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System Test Group Memo #1542

To: George Silver

From: V. Megna/R. Sheridan

Subject: G&N ICDs, Procurement Specification and Assembly Test Procedure Interface Signal Requirements

Date: 19 August 1970

This report is a comprehensive listing of all G&N system interface signals, impedances, noise and marginal operational requirements as defined in pertinent ICDs, and those Procurement Specifications and Assembly Test Procedures in which the ICD requirement is tested.

A complete examination of all Qualification Tests, Design Verification Tests, and JDCs used to test the system would be necessary to fully verify that all interface requirements are tested and the tolerances to which they are measured.

Successful operation of the G&N system in the Apollo program is an indication of its capability to meet interface requirements, but a review of all testing performed on the system would strengthen the knowledge of its ability to meet the requirements of space flight.

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SYSTEM PS 2015000			ISS ATP 2015497			UNIT PS 2067222		
ARA.	Level	Tolerance	PARA.	Level	Tolerance	PARA.	Level	Tolerance
15.2	±5.4	±6%	3.4.6.6	±5.4	±6%	3.1.12	5.064	±3%
-	-	-	3.4.6.4	10	max.	3.1.12	±5	max.
15.2.1	50	max.	3.4.6.4	142(A)	max.	3.1.12	±5	max.
-	-	-	-	-	-	-	-	-
1.3	20.1K	±2%	3.2.1	20K	±2%	3.1.12	20K	±1%
15.2	0.014	±6%	3.4.6.5	0.0132	(B)	3.1.12	0.0132	±11%
6.12	8	max.	-	-	-	3.1.12	13.3	±12%
-	-	-	3.4.6.1	10	max.	3.1.12	±5°(C)	-
-	-	-	-	-	-	3.1.12	±10	max.
1.3	40K	±5% ∠±5°	3.2.1	40K	±5%	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
1.11	28	±5%	3.4.8	28	±5%	-	-	-
2.2	800	±1 cps	3.4.8	800	±8	-	-	-
-	-	-	3.4.8	745	±45	-	-	-
.3	3	-	3.2.1	3	-	-	-	-
5.12	5.1	max.	3.4.6.3	5.1	max.	3.1.12	5.112	±5.5%
-	-	-	-	-	-	-	-	-
.12	0.3	±13%	3.4.6.2	0.013(D)	±1.3	3.1.12	132(E)	±7
-	-	-	-	-	-	-	-	-
.12	In-phase	-	-	-	-	-	-	-

NOTES:

(A) This level called out as 142 mvpip.

(B) Tolerance is given as ±13% for 1st pulse, ±8% for second thru fourth and ±5% for all others.

(C) Phase shift measured at 2.15 vrms.

(D) Output per pulse.

(E) Output set for 132 ±7 mv/10 $D\theta_c$ pulses.

(F) Measured at $+45^{O}$.

(G) With no signal input to signal conditioner, output should be 2.5 vdc ±0.1 vdc.

(H) Levels given are 4.5 for inphase and 0.5 for π phase.

(J) This level only for 16^{O} max input.

(K) This level only for 7^{O} max input.

(M) Levels given are 4.6 for inphase and 0.4 for π phase.

(N) This level only for SIVB signals, SPS tested at 10 ± 0.5 vdc with 2K load in series.

SYSTEM PS 2015000			ISS ATP 2015497			UNIT PS 2067222		
ARA.	Level	Tolerance	PARA.	Level	Tolerance	PARA.	Level	Tolerance
15.2	±5.4	±6%	3.4.6.6	±5.4	±6%	3.1.12	5.064	±3%
	-	-	3.4.6.4	10	max.	3.1.12	±5	max.
15.2.1	50	max.	3.4.6.4	142(A)	max.	3.1.12	±5	max.
	-	-	-	-	-	-	-	-
1.3	20.1K	±2%	3.2.1	20K	±2%	3.1.12	20K	±1%
15.2	0.014	±6%	3.4.6.5	0.0132	(B)	3.1.12	0.0132	±11%
	-	-	-	-	-	-	-	-
5.12	8	max.	-	-	-	3.1.12	13.3	±12%
	-	-	3.4.6.1	10	max.	3.1.12	±5°(C)	-
	-	-	-	-	-	3.1.12	±10	max.
.3	40K	±5% ∠ ±5°	3.2.1	40K	±5%	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
.11	28	±5%	3.4.8	28	±5%	-	-	-
2.2	800	±1 cps	3.4.8	800	±8	-	-	-
	-	-	3.4.8	745	±45	-	-	-
.3	3	-	3.2.1	3	-	-	-	-
12	5.1	max.	3.4.6.3	5.1	max.	3.1.12	5.112	±5.5%
	-	-	-	-	-	-	-	-
12	0.3	±13%	3.4.6.2	0.013(D)	±1.3	3.1.12	132(E)	±7
	-	-	-	-	-	-	-	-
12	In-phase	-	-	-	-	-	-	-

