



**Space  
Systems Division**

ALSEP Array E Power Budget

NO.	KEY. NO.
ATM 1076	
PAGE <u>1</u>	OF <u>10</u>
DATE 2-1-72	

SUMMARY

This issue of the ALSEP Array E Power Budget provides the Best Estimate Information on the power distribution within the components of the Data, Power and Experiment Subsystems.

The information is presented as follows:

Table I	Data Subsystem Power
Table II	Experiment Power
Table III	System Power Distribution
Figures I through V	Experiment Power Profiles

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TABLE I  
DATA SUBSYSTEM POWER

Component	Day	Night
Receiver	0.90	0.90
Command Decoder	0.65	0.65
Data Processor	2.30	2.30
Transmitter (Teledyne)	9.00	9.00
Diplexer Switch	0.10	0.10
Harness Losses*	0.30	0.35
PDU**	1.75	2.50
Totals	15.00	15.80

\* Manganin insert losses plus arbitrary 0.25 watts for copper and connector losses.

\*\*Includes 0.075 watts for quiescent load of PDU active circuits.

All powers are in watts.

TABLE II A

## STEADY STATE EXPERIMENT POWERS

Experiment	Operate Power (watts)		Standby Power (watts)
	Day	Night	
LSG	2.75**	8.75***	4.3
LMS	10.01	11.00*	7.5
LEAM	3.16	6.6	5.0
HFE	3.90	10.70	4.2
LSPE	5.3	5.3	0
Total	25.12	42.35	21.0

\* Includes 1.5 watts backup heater.

\*\* Minimum (LSG proportional heater see Figure 5B)

\*\*\* Maximum (LSG proportional heater see Figure 5B)

TABLE II B

## MAXIMUM TRANSIENT EXPERIMENT POWERS \*

Experiment	Operate Power (Watts)	
	Day	Night
LSG	10.0	8.75**
LMS	10.5	11.0**
LEAM	3.16**	6.6**
HFE	6.12	10.7**
LSPE	6.97	6.97
Total	36.75	44.02

\* Does not include turn on transients.

\*\* Same as Steady State Experiment Powers

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TABLE III  
SYSTEM POWER DISTRIBUTION

	Day (watts)				Night (watts)			
	LSPE On		LSPE Off		LSPE On		LSPE Off	
	Steady	Transient*	Steady	Transient*	Steady	Transient*	Steady	Transient*
Data Subsystem (Table I)	15.00	15.00	15.00	15.00	15.80	15.80	15.80	15.80
Experiments (Table II)	25.12	36.75	19.82	29.78	42.35	44.02	37.05	37.05
Total PCU Load	40.12	51.75	34.82	44.78	58.15	59.82	52.85	52.85
PCU Losses (2.25 W + 10% Load)	6.26	7.43	5.73	6.73	8.07	8.23	7.54	7.54
Minimum Reserve Watts	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
<u>Total Power Required</u>	48.38	61.18	42.55	53.51	68.22	70.05	62.39	62.39
Assumed RTG EOM Power	72.00	72.00	72.00	72.00	72.00	72.00	72.00	72.00
Reserve Power Available	23.62	10.82	29.45	18.49	3.78	1.95	9.61	9.61

\* Transients include all transients in excess of 128 mS,  
for example power consumption due to motors operating  
for short periods of time.

