

Un-manned Satellites on Postage Stamps : 26

By Guest Contributors Don Hillger and Garry Toth

The San Marco Series

This is the twenty-sixth in a series of articles about un-manned satellites on postage stamps. This article features the Italian San Marco-series satellites. Five San Marco satellites were successfully launched, starting with San Marco-1 on 15 December 1964, and ending with San Marco-D/L on 25 March 1988. Only San Marco-D/M failed (in 1983). In addition, the San Marco satellites were preceded by two San Marco sub-orbital rockets launched in 1963.

San Marco is not only the name of a series of satellites, but also is the name of a floating launch facility located near the Earth's equator off the coast of Kenya, close to the town of Malindi. The San Marco sub-orbital launches and that of San Marco-1 were from Wallops Island VA, but the remaining San Marcos as well as several other satellites were launched from the San Marco platform. One of those other satellites was Explorer-42/Uhuru, the first American satellite launched by a foreign team. (The Explorer satellites were covered in the 16th article in this series.) The San Marco platform appears on two of the stamps issued by Paraguay in 1966 (*Scott* 962 and 963).

The San Marco satellites were designed to measure air density at orbital altitude, as well as to monitor ionospheric characteristics. San Marco-1 and 2 were spherical in shape, to provide a constant cross section to eliminate the need for satellite attitude control and simplify the determination of atmospheric drag through observations of changes in the satellite's orbit. The satellites had telemetry and command antennas attached to the spherical body.

San Marco-3 and 4 were a bit larger and consisted of two parts: a heavier internal structure and a lighter outer shell. A series of flexible arms connected the two parts. Stresses in the flexible arms caused by atmospheric drag were used to determine the air density at orbital altitude. These San Marcos employed an attitude control system and a spin rate control system, and were powered by rows of solar panels mounted equatorially on the inner core.

According to available documentation, the first four San Marco satellites had black and white longitudinal sections painted on their surface for thermal control. However these stripes are often not reproduced on postal items showing the satellites. Moreover, in cases where the stripes are shown, they are red and white (see the stamps from Ajman, Manama, Micronesia, and Poland) rather than black and white.

The non-striped images of the satellites on the

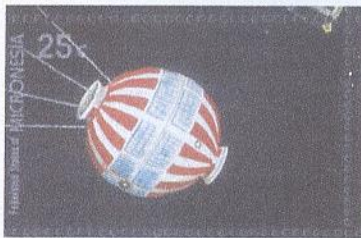
Ecuador, Panama, and Paraguay stamps have an appearance that is more like that of Vanguard-2, and include a launch attachment that is reminiscent of some of the Vanguard-1 images seen on stamps. This common, but likely incorrect, image of San Marco-1 on all these items may be the result of the same designer working on them. Another possibility is that multiple designers may have been influenced by an incorrect reference image of the satellite in their stamp designs, or the incorrect image propagated from one stamp to another.

The final satellite in the series, San Marco-5 (D/L), was about 1 m in diameter with wider rows of equatorially-mounted solar panels, and no stripes. This was the last satellite launched from the San Marco platform. This satellite appears on only two stamps, one issued by Comoro Islands and the other by Italy.

A checklist of postal items showing San Marco-series satellites (<http://www.cira.colostate.edu/ramm/hillger/SanMarco.htm>) is available on the Website developed by the authors for the un-manned satellites featured in this series of articles (<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@hotmail.com.



A version of this article first appeared in *The Astrophile* for March/April 2007



Country	Catalog Number*	Type of Item**	Year of Issue	Notes on Content
Ajman	Mi266		1968	San Marco-1/2 ¹
Comoro Islands	281 (BL107)	SS1	1977	San Marco-D/L
Ecuador	756 (Mi1283) 756A (Mi1284) 756B (Mi1285)	On selvedge in black	1966	San Marco-1 ²
Ecuador	756 (Mi1283) 756A (Mi1284) 756B (Mi1285)	On selvedge in red	1966	San Marco-1 ²
Ecuador	757 (Mi1292)	On stamp and on selvedge in black	1966	San Marco-1 ²
Ecuador	757A (Mi1293)	On stamp and on selvedge in black	1966	San Marco-1 ²
Ecuador	757B (Mi1294)	Only on selvedge in black	1966	San Marco-1 ²
Ecuador	757c (BL31) i757c (BL32)	MS3 (757-757B), changed colors on imperforate	1966	San Marco-1 ²
Ecuador	758 (Mi1301) 758A (Mi1302) 758B (Mi1303) 758C (Mi1304) 758D (Mi1305) 758E (Mi1306)	Only on selvedge in black	1966	San Marco-1 ²
Hungary	C254 (Mi2195)		1965	SolRad-1/7 (not San Marco-1) ³
Italy	1189 (Mi1492)		1975	San Marco-D/L
Manama	Mi96A Mi96B		1968	San Marco-1/2 ¹
Micronesia	81g (Mi138)	One of MS9 (81a-i)	1989	San Marco-3/4 ¹
Panama	469 (Mi893) i469 (Mi898)	Changed colors on imperforate	1966	San Marco-1 launch
	469A (Mi894)			
Panama	i469A (Mi899)	Changed colors on imperforate	1966	San Marco-1 ²
Panama	469B (Mi895) i469B (Mi900)	Changed colors on imperforate	1966	San Marco name
Panama	469D (Mi897) i469D (Mi902)	Changed colors on imperforate	1966	San Marco-1 ²
Panama	469e (BL53)	MS2 (469C-469D)	1966	San Marco-1 ²
Panama	C365b (Mi1138)	One of MS6 (C365a-f) and on selvedge	1969	San Marco-2 ²
Paraguay	959 (Mi1591) i959 (Mi1599)	On stamp and on selvedge, changed colors on imperforate	1966	San Marco-1 ²
Paraguay	961 (Mi1593) i961 (Mi1601)	On selvedge only	1966	San Marco-1 ² , also San Marco platform ⁴
Paraguay	962 (Mi1594) i962 (Mi1602)	On stamp and on selvedge, changed colors on imperforate	1966	San Marco-1 ² , also San Marco platform ⁴
Paraguay	963 (Mi1595) i963 (Mi1603)	On stamp and on selvedge, changed colors on imperforate	1966	San Marco-1 ² , also San Marco platform ⁴
Paraguay	966 (Mi1598) i966 (Mi1606)	On stamp and on selvedge, changed colors on imperforate	1966	San Marco-1 ²
Paraguay	966a (BL87) i966a (BL88)	SS1, changed colors on imperforate	1966	San Marco-1 ²
Paraguay	966a muestra (BL87 muestra) i966a muestra (BL88 muestra)	SS1 overprinted "MUESTRA", changed colors on imperforate	1966	San Marco-1 ²
Poland	1472 (Mi1736)		1966	San Marco-1/2 ¹
Yugoslavia	1045 (Mi1409)		1971	San Marco-1/2