UNMANNED SATELLITES ON POSTAGE STAMPS: PART 17 - EXPLORER-RELATED SERIES

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This is the seventeenth in a series of articles about un-manned satellites on postage stamps. This article features scientific/research satellites closely related to the Explorer-series: the Injun, SolRad, GEOS, and ISEE series. These series are related to the Explorer series because some of these satellites had Explorer names and numbers as well. In particular the following satellites were synonymous:

Explorer-25 = Injun-4	**Explorer-40 = Injun-5**
Explorer-29 = GEOS-1	**Explorer-44 = SolRad-10**
Explorer-30 = SolRad-8	**Explorer-52 = Injun-6**
Explorer-36 = GEOS-2	**Explorer-56 = ISEE-1**
Explorer-37 = SolRad-9	**Explorer-59 = ISEE-3 (later renamed ICE)**

Like the Explorer series, there are too many Explorer-related satellites to give details on the individual spacecraft. Rather, this article includes only basic information about the various series.

The Injun series consists of six satellites. Injun was a series of spacecraft designed and built by the University of Iowa to study the natural and artificial trapped radiation belts, auroras and airglow, and other geophysical phenomena. The last three of the series, Injun-4 through Injun-6, were also given Explorer series names and numbers.

Rwanda 130

The SolRad (Solar Radiation) name is generally synonymous with the name Galactic Radiation Energy Background (GREB) or Galactic Radiation And Background (GRAB). The alternative designations were the result of the satellites' dual functions: the SolRad scientific payload was designed to monitor solar radiation, in particular Lyman-alpha and soft X-ray emissions, while the names GREB/GRAB were to hide the fact that these satellites were also the first U.S. electronic intelligence missions. There were many satellites in the SolRad/GREB/GRAB series. Three of them, SolRad-8 thru SolRad-10, were also given Explorer series names and numbers.

The GEOS series includes three satellites. The first two GEOS (Geodetic Earth Orbiting Satellite) were also given Explorer series names and numbers. These satellites were part of the U.S. National Geodetic Satellite Program (NGSP) designed specifically for geodetic studies. For GEOS-3 (not an Explorer satellite) the acronym was changed to Geodynamics Experimental Ocean Satellite. The GEOS-3 mission provided the stepping stone between the NGSP and the Earth and Ocean Application Program, which included a satellite altimetry experiment. The GEOS series covered in this article is the U.S.-series from 1965-1975. There

was also an entirely different series of European GEOS satellites (ESA-GEOS) launched in the 1977-1978 time frame.

Gambia 609

The ISEE (International Sun-Earth Explorer) series includes three satellites, two of which, ISEE-1 and ISEE-3, were given Explorer series names and numbers. Together these satellites were designed to investigate solar-terrestrial relationships, examine the solar wind and plasma sheets, and investigate cosmic rays and solar flare effects in the interplanetary region between the earth and the sun. In addition, ISEE-3 was renamed ICE (International Cometary Explorer) in 1983 when its mission was changed from that of a heliocentric orbit where it studied changes in the near-earth interplanetary medium, to a trajectory intercepting the tail of Comet Giacobini-Zinner to study the interaction between the solar wind and a cometary atmosphere. ICE later encountered Comet Halley in 1986, making it the first spacecraft to directly investigate two comets.

Readers are referred to the authors' Website for reference images of the satellites in the Explorer-related series, as well as images of launch covers and many postal items that feature these satellites. As a complement to this article, a checklist of Explorer-related satellites is presented both here and on the Website developed by the authors: **http://www.cira.colostate.edu/ramm/hillger/satellites.htm**. E-mail correspondence is welcome. Don Hillger can be reached at **hillger@cira.colostate.edu** and Garry Toth at **garry.toth@ec.gc.ca**.

