

**AEC DISTRIBUTION FOR PART 50 DOCKET MATERIAL
(TEMPORARY FORM)**

CONTROL NO: 6403

FILE: _____

FROM: Carolina Power & Light Company Raleigh, N.C. 27602 E. E. Utley		DATE OF DOC 8-16-73	DATE REC'D 8-22-73	LTR X	MEMO	RPT	OTHER
TO: A Giambusso		ORIG 1	CC	OTHER	SENT AEC PDR X SENT LOCAL PDR X		
CLASS	UNCLASS XXX	PROP INFO	INPUT	NO CYS REC'D 40	DOCKET NO: 50-261		

DESCRIPTION:

Ltr trans the following:.....

ENCLOSURES:

BIWEEKLY REPORT OF RESULTS OF INCORE SURVEILLANCE

(40 cys of encl rec'd)

ACKNOWLEDGED

DO NOT REMOVE

PLANT NAME: H. B. Robinson #2

FOR ACTION/INFORMATION

8-22-73

GC

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MOORE (L)(EWR)	STELLO	ENVIRO	SERVICE (L)	
DEYOUNG(L)(PWR)	HOUSTON	MULLER	SHEPPARD (E)	INFO
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P. COLLINS	ROSS	KNIGHTON	TEETS (L)	
	IPPOLITO	YOUNGBLOOD	WADE (E)	
<input checked="" type="checkbox"/> REG OPR	TEDESCO	REGAN	WILLIAMS (E)	
FILE & REGION(3)	LONG	PROJECT LDR	WILSON (L)	
MORRIS	LAINAS			
<input checked="" type="checkbox"/> STEELE	BENAROYA	HARLESS		
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8-22-73 TEETS		



Carolina Power & Light Company

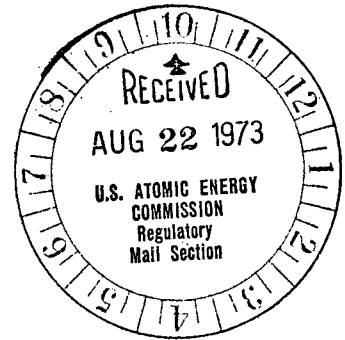
August 16, 1973

File: NG 5211.1

Serial: NG-73-288

Mr. A. Giambusso
Deputy Director for Reactor Projects
Directorate of Reactor Licensing
U. S. Atomic Energy Commission
Washington, D. C. 20545

50-261



Dear Mr. Giambusso:

H. B. ROBINSON UNIT NO. 2
LICENSE DPR-23
BIWEEKLY REPORT OF RESULTS OF INCORE SURVEILLANCE

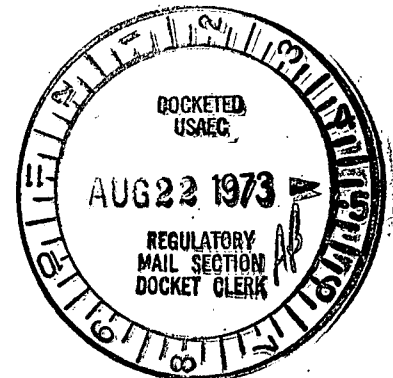
In accordance with the requirements of the "Interim Conditions for Operation, H. B. Robinson Unit No. 2," dated July 25, 1973, we hereby submit as an attachment the biweekly report of the results of incore surveillance for the period July 25 - August 8, 1973.

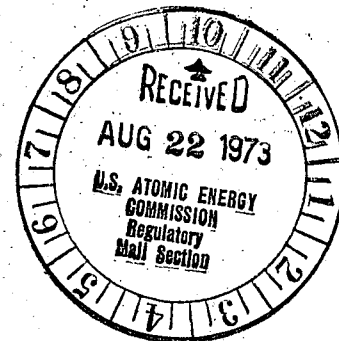
Yours very truly,

E. E. Utley
Vice-President
Bulk Power Supply

DBW:mvp
Attachment

cc: Messrs. C. D. Barham
N. B. Bessac
B. J. Furr
D. V. Menscer
D. B. Waters



H. B. ROBINSON STEAM ELECTRIC PLANTUNIT NO. 2AUGUST 13, 1973INCORE SURVEILLANCE DATA SUMMARY

Robinson File No. 2-A-7

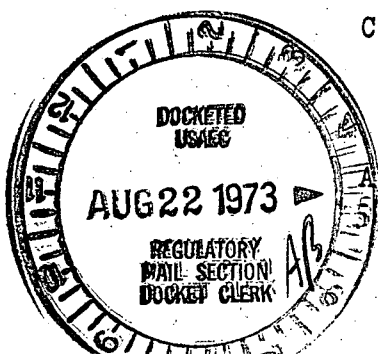
To evaluate the core $F_z S(z)$ response we have taken data at approximately half hour intervals while operating above 92% power. For convenience the data has been compiled on graphs with data points at approximately one hour intervals. There were seven periods during which data was not taken at one hour intervals. August 2, 3, 5, and 7 were maintenance outages. Flux maps were taken on July 27, 30, and August 8, and two thimble surveillance was not performed during this time. During this reporting period there were two valve tests and one turbine runback, all of which are included on the graphs. The valve tests were on July 29 and August 5, and the turbine runback was on August 1.

An operational alarm valve for $F_z S(z)$ of $\frac{1.46}{P}$ has been used. This provides ample margin between operational and technical specification limits. The $S(z)$ curve which has been penalized due to decreasing KW/FT limits above 6 feet in the core is attached. Also attached are the results of full incore flux maps taken during this interval. These include a summary page, peak rod enthalpy rise, and average axial conditions.

Compiled By:

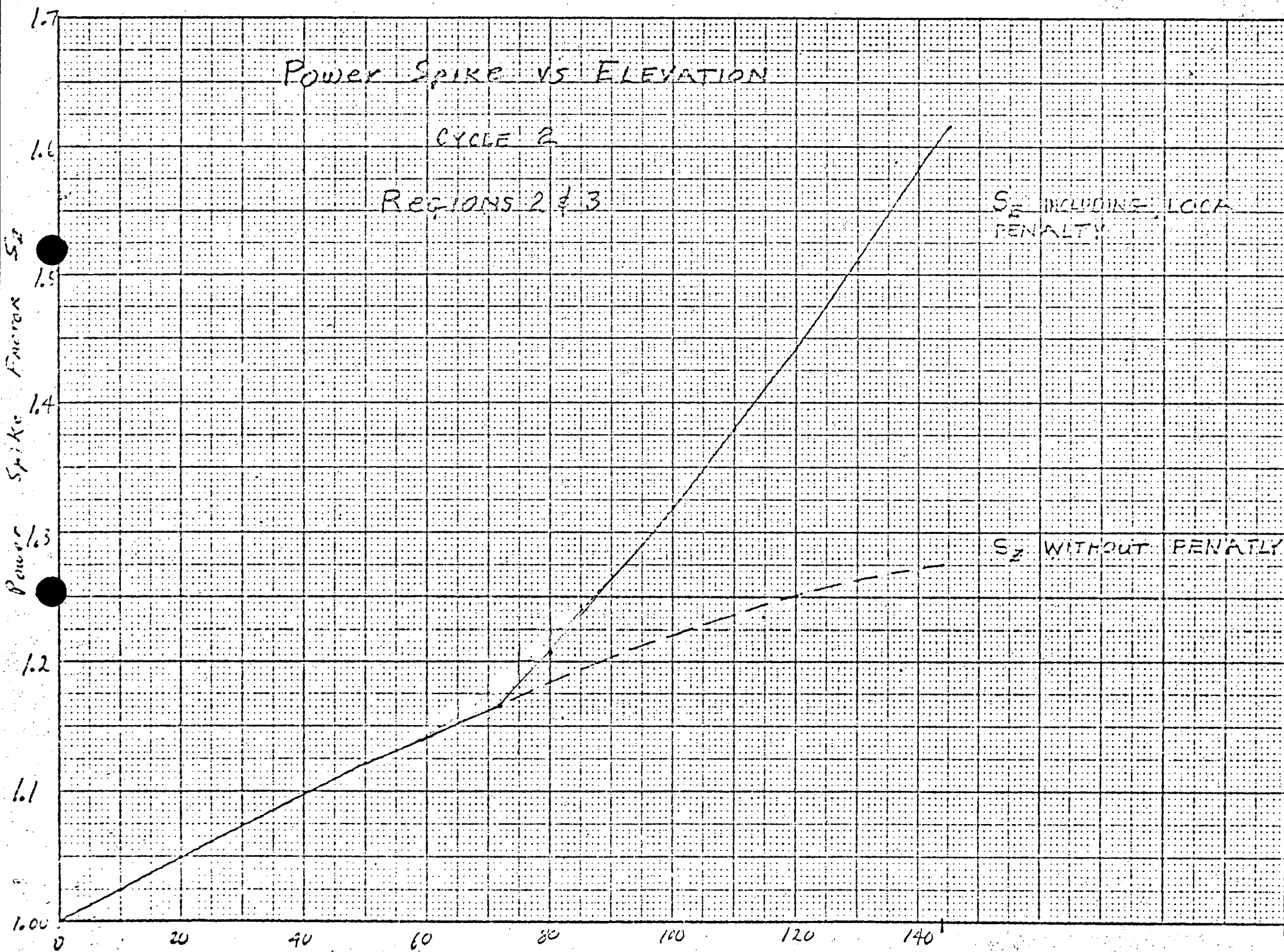
R. H. Chambers

Approved By:

