DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

Prepared for the
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

ATLAS OF MERCURY
1:5,000,000 TOPOGRAPHIC SERIES
SHAKESPEARE QUADRANGLE
H 5M 45/135 R, 1977
I-1066 (H-3)

NOTES ON BASE

This is one sheet in a series of topographic map sheets covering that part of the surface of Mercury that was illuminated during the Mariner 10 encounters (Davies and Batson, 1975). The source of map data was the Mariner 10 television experiment (Murray, 1975).

ADOPTED FIGURE

The map projections are based on a sphere with a radius of 2,439 km.

PROJECTION

The Lambert conformal conic projection is used for this sheet, with a scale of 1:4,623,000 at lat 22.5°. Latitudes are based on the assumption that the spin axis of Mercury is perpendicular to the plane of the orbit. Longitudes are positive westward in accordance with the usage of the International Astronomical Union (IAU, 1971). Meridians are numbered so that a reference crater named Hun Kal (lat 0.6° S) is centered on long 20° (Murray and others, 1974; Davies and Batson, 1975).

CONTROL

Planimetric control is provided by photogrammetric triangulation using Mariner 10 pictures (Davies and Batson, 1975). Discrepancies between images in the base mosaic and computed control-point positions appear to be less than 2 km. Since the base mosaic was controlled by a later iteration of the control net, discrepancies as large as 20 km are present between the Tolstoj (H-8) and Beethoven (H-7) sheets to the south. These were adjusted during compilation for consistency between the sheets. Similar discrepancies were adjusted along the east edge, joining the Victoria (H-2) quadrangle. In addition to differences between the control nets, pictures along this edge were so foreshortened that precise feature placement was impossible.

MAPPING TECHNIQUES

Mapping techniques are similar to those described by Batson (1973a,b). A mosaic was made with pictures that had been digitally transformed to the Lambert conformal conic projection. Shaded relief was copied from the mosaics and portrayed with uniform illumination with the sun to the west. Many Mariner 10 pictures besides those in the base mosaic were examined to improve the portrayal. The shading is not generalized and may be interpreted with nearly photographic reliability (Inge, 1972, Inge and Bridges, 1976).

Shaded relief analysis and representation were made by P. M. Bridges.

COLOR

The color of the shaded relief was selected for optimum discrimination of detail and is not intended to represent the color of Mercury even approximately.

NOMENCLATURE

All names on this sheet are approved by the International Astronomical Union (IAU, 1977).

H-3: Abbreviation for Mercury (Hermes) sheet number 3.

H 5M 45/135 R: Abbreviation for Mercury (Hermes) 1:5,000,000 series; center of sheet, 45° N. lat, 135° long; shaded relief map, R.

A small part of the H-4 quadrangle is included on this sheet, because insufficient data are available to justify preparation of a separate sheet.

REFERENCES

Batson, R. M., 1973a, Cartographic products from the Mariner 9 mission: Jour. Geophys. Research, v. 78, no. 20, p. 4424-4435.

_____ 1973b, Television cartography: U.S. Geol. Survey open-file report, Astrogeology 58, 35 p.

Davies, M. E., and Batson, R. M., 1975, Surface coordinates and cartography of Mercury: Jour. Geophys. Research, v. 80, no. 17, p. 2417-2430.

Inge, J. L., 1972, Principles of lunar illustration: Aeronaut. Chart and Inf. Center Ref. Pub. RP-72-1, 60 p.

