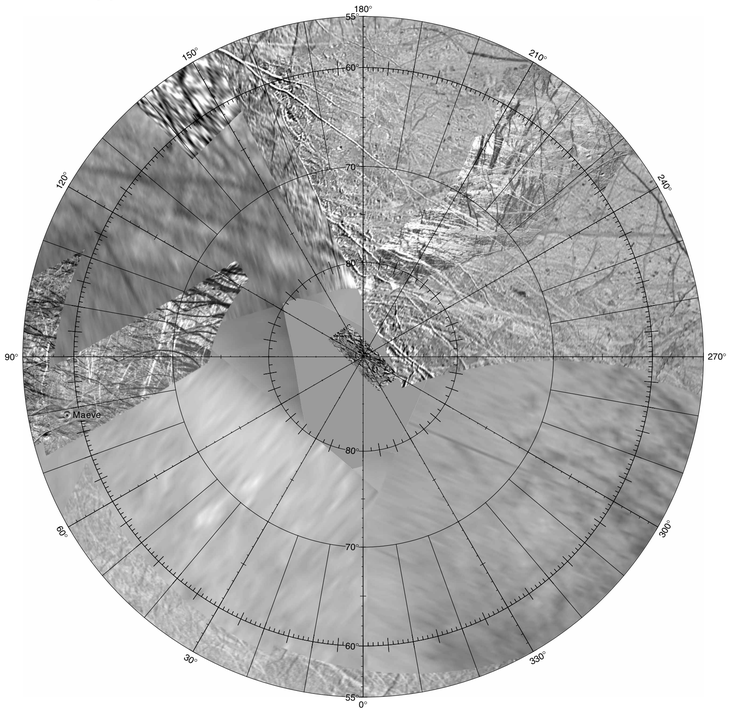
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Prepared for the
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

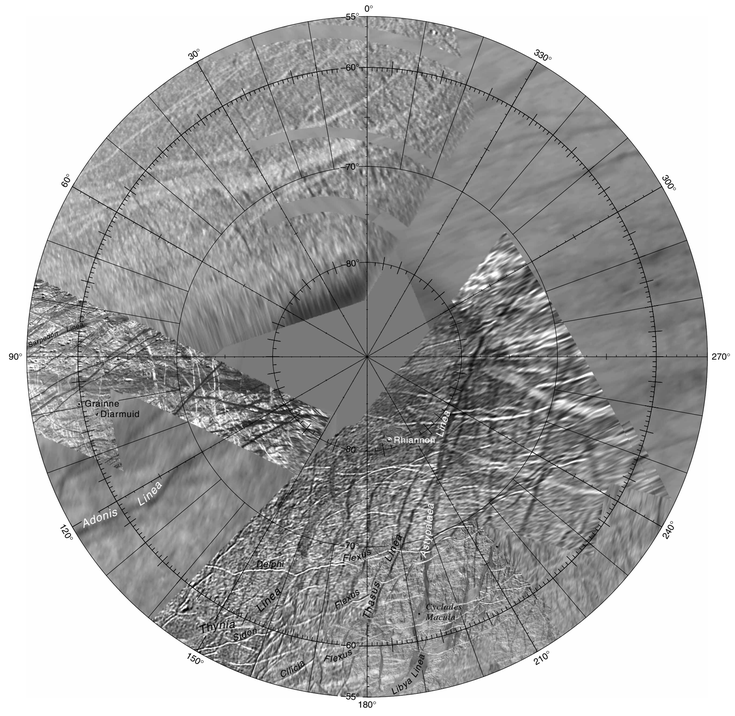
GEOLOGIC INVESTIGATION SERIES I–2757
ATLAS OF JOVIAN SATELLITES: EUROPA



SCALE 1:8 388 000 (1 mm = 8.39 km) AT 56° LATITUDE
POLAR STEREOGRAPHIC PROJECTION

KILOMETERS

NORTH POLAR REGION



SCALE 1:8 388 000 (1 mm = 8.39 km) AT –56° LATITUDE
POLAR STEREOGRAPHIC PROJECTION

KILOMETERS

SOUTH POLAR REGION

NOTES ON BASE

This sheet is one in a series of maps of the Galilean satellites of Jupiter at a nominal scale of 1:15,000,000. This series is based on data from the Galileo Orbiter Solid-State Imaging (SSI) camera and the Voyager 1 and 2 spacecraft.