Benny J. Furr

Attachments

6403



AVG AXIAL CONDITIONS

HBP2 CYCLE 2 MAP 111 TAKEN 7-27-73 96 PCT POWER 1000EPPH ARO PDQ D-288

AVERAGE SOURCE PER FOOT = 0.146513E-17 AVERAGE KW/FT = 0.557545E 01 AVERAGE KW/SOURCE = 0.380542E 19

POWER LEVEL EDITED AT = 2142.80 MEGAWATTS THERMAL

POINT	KW/FT	NORMALIZED KW/FT	MAX KW/FT	POINT	KW/FT	NORMALIZED KW/FT	MAX KW/FT
1	3.123321	0.561089	0.715388	30	6.090337	1.092349	1.273678
2	2.633457	0.472331	0.601041	31	6.133993	1.100180	1.276208
3	3.055079	0.549132	0.696675	32	6.147318	1.106156	1.277610
4	3.637939	0.652493	0.827361	33	6.175927	1.107700	1.273854
5	4.023792	0.722596	0.914806	34	6.132575	1.079925	1.260513
6	4.250298	0.762322	0.963194	35	6.111933	1.096223	1.247500
7	4.727357	0.847978	1.068876	36	6.013871	1.078638	1.223175
8	5.136703	0.921308	1.159004	37	5.731613	1.028009	1.157537
9	5.385970	0.966195	1.210256	38	5.861078	1.051229	1.179479
10	5.548344	0.995139	1.245714	39	6.118950	1.097491	1.224787
11	5.673194	1.017531	1.271404	40	6.230382	1.117467	1.240387
12	5.752979	1.031841	1.284642	41	6.287543	1.127720	1.242746
13	5.789514	1.038394	1.287608	42	6.327394	1.134868	1.248353
14	5.769703	1.034841	1.280510	43	6.350324	1.138980	1.243765
15	5.725645	1.027118	1.265922	44	6.347567	1.138485	1.238670
16	5.507903	0.997886	1.215098	45	6.280066	1.126379	1.218741
17	5.484368	0.984651	1.206689	46	6.198929	1.111826	1.194100
18	5.765197	1.034033	1.261518	47	5.926074	1.062987	1.136757
19	5.893490	1.058012	1.287600	48	5.842116	1.047829	1.113841
20	5.945139	1.066307	1.294496	49	6.061398	1.087249	1.148677
21	5.972504	1.071215	1.296168	50	6.127804	1.099070	1.156219
22	5.988746	1.074128	1.294324	51	6.028604	1.081277	1.131015
23	5.935179	1.073488	1.288185	52	5.829922	1.045642	1.086944
24	5.940421	1.065460	1.274289	53	5.509774	0.988221	1.020832
25	5.894232	1.057894	1.258893	54	5.937338	0.993486	0.928784
26	5.730546	1.027818	1.218991	55	4.399435	0.789073	0.804854
27	5.602015	1.004765	1.185621	56	3.593577	0.644536	0.654204
28	5.410452	1.042221	1.225651	57	2.624279	0.470685	0.508340
29	6.015200	1.079052	1.262489				

HRR2 CYCLE 2 MAP 111 TAKEN 7-27-73 96 PCT POWER1000EFPH ARO PDQ D-288

SUMMARY OF KEY PERFORMANCE PARAMETERS

MAXIMUM PEAK KW/FT OF 10.00 OCCURRED IN ASSEMBLY 6 LOCATED AT J 2
PEAK KW/FT IN REGION 1 OF 6.70 OCCURRED IN ASSEMBLY 79 AT LOCATION H 8
PEAK KW/FT IN REGION 2 OF 7.38 OCCURRED IN ASSEMBLY 7 AT LOCATION H 2
PEAK KW/FT IN REGION 3 OF 4.37 OCCURRED IN ASSEMBLY 46 AT LOCATION M 6
PEAK KW/FT IN REGION 4 OF 10.00 OCCURRED IN ASSEMBLY 6 AT LOCATION J 2

MAXIMUM AXIAL PEAKING FACTOR OF 1.22 OCCURRED IN ASSEMBLY 1 LOCATED AT J 1
MAXIMUM AXIAL PEAKING FACTOR IN REGION 1 OF 1.20 OCCURRED IN ASSEMBLY 79 LOCATED AT H 8
MAXIMUM AXIAL PEAKING FACTOR IN REGION 2 OF 1.19 OCCURRED IN ASSEMBLY 85 LOCATED AT B 8
MAXIMUM AXIAL PEAKING FACTOR IN REGION 3 OF 1.21 OCCURRED IN ASSEMBLY 93 LOCATED AT D 8
MAXIMUM AXIAL PEAKING FACTOR IN REGION 4 OF 1.22 OCCURRED IN ASSEMBLY 157 LOCATED AT G15

MAXIMUM RADIAL PEAKING FACTOR OF 1.27 OCCURRED IN ASSEMBLY 6 LOCATED AT J 2
MAXIMUM RADIAL PEAKING FACTOR IN REGION 1 OF 0.89 OCCURRED IN ASSEMBLY 79 LOCATED AT H 8
MAXIMUM RADIAL PEAKING FACTOR IN REGION 2 OF 1.00 OCCURRED IN ASSEMBLY 111 LOCATED AT E10
MAXIMUM RADIAL PEAKING FACTOR IN REGION 3 OF 1.17 OCCURRED IN ASSEMBLY 112 LOCATED AT D10
MAXIMUM RADIAL PEAKING FACTOR IN REGION 4 OF 1.27 OCCURRED IN ASSEMBLY 152 LOCATED AT G14

AVERAGE AXIAL OFFSET (PERCENT) -5.16

MAXIMUM GROSS PEAKING (FOM) FACTOR OF 1.74 OCCURRED IN ASSEMBLY 6 LOCATED AT J 2
MAXIMUM GROSS PEAKING FACTOR IN REGION 1 OF 1.17 OCCURRED IN ASSEMBLY 79 LOCATED AT H 8
MAXIMUM GROSS PEAKING FACTOR IN REGION 2 OF 1.28 OCCURRED IN ASSEMBLY 151 LOCATED AT H14
MAXIMUM GROSS PEAKING FACTOR IN REGION 3 OF 1.46 OCCURRED IN ASSEMBLY 112 LOCATED AT D10
MAXIMUM GROSS PEAKING FACTOR IN REGION 4 OF 1.74 OCCURRED IN ASSEMBLY 152 LOCATED AT G14

CENTER ASSEMBLY AVERAGE POWER FRACTION 0.885
REGION 2 AVERAGE POWER FRACTION 0.933
REGION 3 AVERAGE POWER FRACTION 1.081
REGION 4 AVERAGE POWER FRACTION 0.942

END OF INCORE RUN IBM VERSION 1 06-01-73

	R	P	N	M	L	K	J	H	G	F	E	D	C	B	A	
1							1.145.	1.191.	1.145.							1
2					1.203.	1.364.	1.464.	1.081.	1.464.	1.364.	1.203.					2
3				1.166.	1.398.	0.999.	1.037.	1.210.	1.037.	0.999.	1.398.	1.166.				3
4			1.218.	1.118.	0.974.	1.276.	1.047.	1.176.	1.047.	1.276.	0.974.	1.118.	1.218.			4
5		1.247.	1.444.	1.053.	1.220.	1.055.	1.141.	0.993.	1.141.	1.055.	1.220.	1.053.	1.444.	1.247.		5
6		1.301.	1.047.	1.304.	1.070.	1.263.	1.208.	1.241.	1.208.	1.263.	1.070.	1.304.	1.047.	1.301.		6
7	1.111.	1.392.	0.999.	1.022.	1.090.	1.181.	1.167.	0.945.	1.167.	1.181.	1.090.	1.022.	0.999.	1.392.	1.111.	7
8	1.197.	1.043.	1.183.	1.128.	0.979.	1.209.	0.926.	0.970.	0.926.	1.209.	0.979.	1.128.	1.183.	1.043.	1.197.	8
9	1.111.	1.392.	0.999.	1.022.	1.090.	1.181.	1.167.	0.945.	1.167.	1.181.	1.090.	1.022.	0.999.	1.392.	1.111.	9
10		1.301.	1.047.	1.304.	1.070.	1.263.	1.208.	1.241.	1.208.	1.263.	1.070.	1.304.	1.047.	1.301.		10
11		1.247.	1.444.	1.053.	1.220.	1.055.	1.141.	0.993.	1.141.	1.055.	1.220.	1.053.	1.444.	1.247.		11
12			1.218.	1.118.	0.974.	1.276.	1.047.	1.176.	1.047.	1.276.	0.974.	1.118.	1.218.			12
13				1.166.	1.398.	0.999.	1.037.	1.210.	1.037.	0.999.	1.398.	1.166.				13
14					1.203.	1.364.	1.464.	1.081.	1.464.	1.364.	1.203.					14
15							1.145.	1.191.	1.145.							15

R P N M L K J H G F E D C B A

AVG AXIAL CONDITIONS HBR2 CYCLE 2 MAP 112 TAKEN 7-30-73 100 PCT POWER1000EFPH ARO PDQ 0-288

AVERAGE SOURCE PER FOOT = 0.145013E-17 AVERAGE KW/FT = 0.557545E 01 AVERAGE KW/SOURCE = 0.384480E 19

POWER LEVEL EDITED AT = 2142.80 MEGAWATTS THERMAL

POINT	KW/FT	NORMALIZED KW/FT	MAX KW/FT	POINT	KW/FT	NORMALIZED KW/FT	MAX KW/FT
1	2.977472	0.534033	0.680892	30	6.075785	1.089739	1.270635
2	2.437021	0.437099	0.556208	31	6.133592	1.100107	1.276124
3	2.844508	0.510185	0.648445	32	6.183060	1.108980	1.280871
4	3.418069	0.613057	0.777357	33	6.214718	1.114658	1.281857
5	3.825117	0.686065	0.868558	34	6.231535	1.117674	1.290853
6	3.928454	0.704599	0.890260	35	6.223729	1.116274	1.270319
7	4.458618	0.799688	1.008006	36	6.102135	1.094465	1.241123
8	4.910065	0.880659	1.107867	37	5.728374	1.027429	1.156883
9	5.192255	0.931272	1.166510	38	5.889064	1.056250	1.185111
10	5.371151	0.963358	1.205931	39	6.203174	1.112587	1.241646
11	5.512691	0.988744	1.235435	40	6.328325	1.135035	1.259888
12	5.608309	1.005894	1.252337	41	6.399261	1.147758	1.264828
13	5.672247	1.017362	1.261528	42	6.457067	1.158125	1.273936
14	5.681586	1.019036	1.260954	43	6.500040	1.165833	1.273088
15	5.648456	1.013094	1.248637	44	6.518345	1.169116	1.271997
16	5.358409	0.961073	1.182118	45	6.509563	1.167541	1.263278
17	5.332065	0.956348	1.172003	46	6.439451	1.154965	1.240432
18	5.638439	1.011298	1.233783	47	6.126459	1.098828	1.175197
19	5.792729	1.038971	1.264426	48	5.941464	1.065648	1.132783
20	5.848925	1.049050	1.273546	49	6.229388	1.117290	1.180415
21	5.884940	1.055510	1.277165	50	6.358385	1.140426	1.199726
22	5.912624	1.060475	1.277872	51	6.297249	1.129460	1.181415
23	5.927783	1.063194	1.275832	52	6.138941	1.101067	1.144557
24	5.934983	1.064467	1.273102	53	5.863736	1.051706	1.086412
25	5.909319	1.059882	1.261259	54	5.440489	0.975794	1.003116
26	5.695659	1.021561	1.211571	55	4.838129	0.867756	0.885111
27	5.445797	0.976746	1.152559	56	3.987591	0.715206	0.725933
28	5.765810	1.034142	1.216150	57	2.903130	0.520699	0.562355
29	5.993534	1.074986	1.257732				

