This report describes the latest estimate from Ames Research Center (ARC) of the magnetometer power profile. Although this profile is in violation of the interface control specification IC 314103 released 1 June 1966, it is apparently a fact of life if the magnetometer is to perform according to the design and performance specification prepared by the PI. ARC plans to deliver an Engineering Model having this out of spec. power profile.

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Figure 1 gives a general time history for the magnetometer, showing approximately when the magnetometer is in its various modes or sequences. The scientific mode is that mode in which the magnetometer is making vector magnetic field intensity measurements. The site survey mode is that mode in which the magnetometer is making a magnetic field gradient measurement. The flip/calibrate cycle is a short duration sequence during which the magnetometer makes an end-to-end calibration of itself. As seen in Figure 1, the site survey mode is a one shot sequence which occurs very early in the mission. The flip/cal sequence is initiated automatically by the ALSEP data S/S every 12 hours or by ground command on an as necessary basis. Ground command initiation of this flip/cal sequence will probably occur every few hours during lunar sun rise and sun set when the instrument temperature is changing at a rather rapid rate.

The design target power profile for each mode is shown in Figure 2. 3.5 watts are required during lunar day for the scientific mode. This represents the "normal operating" power. An additional watt (4.5 watts total) is required for thermal control during lunar night. During the flip/cal cycle an additional 0.1 watts is required during the electronic calibration sequence on either side of the 7.0 watt peak required for flipping. At lunar night the 1.0 watt thermal control power is switched off during the flip/cal sequence. Since the site survey occurs during lunar day the baseline power is just 3.5 watts. During the site survey the profile sequence shown in Figure 2 is repeated 3 separate times. The spacing between each will probably be of the order of several minutes but could be up to several hours. It will be noted that the peak power during this sequence is 7.5 watts.

The magnetometer will be deployed in the scientific mode. The site survey sequence associated with each axis will be initiated by a single command. Upon receiving this command the magnetometer will automatically cycle through the various steps shown by changes in the power level. The same is true with the flip/cal cycle i.e., upon receipt of a command the instrument automatically runs through the electronic calibration, flips, then repeats the calibration sequence. Thus the peak power in each of these two modes occurs about 5 minutes after the initiating command is given.

As of 9 June 1966 the estimated operating power was 3.8 watts or 0.3 watts over the target value. Also the night time target power of 4.5 watts is 1.0 watts and the 7.5 watt peak (site survey) is 0.5 watts above the ICS values.

Although backed by little or no analysis by the magnetometer P.E., it is his considered opinion that there is little hope in reducing these target power values without requiring changes in the design and performance specification of this instrument. Present planning by ARC calls for delivering an engineering model with an out of spec. power profile.

As a result of this power problem the Systems Engineering Group must determine the feasibility of, and conditions under which additional power can be supplied to the magnetometer. Also, in order to avoid any scheduling problems with the development of this instrument this determination should be made prior to the engineering model release which is presently scheduled for about the third week in July.