PROJECTION

Mercator and Polar Stereographic projections used for this map of Europa are based on a sphere having a radius of 1,562.09 km. The scale is 1:8,388,000 at ±56° latitude for both projections. Longitude increases to the west in accordance with the International Astronomical Union (1971; Davies and others, 1996). Latitude is planetographic.

CONTROL

The process of creating a geometric control network began with selecting control points on the individual images, making pixel measurements of their locations, using reseau locations to correct for geometric distortions, and converting the measurements to millimeters in the focal plane. These data are combined with the camera focal lengths and navigation solutions as input to a photogrammetric triangulation solution (Davies and others, 1998; Davies and Katayama, 1981). The solution used here was computed at the RAND Corporation in June 2000. Solved parameters include the radius (given above) of the best-fitting sphere, the coordinates of the control points, the three orientation angles of the camera at each exposure (right ascension, declination, and twist), and an angle (W_0) that defines the orientation of Europa in space. W_0—in this solution 36.022°—is the angle along the equator to the east, between the 0° meridian and the equator's intersection with the celestial equator at the standard epoch J2000.0. This solution places the crater Cilix at its defined longitude of 182° west (Davies and others, 1996).

MAPPING TECHNIQUE

This global map base uses the best image quality and moderate resolution coverage supplied by Galileo SSI and Voyager 1 and 2 (Batson, 1987; Becker and others, 1998; 1999; 2001). The digital map was produced using Integrated Software for Imagers and Spectrometers (ISIS) (Eliason, 1997; Gaddis and others, 1997; Torson and Becker, 1997). The individual images were radiometrically calibrated and photometrically normalized using a Lunar-Lambert function with empirically derived values (McEwen, 1991; Kirk and others, 2000). A linear correction based on the statistics of all overlapping areas was then applied to minimize image brightness variations. The image data were selected on the basis of overall image quality, reasonable original input resolution (from 20 km/pixel for gap fill to as much as 40 m/pixel), and availability of moderate emission/incidence angles for topography and albedo. Although consistency was achieved where possible, different filters were included for global image coverage as necessary: clear/blue for Voyager 1 and 2; clear, near-IR (757 nm), and green (559 nm) for Galileo SSI. Individual images were projected to a Sinusoidal Equal-Area projection at an image resolution of 500 m/pixel. The final constructed Sinusoidal projection mosaic was then reprojected to the Mercator and Polar Stereographic projections included on this sheet.

NOMENCLATURE

Names on this sheet are approved by the International Astronomical Union (IAU, 1980, 1986, 1999, and 2001). Names have been applied for features clearly visible at the scale of this map; for a complete list of nomenclature of Europa, please see http://planetarynames.wr.usgs.gov. Font color was chosen only for readability.

Je 15M CMN: Abbreviation for Jupiter, Europa (satellite): 1:15,000,000 series, controlled mosaic (CM), nomenclature (N) (Greeley and Batson, 1990).

