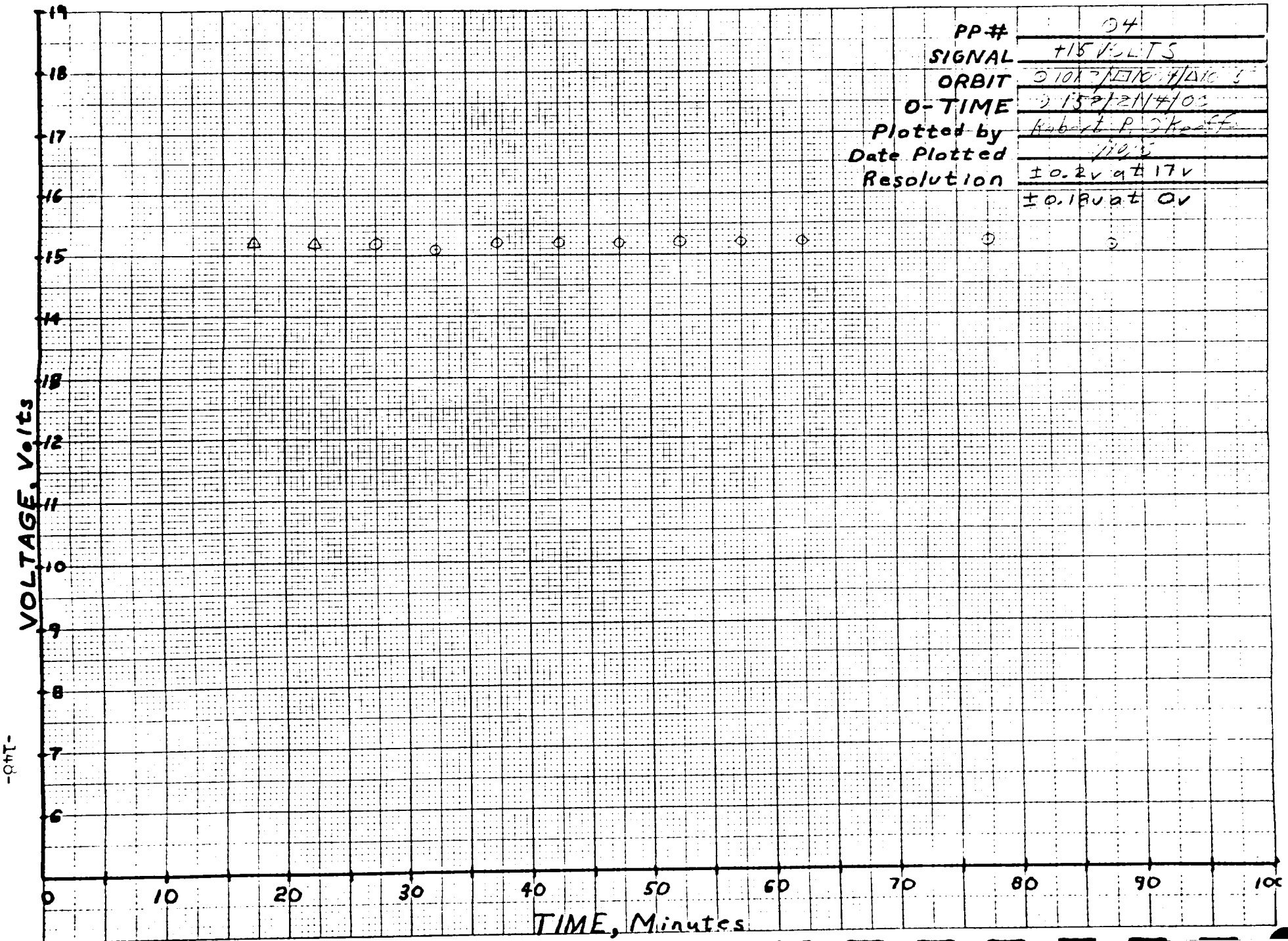
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



K&E X 10 NCH 147
7½ X 10 INCHES
KEUFFEL & ESSER CO.



K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



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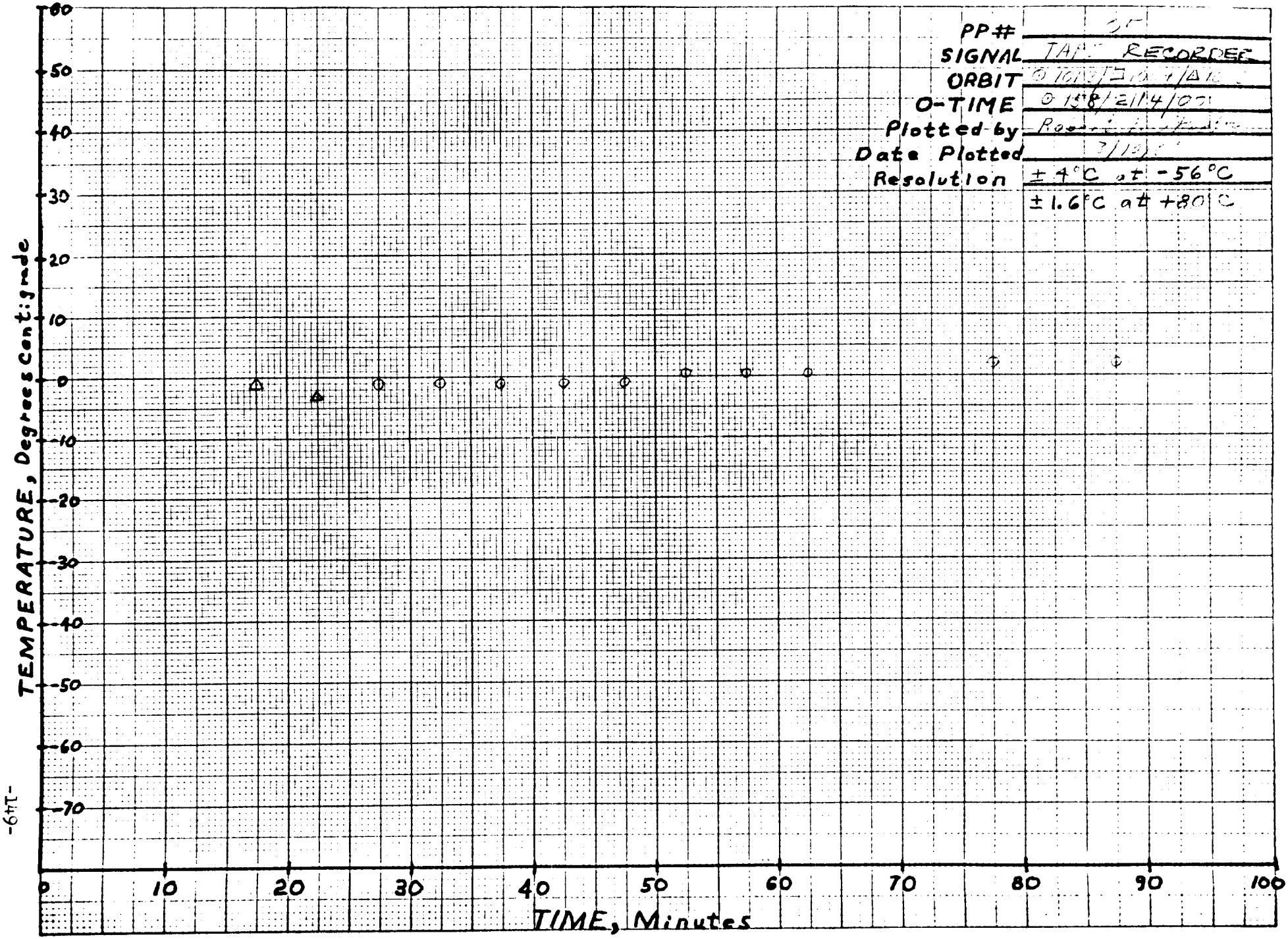

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7½ X 10 INCHES MADE IN U.S.A.
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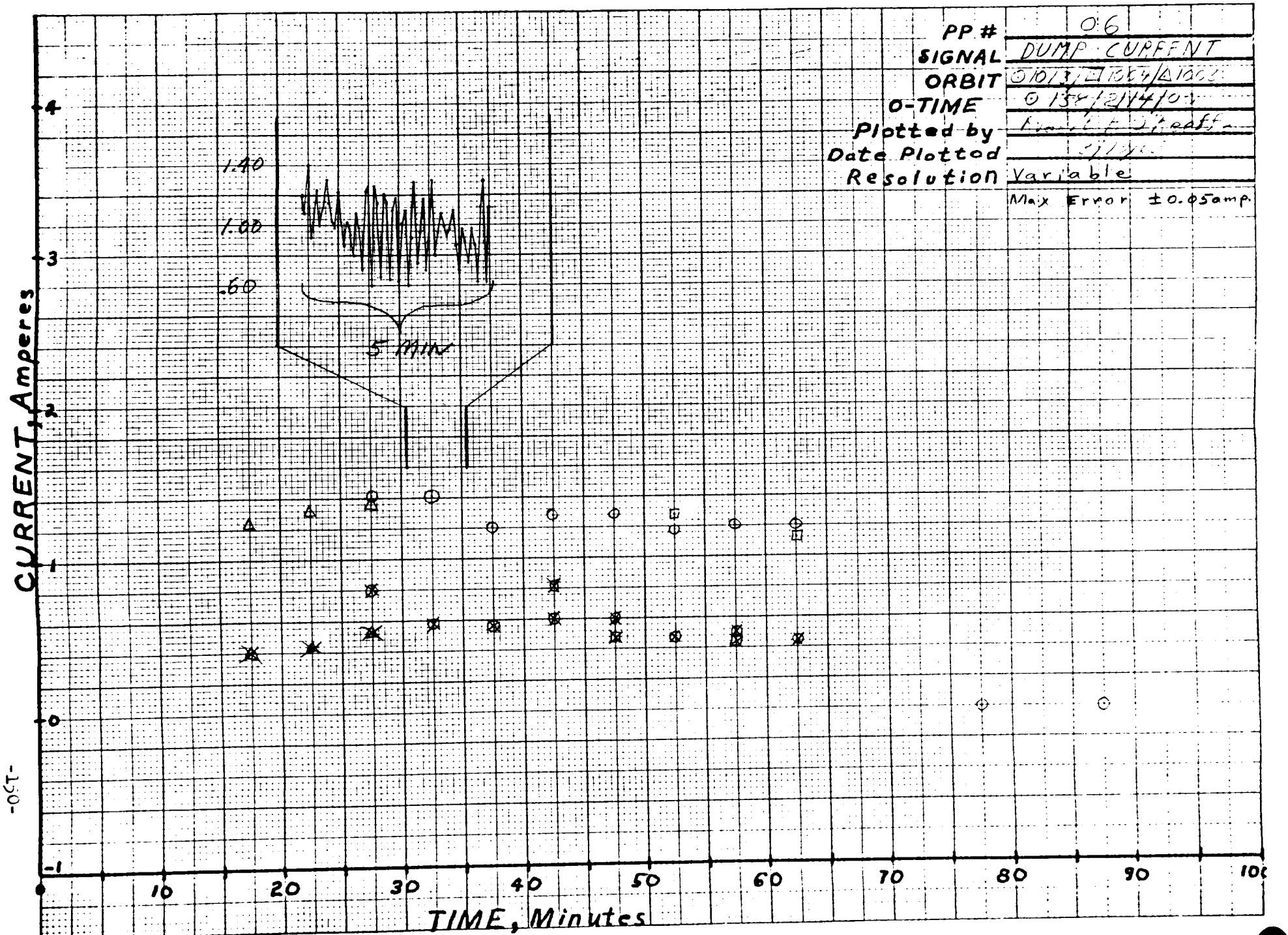

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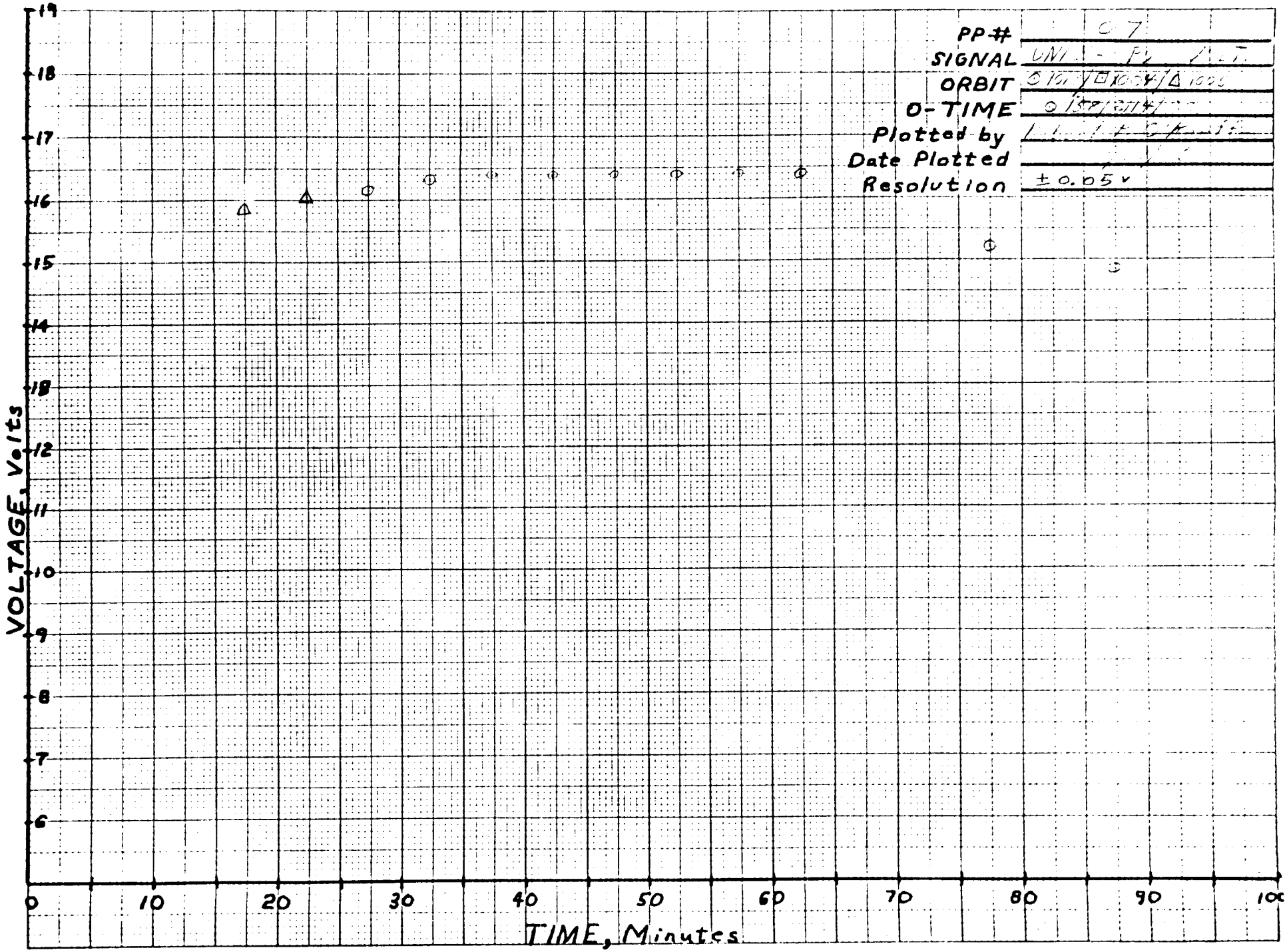
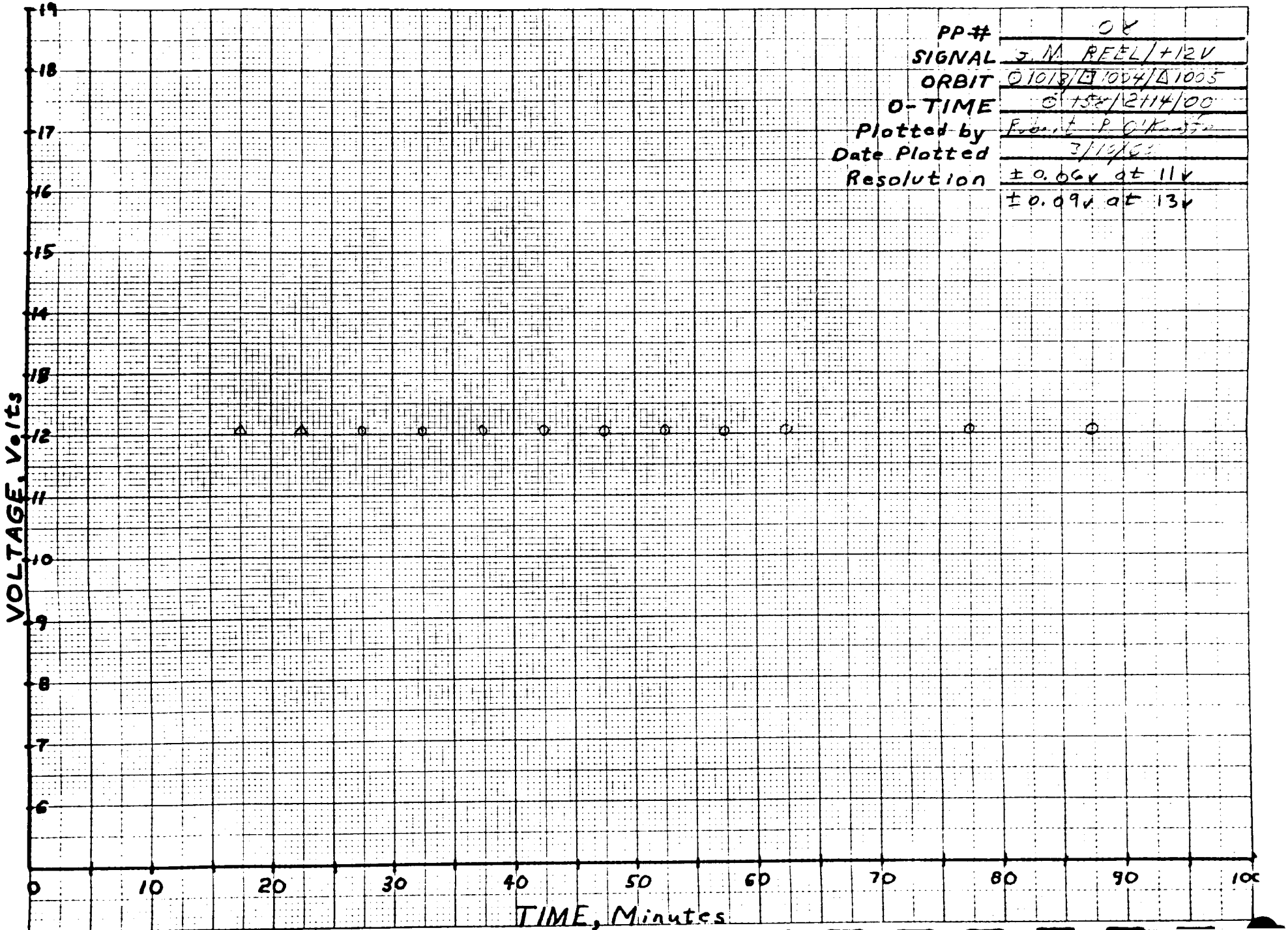
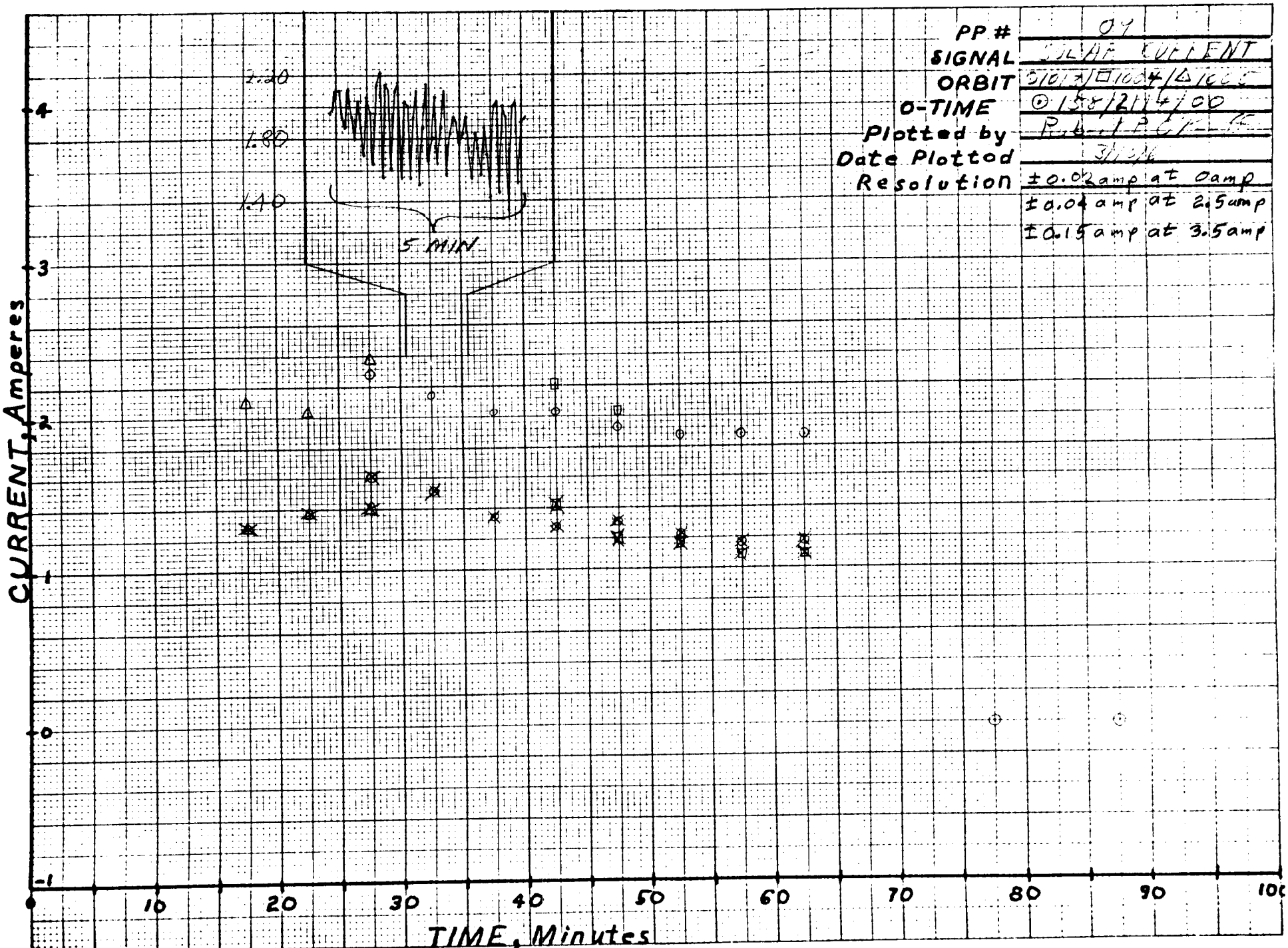


K+E 10 X 10 10 1/2 INCH 46 1472
7 1/2 X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
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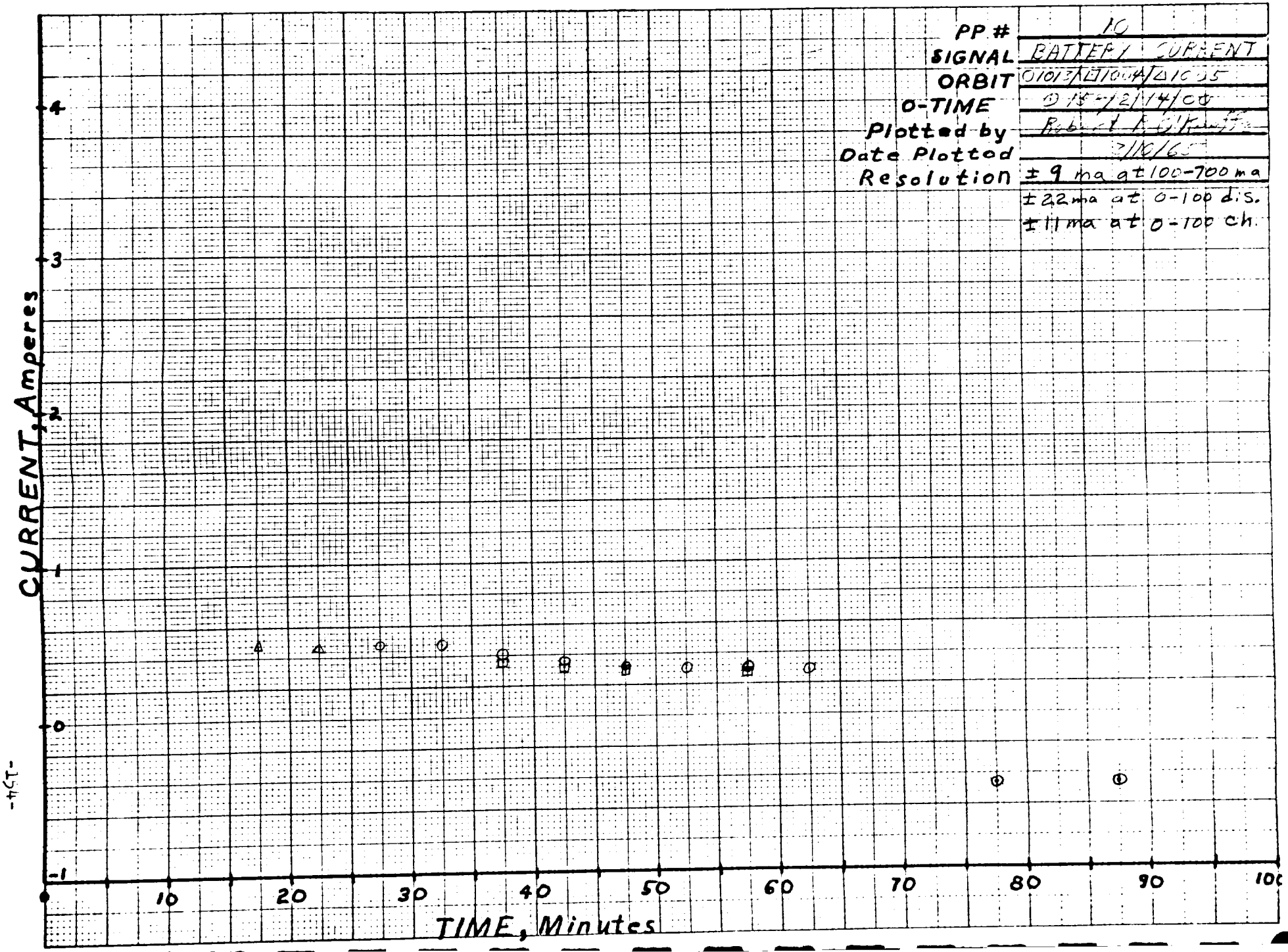

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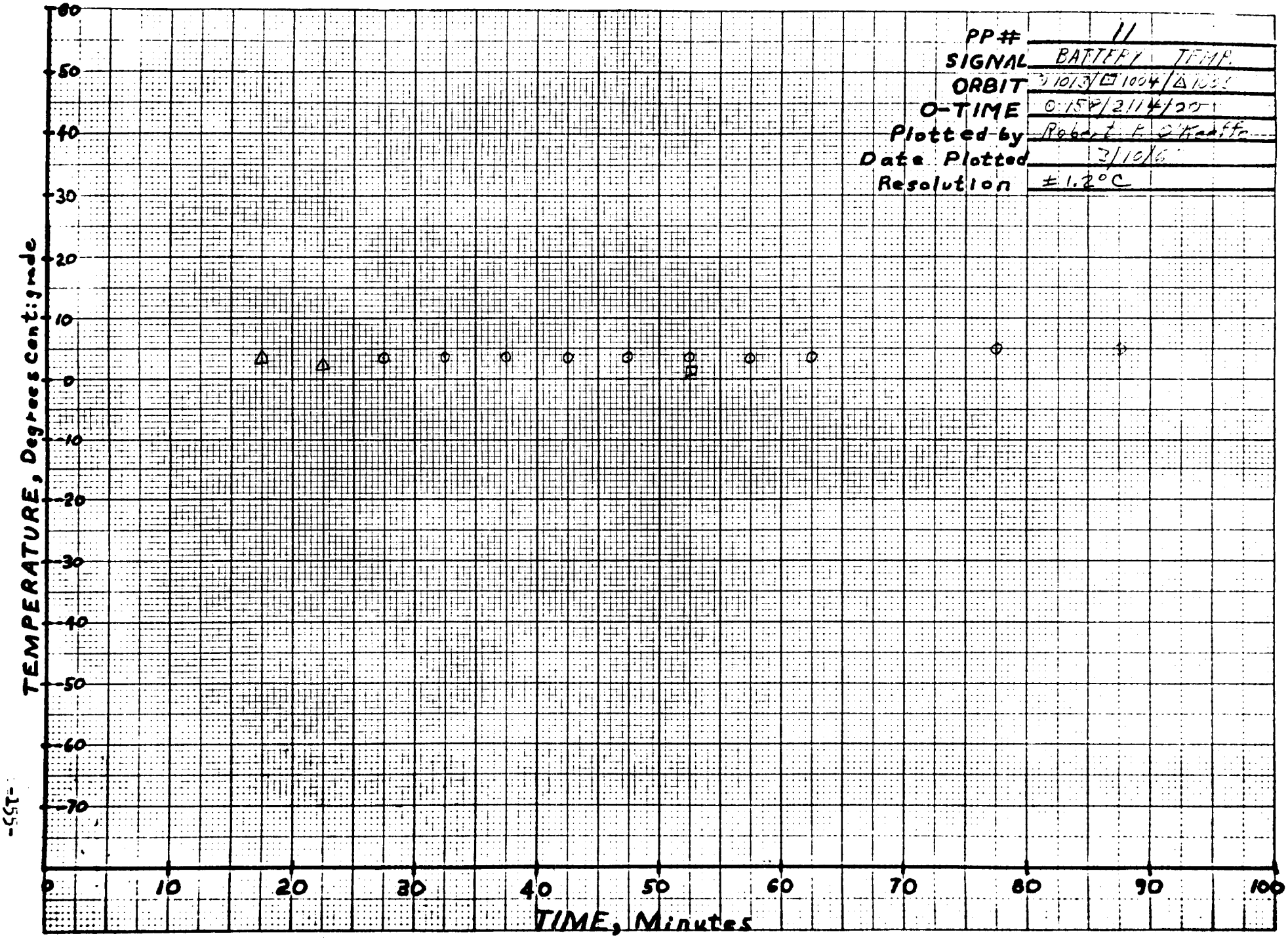
KEUFFEL & ESSER CO.



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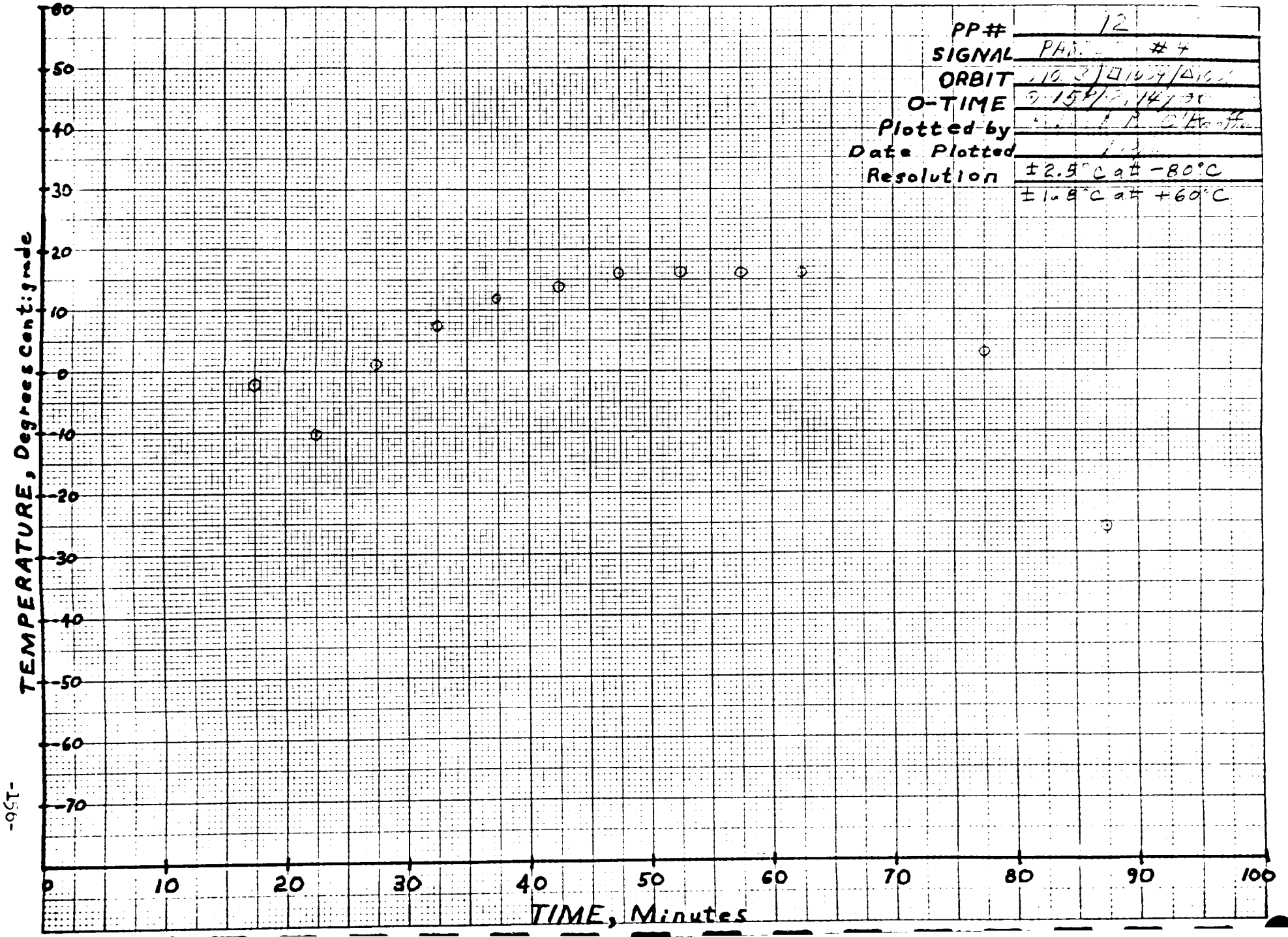

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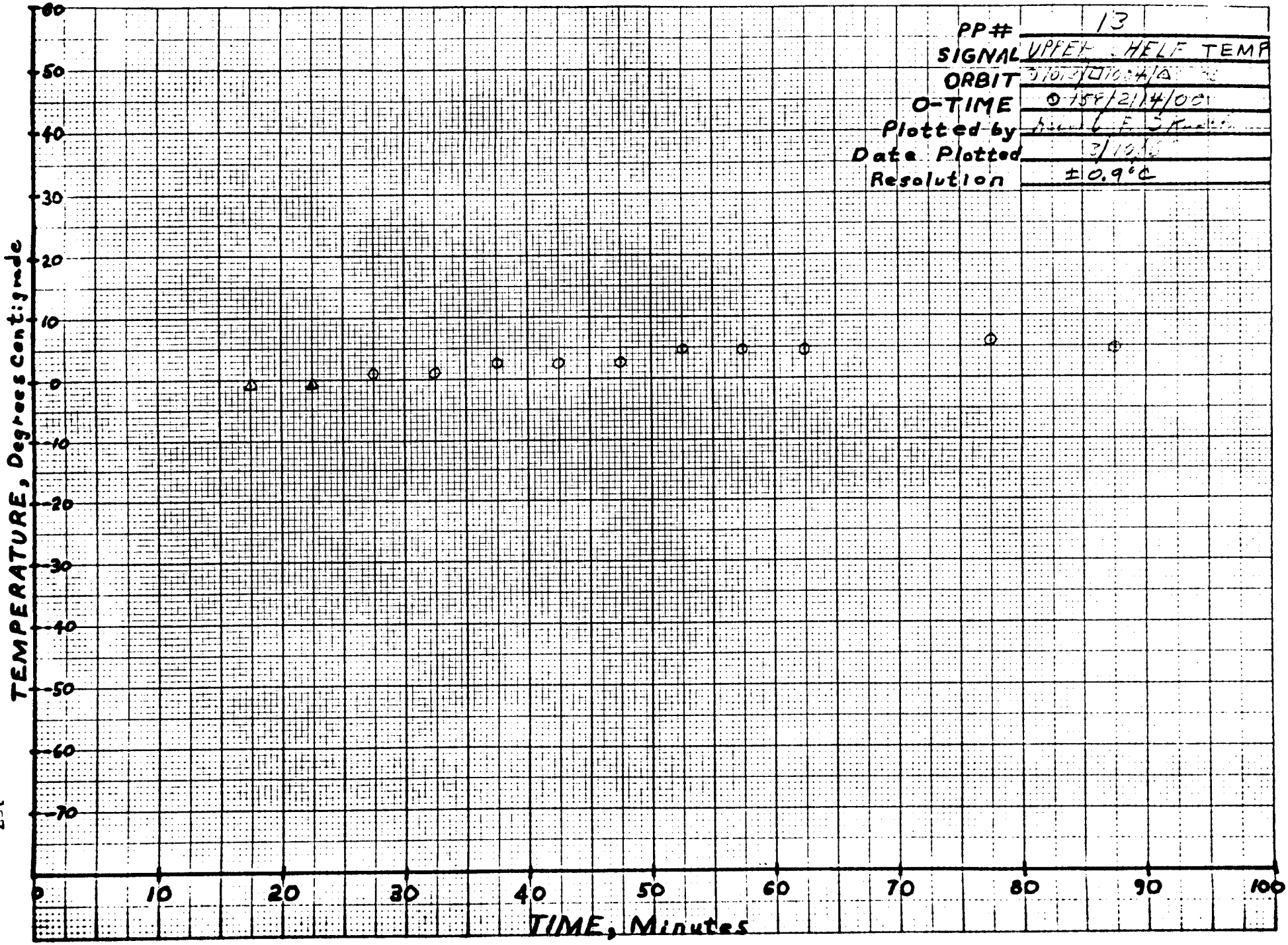
KEUFFEL & ESSER CO.



K&E 10 X 10 TO ½ INCH 46 1472
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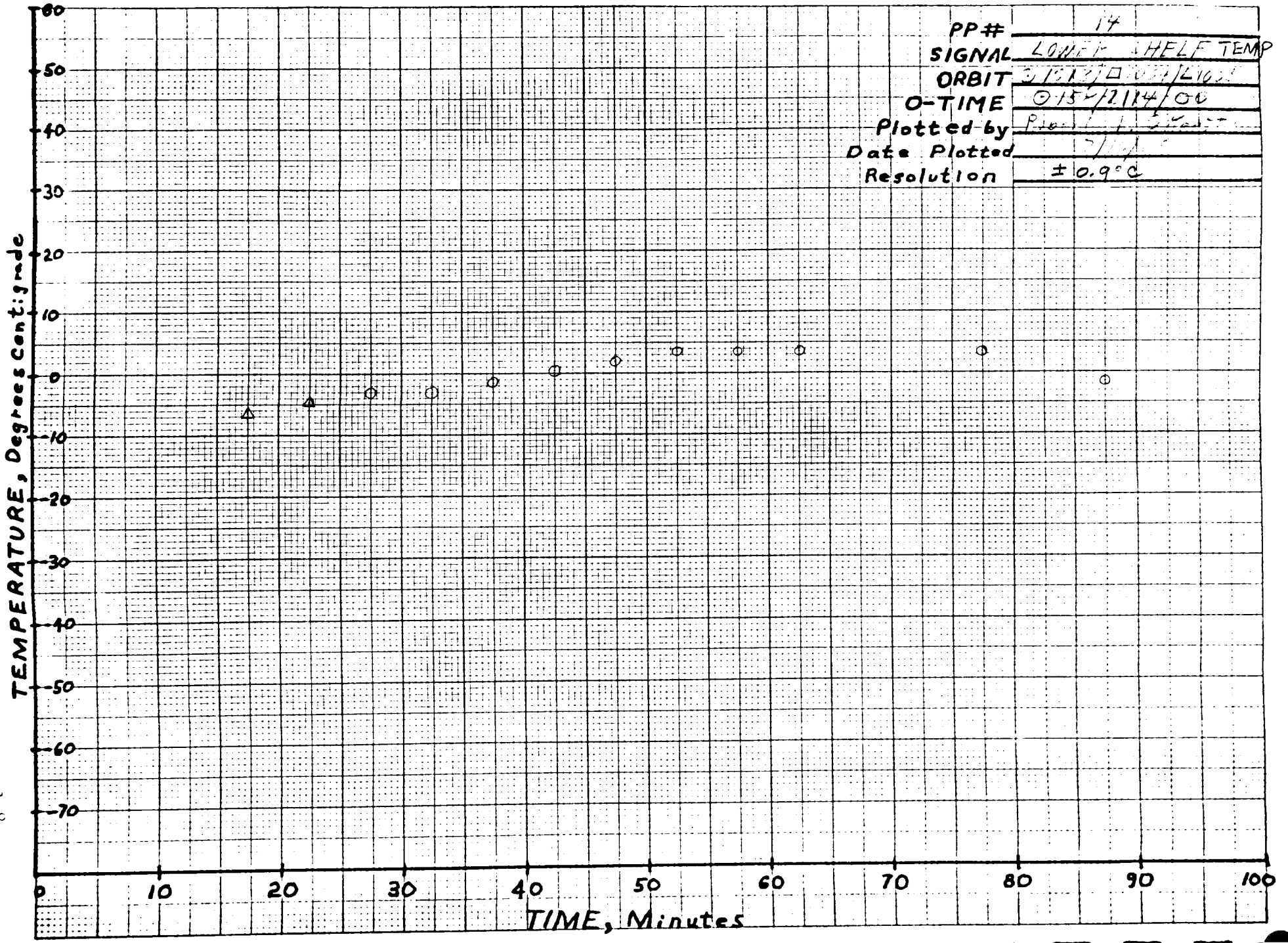

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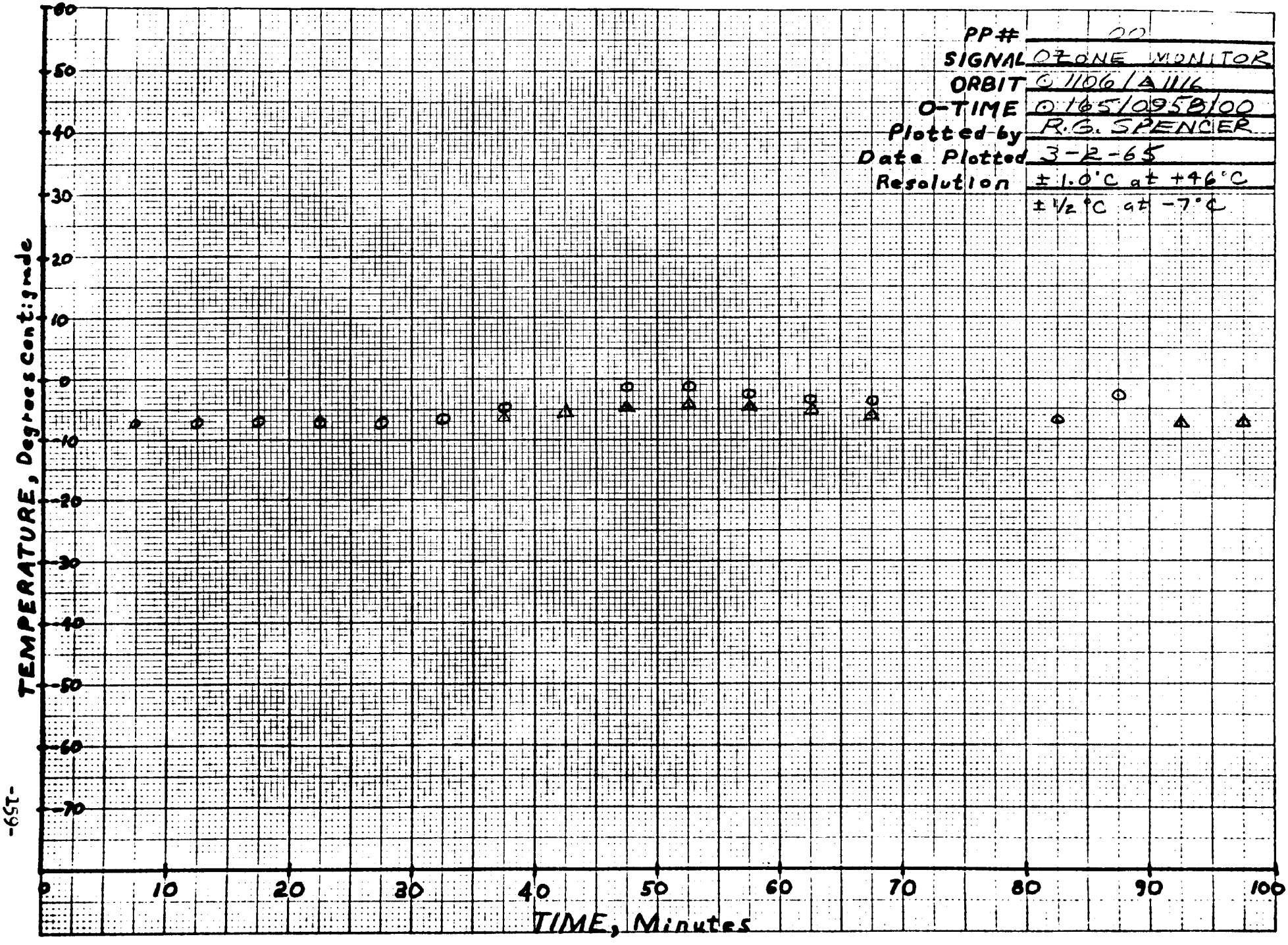

K+E 10 X 10 TO ½ INCH 46 1472
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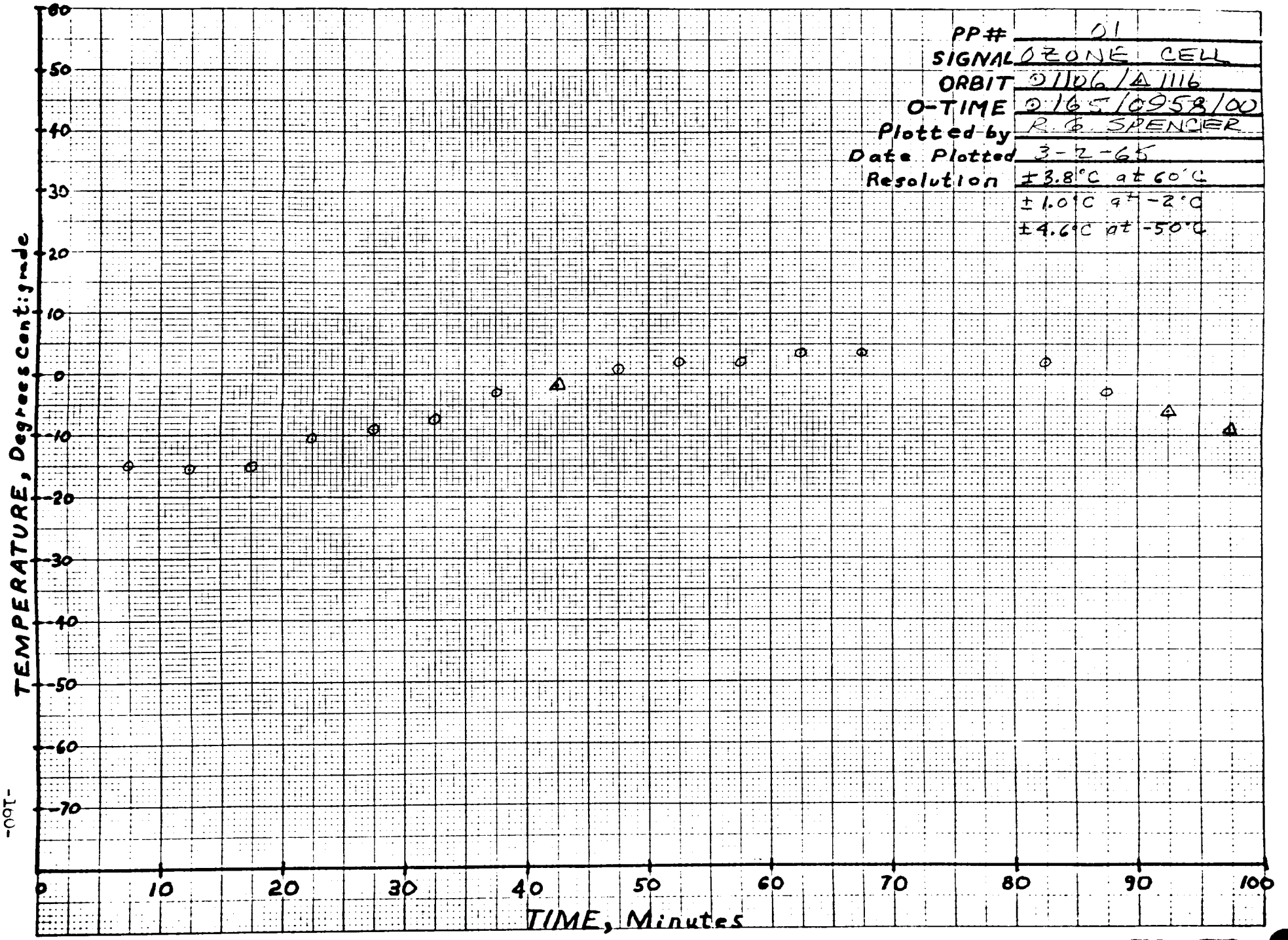
KEUFFEL & ESSER CO.



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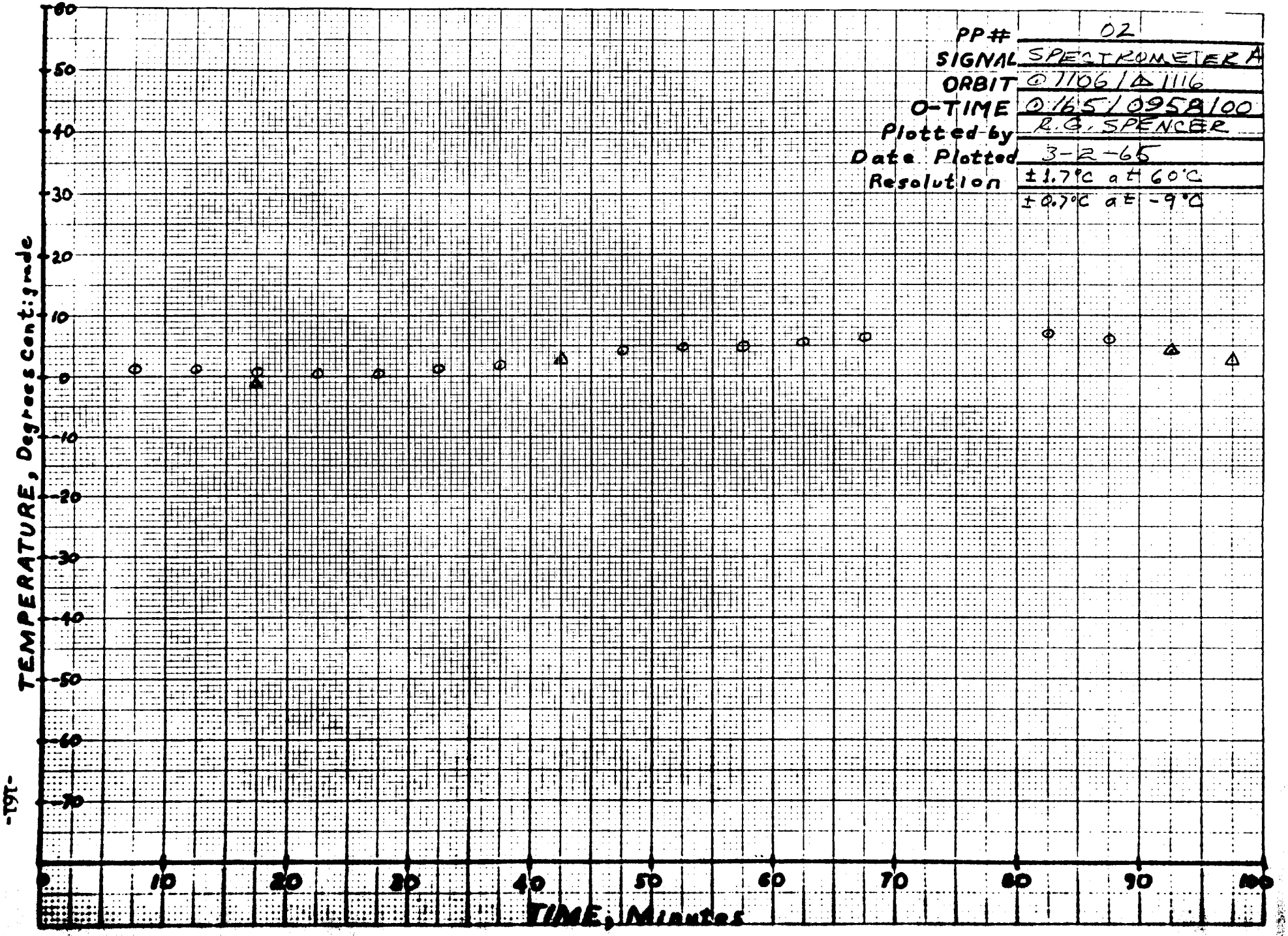
KEUFFEL & ESSER CO.



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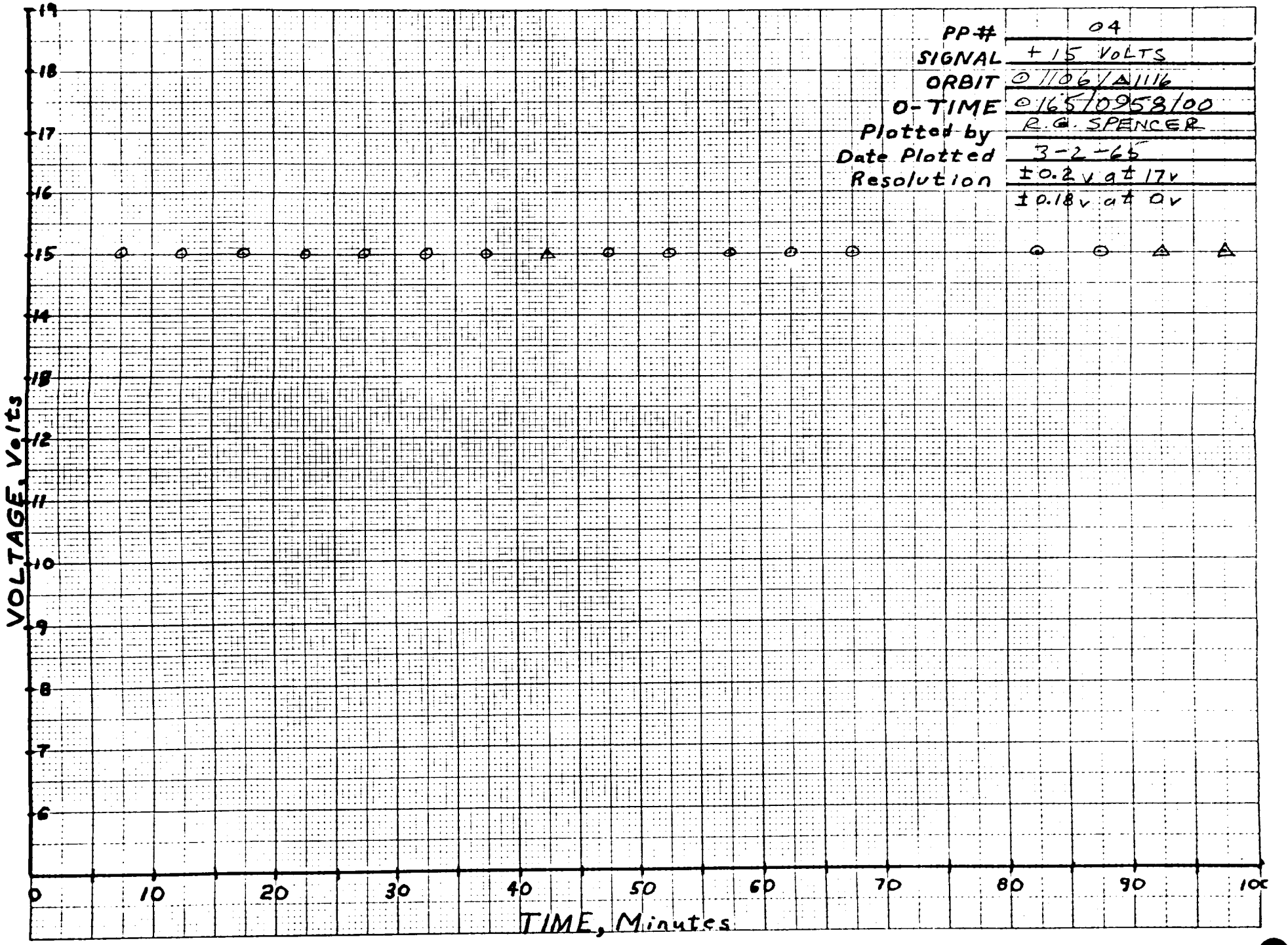
KEUFFEL & ESSER CO.



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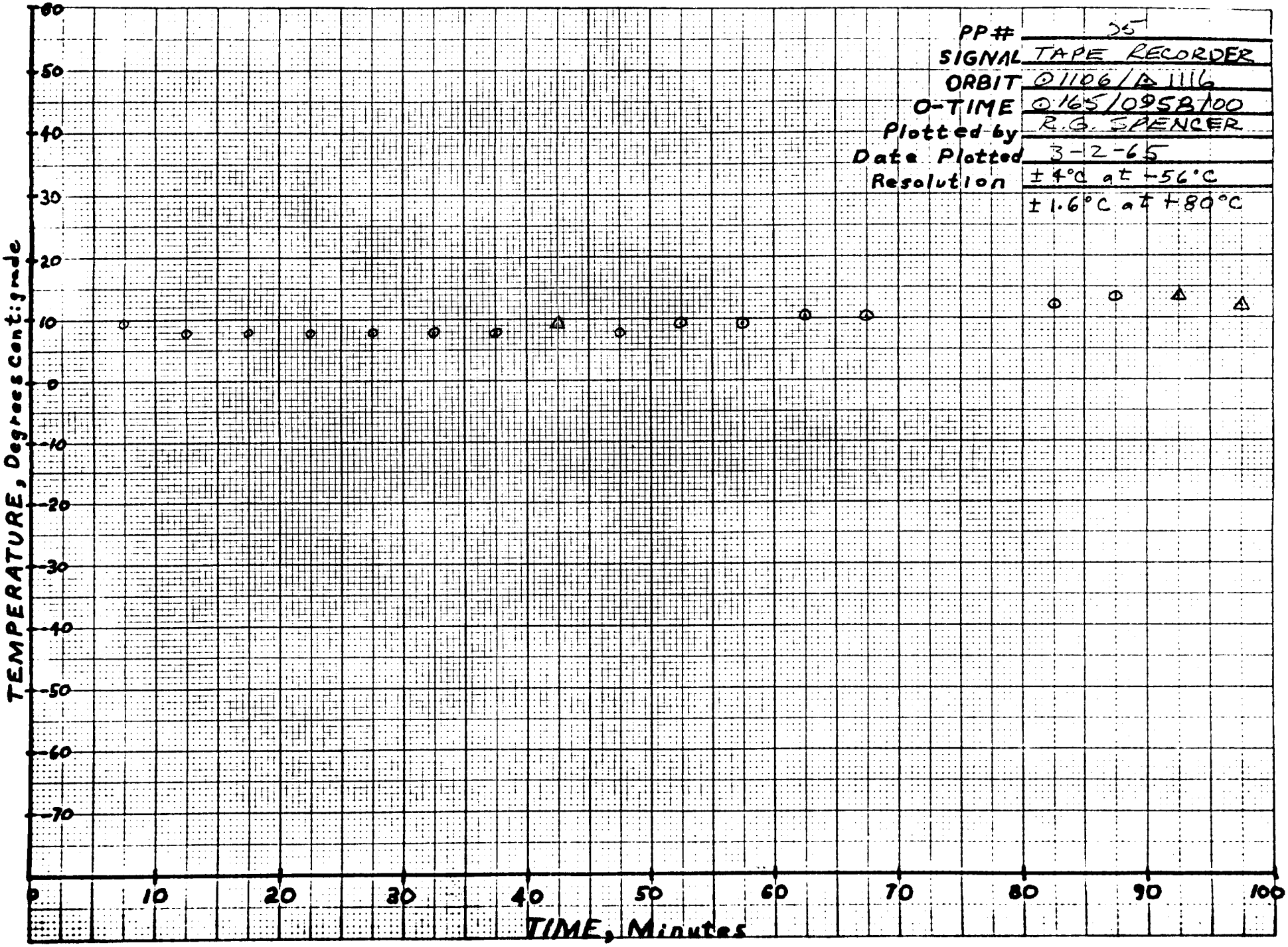

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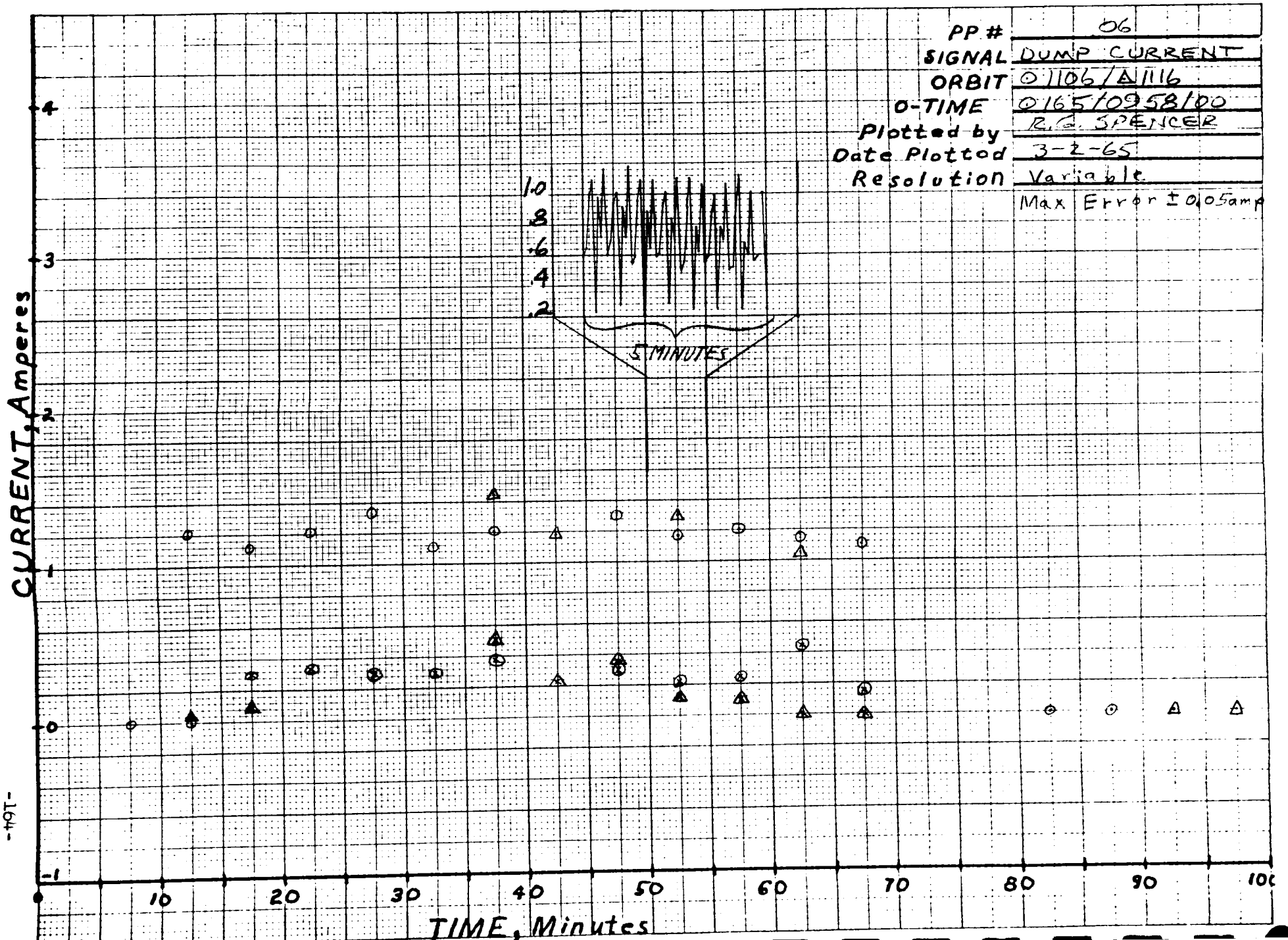
KEUFFEL & ESSER CO.



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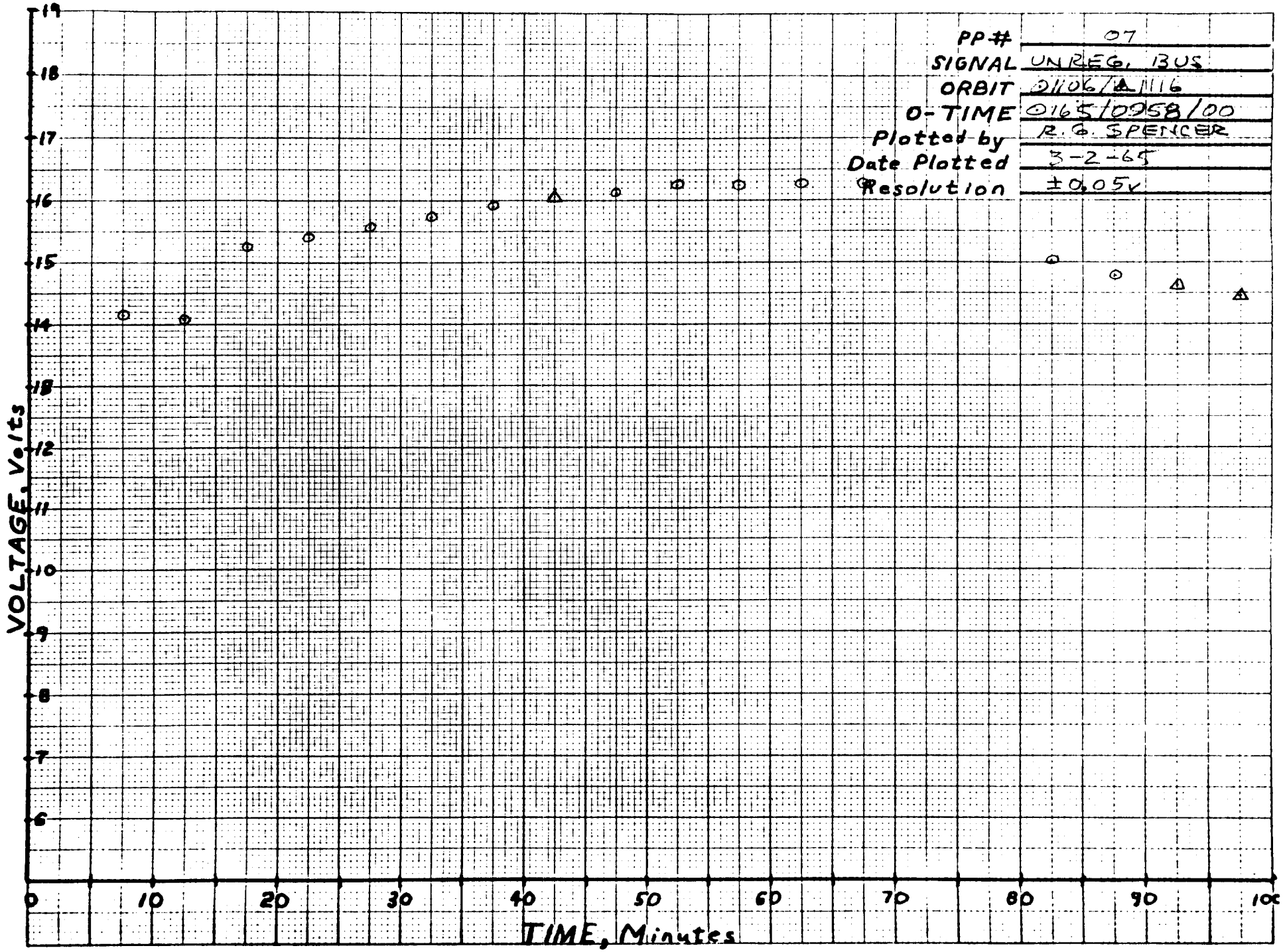
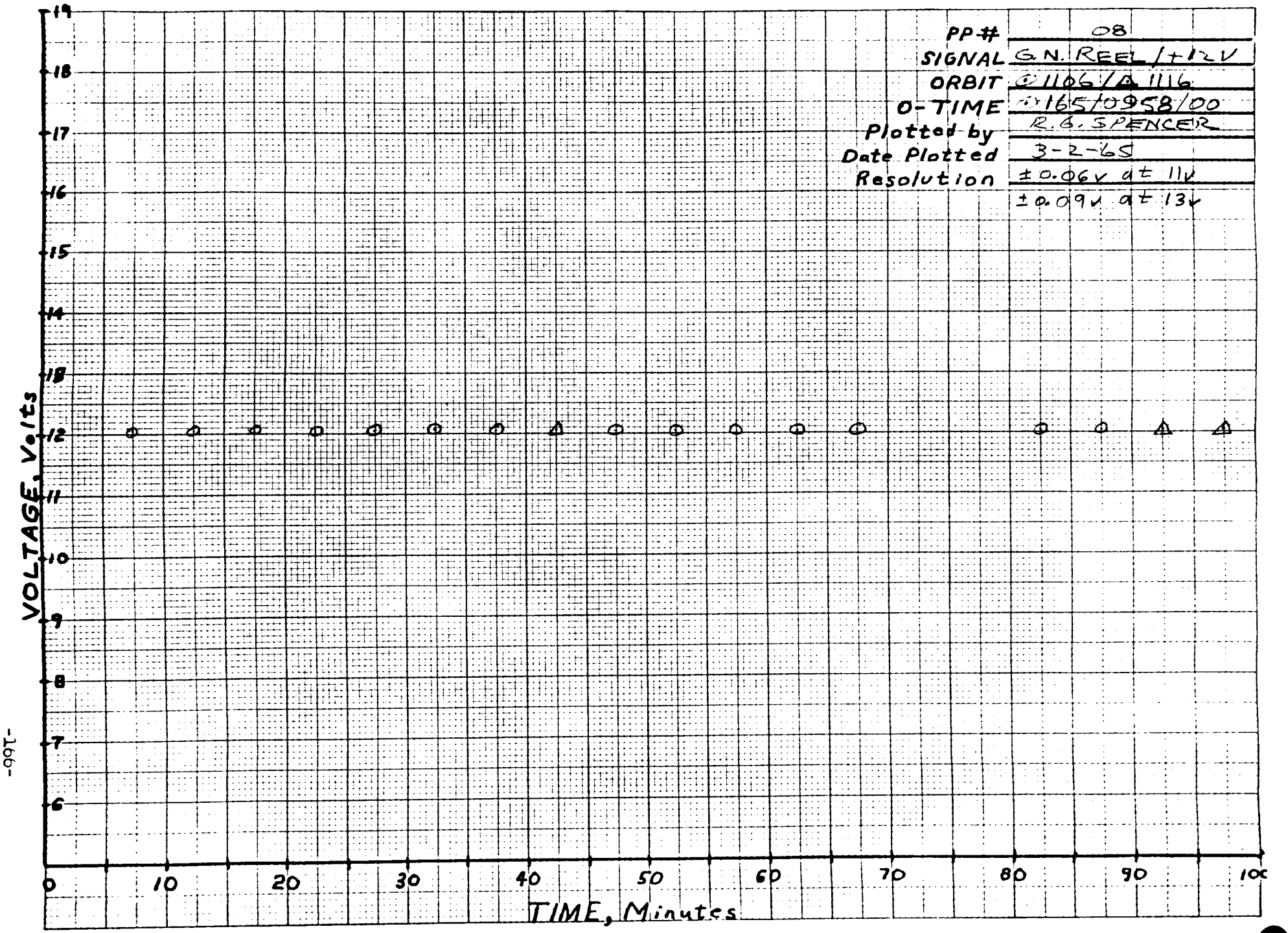
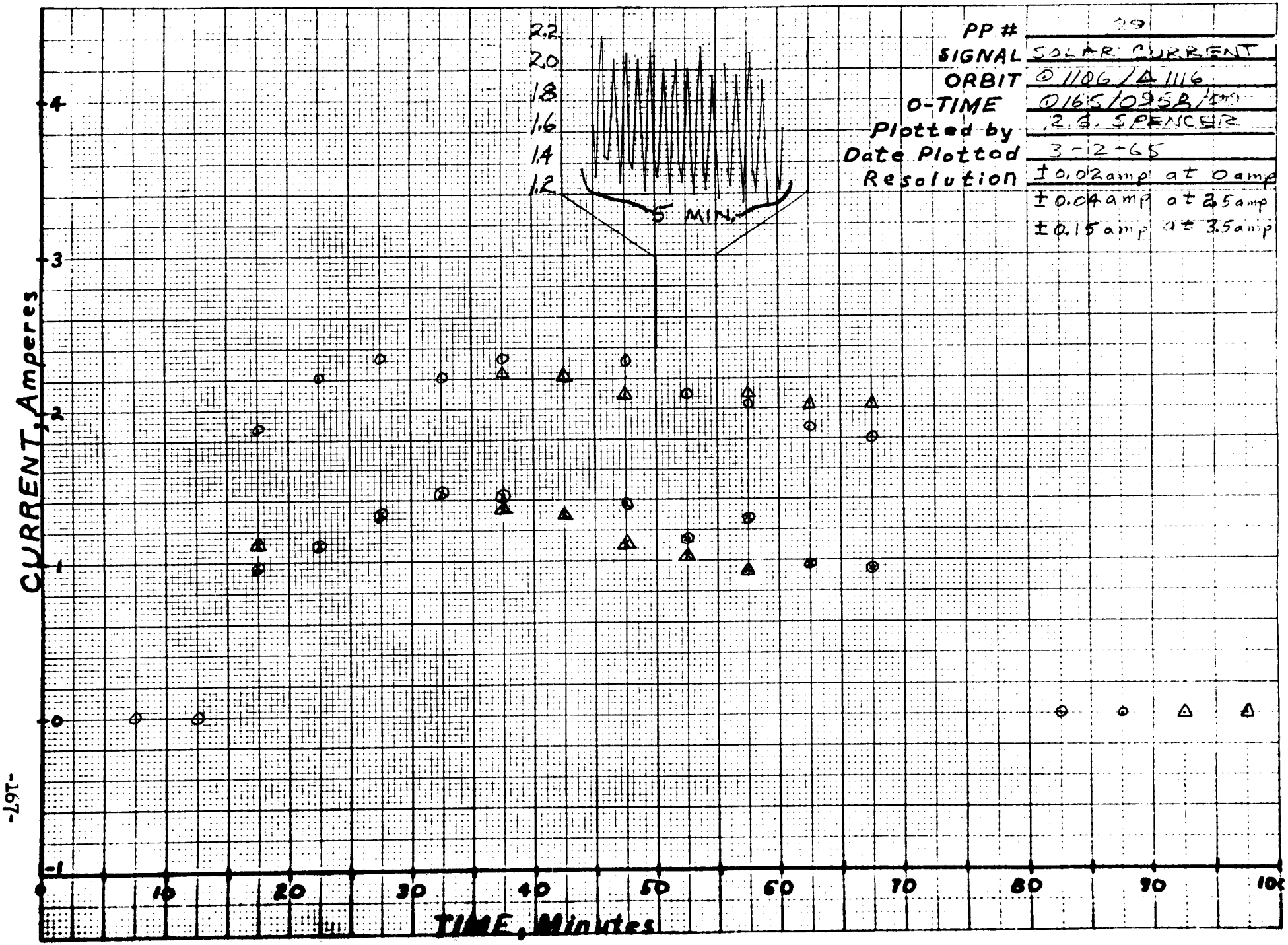
KEUFFEL & ESSER CO.



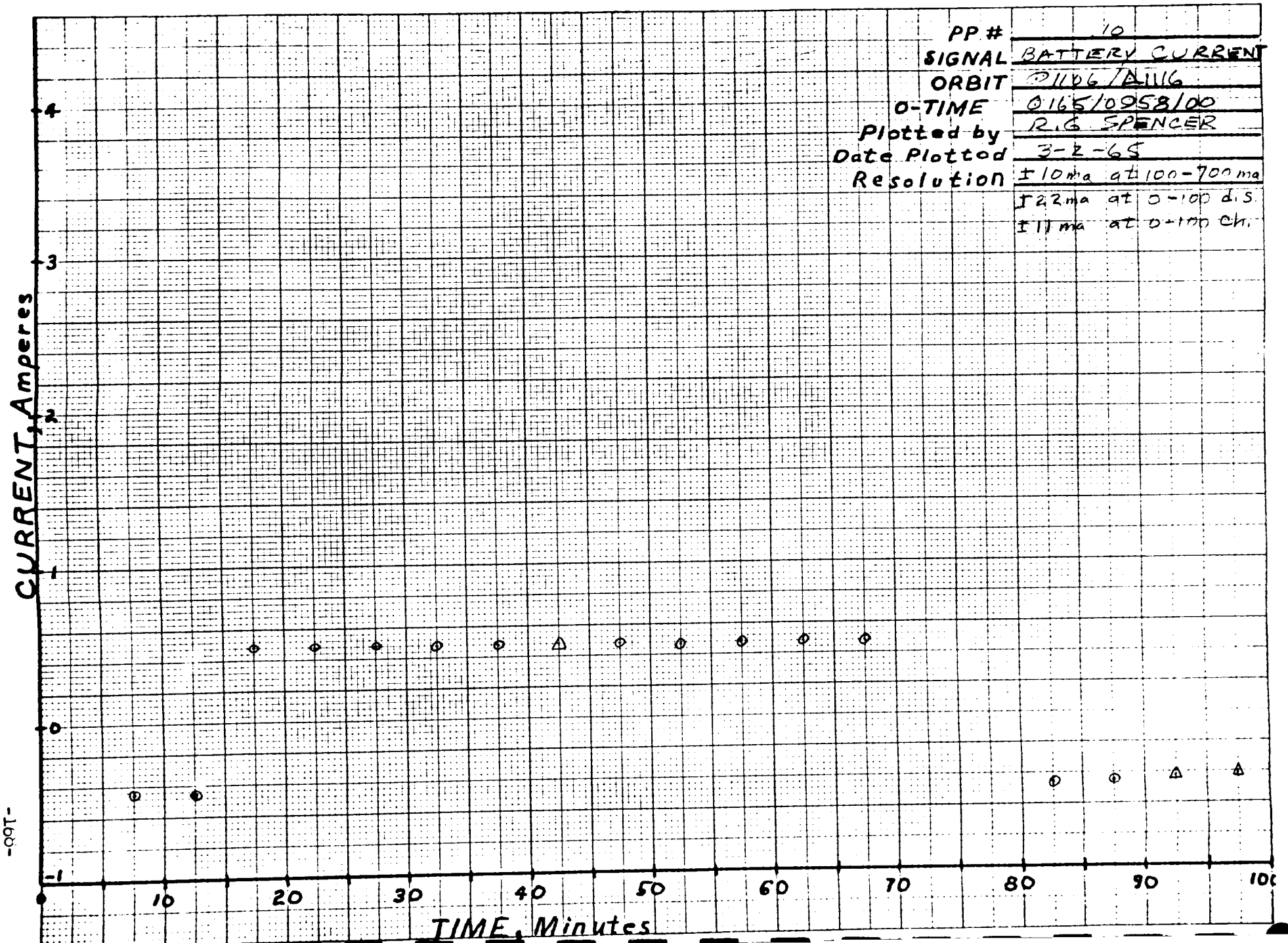
K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



KEUFFEL & ESSER CO.



K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



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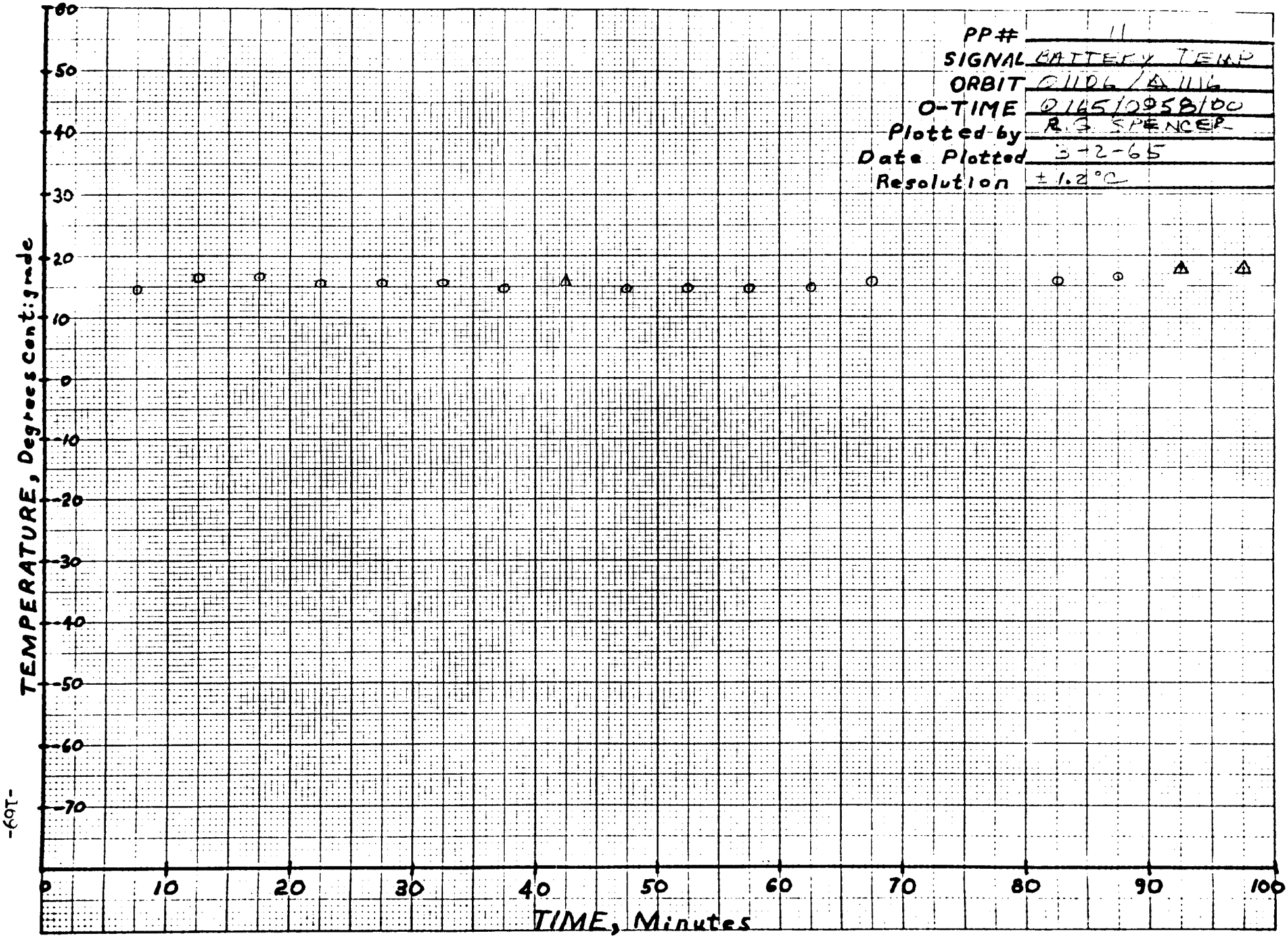
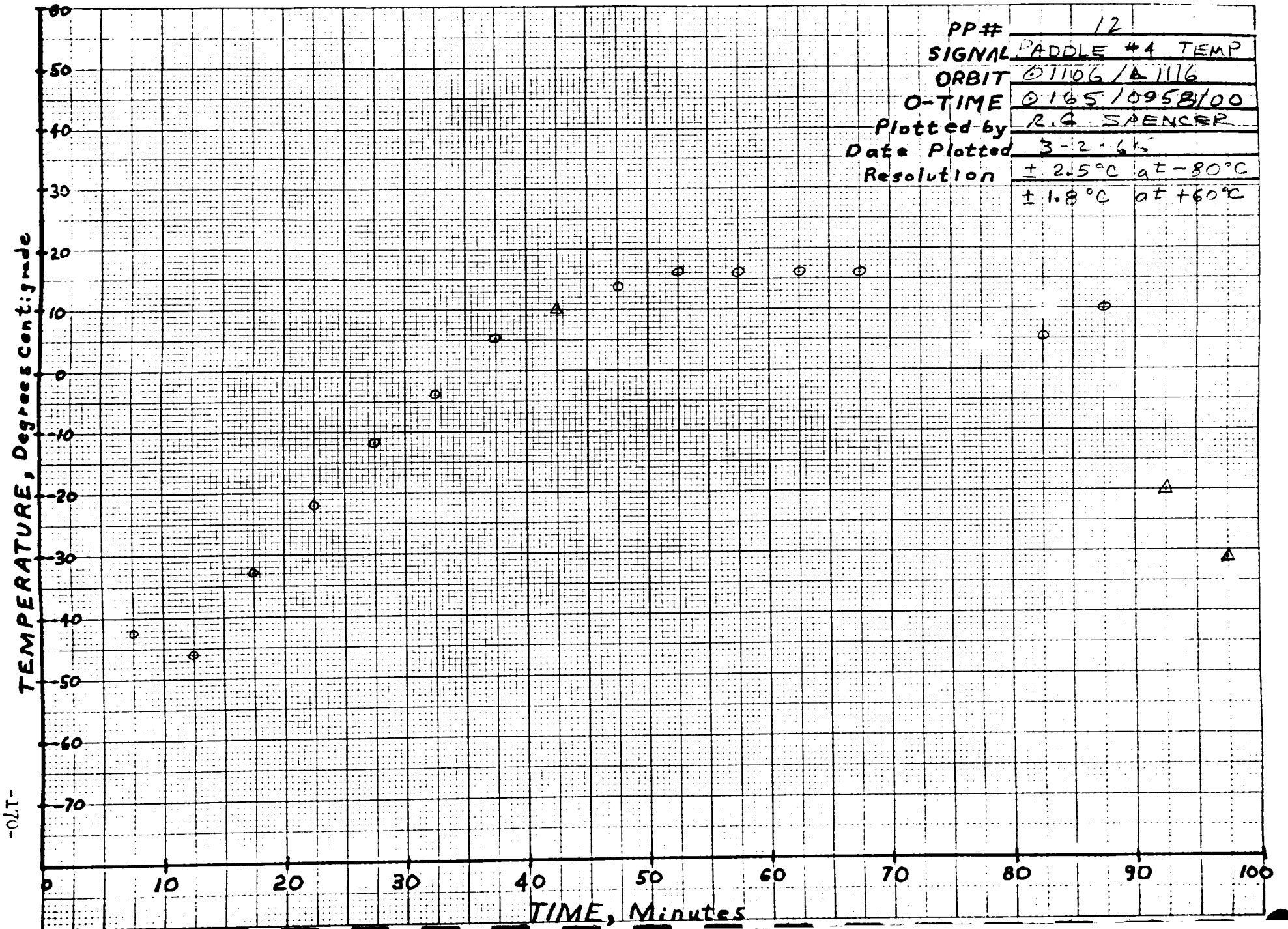


K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



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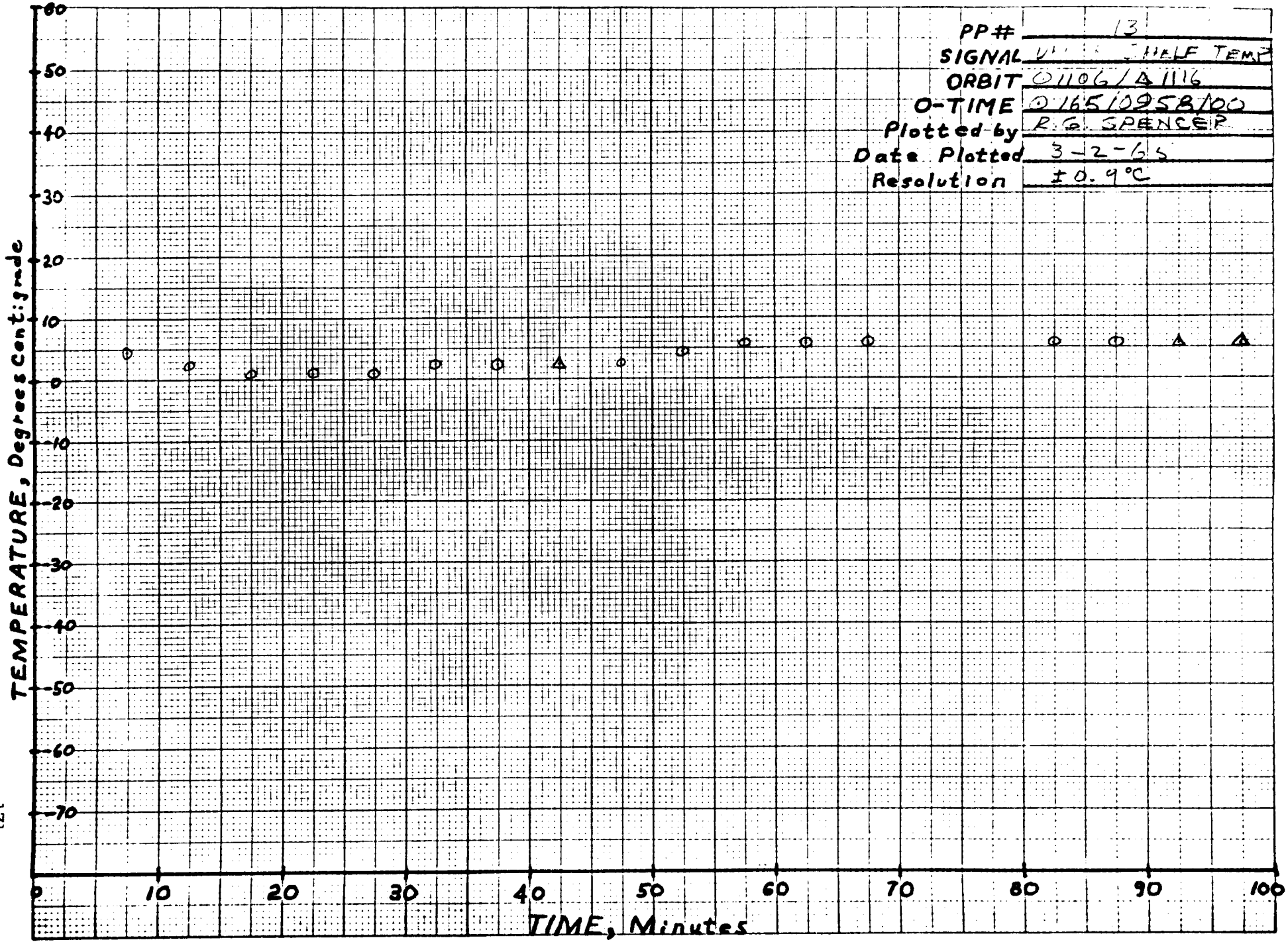
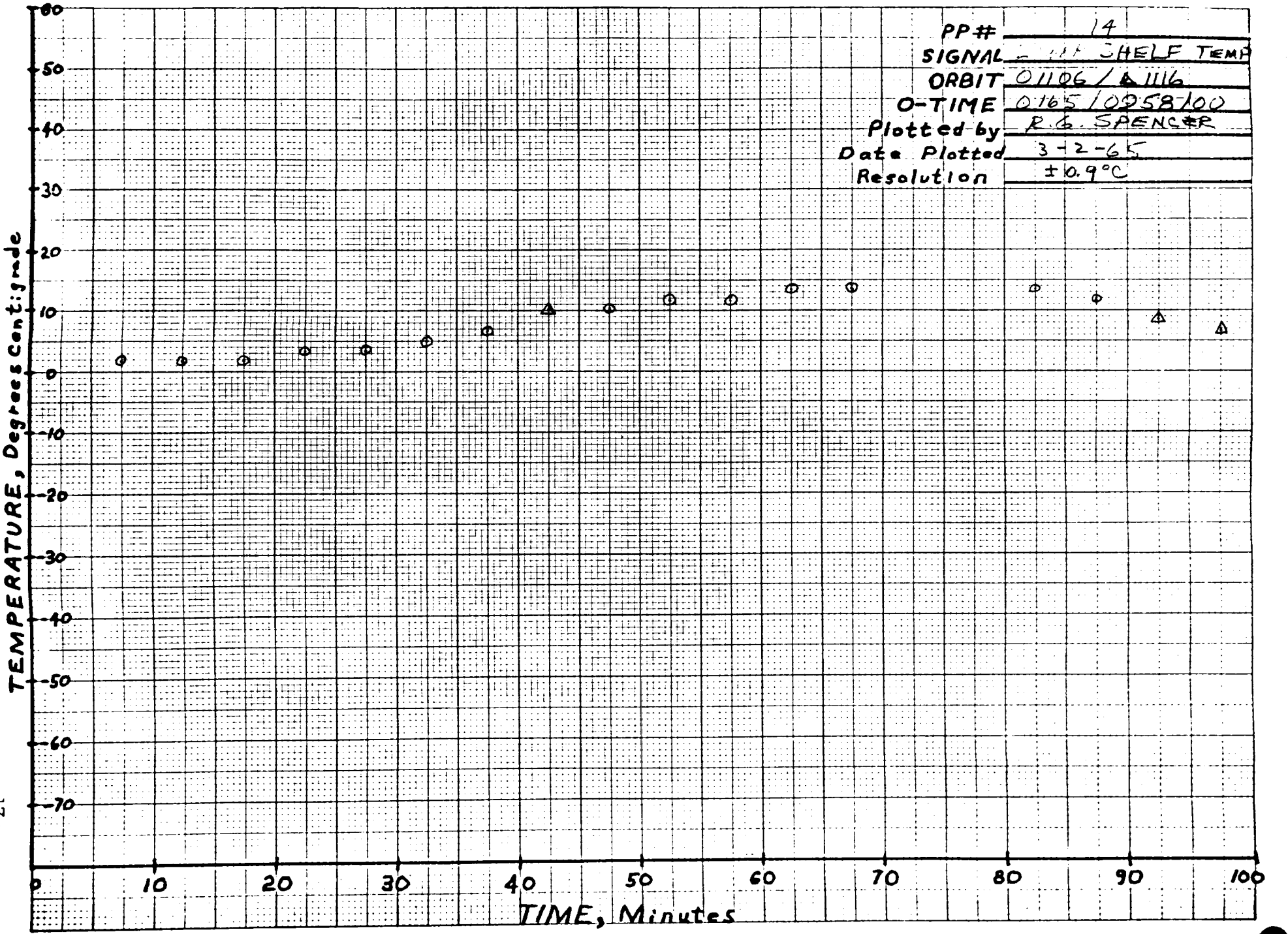
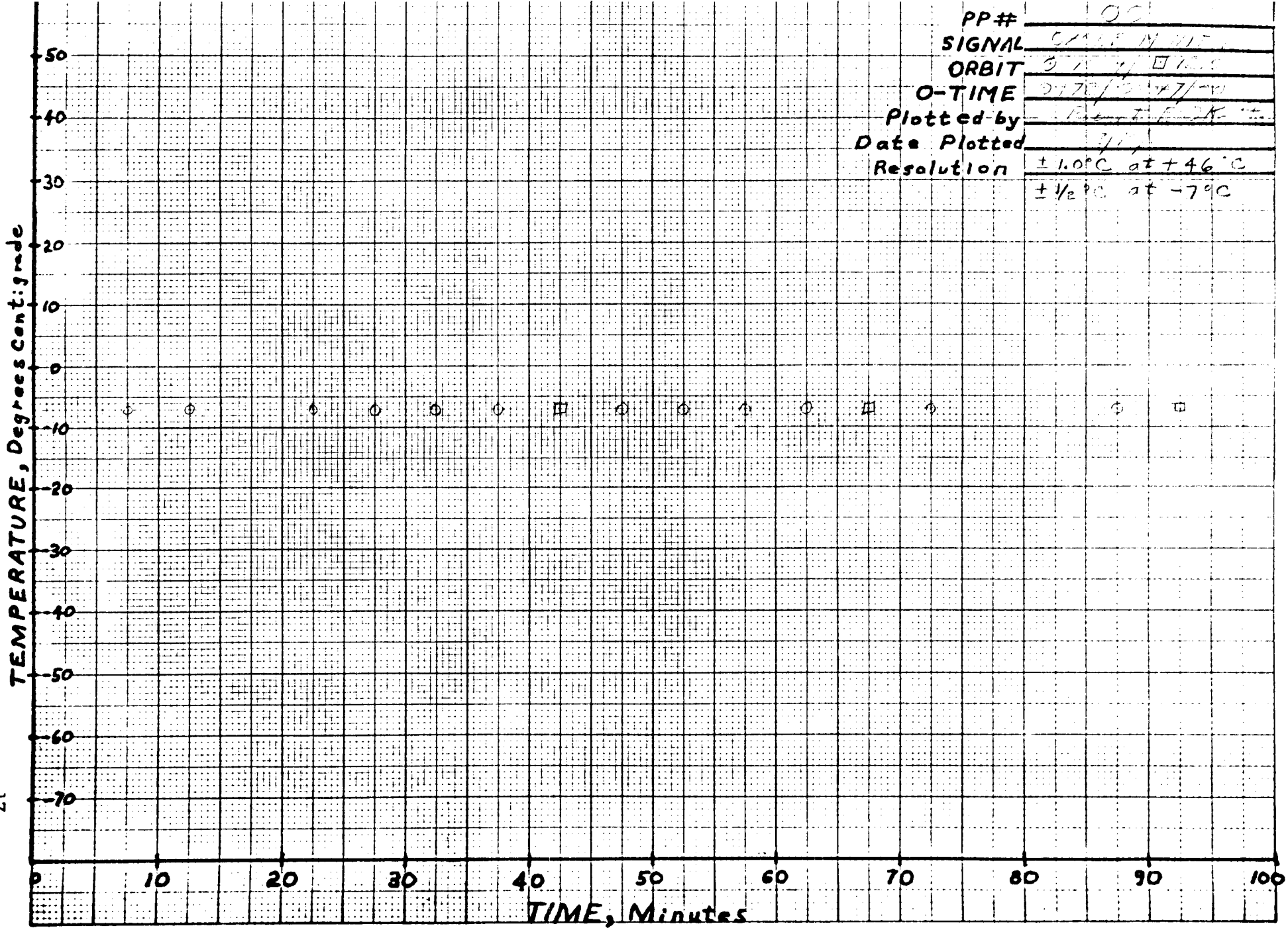
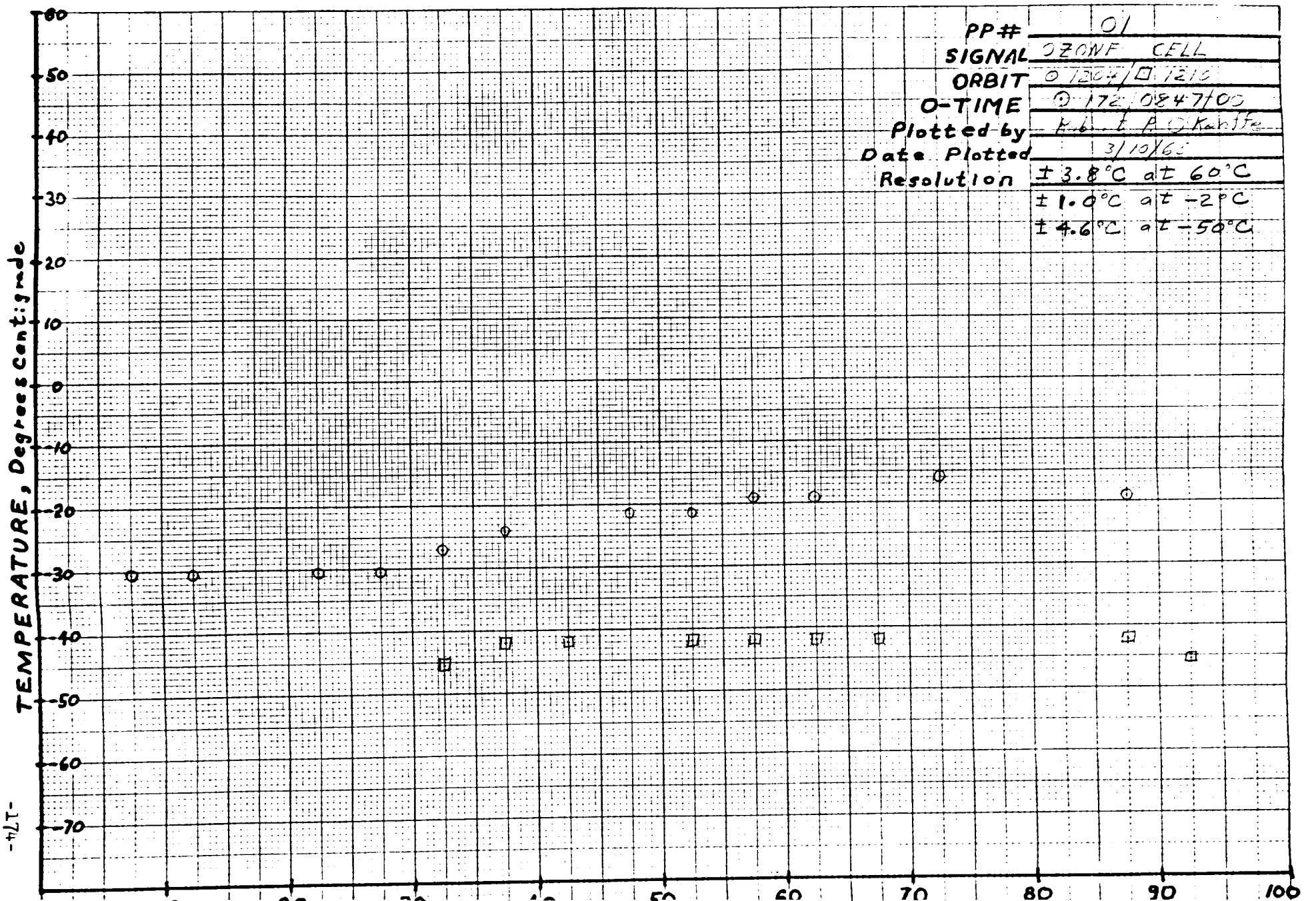


K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.




PP#
SIGNAL
ORBIT
O-TIME
Plotted by
Date Plotted
Resolution
± 1.0°C at +46°C
± 1/2°C at -7°C
TEMPERATURE, Degrees Centigrade
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



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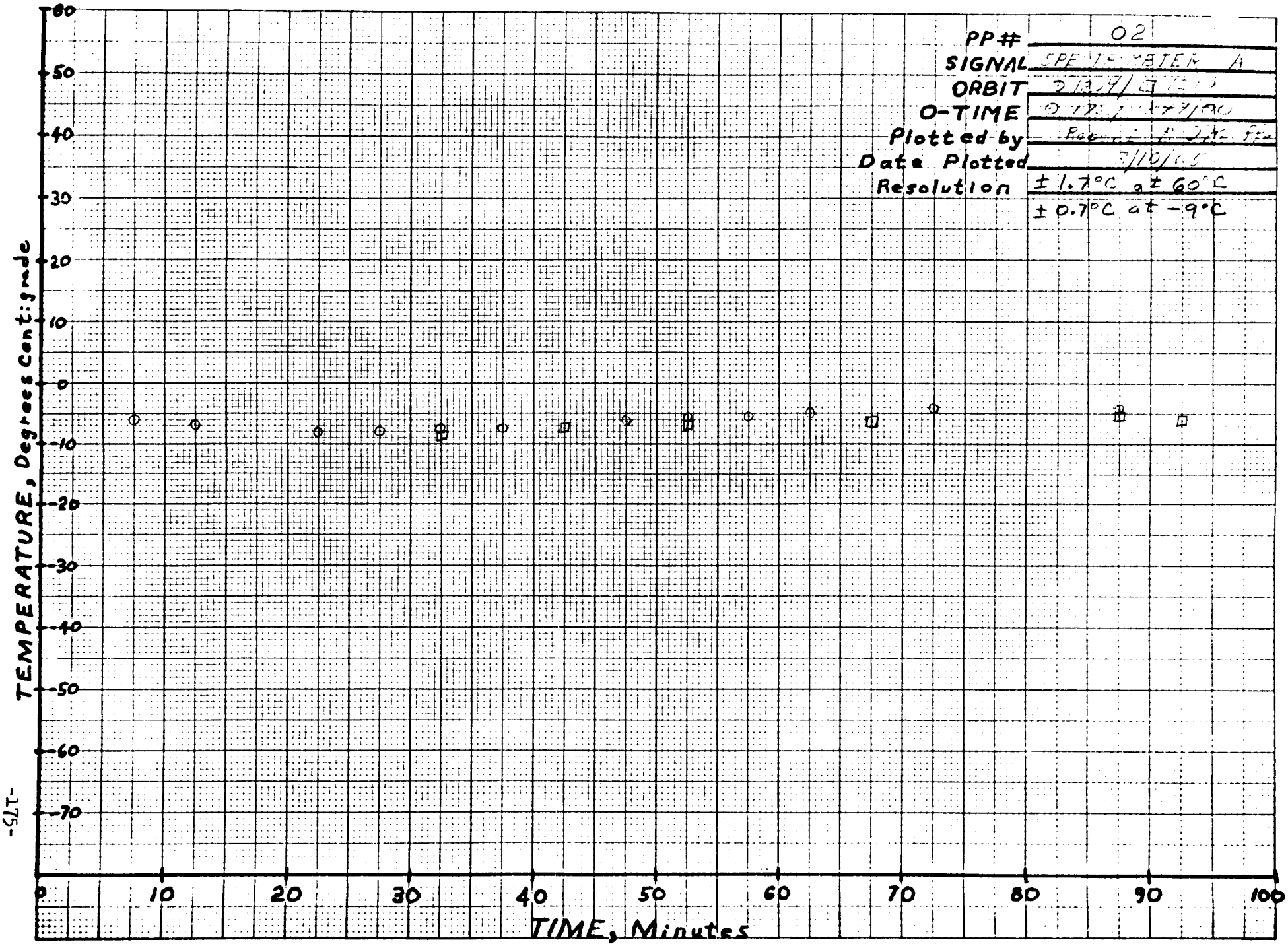
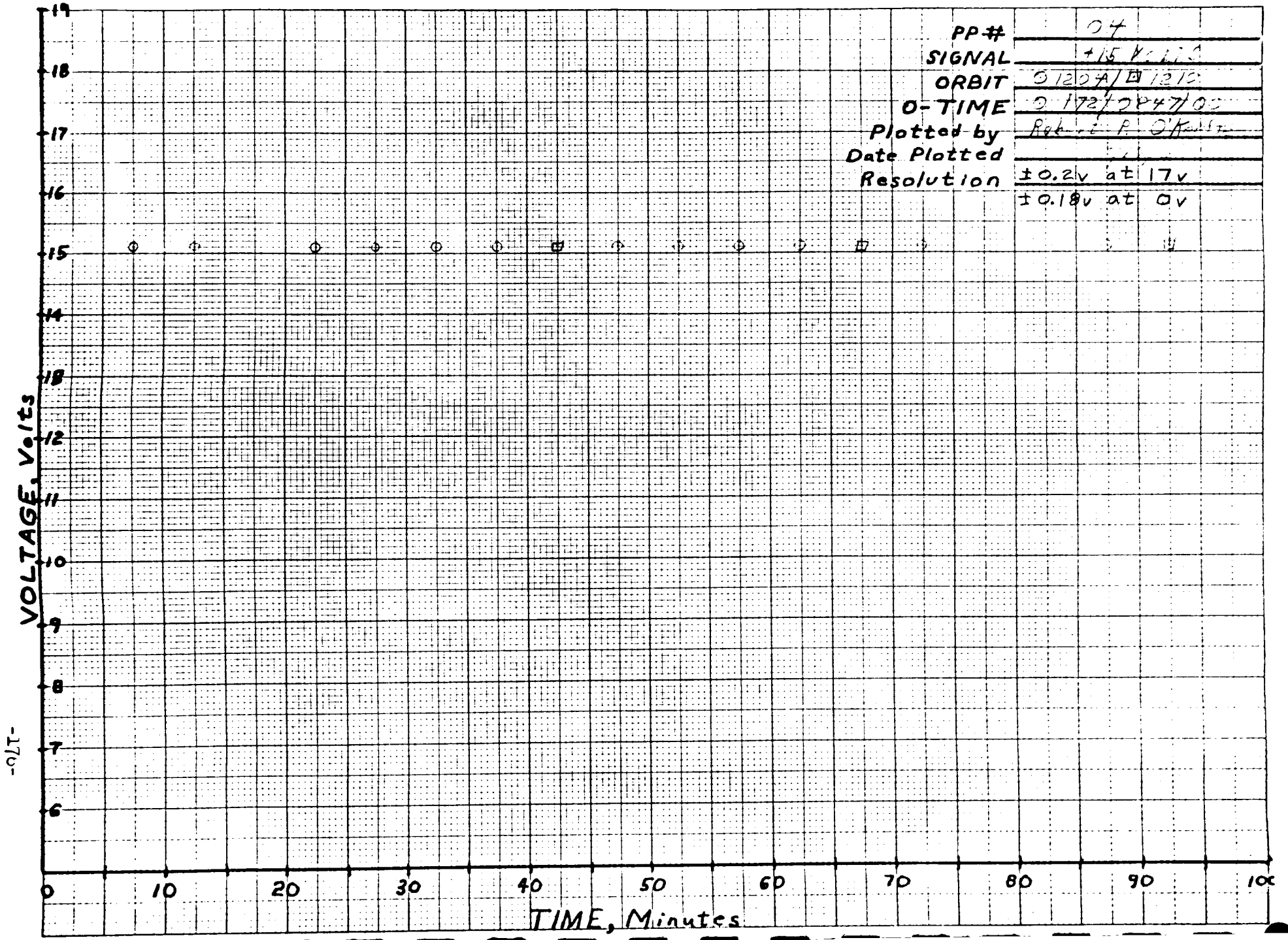


K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



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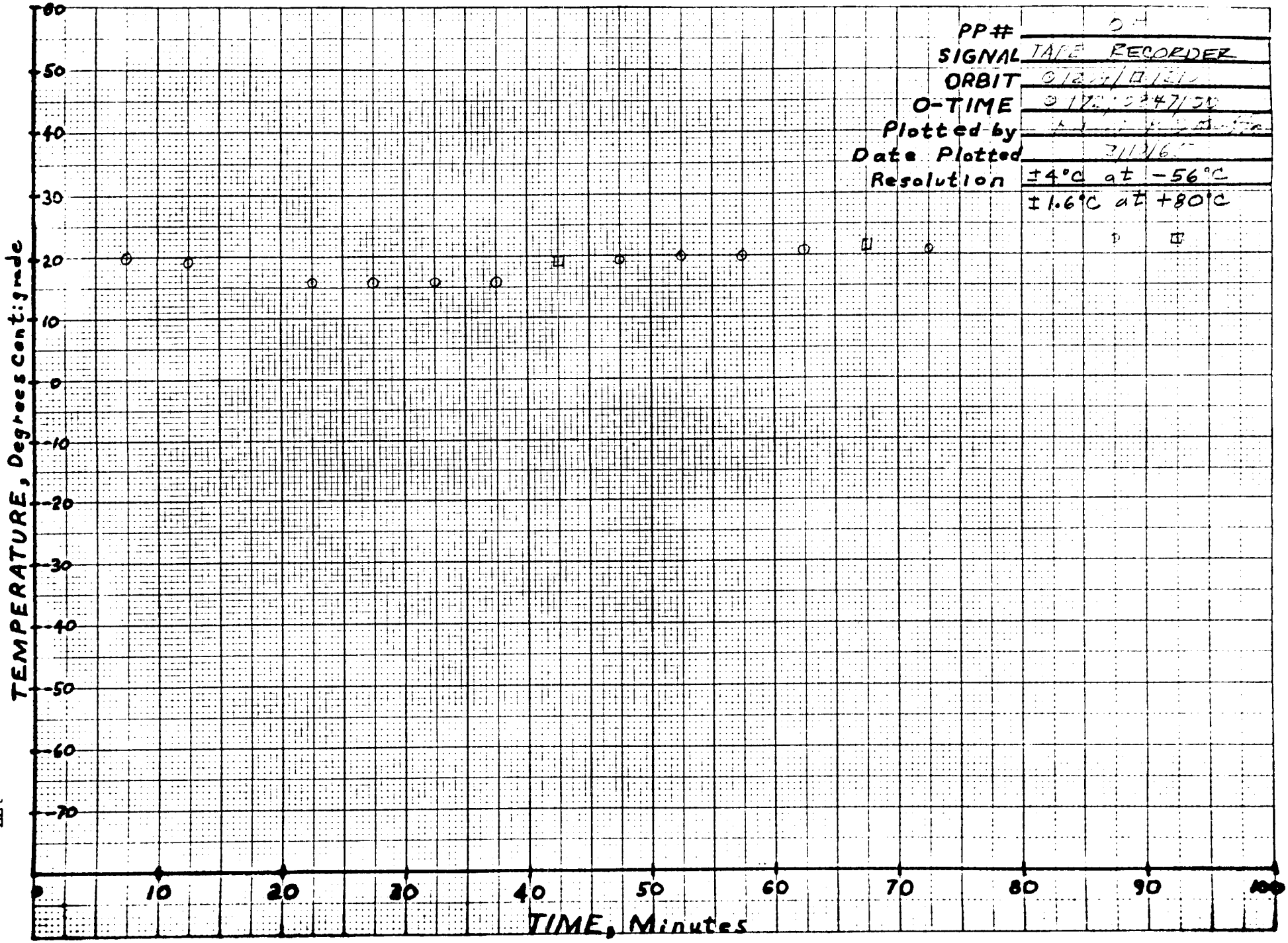
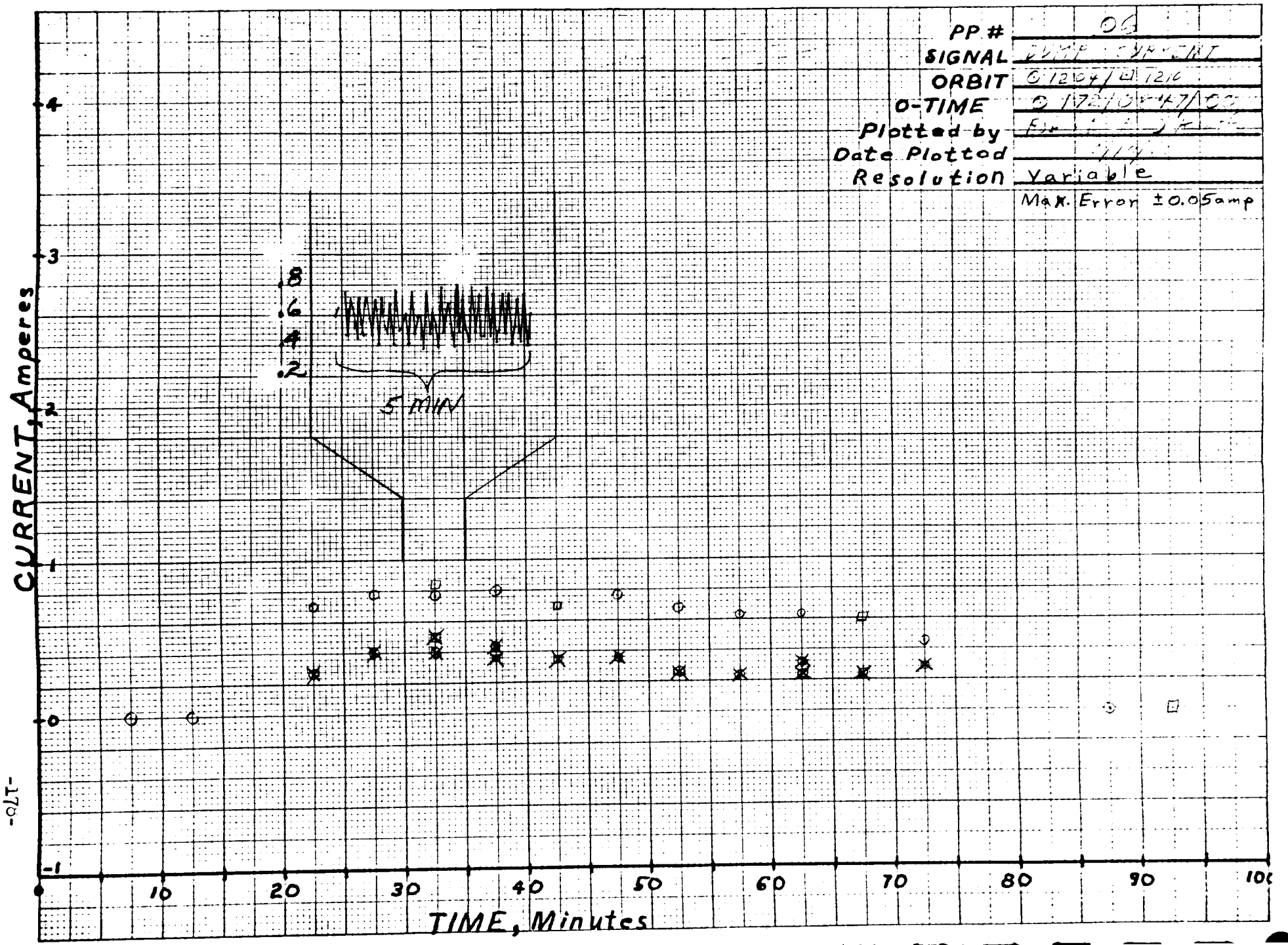


K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



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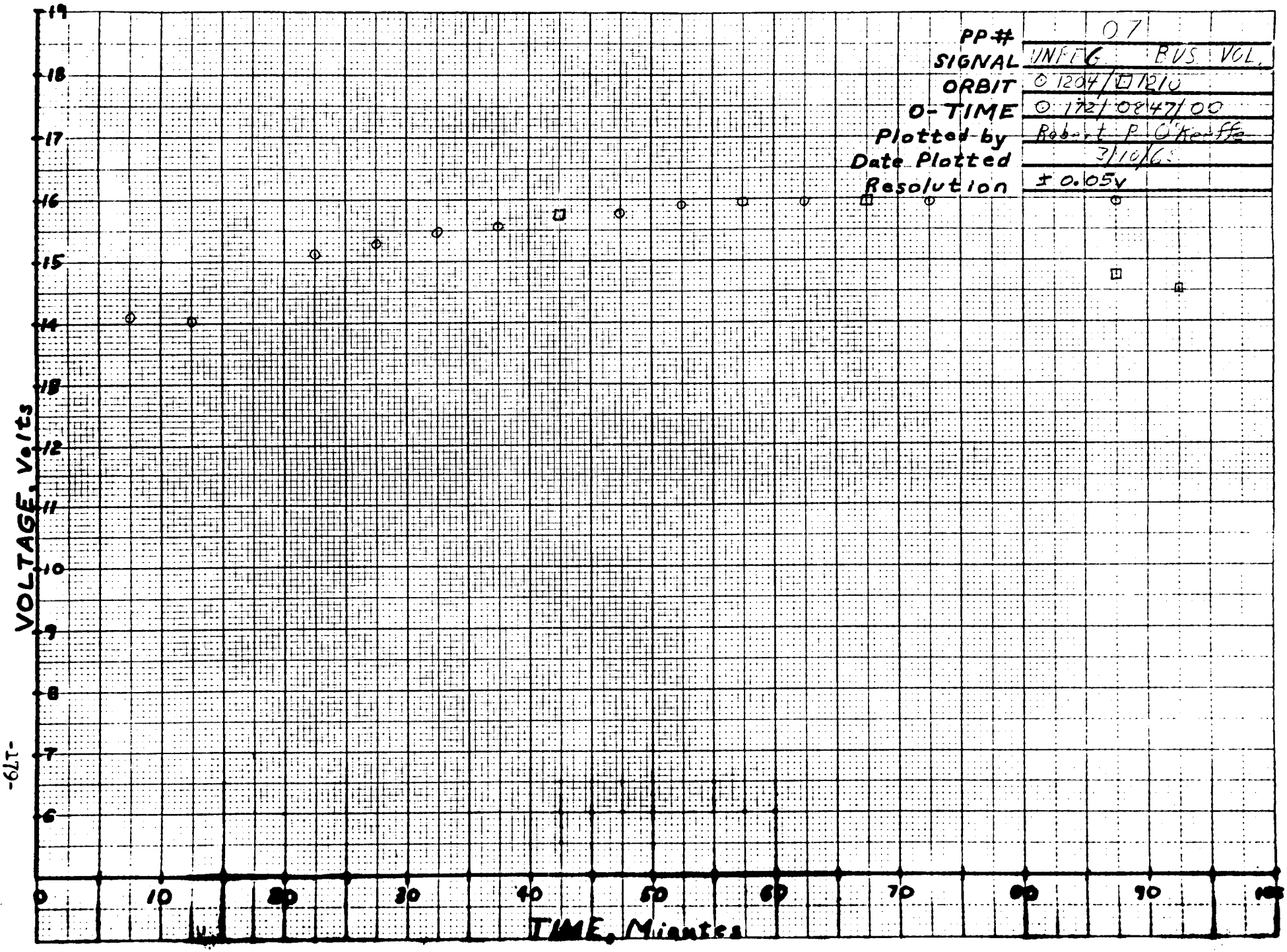
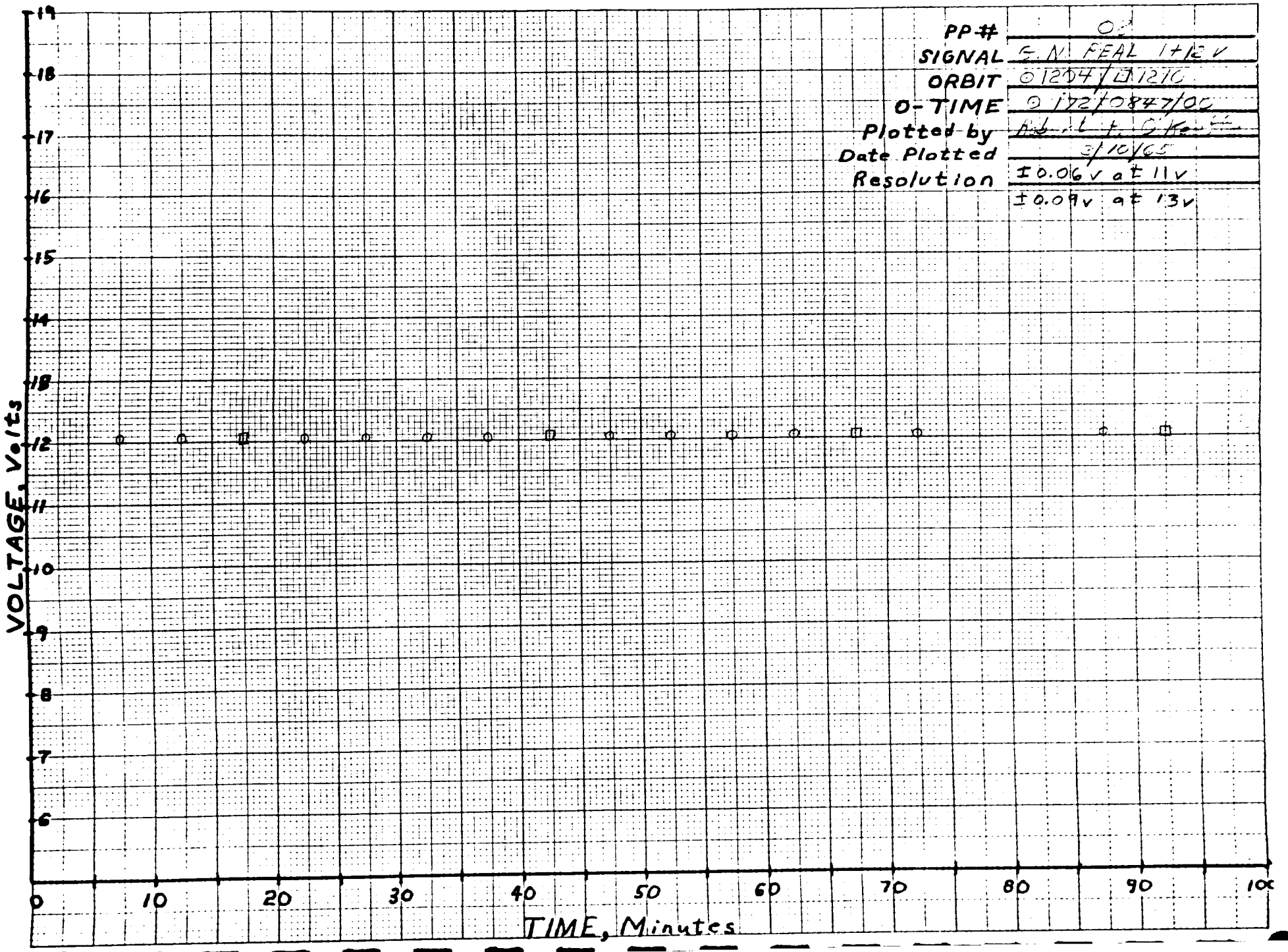
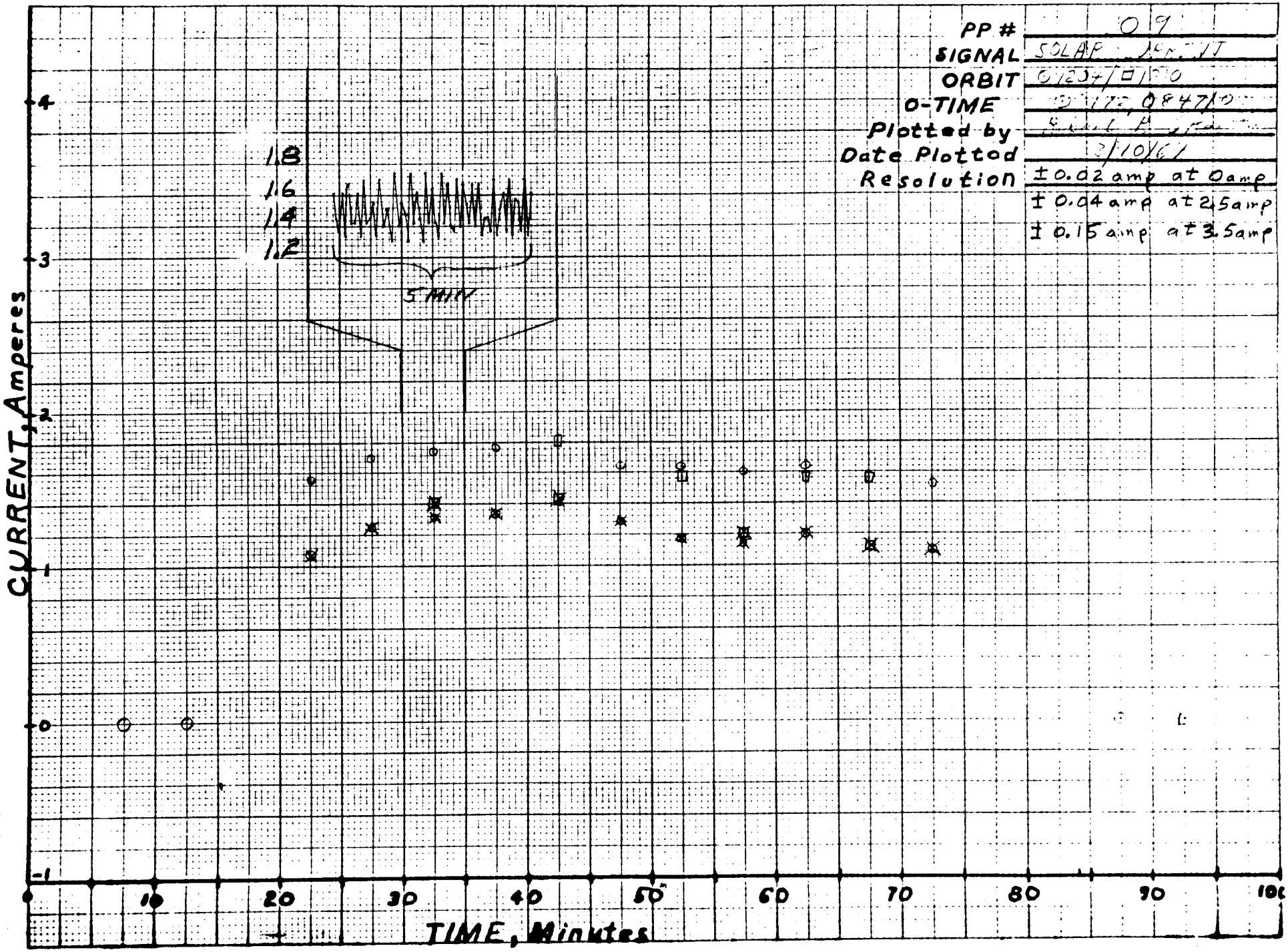


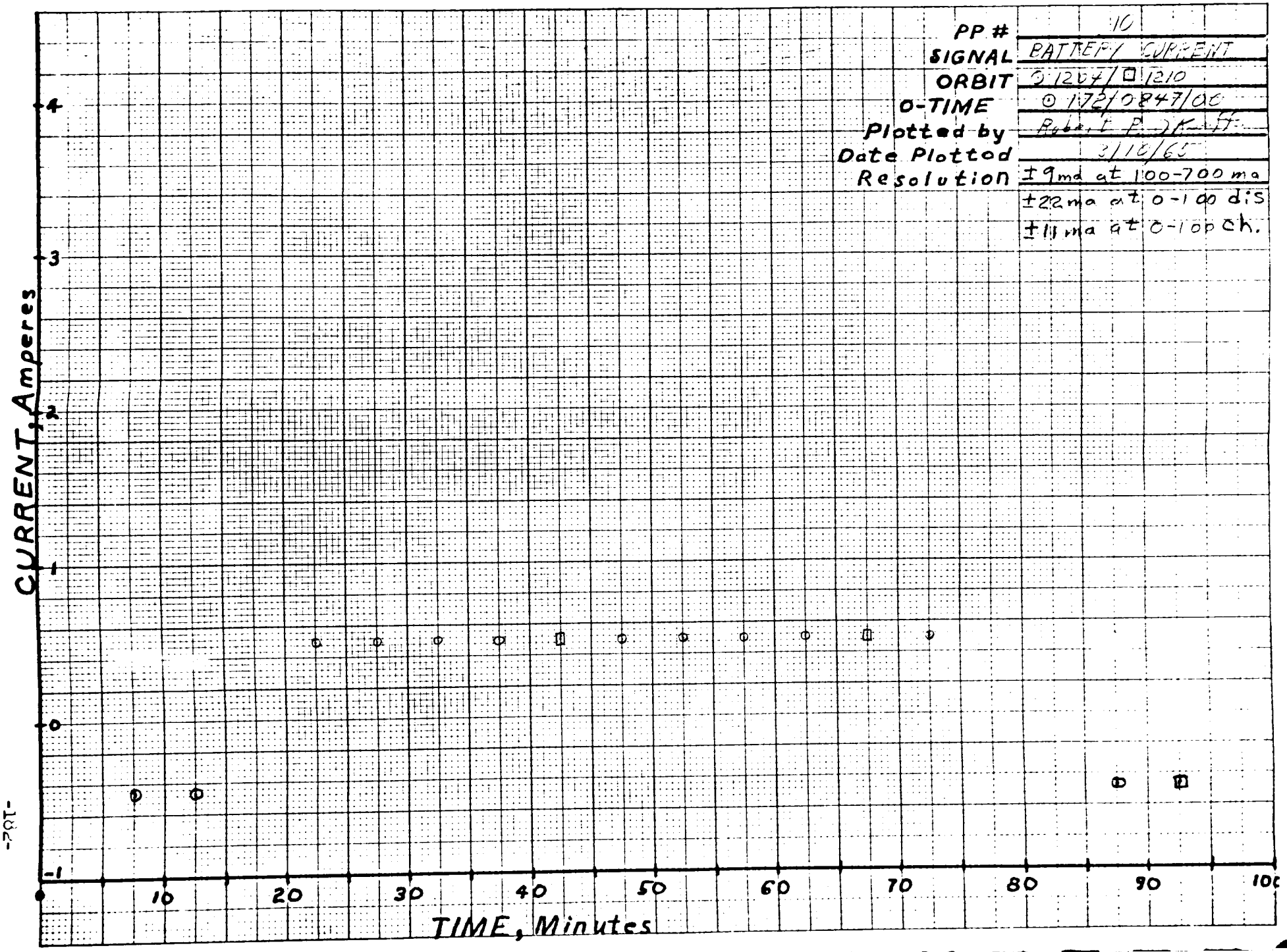
K+E 10 X 10 TO 1/2 INCH 46 1472
7 1/2 X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



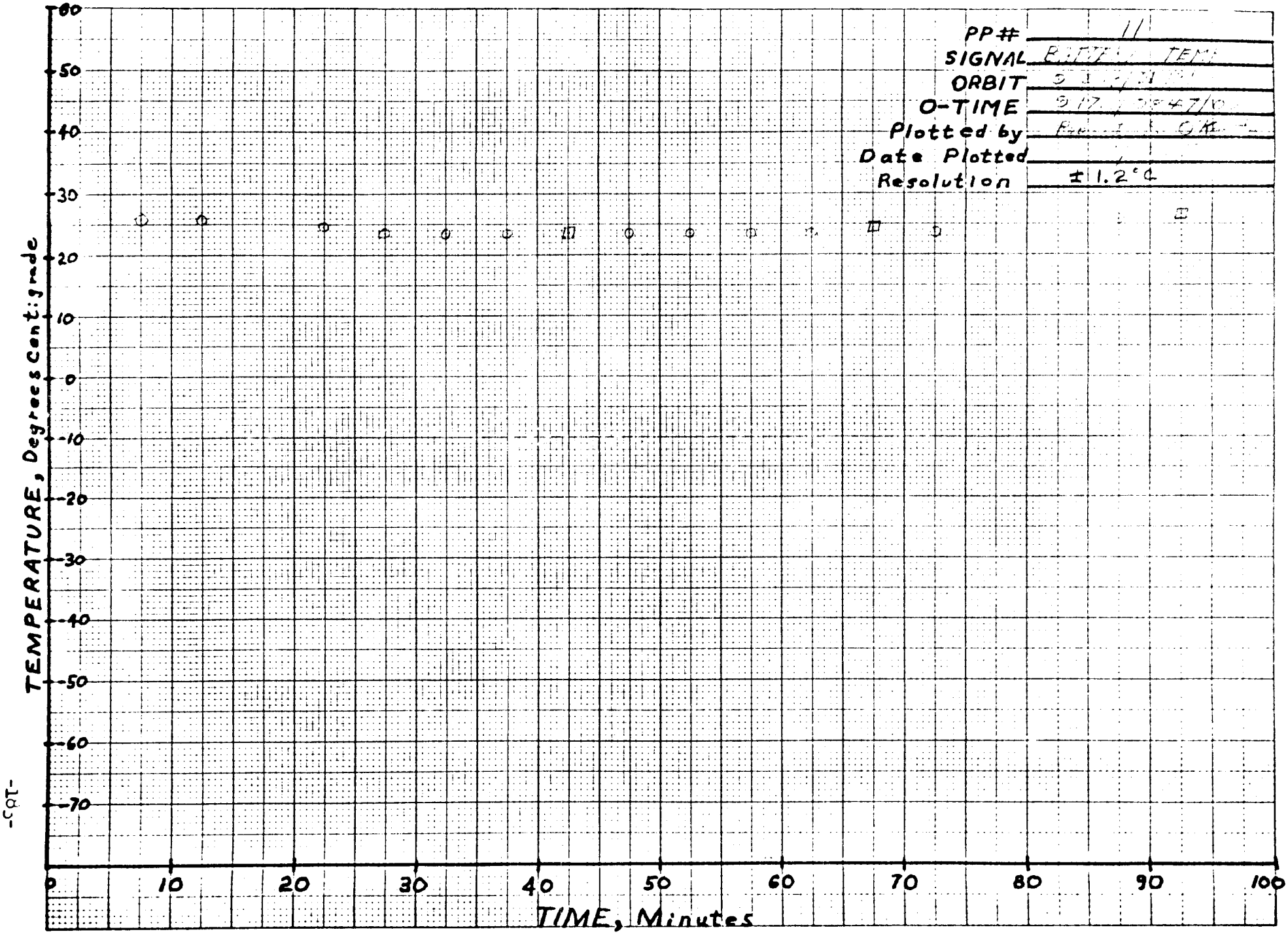
KEUFFEL & ESSER CO.



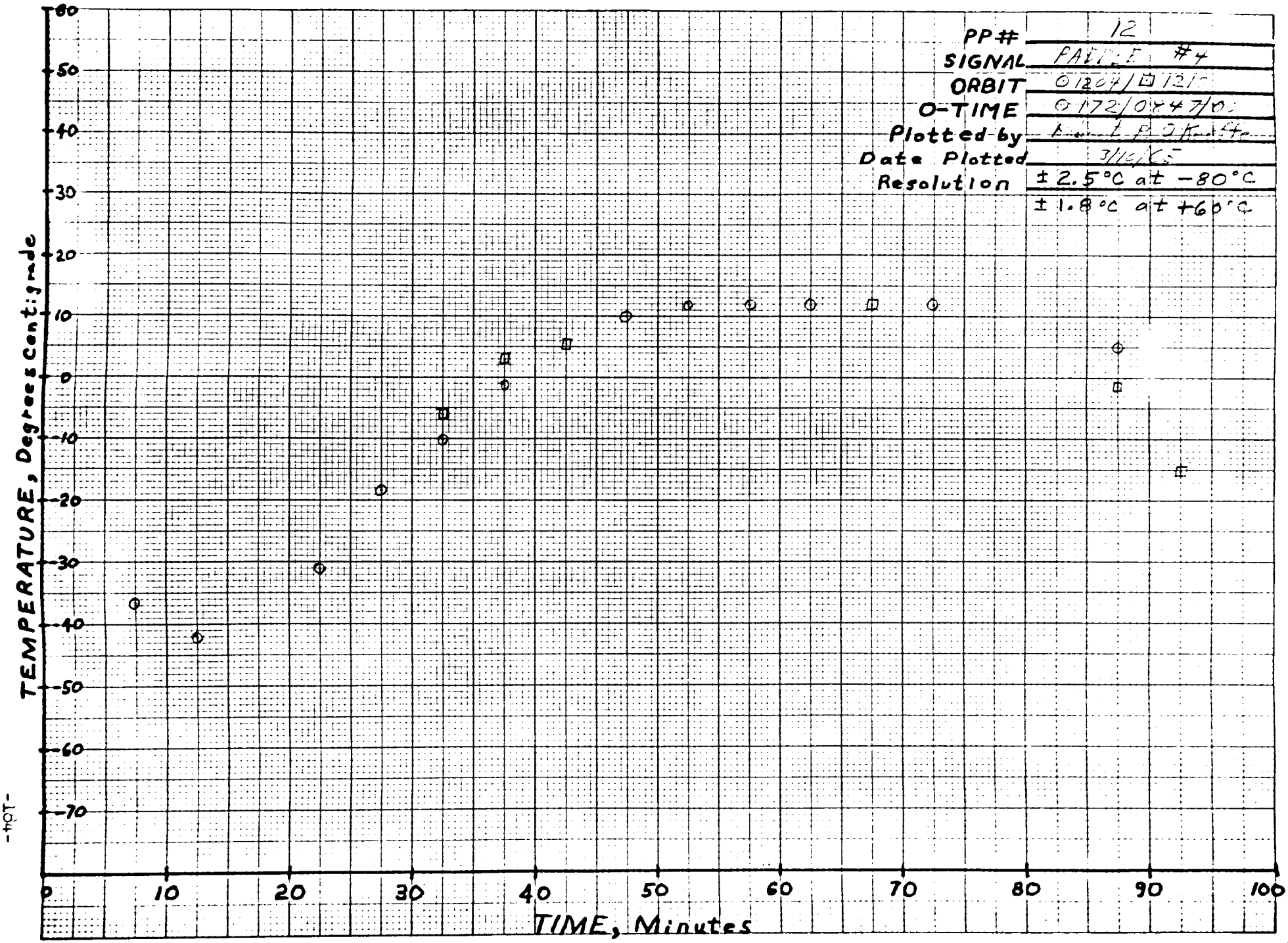
K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



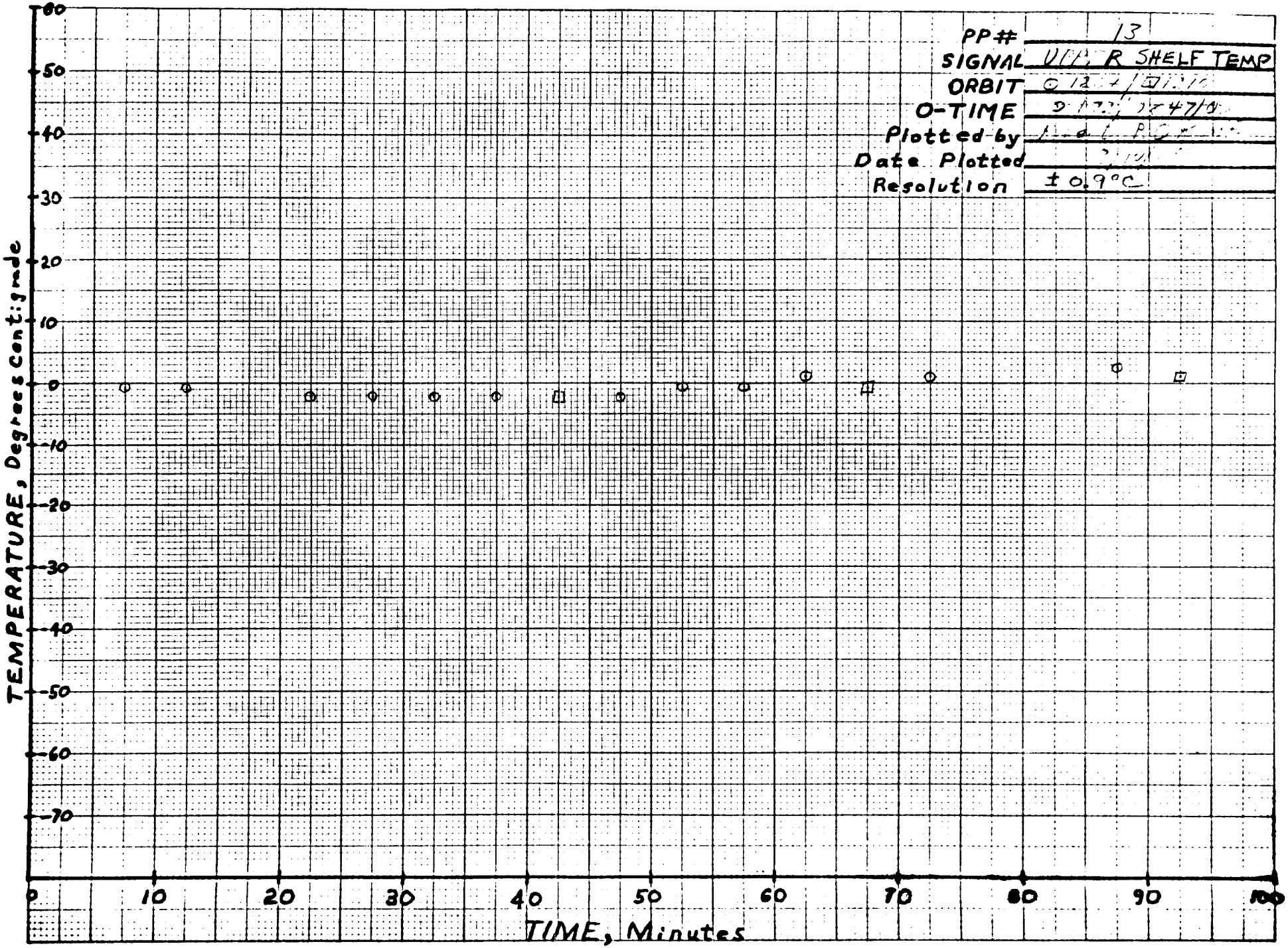
KEUFFEL & ESSER CO.



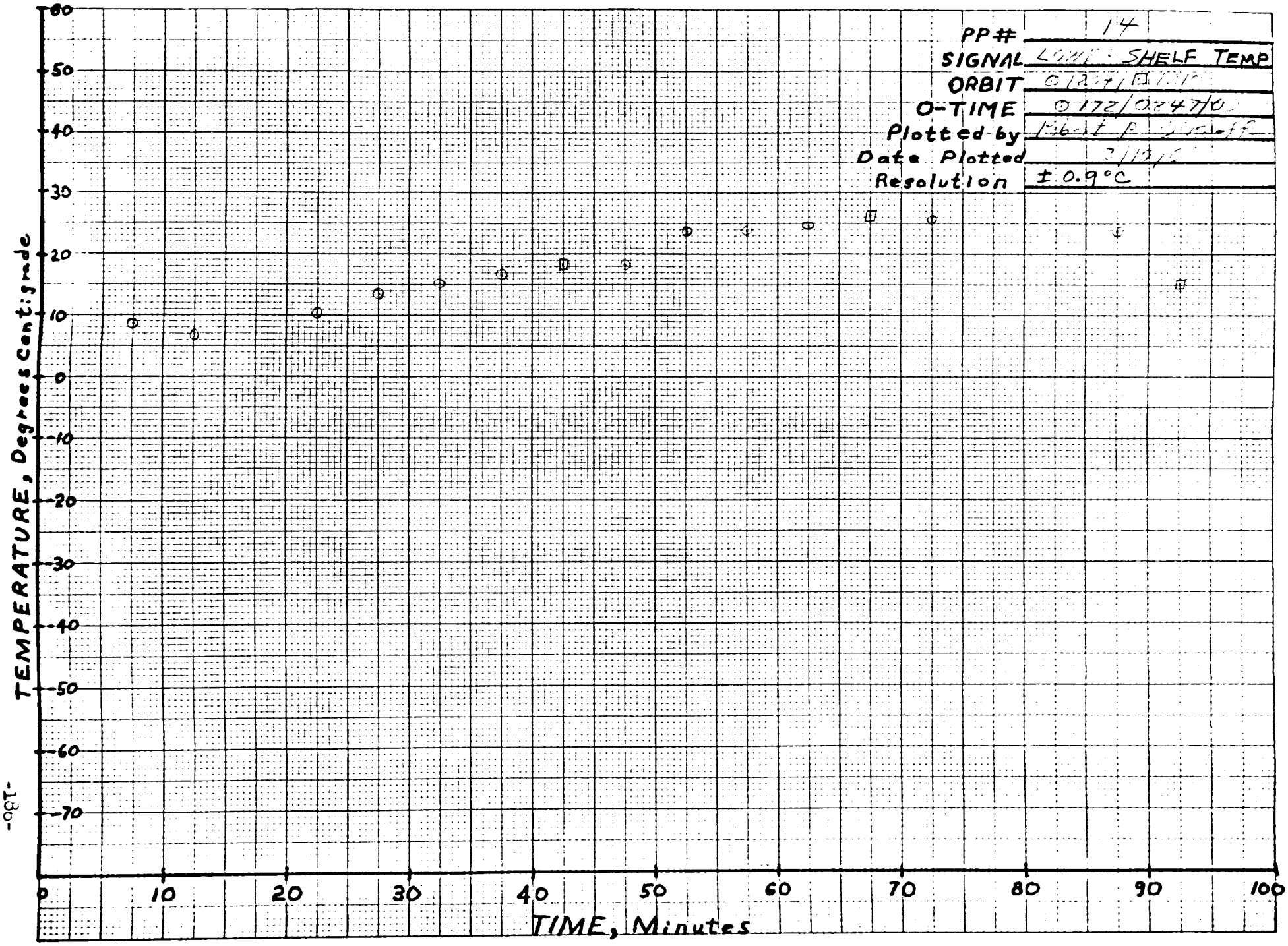
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



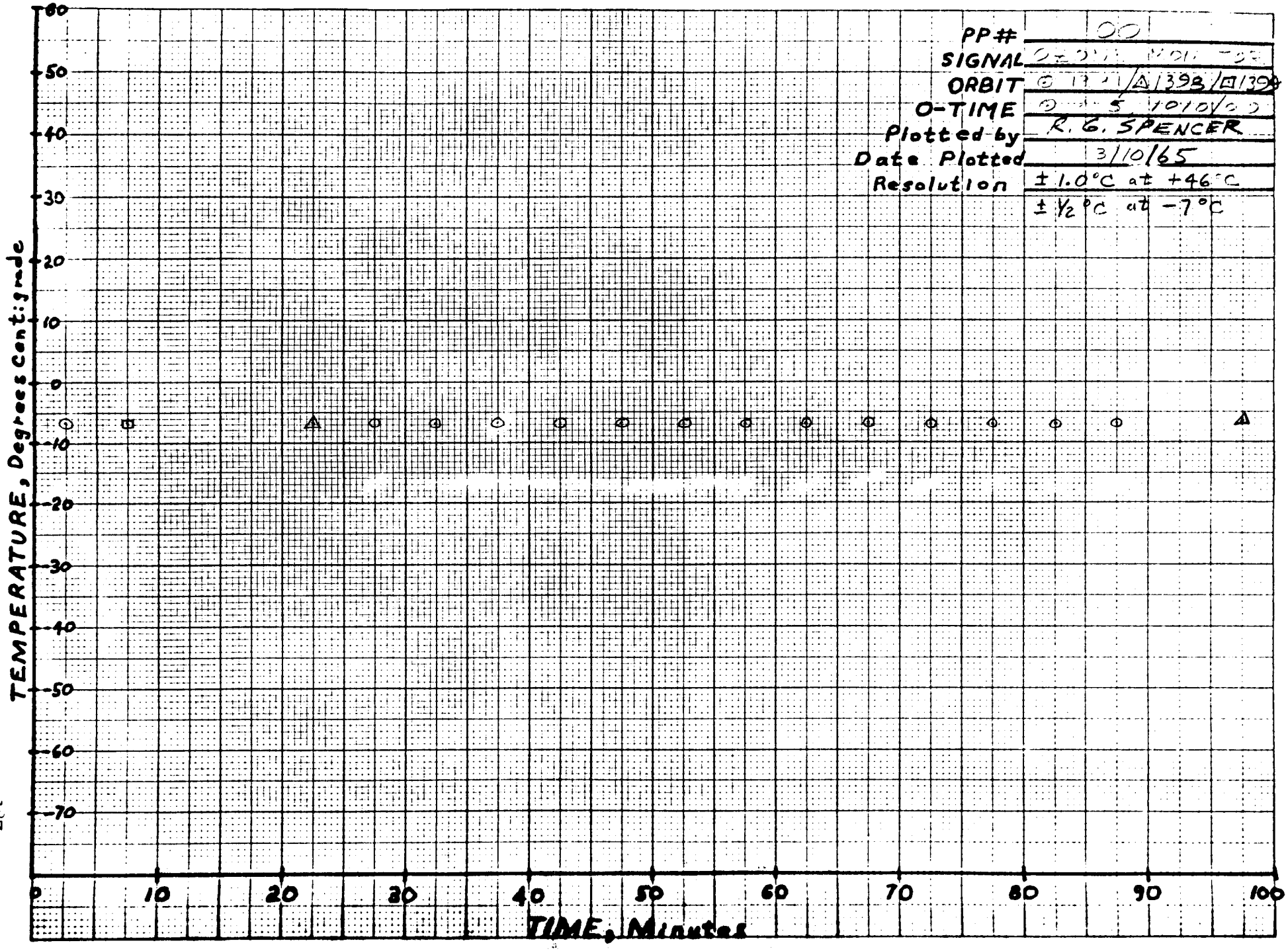
KEUFFEL & ESSER CO.



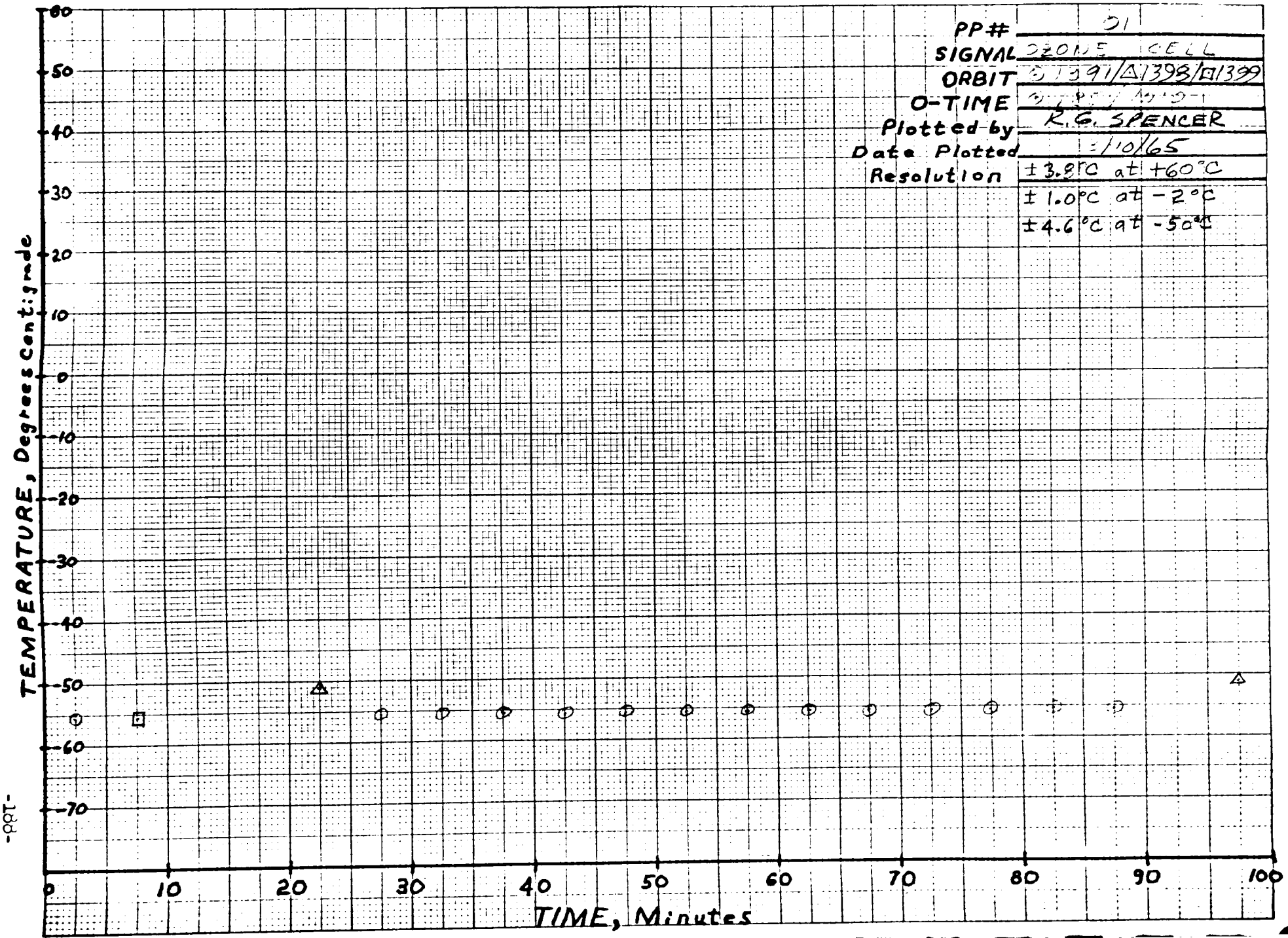
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



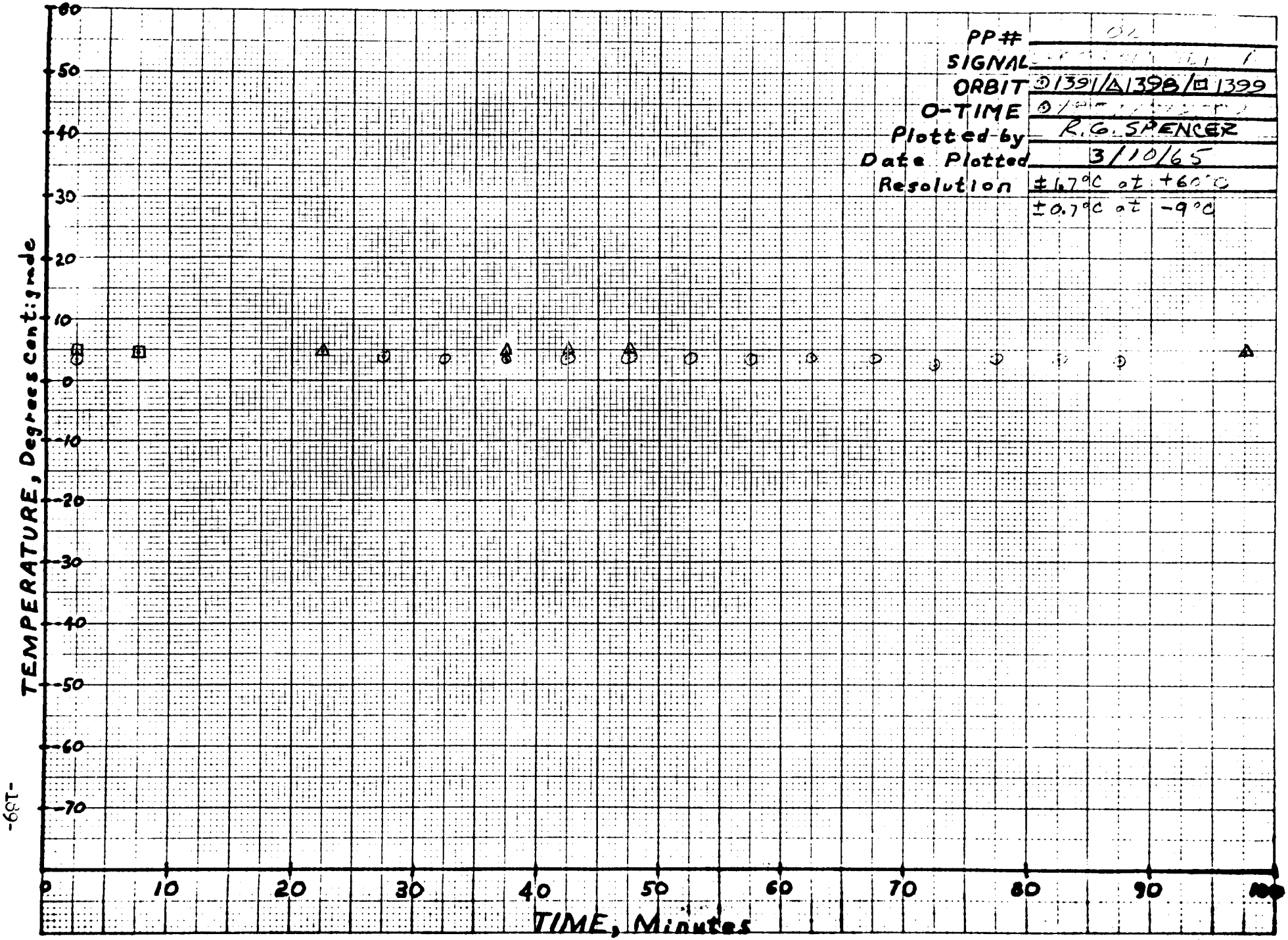
KEUFFEL & ESSER CO.



