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
BEETHOVEN QUADRANGLE
H 5M 0/108 R, 1977
I-1029 (H-7)

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 2439 km.

PROJECTION

The Mercator projection is used for this sheet, with a scale of 1:5,000,000 at the equator. Latitudes are based on the assumption that the spin axis of Mercury is perpendicular to the plane of the orbit. Longitudes are positive westwards 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 10 km. No attempt was made to resolve discrepancies in feature positions on this sheet and those on the Kuiper quadrangle to the east, because the Kuiper quadrangle was controlled by an earlier, more preliminary net. Discrepancies as large as 30 km were noted along the southern part of the boundary between these sheets.

MAPPING TECHNIQUES

Mapping techniques are similar to those described by Batson (1973a, 1973b). A mosaic was made with pictures that had been digitally transformed to the Mercator 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 near photographic reliability (Inge, 1972, Inge and Bridges, 1976).

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-7: Abbreviation for Mercury (Hermes) sheet number 7.

H 5M 0/108 R: Abbreviation for Mercury (Hermes) 1:5,000,000 series; center of sheet, 0° latitude, 108° longitude; shaded relief map, R.

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 rept., Astrogeol. 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, Jay L., and Bridges, Patricia M., 1976, Applied photo interpretation for airbrush cartography: Photogram. 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. XIVB, 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., 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.
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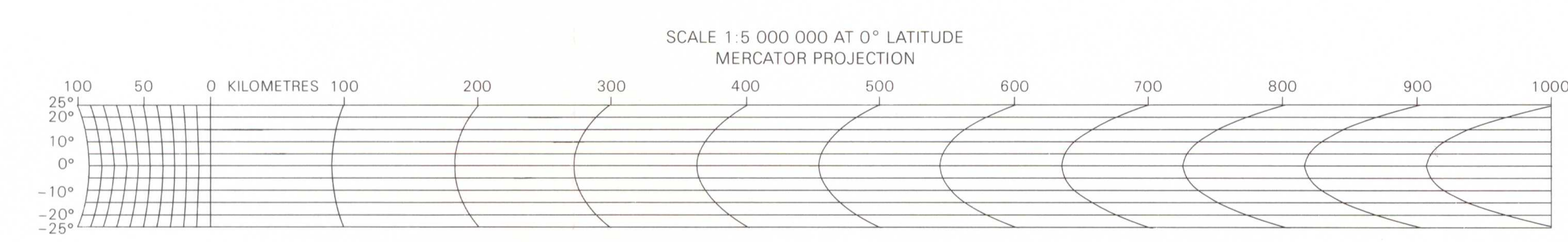
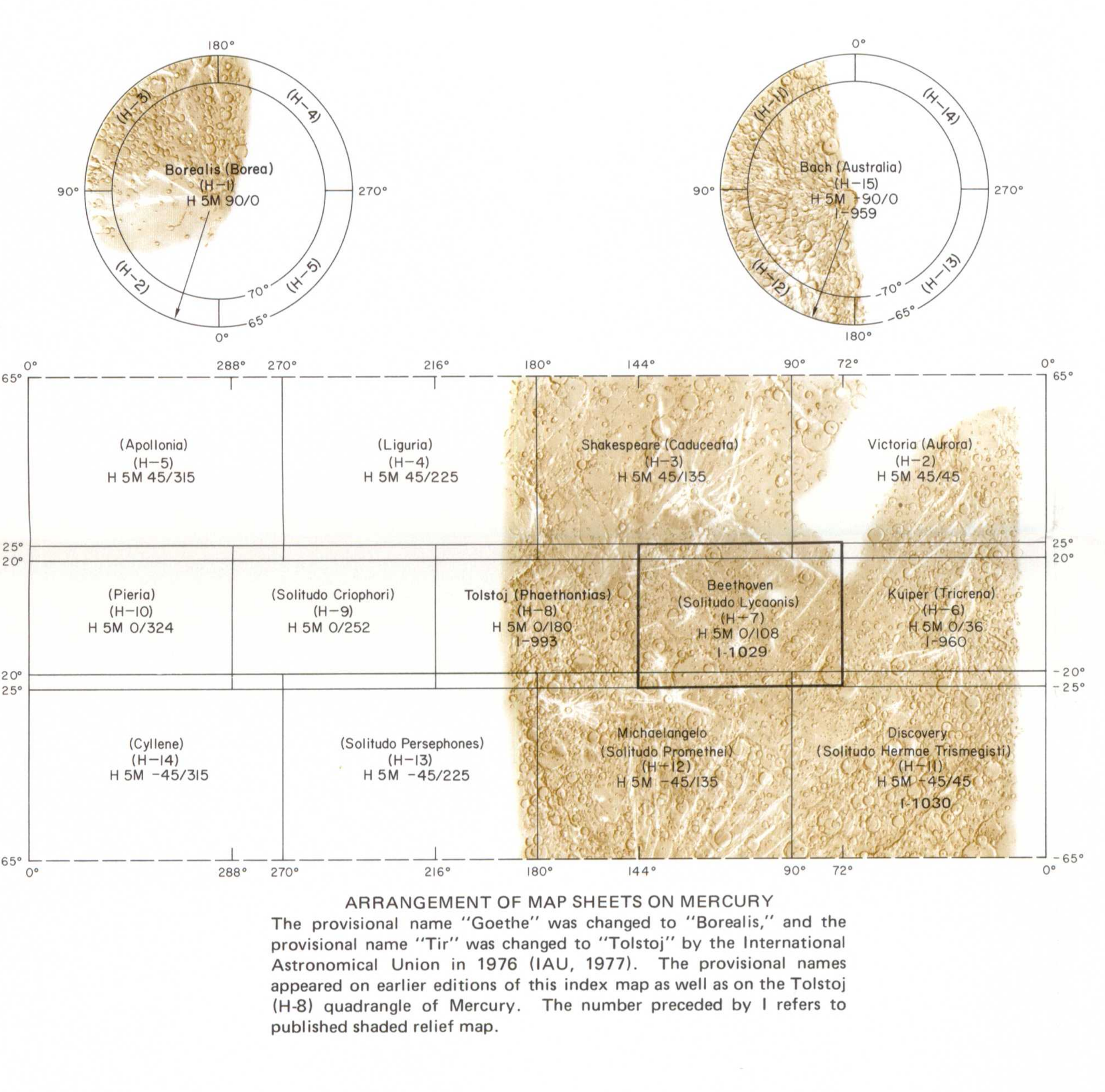
Interior—Geological Survey, Reston, Va.—1977—G76388

