

# APOLLO 16



**Delco Electronics**

GENERAL MOTORS CORPORATION MILWAUKEE, WISCONSIN 53201



	EARTH	MOON
SATELLITE ORBIT	100 x 100 n mi	60 x 60 n mi
SATELLITE ORBIT DURATION	1 hr 28 min	2 hr
SATELLITE ORBIT RATE	4.1 deg/min	3.0 deg/min
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$V_C$ (SURFACE)	7,905.4 m/sec	1,679.5 m/sec
I.E. $V_C = \sqrt{\frac{\mu}{R}}$	25,936.0 ft/sec	5,510.2 ft/sec
	15,396.7 n mi/hr	3,262.6 n mi/hr
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ESCAPE VELOCITY (SURFACE)	11,027 m/sec	2,380 m/sec
	36,178 ft/sec	7,750 ft/sec
	21,421 n mi/hr	4,572 n mi/hr
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VOLUME	1	0.0202
RADIUS	1	0.272
MASS	1	0.0123
DENSITY	1	0.606
SURFACE GRAVITY	1	0.16
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ONE DEGREE ON SURFACE	60 n mi	16.4 n mi
$\mu$	$0.3986032 \times 10^{25} \text{ m}^3/\text{sec}^2$	$0.4902776 \times 10^{23} \text{ m}^3/\text{sec}^2$
RADIUS	6,378,165 m	1,738,090 m
	20,925,738 ft	5,702,395 ft
	3,444 n mi	938.5 n mi
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ORBIT CHARACTERISTICS	EARTH ABOUT SUN	MOON ABOUT EARTH
SEMI MAJOR AXIS	$1.496 \times 10^{11} \text{ m}$ $4.908 \times 10^{11} \text{ ft}$ $8.073 \times 10^7 \text{ n mi}$	384,400,000 m 1,261,139,500 ft 207,430 n mi
ECCENTRICITY	0.0167	0.055
MEAN VELOCITY	29,770 m/sec 97,702 ft/sec 57,888 n mi/hr	1,022 m/sec 3,353 ft/sec 1,980 n mi/hr
PERIOD	365.24 days	27.32 days
INCLINATION	23.44 deg	5.15 deg

MOON SURFACE TEMPERATURE -72°F to +214°F (sun side), -238°F (dark side)

$$\mu_{\text{SUN}} = 0.132715445 \times 10^{21} \text{ m}^3/\text{sec}^2$$

$$\begin{aligned} 1 \text{ meter} &= 3.2808 \text{ ft} \\ &= 5.3961 \times 10^{-4} \text{ n mi} \\ &= 6.2137 \times 10^{-4} \text{ s mi} \\ 1 \text{ arc-second} &= 4.8481 \times 10^{-6} \text{ rad} \\ &= 2.7778 \times 10^{-4} \text{ deg} \end{aligned}$$