SUMMARY OF KEY PERFORMANCE PARAMETERS

MAXIMUM PEAK KW/FT OF 10.25 OCCURRED IN ASSEMBLY 6 LOCATED AT J 2
PEAK KW/FT IN REGION 1 OF 7.03 OCCURRED IN ASSEMBLY 79 AT LOCATION H 8
PEAK KW/FT IN REGION 2 OF 7.58 OCCURRED IN ASSEMBLY 7 AT LOCATION H 2
PEAK KW/FT IN REGION 3 OF 8.60 OCCURRED IN ASSEMBLY 46 AT LOCATION M 6
PEAK KW/FT IN REGION 4 OF 10.25 OCCURRED IN ASSEMBLY 6 AT LOCATION J 2

MAXIMUM AXIAL PEAKING FACTOR OF 1.25 OCCURRED IN ASSEMBLY 2 LOCATED AT H 1
MAXIMUM AXIAL PEAKINGFACTOR IN REGION 1 OF 1.24 OCCURRED IN ASSEMBLY 79 LOCATED AT H 8
MAXIMUM AXIAL PEAKINGFACTOR IN REGION 2 OF 1.21 OCCURRED IN ASSEMBLY 85 LOCATED AT B 8
MAXIMUM AXIAL PEAKINGFACTOR IN REGION 3 OF 1.24 OCCURRED IN ASSEMBLY 83 LOCATED AT D 8
MAXIMUM AXIAL PEAKINGFACTOR IN REGION 4 OF 1.25 OCCURRED IN ASSEMBLY 156 LOCATED AT H15

MAXIMUM RADIAL PEAKING FACTOR OF 1.29 OCCURRED IN ASSEMBLY 6 LOCATED AT J 2
MAXIMUM RADIAL PEAKING FACTOR IN REGION 1 OF 0.91 OCCURRED IN ASSEMBLY 79 LOCATED AT H 8
MAXIMUM RADIAL PEAKING FACTOR IN REGION 2 OF 1.00 OCCURRED IN ASSEMBLY 111 LOCATED AT E10
MAXIMUM RADIAL PEAKING FACTOR IN REGION 3 OF 1.18 OCCURRED IN ASSEMBLY 112 LOCATED AT D10
MAXIMUM RADIAL PEAKING FACTOR IN REGION 4 OF 1.29 OCCURRED IN ASSEMBLY 152 LOCATED AT G14

AVERAGE AXIAL OFFSET (PERCENT) -7.83

MAXIMUM GROSS PEAKING (FQN) FACTOR OF 1.79 OCCURRED IN ASSEMBLY 6 LOCATED AT J 2
MAXIMUM GROSS PEAKING FACTOR IN REGION 1 OF 1.22 OCCURRED IN ASSEMBLY 79 LOCATED AT H 8
MAXIMUM GROSS PEAKING FACTOR IN REGION 2 OF 1.32 OCCURRED IN ASSEMBLY 151 LOCATED AT H14
MAXIMUM GROSS PEAKING FACTOR IN REGION 3 OF 1.50 OCCURRED IN ASSEMBLY 112 LOCATED AT D10
MAXIMUM GROSS PEAKING FACTOR IN REGION 4 OF 1.79 OCCURRED IN ASSEMBLY 152 LOCATED AT G14

CENTER ASSEMBLY AVERAGE POWER FRACTION 0.897
REGION 2 AVERAGE POWER FRACTION 0.933
REGION 3 AVERAGE POWER FRACTION 1.086
REGION 4 AVERAGE POWER FRACTION 0.944

END OF INCORE RUN IBM VERSION 1 06-01-73

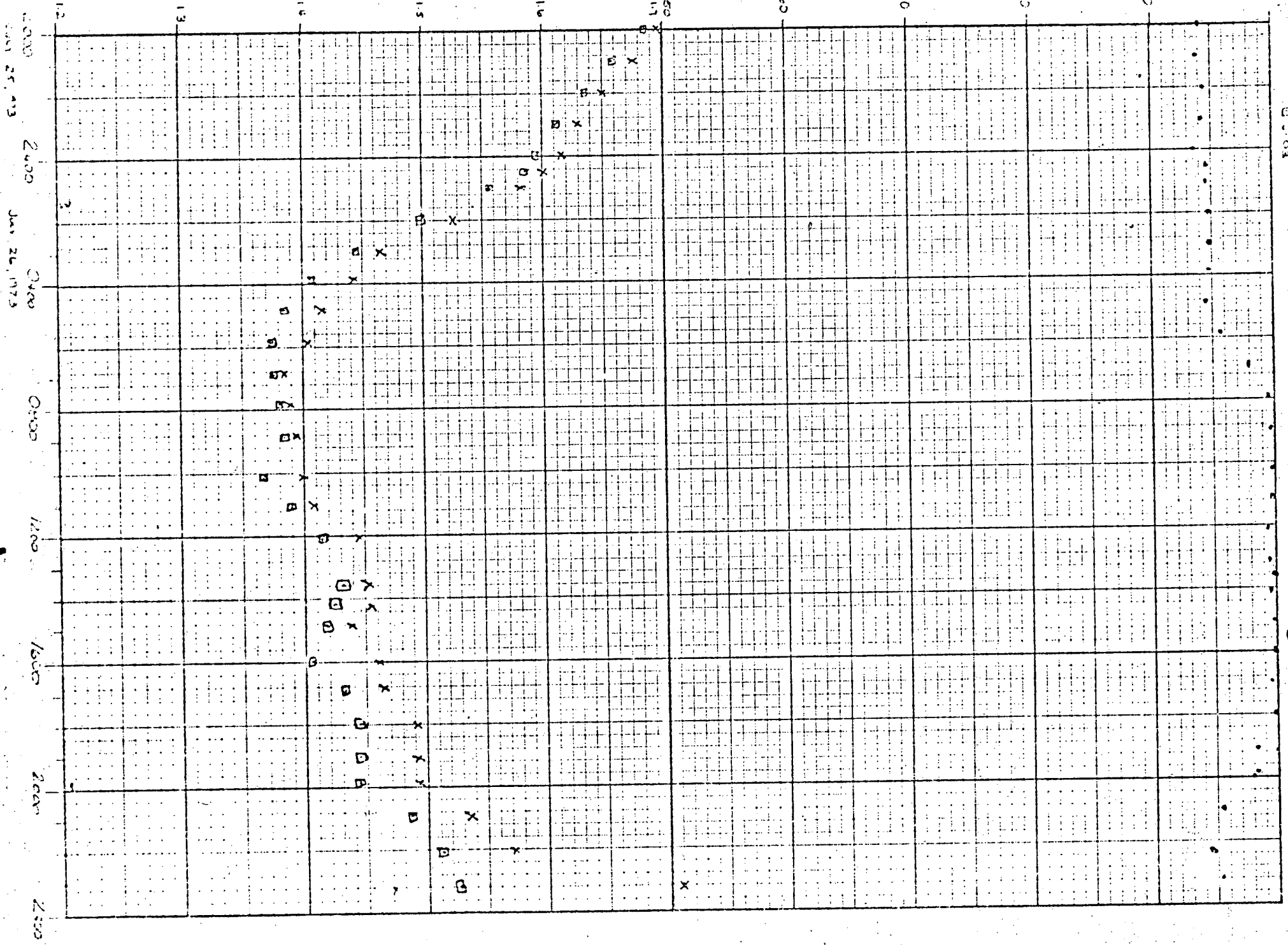
	R	P	N	M	L	K	J	H	G	F	E	D	C	B	A	
1							1.157.	1.204.	1.157.							1
2					1.196.	1.374.	1.478.	1.093.	1.478.	1.374.	1.196.					2
3				1.138.	1.395.	1.006.	1.037.	1.213.	1.037.	1.006.	1.395.	1.138.				3
4			1.228.	1.118.	0.972.	1.274.	0.987.	1.174.	0.987.	1.274.	0.972.	1.118.	1.228.			4
5		1.259.	1.448.	1.053.	1.213.	1.049.	1.135.	0.988.	1.135.	1.049.	1.213.	1.053.	1.448.	1.259.		5
6		1.292.	1.049.	1.316.	1.075.	1.231.	1.205.	1.261.	1.205.	1.231.	1.075.	1.316.	1.049.	1.292.		6
7	1.117.	1.391.	1.012.	1.042.	1.108.	1.187.	1.178.	0.958.	1.178.	1.187.	1.108.	1.042.	1.012.	1.391.	1.117.	7
8	1.212.	1.061.	1.239.	1.169.	0.997.	1.230.	0.939.	0.984.	0.939.	1.230.	0.997.	1.169.	1.239.	1.061.	1.212.	8
9	1.117.	1.391.	1.012.	1.042.	1.108.	1.187.	1.178.	0.958.	1.178.	1.187.	1.108.	1.042.	1.012.	1.391.	1.117.	9
10		1.292.	1.049.	1.316.	1.075.	1.231.	1.205.	1.261.	1.205.	1.231.	1.075.	1.316.	1.049.	1.292.		10
11		1.259.	1.448.	1.053.	1.213.	1.049.	1.135.	0.988.	1.135.	1.049.	1.213.	1.053.	1.448.	1.259.		11
12			1.228.	1.118.	0.972.	1.274.	0.987.	1.174.	0.987.	1.274.	0.972.	1.118.	1.228.			12
13				1.138.	1.395.	1.006.	1.037.	1.213.	1.037.	1.006.	1.395.	1.138.				13
14					1.196.	1.374.	1.478.	1.093.	1.478.	1.374.	1.196.					14
15							1.157.	1.204.	1.157.							15

R P N M L K J H G F E D C B A

Power (%)