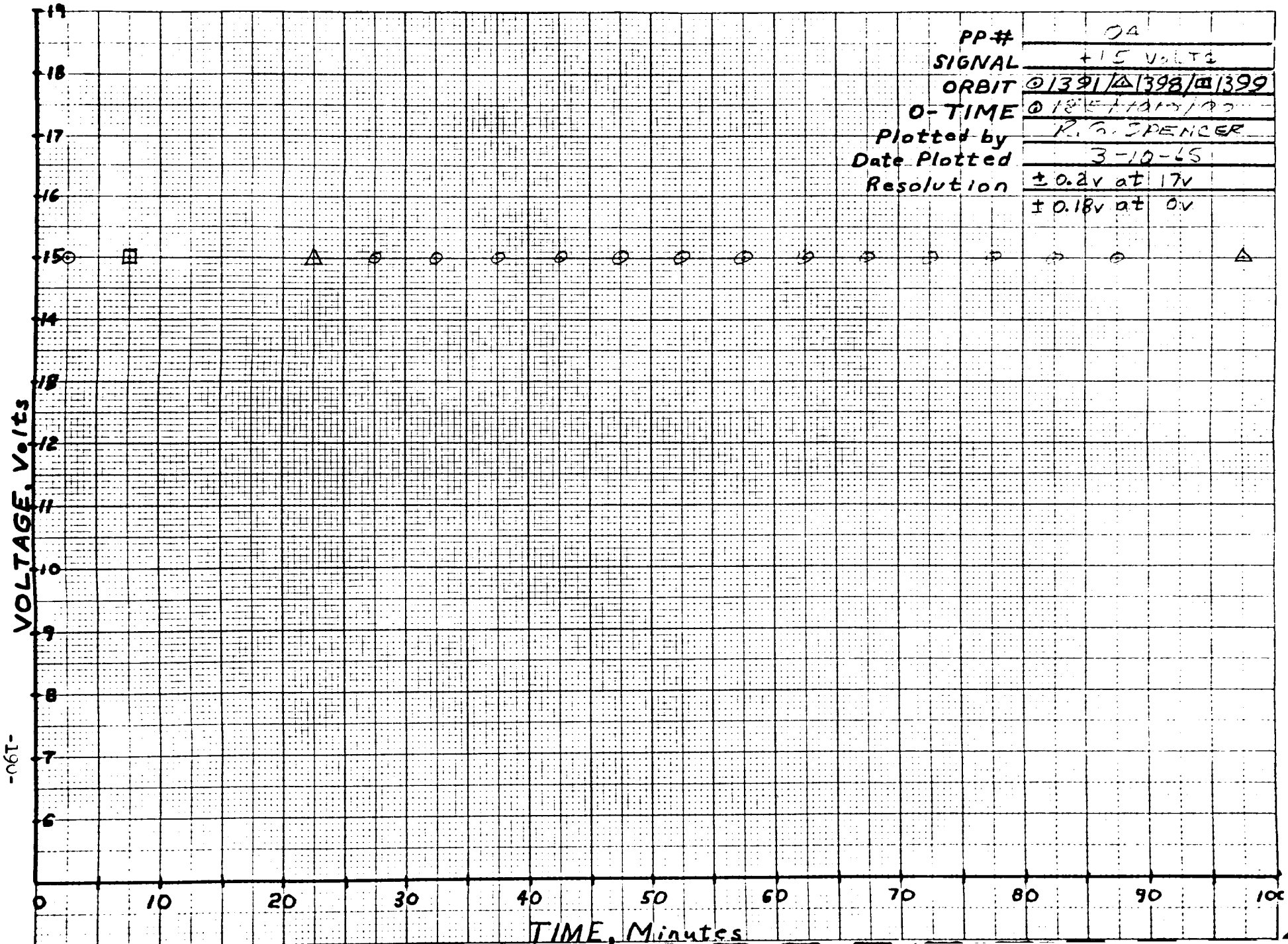
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



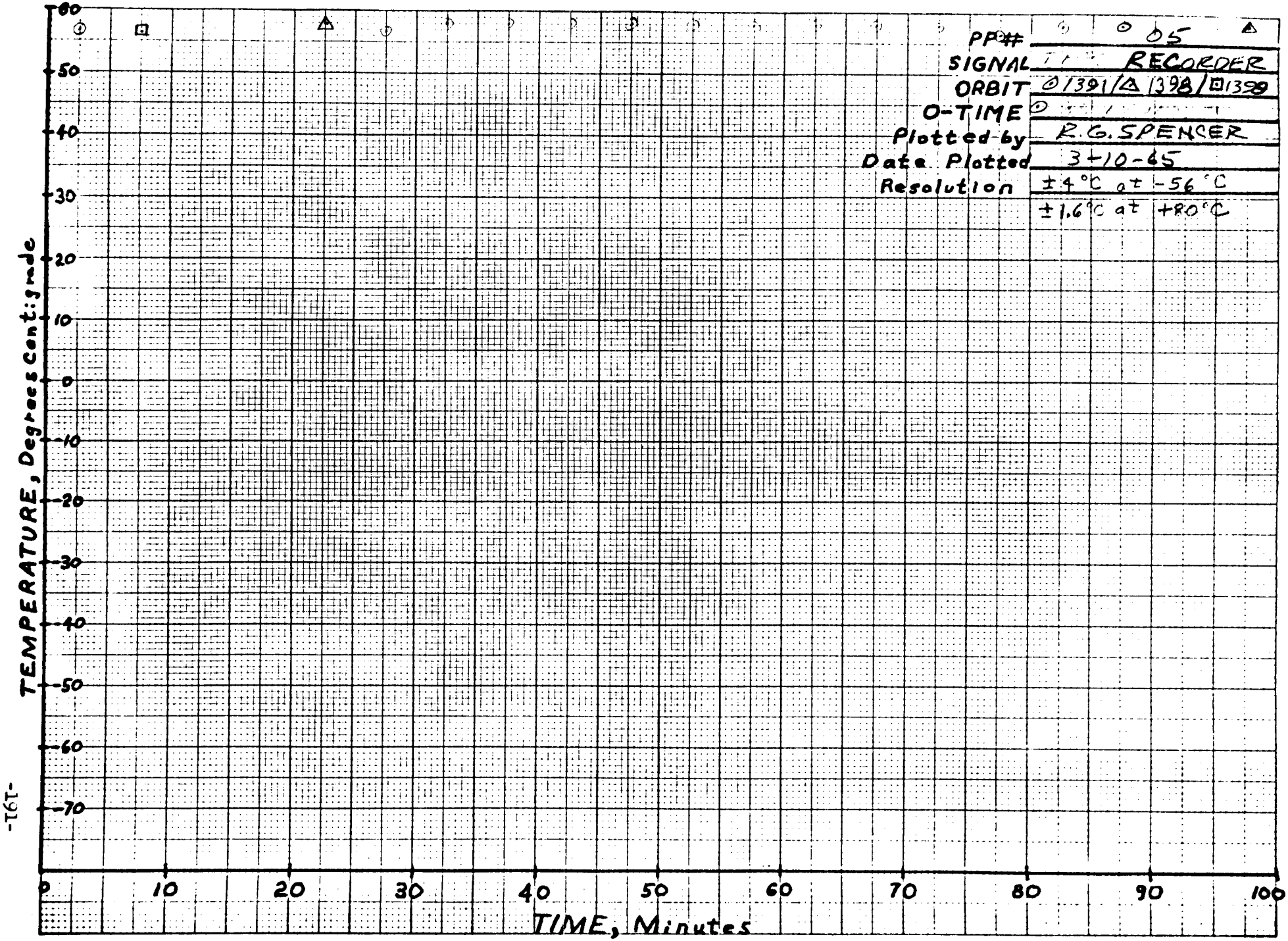
KEUFFEL & ESSER CO.



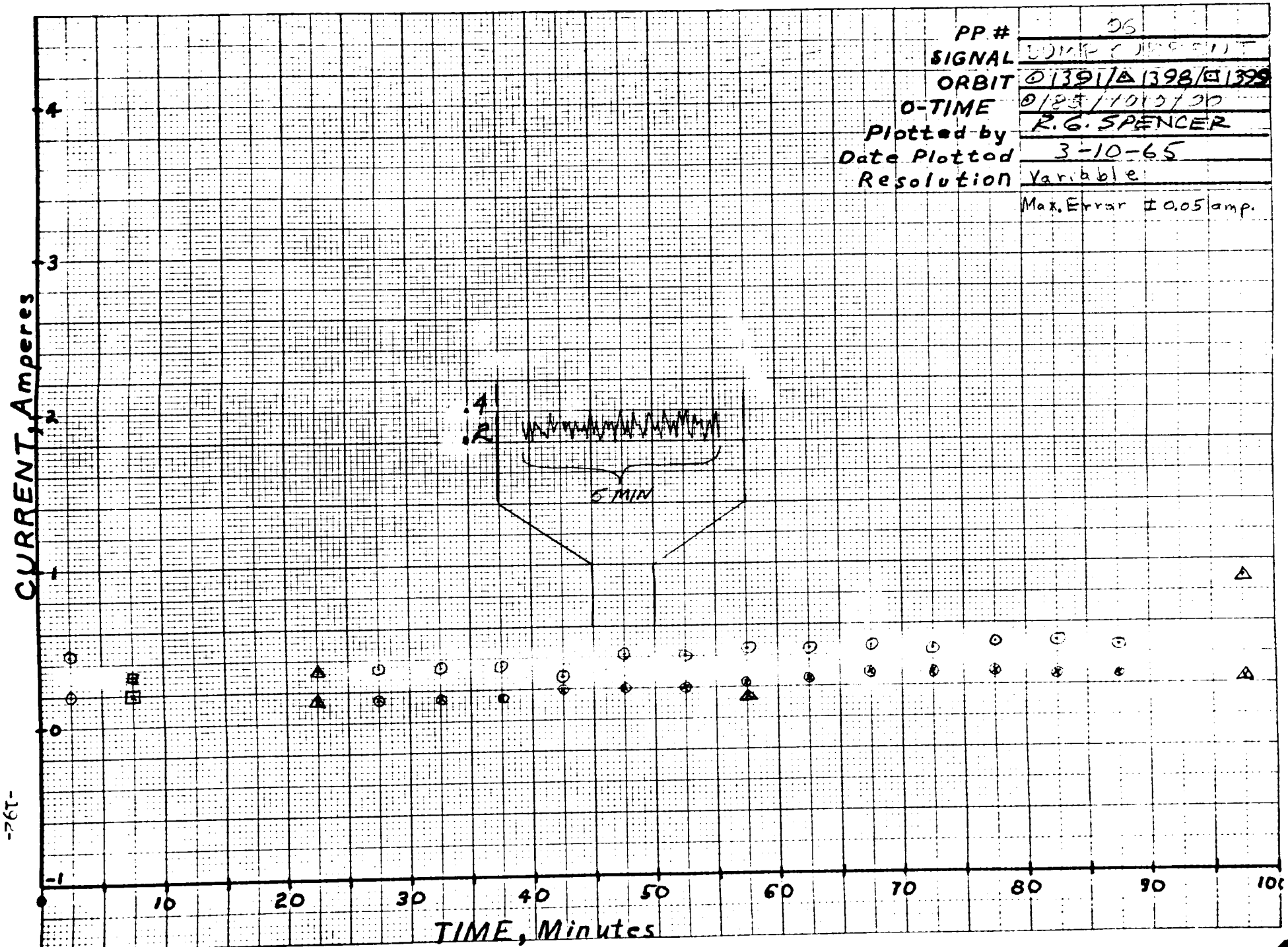
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

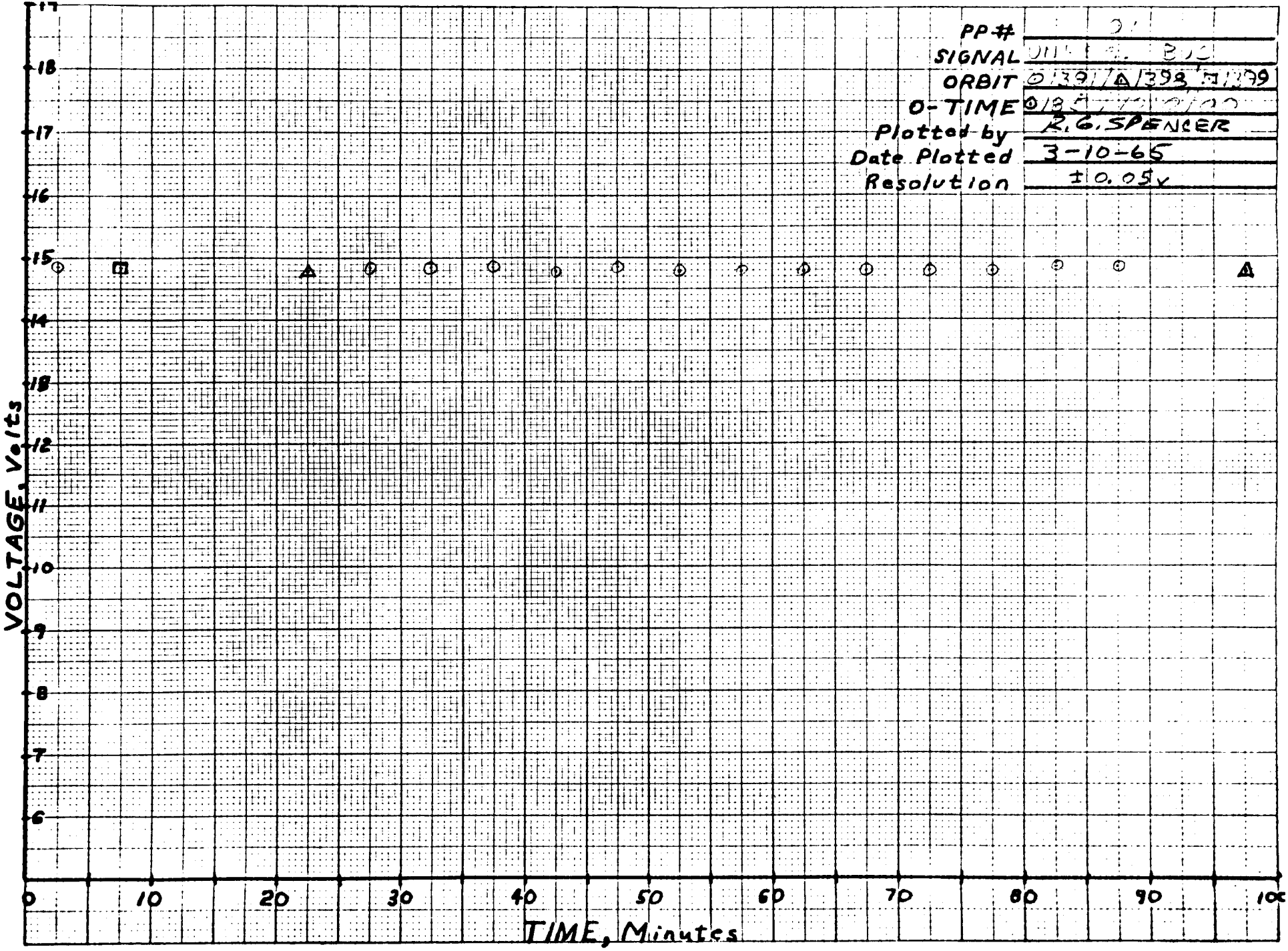


KEUFFEL & ESSER CO.

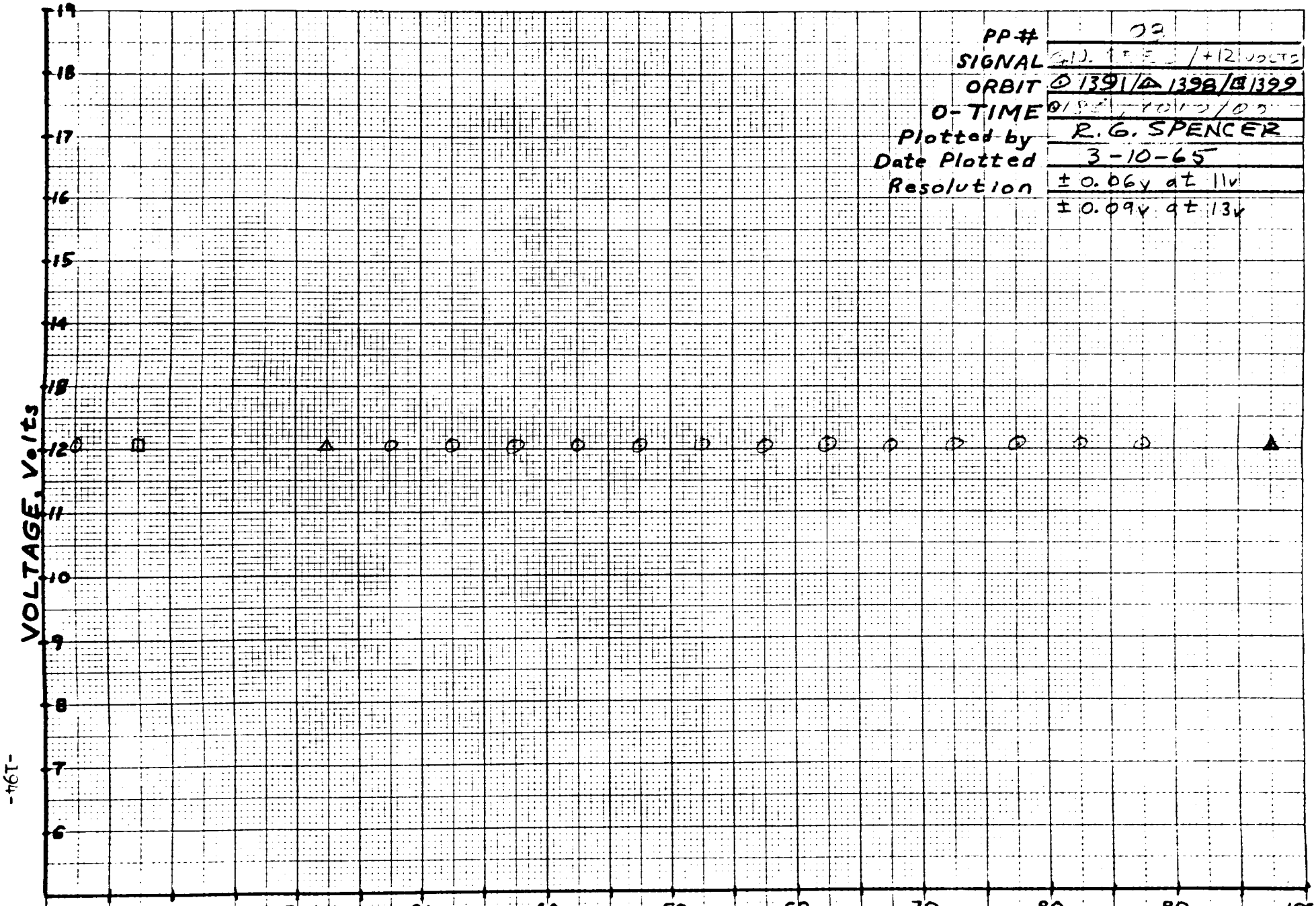


K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

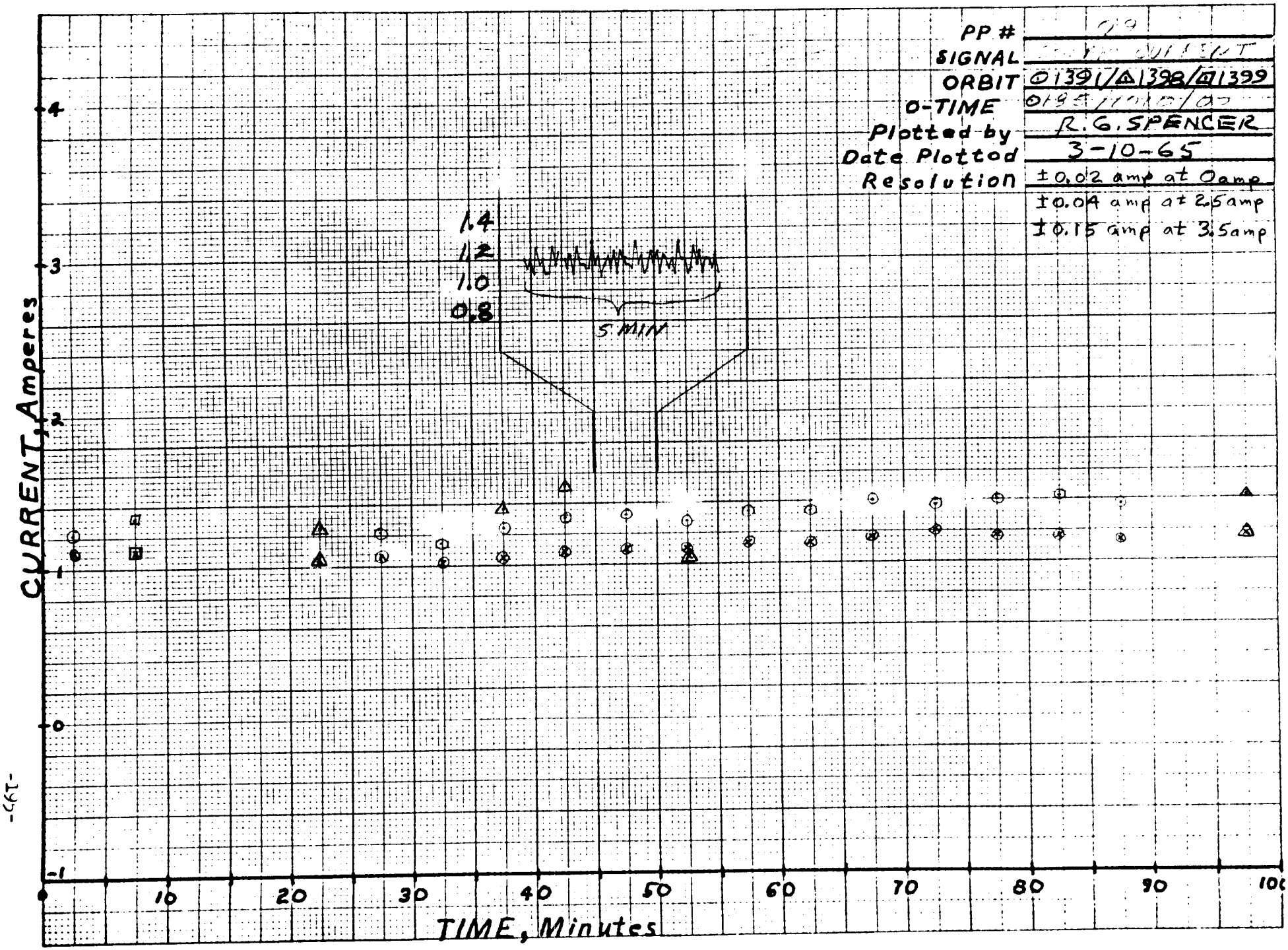



PP #
SIGNAL
ORBIT
O-TIME
Plotted by R.G. SPENCER
Date Plotted 3-10-65
Resolution ±0.05v
VOLTAGE, Volts
17
18
17
16
15
14
13
12
11
10
9
8
7
6
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

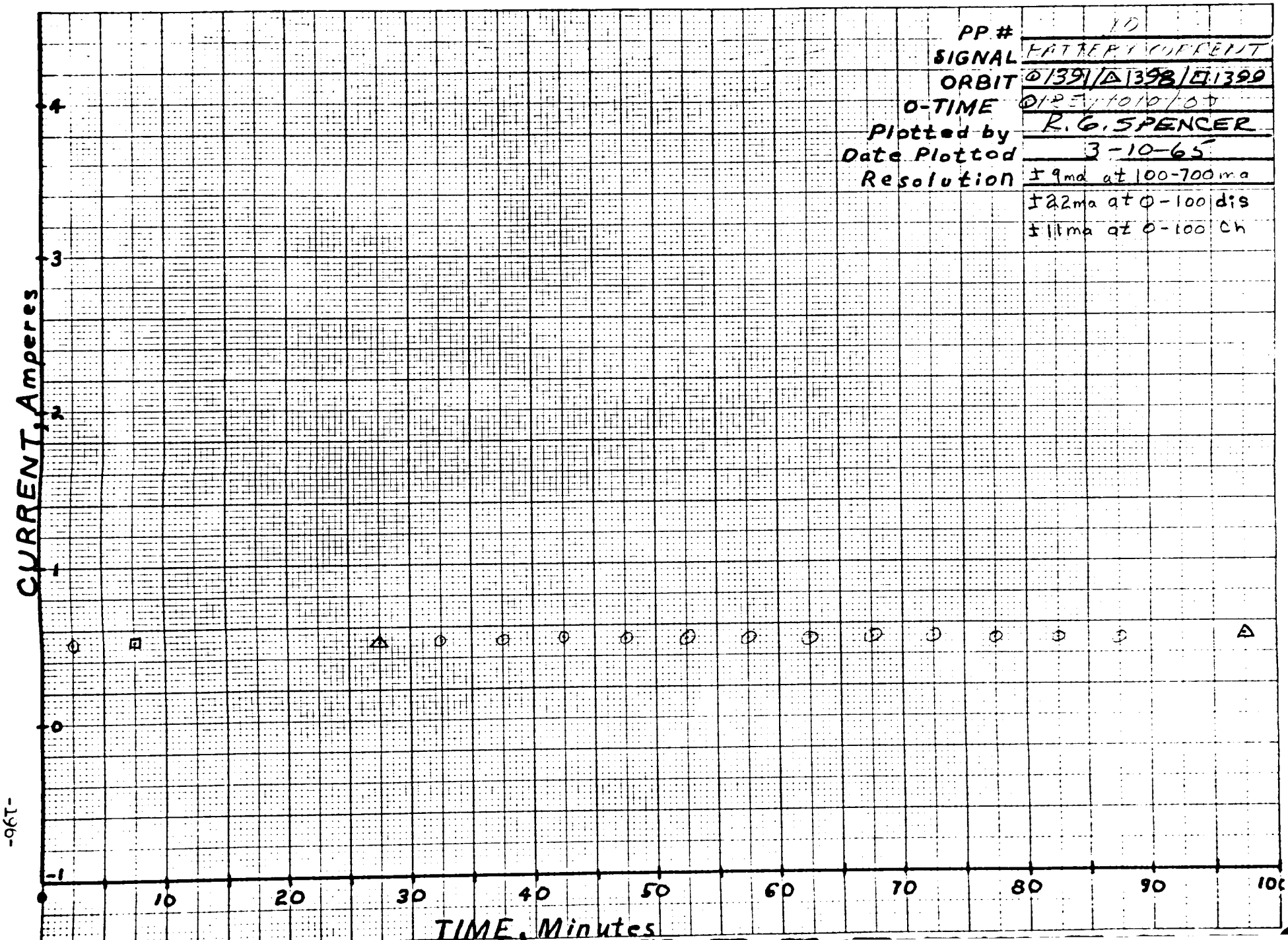
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



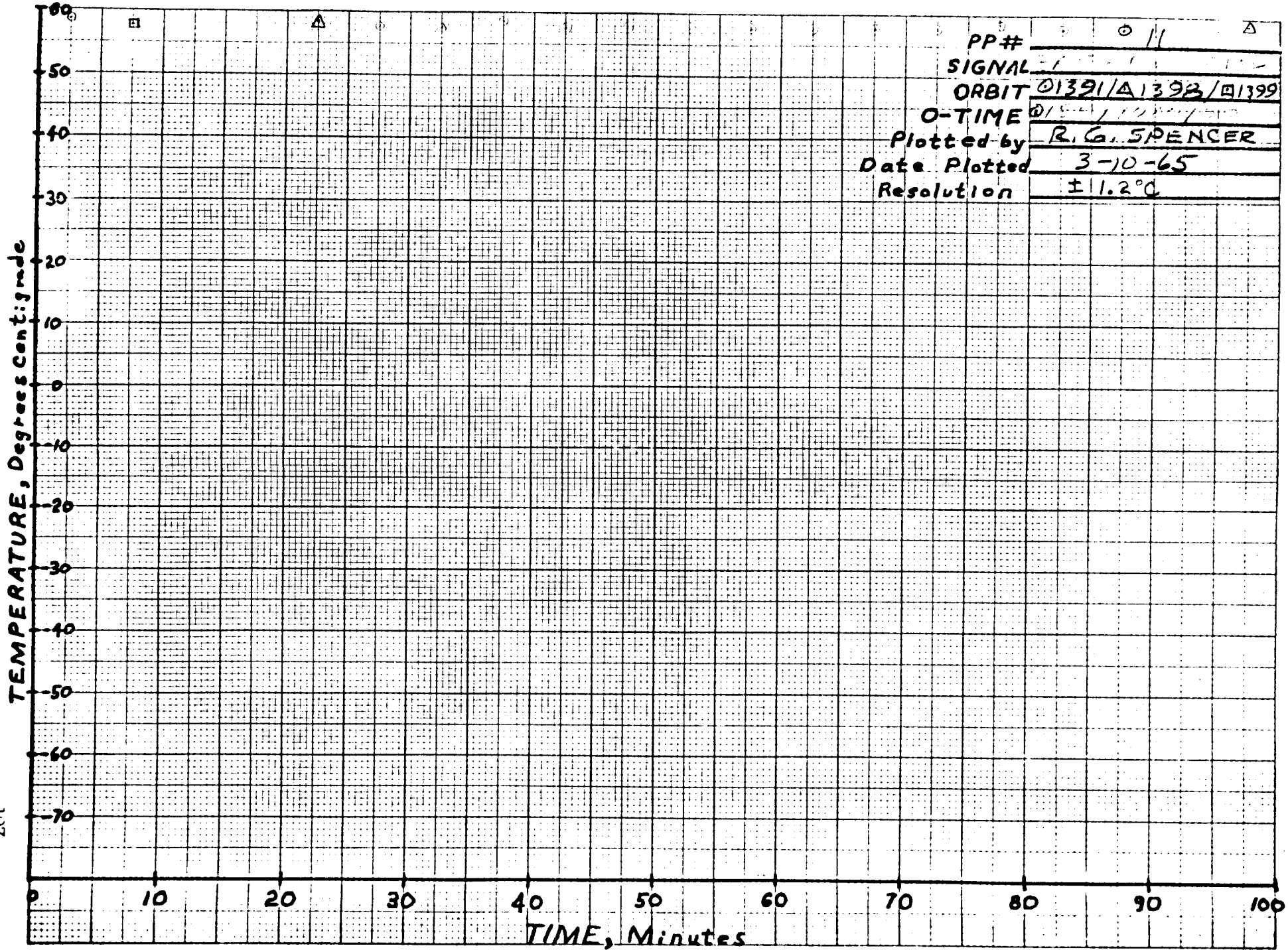
KEUFFEL & ESSER CO.



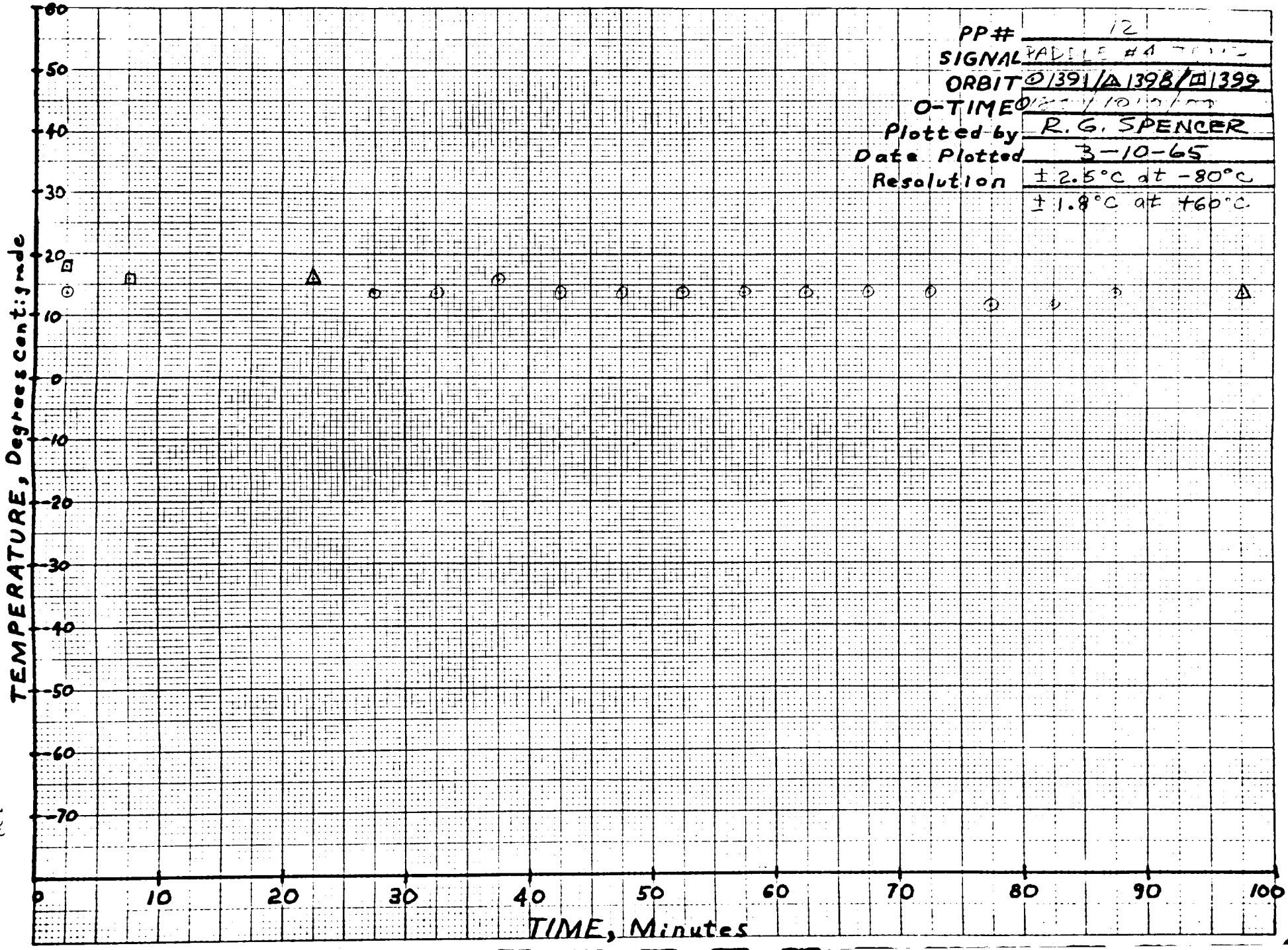
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



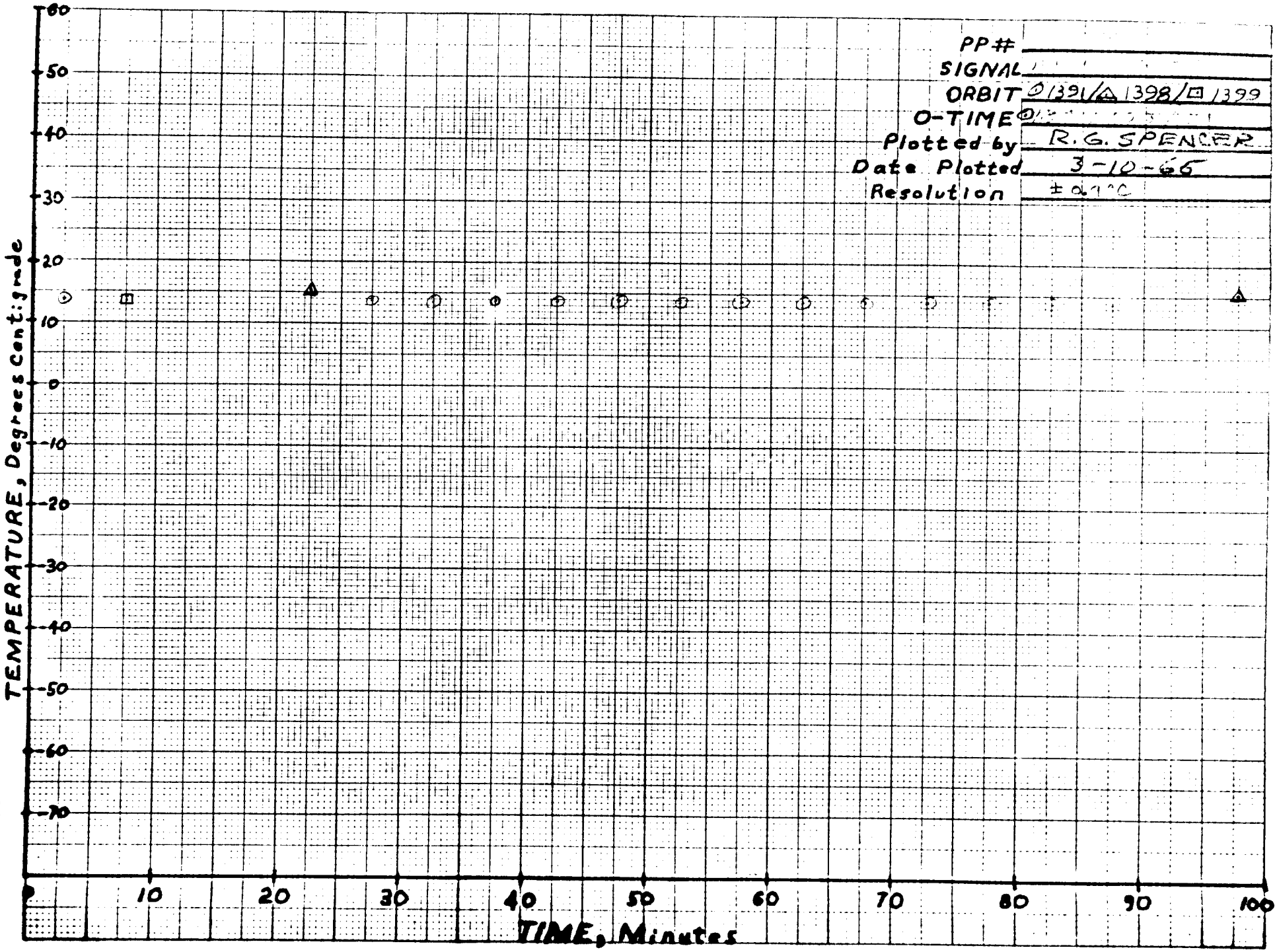
KEUFFEL & ESSER CO.



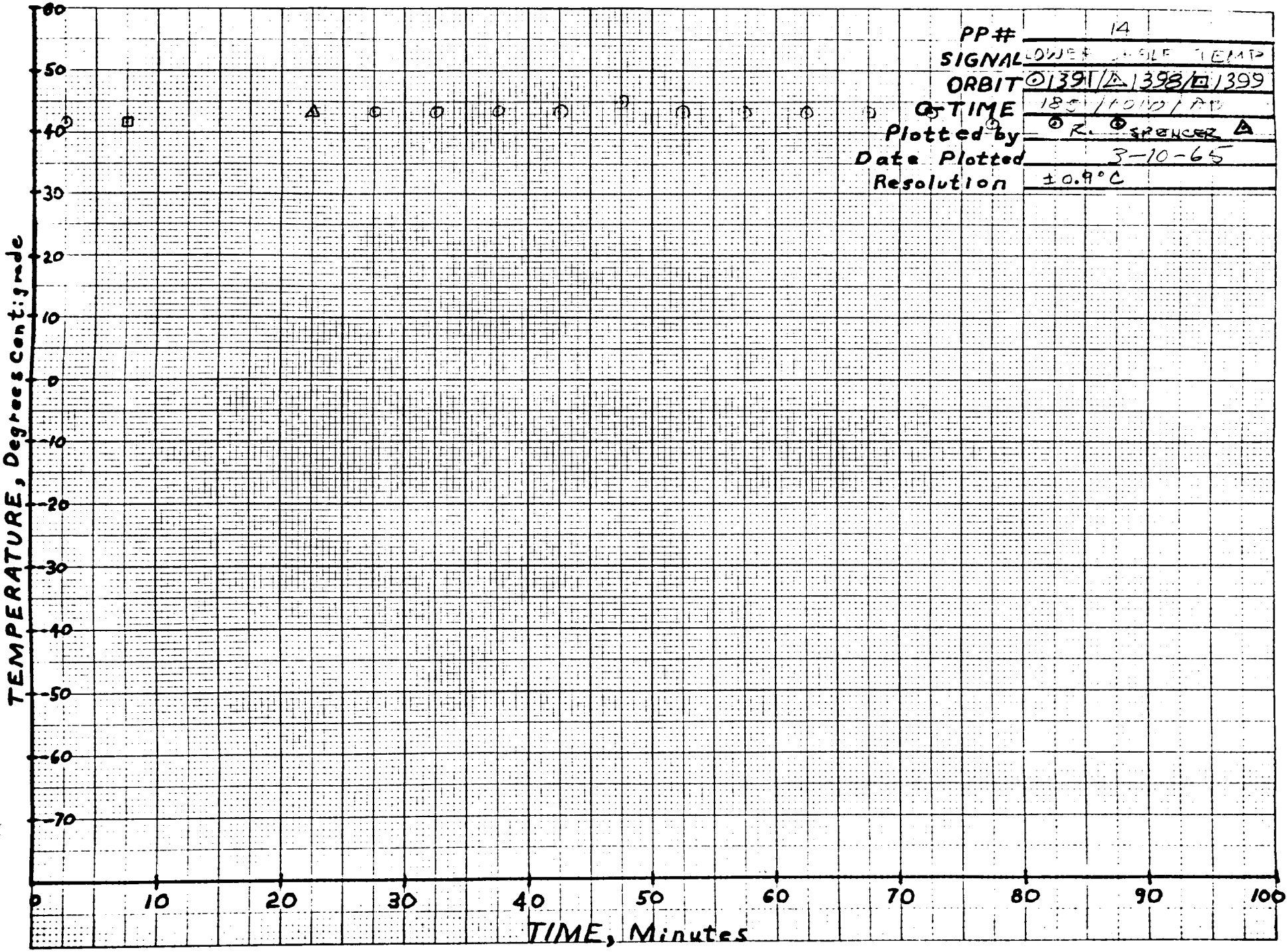
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



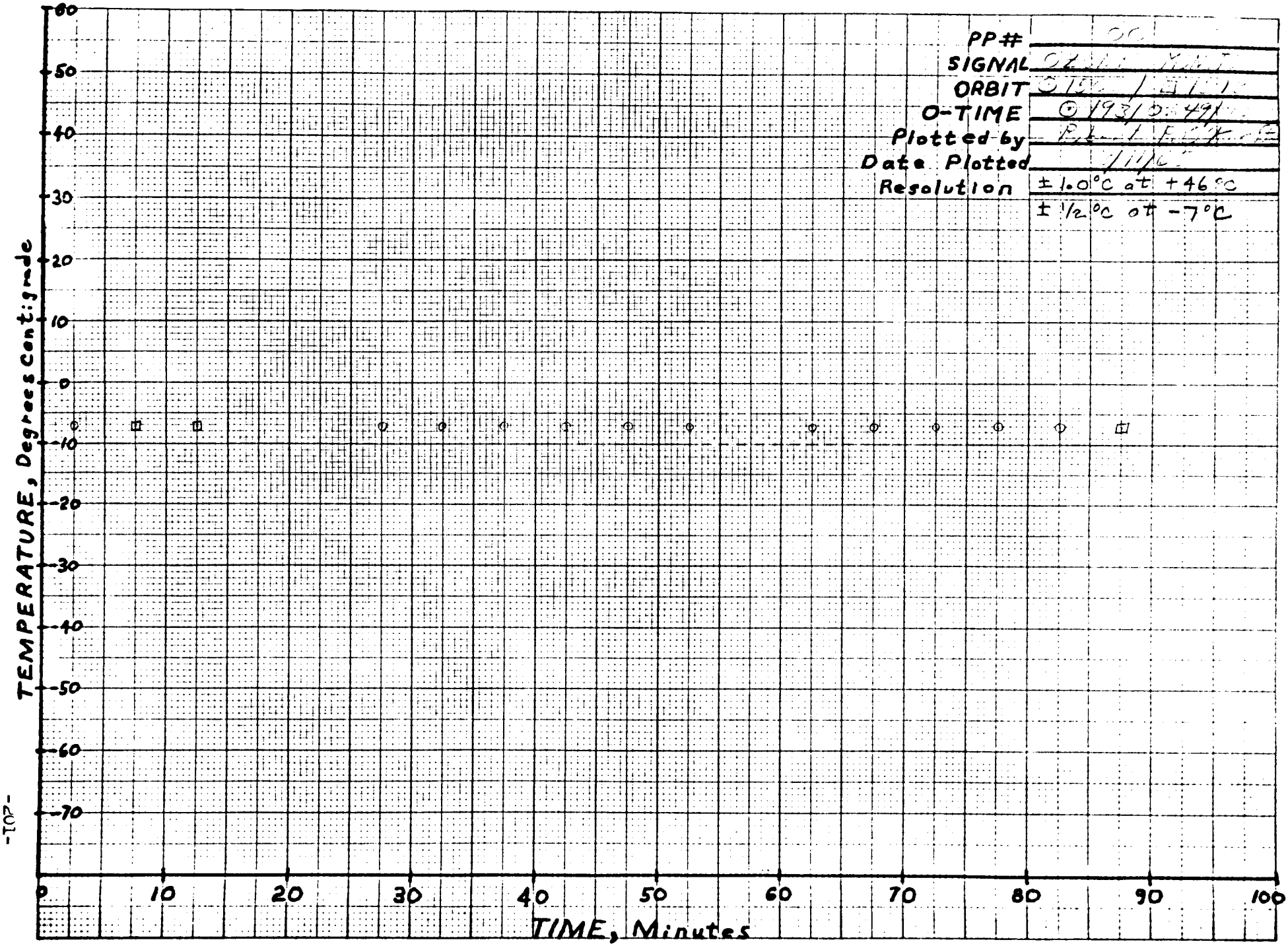
KEUFFEL & ESSER CO.



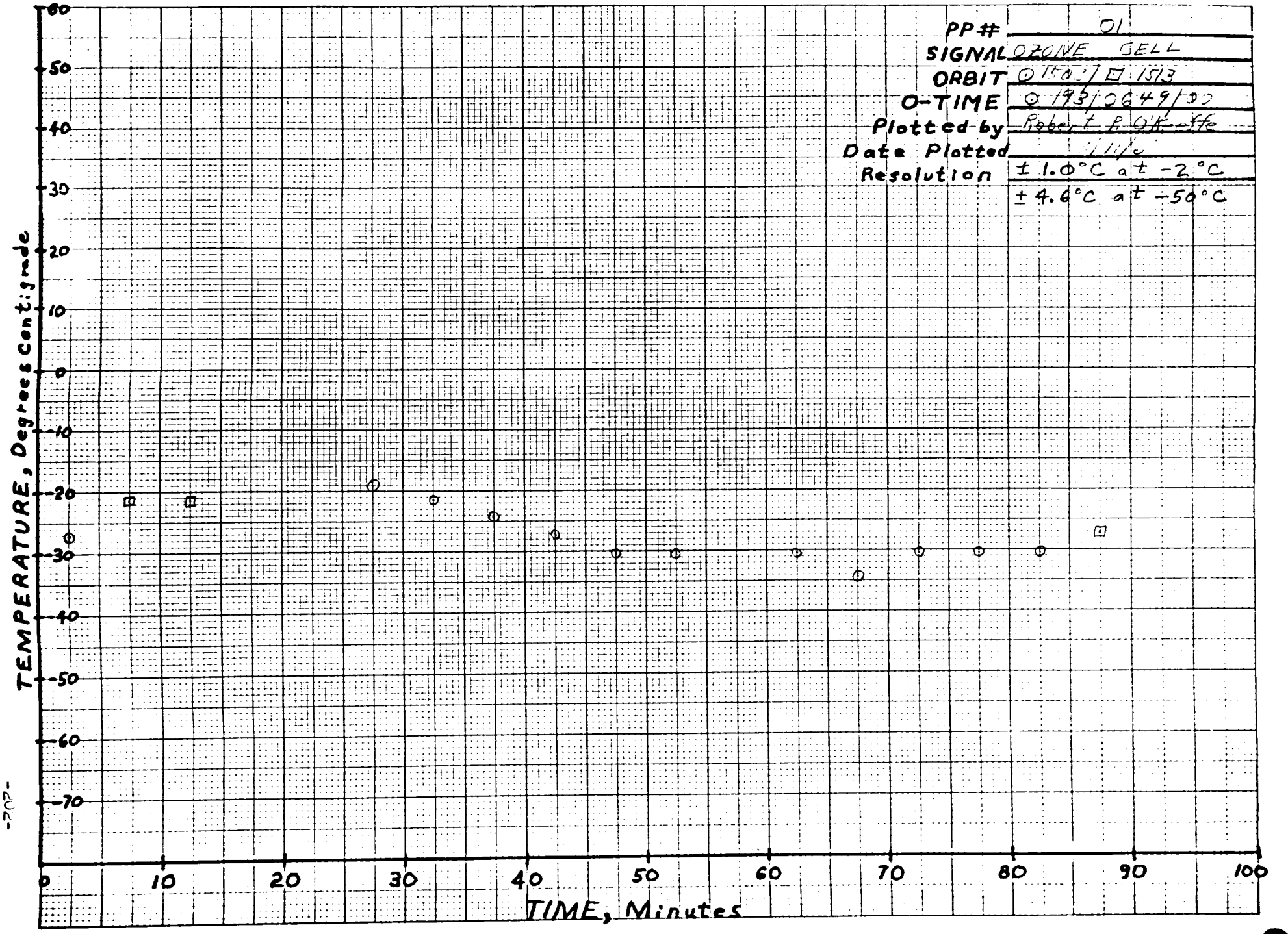
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



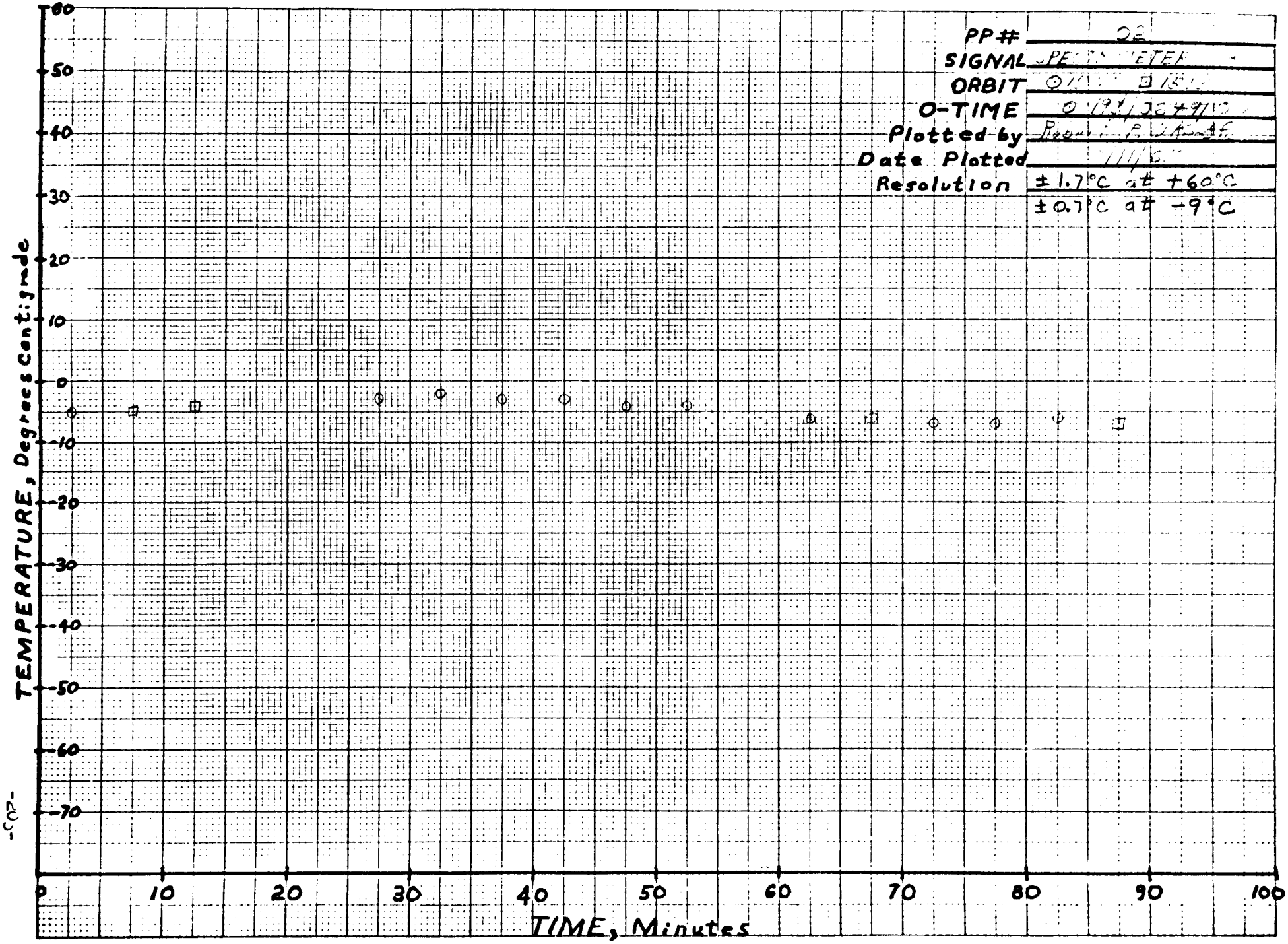
KEUFFEL & ESSER CO.



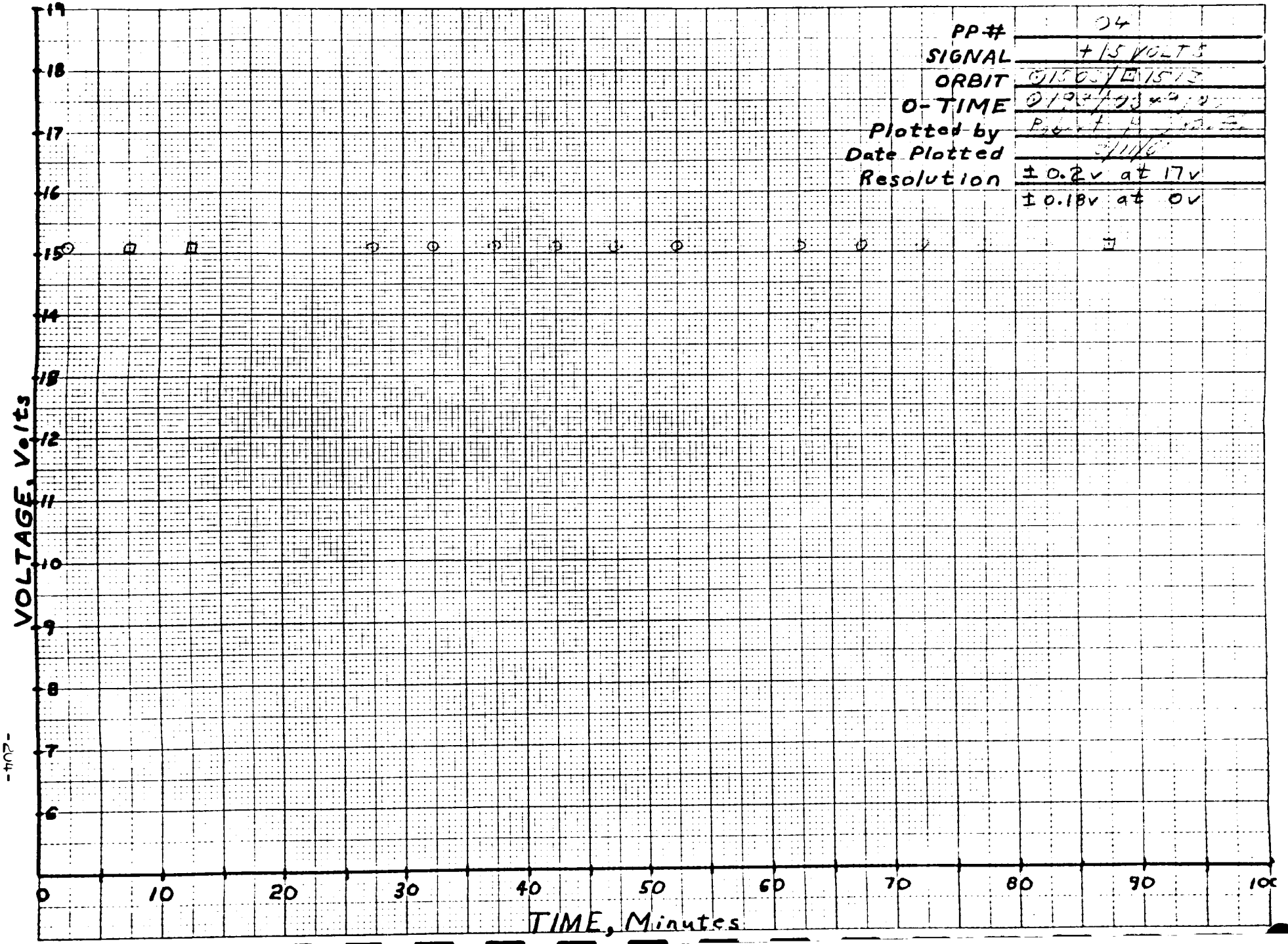
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



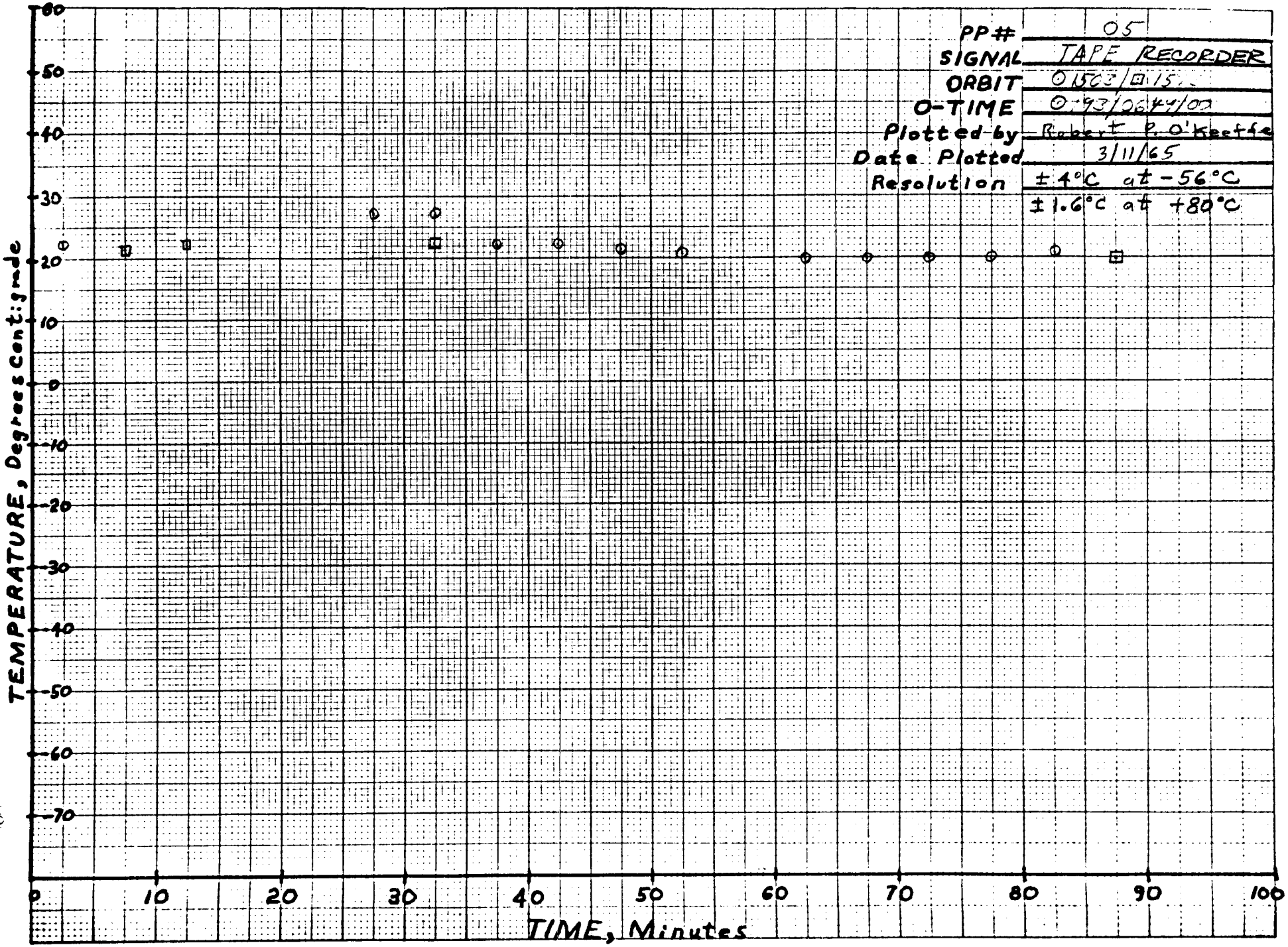
KEUFFEL & ESSER CO.



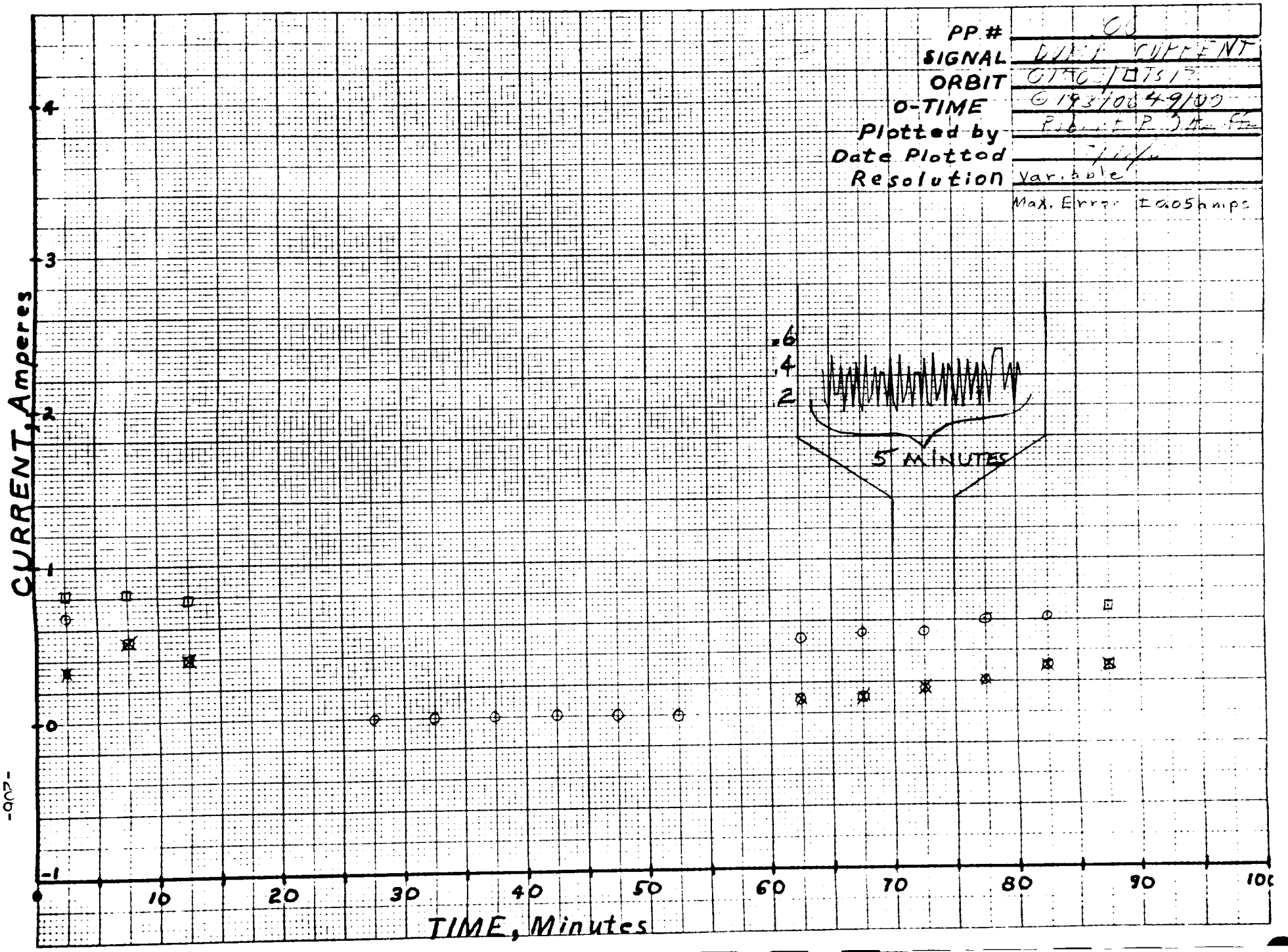
K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



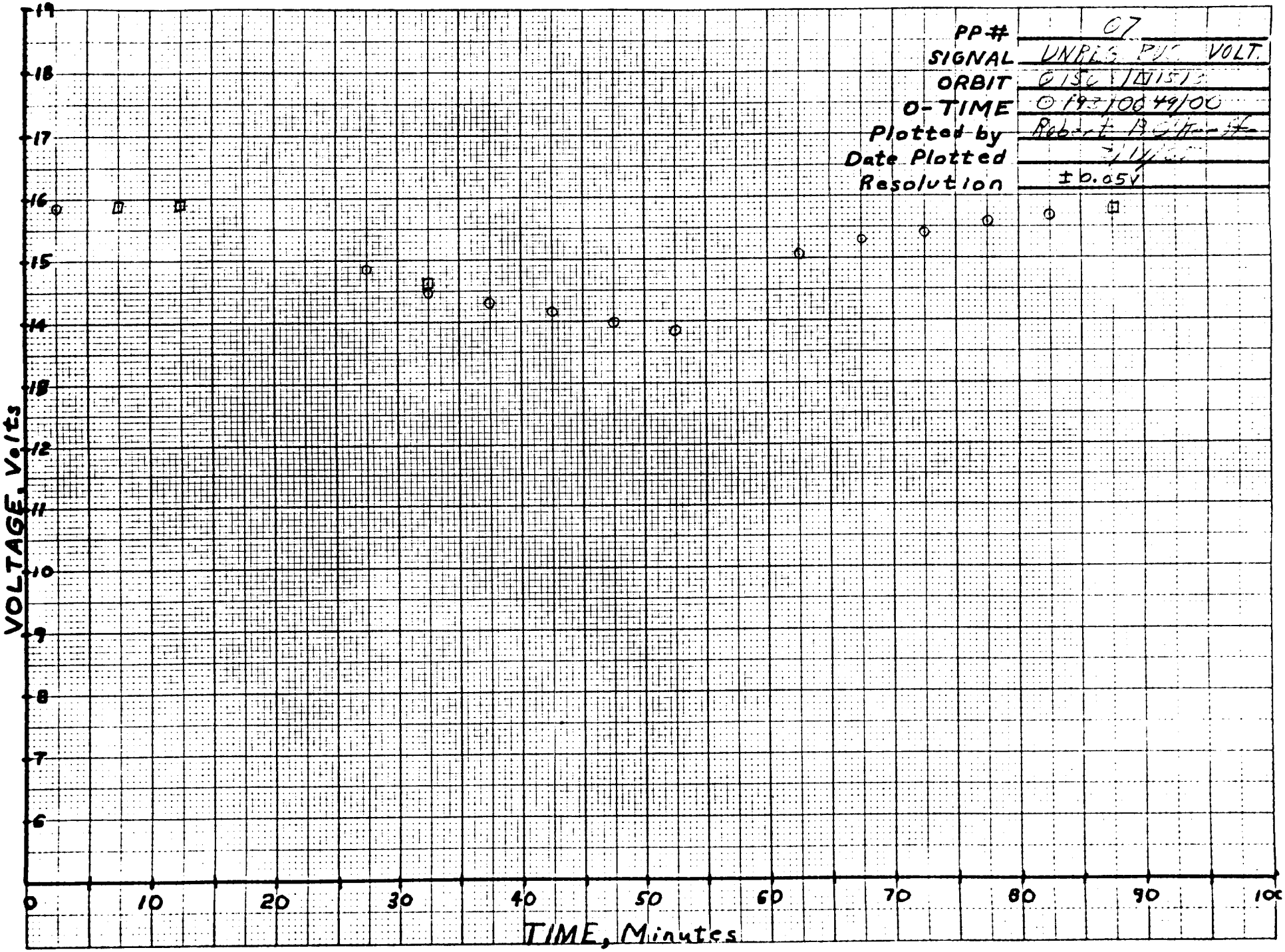
KEUFFEL & ESSER CO.



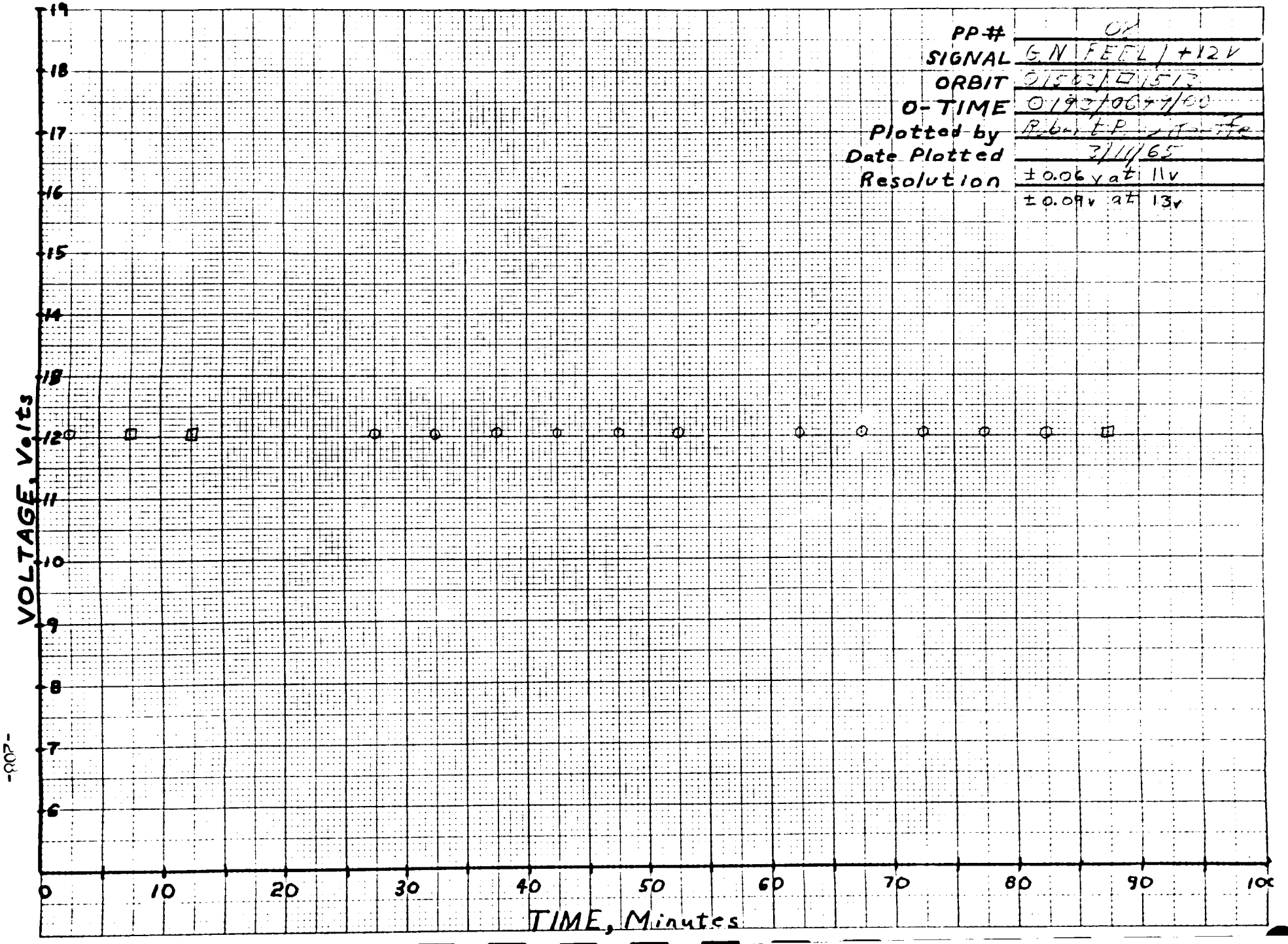
10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



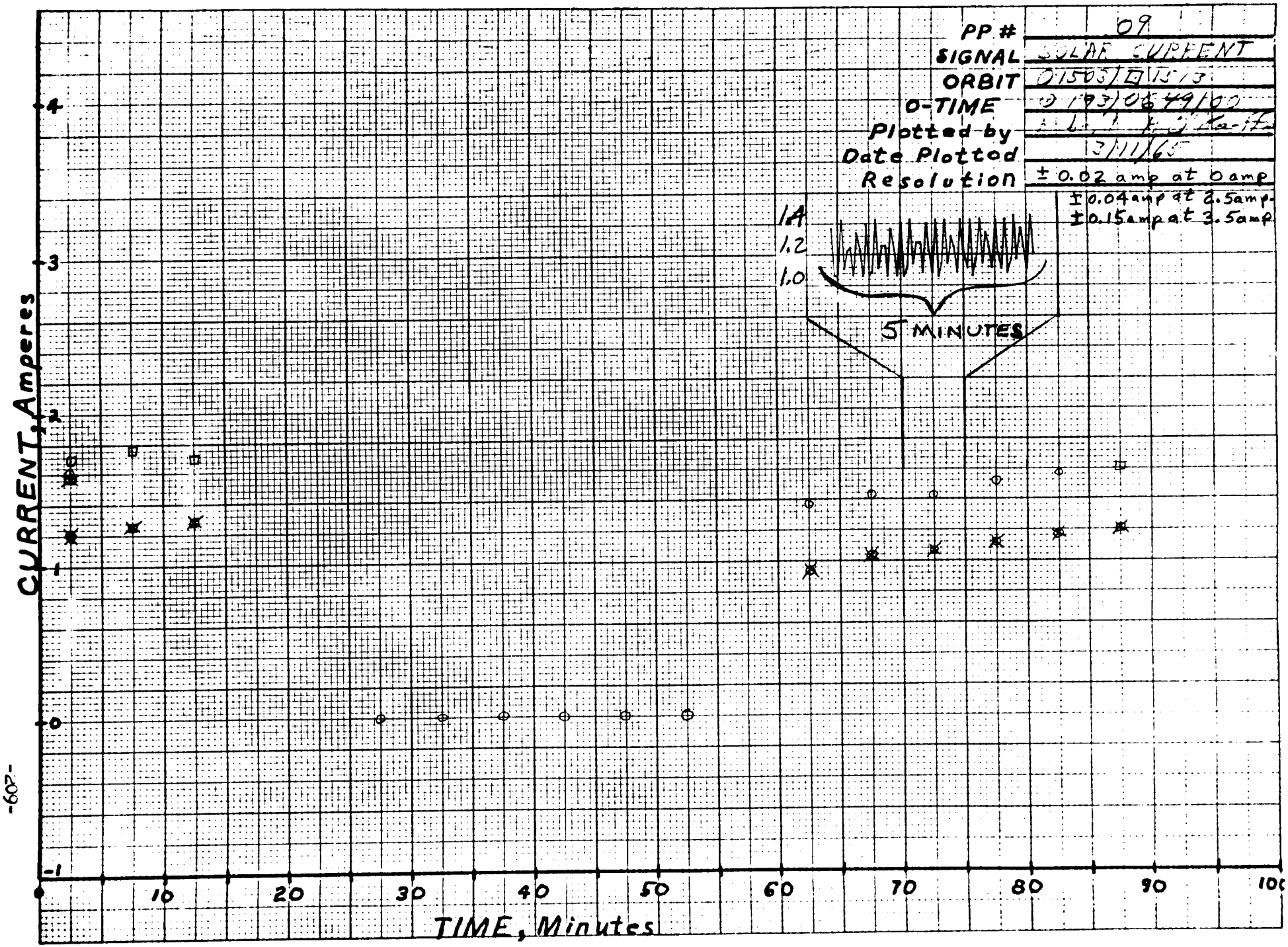
K+E 10 TO CM 472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



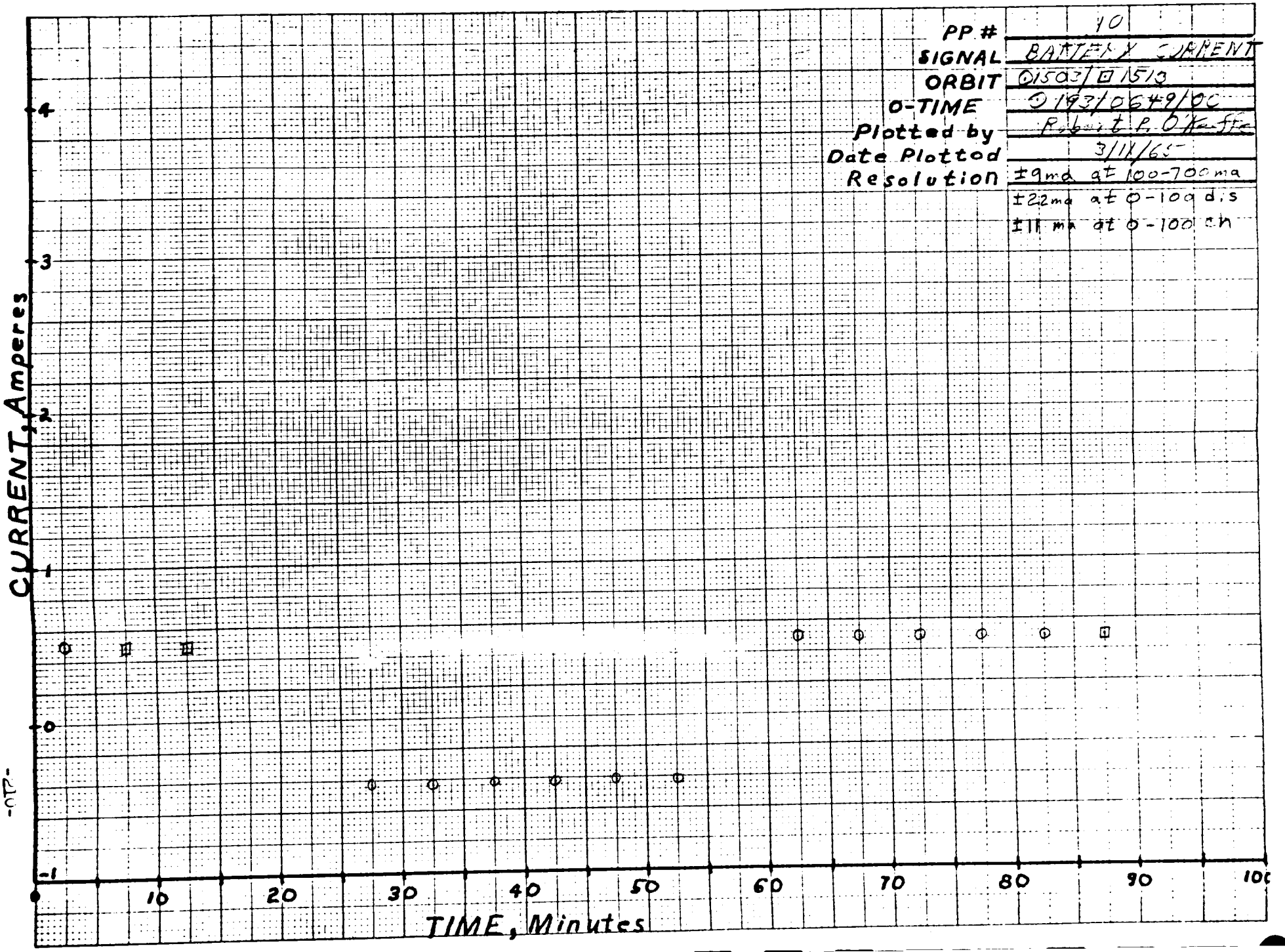
K&E 10 X 10 TO 1/2 INCH 46 1472
7 X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



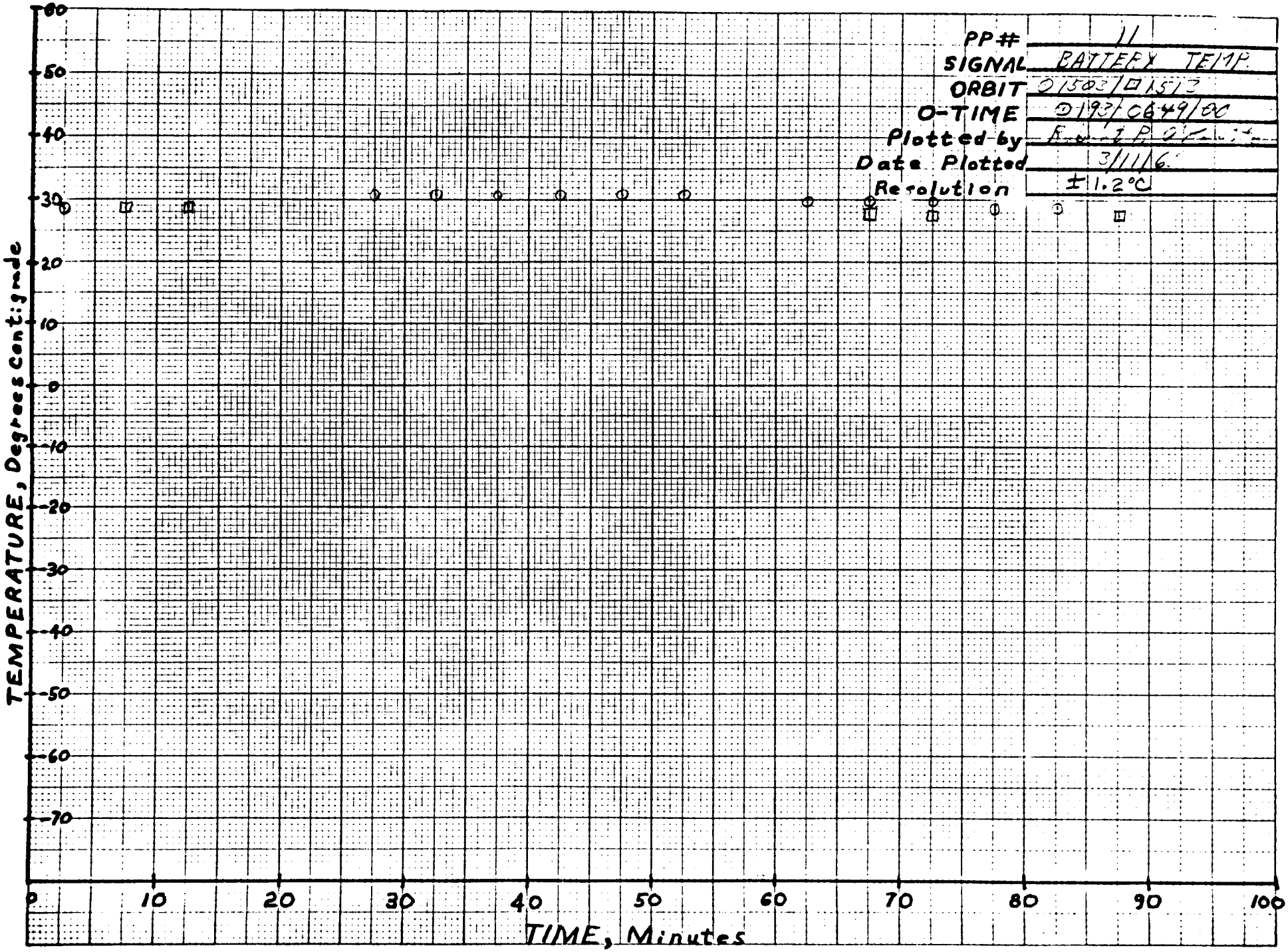
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



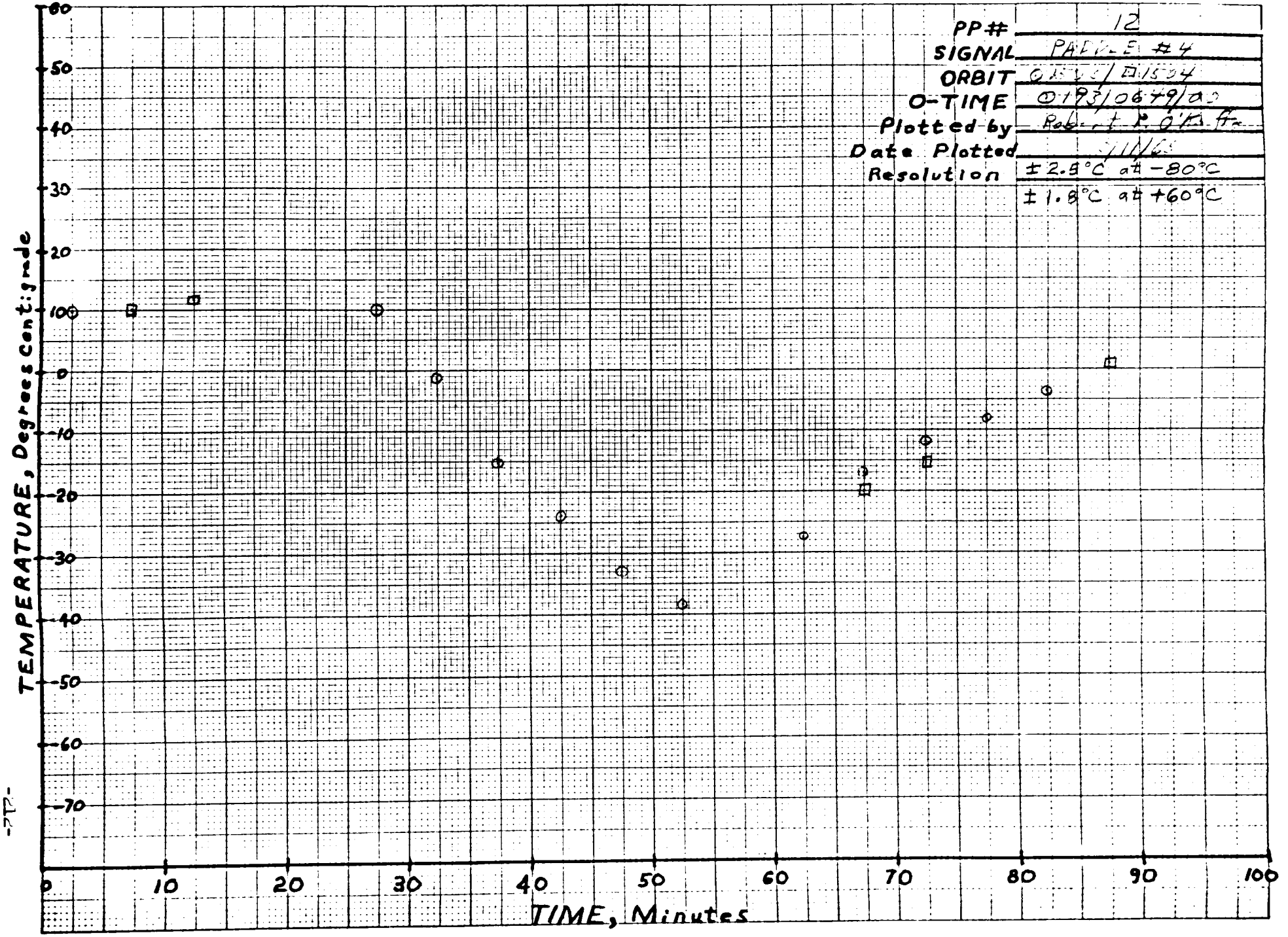
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

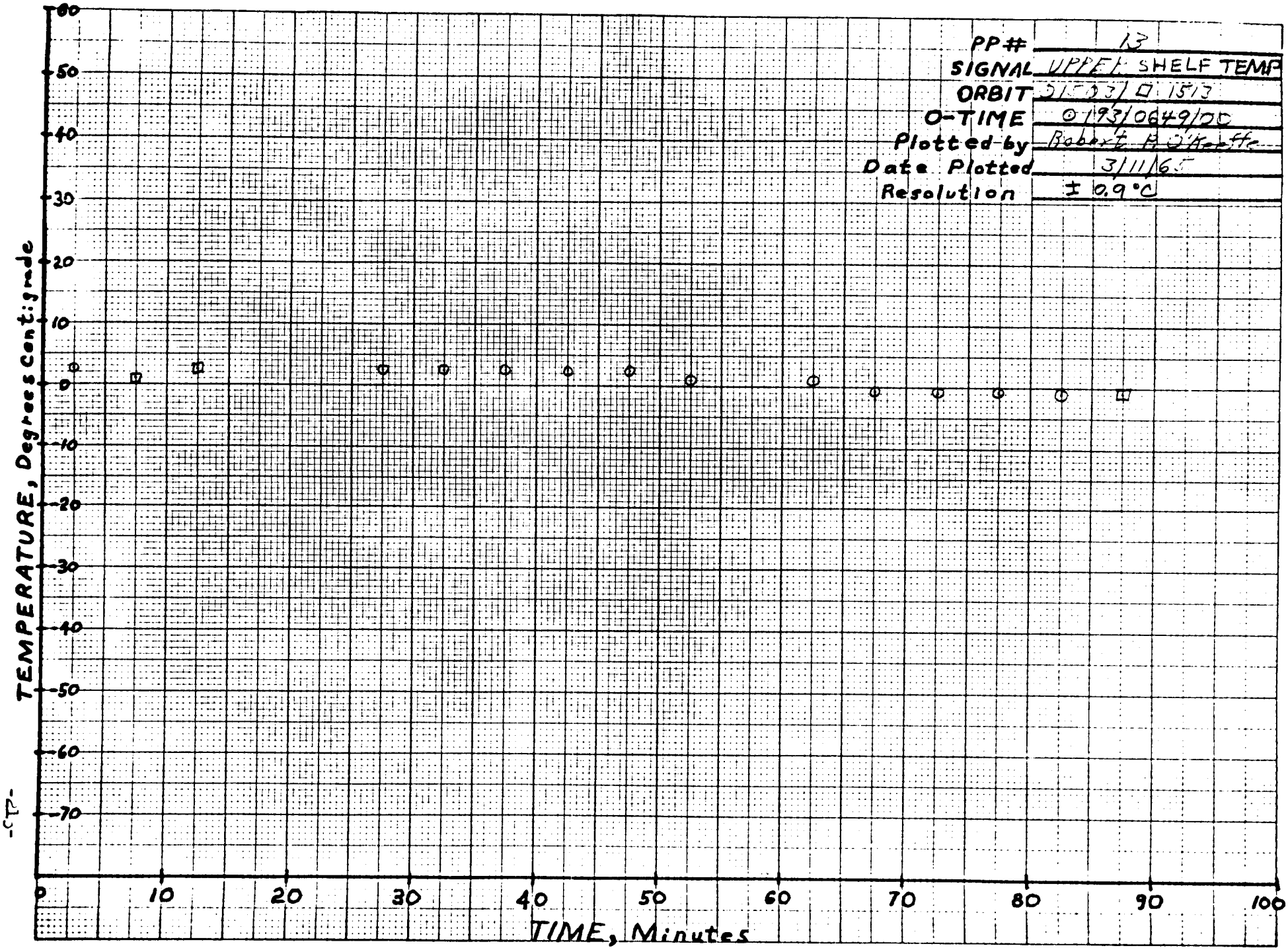


KEUFFEL & ESSER CO.

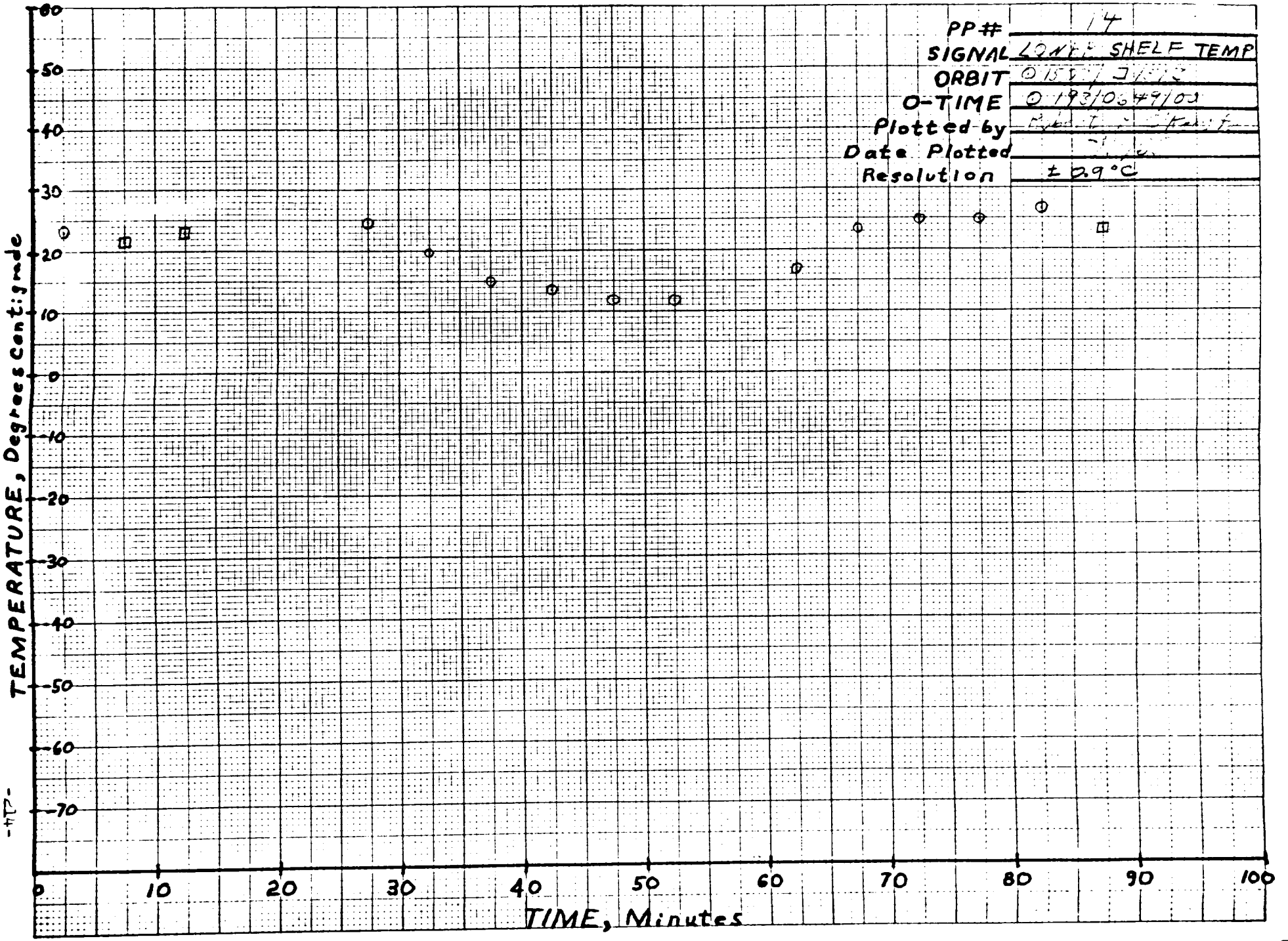


KEUFFEL & ESSER CO.

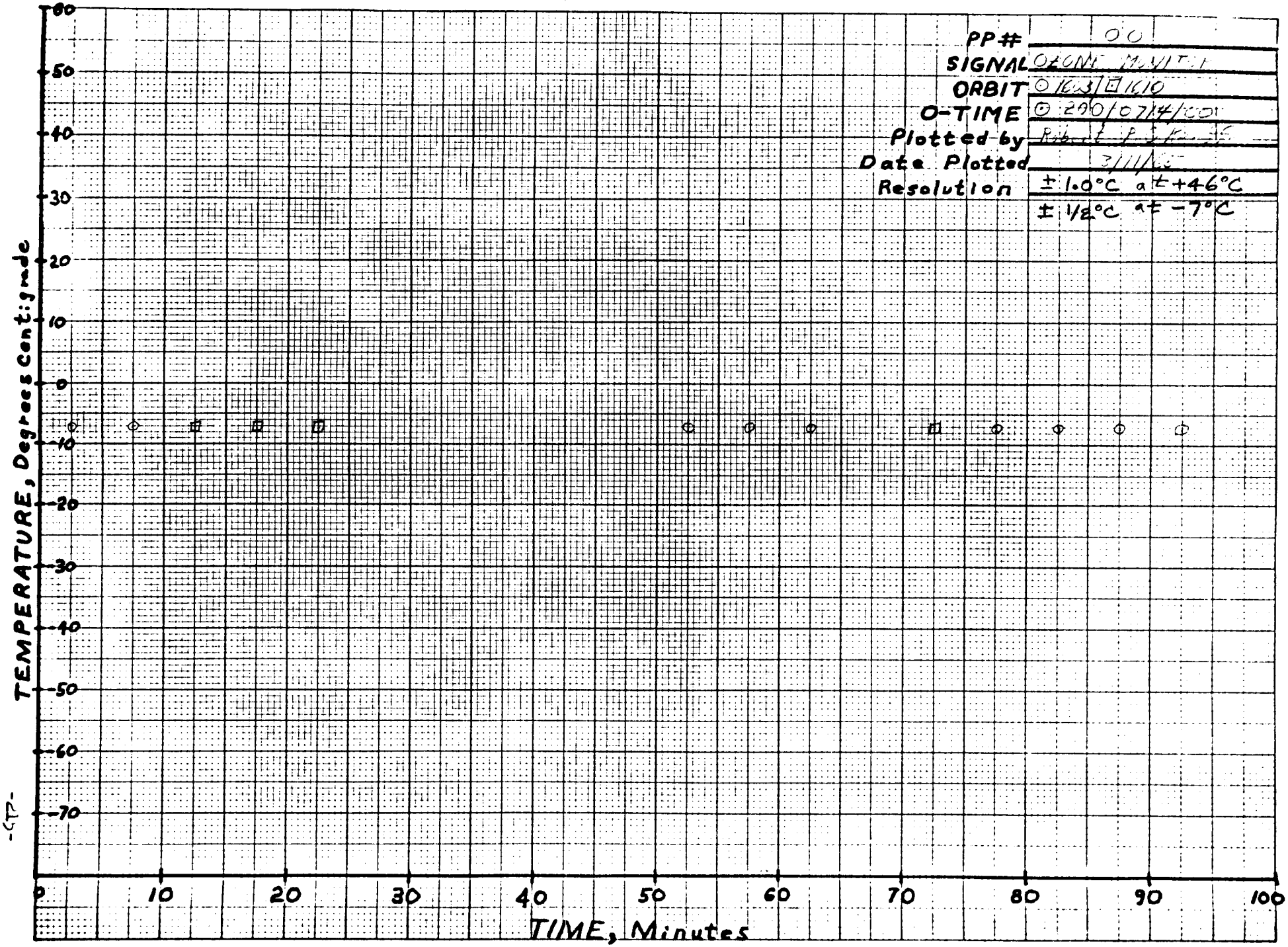



PP# 13
SIGNAL UPPER SHELF TEMP
ORBIT 21-03/0 1513
O-TIME 0193/0649/00
Plotted by Robert H O'Neill
Date Plotted 3/11/65
Resolution ± 0.9°C
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

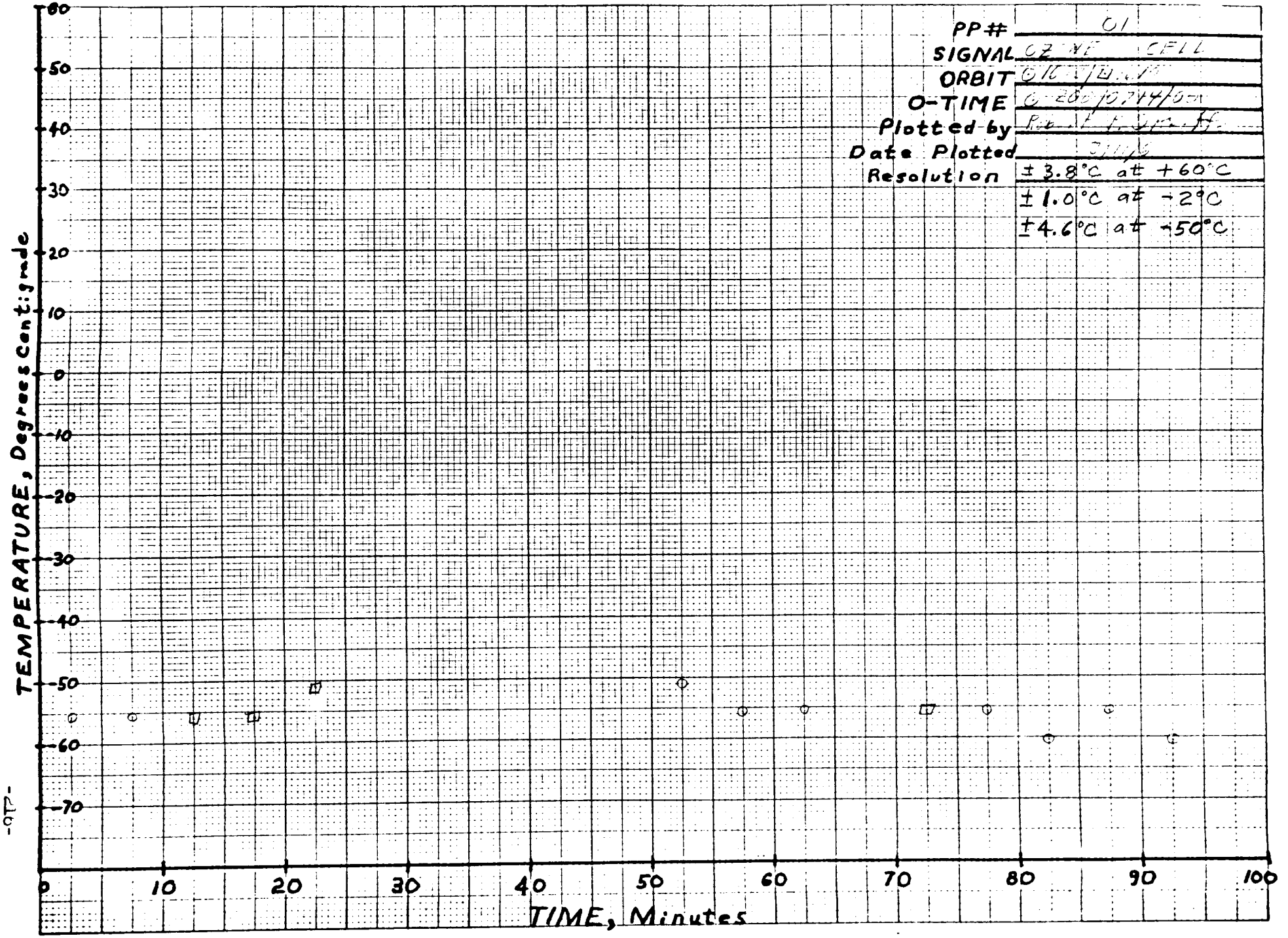
KEUFFEL & ESSER CO.



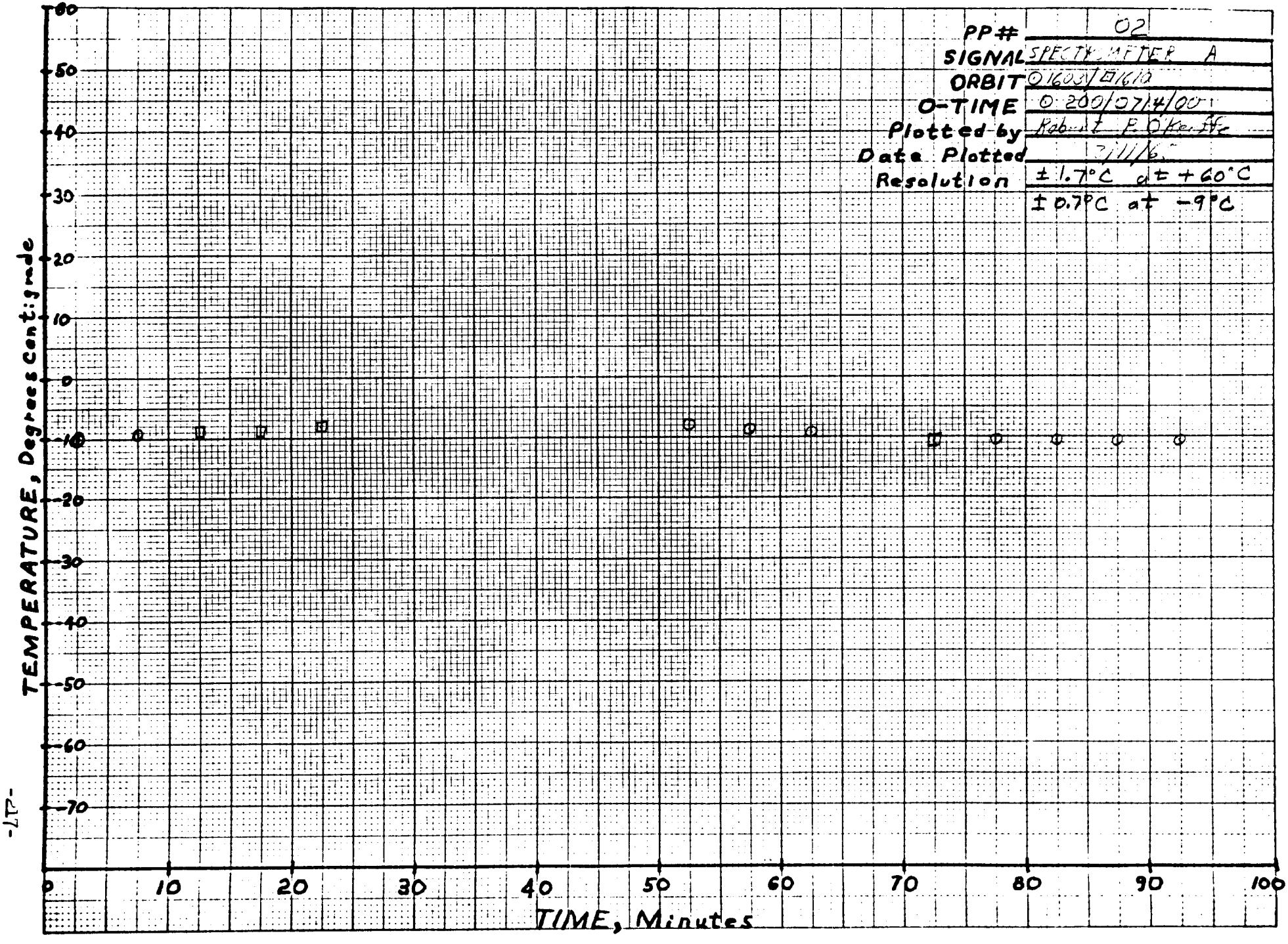
KEUFFEL & ESSER CO.



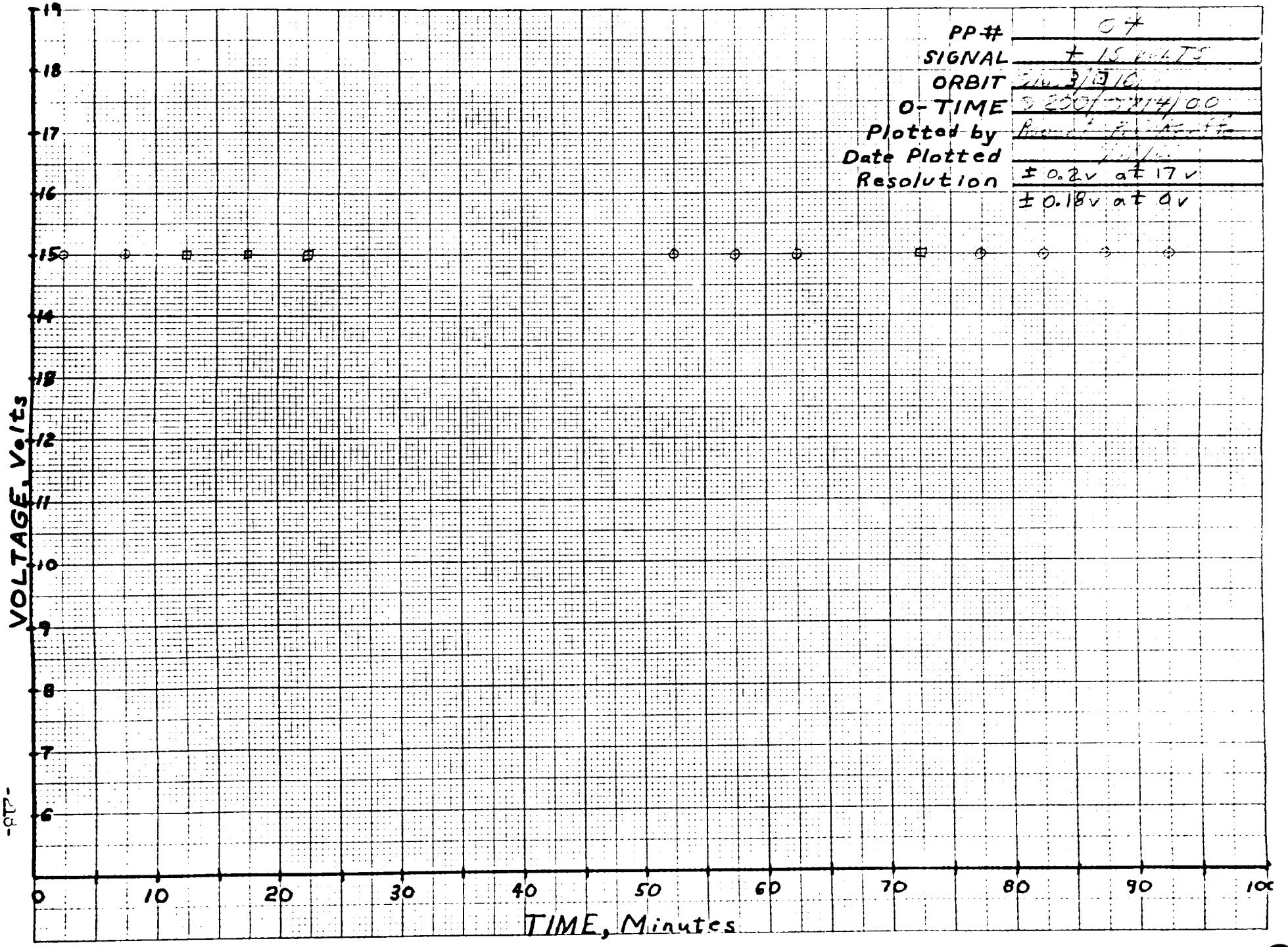
KEUFFEL & ESSER CO.



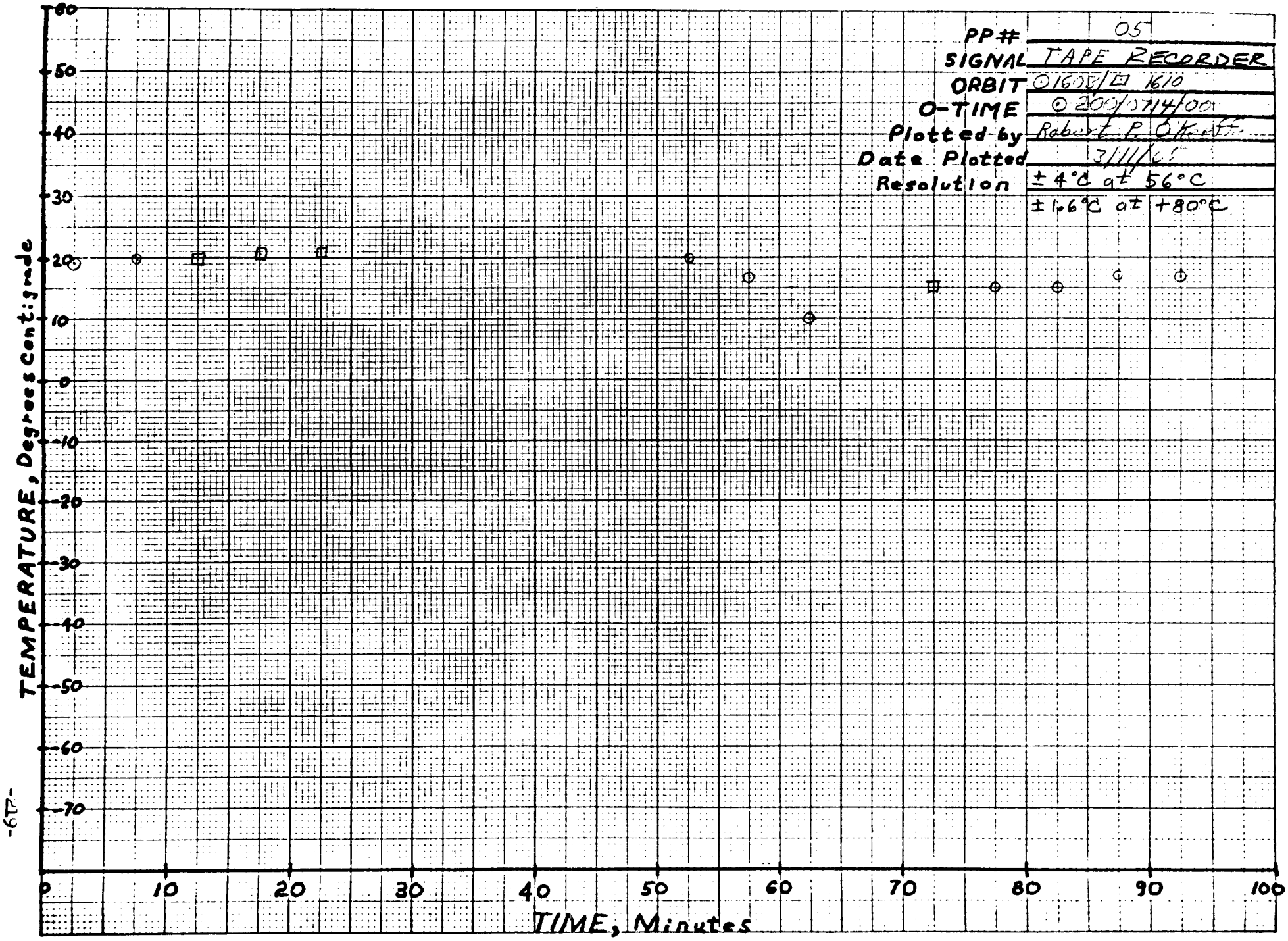
KEUFFEL & ESSER CO.



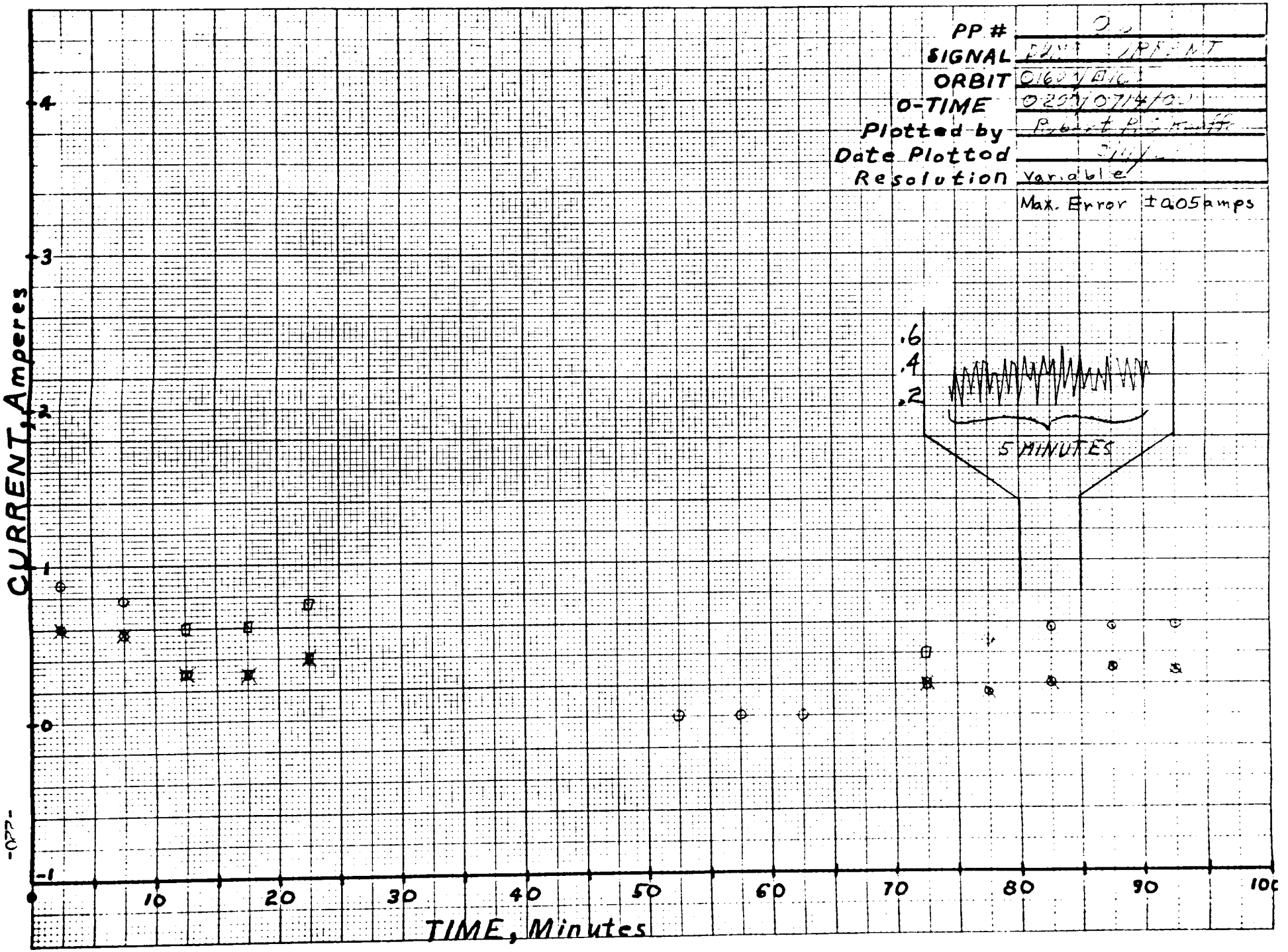
10 X 10 TO 1/2 INCH 46 1472
KEUFFEL & ESSER CO.



KEUFFEL & ESSER CO.

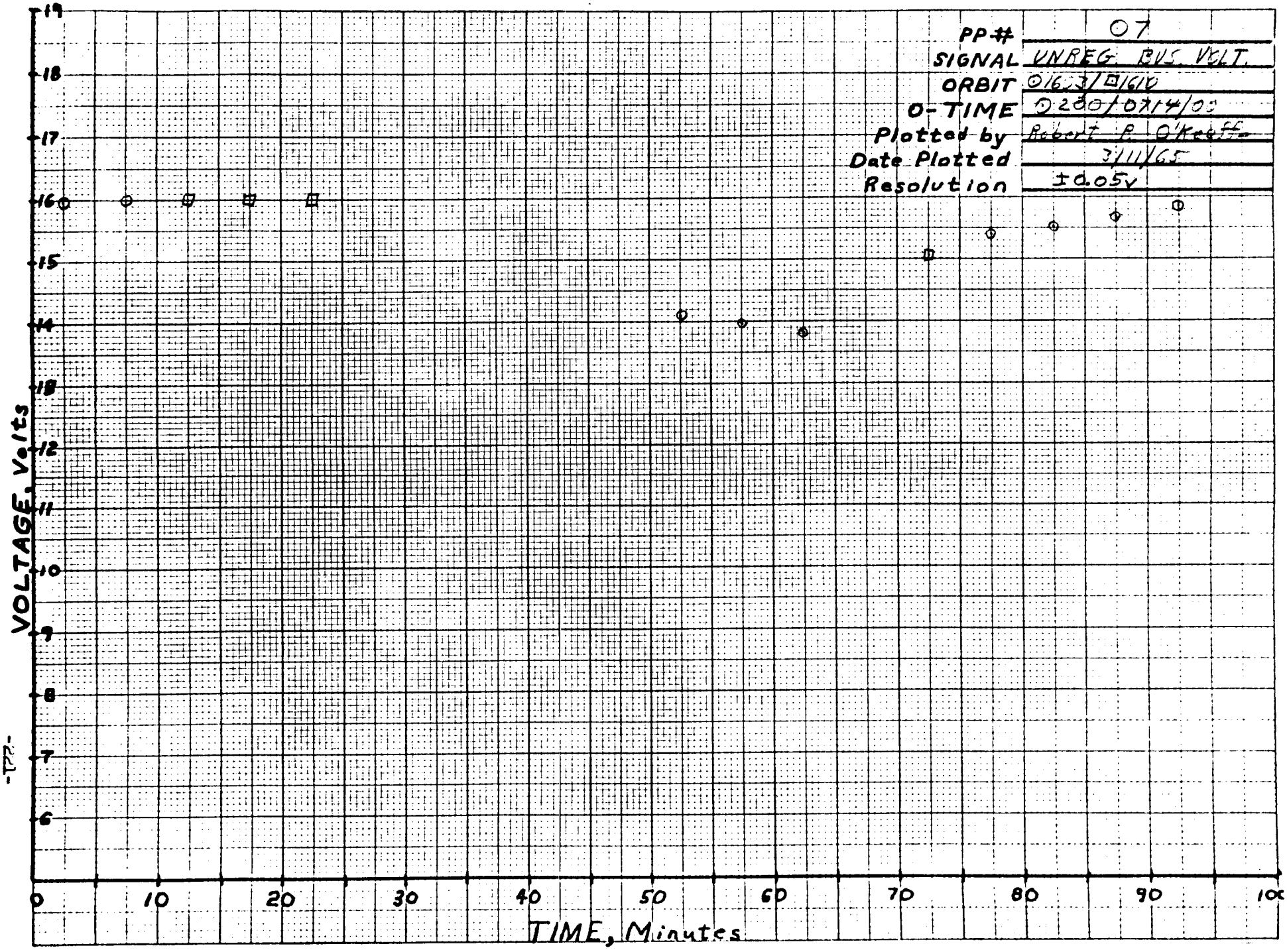


7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

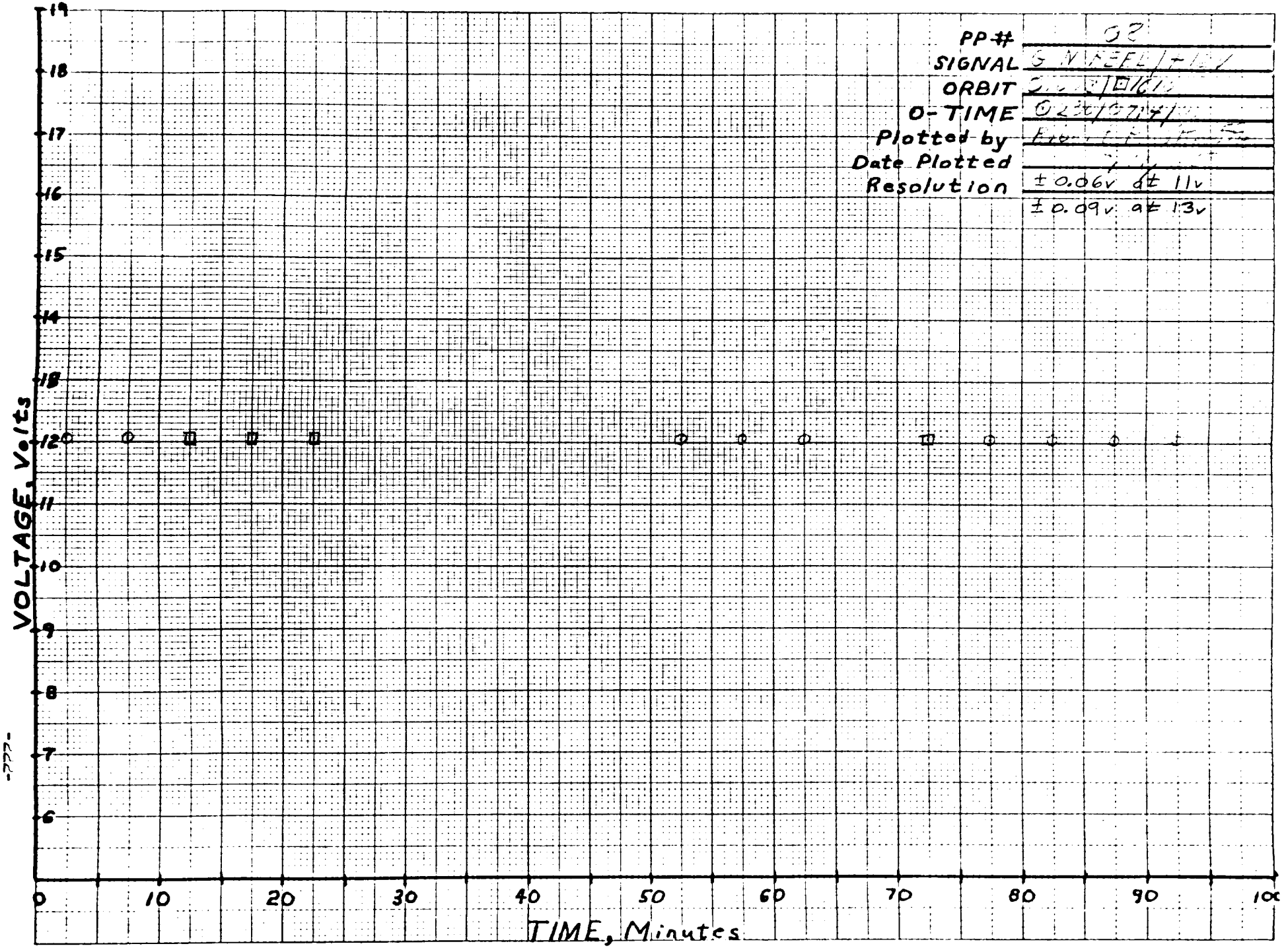


-022-

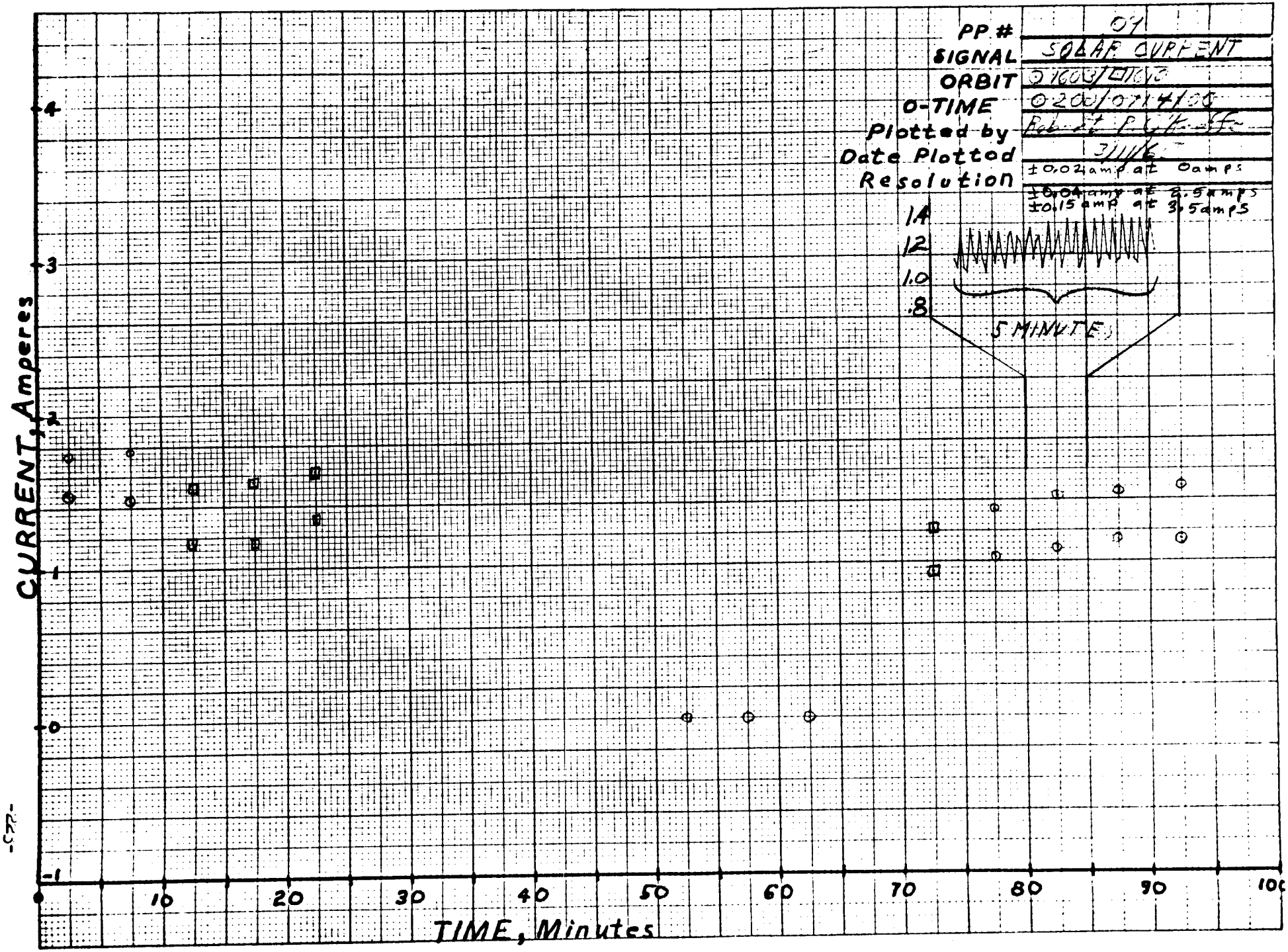
KEUFFEL & ESSER CO.



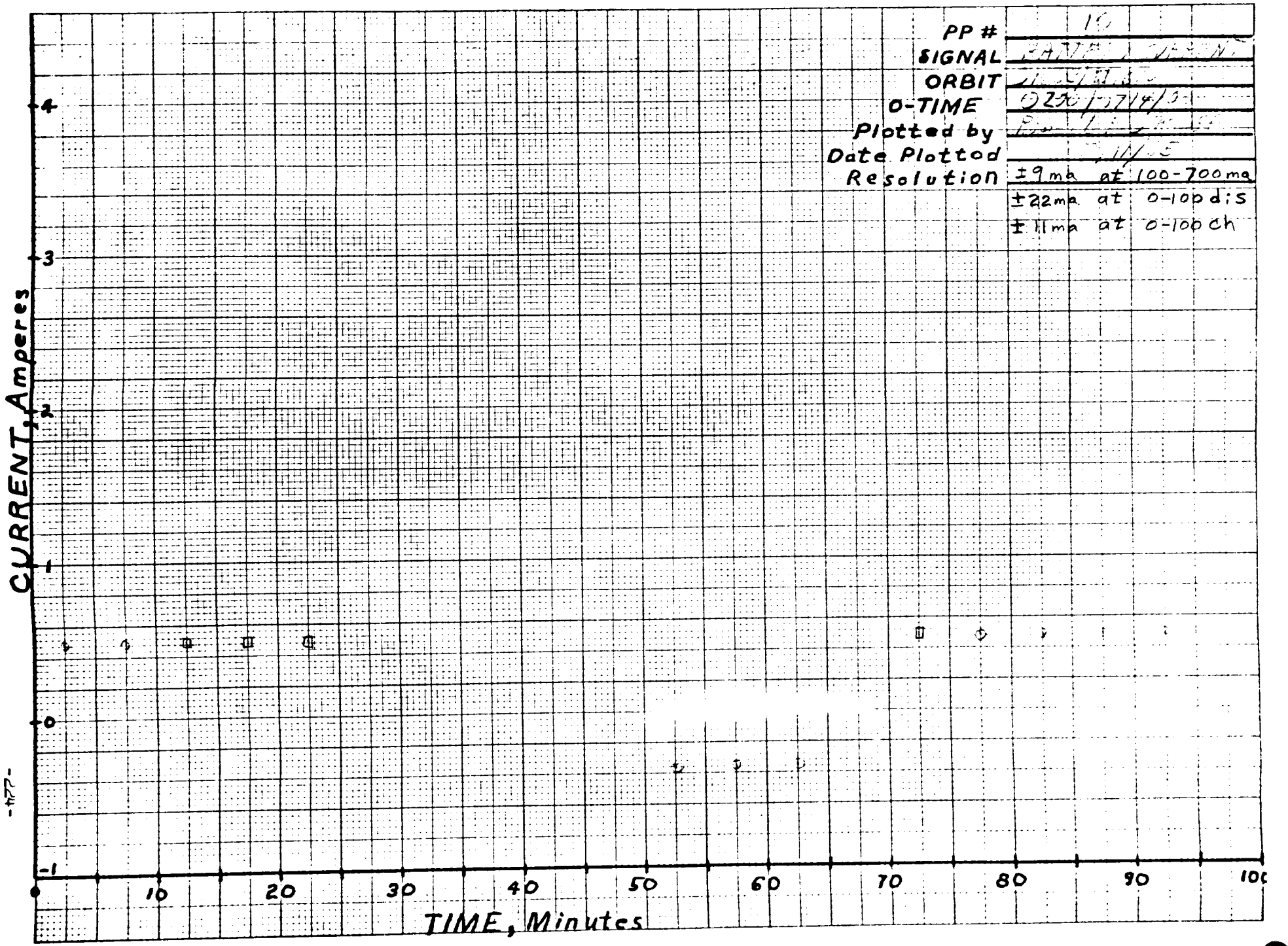
10 X 10 TO ½ INCH 46 1472
KEUFFEL & ESSER CO.



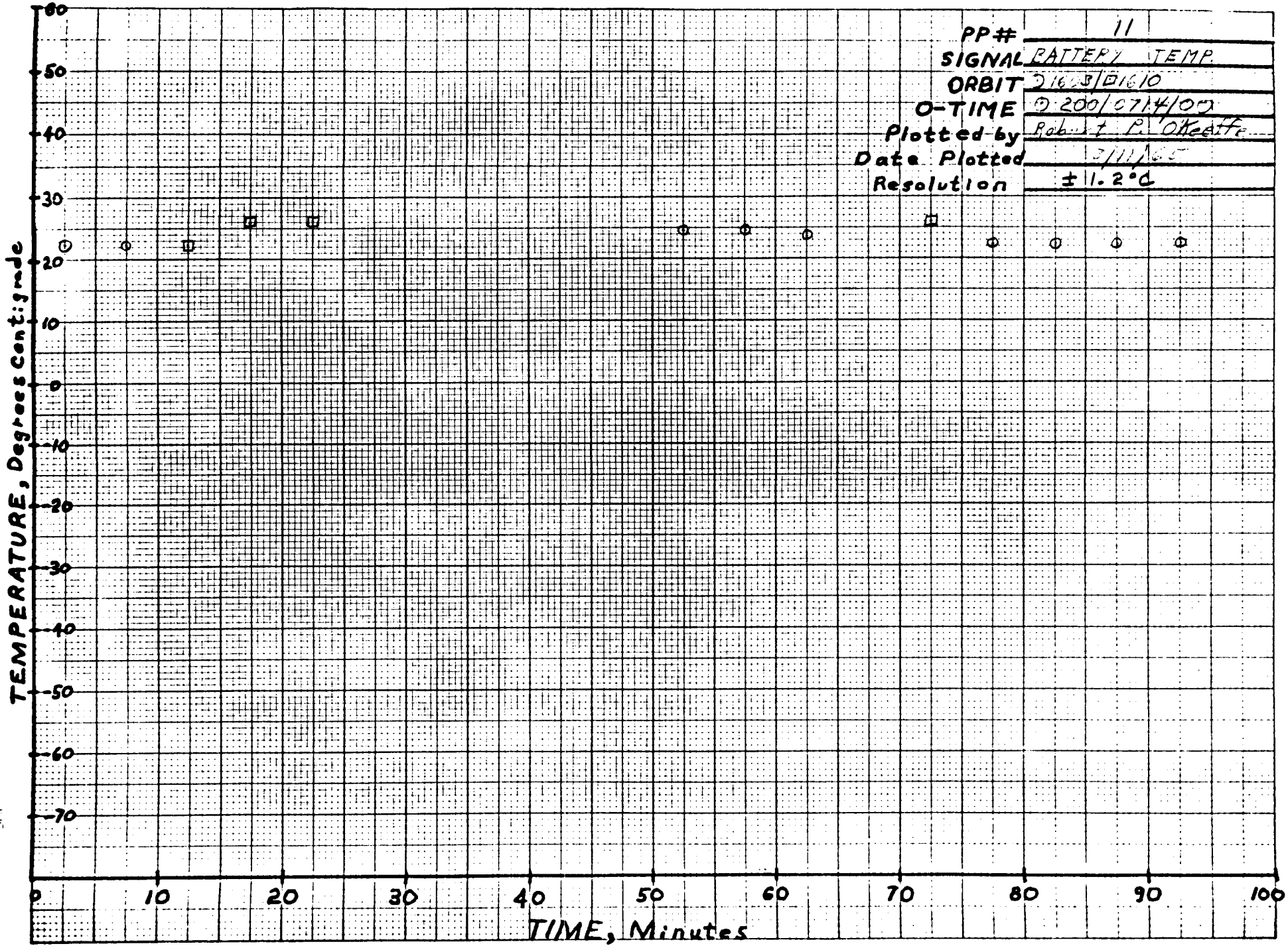
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



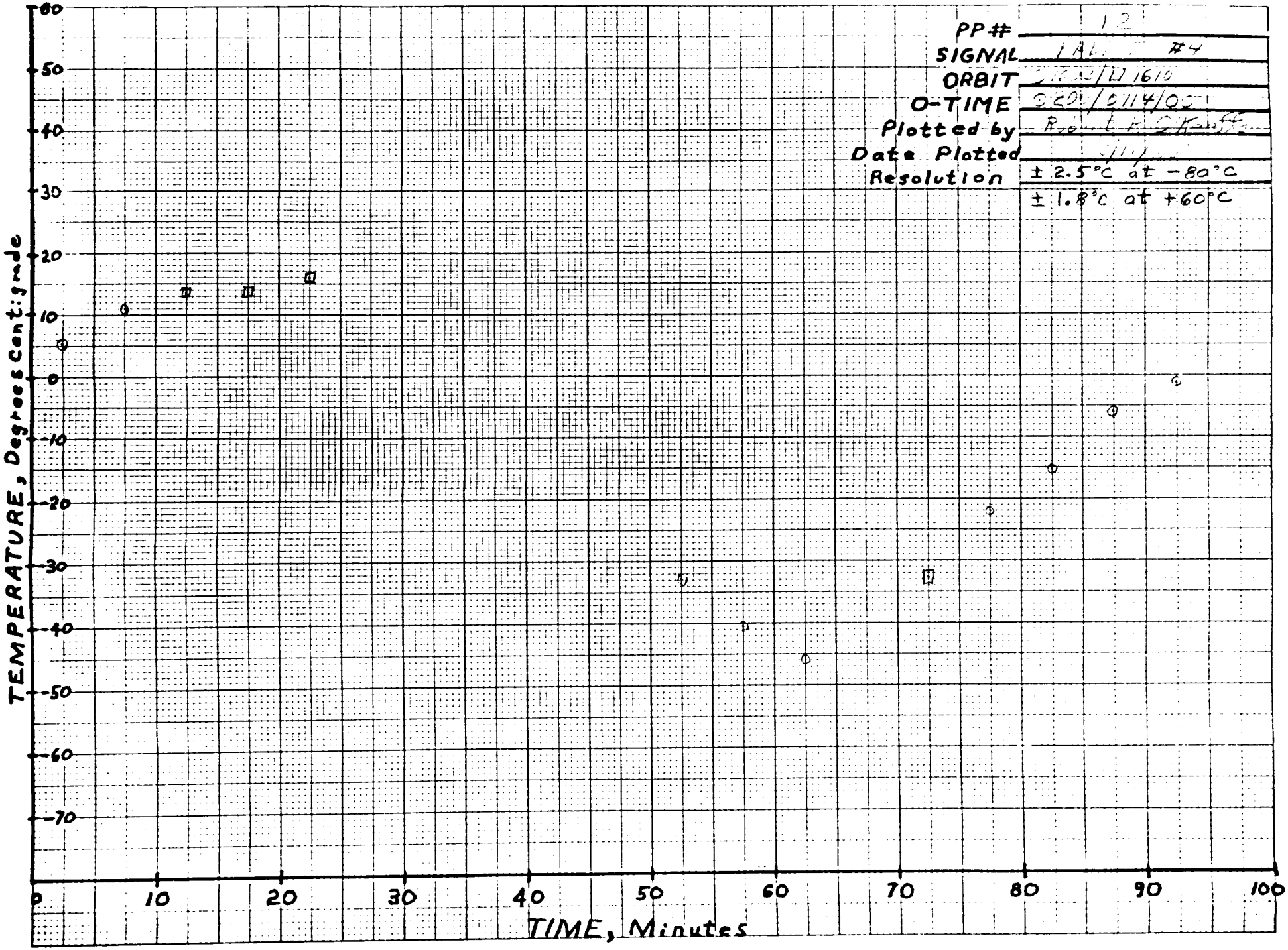
10 X 10 TO ½ INCH 46 1472
KEUFFEL & ESSER CO



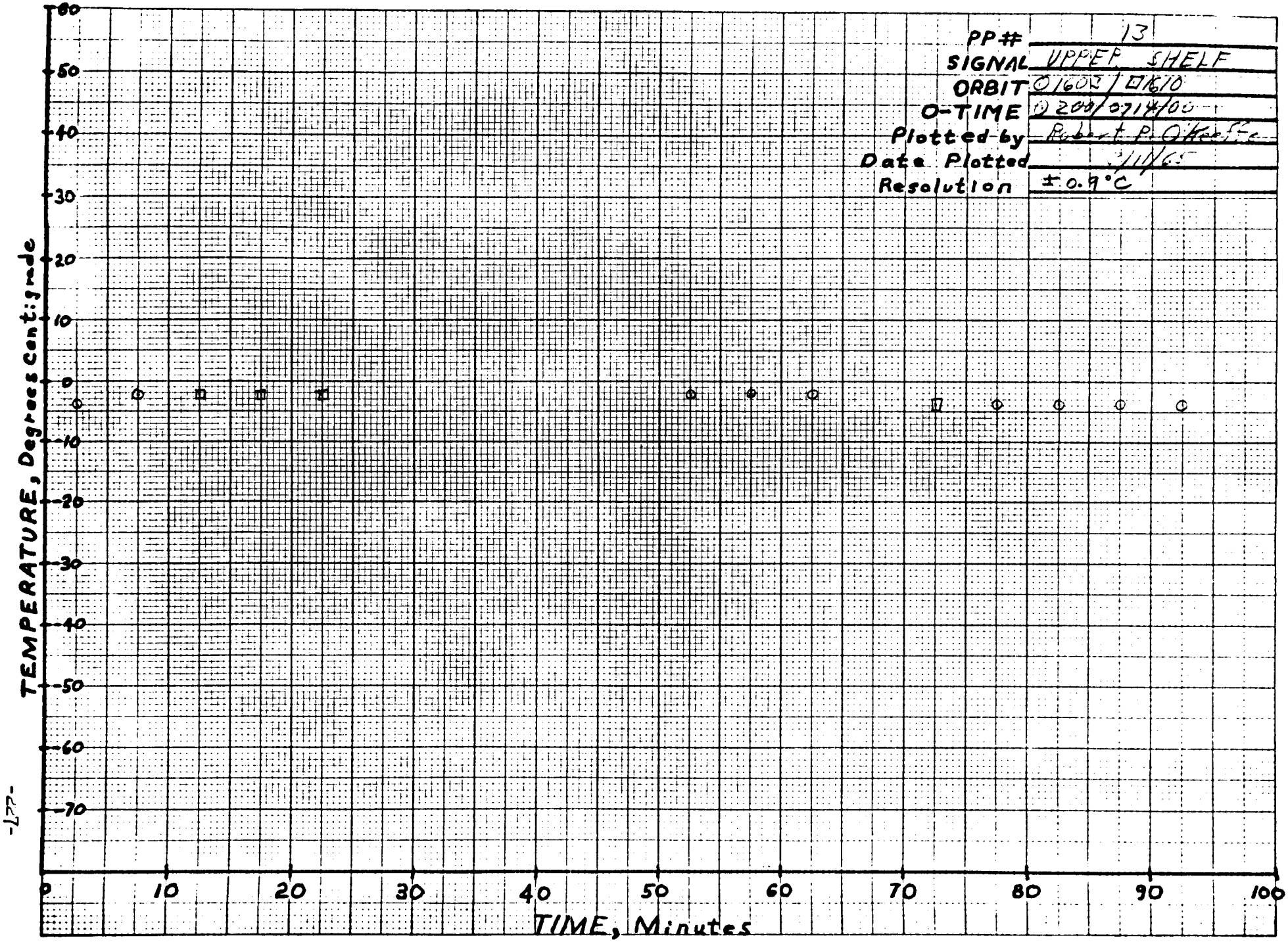
KEUFFEL & ESSER CO.

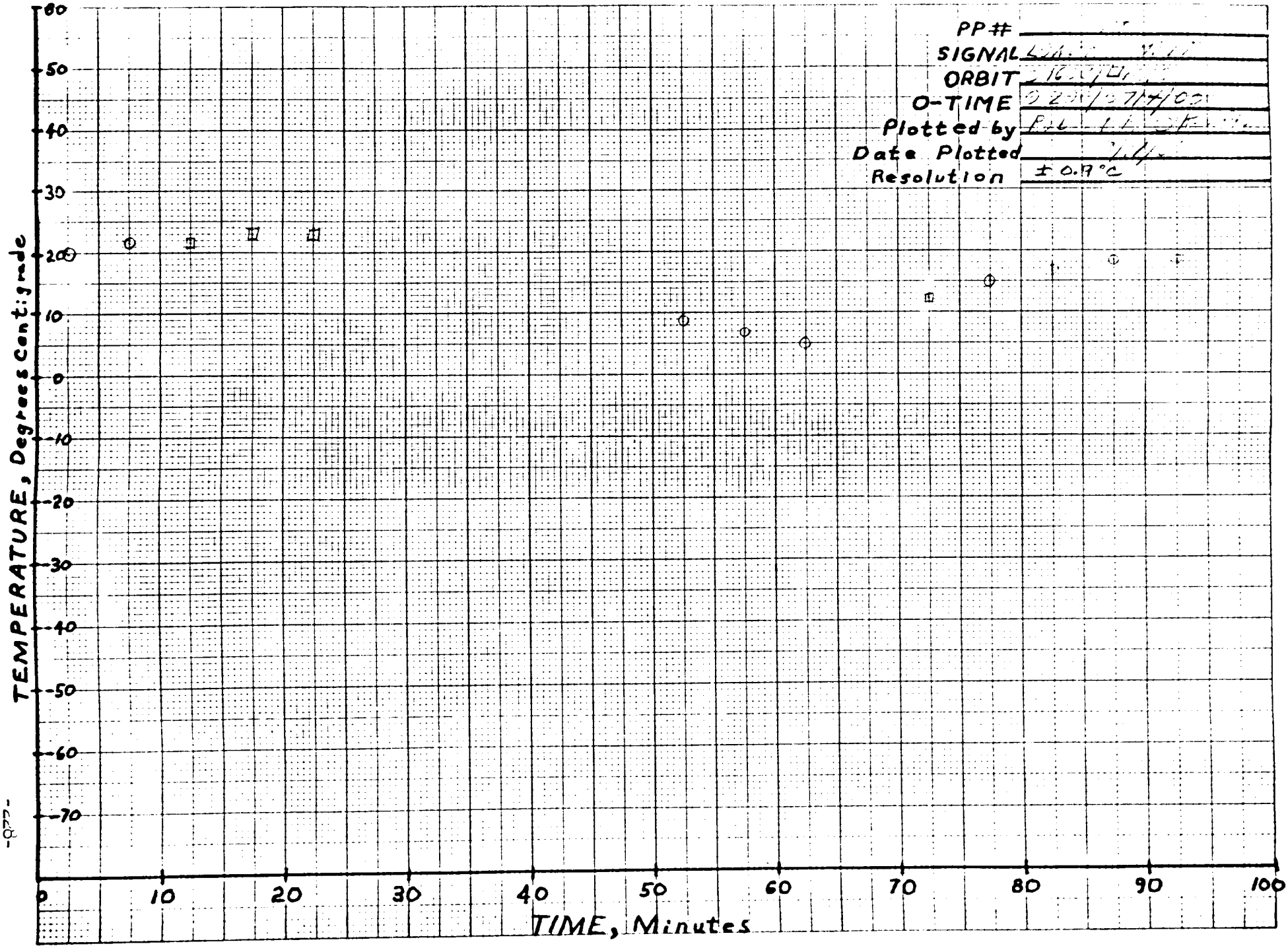


KEUFFEL & ESSER CO

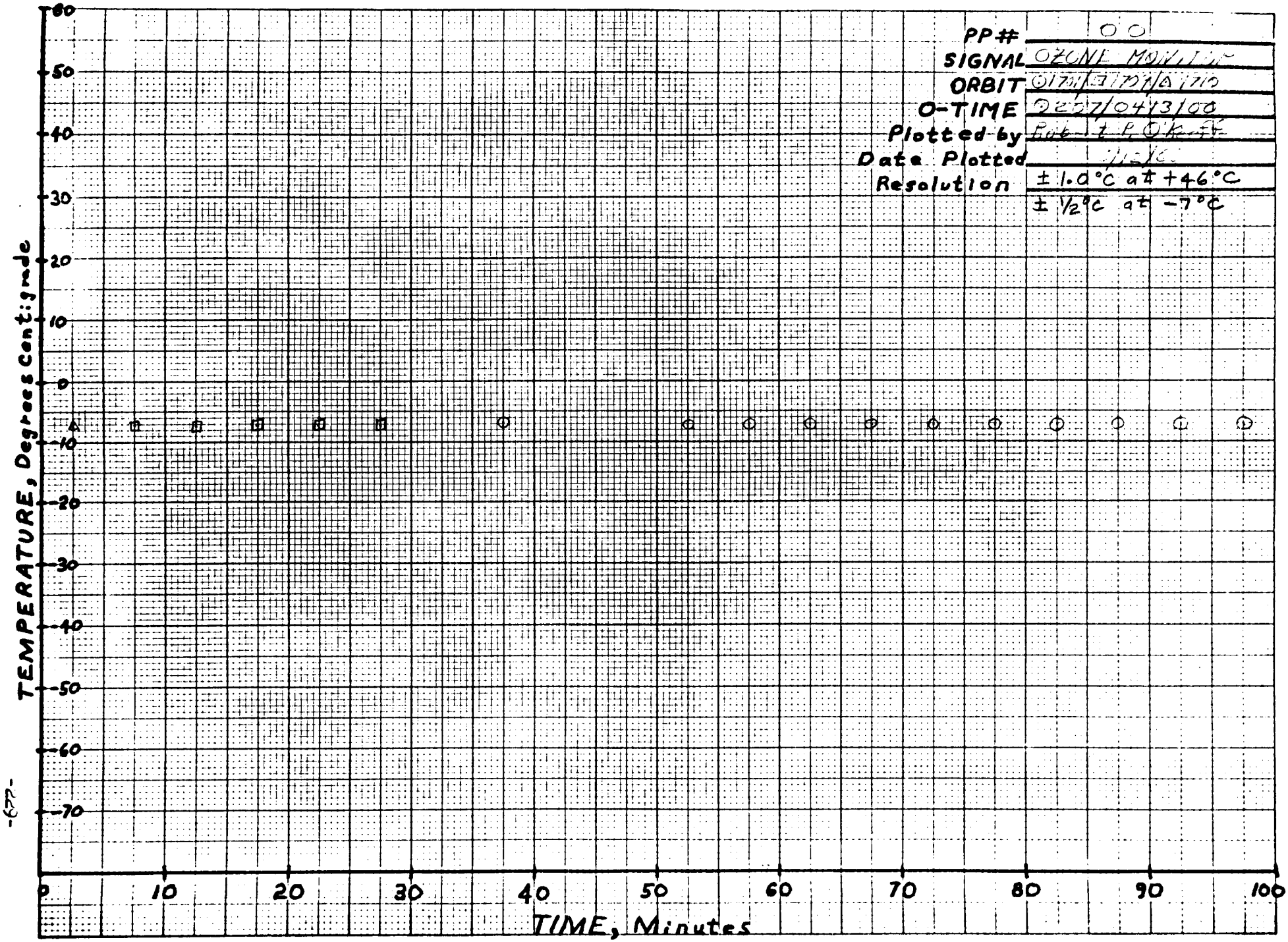


KEUFFEL & ESSER CO.

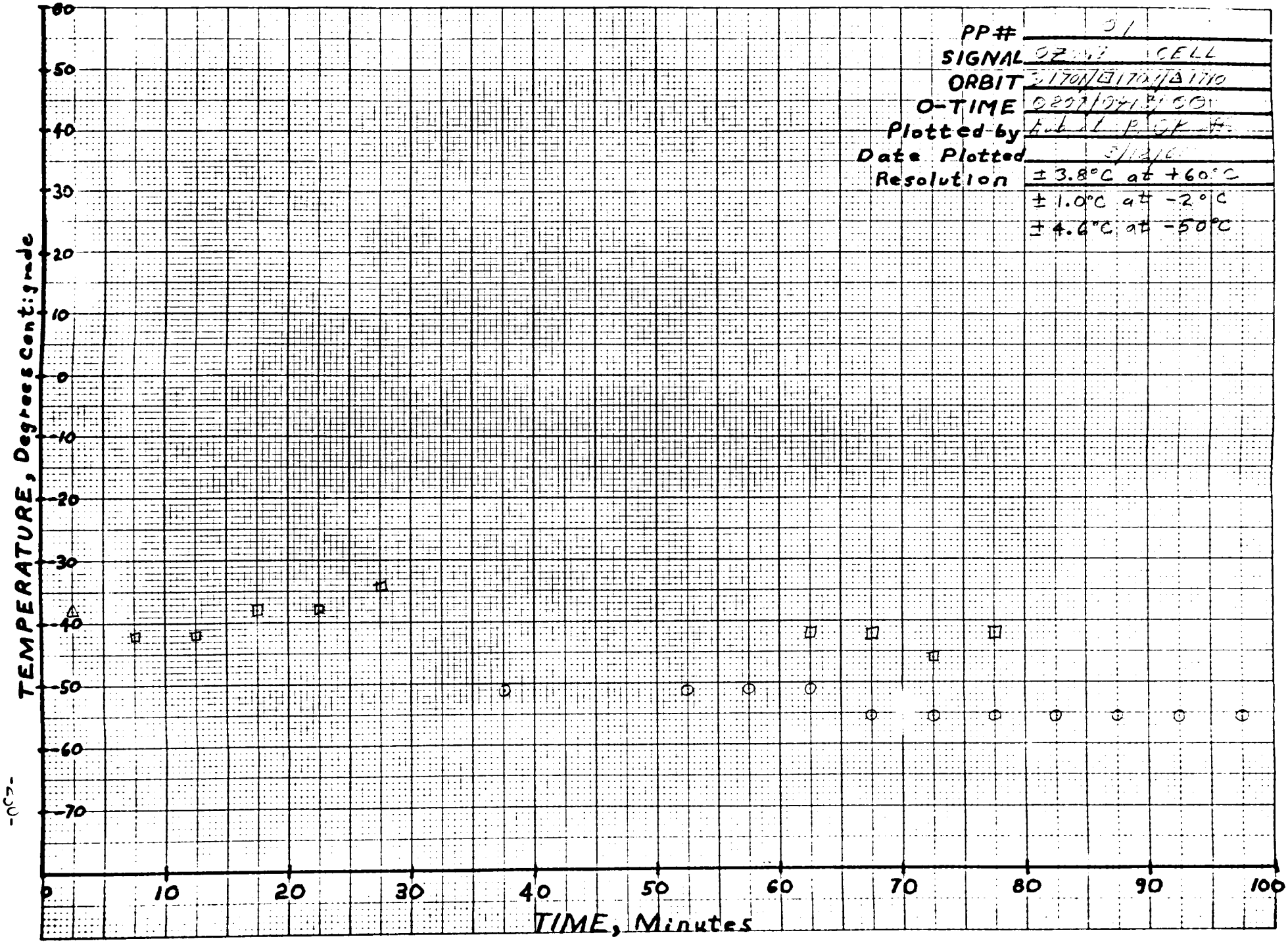



PP#
SIGNAL
ORBIT
O-TIME
Plotted by
Date Plotted
Resolution ± 0.9°C
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

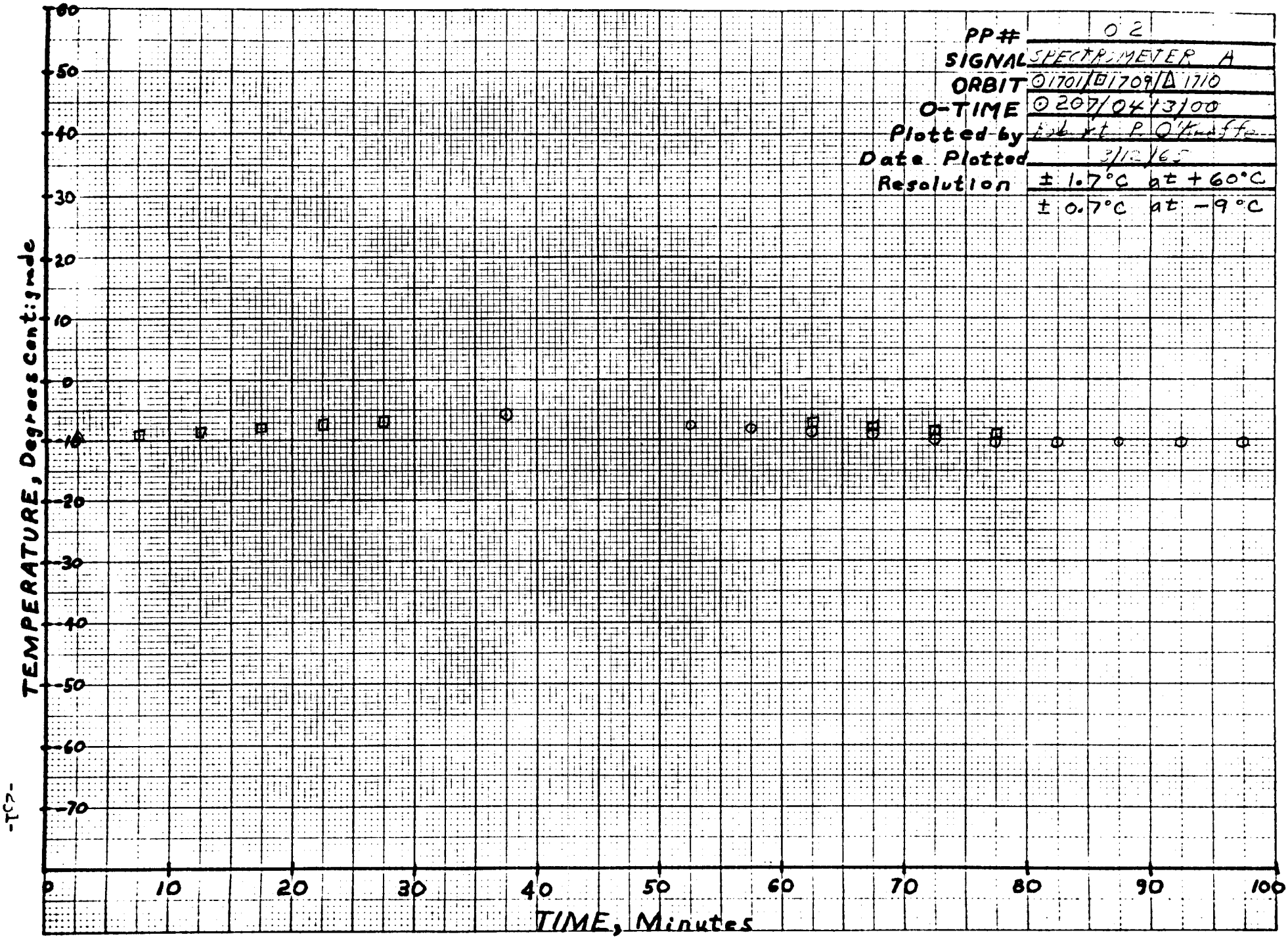
KEUFFEL & ESSER CO.



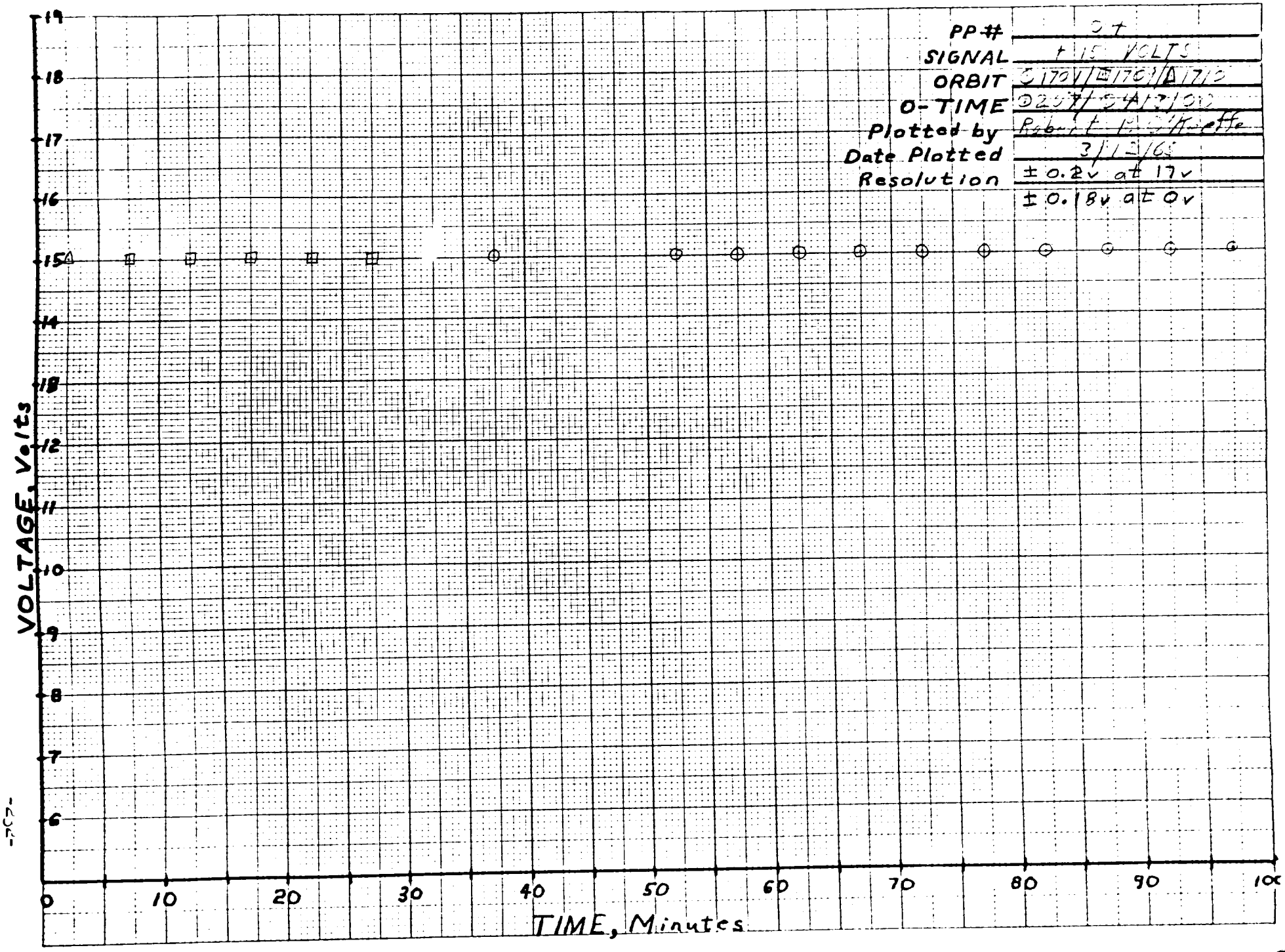
KEUFFEL & ESSER CO.



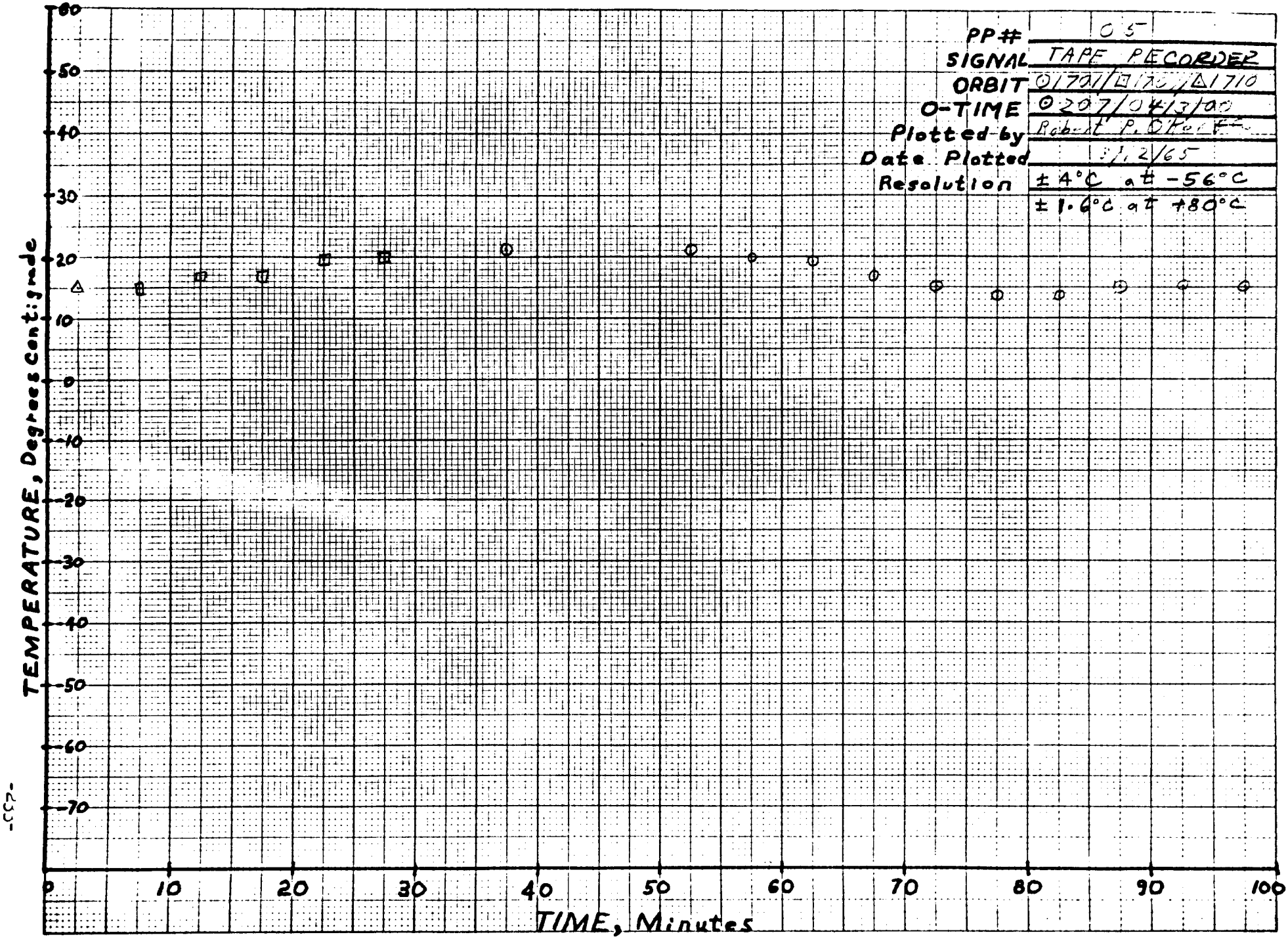
KEUFFEL & ESSER CO.

