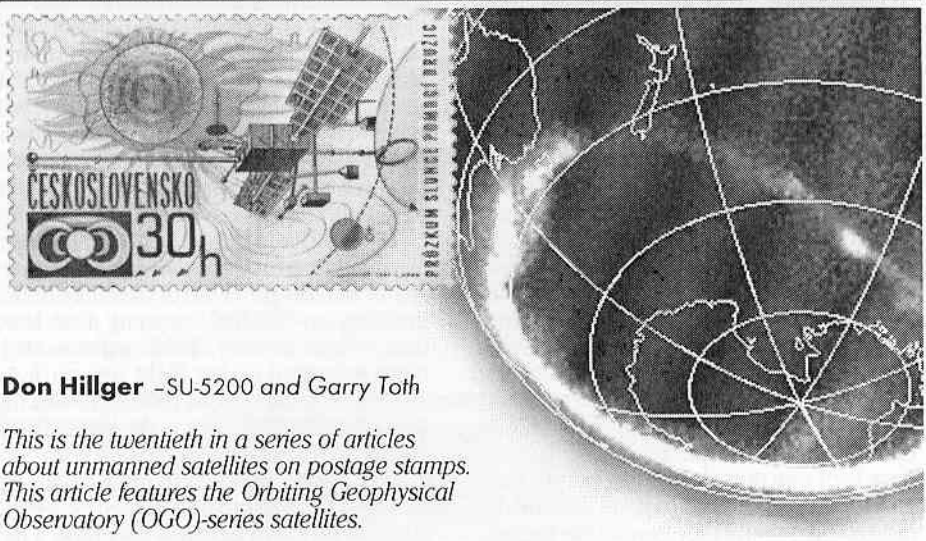
# Unmanned Satellites
## On Postage Stamps



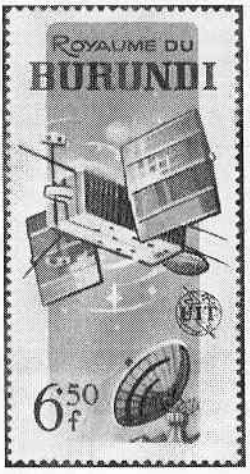

**Don Hillger** -SU-5200 *and Garry Toth*

*This is the twentieth in a series of articles about unmanned satellites on postage stamps. This article features the Orbiting Geophysical Observatory (OGO)-series satellites.*

**Six OGO satellites were launched**, starting with OGO-1 on 5 September 1964, and ending with OGO-6 on 5 June 1969. There were no OGO launch failures.

The OGO satellites were all parallelepiped (box-shaped) in form, with two solar panels and several instrument packages. Three-axis stabilization was intended to keep one side of the spacecraft body pointing towards the earth at all times. However this did not prove possible for all the satellites in the series, and a low-rate spin had to be applied to some of the spacecraft.

Orbital elements such as perigee, apogee, and inclination (to the equator) varied widely among the six satellites. Perigees ranged from about 230 km to 14,000 km, apogees from 900 km to 114,000 km, and inclinations from 31° to 87°, depending on the types of experiments flown and the data that were to be collected.




Some of the instruments were oriented towards the sun, others in the orbital plane, and yet others were attached to booms extending from the spacecraft body. Experiments were for many diversified geophysical studies: energetic particles, geomagnetic and electric fields, plasma waves, interplanetary dust, electromagnetic radiation ranging from very low frequencies to UV and X-rays, atmospheric composition and heating, radio astronomy, aurora and airglow emissions, and ionospheric properties.

*Checklist on following page.*

*Readers are invited to visit the authors' website at:* **http://www.cira.colostate.edu/ramm/hillger/satellites.htm.**

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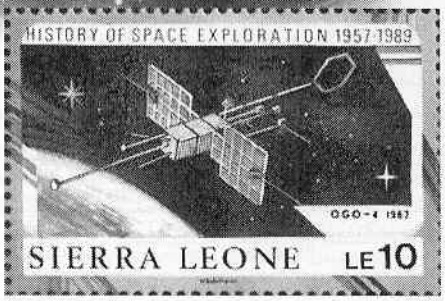
## Orbiting Geophysical Observatory (OGO) Series Satellites

| Country | Catalog Number* | Year of Issue | Notes<br>*OGO-1 thru 6 are basically identical.* |
|---|---|---|---|
| Burundi | 129 | 1965 | |
| Czechoslovakia | 1454 | 1967 | |
| Ghana | 164 | 1964 | |
| | 165 | 1964 | |
| | 166 | 1964 | |
| | 166a | 1964 | Also on margin of imperforate SS-4 |
| | 186 | 1964 | |
| | 186a | 1964 | MS-12 |
| | 187 | 1964 | |
| | 187a | 1964 | MS-12 |
| | 188 | 1964 | |
| | 188a | 1964 | MS-12 |
| Kathiri State of Seiyun (South Arabia) | Mi86A | 1966 | |
| | Mi86B | 1966 | Changed colors on imperforate |
| | Mi89A | 1966 | |
| | Mi89B | 1966 | Changed colors on imperforate |
| | MiA90 | 1967 | |
| | MiB90 | 1967 | Changed colors on imperforate |
| | BLA1A | 1967 | |
| | BLB1A | 1967 | Changed colors on imperforate SS-1 |
| Nigeria | 143a | 1963 | In margin of MS-12 |
| | 144a | 1963 | In margin of MS-12 |
| Panama | C334a | 1965 | In margin of SS-2 (BL36) |
| | iC334a | 1965 | Changed colors on imperforate (BL37) |
| Satellite Beach FL USA | N/A | 1964 | Local set-D-5 (green) |
| | N/A | 1964 | Local set-D-5 (green), overprinted in gold |
| Sierra Leone | 1069i | 1989 | One of MS-9 |
| Togo | 500 | 1964 | |
| | 504 | 1964 | |
| | 505a | 1965 | Imperforate SS-4 |

*Scott catalog number, unless prefixed with Mi or BL for Michel; "i" prefix denotes imperforate version.

**KEY:** SS# = Souvenir Sheet, MS# = Miniature Sheet. *# indicates number of stamps in sheet.*


*Because the six OGO spacecraft were so similar, all but one of the postal items listed in the checklist do not specifically note a satellite number. Only the stamp from Sierra Leone issued in 1989 (Scott 1069a) specifically identifies the satellite (as OGO-4).*