F₂ S_E

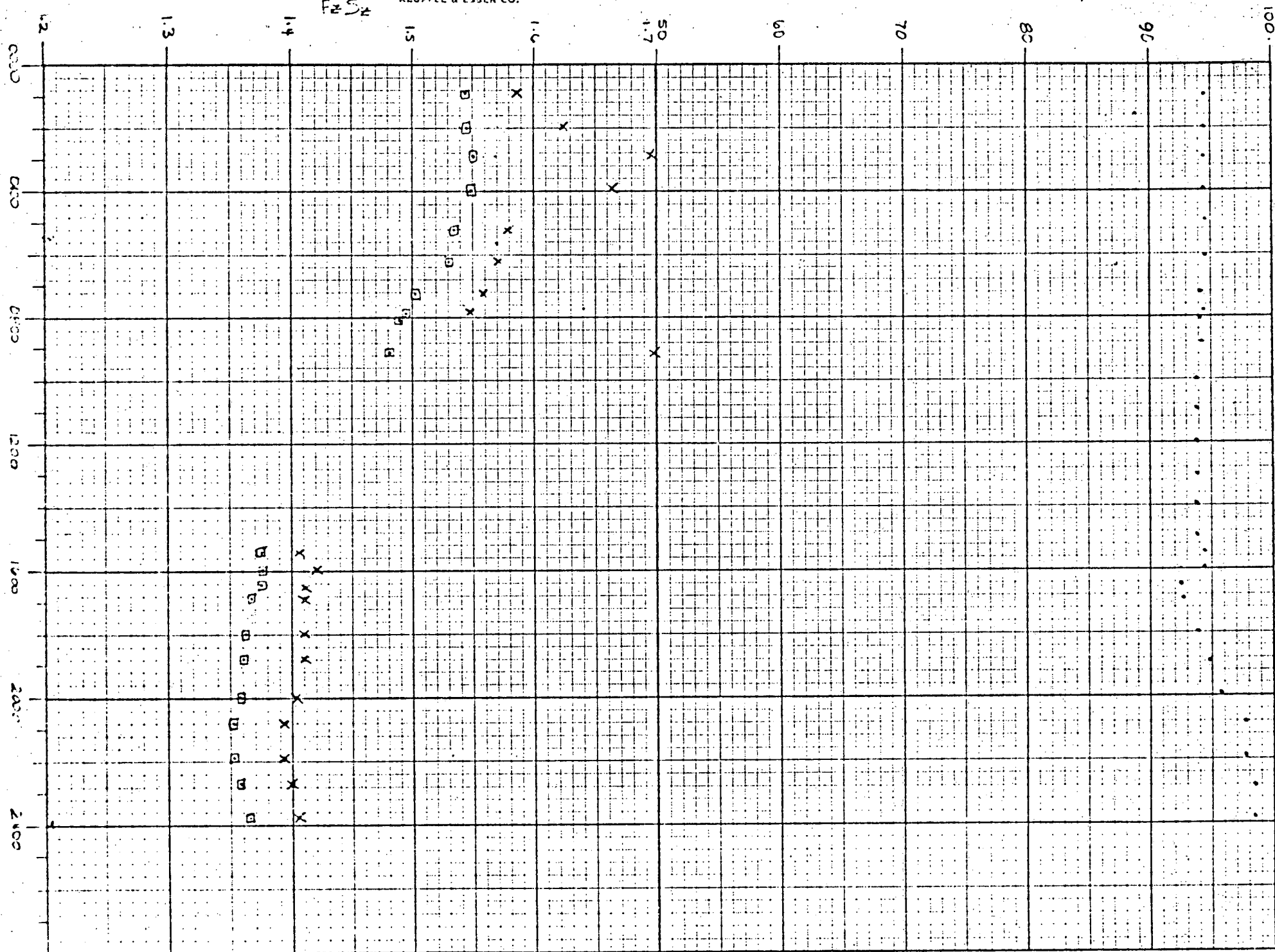
Legend: • Power
 x F₂
 O S_E



POWER (%)

X F-13
 55-03

July 27, 1933

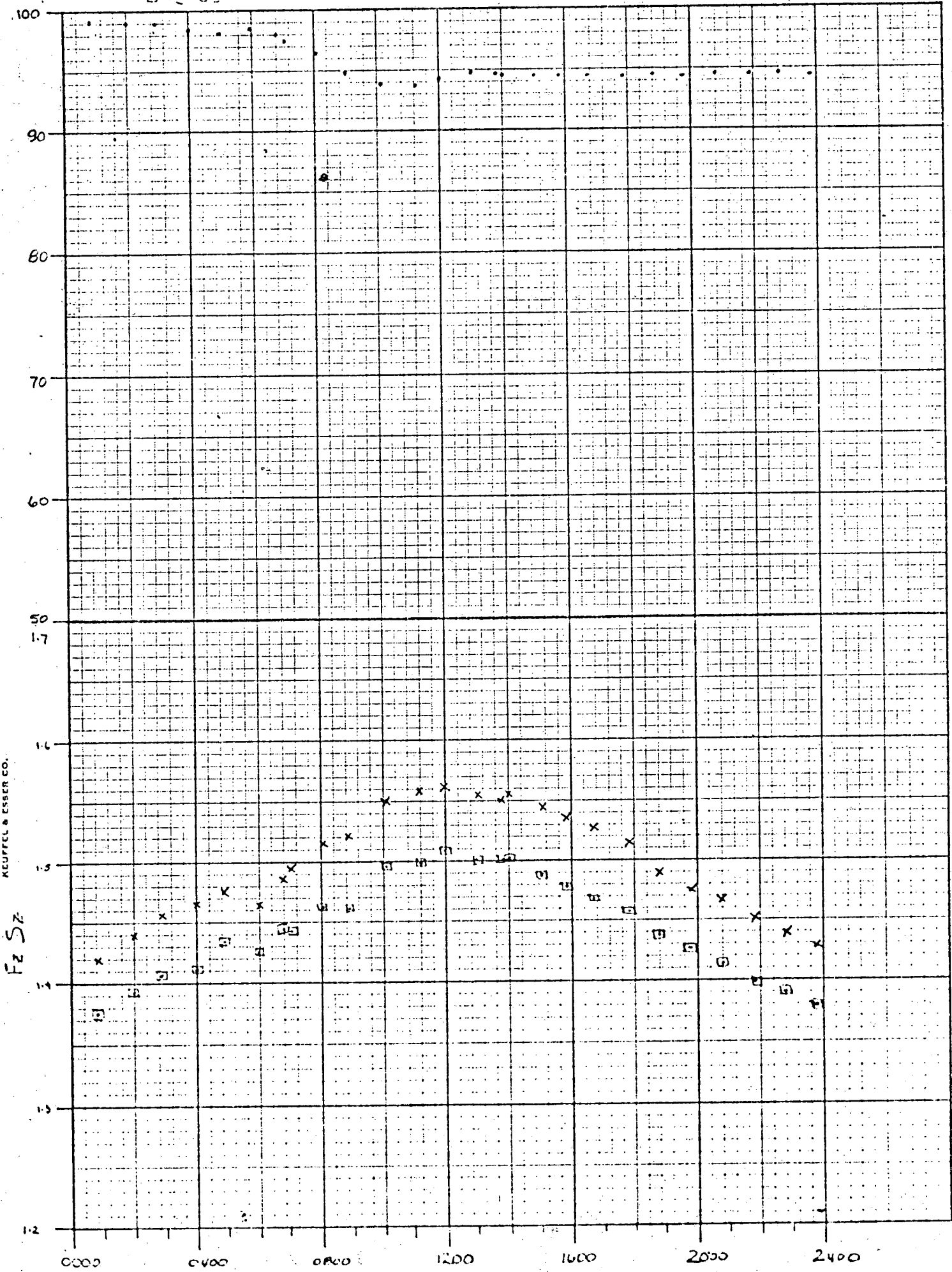


LEWIS: • Power
 x F-13
 □ C-03

JULY 28, 1973

POWER (%)

K&E 10 X 10 TO THE INCH 46 0780
 7 X 10 INCHES
 KEUFFEL & ESSER CO.