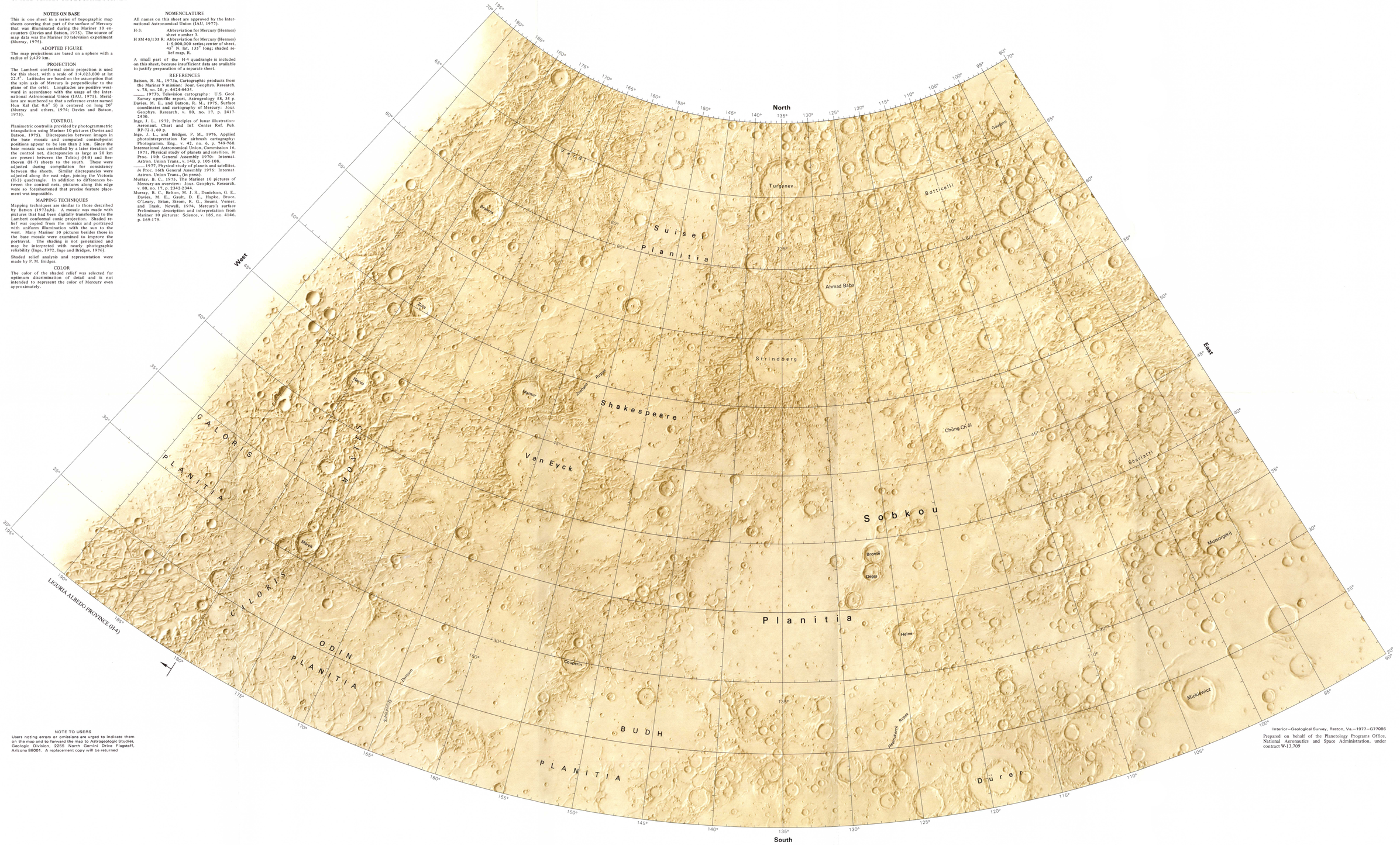
Inge, J. L., and Bridges, P. M., 1976, Applied photointerpretation for airbrush cartography: Photogramm. Eng., v. 42, no. 6, p. 749-760.

International Astronomical Union, Commission 16, 1971, Physical study of planets and satellites, *in* Proc. 14th General Assembly 1970: Internat. Astron. Union Trans., v. 14B, p. 105-108.

_____ 1977, Physical study of planets and satellites, *in* Proc. 16th General Assembly 1976: Internat. Astron. Union Trans., (in press).

Murray, B. C., 1975, The Mariner 10 pictures of Mercury-an overview: Jour. Geophys. Research, v. 80, no. 17, p. 2342-2344.

