

**GOVERNMENT OF INDIA
SPACE
LOK SABHA**

UNSTARRED QUESTION NO:3430
ANSWERED ON:16.03.2011
SATELLITES LAUNCHED BY ISRO
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Will the Minister of SPACE be pleased to state:

- (a) the names of the satellites launched by the Indian Space Research Organisation (ISRO) since its inception;
- (b) the details of the satellites which are still active;
- (c) the details of the satellites which were lost/destroyed/aborted due to launch failures etc., since the inception of ISRO alongwith the reasons therefor;
- (d) the details of the transponders available in terms of numbers and capacity on satellites that are launched and managed by ISRO;
- (e) the number of transponders on all these satellites that have been sold/leased/rented to the Government and private entities; and
- (f) the rent/royalty/lease charges/sale proceed dues ISRO get from each transponder on each and every satellite from the entity it has been given to?

Answer

MINISTER OF STATE IN THE MINISTRIES OF PARLIAMENTARY AFFAIRS, PERSONNEL, PUBLIC GRIEVANCES & PENSIONS
AND IN PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY):

- (a) Following satellites were launched by Indian Space Research Organisation (ISRO) since its inception:

S1 No. Satellite

- 1 Aryabhata
- 2 Bhaskara-I
- 3 Rohini Technology Payload (RTP)
- 4 Rohini (RS-1)
- 5 Rohini (RS-D1)
- 6 Ariane Passenger Payload Experiment (APPLE)
- 7 Bhaskara-II
- 8 INSAT-1A
- 9 Rohini (RS-D2)
- 10 INSAT-1B
- 11 Stretched Rohini Satellite Series (SROSS-1)
- 12 IRS-1A
- 13 Stretched Rohini Satellite Series (SROSS-2)
- 14 INSAT-1C
- 15 INSAT-1D
- 16 IRS-1B
- 17 Stretched Rohini Satellite Series (SROSS-C)
- 18 INSAT-2A
- 19 INSAT-2B
- 20 IRS-1E
- 21 Stretched Rohini Satellite Series (SROSS-C2)
- 22 IRS-P2
- 23 INSAT-2C
- 24 IRS-1C
- 25 IRS-P3
- 26 INSAT-2D
- 27 IRS-1D
- 28 INSAT-2DT
- 29 INSAT-2E
- 30 Oceansat (IRS-P4)
- 31 INSAT-3B
- 32 GSAT-1
- 33 Technology Expt Satellite (TES)
- 34 INSAT-3C
- 35 KALPANA-1 (METSAT)

- 36 GSAT-2
- 37 INSAT-3E
- 38 INSAT-3A
- 39 Resourcesat-1 (IRS-P6)
- 40 EDUSAT (GSAT-3)
- 41 CARTOSAT-1
- 42 HAMSAT
- 43 INSAT-4A
- 44 INSAT-4C
- 45 INSAT-4CR
- 46 SRE - 1
- 47 CARTOSAT - 2
- 48 INSAT-4B
- 49 IMS-1
- 50 CARTOSAT - 2A
- 51 Chandrayaan-1
- 52 RISAT-2
- 53 ANUSAT
- 54 Oceansat-2
- 55 GSAT-4
- 56 CARTOSAT-2B
- 57 STUDSAT
- 58 GSAT-5P

(b) The following satellites are still active:

(i) Geostationary Satellites

S1 No Name of the Satellite

- 1 INSAT-2E
- 2 INSAT-3C
- 3 KALPANA-1 (METSAT)
- 4 GSAT-2
- 5 INSAT-3E
- 6 INSAT-3A
- 7 INSAT-4A
- 8 INSAT-4CR
- 9 INSAT-4B

(ii) Low Earth Orbiting - Earth Observation Satellites

S1 No Name of the Satellite

- 1 TES
- 2 RESOURCESAT-1
- 3 CARTOSAT-1
- 4 CARTOSAT-2
- 5 CARTOSAT-2A
- 6 IMS-1
- 7 RISAT-2
- 8 OCEANSAT
- 9 CARTOSAT-2B

(c) The following satellites were lost/destroyed/aborted due to launch failure etc., since inception of ISRO.

S1 No. Satellite Name Period of operations and reasons for lost/destroyed/aborted

1. RTP Launch failure of SLV-3
2. SROSS-1 Launch failure of ASLV
3. SROSS-2 Launch failure of ASLV
4. IRS-1E Launch failure of first developmental flight of PSLV.
5. INSAT-4C Launch Failure of GSLV-F02
6. GSAT-4 Launch Failure of GSLV-D3
- 7 GSAT-5P Launch Failure of GSLV-F06

(d) The transponders available in terms of numbers along with their capacity, satellite-wise, are as follows:

S1 No Name of the Satellite No. of Transponders, which are currently operational

1 INSAT-2E 19
 2 INSAT-3C 33
 4 GSAT-2 9
 5 INSAT-3E 25
 6 INSAT-3A 24
 7 INSAT-4A 24
 8 INSAT-4CR 12
 9 INSAT-4B 14
 Total 160

ISRO does not manage satellites other than those made by it.