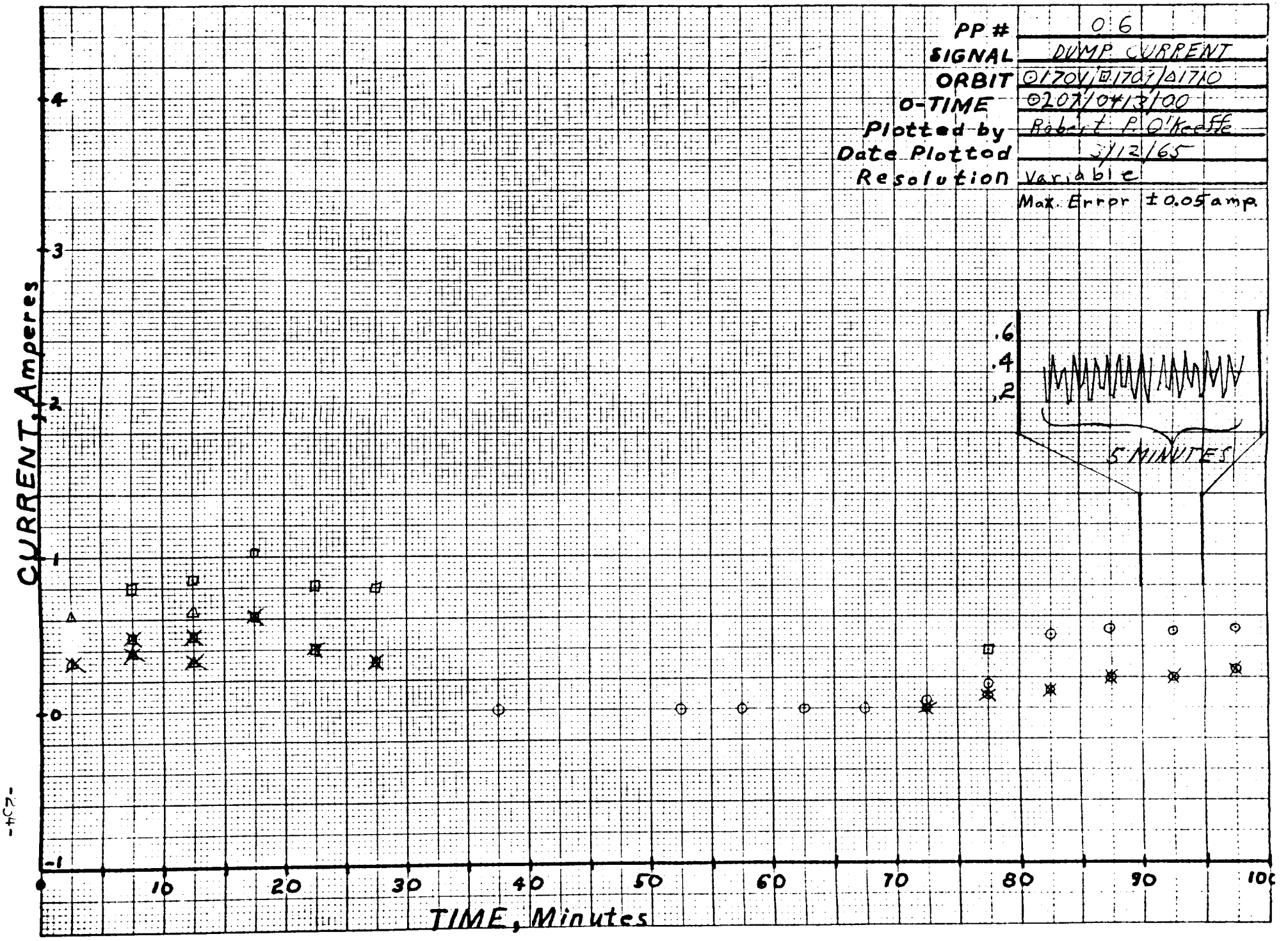


KEUFFEL & ESSER CO

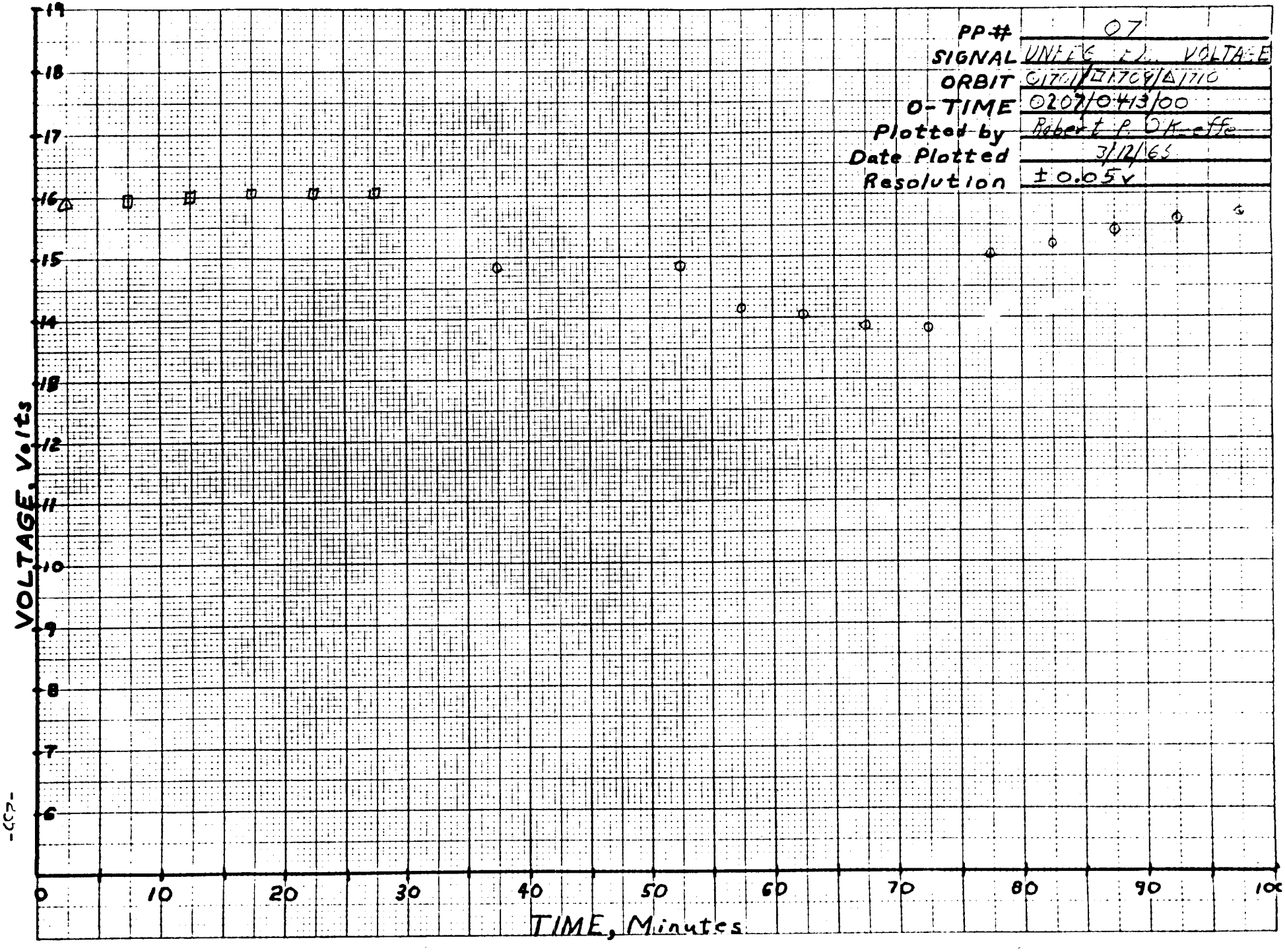


KEUFFEL & ESSER CO.

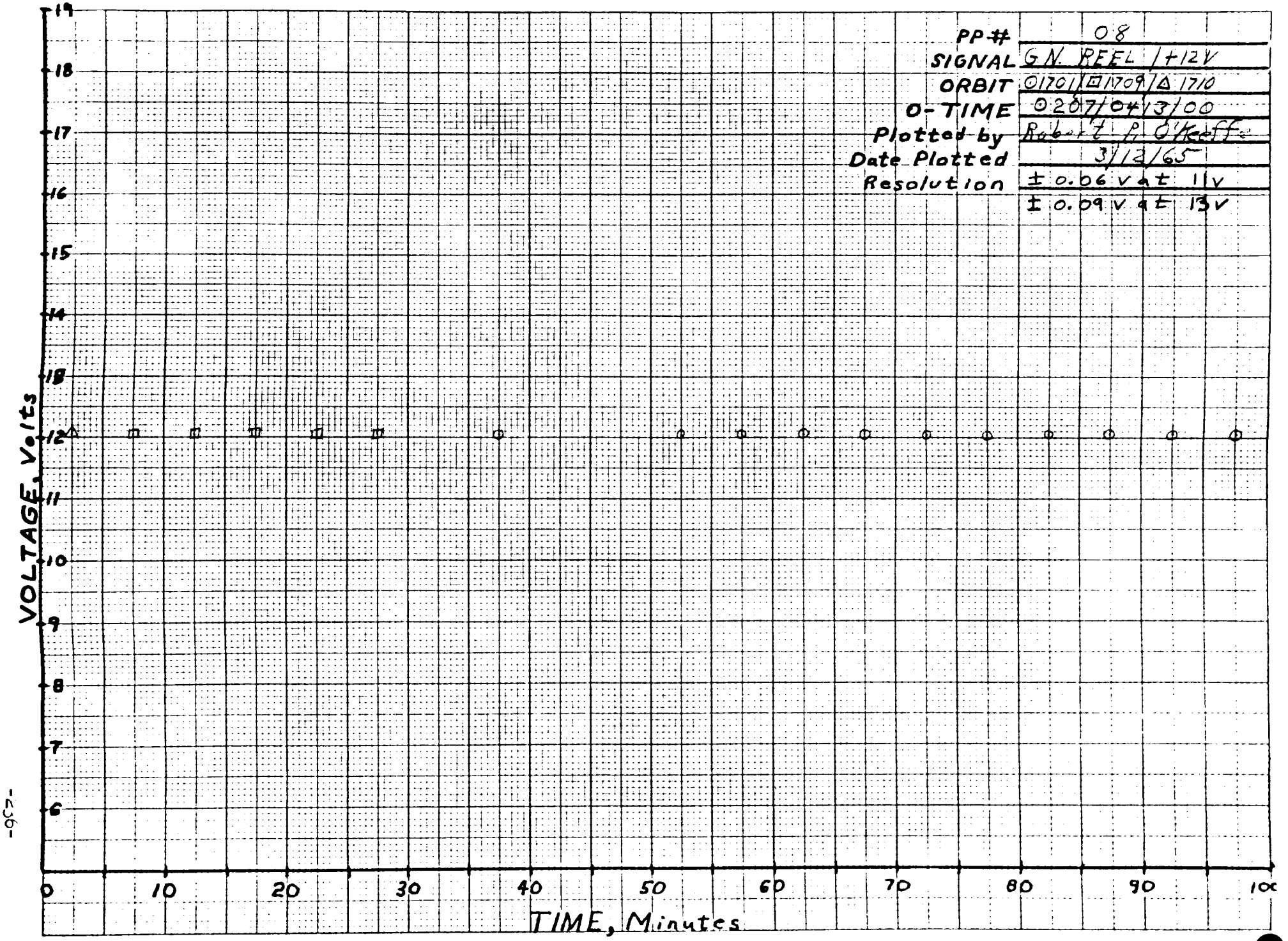



PP # 06
SIGNAL DUMP CURRENT
ORBIT ⊙1704/⊡1707/△1710
0-TIME ⊙2071/04/13/00
Plotted by Robert P. O'Keeffe
Date Plotted 3/12/65
Resolution Variable
Max. Error ±0.05 amp.
.6
.4
.2
5 MINUTES
CURRENT, Amperes
4
3
2
1
0
-1
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

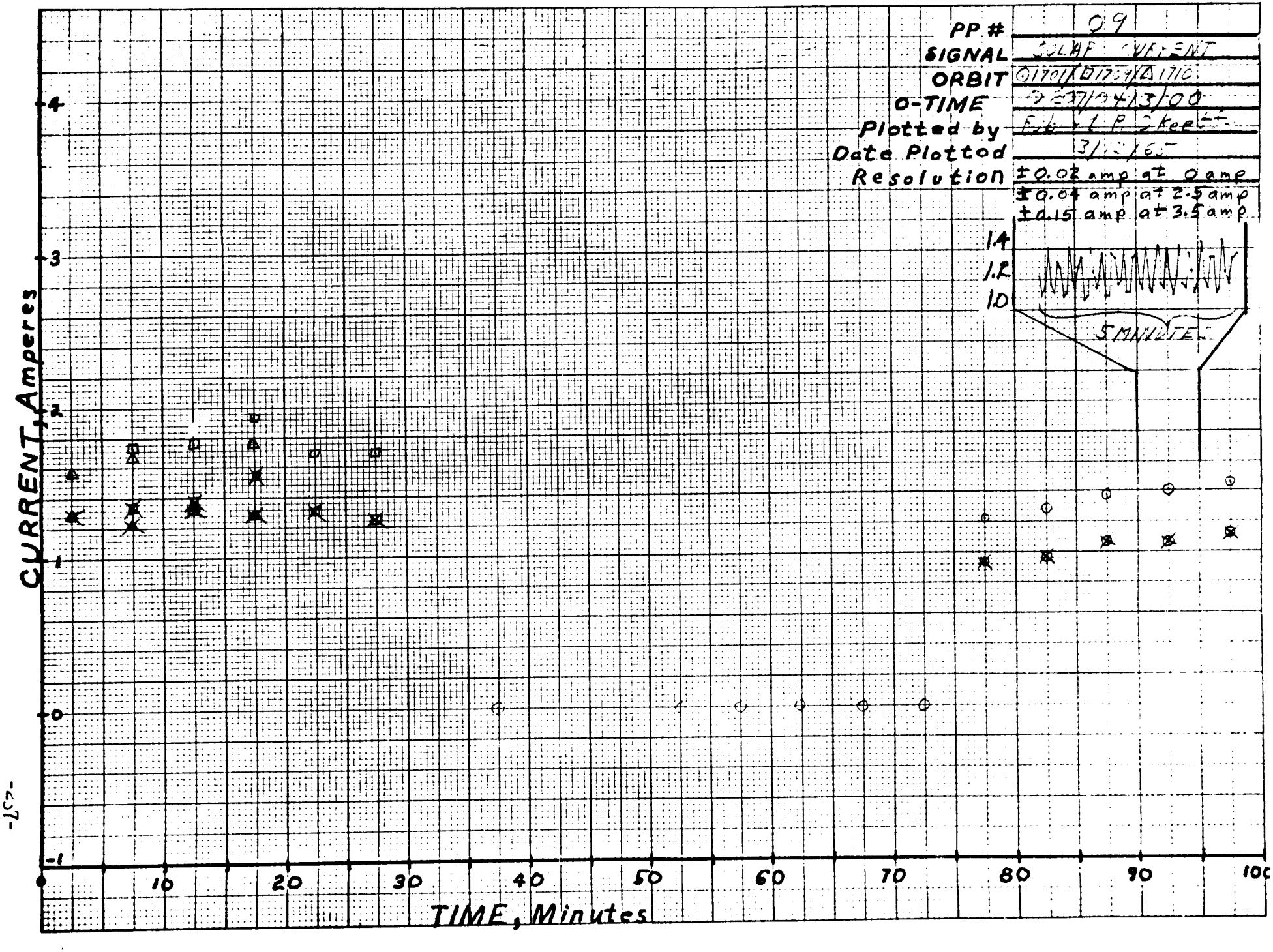
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



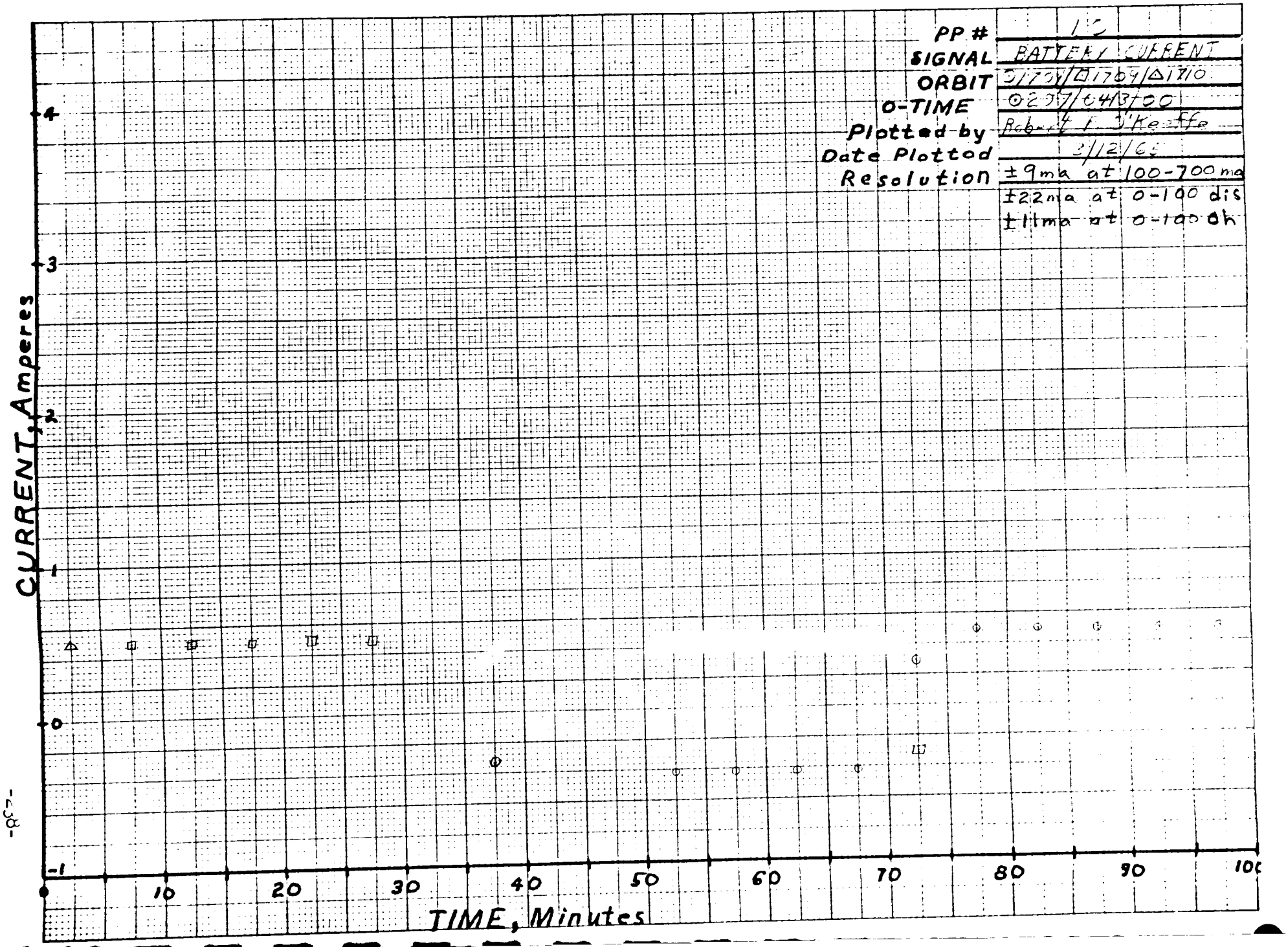
KEUFFEL & ESSER CO.



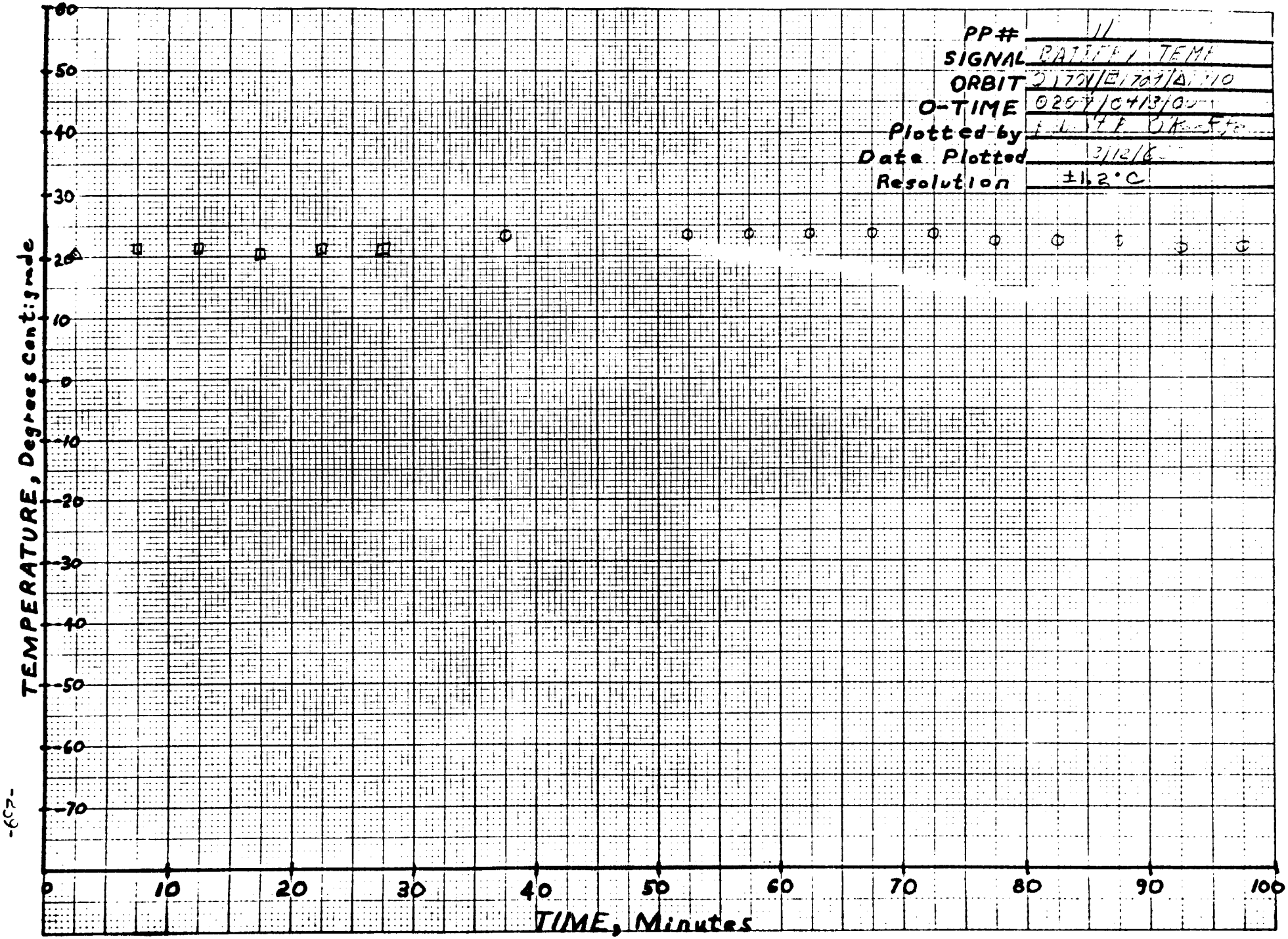
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



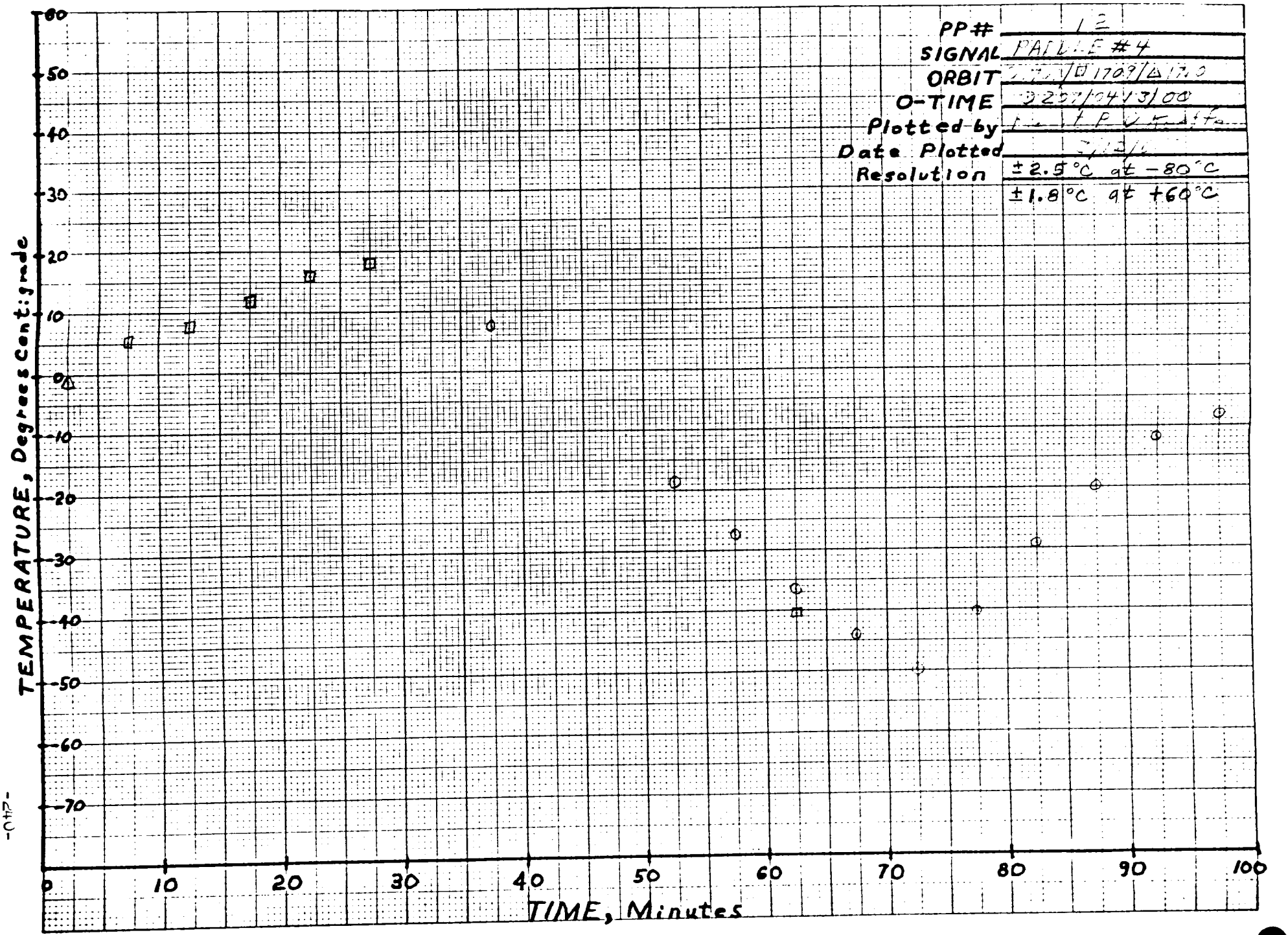
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



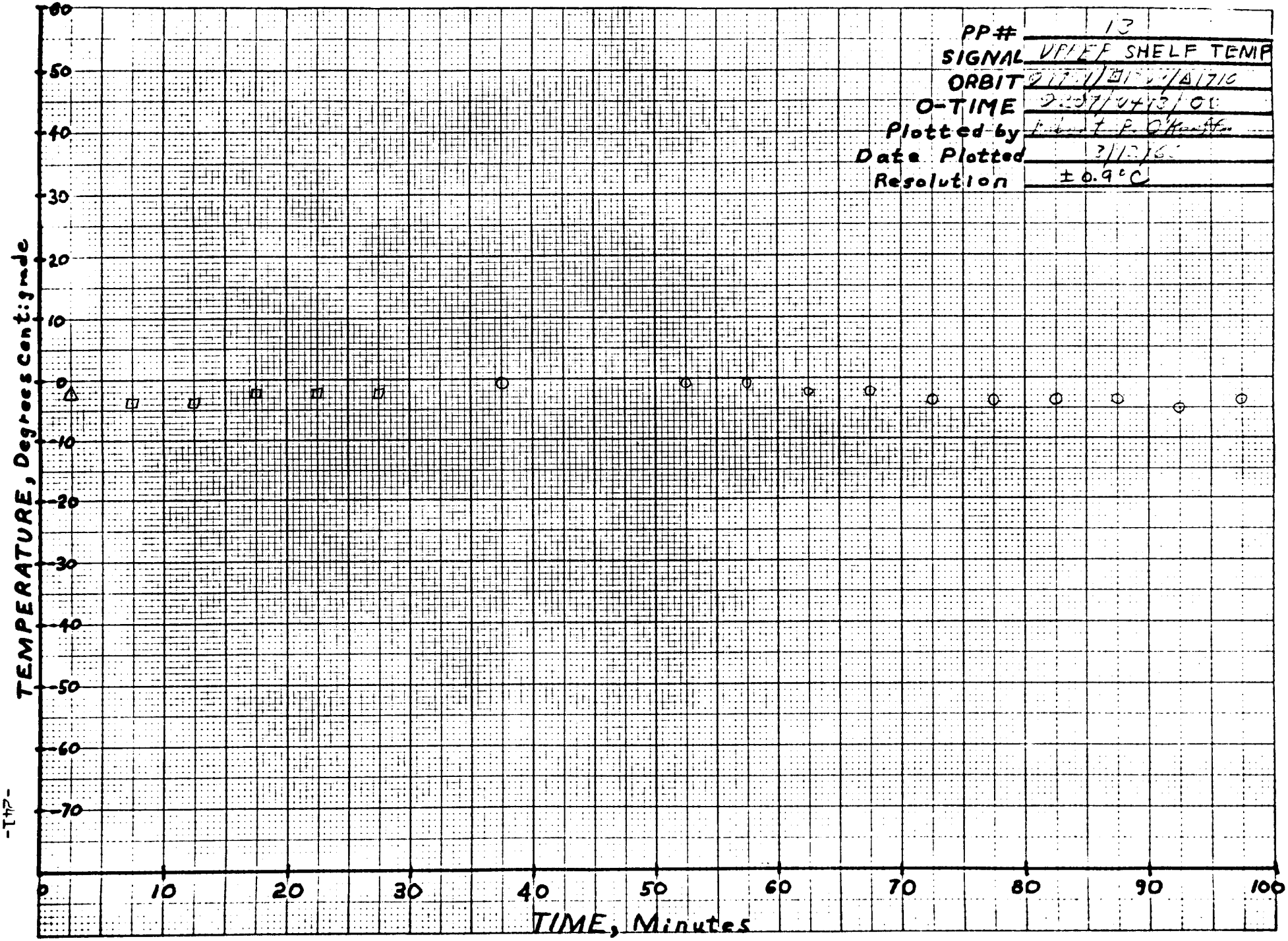
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



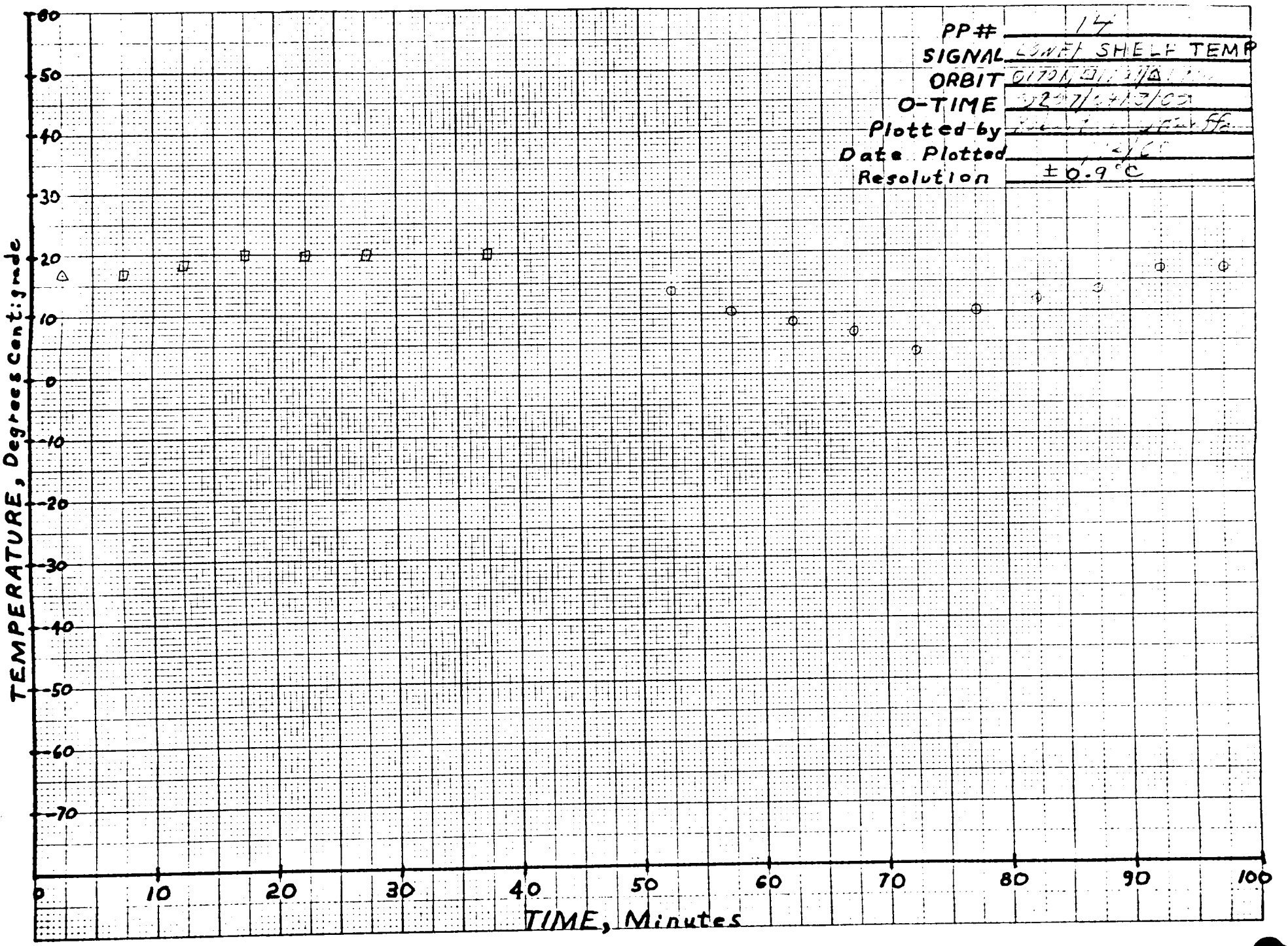
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



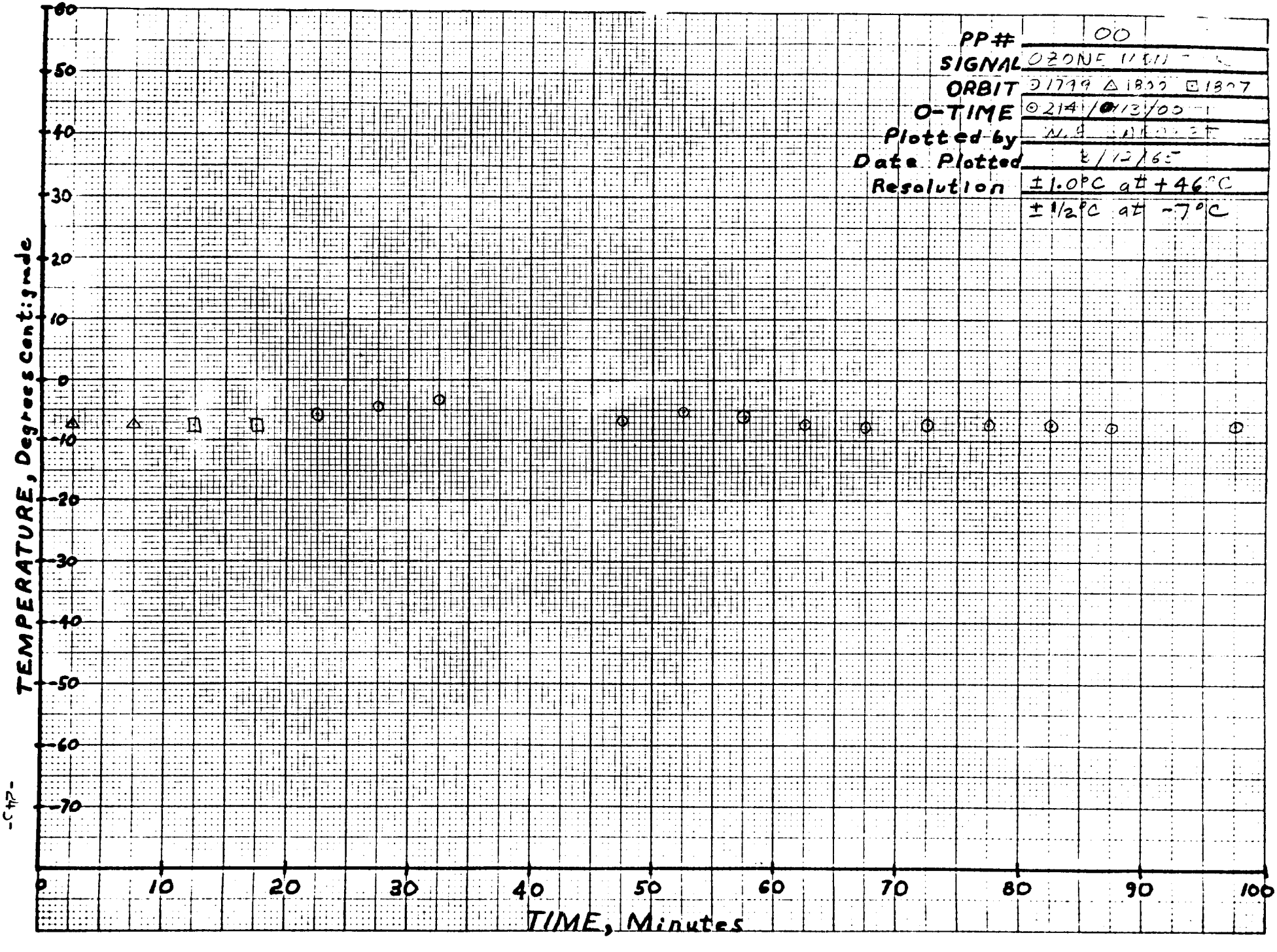
KEUFFEL & ESSER CO.



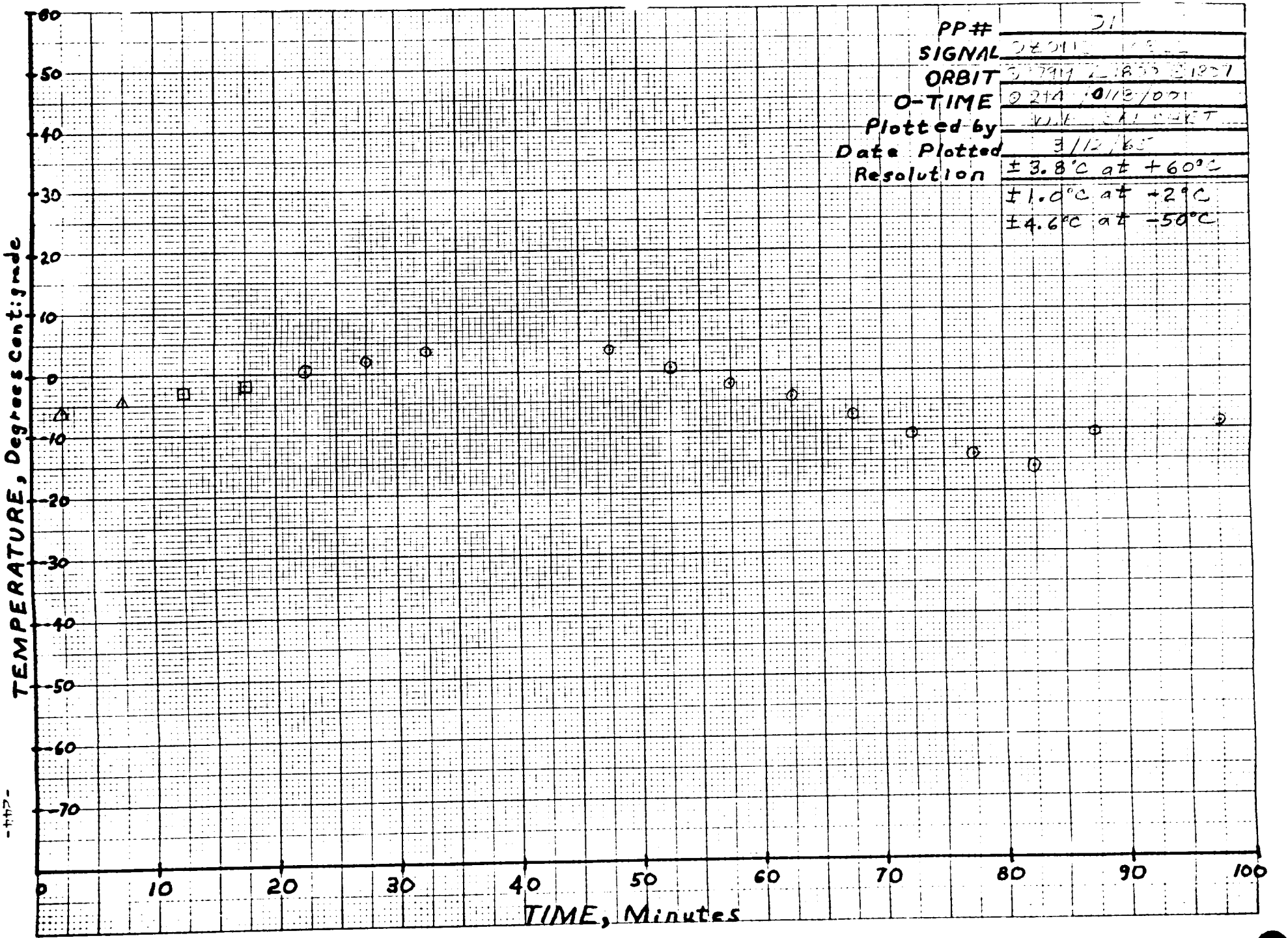
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



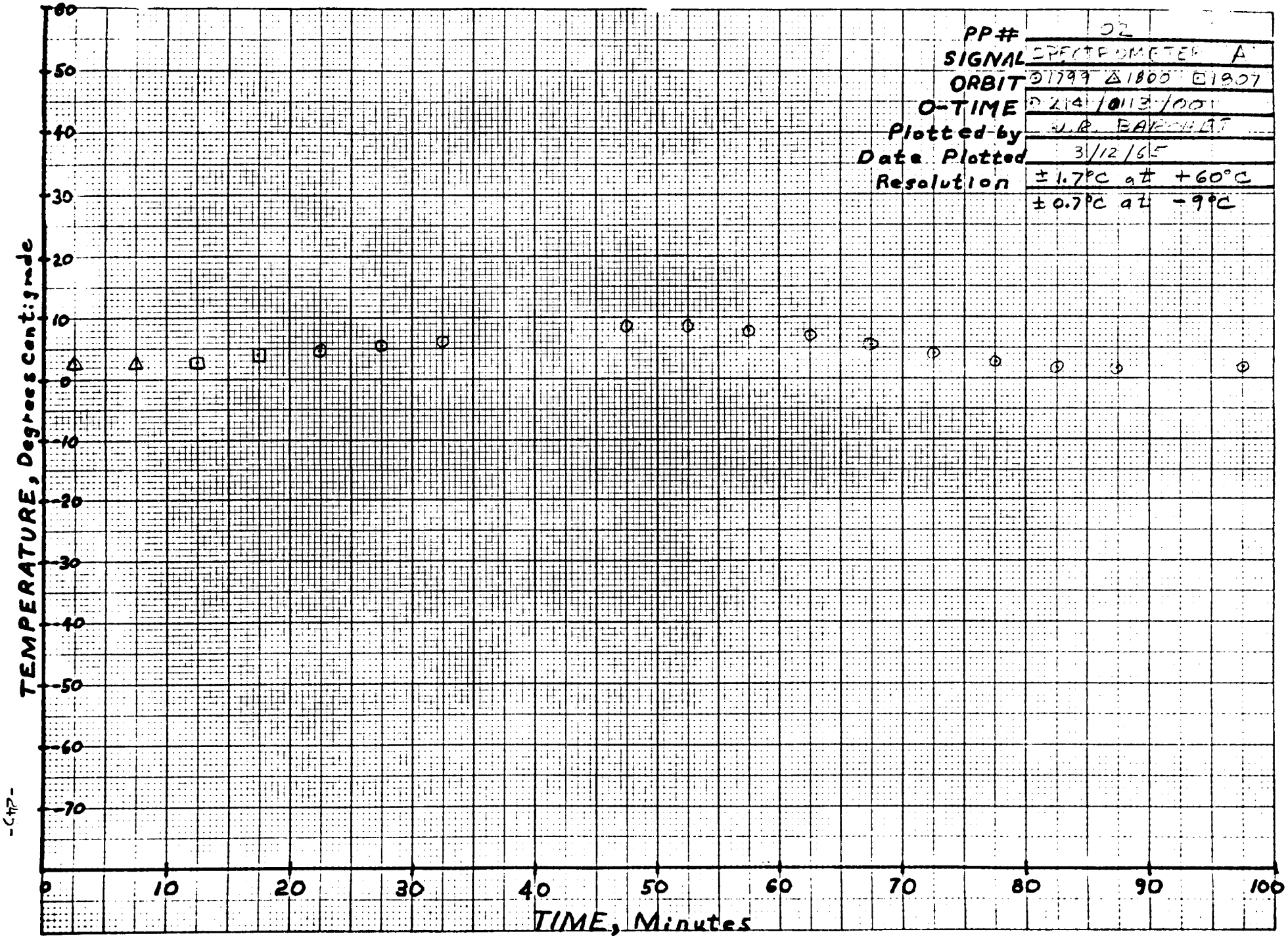
KEUFFEL & ESSER CO.



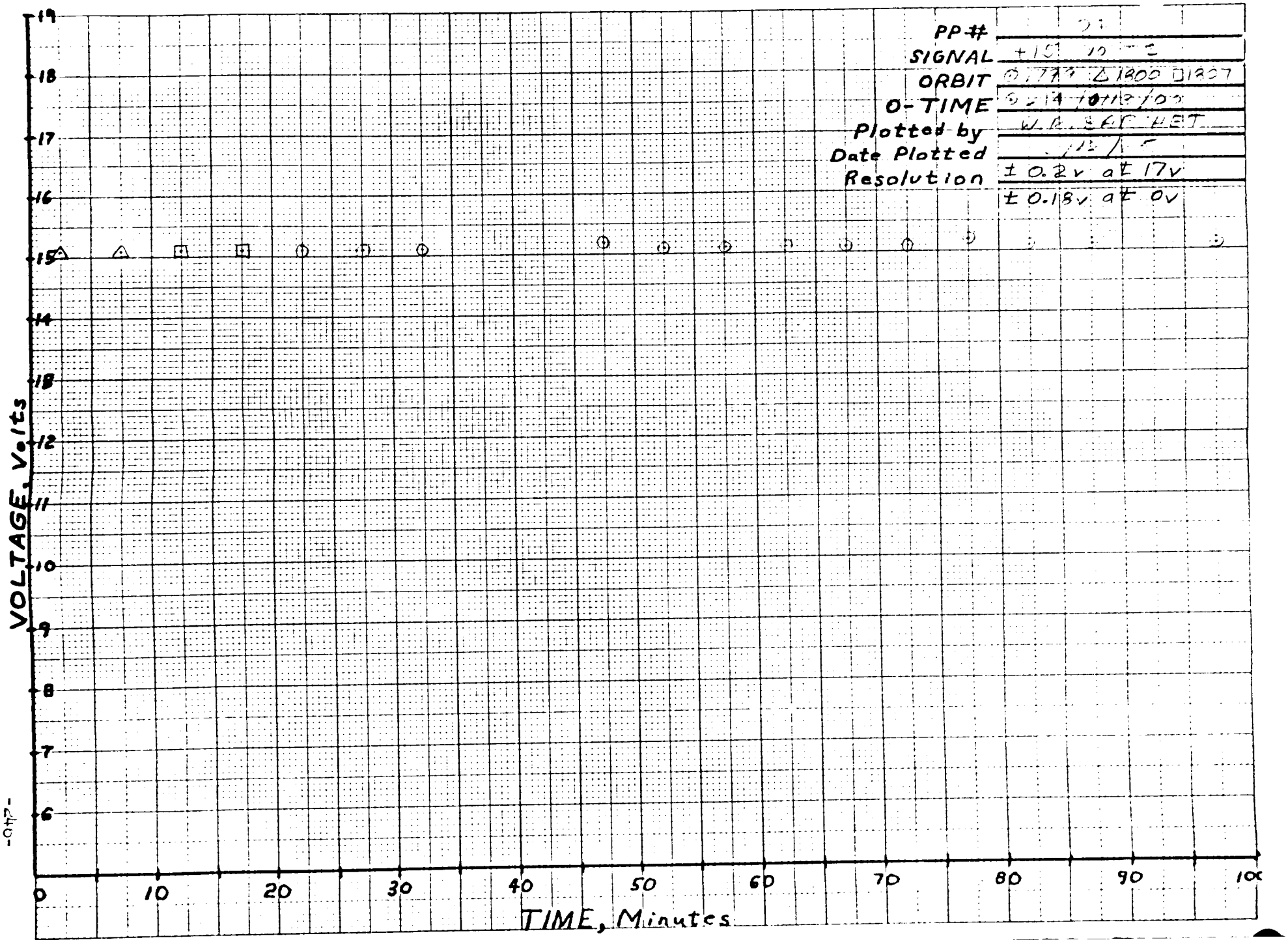
K+E 10 X 10 TO 1/2 INCH 46 1472
7 1/2 X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



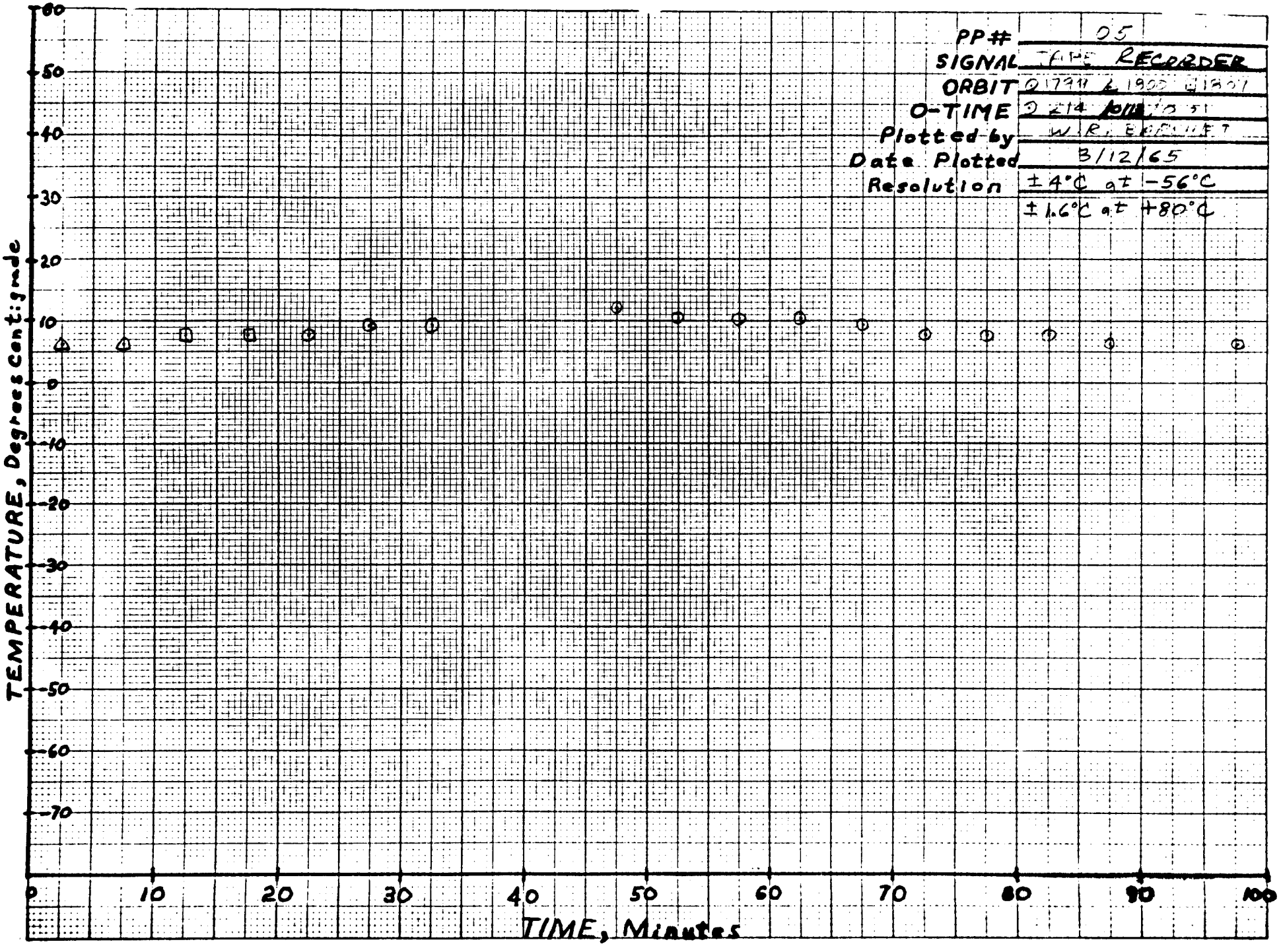
KEUFFEL & ESSER CO.



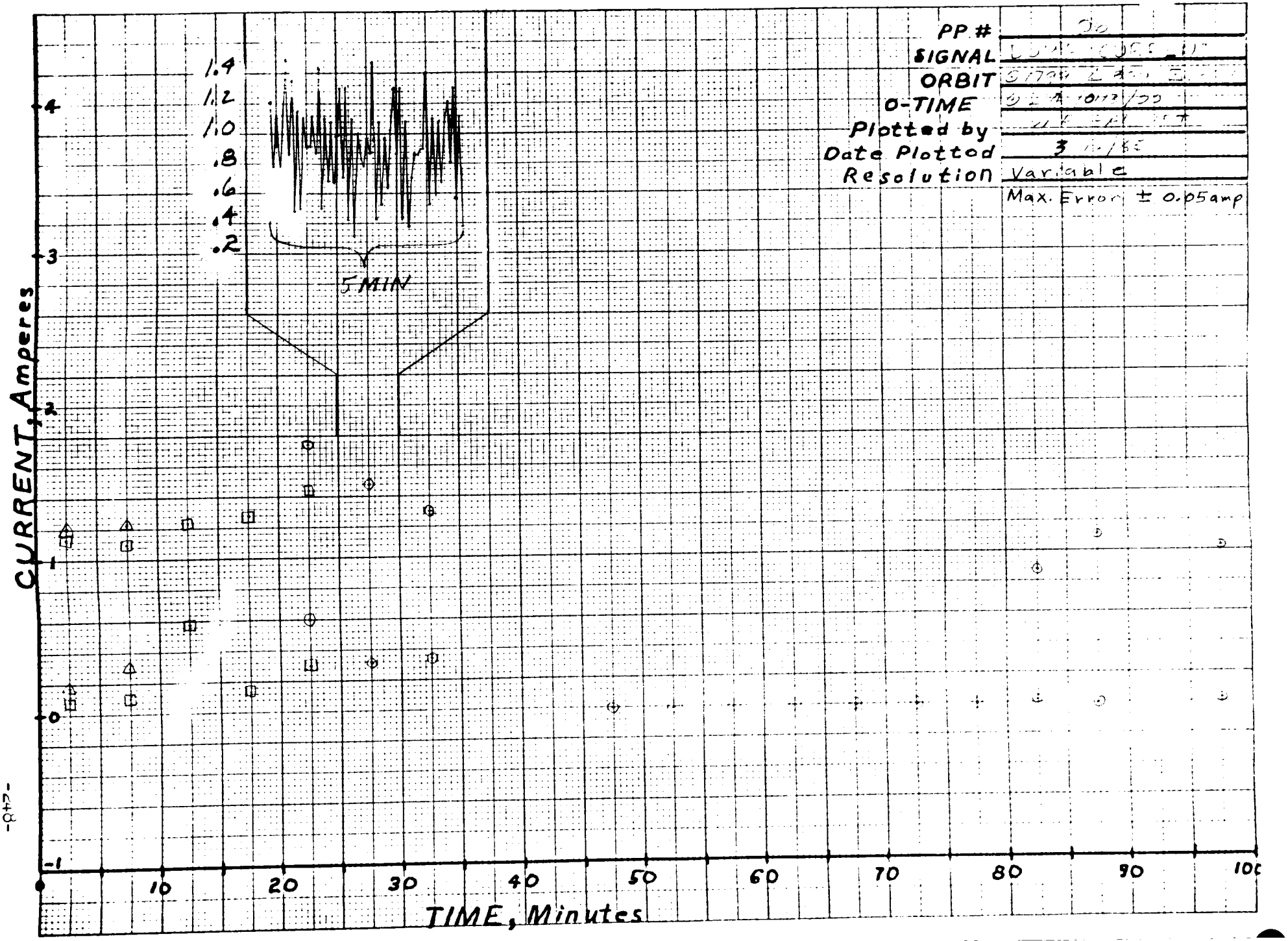
K&E 10 X 10 TO 1/2 INCH 46 1472
7 X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



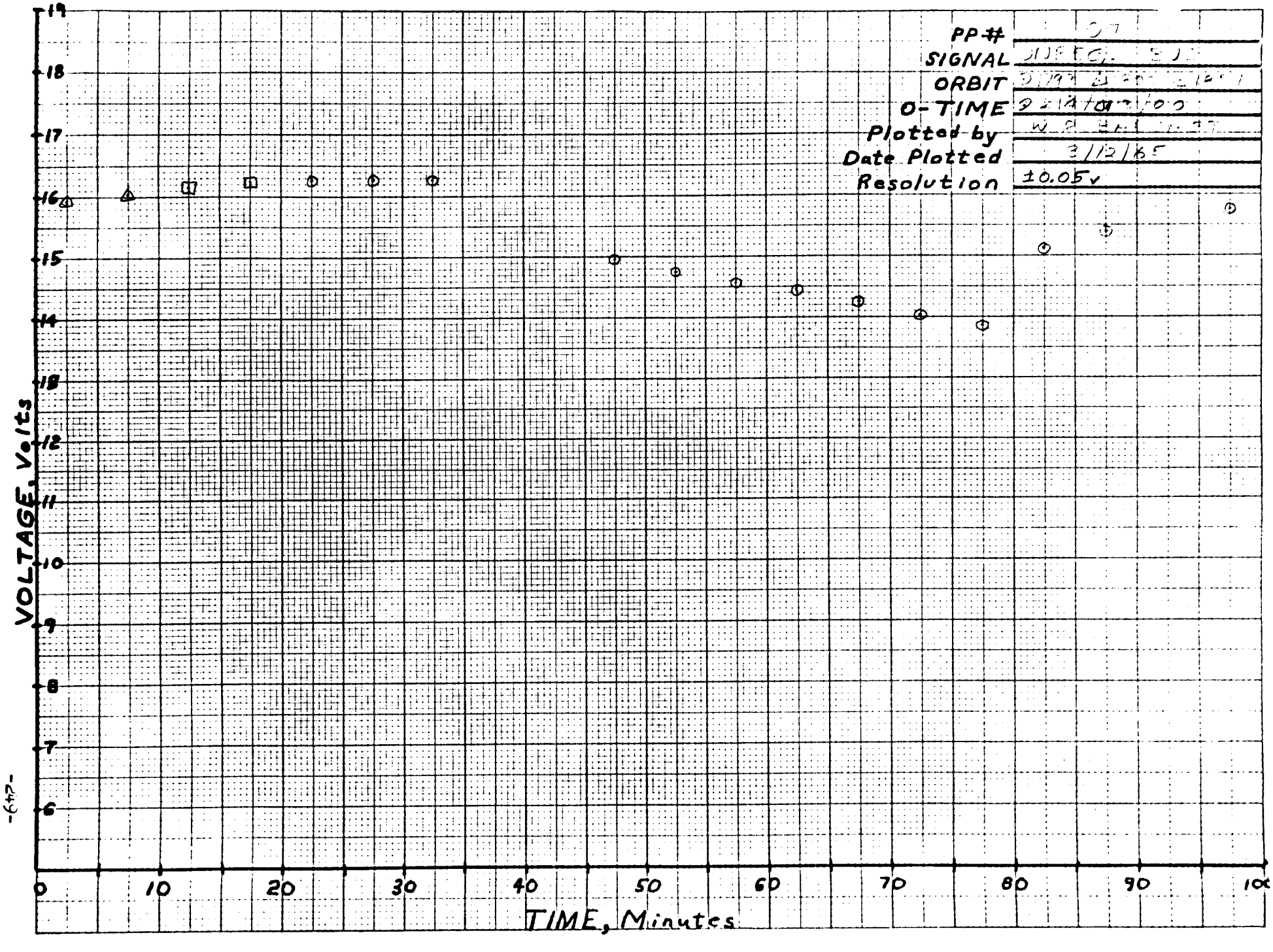
KEUFFEL & ESSER CO.



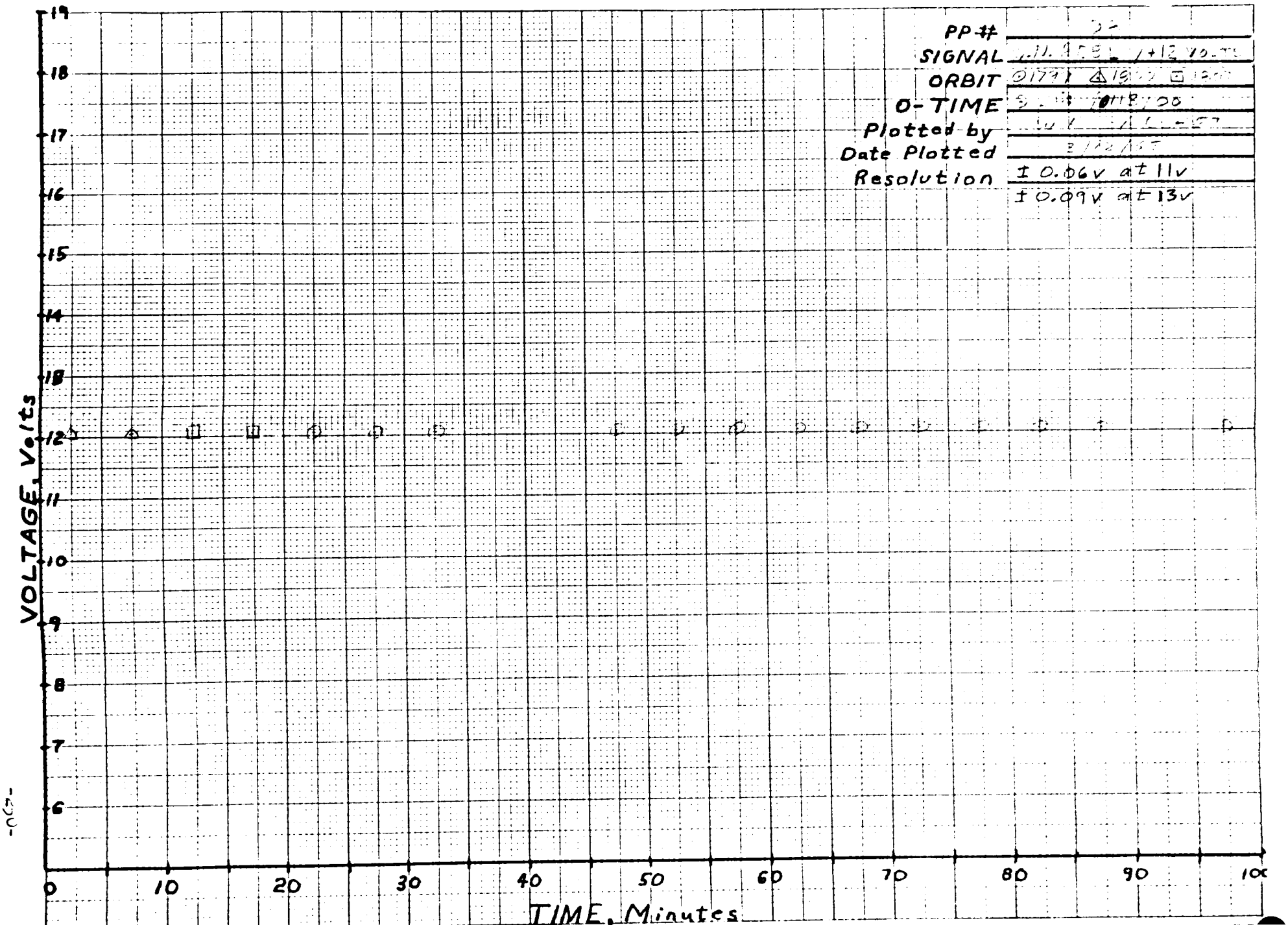
K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



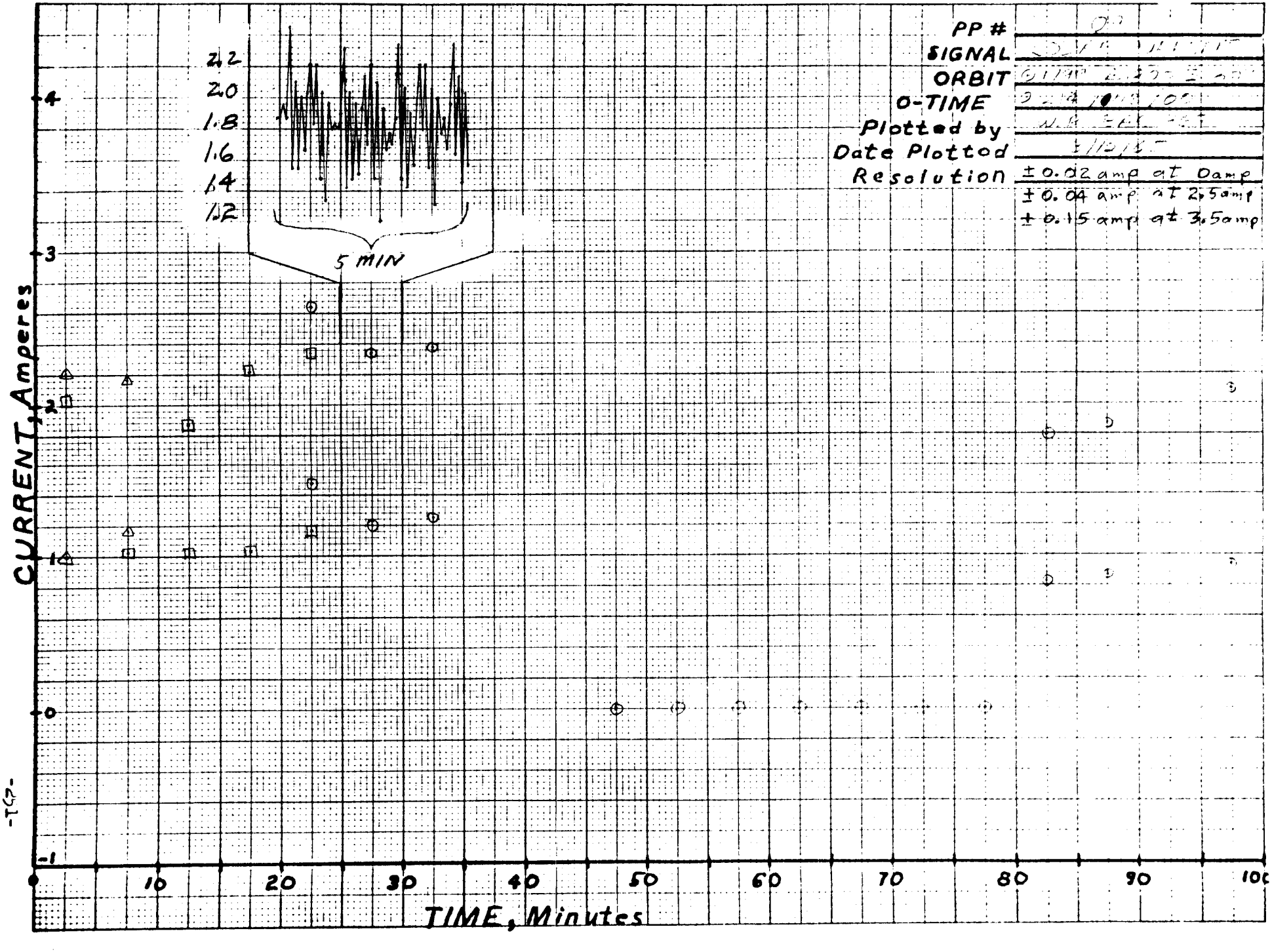
KEUFFEL & ESSER CO.



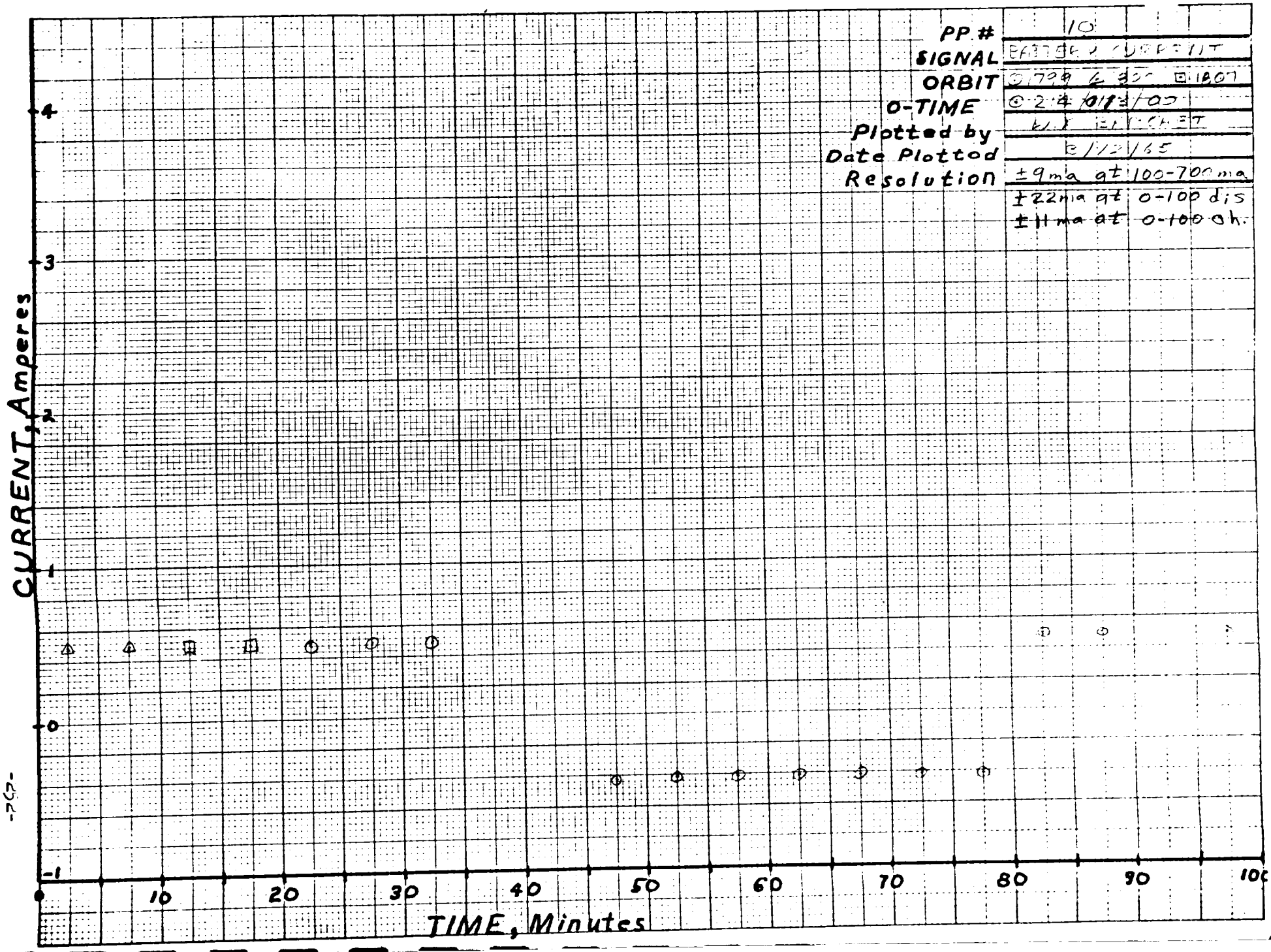
K&E 10 X 10 TO ½ INCH 46 1472
KEUFFEL & ESSER CO.



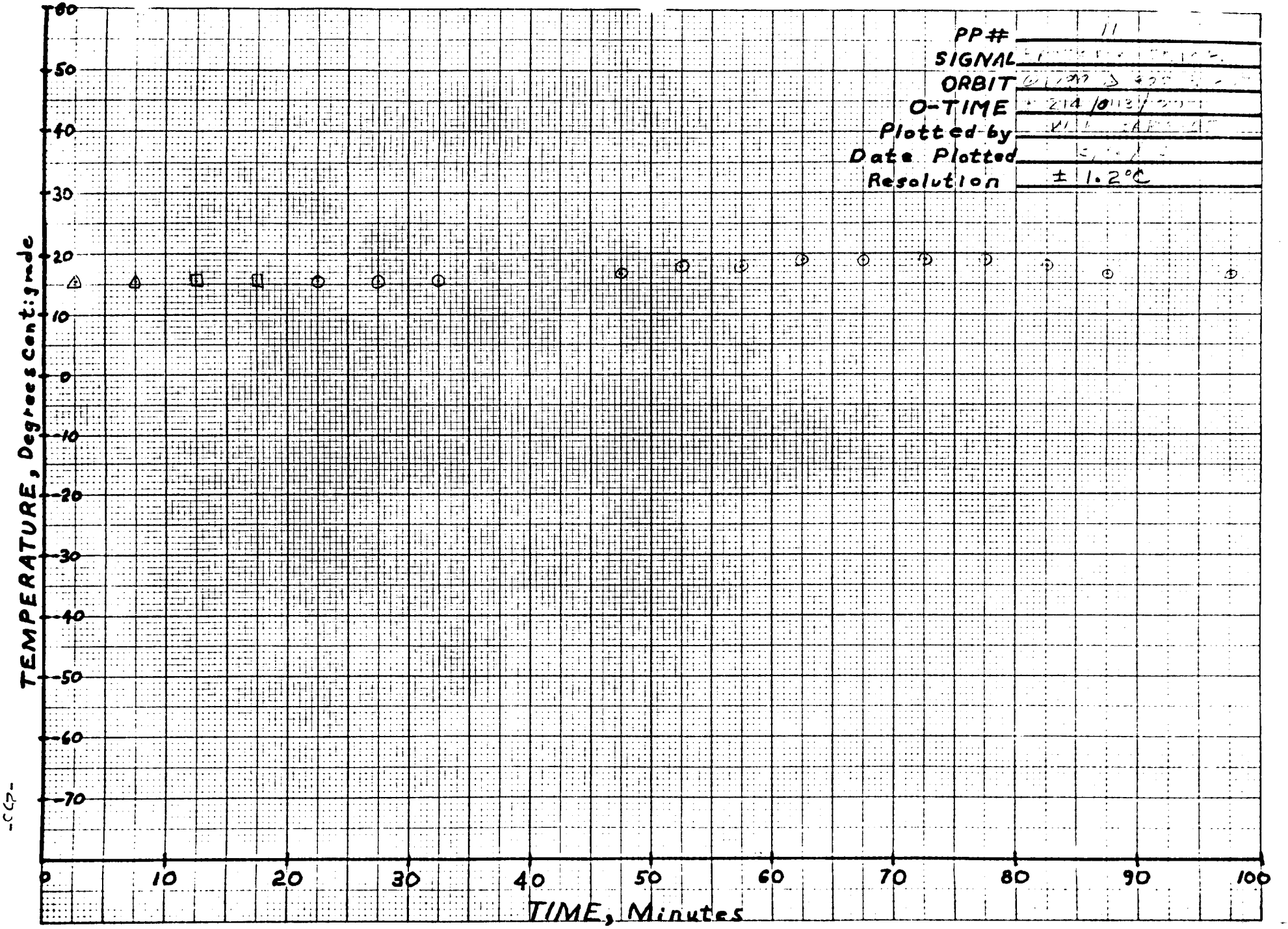
KEUFFEL & ESSER CO.



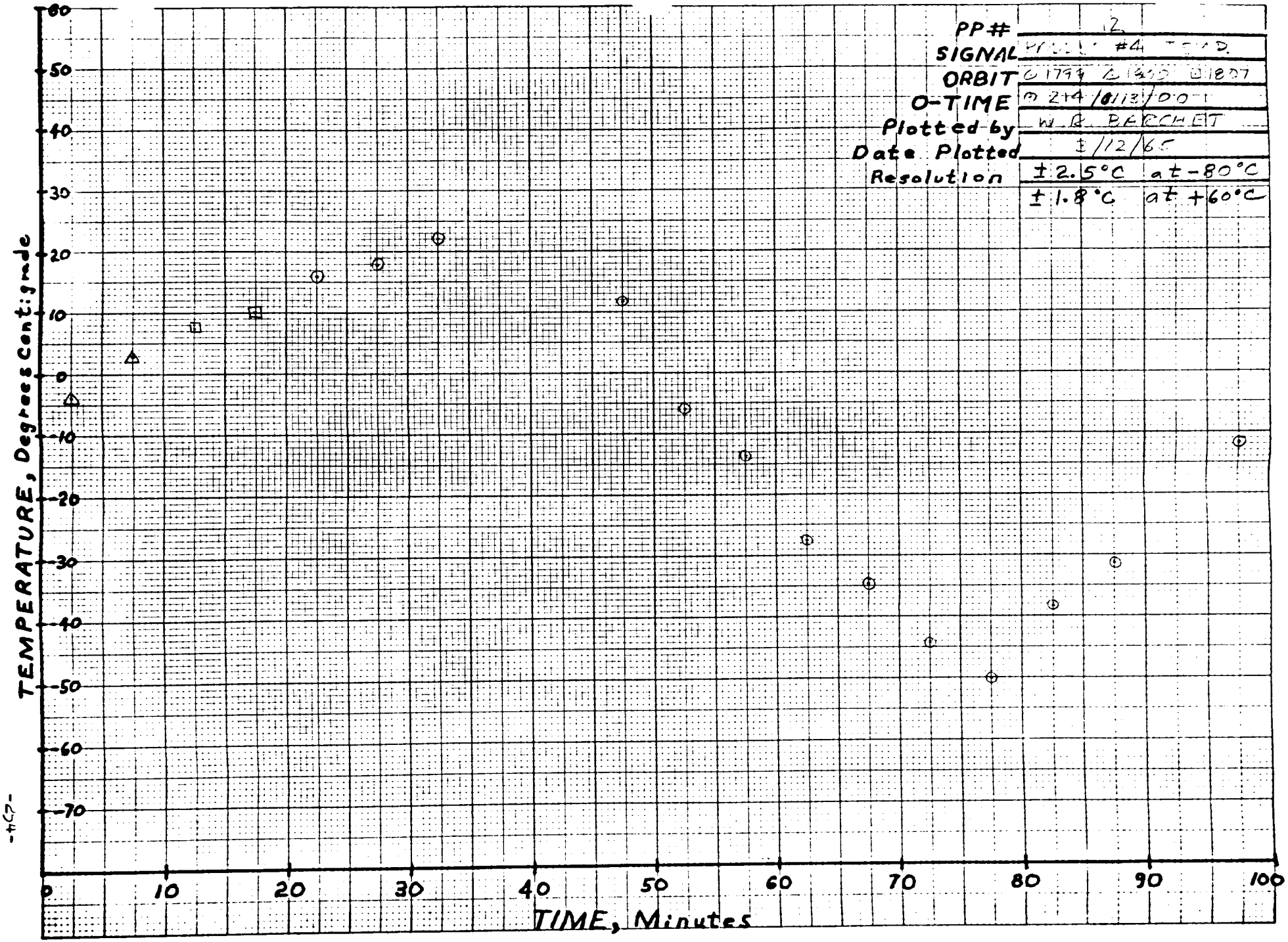
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



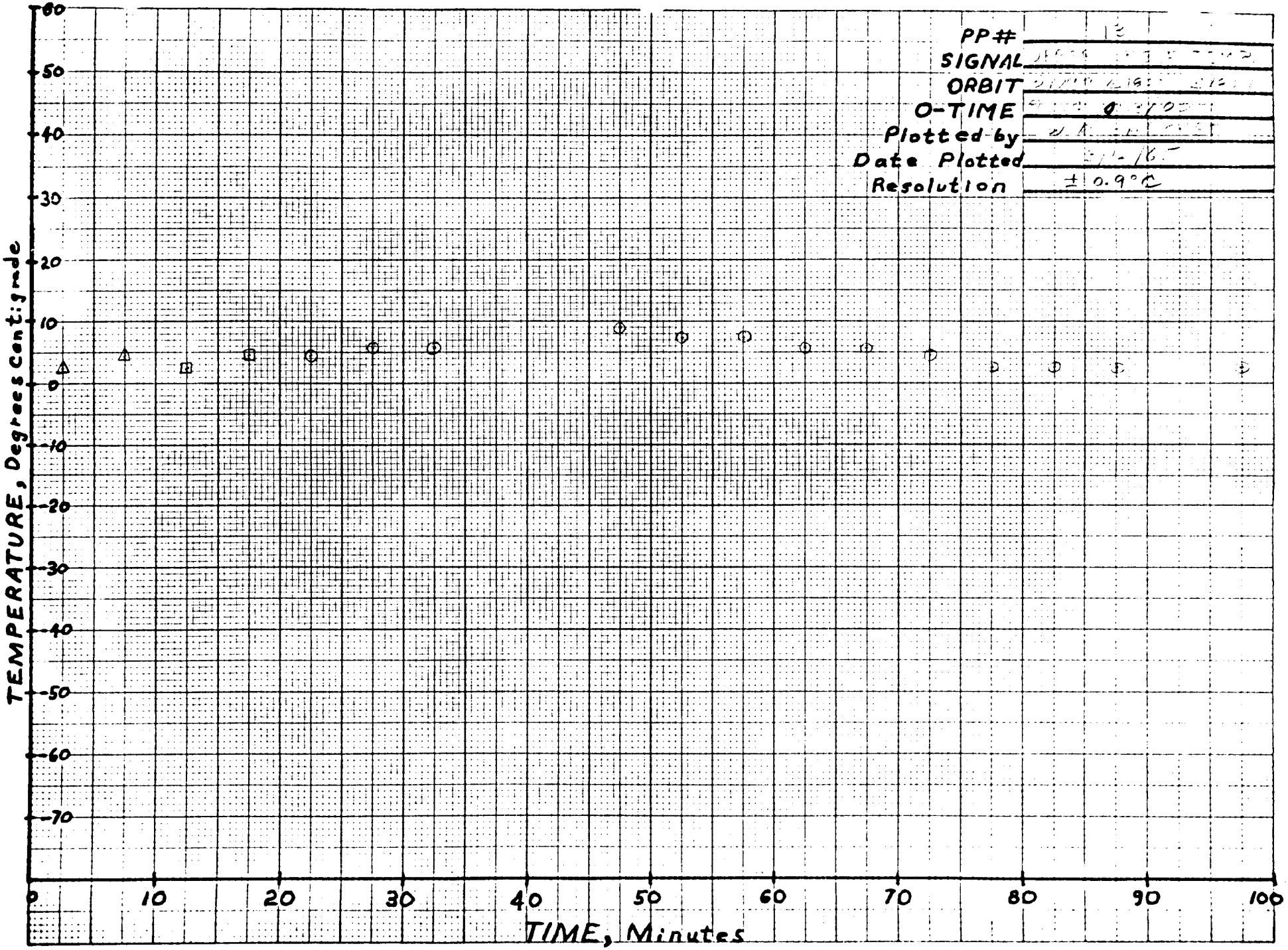
KEUFFEL & ESSER CO.



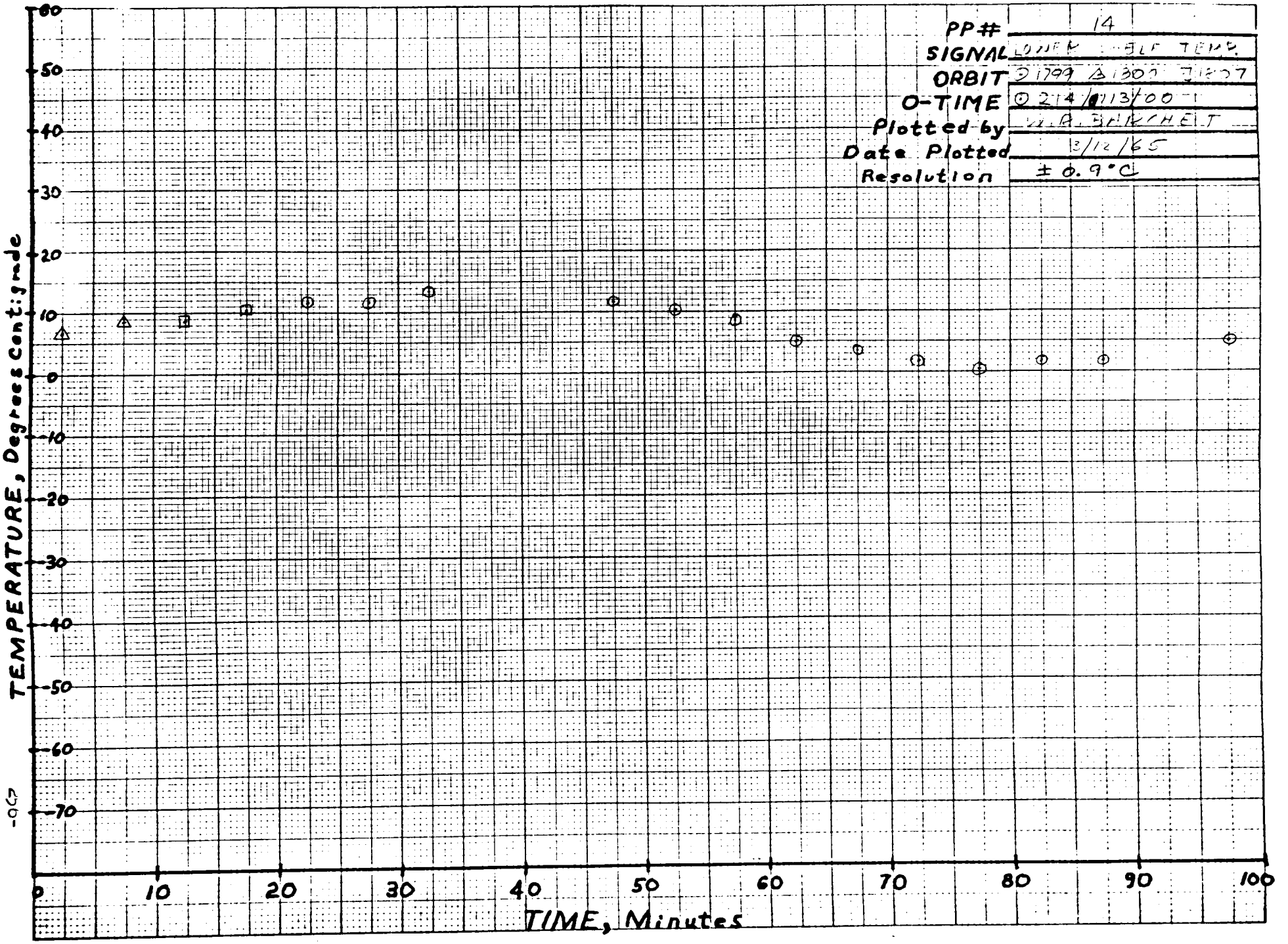
KEUFFEL & ESSER CO.

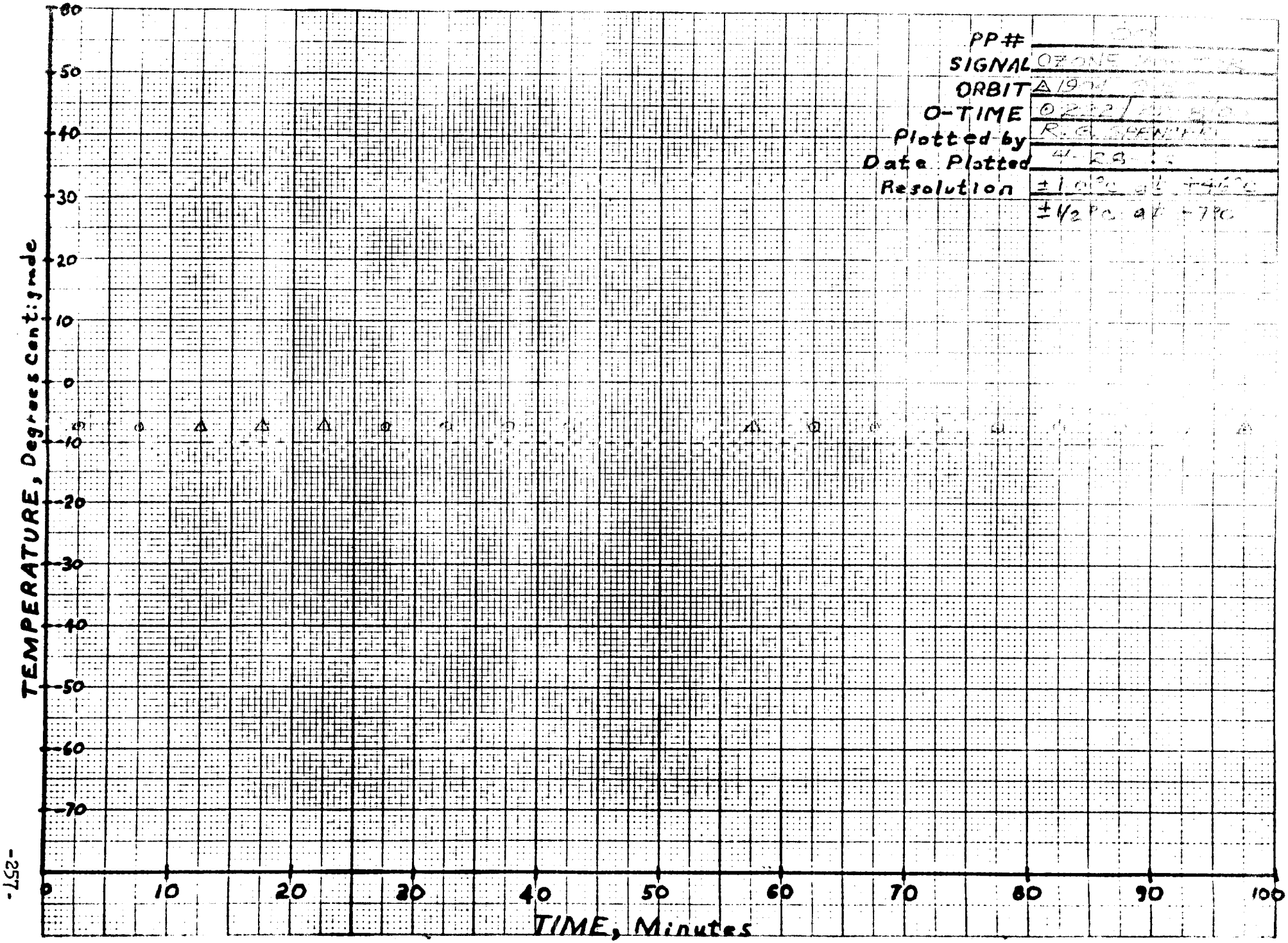


KEUFFEL & ESSER CO.

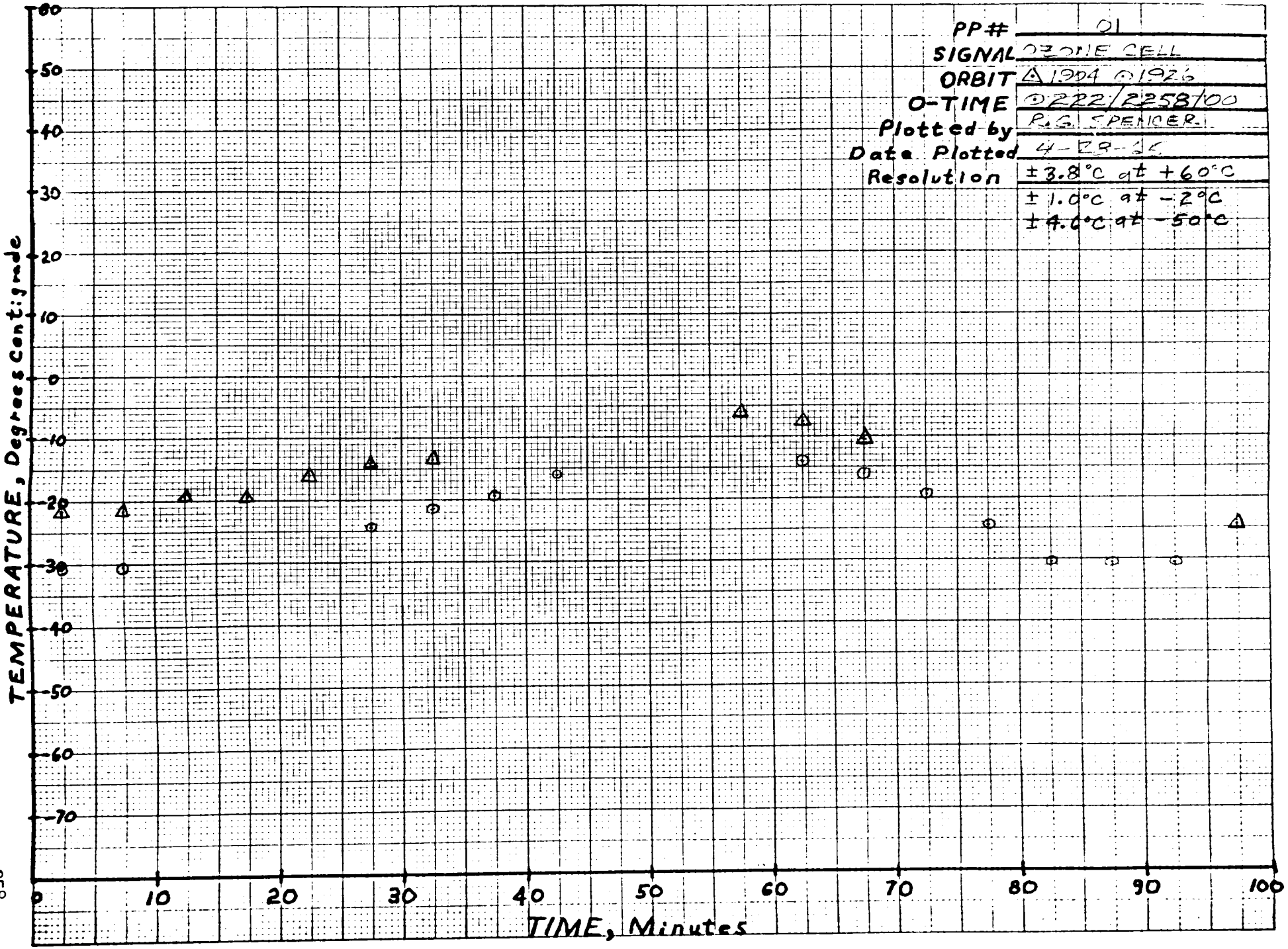


KEUFFEL & ESSER CO.

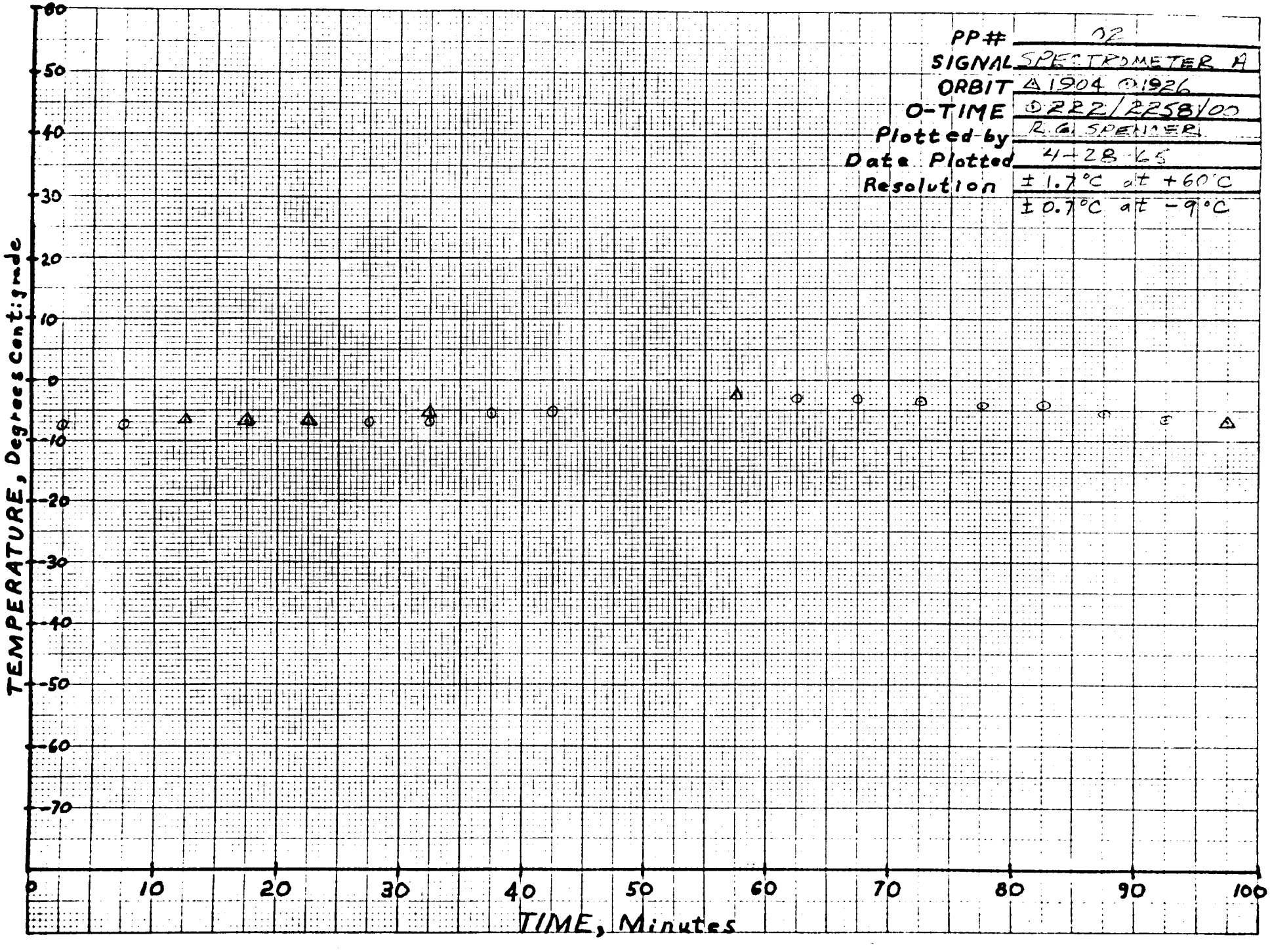



PP#
SIGNAL
ORBIT
O-TIME
Plotted by
Date Plotted
Resolution
TEMPERATURE, Degrees Centigrade
80
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

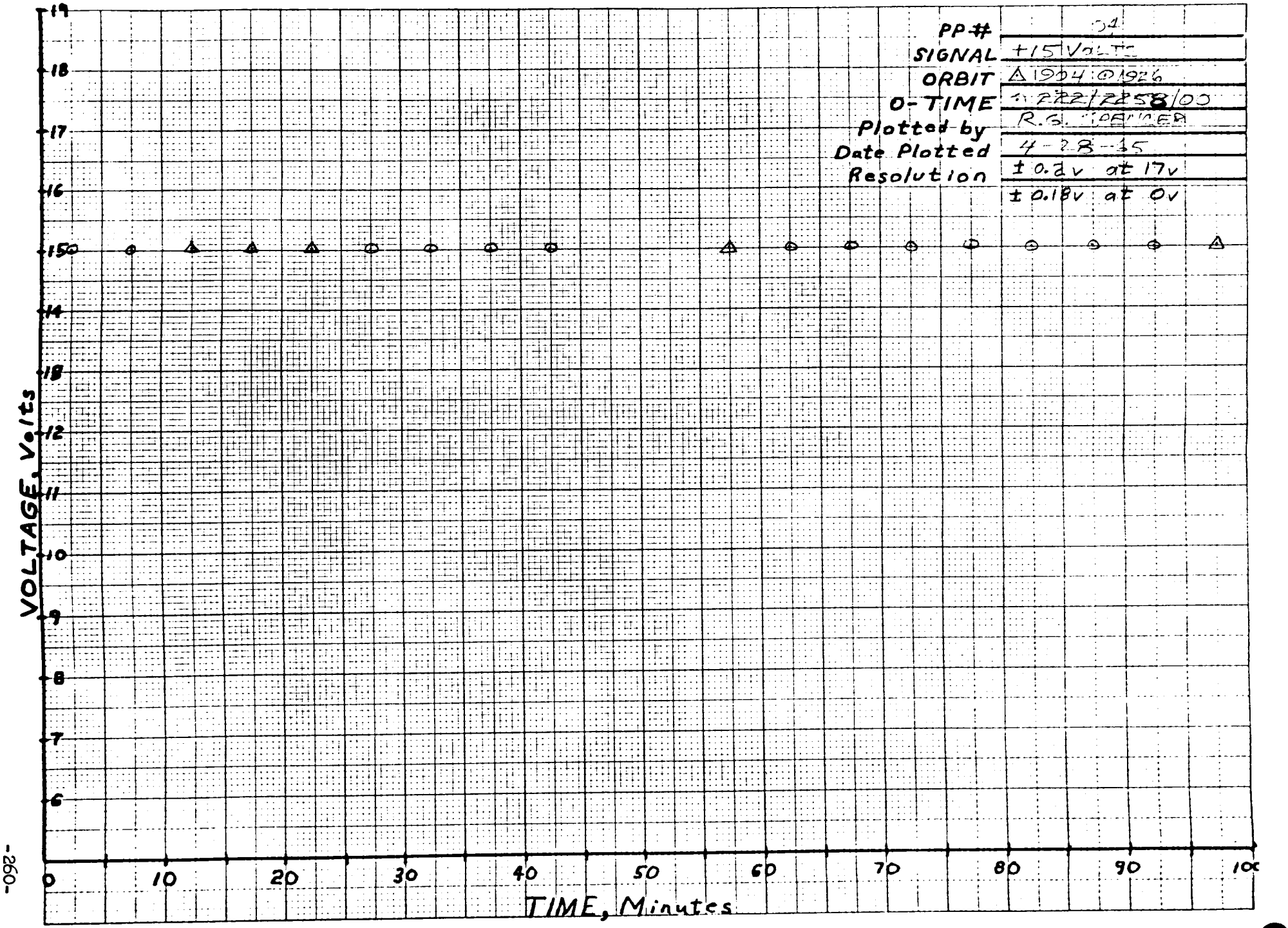
K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

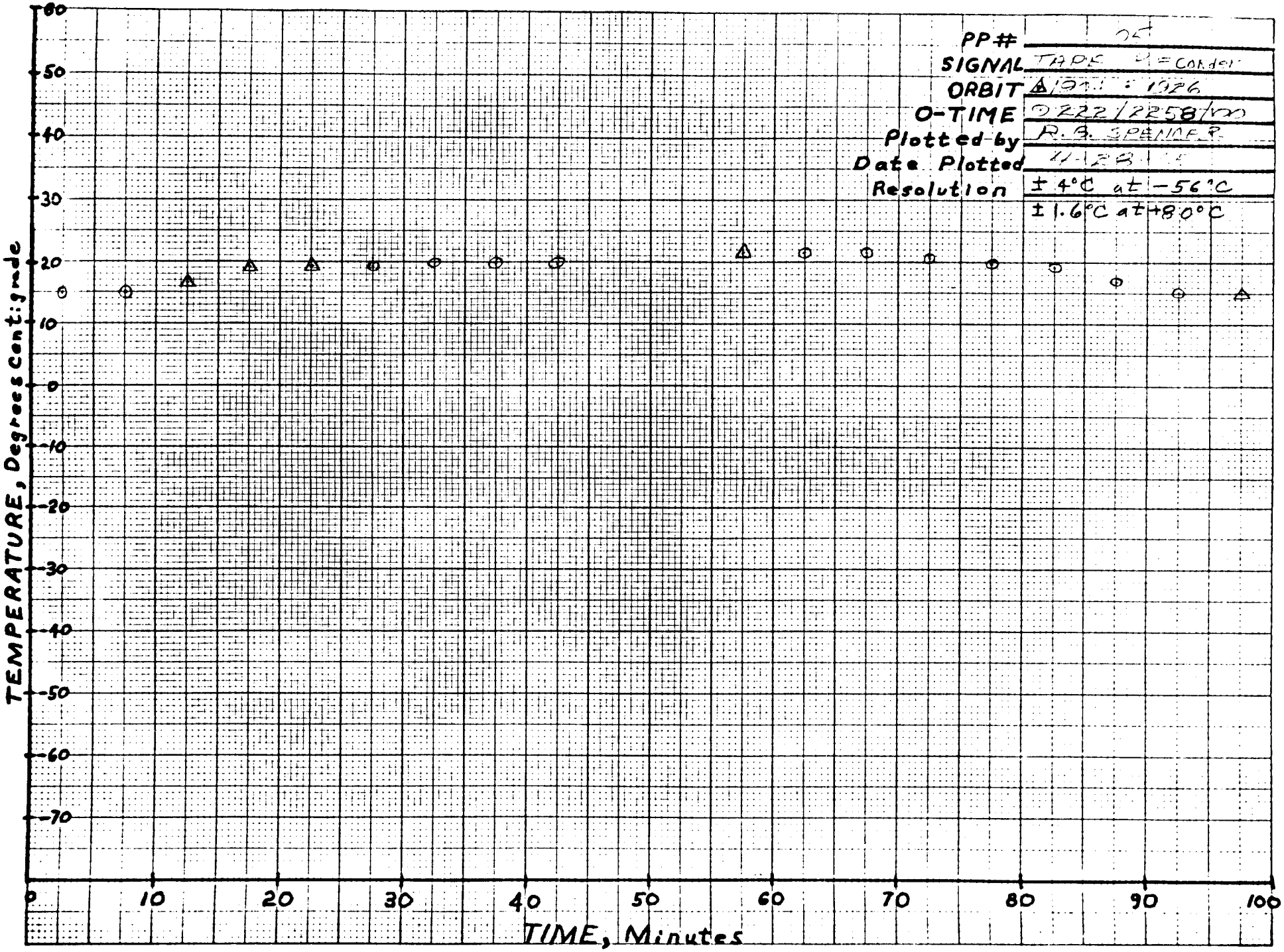


KEUFFEL & ESSER CO.

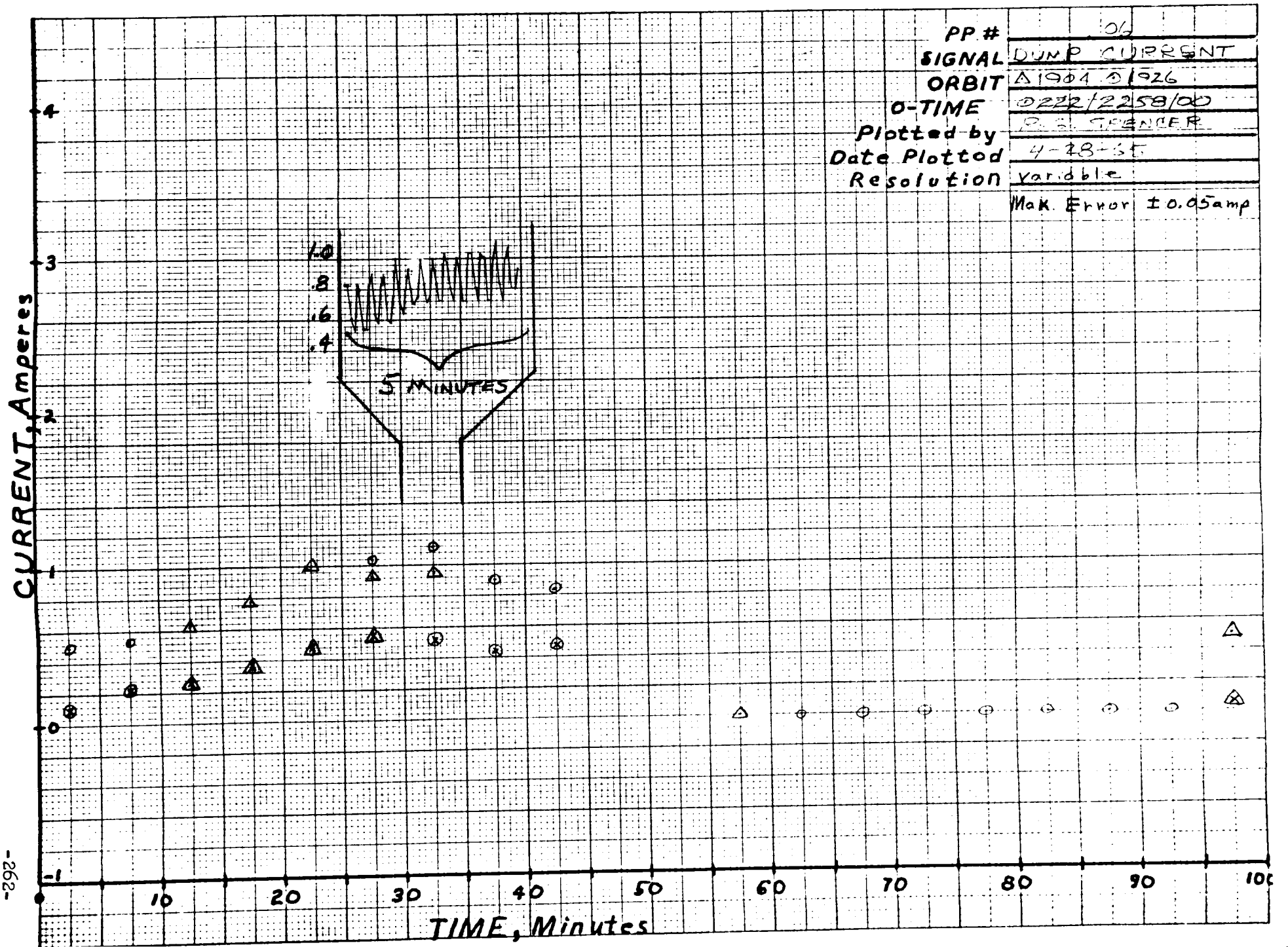


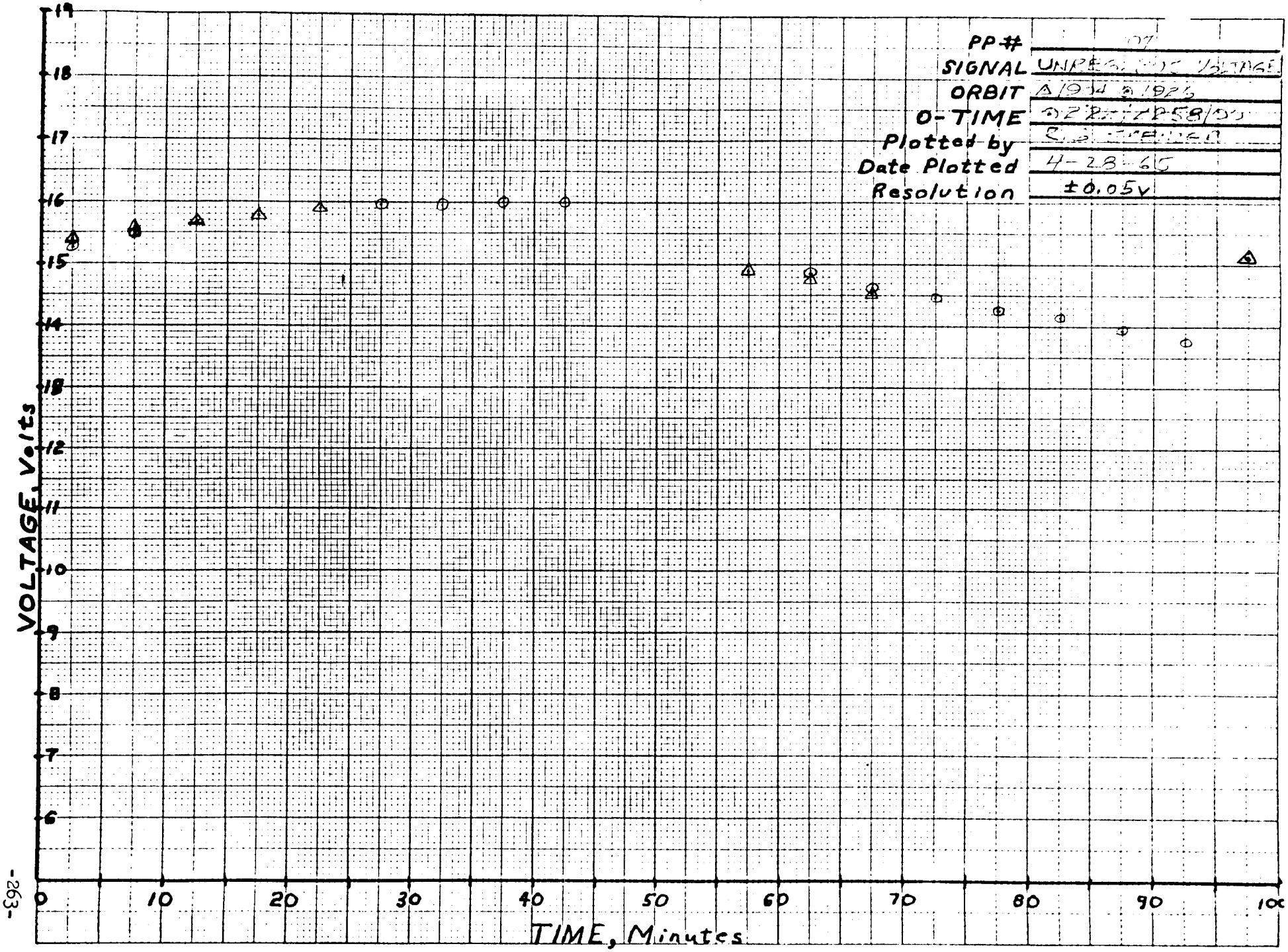
K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



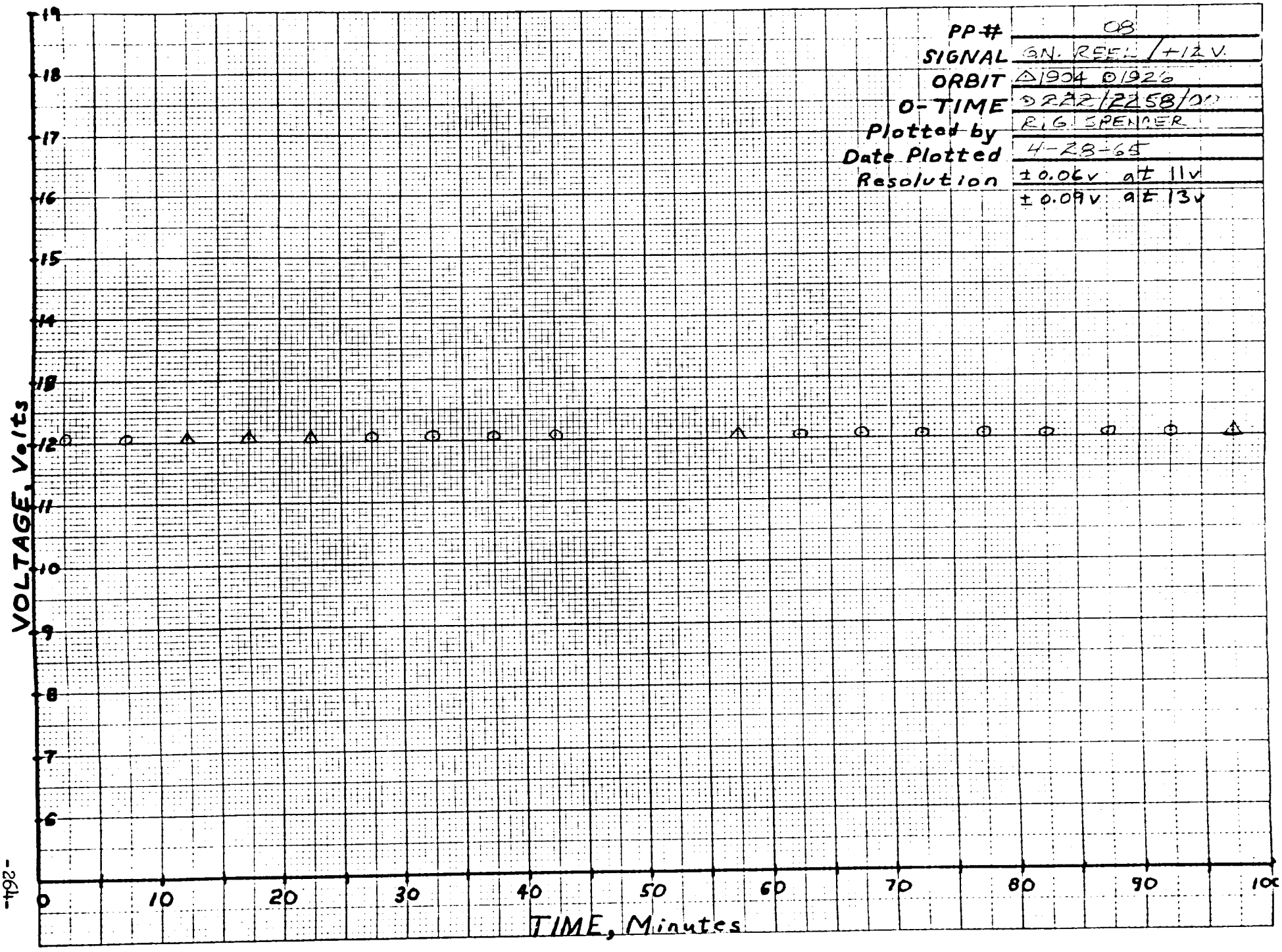

PP#
SIGNAL TAPE
ORBIT
O-TIME
Plotted by R. B. SPENCER
Date Plotted
Resolution ± 4°C at −56°C
± 1.6°C at +80°C
TEMPERATURE, Degrees Centigrade
TIME, Minutes
80
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100

K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

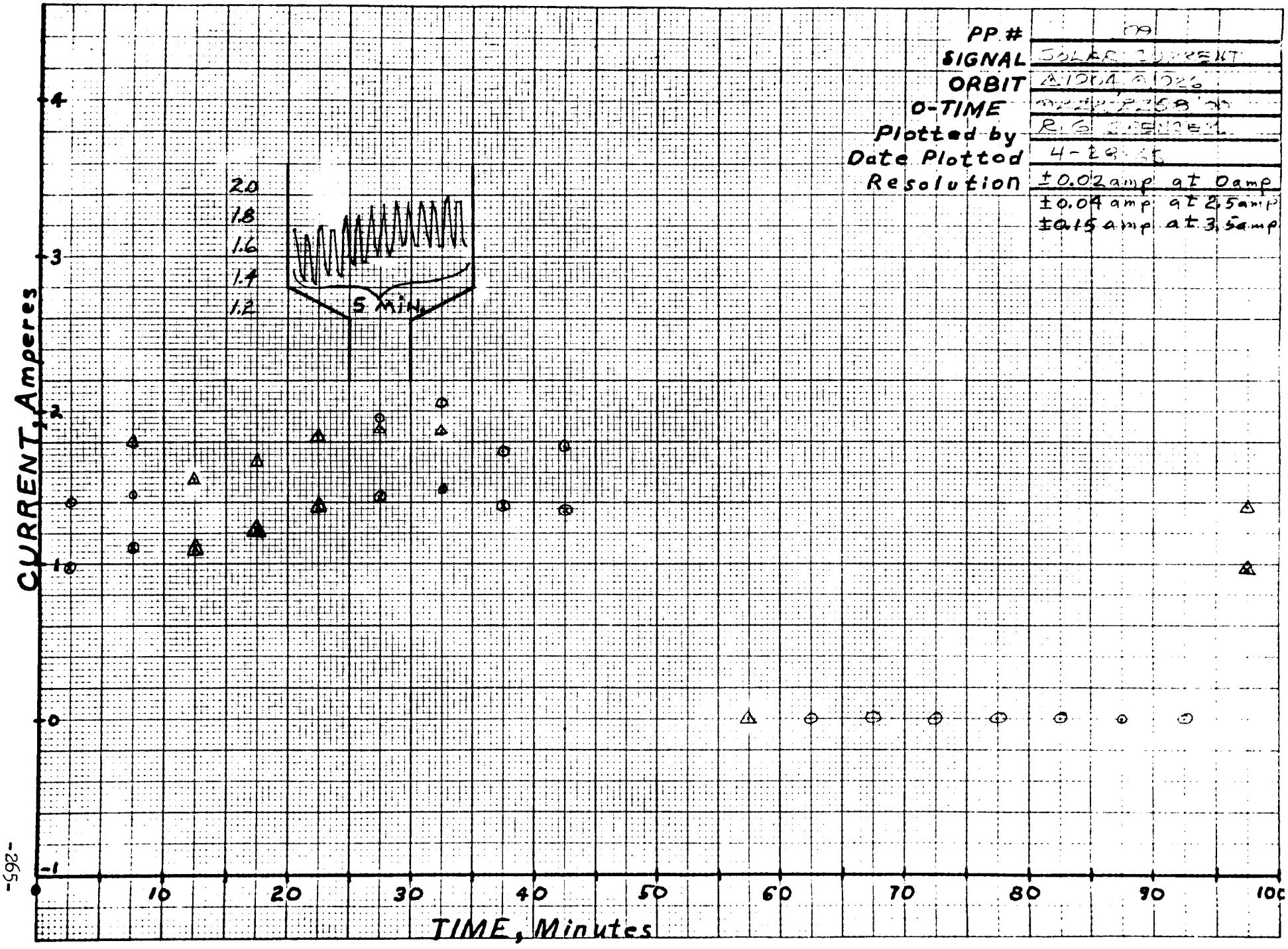



PP #
SIGNAL
ORBIT
O-TIME
Plotted by
Date Plotted
Resolution
4-28-65
±0.05v
VOLTAGE, Volts
TIME, Minutes
19
18
17
16
15
14
13
12
11
10
9
8
7
6
0
10
20
30
40
50
60
70
80
90
100

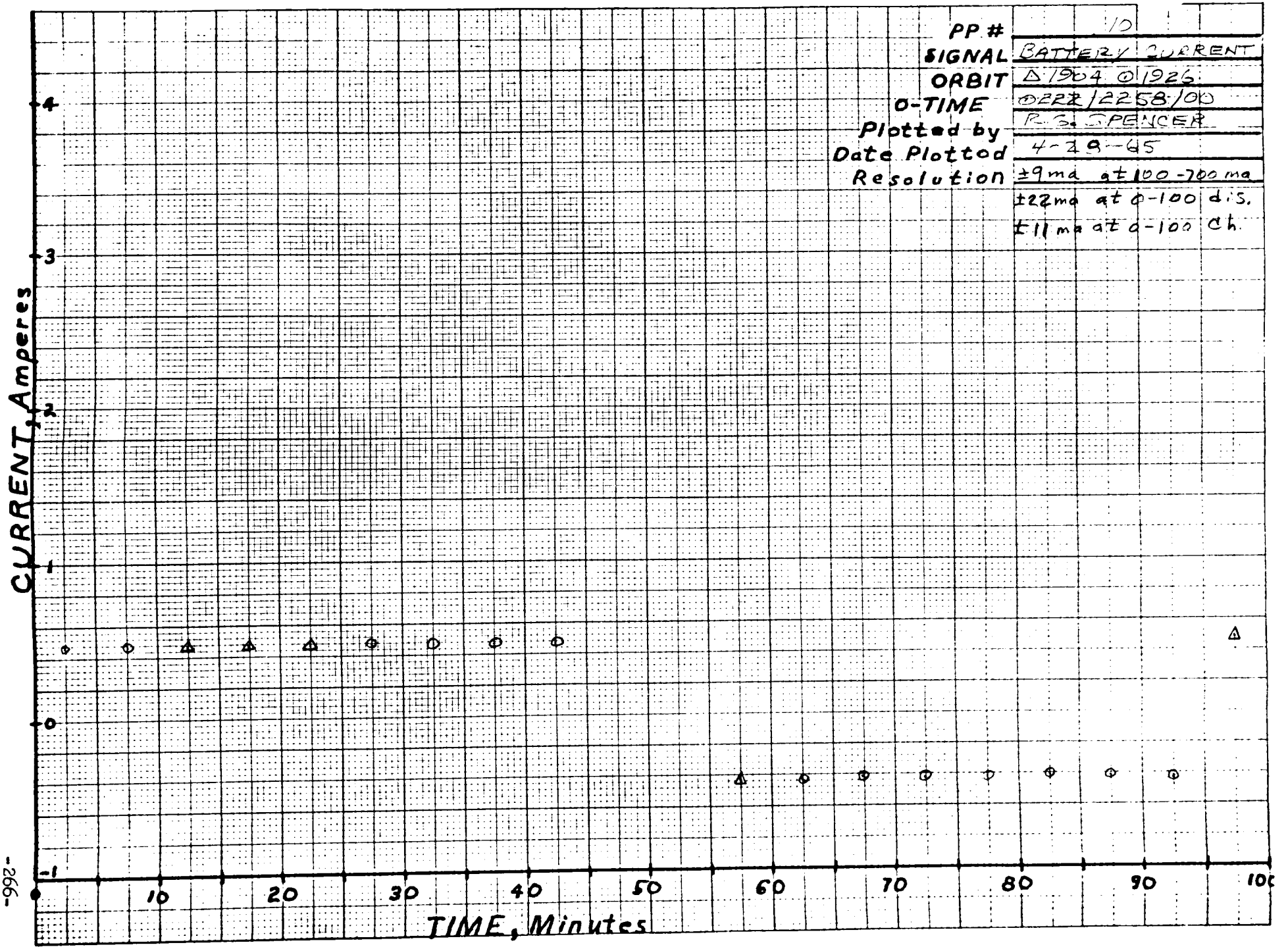
KEUFFEL & ESSER CO.



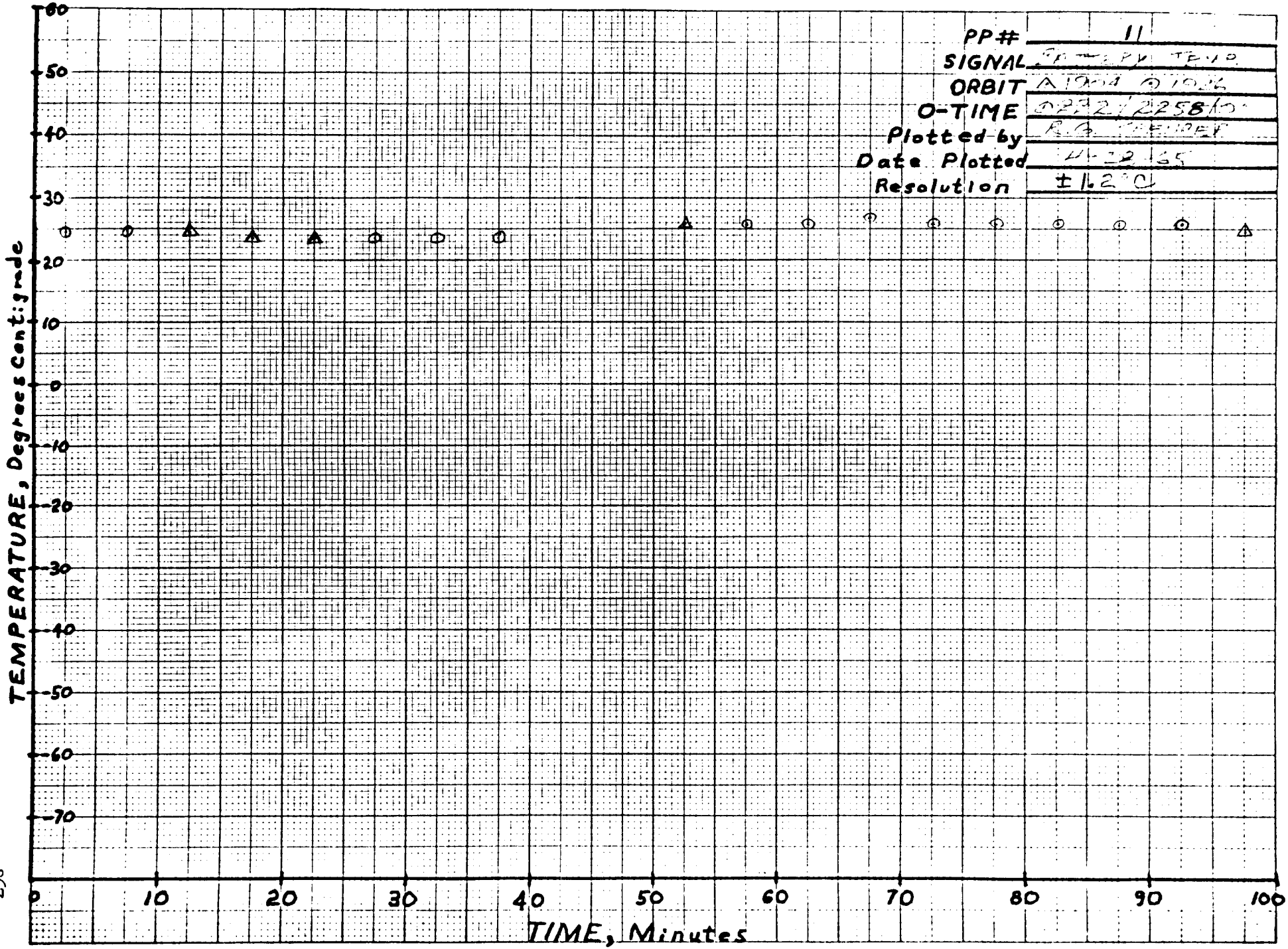
KEUFFEL & ESSER CO.

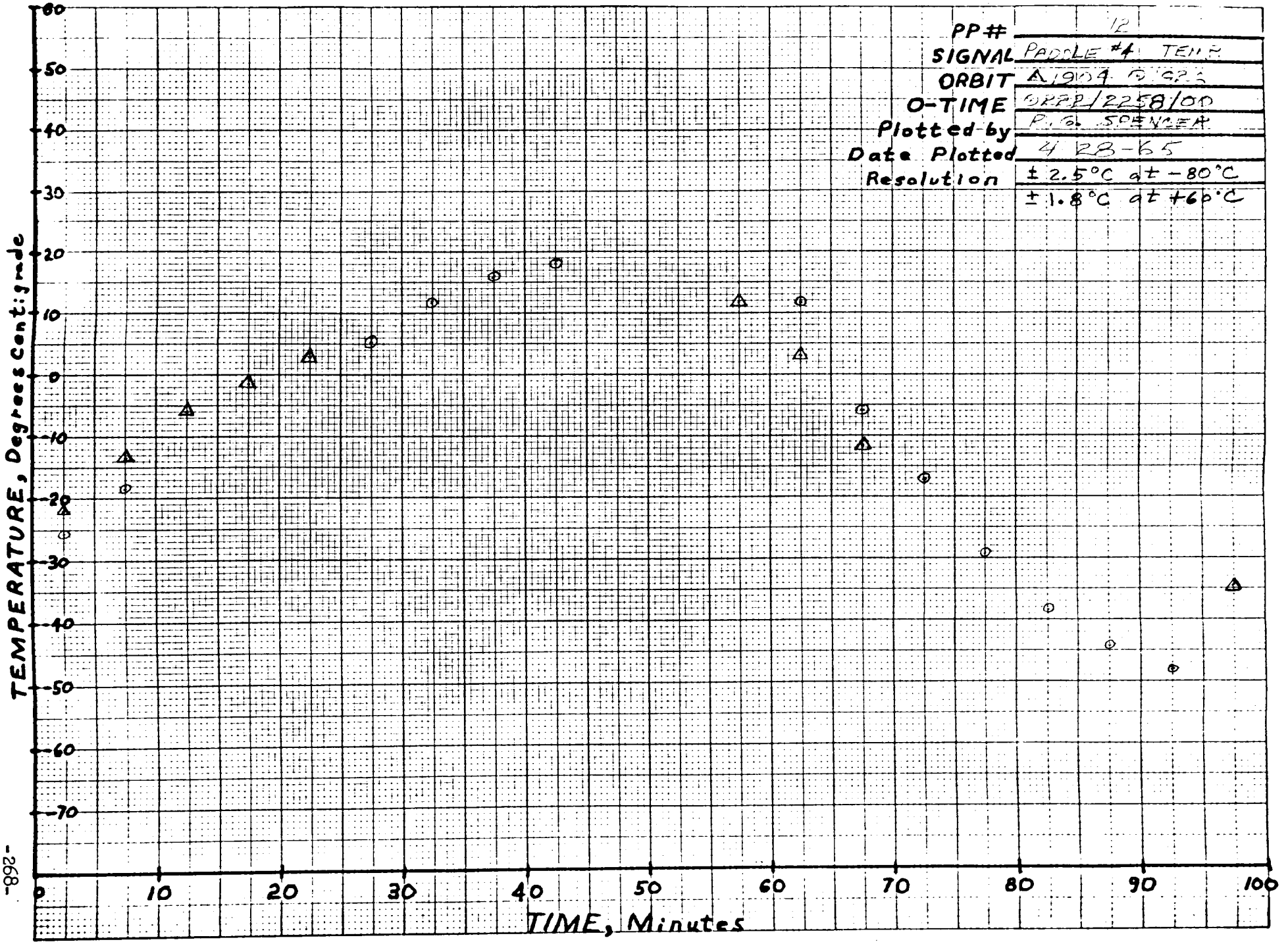


KEUFFEL & ESSER CO.

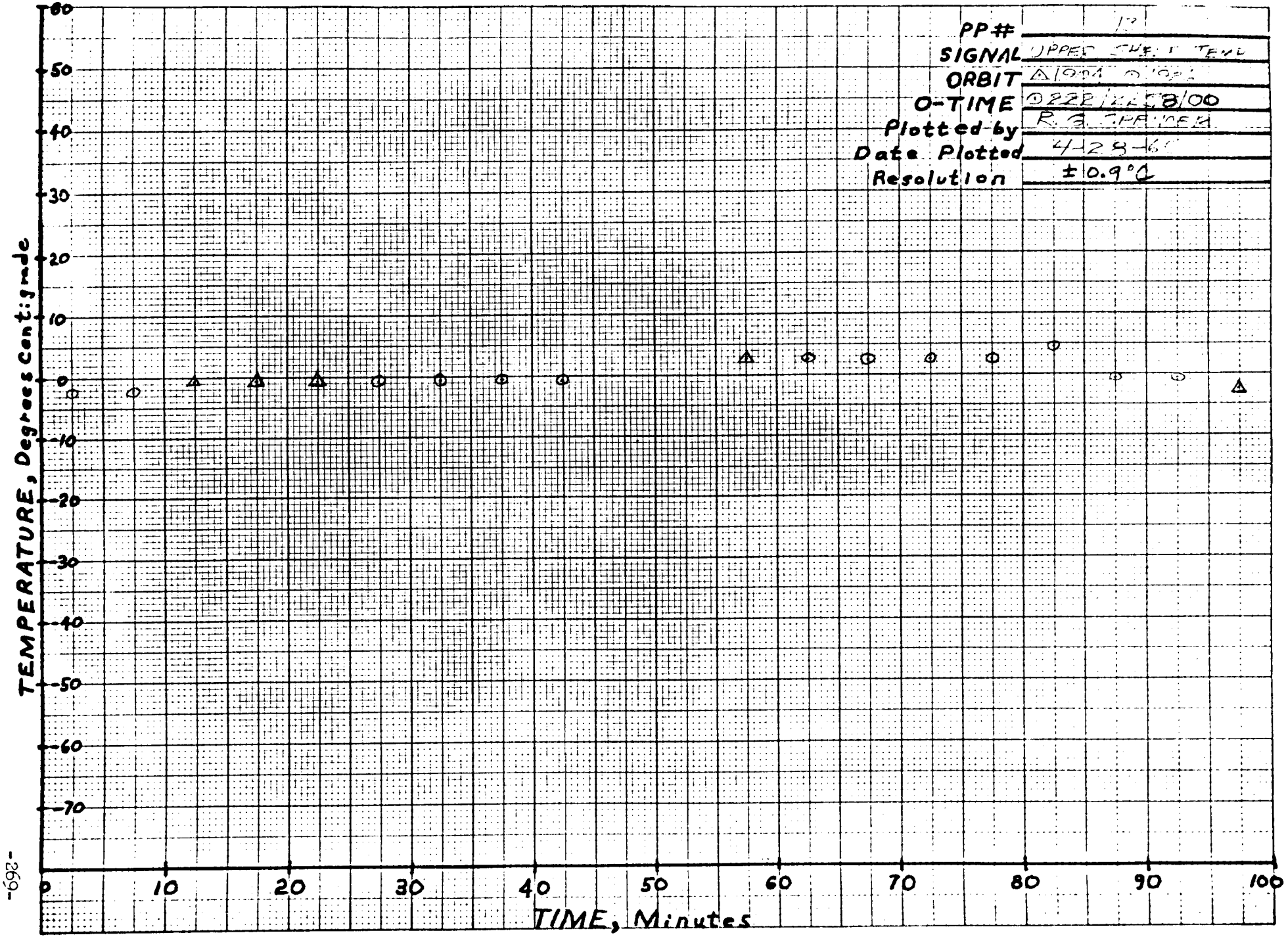


KEUFFEL & ESSER CO.

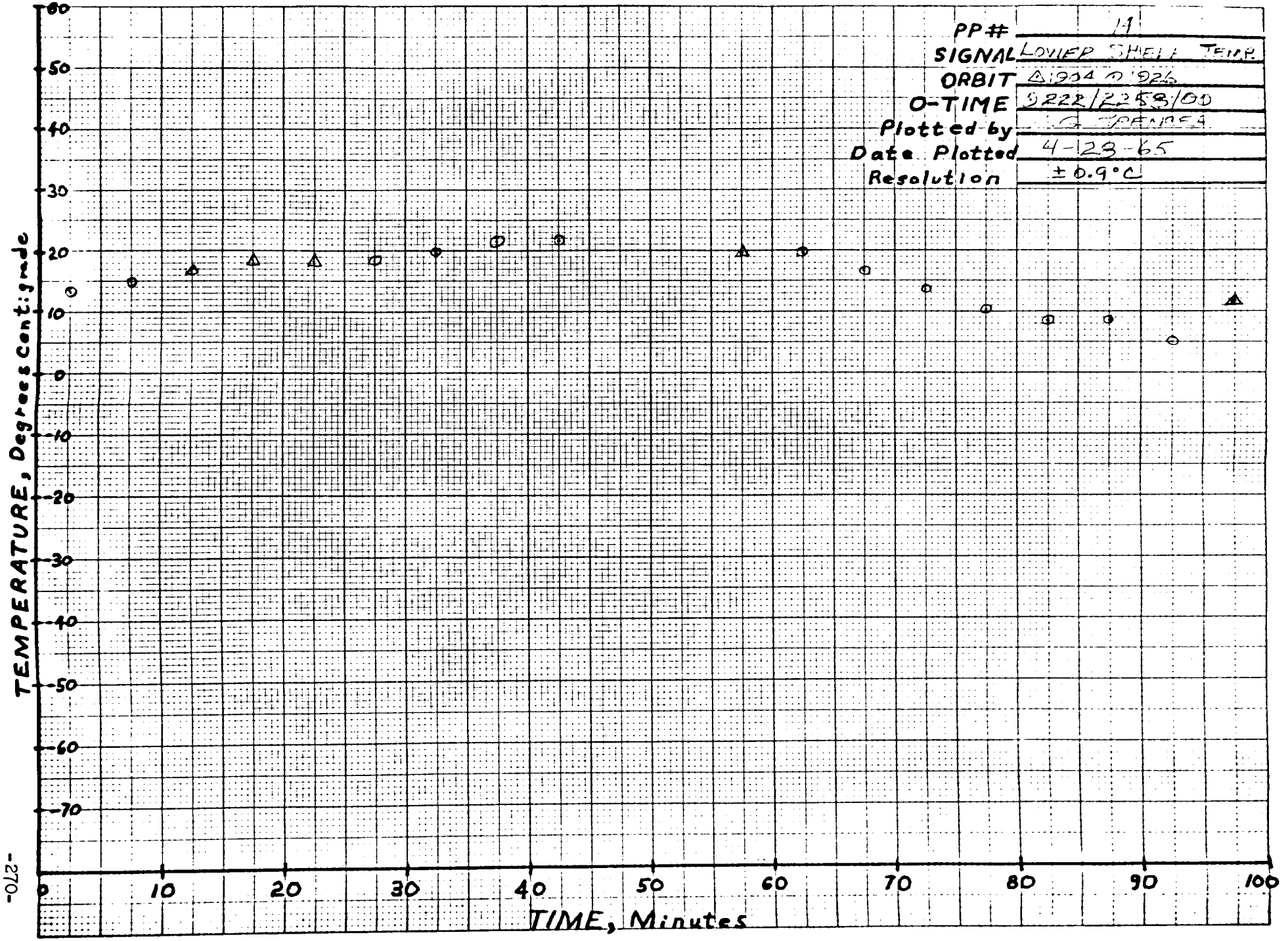


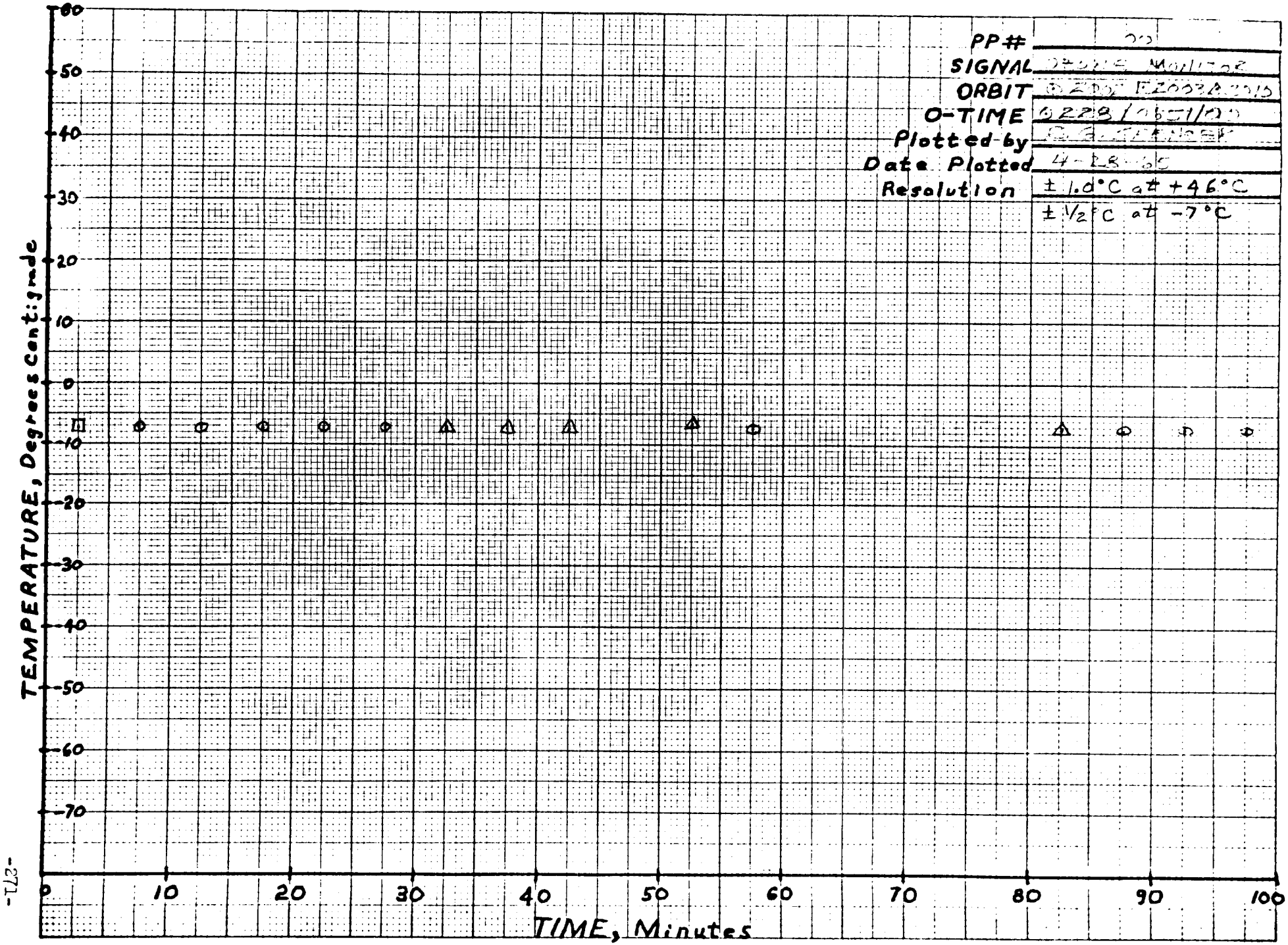

PP# 12
SIGNAL PADDLE #4 TEMP
ORBIT A 1904 D 62
O-TIME 0RPP/2258/00
Plotted by P. G. SPENCER
Date Plotted 4 28-65
Resolution ± 2.5°C at -80°C
± 1.8°C at +60°C
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

KEUFFEL & ESSER CO.

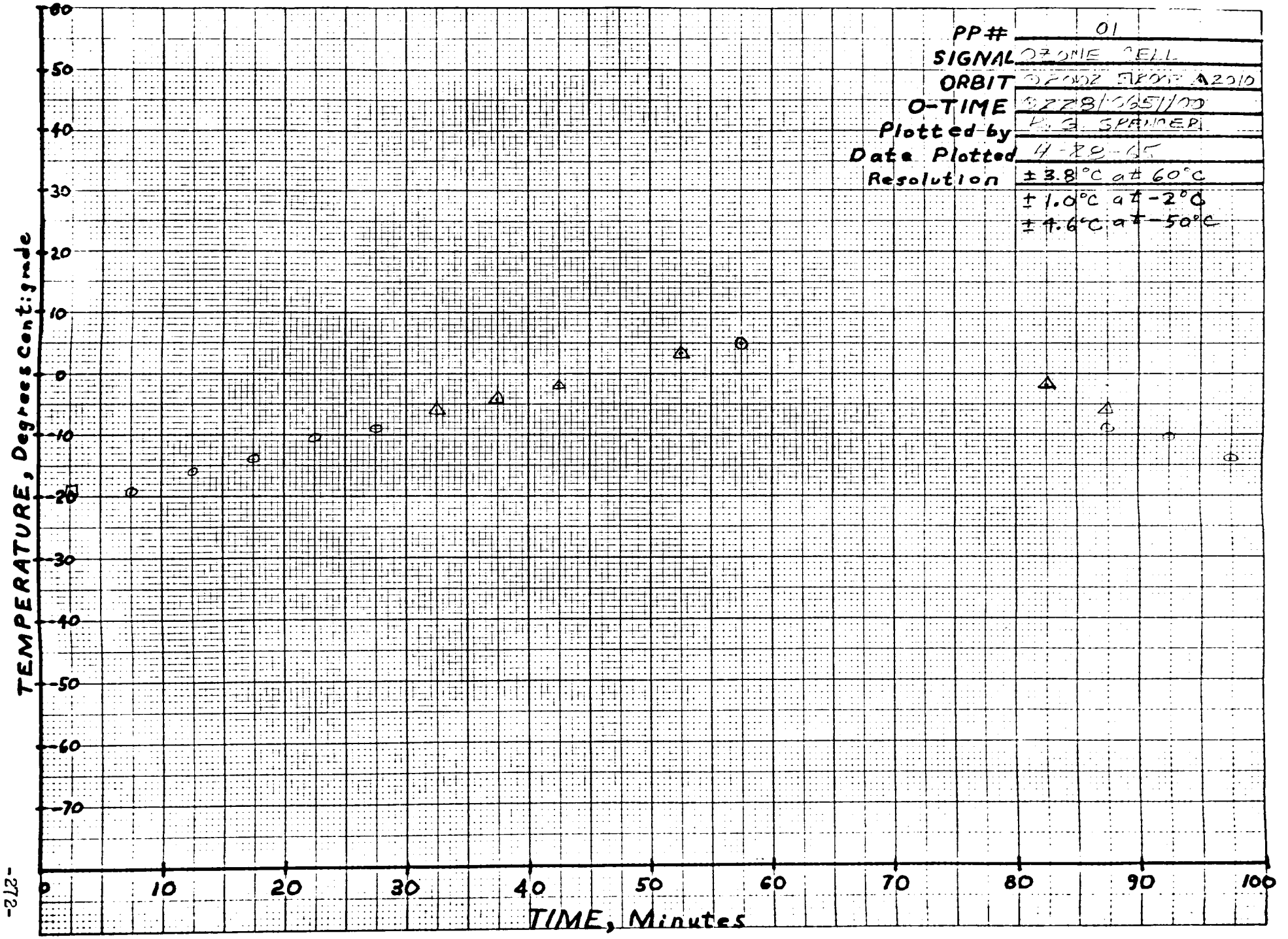


KEUFFEL & ESSER CO.

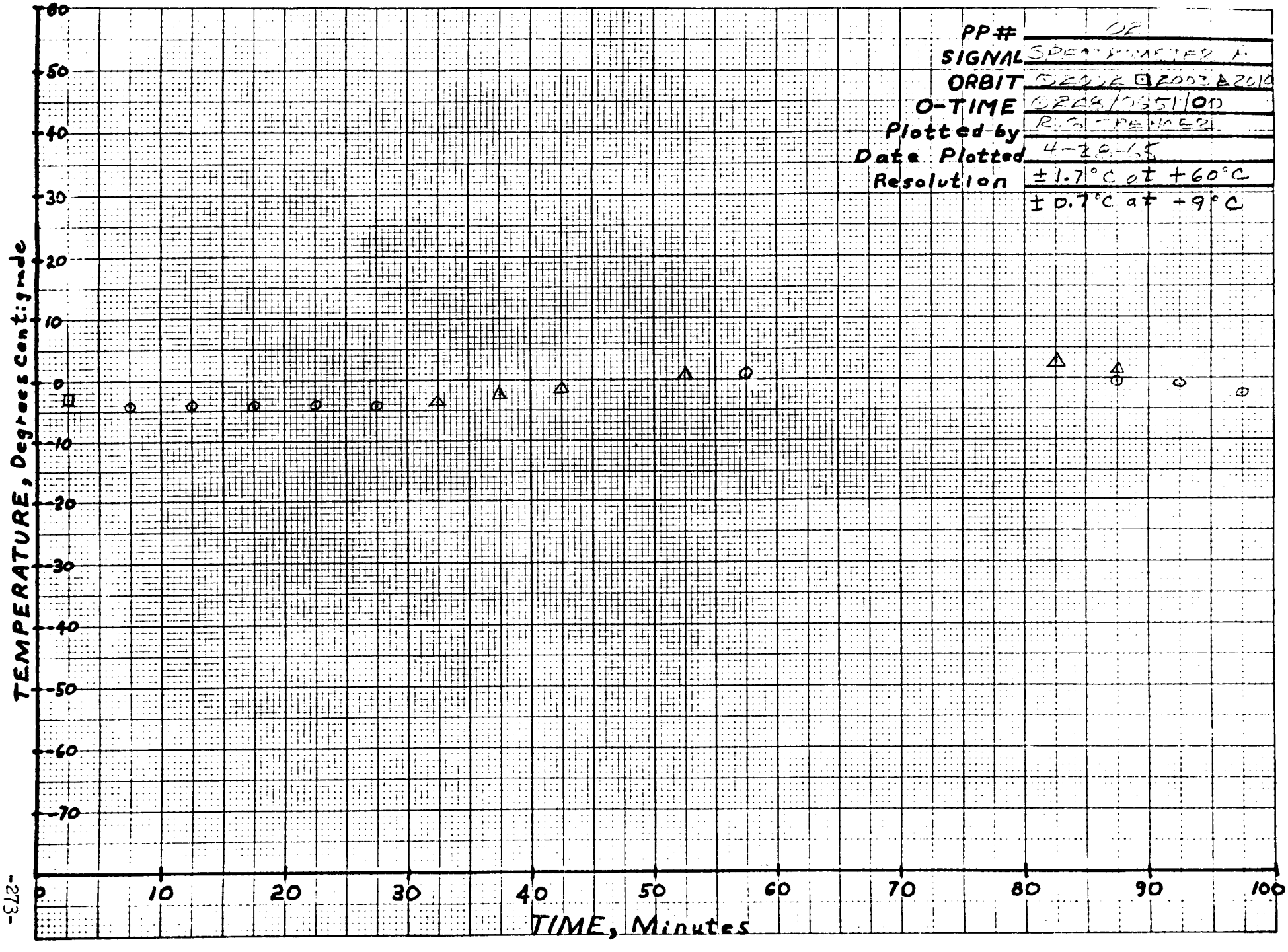



PP# [illegible]
SIGNAL [illegible]
ORBIT [illegible]
O-TIME [illegible]
Plotted by [illegible]
Date Plotted 4-28-66
Resolution ± 1.0°C at +46°C
± 1/2°C at -7°C
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

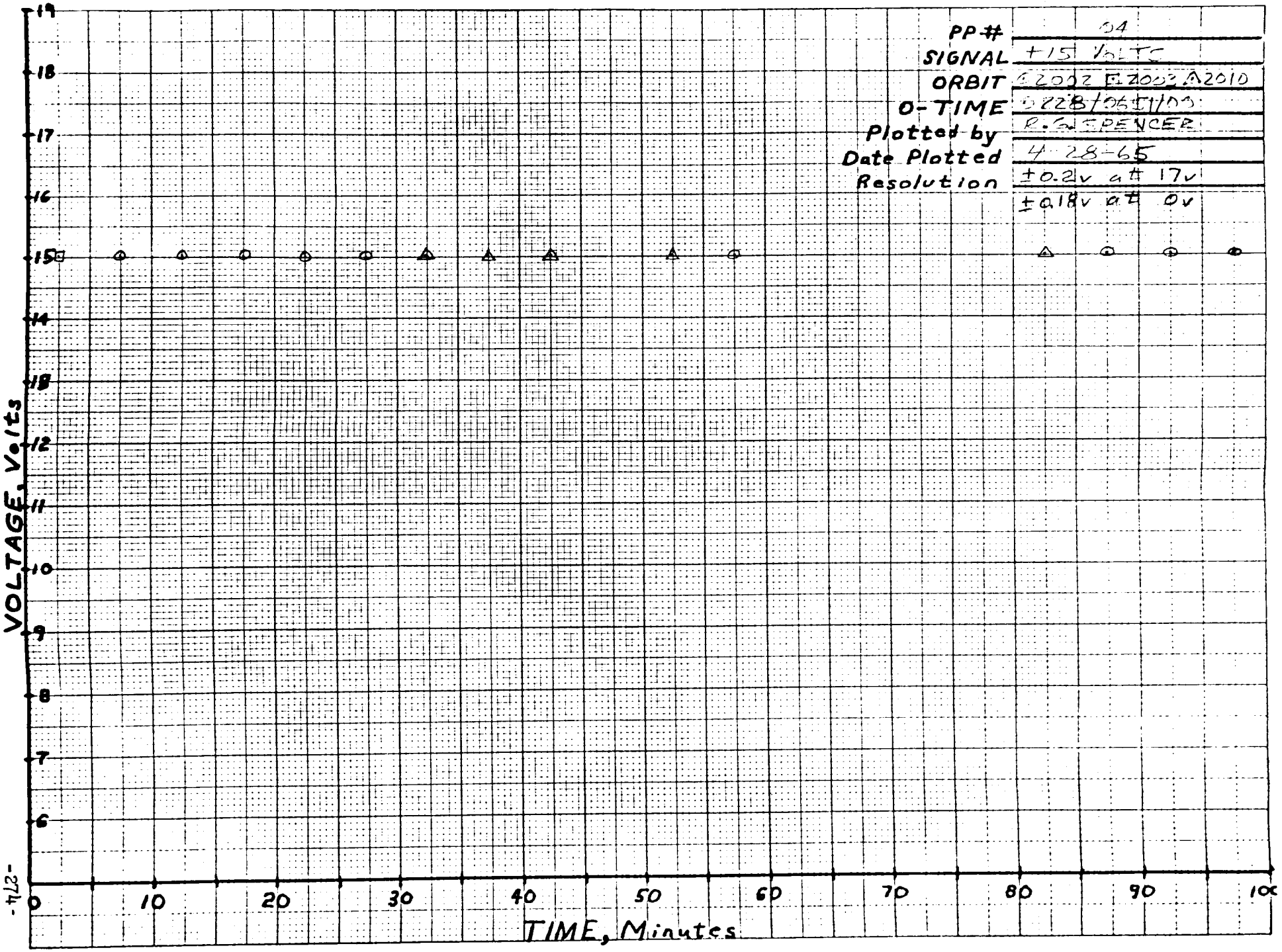
KEUFFEL & ESSER CO.



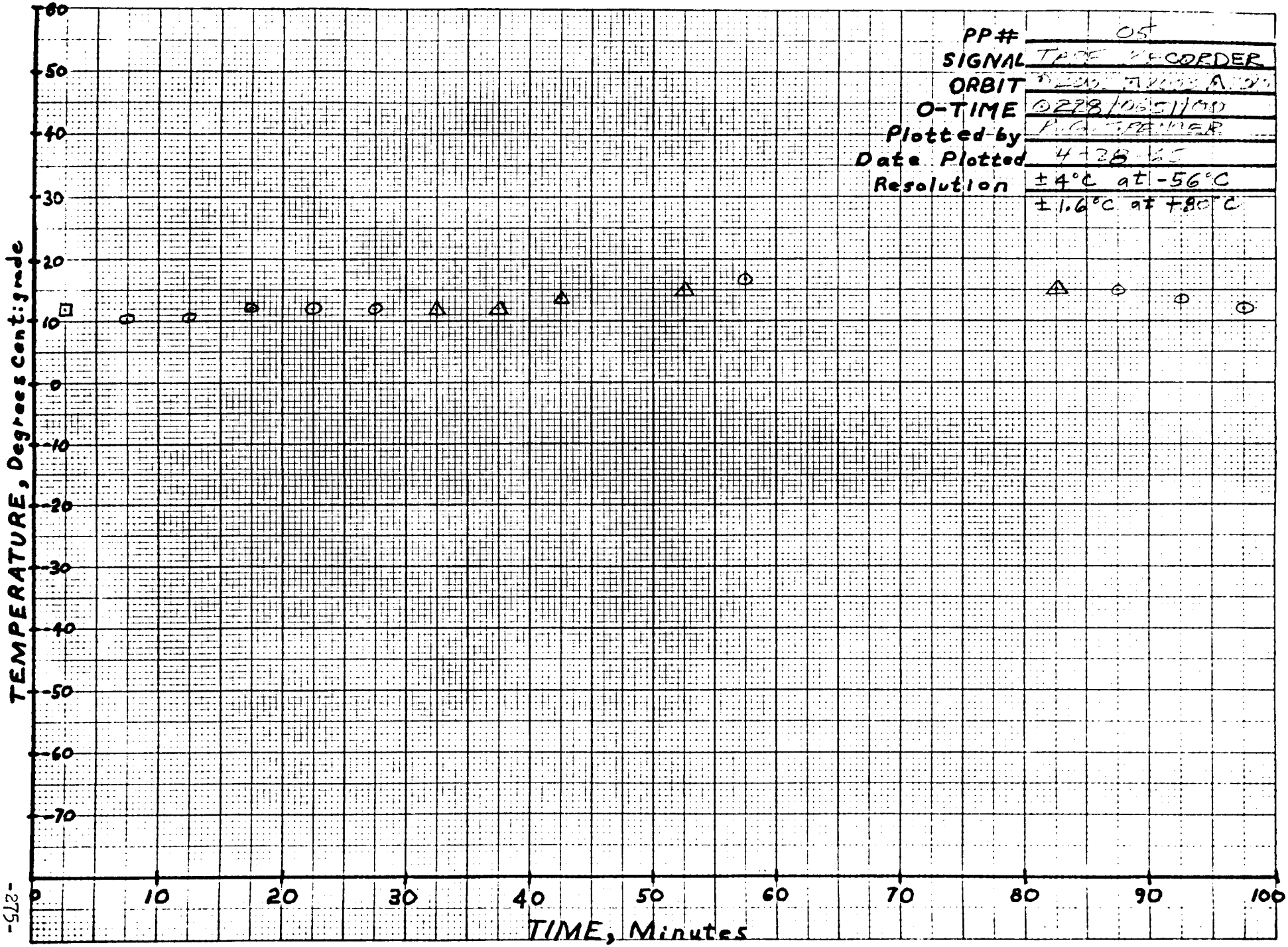
KEUFFEL & ESSER CO.