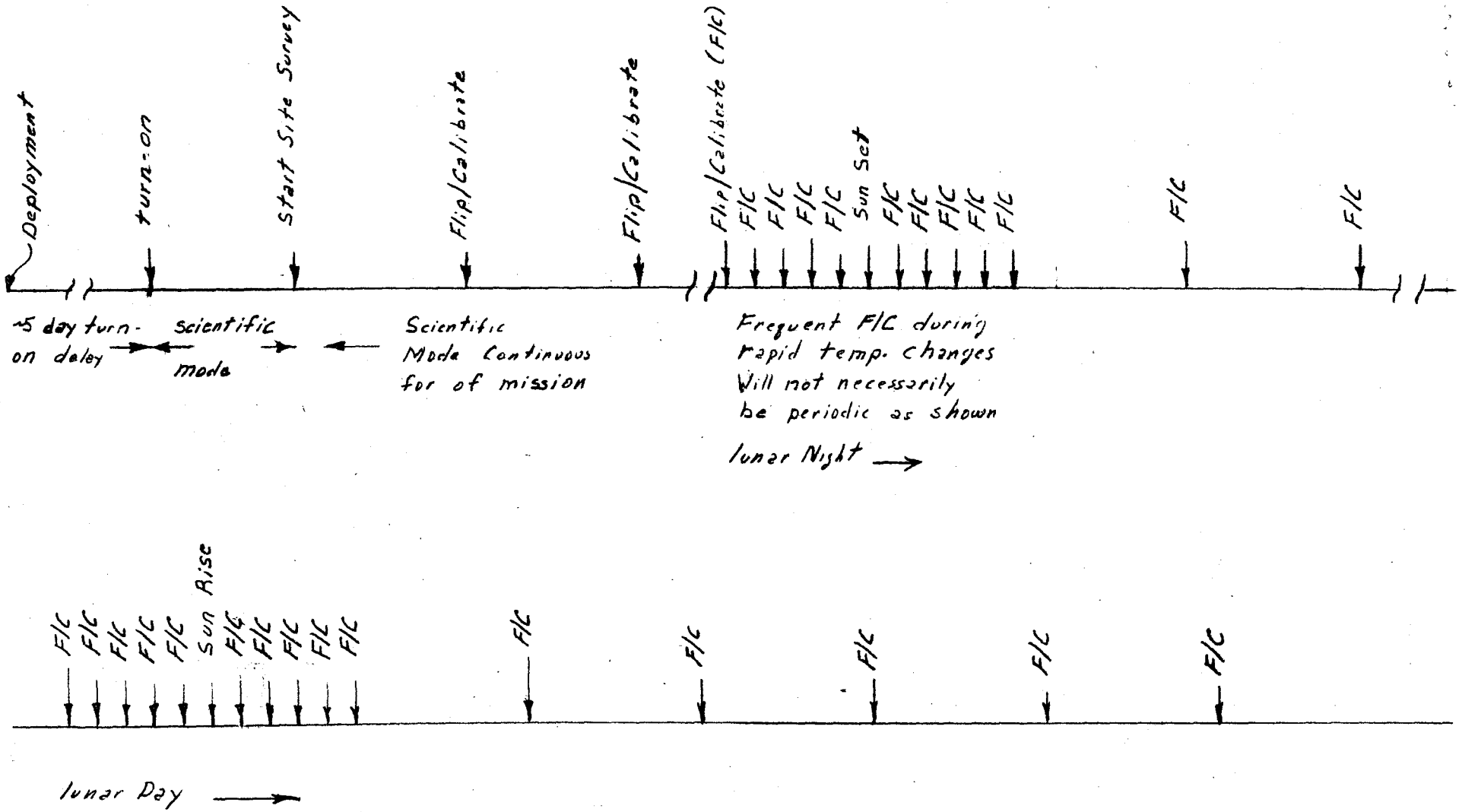
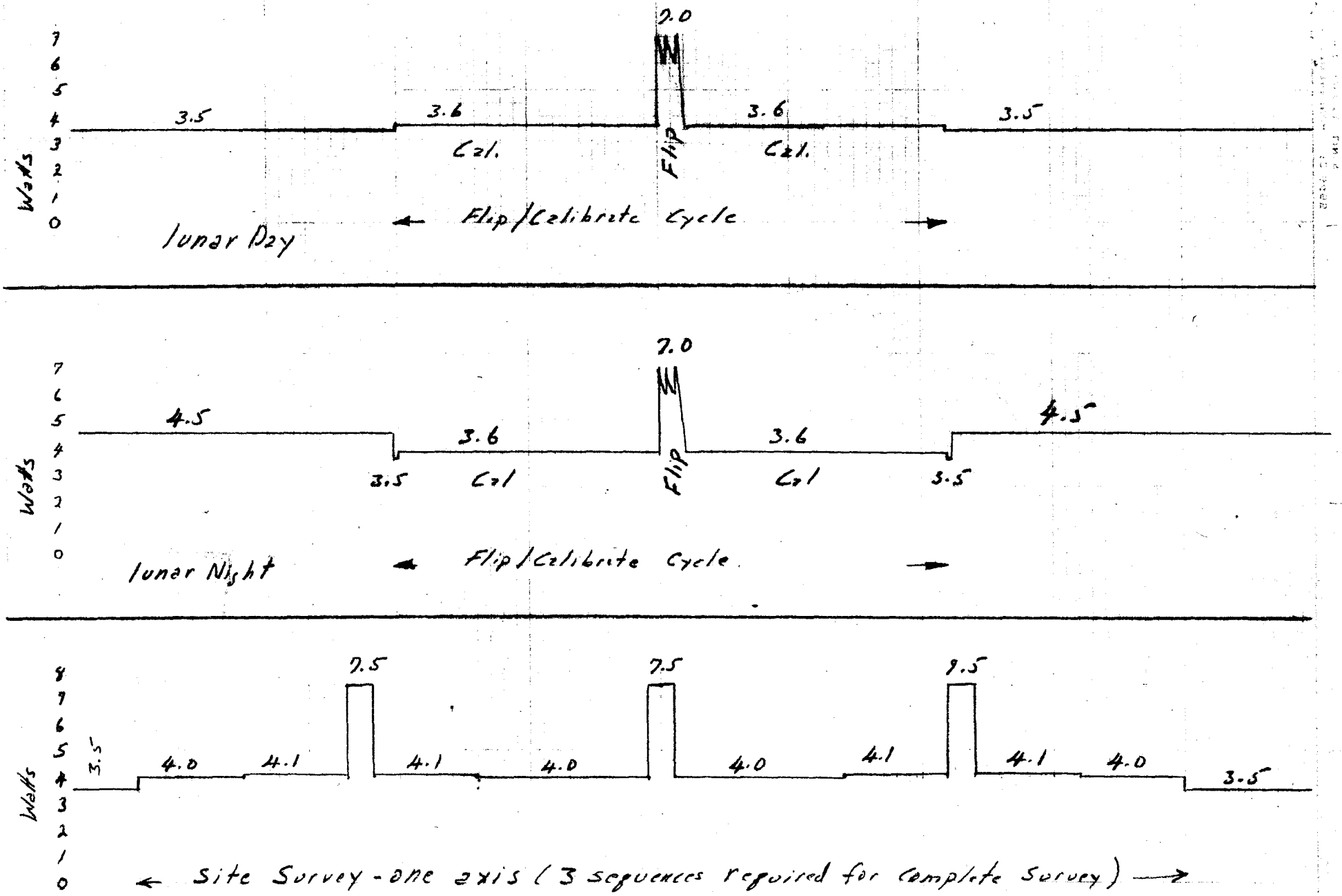