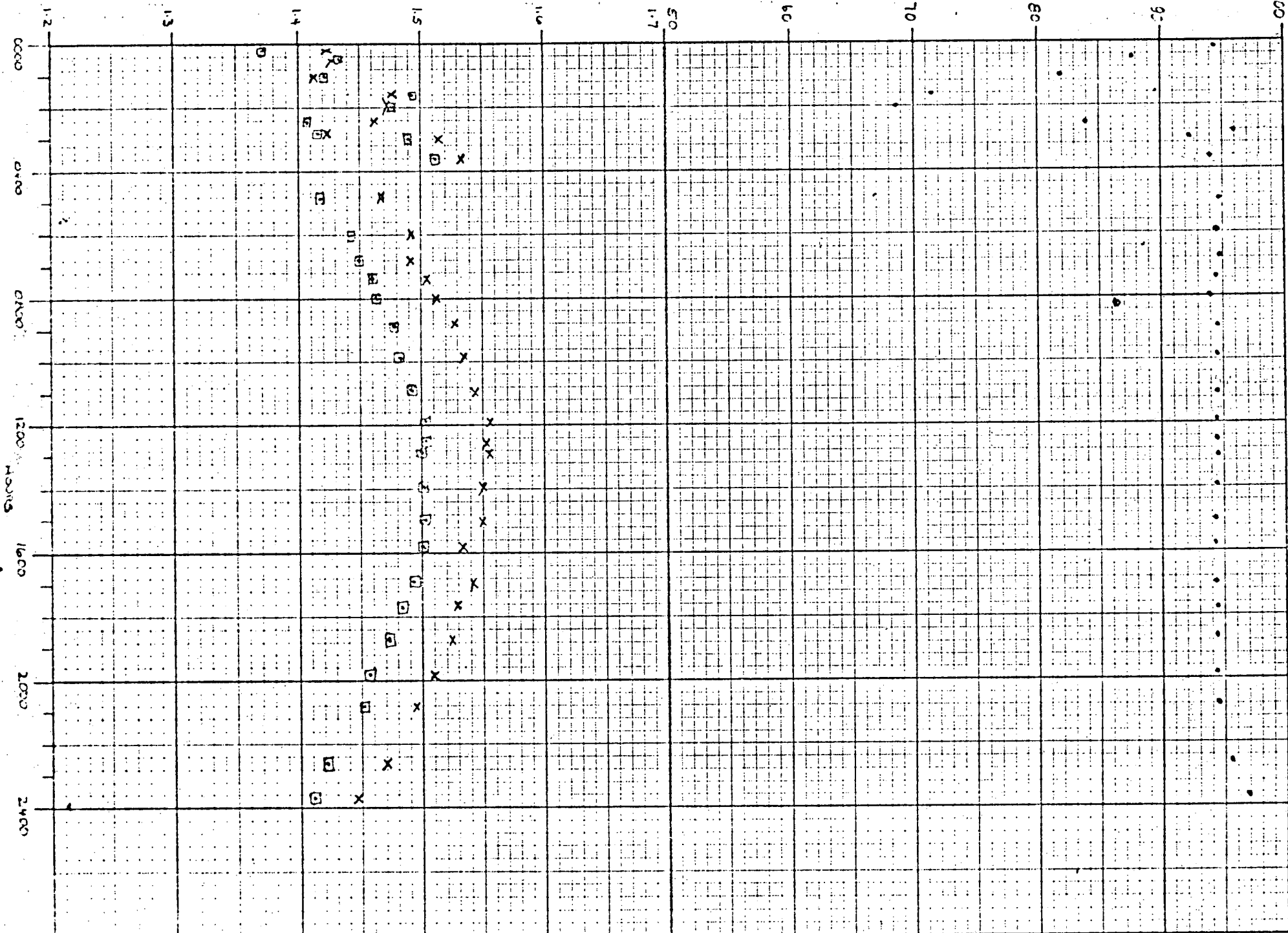


Power (%)

Fz Sz

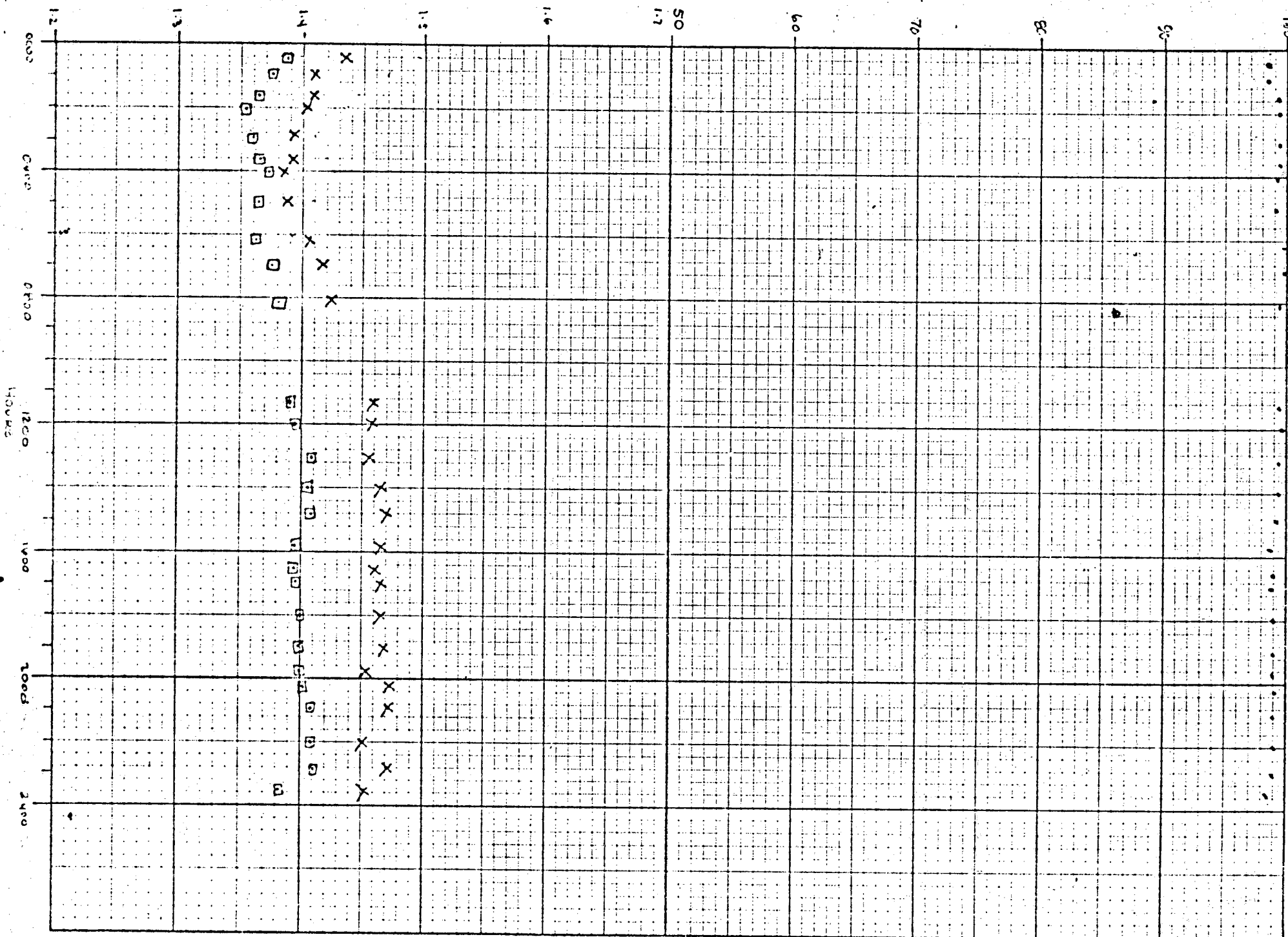
LEGEND:
• POWER
X F-2
WJ-02

JULY 29, 1973



FZS₂

POWER (%)



LEGEND: POWER
 1.5-1.8
 FZ-03

JULY 30, 1973

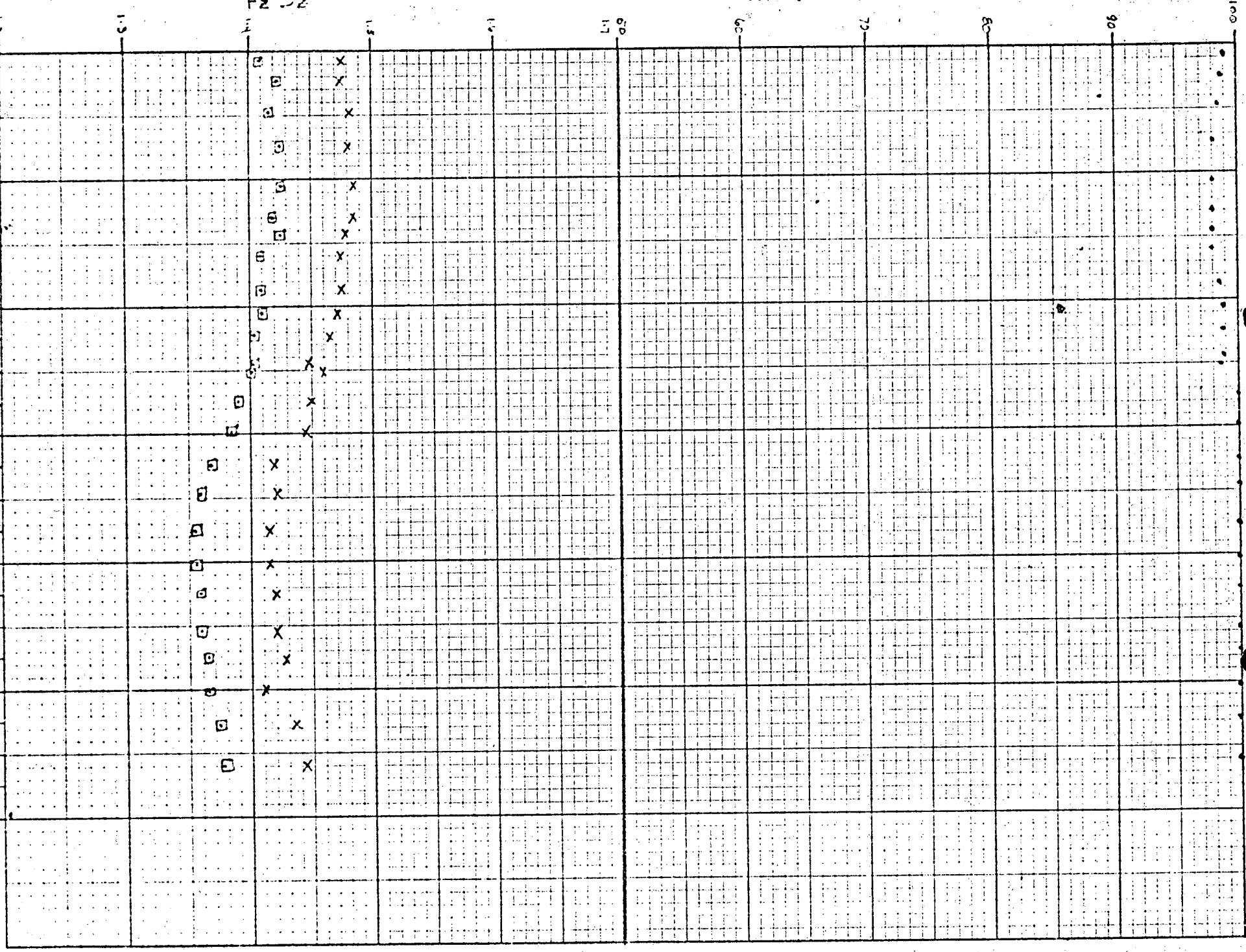
Fz Sz

Power (710)