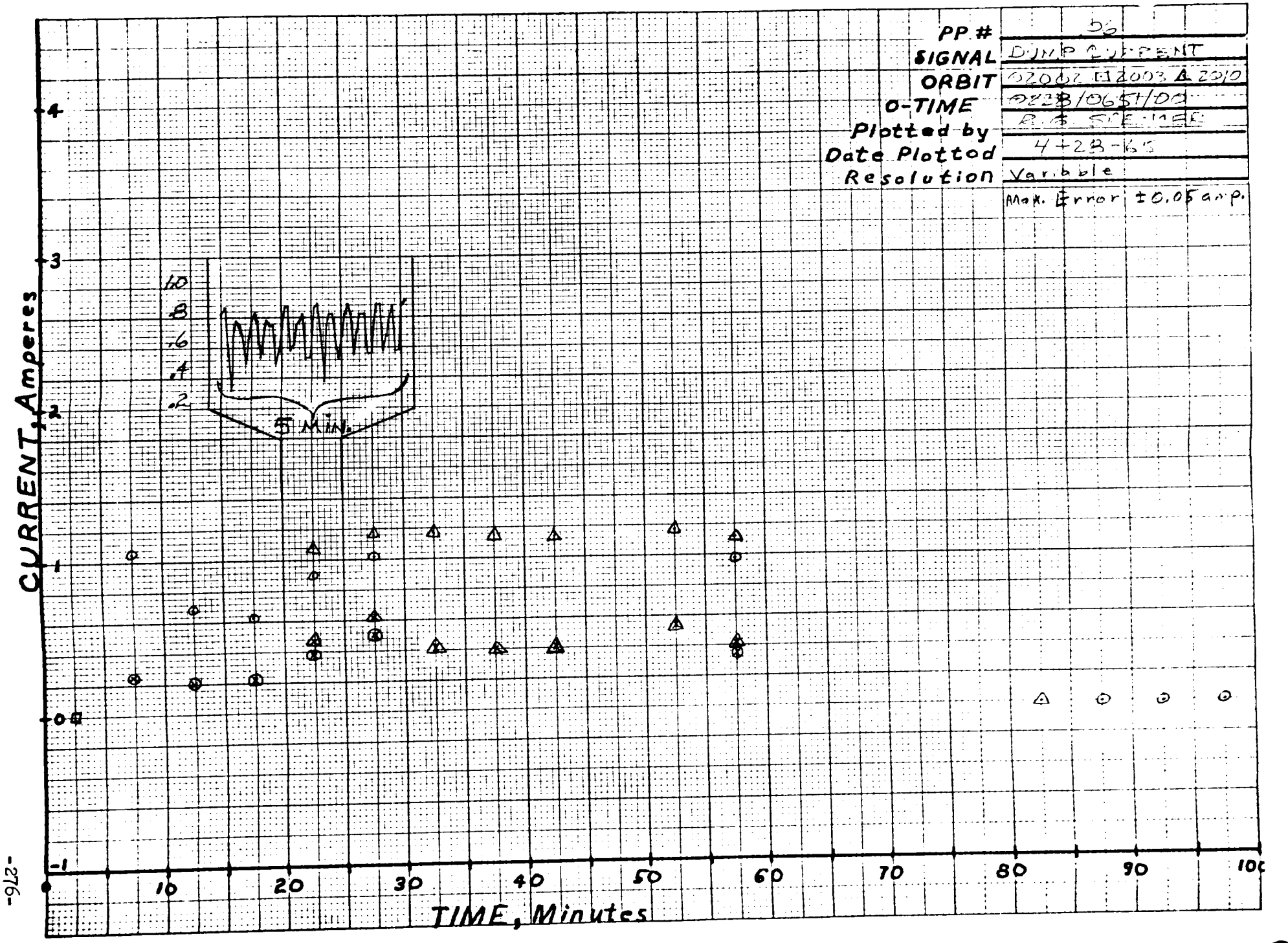
KEUFFEL & ESSER CO.



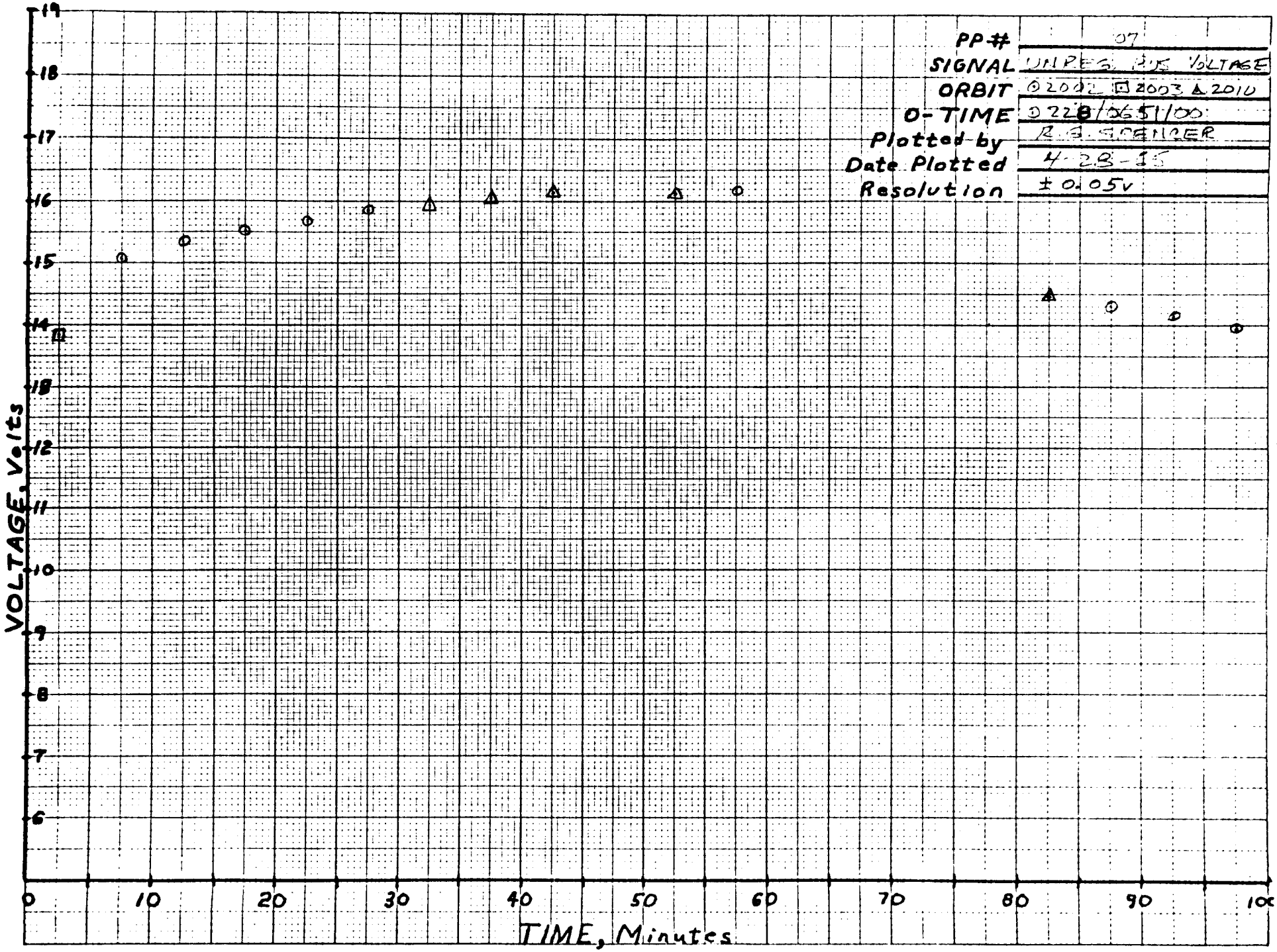
KEUFFEL & ESSER CO.



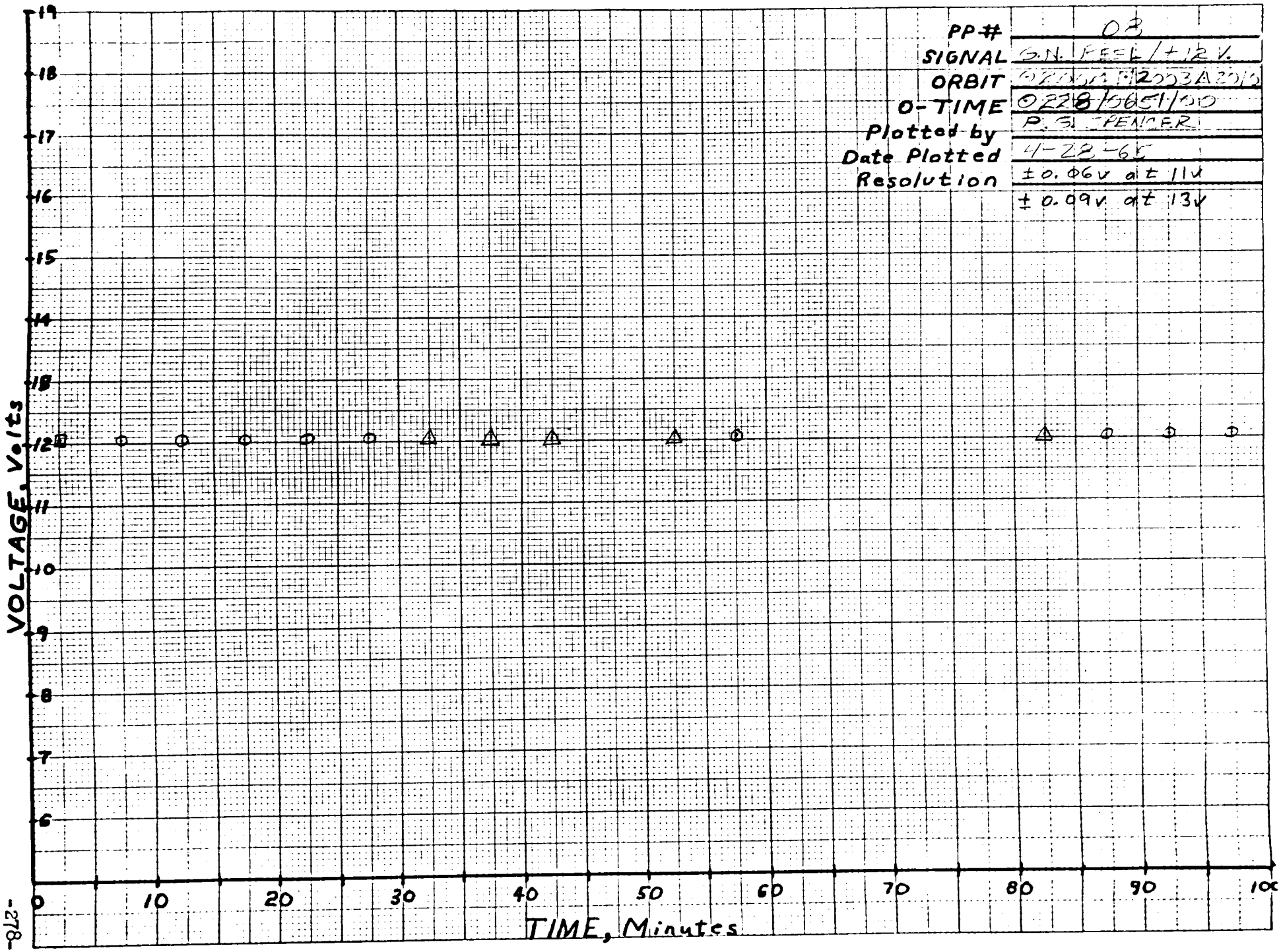
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

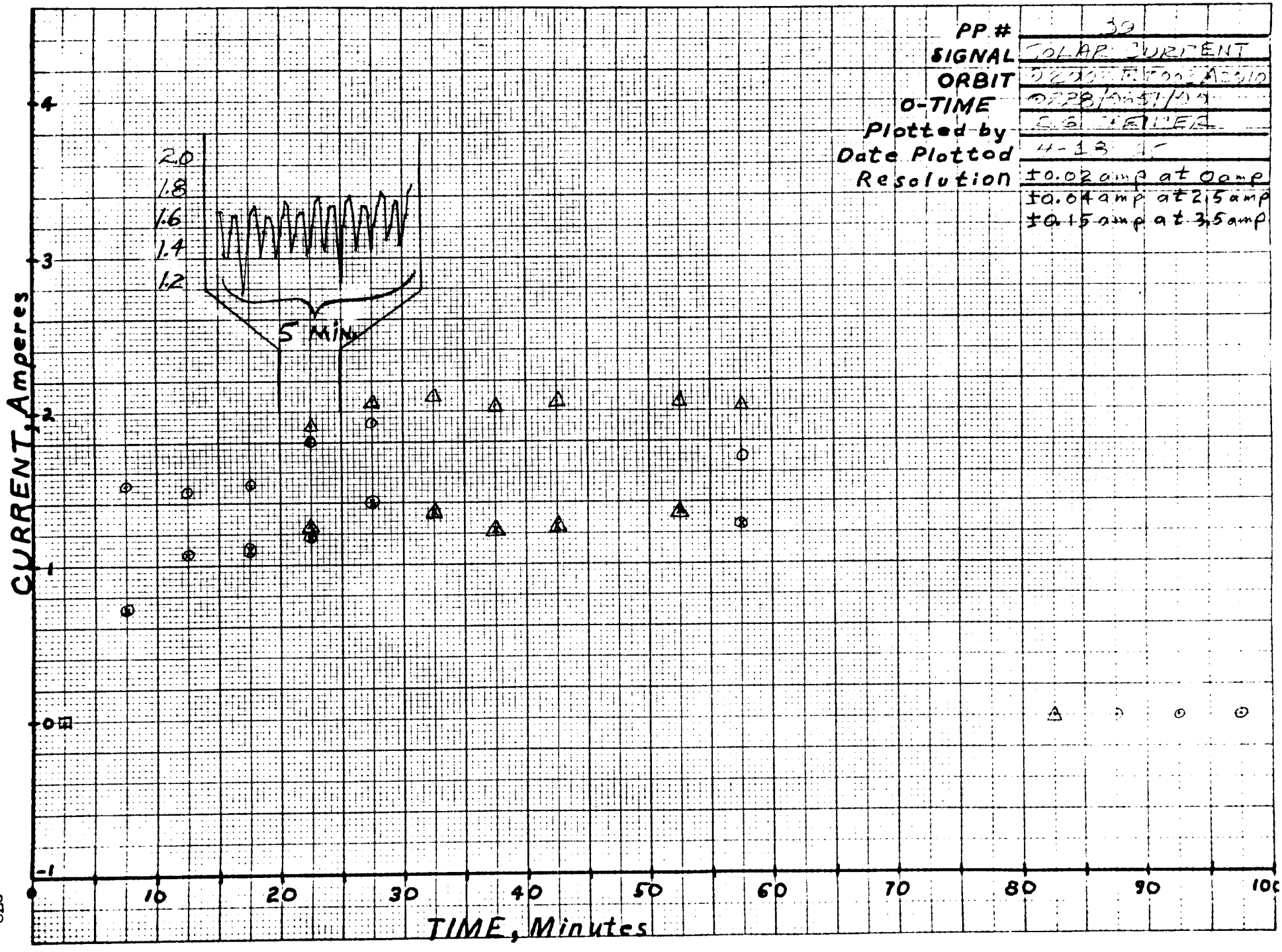


KEUFFEL & ESSER CO.

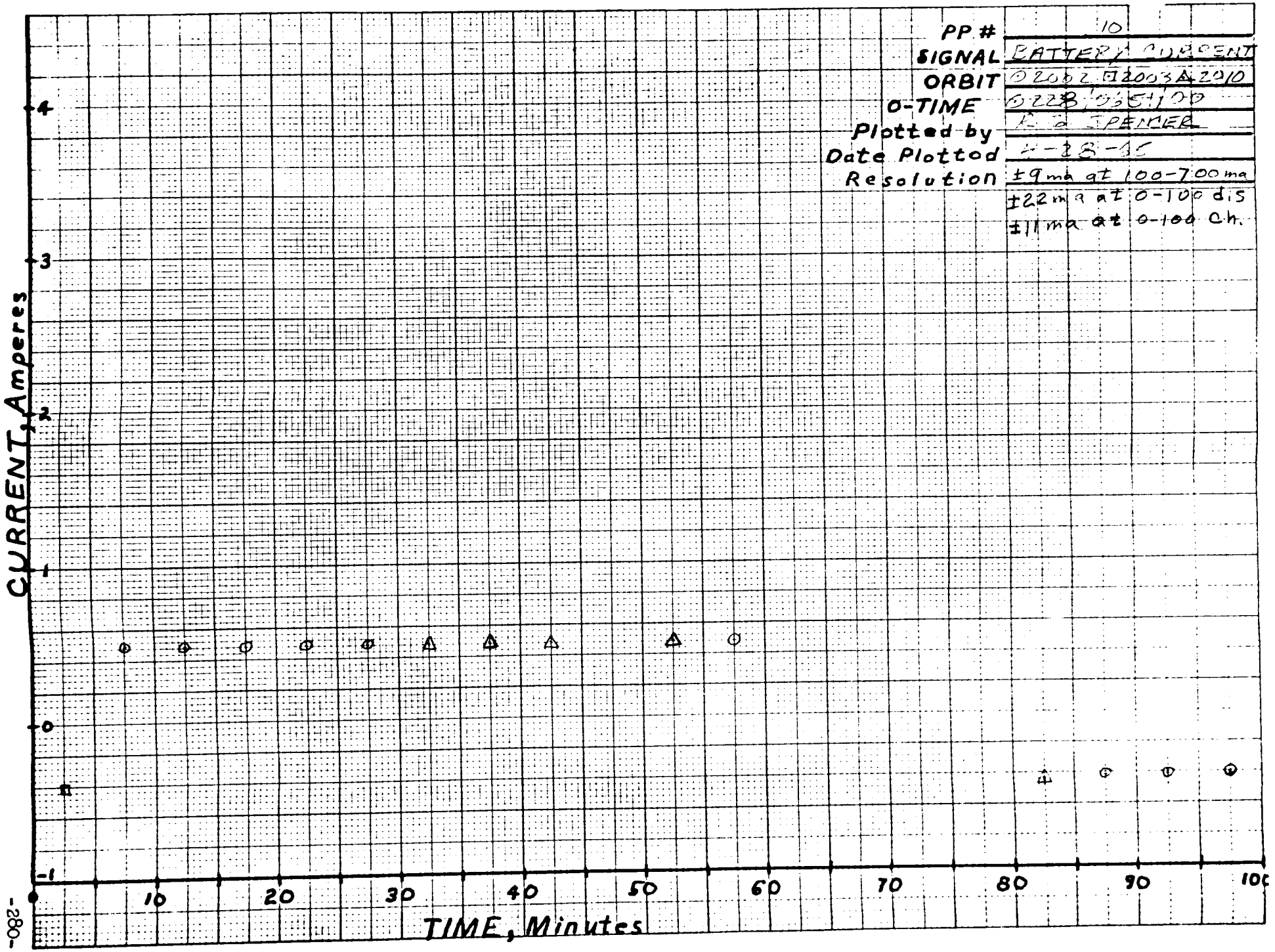


K&E 10 X 10 TO 1 INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

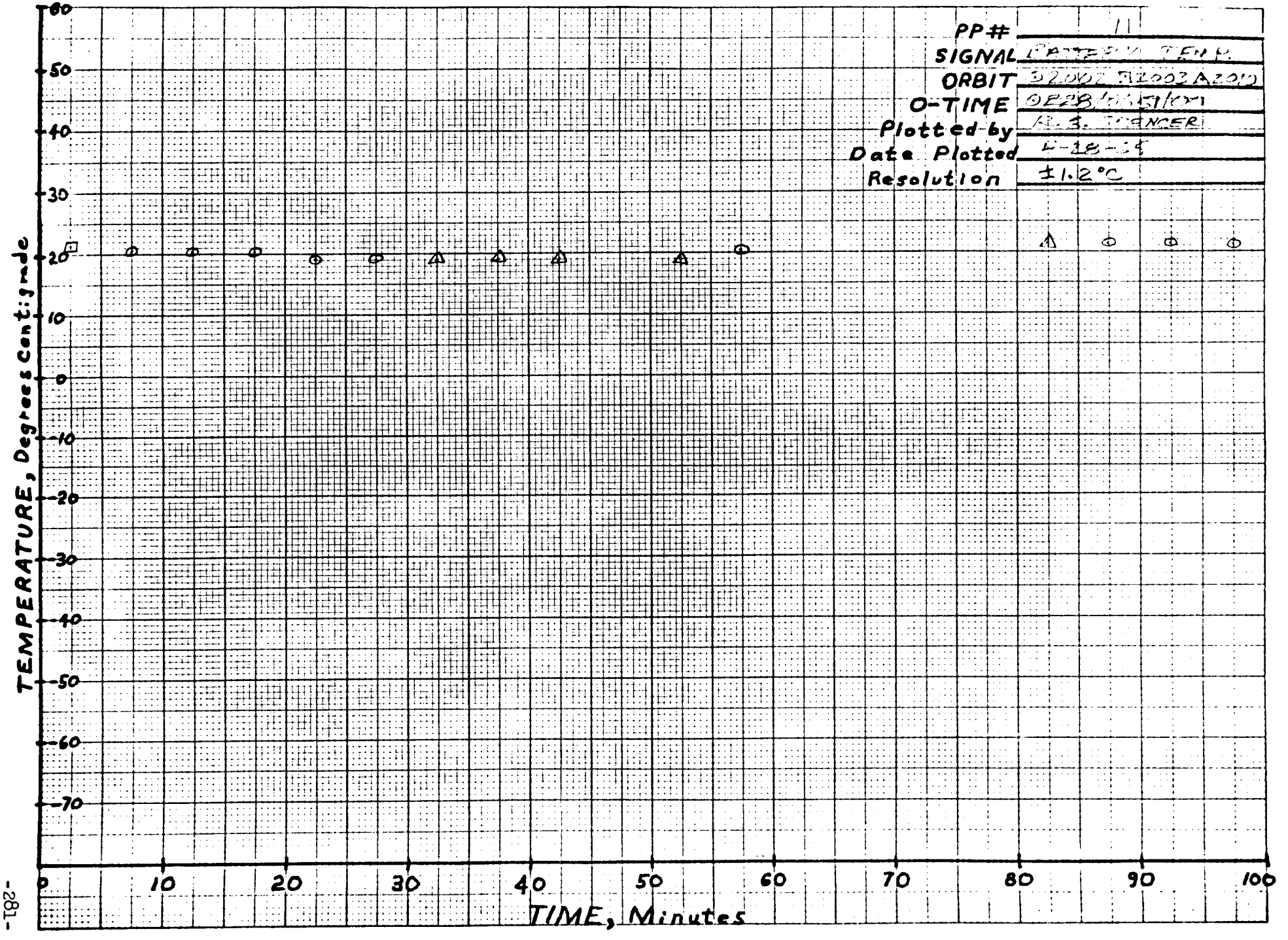



PP #
SIGNAL
ORBIT
O-TIME
Plotted by
Date Plotted
Resolution
±0.02 amp at 0 amp
±0.04 amp at 2.5 amp
±0.15 amp at 3.5 amp
2.0
1.8
1.6
1.4
1.2
5 MIN
CURRENT, Amperes
TIME, Minutes
-1
0
1
2
3
4
10
20
30
40
50
60
70
80
90
100

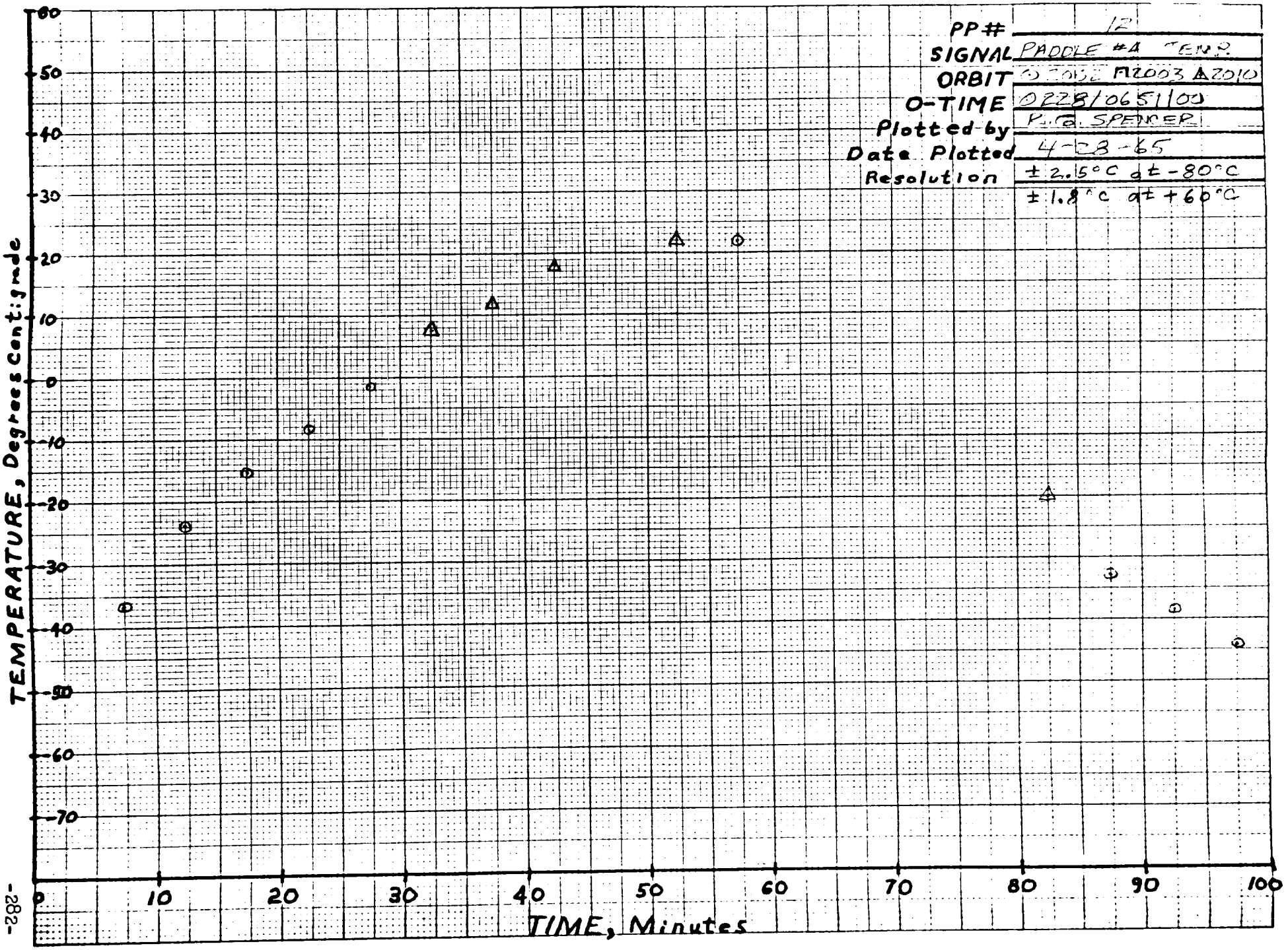
KEUFFEL & ESSER CO.

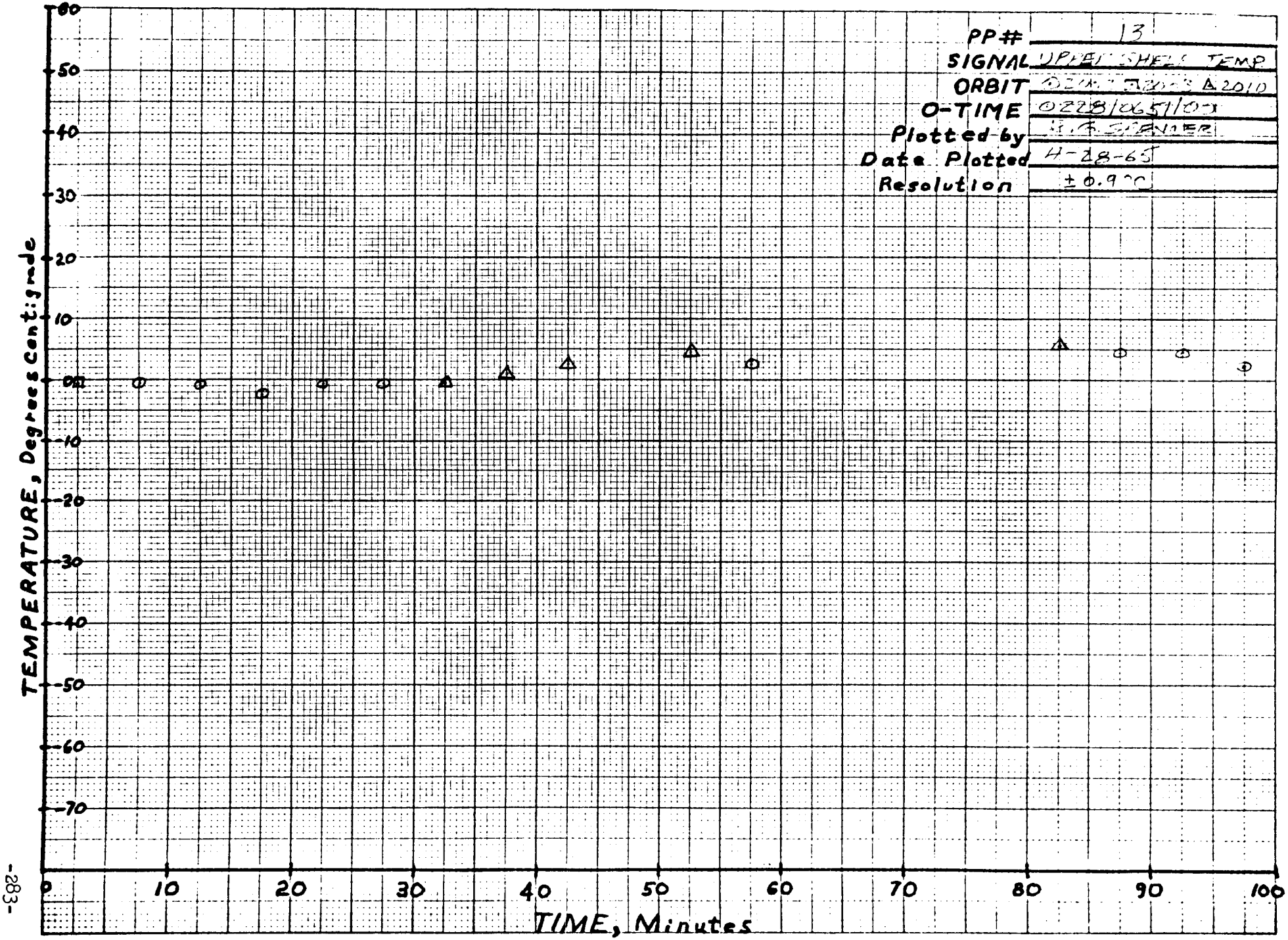


KEUFFEL & ESSER CO.

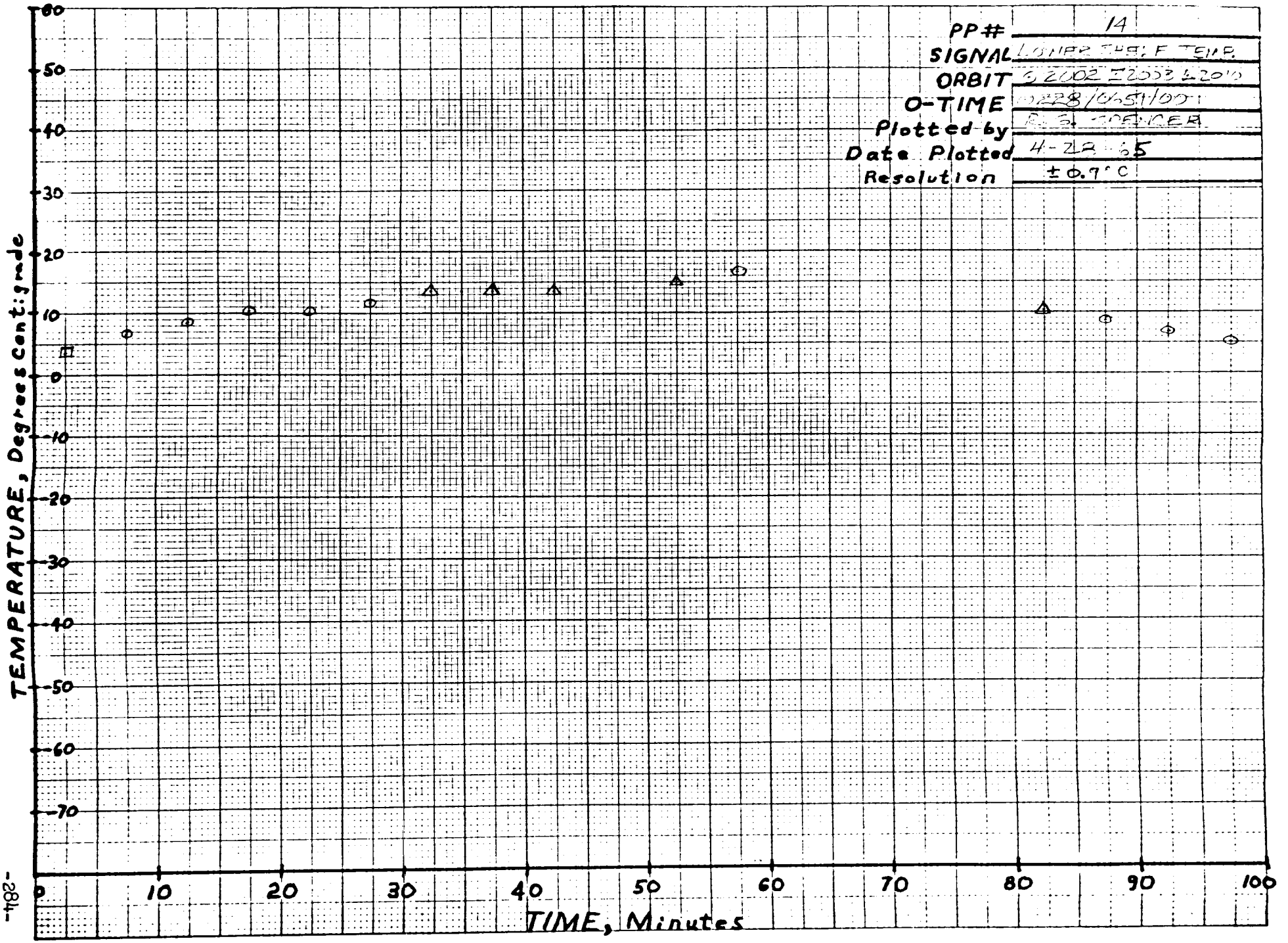


KEUFFEL & ESSER CO.

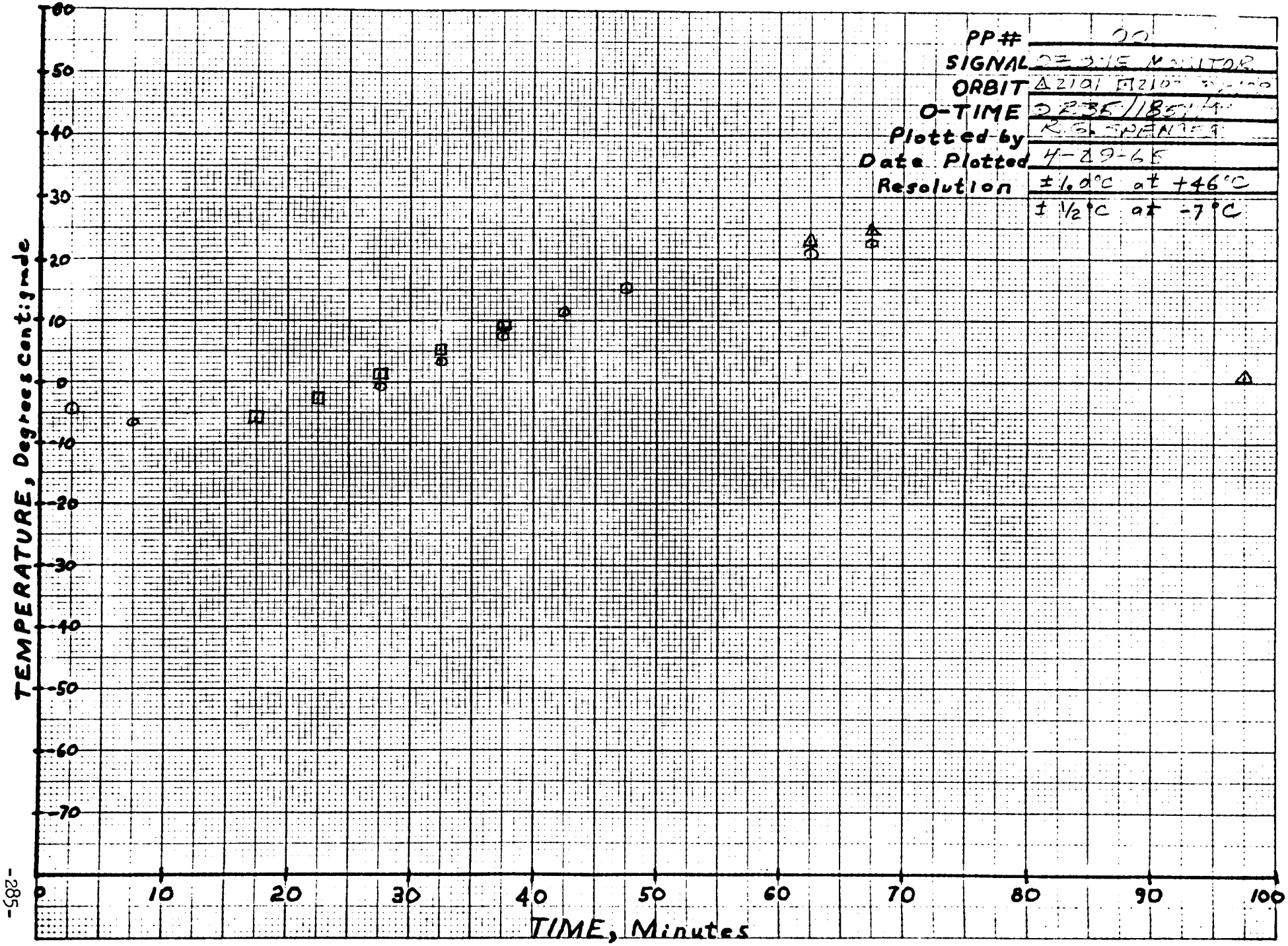



PP# 13
SIGNAL UPPER SHELL TEMP
ORBIT
O-TIME 0228/0651/0-1
Plotted by
Date Plotted 4-28-65
Resolution ±0.9°C
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

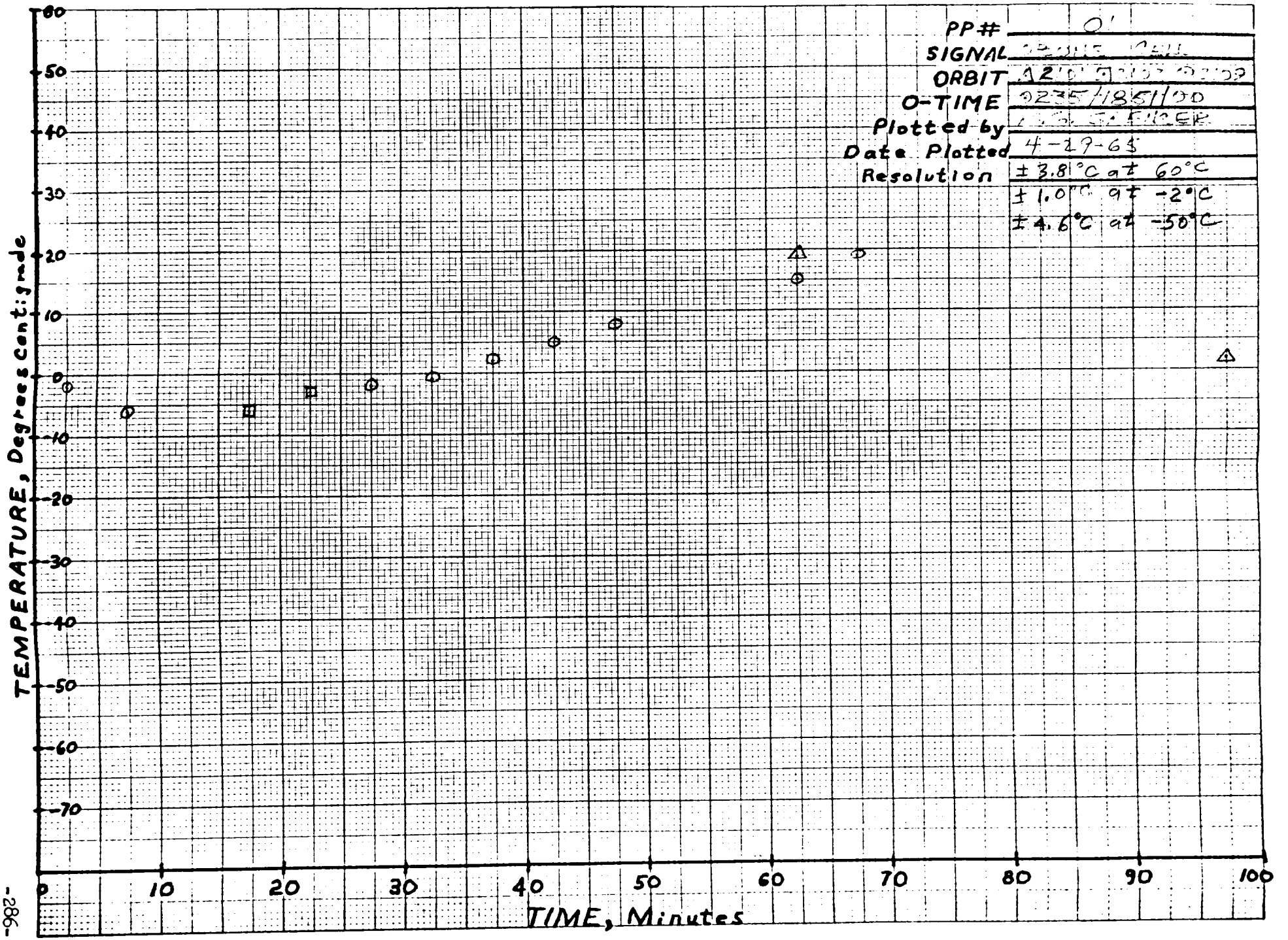
KEUFFEL & ESSER CO.



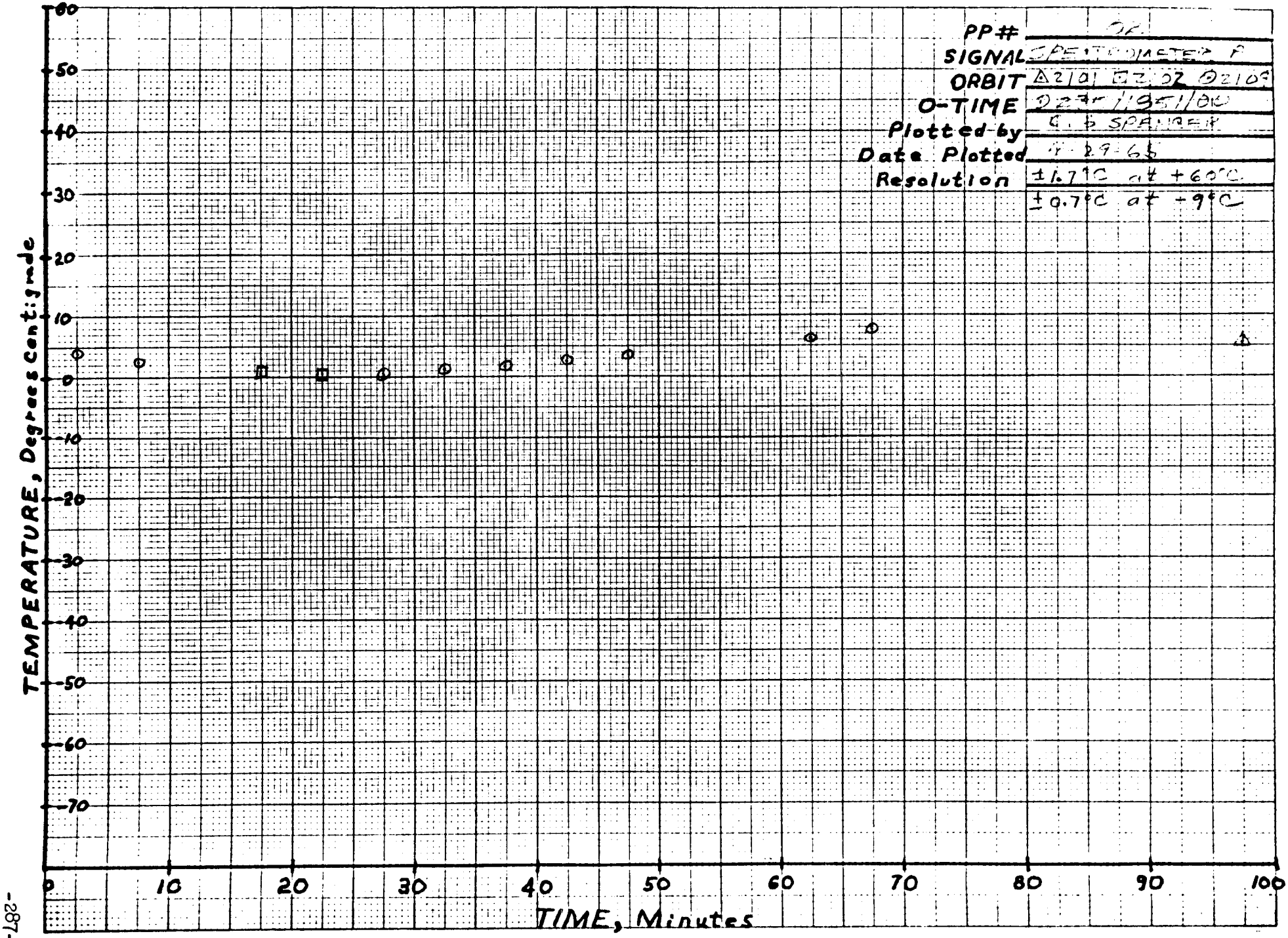
KEUFFEL & ESSER CO.



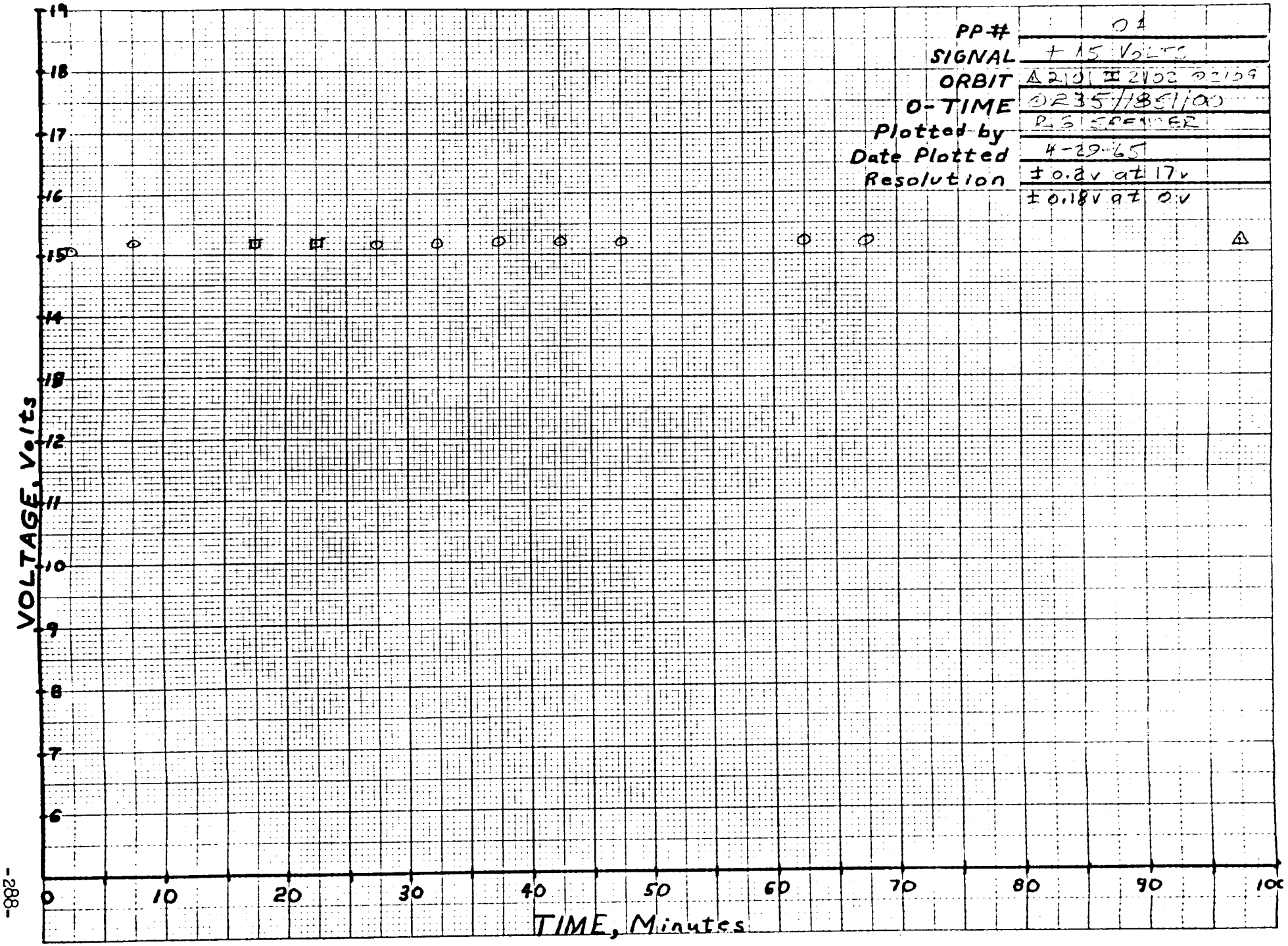
KEUFFEL & ESSER CO.



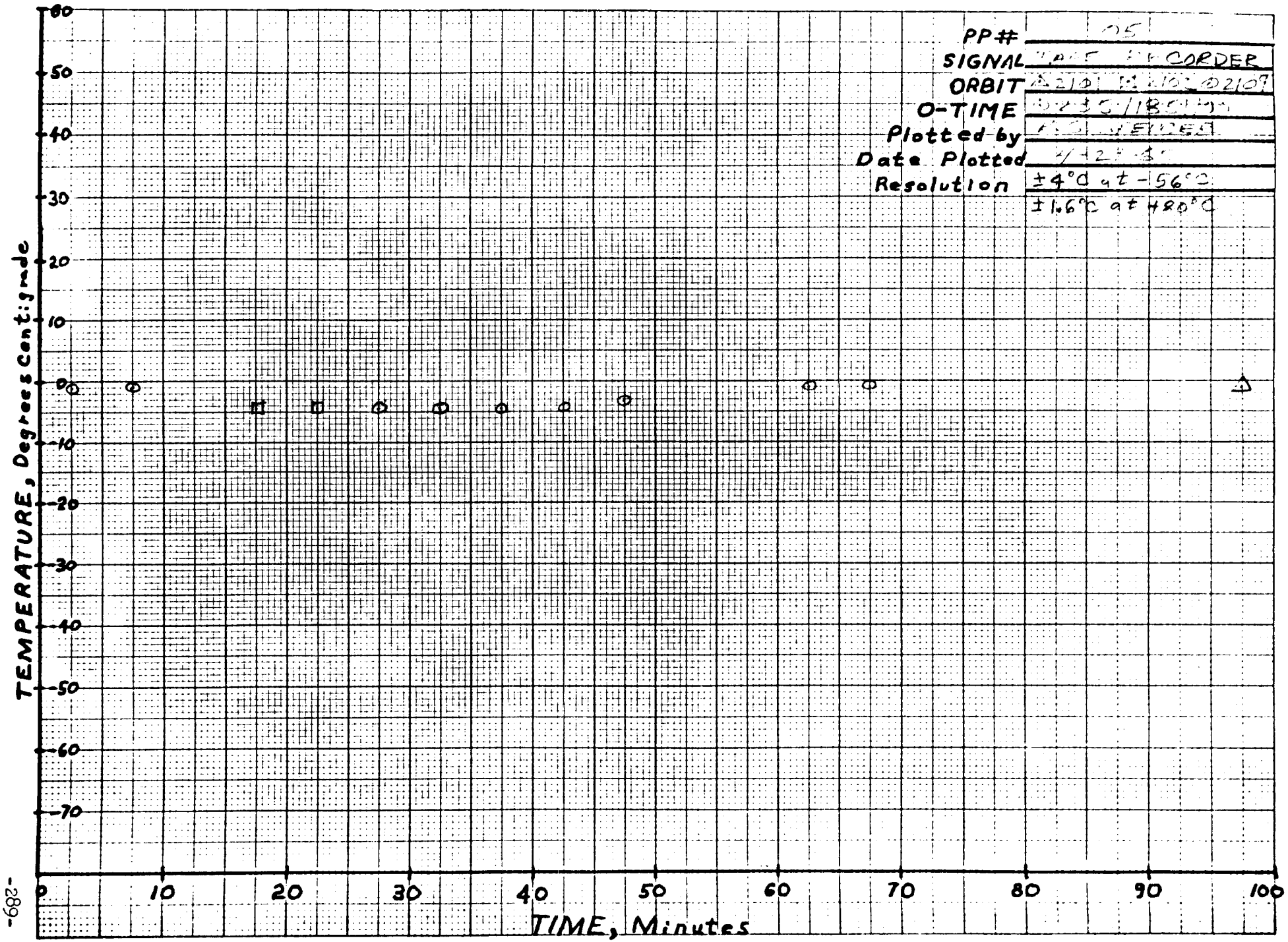
KEUFFEL & ESSER CO.



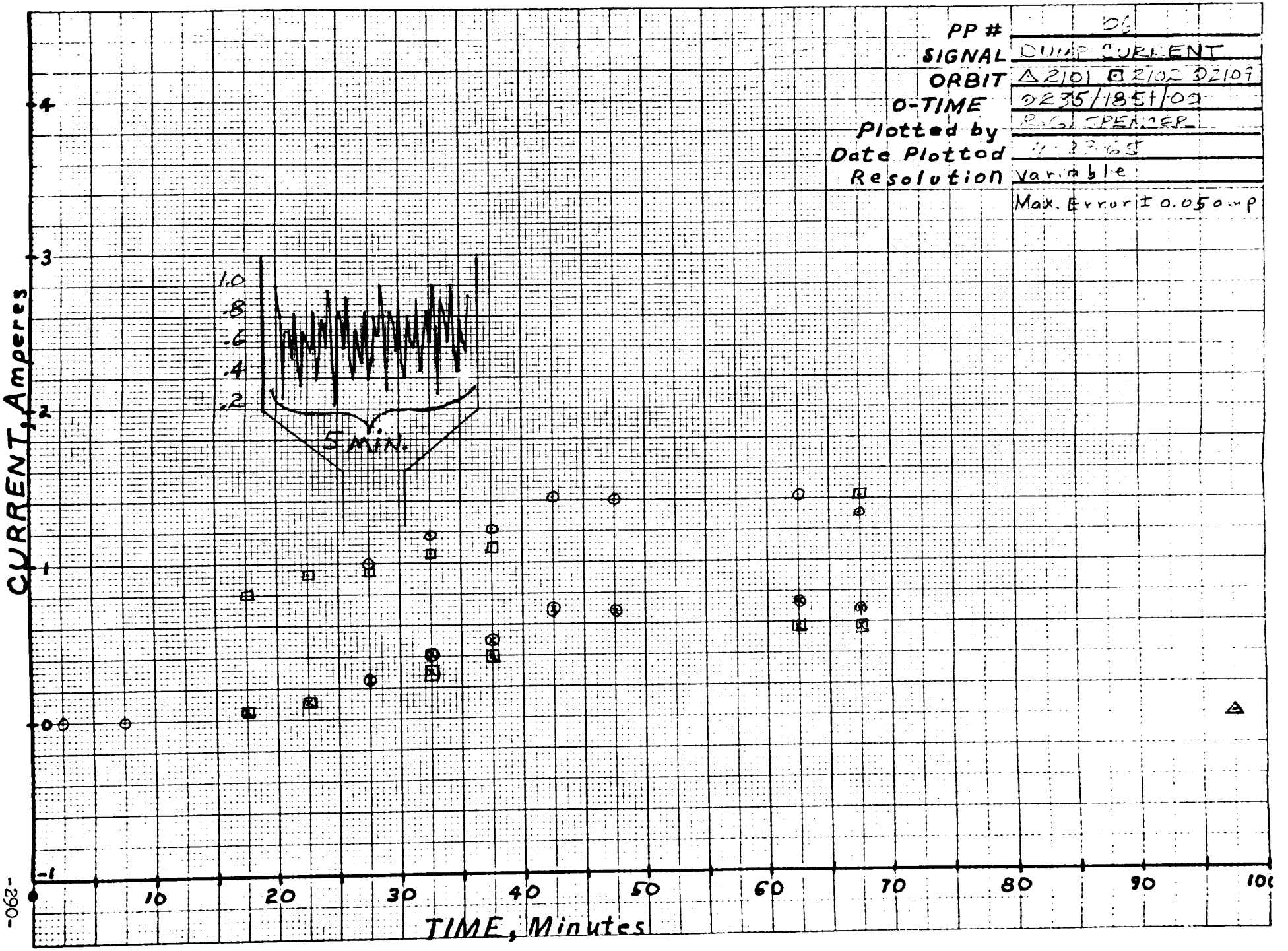
KEUFFEL & ESSER CO.

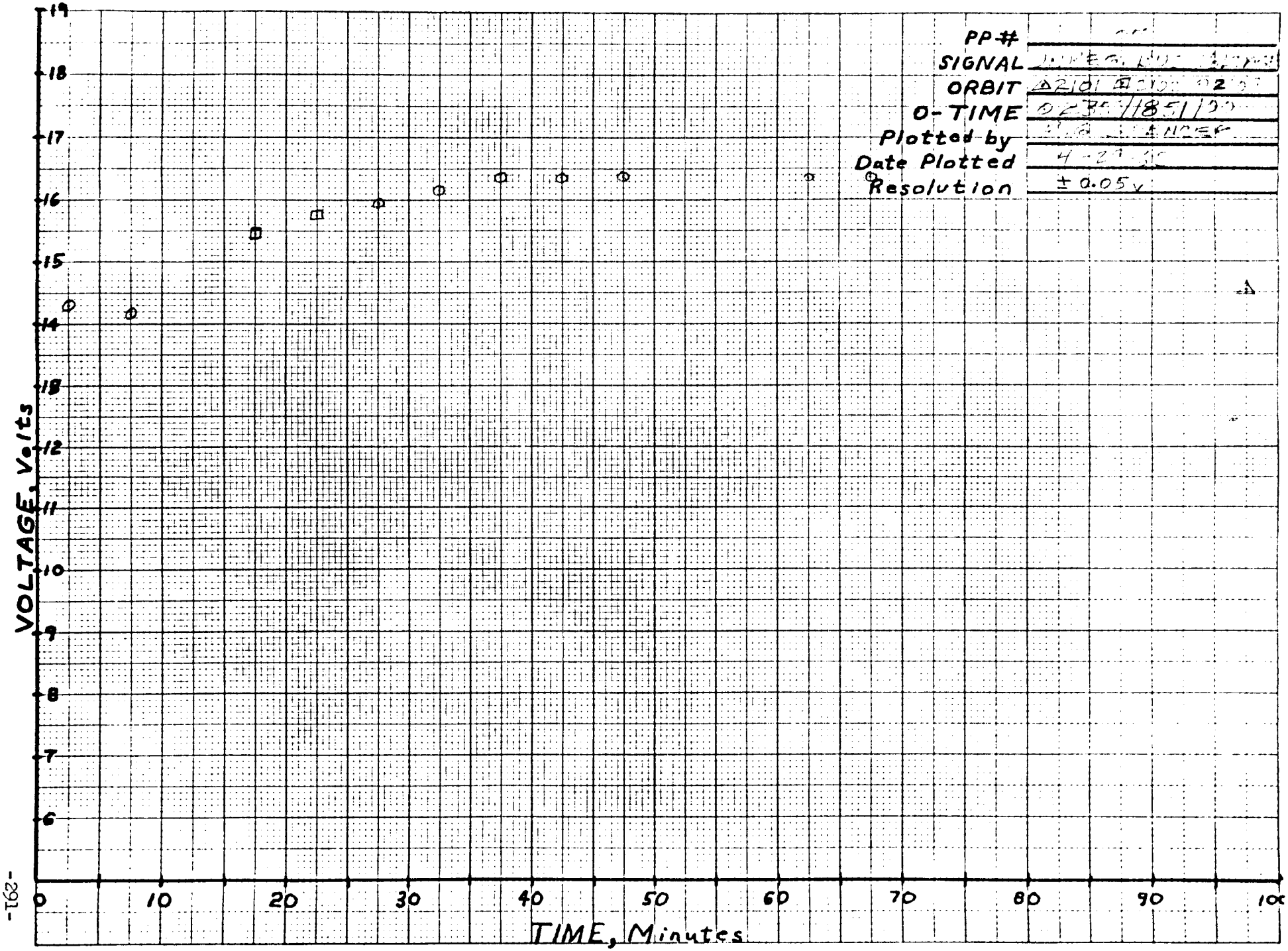


KEUFFEL & ESSER CO.

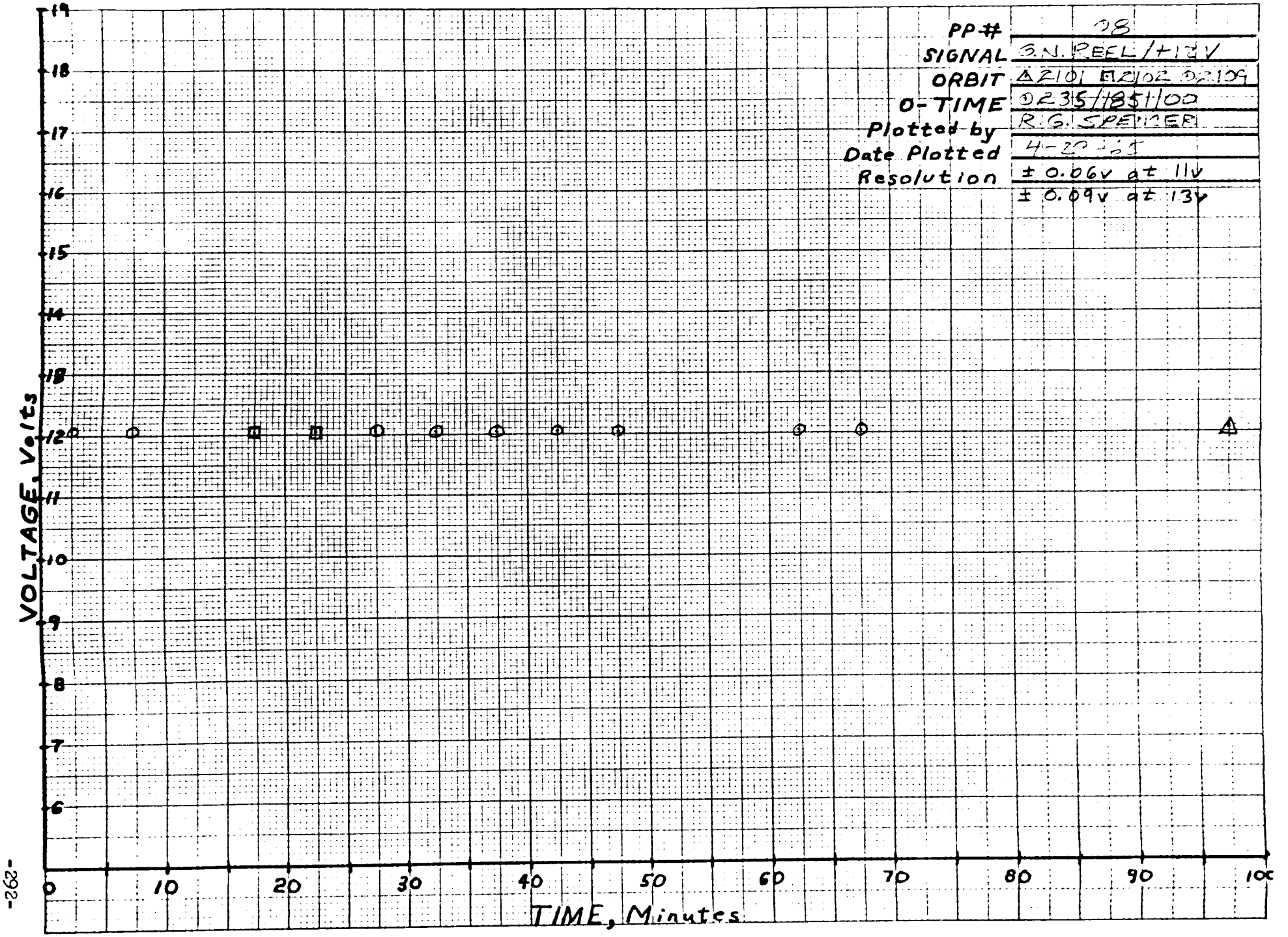


KEUFFEL & ESSER CO.

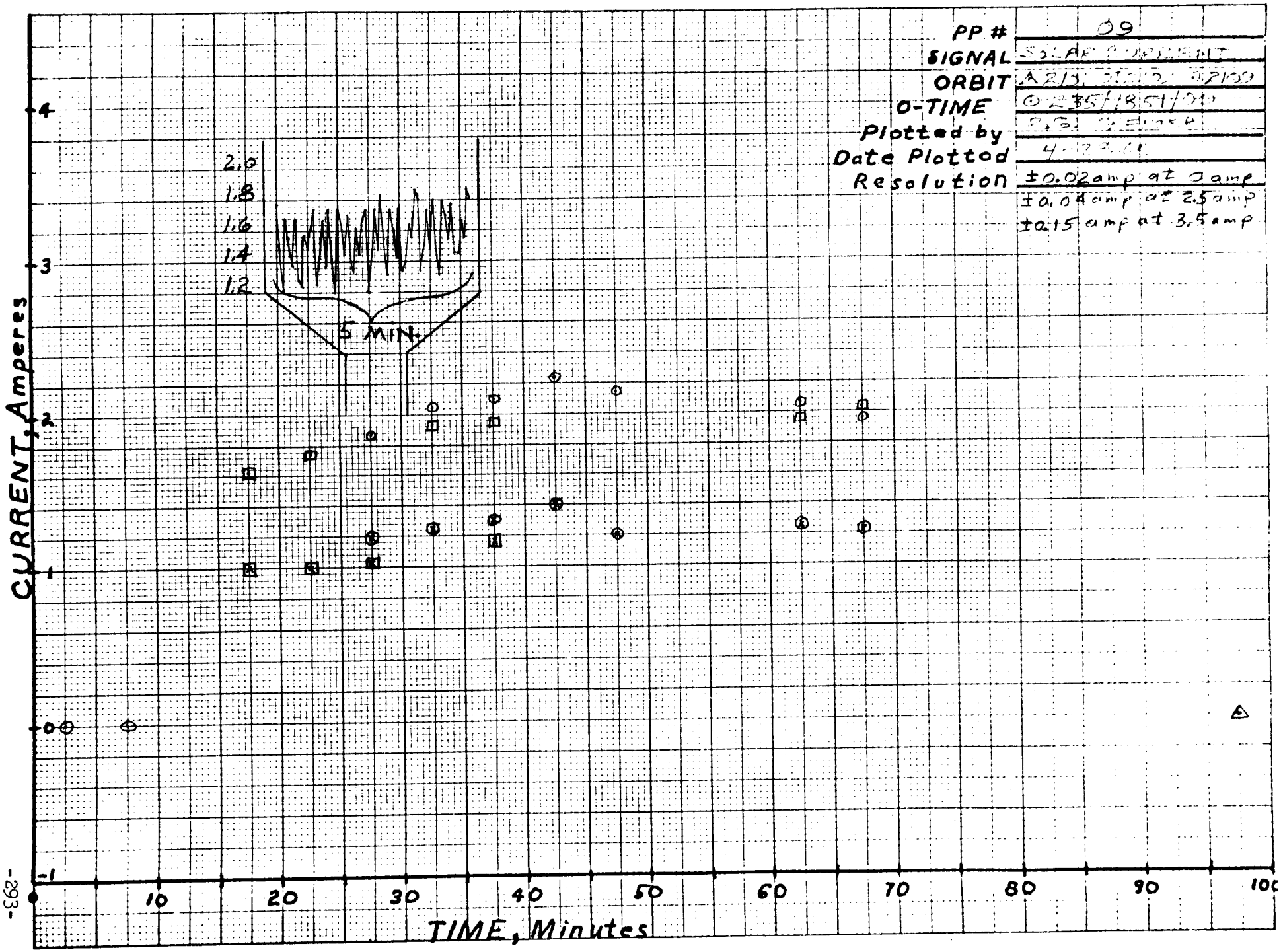



PP #
SIGNAL
ORBIT
O-TIME
Plotted by
Date Plotted
Resolution
± 0.05 v
VOLTAGE, Volts
19
18
17
16
15
14
13
12
11
10
9
8
7
6
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

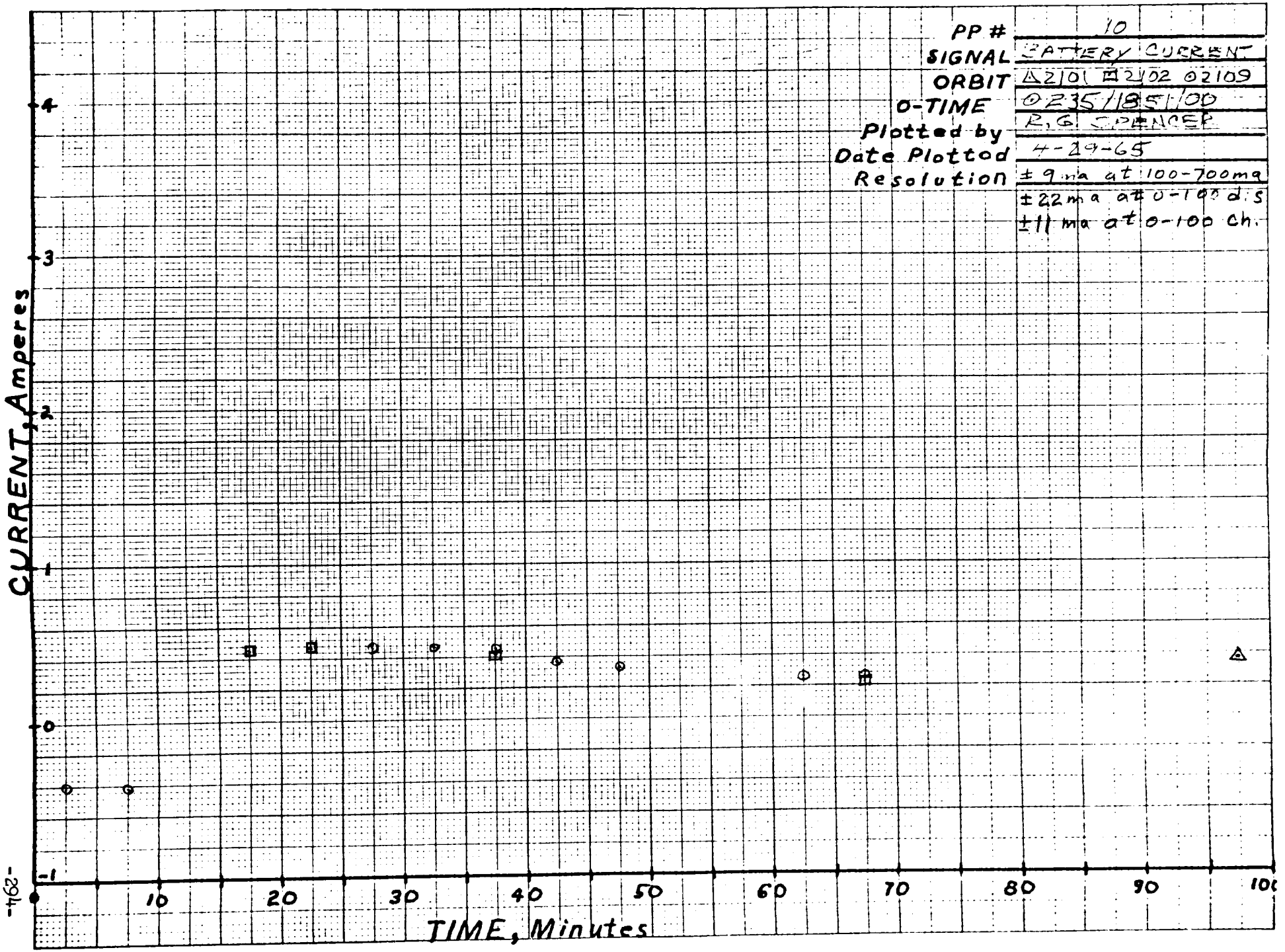
KEUFFEL & ESSER CO.



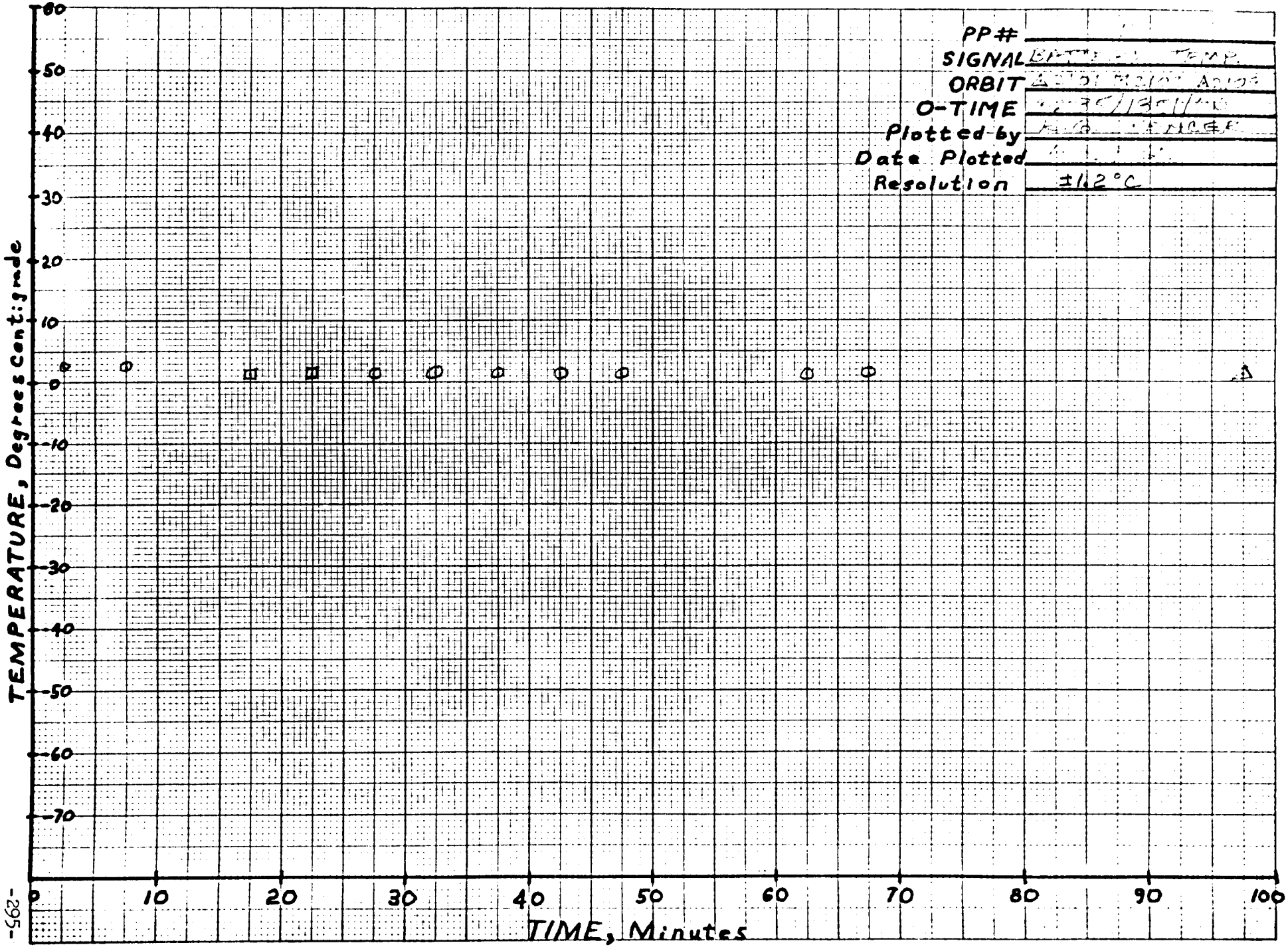
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



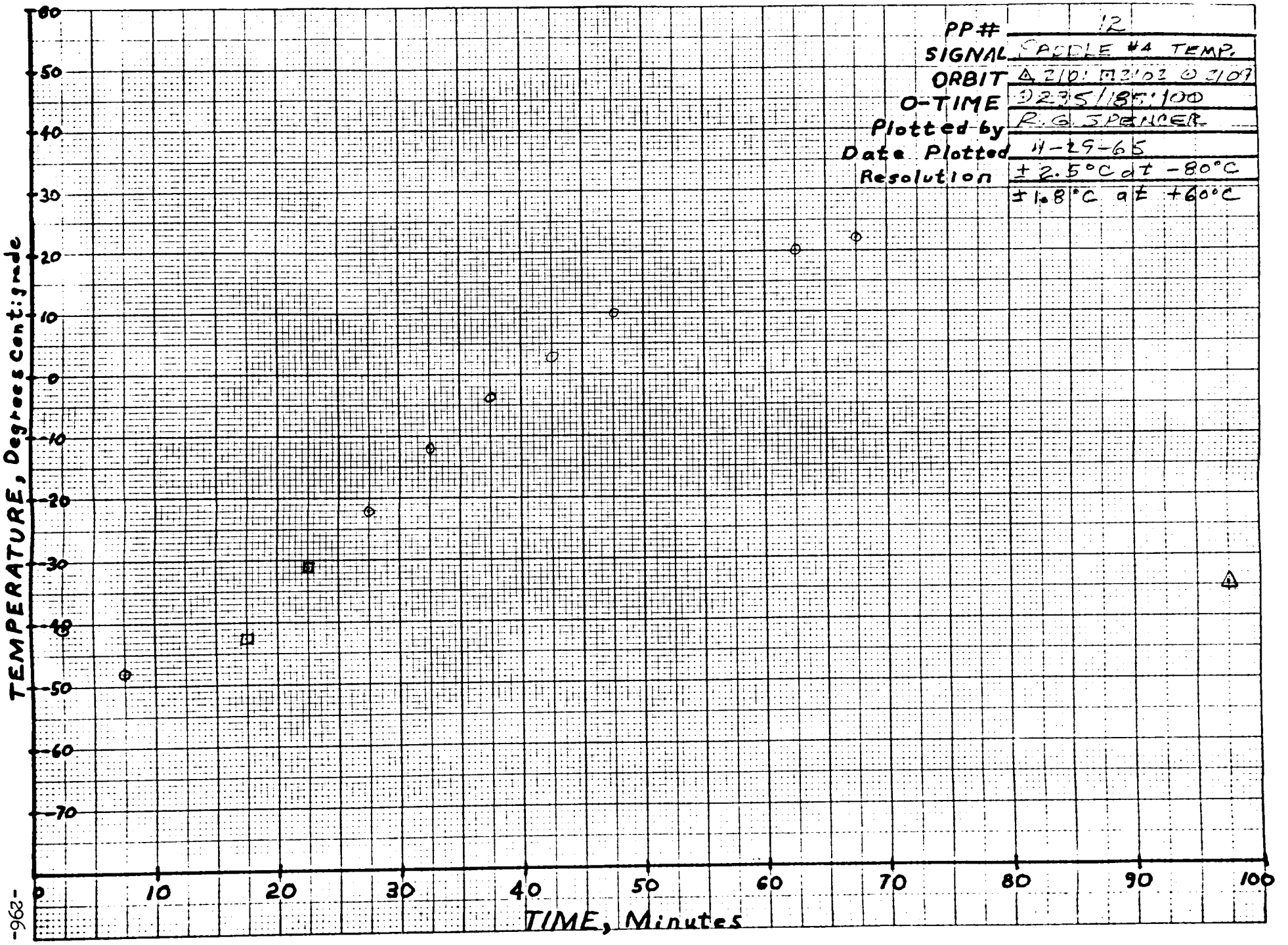
KEUFFEL & ESSER CO.



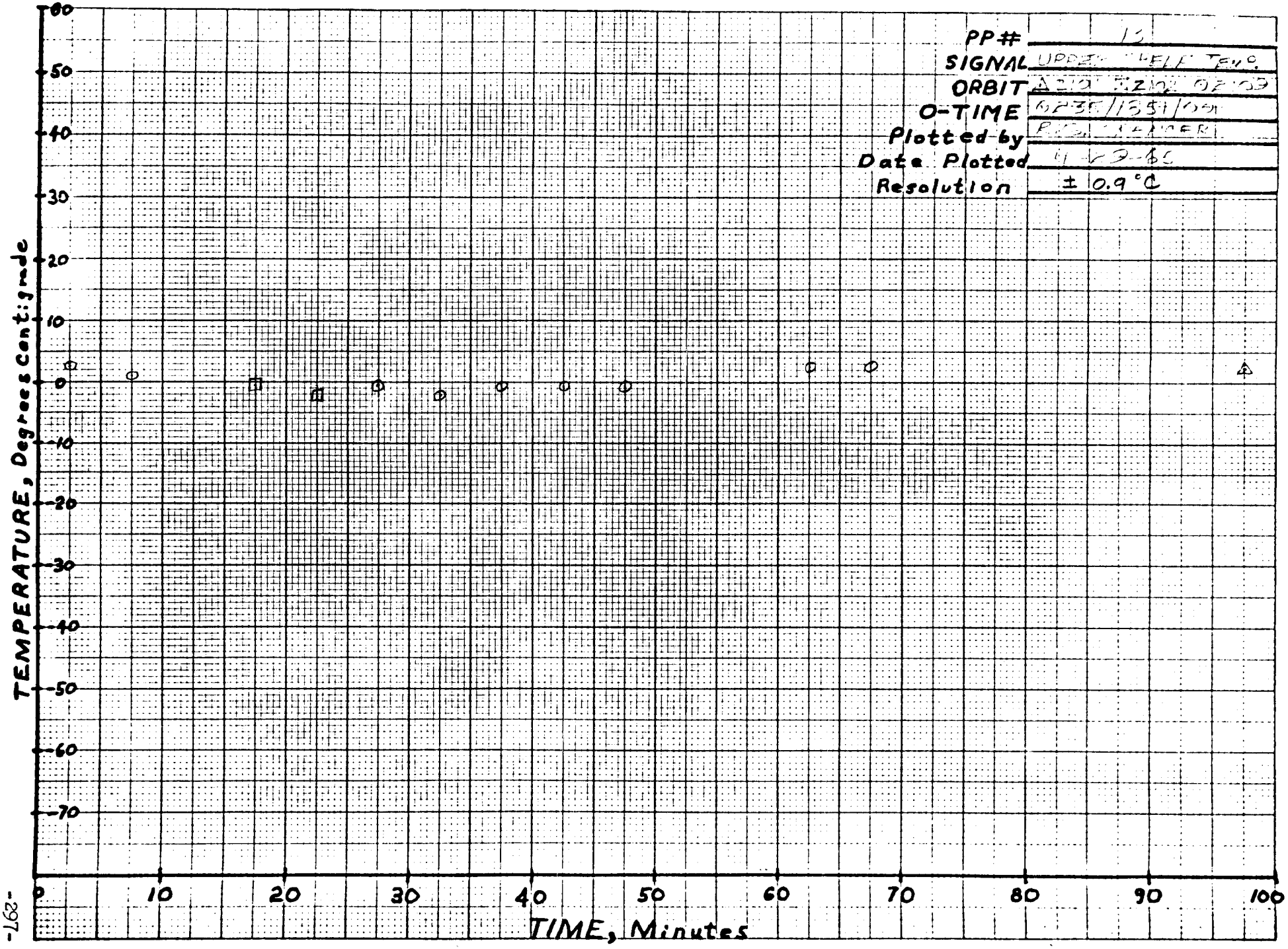
KEUFFEL & ESSER CO.

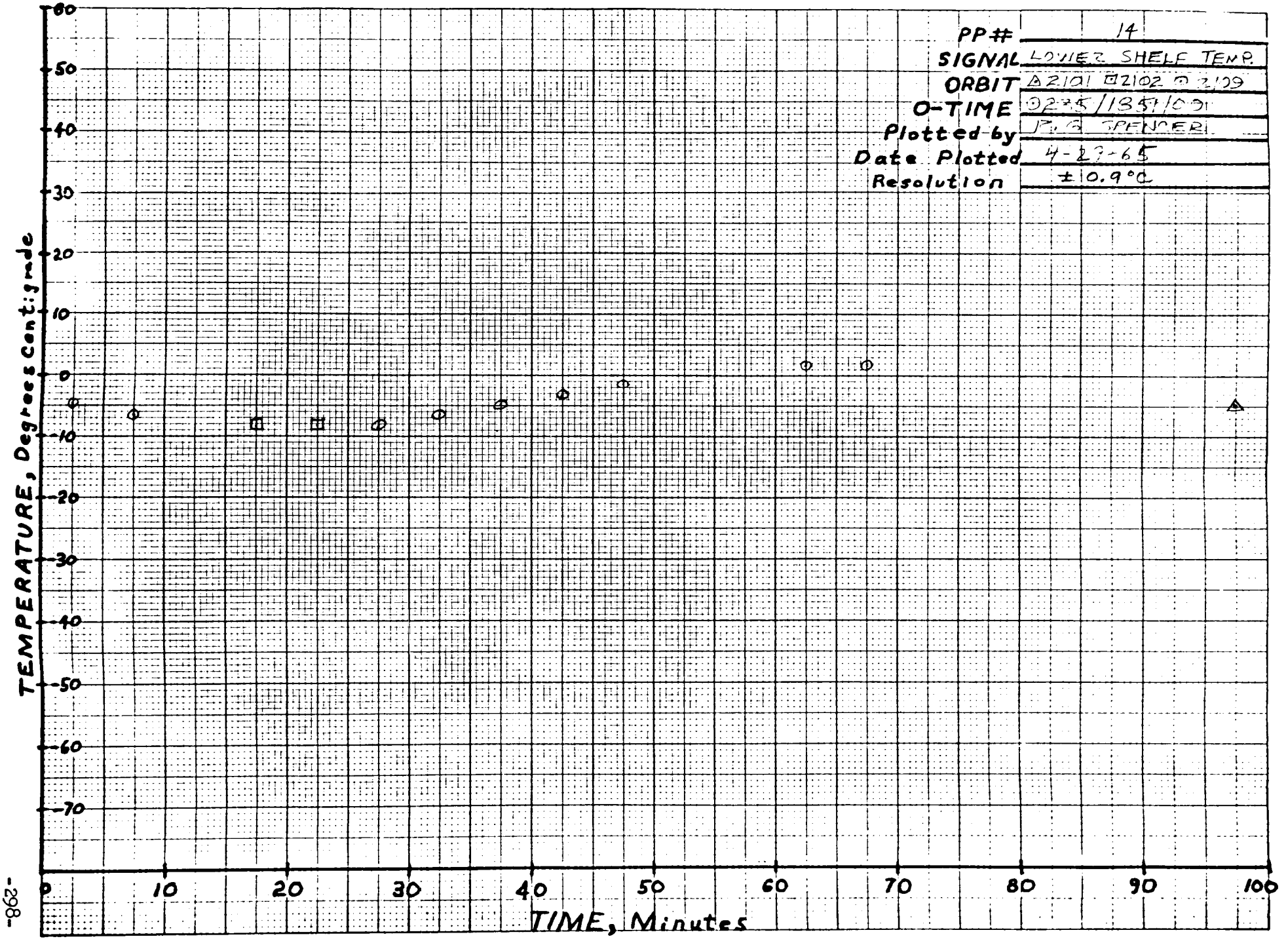


KEUFFEL & ESSER CO.

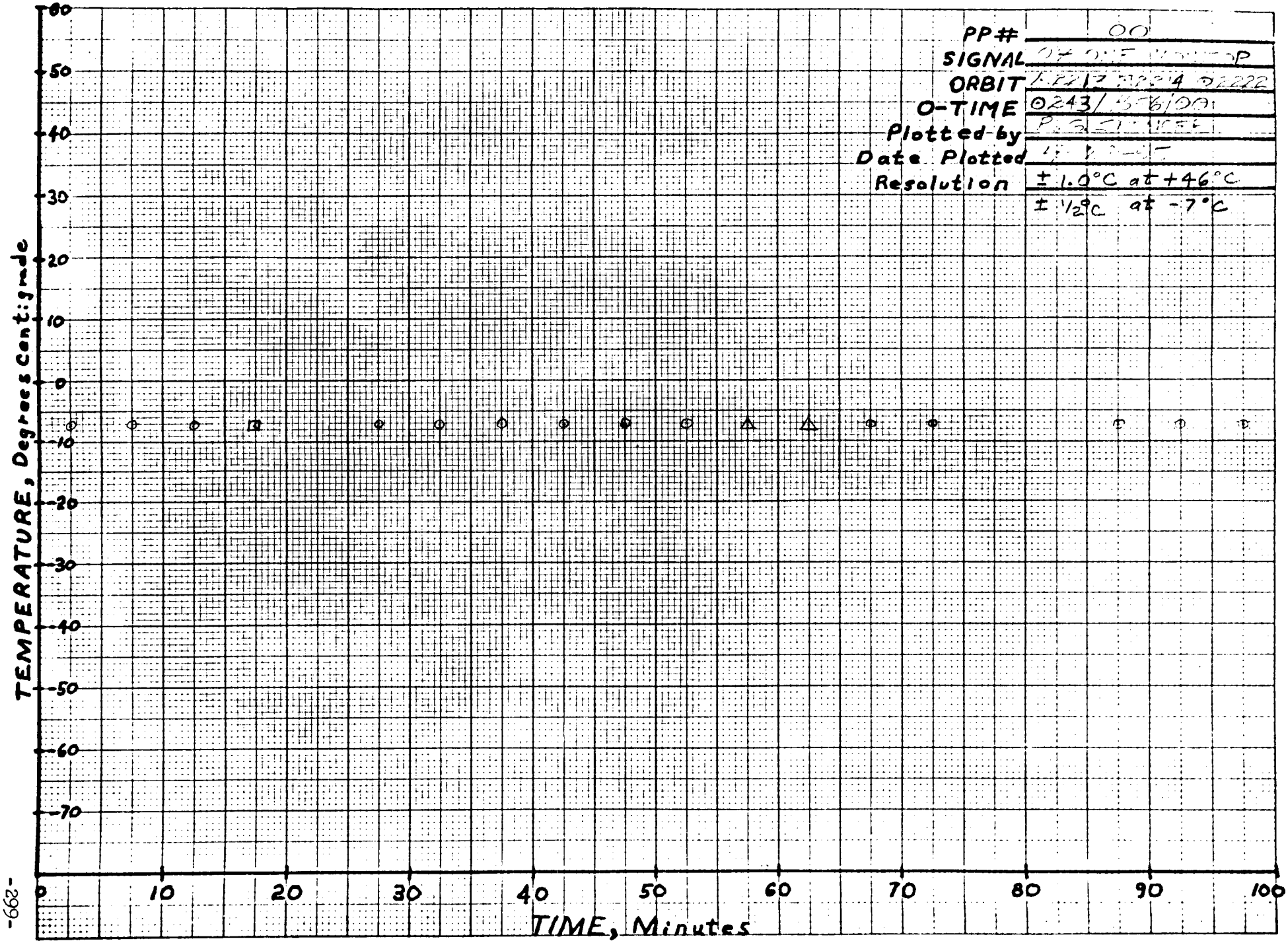


KEUFFEL & ESSER CO.

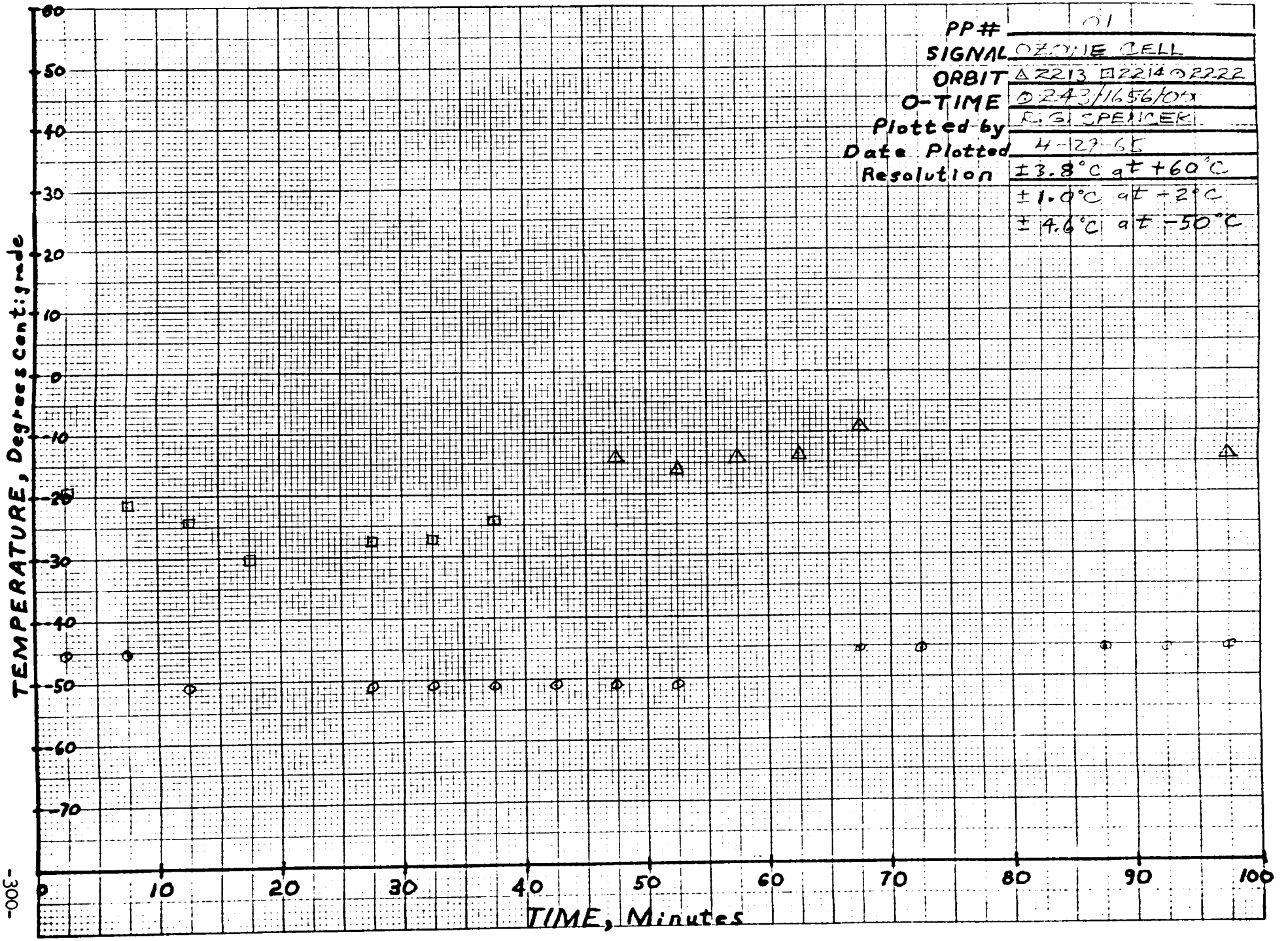



PP# 14
SIGNAL LOWER SHELF TEMP.
ORBIT △2101 □2102 ○2109
O-TIME 0275/1351/0931
Plotted by J. G. SPENCER
Date Plotted 4-23-65
Resolution ±0.9°C
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

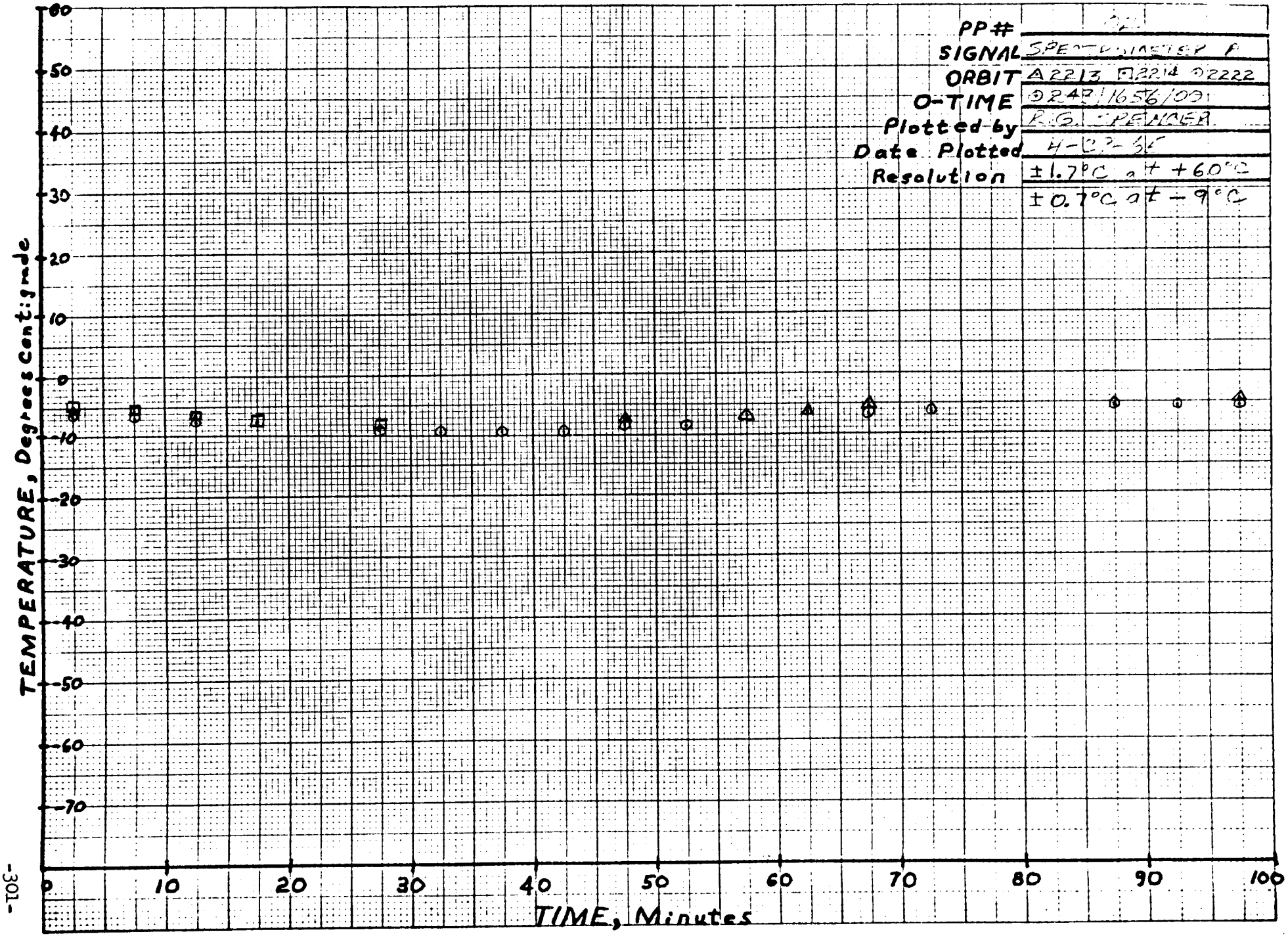
KEUFFEL & ESSER CO.



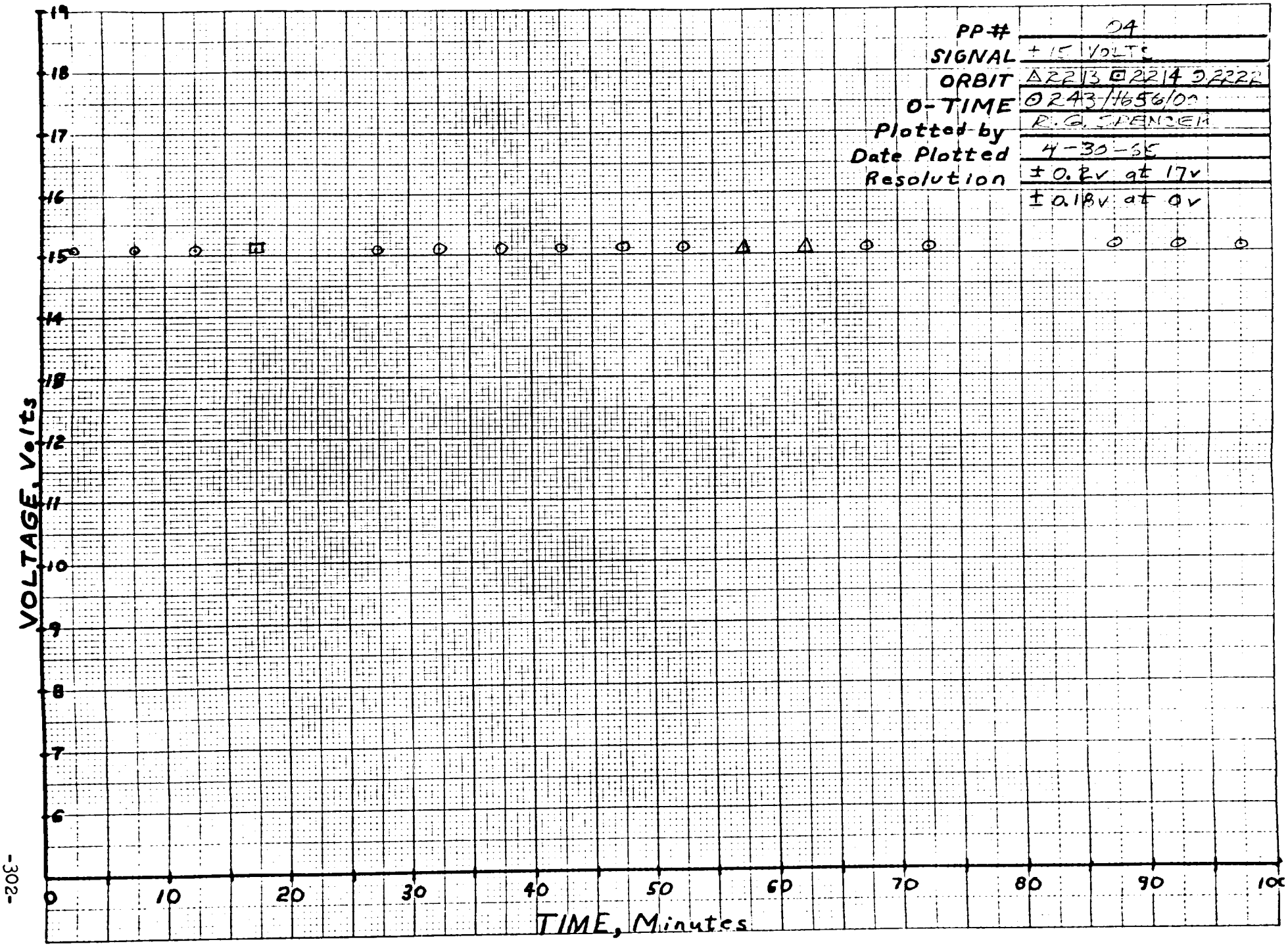
KEUFFEL & ESSER CO.



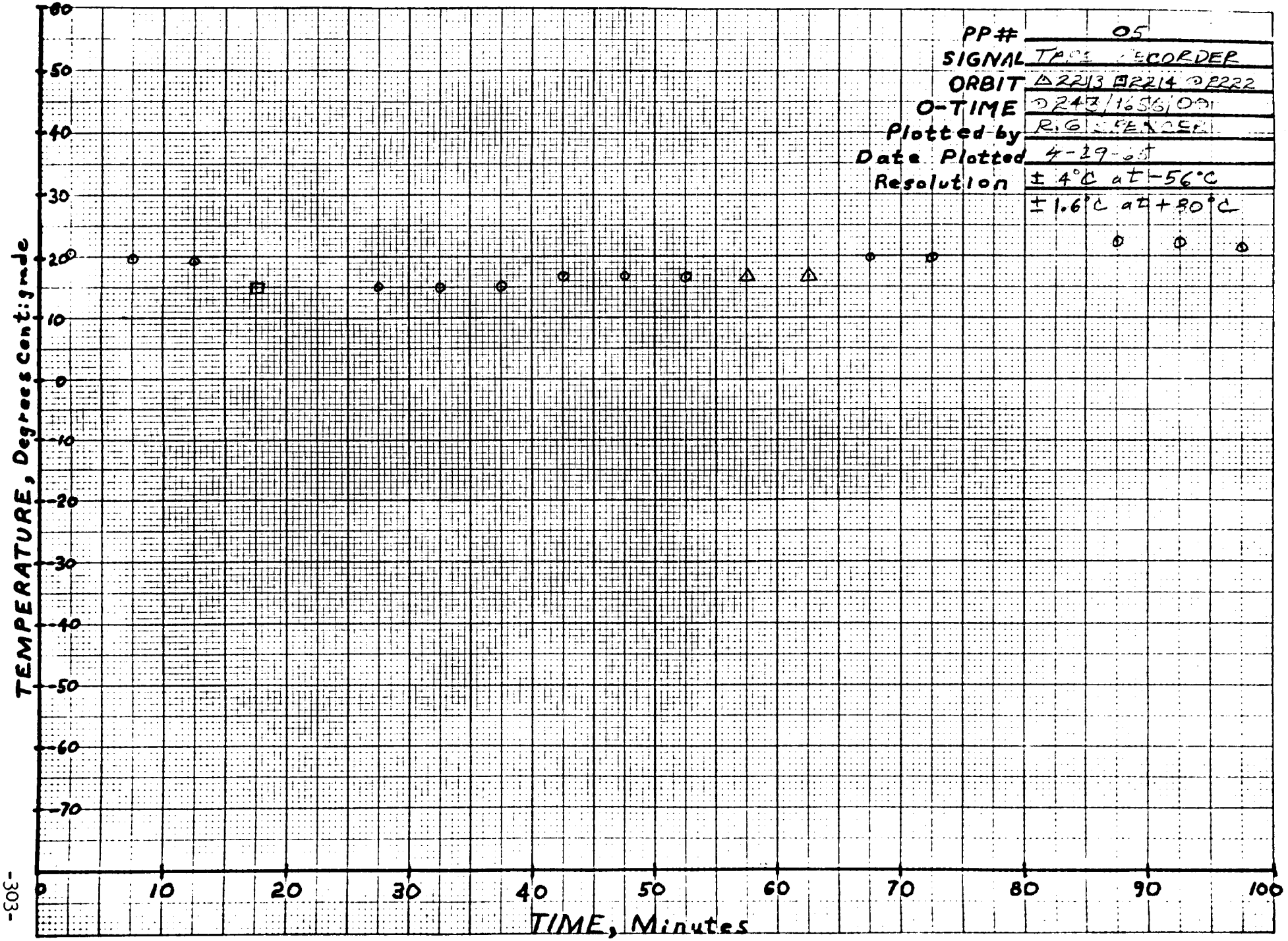
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



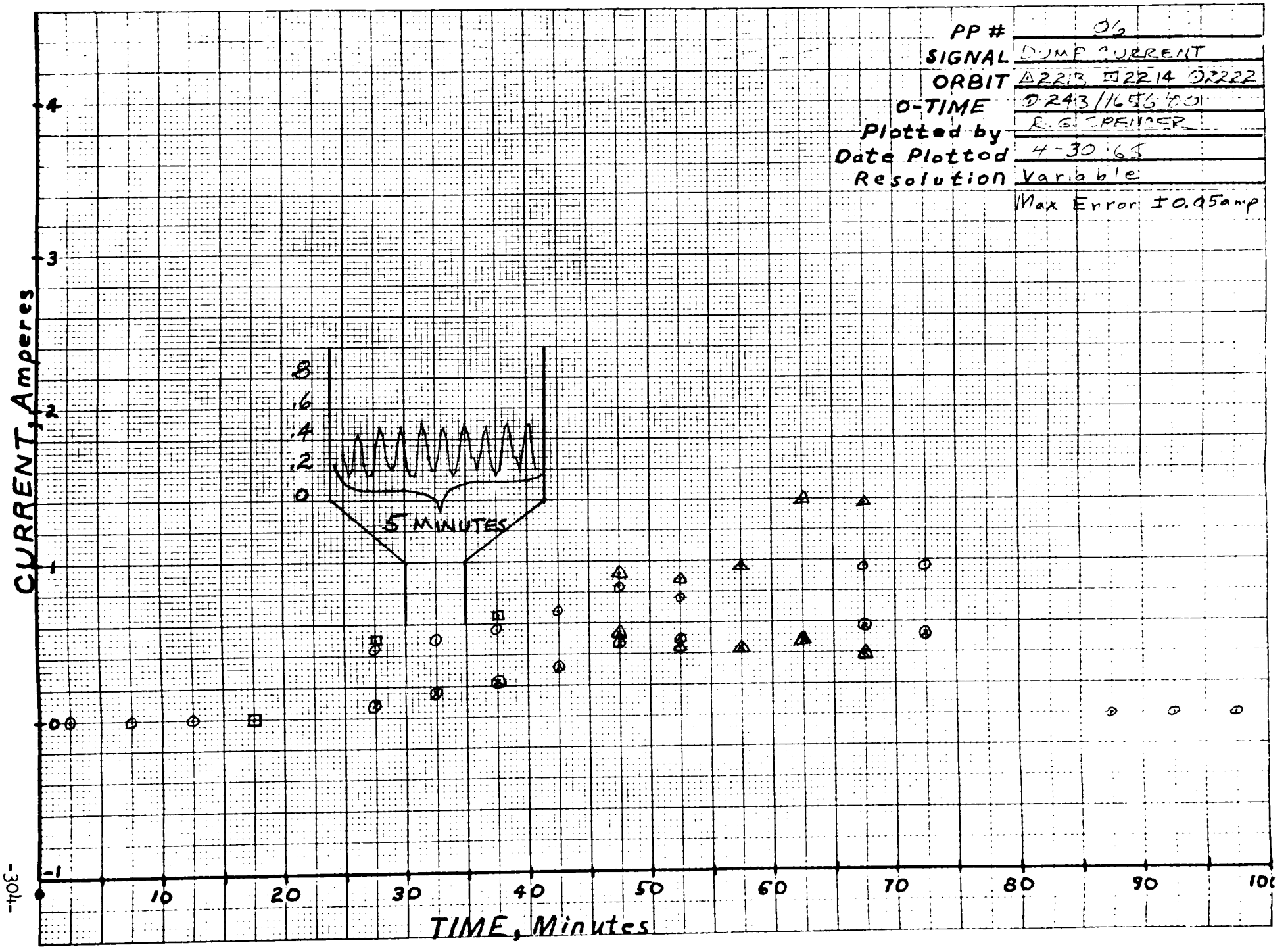
KEUFFEL & ESSER CO.



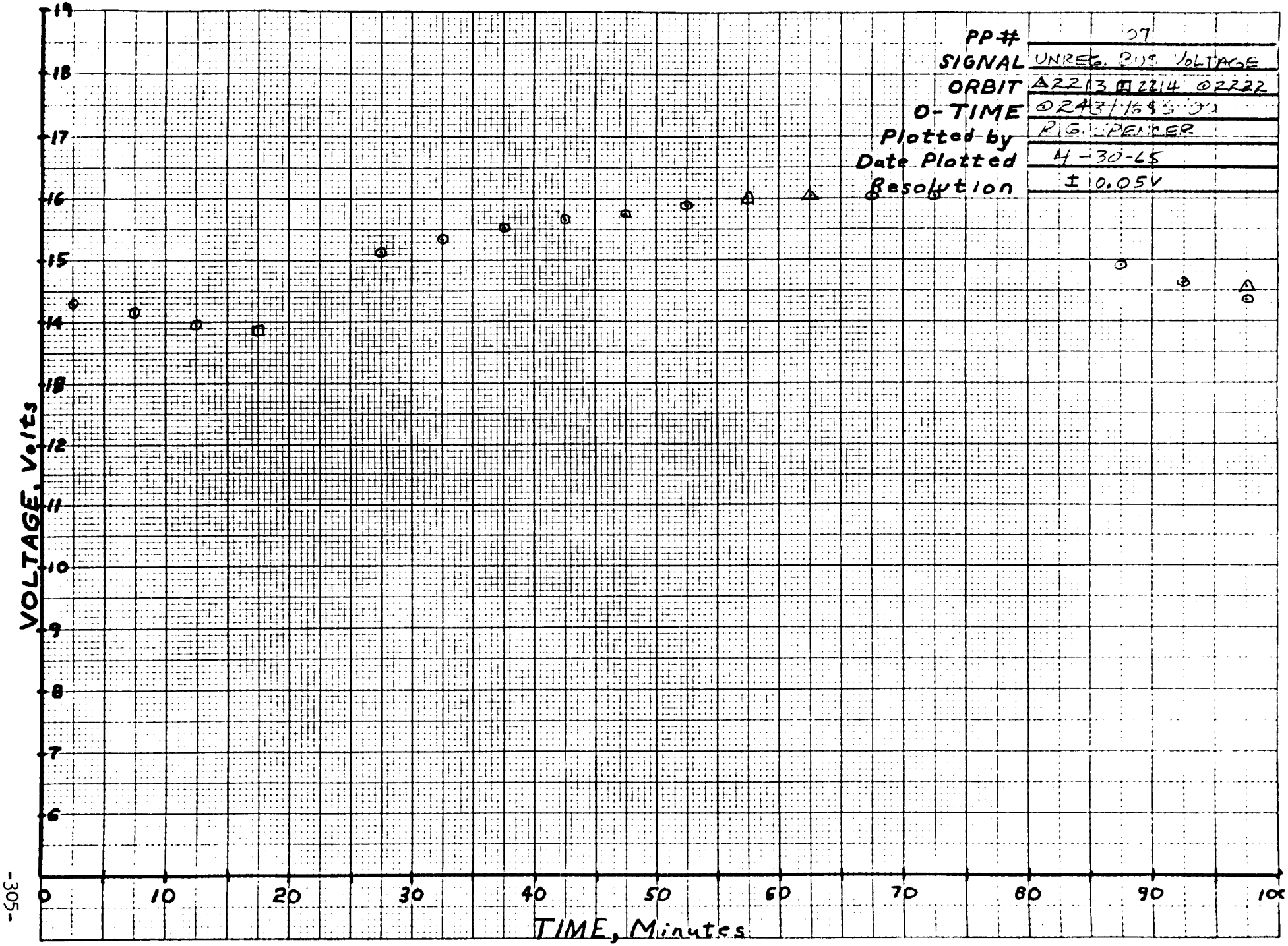
KEUFFEL & ESSER CO.



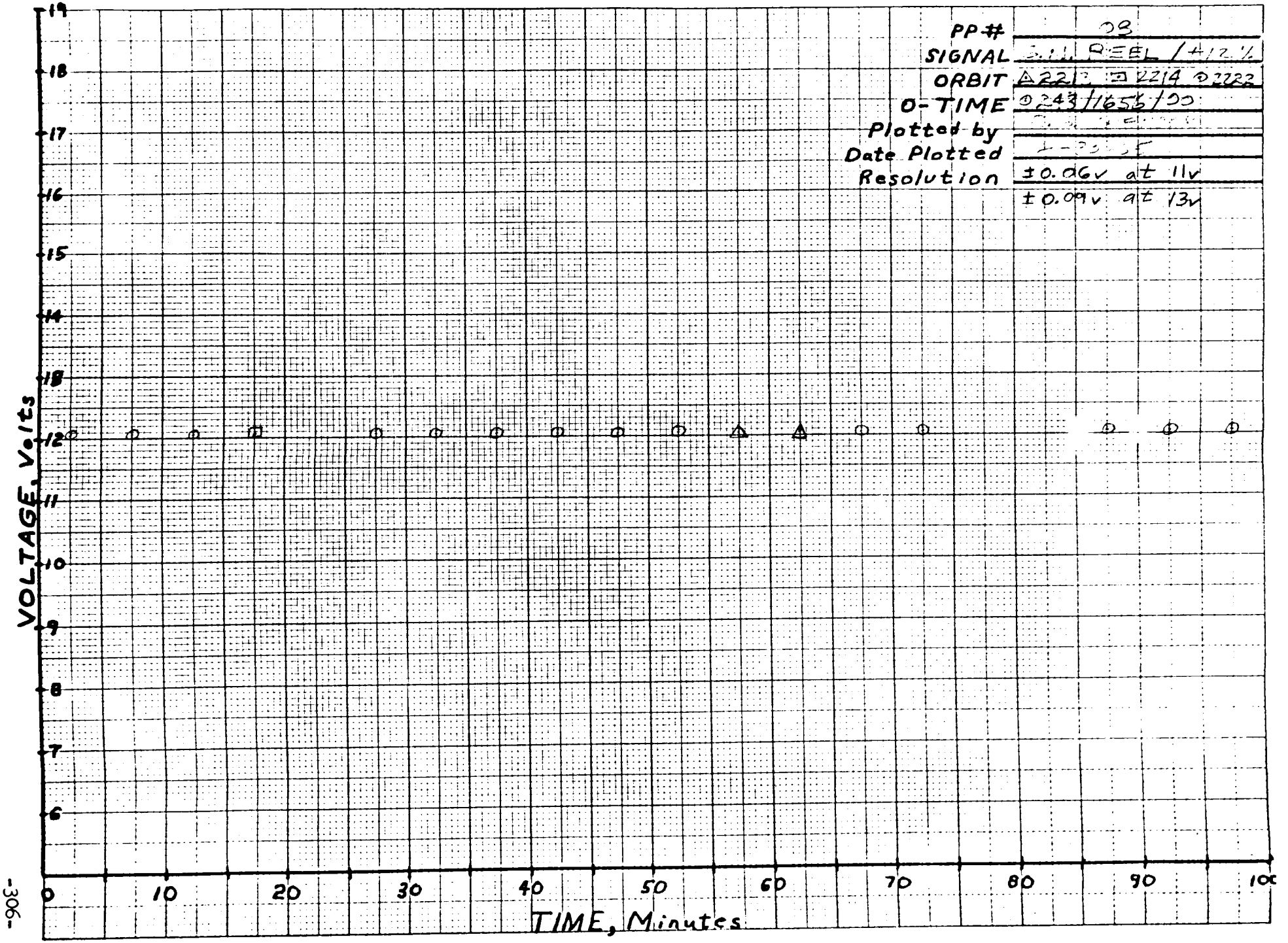
KEUFFEL & ESSER CO.



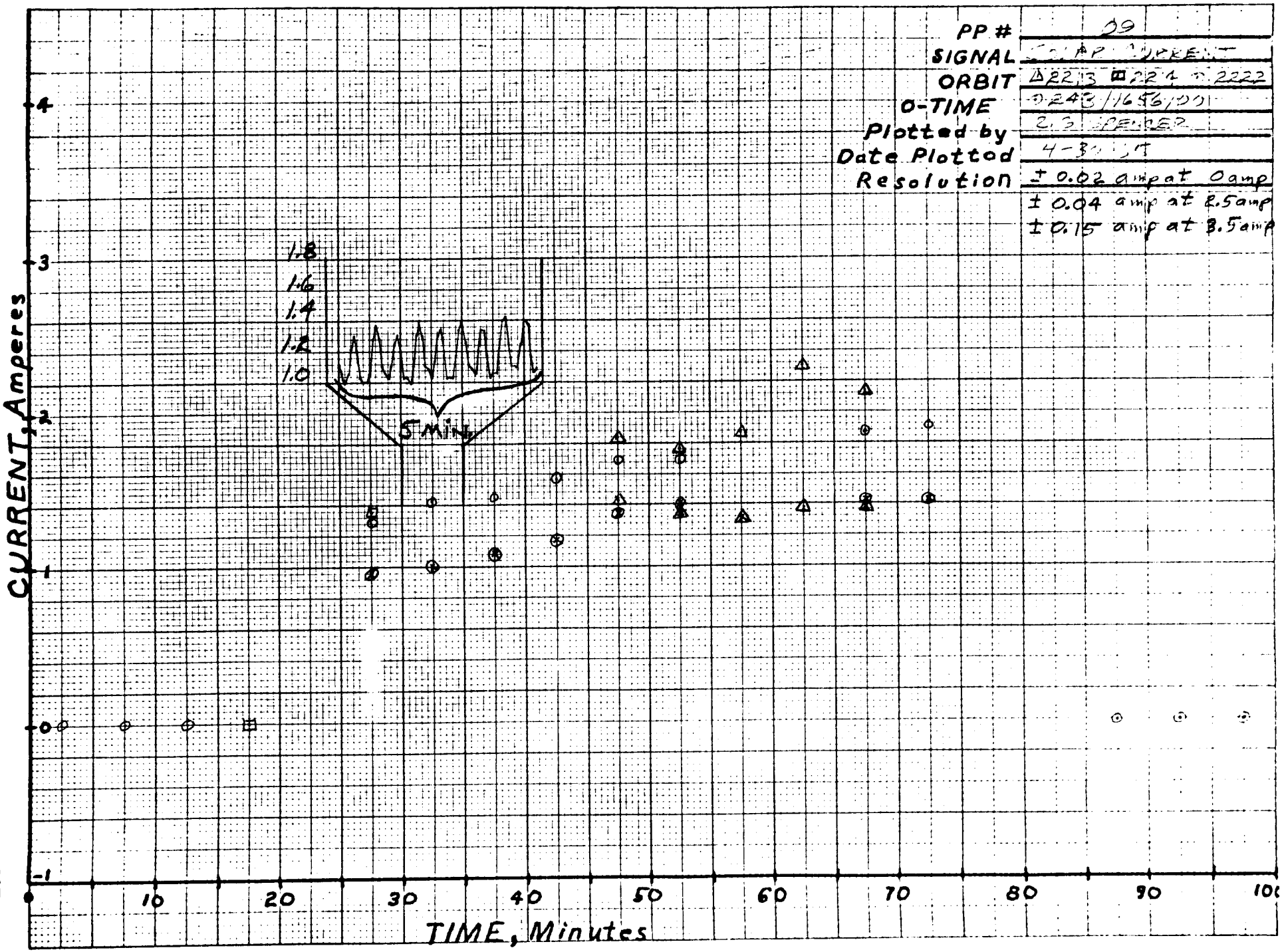
KEUFFEL & ESSER CO.



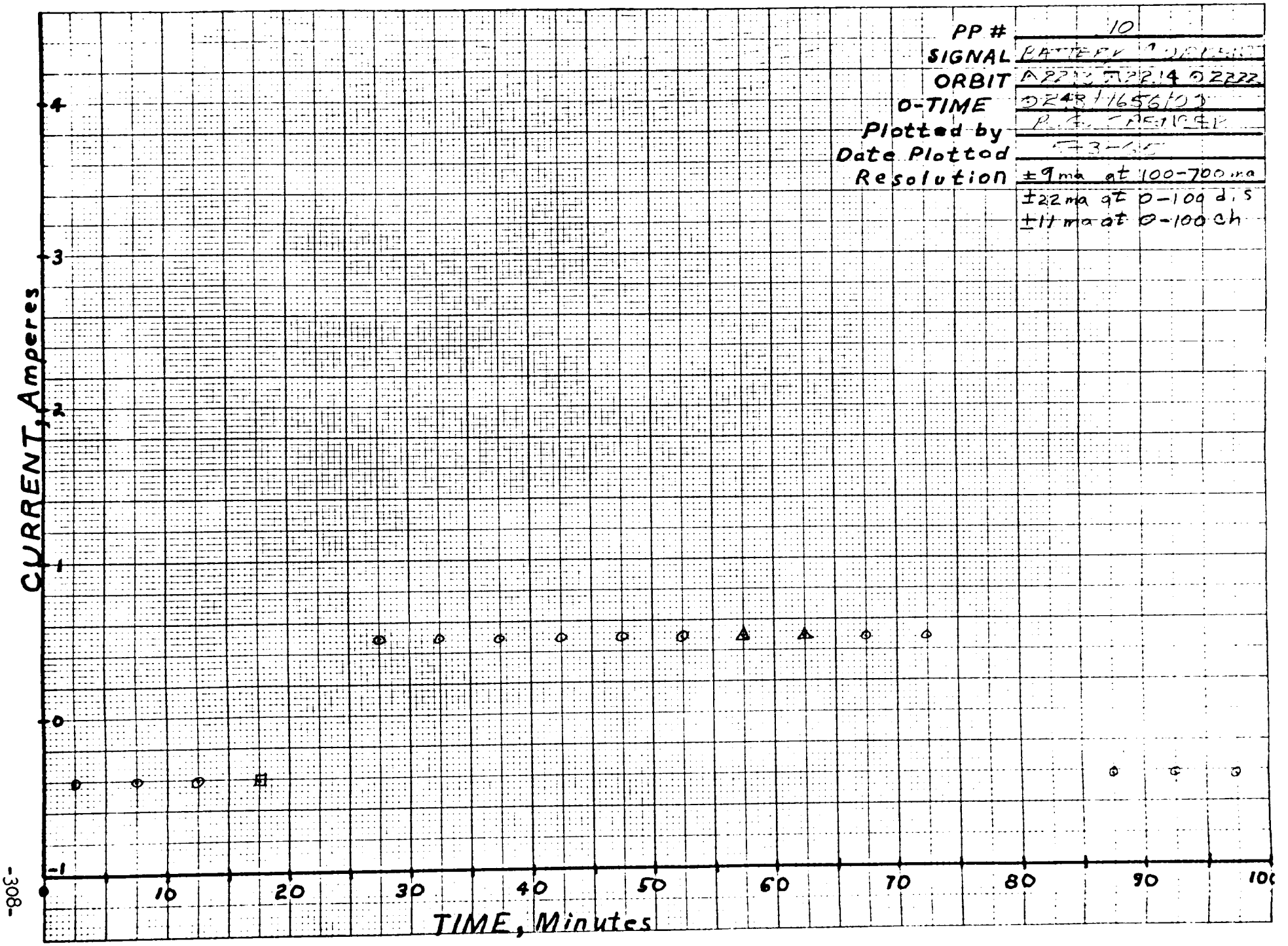
KEUFFEL & ESSER CO.



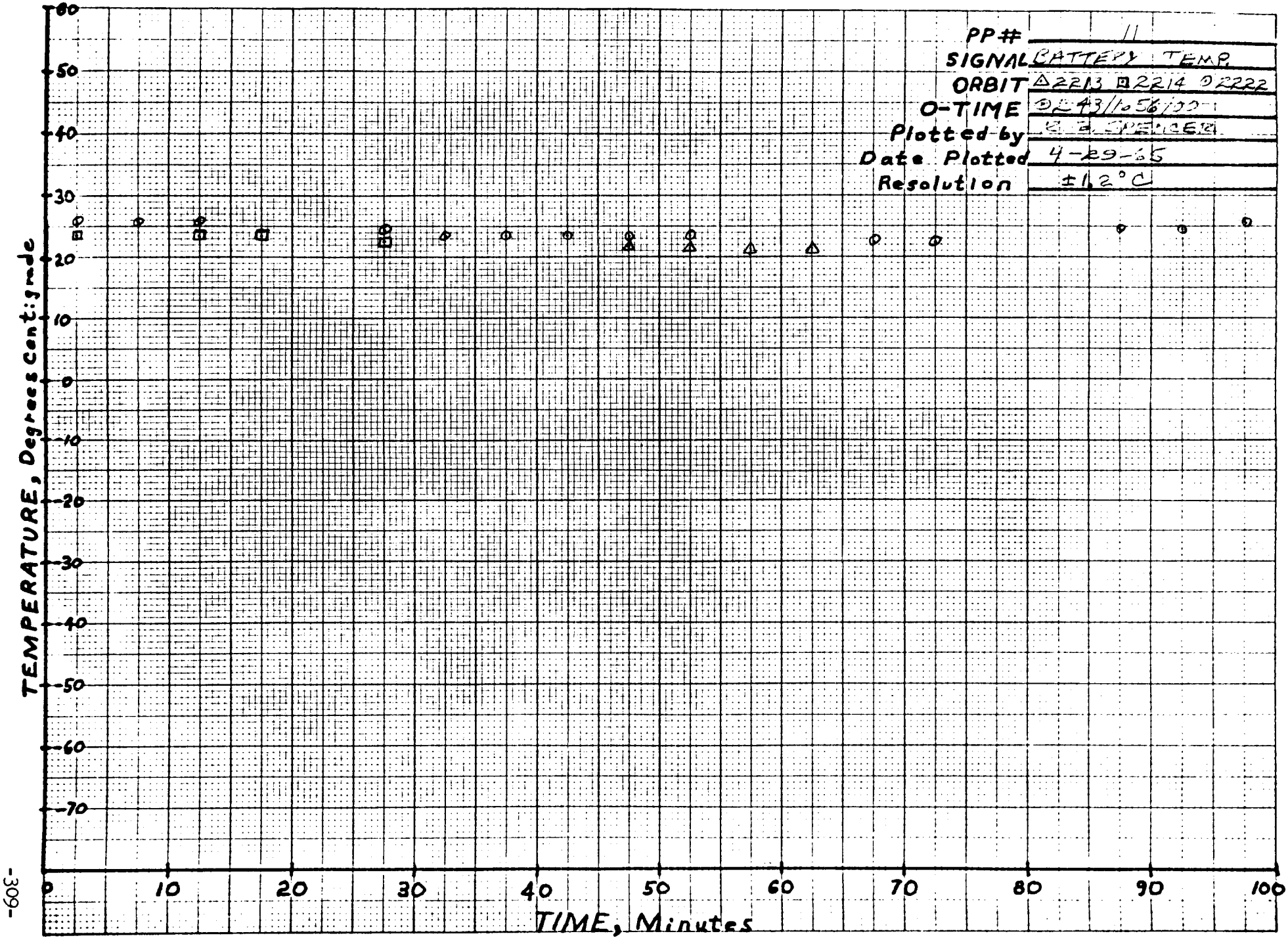
KEUFFEL & ESSER CO.



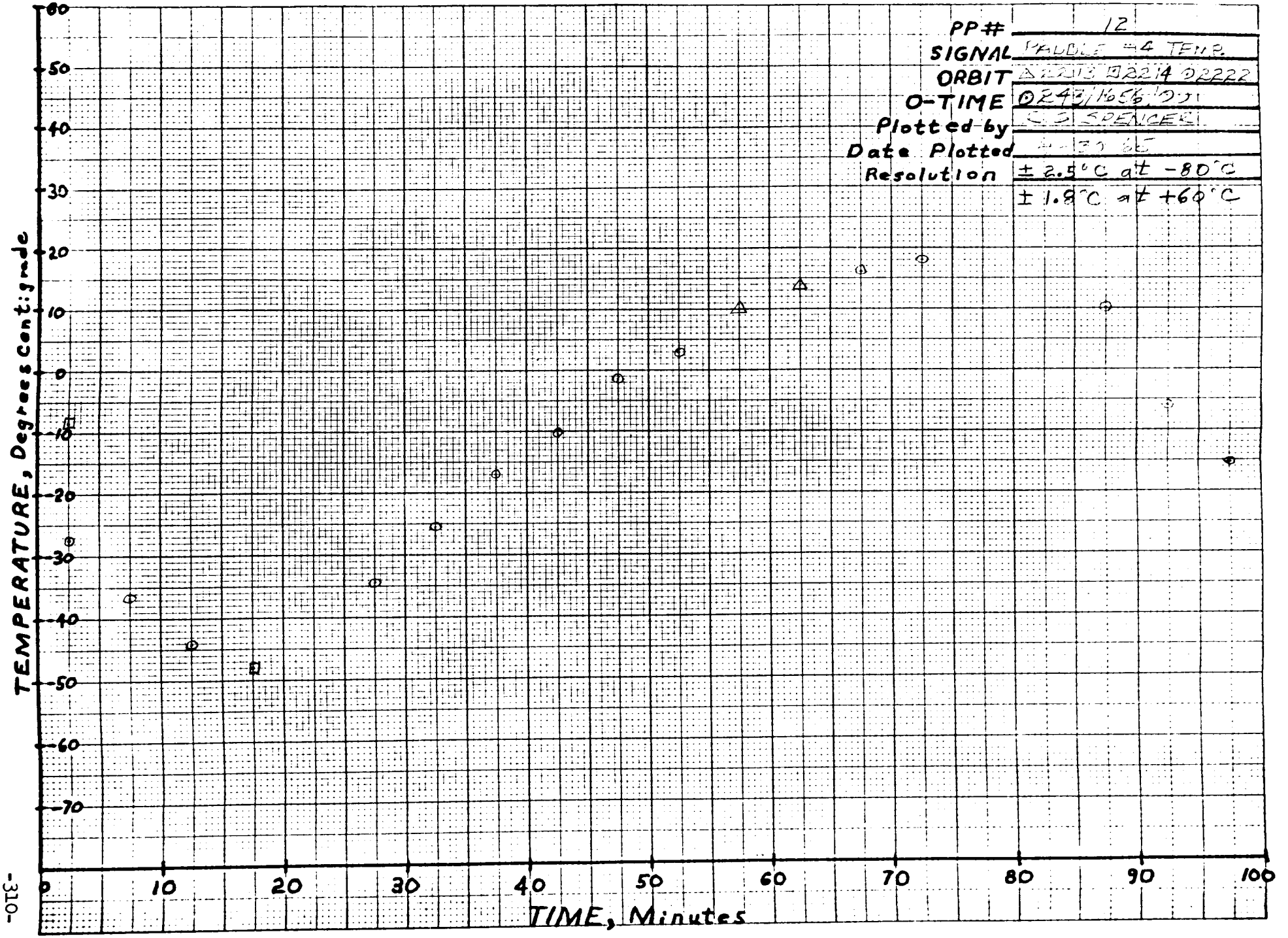
KEUFFEL & ESSER CO.



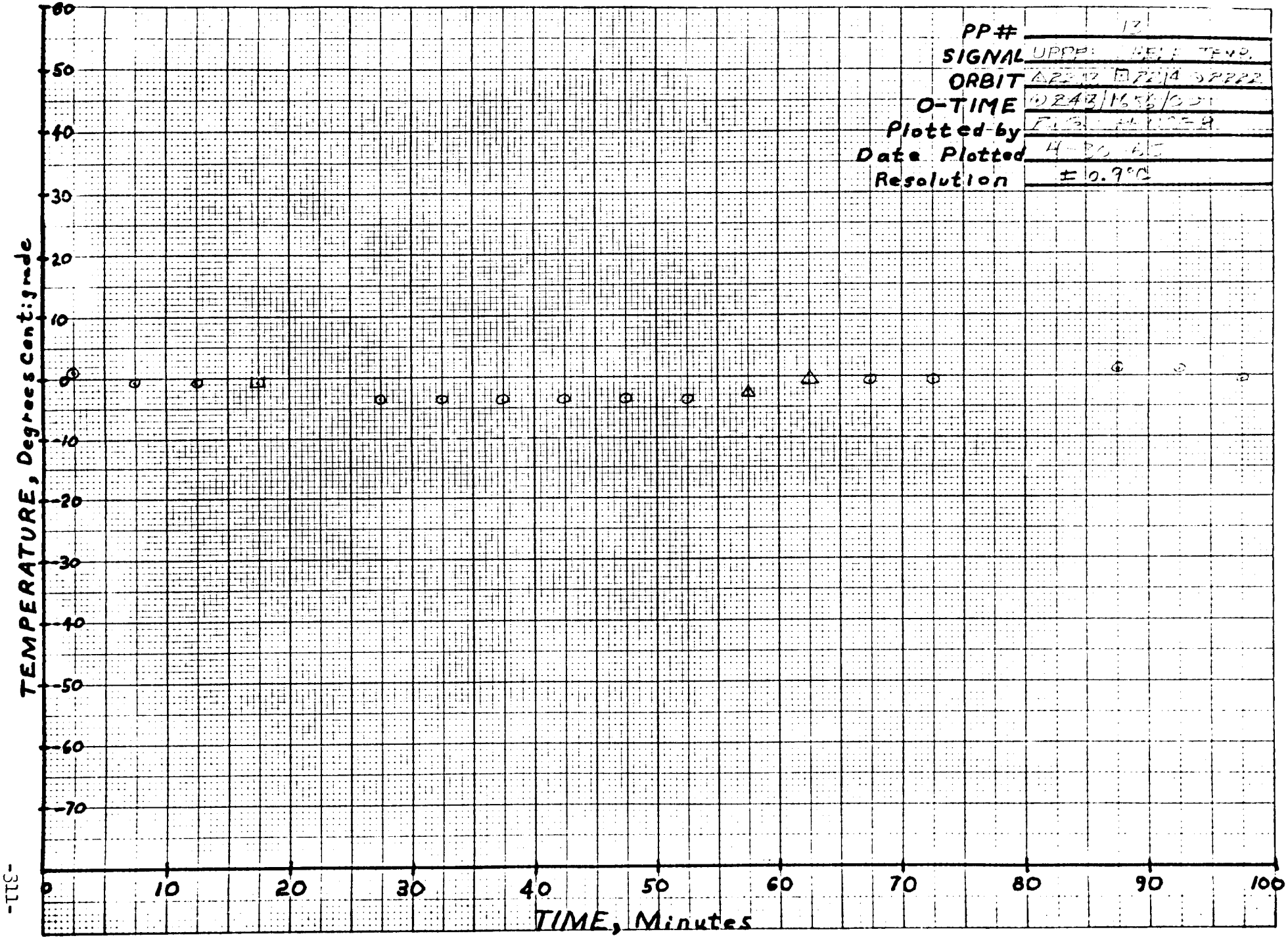
KEUFFEL & ESSER CO.



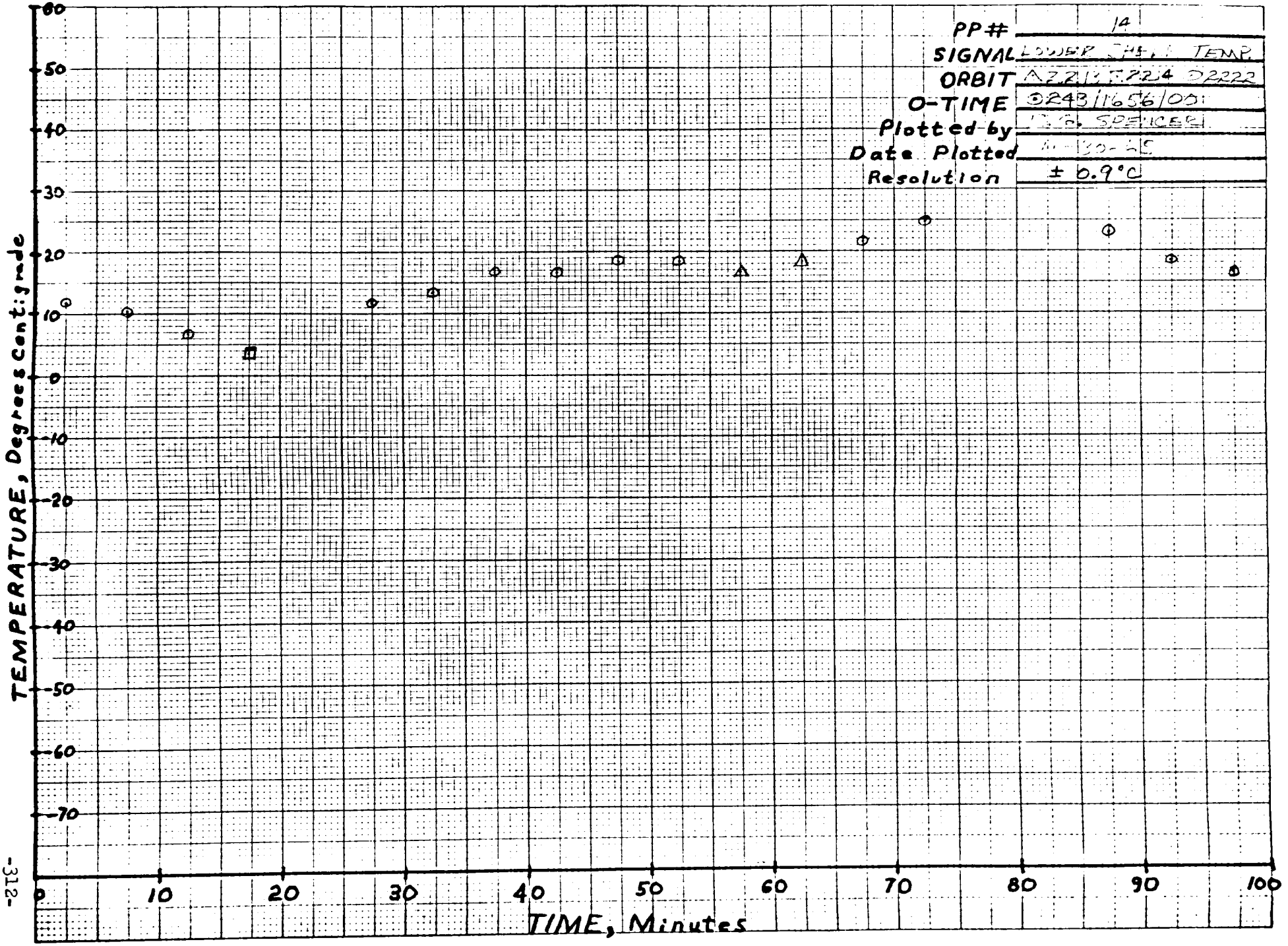
KEUFFEL & ESSER CO.



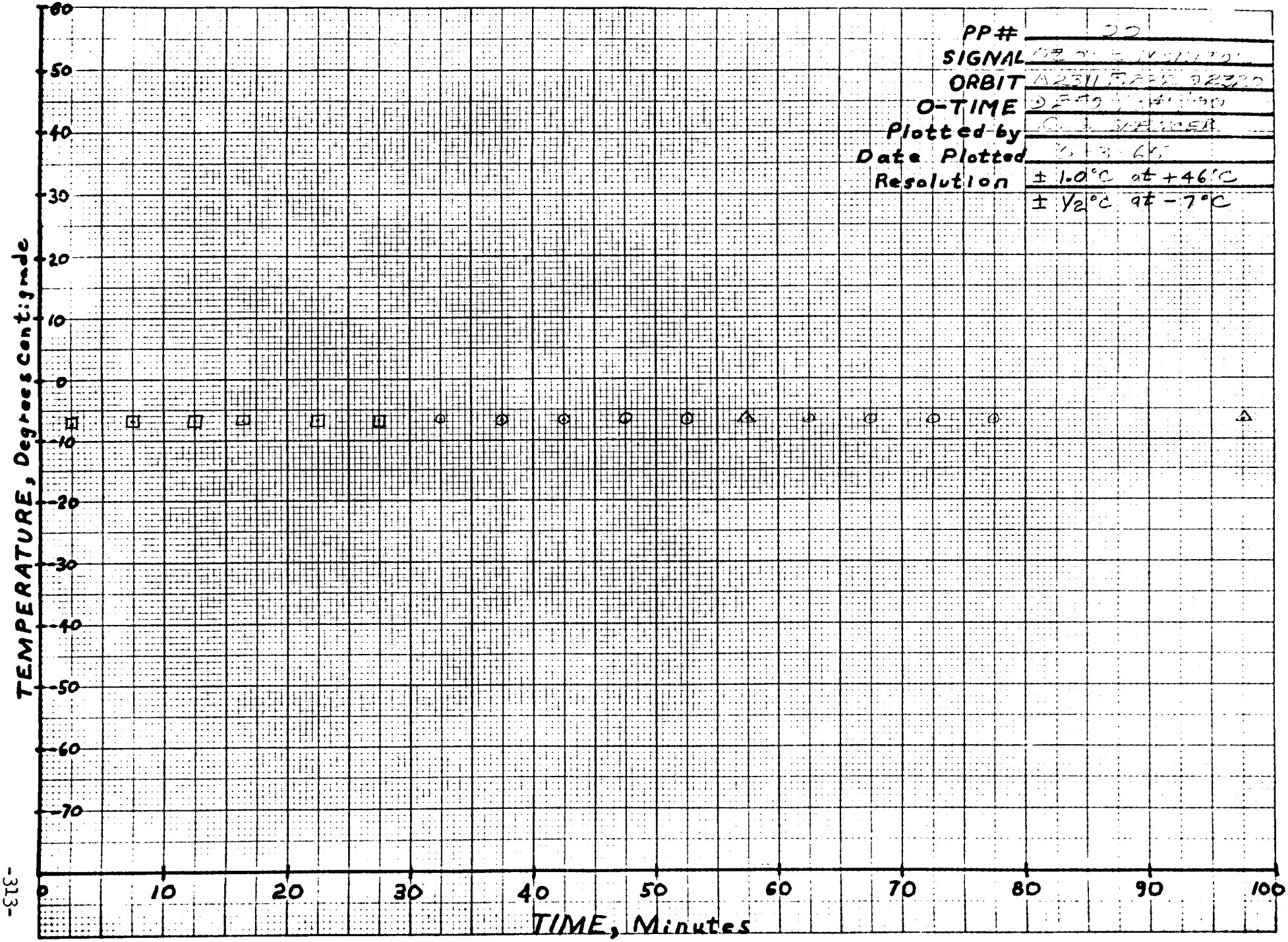
KEUFFEL & ESSER CO.



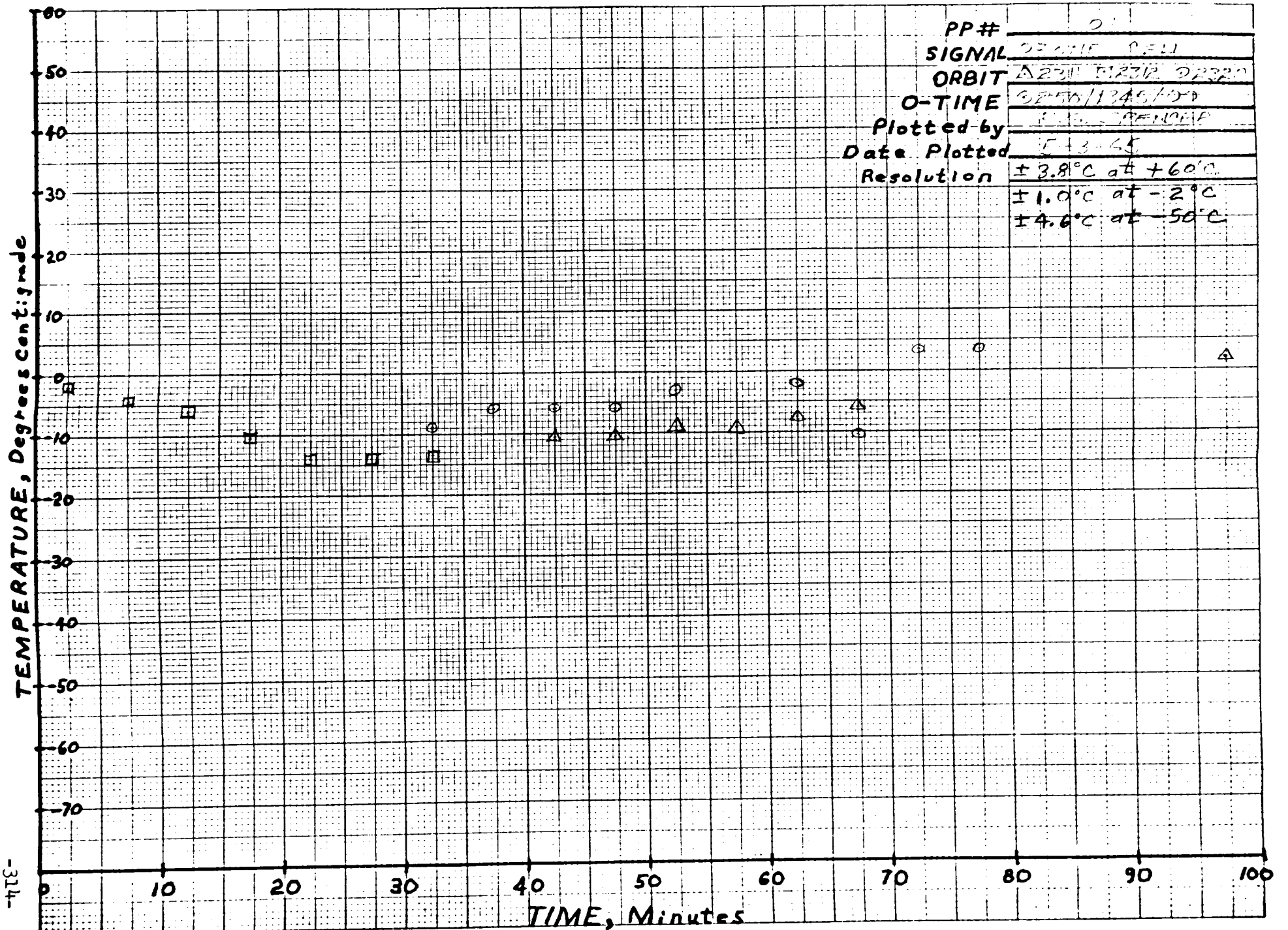
KEUFFEL & ESSER CO.



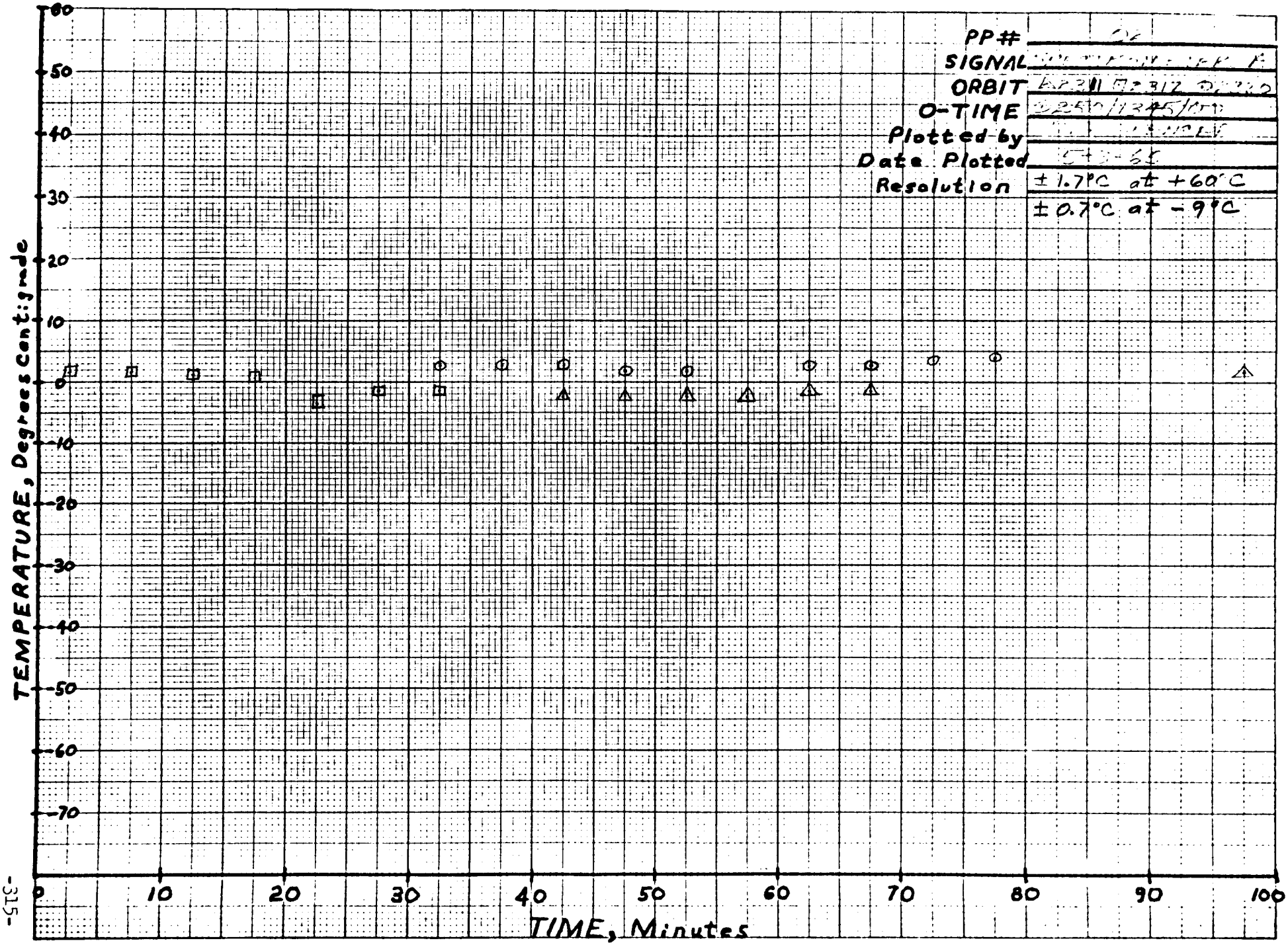
KEUFFEL & ESSER CO.



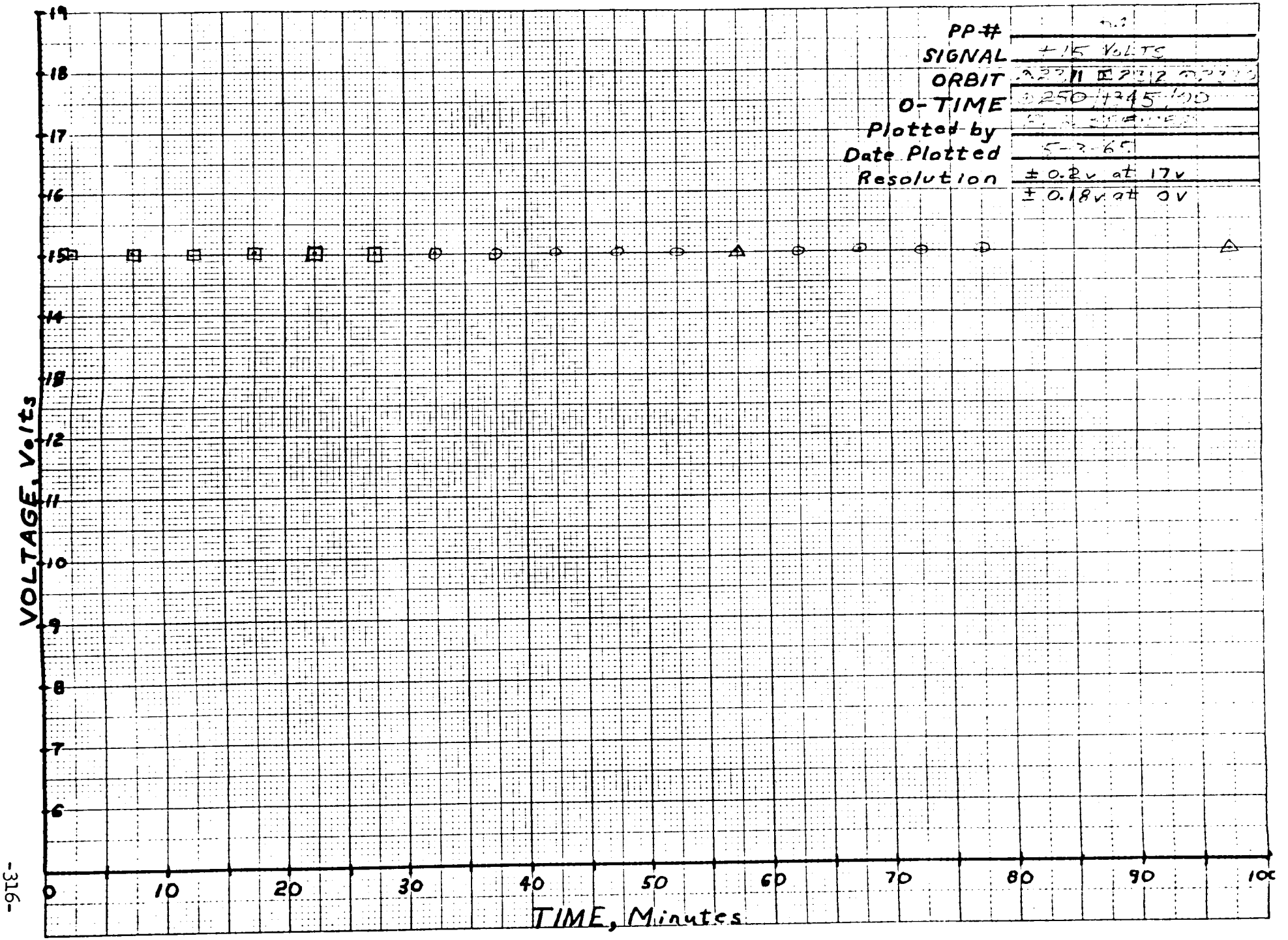
KEUFFEL & ESSER CO.

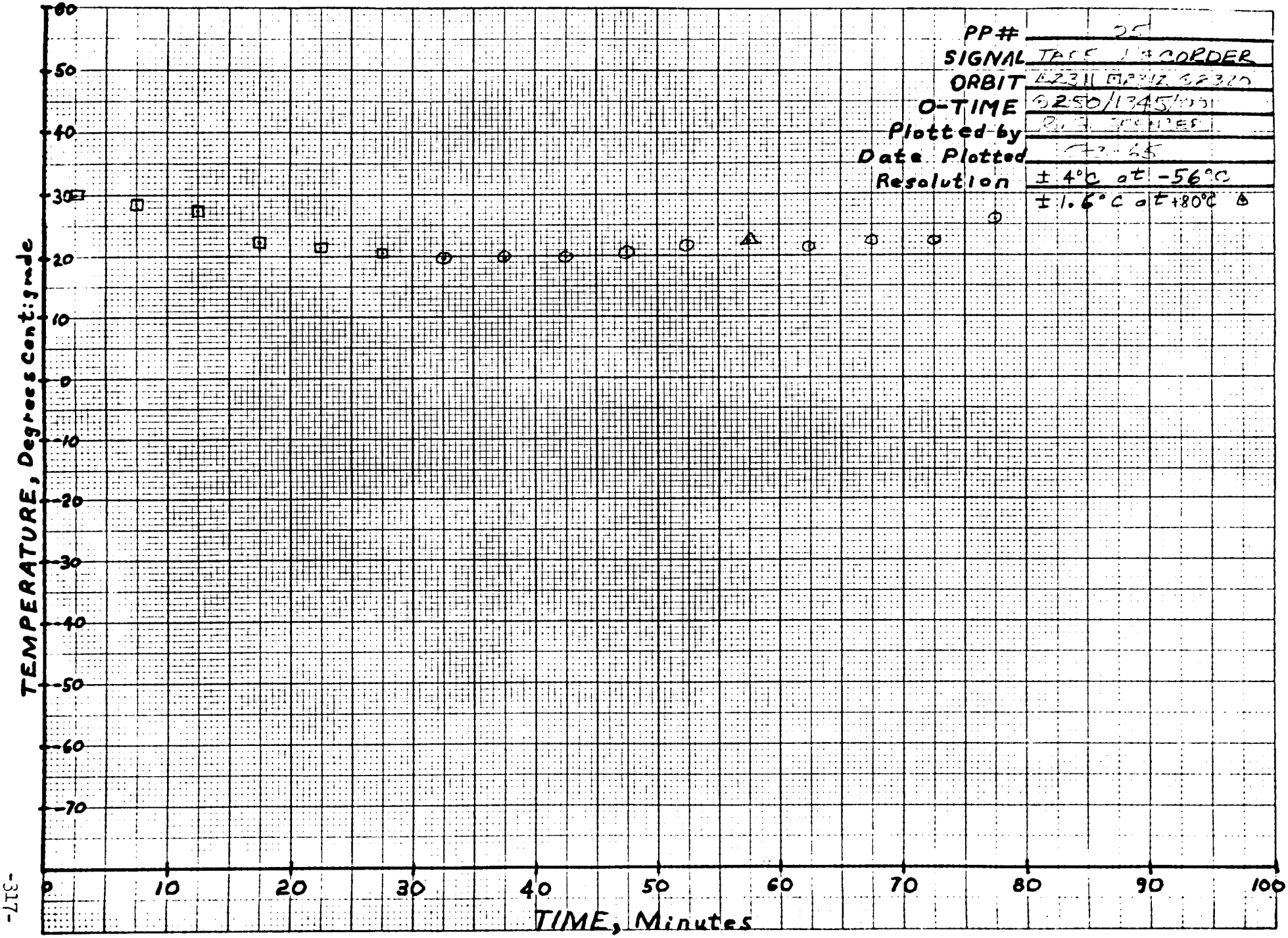


KEUFFEL & ESSER CO.

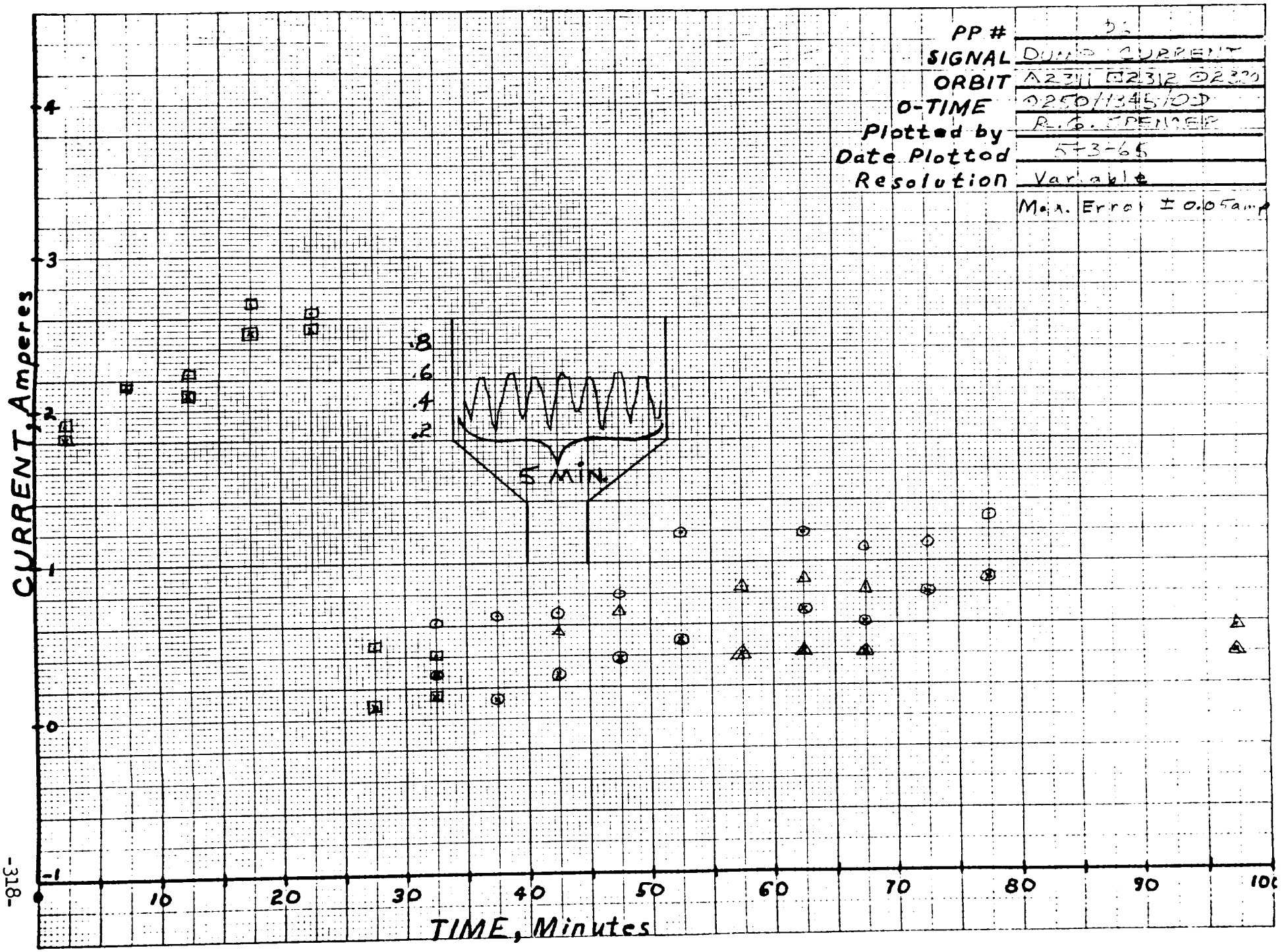


KEUFFEL & ESSER CO.