		ICD		SYSTEM PS 2015000			ISS ATP 2015497			UNIT PS 2067222		
		Level	Tolerance	PARA.	Level	Tolerance	PARA.	Level	Tolerance	PARA.	Level	Tolerance
MH01-01307-216												
PITCH TVC YAW TVC												
SIGNAL CHARACTERISTICS	vdc	±5.4	±6%		±5.4	±6%	3.4.6.6	±5.4				
Voltage	mvdc	10	max.	3.1.15.2	-	-	3.4.6.4	10	±6%	3.1.12	5.064	±3%
DC Null	mv rms	50	max.	-	50	max.	3.4.6.4	142(A)	max.	3.1.12	±5	max.
Noise	ohms	2K	max.	3.1.15.2.1	-	-	-	-	max.	3.1.12	±5	max.
Output Impedance	ohms	20.1K	±2%	-	20.1K	±2%	3.2.1	20K	-	-	-	-
Output Load	vdc	0.014	±6%	4.2.1.3	0.014	±6%	3.4.6.5	0.0132	±2%	3.1.12	20K	±1%
Quantization:				3.1.15.2					(B)	3.1.12	0.0132	±11%
MH01-01324-216												
PITCH ATT. ERROR ROLL ATT. ERROR YAW ATT. ERROR												
SIGNAL CHARACTERISTICS												
Resolution (158.2 sec)	mv rms	13.18	-	-	-	-	-	-	-	3.1.12	13.3	±12%
Phase Shift (at 1.8 v rms)	deg	8	max.	3.1.6.12	8	max.	-	-	-	3.1.12	±5°(C)	-
Null Voltage	mv rms	56	max.	-	-	-	3.4.6.1	10	max.	3.1.12	±10	max.
Output Impedance (Res)	ohms	1000	max.	-	-	-	-	-	-	-	-	-
Output Load: Normal	ohms	40K	±5% ∠±5°	4.2.1.3	40K	±5% ∠±5°	3.2.1	40K	±5%	-	-	-
Minimum	ohms	30.2K	±5% ∠±5°	-	-	-	-	-	-	-	-	-
Turn-on Transient: Voltage	v rms	45	max.	-	-	-	-	-	-	-	-	-
Time	sec	5	max.	-	-	-	-	-	-	-	-	-
Reference Voltage:	v rms	28	±5%	3.1.4.11	28	±5%	3.4.8	28	±5%	-	-	-
Frequency: With Syn	cps	800	±8 cps	3.1.4.2.2	800	±1 cps	3.4.8	800	±8	-	-	-
Without Syn	cps	745	±45 cps	-	-	-	3.4.8	745	±45	-	-	-
Load	w	0.2	-	4.2.1.3	3	-	3.2.1	3	-	-	-	-
Output Voltage:	v rms											
Normal	(±16 7/8 deg)	5.1	max.	3.1.6.12	5.1	max.	3.4.6.3	5.1	max.	3.1.12	5.112	±5.5%
Boost & Entry	(±67 1/2 deg)	5.1	-	-	-	-	-	-	-	-	-	-
Quantization	v rms/deg											
Normal	(all axis)	0.3	±13%	3.1.6.12	0.3	±13%	3.4.6.2	0.013(D)	±1.3	3.1.12	132(E)	±7
Boost & Entry	(Roll only)	0.075	±20%	-	-	-	-	-	-	-	-	-
Phasing	(Positive S/C)	In-phase	-	3.1.6.12	In-phase	-	-	-	-	-	-	-

ICD				SYSTEM PS 2015000			ISS ATP 2015497 Rev.		
		Level	Tolerance	PARA.	Level	Tolerance	PARA.	Level	Tolerance
MH-01325-216									
PITCH TOTAL ERROR ROLL TOTAL ERROR YAW TOTAL ERROR									
SIGNAL CHARACTERISTICS	mv rms	150	max.	3.1.6.4.1	150	max.	3.4.10.6	150	max.
Null Voltage	mv rms	33	max.		-	max.	3 4.10.6	33	max.
Harmonic	ohms	190+j150	-	-	-	-	-	-	-
Output Impedance		≤0.5°	-	-	-	-	-	-	-
Function Error	(at ±30°, ±45°; ±60°)	≤5°	-	-	-	-	-	-	-
Phase Diff.	($1\theta_1 - \theta_2 1$)			-					
Phasing:									
0° to 90°		In phase	-	3.1.6.4	In phase	-	-	-	-
sin out		In phase	-	3.1.6.4	In phase	-	-	-	-
cos out									
90° to 180°		In phase	-	3.1.6.4	In phase	-	-	-	-
sin out		Out-of-phase	-	3.1.6.4	Out-of-phase	-	-	-	-
cos out									
Output Voltage:									
Normal									
$V_{max} \sin(wt+\theta_1) \sin Ag$	v rms	26	±10%	3.1.6.4	18.38(F)	±10%	3.4.10.6	26	±10%
$V_{max} \cos(wt+\theta_2) \cos Ag$	v rms	26	±10%	3.1.6.4	18.38(F)	±10%	3.4.10.6	26	±10%
Backup									
$V_{max} \sin(wt+\theta_1) \sin Ag$	v rms	24.5	±10%	3.1.6.5	17.38(F)	±10%	-	-	-
$V_{max} \cos(wt+\theta_2) \cos Ag$	v rms	24.5	±10%	3.1.6.5	17.38(F)	±10%	-	-	-
Phase Shift									
Normal	deg	+6	±5	3.1.6.4	+6	±5	-	-	-
Backup	deg	+12	±5	3.1.6.5	+12	±5	-	-	-
Output Load (Resolver)									
Normal									
Primary	ohms	Z_{po}=310±15%+j1970±10%		4.2.1.3.1	Z_{po}=310±15%+j1970±10%		3.2.1	398±15%+j1960±10%	
		Z_{so}=375±15%+j2160±10%		-	Z_{so}=375±15%+j2160±10%		-	398±15%+j1960±10%	
Secondary	ohms	51.1K	-	-	51.1K	-	-	51.1K	-
Backup									
Primary	ohms	Z_{po}=300±20%+j1820±20%		4.2.1.3.2	Z_{po}=300±20%+j1820±20%		-	-	-
		Z_{so}=1410±20%+j7350+20%		-	Z_{so}=1225±20%+j735±20%		-	-	-
Secondary	ohms	50K	-	-	50K	-	-	-	-

ICD				SYSTEM PS 2015000 PARA.	Level	Tolerance
		Level	Tolerance			
MH01-01328-216						
SIGNAL CONDITIONER						
SIGNAL CHARACTERISTICS						
High Level Analog		0 to 5 vdc	max.	3.1.17.1	-	-
Output Voltage						
Output Impedance		5000	max.	-	-	-
G&N ON or OFF		-1.5 to +16	max.	-	-	-
Over/Under Voltage						
Event Measurement						
Output Voltage		4.25	±0.75	3.1.17.1	-	-
Signal ON		0.0	±0.5	3.1.17.1	-	-
Signal OFF						
Output Impedance		5000	max.	-	-	-
G&N ON or OFF		-2 to +32	max.	-	-	-
Over/Under Voltage						
Signal Outputs						
2.5 vdc TM Bias	vdc	-	-	3.1.17.3	2.5	±0.06
IMU 28 v rms, 800 cps, 1%, 0°	vdc	-	-	3.1.17.3	4.5	±0.4
3.2 Kc, 28 v rms	vdc	-	-	3.1.17.3	4.4	±0.5
IG 1x sin	vdc/v rms	-	-	3.1.17.7	0.123	±12%
IG 1x cos	vdc/v rms	-	-	3.1.17.7	0.123	±12%
MG 1x sin	vdc/v rms	-	-	3.1.17.7	0.123	±12%
MG 1x cos	vdc/v rms	-	-	3.1.17.5(G)	0.91	±15%
IGA Servo Error	vdc/v rms	-	-	3.1.17.5(G)	0.91	±15%
MGA Servo Error	vdc/v rms	-	-	3.1.17.7	0.123	±12%
OG 1x sin	vdc/v rms	-	-	3.1.17.7	0.123	±12%
OG 1x cos	vdc/v rms	-	-	3.1.17.5(G)	0.91	±15%
OGA Servo Error	vdc/v rms	-	-	3.1.17.3	3.5	±1.2
+120 vdc Pipa	vdc	-	-	3.1.17.10	4.5/0.5(H)	±0.5
Shaft CDU DAC		-	-	3.1.17.10	4.5/0.5(H)	±0.5
Trunnion CDU DAC		-	-	3.1.17.4	2.63	±0.40
Pipa Temp.	vdc	-	-	3.1.17.2	4.4	±0.5
28 vdc CMC Oper.	vdc	-	-	3.1.17.3	4.3	±0.4
28 v rms Optics Operate Discrete		-	-	3.1.17.3	4.3	±0.6
CMC Warning	vdc	-	-	3.1.17.3	4.5	±0.4
Optics 28 v rms, 800 cps, 1%	vdc	-	-	3.1.17.11(G)	5.1	±1.0
SXT Trunnion Tach Out	vdc/v rms	-	-	3.1.17.11(G)	5.1	±1.0
SXT Shaft Tach Out	vdc/v rms	-	-			