12000
10000
8000
6000
4000
2000
0

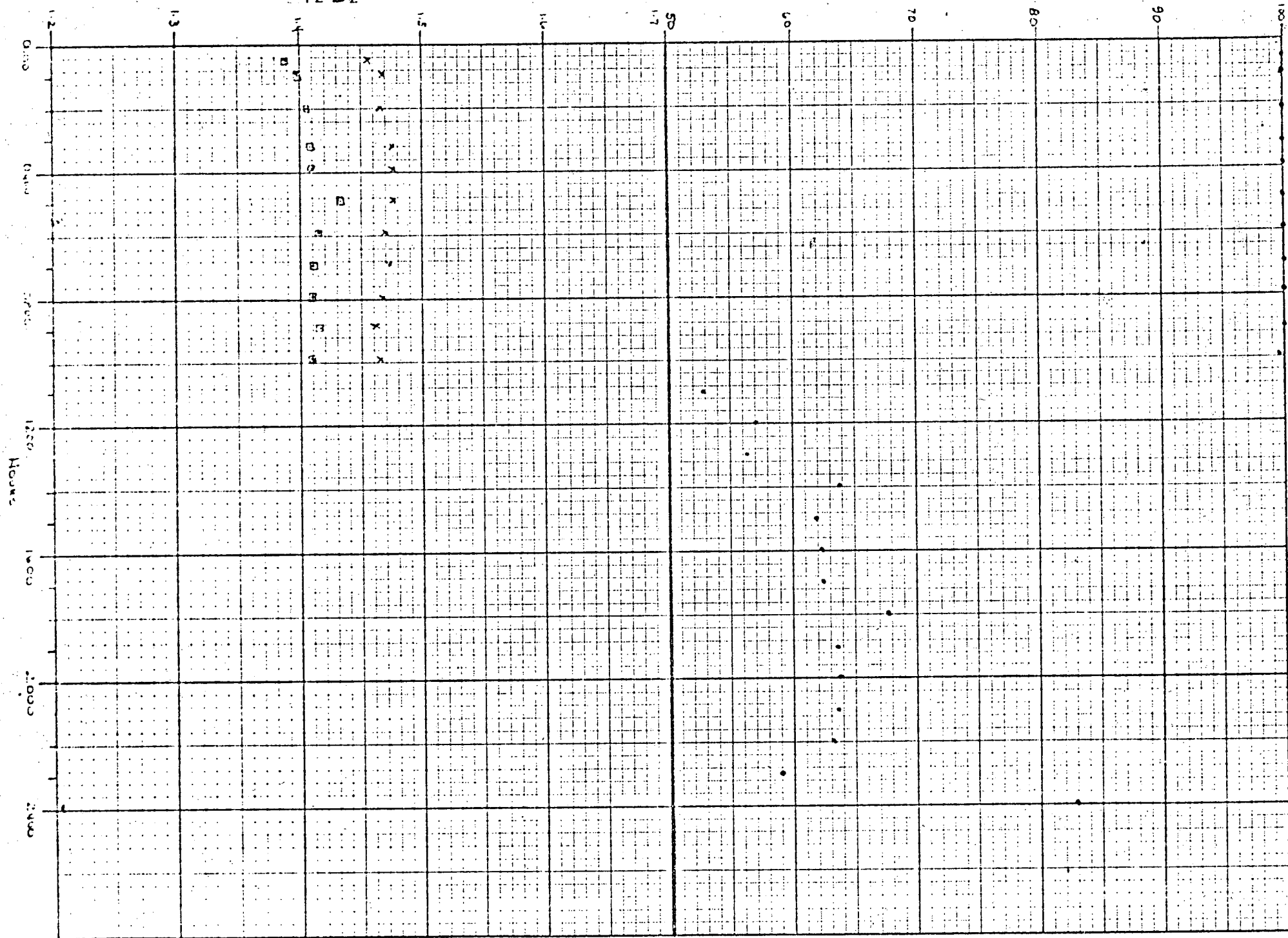
Legend: X Power
 0 7-03

JULY 31 1973



Fz Sz

Power (%)

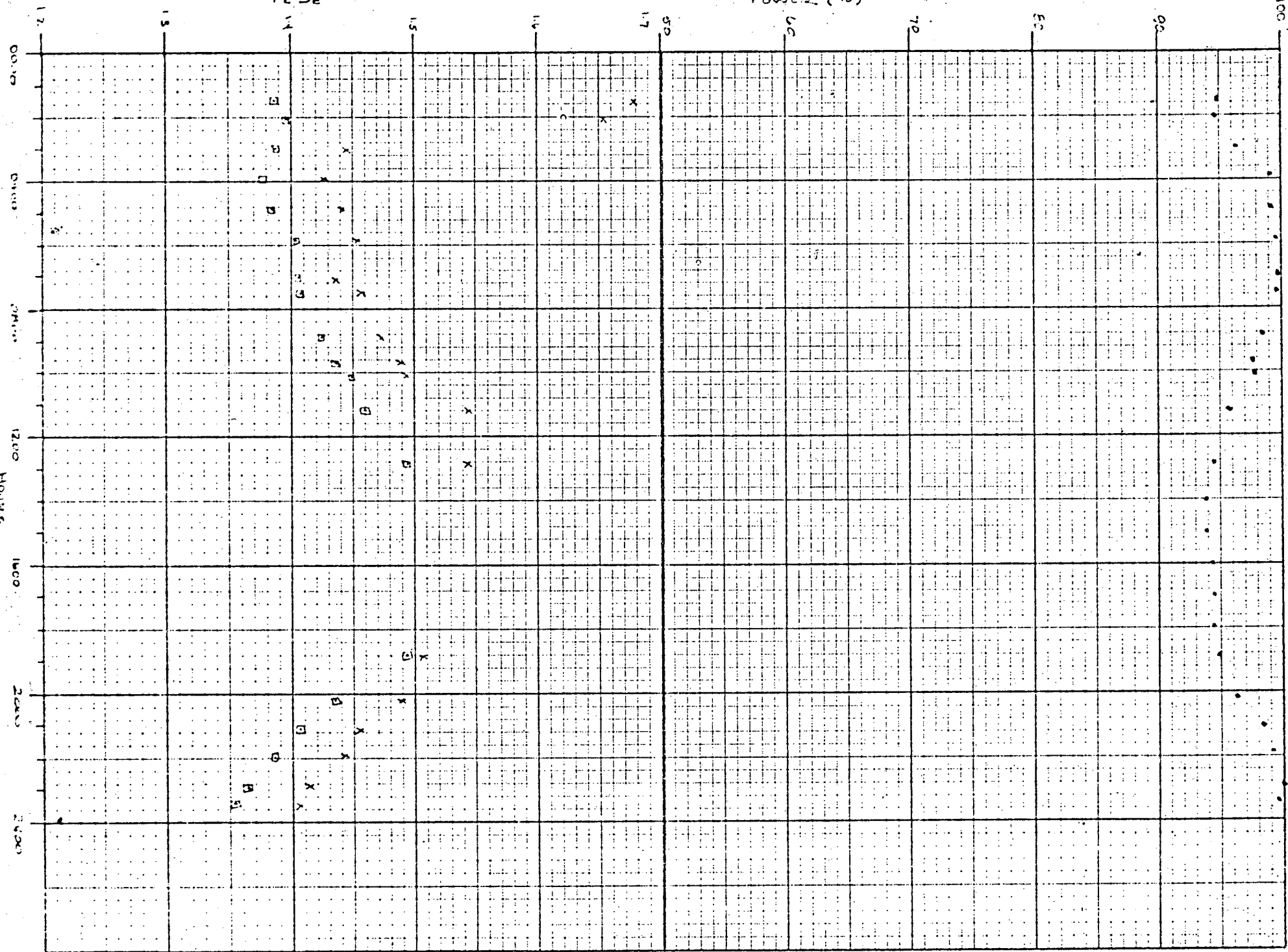


Fe Sa

Power (70)

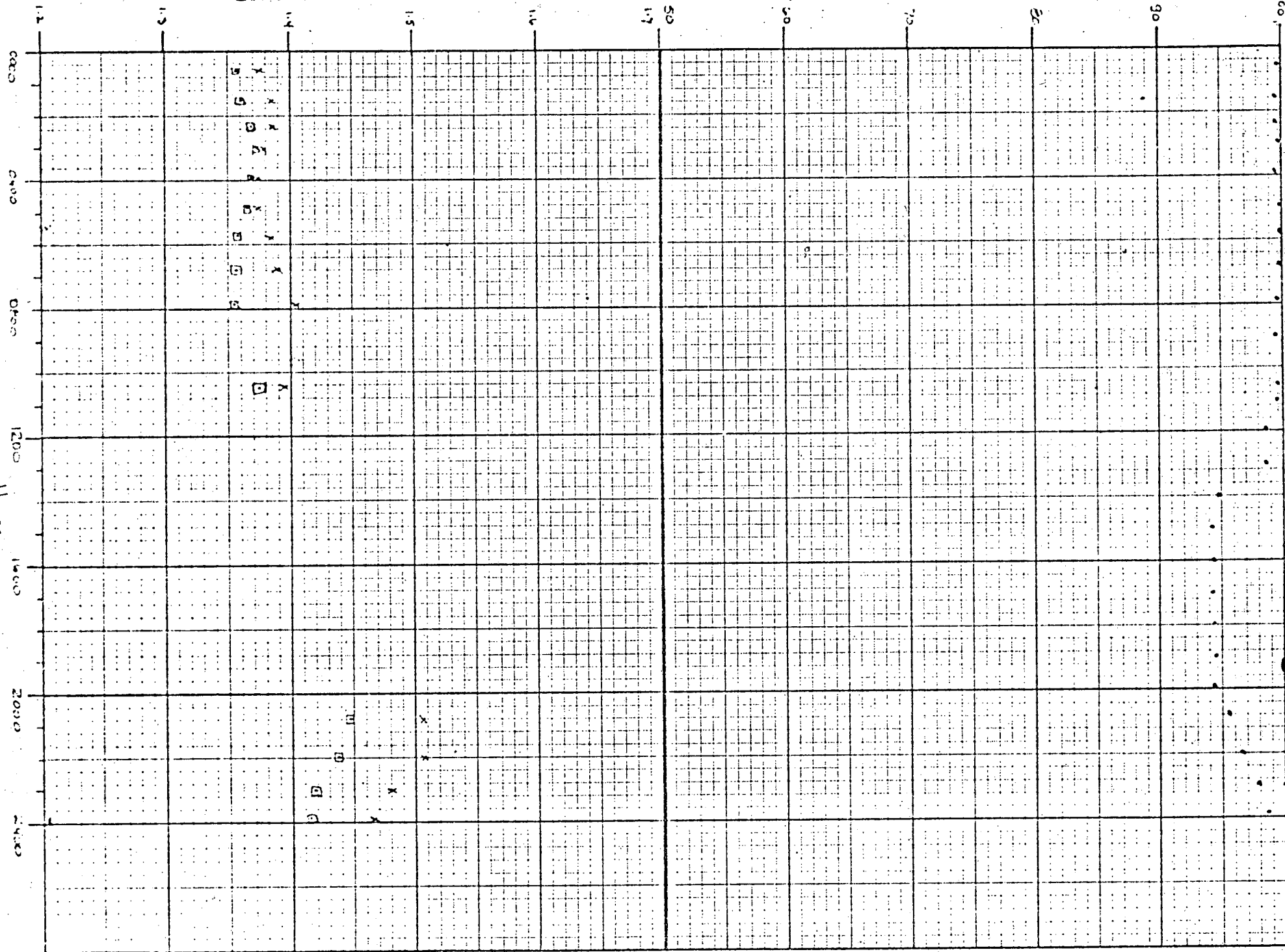
Legend:
 X 7-13
 B 2-03

Aug. 2, 1973



Fz Sz

Power (70)