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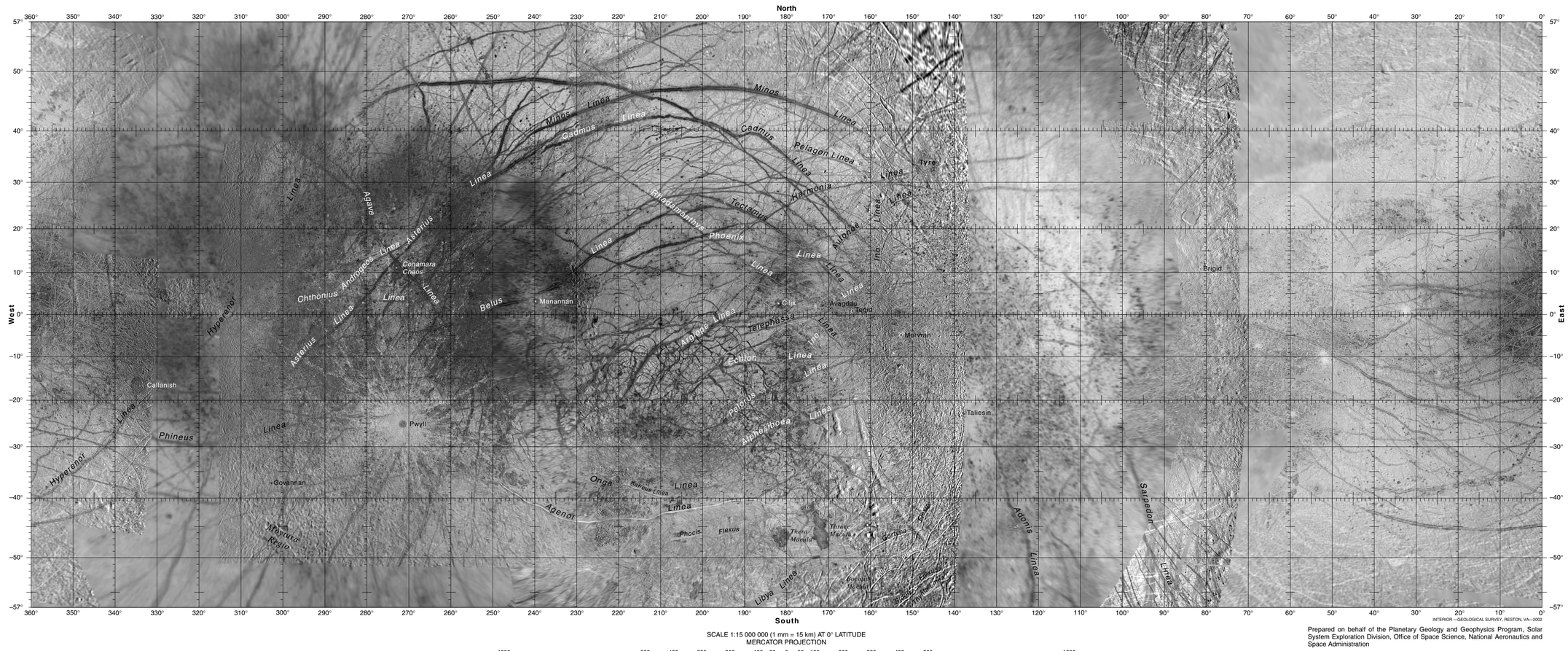
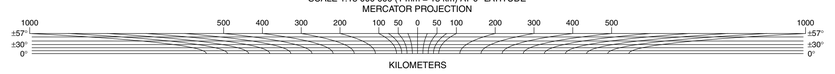


SCALE 1:15 000 000 (1 mm = 15 km) AT 0° LATITUDE
MERCATOR PROJECTION



KILOMETERS

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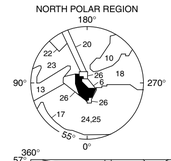
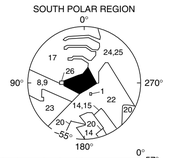
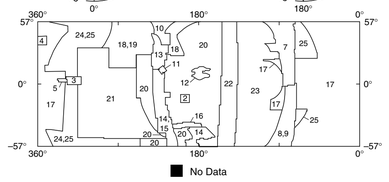
INTERIOR—GEOLOGICAL SURVEY, RESTON, VA—2002

