

Un-manned Satellites on Postage Stamps

36 – The Echo series

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This is the thirty-sixth in a series of articles about un-manned satellites on postage stamps. This article features the satellites in the U.S. Echo series. The first Echo attempt was a launch failure on May 13, 1960, followed by the successful launch of Echo-1A on August 12, 1960. The last one, Echo-2, was launched on January 25, 1964.

The Echo satellites were simply large spherical balloons. They were inflated automatically in space by the vaporization of benzoic acid contained within them. The Echo satellites were the first civilian telecommunications satellites. They merely reflected back toward Earth the electromagnetic signals striking their surface.

Echo-1A was designed to be a passive communications reflector for intercontinental and transcontinental telephone (voice), radio, and television signals. The 30 meter diameter balloon was made of very thin (0.0127 mm) mylar polyester film and had a mass of only 76 kg. Echo-1A carried a beacon transmitter for telemetry purposes, powered

by nickel-cadmium batteries charged by solar cells mounted on the balloon. As a result of the large size and low mass of the satellite, measurements of the changes of its orbit with time were also used to determine atmospheric density and solar pressure at its orbital altitude. Thus, a secondary goal of this satellite was scientific in nature.

Echo-2 was a larger, 41 meter diameter, balloon of aluminum foil-mylar laminate. It was used to test propagation, tracking, and passive communications techniques. Like Echo-1A, a beacon telemetry system provided a signal for tracking, and also relayed the internal pressure of the balloon. The inflation pressures were small compared



An integral part of the Echo system was the installation of a horn antenna in Holmdel, NJ by Bell Laboratories, the size of which can be gauged by the operator's shack on the left side of the cachet. The cover is cancelled at Patrick AFB on the day of Echo 1-A's successful launch.

A checklist of postal items identified as showing Echo-series satellites is available as part of the website developed by the authors to accompany this series of articles at: <http://rammb.cira.colostate.edu/dev/hillger/satellites.htm>
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to those on Earth, but were large compared to the relative vacuum of space.

Before the Echo-1A launch, five sub-orbital Shotput launches were used to test Echo concepts. Similarly, before the orbital flight of Echo-2, two sub-orbital tests called Big Shot took place. However, Big Shot-1 failed due to the balloon rupturing during inflation.

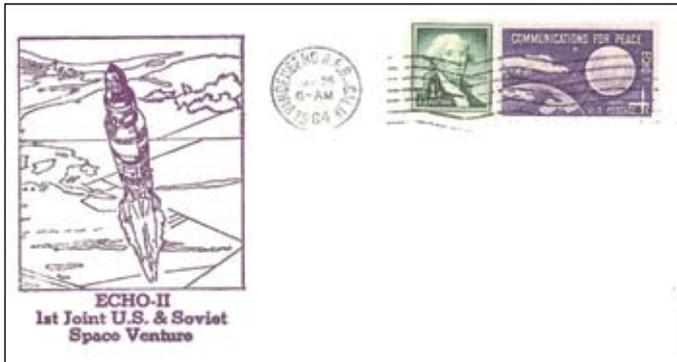
Because of the "first" nature of the Echo satellites, a large number of postal items show one or the other of these spacecraft. On most of the stamps, either Echo-1, or Echo-2, or both Echo satellites are specifically identified. 🌍

Top: A Space Craft launch cover calls the Echo II satellite a "Mirror in the Sky", an apt description as it could be spotted by ground observers without any visual aids required.

Second: This Velvetone cover dated January 25, 1964, features William Sullivan, the inventor of the silver mylar balloon. Note that an Echo stamp was used for postage.

Third: A Harry Gordon cover highlights the fact that the Echo II launch was a polar orbiting satellite, which is why the Soviets participated in the experiment.

Bottom: An unidentified cover features a rubber stamp cachet of the Thor Agena B booster. All four of these covers were cancelled at Vandenberg AFB on the day of the launch.



Postage Stamps featuring the Echo I and II Satellite



The Echo I and II Checklist is on the following page.