ICD		Level	Tolerance	SYSTEM PS2015000 PARA	Level	Tolerance	ISS ATP 2015497 Rev L PARA	Level	Tolerance	UNIT RS2016007 PARA	Level	Tolerance
MH 01-01328-216												
Signal Outputs												
SCT Trun Tach Out	vdc/vrms			3.1.17.11(G)	0.50	±0.10						
SCT Shaft Tach Out	vdc/vrms			3.1.17.11(G)	0.50	±0.10						
IRIG Temp	vdc			3.1.17.4	2.75	±0.80						
Pitch Att. Error	vdc/vrms			3.1.17.12(J)	0.41	±12%						
Yaw Att. Error	vdc/vrms			3.1.17.12(J)	0.41	±12%						
Roll Att. Error	vdc/vrms			3.1.17.12(J)	0.41	±12%						
IMU Heater Cur. Discrete	vdc			3.1.17.2	4.4	±0.5						
IMU Blower Cur. Discrete	vdc			3.1.17.3	4.3	±0.4						
Trun. CDU Fine Error	vdc			3.1.17.9	4.6/0.4(M)	±0.4						
Shaft CDU Fine Error	vdc			3.1.17.9	4.6/0.4(M)	±0.3						
IG 1X Resolver Out-Sin	vdc/vrms			3.1.17.8(B)	0.5	±12%						
OG 1X Resolver Out-Sin	vdc/vrms			3.1.17.8(G)	0.5	±12%						
IG TM Cur.	v/v			3.1.17.5(G)	5.0	±1.0						
MG TM Cur.	v/v			3.1.17.5(G)	5.0	±1.0						
OG TM Cur.	v/v			3.1.17.5(G)	2.8	±1.0						
MG 1X Resolver Out-Sin	vdc/vrms			3.1.17.8(B)	0.5	±12%						
MH01-01344-216												
CMC DISCRETE INPUTS												
IMU Cage				3.1.5.5	Set channel bit		3.4.4.1	Functions		3.1.1.18	Set channel bit	
GN&C Auto Pilot Control				3.1.5.5						3.1.1.18		
S/C Control Saturn				3.1.5.5						3.1.1.18		
Voltage	vdc	28	nom.	4.2.1.4.2	17.5	±0.5				3.1.1.16.1	17 vdc	±0.2 vdc
Current												
IMU Cage & GN&C Auto	amps	0.050	max.									
S/C Control Saturn	amps	0.075	max.									

ICD				SYSTEM PS 2015000			UNIT PS 2016007		
		Level	Tolerance	PARA.	Level	Tolerance	PARA.	Level	Tolerance
MH01-01380-216									
CMC SIGNALS							3.1.1.17	Set Channel Bit	
RCS Jets Output	vdc	0 to +8	min. /max.	3.1.5.4	3 to 6	Bit ON	-	-	-
Voltage	ma	1	max.	-	-	-	-	-	-
Current: ON	μamp	16	max.	-	-	-	-	-	-
OFF	ohms	3K	max.	-	2K	-	3.1.1.16.11	2K	± 1K
Output Impedance: ON	ohms	0.5 meg.	min.	4.2.1.4.2	-	-	-	0.5 meg.	min.
OFF	μsec	1	max.	-	-	-			
Source Rise Time:				-					
Noise Rejection:	vdc	+80	-	-	-	-	-	-	-
OFF: Pulse amp.	m sec	0.5	max.	-	-	-	-	-	-
Pulse width	pps	10	max.	-	-	-	-	-	-
Pulse Rep rate	v	-20	-	-	-	-	-	-	-
ON: Pulse amp	m sec	1	max.	-	-	-	-	-	-
Pulse width	pps	10	max.	-	-	-	-	-	-
Pulse Rep rate				-					
Discrete Inputs		-	-	3.1.5.5	Set Channel Bit		3.1.1.18	Set Channel Bit	
Attitude Hold		-	-	3.1.5.5	-	-	3.1.1.18	-	-
Free Drift		-	-	3.1.5.8.1	-	-	3.1.1.18	-	-
Accept Uplink		-	-	3.1.5.5	-	-	3.1.1.18	-	-
C/M - S/M Separate		-	-	3.1.5.5	-	-	3.1.1.18	-	-
SIVB Separate		-	-	3.1.5.5	-	-	3.1.1.18	-	-
Lift Off		-	-	3.1.5.5	-	-	3.1.1.18	-	-
Ullage Thrust Present		-	-	3.1.5.5	-	-	3.1.1.18	-	-
Data Good									
Voltage: ON	vdc	28	±11	4.2.1.4.2	17.5	±0.5	3.1.1.16.1	17	±0.2
OFF	vdc	0	±2	-	0	±2	-	4	±0.2
Noise Rejection:									
OFF: Pulse amp	v	+80	-	-	-	-	-	-	-
Pulse width	m sec	0.5	max.	-	-	-	-	-	-
Pulse rep rate	pps	10	max.	-	-	-	-	-	-
ON: Pulse amp	v	-20	-	-	-	-	-	-	-
Pulse width	m sec	1	max.	-	-	-	-	-	-
Pulse rep rate	pps	10	max.	-	-	-	-	-	-

