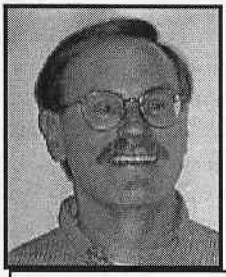
# UN-MANNED SATELLITES ON POSTAGE STAMPS: THE SMS/GOES SERIES

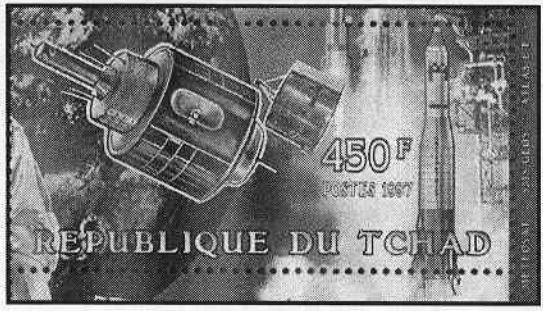
**Don Hillger (SU 5200) and Garry Toth**



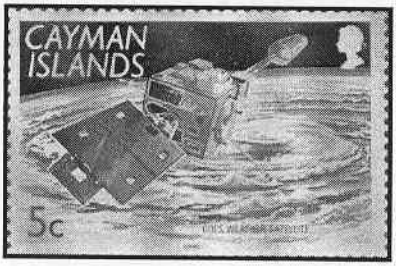
**D. Hillger** **G. Toth**

This is the fifth in a series of articles about un-manned satellites on postage stamps. This article features the satellites in the Synchronous Meteorological Satellite (SMS) and Geostationary Operational Environmental Satellite (GOES) series. SMS-1 was launched on 17 May 1974 and the series continues through GOES-12 launched 23 July 2002. The change in name from SMS to GOES took place after SMS-2, with the launch of GOES-1. Of all the satellites, only GOES-G suffered a launch failure and was destroyed. Several more satellites in the GOES series (GOES-N to GOES-Q) will be launched through 2010, after which the U.S. geostationary satellite series will be redesigned with improved instrumentation.


All SMS/GOES were launched into geosychronous orbits at the required 35,800 km altitude above the equator, where they remain stationary with respect to the earth. This is the preferred orbit for the weather observation role of the SMS/GOES series. Typically two such geostationary satellites are operated by the National Oceanic and Atmospheric Administration (NOAA) at one time: one positioned to view the eastern U.S. and western Atlantic with a sub-satellite point at 90°W over the equator, and the other to view the western U.S. and eastern Pacific with a sub-satellite point at 135°W. These two positions together allow full coverage of the Western Hemisphere as well as large portions of the Atlantic and Pacific Oceans. Full-disk images of the earth can be obtained every half-hour from current GOES, with smaller-area images available every 5 minutes during special Rapid Scan Operations.

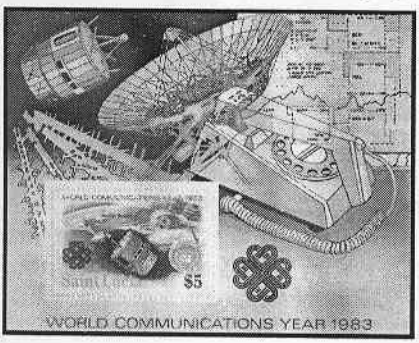


A table listing the complete series with launch dates and images of stamps featuring these satellites is available on the website developed by the authors: http://www.cira.colostate.edu/ramm/hillger/satellites.htm. This article contains an abridged form of the website table, along with images of several SMS-GOES stamps.




SMS/GOES satellites through GOES-7 were cylindrical spin-stabilized spacecraft. Starting with GOES-8 a three-axis stabilized spacecraft design was used. With GOES-N to be launched in 2004, the three-axis design will change slightly with new multi-satellite procurement for continuing the GOES series. On spinning satellites the Earth is viewed during only a small fraction of each spin via a camera that spins with the spacecraft. Images are constructed from successive scan lines as the camera steps to the next line with each spin. In contrast, on a non-spinning craft the imaging cameras have more time available to point at the Earth. This increases the signal, reduces noise in the data, and allows greater spatial and temporal resolution in imagery and data. Current GOES instrumentation includes a 5-spectral-band Imager that collects visible imagery at 1 km resolution and infrared imagery at 4 km resolution (at the Earth's surface). A 19-spectral-band Sounder instrument also takes measurements at 10 km spatial resolution.


In addition to weather images, there are instruments on board GOES for measuring solar X-rays, particles emitted by the sun, and the Earth's magnetic field. These aspects of space environment monitoring are critical to dependable operation of the Earth's telecommunications links and power grid. Other features of GOES include relaying environmental data from collections systems located within the view of the satellite. Search and rescue capabilities for ships and planes are also part of the GOES system.

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**Checklist of Postal Items Showing SMS/GOES**

| Country | Cat. No.* | Type** | Year | Notes*** |
|---|---|---|---|---|
| Angola | 1110c | Part of S/S6 (1110a-f) | 1999 | GOES-D |
| Angola | 1110f | Part of S/S6 (1110a-f) | 1999 | SMM (not SMS)[1] |
| Cayman Isl. | 628 | | 1991 | Three-axis GOES |
| Chad | 708d | Part of S/S6 (708a-f) | 1997 | SMS/GOES[2] (not GEOS) |
| Niger | Unknown | Part of S/S6 (?-?) | 2000? | Three-axis GOES |
| North Osetia | Local | Part of S/S6 | 1997 | Three-axis GOES |
| St. Lucia | 611 | S/S1 | 1983 | SMS/GOES |
| Venezuela | 1426e | Part of S/S5 (1426a-e) | 1989 | Poorly-depicted SMS/ GOES |

**Scott* number, unless indicated with Mi or BL for *Michel*
**S/S# = souvenir sheet, where # = number of stamps in sheet
***SMS/GOES (GOES-1 thru GOES-7) were spin-stabilized spacecraft; three-axis spacecraft started with GOES-8.
[1]Solar Maximum Mission (SMM), not SMS as indicated on the stamp
[2]SMS/GOES, not Geodynamics Earth Observation Satellite (GEOS) as stamp indicates.

## A LOOK INTO HISTORY

**Colin Fries, Historian (SU 4541)**

**55 YEARS AGO - 1948**
Feb. 4 First flight of Douglas D-558-II, No. 1, Dryden Flight Res. Cen., CA
**50 YEARS AG0 - 1950**
Feb. 21 First powered flight of Bell X-1A
**45 YEARS AGO - 1958**
Jan. 4 Sputnik 1 re-entered the Earth's atmosphere (transmitted 21 days)
Jan. 17 Polaris First launched, ESMC
Jan. 31 Explorer 1 launched, 1st U.S. satellite, 10:48 PM, EST, ESMC
**40 YEARS AGO - 1963**
Jan. 4 Mariner 2 ceased transmitting data (launched 8/27/62)
Feb. 9 First flight of Boeing 727, Seattle, WA
Feb. 14 Syncom 1 launched, 12:35 AM, EST, ESMC
**35 YEARS AGO - 1968**
Jan. 7 Surveyor 7 launched, 10:48 PM, EST, ESMC (Moon landing Jan. 9th)
Jan. 22 Apollo 5 launched, 5:48 PM, EST, KSC, unmanned test