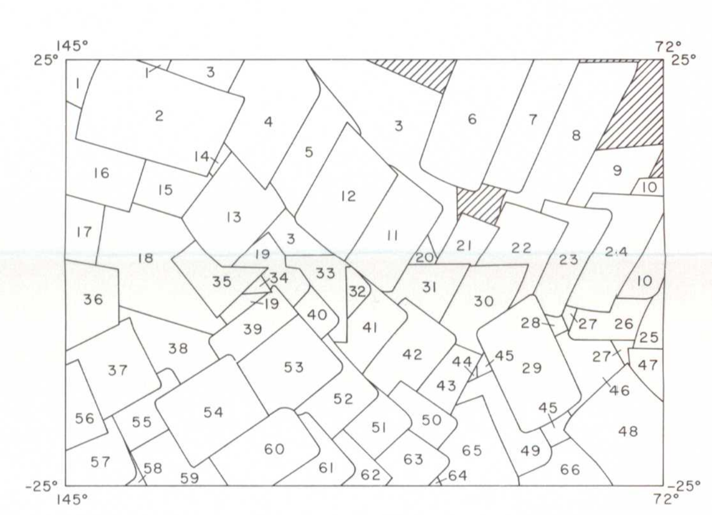
Prepared on behalf of the Planetology Programs Office, National Aeronautics and Space Administration under contract W-13,709