ICD			SYSTEM PS 2015000 Rev. L			UNIT PS 2016007		
	Level	Tolerance	PARA	Level	Tolerance	PARA	Level	Tolerance
MH01-01380-216								
Attitude Signals From GDC						3.1.1.20.4.1		
BMAG's			3.1.1.3.5			3.1.1.16.10	6	±1
Amplitude vdc	7	±3	4.2.1.4.2.3	7	±3			
Pulse width μsec	2 to 6			2 to 6			3.0	±0.5
Backswing vdc	4	max		4			40% of A	max
Droop (at 2 μsec)	20%			20%			15% of A	max
Rise Time (10-90% of A) μsec	0.5	max		0.5			0.2	max
Delta angle (per pulse) deg	0.1	±8%		0.1	±8%			
Rep rate pps	640	max		640	max			
Output Impedance ohms	100	max						
Output Load ohms	200	±10%						
Noise: ON vdc	Within pulse envelope			Within pulse envelope				
OFF vdc	-4.0 to+0.4	max.		-4.0 to +0.4	max.		0.4 vpp	max
Main Engine & Saturn Engine Control								
SIVB ON			3.1.5.10.2		Bit on	3.1.1.17	Set channel bit	
SIVB CUTOFF			3.1.5.10.1			3.1.1.17		
SPS ON/OFF			3.1.5.7			3.1.1.17		
Amplitude vdc	0 to +8	min/max	4.2.1.4.2.4 (N)	28.8	±3.0			
Current: ON ma	1.5	max.						
OFF μamp	16	max.						
Output Impedance: ON ohm	3K	max.				3.1.1.16.11	2K	±1K
OFF ohms	0.5 meg.	min.					0.5 meg	min
Rise time μsec	1	max.						
Noise:								
OFF: Amplitude V	+80							
Width msec	0.5	max.						
Rep rate pps	10	max.						
ON: Amplitude V	-20							
Width msec	1	max.						
Rep rate pps	10	max.						

ICD		SYSTEM PS 2015000					UNIT PS 2016007		
		Level	Tolerance	PARA	Level	Tolerance	PARA	Level	Tolerance
MH01-01380-216				3.1.5.5			3.1.1.18	Set channel bit	
Rotational & Translational H/C									
Amplitude: ON	vdc	28	±11	4.2.1.4.2.2	28	±11	3.1.1.16.1	17	±0.2
OFF	vdc	-5 to +2			-5 to +2			+4.0	±0.2
Current ON	amps	0.01							
Output Impedance:									
ON: Rotation	ohms	3.9K	nom.	4.2.1.4.2.2	3.9K				
Translation	ohms	1.95K	nom.		1.95K				
OFF: Both	ohms	7K	min.		100K	min.			
Noise:	vdc	same as Main Engine							
Master Clock									
Amplitude	vdc	4 to 14		3.1.1.2.2	4 to 14		3.1.1.19	10.0	±2.0
Pulse width	μsec	0.5	±0.25		0.5	±0.25			
Zero shift (% of A)		50%			50%				
Rise Time (10 to 90% of A)	μsec	0.2	max.		0.2	max.			
Noise & Ripple	V	0.2	max.		0.2	max.			
Frequency	Kc	1024	±2 PPM		1024	±2 PPM	3.1.1.5	1024	±0.30 PPM
Output Impedance	ohms	100	nom.						
Output Load	ohms	500	nom.		500	nom.	3.1.1.16.7	510	nom.
Telemetry									
Downlink Data							3.1.1.21		
Amplitude	vdc	7	±3	3.1.5.9.1	7	±3	3.1.1.16.5	6	±1
Pulse width (at A/2)	μsec	2.5 to 6			2.5 to 6				
Backswing	V	6	max.		6V	max.		40% of A	max.
Droop (% of A at 2 sec)		15%	max.		15%	max.		15% of A	max.
Output Impedance	ohms	100	max.						
Output Load	ohms	500	±10%		500	nom.		510	nom.
Rise time (10 to 90% of A)	μsec	0.2	max.		0.2	max.		0.2	max.
Noise: ON	vdc	within pulse envelope			within pulse envelope				
OFF	vdc	-4.0 to +0.4 max.			-4.0 to +0.4			0.4v p-p	max.

ICD				SYSTEM PS 2015000			UNIT PS 2016007		
MH01-01380-216		Level	Tolerance	PARA	Level	Tolerance	PARA	Level	Tolerance
Downlink Start, End, & Syn Pulse				4.2.1.4.2.1			3.1.1.21		
Amplitude	vdc	4.5	±1		4.5	±1.0	3.1.1.16.8	2.3	±0.4
Pulse Width (at A/2)	μsec	4.5	±1.5		4.5	±1.5		3.0	±0.6
Droop (% of A at 2 sec)		15%	max.		15%				
Rise time (10 to 90% of A)	μsec	0.2	max.		0.2	max.			
Output Impedance	ohms	100	max.					510	nom.
Output Load	ohms	200	nom.						
Noise: ON	vdc	within pulse envelope			within pulse envelope				
OFF	vdc	-4.0 to 10.4	max.		-4.0 to 0.4				
Repetition Rate				3.1.5.9					
Start: Normal	pps	50			50				
Low	pps	10			10				
End: Normal	pps	50			50				
Low	pps	10			10				
Syn: Normal	Kc	51.2			51.2				
Low	Kc	1.6			1.6				
Pulses/burst		40			40				
Timeing:									
From start to first syn	μsec	19.5	±5						
From Last Syn to End	μsec	19.5	±5						
Uplink				3.1.5.8.1			3.1.1.20.6		
Amplitude	vdc	7	±3	4.2.1.4.2.1	4.5	±1.0	3.1.1.16.10	6	±1
Pulse Width (at A/2)	μsec	2-6			4.5	±1.5		3.0	±0.5
Backswing	vdc	4	max					40% of A	max.
Droop (% of A)		20%	max		15%	max		15% of A	max.
Rise time (10 to 90% of A)	μsec	1	max		0.2	max		0.2	max.
Output Impedance	ohms	200	max						
Output Load	ohms	200	nom.						
Noise: ON	vdc	within pulse envelope			within pulse envelope				
OFF	vdc	-4.0 to +0.4	max.		-4.0 to +0.4			0.4v p-p	max
Repetition Rate	pps	1.1K	max.						
Time between word	sec	0.1	max						