(e) The number of transponders on all these satellites that have been sold/leased/rented to Government and Private entities are:

Government Users 57.42 Transponders
 Private Users 68.86 Transponders
 Sub-total 126.28
 Other Applications
 (Free - DD&AIR/Societal/ISRO etc) 33.72 Transponders
 Total: 160.00 Transponders

(f) The present price structure for various services are as follows:

TV customers

Bandwidth Lease rate/yr Equivalent rate for full
 transponder (36 MHz)

4.5 MHz ` 60 lakhs/year ` 480 lakhs/year
 9.0 MHz ` 115 lakhs/year ` 460 lakhs/year
 18.0 MHz ` 220 lakhs/year ` 440 lakhs/year
 36.0 MHz ` 400 lakhs/year ` 400 lakhs/year

DTH Customers

Number of Lease rate/transponder/ Equivalent rate for full
 transponders year transponder (36 MHz)

Upto 6 ` 475 lakhs/year ` 475 lakhs/year
 7-12 ` 460 lakhs/year ` 460 lakhs/year
 13-18 ` 450 lakhs/year ` 450 lakhs/year
 More than 18 ` 440 lakhs/year ` 440 lakhs/year

DSNG Customers:

Satellite Cost/Mhz per year Equivalent rate for full
 transponder (36 MHz)

INSAT-3B (45 dBW) ` 12 lakhs/MHz/year ` 432 lakhs/year
 INSAT-3A (48 dBW) ` 13.2 lakhs/MHz/year ` 475 lakhs/year
 INSAT-4 series (52 dBW) ` 14.4 lakhs/MHz/year ` 518 lakhs/year

VSAT Extended C-band Customers:

Extended C-band bandwidth Cost/MHz per year Equivalent rate for full
(including NOCC charges) transponder (36 MHz)

| | | |
|------------------|----------------------|------------------|
| 0-9 to 18 MHz | ` 10 lakhs/MHz/year | ` 360 lakhs/year |
| 9.1 to 18 MHz | ` 8.7 lakhs/MHz/year | ` 313 lakhs/year |
| 18.1 to 27 MHz | ` 7.7 lakhs/MHz/year | ` 295 lakhs/year |
| 27.1 to 35.9 MHz | ` 7.4 lakhs/MHz/year | ` 277 lakhs/year |
| 36.0 to 72 MHz | ` 7.4 lakhs/MHz/year | ` 266 lakhs/year |
| Over 72 MHz | ` 7.2 lakhs/MHz/year | ` 259 lakhs/year |

VSAT Ku-band Customers

Ku-band bandwidth Cost/MHz per year Equivalent rate for
on INSAT-3B (including NOCC full transponder
(72 MHz per charges for INSAT-3B) (72 MHz)
transponder)

| | | |
|--------------------|-----------------------|----------------------|
| 0 to 4.5 MHz | ` 9.36 lakhs/MHz/year | ` 673 lakhs per year |
| 4.6 to 18 MHz | ` 7.04 lakhs/MHz/year | ` 506 lakhs per year |
| 18.1 to 35.9 MHz | ` 6.28 lakhs/MHz/year | ` 452 lakhs per year |
| 36 MHz | ` 6.11 lakhs/MHz/year | ` 439 lakhs per year |
| 36.1 MHz and above | Service not available | N/A |

Ku-band bandwidth Cost/MHz per year Equivalent rate for
on INSAT-3A (including NOCC full transponder
charges for INSAT-3A) (36 MHz)

| | | |
|---------------------------|-----------------------|----------------------|
| 0 to 4.5 MHz | ` 10.8 lakhs/MHz/year | ` 388 lakhs per year |
| 4.6 to 18 MHz | ` 10.2 lakhs/MHz/year | ` 367 lakhs per year |
| 18.1 to 35.9 MHz | ` 9.6 lakhs/MHz/year | ` 345 lakhs per year |
| 36 MHz (full transponder) | ` 9.0 lakhs/MHz/year | ` 324 lakhs per year |
| 36.1 to 72 MHz | ` 8.4 lakhs/MHz/year | ` 302 lakhs per year |
| Over 72 MHz | ` 7.8 lakhs/MHz/year | ` 280 lakhs per year |

Ku-band bandwidth Cost/MHz per year Equivalent rate for
on INSAT-4 series() (including NOCC full transponder
charges for INSAT-4series) (36 MHz)

| | | |
|---------------------------|-------------------------|----------------------|
| 0 to 4.5 MHz | ` 14.4 lakhs/MHz/ year | ` 518 lakhs per year |
| 4.6 to 18 MHz | ` 14.16 lakhs/MHz/ year | ` 509 lakhs per year |
| 18.1 to 35.9 MHz | ` 14.04 lakhs/MHz/ year | ` 505 lakhs per year |
| 36 MHz (full transponder) | ` 13.92 lakhs/MHz/ year | ` 501 lakhs per year |
| 36.1 to 72 MHz | ` 12.6 lakhs/MHz/year | ` 453 lakhs per year |
| Over 72 MHz | ` 11.4 lakhs/MHz/ year | ` 410 lakhs per year |

() Ku-band VSAT services in INSAT-4 series is yet to start

Occasional usage.

Occasional use Cost/MHz per day Equivalent rate for
bandwidth full transponder (36 MHz)

C-band ` 3000/MHz ` 394 lakhs per year
Ku-band ` 4000/MHz ` 525 lakhs per year

For the year 2009-10, the revenue earned by ISRO by leasing transponders is ` 502.56 Crores.