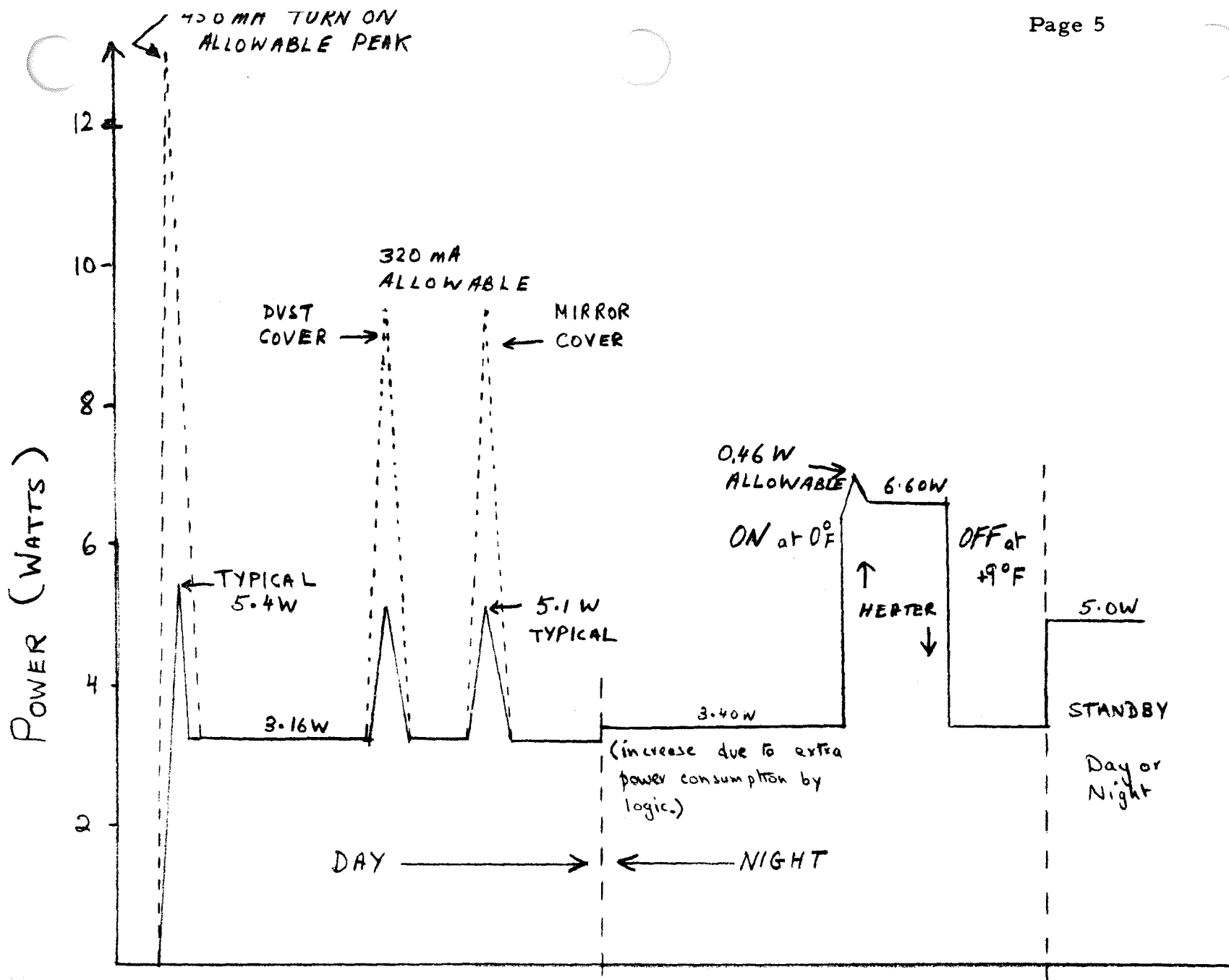


FIGURE 1 LEAM POWER PROFILE

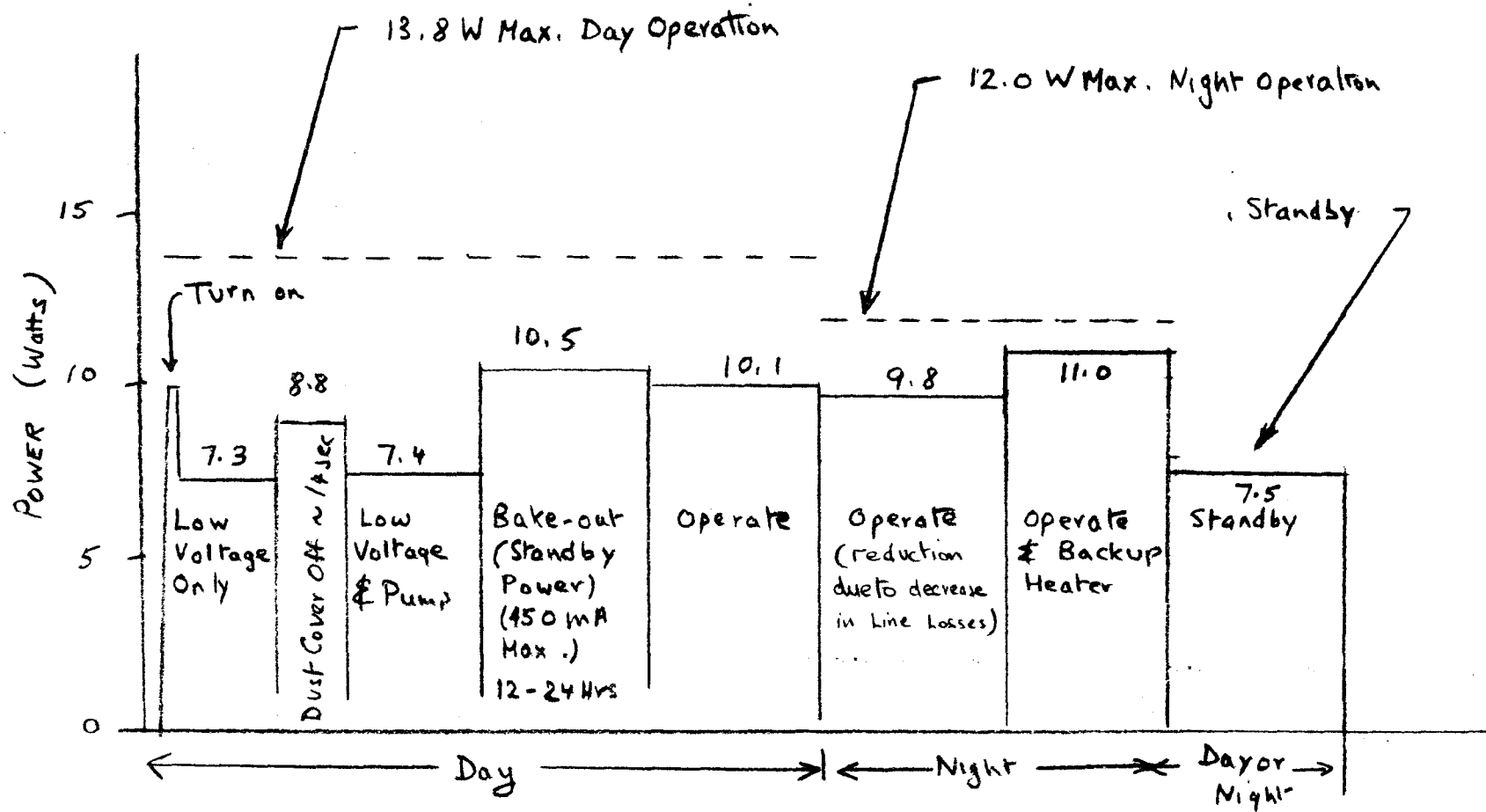