ARRANGEMENT OF MAP SHEETS ON MERCURY

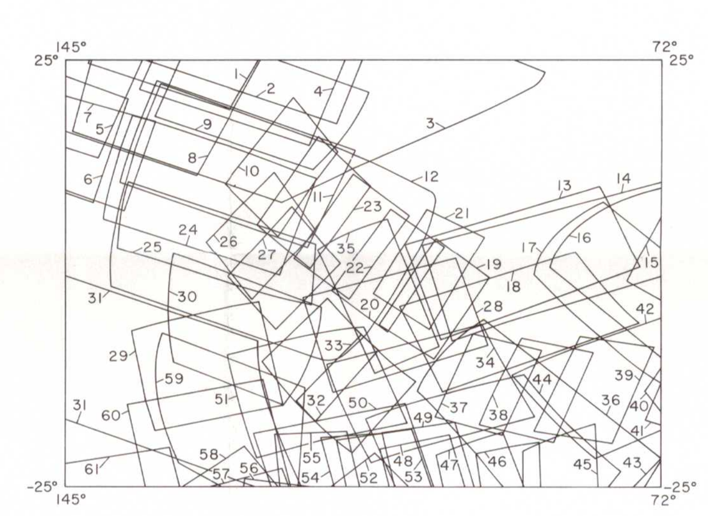
The provisional name "Goethe" was changed to "Borealis," and the provisional name "Tir" was changed to "Tolstoj" by the International Astronomical Union in 1976 (IAU, 1977). The provisional names appeared on earlier editions of this index map as well as on the Tolstoj (H-8) quadrangle of Mercury. The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



Index No.	FDS No.	Index No.	FDS No.	Index No.	FDS No.
1	000182	23	166772	45	166698
2	000178	24	166771	46	166691
3	000508	25	166763	47	166676
4	166786	26	166764	48	166639
5	166785	27	166585	49	166699
6	166768	28	166697	50	166799
7	166767	29	166692	51	166806
8	166766	30	166781	52	166807
9	166765	31	166782	53	166808
10	166770	32	166715	54	166816
11	166783	33	166696	55	166821
12	166784	34	166810	56	166828
13	166798	35	166804	57	166827
14	166792	36	000215	58	166826
15	000179	37	166822	59	166820
16	000183	38	000211	60	166815
17	000214	39	166809	61	166814
18	000210	40	166802	62	166813
19	166803	41	166794	63	166805
20	166694	42	166793	64	166642
21	166774	43	166780	65	166700
22	166773	44	166693	66	166640

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. Cross-hatched areas indicate no photo coverage on the mosaic.



Index No.	FDS No.	Index No.	FDS No.	Index No.	FDS No.
1	000177	23	166790	45	166703
2	000172	24	000209	46	166704
3	000371	25	000205	47	166705
4	000169	26	166797	48	166706
5	000212	27	166796	49	166701
6	000213	28	166877	50	166882
7	000183	29	166889	51	166883
8	000204	30	000206	52	166812
9	000173	31	000247	53	166702
10	166791	32	166801	54	166707
11	000208	33	166800	55	166708
12	000383	34	166876	56	166714
13	166865	35	166695	57	166887
14	166871	36	166586	58	166819
15	166769	37	166779	59	000207
16	166578	38	166778	60	166888
17	166584	39	166777	61	166900
18	166864	40	166638		
19	166787	41	166775		
20	166788	42	166862		
21	166782	43	166655		
22	166789	44	166875		

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.

SHADED RELIEF MAP OF THE BEETHOVEN QUADRANGLE OF MERCURY

(SOLITUDO LYCAONIS ALBEDO PROVINCE)

H-7

H 5M 0/108 R

1977

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