

Un-manned Satellites on Postage Stamps : 36

By Guest Contributors Don Hillger and Garry Toth

The Echo Series

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 13 May 1960, followed by the successful launch of Echo-1A on 12 August 1960. The last one, Echo-2, was launched on 25 January 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.

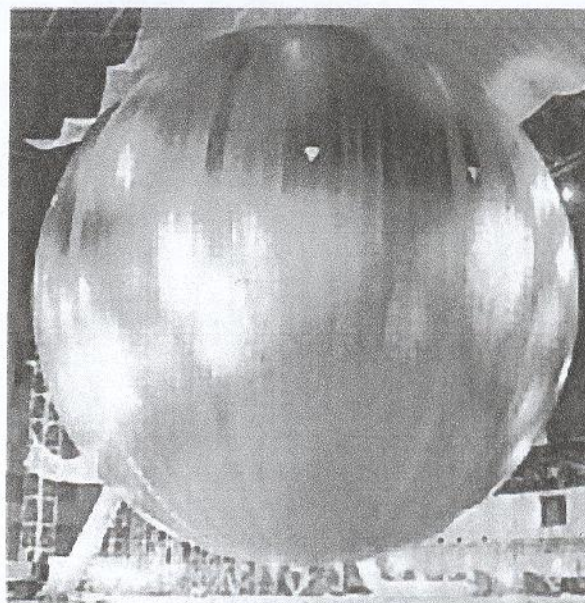
Echo-1A was designed to be a passive communications reflector for intercontinental and transcontinental telephone (voice), radio, and television signals. The 30 m diameter balloon was made of very thin (0.0127 mm) mylar polyester film and had a mass of only 76 kg. Echo-1A carried a beacon transmitter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

A checklist of postal items identified as showing Echo-series satellites (<http://rammb.cira.colostate.edu/dev/hillger/Echo.htm>) - most of which is reprinted opposite—is available



NASA photo taken from Encyclopaedia Astronautica site.

as part of the Website developed by the authors to accompany this series of articles (<http://rammb.cira.colostate.edu/dev/hillger/satellites.htm>).

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Country	Catalog Number*	Type of Item**	Year of Issue	Notes on Content
Echo				
Batum	Local b Local ib	One of MS6 (a-f) One of 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) iC351 (Mi?)	Changed colors on imperforate	1966	Echo-2
Panama	C352 (BL54) 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	895-899 fdc	One of five stamps on FDC		
Paraguay	900 (Mi1476)			
Paraguay	900-902 fdc	One of three stamps on FDC		
Paraguay	900a (BL73) i900a (BL74)	On one of MS2 (899-900) Changed colors on imperforate		
Paraguay	900a muestra i900a muestra	On one of MS2 (899-900) overprinted "muestra" Changed colors on imperforate		
Paraguay	994 (Mi1650)		1966	Echo-1, Echo-2
Paraguay	1001 (Mi1657)			
Paraguay	1001a (BL93) i1001a	SS1 (1001) Changed colors on imperforate		
Paraguay	1001a muestra i1001a muestra	SS1 (1001) overprinted "muestra" Changed colors on imperforate		
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 FL (U.S.)	Local	Set-D01 (green)	1964	Echo
Satellite Beach FL (U.S.)	Local o/p	Set-D01 (green) overprinted in gold	1965	Echo
United Nations	112-113 fdc (Mi122-123 fdc)	(Orbit) cachet on FDC	1962	Echo; also U.S. 1173
United States	1173 (Mi803)			
United States	1173 fdc!	Stamp and (ArtCraft) cachet on FDC		