FIGURE 2 LMS POWER PROFILE

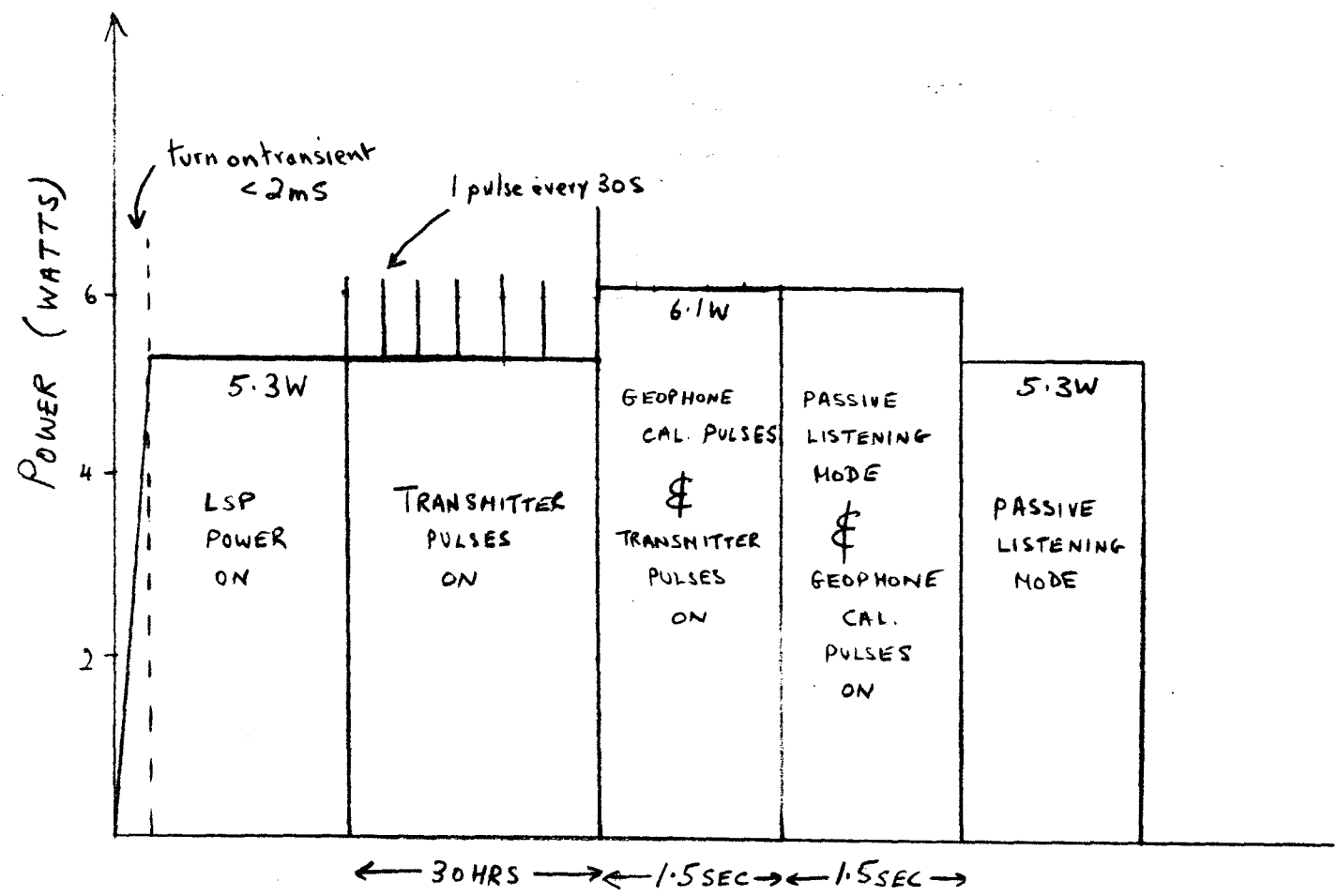


FIGURE 3 LSPF POWER PROFILE

POWER (WATTS)

B. D. S. Feb.

Figure 4. HFE SNT - ARRAY E  
MEASURED POWER PROFILE.

