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NRL OUTGOING DOCUMENT

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A
Payload 135 (GREB)

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~~SECRET~~TelemetryPayload 135 (GREB)IRIG Channels 5 and 6

In this satellite, the housekeeping data is fed to both channel 5 and channel 6.

For channel 5, low band edge is 1200, center frequency is 1300, and high band edge is 1400.

For channel 6, low band edge is 1575, center frequency is 1700, and high band edge is 1825.

A sixteen position electronic commutator provides the following information at the rate of two segments per second:

<u>Segment</u>	<u>Function</u>
1	0 volt calibrate
2	+5 volt calibrate
3	Package temperature
4	Skin temperature
5	Solar Cell temperature
6	Minus battery voltage
7	Plus battery voltage
8	D.L. #1/R and D relay position indicator
9	D.L. #2 relay position indicator
10	D.L. #3 relay position indicator and separation telltale
11	D.L. #4 relay position indicator
12	Enable relay position indicator
13	Execute relay position indicator

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<u>Segment</u>	<u>Function</u>
14.	Spare relay position indicator and battery pressure telltale
15	Battery temperature
16	Command telltale

A more descriptive explanation of these functions follows:

Segment 1

The frequency is at the low band edge.

Segment 2

The frequency is at the high band edge.

Segments 3, 4 and 5

The frequency decreases as the temperature rises.

Segment 6

The frequency decreases as the battery voltage increases; i.e., from -10v to -13v.

Segment 7

The frequency increases as the battery voltage increases; i.e., from +10v to +13v.

Segment 10

When separation occurs the negative going spike is removed

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~~SECRET~~Segments 8 thru 13

(First read Command System Description)

	RPI	<i>after 50 mins</i> Reset	<i>armed</i> Enable	Command On	Execute	Reset
8	D.L. #1/R&D	MID/MID	Low/Low	yes Mid/Low no Low/Low	Mid/High Low/Low	MID/MID
9	D.L. #2	MID	Low	yes Mid no Low	Mid Low	MID
10	D.L. #3	MID	Low	yes Mid no Low	Mid Low	MID
11	D.L. #4	MID	Low	yes Mid no Low	Mid Low	MID
12	Enable	High	Low	Low	Low	High
13	Execute	High	High	High	Low	High

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~~SECRET~~Segment 14

Spare relay position indicator (mid band). If the battery can pressure is lost, the negative going spike is removed.

Segment 15

The frequency decreases as the temperature rises.

Segment 16

When any tone or combination of tones is being received, the output frequency increases; otherwise the output is a low frequency. The stronger the signal the higher the frequency goes.

Command SystemPayload 135 (GREB)

The tones used in this system are:

- N (0) - 7500 cycles
- M (1) - 6750 cycles
- I (5) - 3950 cycles
- J (4) - 4500 cycles
- K (3) - 5250 cycles
- L (2) - 6000 cycles

Commands are sent to the system by means of a series of chopped tone pairs.

First the system is addressed. This is accomplished by sending four chopped tone pairs in the following sequence:

- NL (02)
- NK (03)
- NJ (04)
- NI (05)

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The reception by the satellite of these four tone pairs in the proper sequence will automatically throw the enable relay, and apply +12 volts to the D.L. transmitters.

We now command the desired functions:

Telemetry On	JI - (45)
Telemetry Off	LI or JK - (25 or 43)
R & D On	LJ or LK - (24 or 23)
D.L. #1 On	ML - (120)
D.L. #2 On	MK - (13)
D.L. #3 On	MJ - (14)
D.L. #4 On	MI - (15)

Note: "R and D" and "D.L. #4" cannot both be on at the same time. D.L. #1 must be on for R & D to be operational.

The sending of the telemetry on or telemetry off command will place +12 volts on or remove it from the telemetry system.

The sending of D.L. #1, 2, 3, 4, or "R and D" "ON" merely establishes relays in the proper position. +12 volts will not be placed on the arms of the relays until the execute command is sent. At this time +12 volts is also applied to 48 minute timer.

The execute command is the "IK" (53) tone pair.

With our existing Digital Command Tone Generator, a maximum of ten tone pairs may be sent in any one series, four address tone pairs, a maximum of five function command tone pairs, and the execute tone pair.

This entire series takes approximately 2 seconds.

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After the 48 minute timer, which was activated by the execute relay, times out, an internal reset pulse is generated, returning the command system to reset condition.

If for any reason, during the 48 minute timing period, it is desired to reset the system, tone pair "NM" (01) will perform this function.

If for any reason a satellite is only partially addressed, sending the execute command will reset it.

Note: II command is the same as IL command.

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