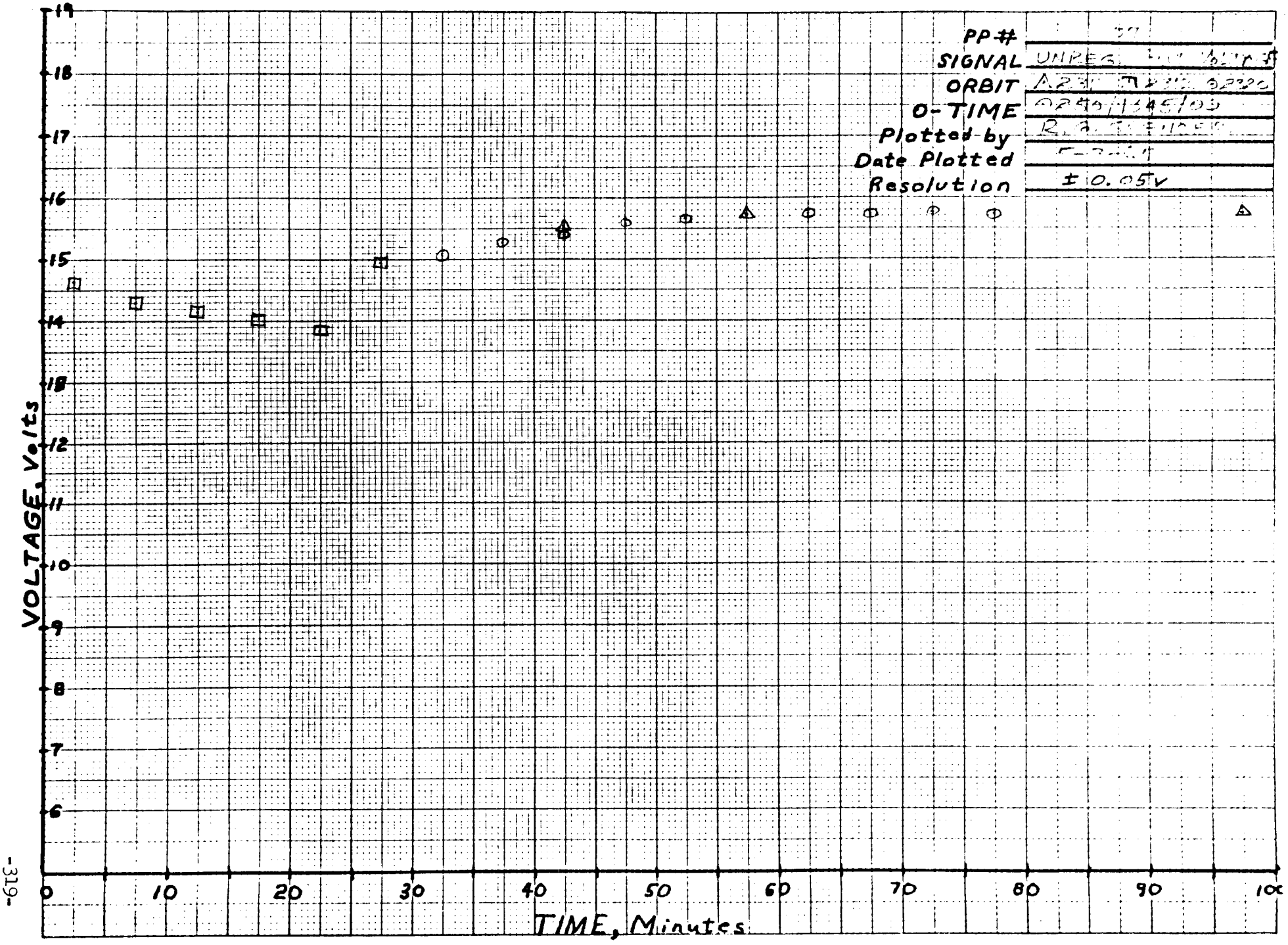



PP# 25
SIGNAL TAPE RECORDER
ORBIT
O-TIME 0250/1345
Plotted by
Date Plotted
Resolution ± 4°C at -56°C
± 1.6°C at +80°C
TEMPERATURE, Degrees Centigrade
80
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

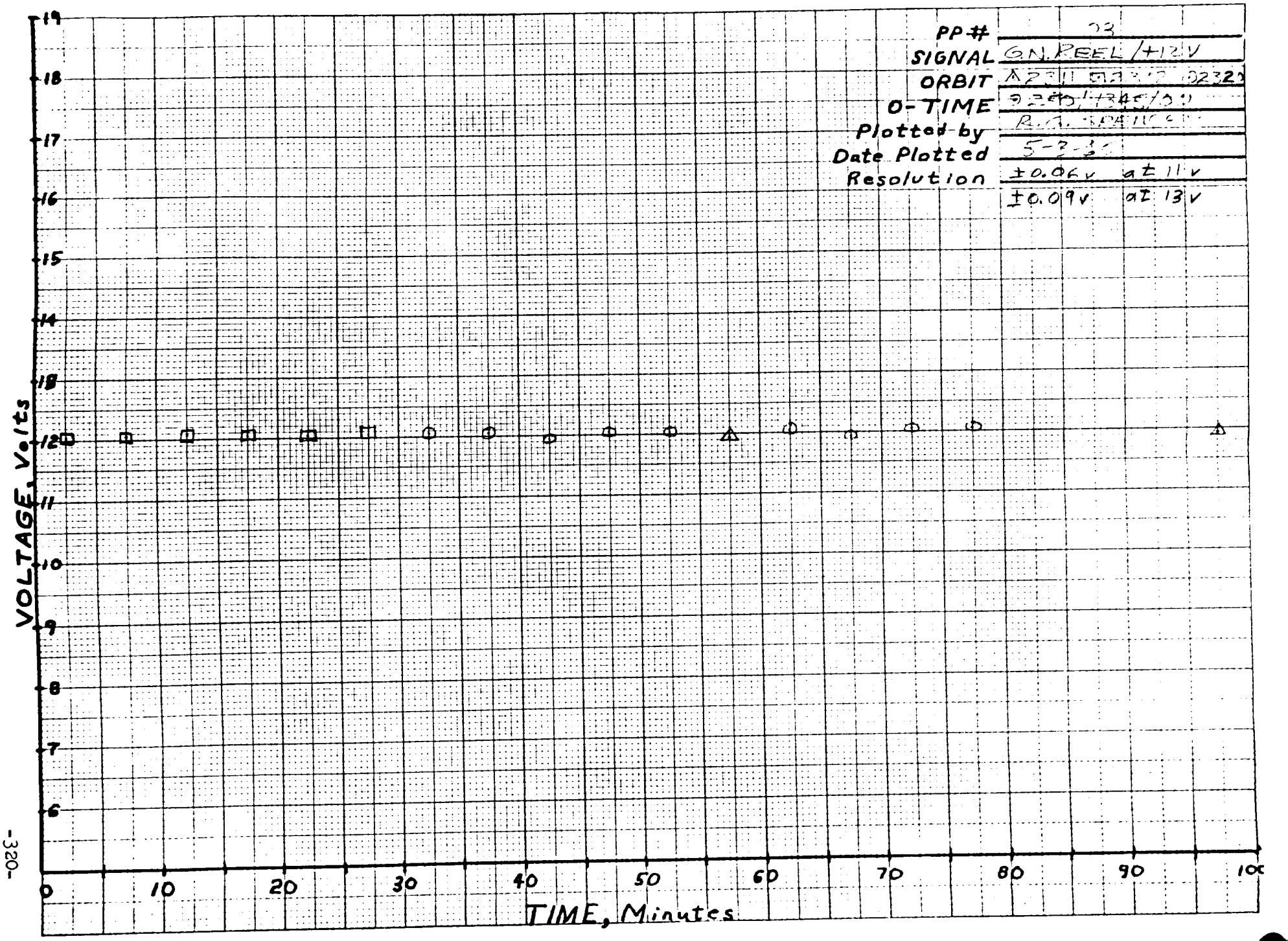
KEUFFEL & ESSER CO.



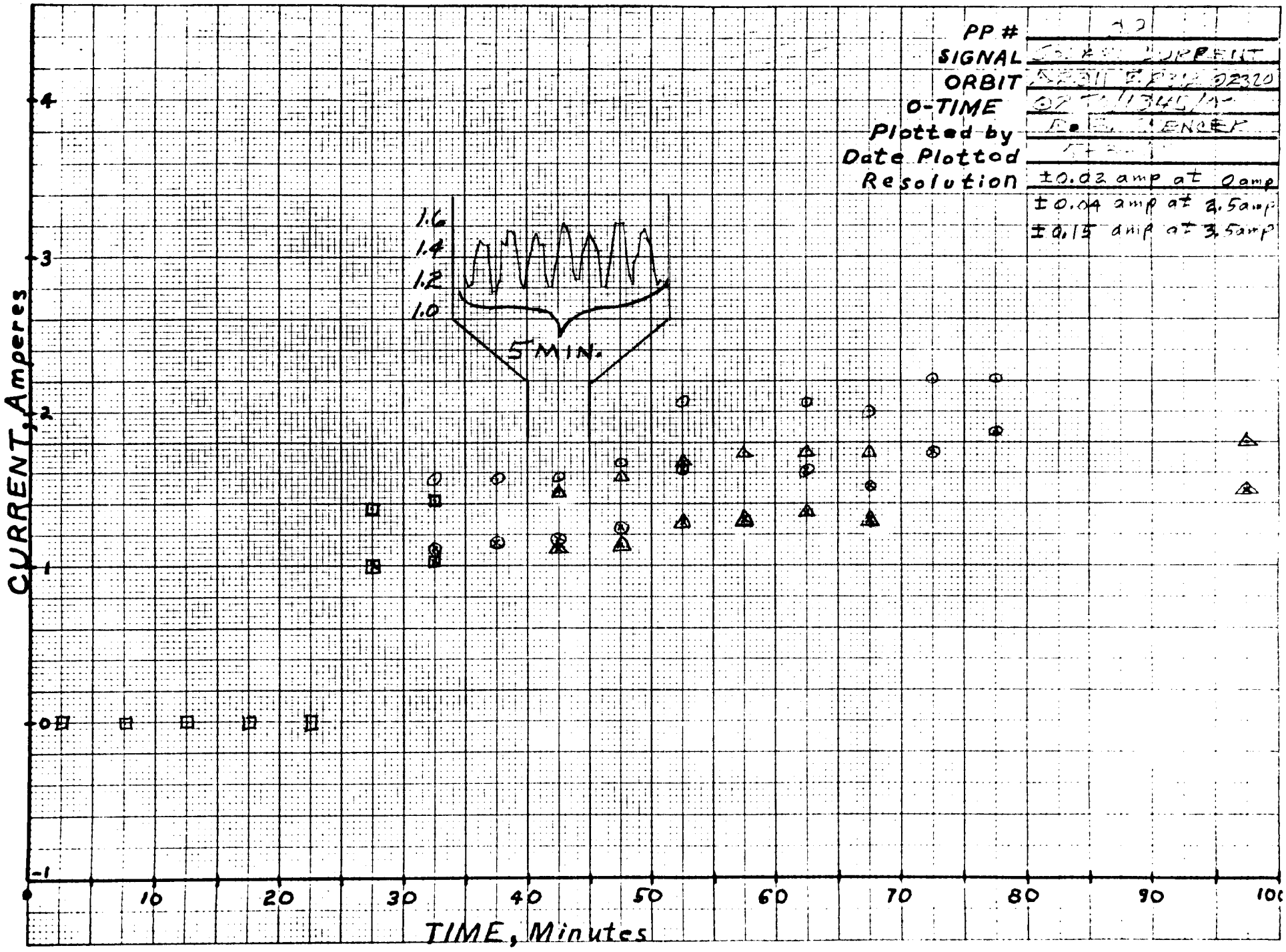
KEUFFEL & ESSER CO.



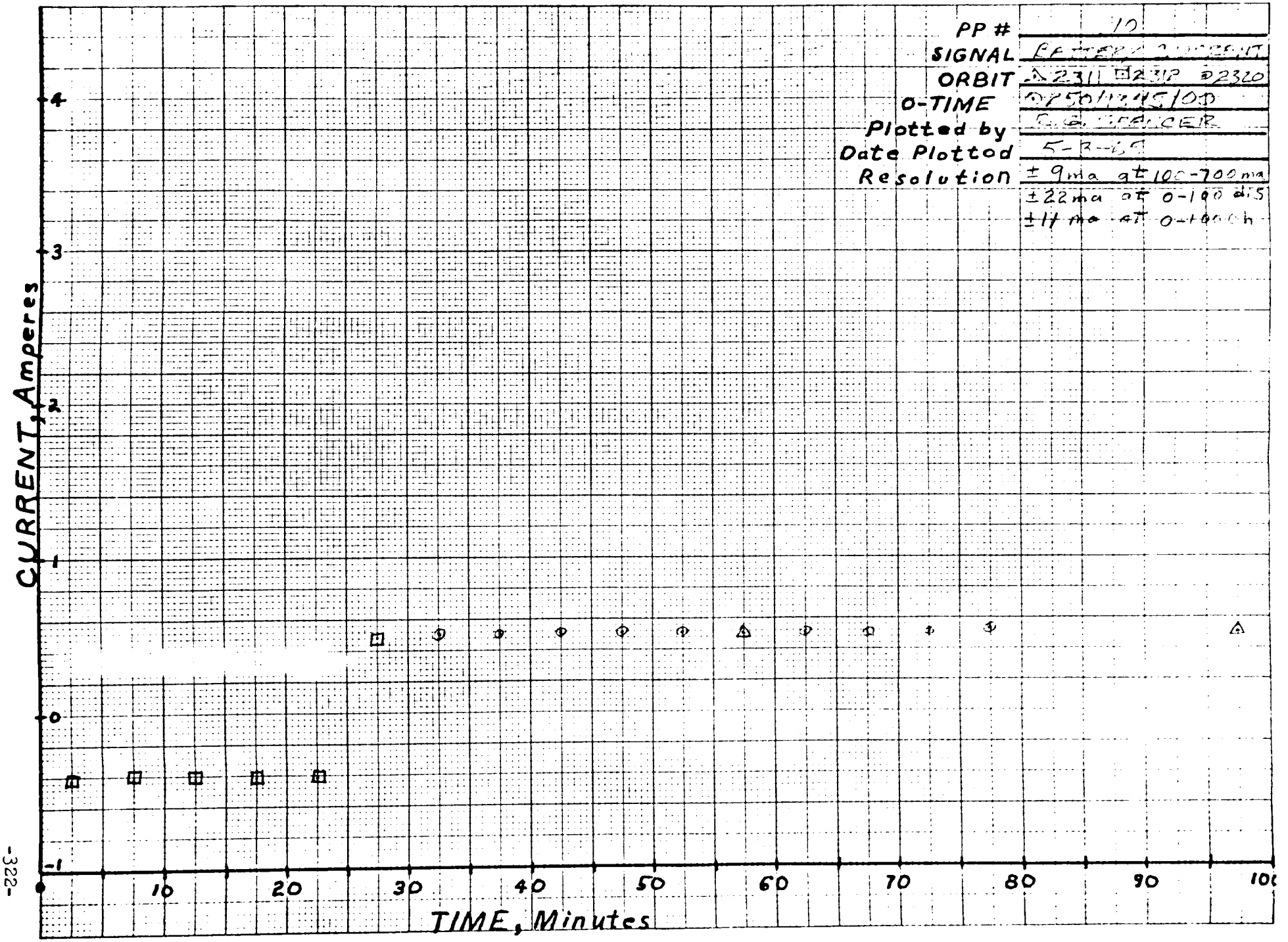
K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



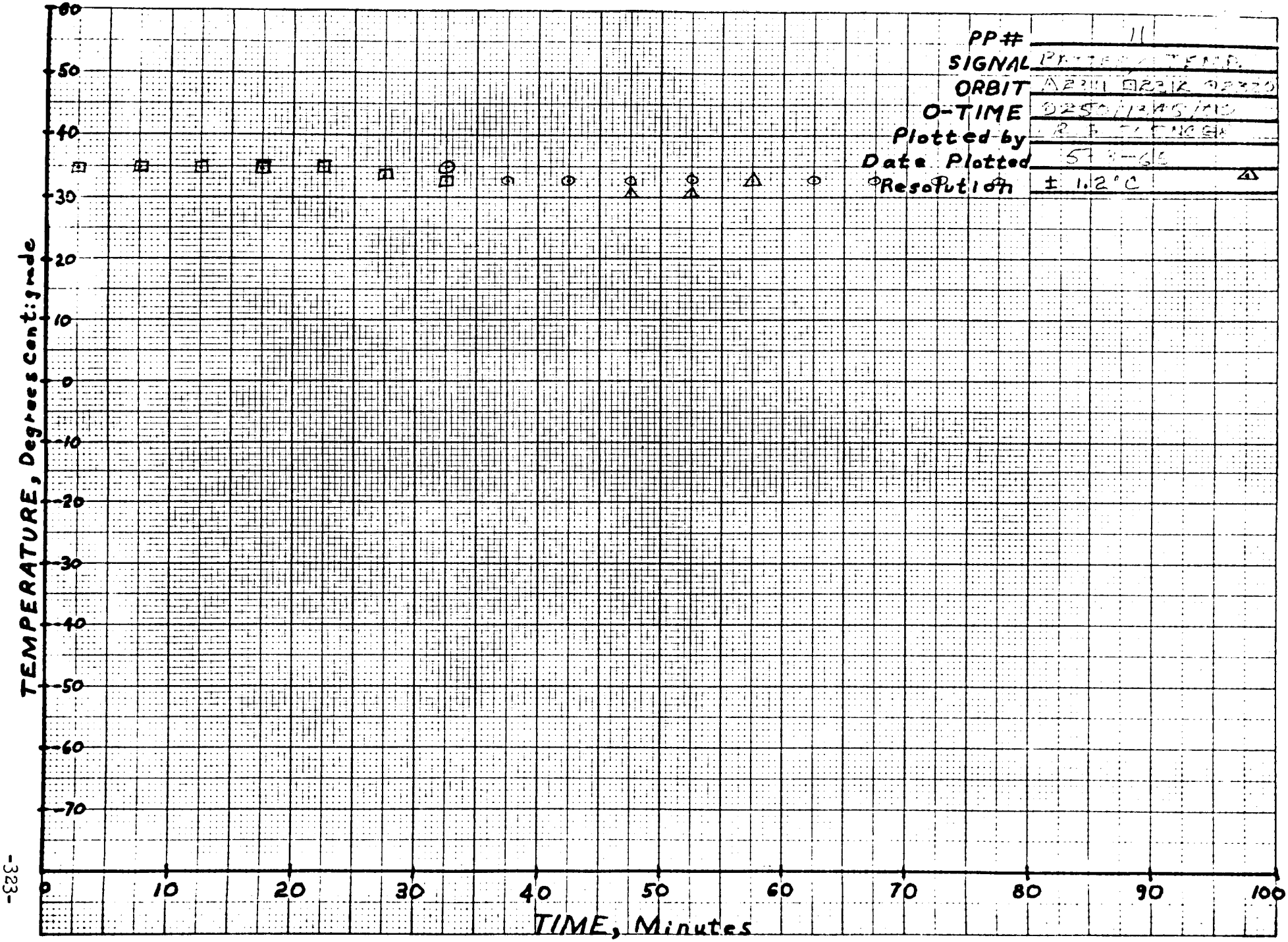
KEUFFEL & ESSER CO.



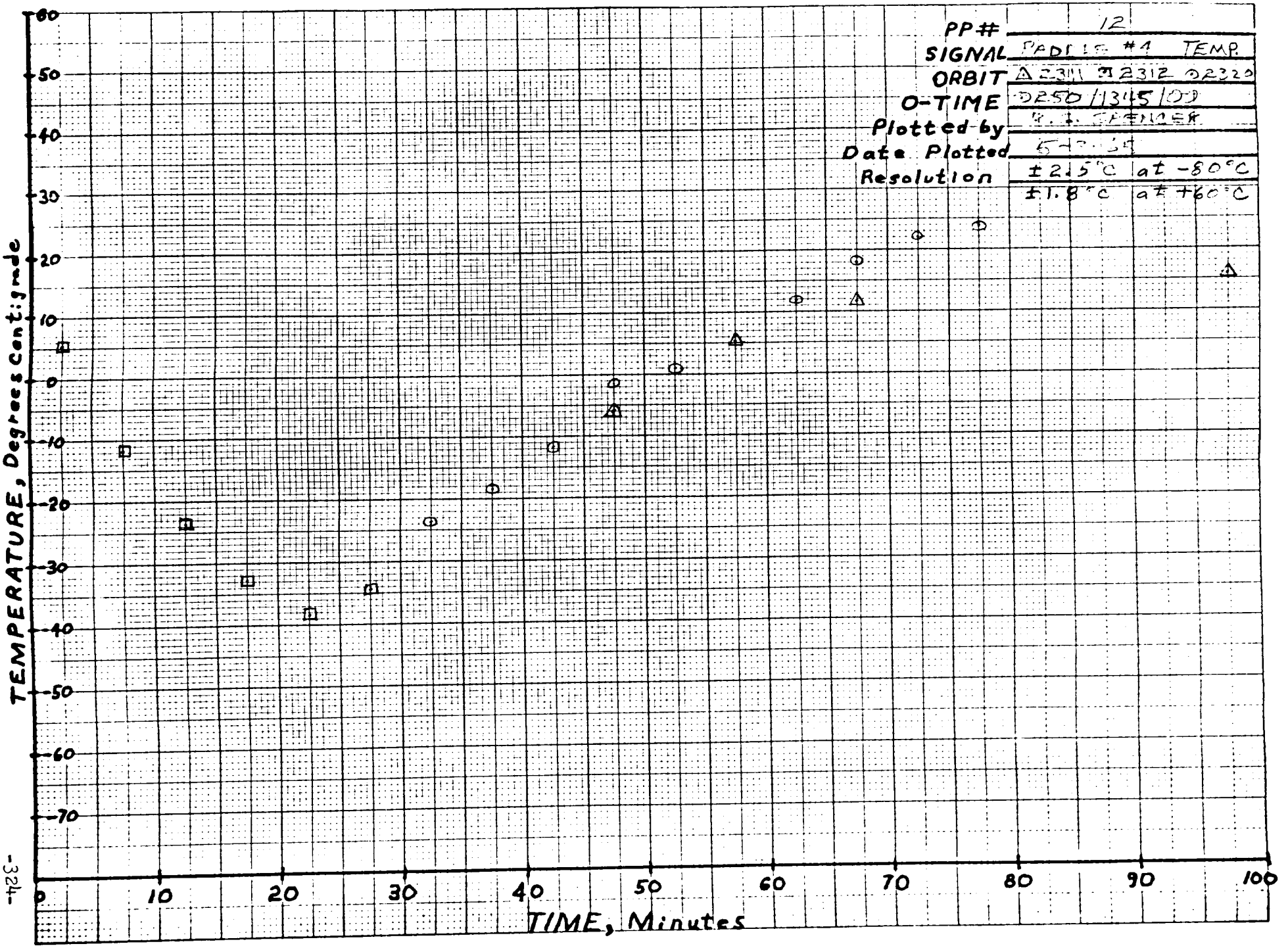
KEUFFEL & ESSER CO.



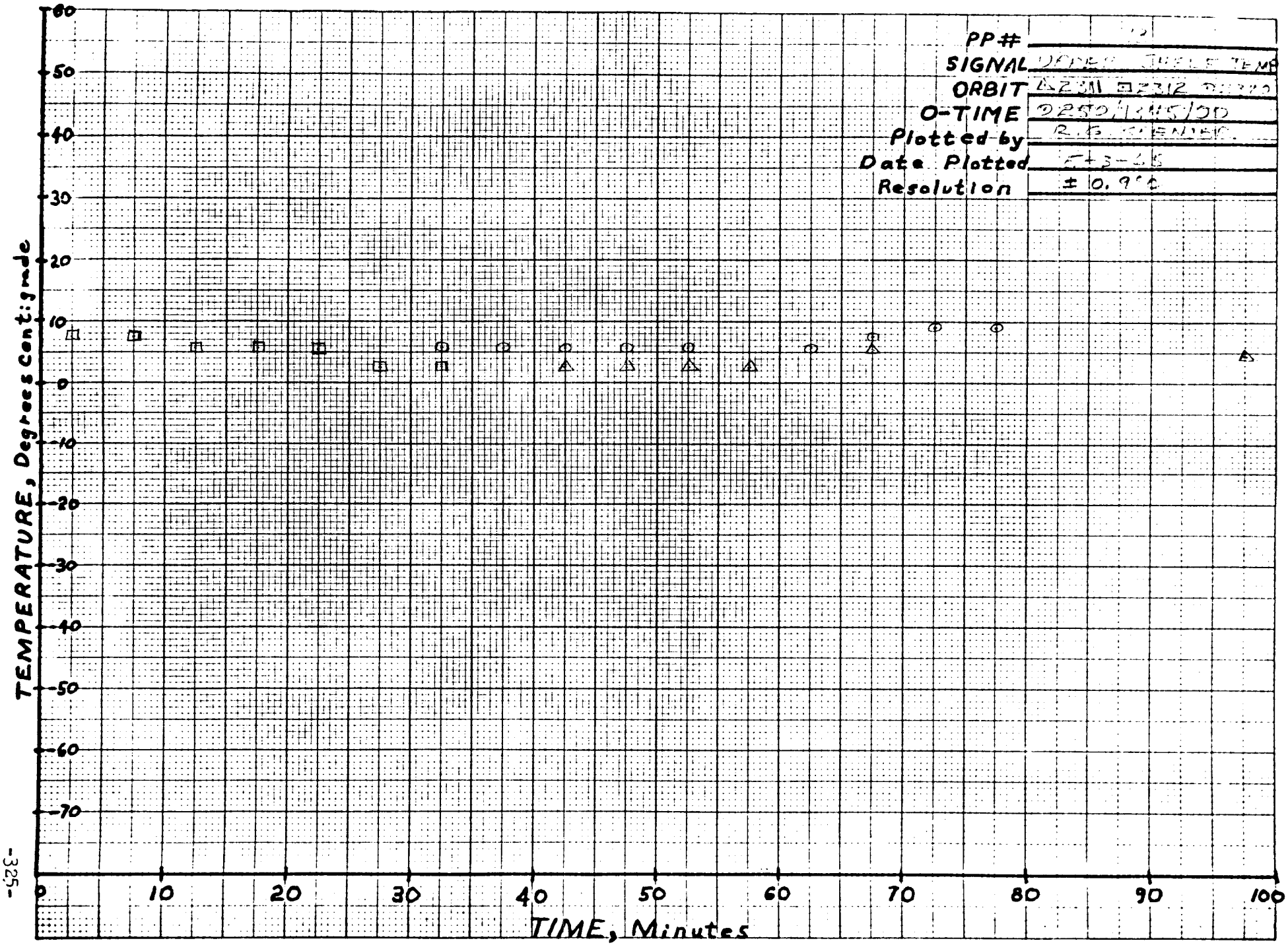
KEUFFEL & ESSER CO.



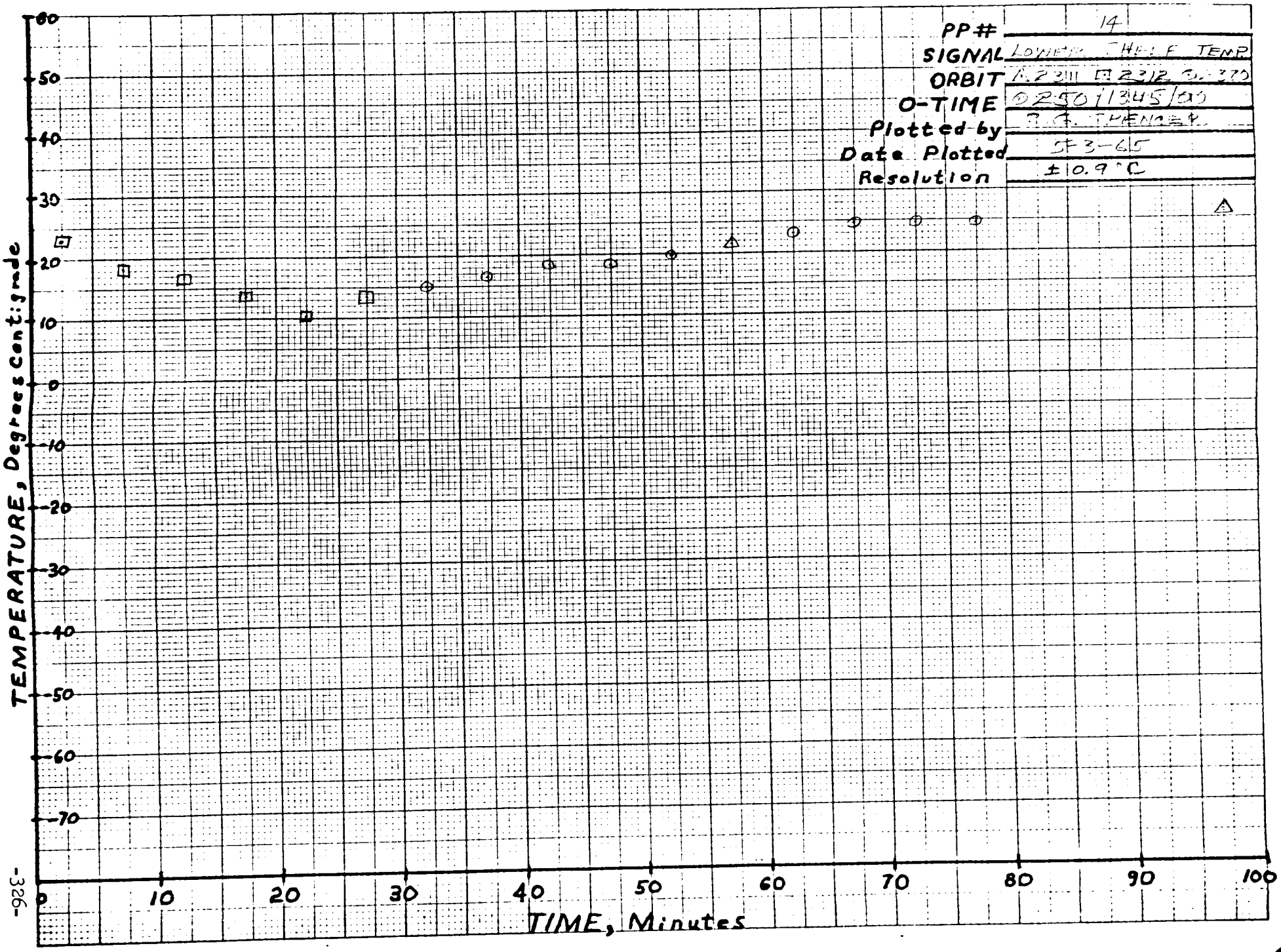
KEUFFEL & ESSER CO.



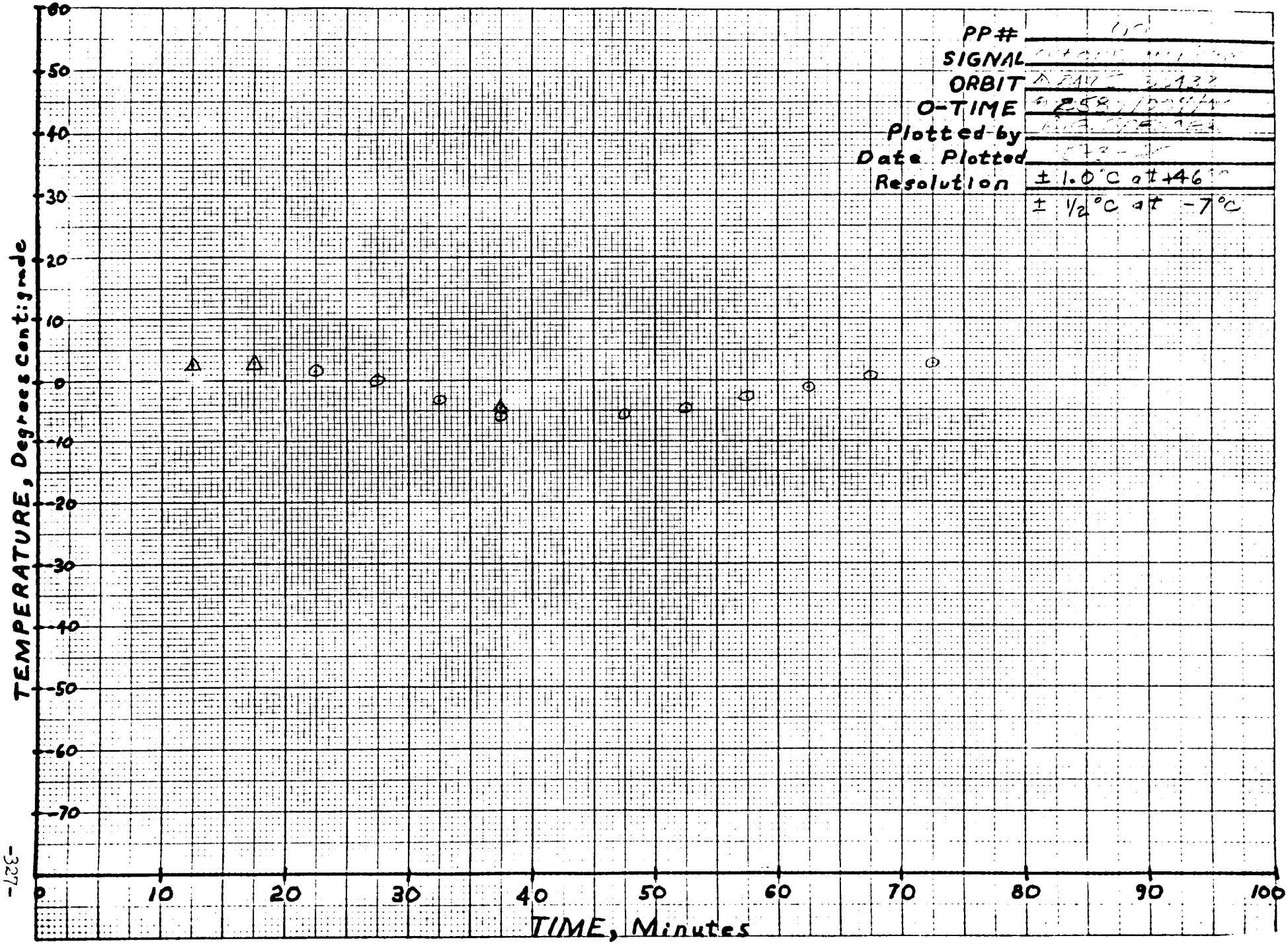
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



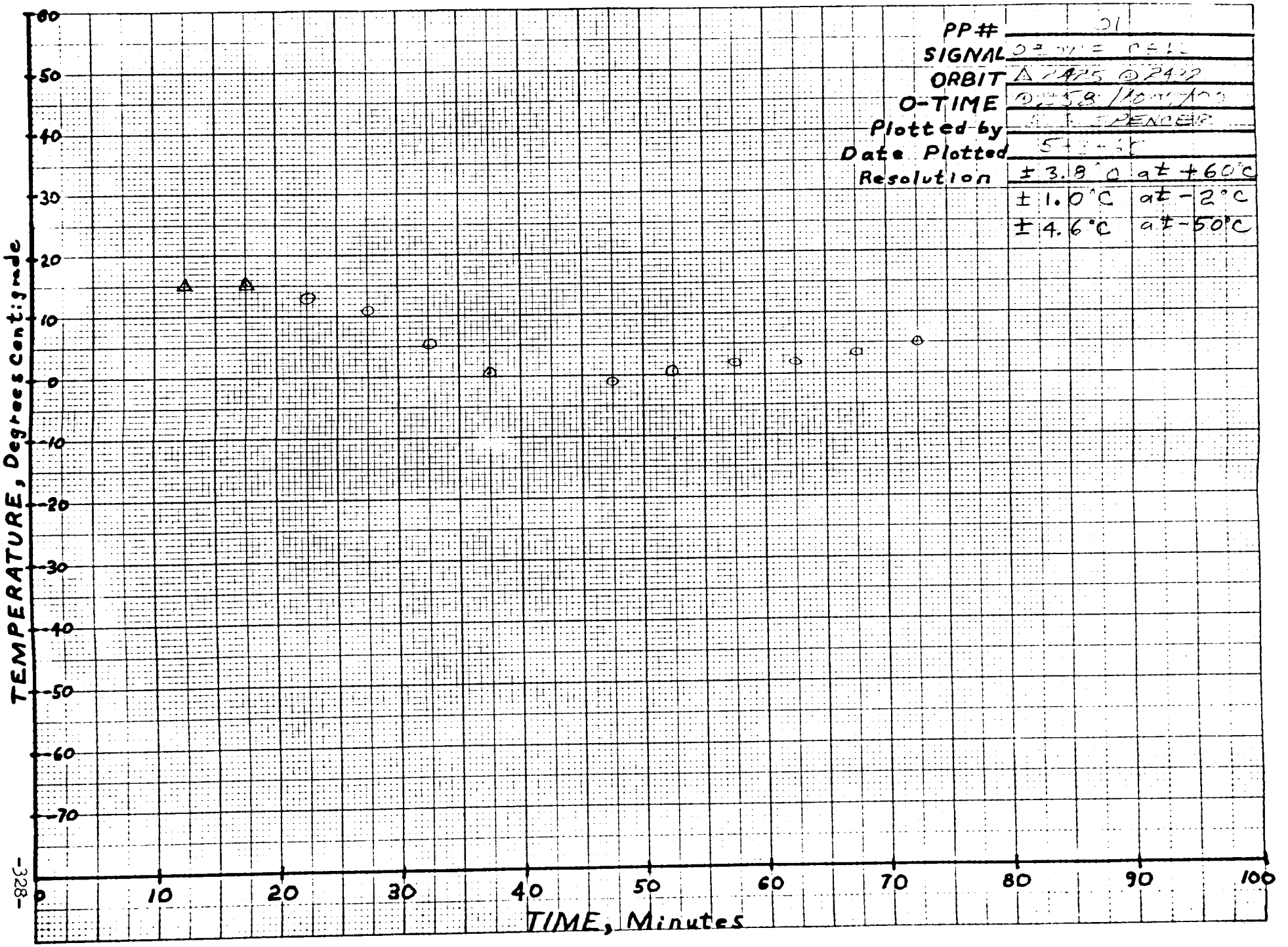
KEUFFEL & ESSER CO.



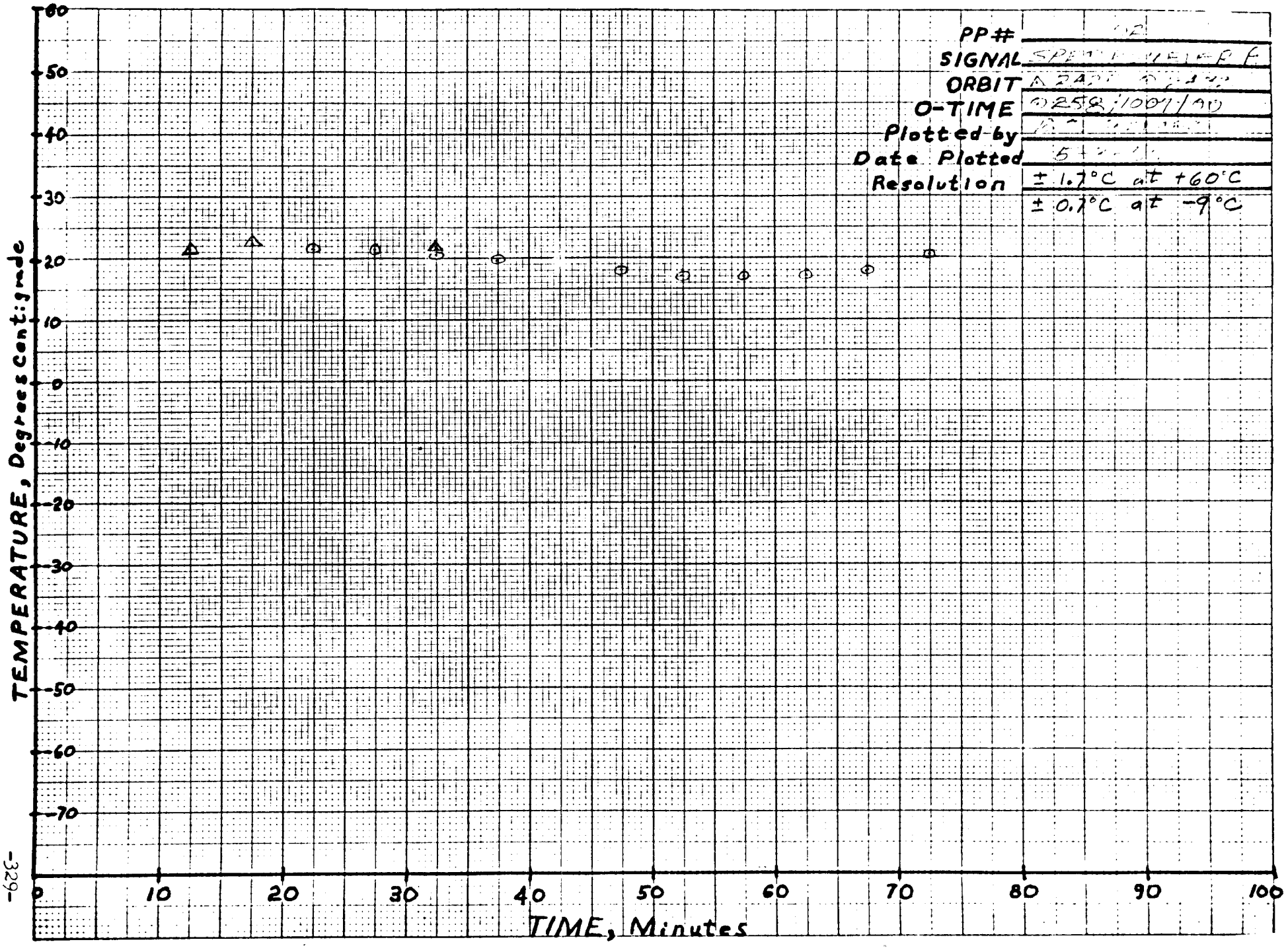
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



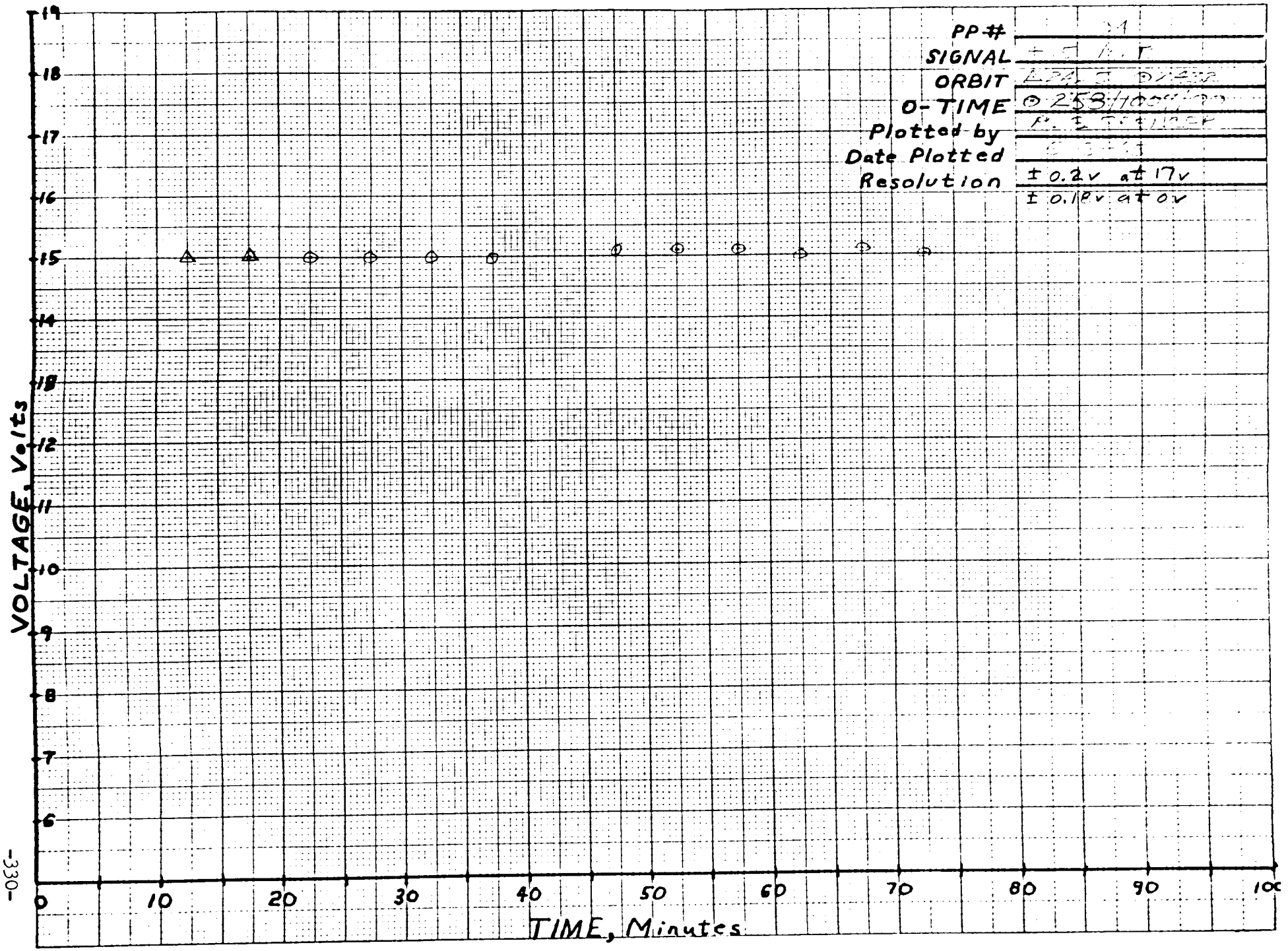
KEUFFEL & ESSER CO.

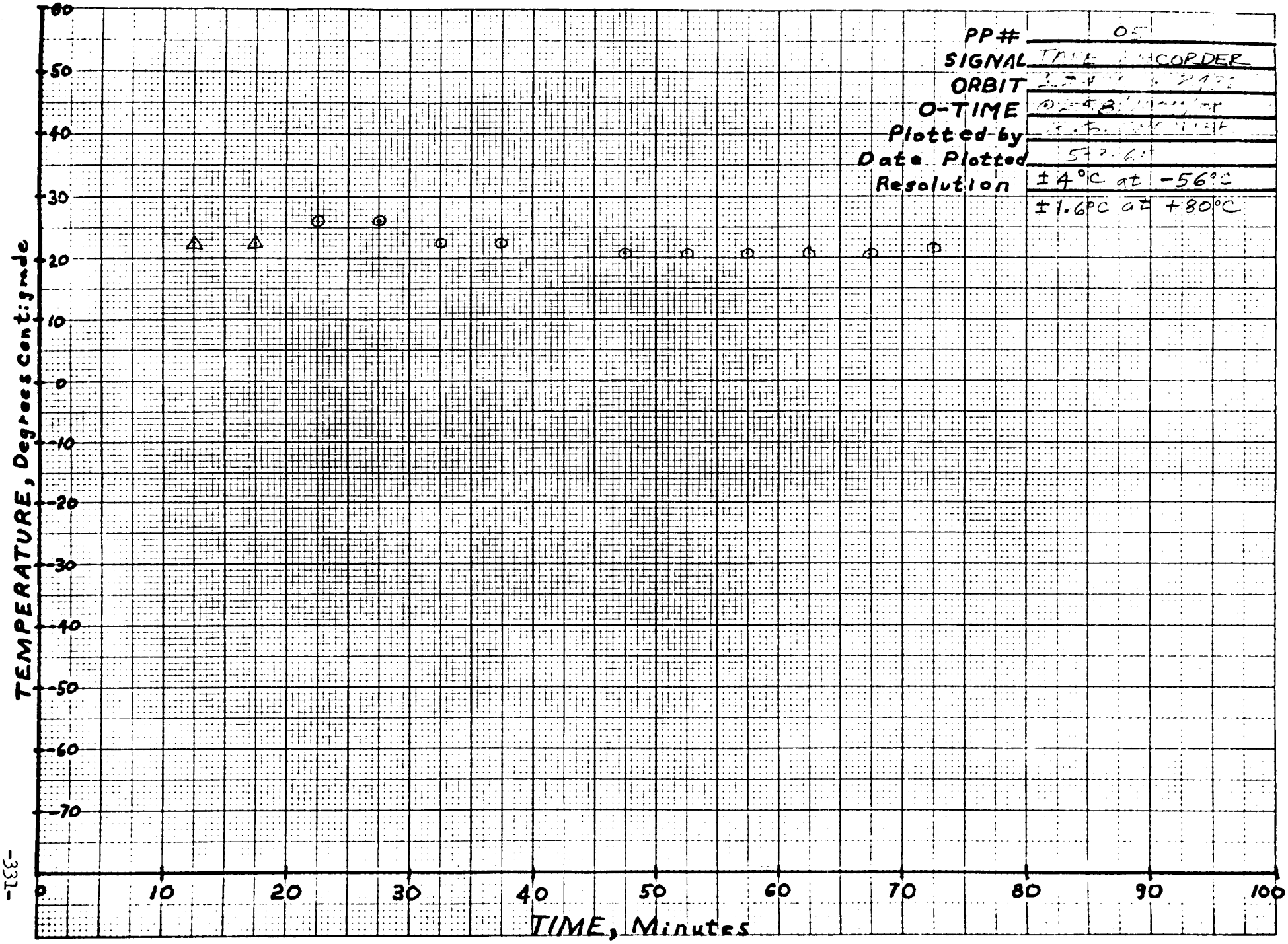


K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

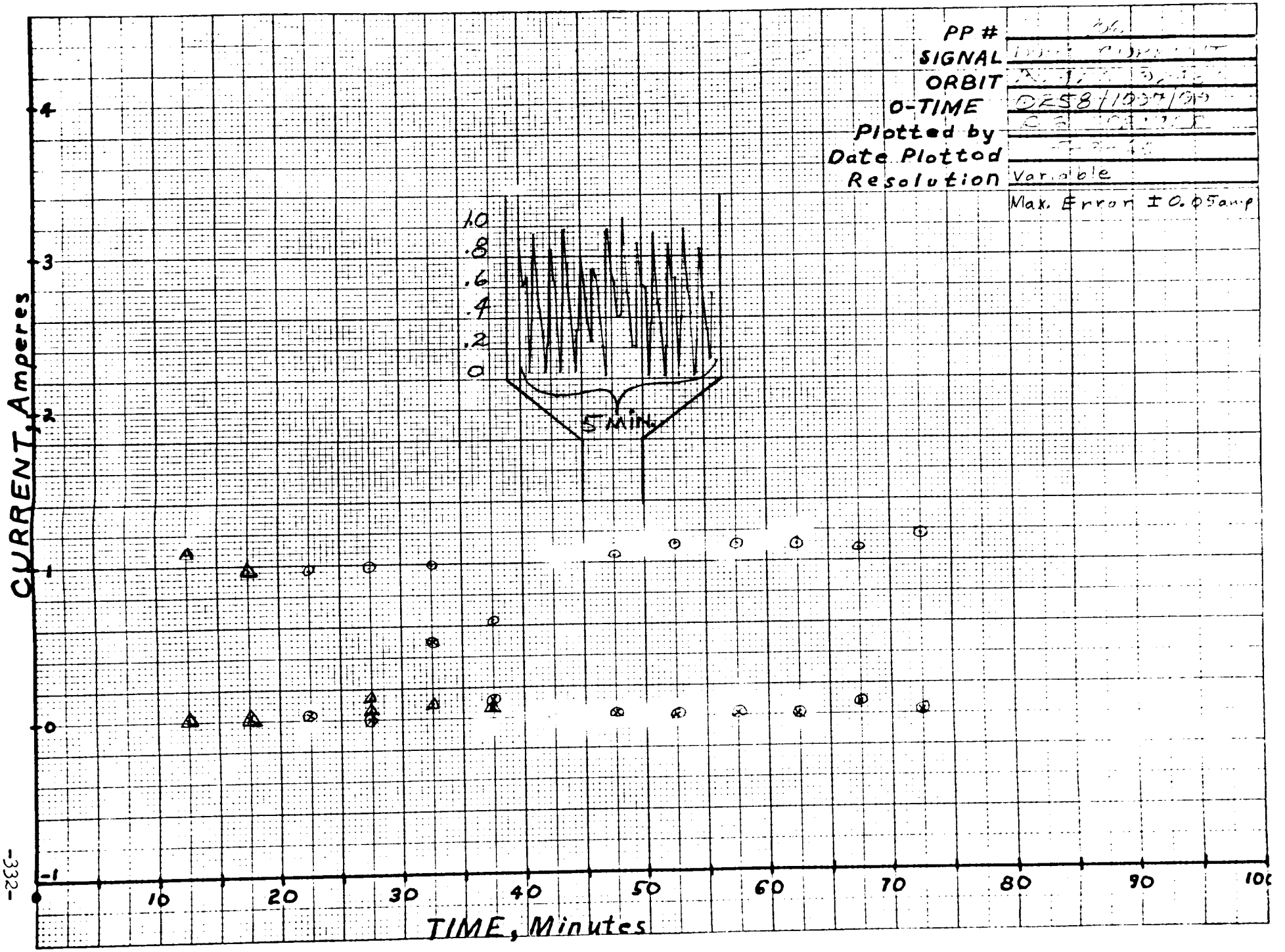


KEUFFEL & ESSER CO.

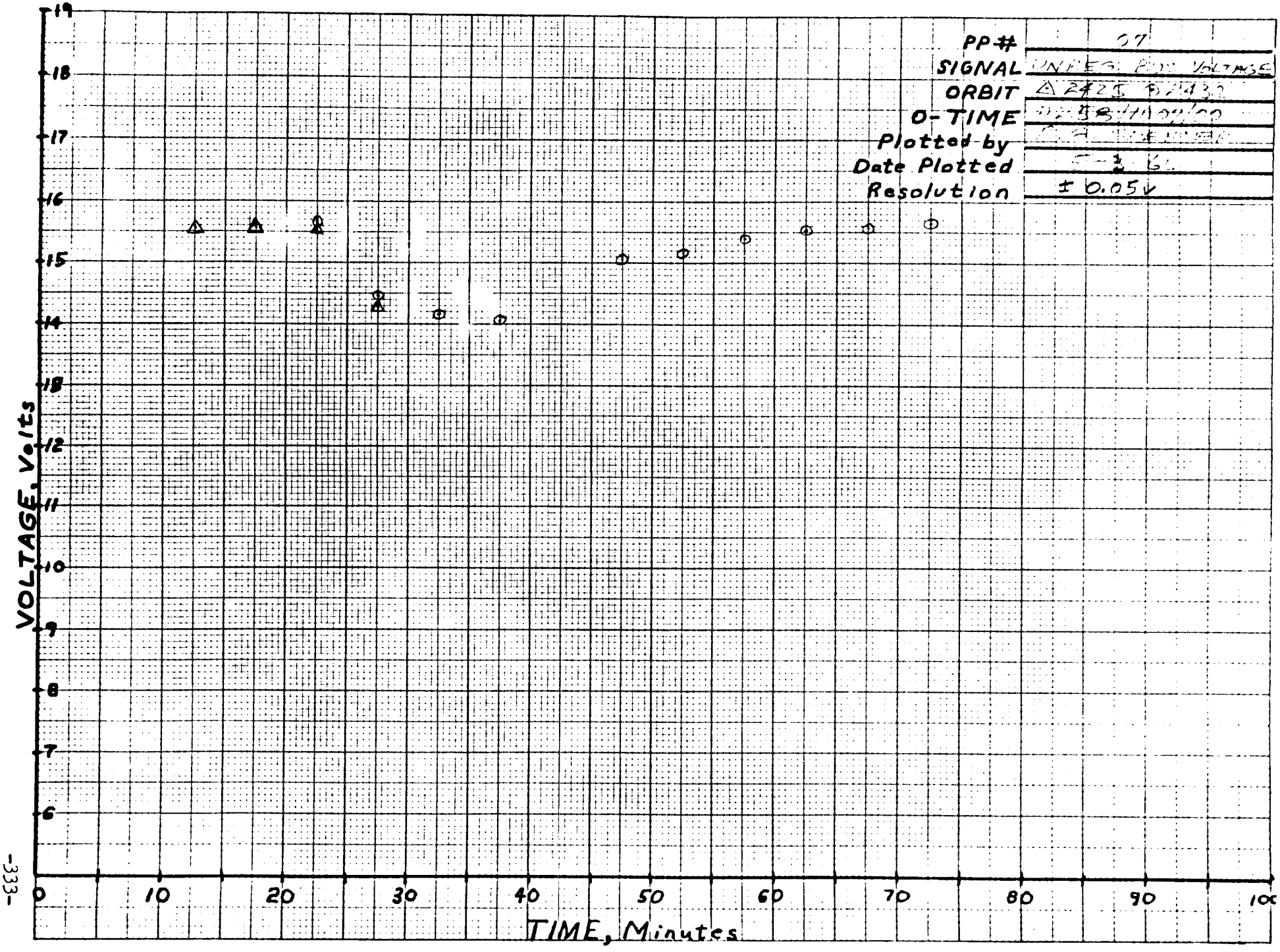



PP# 05
SIGNAL
ORBIT
O-TIME
Plotted by
Date Plotted
Resolution ±4°C at -56°C
±1.6°C at +80°C
TEMPERATURE, Degrees centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

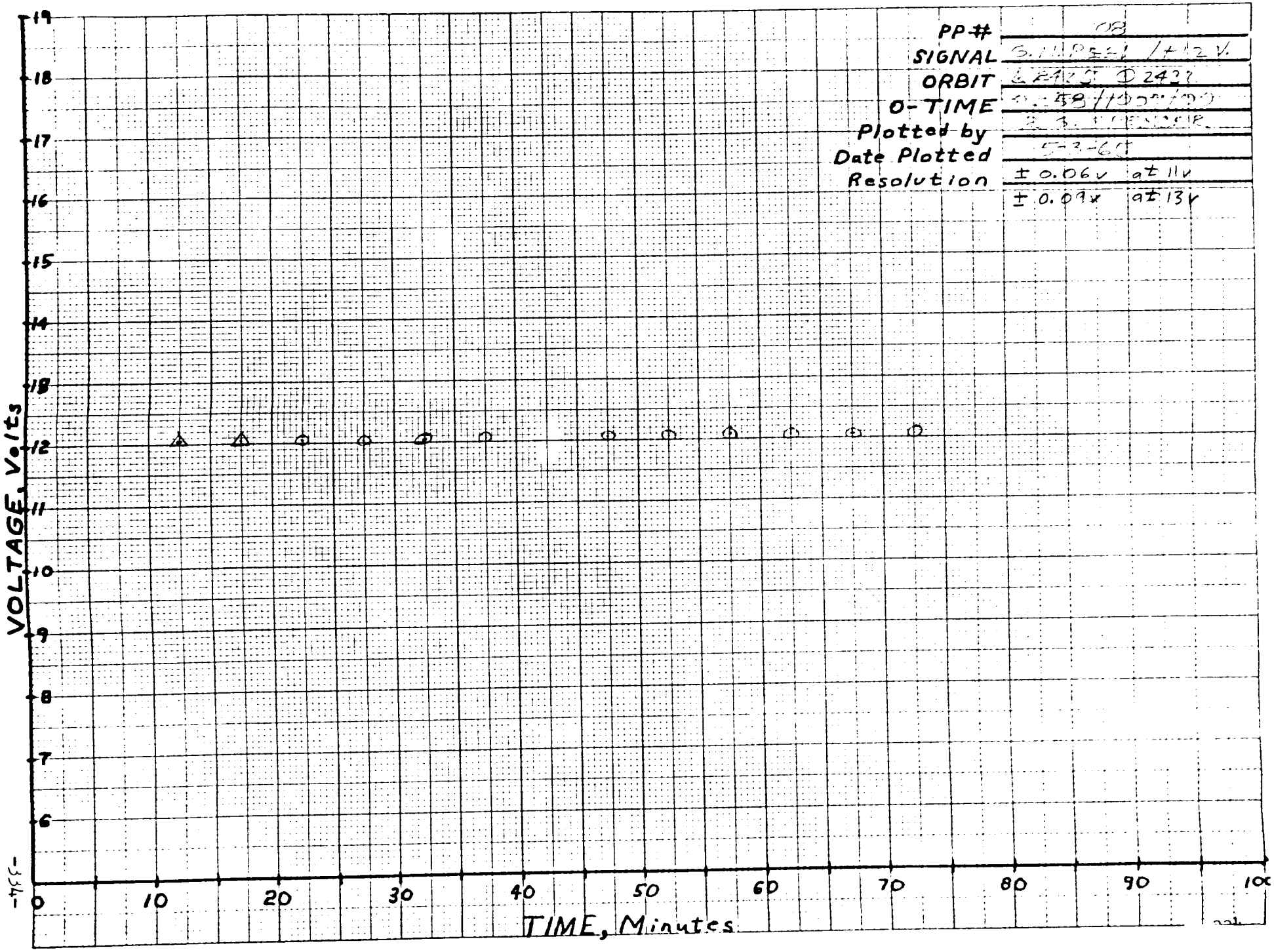
KEUFFEL & ESSER CO.



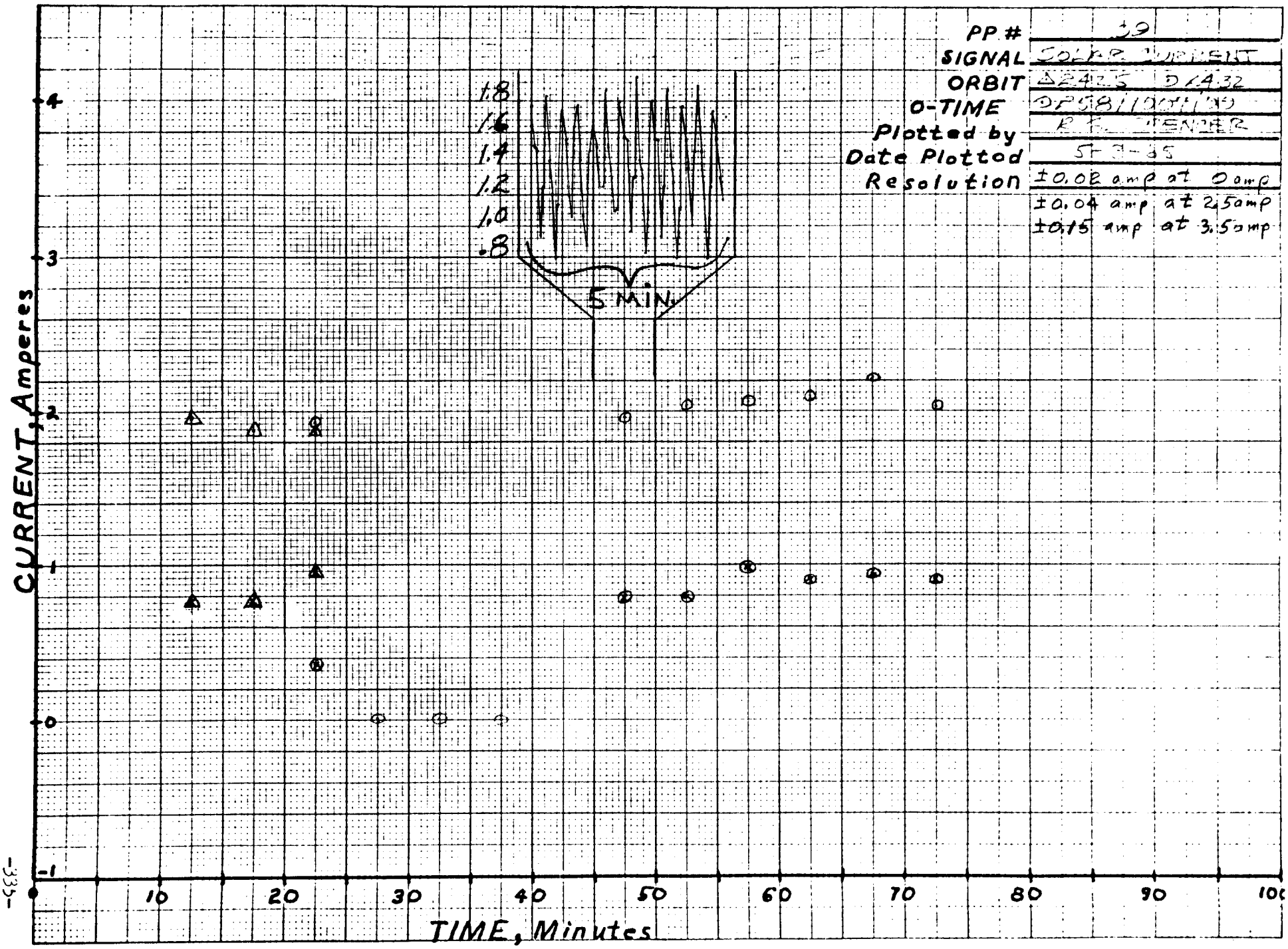
KEUFFEL & ESSER CO.



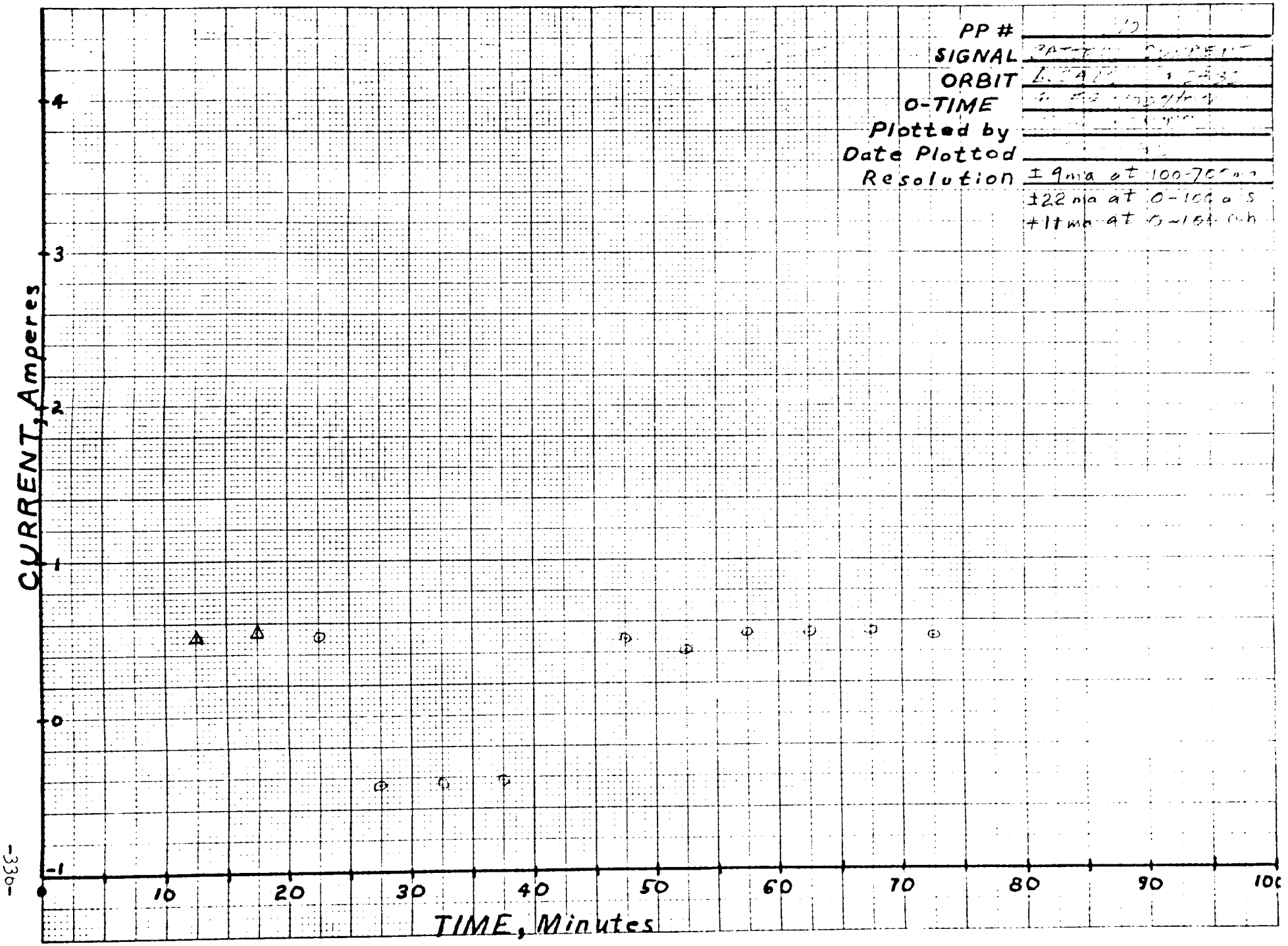
KEUFFEL & ESSER CO. MADE IN U.S.A.



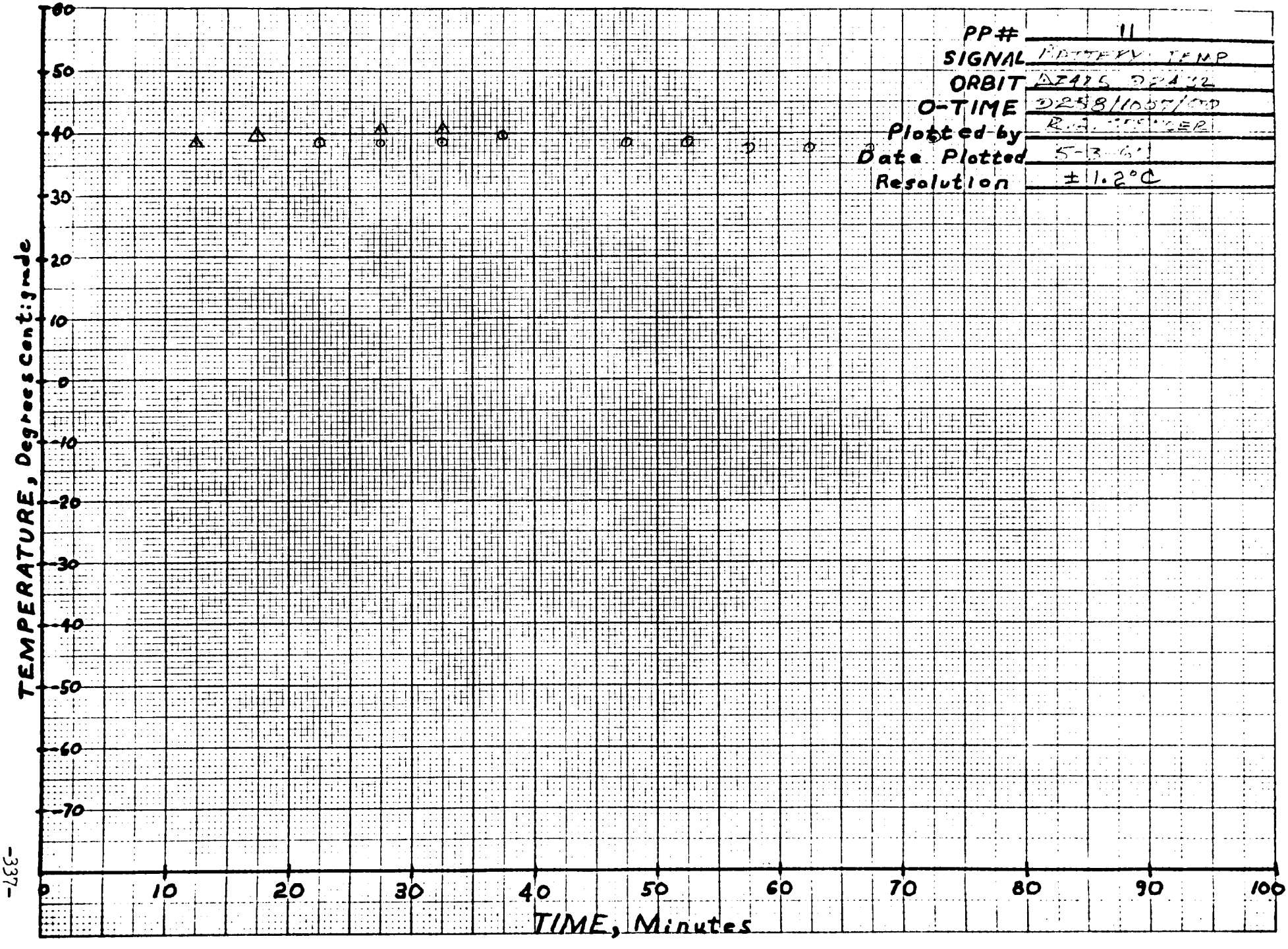
KEUFFEL & ESSER CO.



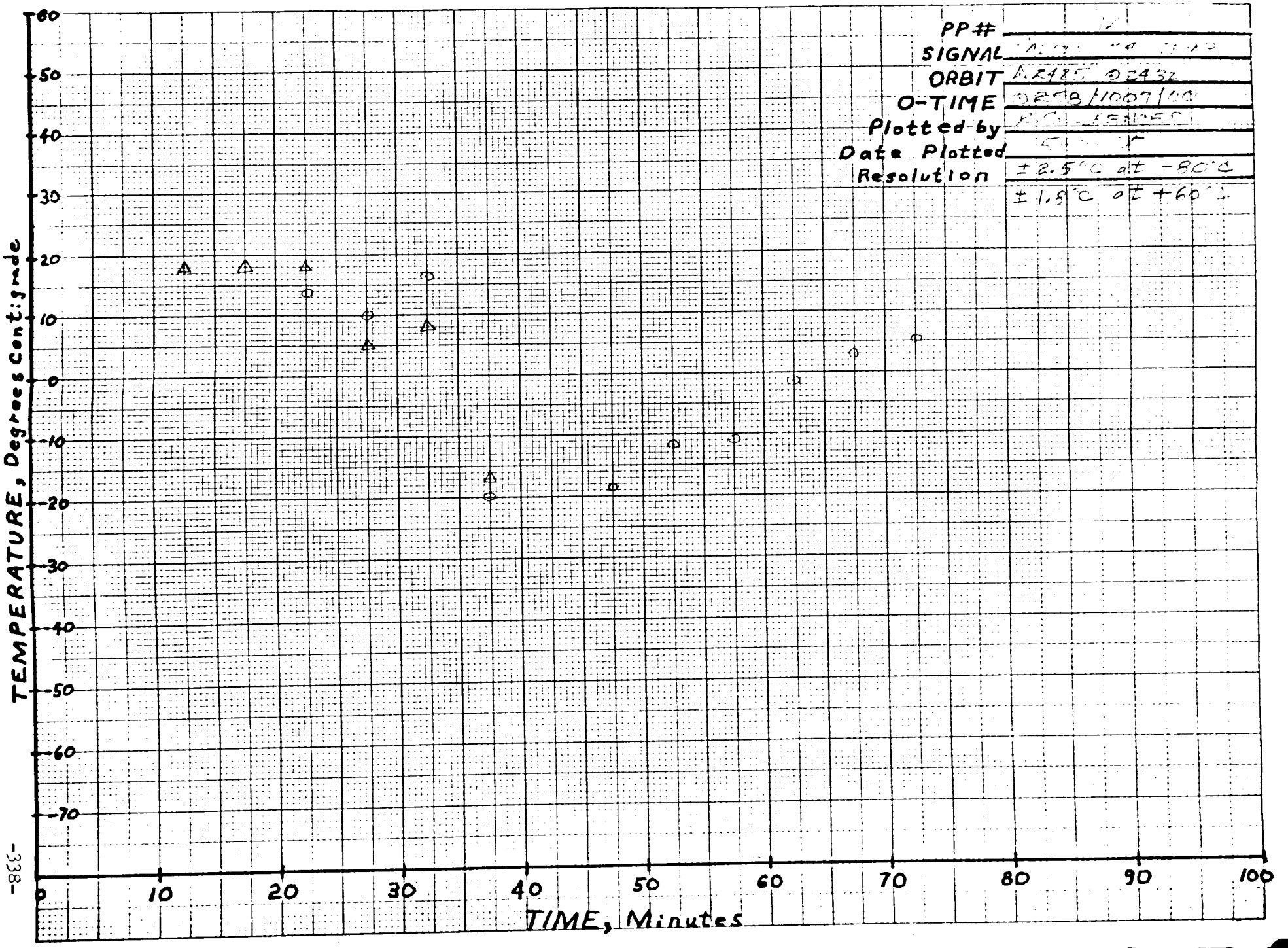
KEUFFEL & ESSER CO.



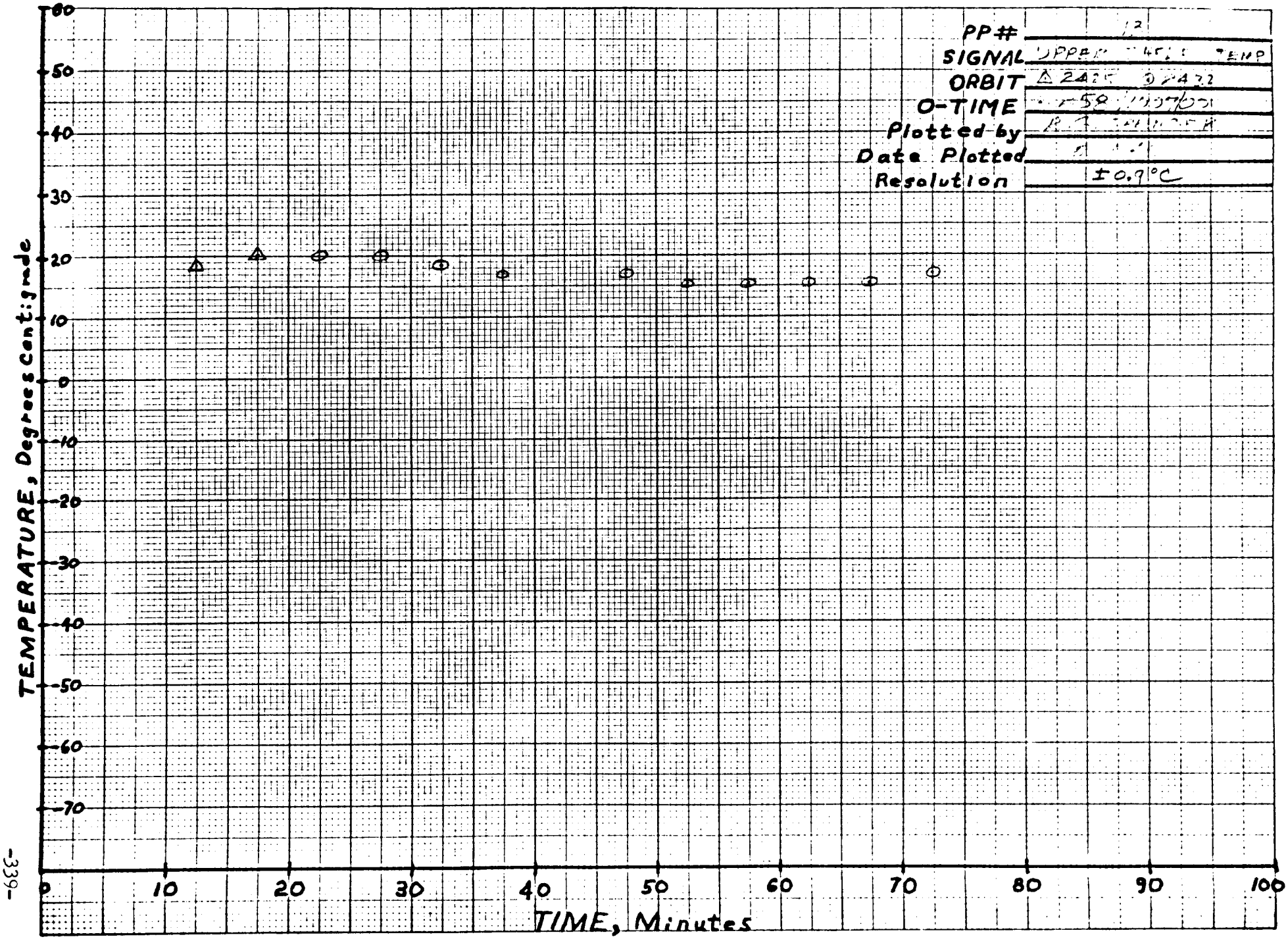
KEUFFEL & ESSER CO.



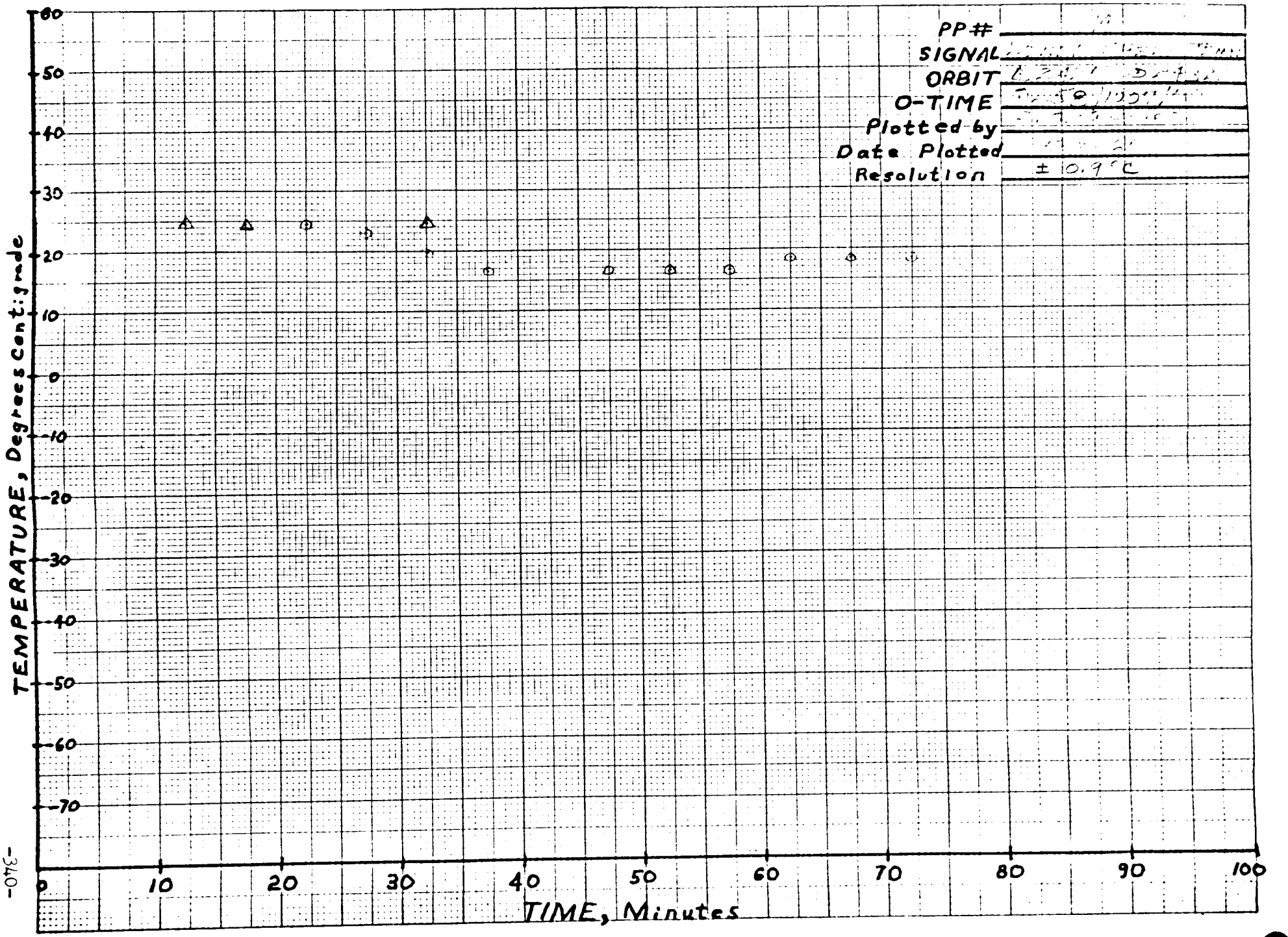
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



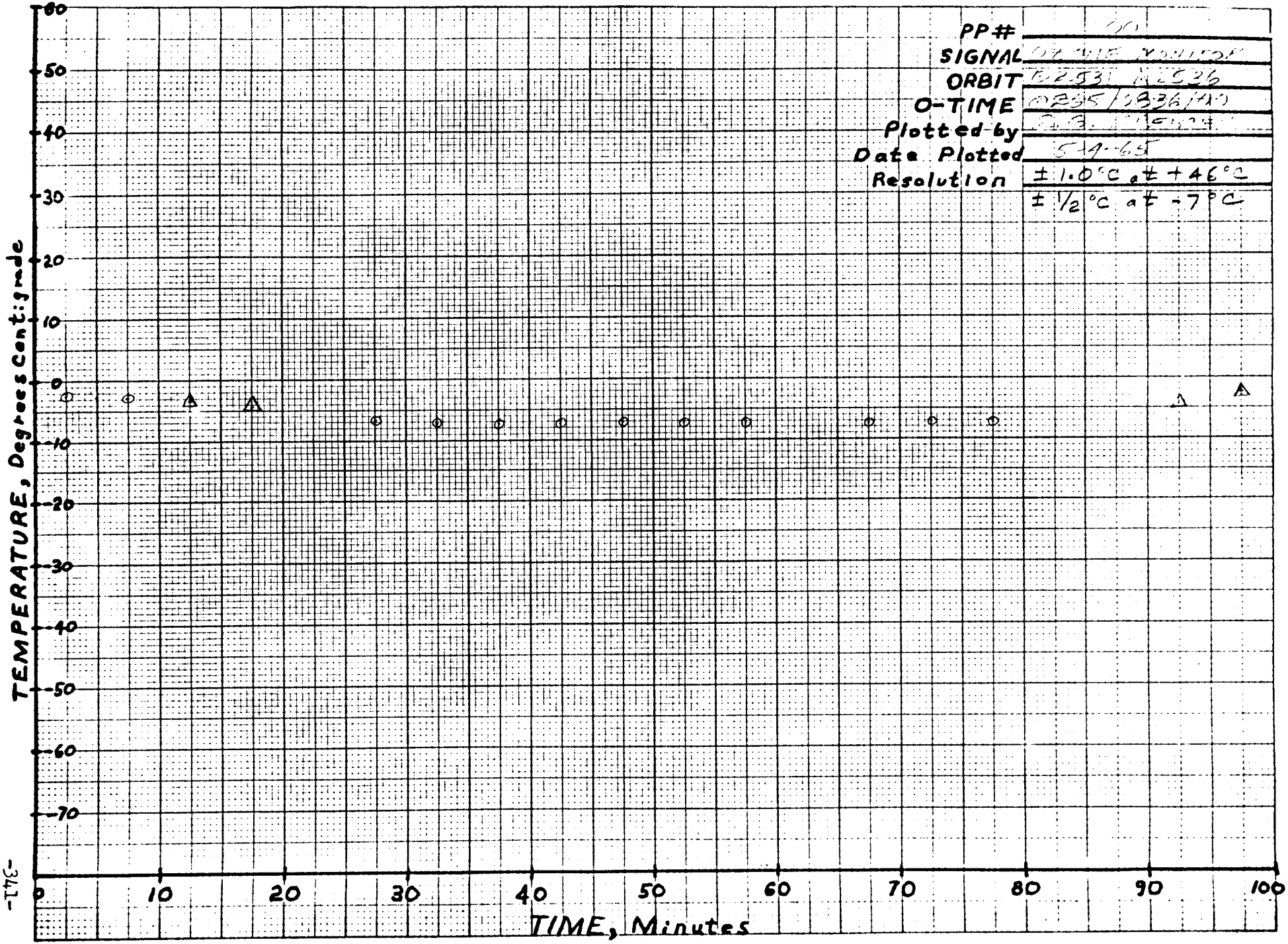
KEUFFEL & ESSER CO.



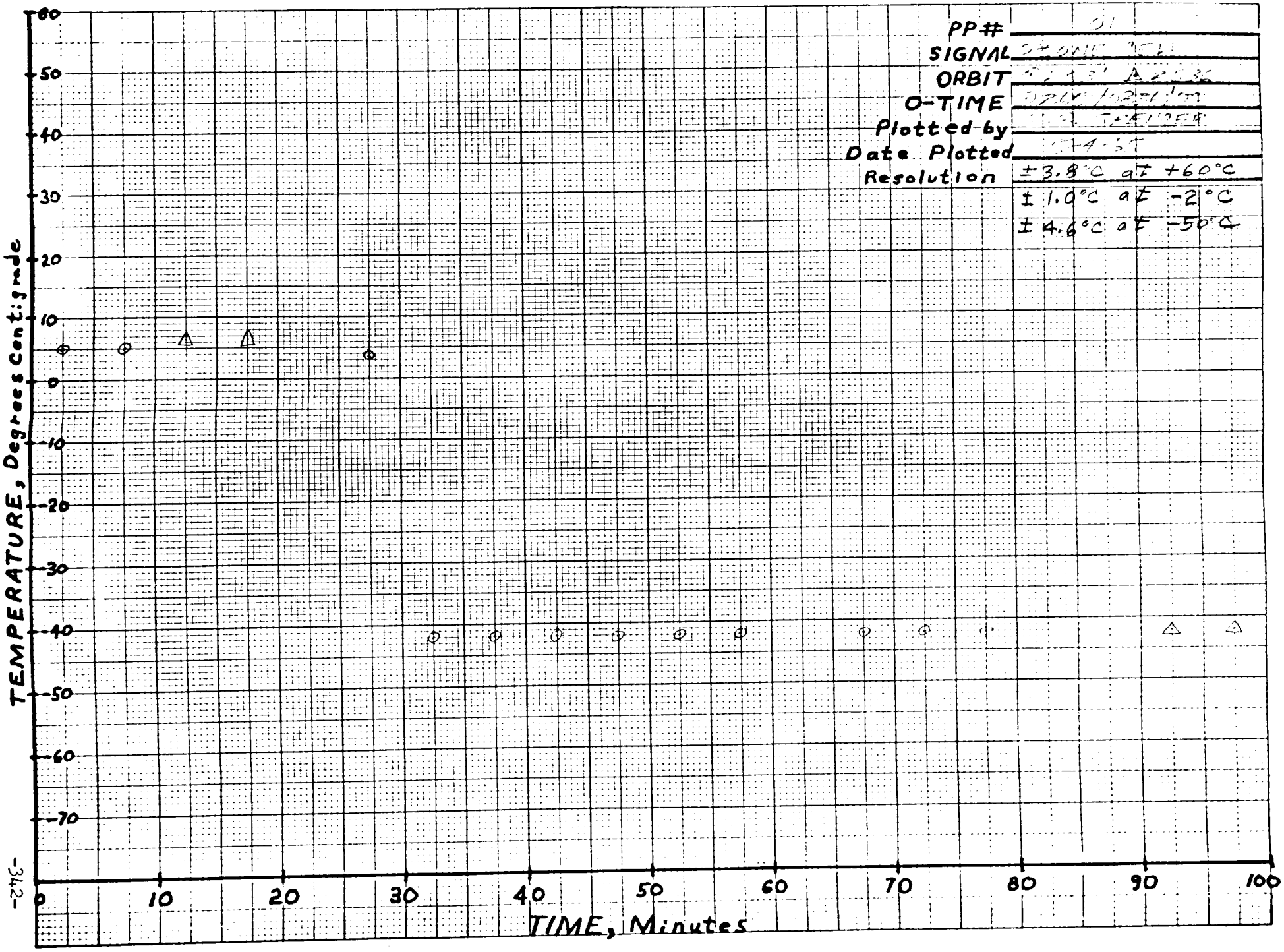
K+E 10 X 10 TO ½ INCH 46 1472
KEUFFEL & ESSER CO.



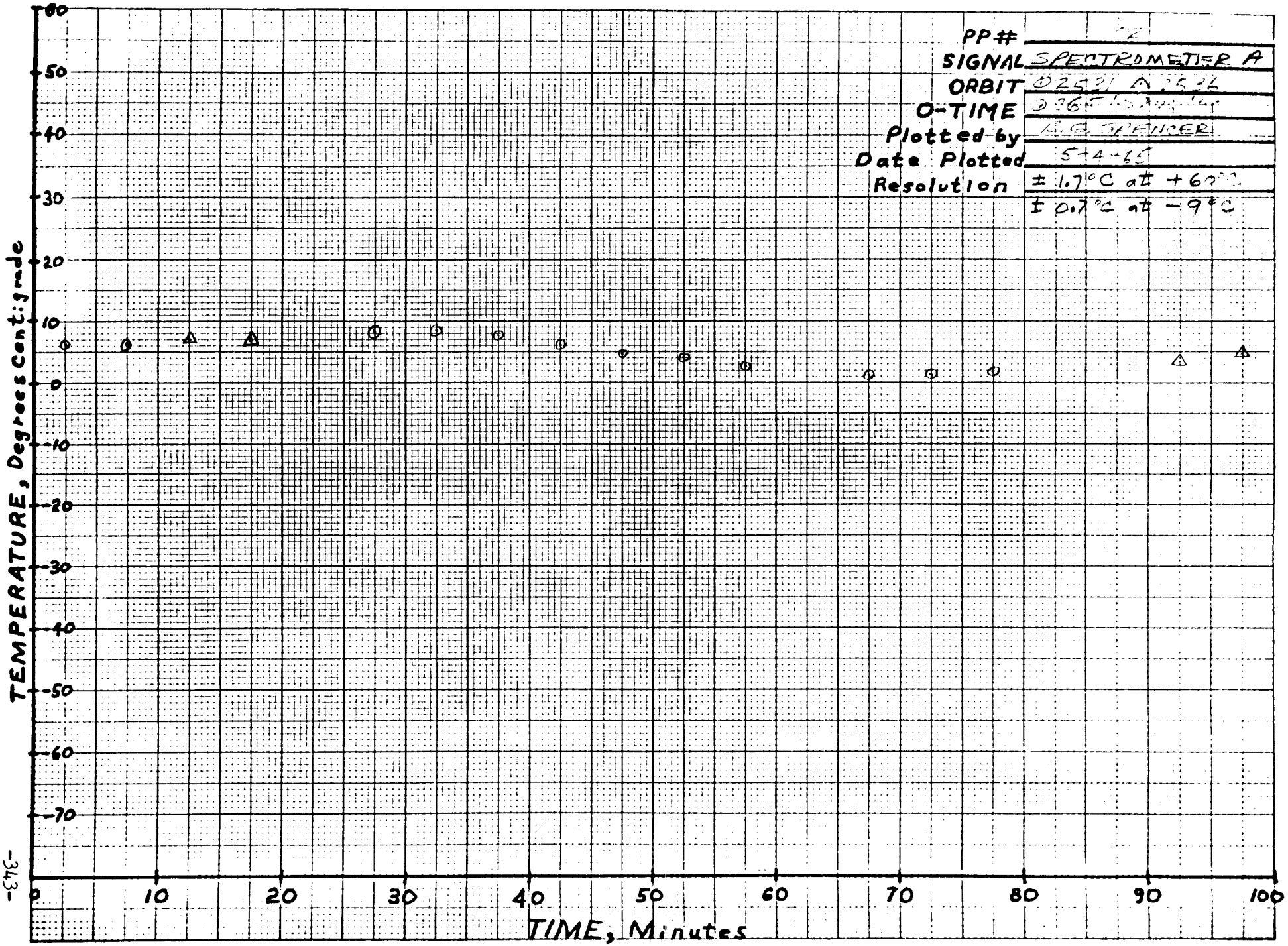
KEUFFEL & ESSER CO.



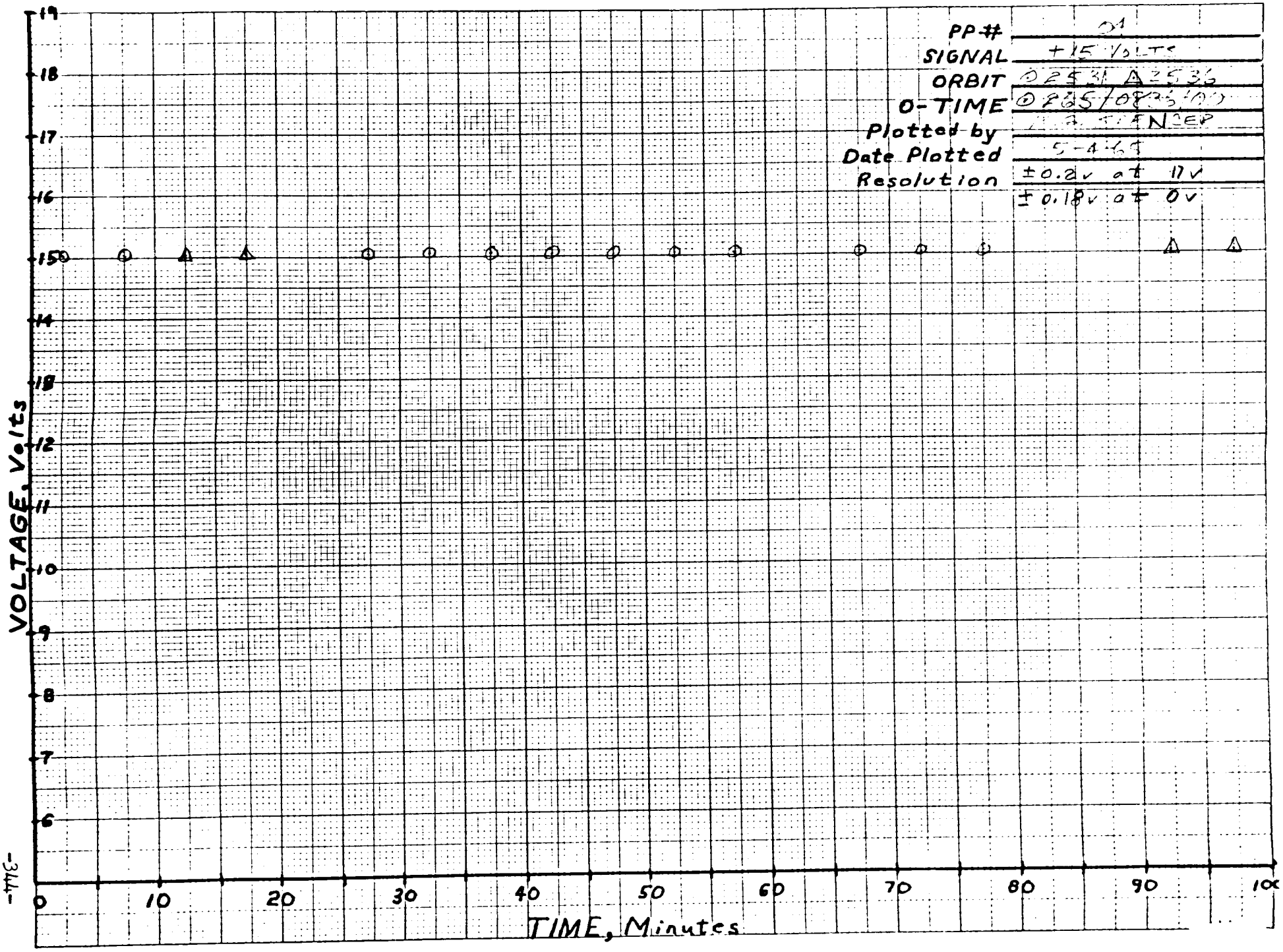
KEUFFEL & ESSER CO.

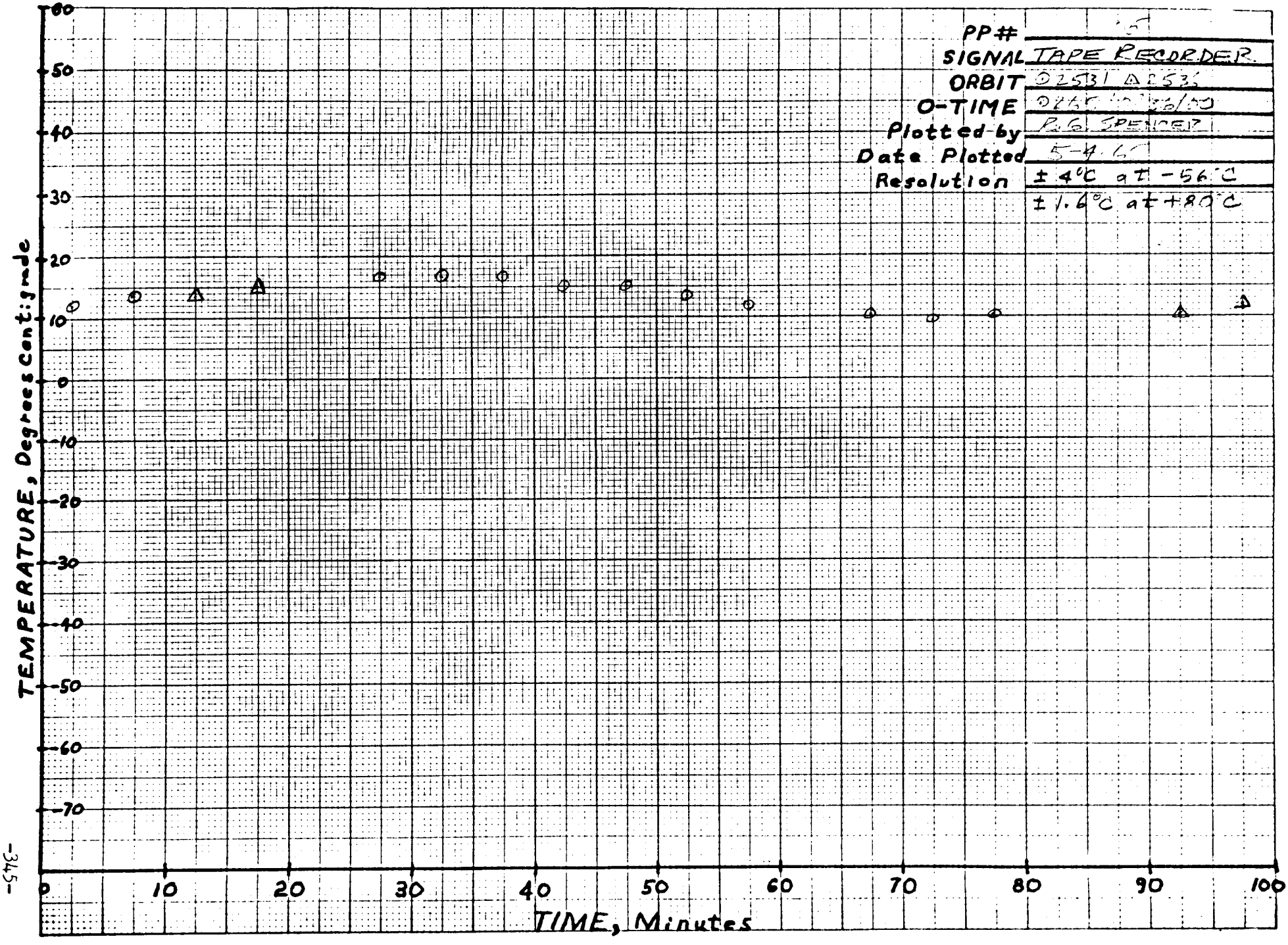


KEUFFEL & ESSER CO.

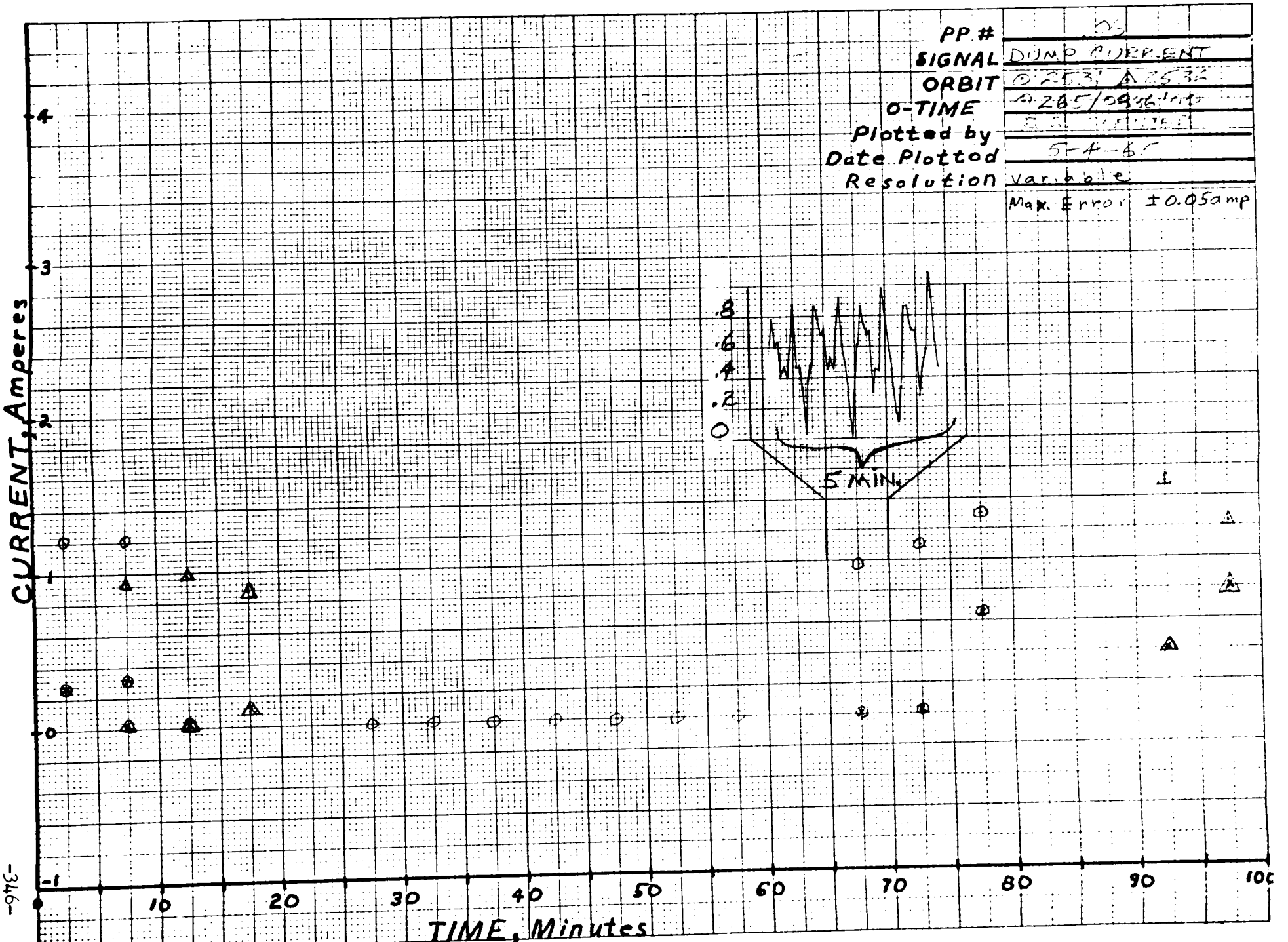


KEUFFEL & ESSER CO.

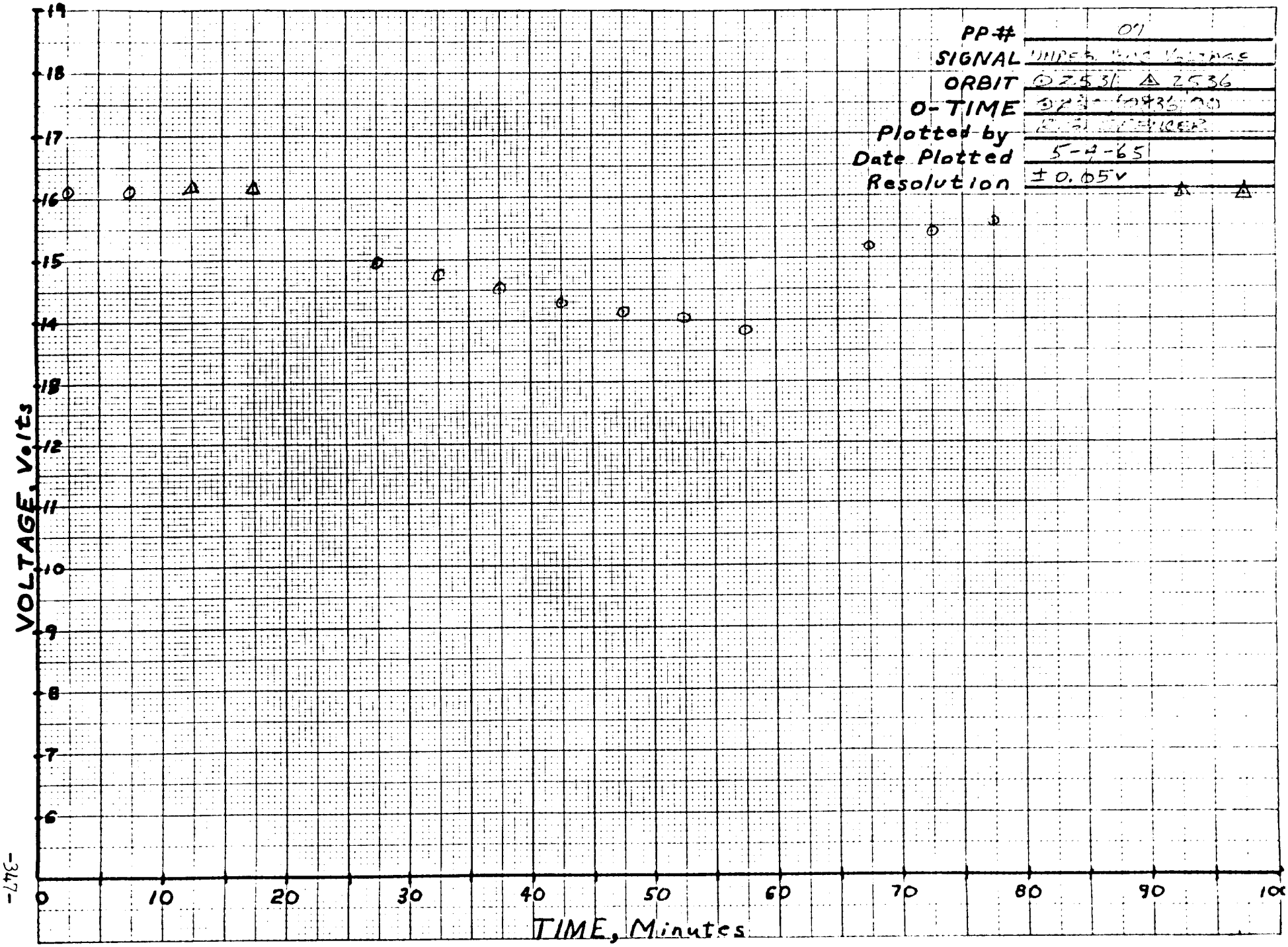



PP#
SIGNAL TAPE RECORDER
ORBIT ⊙2531 △2536
O-TIME
Plotted by R.G. SPENCER
Date Plotted 5-4-65
Resolution ±4°C at -56°C
±1.6°C at +80°C
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

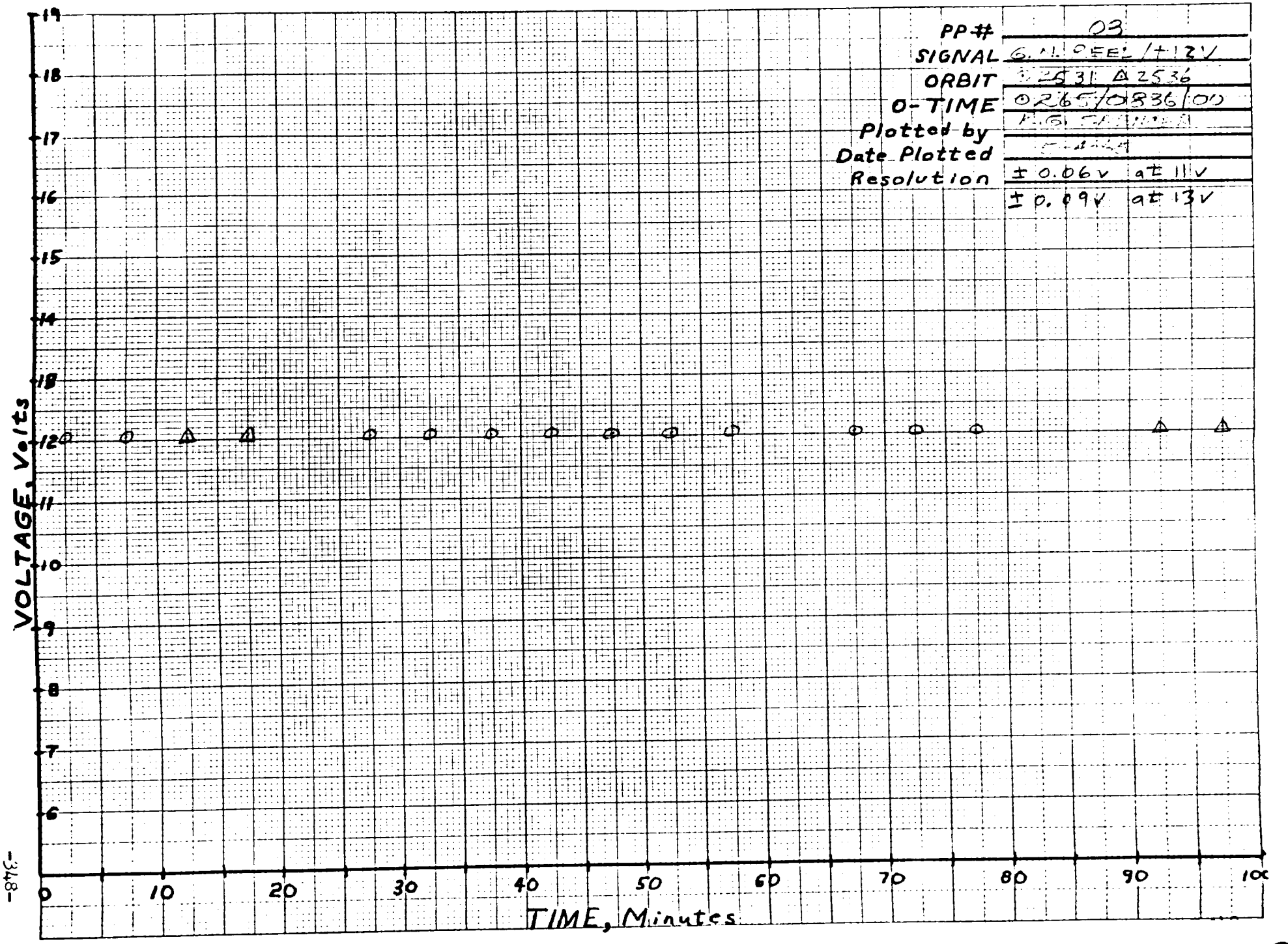
K&E 7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



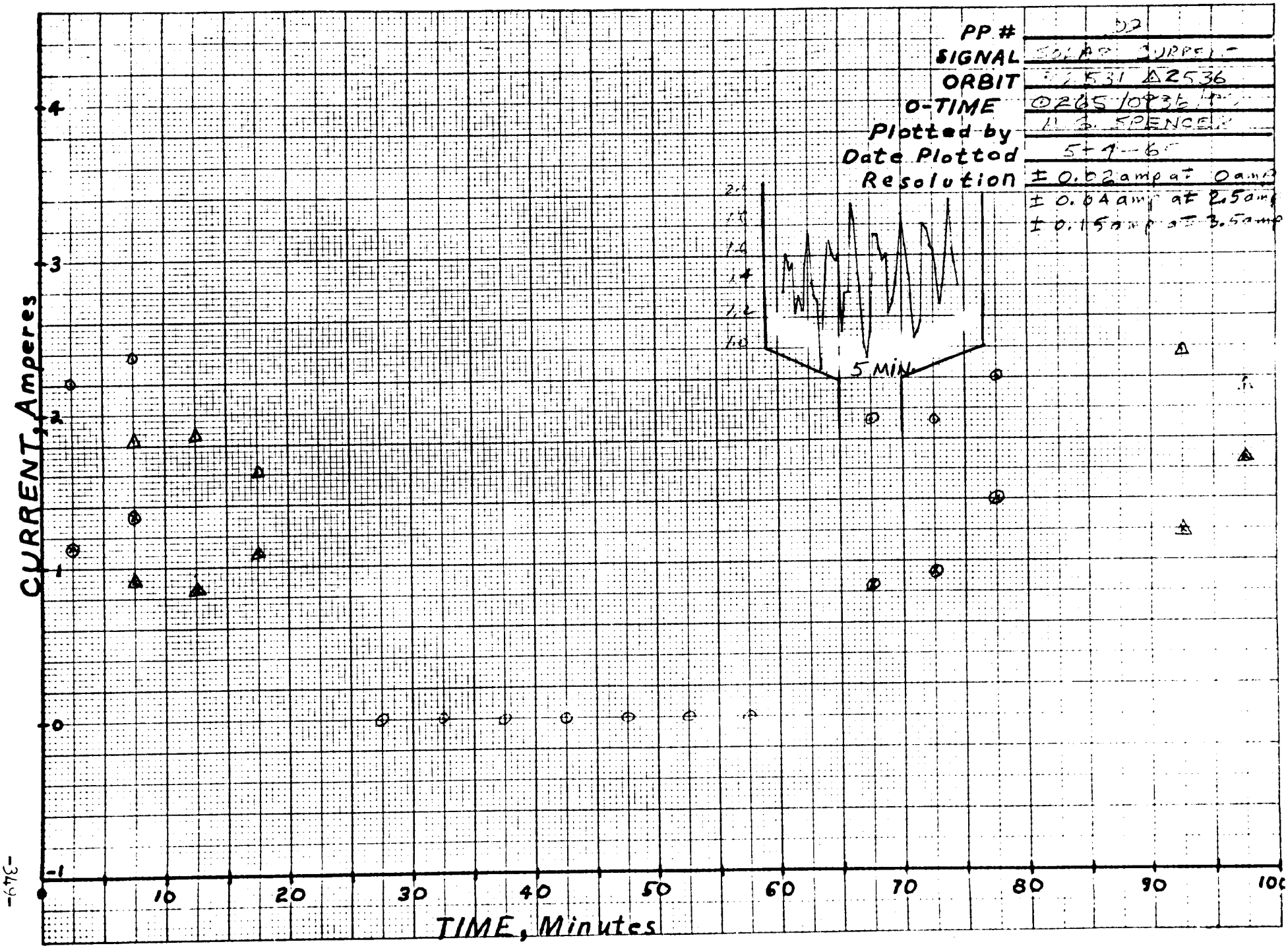
K&E 10 TO INCH 147
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



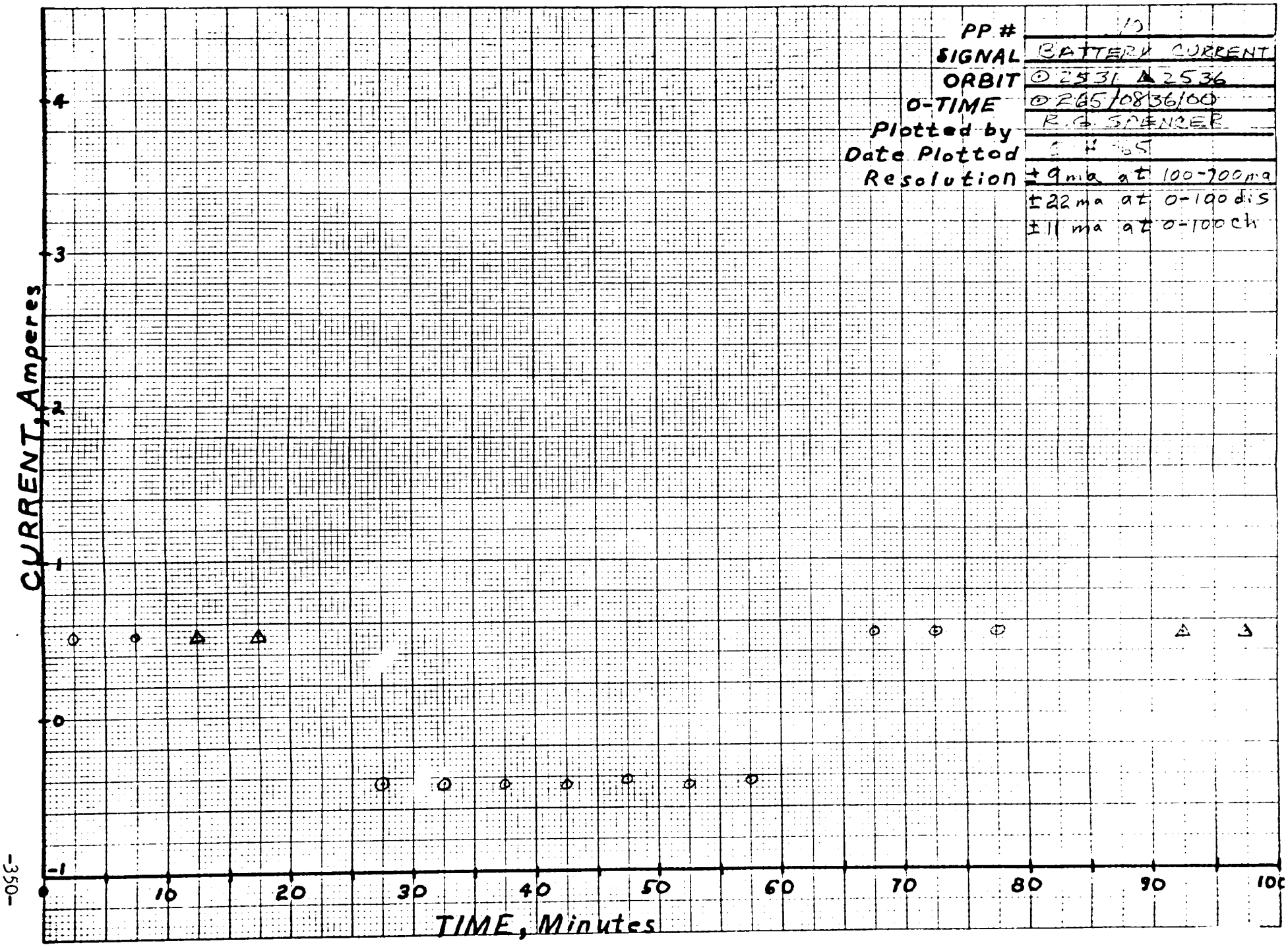
K&E 10 X 10 TO 1/2 INCH 46 1472
7 X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



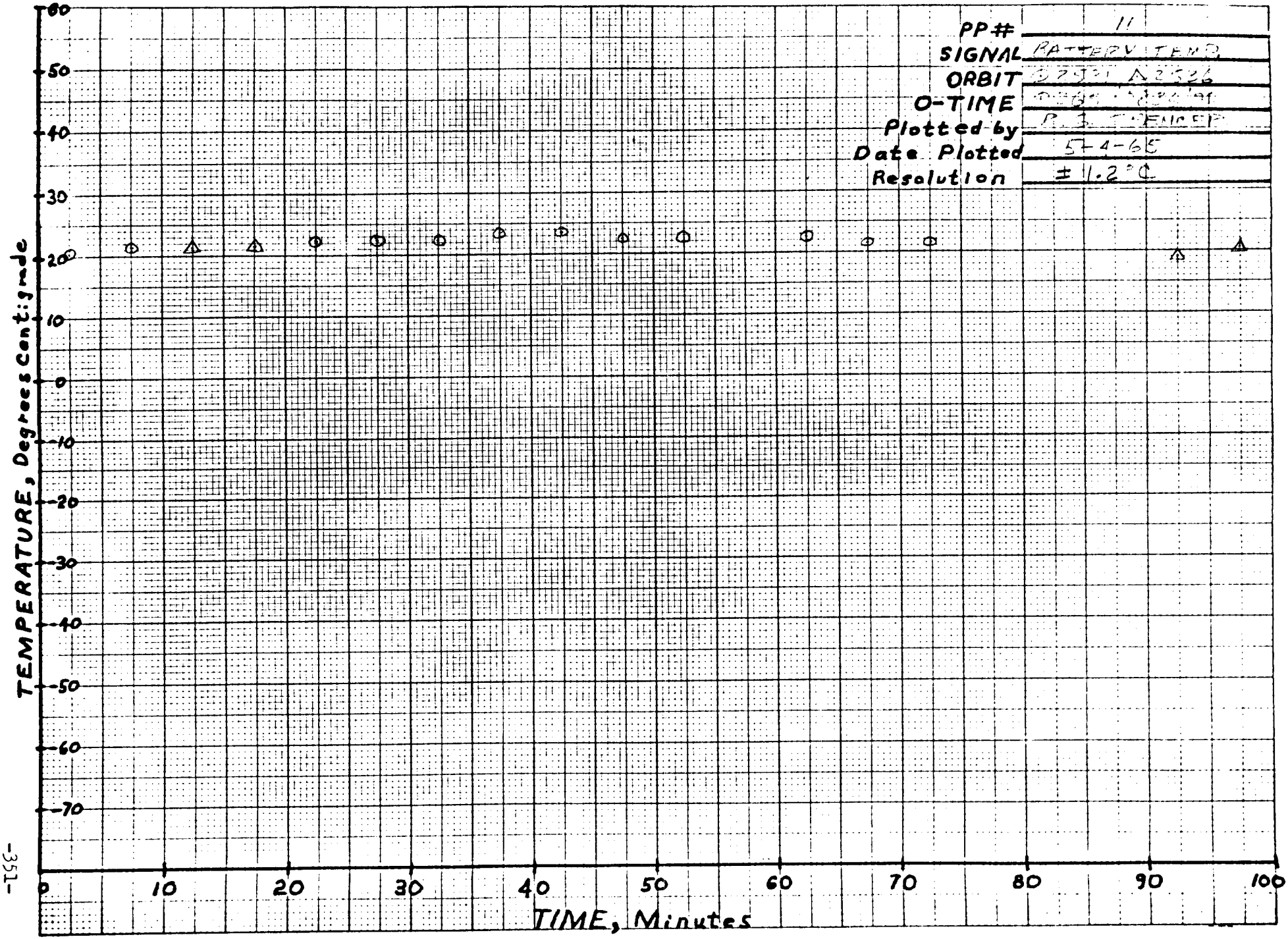
K+E 10 TO INCH 147
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



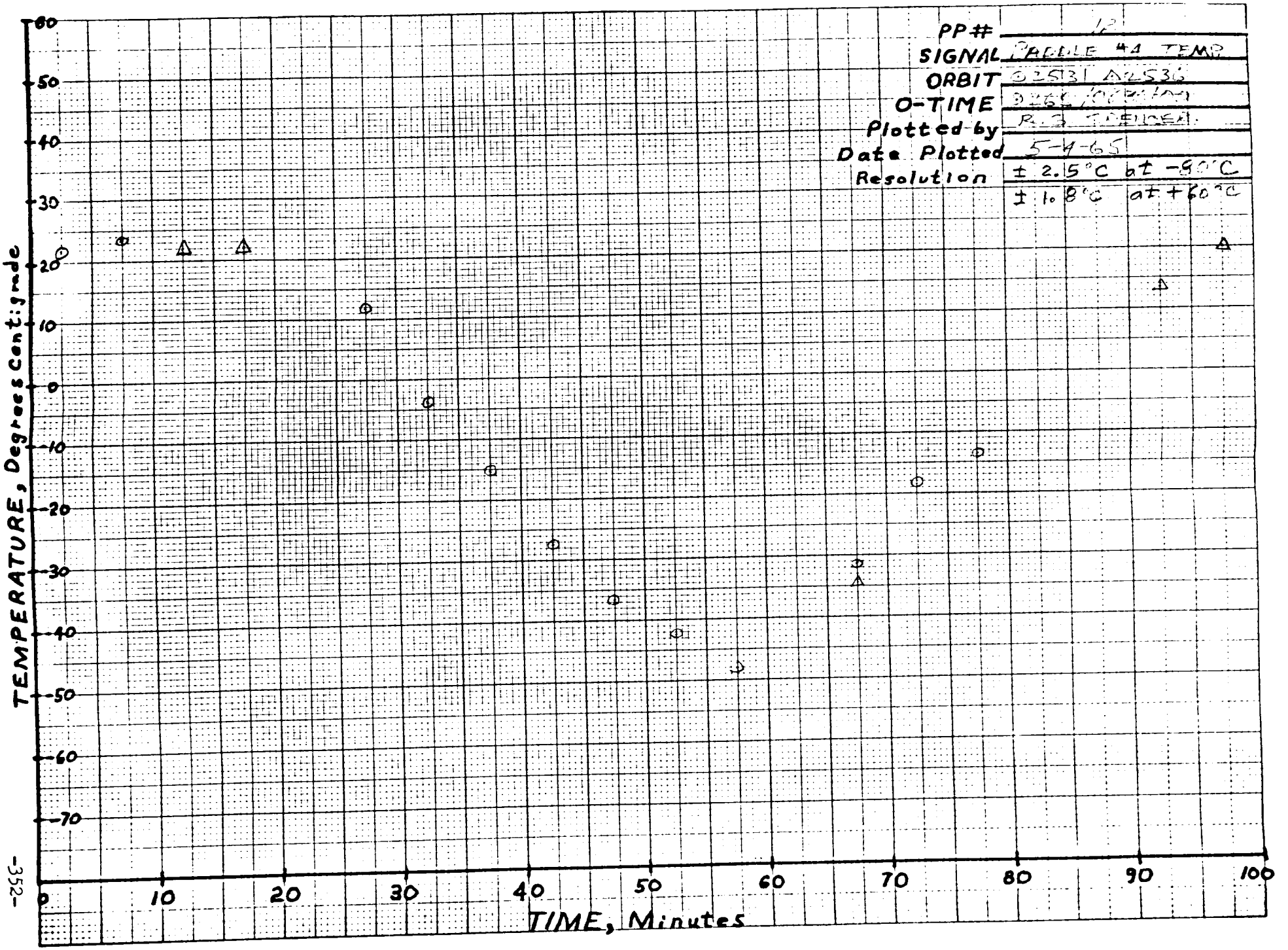
KEUFFEL & ESSER CO.



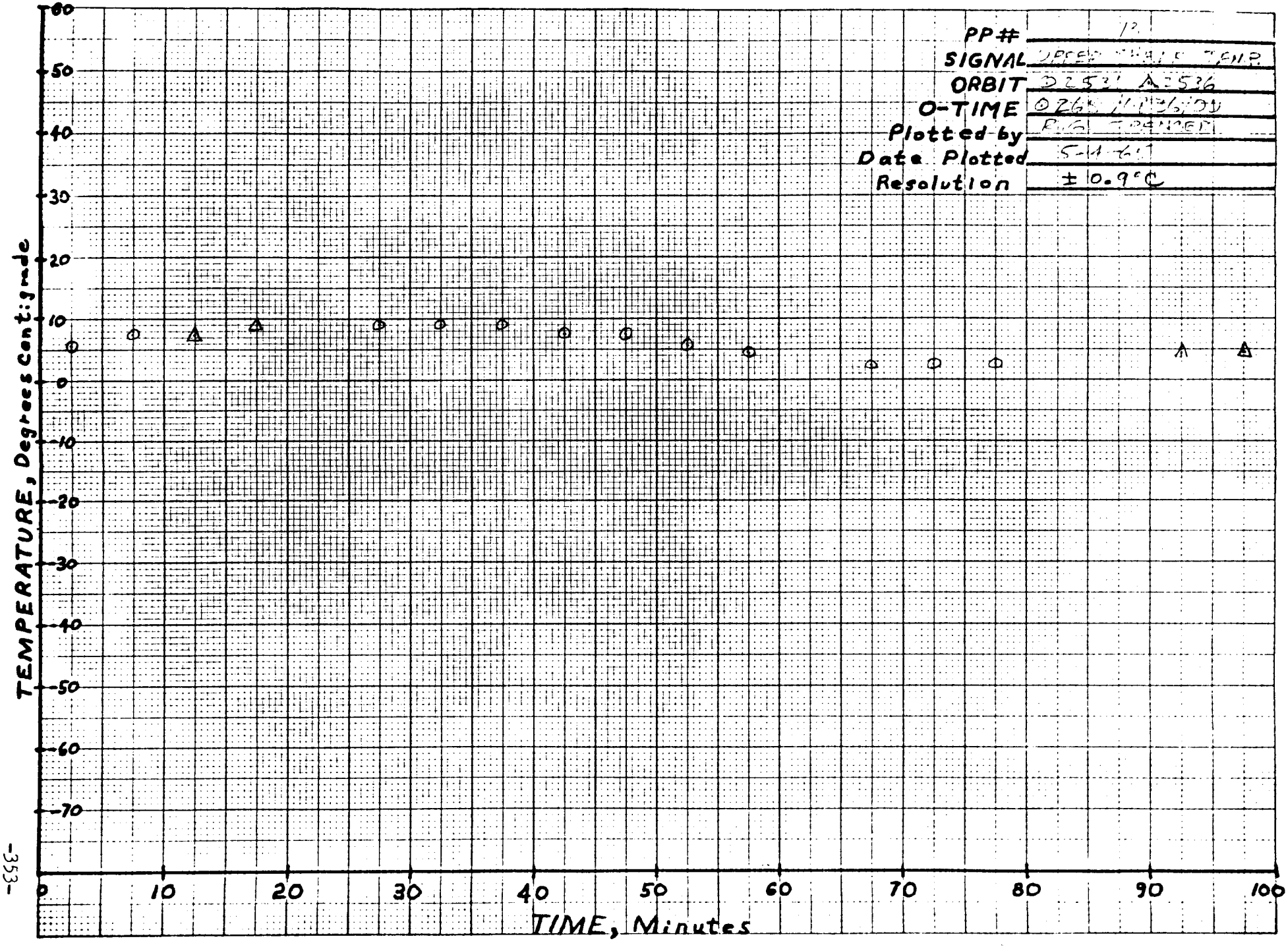
KEUFFEL & ESSER CO.



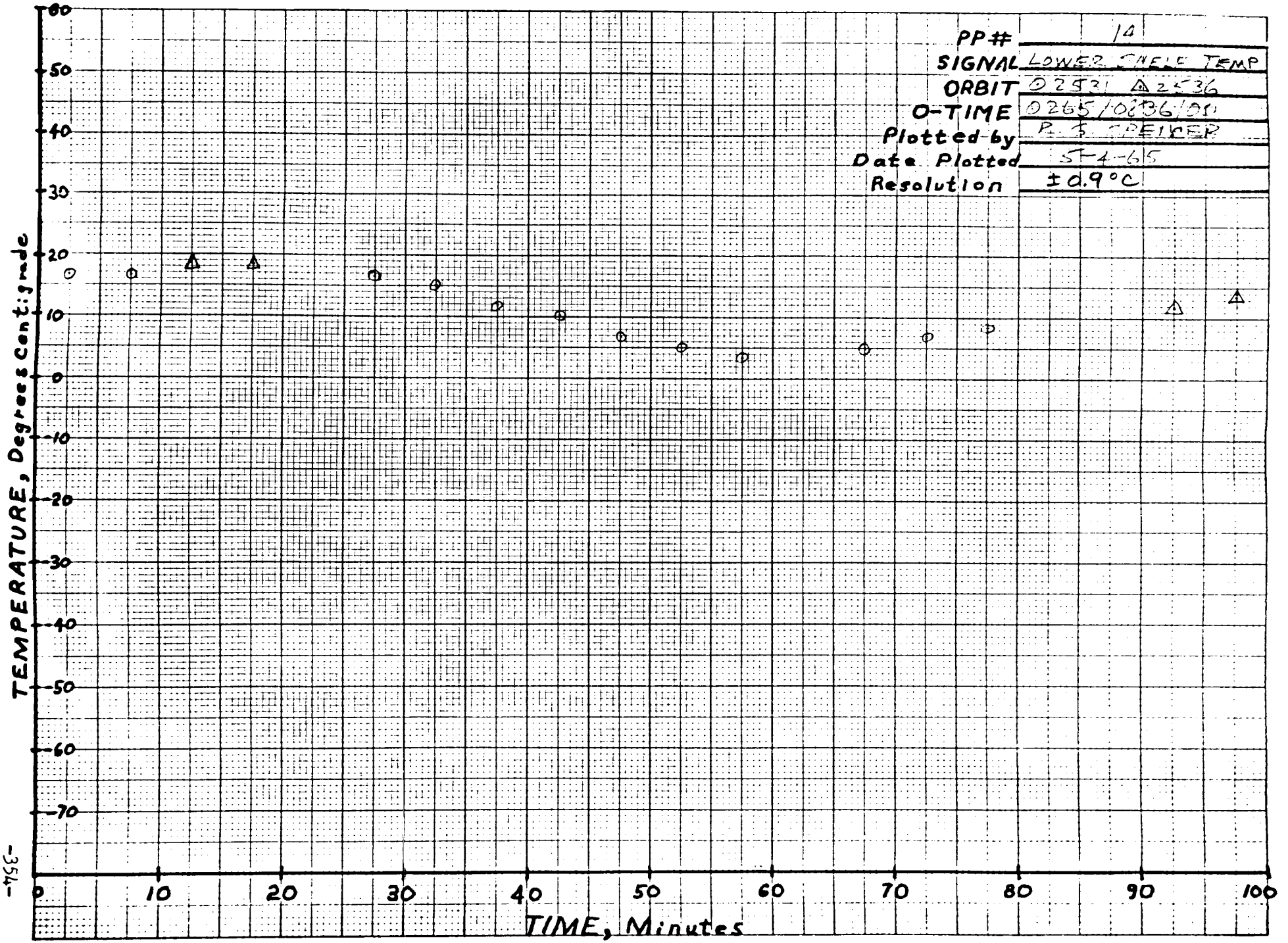
KEUFFEL & ESSER CO.



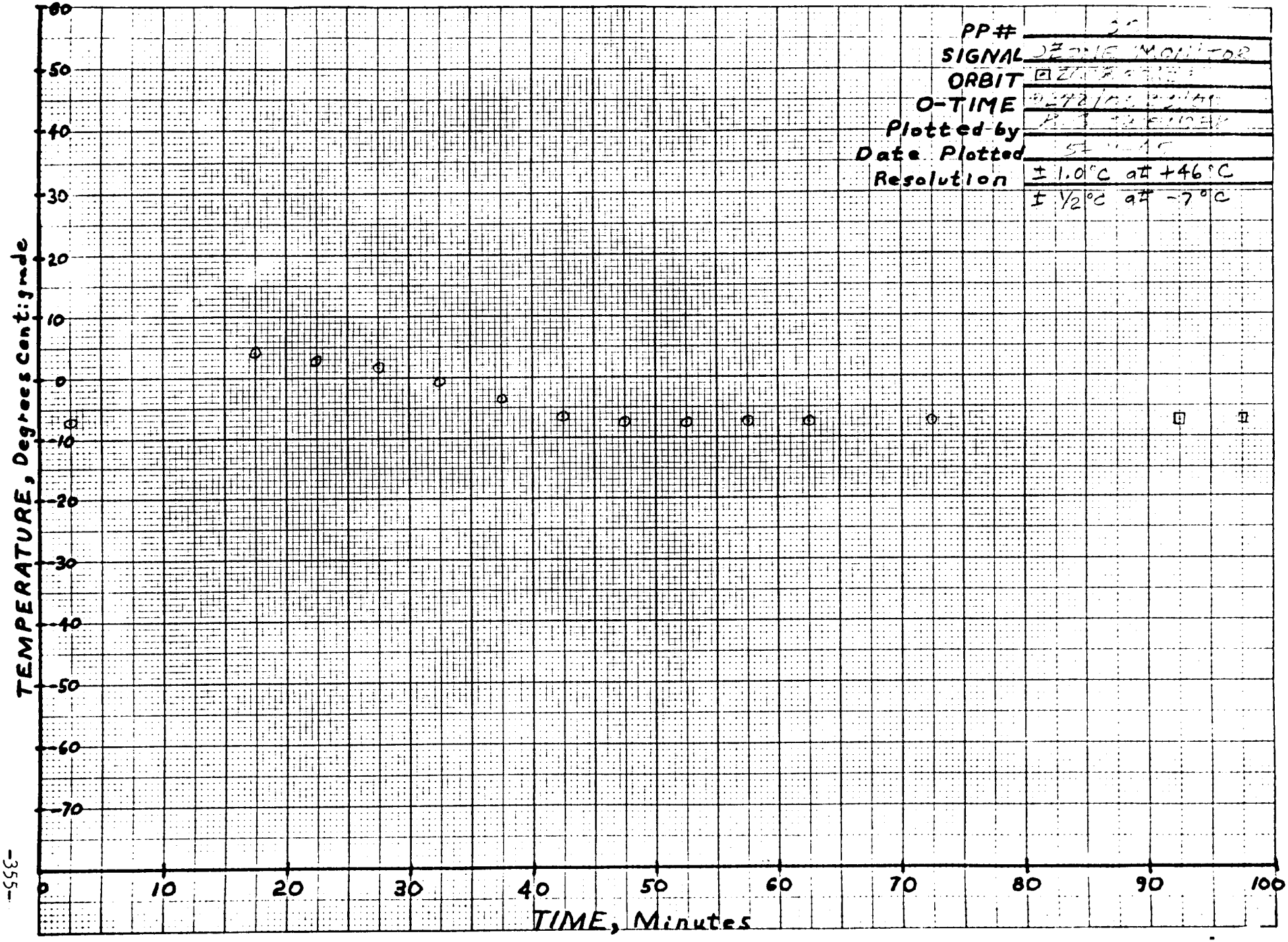
REUFFEL & ESSER CO.



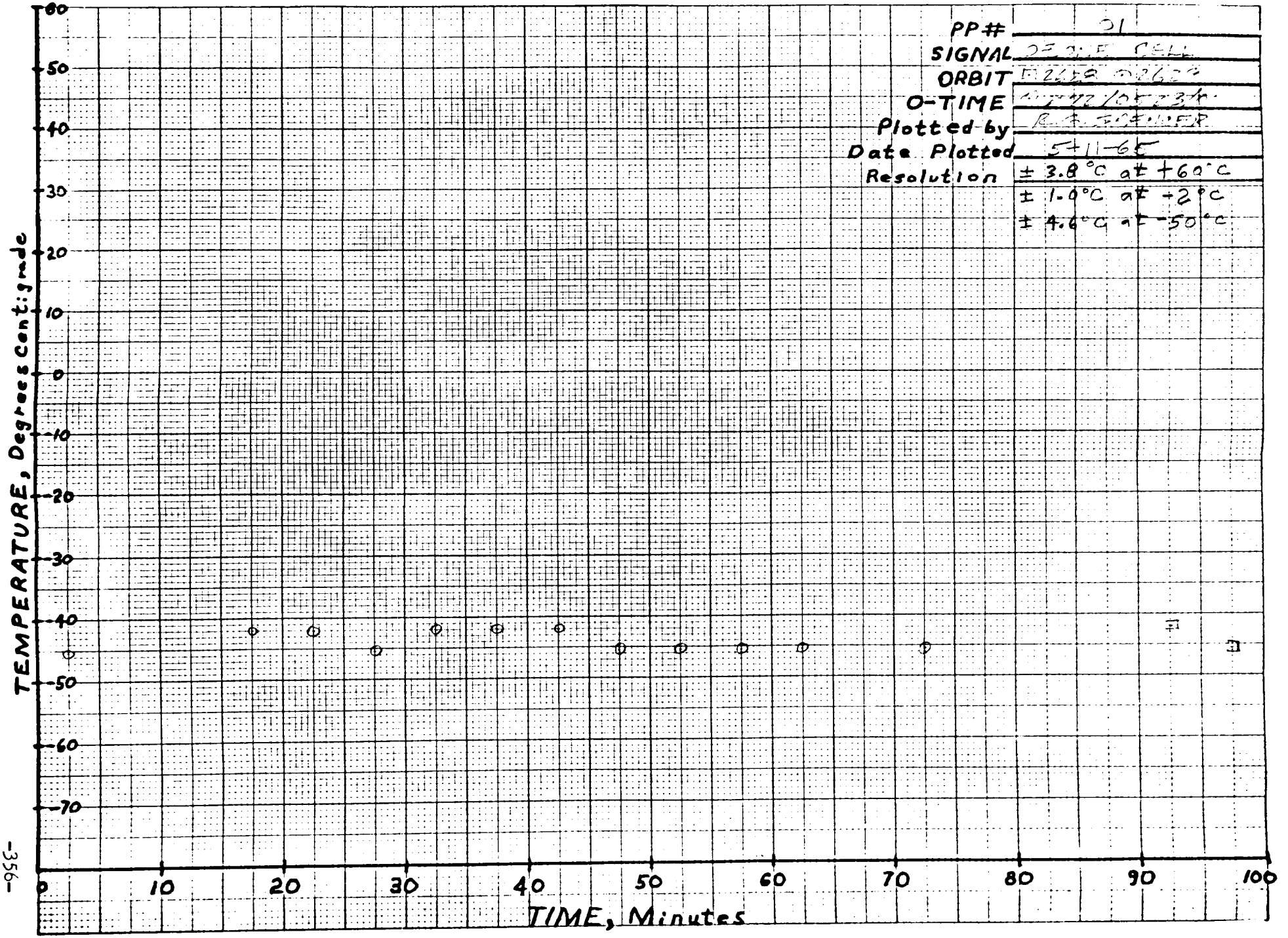
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



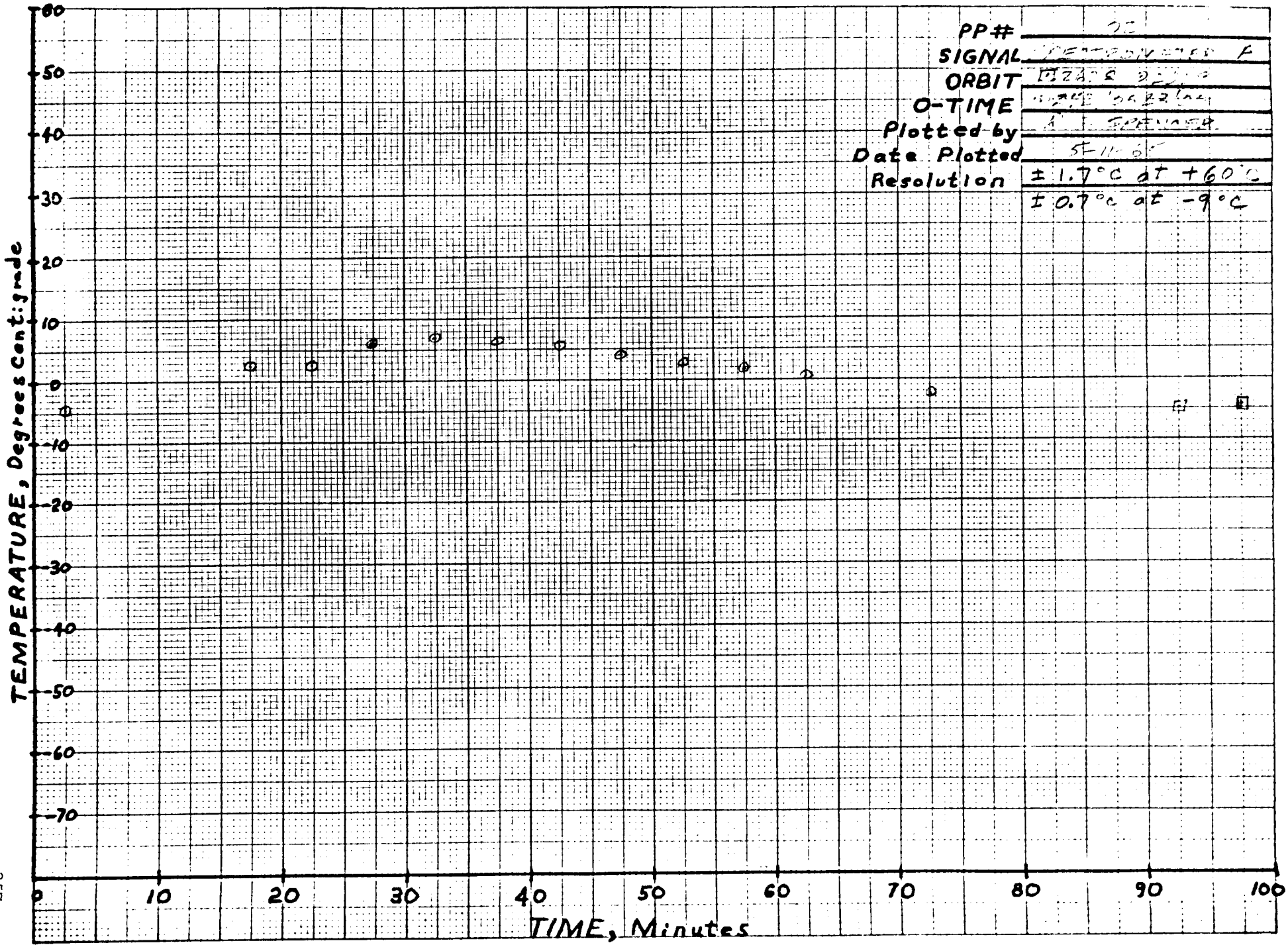
KEUFFEL & ESSER CO.



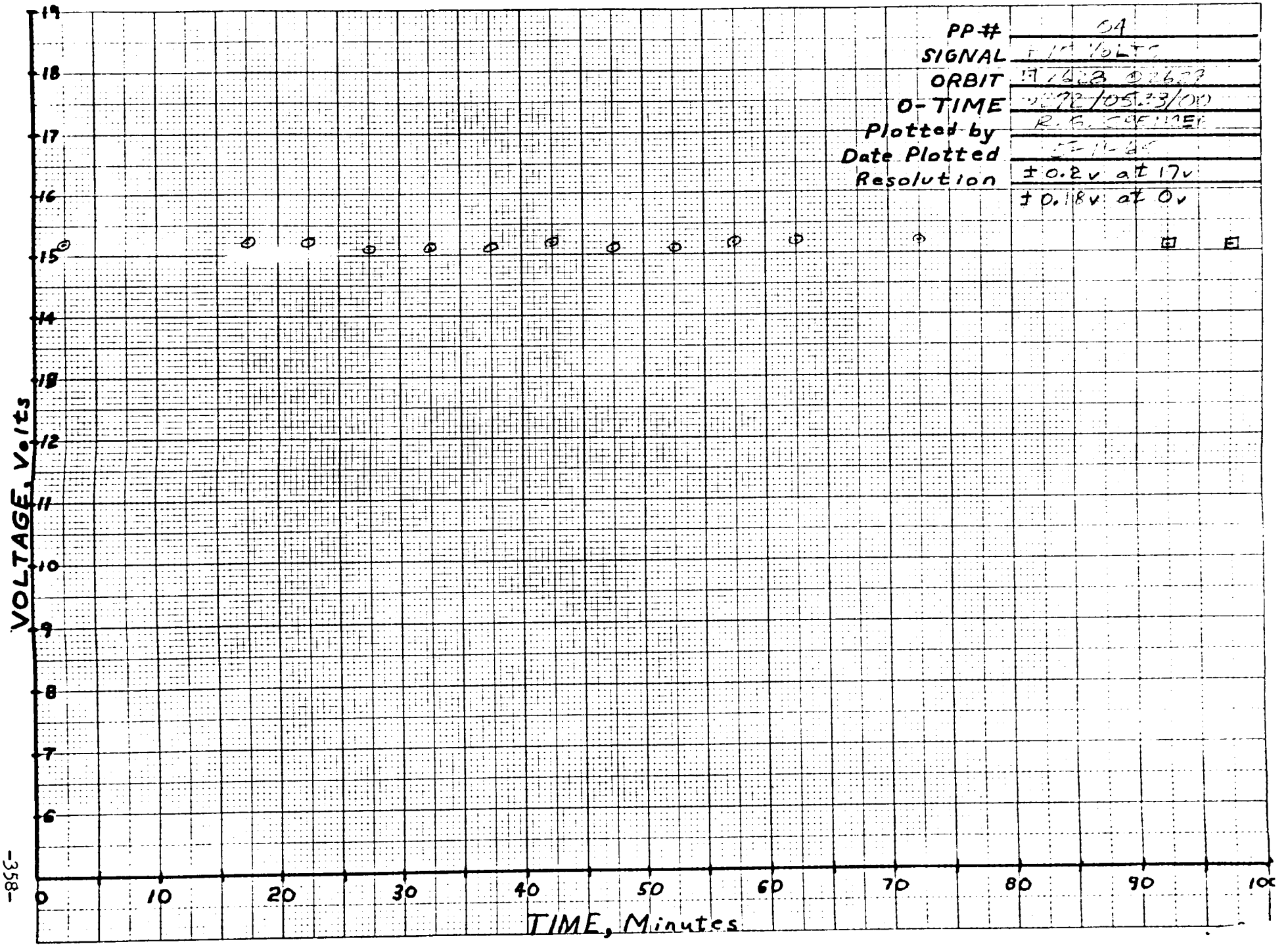
KEUFFEL & ESSER CO.



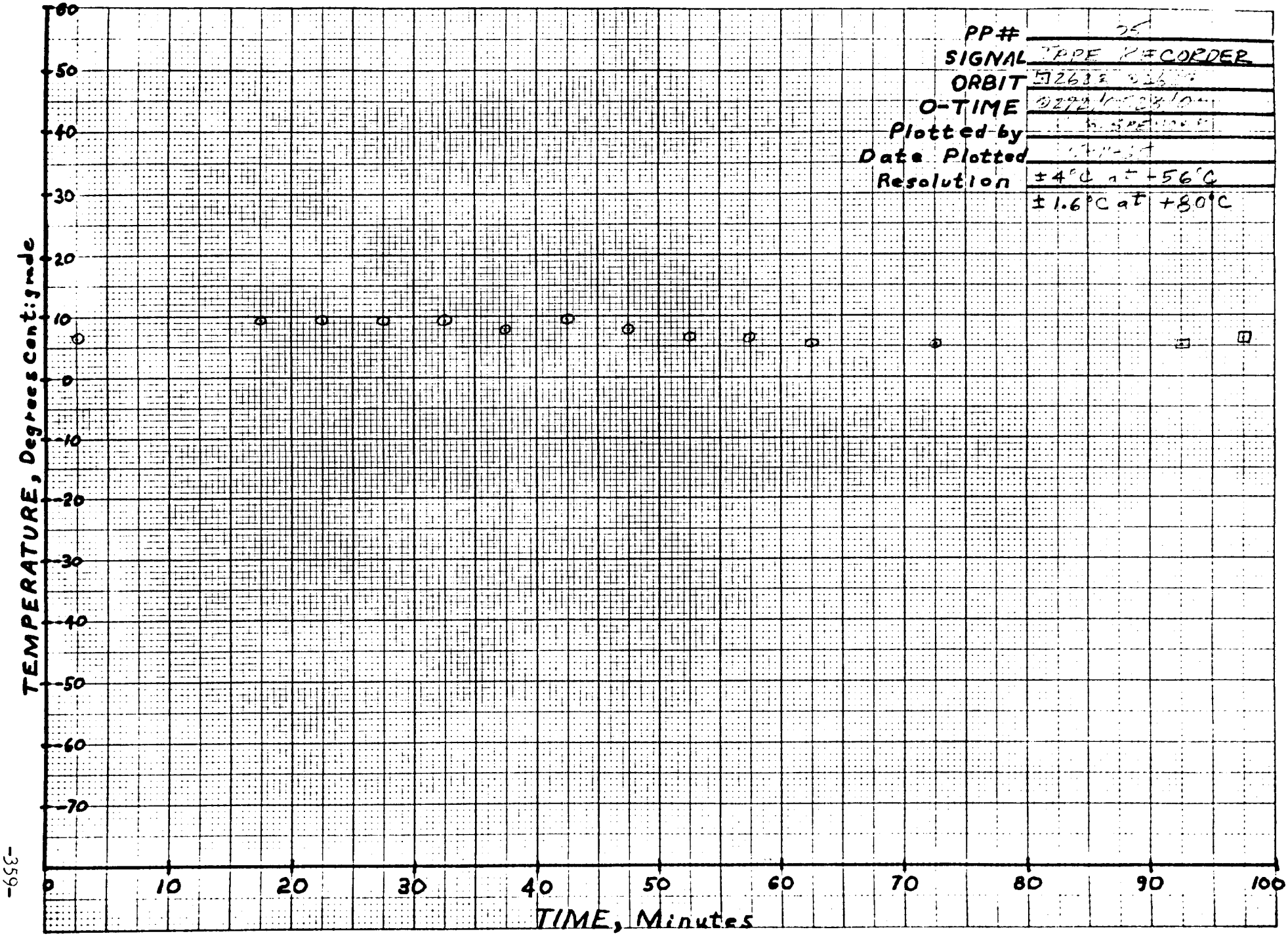
KEUFFEL & ESSER CO.



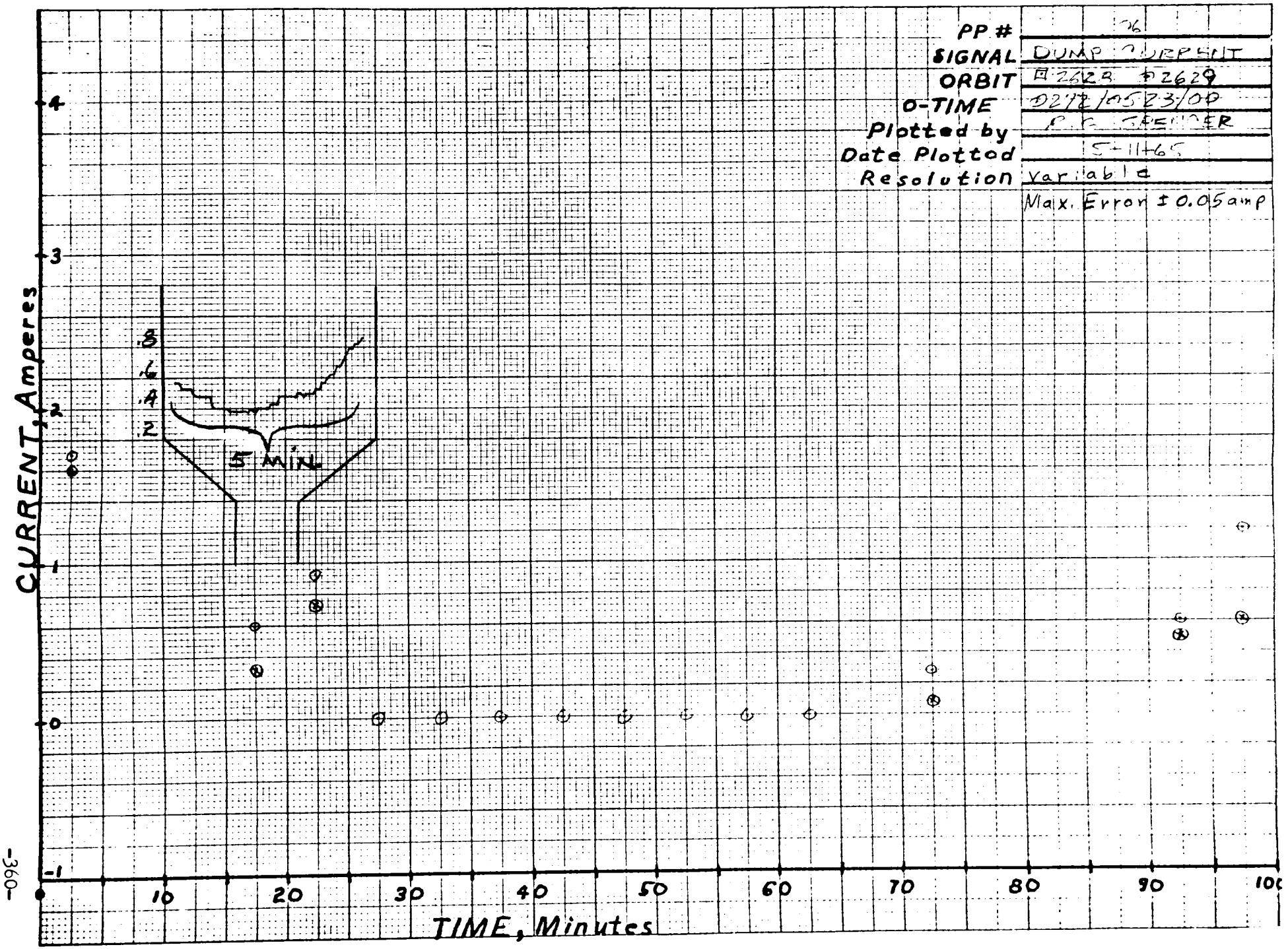
KEUFFEL & ESSER CO.