LEGEND	
LUNAR DAY	—————
LUNAR DAWN/DUSK	- - - - -
LUNAR NITE	— · — · —
THERMAL PLATE TEMPERATURE	> 27-33°C
	> 17-23°C
	< 17-23°C

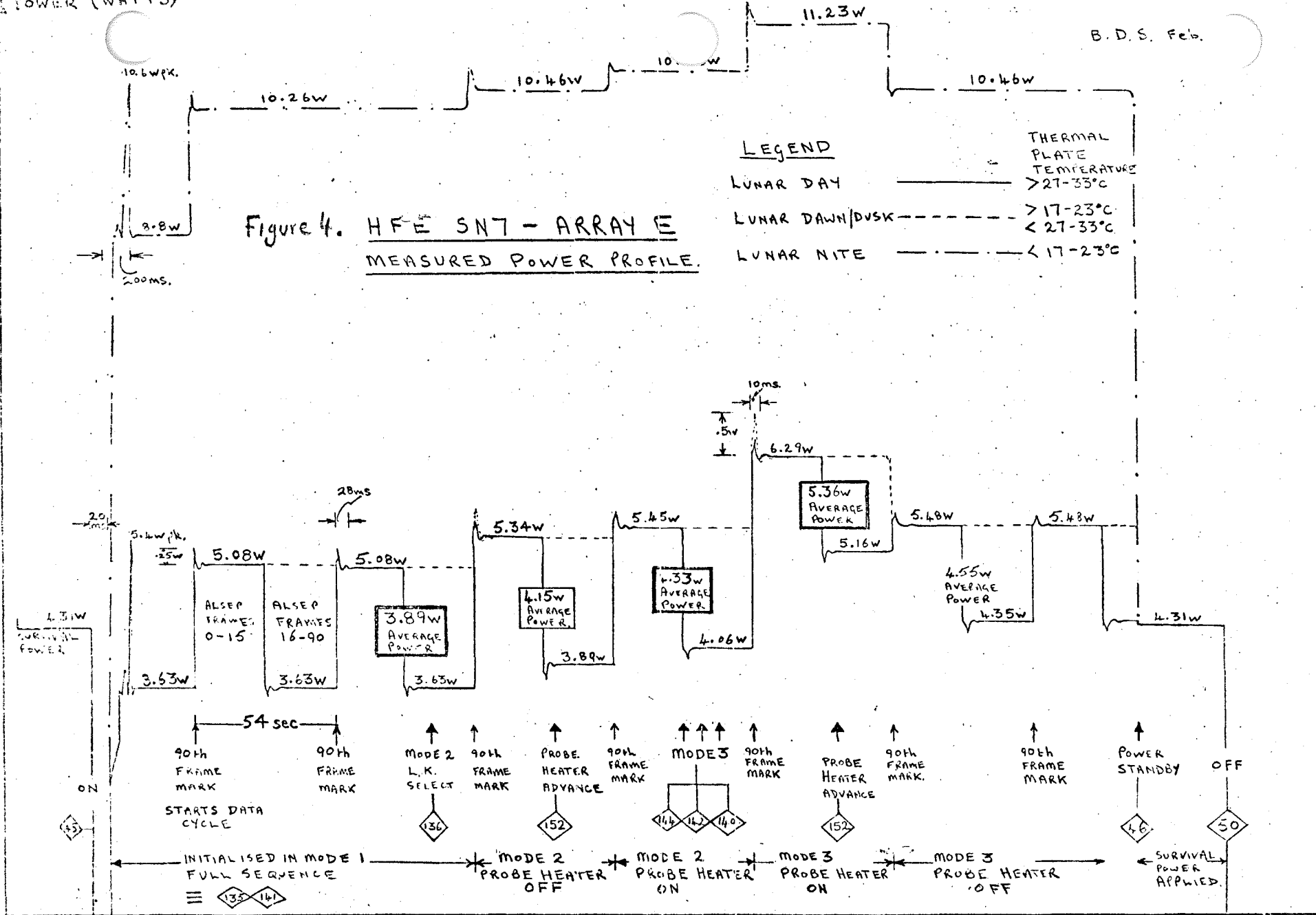
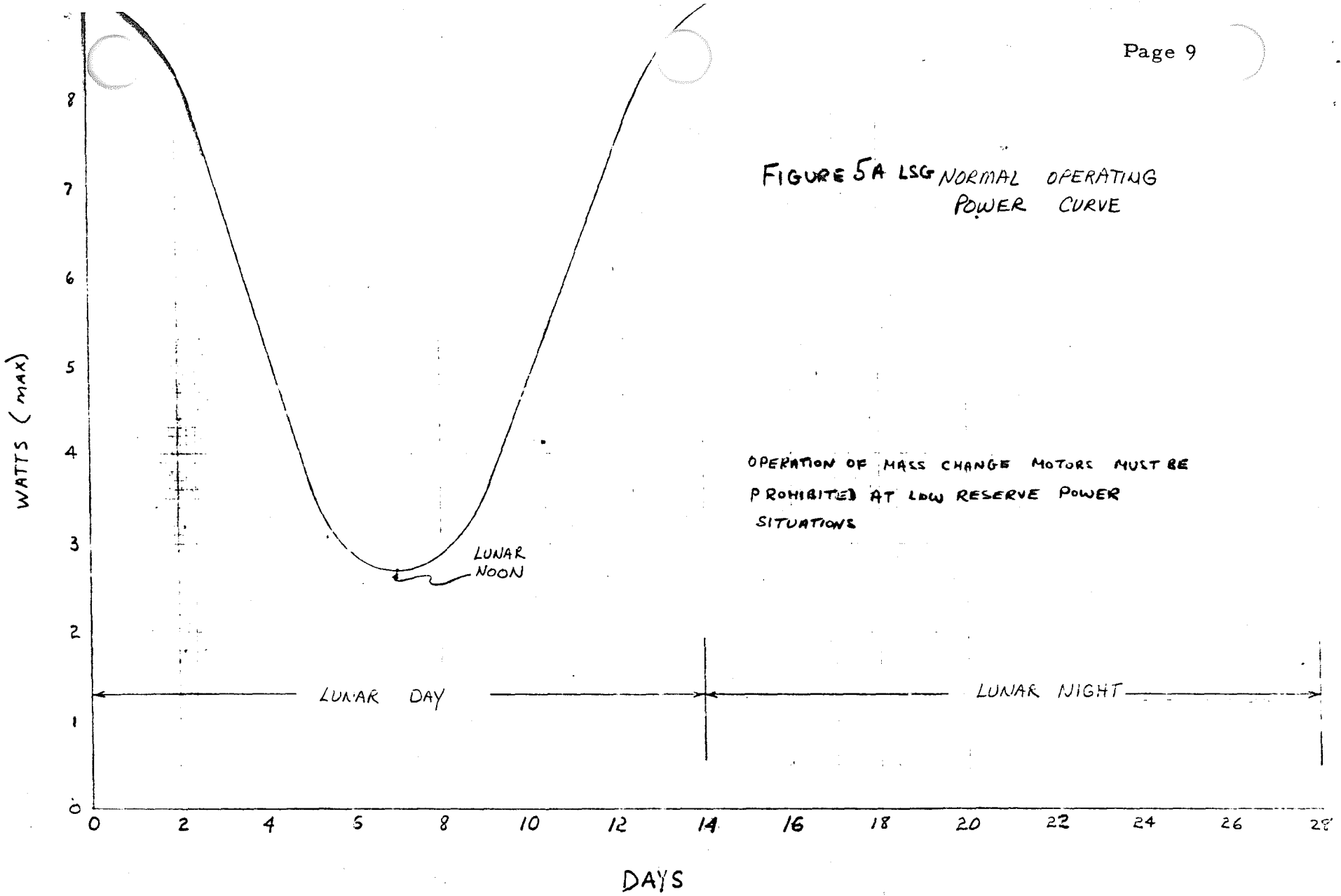