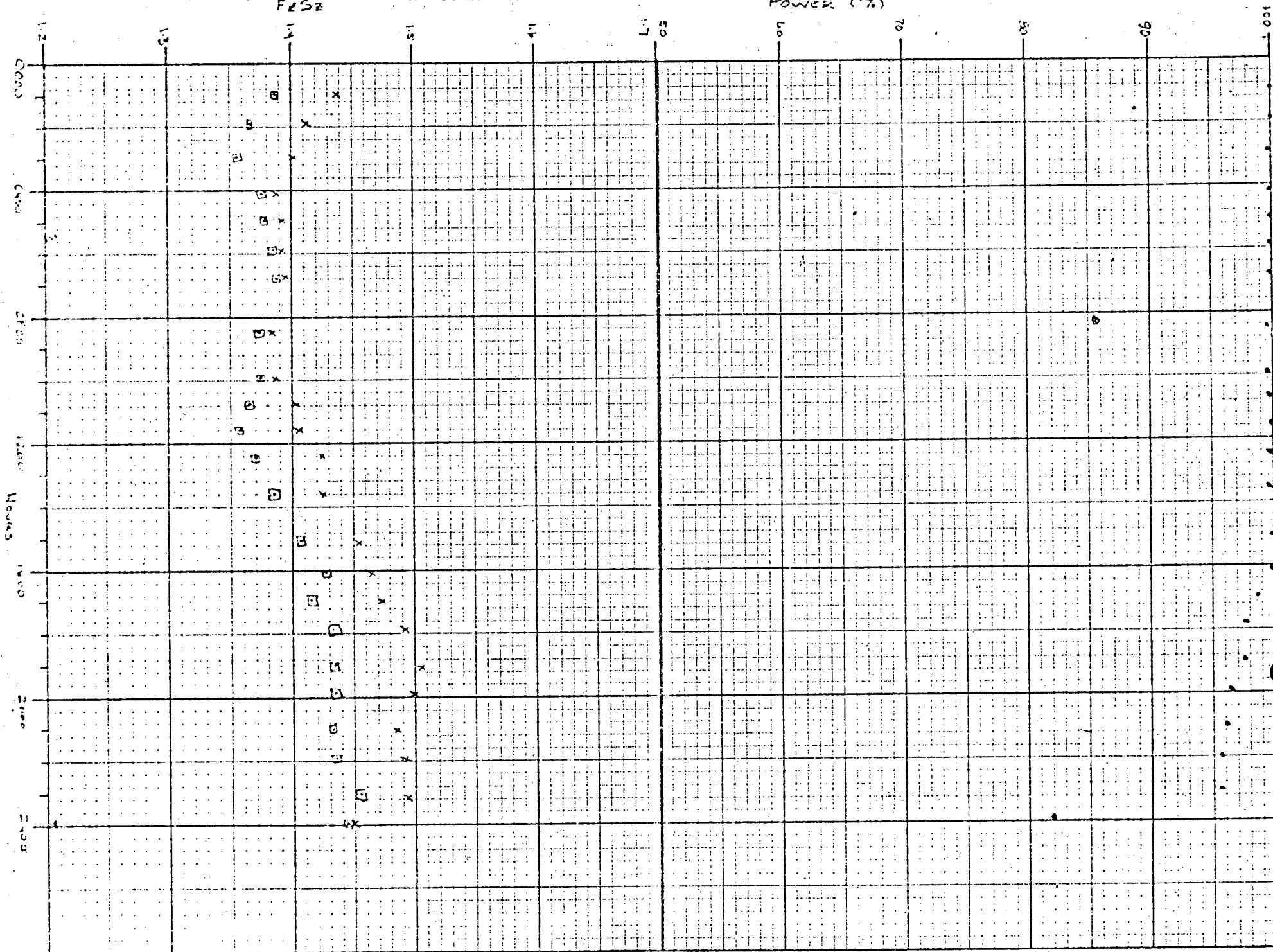


Legend: 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

Aug 2 1952

F252

Power (%)

