THE GALILEO SOLID STATE IMAGING EXPERIMENT AND PERFORMANCE OF THE CAMERA AT EARTH-MOON ENCOUNTER 1. M. Belton[1], J. Head[2], C. Chapman[3], K. Klaasen[4], C. Anger[5], M. Carr[6], A. McEwen[7], C. Pieters[2], M. Davies[8], R. Greeley[9], R. Greenberg[10], G. Neukum[11] C. Pilcher[12], J. Veverka[13], F. Fanale[14],A. Ingersoll[15],J. Pollack[16], P. Gierasch[13], D. Morrison[16], B. Paczkowski[4], W. Cunningham[4], and E. DeJong[4]. [1] NOAO, Tucson, AZ; [2]Brown Univ., Providence RI; [3]Planetary Science Inst., Tucson AZ; [4]JPL, Pasadena CA., [5]ITRES Res., Ltd., Calgary Canada; [6]USGS, Menlo Park CA; [7]USGS, Flagstaff AZ; [8]RAND, Santa Monica CA; [9]Ariz. State Univ., Tempe AZ; [10]Univ. Arizona, Tucson AZ; [11]DLR, Oberpfaffenhofen FRG; [12]NASA HQ, Washington DC.; [13]Cornell Univ, Ithaca NY; [14]Univ. Hawaii, Honolulu HI; [15]Cal. Inst. Tech., Pasadena, CA; [16]NASA Ames R.C., Moffett Field CA.

The scientific and technical goals of the Solid State Imaging (SSI) experiment at the December 1990 Earth-Moon encounter by the Galileo spacecraft were to (I) investigate the distribution of compositional units on the farside lunar crust with emphasis on the Orientale basin [1-4]; (II) explore regions near the lunar south pole for which images have not previously been obtained [5]; (III) improve the selenodetic control net [5]; (IV) test the SSI capability for sequencing and data reduction techniques to be used at Jupiter and the Galilean satellites (this last objective encompassed most of the measurement goals directed at the Earth itself).The geometry of the Earth-Moon 1 encounter [6] is shown in Figure 1. Early imaging of the Moon during this encounter included observations of the Apollo 12 and 14 landing sites and extended west to include Oceanus Procellarum and the Humorum basin. This sequence enabled relative calibration of Galileo data using previous Earth-based multispectral observations and spectral data obtained from Apollo samples [1]. The imaging sequence extended around the western limb and provided new color data for mare deposits in the Orientale basin and those associated with the craters Grimaldi, Riccioli, and Schickard [3]. Later imaging sequences covered part of the farside and included mare deposits in the Apollo basin, light plain deposits such as those in the Korolev basin, and dark mantle (pyroclastic?) materials associated with Orientale. The multispectral images show a major anomaly associated with the interior and margins of the South Pole-Aitken basin [1]. We have prepared a sequence of multispectral images [4] to illustrate the degree to which the above goals were realized. Movies have also been made from the data set and illustrate the dynamic nature of the Earth's atmosphere and the global context of lunar crustal heterogeneity. Immediately prior to the Earth-Moon encounter the SSI camera was subjected to a comprehensive inflight calibration. We describe the current performance of the camera system and the prospects for future improvements.

Following this encounter the spacecraft is heading toward the inner part of the asteroid belt and will fly by the asteroid Gaspra in October, 1991 (Fig. 2). Prior to reaching Gaspra, there will be a systematic calibration sequence centered around lens cover deployment. After the Gaspra encounter, the spacecraft will return to the Earth-Moon system for a second Earth-Moon encounter in December 1992. The geometry of this second lunar encounter is illustrated in Figure 3 and will permit multispectral images of the North Polar region to be obtained. This encounter will be considerably closer to the Moon than the first one [Fig. 1, 3]. After the second Earth-Moon encounter the spacecraft passes back through the asteroid belt [Fig. 2] and goes into orbit around Jupiter in late 1995 to begin the systematic exploration of the Jovian system.