ICD				SYSTEM PS 2015000			UNIT PS 2016007		
		Level	Tolerance	PARA.	Level	Tolerance	PARA.	Level	Tolerance
MH01-01380-216					Functions		3.1.2		
Display Keyboard Illumination				3.1.5.1					
Main DSKY							tested at DSKY level		
Alpha Numeries									
DSKY Keys									
Status Lights									
Caution Lights					Functions		3.1.2		
LEB DSKY				3.1.5.1					
Alpha Numeries							tested at DSKY level		
DSKY Keys									
Caution Lights									
Status Lights							3.1.2.3		
Dimmer Control							tested at DSKY level		
Amplitude (800cps sq. wave)	vdc	14	max						
Current	ma	2	max						
Panel & DSKY Ill. LEB				4.2.1.4.1					
Amplitude	v rms	115	±4.3		115	±4.3			
Current (at 75v)	ma	317.5	nom.						
Frequency	cps	400	±7		400	±7			
VA		23.8							
Power	w	10.66	max						
Power Factor		0.5							
Noise: Modulation		0.5%							
Transients (v rms)		50 to 150							
Recovery Time	m sec	30							
MAIN DSKY KEYS ILL.				4.2.1.4.1			3.1.2		
Amplitude	(v rms)	115	±4.3		115	±4.3	tested at DSKY level		
Current	(ma at 7.5v)	17.5							
Frequency	(cps)	400	±7		400	±7			
VA		1.32							
Watts		0.66	max						
Power Factor		0.50							
Noise: Modulation (%)		0.5							
Transients	(v rms)	50 to 150							
Recovery Time	(m sec)	30							
LEB Status & Caution ILL.				4.2.4.1			3.1.2		
Amplitude	(v rms)	0-5 var.			0-5 var.		tested at DSKY level		
Current: Caution	(amps)	0.180							
Status	(amp)	0.225							
Lamp Test	(amps)	3.1	max						
Time	(sec)	30	max						
S/C Displays									
CMC Warning				3.1.5.10.5			3.1.1.17		
ISS Warning				3.1.5.10.4			3.1.1.17		
Amplitude									
Current	(vdc)	28	nom		28	nom			
Peak (10 m sec)	(ma)	120			120				
	(amps)	1			1				

ICD				SYSTEM PS 2015000			UNIT PS 2016007					
		Level	Tolerance	PARA.	Level	Tolerance	PARA.	Level	Tolerance			
MH01-01380-216							3.1.1.2					
Computer Input Power	(vdc)	28.3	±2.5					34.0	21.5			
Amplitude	(amps)	4.2	max				3.1.1.4	4.0	max			
Current												
VHF Ranging							3.1.1.20.7					
Range Strobe							3.1.1.20.7					
Command Readout	(vdc)	3.75	±1.5				3.1.1.19	6	±1			
Amplitude	μsec	3	±0.5					3.0	±0.5			
Pulse width (at A/2)		20										
Backswing (% of A)	μsec	0.2	max									
Rise Time (10 to 90% of A)	Kc	3.2										
Repetion Rate	vdc	within pulse envelope						3.2				
Noise: ON	vdc	-4.0 to +0.4	max									
OFF												

ICD				SYSTEM PS 2015000 Rev. L			UNIT PS 2016007		
		Level	Tolerance	PARA.	Level	Tolerance	PARA.	Level	Tolerance
MH01-01380-216									
Range	vdc	7	±3				3.1.1.20.7		
Amplitude	μsec	4	±2				3.1.1.16.10	6	±1
Pulse width (at A/2)	vdc	4	max.					3.0	±0.5
Backswing	%	20	max.					40% of A	max.
Droop (% of A)	μsec	0.2						15% of A	max.
Rise time (10 - 90% of A)	Kc	3.2						0.2	max.
Rep. Rate	vdc	within pulse envelope						3.2	±0.2pps
Noise: ON	vdc	-4.0 to +0.4						0.4pip	max.
OFF									
MH01-01386-216									
G&N ATTITUDE ERROR	vdc	±5.4	max.	3.1.6.13	±5.06	±6%			
Amplitude	v/deg	0.3	±6%	3.1.6.13					
Scale Factor	vdc/pulse	0.014	max.						
Quantization	mv rms	50	max.	3.1.6.13	50	max.			
Noise	m vdc	10	max.						
Null	ohms	(20.1K±2%)±j 250		4.2.1.3.3	40.2K				
Output Load (at 800cps)				3.1.6.13					
Signal Phase		Positive							
Vehicle Motion Clockwise									

ICD			SYSTEM PS 2015000		
	Level	Tolerance	PARA.	Level	Tolerance
MH01-01327-216					
SYSTEM POWER INPUT				System ability to accept all power input variations and meeting of all power input requirements met at qualification test level.	
DC Power	25.8 to 30.8				
Steady State					
Variations	25.8 to 31.8				
Bus ripple					
Starting gimbal motors	24.0 to 31.8				
Time duration 1 sec max					
Switch S/C batteries prior to Delta V or Entry	25.8 to 32.8				
Open circuit	-24 to +80				
Time duration 10 μsec max					
Power Loads (watts)					
AGC	90, 70, 54				
Operate Max, Nom, Min	22, 15, 10				
Standby	132, 90, 64				
Optics					
IMU	258, 185, 132				
Operate	168, 50, 8				
Standby	70, 40, 20				
Display & Control	700				
Peak Power (watts)					
AC Power	111 to 119				
Steady state					
Variations:	50 to 150				
15 m sec max	105 to 125				
50 m sec max					
Frequency:	400cps				
With syn	400cps	±7cps			
Without syn					
Modulation:	0.75% max				
0 to 90 cps	4.0% max				
90 to 400 cps	5% max				
Total Distortation (of fundamental)	4% max				
Highest Harmonic (of fundamental)	1.414	±10%			
Crest factor	57				
Peak Power (watts)					