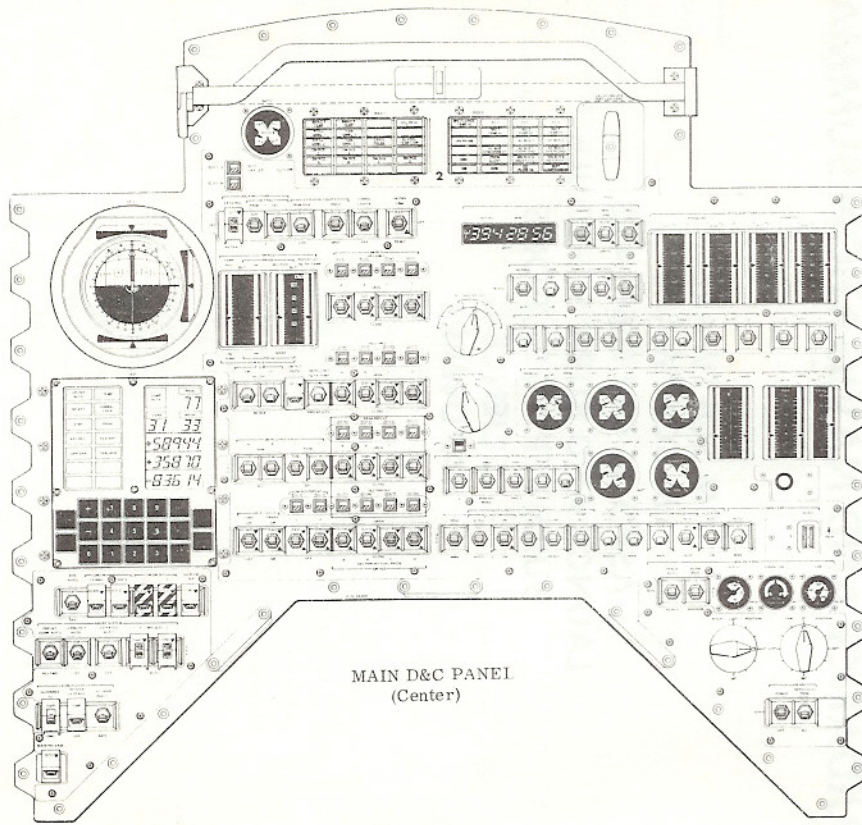
$$\begin{aligned} 1 \text{ meru} &= 7.292115 \times 10^{-8} \text{ rad/sec} \\ &= 4.178 \times 10^{-6} \text{ deg/sec} \\ &= 2.507 \times 10^{-4} \text{ arc-min/sec} \\ &= 0.01504 \text{ arc-sec/sec} \\ 1 \text{ cm/sec}^2 &= 3.281 \times 10^{-2} \text{ ft/sec}^2 \\ &= 1.0197 \times 10^{-3} \text{ g} \end{aligned}$$

## GUIDANCE AND NAVIGATION SUMMARY

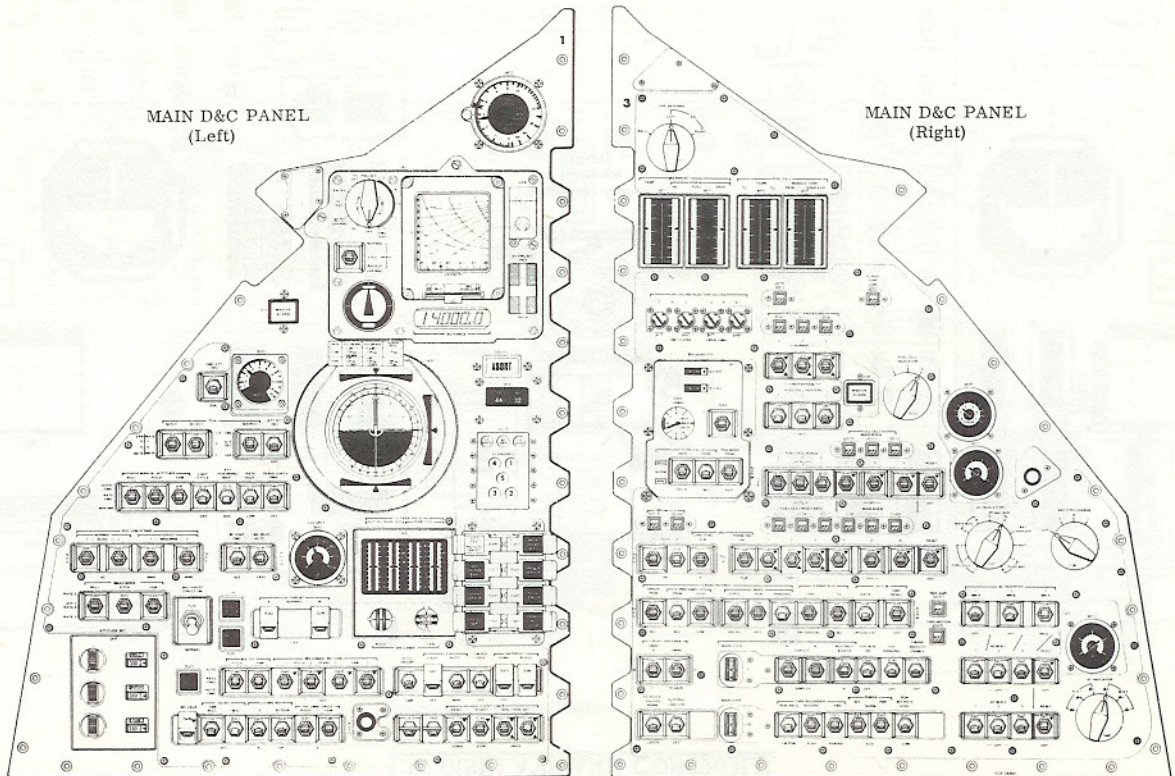
CM SOFTWARE  
LM SOFTWARE  
ASPO 45 CRT DISPLAYS  
LAUNCH AND BURN SCHEDULE  
BURN PERTURBATIONS  
SCIENCE  
HARDWARE