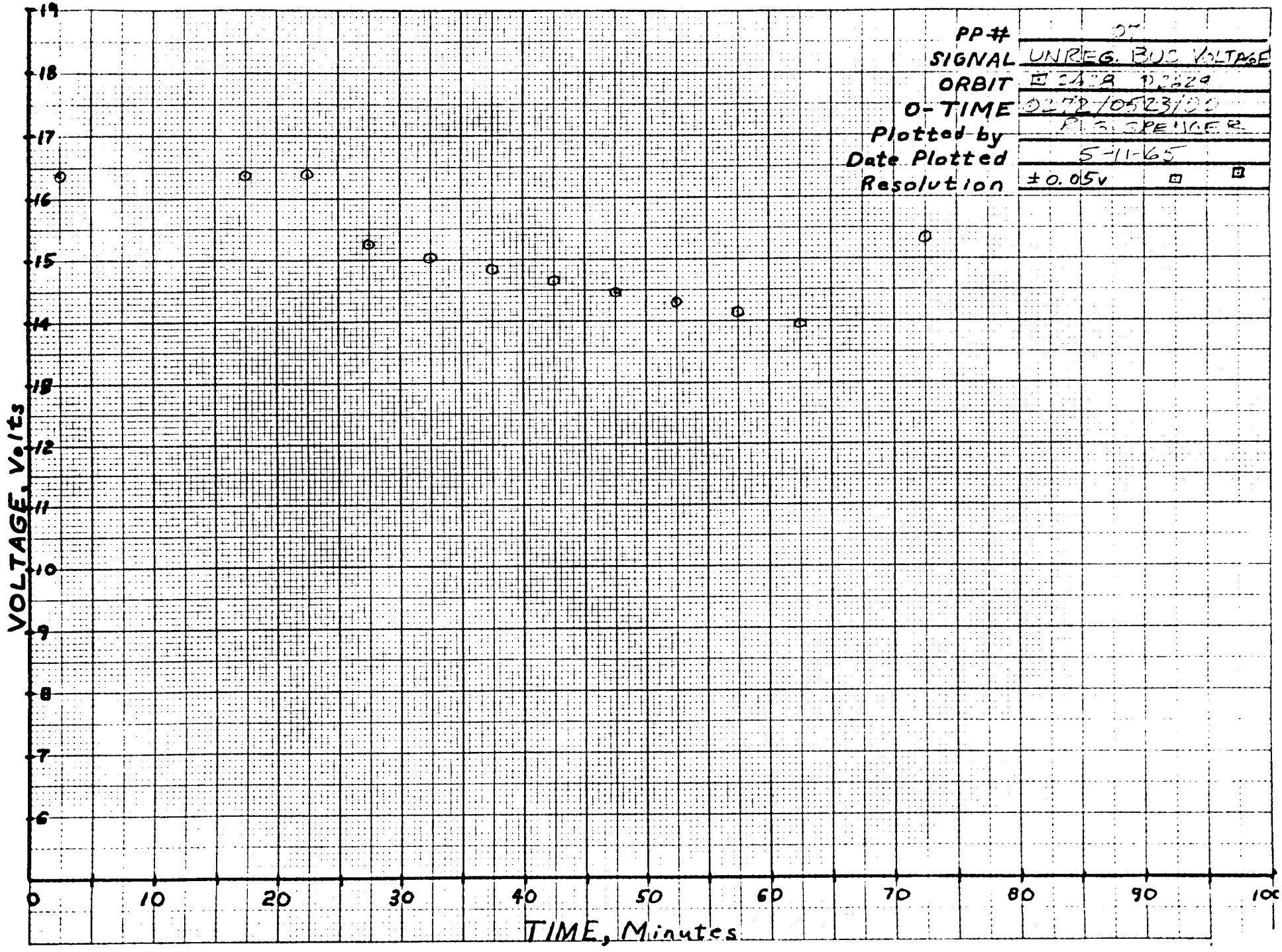
KEUFFEL & ESSER CO.



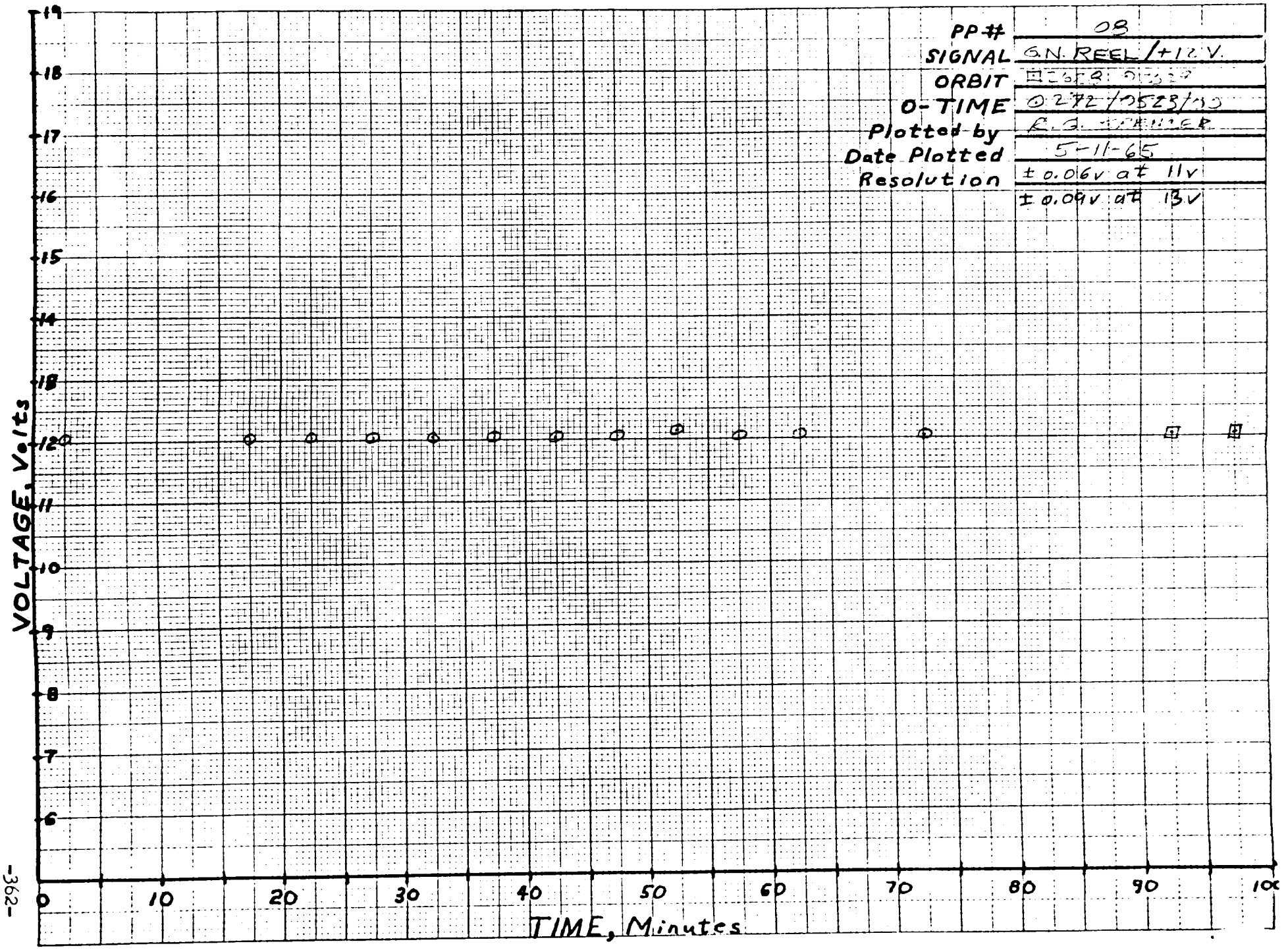
KEUFFEL & ESSER CO.



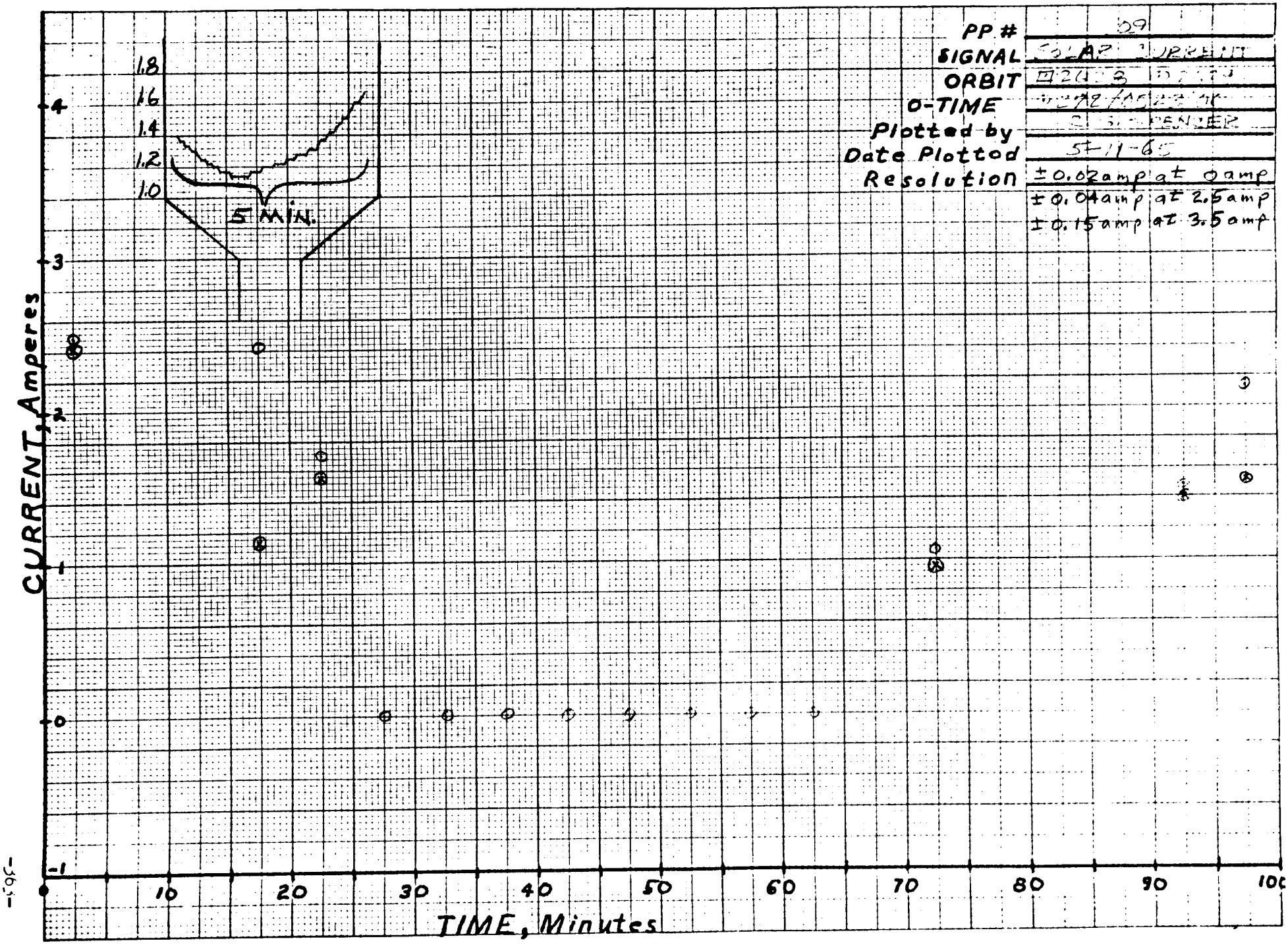
KEUFFEL & ESSER CO.



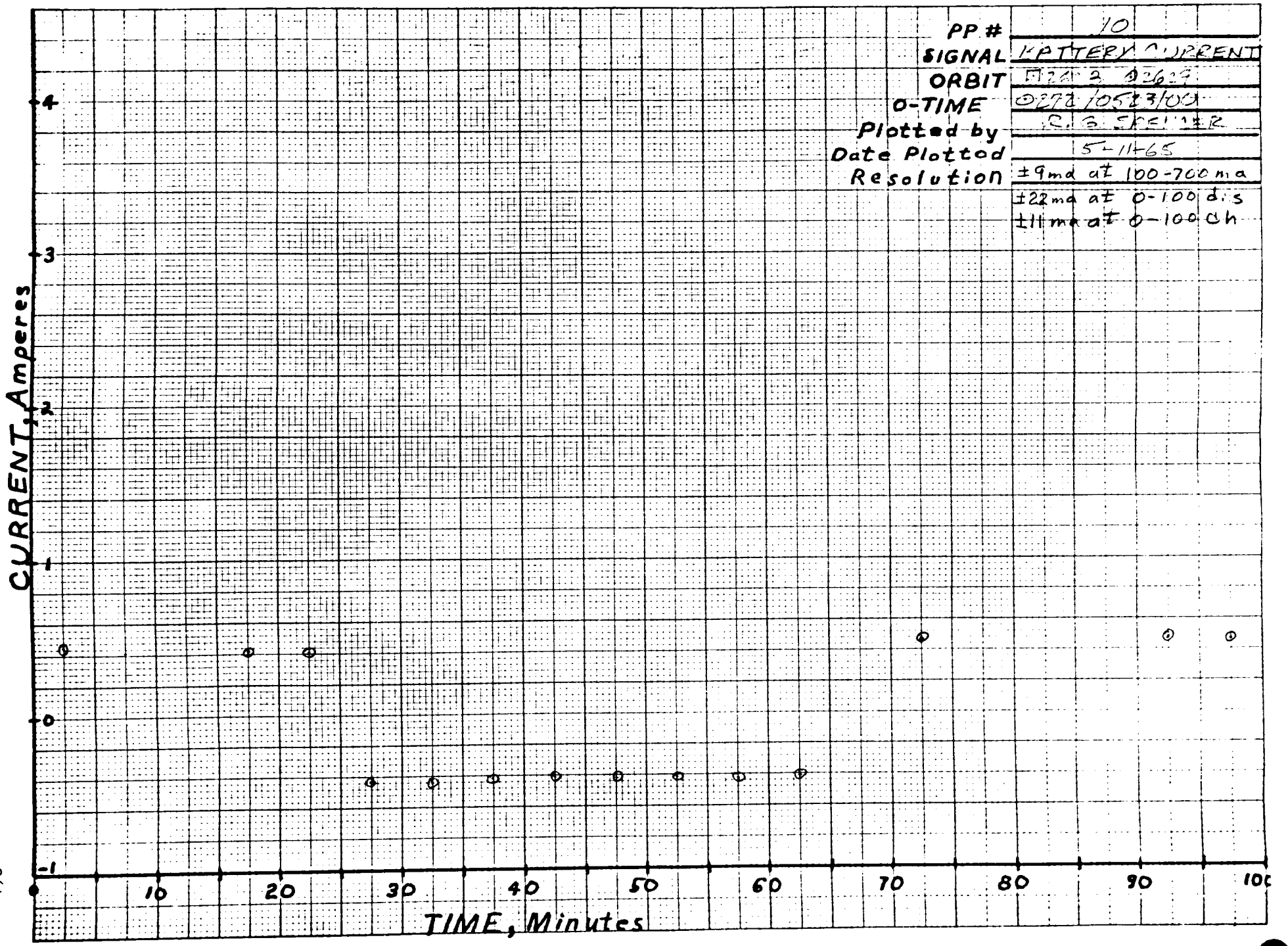
KEUFFEL & ESSER CO.



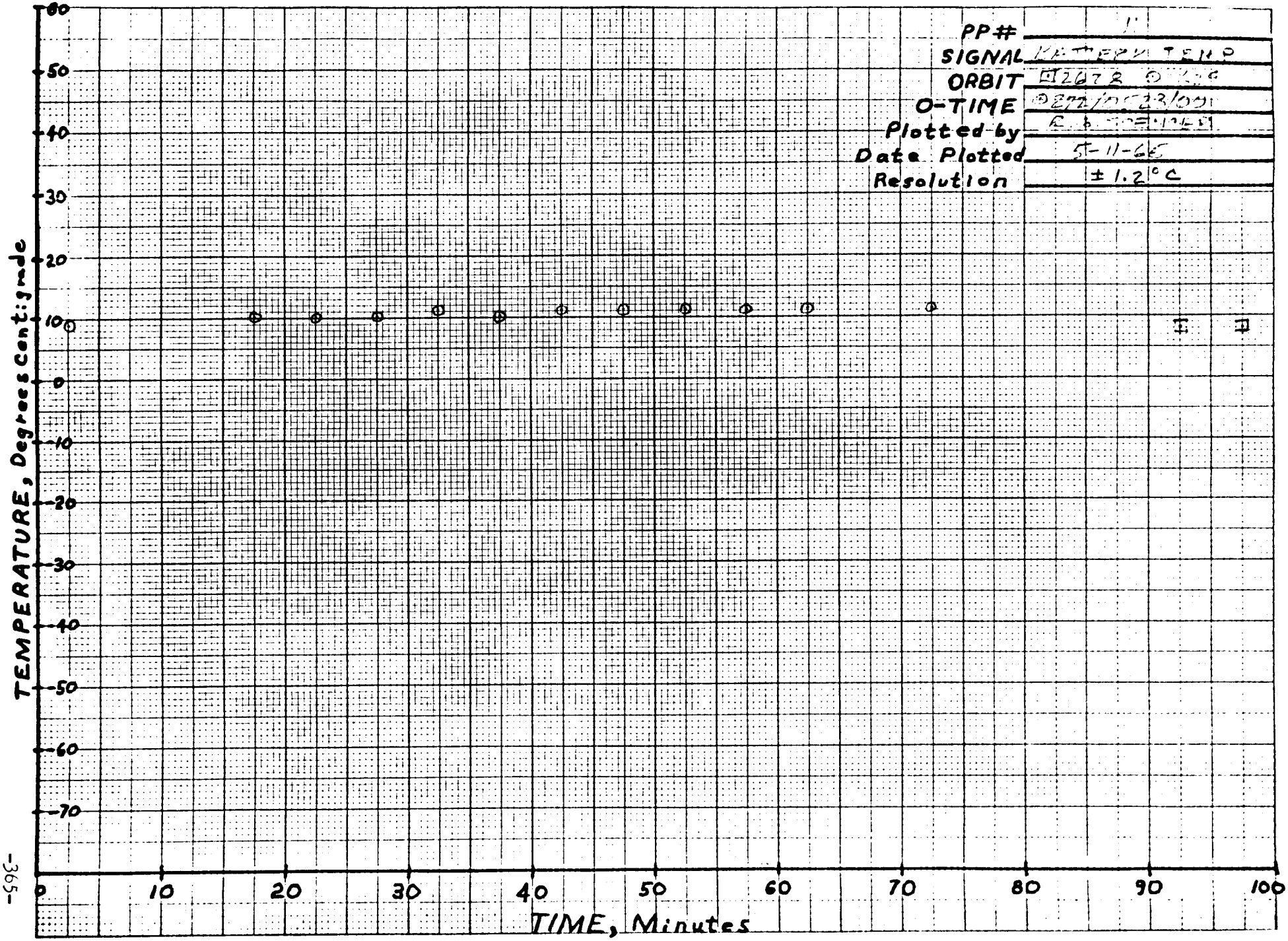
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



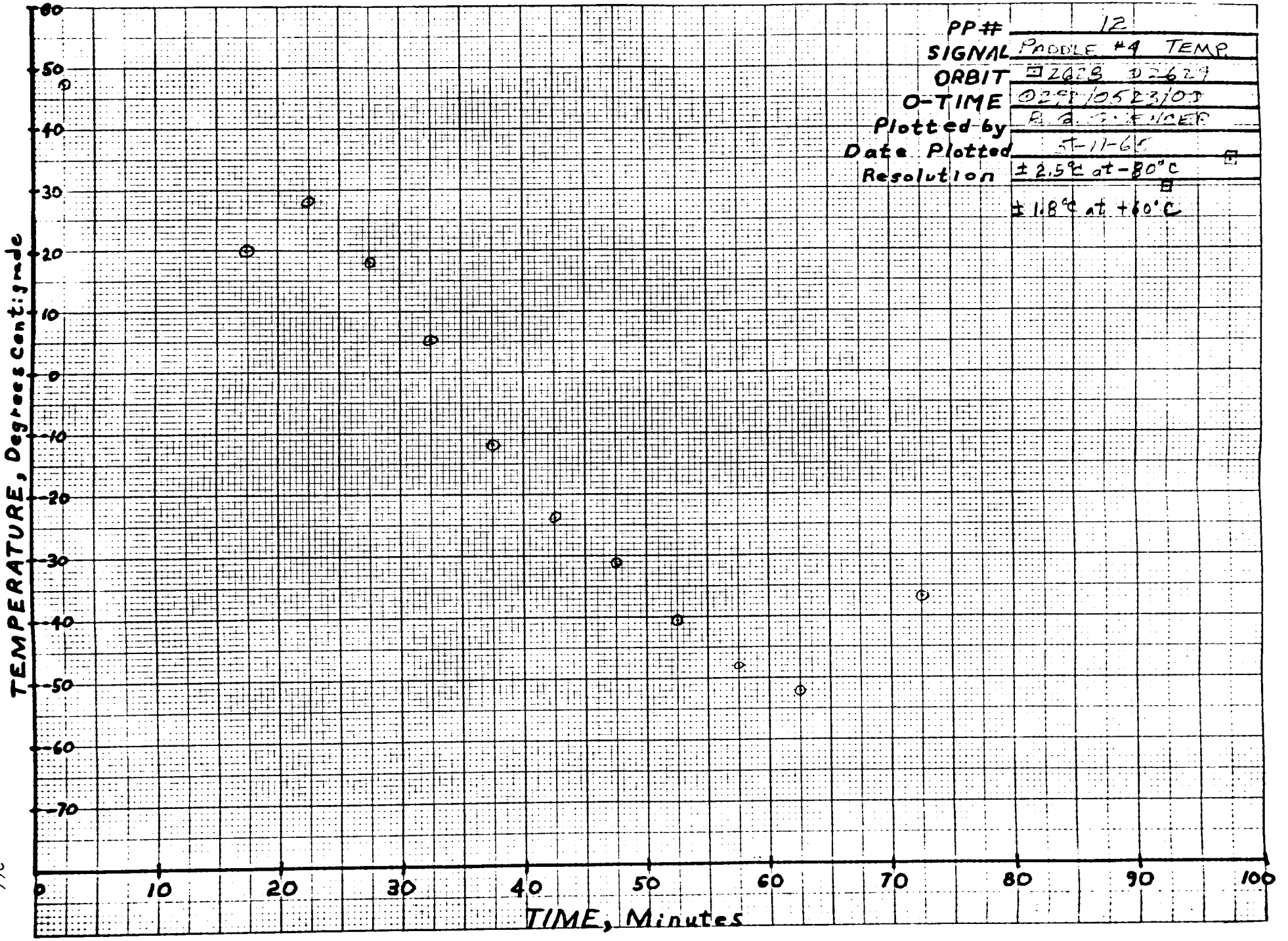
K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



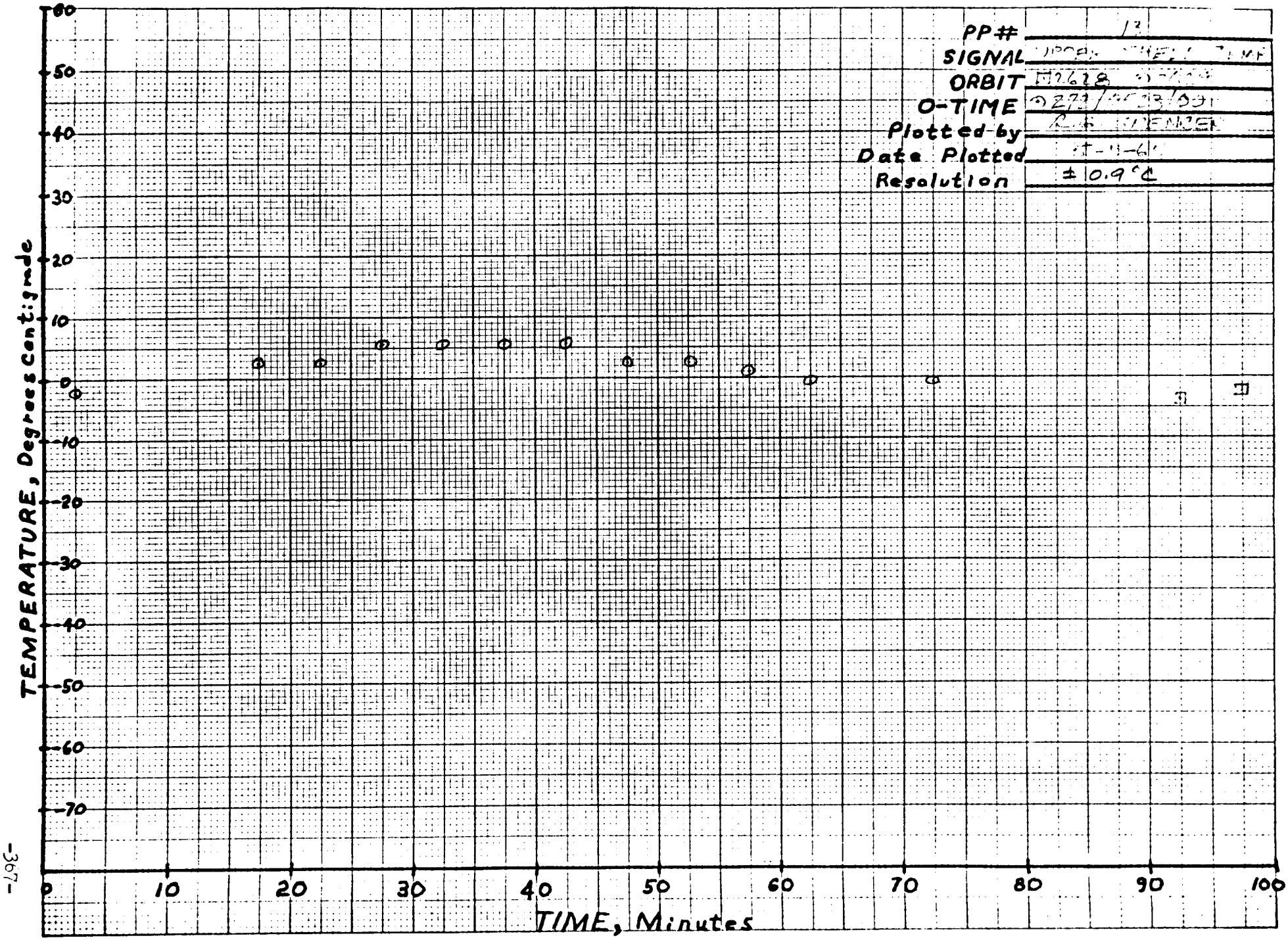
KEUFFEL & ESSER CO.



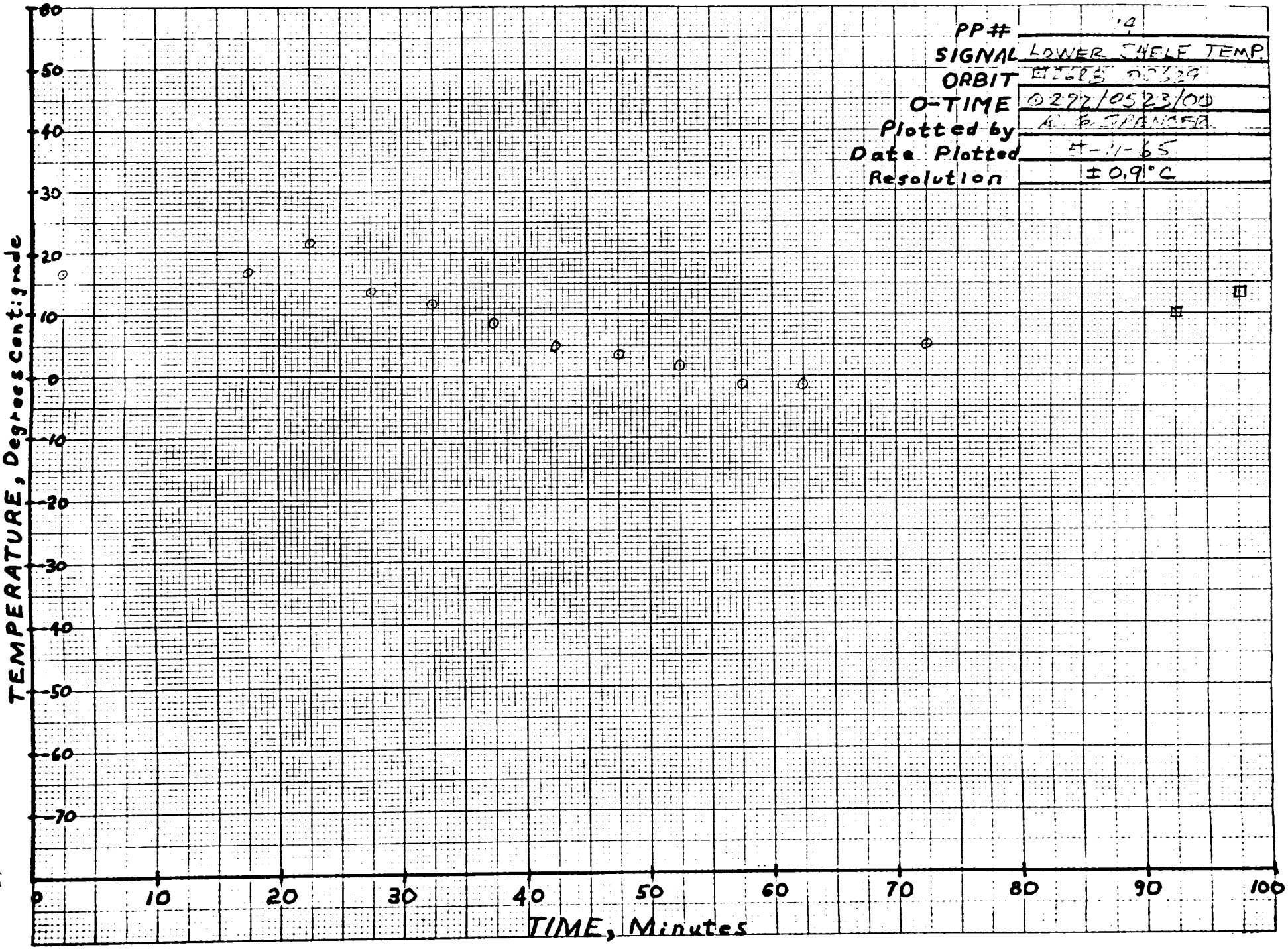
KEUFFEL & ESSER CO.

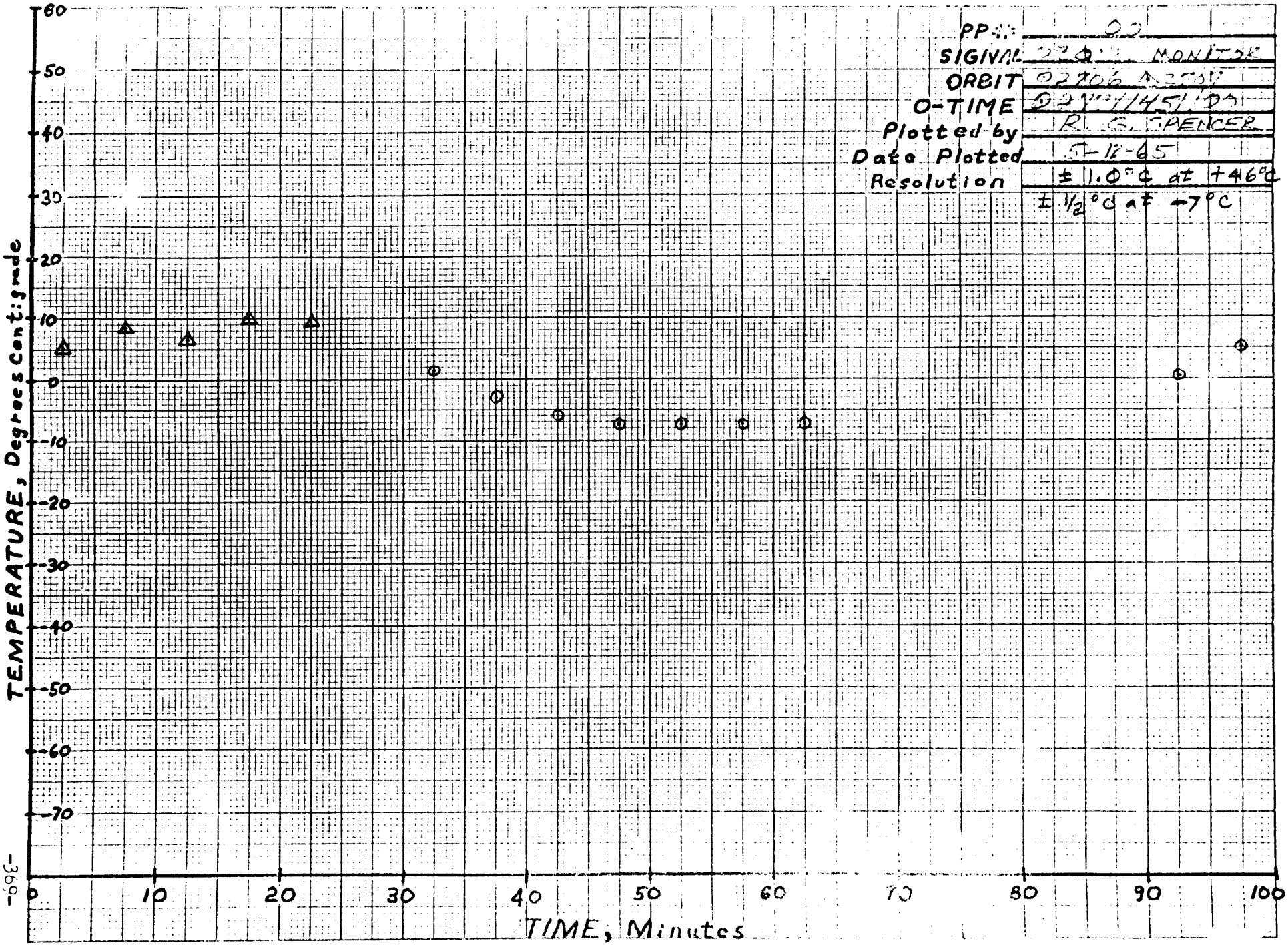


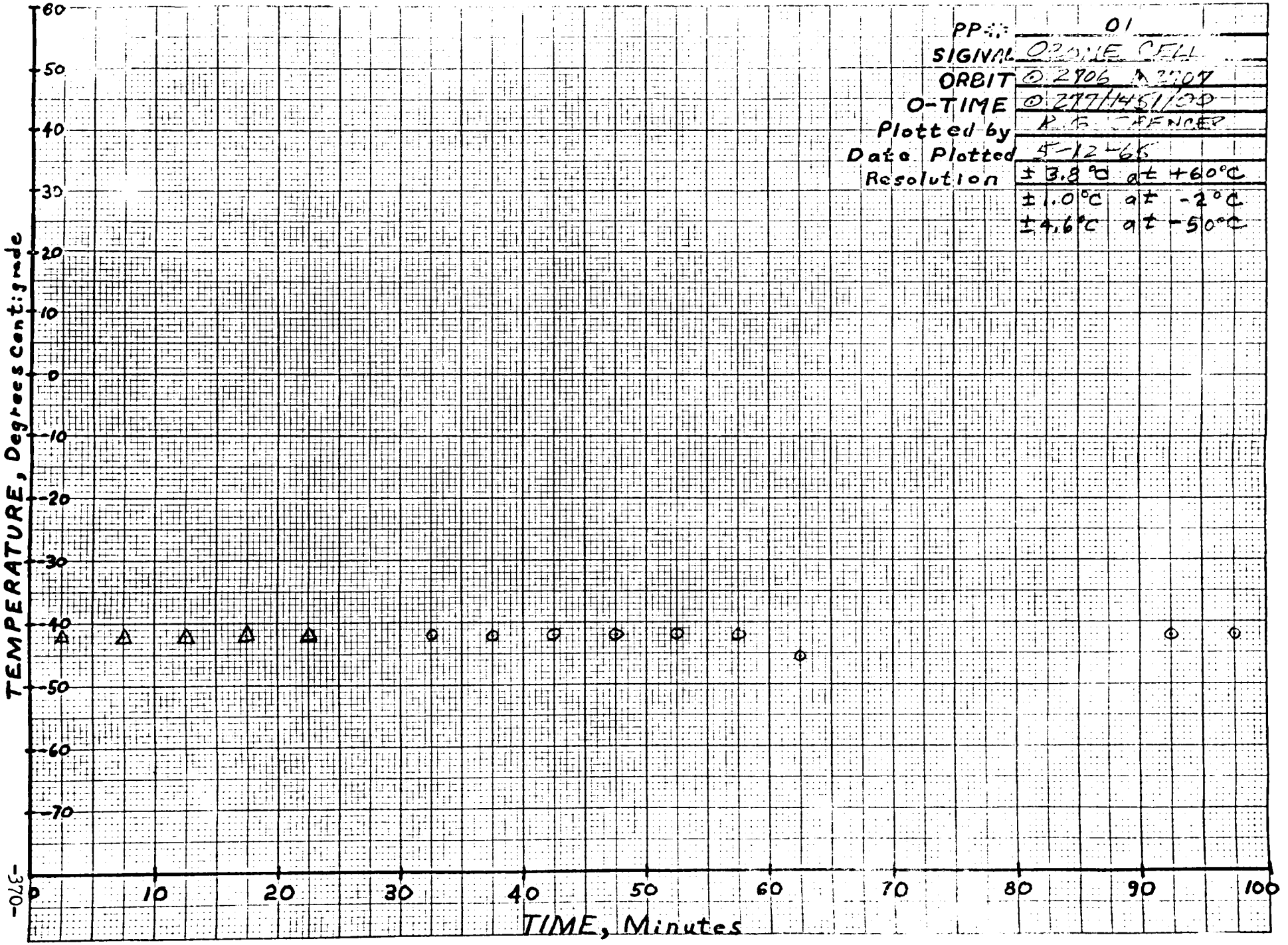
KEUFFEL & ESSER CO.

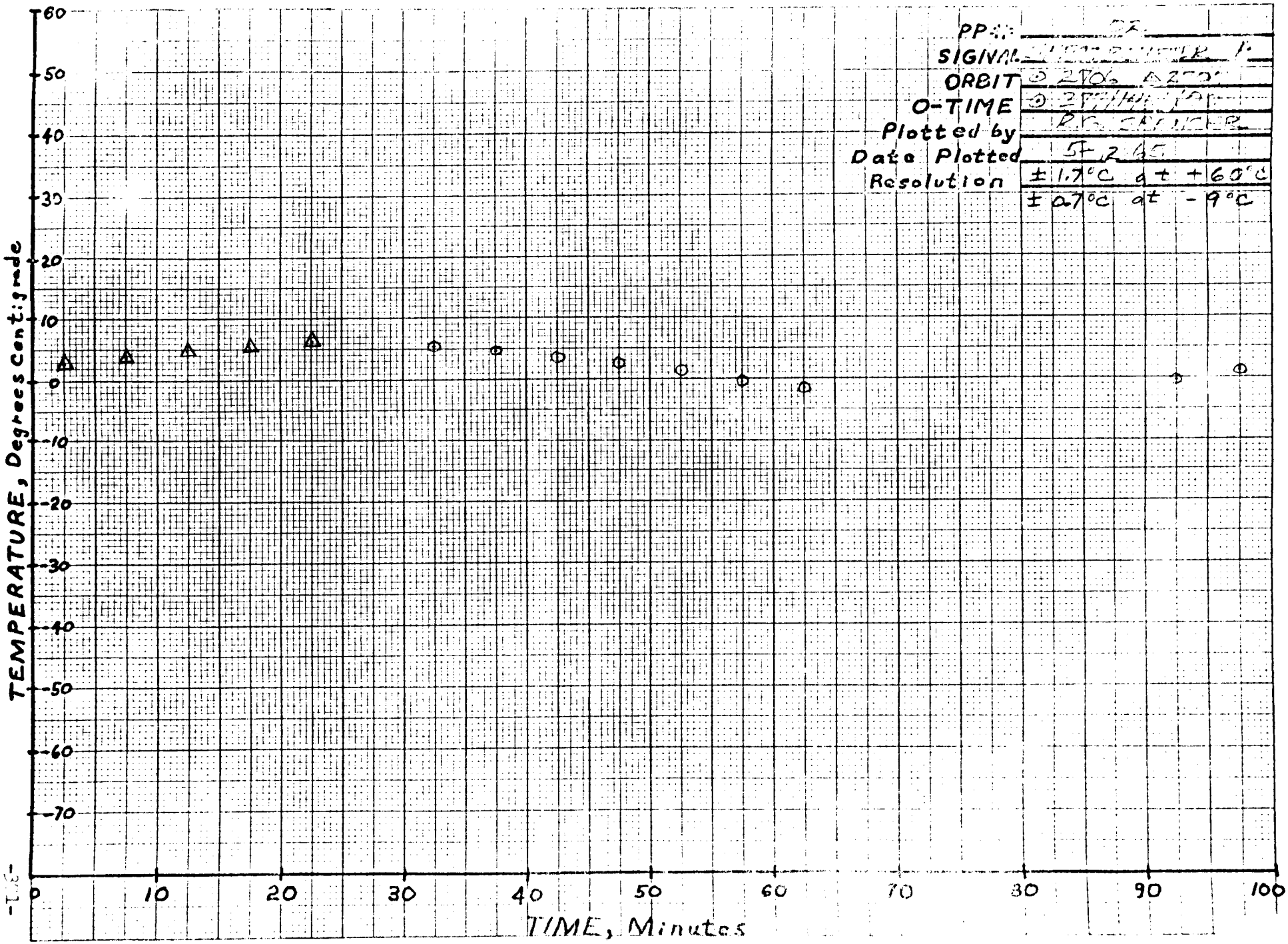


KEUFFEL & ESSER CO.

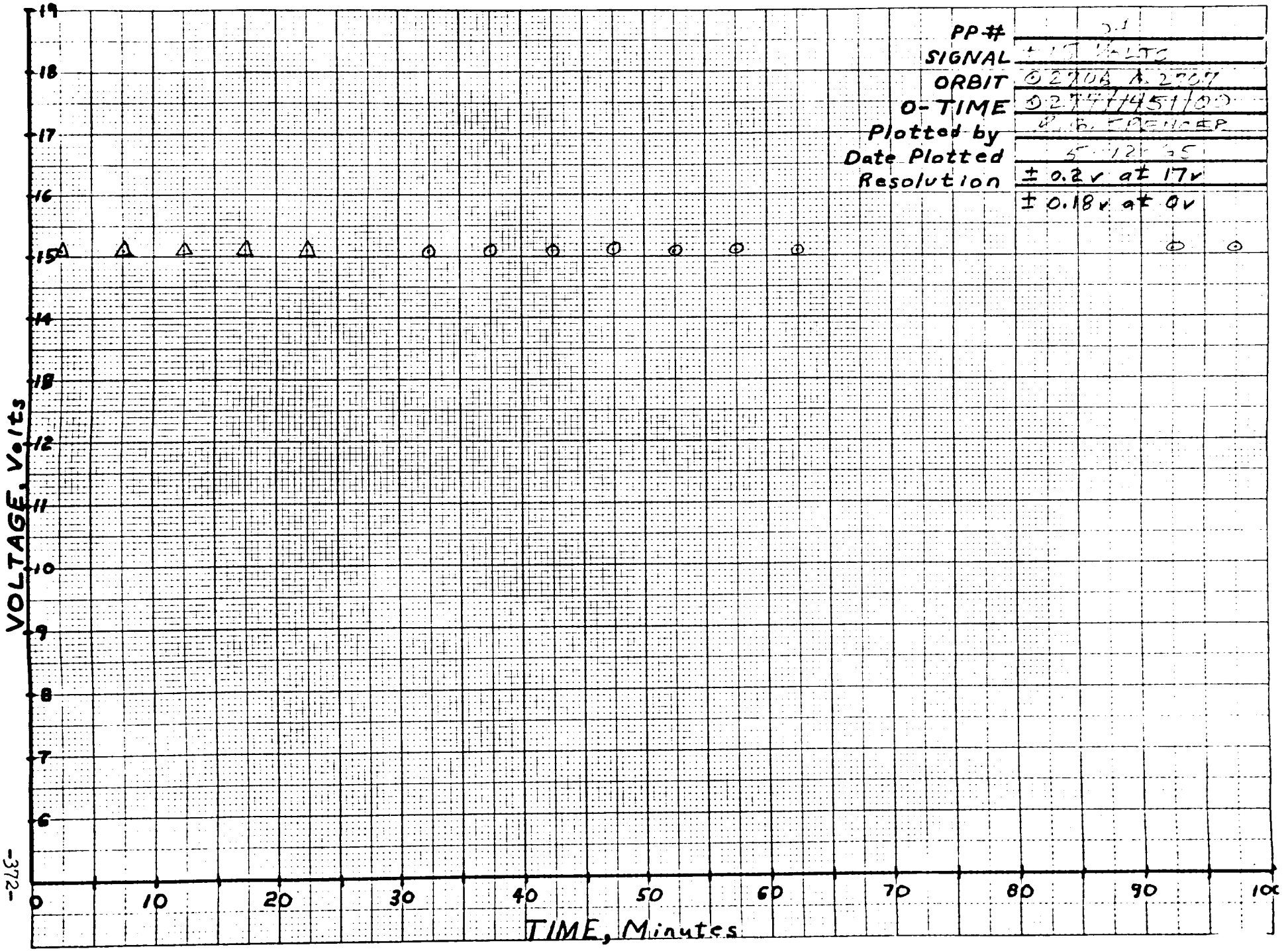


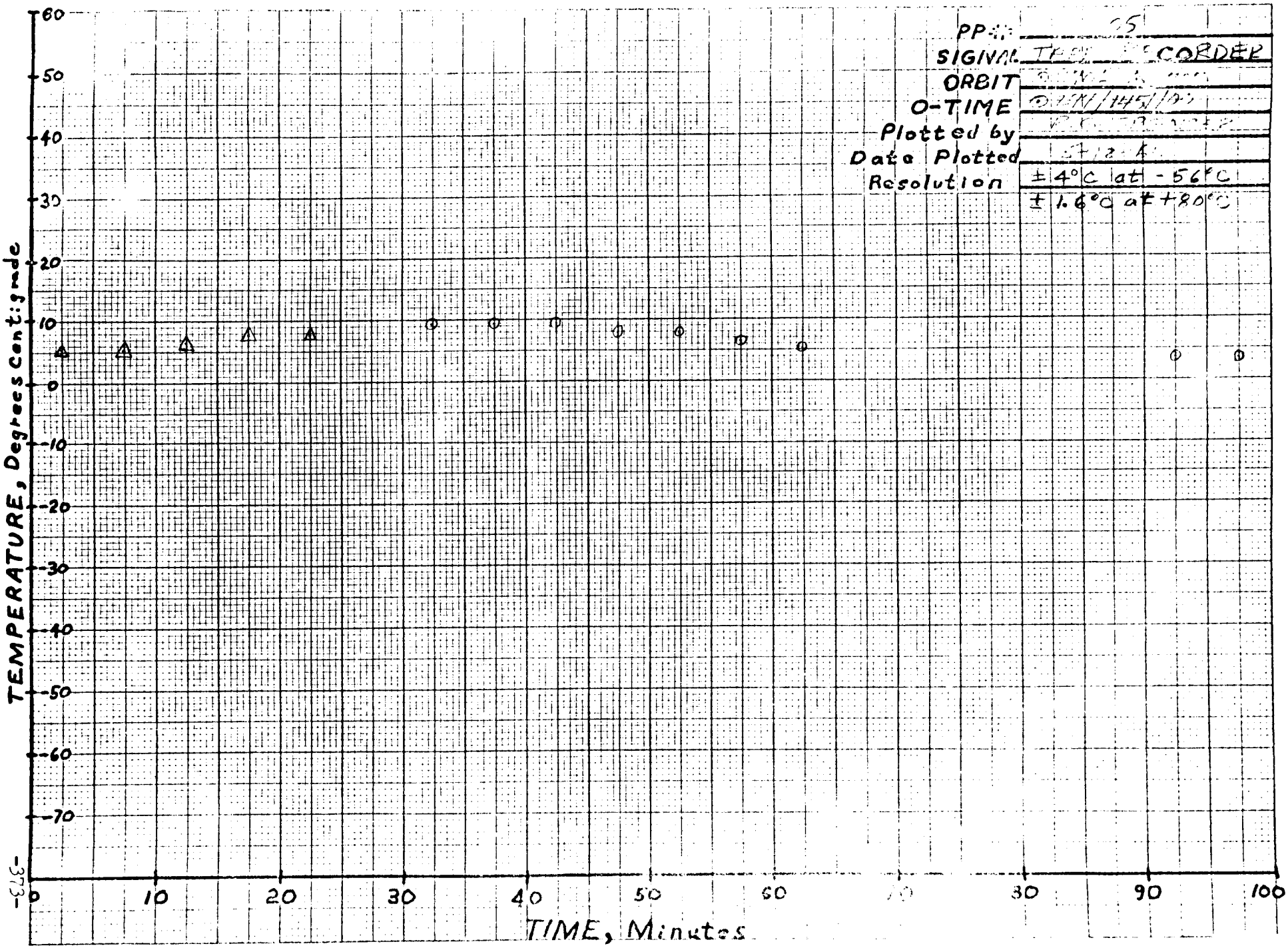

PP
SIGNAL
ORBIT
O-TIME
Plotted by
Date Plotted
Resolution
R. G. SPENCER
5-18-65
± 1.0°C at +46°C
± 1/2°C at -7°C
TEMPERATURE, Degrees Centigrade
TIME, Minutes
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100


PP# 01
SIGNAL OZONE CELL
ORBIT ⊙ 2706 ⊙ 2707
O-TIME ⊙ 277/1451/00
Plotted by R. G. SPENCER
Date Plotted 5-12-66
Resolution ± 3.8 °C at +60°C
± 1.0 °C at -2 °C
± 4.6 °C at -50 °C
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

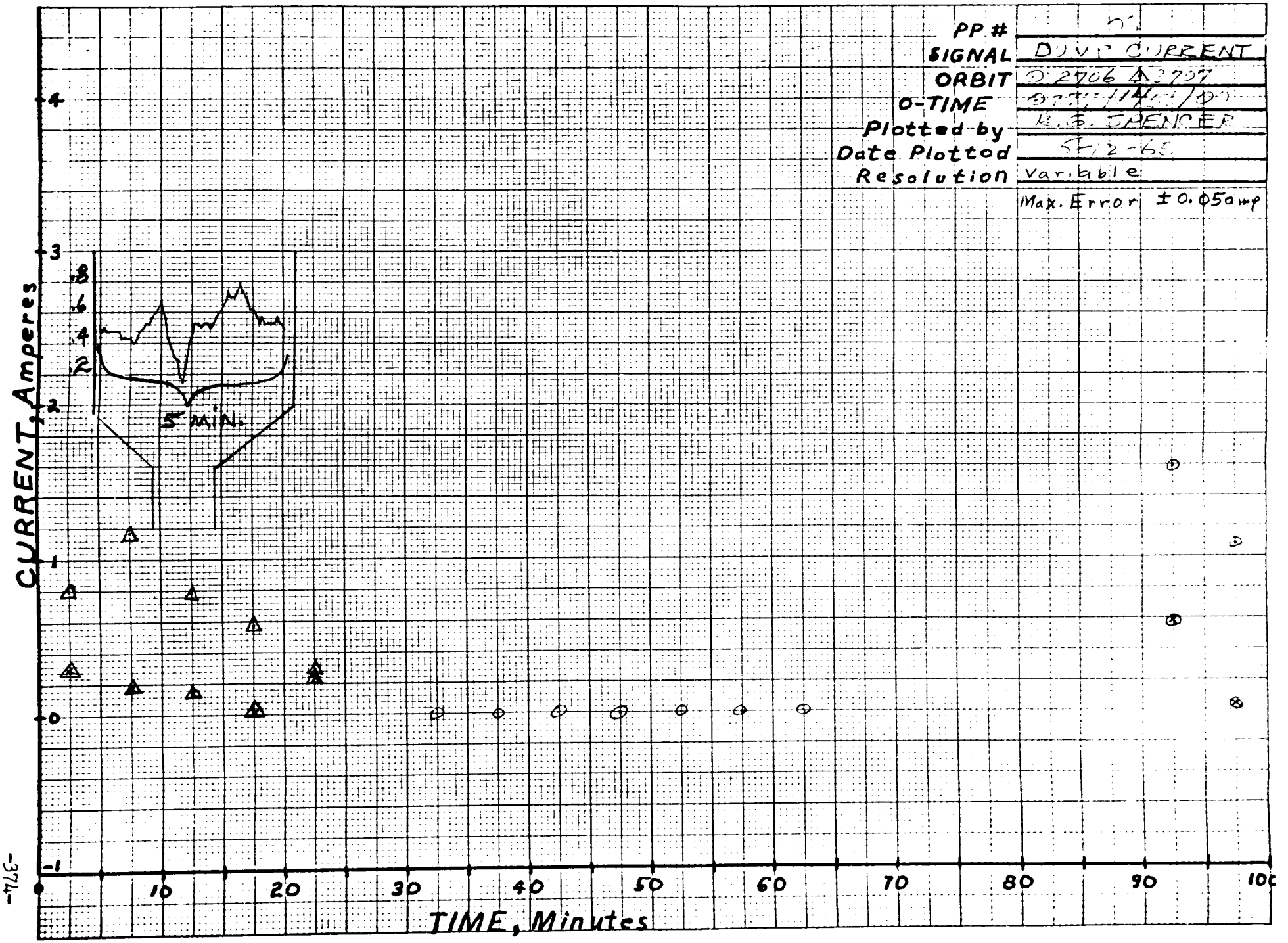

PP
SIGNAL
ORBIT
O-TIME
Plotted by
Date Plotted
Resolution
±1.7°C at +60°C
±0.7°C at -9°C
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

K&E 10 X 10 TO 1/2 INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

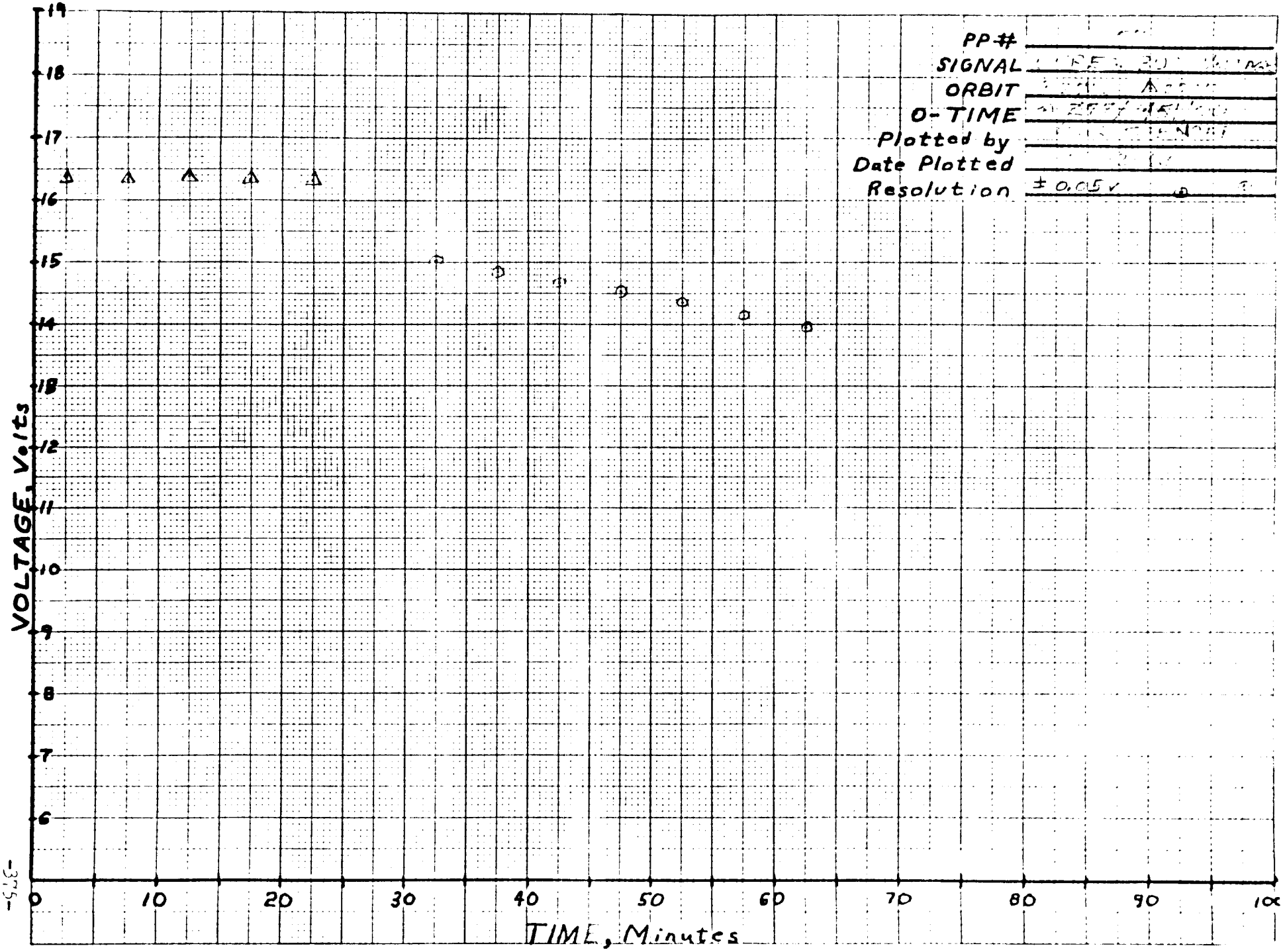



PP#
SIGNAL
ORBIT
O-TIME
Plotted by
Date Plotted
Resolution
± 4°C at -56°C
± 1.6°C at +80°C
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
80
90
100
TIME, Minutes

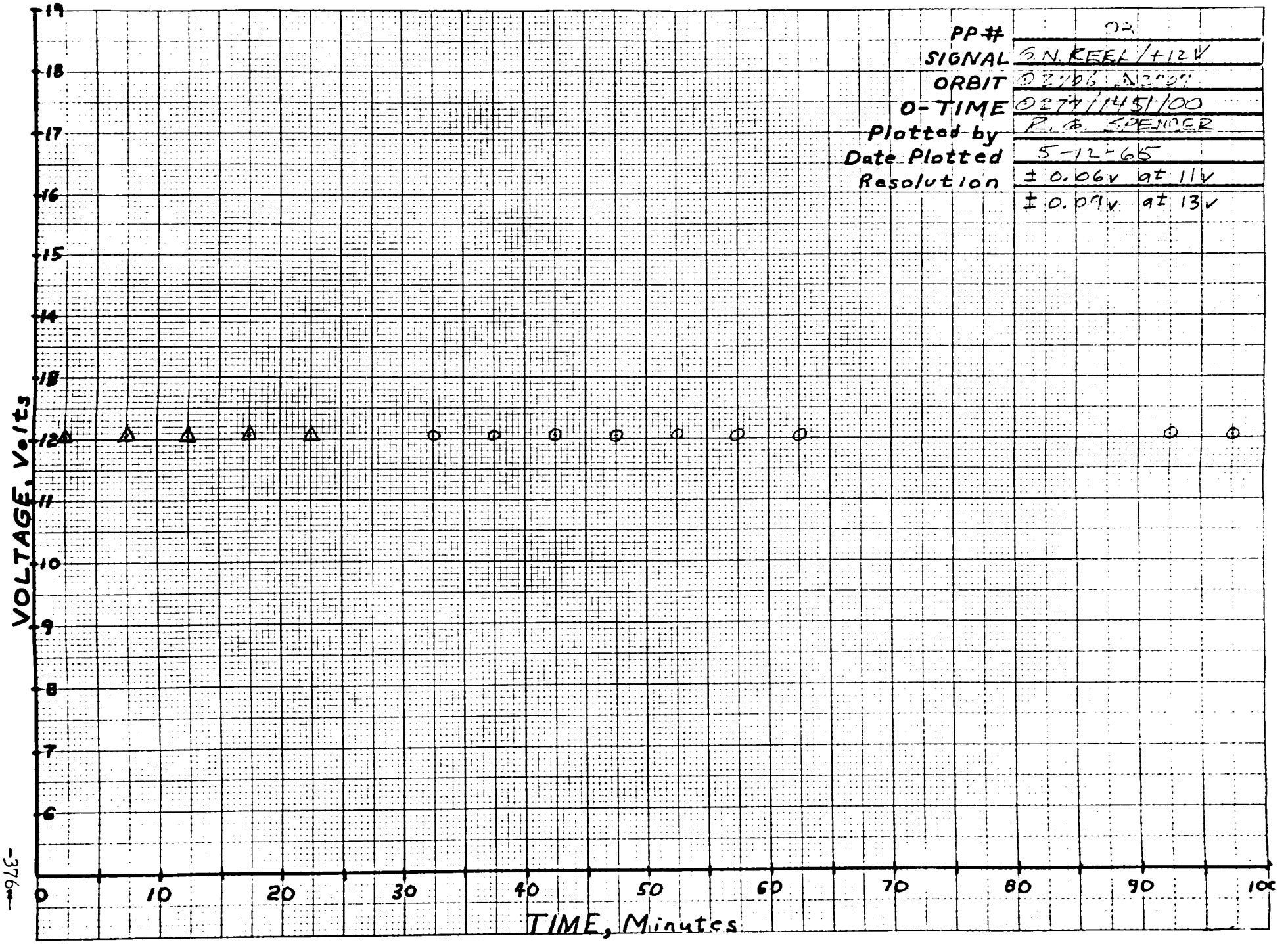
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



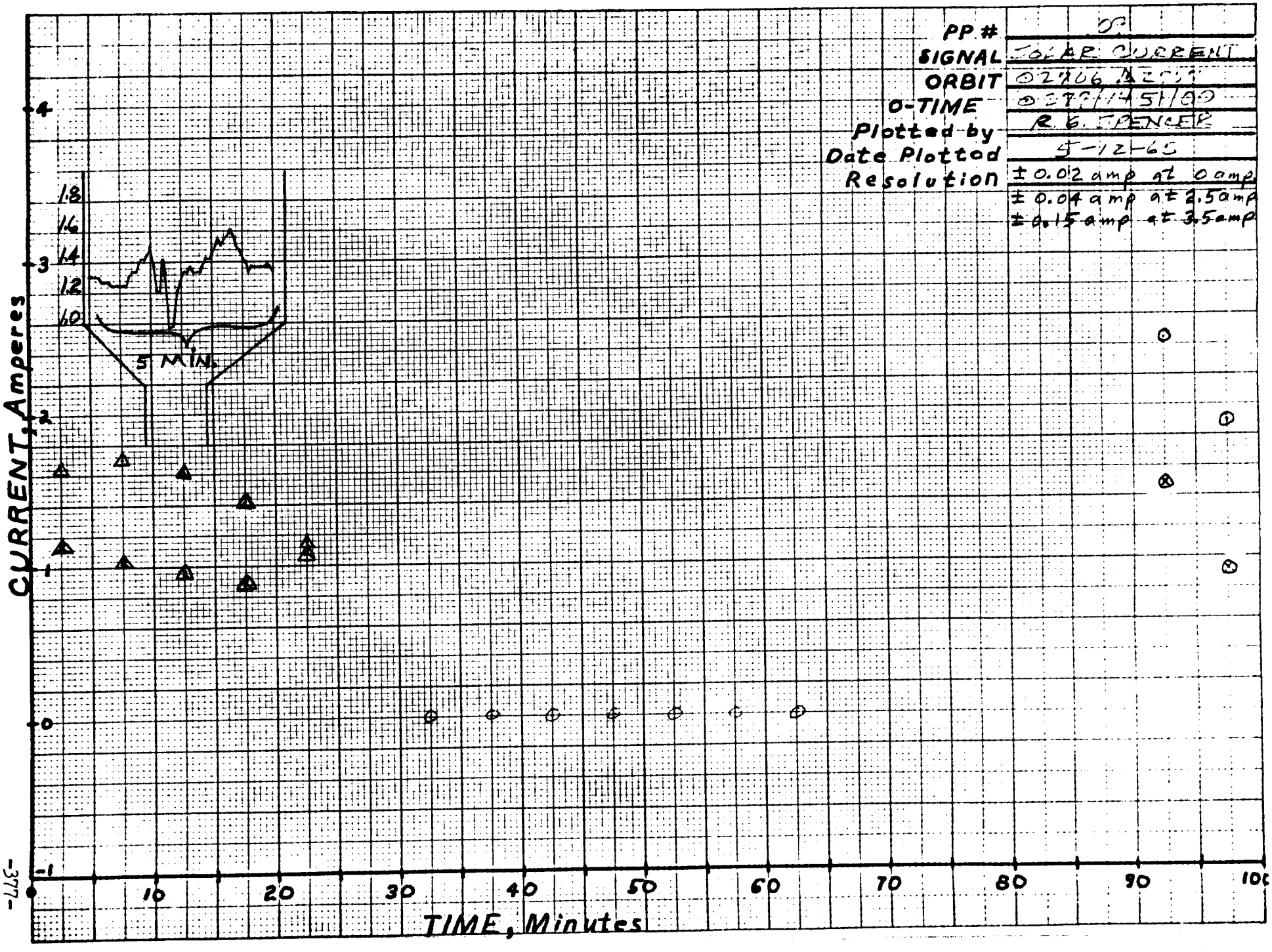
KEUFFEL & ESSER CO.



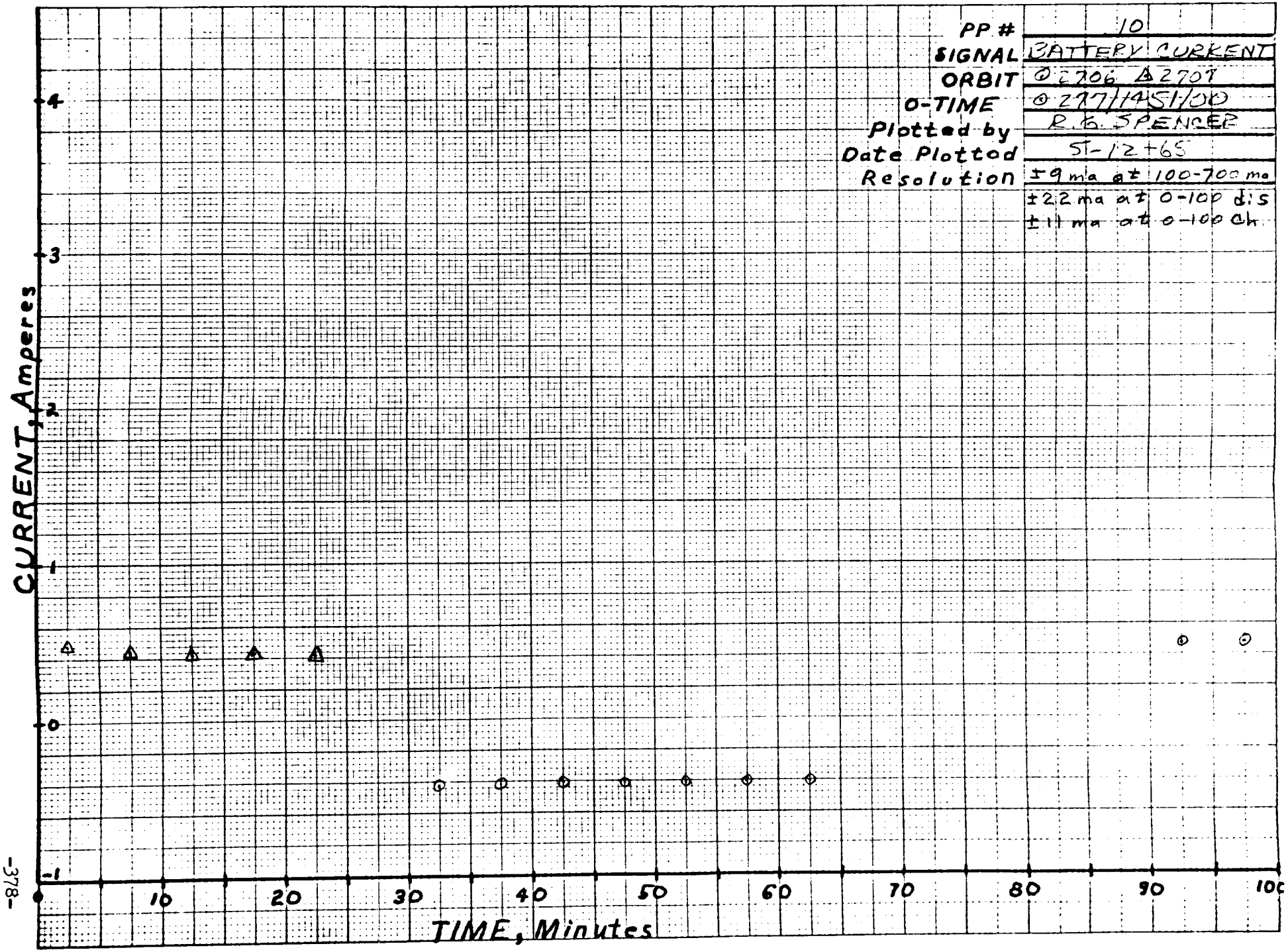
KEUFFEL & ESSER CO.

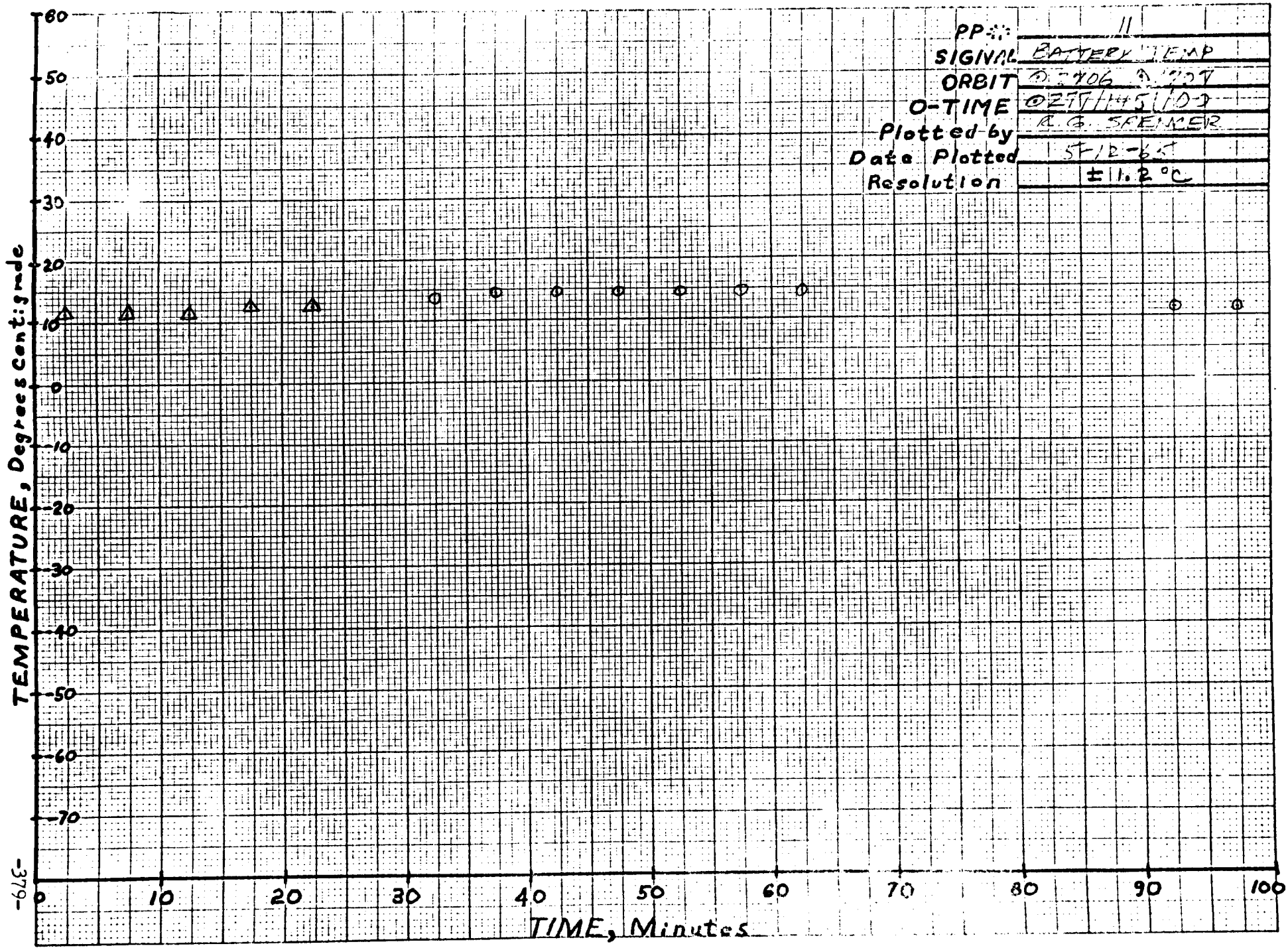


K+E 7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

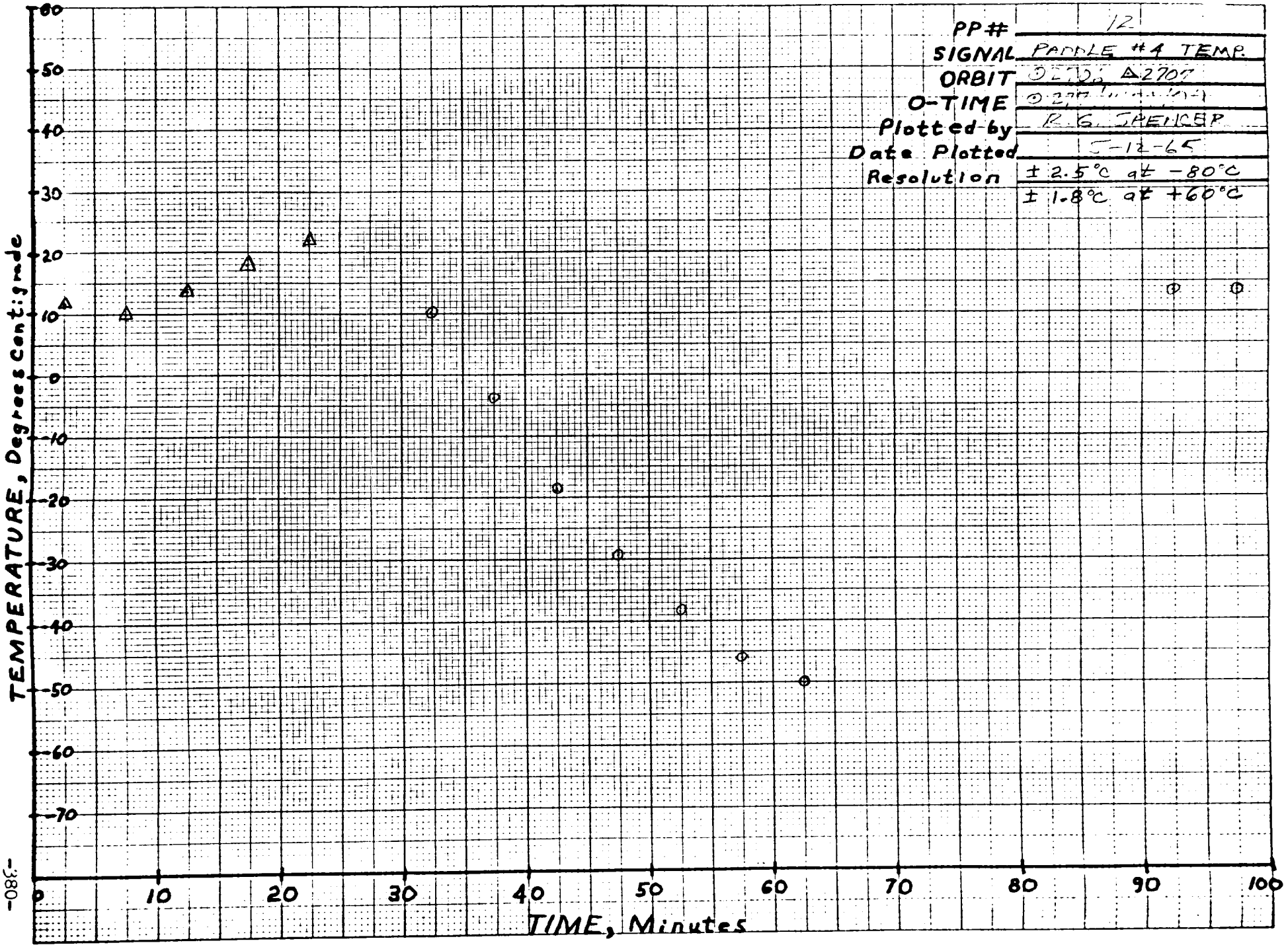


KEUFFEL & ESSER CO.

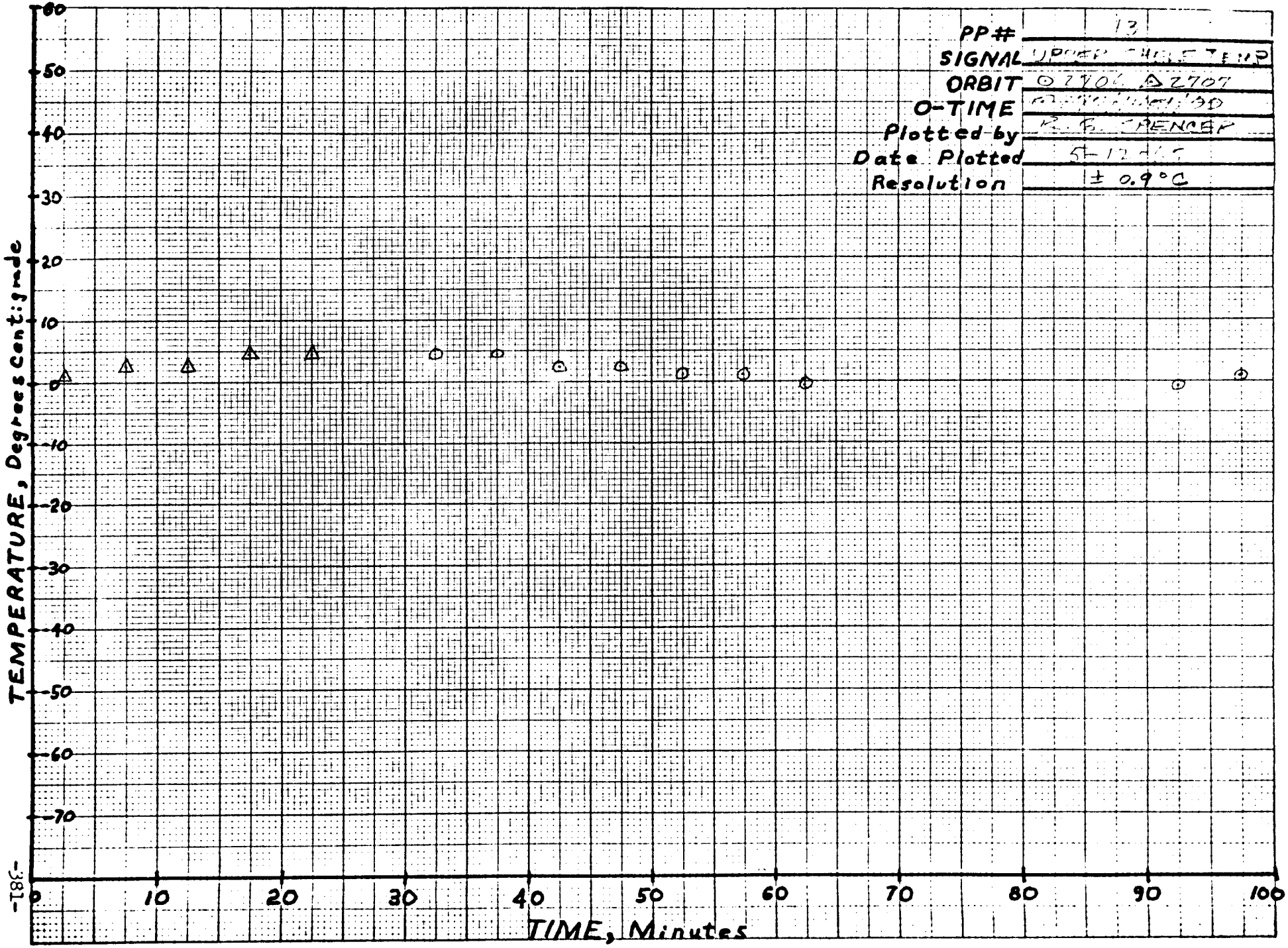



PP
11
SIGNAL
BATTERY TEMP
ORBIT
O-TIME
Plotted by
R. G. SPEIMER
Date Plotted
Resolution
±1.2 °C
TEMPERATURE, Degrees centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

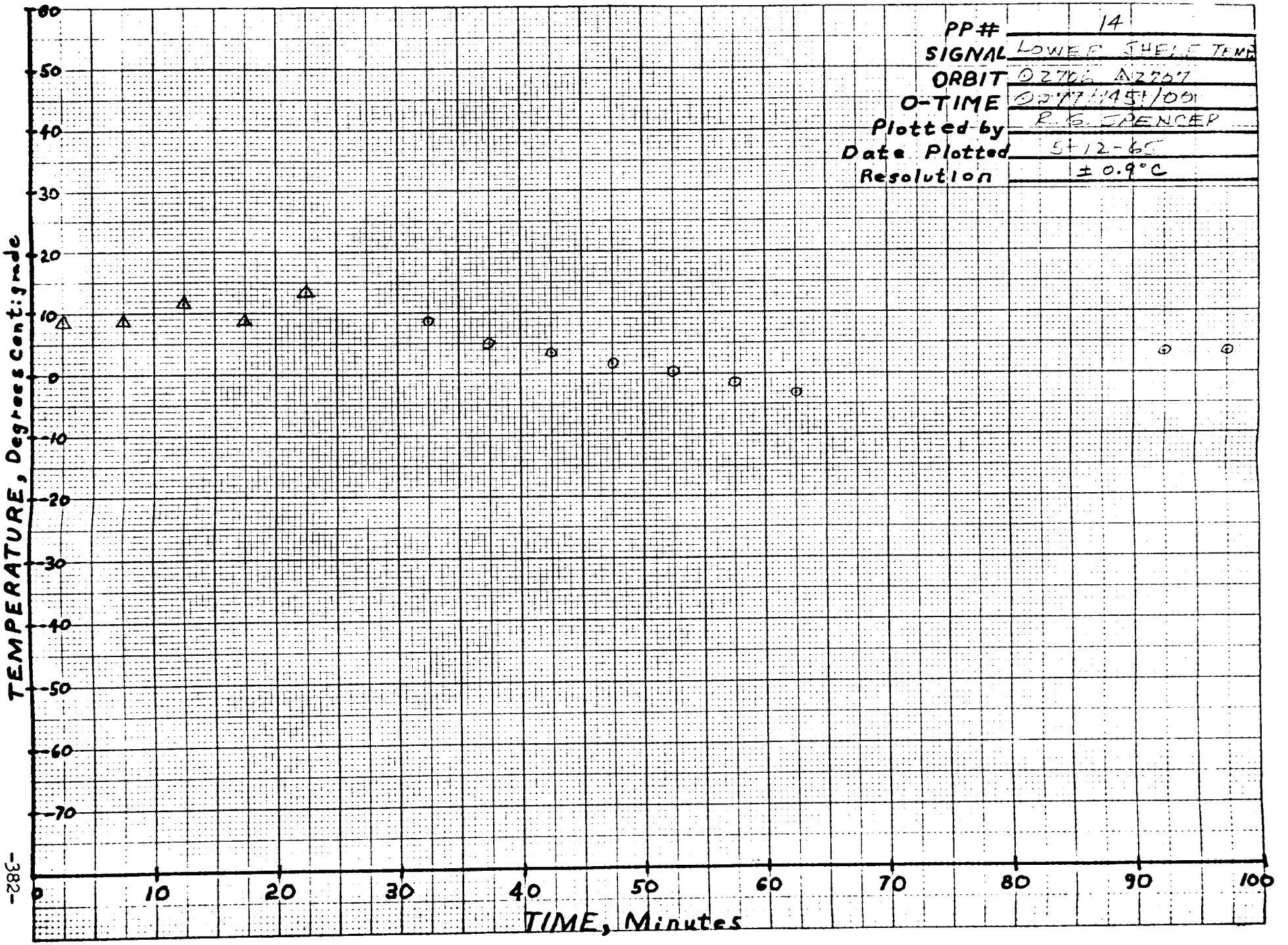
KEUFFEL & ESSER CO.

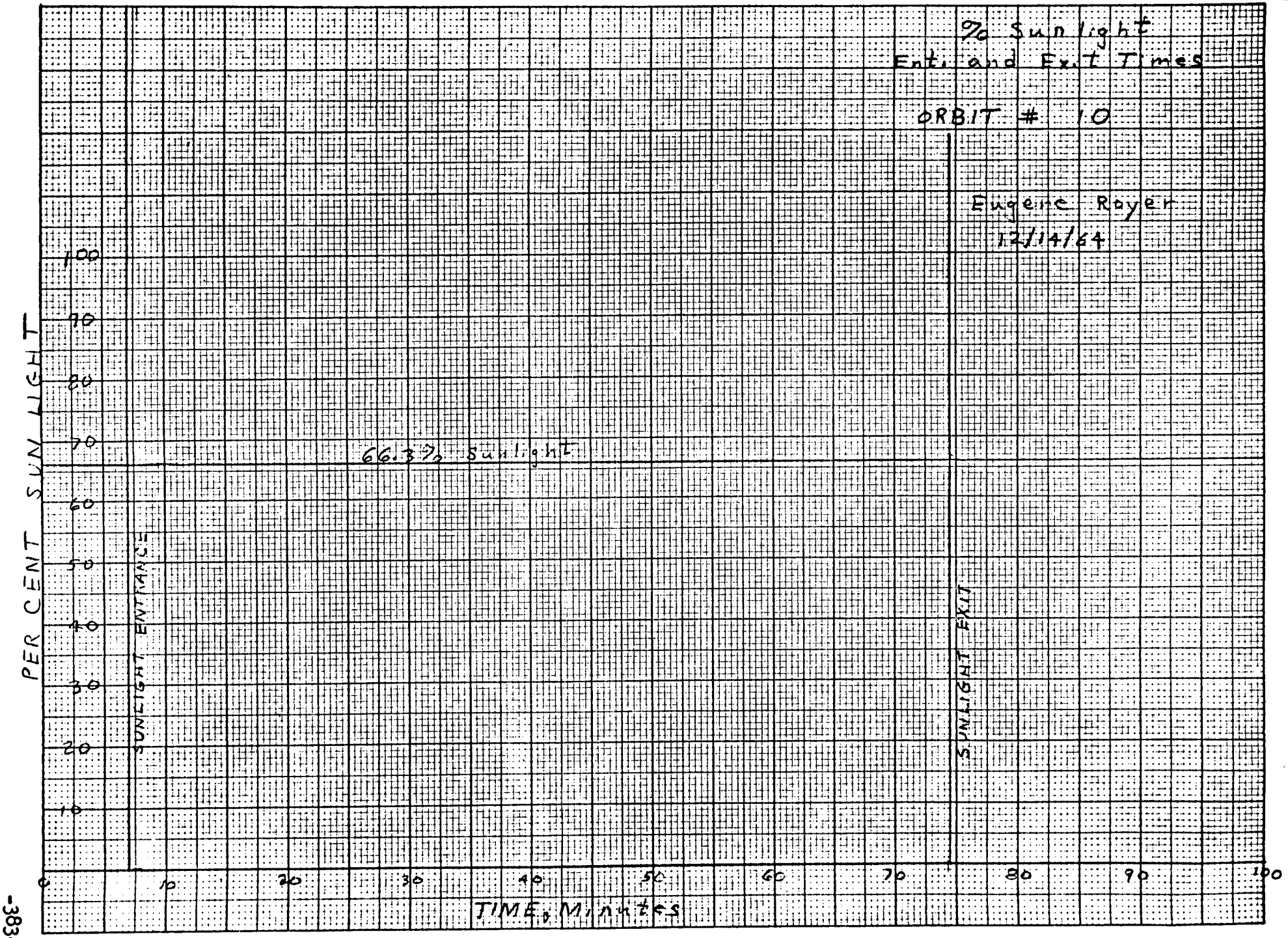


KEUFFEL & ESSER CO.

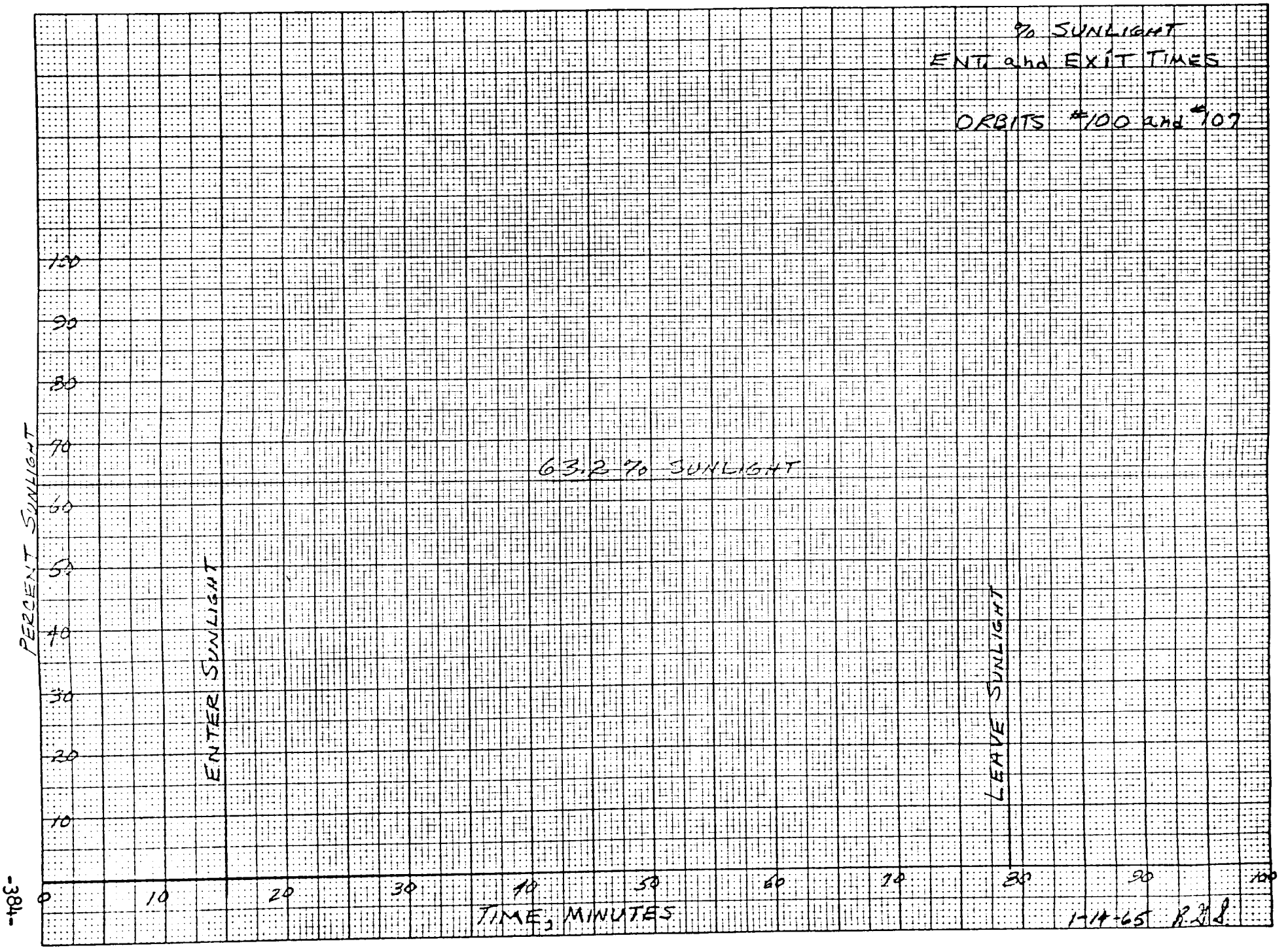


KEUFFEL & ESSER CO.

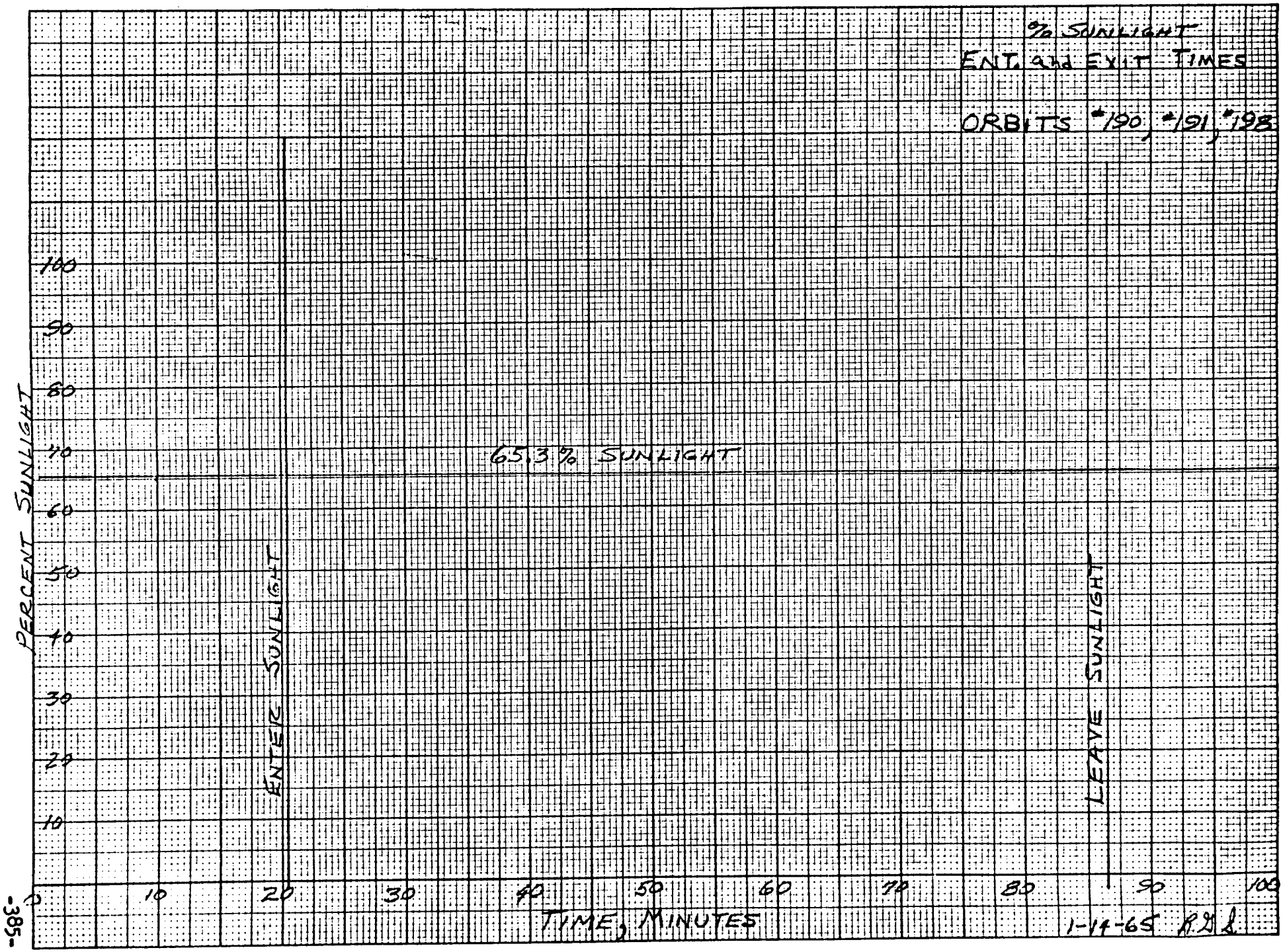



% Sunlight
Enti. and Exit Times
ORBIT # 10
Eugene Royer
12/14/64
66.3% Sunlight
SUNLIGHT ENTRANCE
SUNLIGHT EXIT
PER CENT SUN LIGHT
100
90
80
70
60
50
40
30
20
10
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

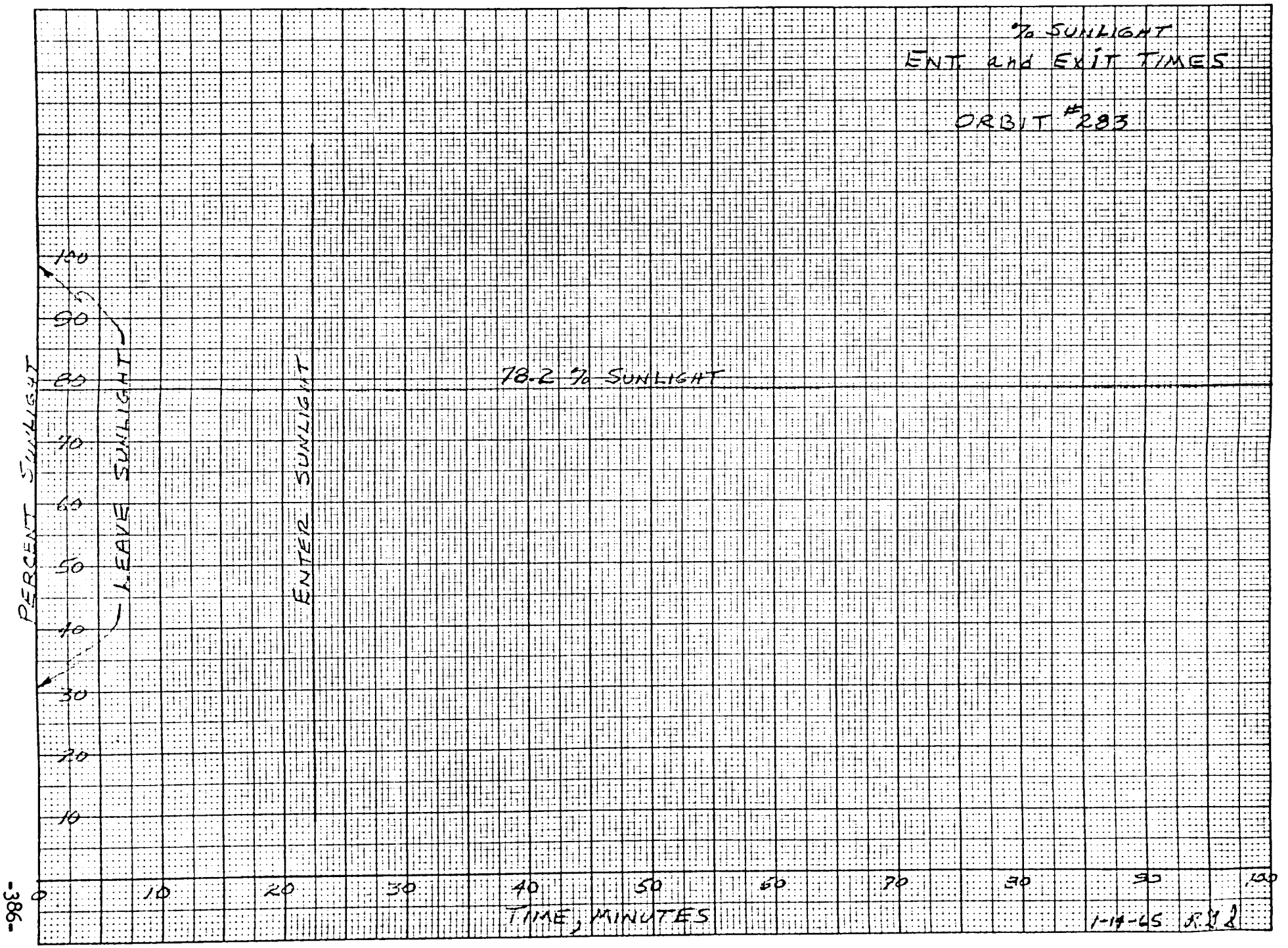
KEUFFEL & ESSER CO.



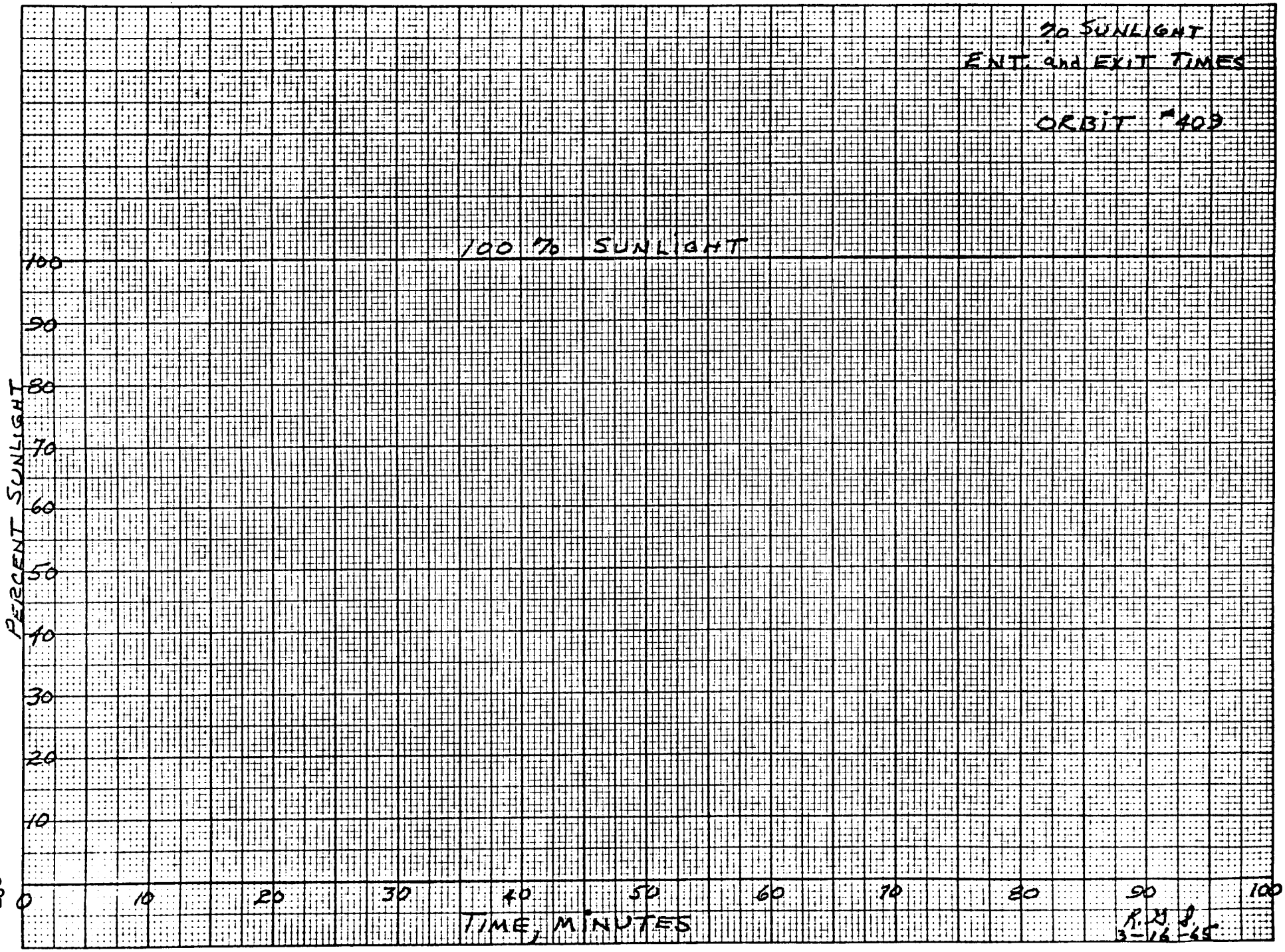
KEUFFEL & ESSER CO.



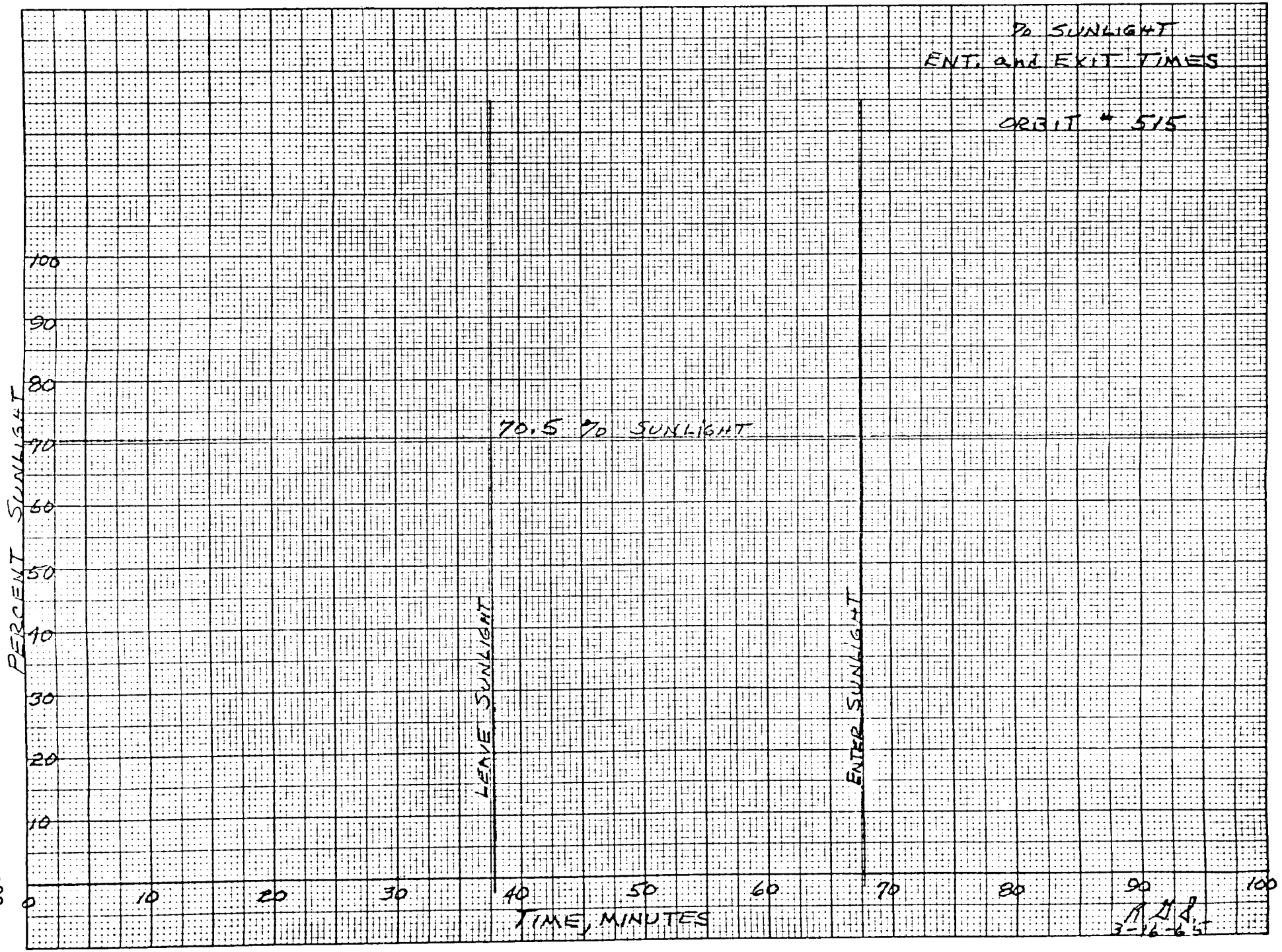
KEUFFEL & ESSER CO.



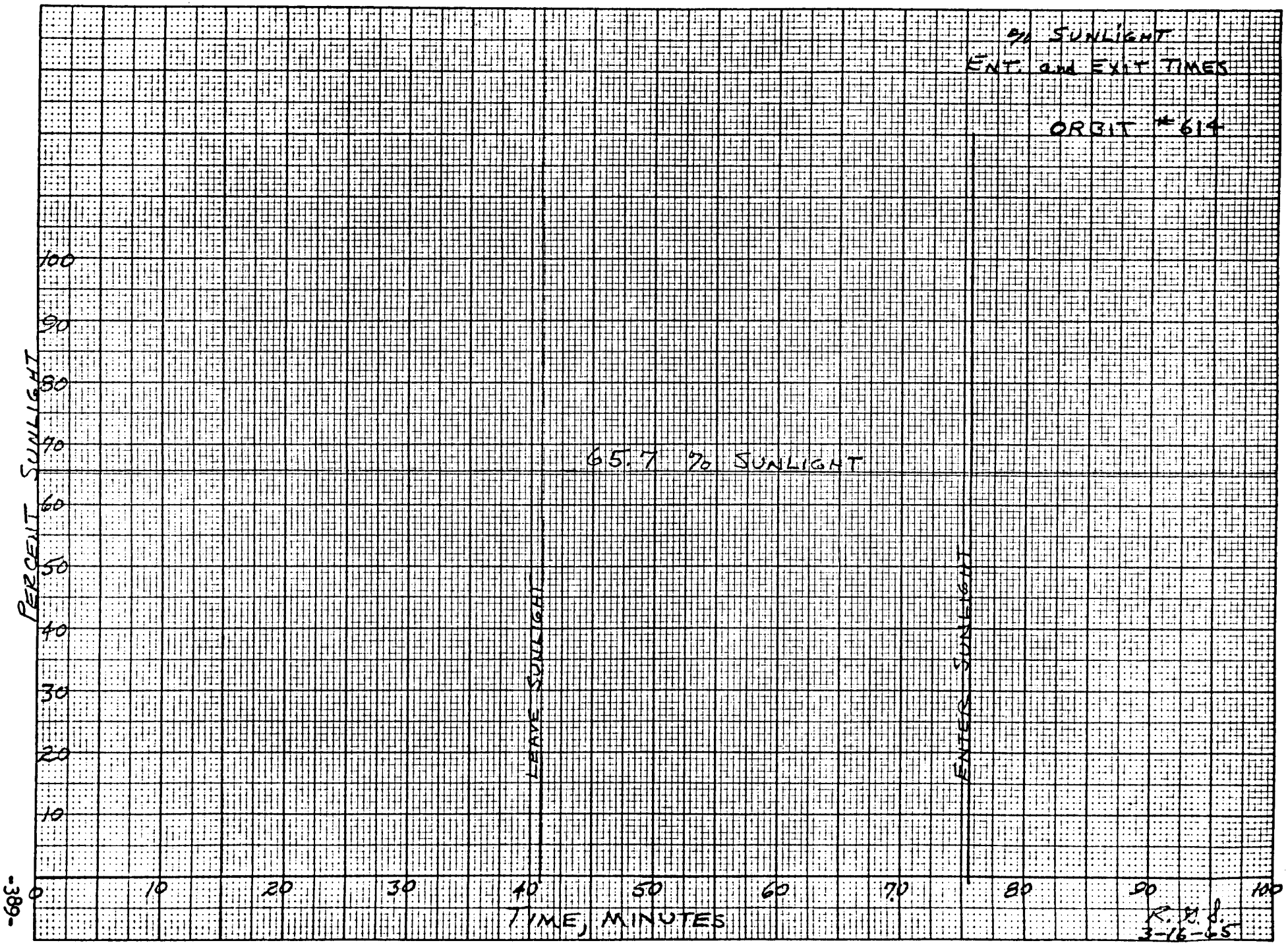
KEUFFEL & ESSER CO.



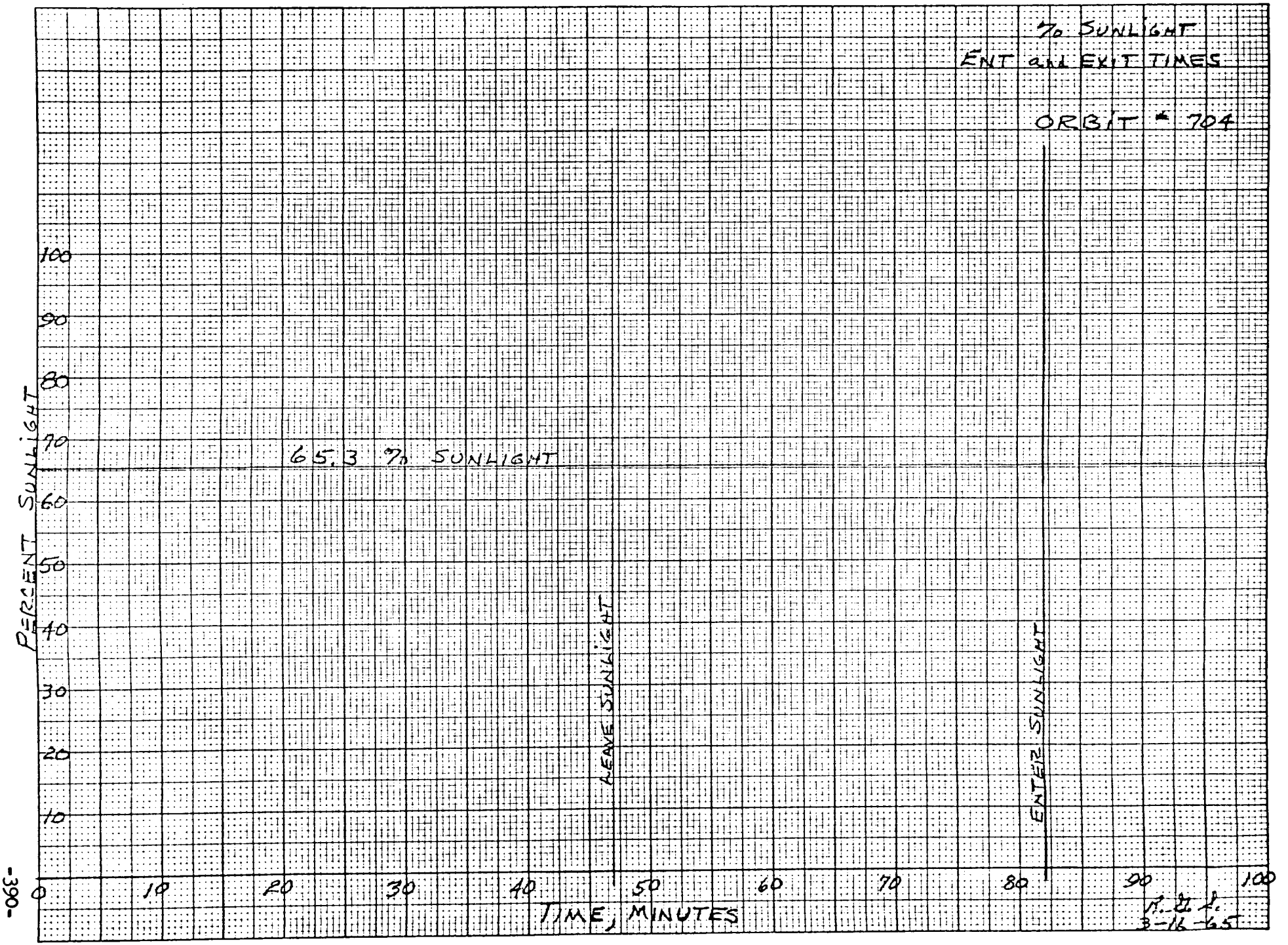
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



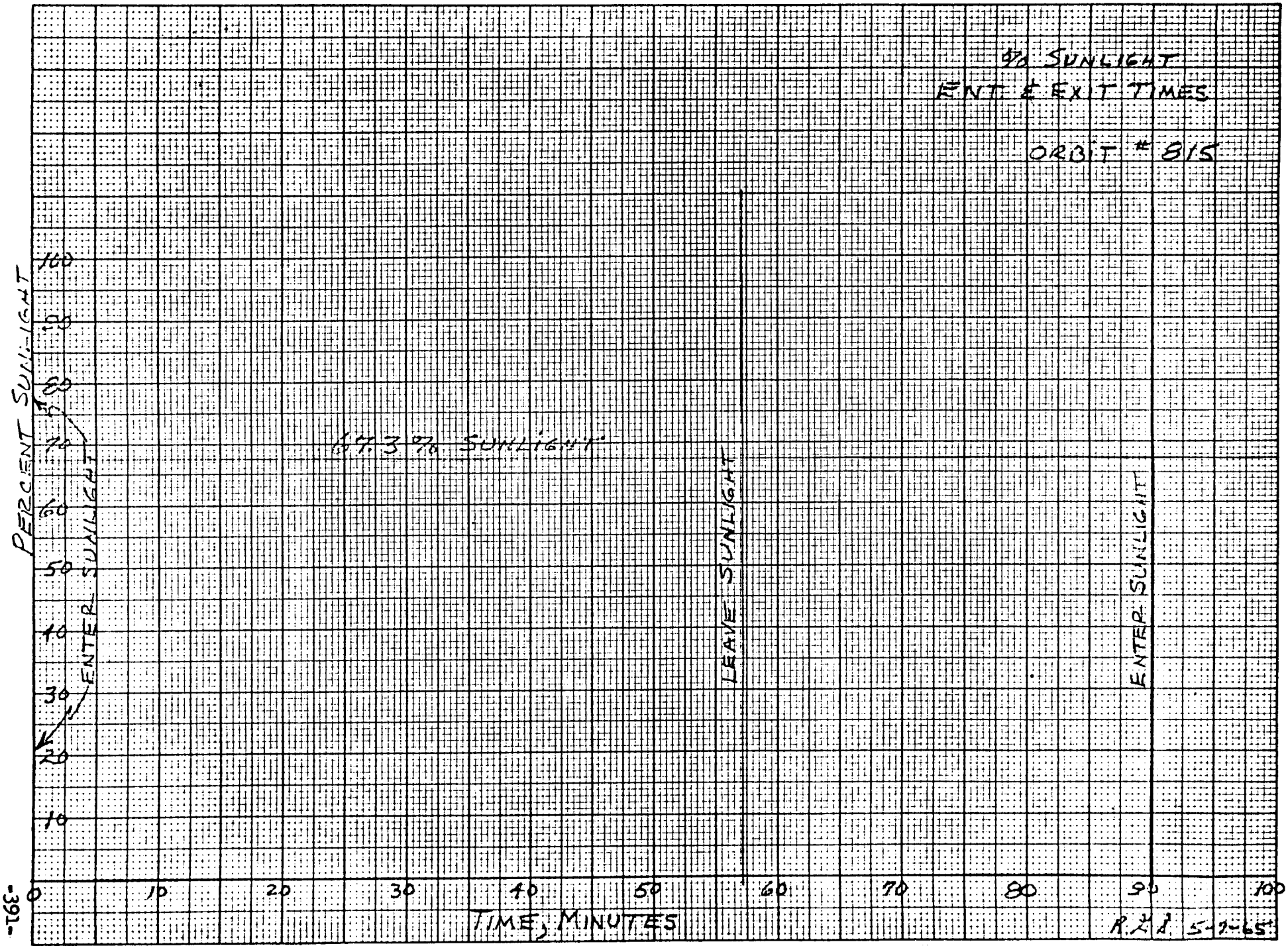
KEUFFEL & ESSER CO.

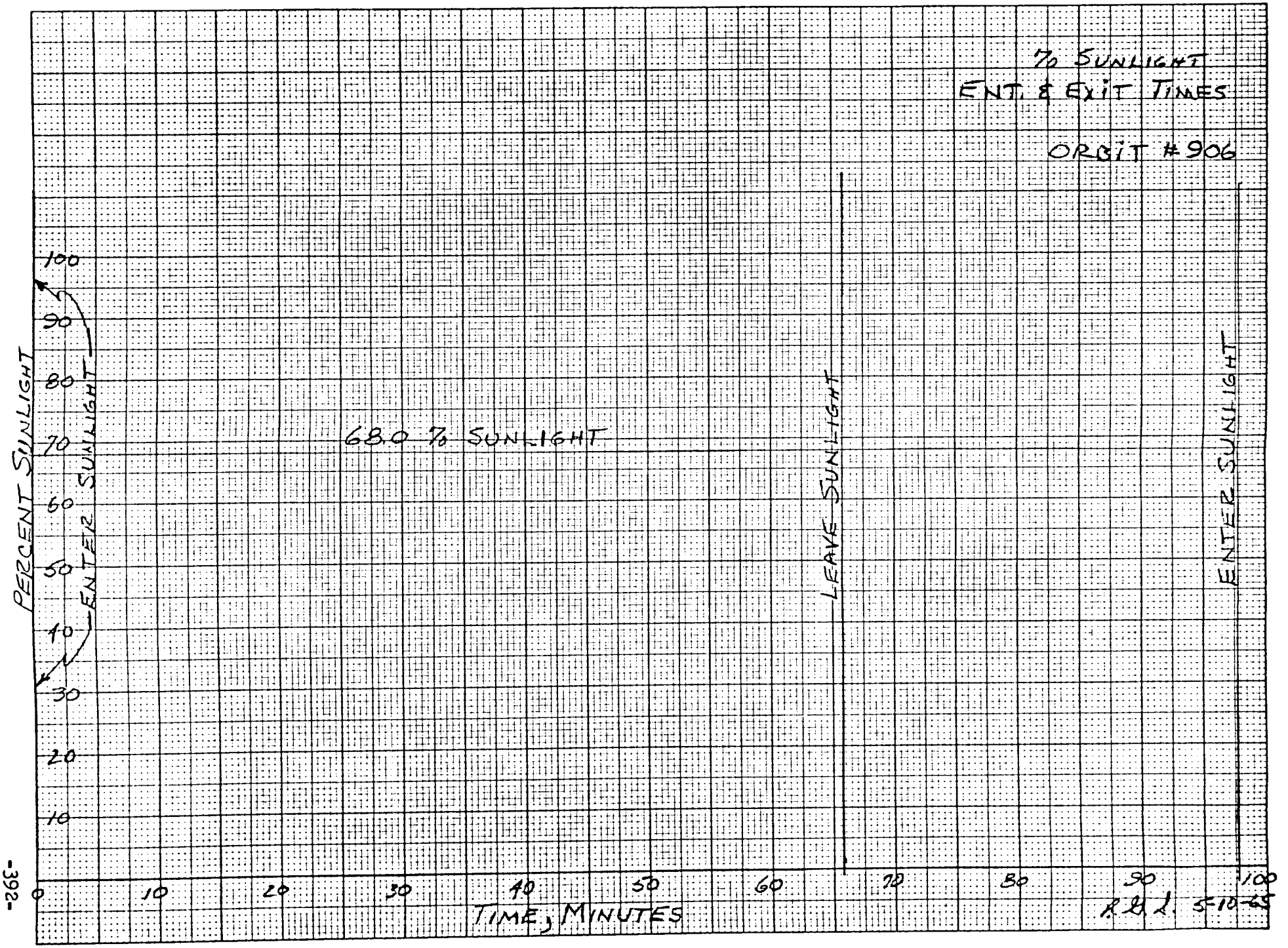


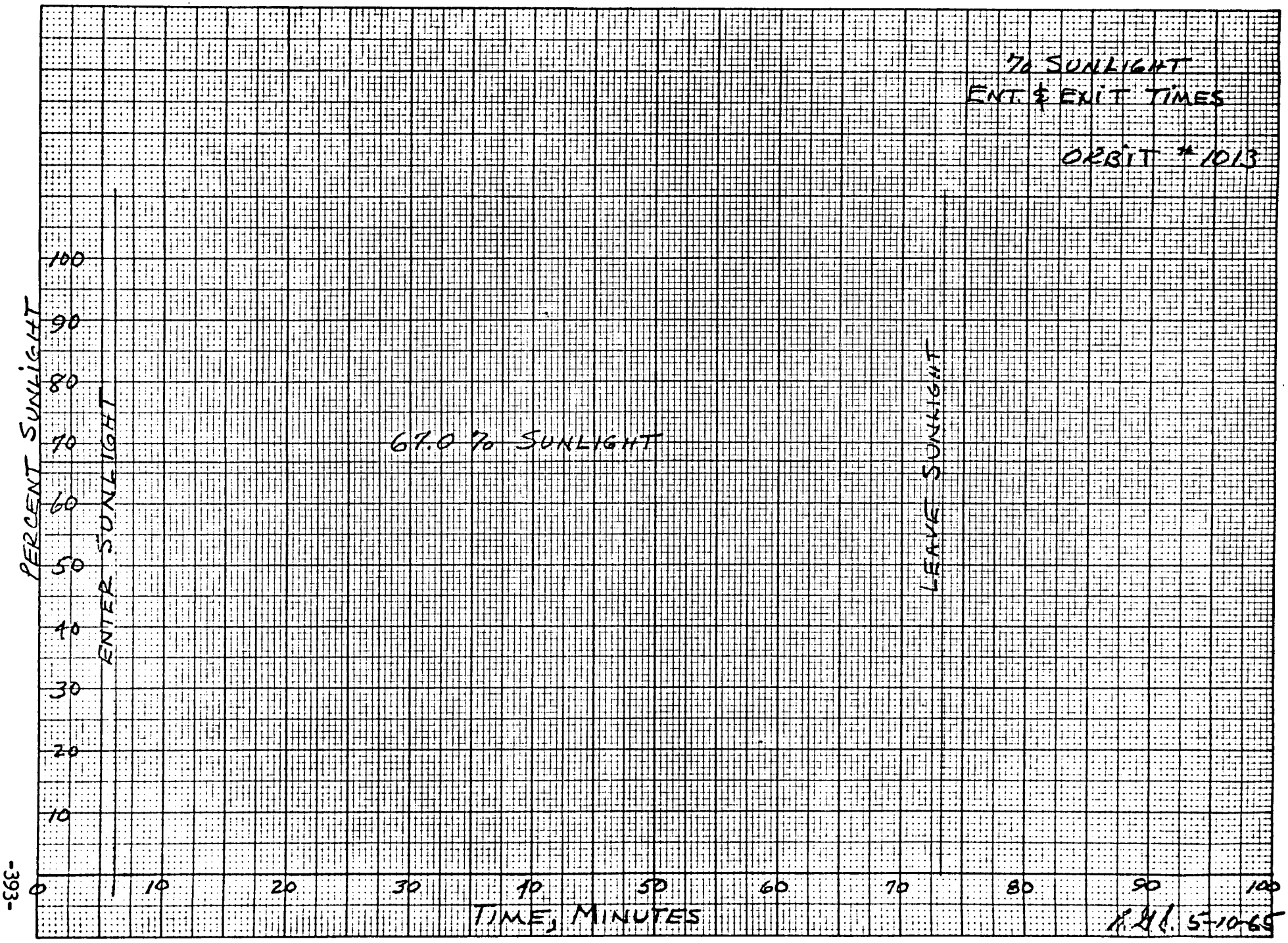
KEUFFEL & ESSER CO.



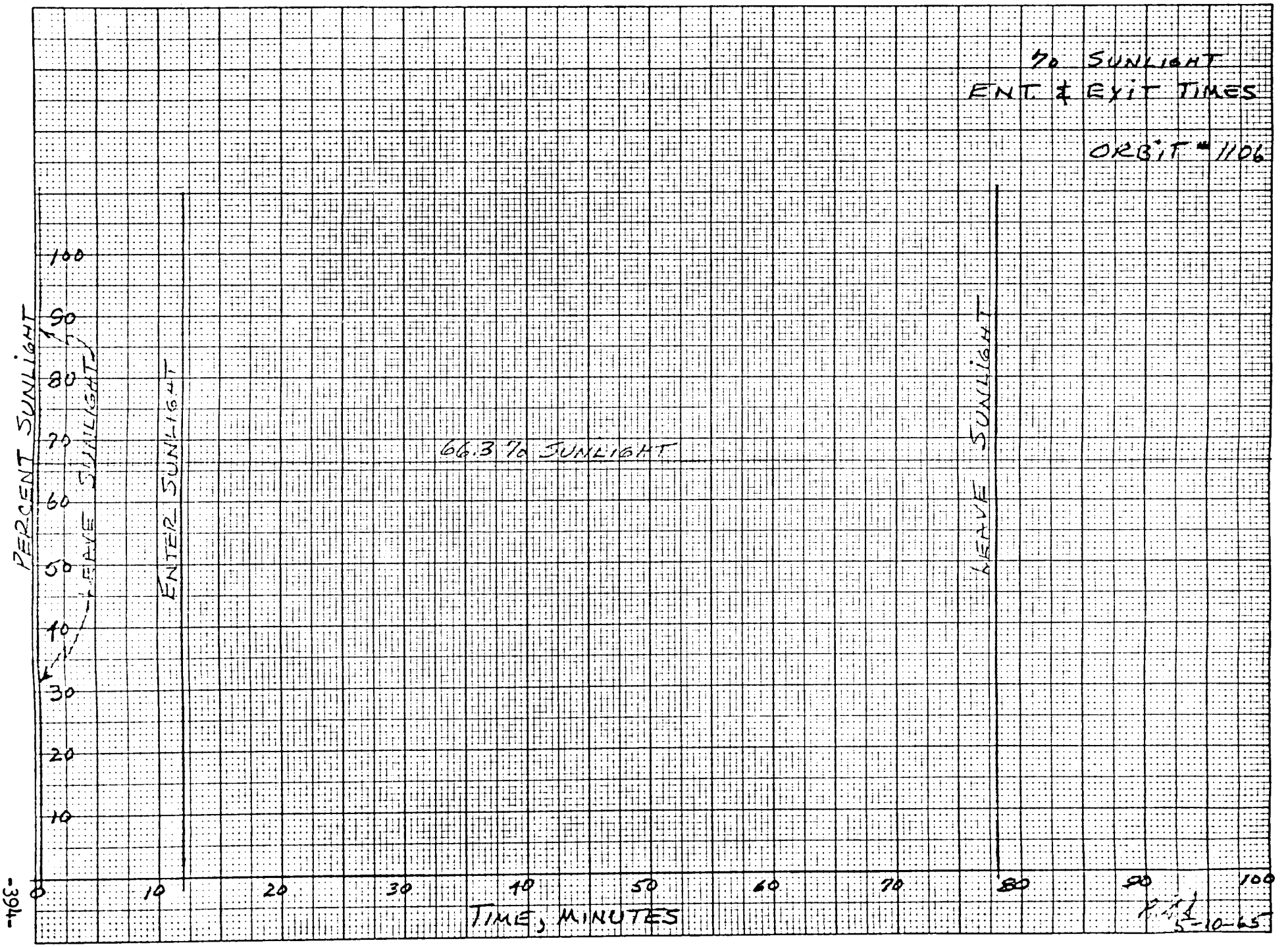
K&E 7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

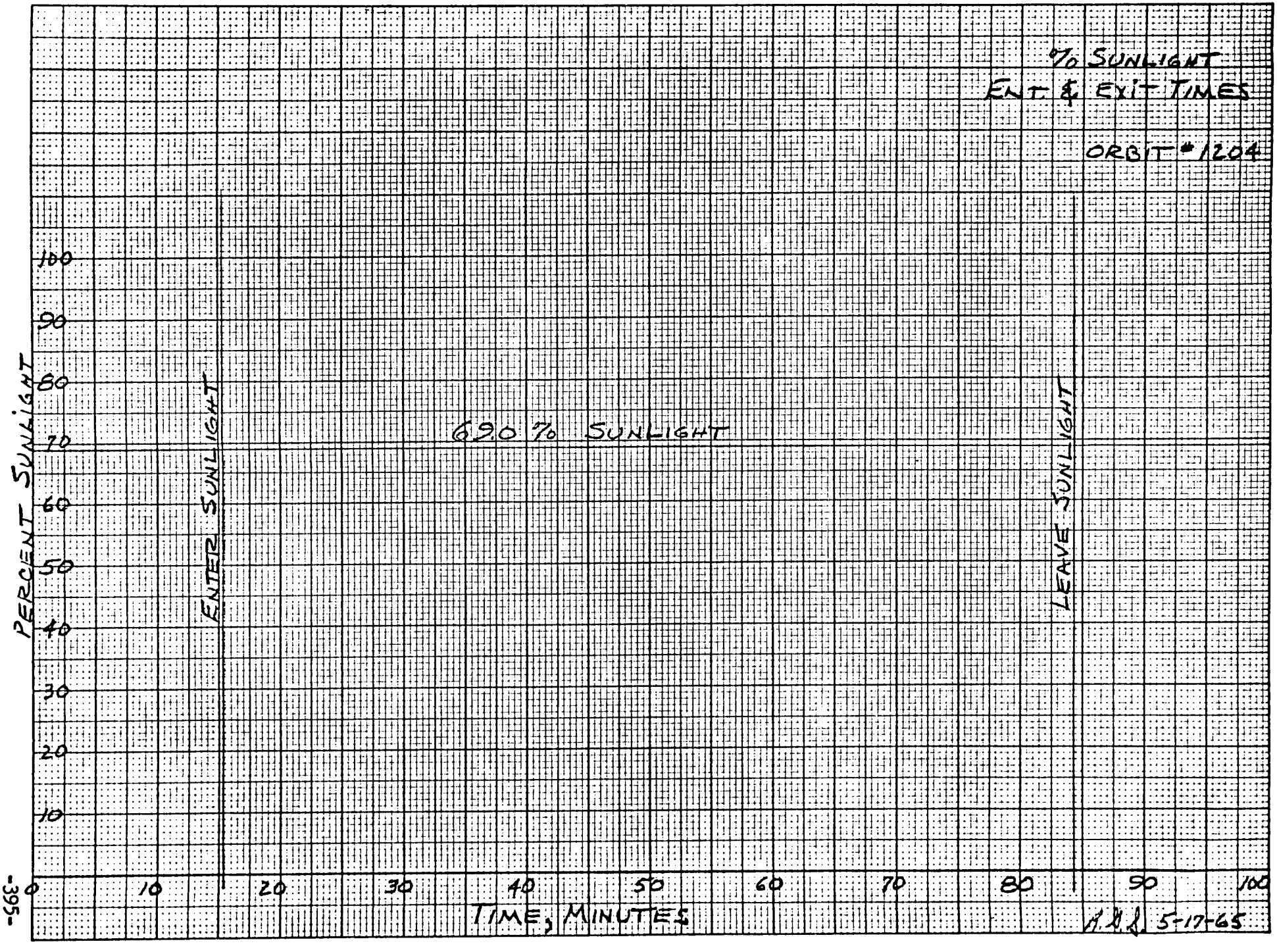



% SUNLIGHT
ENT. & EXIT TIMES
ORBIT #906
68.0 % SUNLIGHT
LEAVE SUNLIGHT
ENTER SUNLIGHT
ENTER SUNLIGHT
PERCENT SUNLIGHT
100
90
80
70
60
50
40
30
20
10
0
10
20
30
40
50
60
70
80
90
100
TIME, MINUTES
R.H.L. 5-10-65

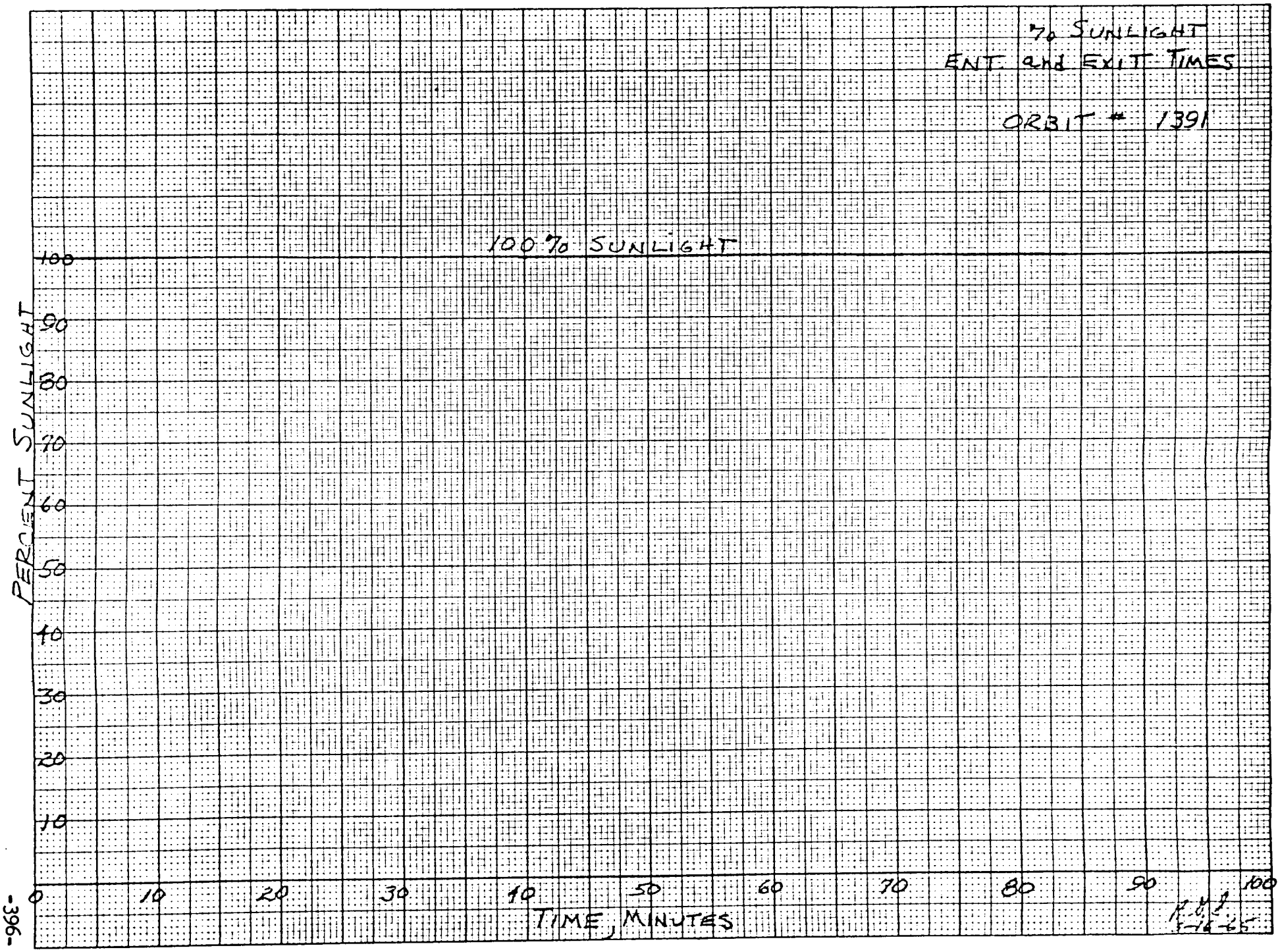

% SUNLIGHT
ENT. & EXIT TIMES
ORBIT # 1013
PERCENT SUNLIGHT
100
90
80
70
60
50
40
30
20
10
0
ENTER SUNLIGHT
67.0 % SUNLIGHT
LEAVE SUNLIGHT
10
20
30
40
50
60
70
80
90
100
TIME, MINUTES
R.H.L. 5-10-65

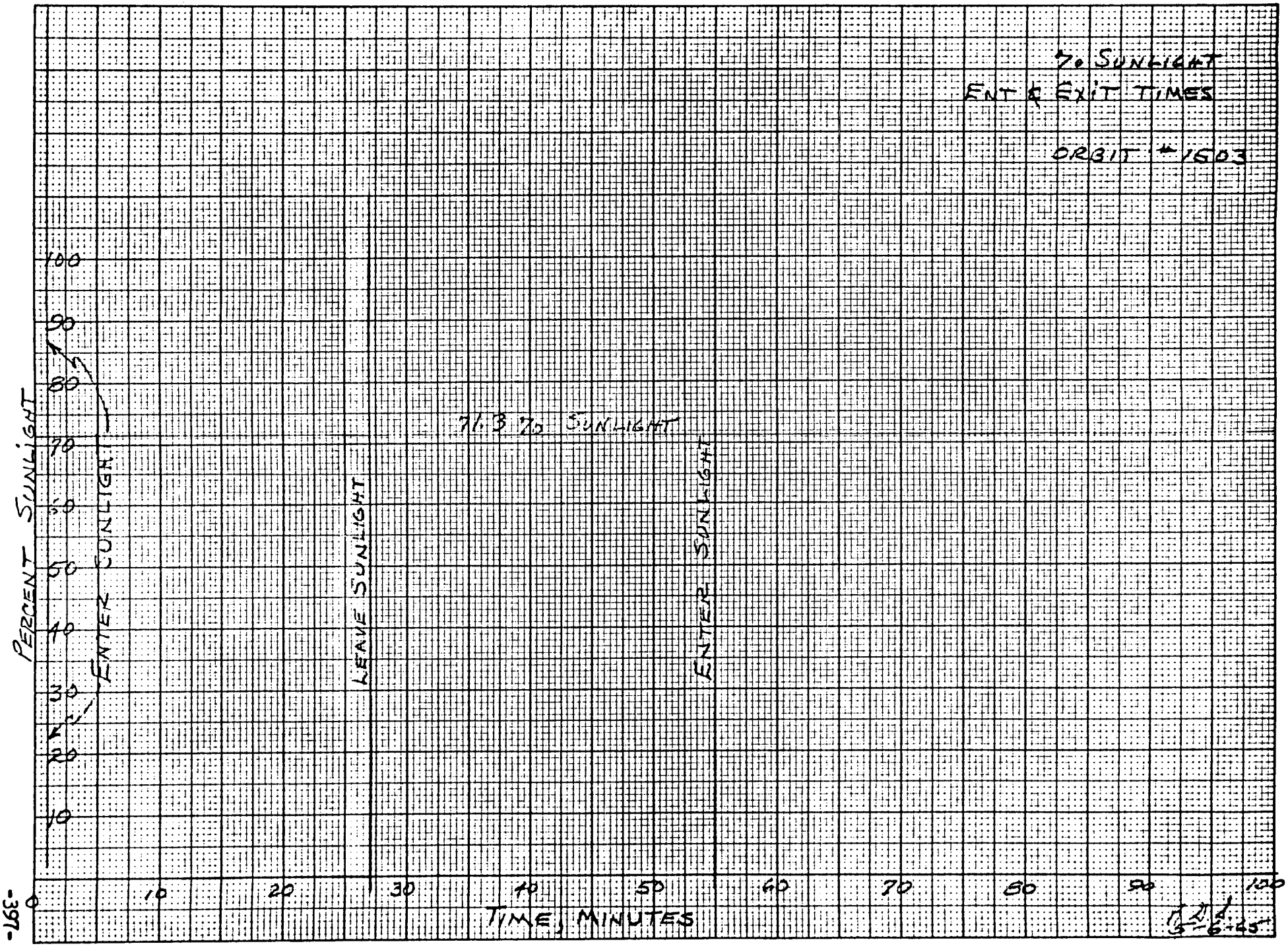
KEUFFEL & ESSER CO.



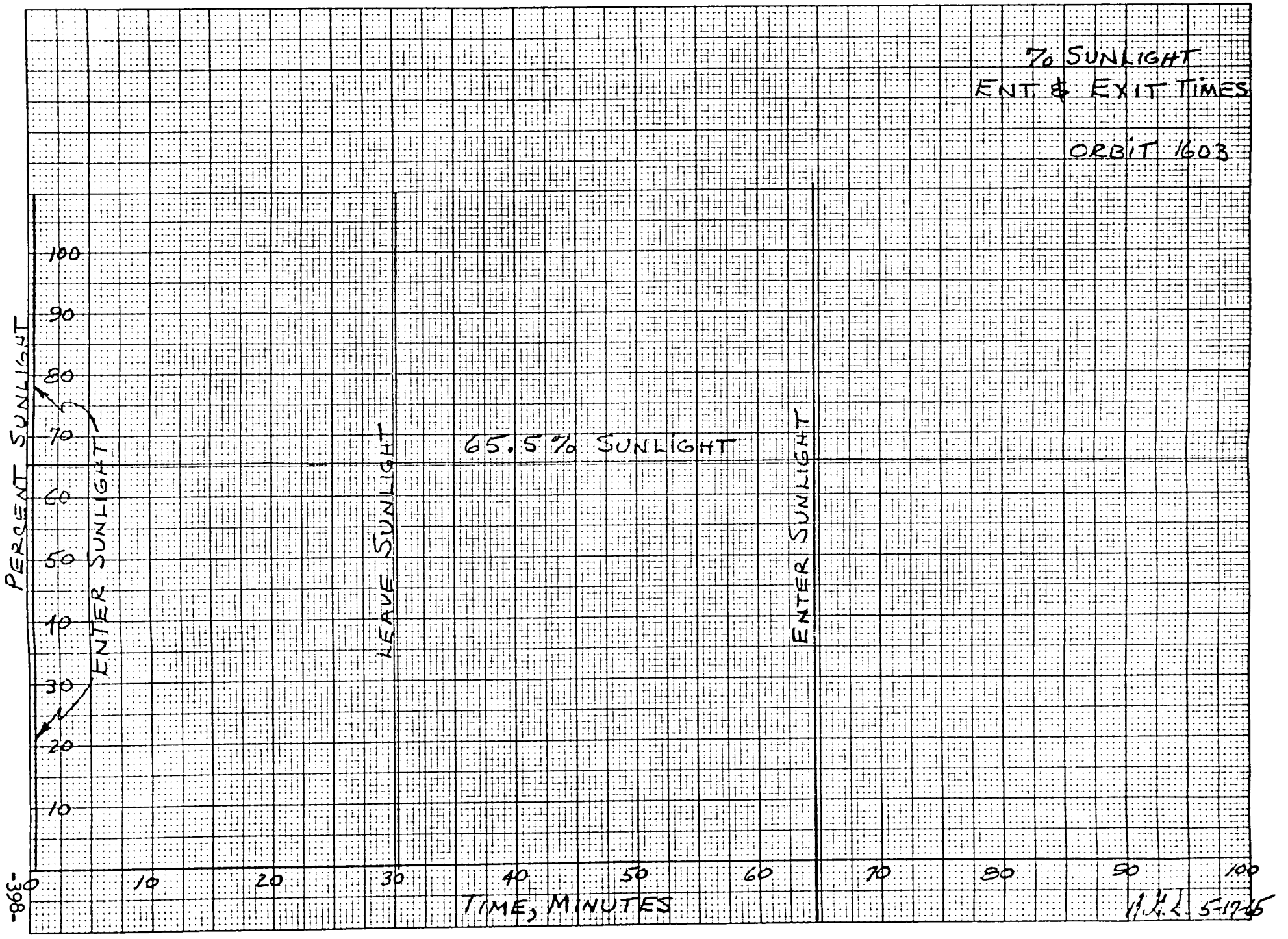

% SUNLIGHT
ENT. & EXIT TIMES
ORBIT #1204
PERCENT SUNLIGHT
100
90
80
70
60
50
40
30
20
10
0
ENTER SUNLIGHT
69.0 % SUNLIGHT
LEAVE SUNLIGHT
10
20
30
40
50
60
70
80
90
100
TIME, MINUTES
5-17-65

KEUFFEL & ESSER CO.

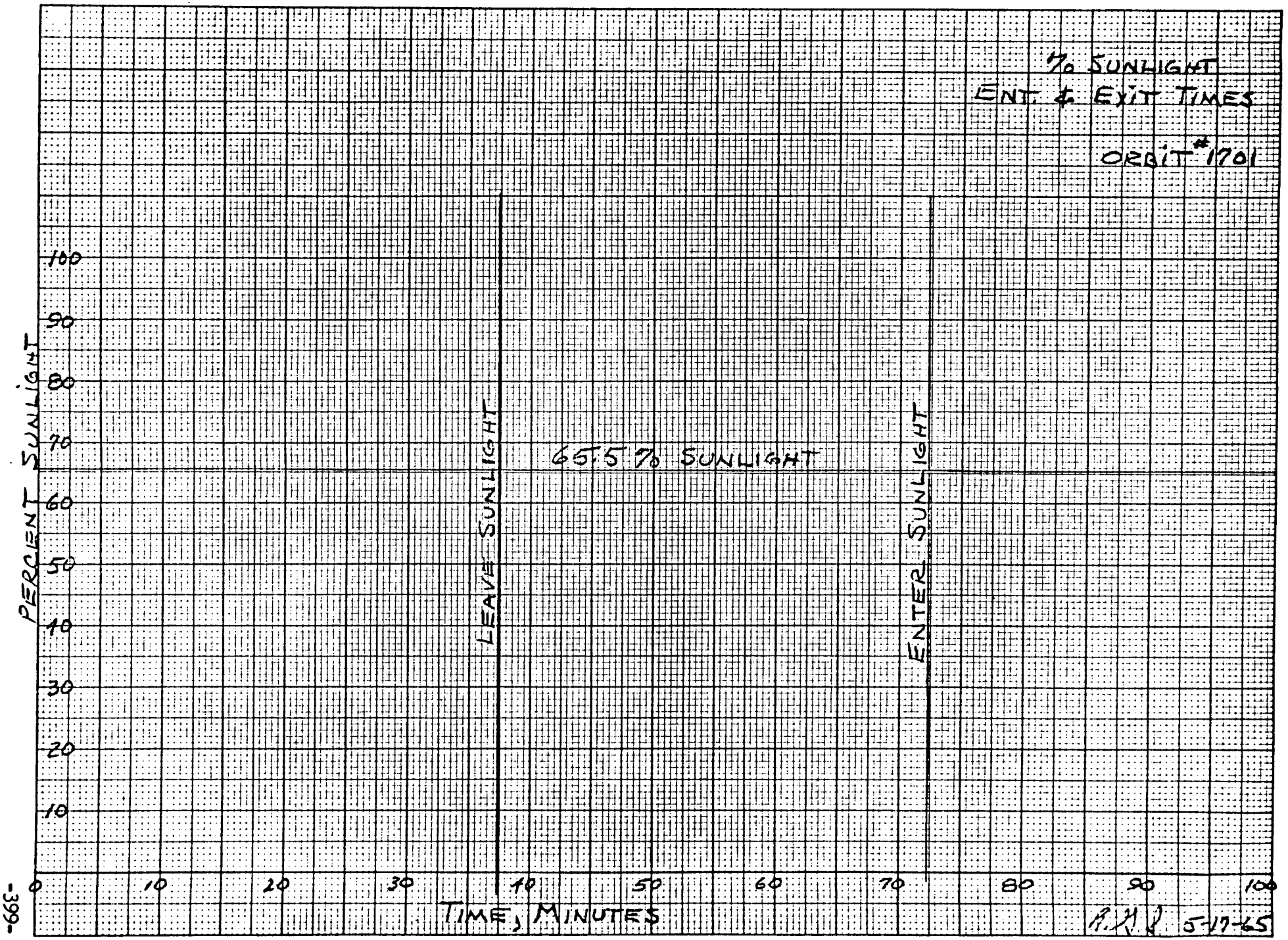



% SUNLIGHT
ENT & EXIT TIMES
ORBIT # 1603
71.3 % SUNLIGHT
ENTER SUNLIGHT
LEAVE SUNLIGHT
ENTER SUNLIGHT
PERCENT SUNLIGHT
100
90
80
70
60
50
40
30
20
10
0
10
20
30
40
50
60
70
80
90
100
TIME, MINUTES

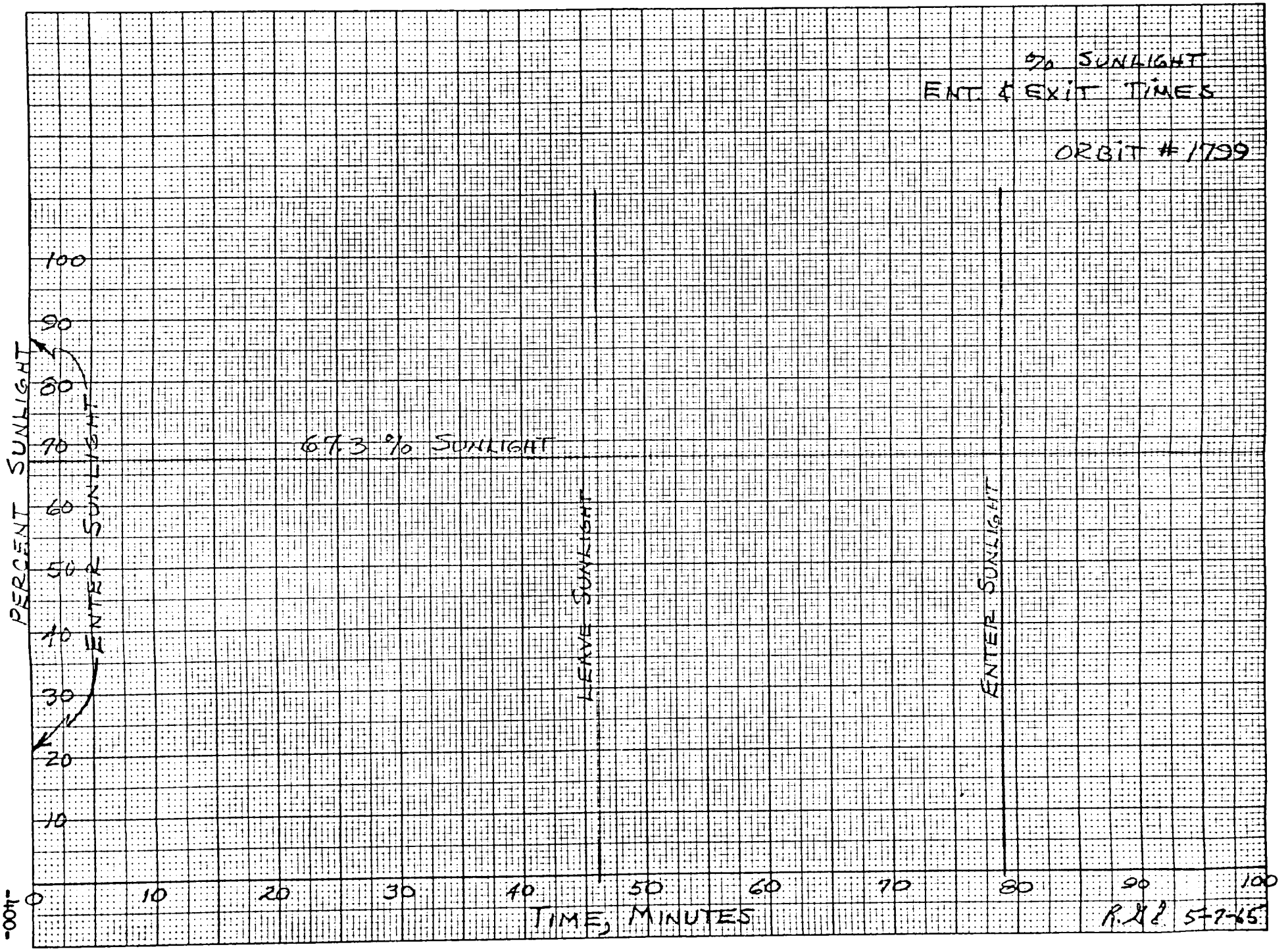
KEUFFEL & ESSER CO.



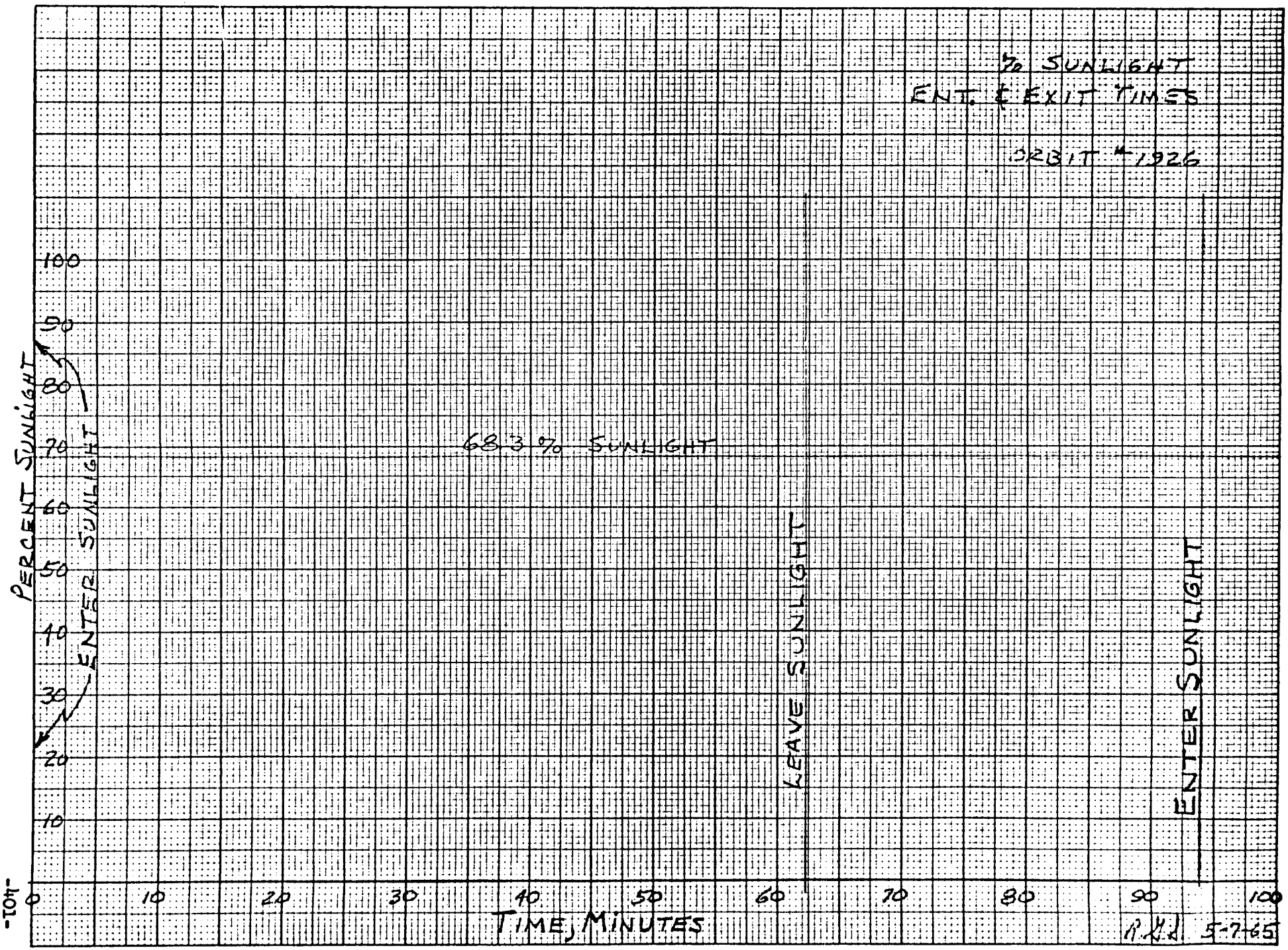
KEUFFEL & ESSER CO.



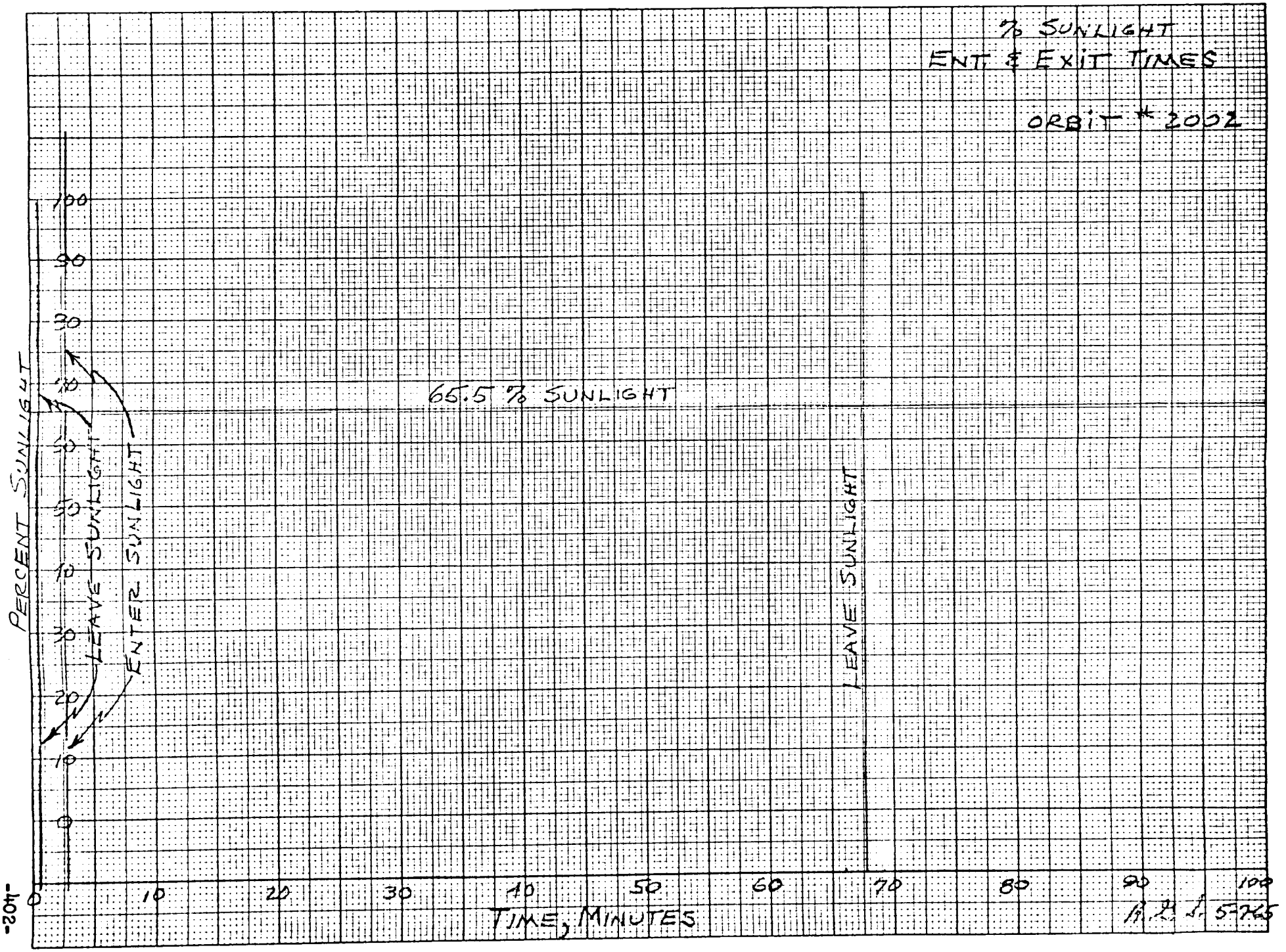
KEUFFEL & ESSER CO.