LIS 370-10004D LGC-LEM ELECTRICAL INTERFACE		ICD REQUIREMENTS	PS 6015000 L MEI DETAIL SPEC PGNCS - LM	PS 2016007 L AGC SUBSYSTEM	
ICD Section	Signal Characteristics				
'D' Circuit					
I Discretes	Signal Level '1'	28 ±11 vdc	17.5 ± 0.5 vdc	17 ± 0.2 v	
II TTCA	" " '0'	0 ± 2 vdc	ICD	4 ± 0.2 v	
III ACA	Noise Limits '1'	-50 v, <0.5 msec, <50 pps			
IV Engine	" " '0'	+50v, <1.0 msec, <50 pps			
VI RR&LR	Load Impedance '1' (MIT)	22K			
	" " '0'	22K			
	Source Impedance '1' (GAEC)	1K → 4K			
	" " '0'	Open			
'A' Circuit					
III ACA	Load Description (MIT)				
	Impedance	2K - 20K non-lin(8K not reading)			
	Quantization	42 states/10 deg			
	Linearity	±10% (3/4°<θ<10°)			
	Sample Rate	5-8/sec			
	Source Description (GAEC)				
	Impedance	(21 ±15%) + (j25.5 ± 10%)	2K at 85°		
	Out of Detent Indication	1-1/4 deg ± 3/4 deg			
	Null Voltage	≤30 mv rms (10K load)	30 mv rms		
	Quadrature Voltage	≤20 mv rms (10K load)	10 mv rms		
	Scale Factor	2.8 v	2.8v rms ±0.14		
	Phase Shift	0° ± 10° max (10K load)	10° max		
	Linearity	5%	ICD		
	Excitation	PGNS 800 cps			
	Scaling - Voltage (vrms)		0.08, 0.9, 1.8, 2.7	0.15, 0.87, 1.75, 2.55	
	- LGC Readout		0, 12, 25, 37	1, 10, 21, 31	

LIS 370-10004D LGC-LEM ELECTRICAL INTERFACE		ICD REQUIREMENTS	PS 6015000 L MEI DETAIL SPEC PGNCS - LM	PS 2016007 L AGC SUBSYSTEM	
ICD Section	Signal Characteristics				
IV Engine	Amplitude	7 ±3 v	ICD	6.0 ± 1v	
Inc Throttle	Width	3 ± 1 μsec	ICD	3.00 ±0.25 μ sec	
DEC Throttle	Droop	20%	ICD		
	Backswing	4 v	ICD		
	Rise Time	0.2 μsec	ICD		
	Repetition Rate	3.2 Kpps	ICD ± 1 pps	ICD	
	Noise Limits '1'	Pulse Envelope			
	" " '0'	+0.4v/-4.0v	+0.4v		
	Load Impedance '1' (GAEC)	200		510	
	" " '0'	<20 (<20 mh of xfmr at 1/f)			
	Source Impedance '1' (MIT)	<100			
	'0'	<10 (10 mh of xfmr at 1/f)			
'C' Circuit					
IV Engine	Signal Level '1'	3 ± 2v	2-5 v		
Engine On	" " '0'	28 ±11v	10 ±1v		
Engine Off	Noise Limits '1'	+50v, 0.5 msec, 50 pps			
	" " '0'	-50v, 1.0 msec, 50 pps			
	Load Impedance '1' (GAEC)	15K	2K ±10%		
	" " '0'	15K			
	Source Impedance '1' (MIT)	<3K		ICD	
	" " '0'	>500K		ICD	
'C' Circuit					
IV Engine	Signal Level '1'	5 ±3v	2 5v		
±Pitch Trim	" " '0'	17 → 31.5v	10 ±1v		
±Roll Trim	Noise Limits '1'	+50v, 0.5 msec, 50 pps			
	" " '0'	-50v, 1.0 msec, 50 pps			
	Load Impedance '1'	11.5K	2K ±10%		
	" " '0'	11.5K			
	Source Impedance '1'	<3K		ICD	
	" " '0'	>500K		ICD	

LIS 370-10004D LGC-LEM ELECTRICAL INTERFACE		ICD REQUIREMENTS	PS 6015000 L MEI DETAIL SPEC PGNCS - LM	PS 2016007 AGC SUBSYSTEM	
ICD Section	Signal Characteristics				
'C' Circuit					
V RCS	Signal Level '1'	2 ±2v	3 → 6v		
	" " '0'	28 ± 11v	9.6 ±0.5v (10 ±1v)		
	Noise Limits '1'	+50v, 0.5 msec, 50 pps			
	" " '0'	-50v, 1.0 msec, 50 pps			
	Load Impedance '1' (GAEC	22K	2K ±10%		
	" " '0'	22K			
	Source Impedance '1' (MIT)	<3K (I_c<5 ma)		ICD	
	'0'	>500K (B^+ 40vdc)		ICD	
'Y' Circuit					
VI RR&LR	Amplitude	7 ±3v	ICD	6 ± 1 vdc	
RR '1' & '0'	Width	4 ±2 μsec	ICD	3 ± 0.5 μsec	
LR '1' & '0'	Backswing	4 v	ICD	40%	
	Rise Time	0.2 μsec	ICD	0.2 μsec	
	Repetition Rate	3.2 kpps (digital data)	ICD	3.2 kc ± 0.2 pps	
	Noise Limits '1'	Pulse Envelope			
	" " '0'	+0.4v → -4.0v		0.4 v p-p	
	Load Impedance '1' (MIT)	200			
	" " '0'	<20 (<20 mh xfmr at 1/F)			
	Source Impedance '1' (GAEC)	<100			
	" " '0'	<10 (<10mh sfmr at 1/F)			
	Timing				
	Gate Strobe - Reset Strobe	2 ± 0.25 sec	ICD		
	Counter Gate Length	79998.0 ±0.25 μ sec	+ T2 + T3<80.935ms RR		
	Freq Gate - Gate Strobe(T1)	RR 313.5 ±.75 s/LR~0.1 s	+ T2 + T3<80.315 ms LR		
	Freq Gate - TE - Reset Strobe (T2)	RR 315.5 ±.5 s/LR 3.1 ± 5 s			
	Freq Gate TE - CRO (T3)	RR 309.5 ±.5 s/LR 2 s(min)			
	Data - CRO	≤1 μsec	ICD		

LIS 370-10004D LGC - LEM ELECTRICAL INTERFACE		ICD REQUIREMENTS	PS 6015000 L MEI DETAIL SPEC PGNCS - LM	PS 2016007 AGC SUBSYSTEM	
ICD Section	Signal Characteristics				
'X' Circuit					
VI RR & LR	Amplitude	3.75 ±1.50 v	7 ± 3v	6 ± 1 vdc	
	Width	3 ±0.5 μsec	ICD	ICD	
	Droop	20%	ICD		
	Backswing	4v	ICD		
	Rise Time	0.2 μsec	ICD		
	Repetition Rate	3.2 kpps	3.2kpps ±1 pps	ICD	
	Noise Limits '1'	Pulse Envelope			
	" " '0'	+0.4→-4.0v	+0.4v		
	Load Impedance '1' (GAEC)	65	200 ±10%	510	
	" " '0'	<10 (<10 mh)			
	Source Impedance '1' (MIT)	<100			
	'0'	<10 (<10 mh)			
'X' Circuit					
XI Altitude Meters	Amplitude	7 ±3v	ICD		
	Width	3 ±1 μsec	ICD		
	Droop	20%	ICD		
	Backswing	4v	ICD		
	Rise Time	0.2 μsec	ICD		
	Repetition Rate	3200 pps	3.2 kpps ±1 pps		
	Noise Limits '1'	Pulse Envelope			
	" " '0'	+0.4 → -4.0v			
	Load Impedance '1' (GAEC)	200	200 ±10%	510	
	" " '0'	<20 (<20 mh)			
	Source Impedance '1' (MIT)	<100			
	" " '0'	<10 (<10 mh)			