NORTH POLAR REGION



SOUTH POLAR REGION



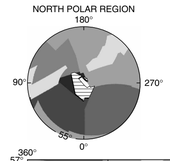


Footprint of the Galileo and Voyager image observation boundaries

1– **17ESRHIANN01**	s0449974326	s0466676878	s0449961900	s0466664326	s0466665239	s0349875178	c2065211
s0466703552	s0449974339	s0466676879	s0449961901	s0466664327		19– **G1ESEUTERM01**	c2065050
2– **C3ESWEDGES01**	s0449974352	s0466676900	s0449961913	s0466664339	17– **25ESGLOBAL01**	s0349887313	c2065155
s0368639400	s0449974365	s0466676901	s0449961914	s0466664340	s0527286301	20– **14ESGLOCOL01**	c2065159
3– **E4ESMACSTR01**	s0449974378	s0466676913	14– **17ESREGMAP01**	s0466664352	s0527286314	s0440984852	c2065215
s0374667300	s0449974401	s0466676914	s0466664152	s0466664365	s0527286326	s0440984865	c2065219
4– **25ESDARKBP01**	s0449974413	9– **17ESREGMAP03**	s0466664153	s0466664366	s0527286327	s0440984878	23– **17ESGSHAPE01**
s0527275700	s0449974426	s0466677052	s0466664165	s0466664378	s0527286339	s0440984900	s0466581865
5– **25ESMOTTER01**	s0449974427	10– **19ESNORLAT01**	s0466664166	s0466664379	s0527286340	s0440984901	s0466581866
s0527275900	s0449974439	s0484884700	s0466664178	s0466664400	s0527286352	s0440984913	24– **G2ESPHOTOM01**
6– **25ESNRTHPL01**	8– **17ESREGMAP02**	s0484884713	s0466664200	s0466664401	s0527286353	s0440984914	s0360063913
s0527272726	s0466676678	s0484884726	s0466664201	s0466664414	s0527286365	21– **E4ESGLOMAP01**	25– **C9ESGLOBAL01**
s0527272713	s0466676700	s0484884727	s0466664213	s0466664415	s0527286366	s0374649000	s0401727700
s0527272700	s0466676713	11– **19ESREGMAP01**	s0466664214	15– **17ESNERTRM01**	s0527286379	s0374649013	26– Voyager 1 & 2 Low
7– **15ESREGMAP02**	s0466676726	s0484884500	s0466664226	s0466664552	s0527286400	s0374649026	Resolution Frames
s0449974200	s0466676739	12– **19ESSTRAT01**	s0466664227	s0466664565	s0527286402	s0374649039	(not visible except in
s0449974213	s0466676752	s0484884300	s0466664239	s0466664578	s0527286413	s0374649052	extreme polar areas)
s0449974214	s0466676765	s0484884301	s0466664240	s0466664600	s0527286427	22– Voyager 2	c1632318
s0449974226	s0466676778	s0484884313	s0466664253	s0466664613	s0527286439	c2064925	c1633452
s0449974239	s0466676800	13– **15ESREGMAP01**	s0466664254	s0466664626	s0527286440	c2064913	c1634216
s0449974252	s0466676813	s0449961801	s0466664266	s0466664639	s0527286452	c2064937	c1634918
s0449974265	s0466676826	s0449961814	s0466664267	s0466664652	s0527286453	c2064949	c1636027
s0449974266	s0466676827	s0449961827	s0466664278	s0466664665	**G1ESGLOBAL01**	c2065001	c1636900
s0449974278	s0466676839	s0449961840	s0466664301	s0349875100	s0349875113	c2065143	c2061159
s0449974300	s0466676852	s0449961853	s0466664302	s0349875113	s0349875126	c2065046	c2062524
s0449974313	s0466676853	s0449961866	s0466664313	s0466664813	s0349875139	c2065022	
s0449974314	s0466676865	s0449961879	s0466664314	s0466665378		c2065203	

Listed above are the images that were used to create the photomosaic. Bold entries represent Galileo observation names, which are areas of Europa that were targeted for scientific investigation. The numbers and letters included in the observation names are in a standard format (NNTIOOOOOOSS) where NN=orbit number, T=target (Europa in this case), I=instrument, OOOOOO=science targeting objective, and SS=sequence number. The numbers connected with these bold observation names correlate to the numbers on the index to the left and are listed in order of descending resolution. The 's' and 'c' entries represent spacecraft clock times, which are used as unique archival identifiers for each image; they are listed in the order they were mosaicked.

NORTH POLAR REGION



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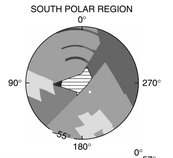

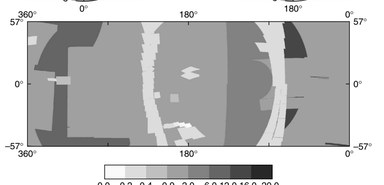

Index showing approximate resolution of images included in the mosaic

NOTE TO USERS

Users noting errors or omissions are urged to indicate them on the map and to forward it to the Astrogeology Team, U.S. Geological Survey, 2255 North Gemini Drive, Flagstaff, Arizona 86001. A replacement copy will be returned.

CONTROLLED PHOTOMOSAIC MAP OF EUROPA

Je 15M CMN

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