Murray, B. C., Belton, M. J. S., Danielson, G. E., Davies, M. E., Gault, D. E., Hapke, Bruce, O'Leary, Brian, Strom, R. G., Soumi, Verner, and Trask, Newell, 1974, Mercury's surface Preliminary description and interpretation from Mariner 10 pictures: Science, v. 185, no. 4146, p. 169-179.



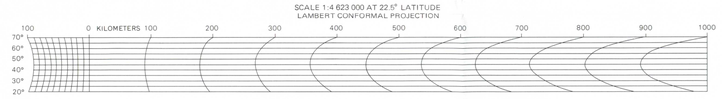
NOTE TO USERS

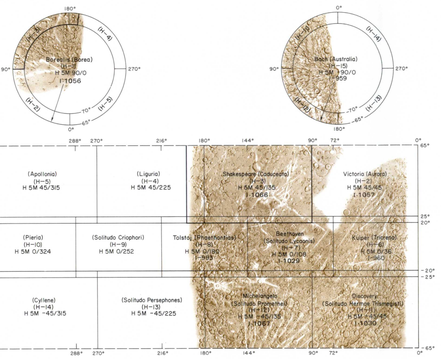
Users noting errors or omissions are urged to indicate them on the map and to forward the map to Astrogeologic Studies, Geologic Division, 2255 North Gemini Drive Flagstaff, Arizona 86001. A replacement copy will be returned

Interior—Geological Survey, Reston, Va.—1977—G77086

Prepared on behalf of the Planetology Programs Office, National Aeronautics and Space Administration, under contract W-13,709

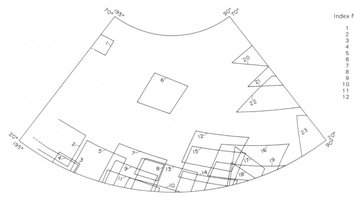
SCALE 1:4 623 000 AT 22.5° LATITUDE
LAMBERT CONFORMAL PROJECTION





ARRANGEMENT OF MAP SHEETS ON MERCURY

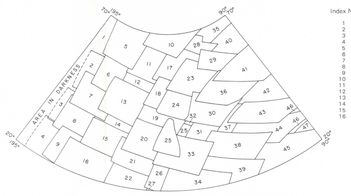
The provisional name "Goethe" was changed to "Borealis," and the provisional name "Tir" was changed to "Tolstoj" by the International Astronomical Union in 1976 (IAU, 1977). The provisional names appeared on earlier editions of this index map as well as on the Tolstoj (H-8) quadrangle of Mercury. The number preceded by I refers to published shaded relief map.



Index No.	FDS No.	Index No.	FDS No.
1	90	13	212
2	199	14	178
3	229	15	177
4	229	16	172
5	191	17	166196
6	159	18	166792
7	216	19	173
8	109	20	144
9	187	21	132
10	213	22	142
11	217	23	166768
12	176		

SUPPLEMENTAL SOURCE INDEX

The Mariner 10 pictures outlined above were used to provide additional detail on the map but were not used on the controlled mosaic.



Index No.	FDS No.	Index No.	FDS No.	Index No.	FDS No.
1	509	17	154	33	181
2	192	18	155	34	204
3	198	19	184	35	152
4	228	20	185	36	146
5	166	21	186	37	143
6	167	22	221	38	168
7	187	23	220	39	169
8	194	24	151	40	148
9	195	25	180	41	145
10	161	26	182	42	133
11	162	27	183	43	134
12	163	28	153	44	135
13	188	29	149	45	371
14	189	30	147	46	275
15	190	31	275	47	511
16	225	32	510		

INDEX TO MARINER 10 PICTURES

The mosaic used to control the positioning of features on this map was made with the Mariner 10 pictures outlined above.

SHADED RELIEF MAP OF THE SHAKESPEARE QUADRANGLE OF MERCURY

(CADUCEATA ALBEDO PROVINCE)

H-3

H 5M 45/135 R

1977

For sale by Branch of Distribution, U.S. Geological Survey, 1200 South Eads Street, Arlington, VA. 22202, and Branch of Distribution, U.S. Geological Survey, Box 25286, Federal Center, Denver, CO 80225.