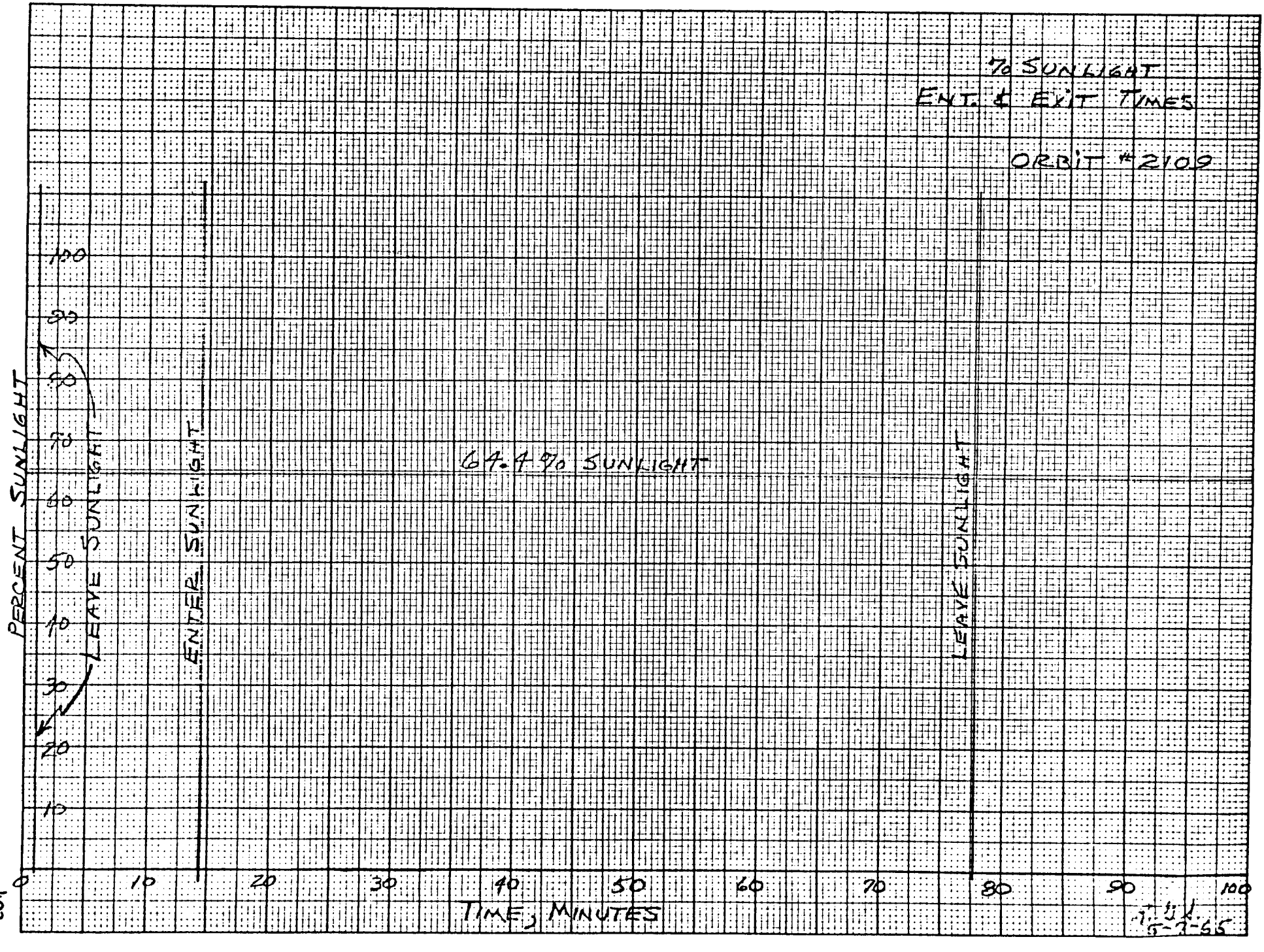
KEUFFEL & ESSER CO.



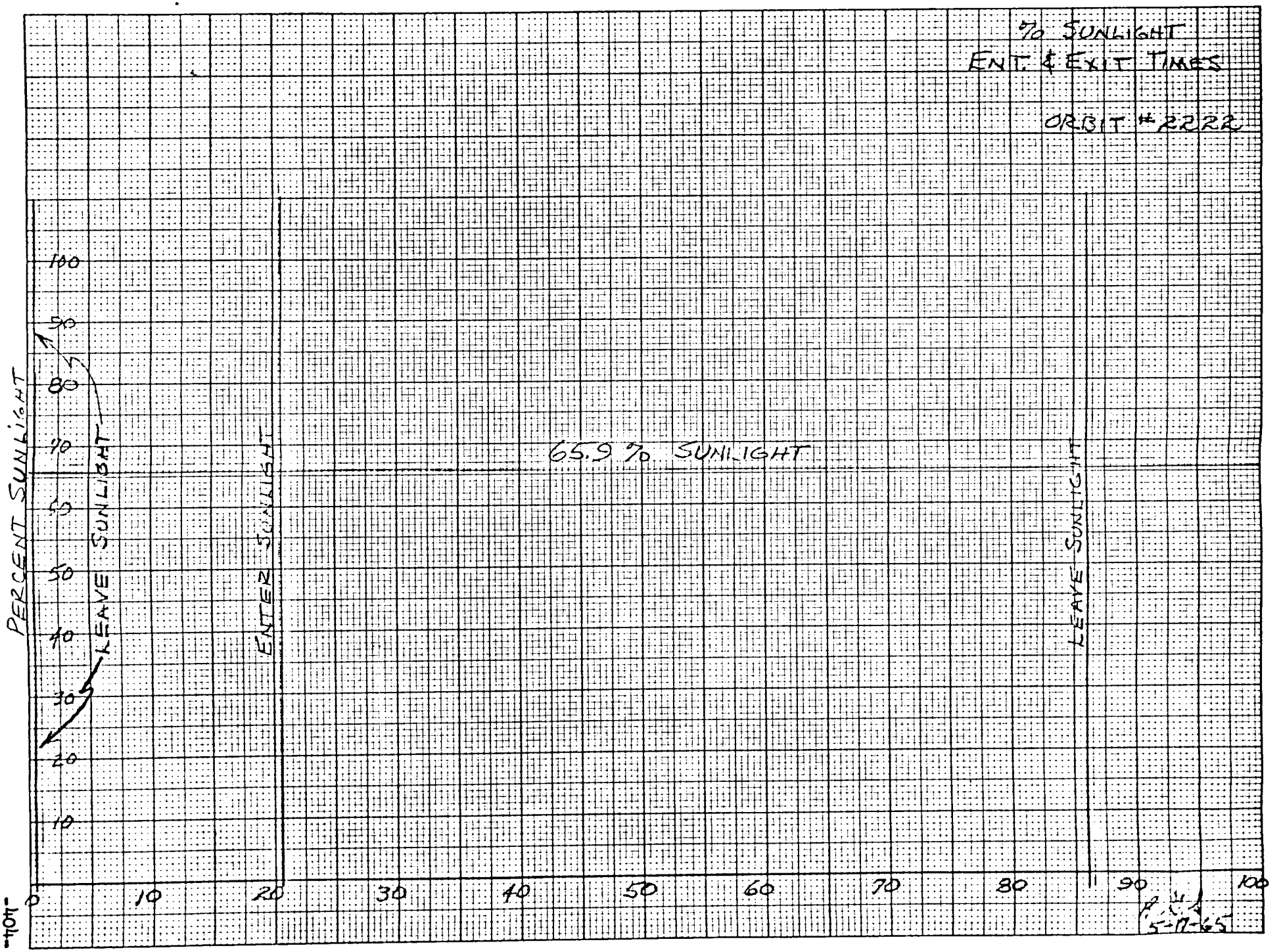
KEUFFEL & ESSER CO.



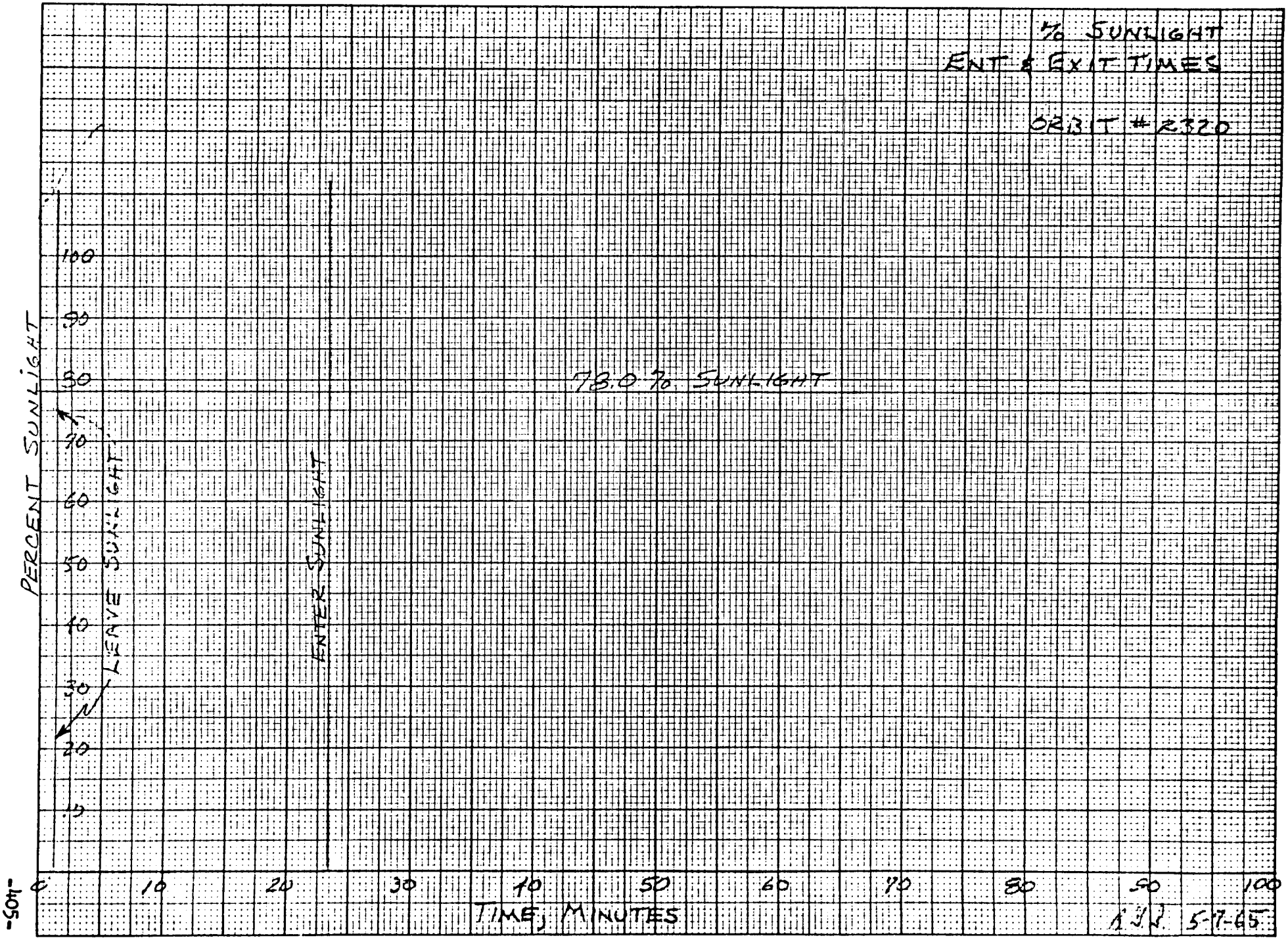
KEUFFEL & ESSER CO.



7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

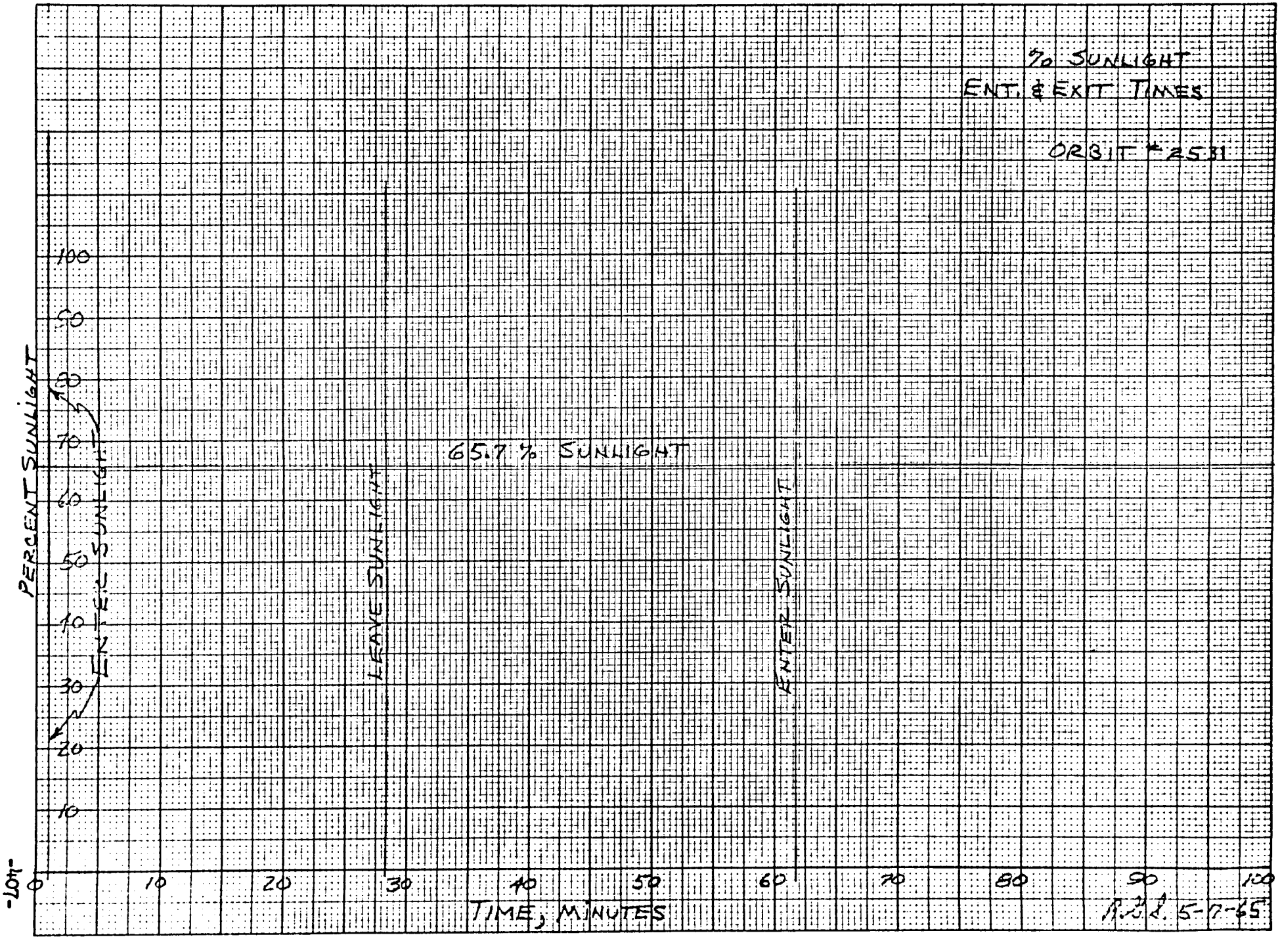


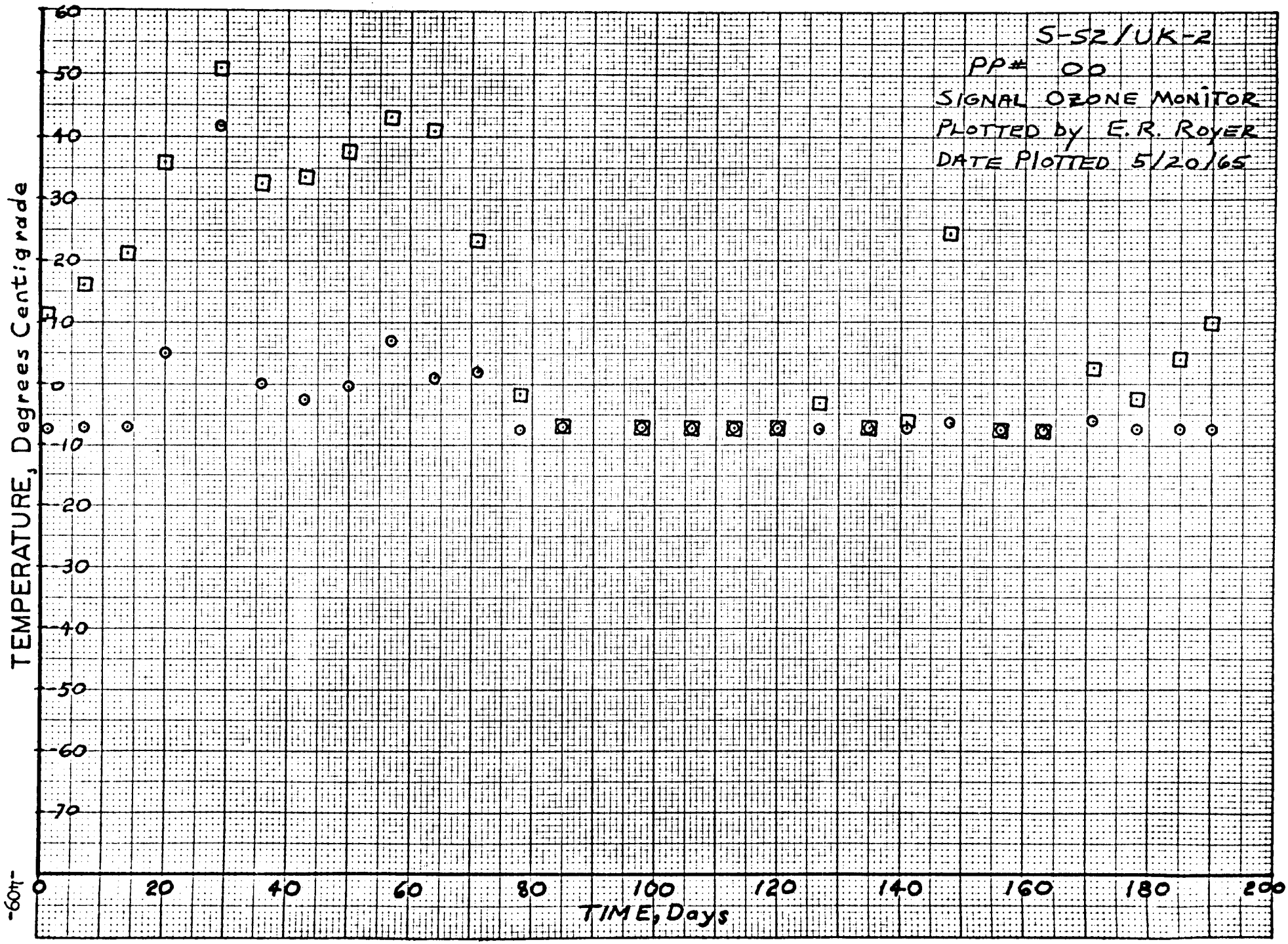
REUFFEL & ESSER CO.



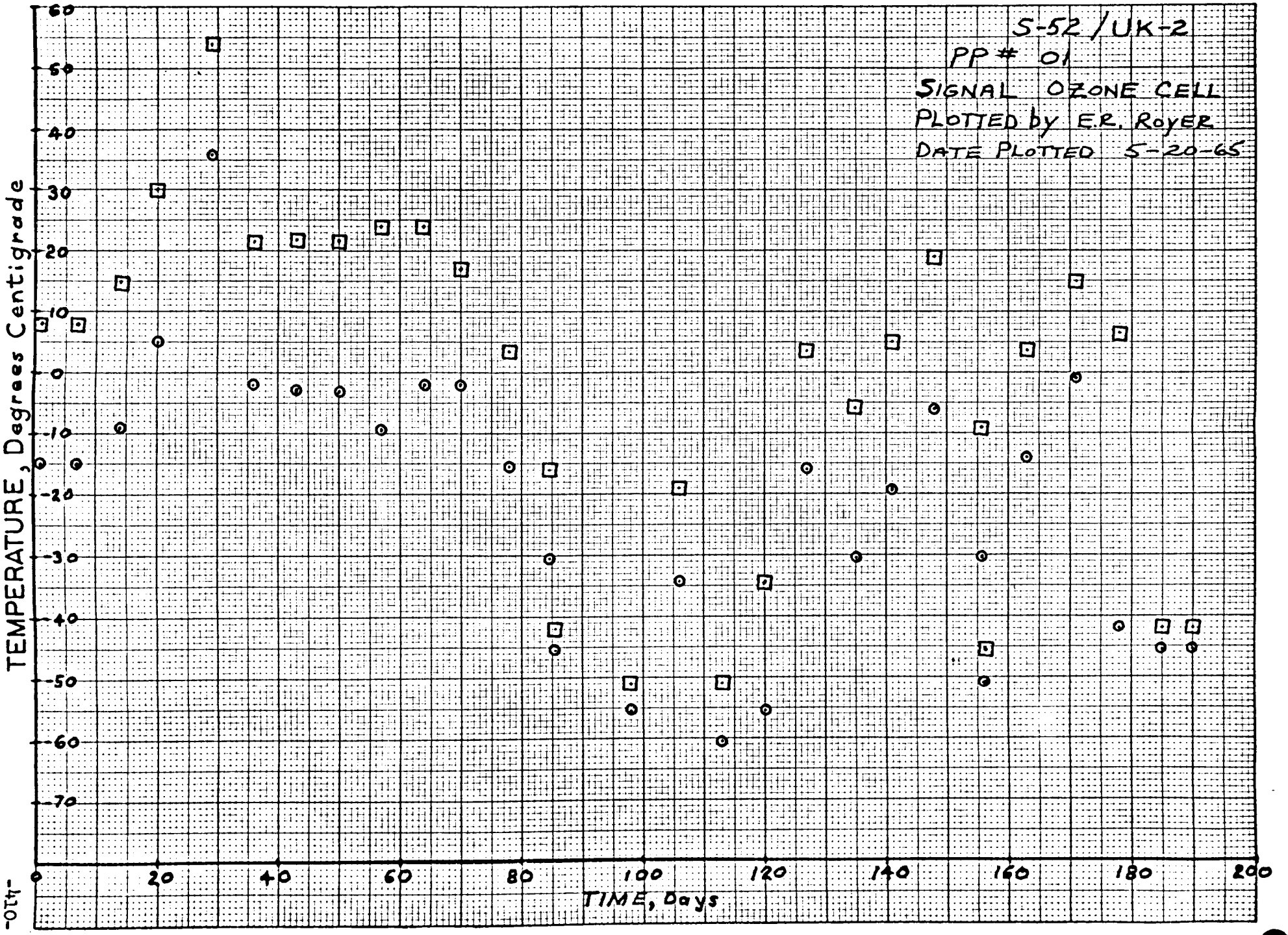
K&E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

KEUFFEL & ESSER CO.

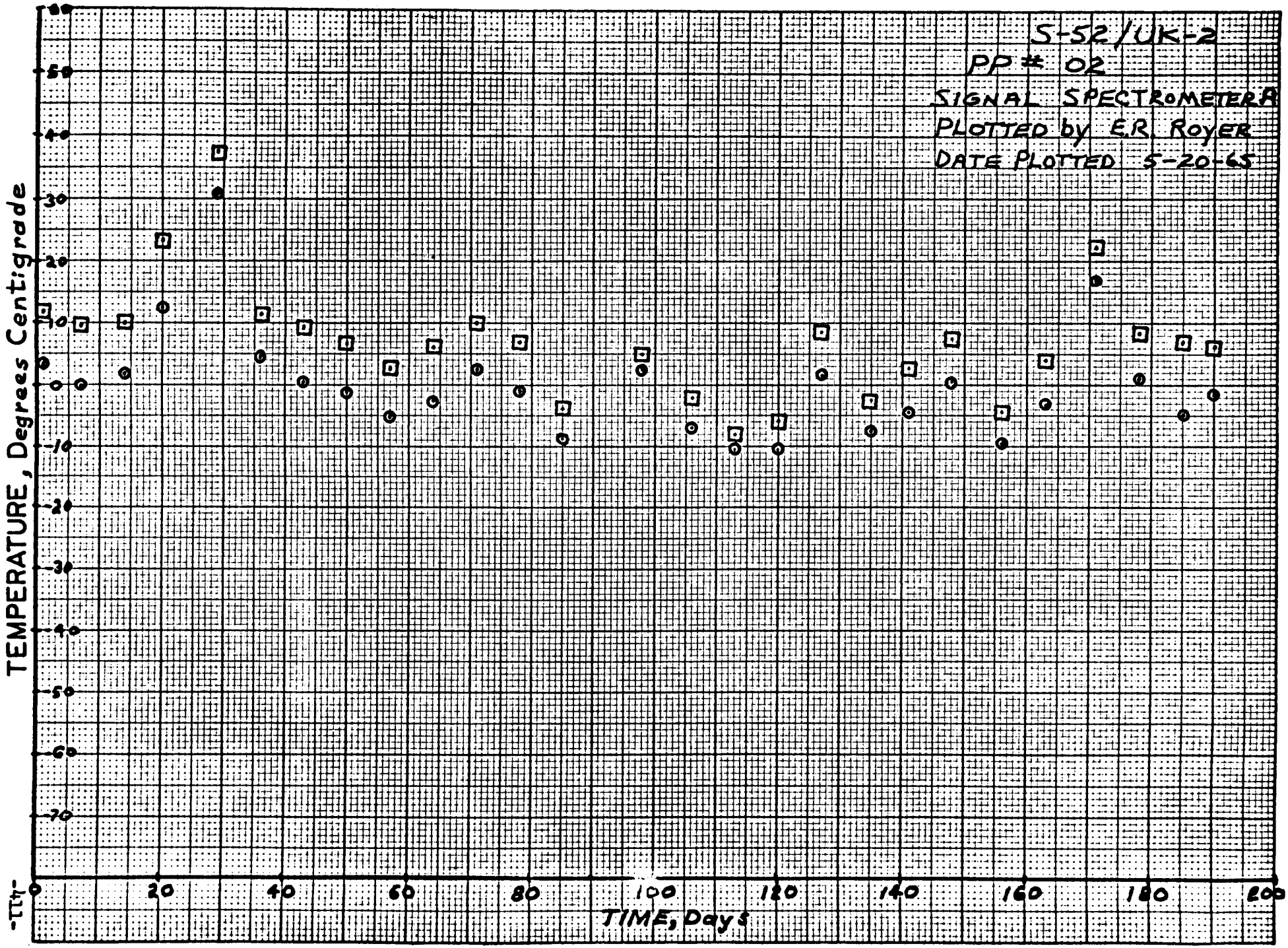



S-52/UK-2
PP# 00
SIGNAL OZONE MONITOR
PLOTTED by E.R. ROYER
DATE PLOTTED 5/20/65
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
20
40
60
80
100
120
140
160
180
200
TIME, Days

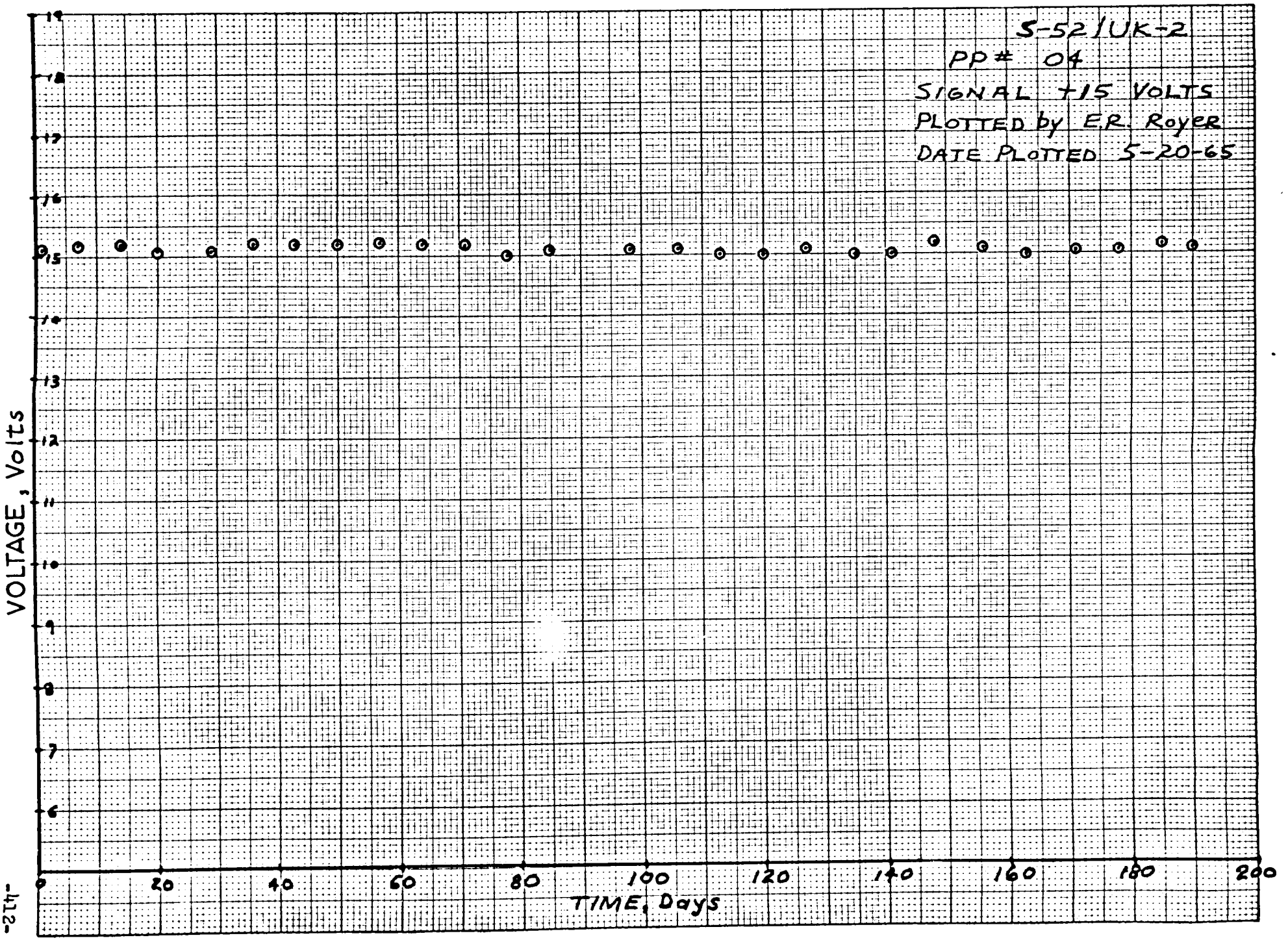
K&E 10 X 10 TO 1 INCH 46 1476
7½ X 10 IN. • ALBANENE • MADE IN U.S.A.
KEUFFEL & ESSER CO.

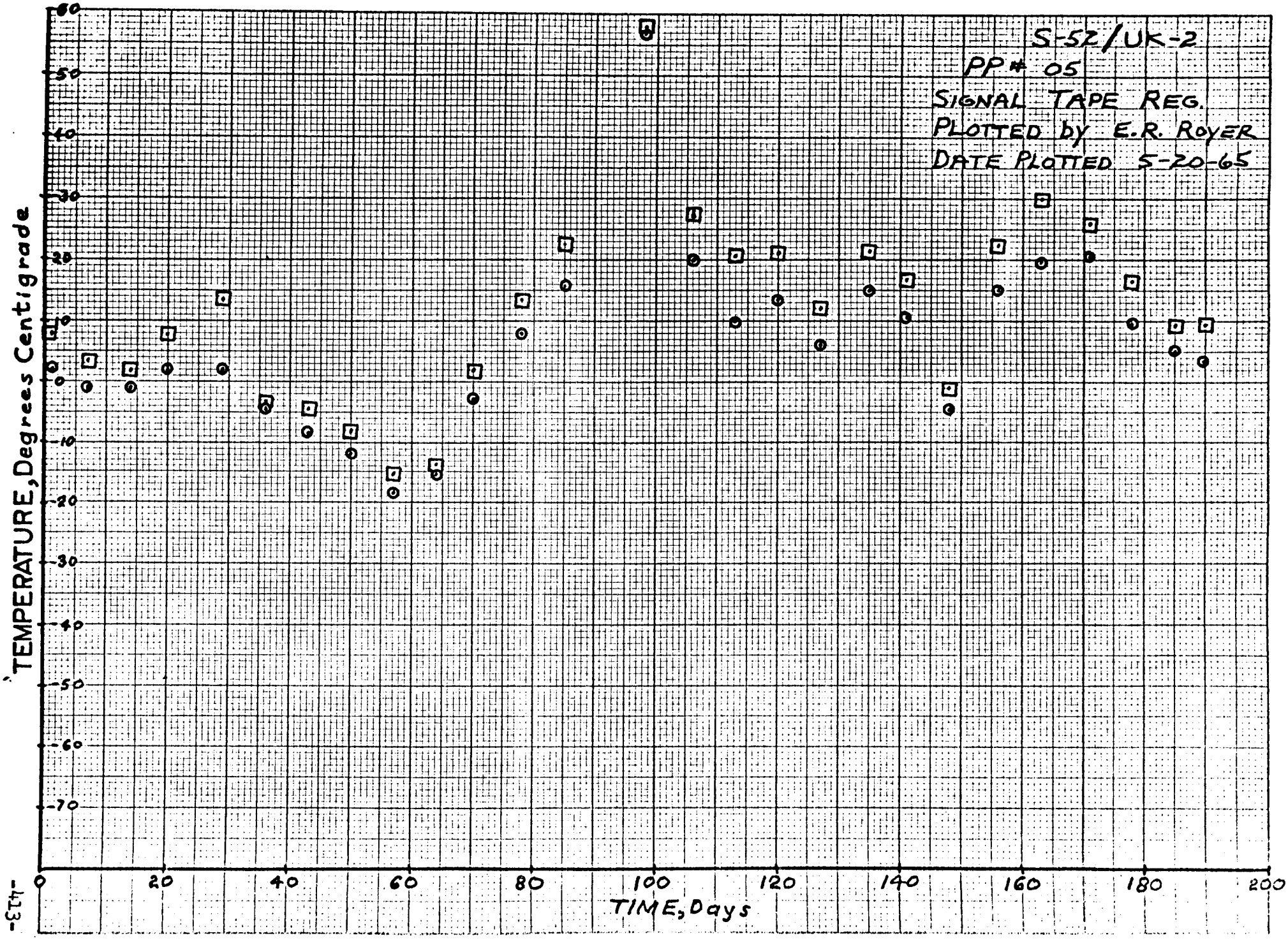


KEUFFEL & ESSER CO.

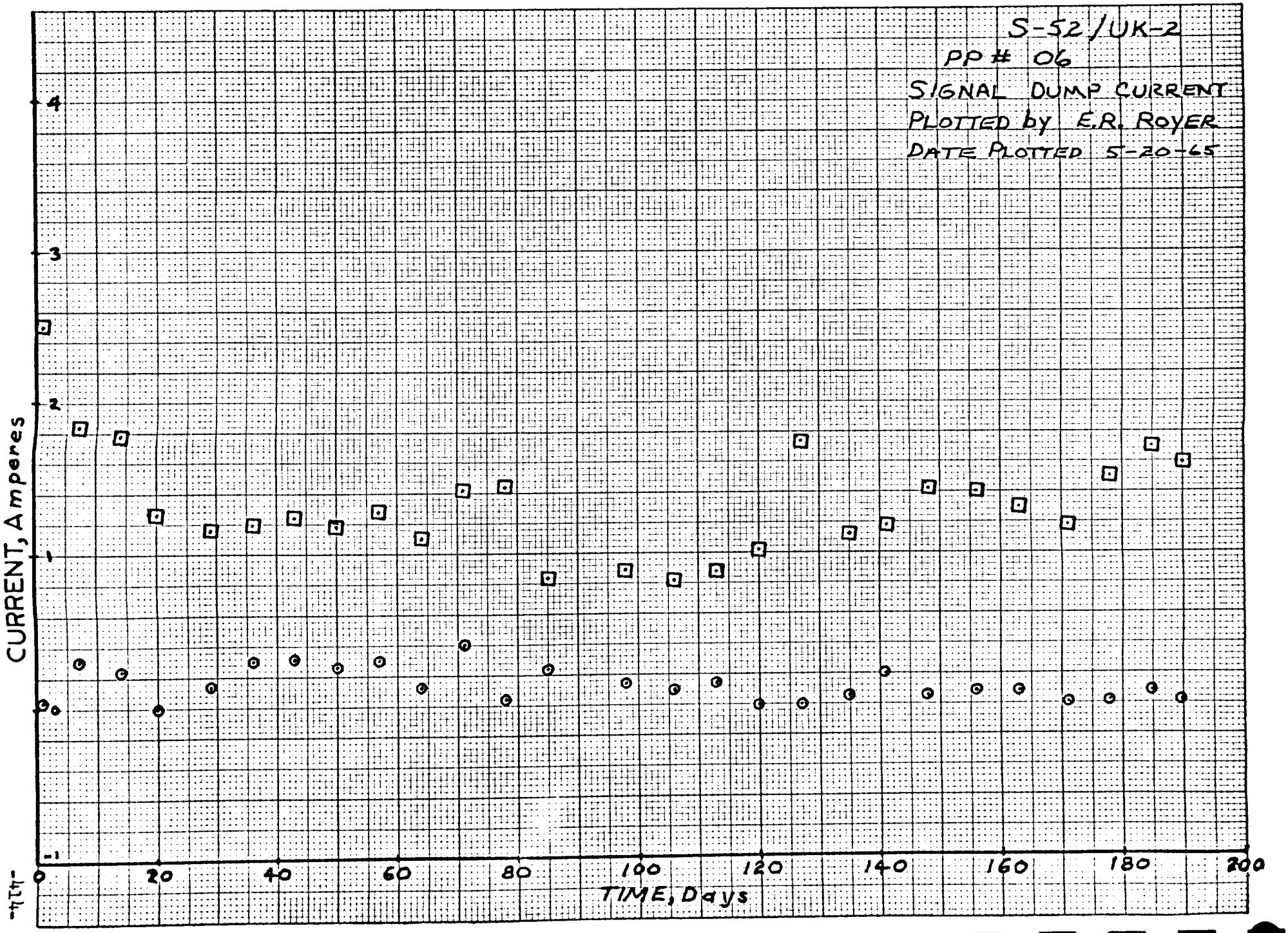


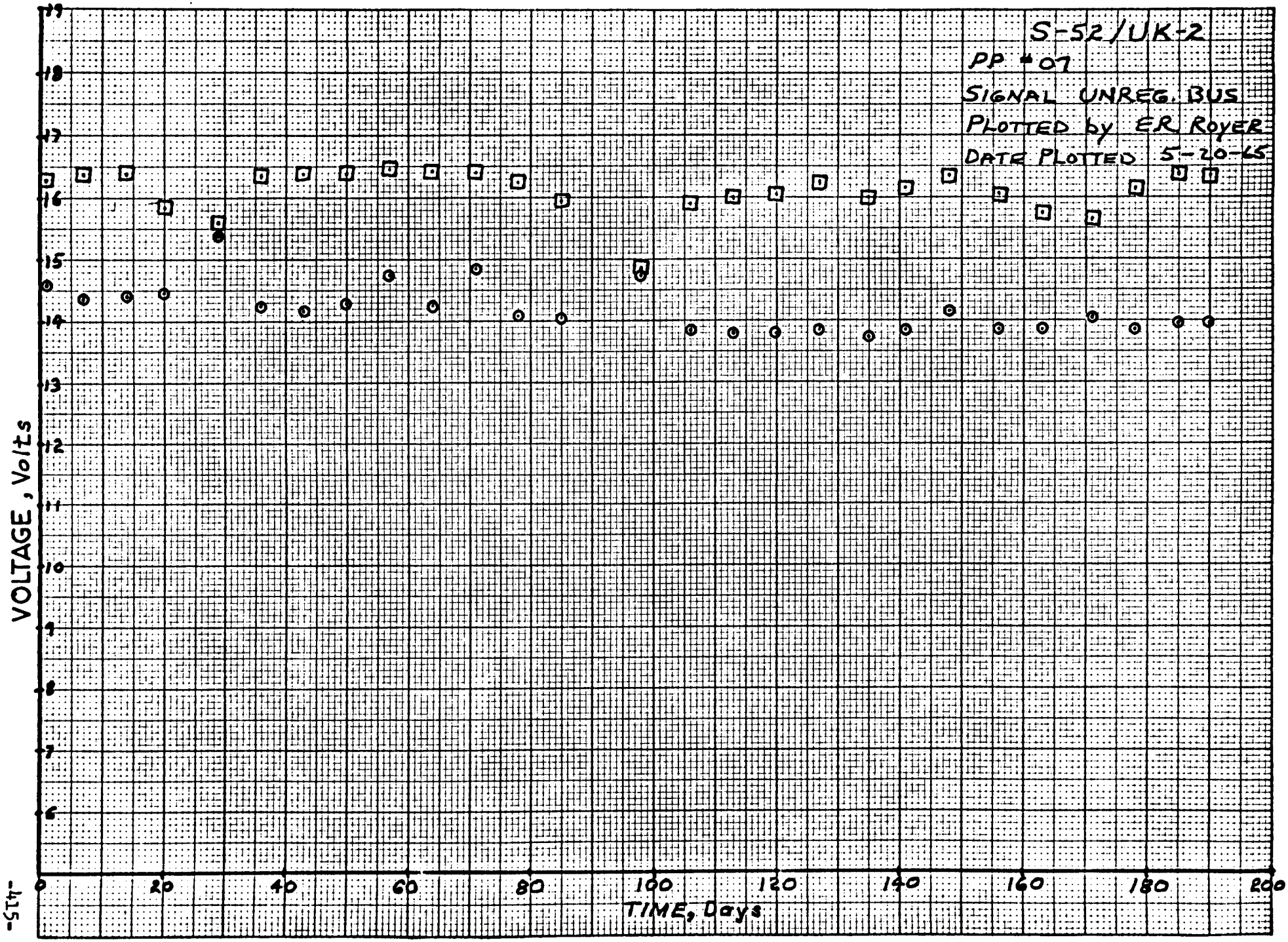
KEUFFEL & ESSER CO.



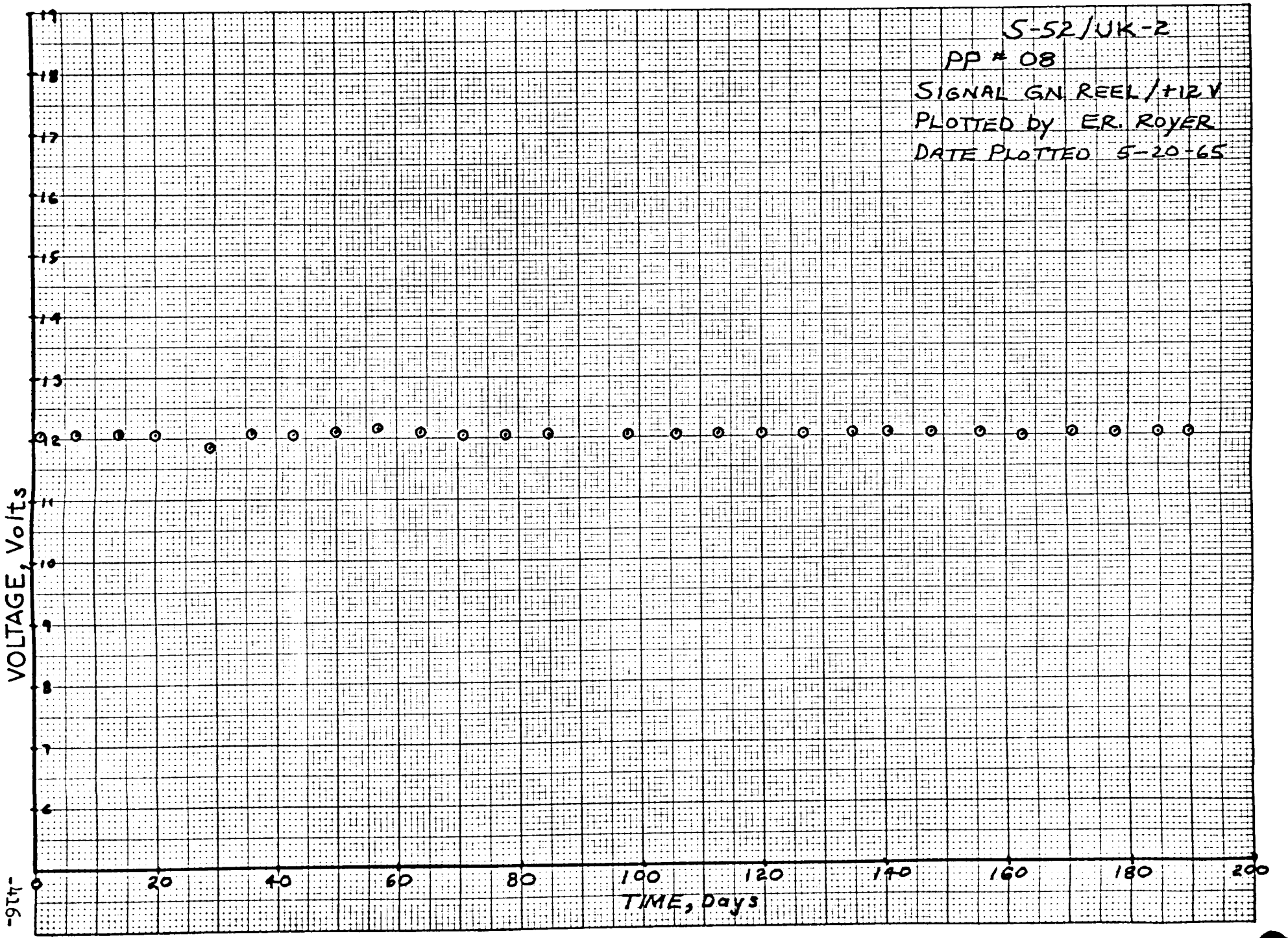

S-52/UK-2
PP # 05
SIGNAL TAPE REG.
PLOTTED by E.R. ROYER
DATE PLOTTED 5-20-65
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
20
40
60
80
100
120
140
160
180
200
TIME, Days

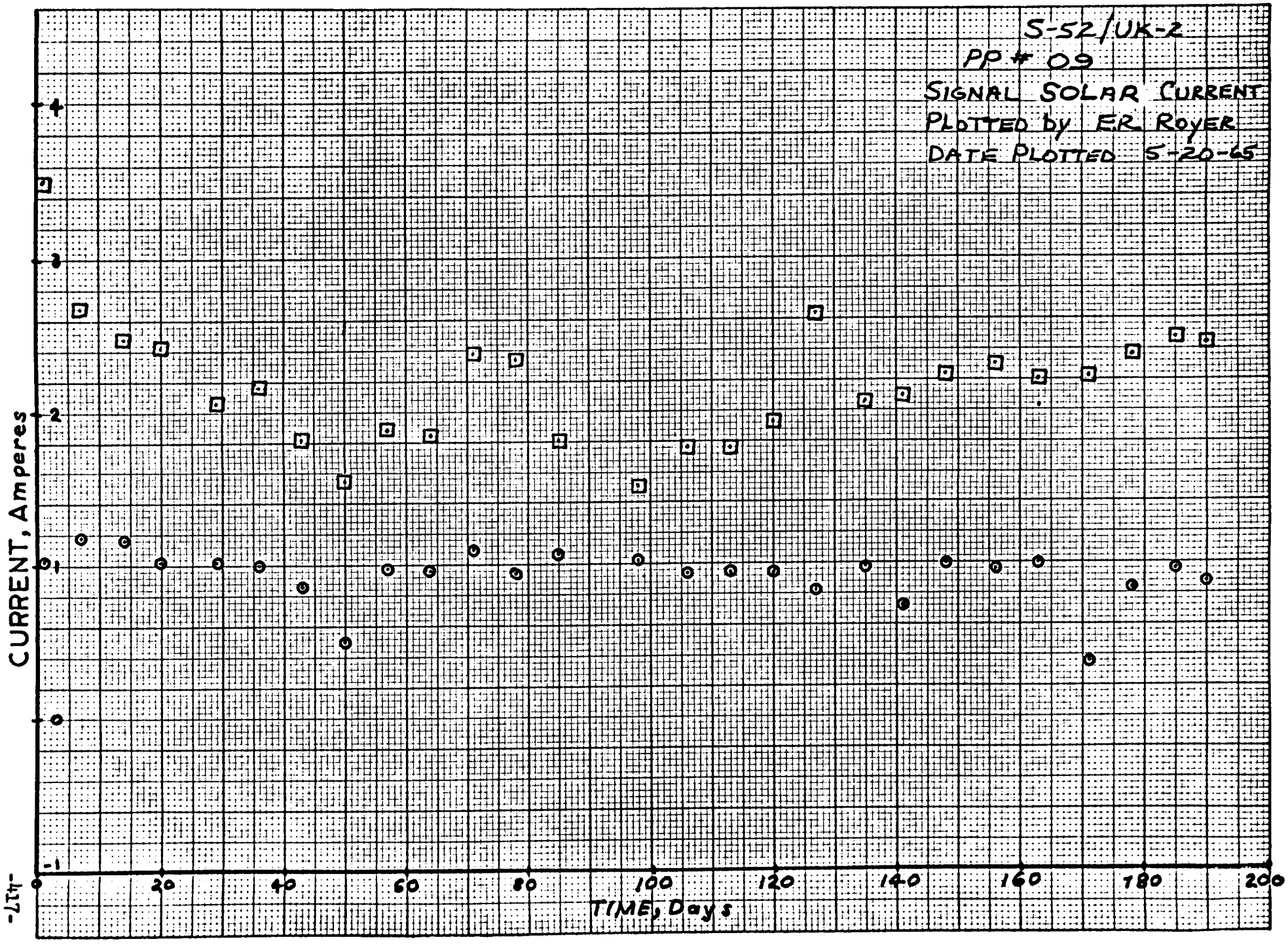
K+E 10 X 10 TO 1/2 INCH 46 1476
7 1/2 X 10 IN. • ALBANENE MADE IN U.S.A.
KEUFFEL & ESSER CO.



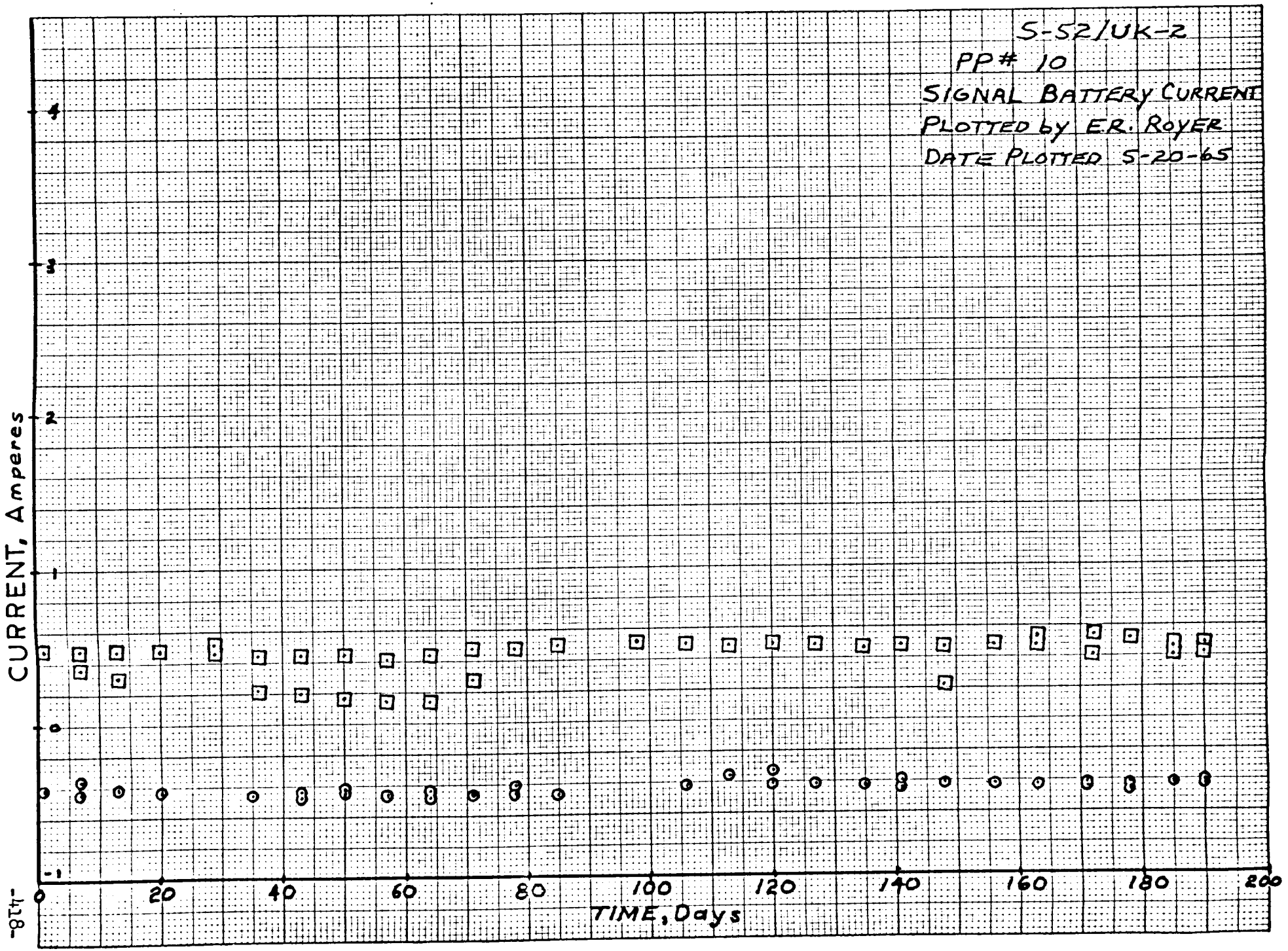

S-52/UK-2
PP #07
SIGNAL UNREG. BUS
PLOTTED by ER ROYER
DATE PLOTTED 5-20-65
VOLTAGE, Volts
19
18
17
16
15
14
13
12
11
10
9
8
7
6
0
20
40
60
80
100
120
140
160
180
200
TIME, Days

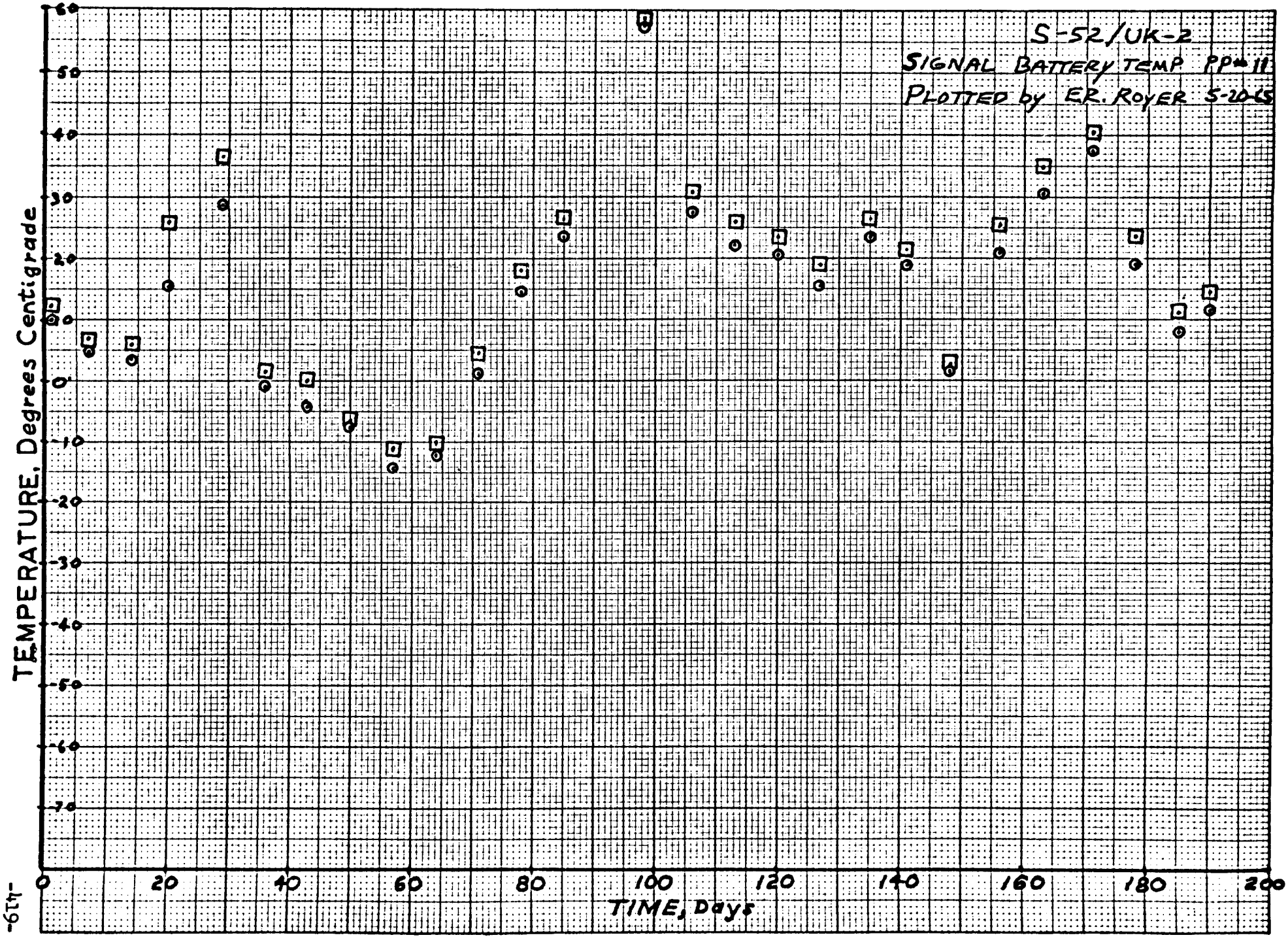
K&E 10 X 10 TO ½ INCH 46 1476
7½ X 10 IN. • ALBANENE MADE IN U.S.A.
KEUFFEL & ESSER CO.



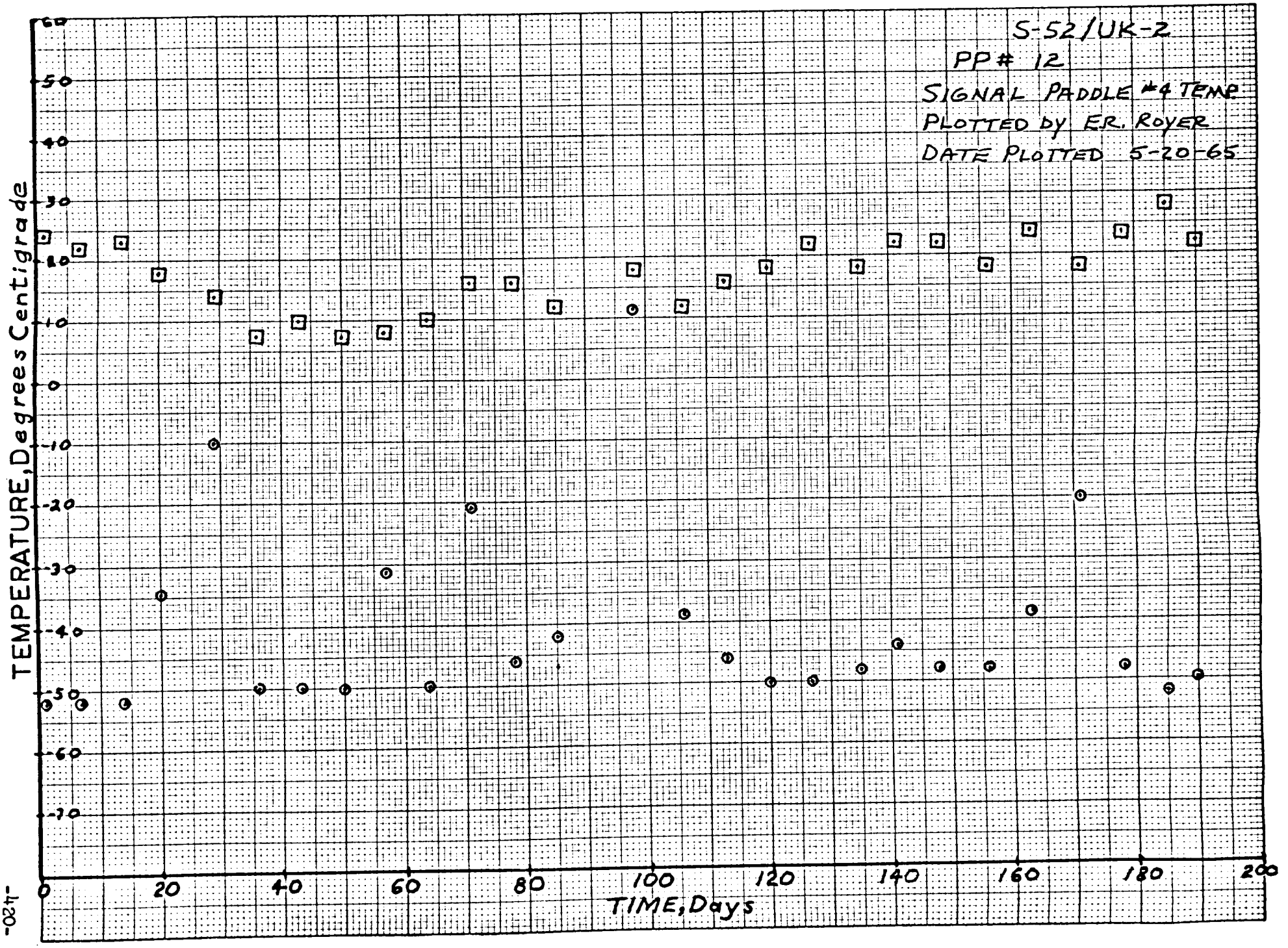

S-52/UK-2
PP # 09
SIGNAL SOLAR CURRENT
PLOTTED by E.R. ROYER
DATE PLOTTED 5-20-65
CURRENT, Amperes
4
3
2
1
0
-1
0
20
40
60
80
100
120
140
160
180
200
TIME, Days

KEUFFEL & ESSER CO.

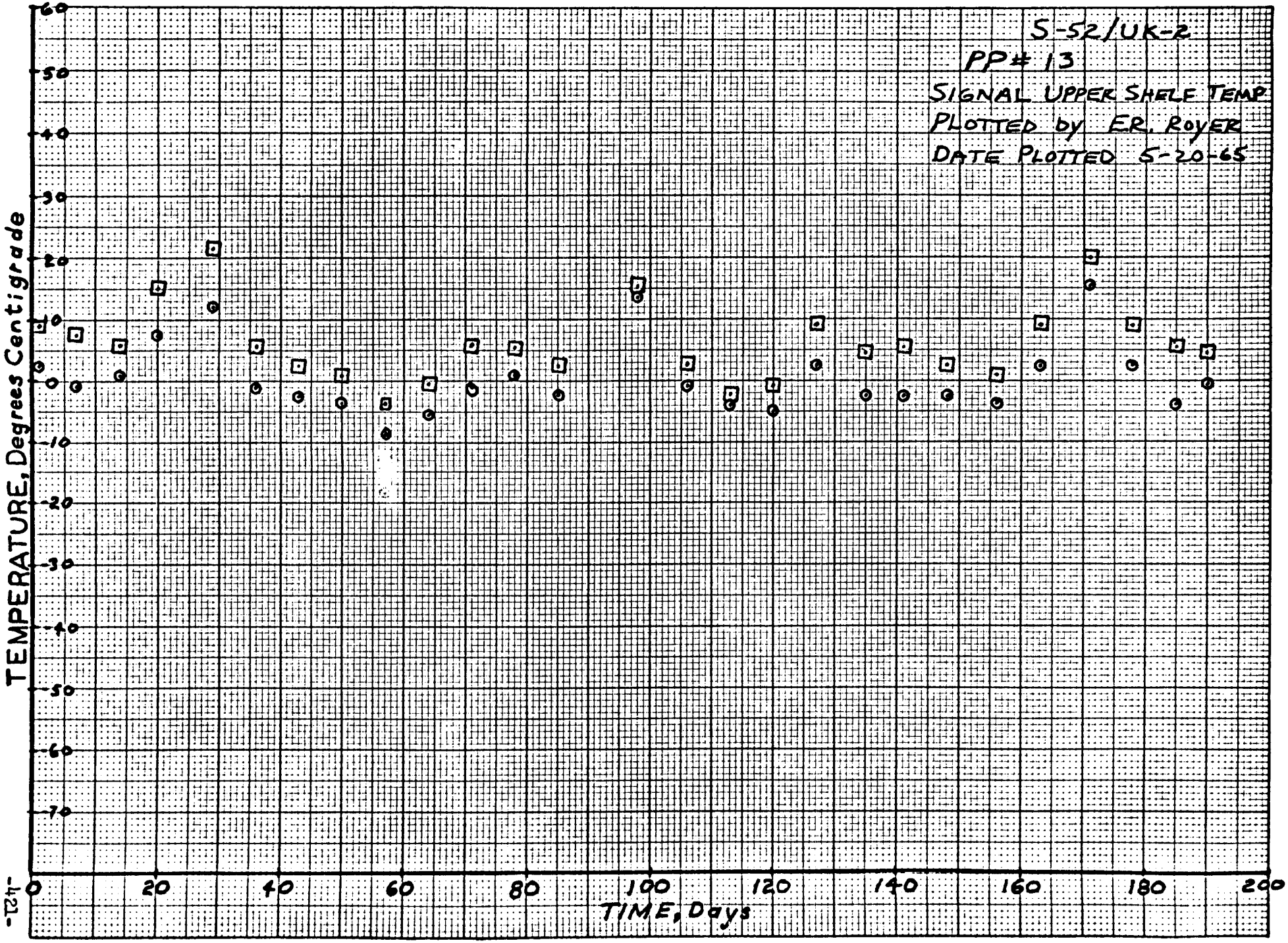


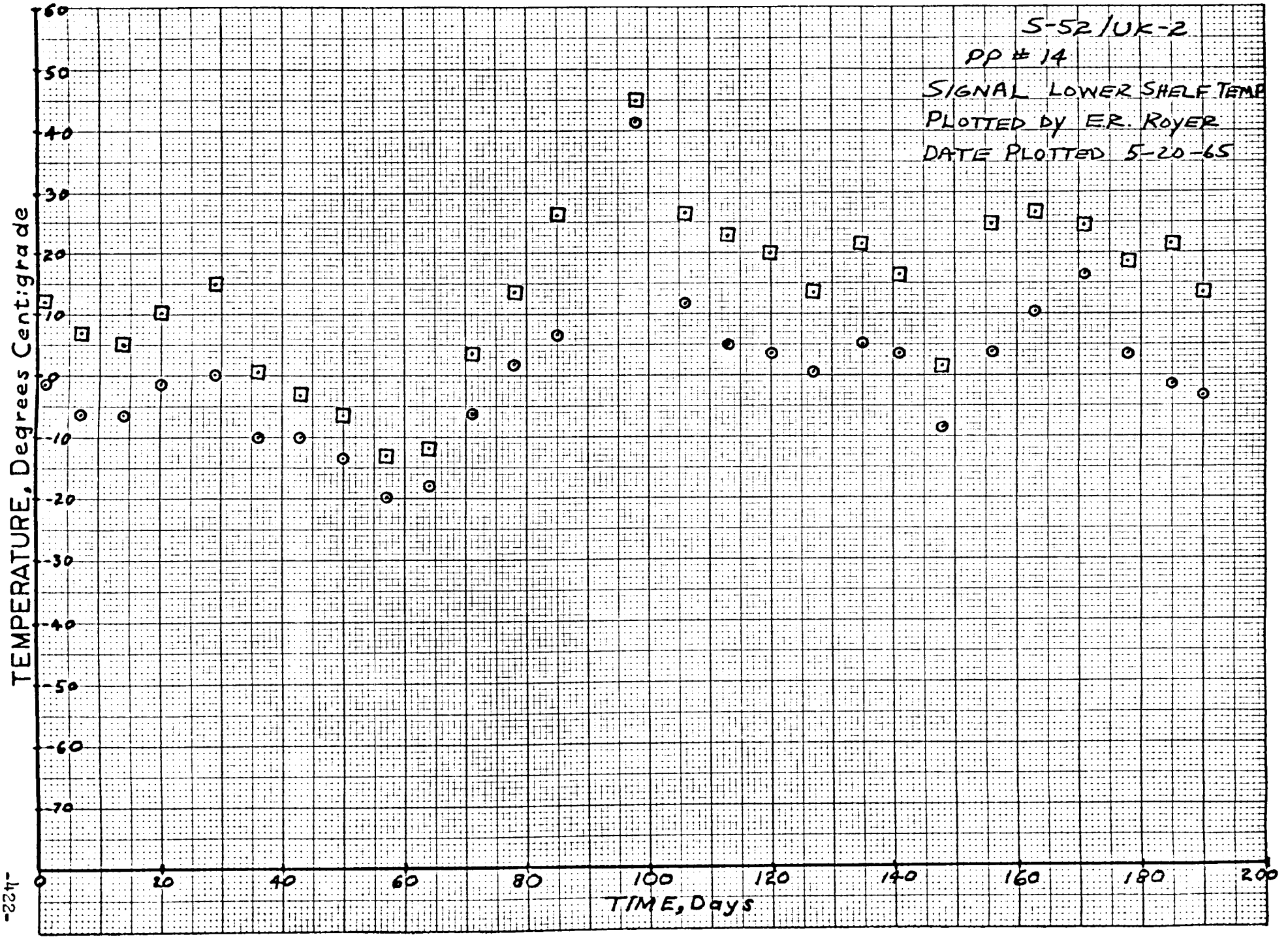

S-52/UK-2
SIGNAL BATTERY TEMP PP# 11
PLOTTED by E.R. ROYER 5-20-65
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
20
40
60
80
100
120
140
160
180
200
TIME, Days

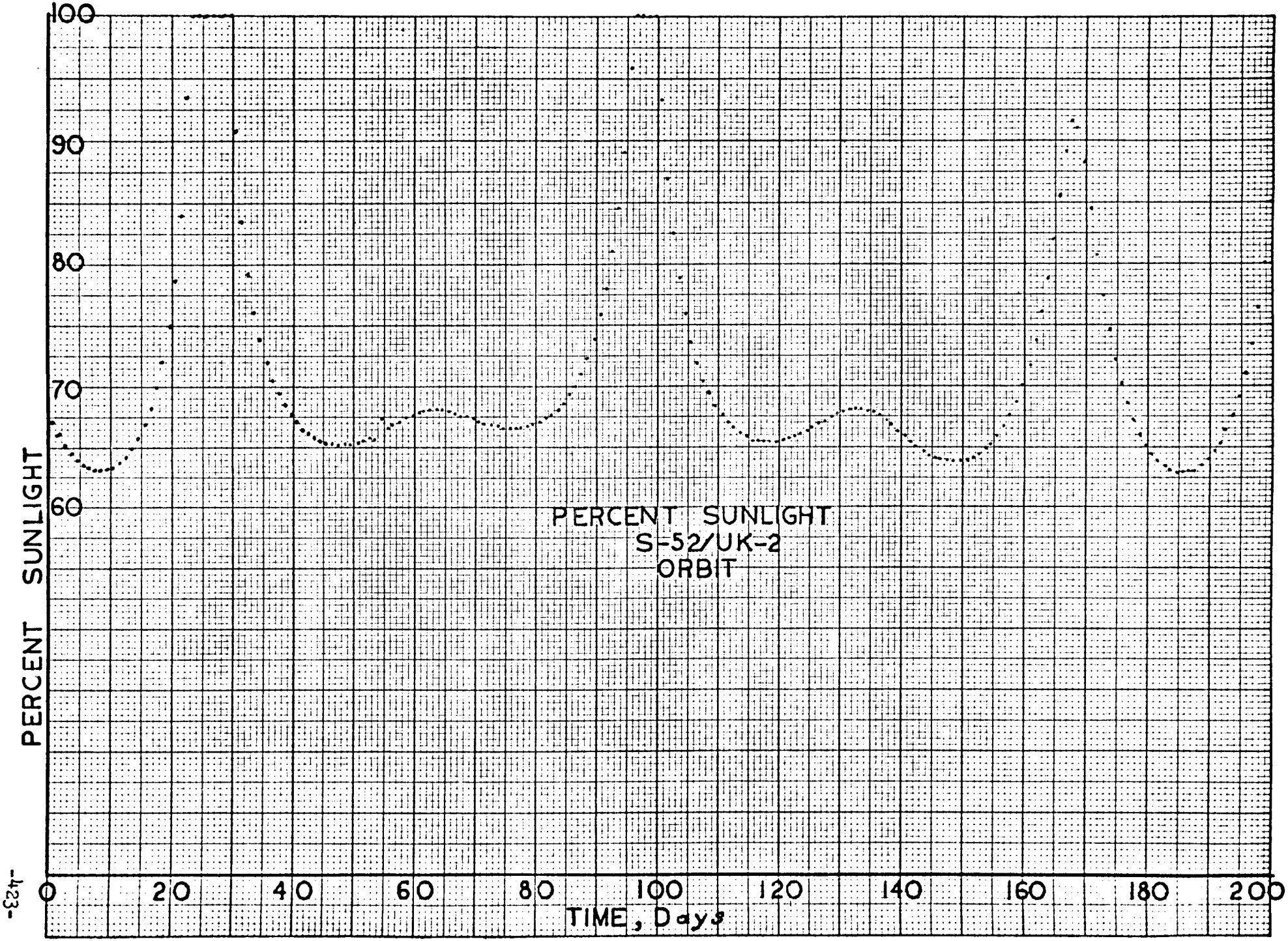
KEUFFEL & ESSER CO.



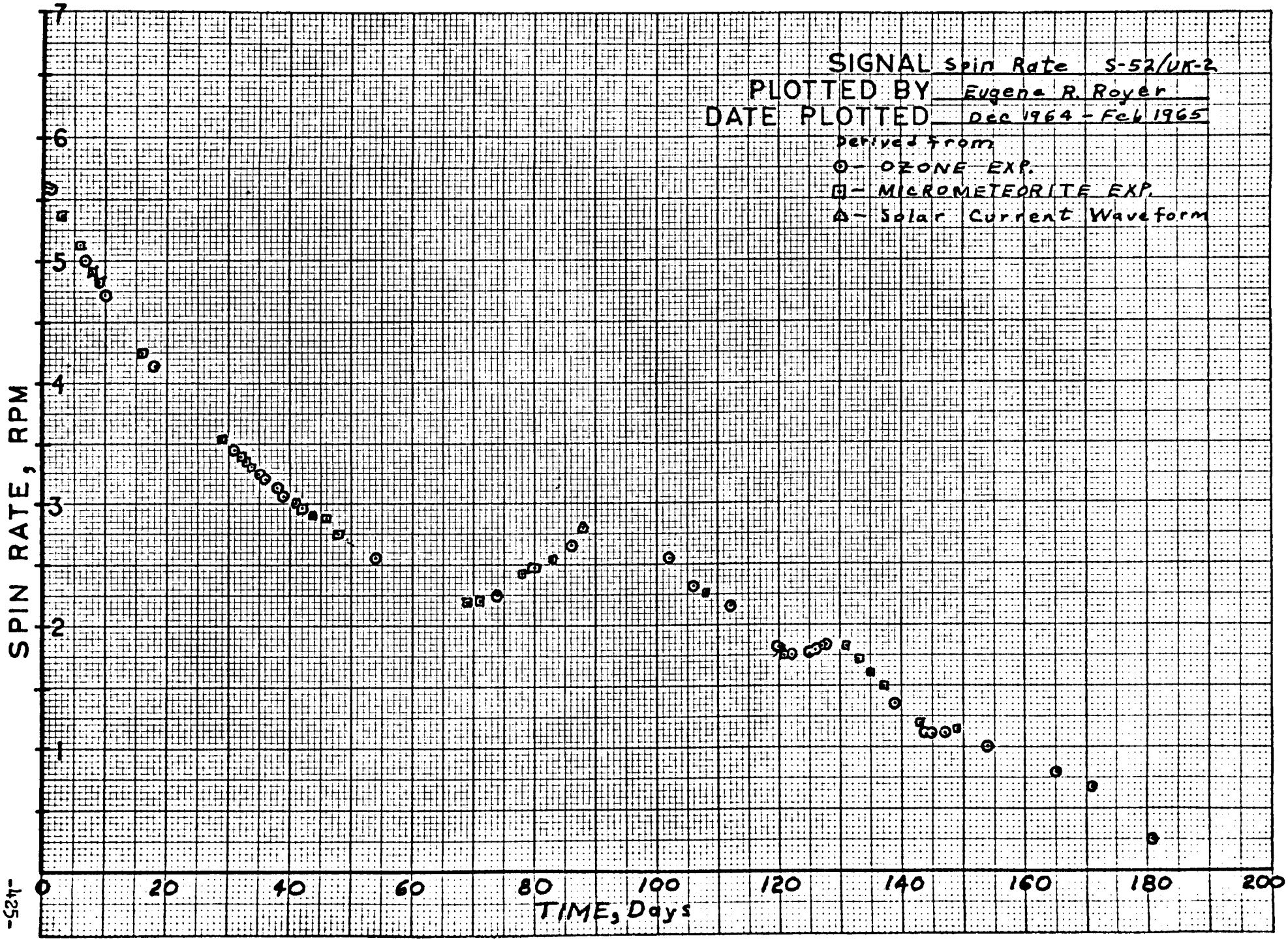
KEUFFEL & ESSER CO.

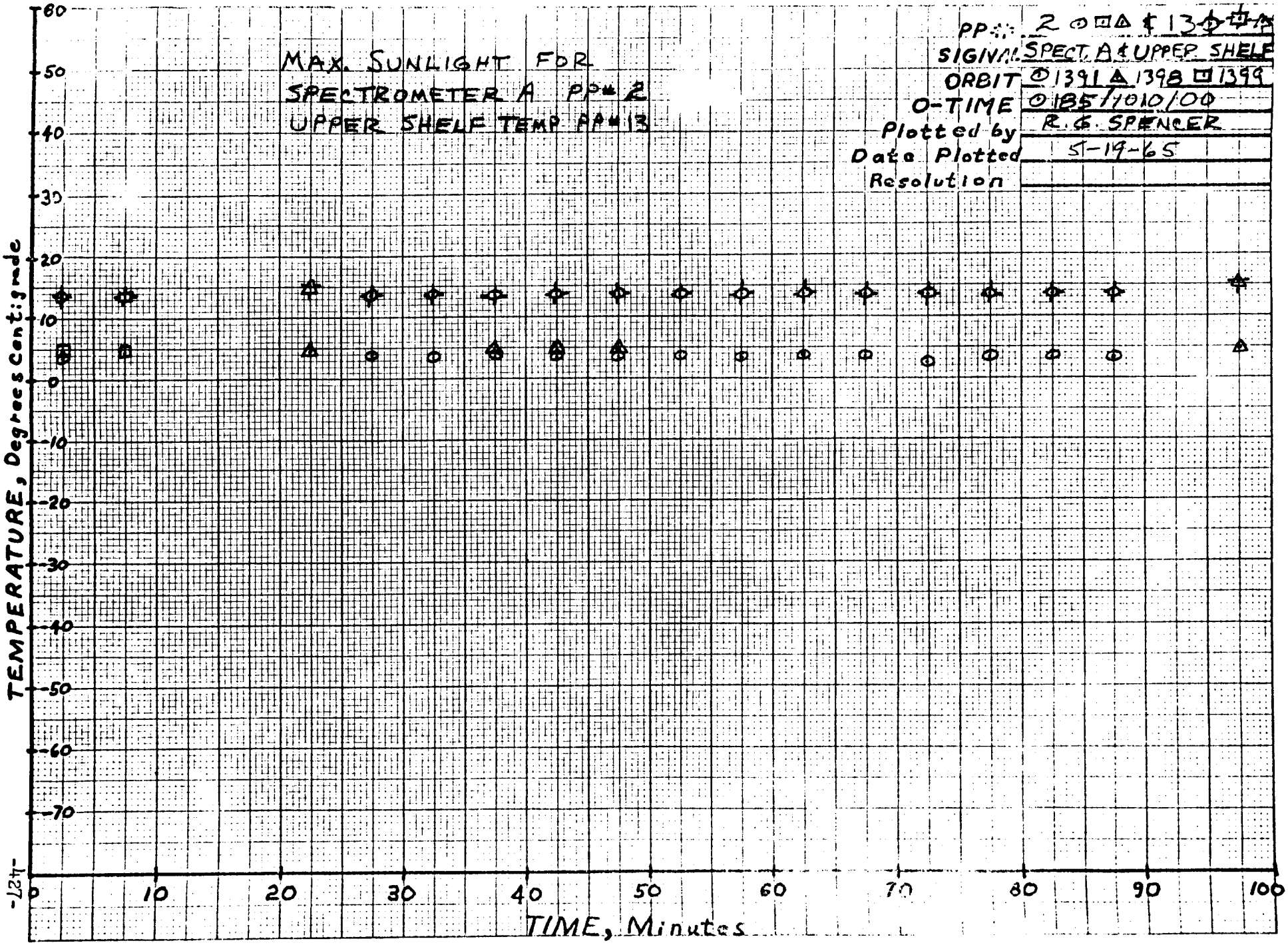



S-52/UK-2
PP # 14
SIGNAL LOWER SHELF TEMP
PLOTTED BY E.R. ROYER
DATE PLOTTED 5-20-65
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
20
40
60
80
100
120
140
160
180
200
TIME, Days

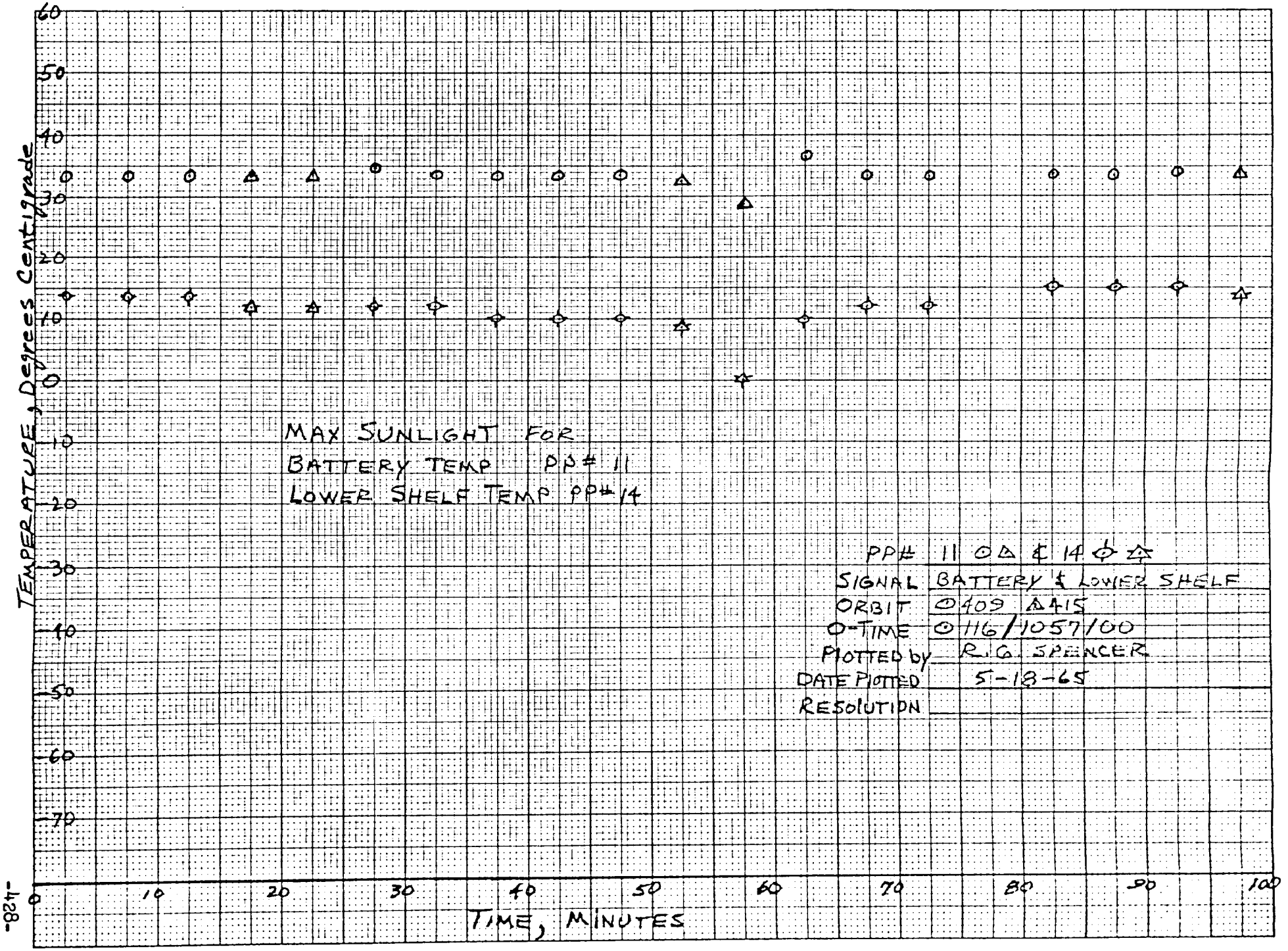

PERCENT SUNLIGHT
S-52/UK-2
ORBIT
PERCENT SUNLIGHT
100
90
80
70
60
0
20
40
60
80
100
120
140
160
180
200
TIME, Days

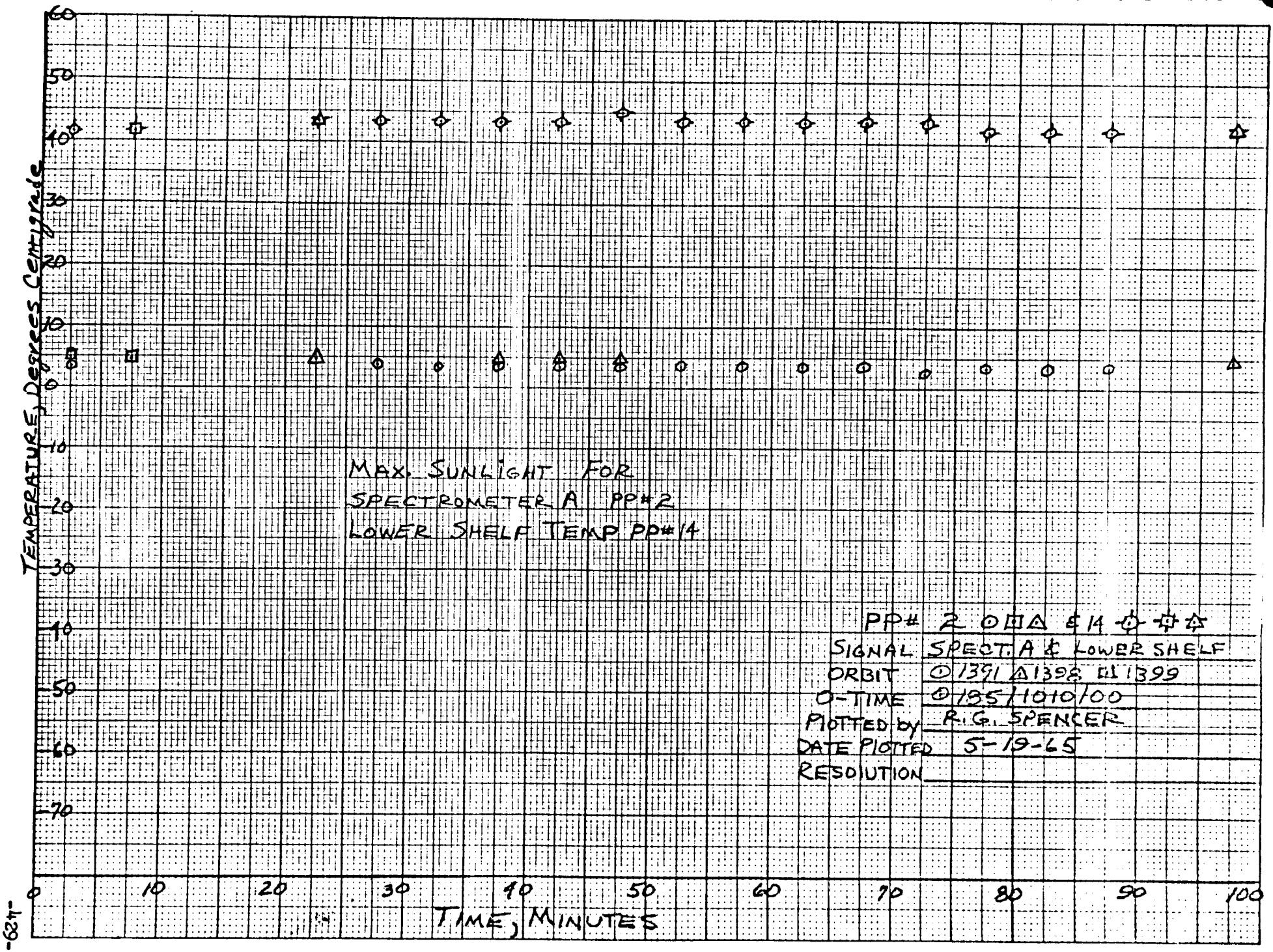
KEUFFEL & ESSER CO.



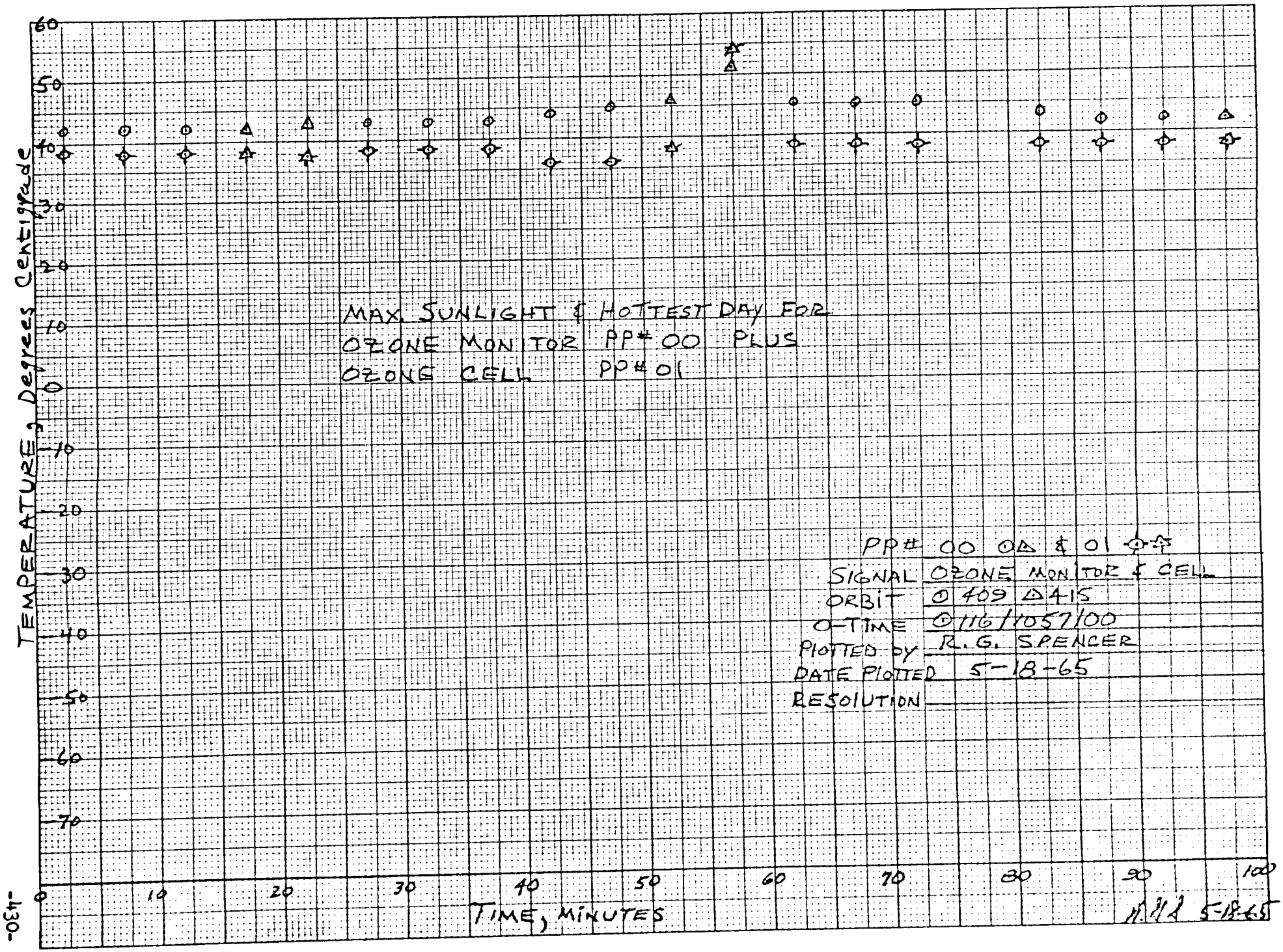

MAX. SUNLIGHT FOR
SPECTROMETER A PP# 2
UPPER SHELF TEMP PP# 13
PP# 2 ⊙ ⊡ △ & 13 ⊕ ⊕ △
SIGNAL SPECT. A & UPPER SHELF
ORBIT ⊙ 1391 △ 1398 ⊡ 1399
O-TIME ⊙ 185/1010/00
Plotted by R. G. SPENCER
Date Plotted 5-19-65
Resolution
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

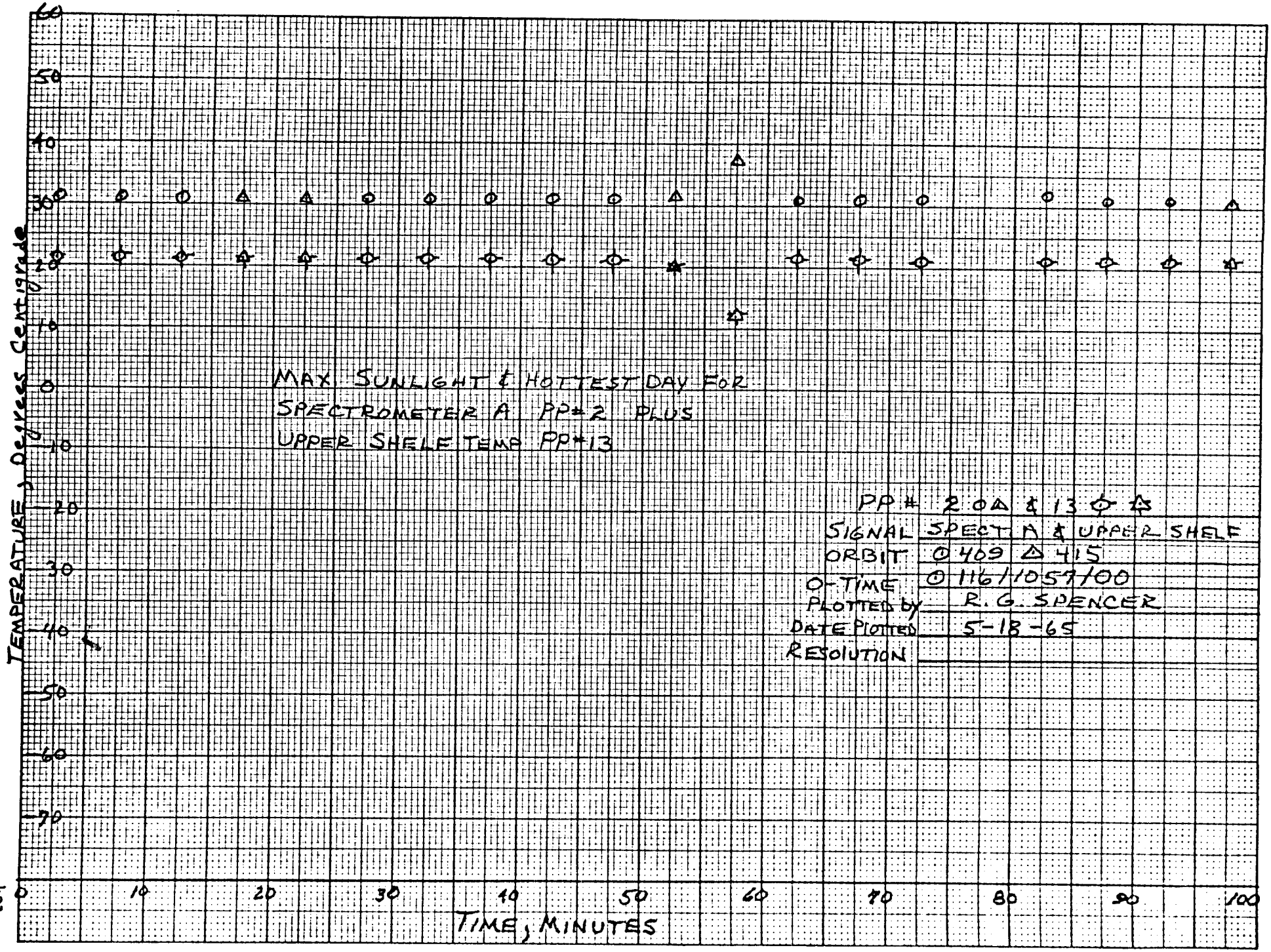
KEUFFEL & ESSER CO.



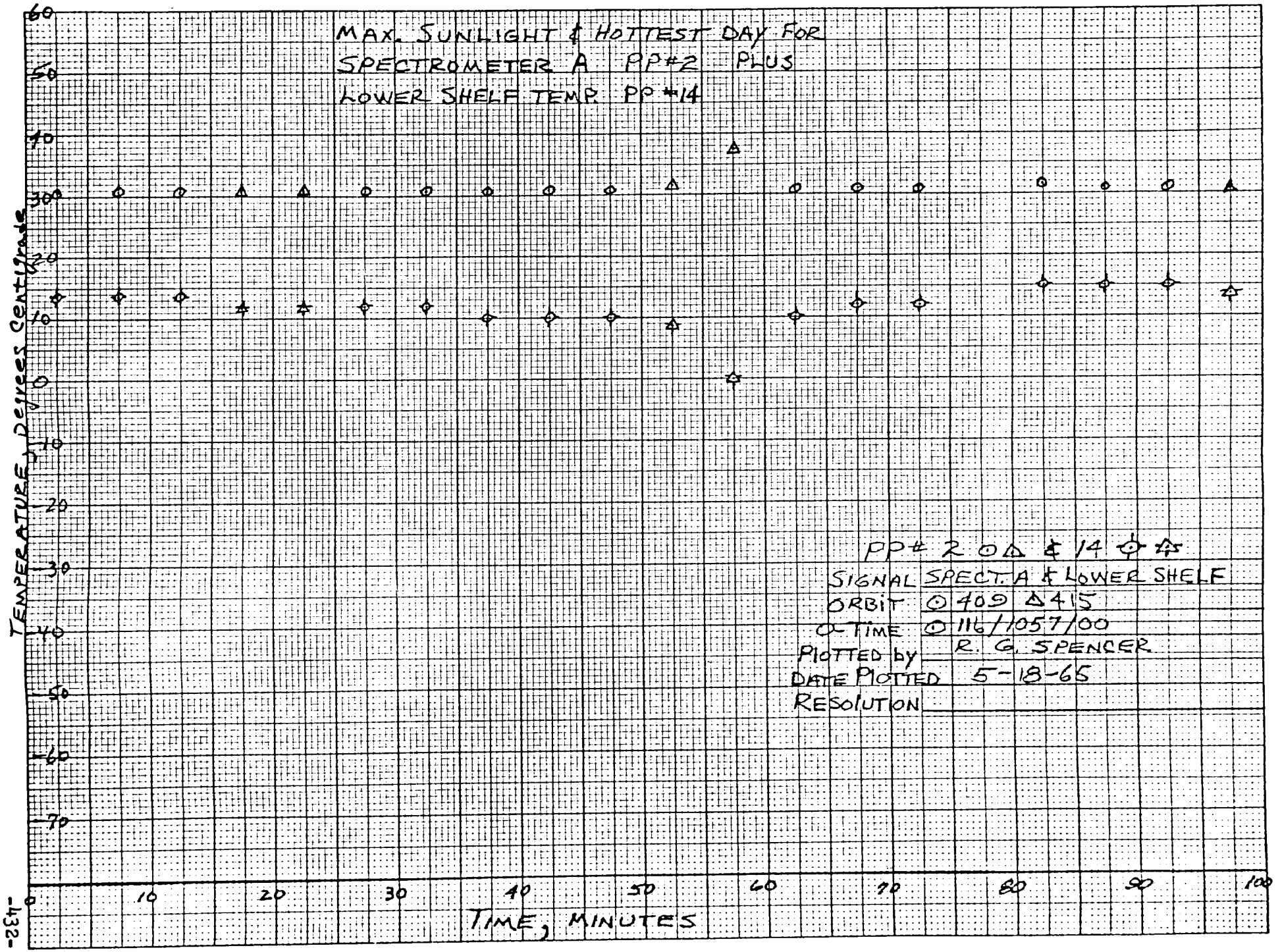

TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70
80
90
100
TIME, MINUTES
MAX. SUNLIGHT FOR
SPECTROMETER A PP#2
LOWER SHELF TEMP PP#14
PP# 2 ⊙ ⊡ △ & 14
SIGNAL SPECT. A & LOWER SHELF
ORBIT ⊙ 1391 △ 1398 ⊡ 1399
O-TIME ⊙ 135/1010/00
PLOTTED by R. G. SPENCER
DATE PLOTTED 5-19-65
RESOLUTION

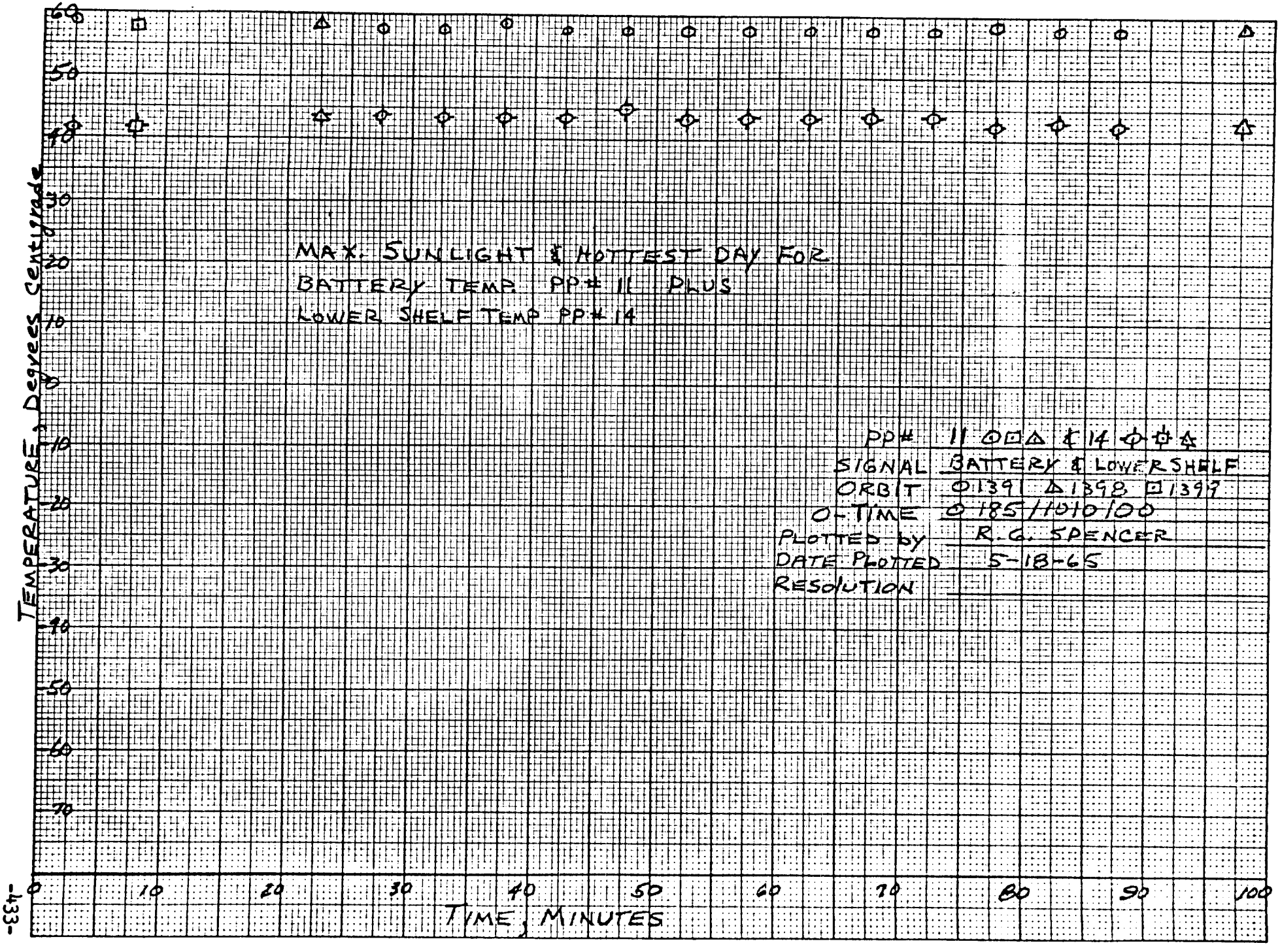
KEUFFEL & ESSER CO.

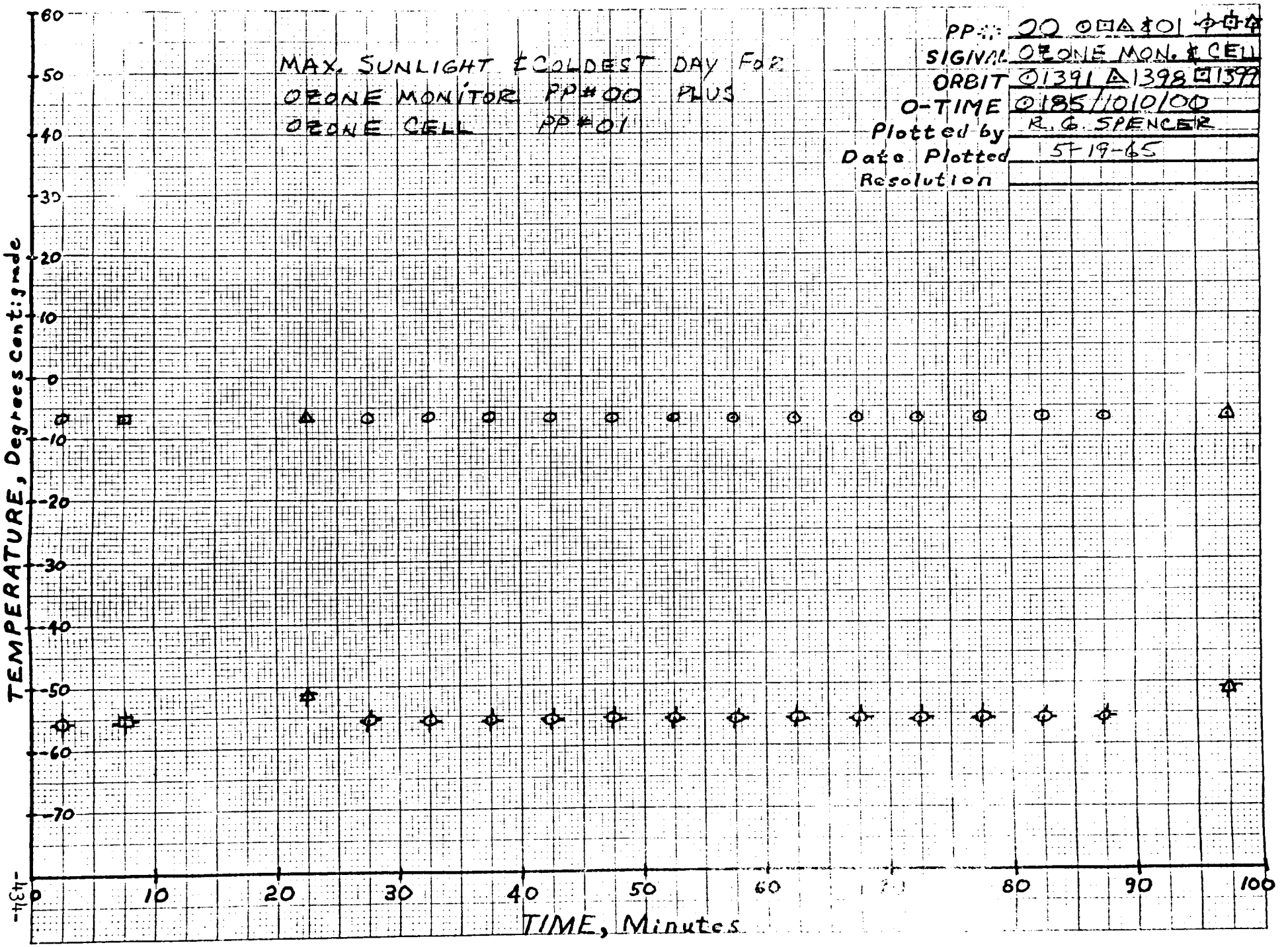


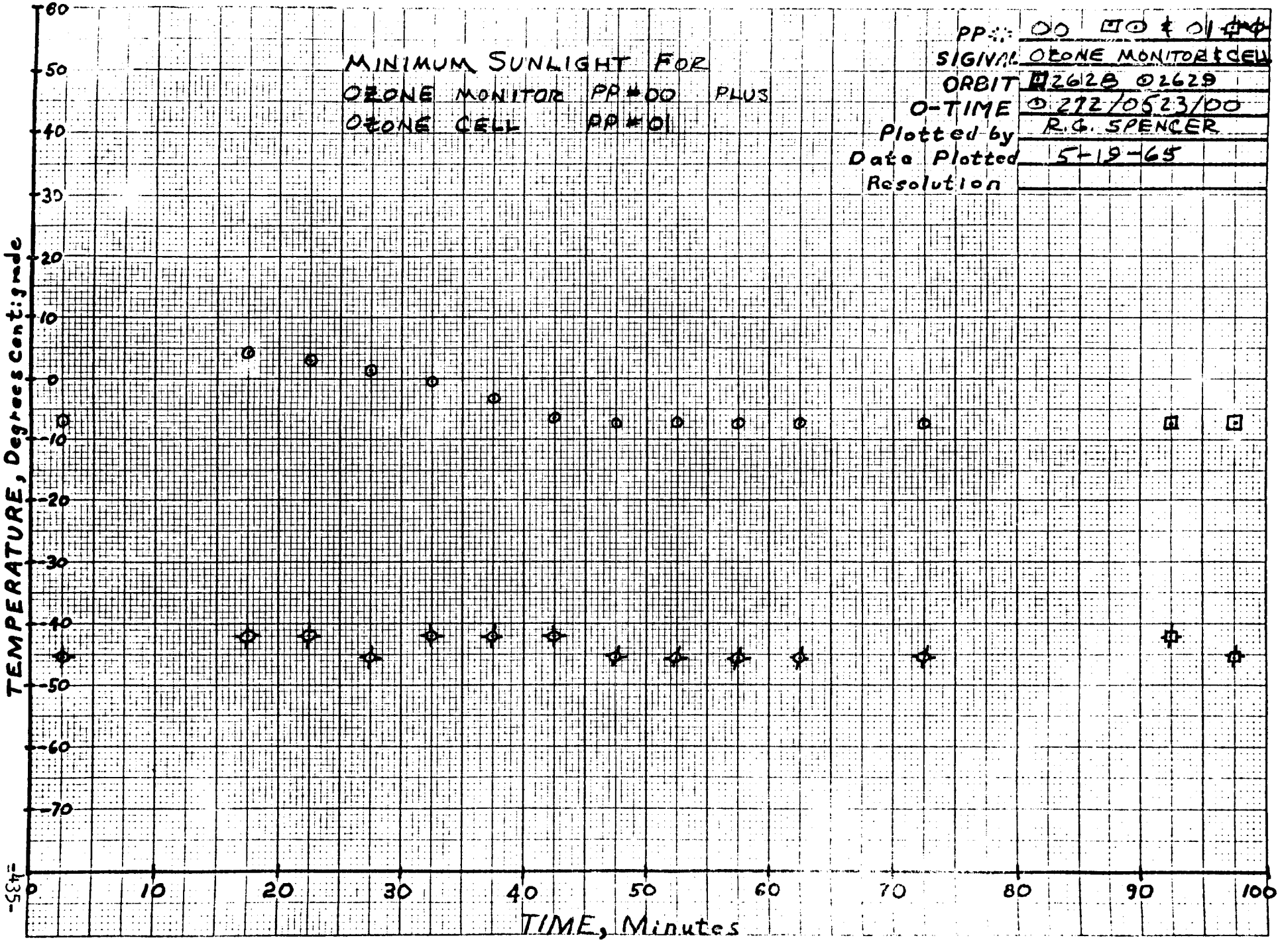

MAX SUNLIGHT & HOTTEST DAY FOR
SPECTROMETER A PP#2 PLUS
UPPER SHELF TEMP PP#13
PP # 2 ○△ & 13 ⊕ ☆
SIGNAL SPECT A & UPPER SHELF
ORBIT ○ 409 △ 415
O-TIME ○ 116/1057/00
PLOTTED by R. G. SPENCER
DATE PLOTTED 5-18-65
RESOLUTION
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, MINUTES

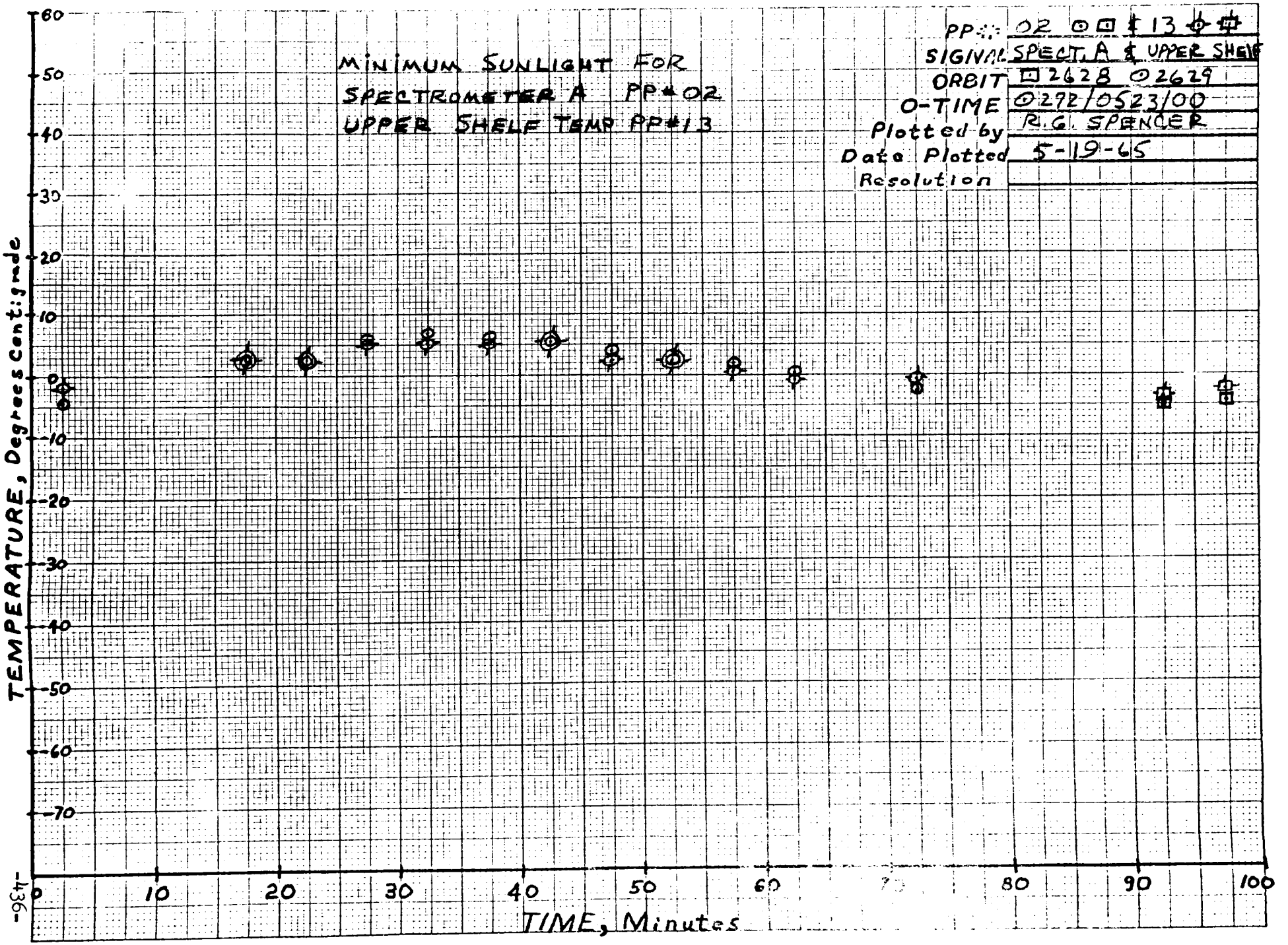
KEUFFEL & ESSER CO.

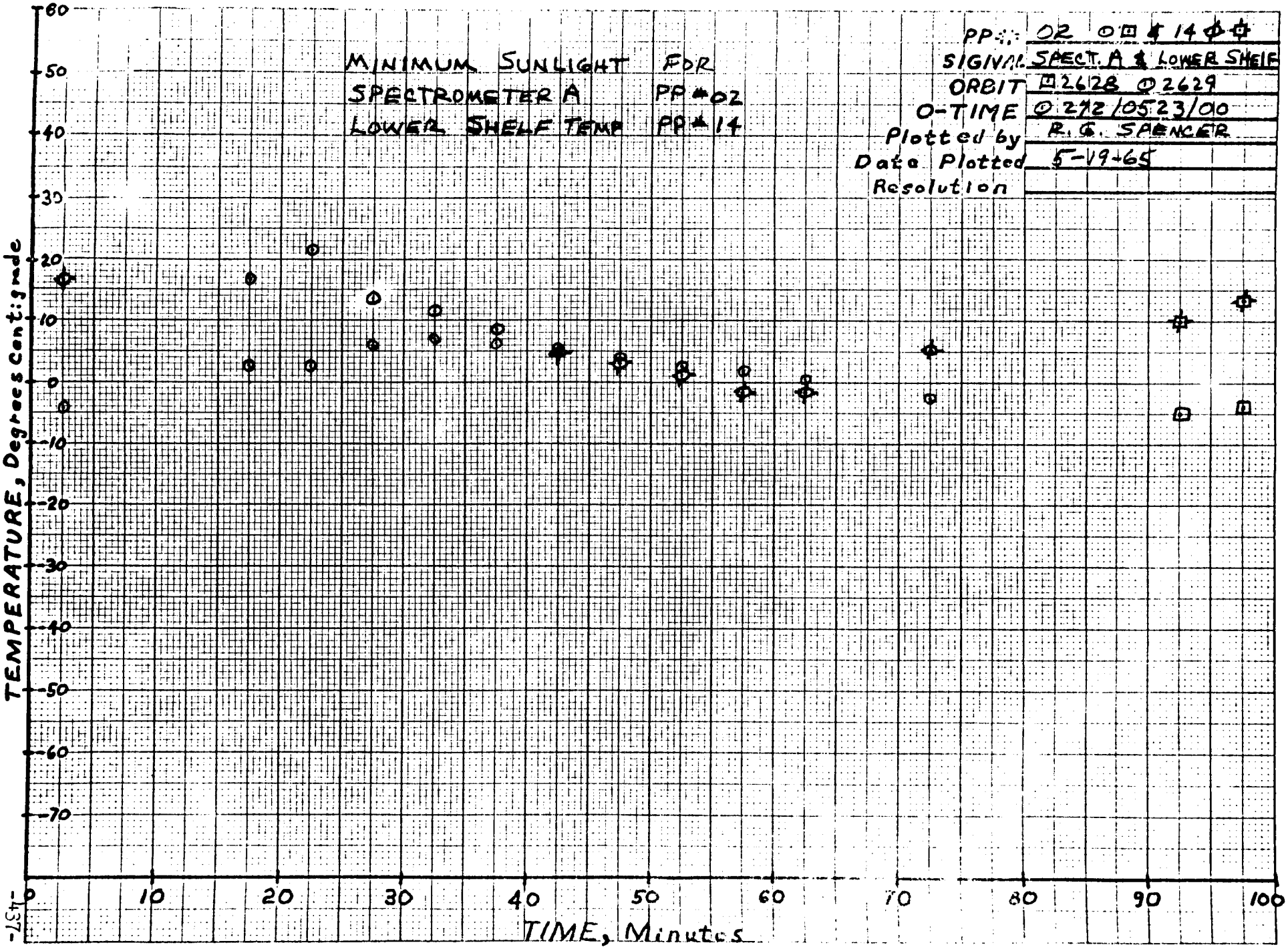


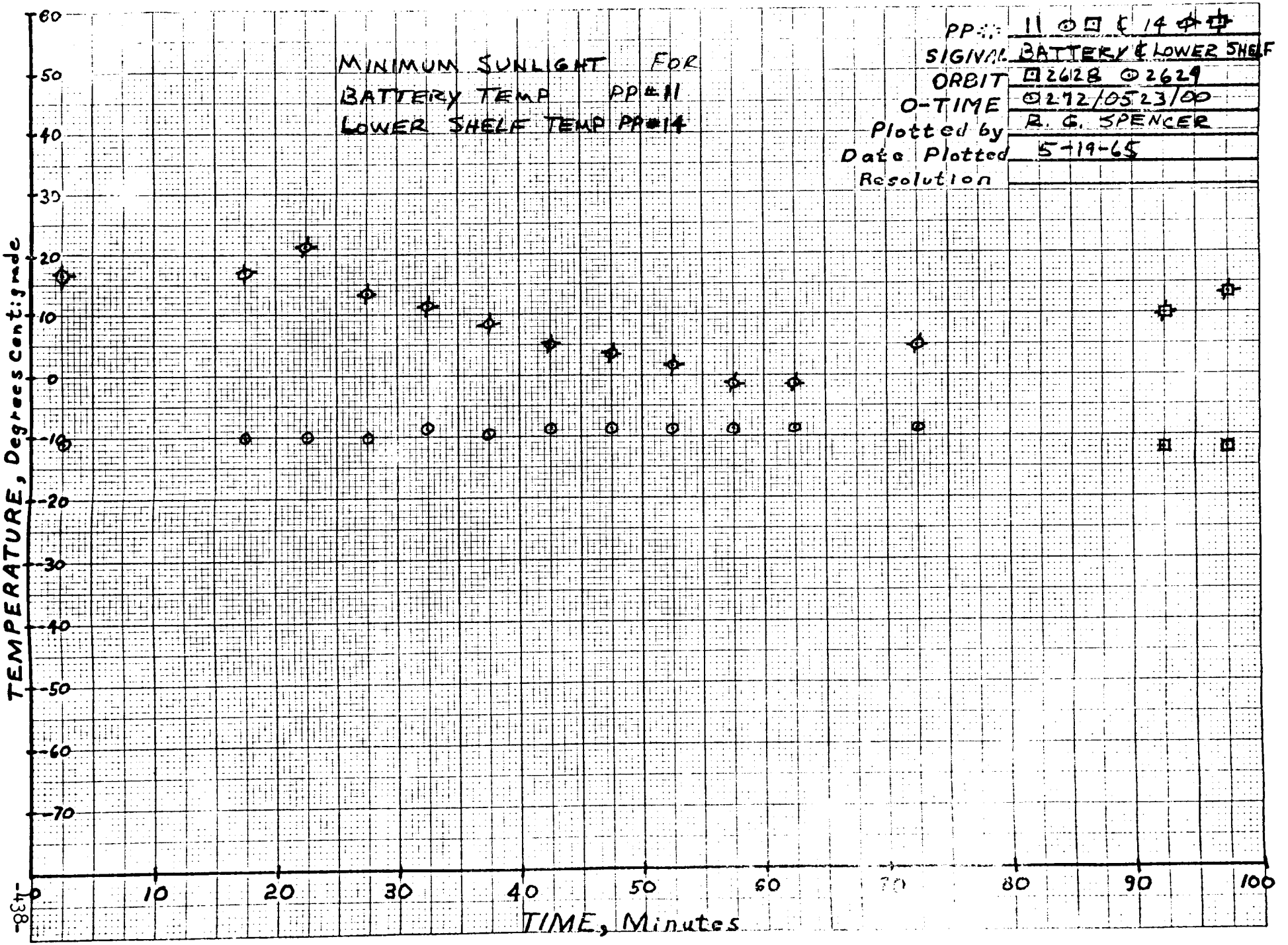

MAX. SUNLIGHT & HOTTEST DAY FOR
BATTERY TEMP. PP# 11 PLUS
LOWER SHELF TEMP PP# 14
PP# 11 ⊙⊡△ & 14 ⊕⊕⊕
SIGNAL BATTERY & LOWER SHELF
ORBIT ⊙1391 △1398 ⊡1399
O-TIME ⊙ 185/1010/00
PLOTTED by R. G. SPENCER
DATE PLOTTED 5-18-65
RESOLUTION
TEMPERATURE, Degrees centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, MINUTES

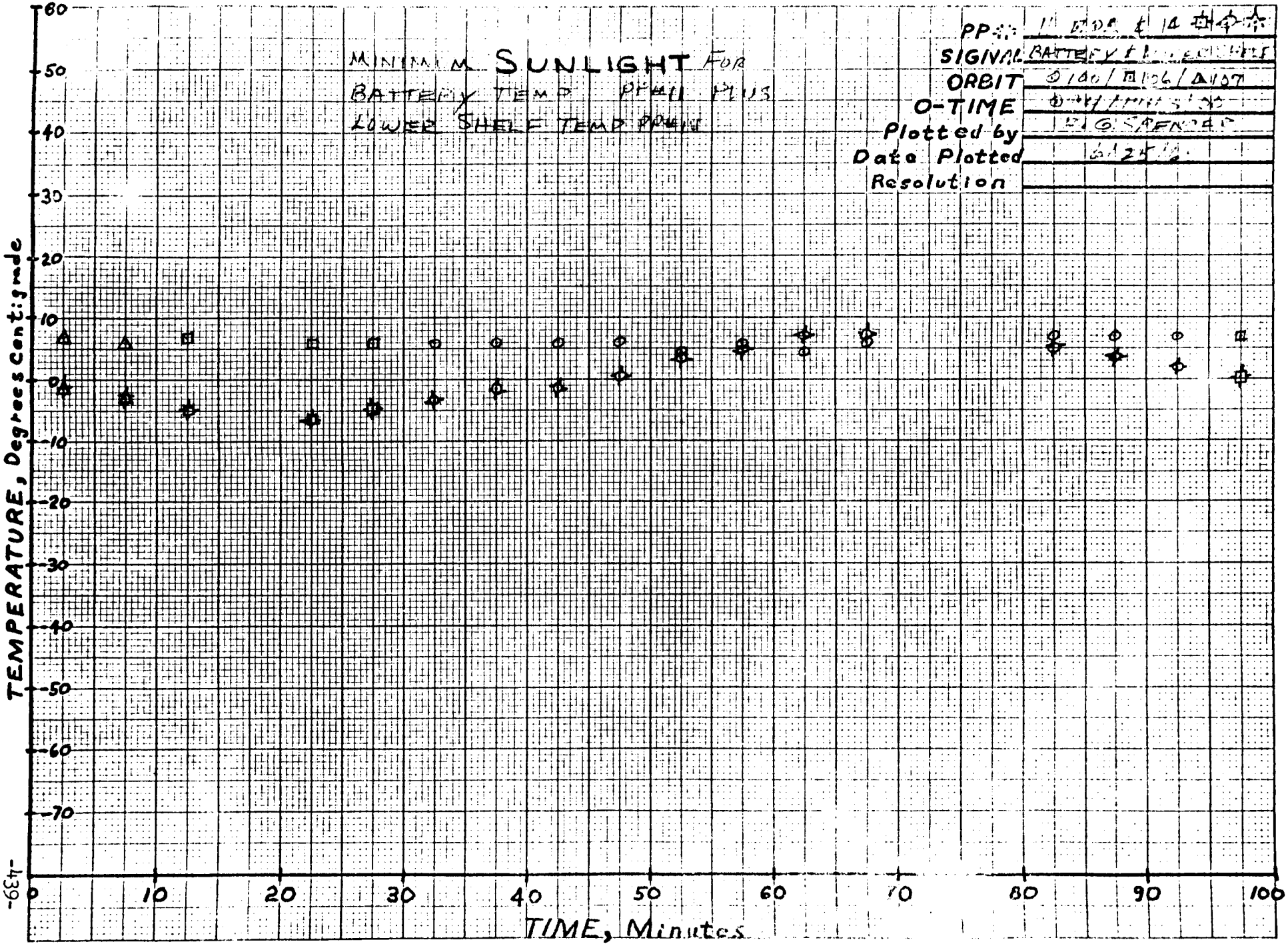

MAX. SUNLIGHT & COLDEST DAY FOR
OZONE MONITOR PP#00 PLUS
OZONE CELL PP#01
PP# 00 ⊙□△ & 01 ⊕⊕⊕
SIGNAL OZONE MON. & CELL
ORBIT ⊙1391 △1398 □1399
O-TIME ⊙185/1010/00
Plotted by R. G. SPENCER
Date Plotted 5-19-65
Resolution
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
80
90
100
TIME, Minutes


MINIMUM SUNLIGHT FOR
OZONE MONITOR PP#00 PLUS
OZONE CELL PP#01
PP#: 00 ⊡ ⊙ & 01 ⊕ ⊕
SIGNAL: OZONE MONITOR & CELL
ORBIT: ⊡ 2628 ⊙ 2629
O-TIME: ⊙ 272/0523/00
Plotted by: R.G. SPENCER
Date Plotted: 5-19-65
Resolution:
TEMPERATURE, Degrees Centigrade
80
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes


MINIMUM SUNLIGHT FOR
SPECTROMETER A PP#02
UPPER SHELF TEMP PP#13
PP#: 02 ⊙ ⊡ & 13 ⊕ ⊕
SIGNAL SPECT. A & UPPER SHELF
ORBIT ⊡ 2628 ⊙ 2629
O-TIME ⊙ 272/0523/00
Plotted by R.G. SPENCER
Date Plotted 5-19-65
Resolution
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
80
90
100
TIME, Minutes


MINIMUM SUNLIGHT FOR
SPECTROMETER A PP #02
LOWER SHELF TEMP PP #14
PP # 02 ⊙⊡ & 14 ⊕⊕
SIGNAL SPECT. A & LOWER SHELF
ORBIT ⊡2628 ⊙2629
O-TIME ⊙272/0523/00
Plotted by R. G. SPENCER
Date Plotted 5-19-65
Resolution
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes


MINIMUM SUNLIGHT FOR
BATTERY TEMP PP#11
LOWER SHELF TEMP PP#14
PP: 11 ⊙ ⊡ & 14 ⊕ ⊕
SIGNAL BATTERY & LOWER SHELF
ORBIT ⊡ 2628 ⊙ 2629
O-TIME ⊙ 272/0523/00
Plotted by R. G. SPENCER
Date Plotted 5-19-65
Resolution
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes


MINIMUM SUNLIGHT FOR
BATTERY TEMP PLUS
LOWER SHELF TEMP PLUS
PP
SIGNAL
ORBIT
O-TIME
Plotted by
Date Plotted
Resolution
TEMPERATURE, Degrees Centigrade
TIME, Minutes
60
50
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-10
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60
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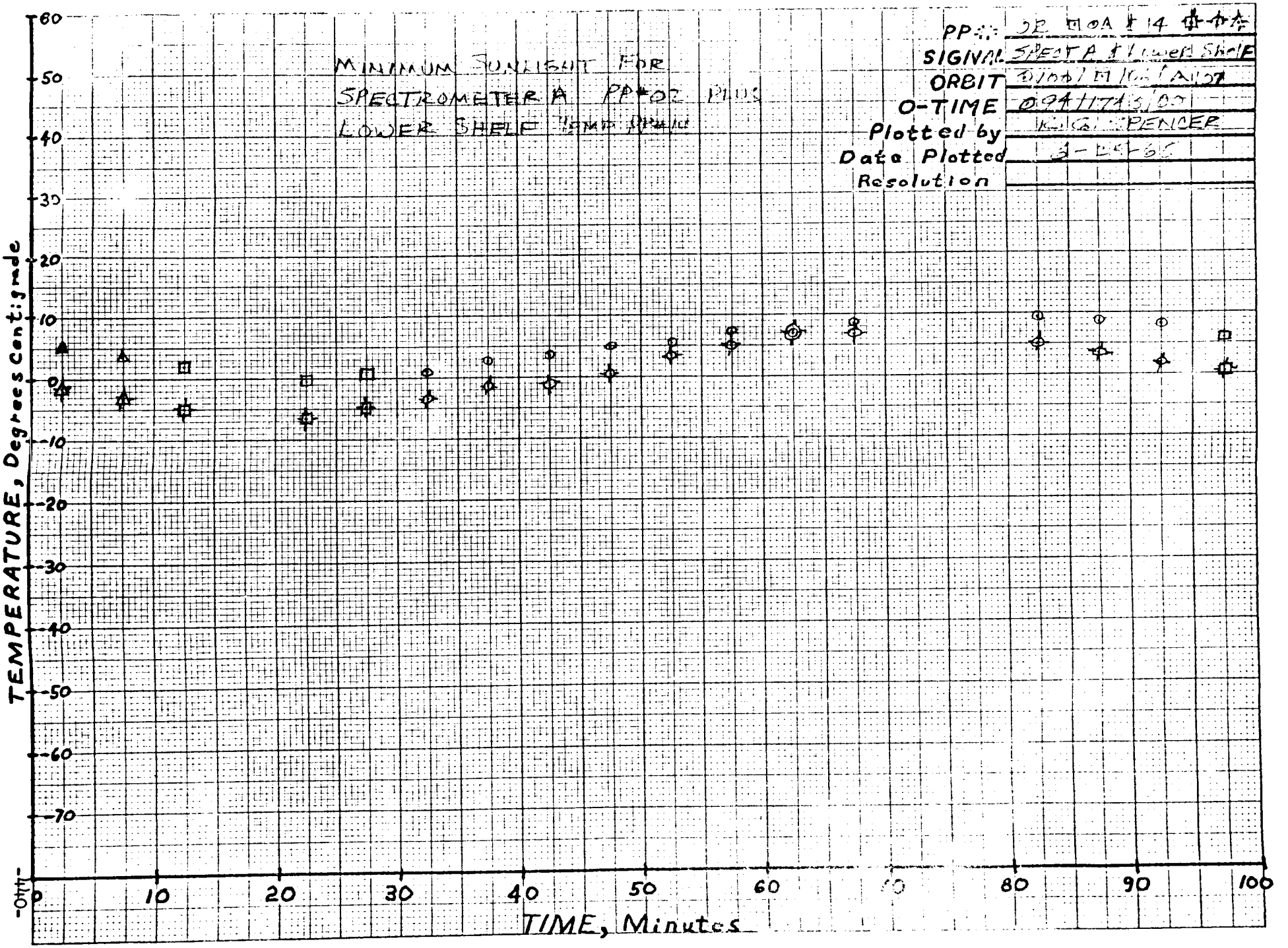
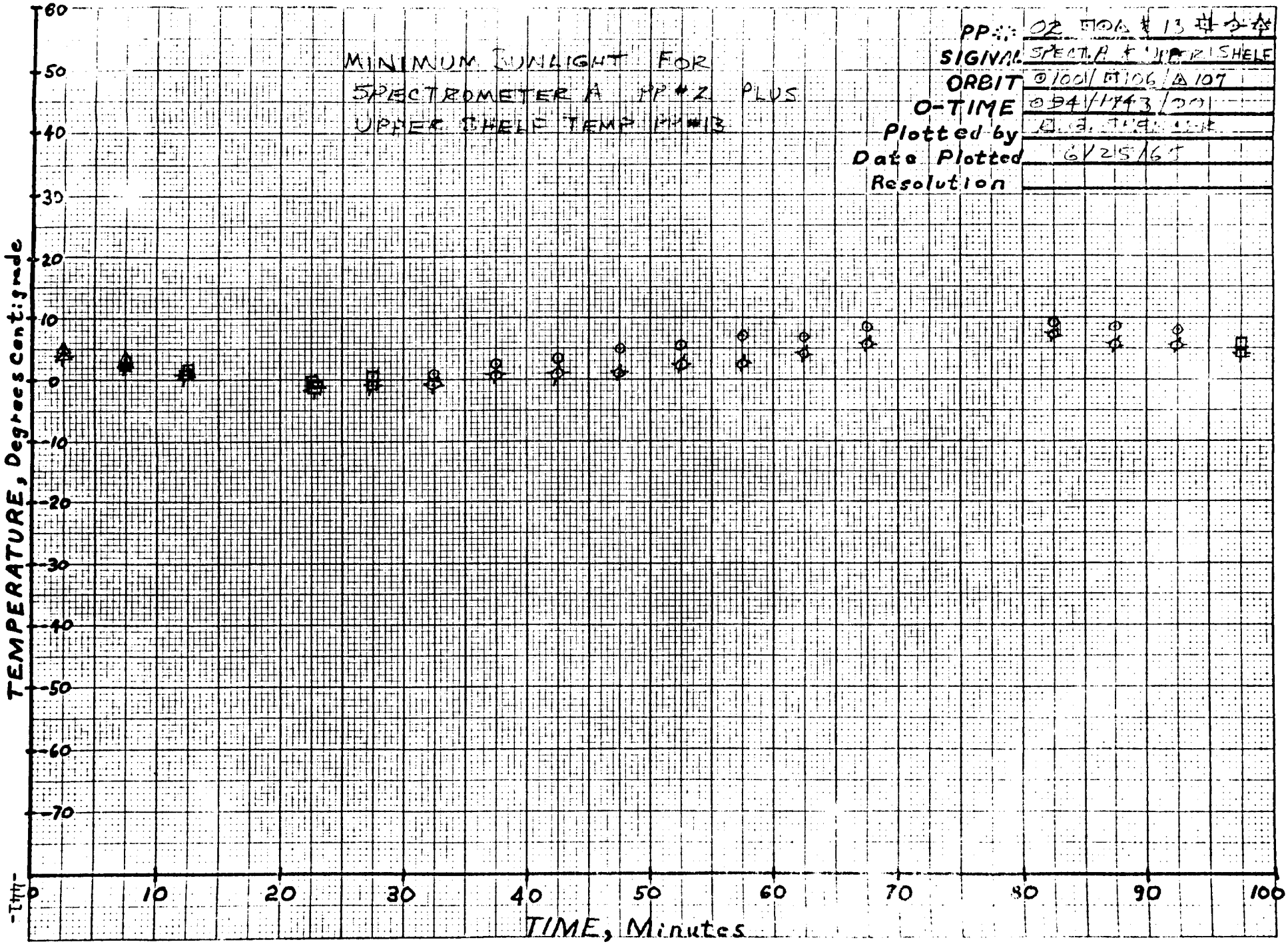
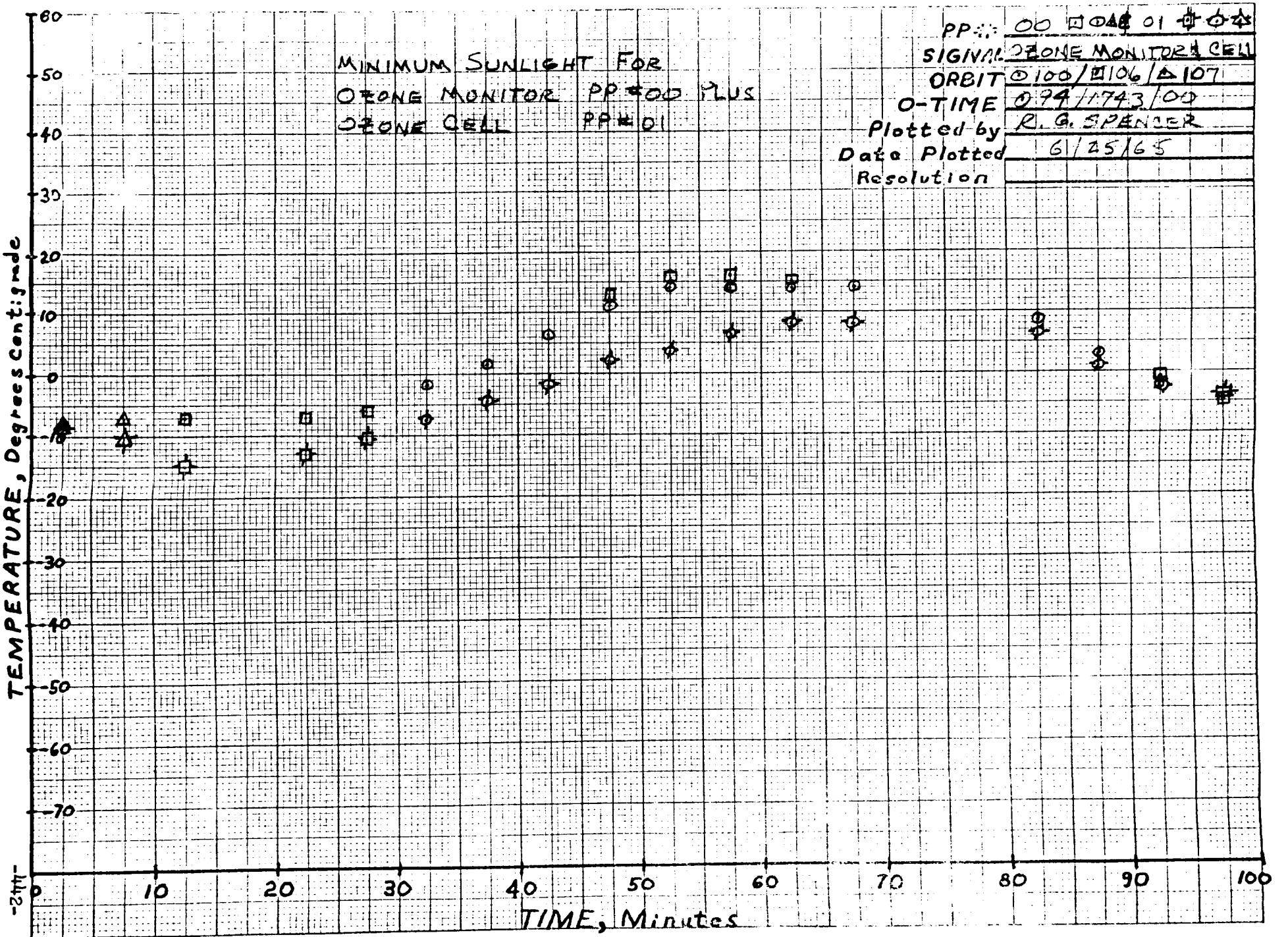
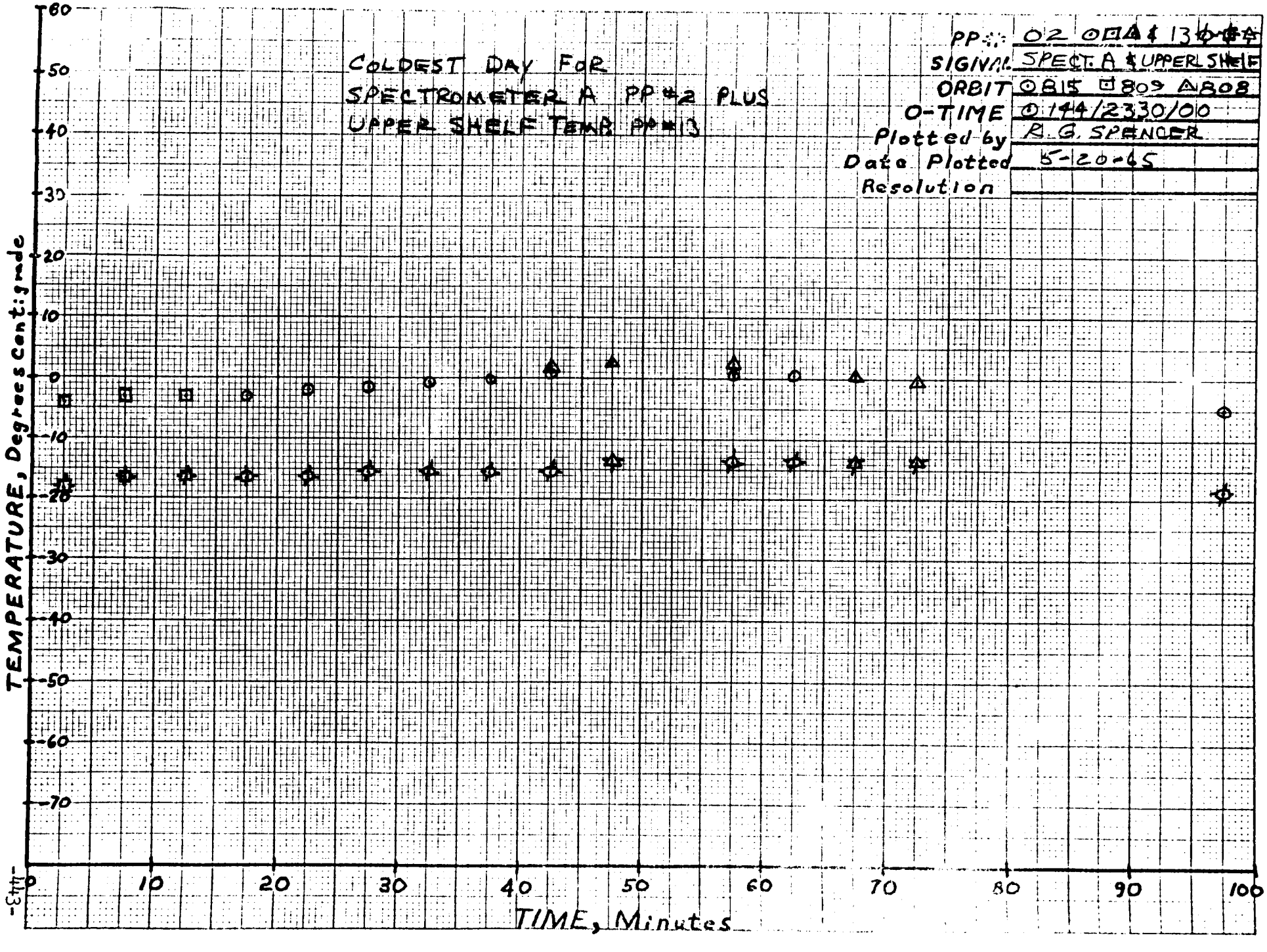
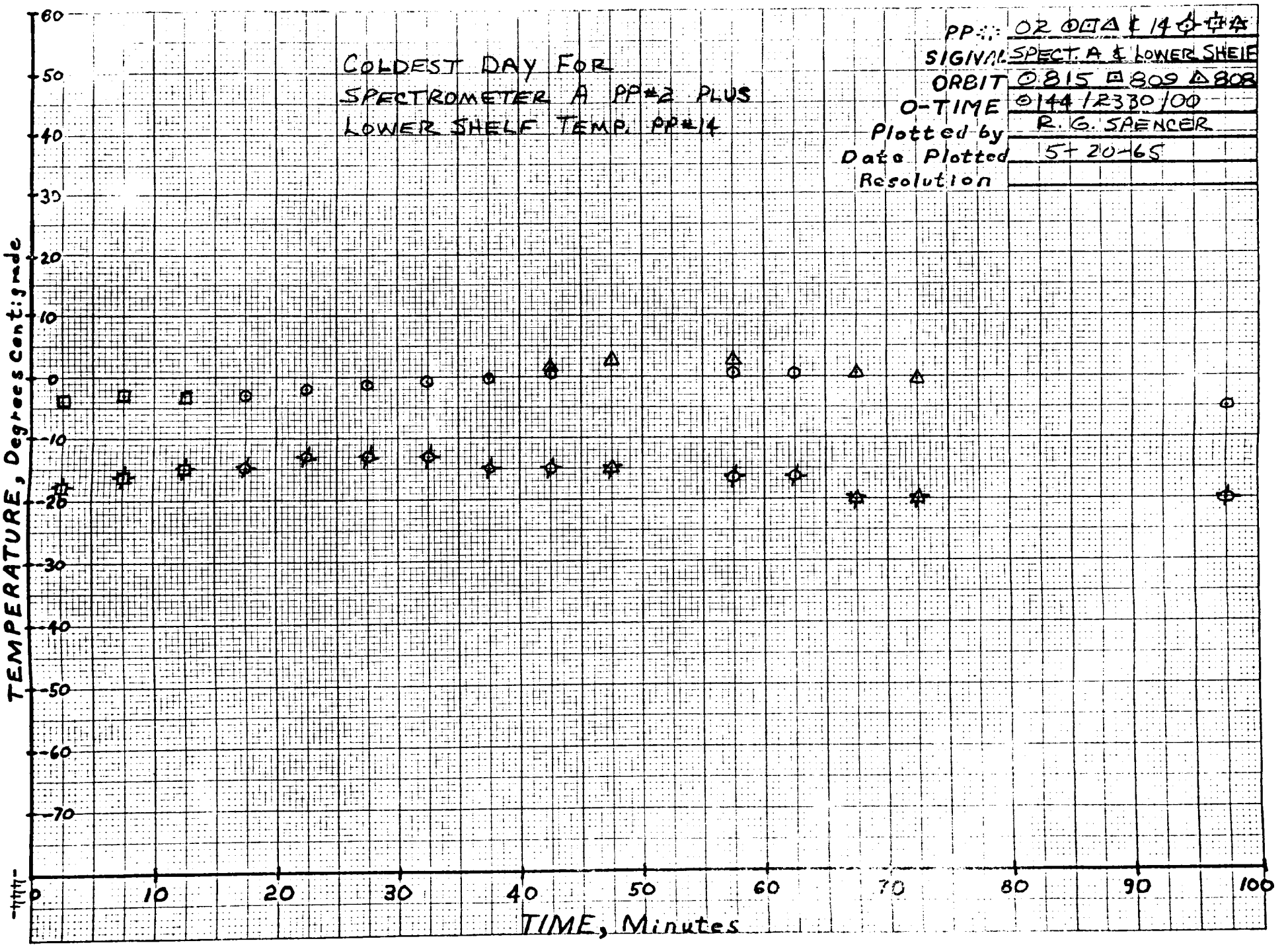
90
100

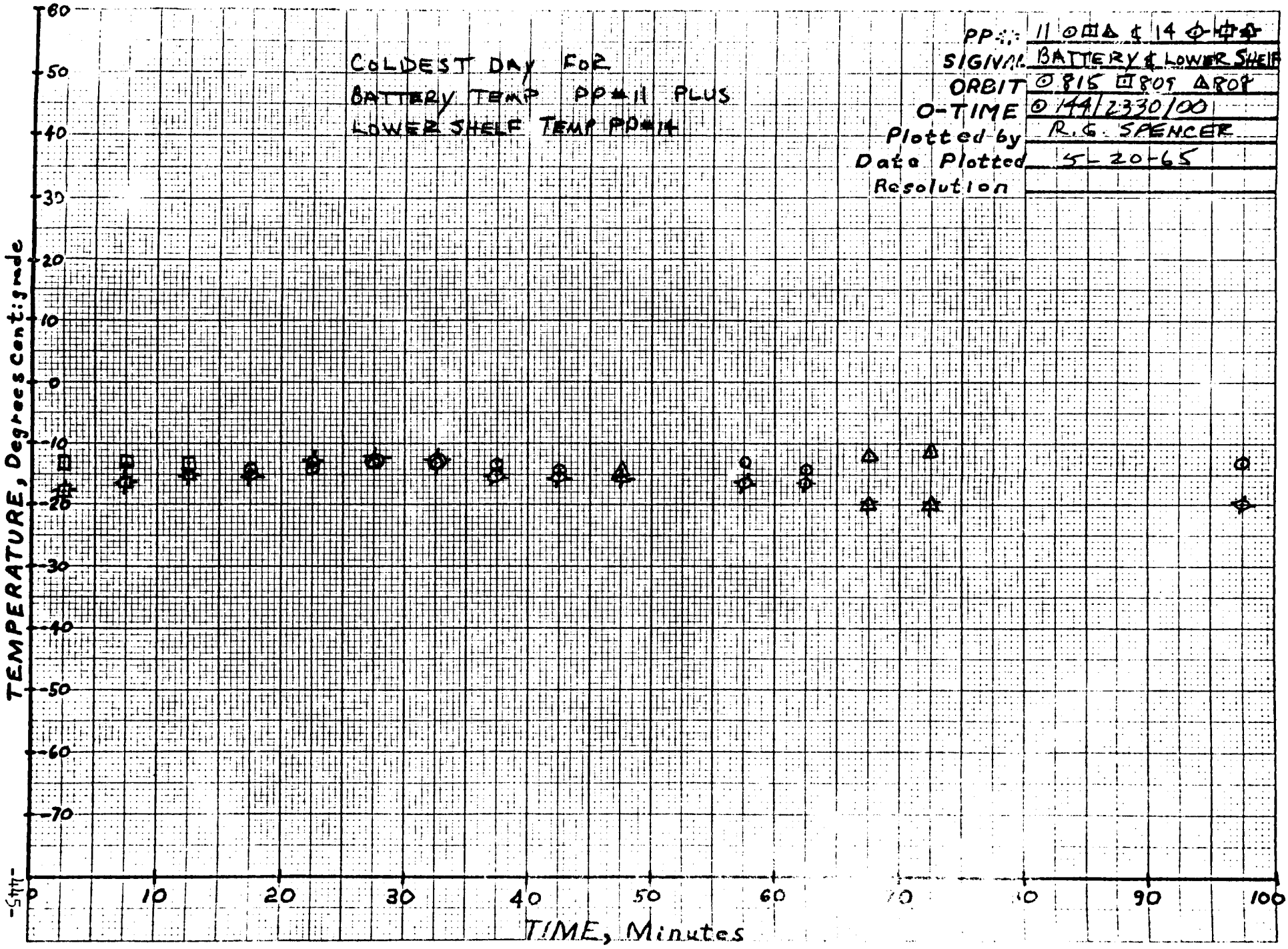

MINIMUM SUNLIGHT FOR
SPECTROMETER A PP#02 PLUS
LOWER SHELF TEMPERATURE
PP#: 02 DOA # 14
SIGNAL: SPECT A & Lower Shelf
ORBIT
O-TIME
Plotted by
Date Plotted
Resolution
TEMPERATURE, Degrees Centigrade
TIME, Minutes
80
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
80
90
100

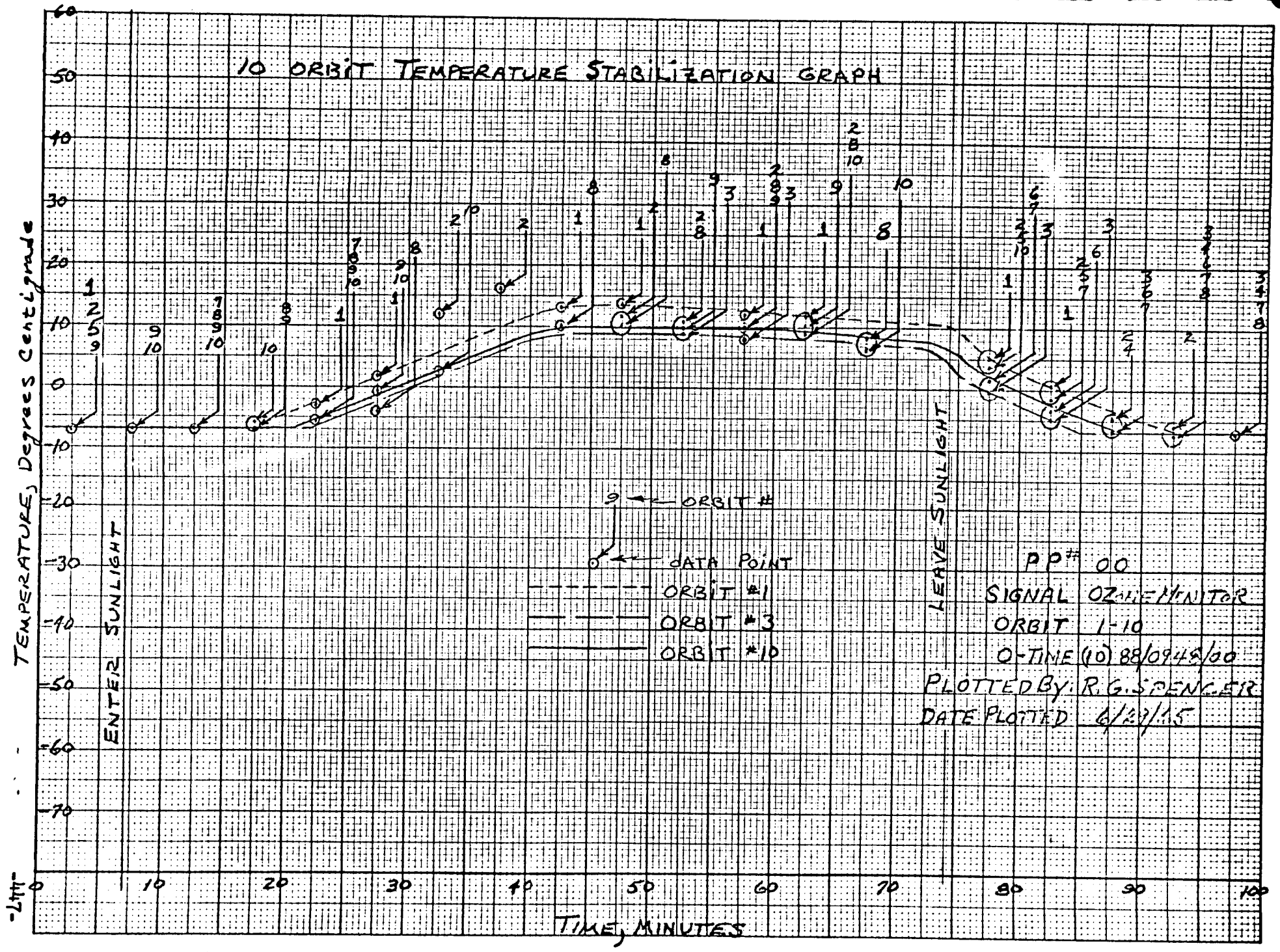

MINIMUM SUNLIGHT FOR
SPECTROMETER A PP#2 PLUS
UPPER SHELF TEMP PP#13
PP
SIGNAL
ORBIT
O-TIME
Plotted by
Date Plotted
Resolution
TEMPERATURE, Degrees Centigrade
TIME, Minutes
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100


MINIMUM SUNLIGHT FOR
OZONE MONITOR PP#00 PLUS
OZONE CELL PP#01
PP#: 00 01
SIGNAL: OZONE MONITOR & CELL
ORBIT: 100/106/107
O-TIME: 094/1743/00
Plotted by: R. G. SPENCER
Date Plotted: 6/25/65
Resolution
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

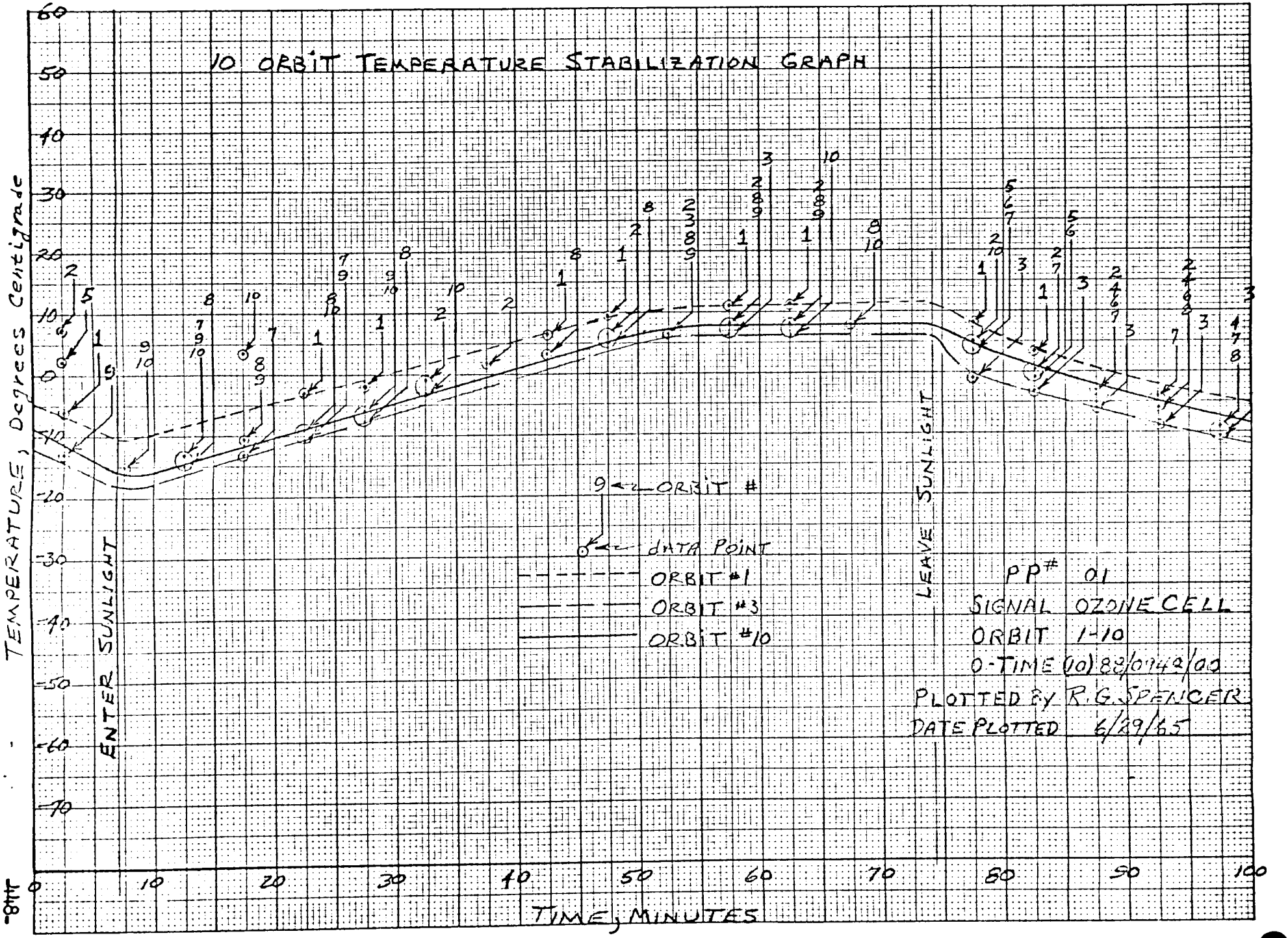

COLDEST DAY FOR
SPECTROMETER A PP #2 PLUS
UPPER SHELF TEMP PP #13
PP 02 ⊙⊡△ & 13
SIGNAL SPECT. A & UPPER SHELF
ORBIT ⊙815 ⊡809 △808
O-TIME ⊙144/2330/00
Plotted by R. G. SPENCER
Date Plotted 5-20-65
Resolution
TEMPERATURE, Degrees Centigrade
TIME, Minutes
80
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100