CM DISPLAYS AND CONTROLS

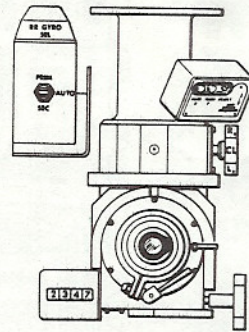
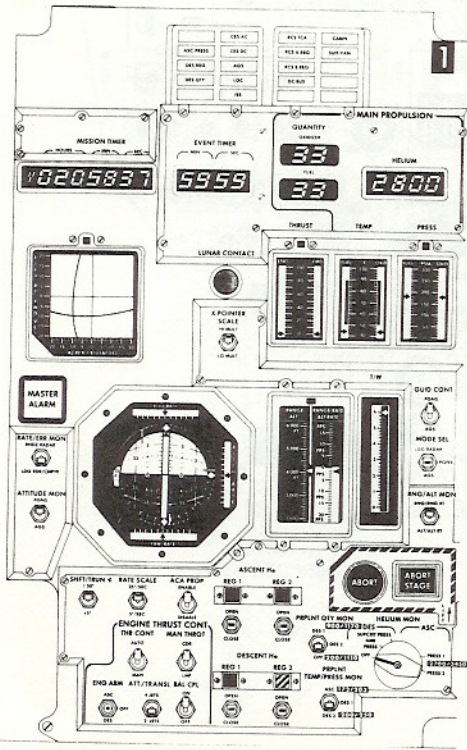


CM DISPLAYS AND CONTROLS

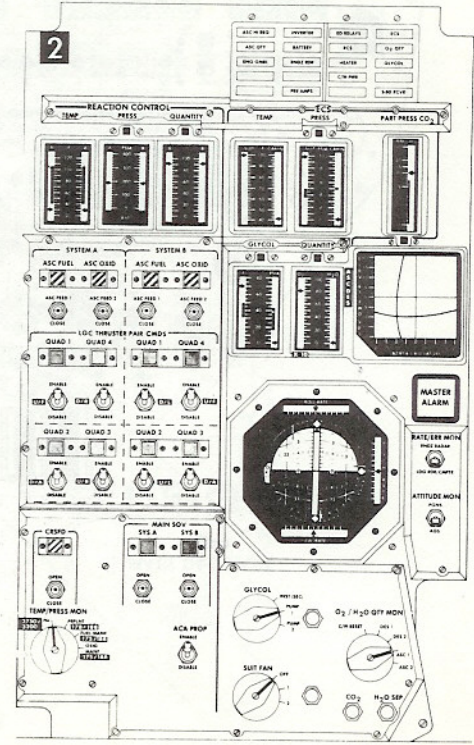




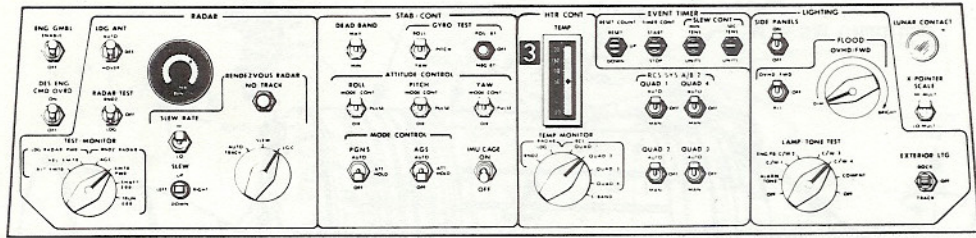
# LM DISPLAYS AND CONTROLS



Alignment Optical Telescope (AOT)