LIS 370-10004D LGC - LEM ELECTRICAL INTERFACE		ICD REQUIREMENTS	PS 6015000 L MEI DETAIL SPEC PGNCS - LM	PS 2016007 AGC SUBSYSTEM	
ICD Section	Signal Characteristics				
'Y' Circuit VII Telemetry	Amplitude	4.5 ± 1v	ICD	2.3 ±0.4 vdc	
	Width	4 ± 1 μsec	ICD	3 ±0.6 μsec	
	Droop	N/A			
	Backswing	0v	ICD		
	Rise Time	0.3 μsec	ICD		
	Repetition Rate	50pps, 2000pps sync (at 51.2 kpps)	ICD		
	Noise Limits '1'	Pulse Envelope			
	" " '0'	0.4 → -4v			
	Load Impedance '1' (MIT)	200		510	
	" " '0'	<20 (< 20 mh)			
	Source Impedance '1' (GAEC)	100	ICD		
	'0'	100			
	Timing				
	Sync - Start Pulse Delay	19.5 ± 5.0 μsec	ICD		
	Sync - Stop Pulse Delay	19.5 ±5.0 μsec	ICD		
	Data - Sync Pulse Delay	≤ 1.0 μsec	ICD		
VII Telemetry Serial Digital Data	Amplitude	7 ±2v	ICD	6 ± 1 vdc	
	Width	4 ± 1.25 μsec	2 → 6 μsec		
	Droop	20%	ICD	15%	
	Backswing	6v	ICD	40%	
	Rise Time	0.2 μsec	ICD	ICD	
	Repetition Rate	At bit sync freq.			
	Noise Limits '1'	Pulse envelope			
	" " '0'	0.4v → -4.0v		0.4v p-p	
	Load Impedance '1' (GAEC)	500	100 ±10%	510	
	" " '0'	500			
	Source Impedance '1' (MIT)	<100			
	" " '0'	< 10 (< 10 mh)			

LIS 370-10004D 'LGC - LEM ELECTRICAL INTERFACE		ICD REQUIREMENTS	PS 6015000 L MEI DETAIL SPEC PGNCS - LM	PS 2016007 AGC SUBSYSTEM	
ICD Section	Signal Characteristics				
VII Telemetry Master Clock	Amplitude	7 ±3v	≥ 4v	10 ± 2 vdc	
	Width	0.5 ± 0.25 μsec	ICD		
	Droop	N/A			
	Backswing	N/A			
	Rise Time	0.2 μsec	ICD		
	Repetition Rate	1024 kpps ±2 ppm	ICD (15 min period)	1024 ± .30 ppm	
	Noise Limits '1'	Pulse Envelope			
	" " '0'	+0.4 → -4.0v	+0.4 -6.0v		
	Load Impedance '1' (GAEC)	120 ±25%	500 ±10%	510	
	" " '0'	120 ±25%			
	Source Impedance '1' (MIT)	<100			
	" " '0'	<10 (10 mh)			
Relay					
VIII C&W	Signal Level '1'	0 ±2			
	'0'	28 ±11			
	Load Impedance '1' (GAEC)	82K	2.5K ±10% (1 amp)		
	" " '0'	94.5K			
	Source Impedance '1' (MIT)	Closure			
	" " '0'	Open			
X Uplink	Amplitude	7 ± 3v	ICD	6 ± 1vdc	
	Width	4 ±1 μsec	3 ± 1 sec	3 ± 0.5 sec	
	Droop	20%	ICD	15%	
	Backswing	4v	ICD	40%	
	Rise Time	1 μsec	0.2 μsec	0.2 μsec	
	Repetition Rate	1 kpps			
	Noise Limit '1'	Pulse Envelope			
	" " '0'	+0.4 → -4.0v	+0.4v	0.4v p-p	
	Load Impedance '1' (MIT)	200			
	Source Impedance '1' (GAEC)	<100	ICD max		
	" " '0'	<10 (< 10 mh)	ICD max		

LIS 370-10004D LGC - LEM ELECTRICAL INTERFACE		ICD REQUIREMENTS	PS 6015000 L MEI DETAIL SPEC PGNCS - LM	PS 2016007 AGC SUBSYSTEM	
ICD Section	Signal Characteristics				
	Timing				
	Bit Rate	1.1 kpps max			
	Min time btn words	0.1 sec			
XII AGS	Amplitude	7 ±3v			
Initialization	Width	3 ±1 μsec			
	Droop	20%			
	Backswing	4v			
	Rise Time	0.2 μsec			
	Repetition Rate	51.2 kpps (Digital)			
	Noise Limit '1'	Pulse Envelope			
	'0'	+0.4 → -4.0v			
	Load Impedance '1' (GAEC)	500 ±30%			
	" " '0'	20 (20 mh)			
	Source Impedance '1' (MIT)	100			
	" " '0'	10 (10 mh)			
Relay					
VI RR&LR	Signal Level '1'	26 ±10v	5	PS2016015 &	
LR Ant Pos CMD	" " '0'	0 ± 2v	10 ±1	PS2016013	
	Load Impedance '1' (GAEC)	22 k	2k ±10%	Test for contact closure	
	'0'	Open			
Relay					
VI RR&LR	Signal Level '1'	4.3 ±1v	5v	PS2016015 &	
RR Auto Track	" " '0'	0 ± 1v	10± 1v	PS2016013	
	Load Impedance '1'	10k	2k ±10%	Test for contact closure	
	" " '0'	10k			
	Source Impedance '1'	Open			
	" " '0'	Closed			