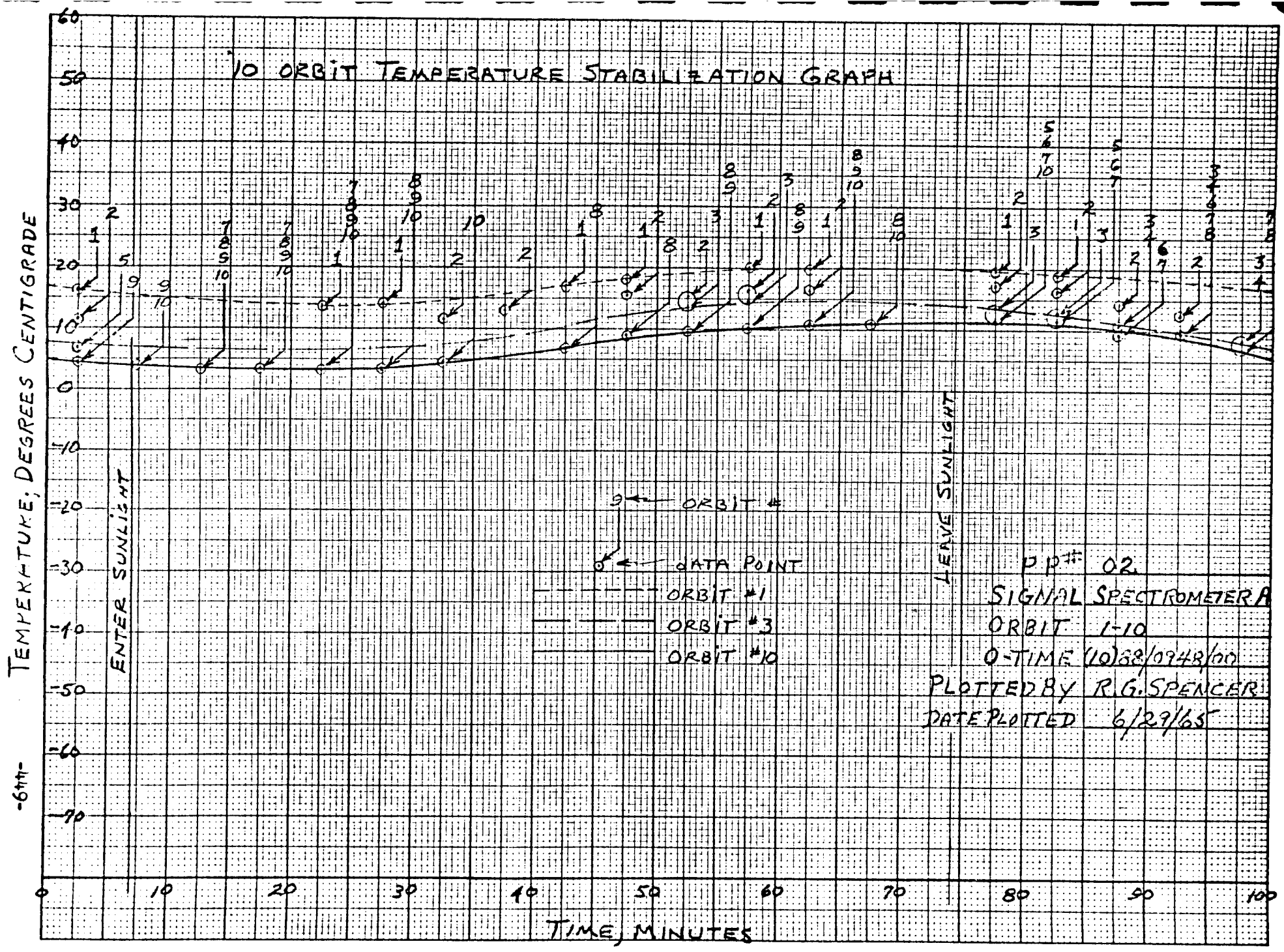

COLDEST DAY FOR
SPECTROMETER A PP#2 PLUS
LOWER SHELF TEMP. PP#14
PP# 02 ⊙⊡△ & 14 ⊕⊕⊕
SIGNAL SPECT. A & LOWER SHELF
ORBIT ⊙815 ⊡809 △808
O-TIME ⊙144/2330/00
Plotted by R. G. SPENCER
Date Plotted 5-20-65
Resolution
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes


COLDEST DAY FOR
BATTERY TEMP PP#11 PLUS
LOWER SHELF TEMP PP#14
PP# 11 ⊙⊡△ & 14 ⊕-⊕⊕
SIGNAL BATTERY & LOWER SHELF
ORBIT ⊙815 ⊡809 △808
O-TIME ⊙144/2330/00
Plotted by R.G. SPENCER
Date Plotted 5-20-65
Resolution
TEMPERATURE, Degrees Centigrade
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
0
10
20
30
40
50
60
70
80
90
100
TIME, Minutes

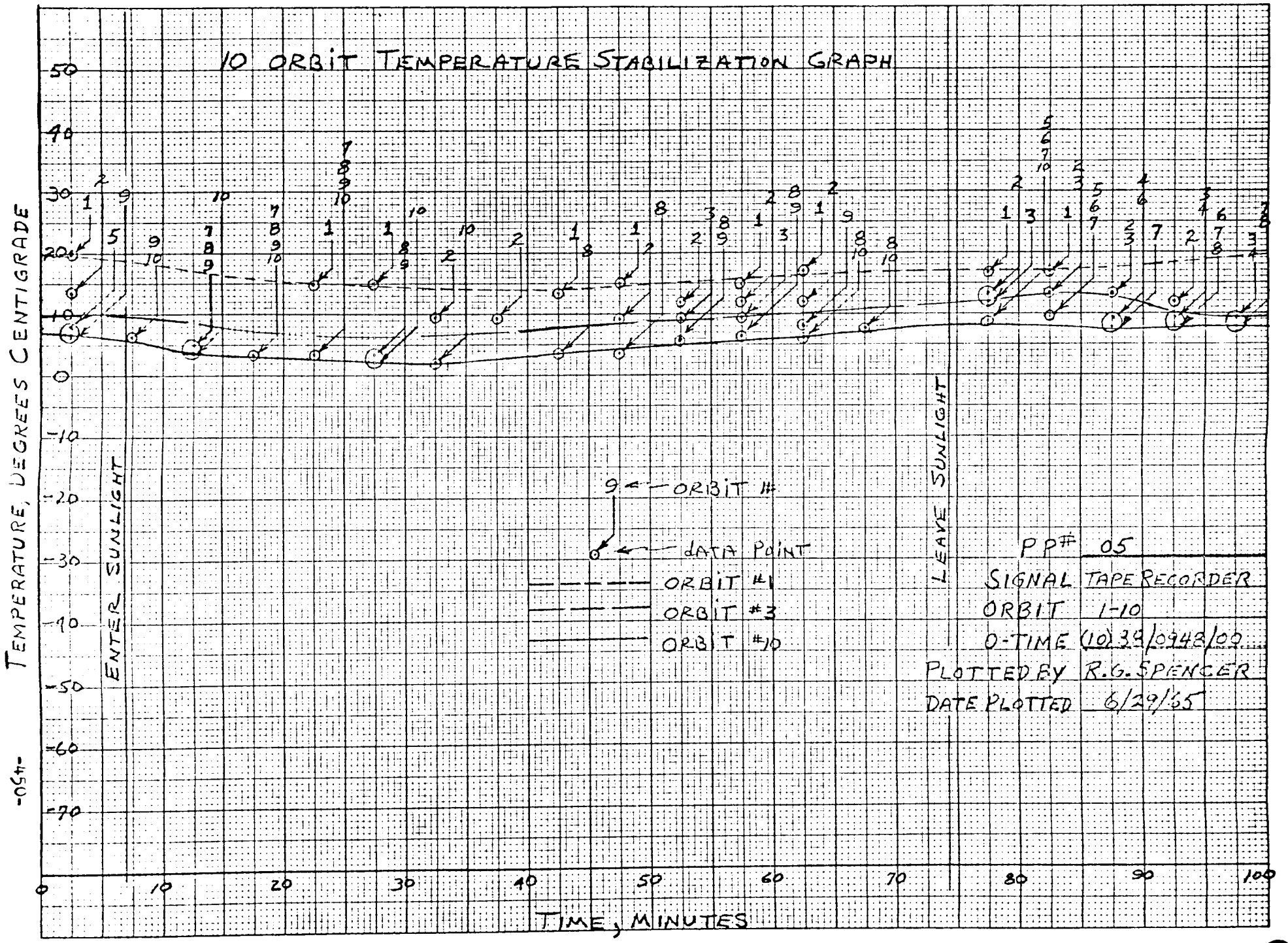

10 ORBIT TEMPERATURE STABILIZATION GRAPH
TEMPERATURE, Degrees Centigrade
TIME, MINUTES
ENTER SUNLIGHT
LEAVE SUNLIGHT
9 ← ORBIT #
DATA POINT
ORBIT #1
ORBIT #3
ORBIT #10
PP# 00
SIGNAL OZONE MONITOR
ORBIT 1-10
O-TIME (10) 88/0945/00
PLOTTED BY: R.G. SPENCER
DATE PLOTTED 6/29/65

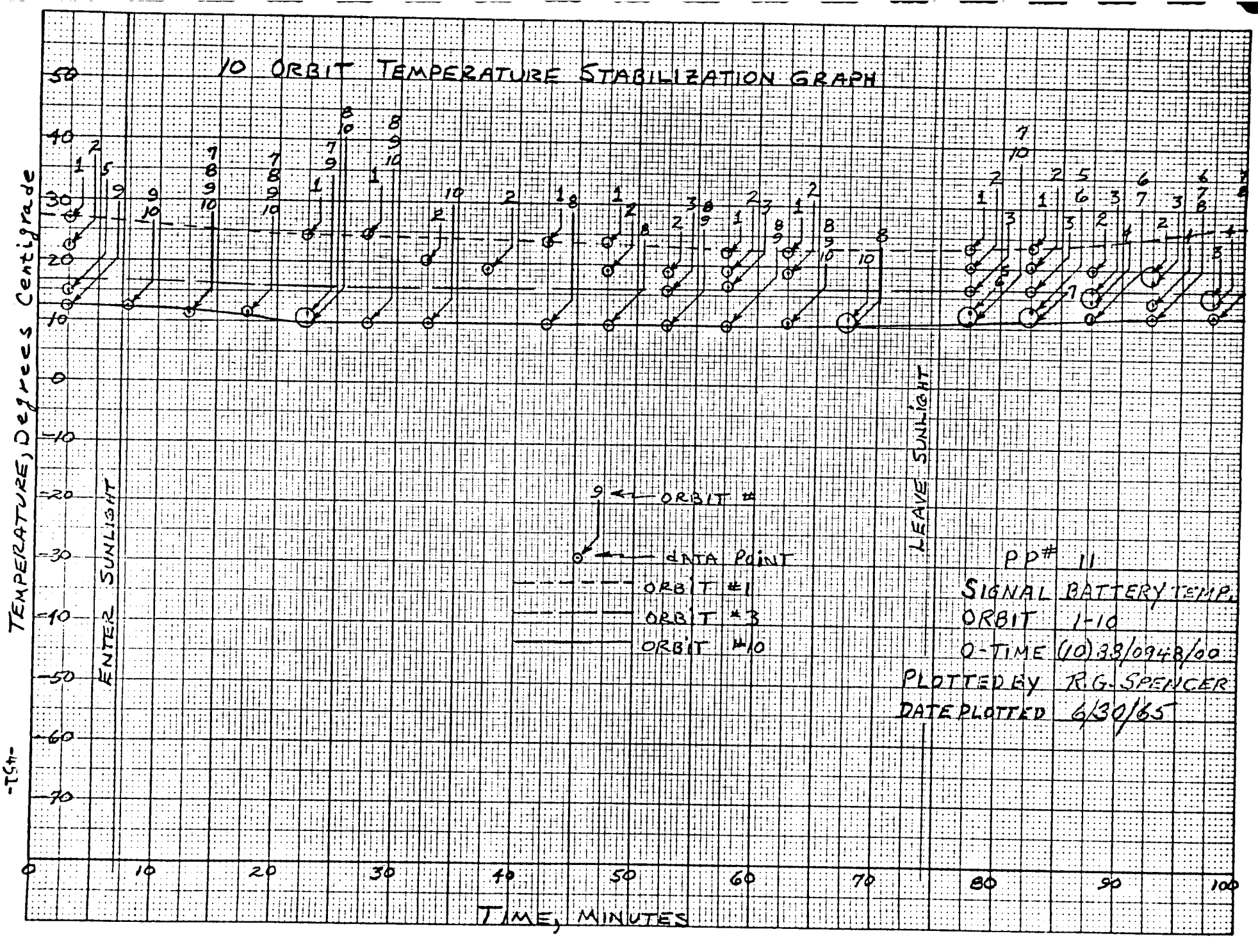
K+E 10 X 10 TO ½ INCH 46 1472
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



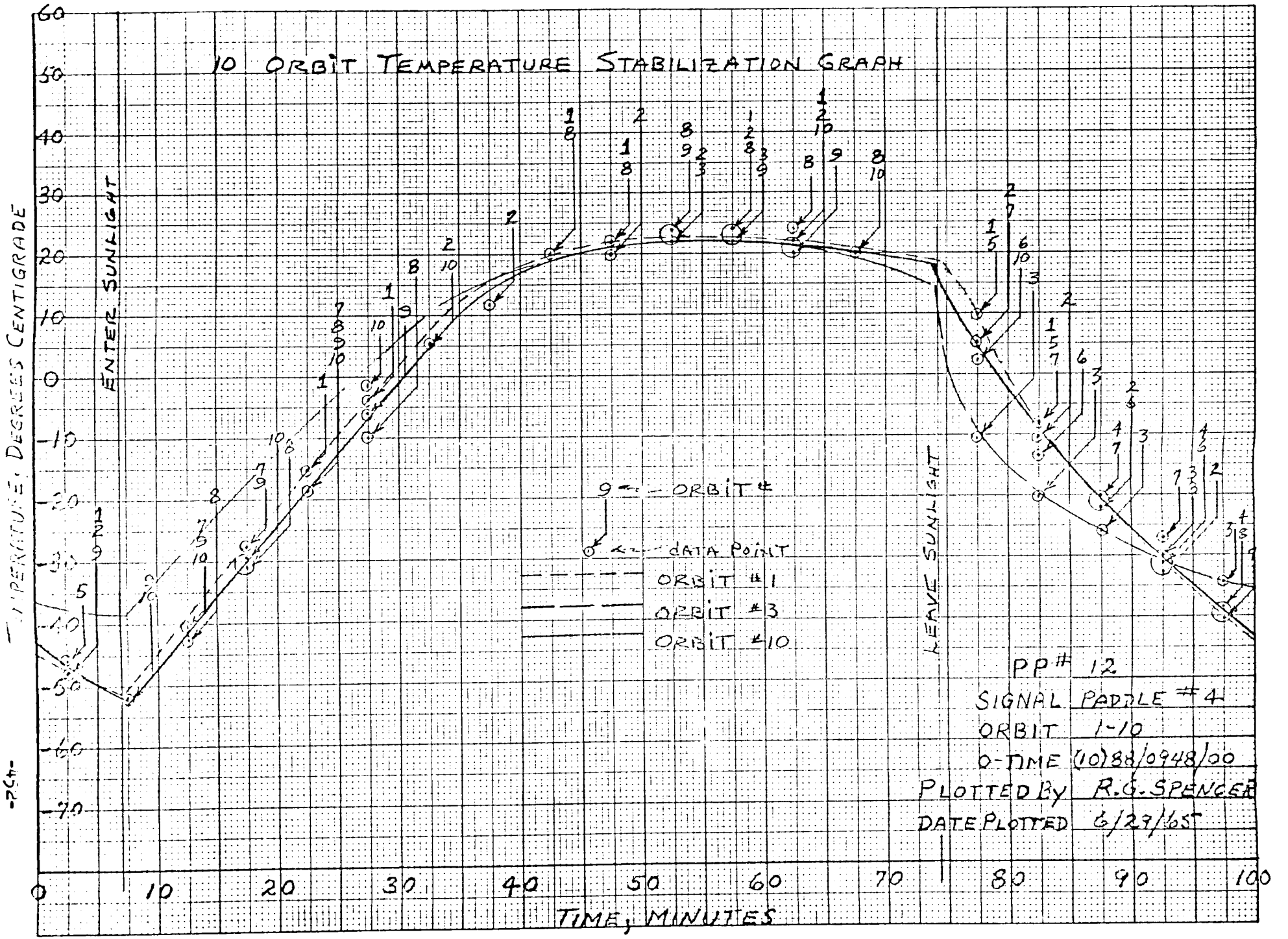

10 ORBIT TEMPERATURE STABILIZATION GRAPH
TEMPERATURE; DEGREES CENTIGRADE
TIME, MINUTES
ENTER SUNLIGHT
LEAVE SUNLIGHT
ORBIT #
DATA POINT
ORBIT #1
ORBIT #3
ORBIT #10
PP# 02
SIGNAL SPECTROMETER A
ORBIT 1-10
O-TIME (10)68/0948/00
PLOTTED BY R.G. SPENCER
DATE PLOTTED 6/29/65

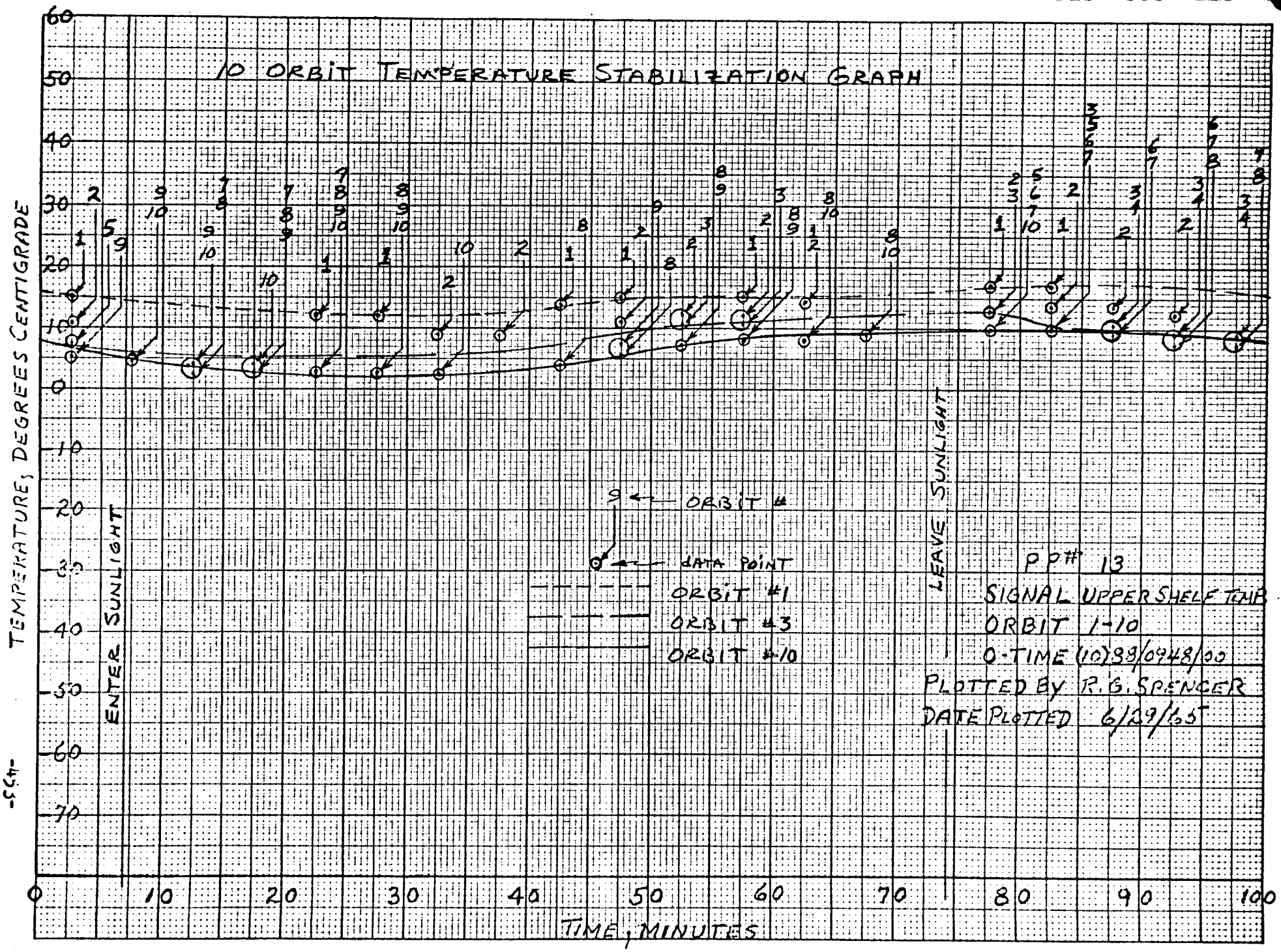
7½ X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



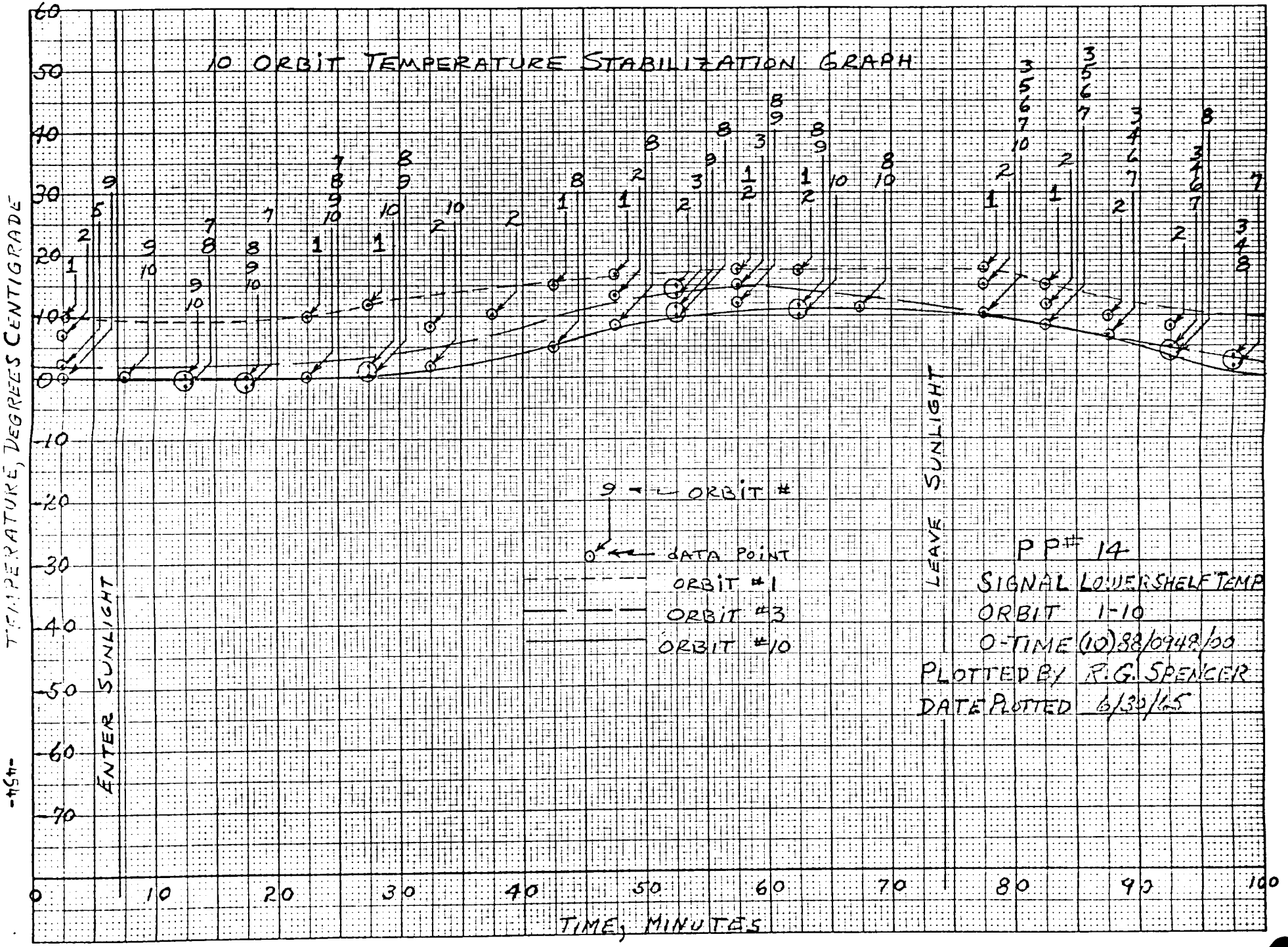

10 ORBIT TEMPERATURE STABILIZATION GRAPH
TEMPERATURE, Degrees Centigrade
TIME, MINUTES
ENTER SUNLIGHT
LEAVE SUNLIGHT
9 ← ORBIT #
← DATA POINT
ORBIT #1
ORBIT #3
ORBIT #10
PP# 11
SIGNAL BATTERY TEMP.
ORBIT 1-10
0-TIME (10) 33/0948/00
PLOTTED BY R.G. SPENCER
DATE PLOTTED 6/30/65

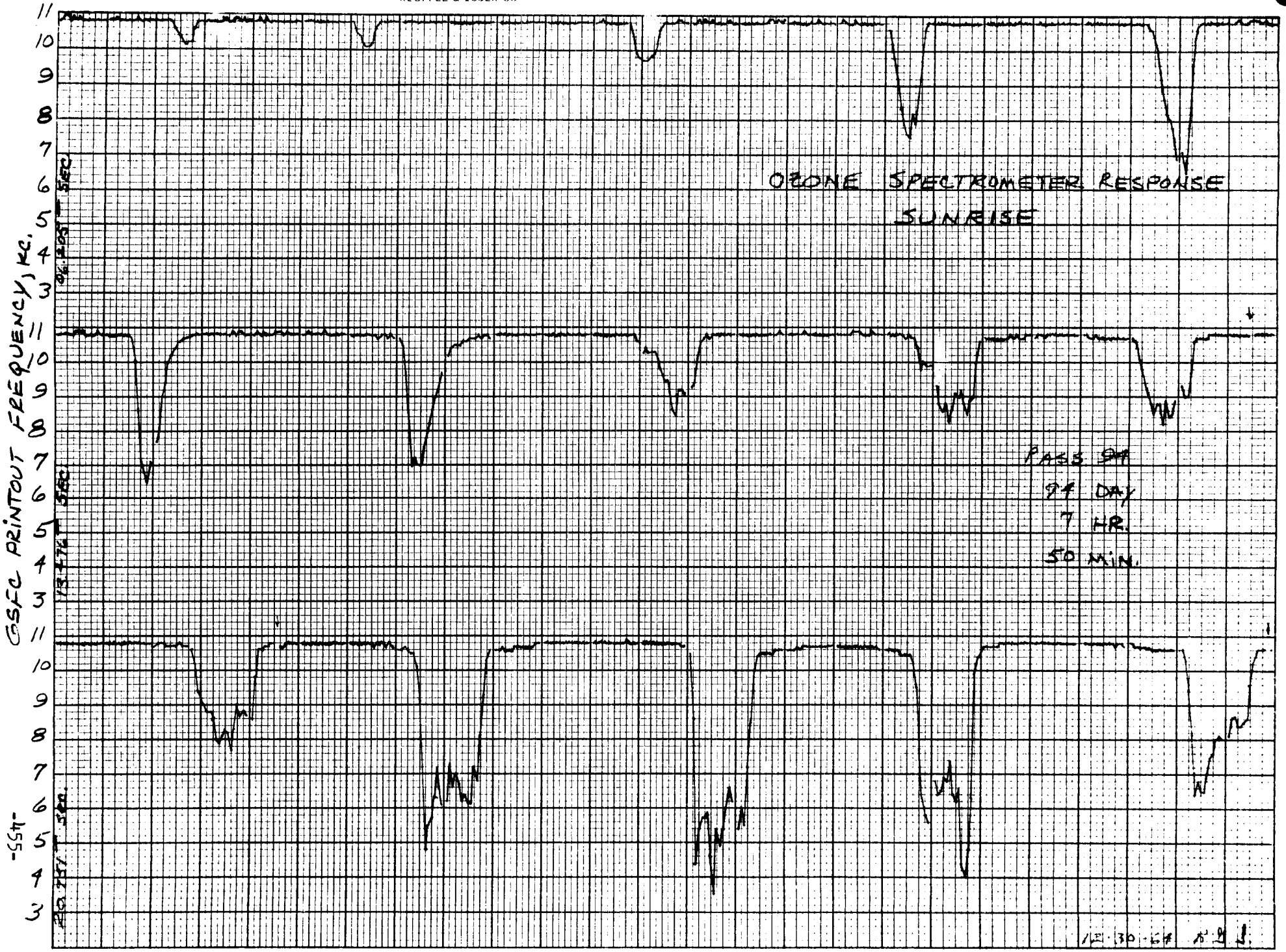
KEUFFEL & ESSER CO.



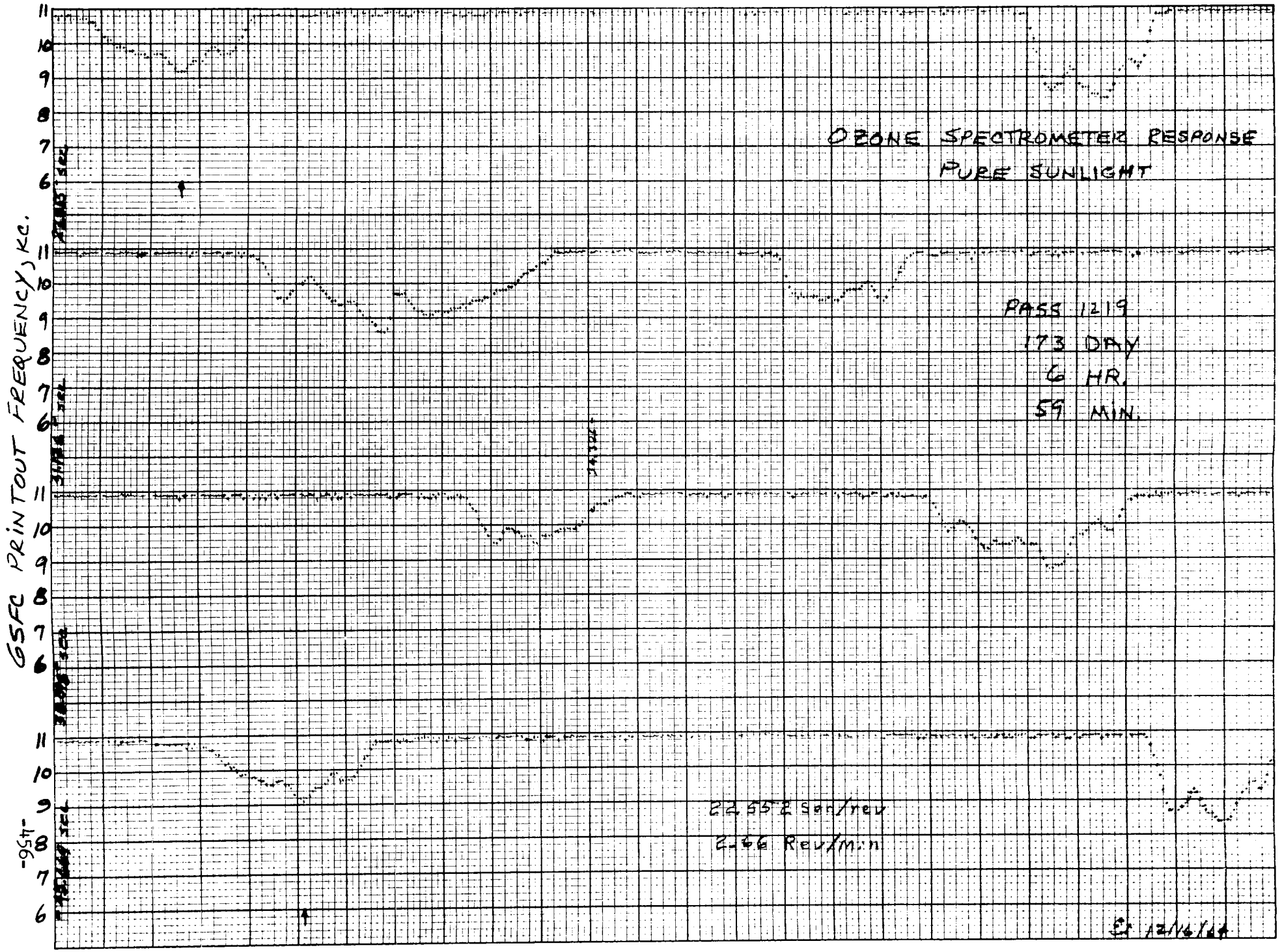

10 ORBIT TEMPERATURE STABILIZATION GRAPH
TEMPERATURE, DEGREES CENTIGRADE
TIME, MINUTES
ENTER SUNLIGHT
LEAVE SUNLIGHT
ORBIT #
DATA POINT
ORBIT #1
ORBIT #3
ORBIT #10
PP# 13
SIGNAL UPPER SHELF TMP
ORBIT 1-10
0-TIME (10)88/0948/00
PLOTTED BY R.G. SPENCER
DATE PLOTTED 6/29/65T

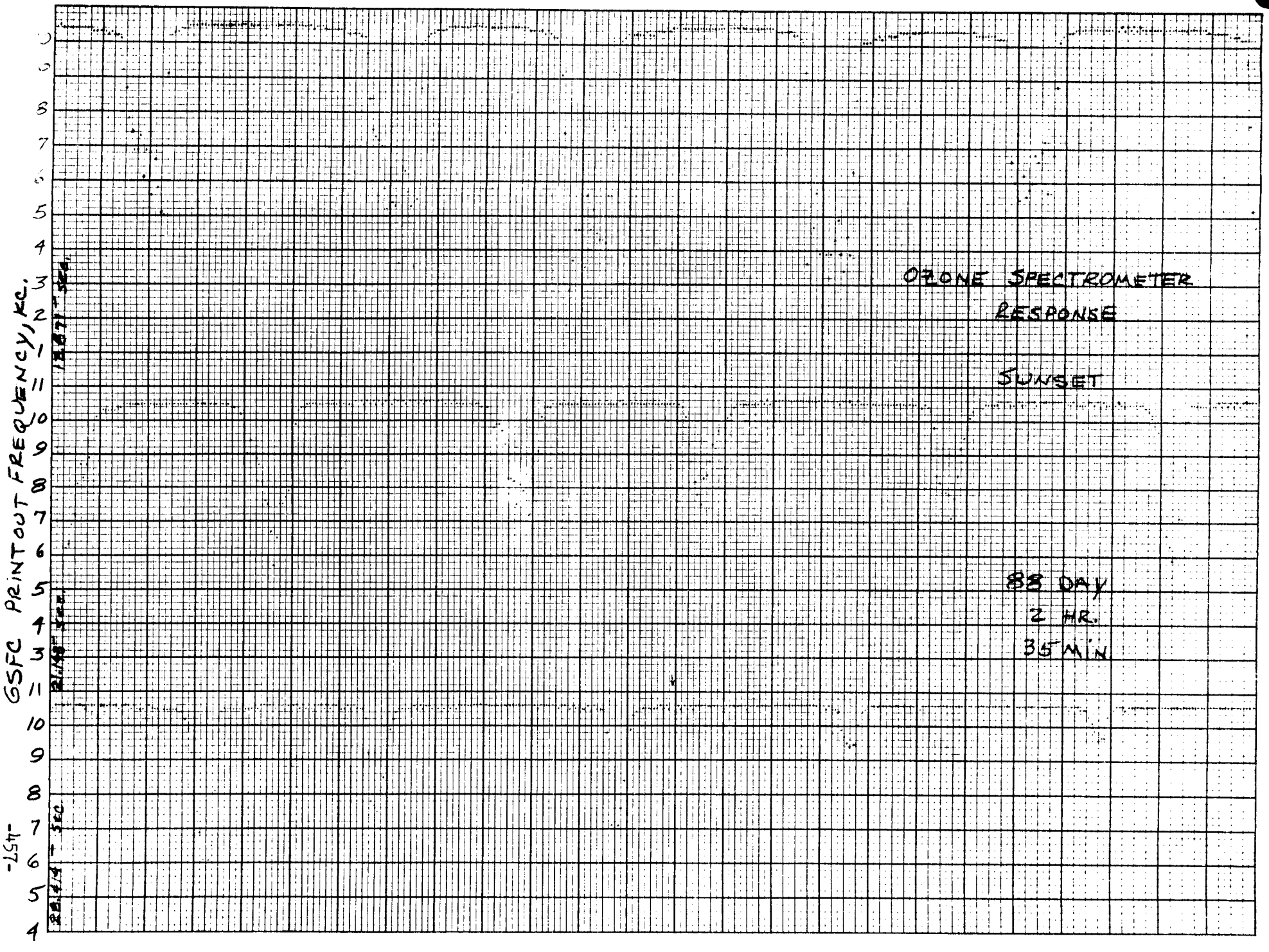
K+E 10 X 10 TO 1/2 INCH 46 1472
7 1/2 X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.



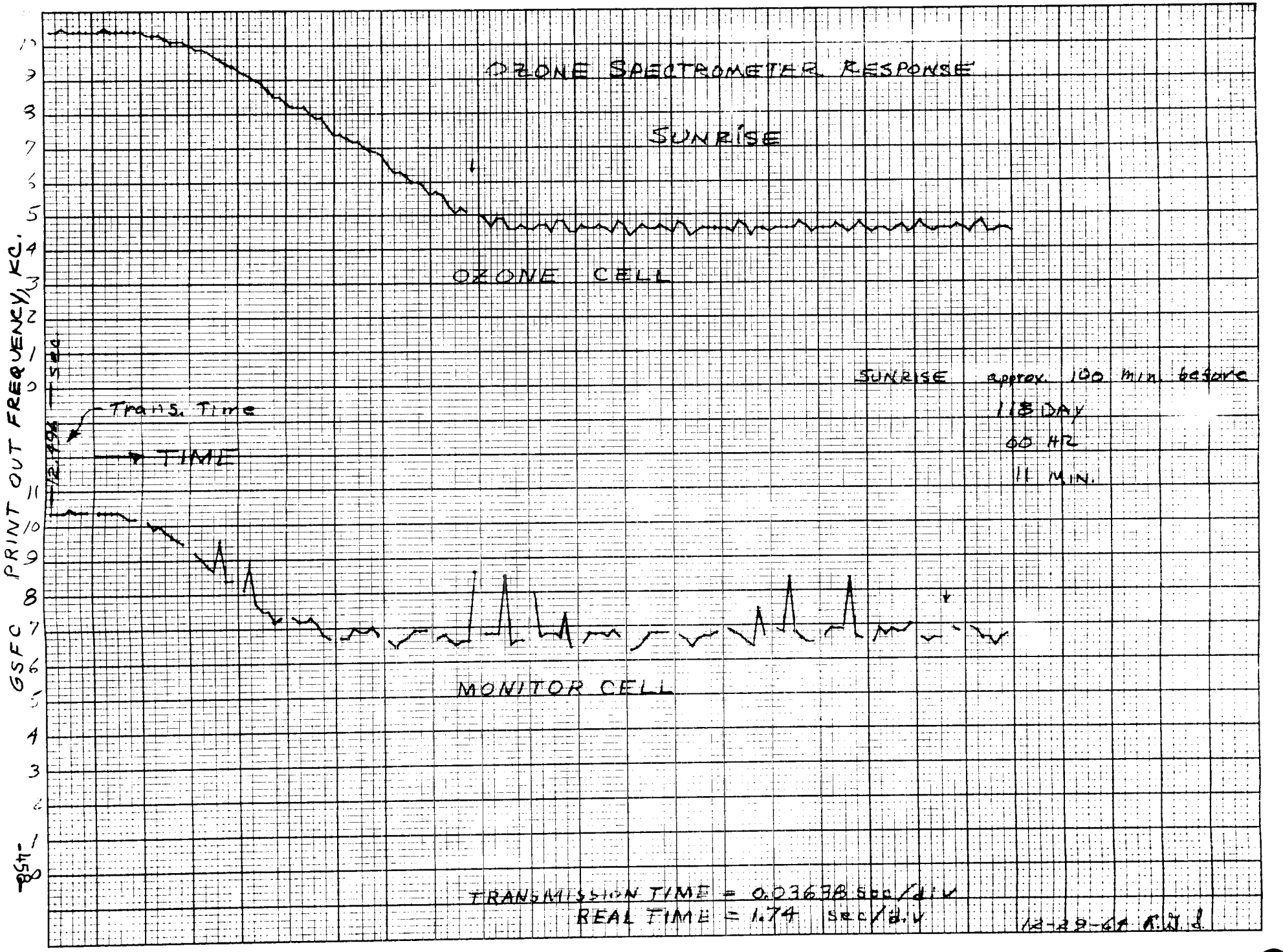

KEUFFEL & ESSER CO.
GSFC PRINTOUT FREQUENCY, KC.
OZONE SPECTROMETER RESPONSE
SUNRISE
PASS 94
94 DAY
7 HR.
50 MIN.
12-30-64

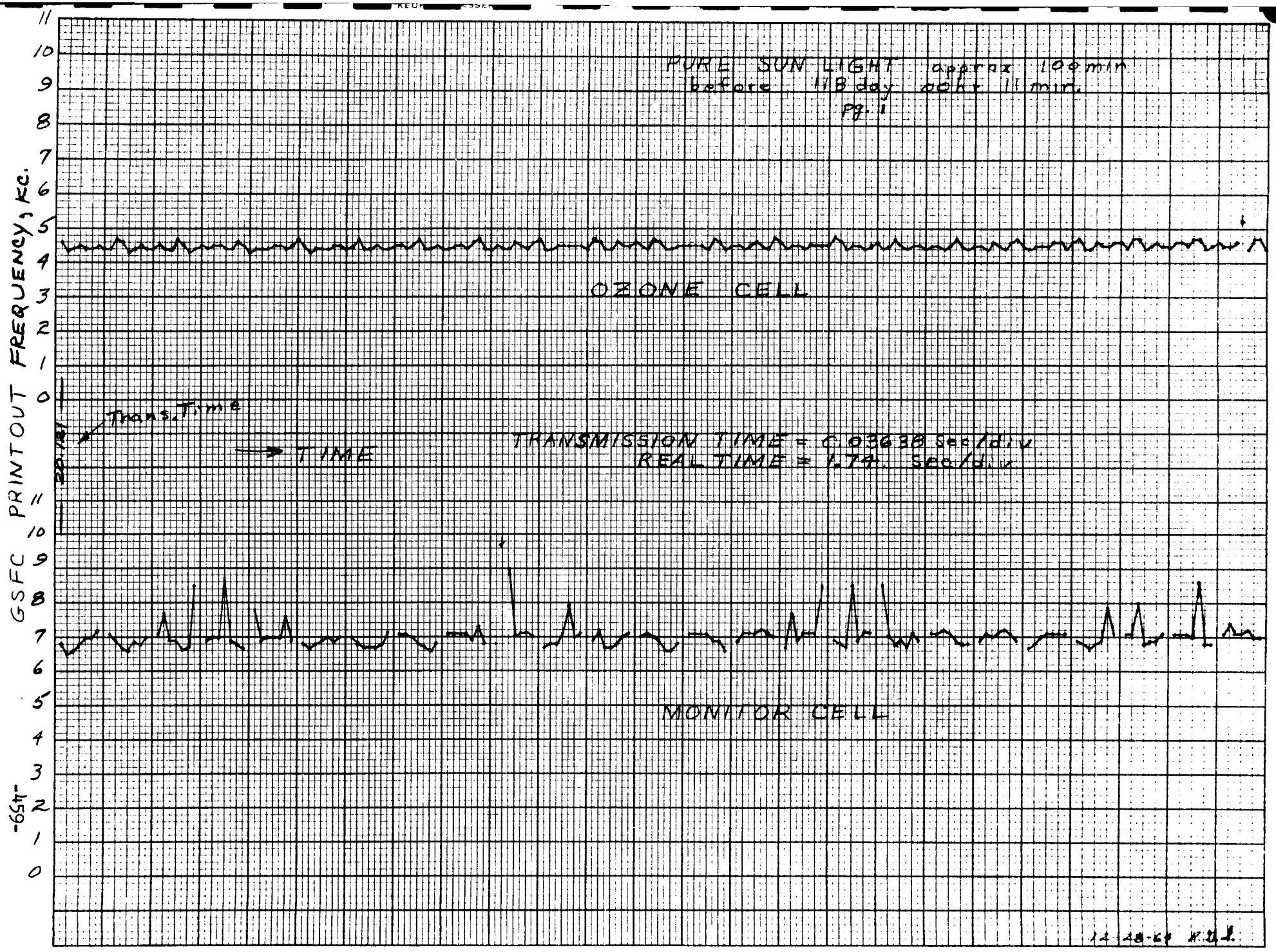
KEUFFEL & ESSER CO.



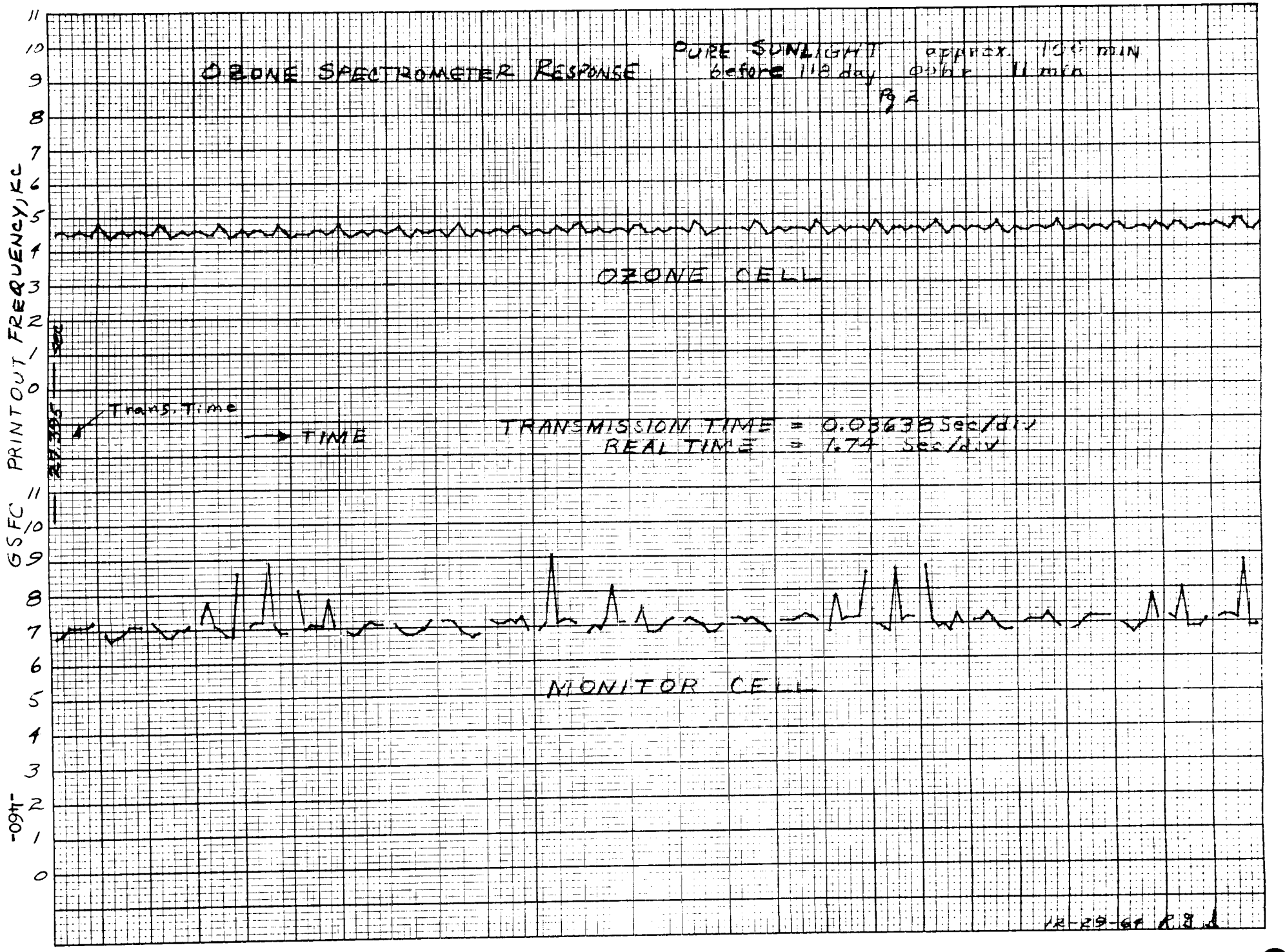

GSFC PRINTOUT FREQUENCY, KC.
OZONE SPECTROMETER
RESPONSE
SUNSET
88 DAY
2 HR.
35 MIN

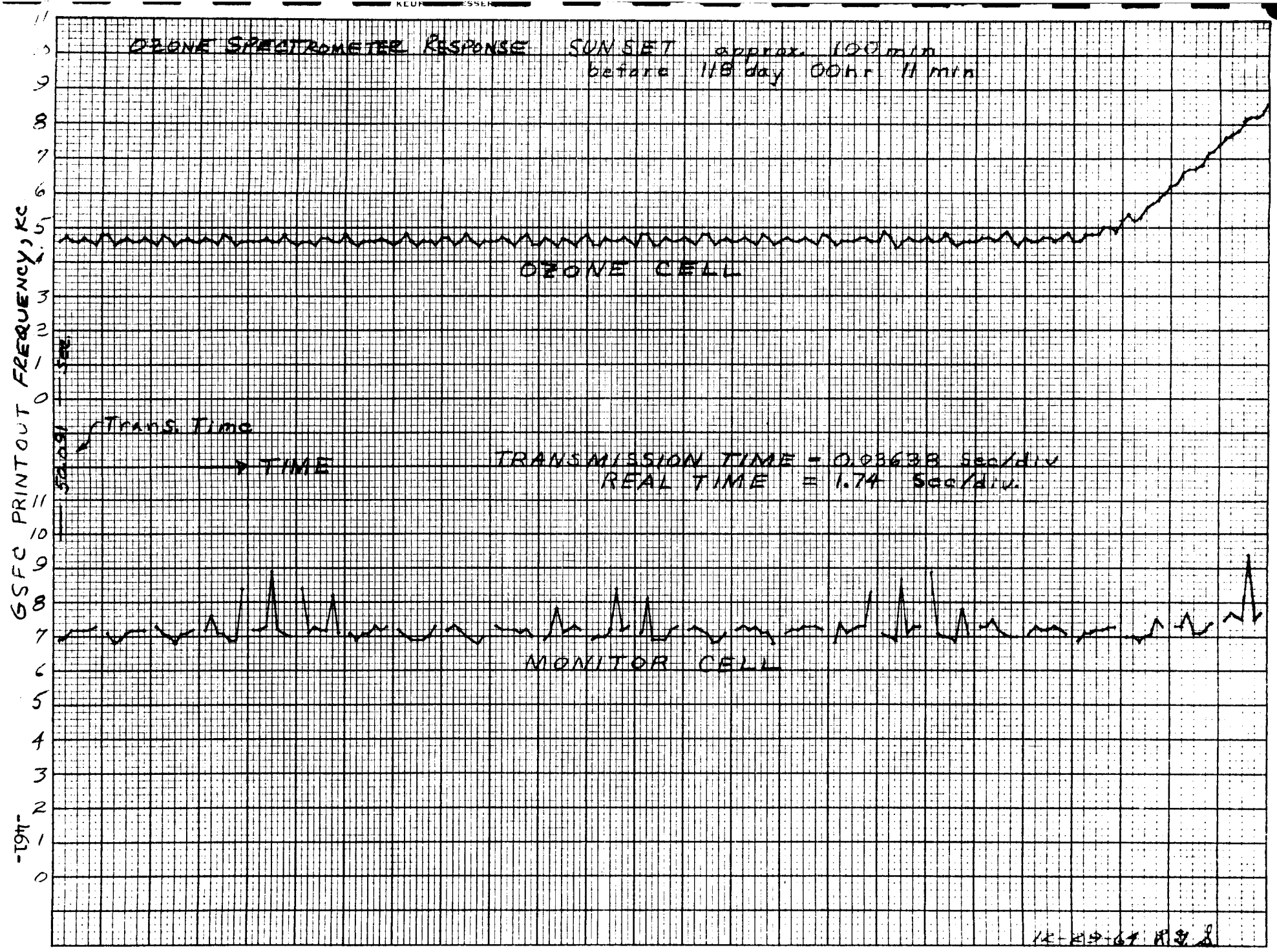
K+E
KEUFFEL & ESSER CO.

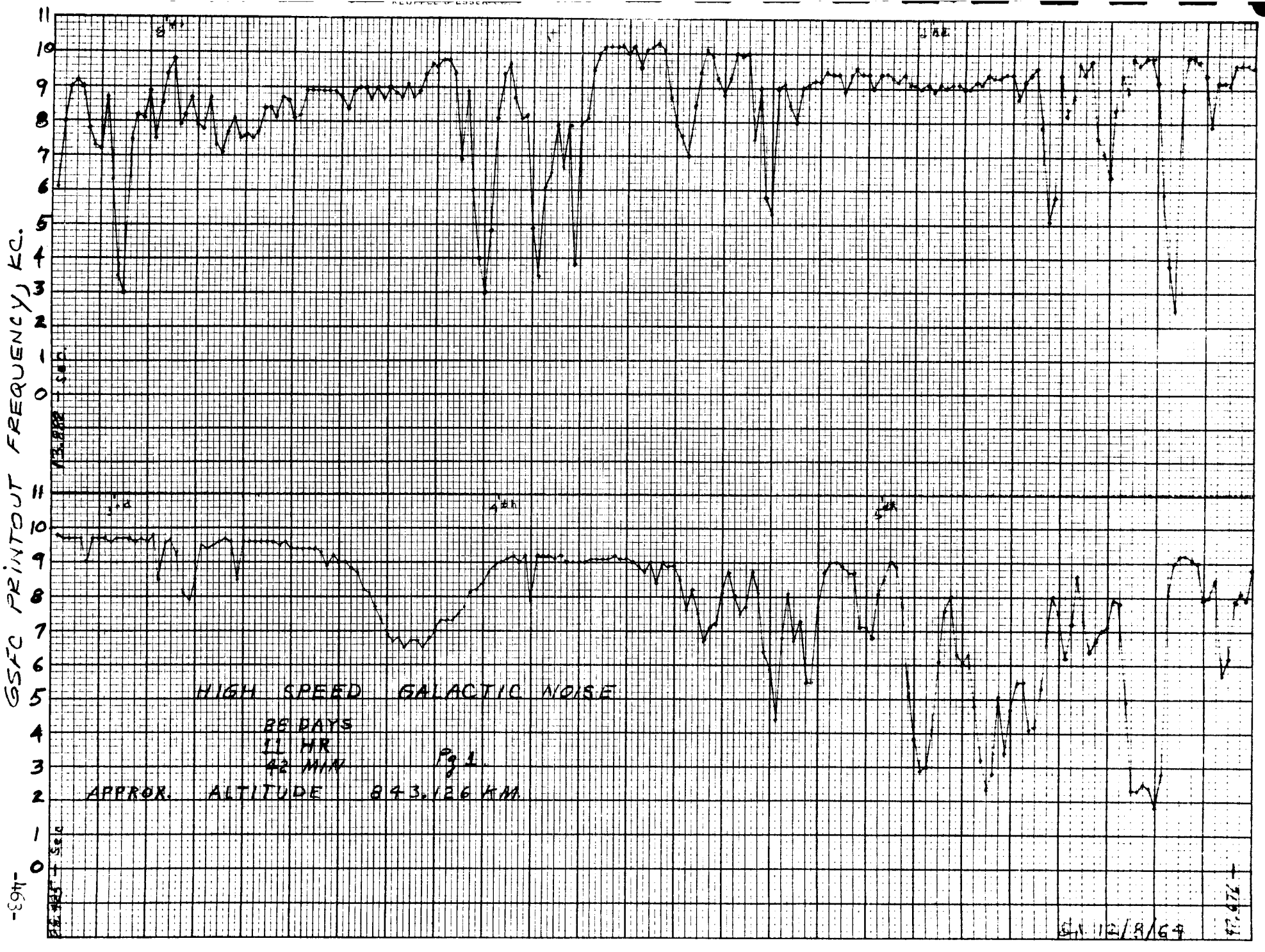



PURE SUN LIGHT approx 100 min
before 118 day 00 hr 11 min.
Pg. 1
OZONE CELL
Trans. Time
TIME
TRANSMISSION TIME = 0.03638 Sec/div
REAL TIME = 1.74 Sec/div
MONITOR CELL
GSFC PRINTOUT FREQUENCY, KC.
12-28-64

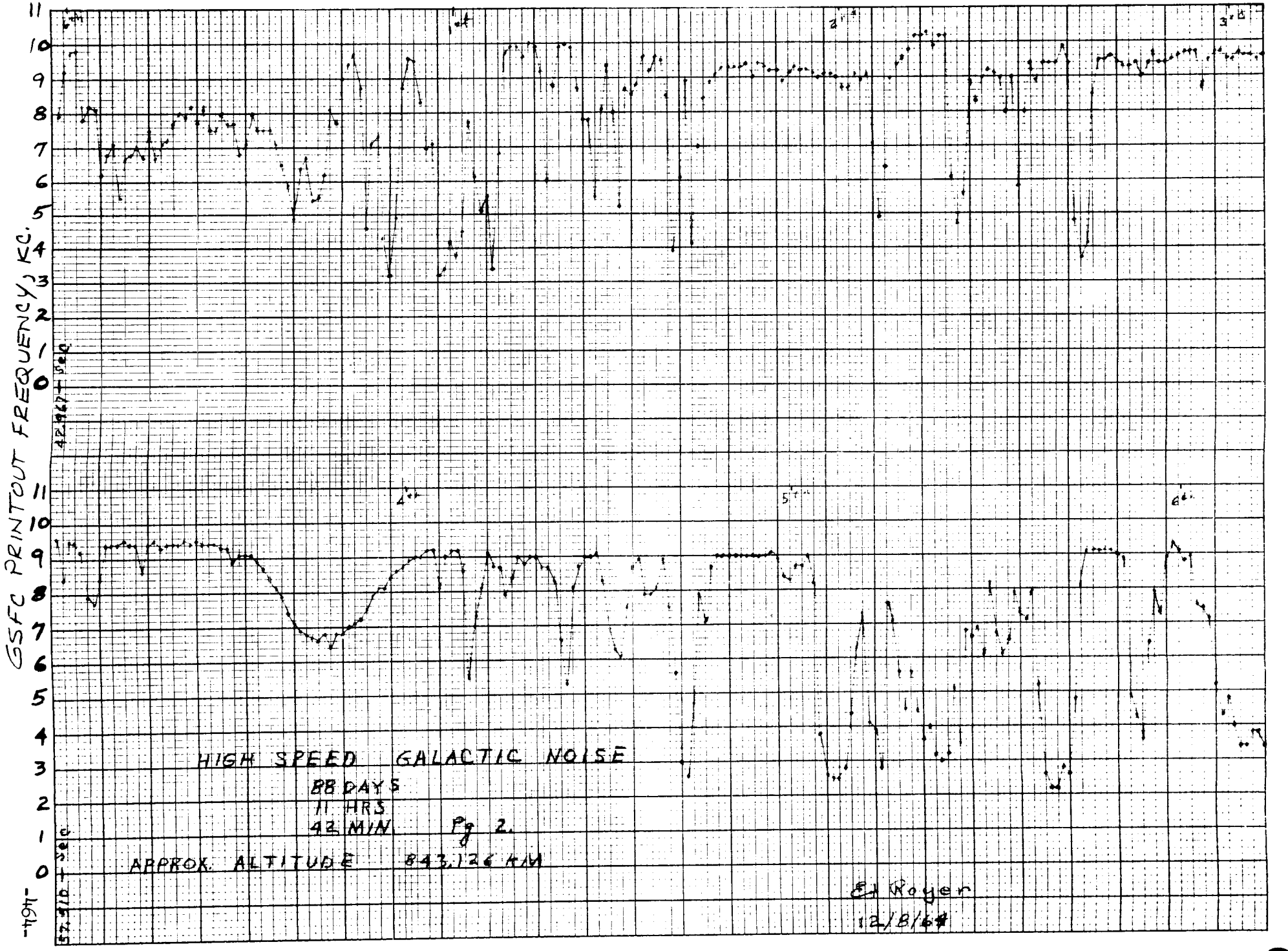
KEUFFEL & ESSER CO.

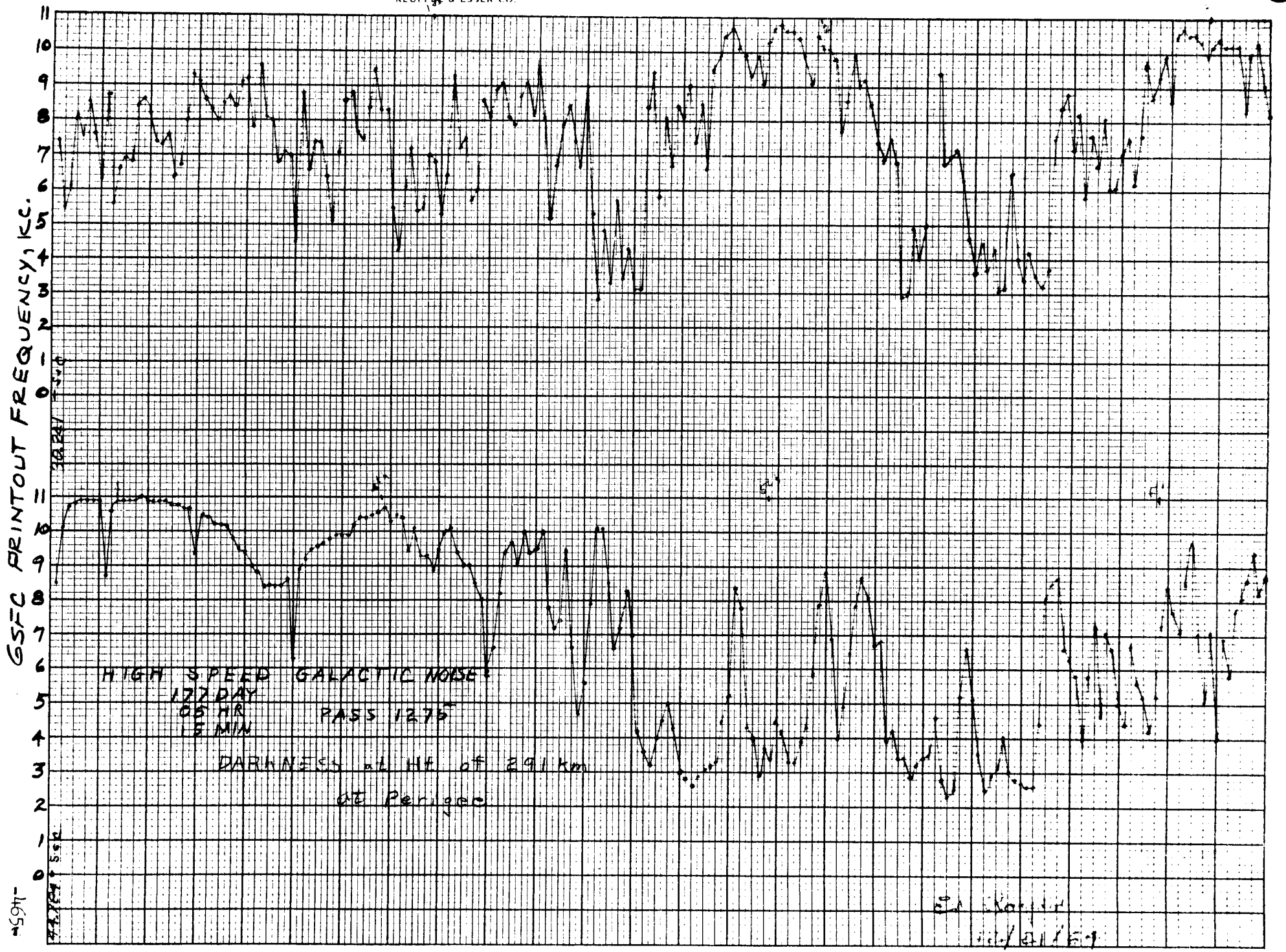



OZONE SPECTROMETER RESPONSE SUNSET approx. 100 min
before 118 day 00hr 11 min
OZONE CELL
Trans. Time
TIME
TRANSMISSION TIME = 0.03638 sec/div
REAL TIME = 1.74 sec/div.
MONITOR CELL
GSFC PRINTOUT FREQUENCY, KC
-194-

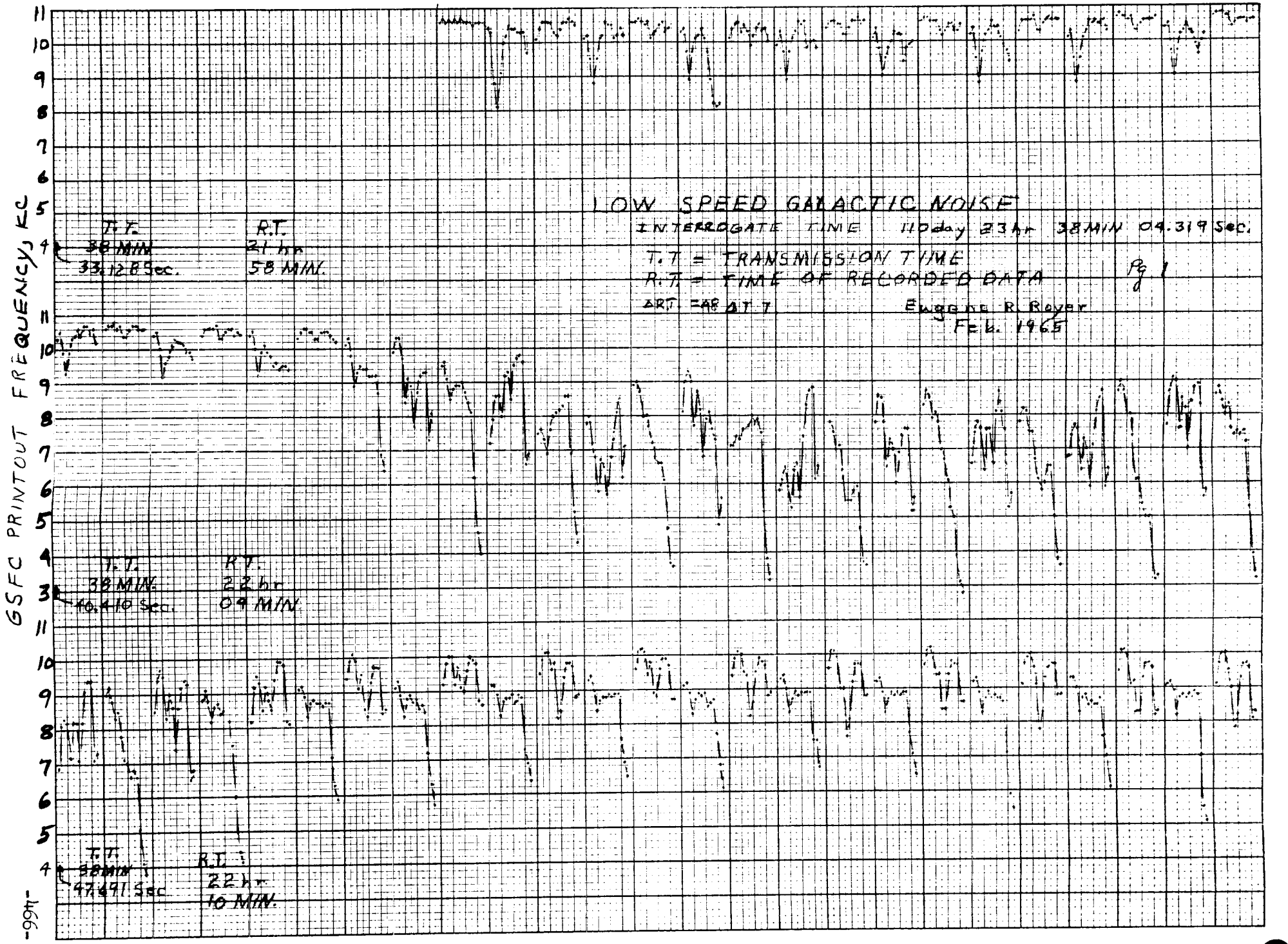

GSFC PRINTOUT FREQUENCY, KC.
HIGH SPEED GALACTIC NOISE
28 DAYS
11 HR
42 MIN
Pg 1
APPROX. ALTITUDE 843.126 KM
12/8/64

KEUFFEL & ESSER CO.

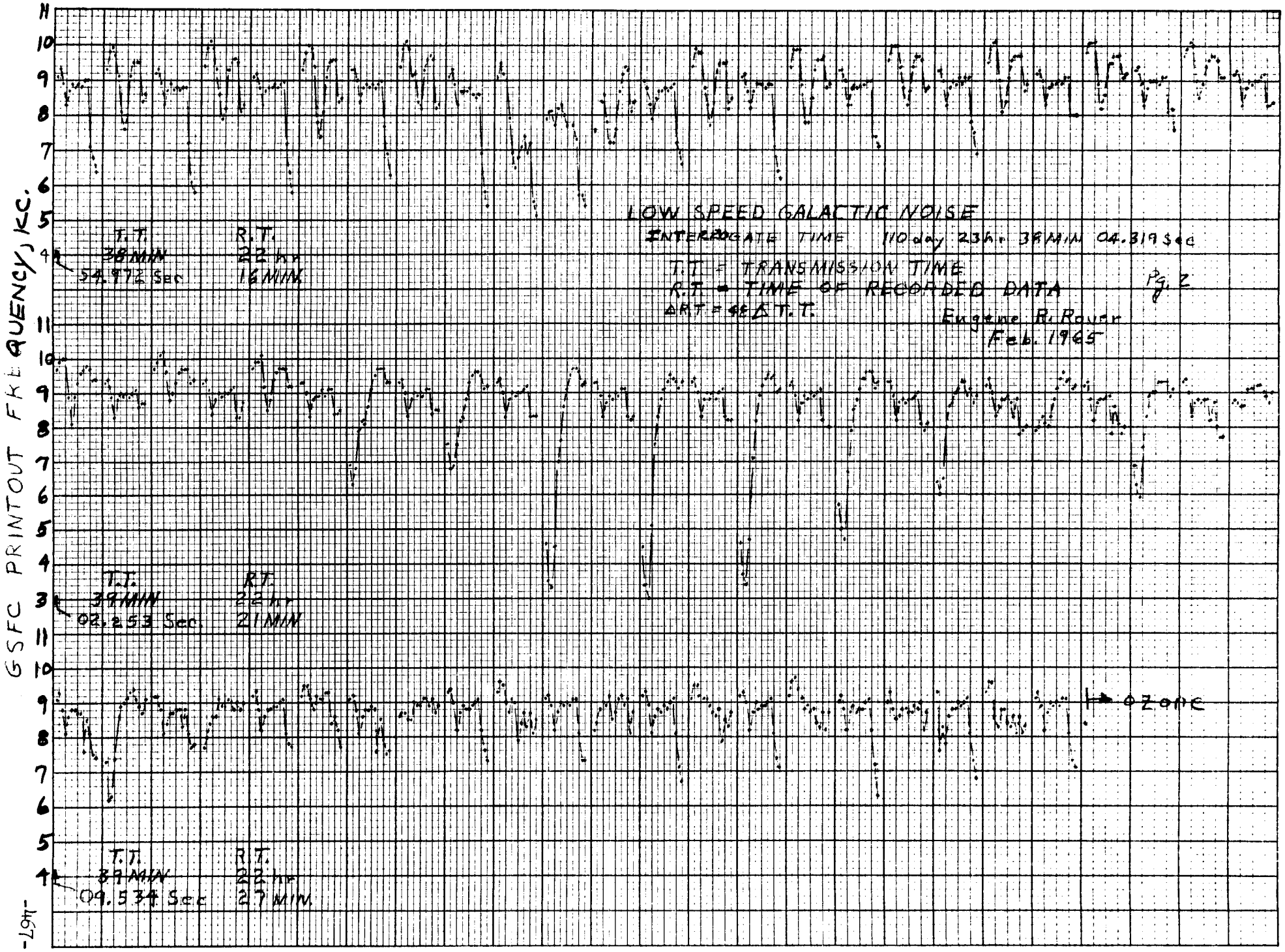



KEUFFEL & ESSER CO.
GSFC PRINTOUT FREQUENCY, KC.
HIGH SPEED GALACTIC NOISE
177 DAY
05 HR
15 MIN
PASS 1275
DARKNESS at HF off 291 km
at Perigee

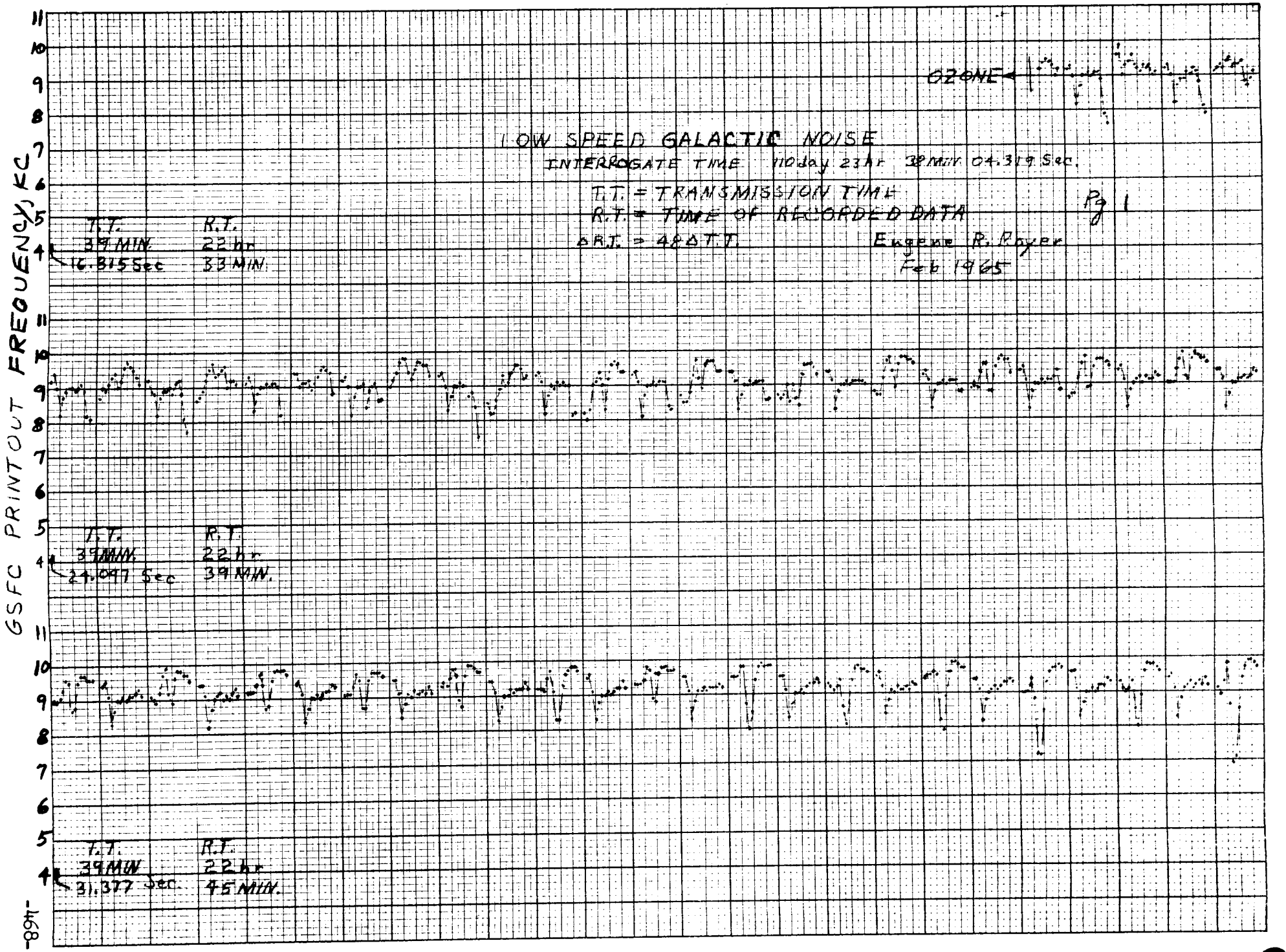
K+E SECURITY PRICES • ALBANY
KEUFFEL & ESSER CO.



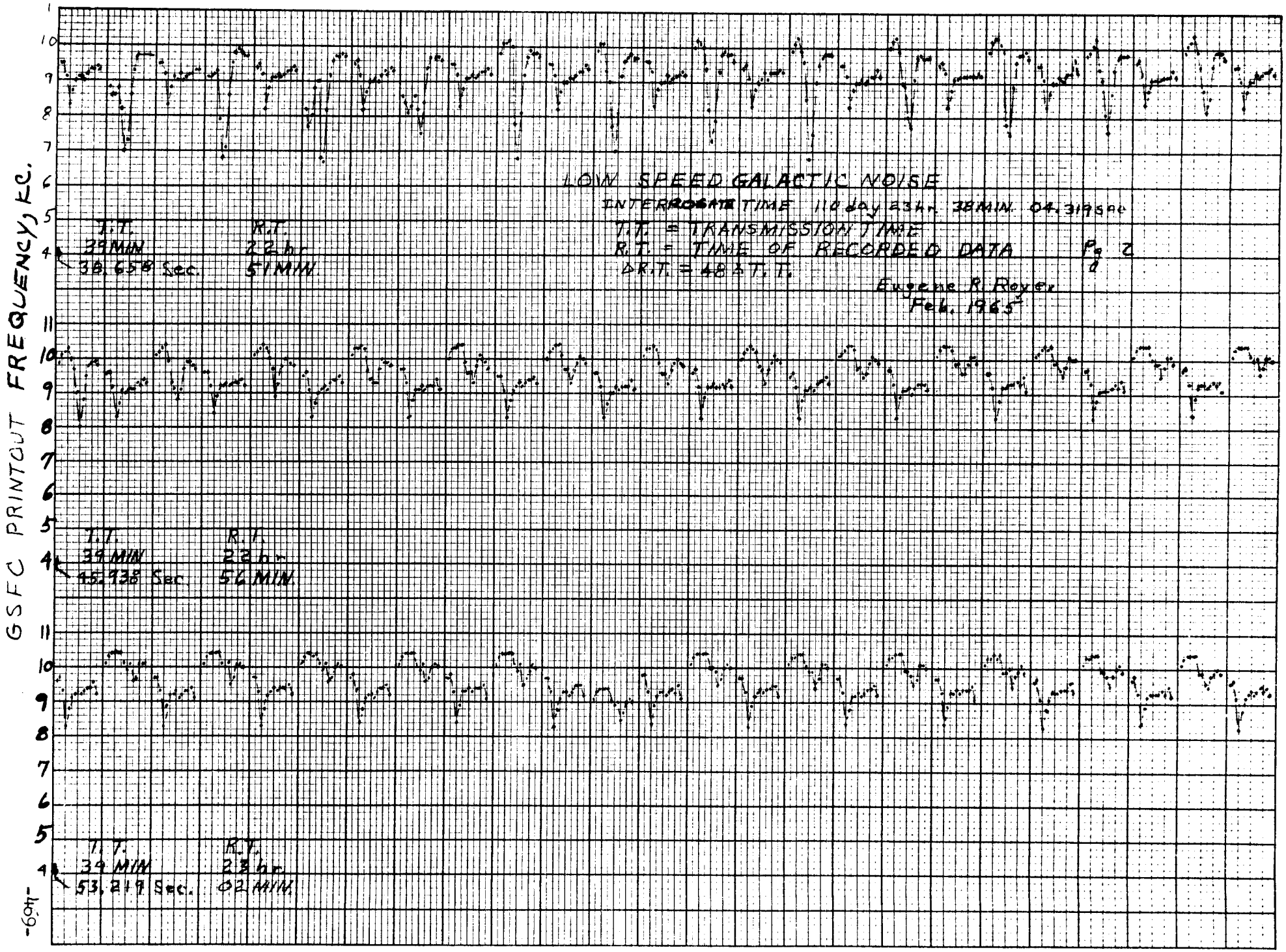
KEUFFEL & ESSER CO.



K+E SECURITY PRICES ... WEEKS OF 5 DAYS X 8 DIVISIONS ... KEUFFEL & ESSER CO.



27 WEEKS OF 5 DAYS X 8 DIVISIONS MADE IN U.S.A.
KEUFFEL & ESSER CO.



K+E SECURITY PRICES ALBANY
52 WEEKS OF 5 DAYS X 8 DIVISIONS MADE IN U.S.A.
KEUFFEL & ESSER CO.

GSFC PRINTOUT FREQUENCY, KC

LOW SPEED GALACTIC NOISE

INTERROGATE TIME 110day 23hr 38MIN 04.319 Sec.

T.T. = TRANSMISSION TIME

R.T. = TIME OF RECORDED DATA

ΔR.T. = 48 ΔT.T.

Eugene R. Royer

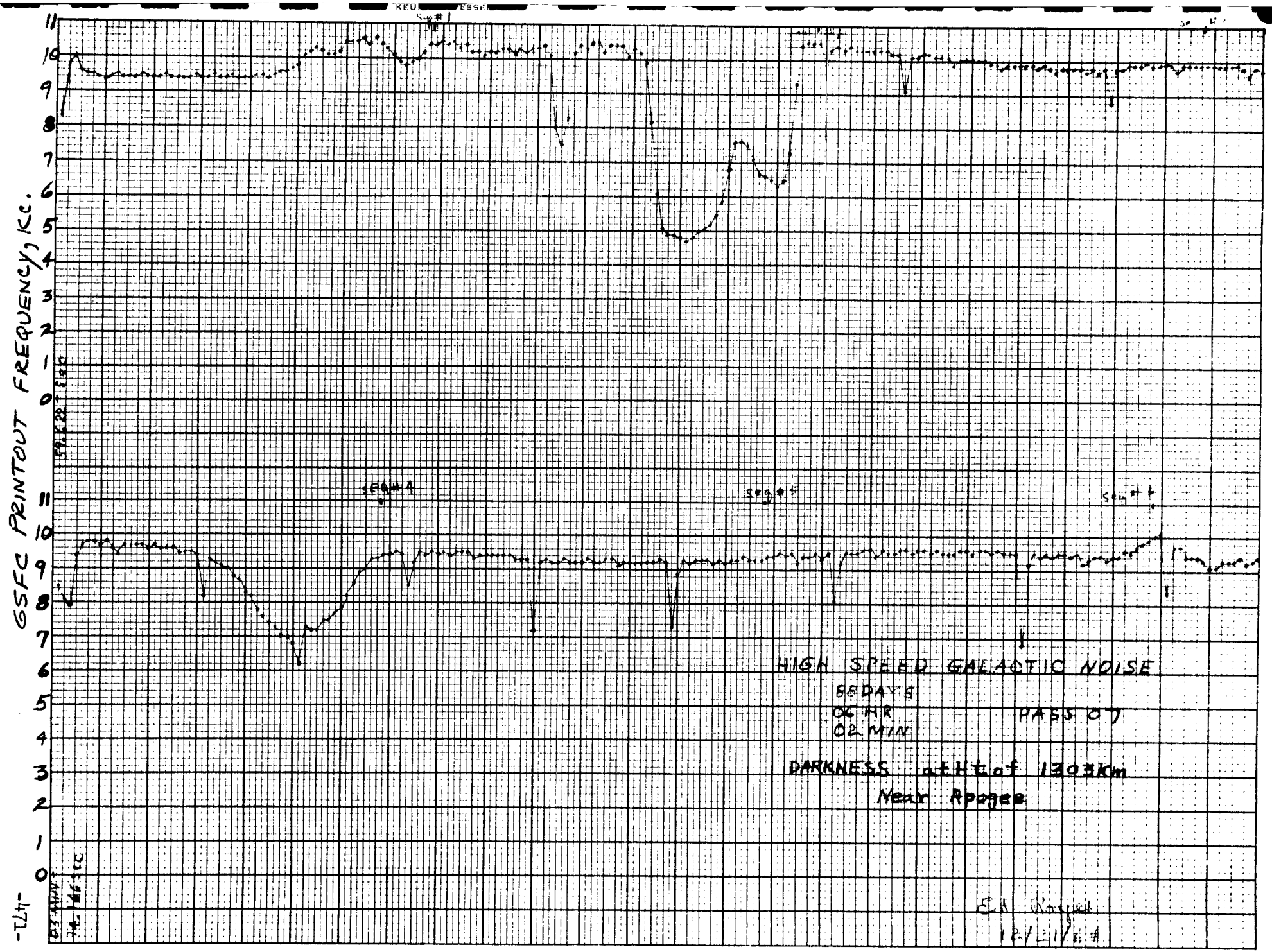
Feb. 1965

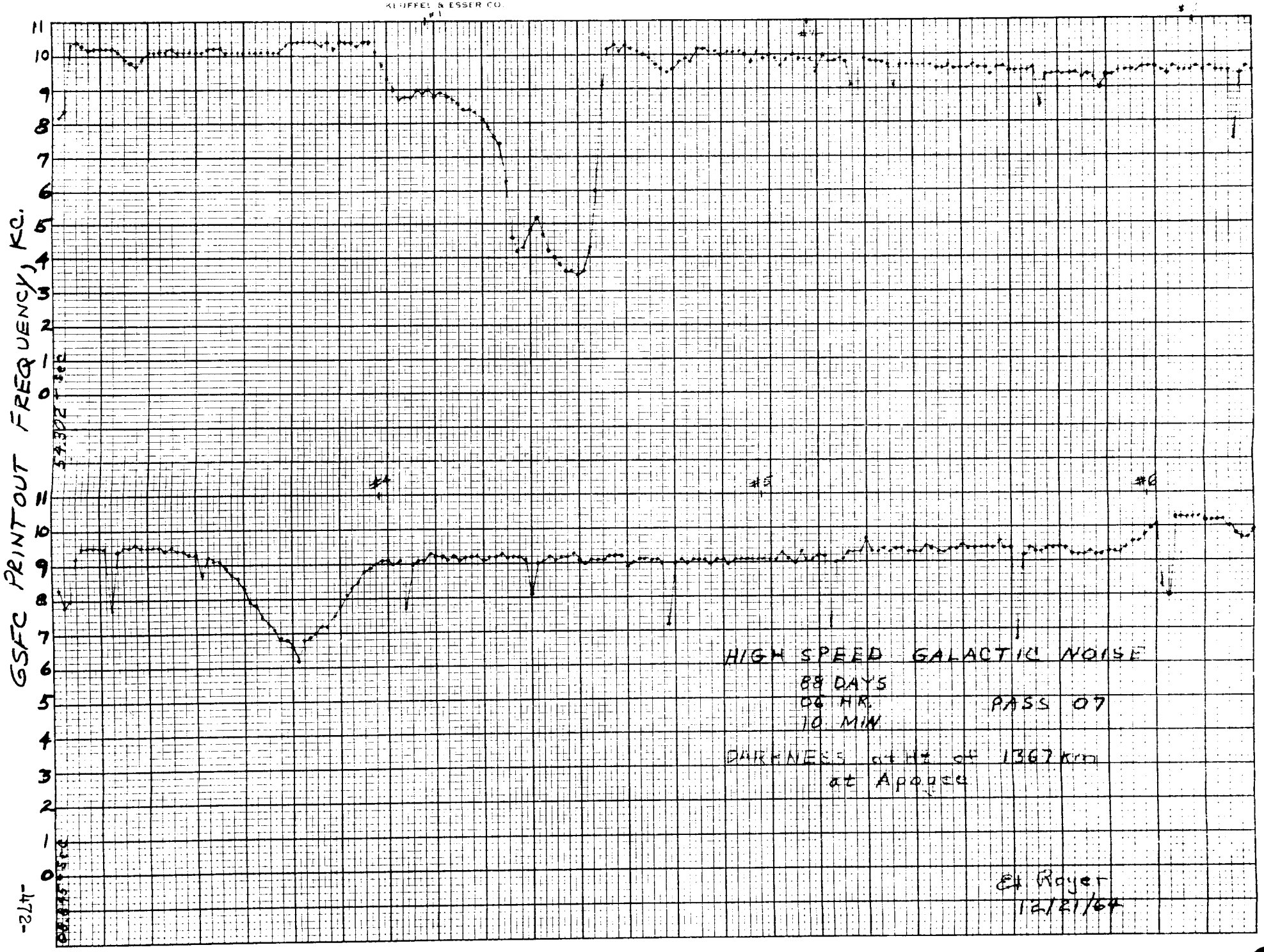
T.T. 40 MIN 00.499 Sec. R.T. 23hr. 08MIN.

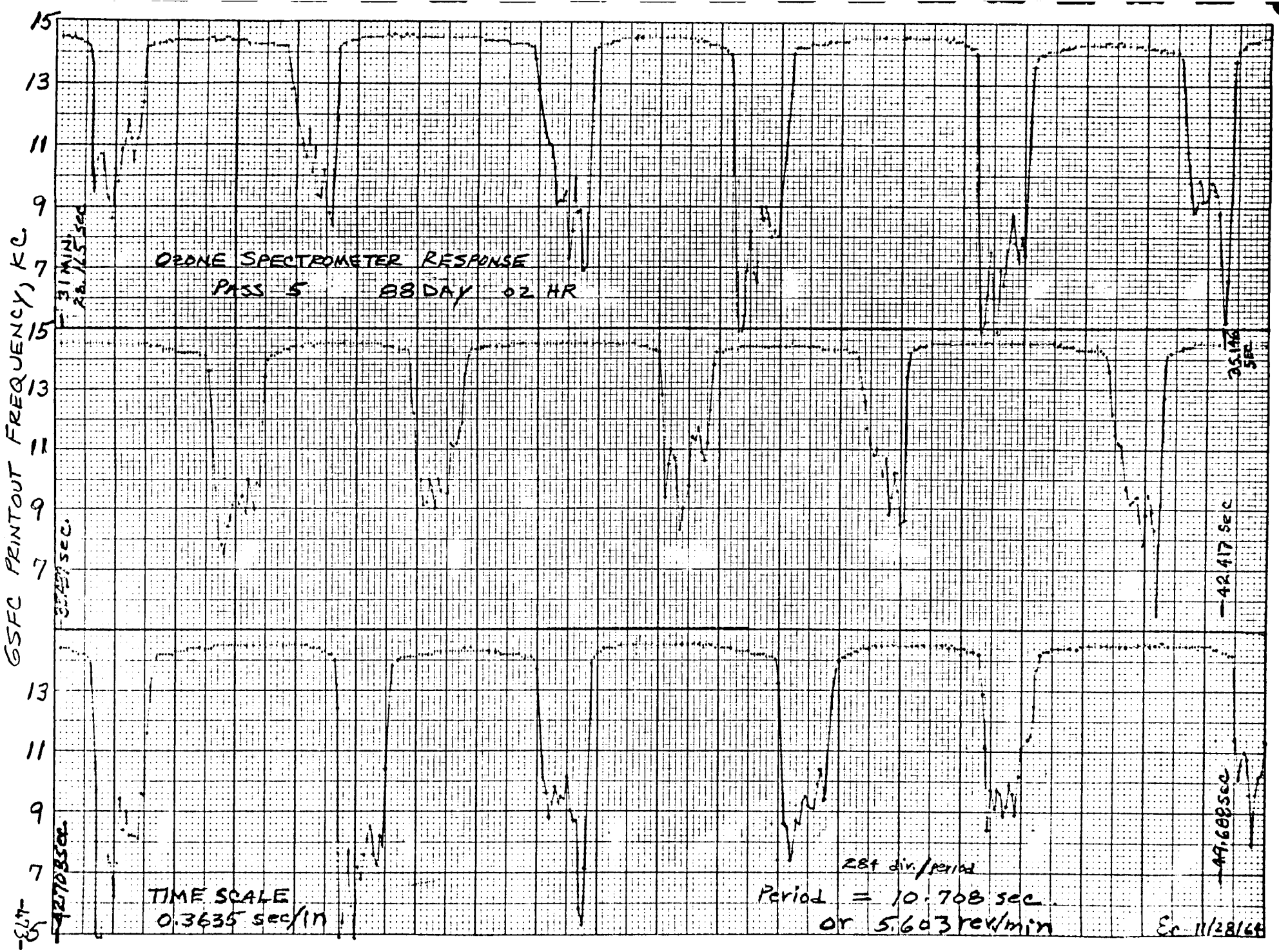
T.T. 40 MIN 7.780 Sec. R.T. 23hr 14 MIN.

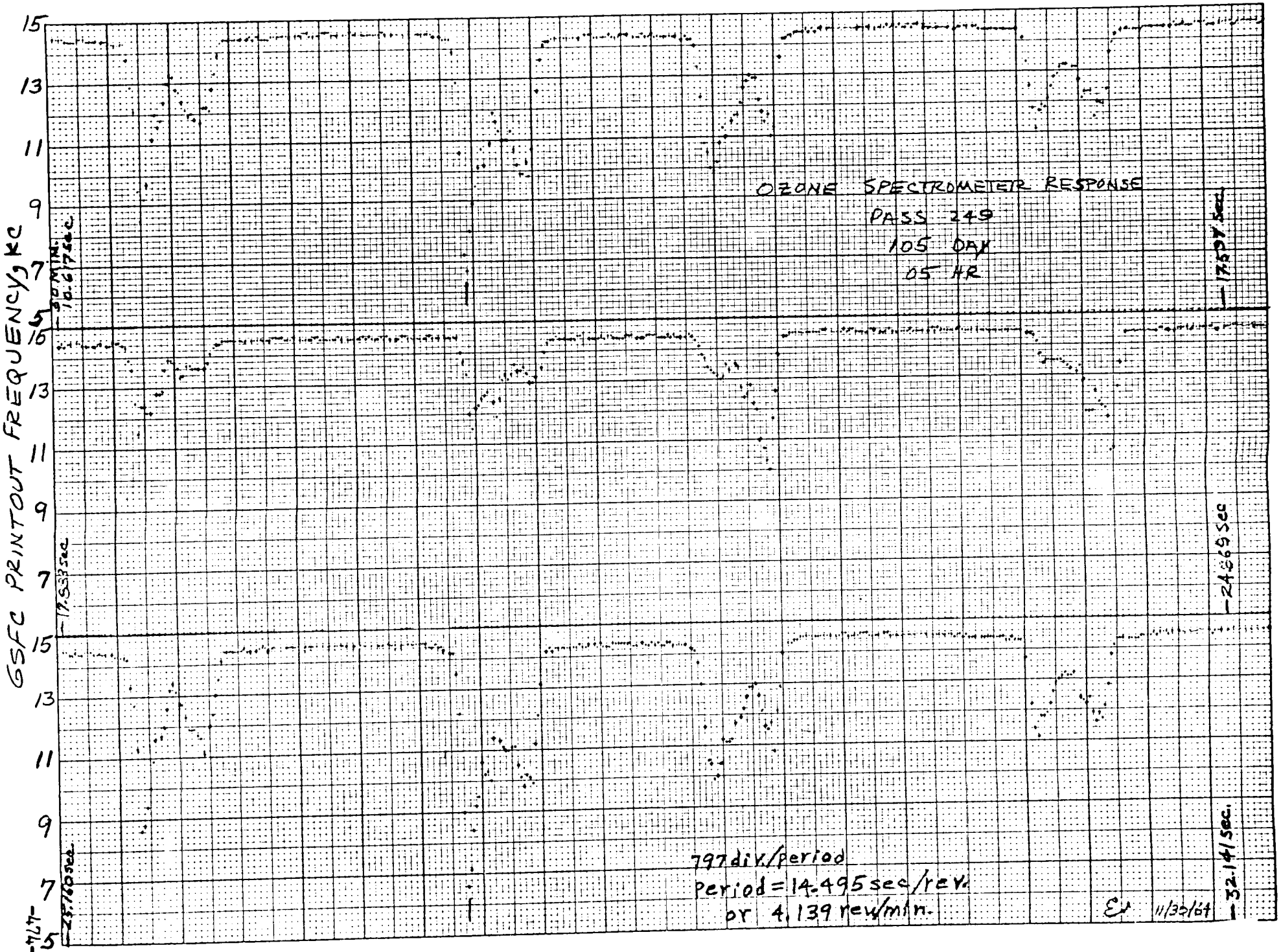
T.T. 40MIN 15.060 Sec. R.T. 23hr 20MIN

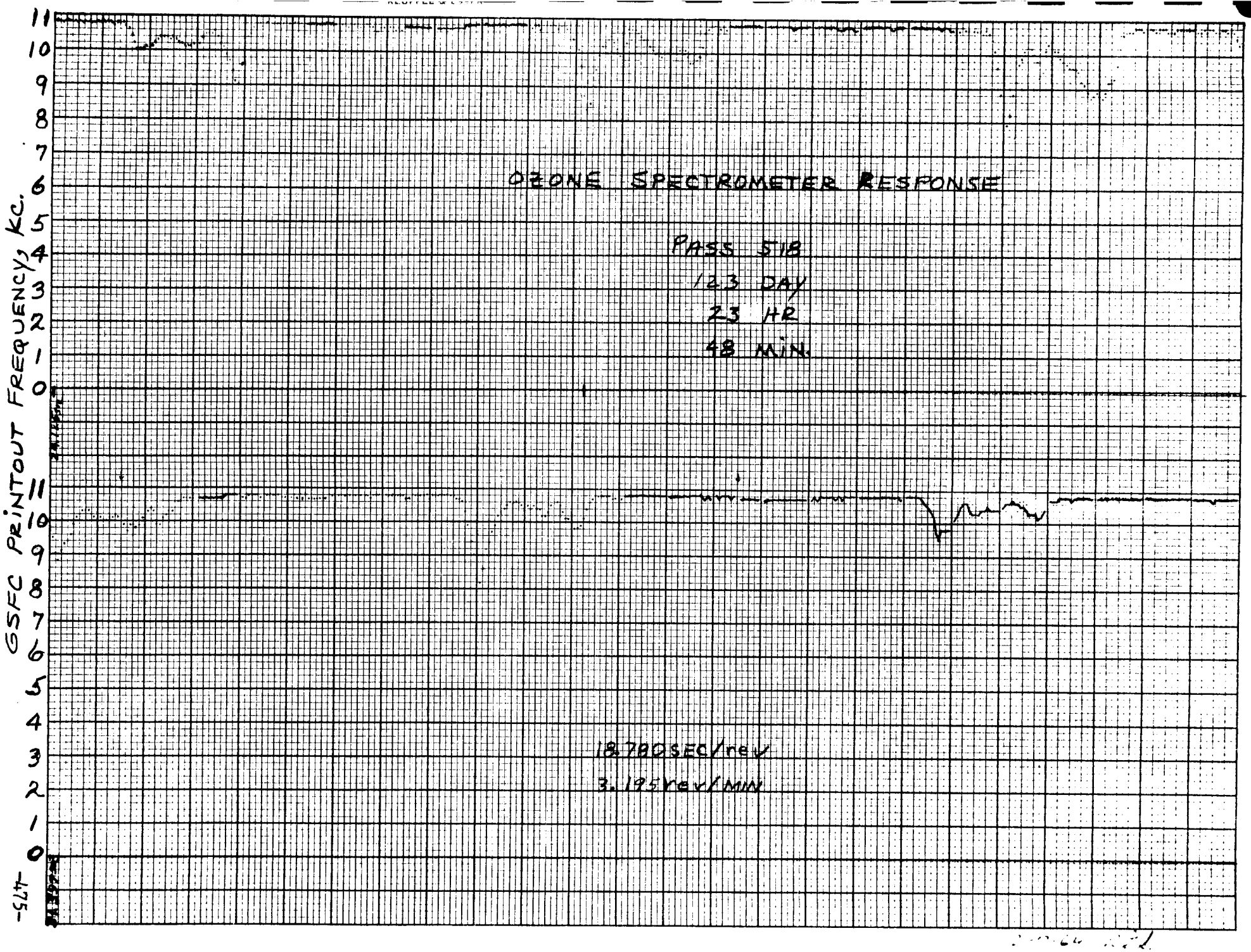
T.T. 40 MIN. 22.341 Sec. R.T. 23hr 26MIN.


GSFC PRINTOUT FREQUENCY, Kc.
SEG #1
SEG #4
SEG #5
SEG #6
HIGH SPEED GALACTIC NOISE
88 DAYS
06 HR
02 MIN
PASS 07
DARKNESS at Ht of 1303 Km
Near Apogee

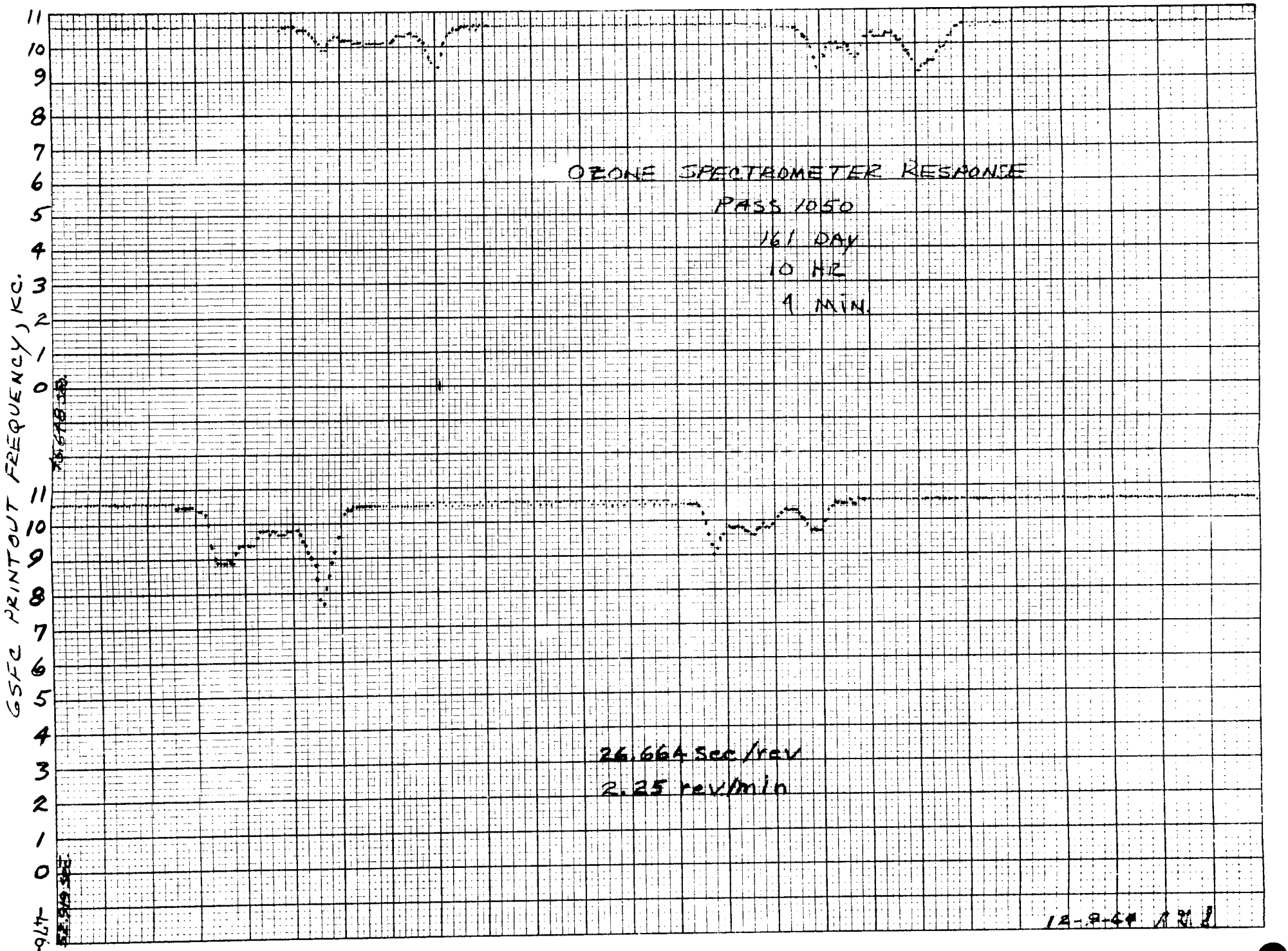

KEUFFEL & ESSER CO.
GSFC PRINTOUT FREQUENCY, KC.
54.302 sec
#4
#5
#6
HIGH SPEED GALACTIC NOISE
88 DAYS
06 HR.
10 MIN
PASS 07
DARKNESS at Ht of 1367 km
at Apogee
E. Royer
12/21/64


GSFC PRINTOUT FREQUENCY, KC
OZONE SPECTROMETER RESPONSE
PASS 5 88 DAY 02 HR
31 MIN 28.125 sec
35.146 SEC
42.417 sec
49.688 sec
42.708 sec
TIME SCALE
0.3635 sec/in
284 div./period
Period = 10.708 sec
or 5.603 rev/min
Ec 11/28/68

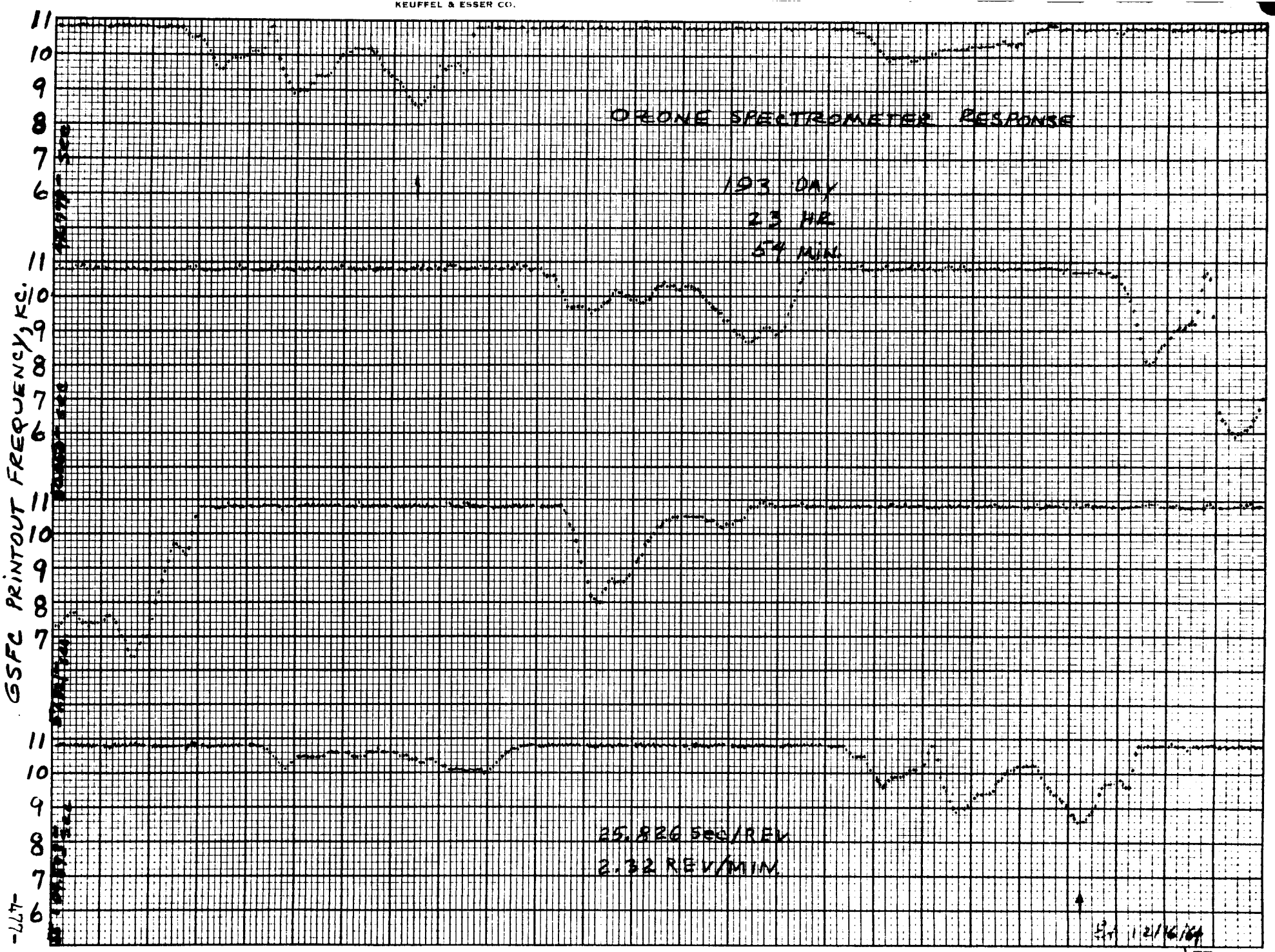

GSFC PRINTOUT FREQUENCY, KC
15
13
11
9
7
5
OZONE SPECTROMETER RESPONSE
PASS 249
105 DAY
05 HR
30 MIN.
10.617 sec
17.533 sec
25.160 sec
17.597 sec
24.869 sec
32.141 sec.
797 div./period
Period = 14.495 sec/rev.
or 4.139 rev/min.
11/30/64

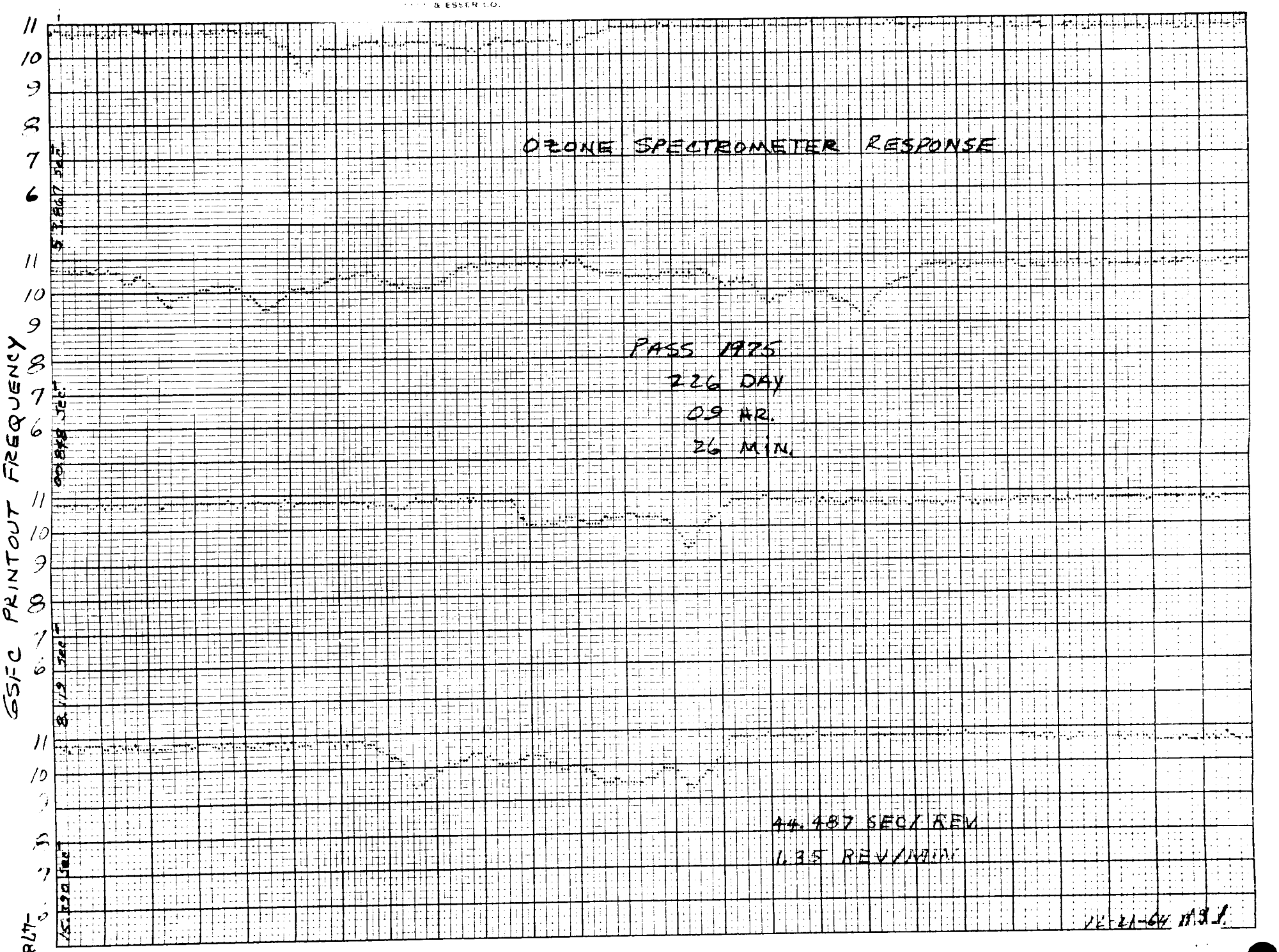

OZONE SPECTROMETER RESPONSE
PASS 518
123 DAY
23 HR
48 MIN.
GSFC PRINTOUT FREQUENCY, KC.
18.780 SEC/rev
3.195 rev/MIN

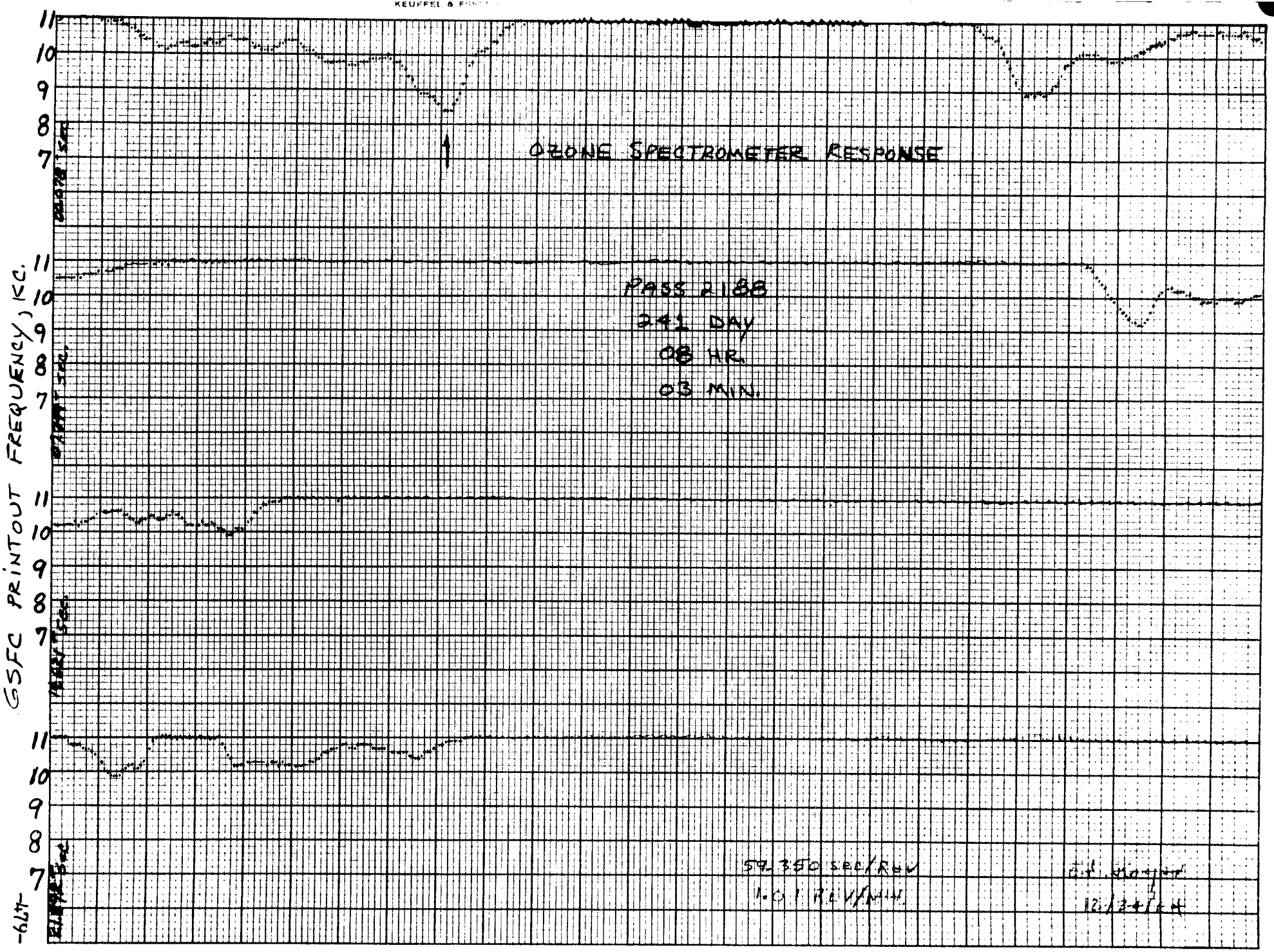
KEUFFEL & ESSER

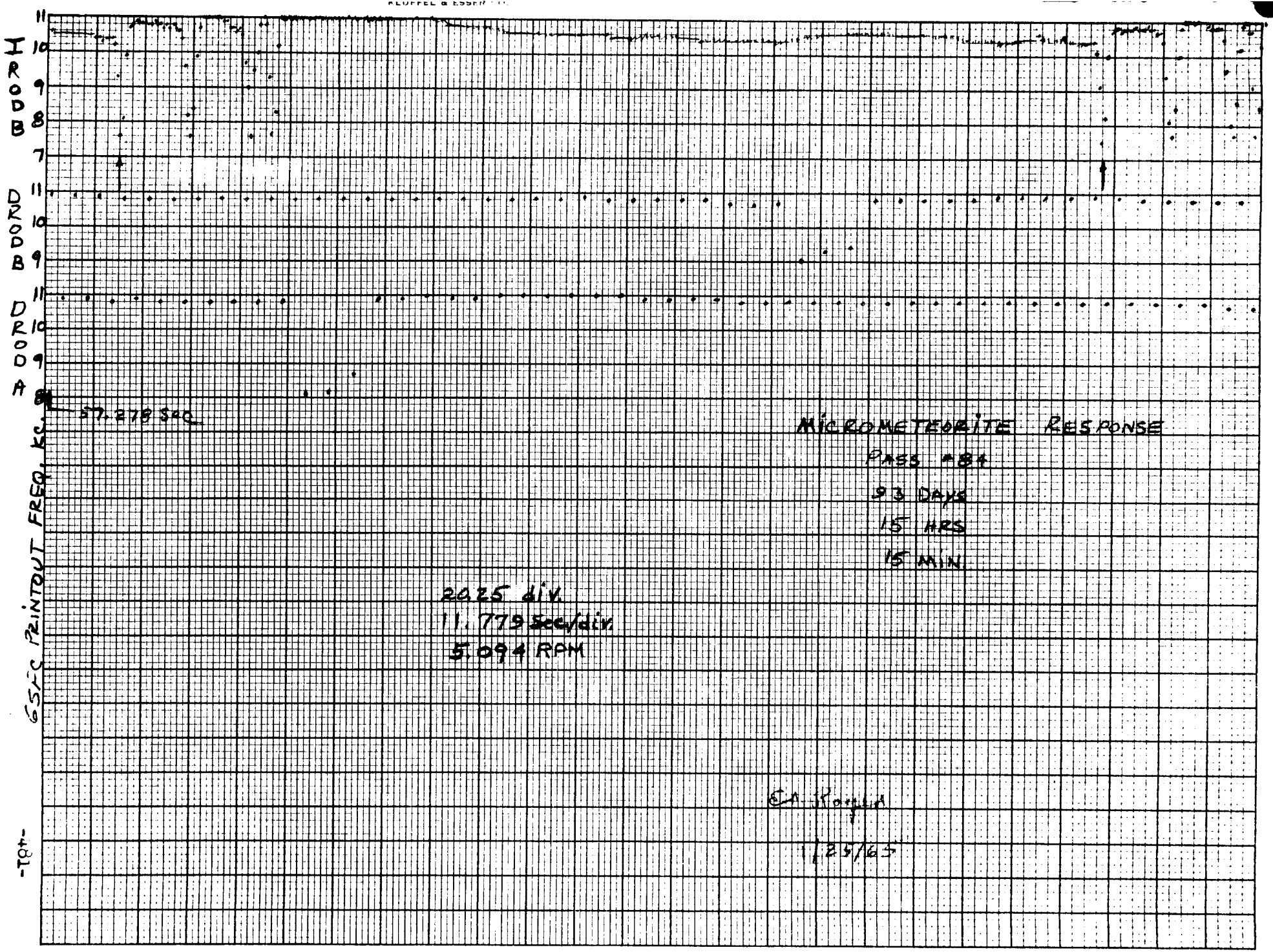


KEUFFEL & ESSER CO.



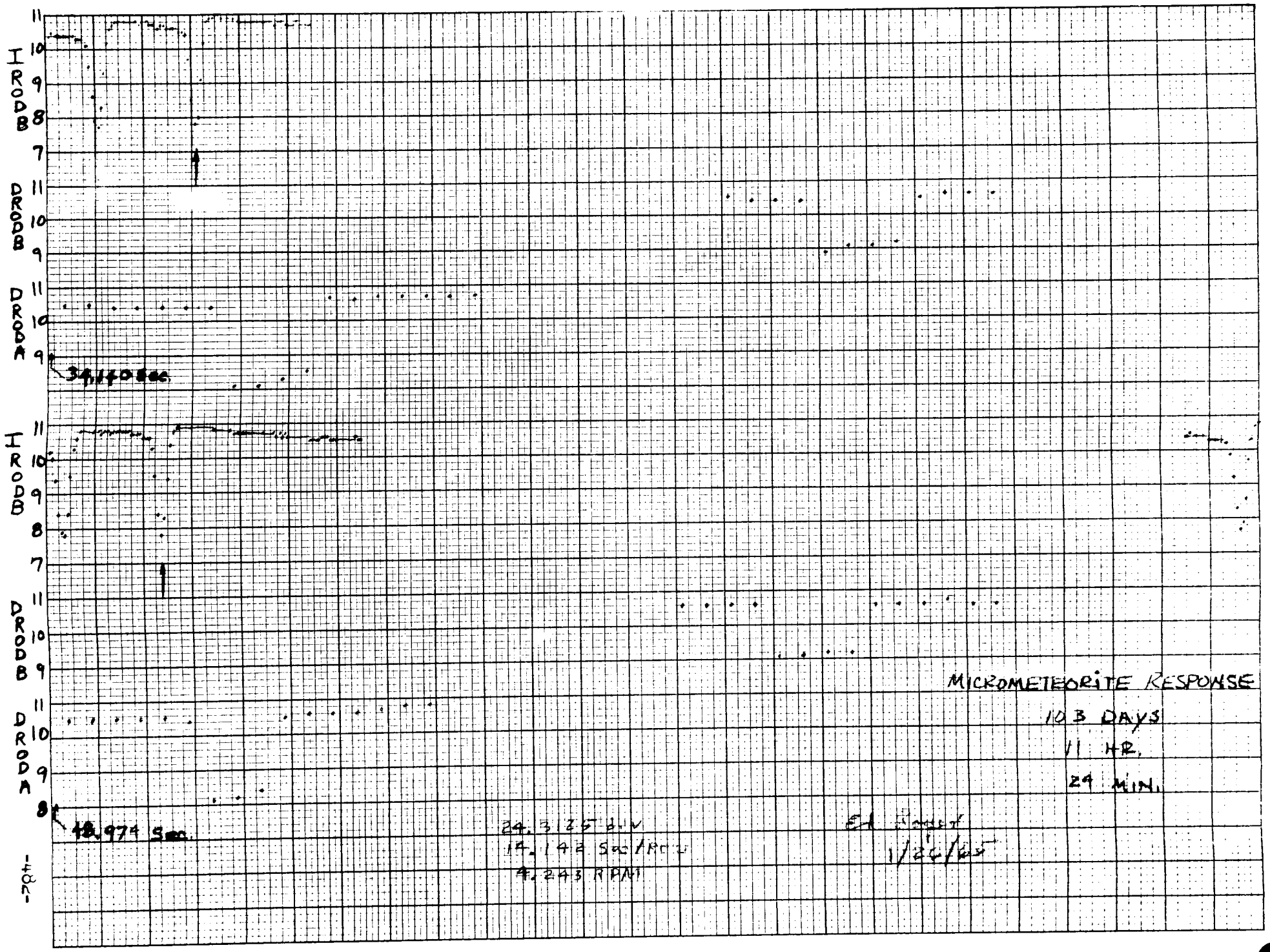

K&E SECURITY PRICES • ALBANENE
OZONE SPECTROMETER RESPONSE
PASS 1975
226 DAY
09 HR.
26 MIN.
44.487 SEC/REV
1.35 REV/MIN
GSFC PRINTOUT FREQUENCY
11
10
9
8
7
6
53.867 SEC
00.848 SEC
8.119 SEC
15.390 SEC
12-21-64 M.S.J.


GSFC PRINTOUT FREQUENCY, KC.
OZONE SPECTROMETER RESPONSE
PASS 2188
241 DAY
08 HR.
03 MIN.
59.350 sec/Rev
1.01 REV/MIN
11
10
9
8
7

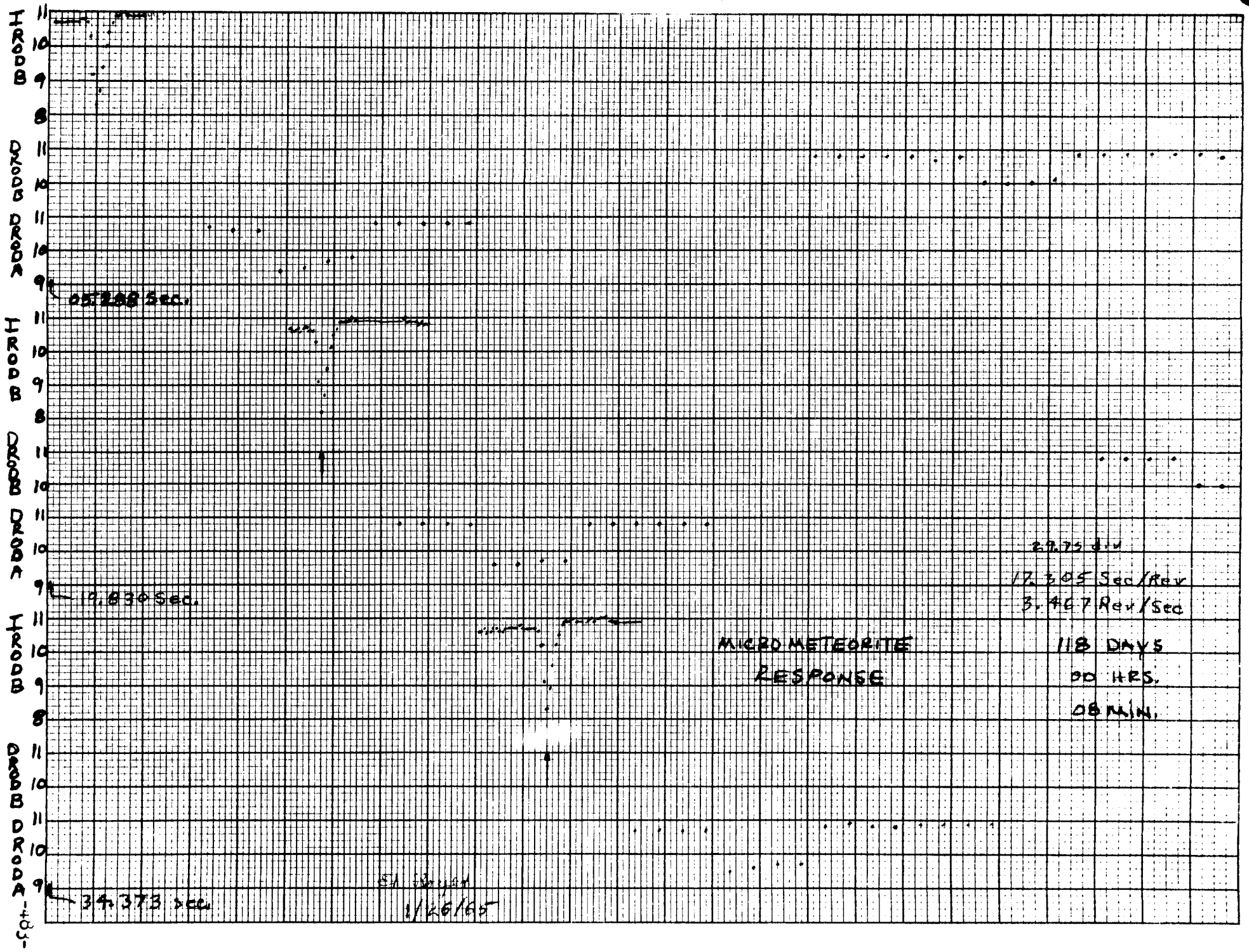


IRODB
DRODB
DRODA
11
10
9
8
7
57.278 SEC
MICROMETEORITE RESPONSE
PASS #84
93 DAYS
15 HRS
15 MIN
20.25 div.
11.779 Sec/div.
5.094 RPM
1/25/65
65FC PRINTOUT FREQ. KC.

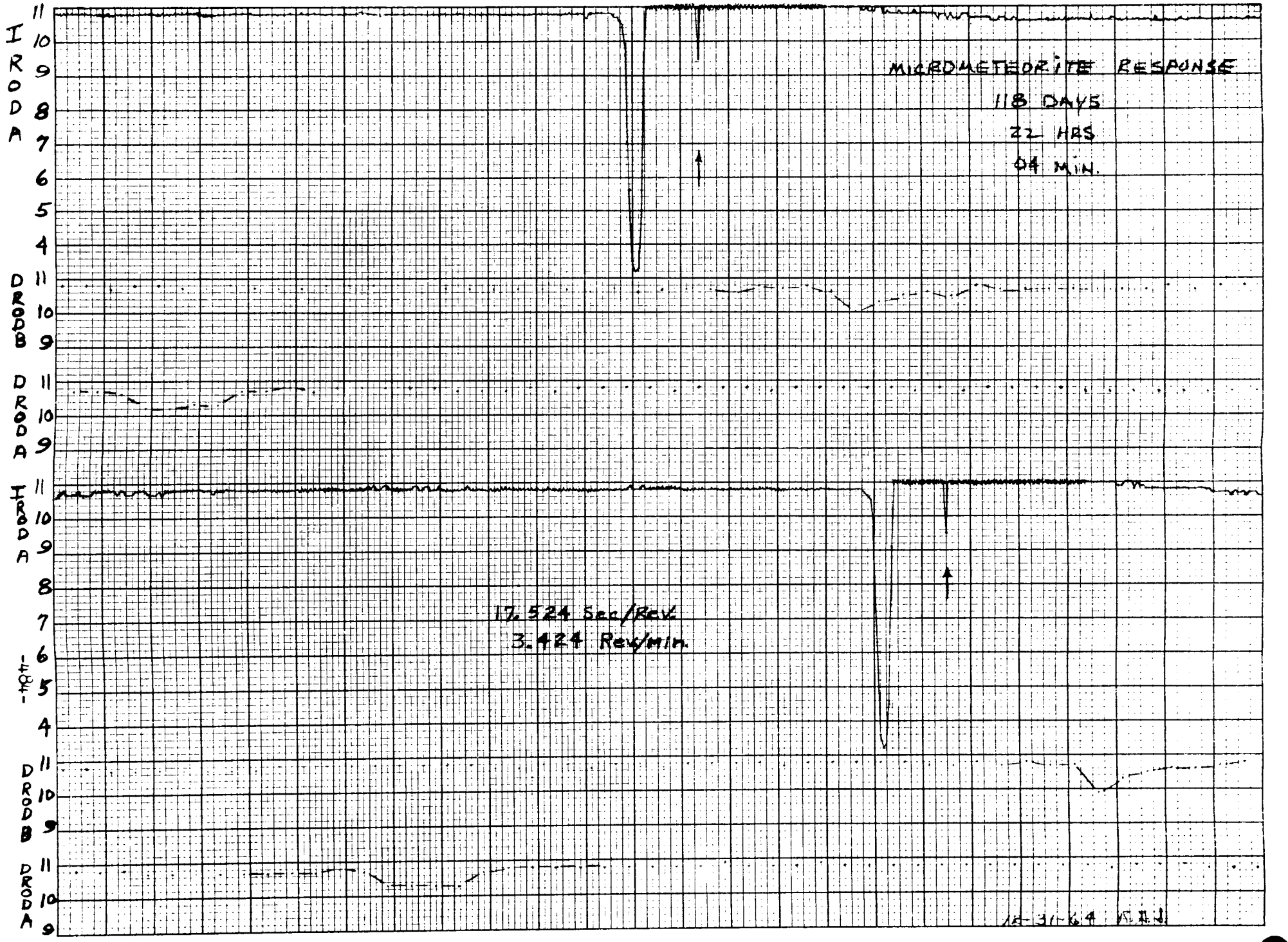
KEUFFEL & ESSER CO.



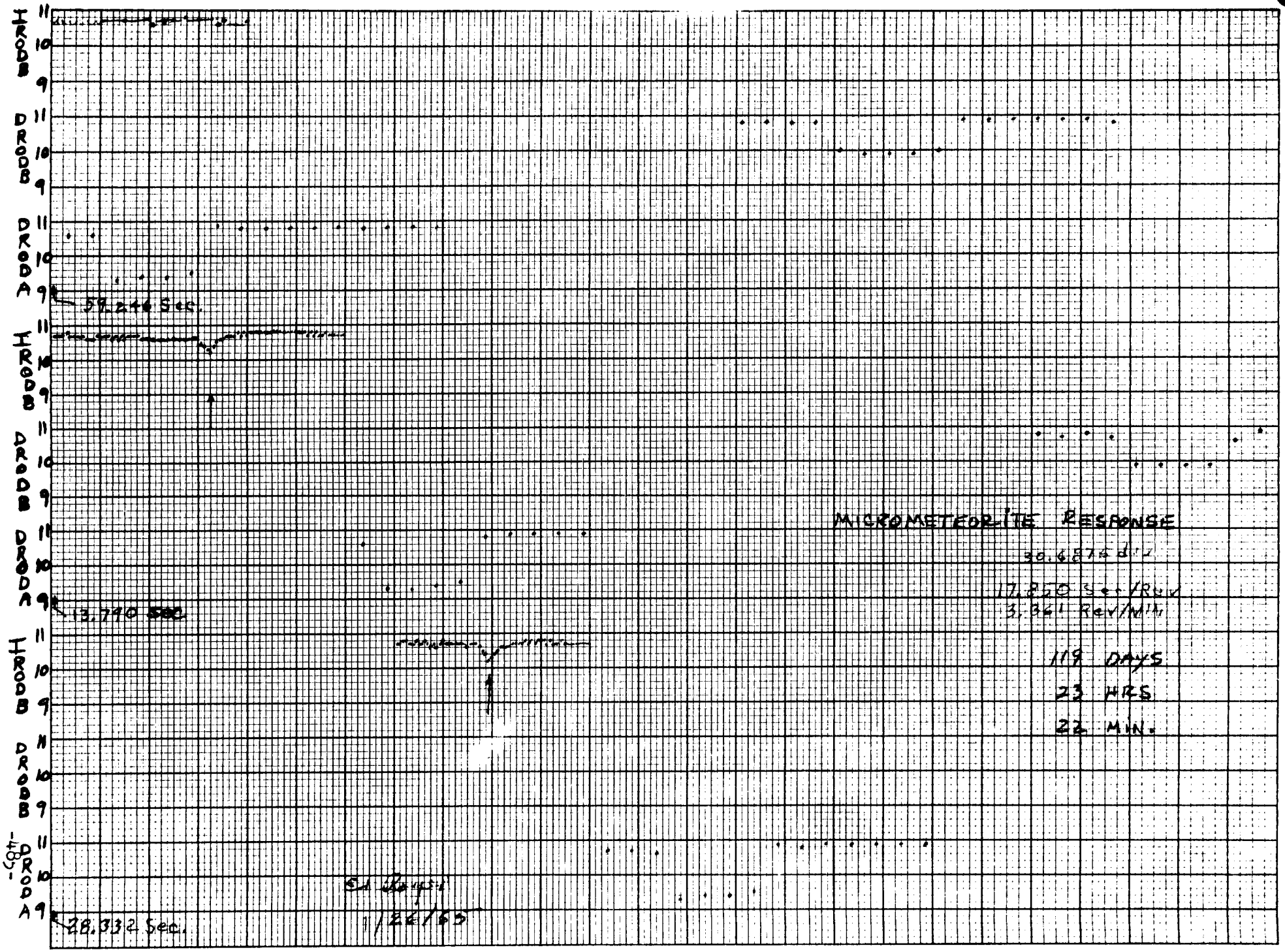
KEUFFEL & ESSER CO.



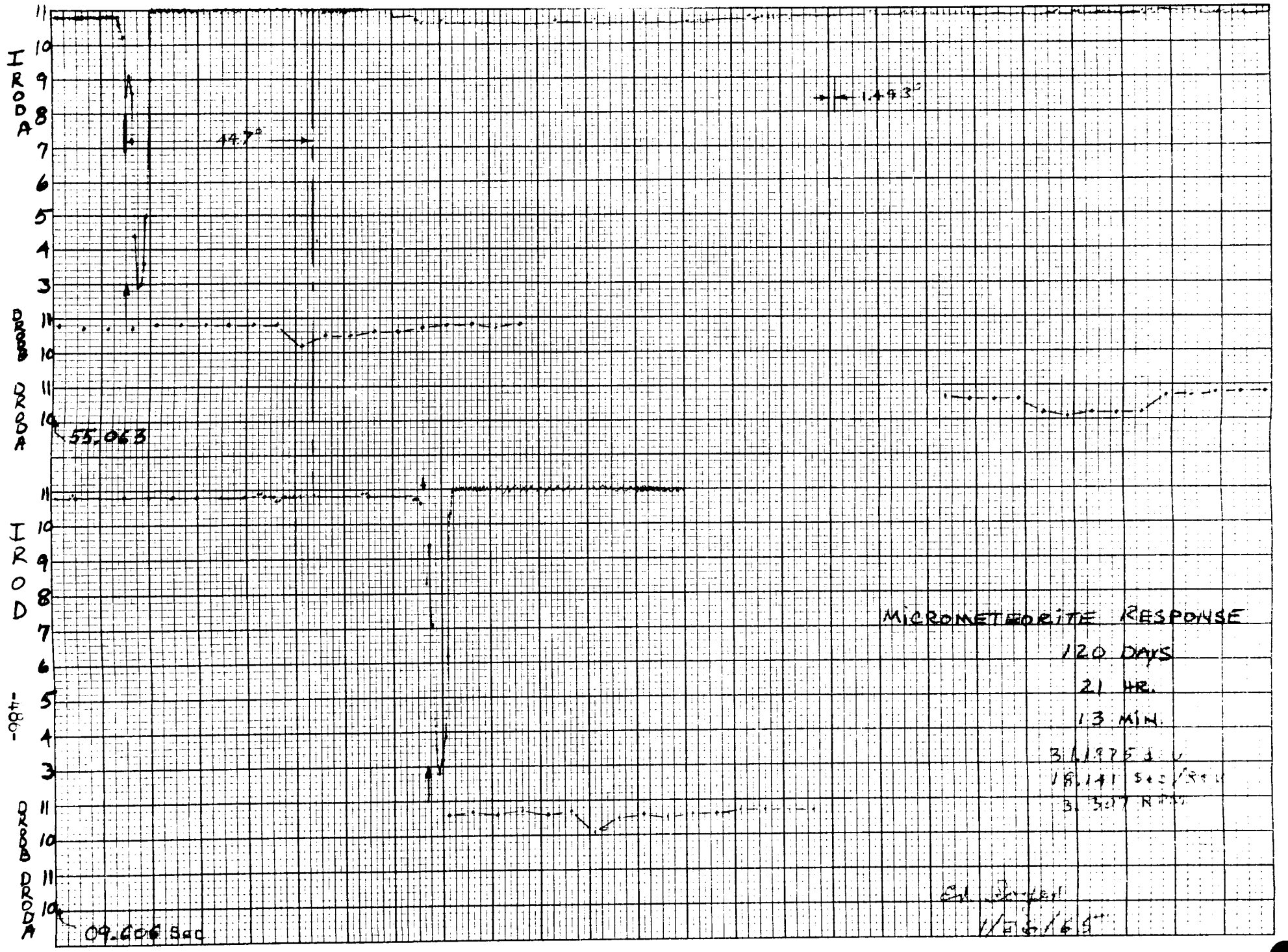
KEUFFEL & ESSER CO.



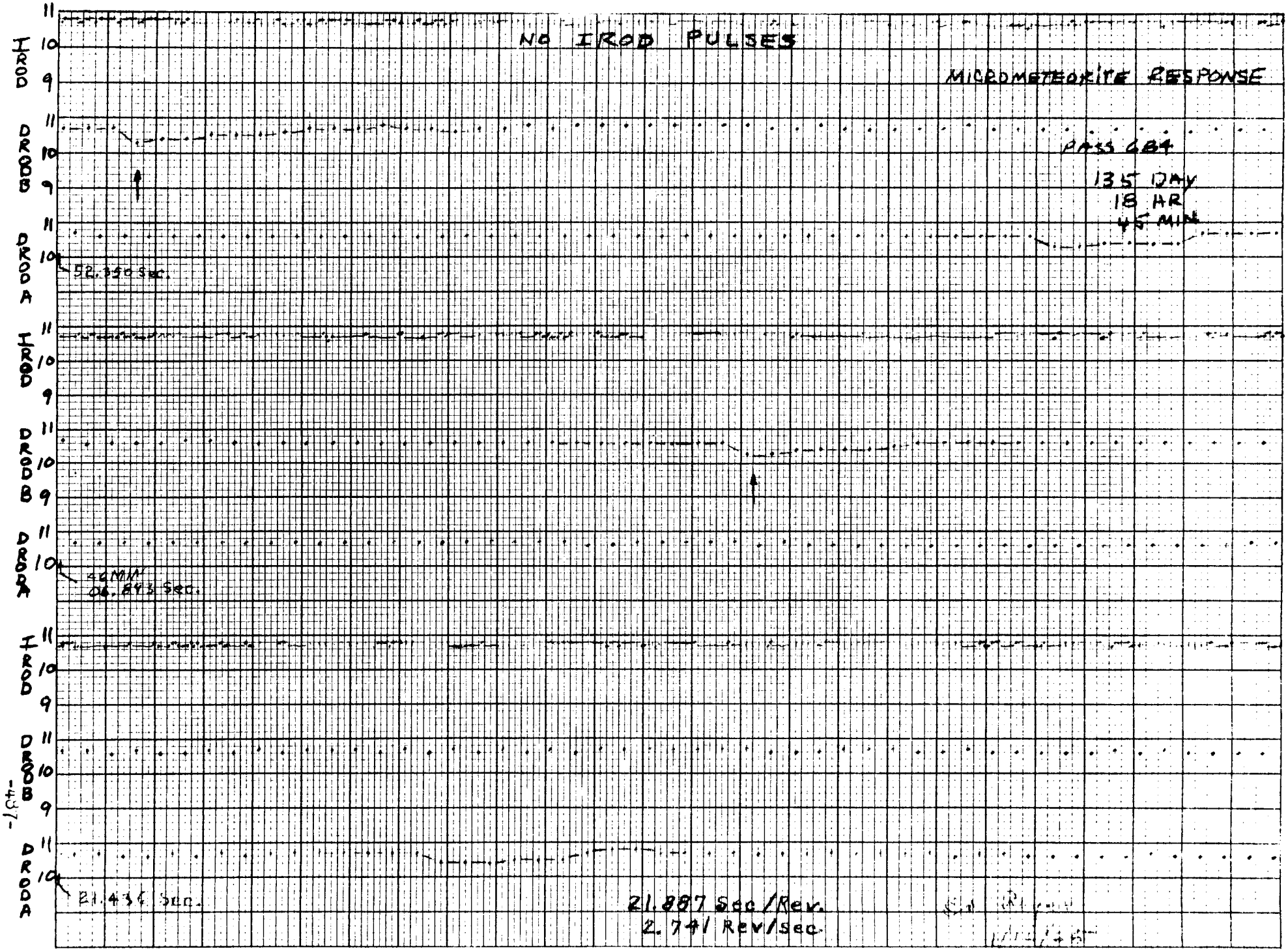
KEUFFEL & ESSER



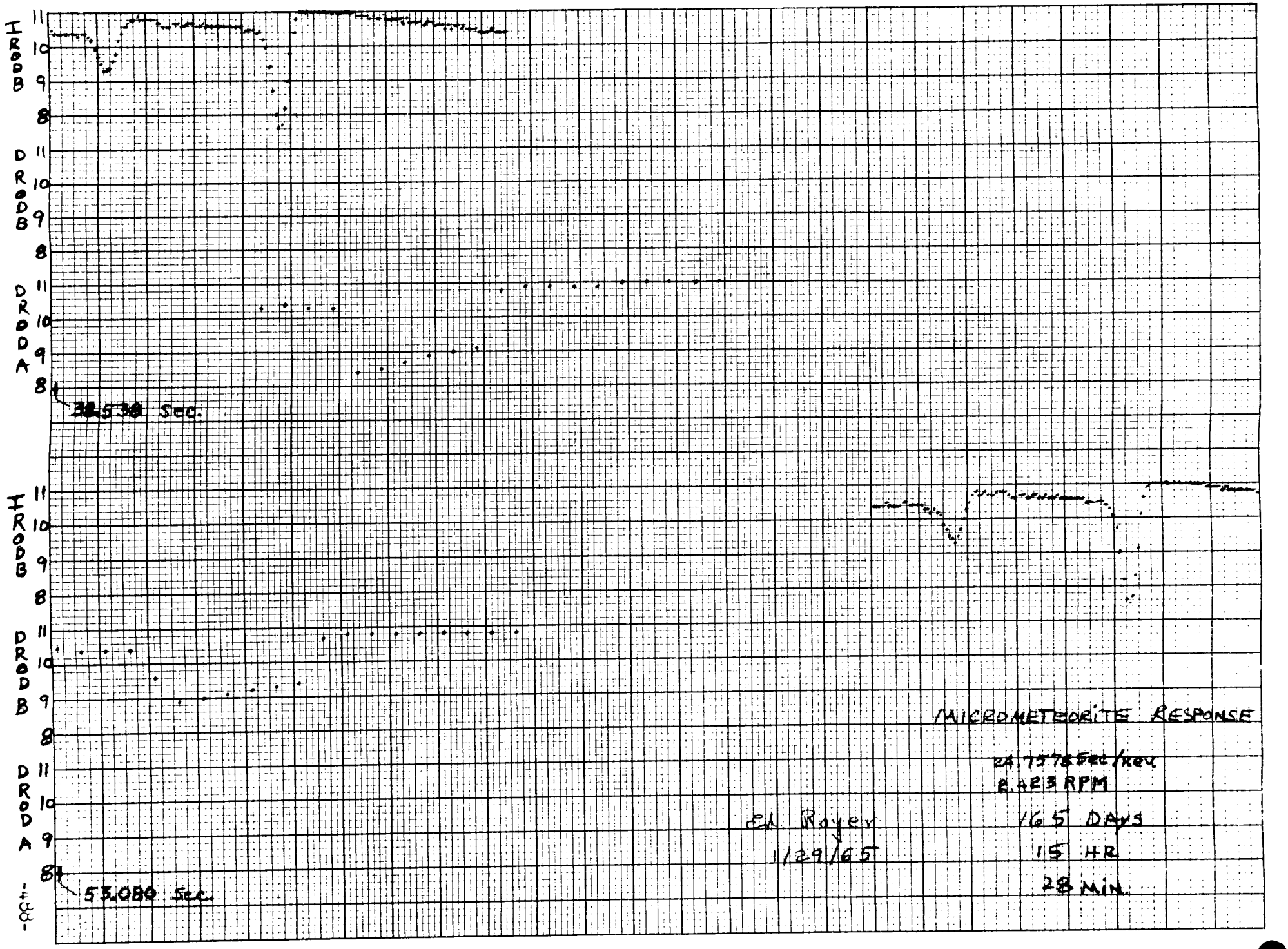
K+E SECURITY PRICES • ALBANENE 46 1657
KEUFFEL & ESSER CO.



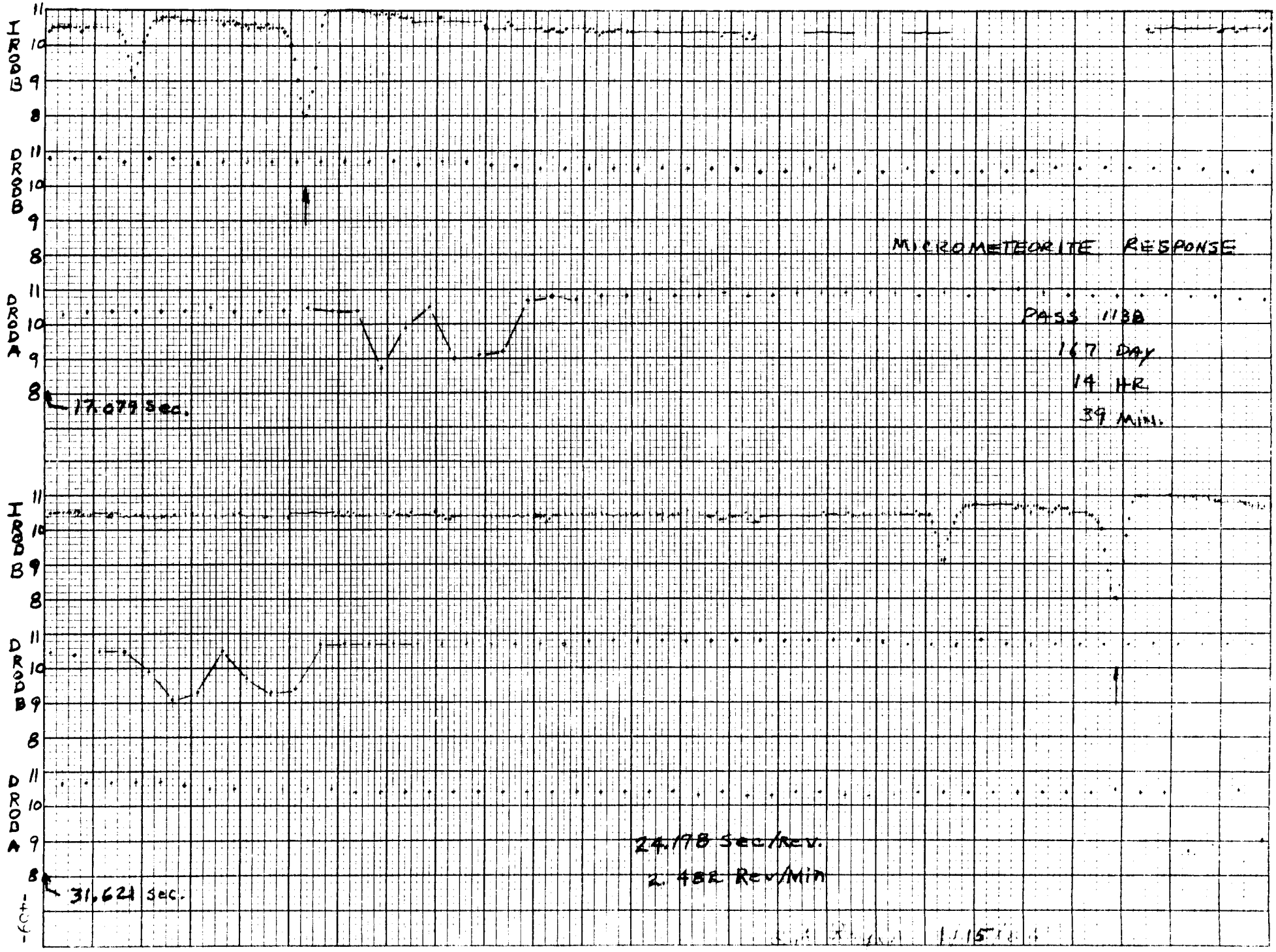
KEUFFEL & ESSER CO.

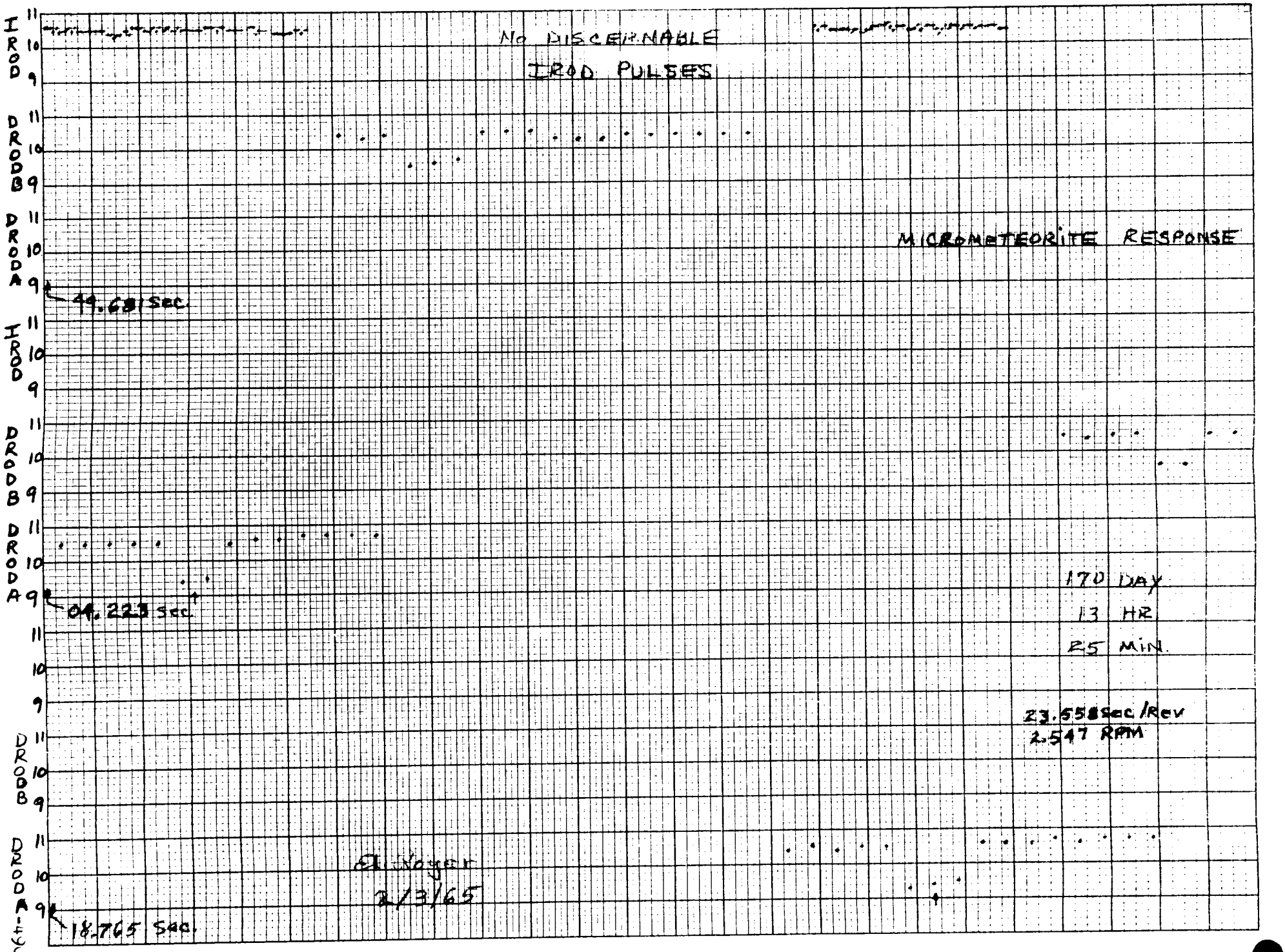


K+E SCHEUFFEL & ESSER CO.

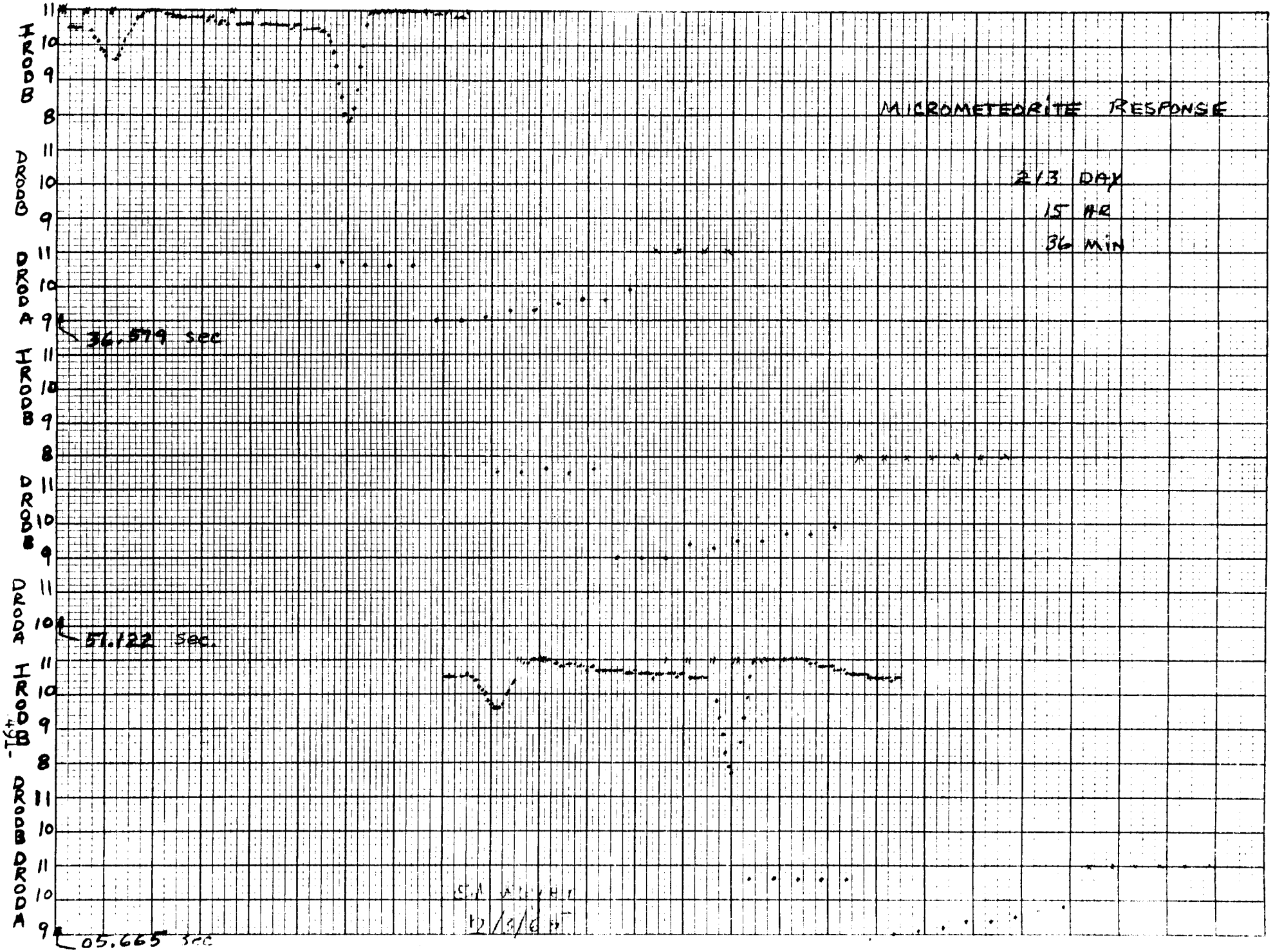


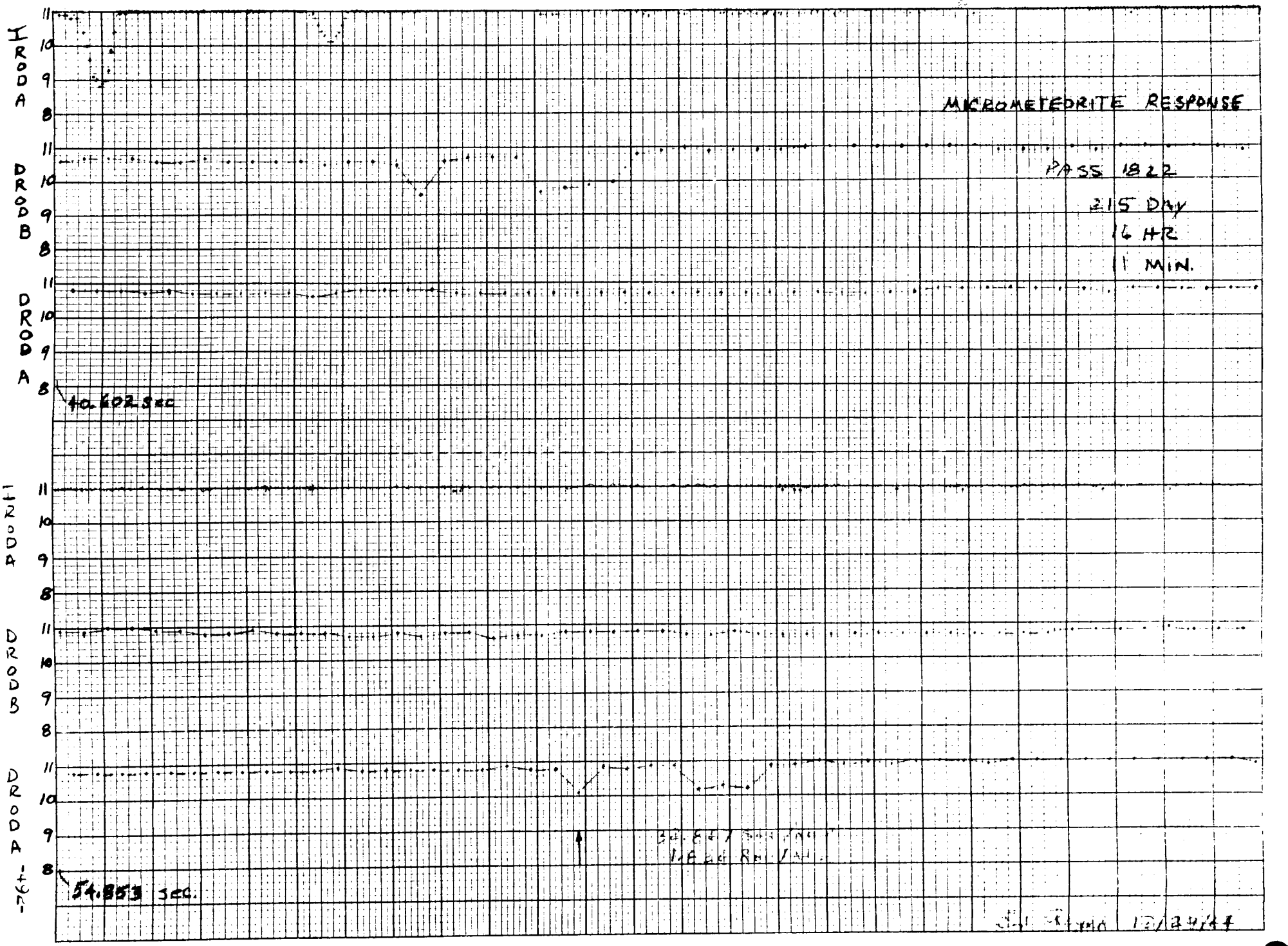
KEUFFEL & ESSER CO.




IROD
DRODB
DRODA
IROD
DRODB
DRODA
DRODB
DRODA
No DISCERNABLE
IROD PULSES
MICROMETEORITE RESPONSE
49.681 Sec.
04.223 Sec.
18.765 Sec.
170 DAY
13 HR
25 MIN.
23.558 Sec/Rev
2.547 RPM
2/13/65

K+E SECURITY PRICES ALBANENE 46 1057
27 WEEKS OF 5 DAYS X 10 DIVISIONS
KEUFFEL & ESSER CO.




MICROMETEORITE RESPONSE
PASS 1822
215 DAY
16 HR
11 MIN.
HRODA
DRODB
DRODA
40.602 sec
HRODA
DRODB
DRODA
54.853 sec.
11
10
9
8