Checklist of Postal Items Showing Explorer-Related Satellites

Country	Catalog #*	Item Type**	Year	Notes on Content
		Injun		
French Southern & Antarctic Terr.	C53		1977/9	Injun-6 / Explorer-52
Rwanda	130		1965	Injun-1[1]
Rwanda	131		1965	Injun-1[1]
Rwanda	132		1965	Injun-1[1]
Rwanda	133		1965	Injun-1[1]
Rwanda	134		1965	Injun-1[1]
Rwanda	135		1965	Injun-1[1]
Rwanda	136	On both stamps of SS2 (136a-b)	1965	Injun-1[1]
		SolRad / GREB / GRAB		
Belgium	None	In margin of cinderella of 2 imperforates	196?	SolRad-1[5]

Belgium	842 maxi	Maxicard	1973	SolRad-1/7[4]
Hungary	C254		1965	SolRad-1/7[4] (not San Marco-1)
Quaiti State (South Arabia)	Mi115-121	On selvedge of each in set of 7 stamps (Mi115-121)	1967	SolRad-1/7[4]
Rwanda	130		1965	SolRad-3[1]
Rwanda	131		1965	SolRad-3[1]
Rwanda	132		1965	SolRad-3[1]
Rwanda	133		1965	SolRad-3[1]
Rwanda	134		1965	SolRad-3[1]
Rwanda	135		1965	SolRad-3[1]
Rwanda	136	On both stamps (SolRad-3) and in margin (SolRad-1) of SS2 (136a-b)	1965	SolRad-3[1], SolRad-1[5]
Satellite Beach FL (U.S.)	Local		19??	SolRad-8
Uruguay	1124		1982	SolRad-1/7[4]

GEOS (U.S.) [6]

Chad	708d	One of SS6 (708a-f)	1997	SMS/GOES[2] (not GEOS)

ISEE / ICE

Ascension	388		1986	ISEE-3 / ICE / Explorer-59
Bolivia	BL146	SS1	1985	ISEE-2 ?
Central Africa Rep.	843		1986	ISEE-3 / ICE / Explorer-59
Chad	708f	One of MS6 (708a-f)	1997	ISEE-1 / Explorer-56, ISEE-23
Equatorial Guinea	BL277(o/p1)	Imperf. SS1 (BL277) first overprint	1977	ISEE-2
Gambia	609		1986	ISEE-3 / ICE / Explorer-59
Hungary	2972		1986	ISEE-3 / ICE / Explorer-59
Malagasy Republic	797		1987	ISEE-3 / ICE / Explorer-59

Malagasy Republic	BL48	SS1 (797)	1987	ISEE-3 / ICE / Explorer-59
Malagasy Republic	Unknown	One of MS6	2000	ISEE-3 / ICE / Explorer-59
Mauritania	619		1986	ISEE-3 / ICE / Explorer-59
Mauritania	619a	SS1 (619)	1986	ISEE-3 / ICE / Explorer-59
Micronesia	344p	One of MS20 (344a-t)	1999	ISEE-3 / ICE / Explorer-59 (not SMM repair)[7]
Micronesia	344q	One of MS20 (344a-t)	1999	SMM repair (not ISEE-3 / ICE / Explorer-59)[7]
Paraguay	C642 label	Label w/ MS9 (5x (C642) + 4 labels)	1986	Poorly-depicted ISEE-3 / ICE / Explorer-59
Poland	2715		1986	ISEE-3 / ICE / Explorer-59

* Scott catalog number, unless indicated with Mi or BL for Michel.

** SS# = souvenir sheet, MS# = miniature sheet, where # = number of stamps in sheet, and the numbers in parentheses are the catalog numbers of the stamps in the sheet.

[1] Three satellites stacked together (Transit-4A, SolRad-3 [GREB-3], and Injun-1).

[2] SMS/GOES (Geostationary Operational Environmental Satellite), not GEOS as indicated on the stamp.

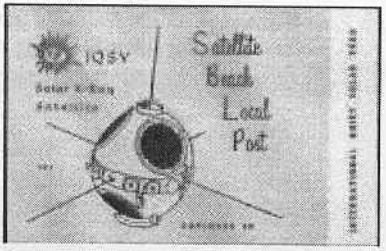
[3] Two satellites stacked together (ISEE-1 / Explorer-56, and ISEE-2).

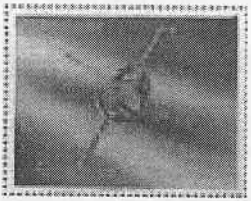
[4] SolRad-1/7 are all basically identical.

[5] Two satellites stacked together (Transit-2A and SolRad-1).

[6] This list includes the U.S.-GEOS series only, not the ESA-GEOS series.

[7] The captions on these two items are transposed: SMM (Solar Maximum Mission) repair, and ISEE-3 / ICE / Explorer-59. ❖





Clockwise from top left:
Central Africa 843
Satellite Beach local (IQSY)
Paraguay C642 label
Hungary C254
Chad 708f