FIGURE 5A LSG NORMAL OPERATING POWER CURVE



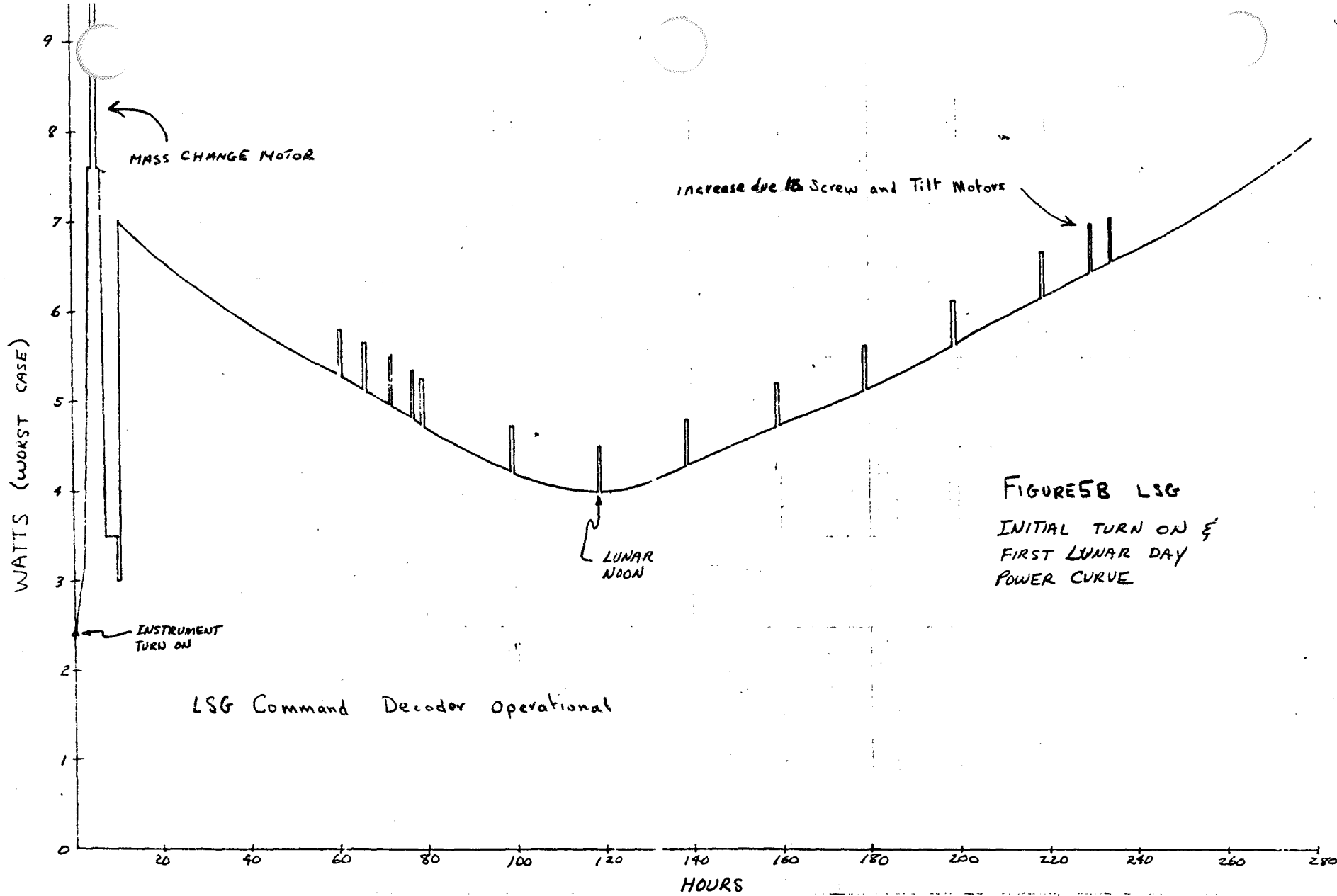


FIGURE 5B LSG  
 INITIAL TURN ON &  
 FIRST LUNAR DAY  
 POWER CURVE