LIS300-10002A (IRN -1) AGS ELECTRICAL INTERFACE WITH PGNCS		ICD REQUIREMENTS	PS 6015000L MEI DETAIL SPEC PGNCS - LM	PS 2016142 AE CDU (LEM)	
Signal	Signal Characteristics				
CDU Zero	Amplitude	7 ±3v	ICD	ICD	
	Width	3 ± 1 μsec	ICD	ICD	
	Croop	20	ICD	ICD	
	Rise Time	0.5 μsec		0.2 μsec	
	Repetition Rate	51.2 Kpps ±10%		ICD	
	Noise Limit '0'	0.4v / -4.0v	±4.0v		
	Load Impedance	500 ±10%	ICD	510 ±5%	
	Source Impedance '1'	<100			
± AIG, ± AMG	Amplitude	7 ± 3v		ICD	
± A_{OG}	Width	3 ± 1 μsec		ICD	
	Droop	20%		ICD	
	Rise Time	0.5 μsec		0.2 μsec	
	Repetition Rate	6.4 Kpps		ICD	
	Load Impedance	500 ± 10%		510 ± 5%	
	Source Impedance '1'	<100			

LIS 370-10006A (IRN's - 1, 2) PGNCS to Rendezvous Radar Angle Electrical Interface					
Signal	Signal Characteristics				
Designate	Phase Shift	0^{O} $\pm 10^{O}$ (0.5v)			
	Electrical Nulls	56 MV rms max			
	Load Impedance	20K ± 5%		20K ± 1%	
	Source Impedance	1K $\angle 0^{O}$ ± 10^{O}			

LIS-350-10002 (IRN's -1, -2) LEM-PGNS Lateral and Forward Velocity Electrical Interface					
Signal	Signal Characteristics				
Lateral & Forward Velocity	Scaling	336 bits = ±5.062v	359 bits = ±4.732 ±6%	384 bits = ±5.064v	
	Null	7.5 MV	7 MV		
	Load Impedance	50K ±5%/Meter	20K ±5%	20K ±1%	
		2K	ICD		

LIS 350-10001 B LEM-PGNS ELECTRICAL INTERFACE FOR TOTAL ATTITUDE SIGNALS, ATTITUDE ERROR SIGNALS AND IMU CAGE SIGNAL		ICD REQUIREMENTS	PS 6015000L MEI DETAIL SPEC PGNCS - LM	PS2016142AE CDU (LEM)	
Signal	Signal Characteristics				
Attitude Error	Amplitude	10V max		13.3 MV ±12%/bit	
	Scale Factor	13.18 MV/Bit			
	Phase Shift	8° max (1.8v rms)			
	Nulls	56 MV rms			
	Load Impedance	20K ± 5% ∠0°		20K ± 1%	
	Source Impedance	1K Max			
IMU Cage	Voltage	28 vdc			
	Current	0.075 amp max (28v)			

LIS-390-10002 A (IRNS-1, -2, -3) PGNS PRIME POWER REQUIREMENTS AND CHARACTERISTICS	ICD REQUIREMENTS			PS 6015000 L MEI DETAIL SPEC PGNCS - LM			ATP 601 5497 K INERTIAL SUBSYSTEM			PS 201 6007 AGC SUBSYSTEM		
SYSTEM CHARACTERISTICS	MAX	NOM	MIN	MAX	NOM	MIN	MAX	NOM	MIN			
D.C. SYSTEM VOLTAGES - Steady State												
IMU Standby On - IMU OPER OFF, LGC OFF	33.5v	28v	22v	ICD	28±1v	ICD	33		24			
- IMU OPER ON	32.5	28v	23.5									
IMU OPERATE ON	33.5	28v	24.5	ICD		ICD	33		24	33		23
LGC ON - IN STBY, IMU OPER OFF	32.5	28v	23.5	33.5		24.5						
-IN OPER, IMU OPER OFF	32.5	28v	23.5	33.5		24.5						
- IN OPER, IMU OPER ON	32.5	28v	23.5									
AOT HEATER	32.5	28v	23.5	33.5		24.5						
TRANSIENT VOLTAGES - AMPLITUDE	±50v						Noise <1v p-p			+50±2v		
- WIDTH	10 sec									10 ± 4.4 sec		
- REPETITION RATE	10 pps									ICD		
A.C. SYSTEM (AOT LAMP)												
AC VOLTAGE - STEADY STATE	115 ± 2.5 v rms											
FREQUENCY	400 ± 10 cps											
WAVE SHAPE - SINUSOIDAL												
- CREST FACTOR	1.41 ± 0.1											
- TOTAL DISTORTION	5% Max											
- IND HARMONIC DISTORTION	4% Max											
TRANSIENT VOLTAGES												
PEAK (FROM TRANSIENT START TO 2.5 ms)	225v											
VOLTAGE (AFTER 2.5 ms)	144 → 188v											
RECOVERY TO STEADY STATE CONDITIONS	50 ms											
VOLTAGE SPIKES ON SINEWAVE	<10v peak											
90% RECOVERY	<0.25 m sec											
LIS-370-10004 LGC LEM ELECTRICAL INTERFACE										PS 201 6015 PS 201 6031 DSKY SUBSYSTEM		
SECTION XIII DSKY ILLUMINATION												
DSKY EL NUMERIC DIMMING	14v Max											
	800 cps											
400 CPS												
VOLTAGE	115v ± 2.5v											
CONTROLLED	20 → 75v											
EMERGENCY CONDITION	115v											
CURRENT	17.5 m amp											
POWER INPUT (AT 75v)	<0.66 watts											
TRANSIENT VOLTAGES	(same as above)											
STATUS LIGHT POWER												
VOLTAGE	2 → 5.5v											
CURRENT	0.225 amp/display											
CAUTION LIGHT POWER												
VOLTAGE	2 → 5.5v											
CURRENT (AT 5v)	0.180 amp/display											

LIS 370-10007 A (IRNS-1, -2) LEM-PGNS 800 CPS POWER ELECTRICAL INTERFACE	ICD REQUIREMENTS	PS 6015000 L MEI DETAIL SPEC PGNCS - LM	ATP 601 5497 K INERTIAL SUBSYSTEM	PS 201 6007 AGC SUBSYSTEM
SYSTEM CHARACTERISTICS				
NORMAL CONDITIONS - VOLTAGE	28 ± 2% v rms	ICD	28 ± 0.42 v rms	
- FREQUENCY	800 ± 0.5% cps	800 ± 1 cps		
DEGRADED CONDITIONS - VOLTAGE	28 ± 5% v rms		ICD	
- FREQUENCY	750 ± 40 cps			
MAX LOAD	7 watts			
PGNS TURN-ON (for 12 secs)	<56 v rms (12 sec)	<45 (for 5 sec)		