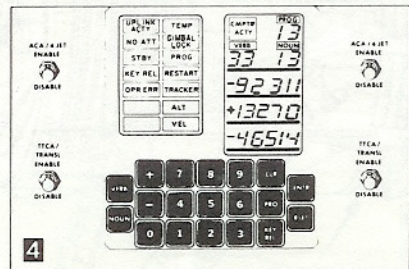
# LM CONTROLS AND DISPLAYS



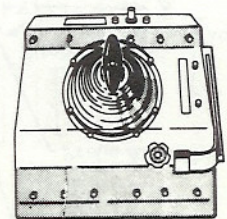
Display Keyboard Assembly (DSKY)



Attitude Controller Assembly (ACA)



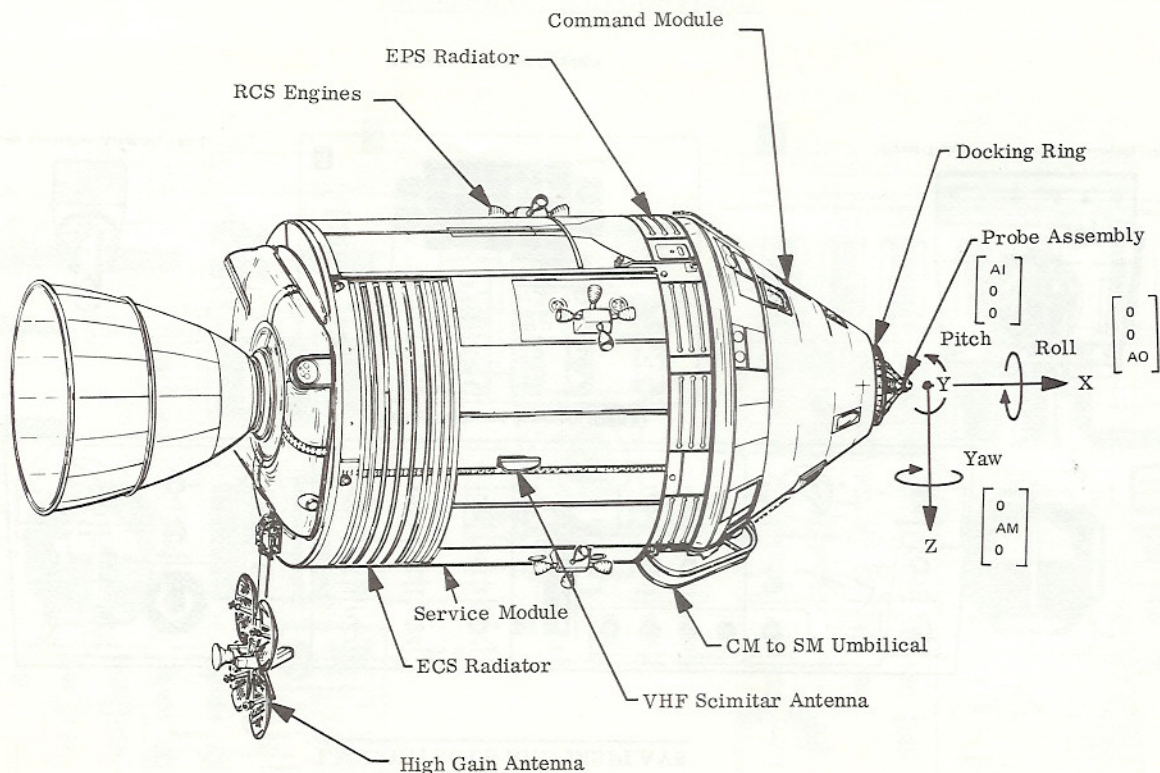
4



Thrust/Translation Controller Assembly (TTCA)



CM/SM CONFIGURATION



LM CONFIGURATION