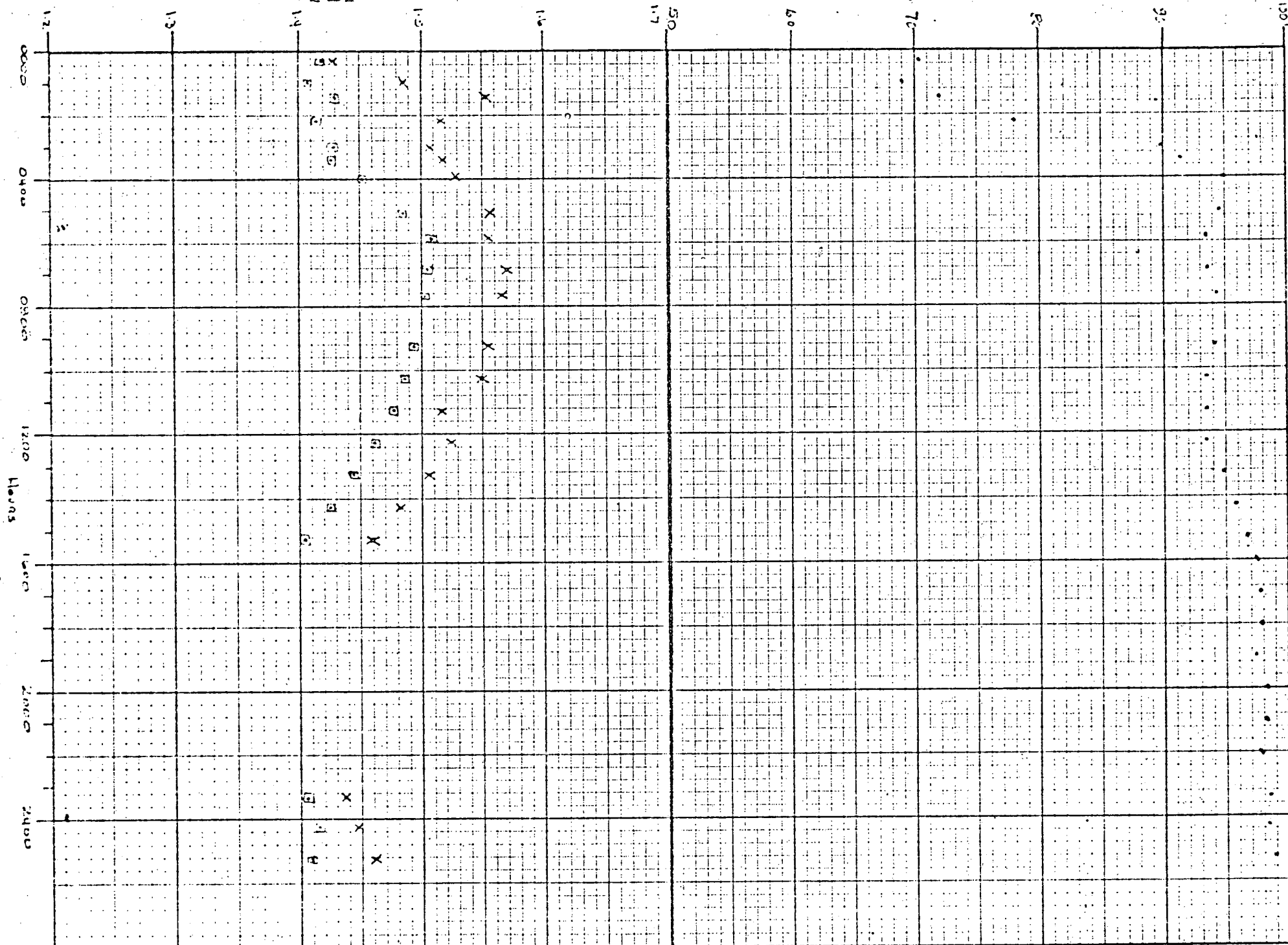


Legend:
 x F-13
 o J-02

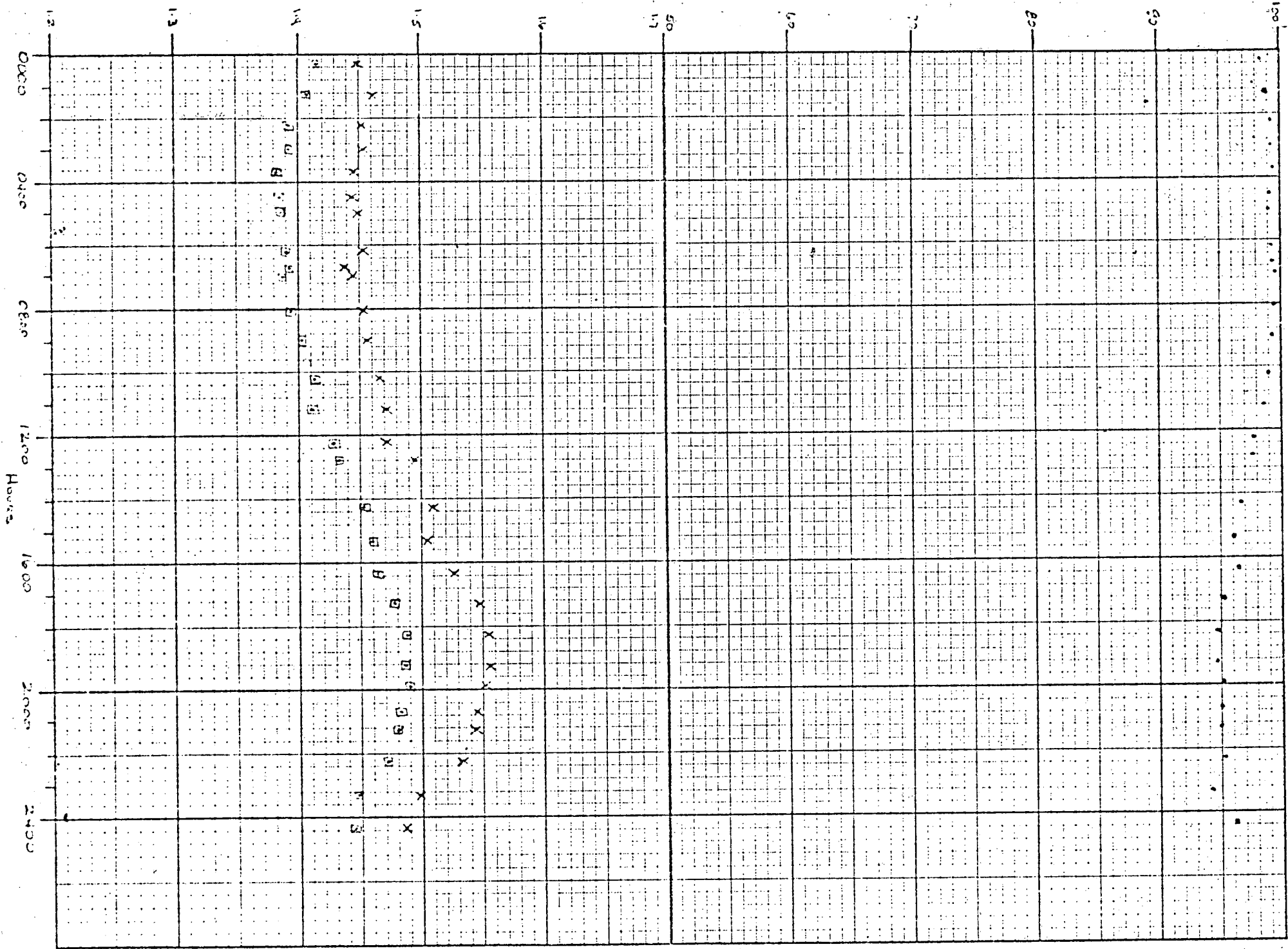
Aug 4 1973

POWER (%)

Aug. 5, 1973



Power (%)

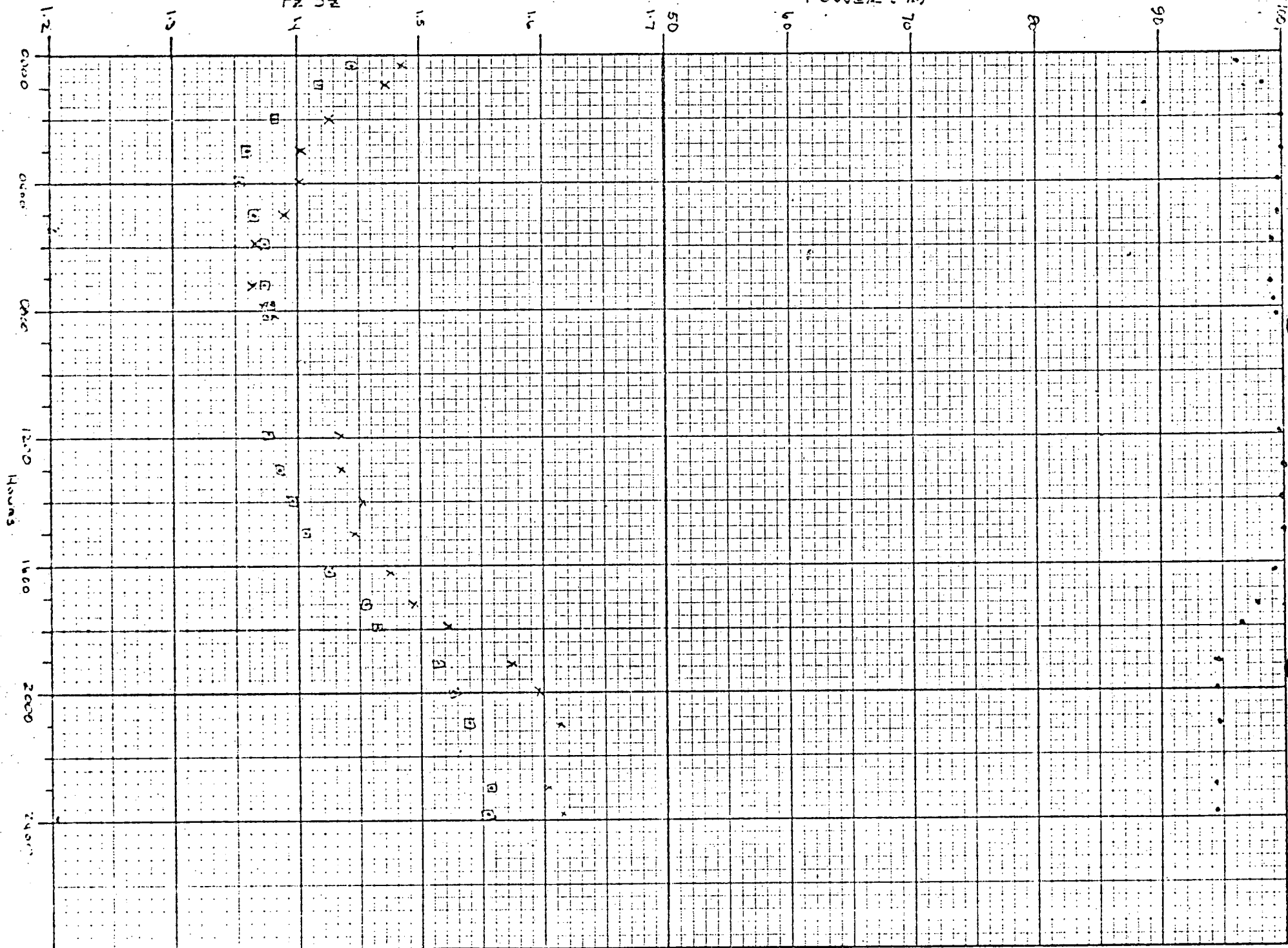


100
 90
 80
 70
 60
 50
 40
 30
 20
 10
 0

Aug 6, 1973

F₂ S₂

POWER (70)

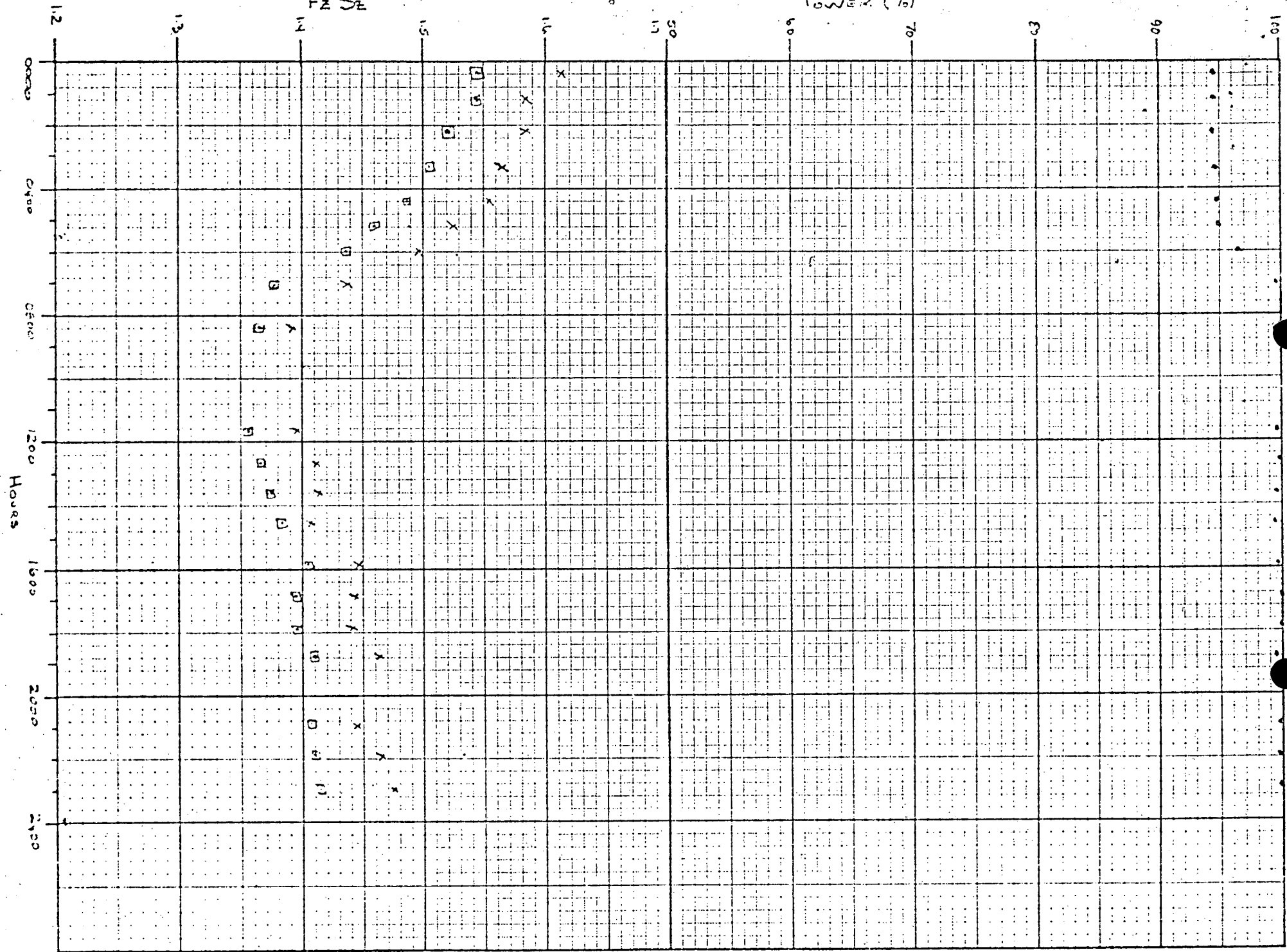


LEGEND:
 x F-3
 27-03

AUG 7 1973

Fz Sz

Power (%)



1000
 2000
 3000
 4000
 5000
 6000
 7000
 8000
 9000
 10000

4000 8000 12000