LUNAR ORBIT TRAVERSE AT EGA1

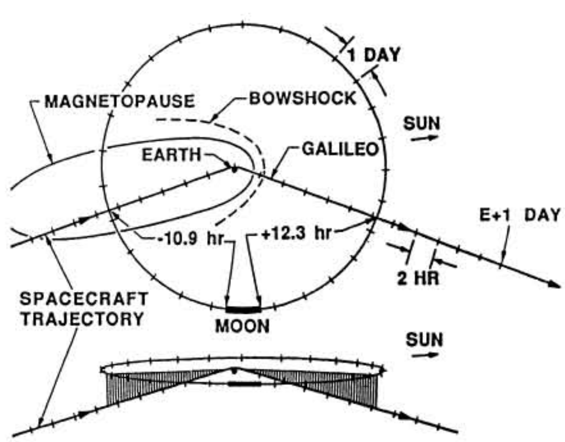

Figure 1

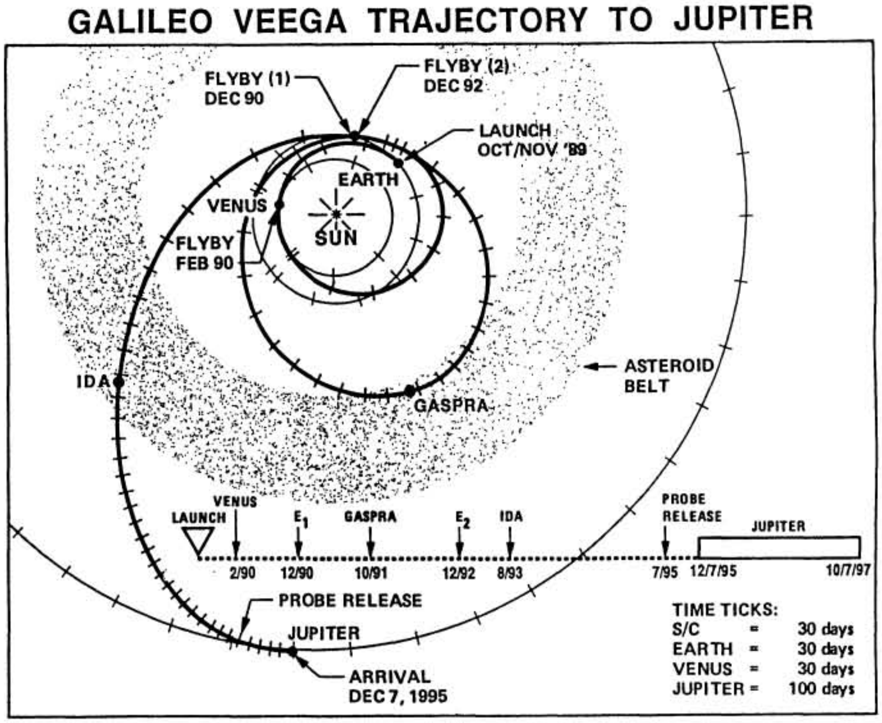

Figure 2

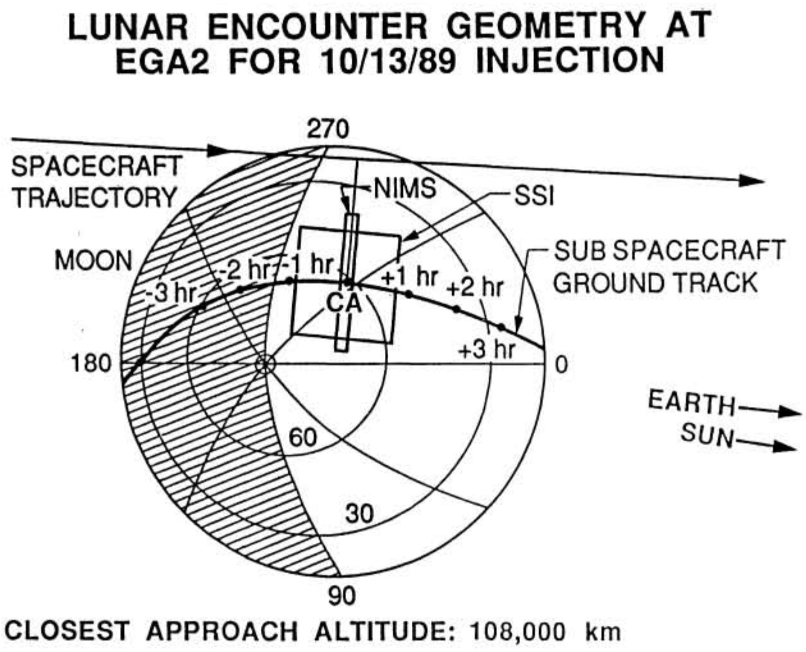

Figure 3

1) J. Head *et al.*, this volume; 2) C. Pieters *et al.*, this volume; 3) R. Greeley *et al.*, this volume; 4) A. McEwen *et al.*, this volume; 5) M. Davies *et al.*, this volume; 6) T. Clarke, Earth and Moon Encounters by the Galileo Jupiter Orbiter , Proc. 1988 Int'l Geoscience and Remote Sensing Symposium, Edinburgh, Scotland, (1988); 7) F. Fanale (1990) EOS **71**, 1803.