Deployment
turn-on
Start Site Survey
Flip/Calibrate
Flip/Calibrate
Flip/Calibrate (F/C)
F/C
Sun Set
~5 day turn-on delay
Scientific mode
Scientific Mode Continuous for of mission
Frequent F/C during rapid temp. changes Will not necessarily be periodic as shown
lunar Night
Sun Rise
lunar Day
Scale: each square = 1 hour

Figure 1



Scale: each square = 15 sec.

Figure 2

Distribution List for ATM-338

D. Bitondo
C. Murtaugh
R. Jones
S. Ellison
H. Beatty
J. Ball
C. Pressly
F. Laux
J. Monsour
W. Reynolds
F. Harrison
B. Rusky
P. Tormohlen
C. Ahlstrom
R. Stegler
C. Morris
J. Whiteford
C. Schorken
R. Klein
J. Montvedas
L. Lewis
L. McCartin
W. Helmreich
V. Hutton
R. Fatka
W. Fahling
J. Hendrickson
J. Golden
W. Tosh
H. Lanning
H. Reinhold
R. Shay
F. Conklin
J. Tupman
J. Lewko
S. A. Farkas
J. Clayton
M. Donnelly
D. Courtois
G. Burton
V. Jansen
H. Collicott
J. Burns
Central Files
O. L. Tiffany
G. Zaitzeff
J. Dye
K. More
R. Magee
H. Miller
E. Parker
W. Johnson
G. Oser
R. Schmidt
F. Robinson
J. Zimmer
A. Collins
E. Glaser
F. Wilburn
W. Wolber - BRLD
L. Walker - BRLD
G. McArthur - BRLD