Checklist of Echo Satellite Postal Stamps and First Day Covers

Country	Catalog No.	Type of Item	Issued	Notes
Batum	Local_b	One of MS6 (a-f), also imperforate MS6 (a-f)	1997	Echo-1
Batum	Local_b o/p	One of MS6 (a-f) overprinted in gold	1998	Echo-1
Dominica	2238b (Mi2897)	One of MS6 (2238 (a-f))	2000	Echo-1
Ecuador	748D (Mi1194)		1966	Echo-2
Ecuador	748f (BL14)	MS3 (748+748B+748D)		
Kazakhstan	291A (Mi294)		2000	Echo
Kazakhstan	295 (Mi295)			
Kazakhstan	297 (Mi296)			
Monaco	606 (Mi799)		1965	Echo-2
Monaco	606 fdc	Stamp and cachet on FDC		
Monaco	605-610 fdc	One of six stamps on FDC		
Mongolia	367 (Mi371)		1964	Echo-2 launch
Panama	C351 (Mi902)			
Panama	iC351 (Mi?)	Changed colors on imperforate	1966	Echo-2
Panama	C352 (BL54)			
Panama	iC352 (BL?)	SS1, changed colors on imperforate		
Paraguay	832 (Mi1340)		1964	Echo-2
Paraguay	831-832 fdc	One of two stamps on FDC		
Paraguay	898 (Mi1474)		1965	Echo-2
Paraguay	900 (Mi1476)			
Paraguay	900a (BL73)			
Paraguay	i900a (BL74)	On one of MS2 (899-900)		
Paraguay	900a muestra			
Paraguay	i900a muestra	On one of MS2 (899-900) overprinted "muestra"		
Paraguay	994 (Mi1650)		1966	Echo-1, Echo-2
Paraguay	1001 (Mi1657)			
Paraguay	1001a (BL93)	SS1 (1001)		
Paraguay	1127 (Mi1866)		1968	Echo-1 re-entry
Paraguay	1134 (Mi1873)			Echo-1
Paraguay	1134a (BL115)	Imperforate MS3 (1126-1127+1134)		
Qatar	64 (Mi67)	Changed colors on imperforate	1965	Echo-2
Qatar	67 (Mi70)	Changed colors on imperforate		
Qatar	68a (BL2)	On one of MS2 (67-68)		
Qatar	94 (Mi97A)	64 overprinted in black	1966	Echo-2
Qatar	97 (Mi100A)	67 overprinted in black		
Qatar	98a (BL3a)	On one of MS2 (97-98), 68a overprinted in black		
Qatar	94 var (Mi97B)	64 overprinted in red	1966	Echo-2
Qatar	97 var (Mi100B)	67 overprinted in red		
Qatar	98a var (BL3b)	On one of MS2 (97-98), 68a overprinted in red		
Qatar	114C (Mi198)	64 surcharged new currency in black/red	1966	Echo-2
Qatar	114F (Mi201)	67 surcharged new currency in black/red		
Qatar	117C (Mi228)	94 surcharged new currency	1966	Echo-2
Satellite Beach	Local	Set-D01 (green)	1964	Echo
Satellite Beach	Local o/p	Set-D01 (green) overprinted in gold	1965	Echo
United Nations	112-113 fdc	(Orbit) cachet on FDC	1962	Echo; also
United Nations	(Mi122-123 fdc)			U.S. 1173
United States	1173 (Mi803)		1960	Echo-1
United States	1173 fdc1	Stamp and (ArtCraft) cachet on FDC		
United States	1173 fdc2	Stamp and (rubber-stamp?) cachet on FDC		
United States	1173 fdc3	Stamp and (ATA Space Unit) cachet on FDC (first day of issue)		
United States	1173 fdc4	Stamp and (ATA Space Unit) cachet on FDC (first day of sale)		
United States	1173 fdc5	Stamp and (Bell Labs) cachet on FDC		Also Echo-1 re-entry
United States	1173 fdc6	Stamp and (Artmaster) cachet on FDC		Also 50th anniv. Echo-1 launch
United States	None	Cachet on 30th anniv. TIROS-1 launch cover	1990	Echo
Uruguay	C422 (BL29)	In (lower-left) margin of MS3 (C422 [a-c])	1976	Echo-1
Uruguay	C423 (BL30)	In (lower-right) margin of MS3 (C423 [a-c])		

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

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