REQUEST FOR PROPOSAL

FOR

IRDCN REMOTE NODES

November – 2024

ISRO TELEMETRY TRACKING AND COMMAND NETWORK (ISTRAC)
INDIAN SPACE RESEARCH ORGANISATION
BANGALORE

1. SCOPE:

1.1 Identification

a) This document presents the Request for Proposal (RFP) for AMC of IRNSS Data communication Network (IRDCN) **15** remote nodes having 16 SCPC based VSAT (IRIMS/IRCDR/IRSCF) point to point links on GSAT-18 connected from remote nodes to HUB located at INC-1, Byalalu.

b) In addition to above, **4** remote nodes (two from Port Blair & two from Kavaratti) having 4 SCPC based VSAT point to point links on CMS-01 connected to INC-1 Hub at Byalalu & INC-2 Hub at Lucknow.

c) In addition to above, 15 remote nodes having 16 SCPC based VSAT (IRIMS/IRCDR/IRSCF) point to point links on GSAT-16 connected from remote nodes to HUB located at INC-2, Lucknow.

d) Total Number of Node under AMC : 34 Numbers

1.2 Introduction:

The IRNSS Data communication Network (IRDCN) is an element of Ground segment that provides the required digital communication backbone to IRNSS network. The IRDCN network connects:

a) IRNSS Range and Integrity Monitoring stations (IRIMS) to IRNSS Navigation Centre (INC-1 & INC-2)

b) Provides the IRIMS+ IRNSS CDMA Ranging Stations (IRCDR) data from remote IRCDR stations to INC-1& INC-2

c) IRNSS Satellite Control Facility (IRSCF) stations to INC-1 & INC-2

d) Island backup links from PBR & Kavaratti to INC1 & INC2

1.3 List of Nodes with Link details

SNo	Current Satellite	Station Name	Data Rate supported (kbps)		
			Existing	Enhancement	No.of Nodes
		Remote VSATs to HUB: INC1 Network			
1.	GSAT#18	INC-1 Hub, Bangalore		Requirement-based	15
2.		MCF, Bhopal (IRIMS+IRCDR)	630		
3.		MCF, Hassan (IRIMS+IRCDR)	630		
4.		Shillong (IRIMS+IRCDR)	630		
5.		Jodhpur (IRIMS+IRCDR)	630		
6.		Port-Blair (IRIMS+IRCDR)	630		
7.		Kolkata	400		
8.		Shadnagar	400		
9.		Udaipur	400		
10.		Pune	400		
11.		Gaggal	400		
12.		Mahendragiri	400		
13.		Dehradun	400		
14.		Kavaratti	400		
15.		Bhopal (IRSCF)	512		
16.		Hassan (IRSCF)	512		
17.		Co-located (REMOTE)	400		
		Back-up links to INC1 / INC2 Network/s			
18.	CMS# 01	Port-Blair-INC1	630	Requirement-based	04
19.		Port-Blair-INC2	630		
20.		Kavaratti-INC1	400		
21.		Kavaratti-INC2	400		
		Remote VSATs to HUB: INC2 Network			
22.	GSAT#16	INC-2 Hub, Lucknow		Requirement-based	15
23.		MCF, Bhopal (IRIMS+IRCDR)	630		
24.		MCF, Hassan (IRIMS+IRCDR)	630		
25.		Shillong (IRIMS+IRCDR)	630		
26.		Jodhpur (IRIMS+IRCDR)	630		
27.		Port-Blair (IRIMS+IRCDR)	630		
28.		Kolkata	400		
29.		Shadnagar	400		
30.		Udaipur	400		
31.		Pune	400		
32.		Gaggal	400		
33.		Mahendragiri	400		
34.		Dehradun	400		
35.		Kavaratti	400		
36.		Bhopal (IRSCF)	512		
37.		Hassan (IRSCF)	512		
38.		Co-located (REMOTE)	400		
				Total Nodes	**34**

1.4 Important Provisions for AMC of VSAT Network

a) **Addition of VSAT Stations**: Based on the need of operational requirements, additional VSAT stations may be incorporated into the Network. In such cases, those stations will be included in the AMC scope on a pro-rata basis with in India (mainland, Island).

b) **Removal of VSAT Stations**: In the event of that a VSAT station needs to be removed from the network, it will be excluded from the AMC scope on a pro-rata basis with in India (mainland, Island).

c) **Adjustment of Data Rates:** The data rates may get increased or decreased as per operational requirement. ISRO-ISTRAC will carry out this additional task. However, this is given as information to the vender.

2. For the AMC of above VSAT links, the information provided by ISRO and the expected details from the vendors are as follows:

2.1 In this RFP, ISRO provides the information regarding:

a) Objectives of IRDCN

b) Performance, functional and operational requirements of IRDCN

c) Details of remote nodes.

d) IRDCN Satcom architecture

e) Technical details regarding HUB and VSAT remotes in Annexure-2

2.2 Vendors shall include in their responses:

a) Clause wise compliance statement to the tender specifications

b) Methods for troubleshooting strategy at remote locations.

c) Maintenance methodology to meet the performance and availability specifications.

3. OBJECTIVE OF IRDCN

The IRNSS Data communication Network (IRDCN) is an element of Ground segment that provides the required digital communication backbone to IRNSS network.

3.1 Operational requirements

a) Location and the addresses of the stations are listed in the table-1, Annexure-1

b) IRDCN Network architecture Diagram Refer Annexure-3

4. ISTRAC/ISRO's responsibility

a) ISTRAC/ISRO shall provide necessary hardwares (Satellite Modem, BUC, LNB, Cables (RG 214/U), and feed required for VSAT Network.

b) ISTRAC will intimate to remotes to arrange necessary permits to carry out AMC: Preventive / Breakdown maintenance.

5. Vendor's responsibility

a) For breakdown maintenance, vendor should visit the site (may be with required spare) to ensure immediate fault identification and diagnosis on the first visit. Once the faulty item is identified by the field engineer, ISRO will arrange for replenishment at the site.

b) 2.4m VSAT, BUC, LNB, Modem & IFL cables are covered under AMC. Any hardware replacement in case of a failure and antenna optimization is to be carried out by the vender.

c) Vendor shall attend the break down maintenance as and when reported by ISTRAC.

d) Vendor shall visit the remote nodes once in six months and carry out the preventive maintenance. Vender can complete the preventive maintenance during their visit for break down maintenance.

e) Vendor to provide Preventive maintenance schedule / Calendar in advance to get necessary site clearance and entry permissions.

f) Preventive maintenance scope includes the following:

Antenna inspection:

i) Reflector cleaning,

ii) Feed inspection,

iii) Tightening of fasteners and screws,

iv) Physical inspection of BUC and LNB.

v) Crimping of connectors if required.

vi) Greasing of screws,

vii) Water proof tape to avoid moisture.

viii) Feed cover (PTFE sheet) to be replaced if case of damage.

ix) Consumables like fasteners, Lubricants, cable connectors, cable-ties, PTFE sheet for feed cover…etc are under vendor scope of supply.

g) Antenna Optimization: In all axis (azimuth, elevation and polarization axis) and XPD measurement with HUB support.

h) Vendor shall ensure that the systems are intact and functionally meeting the requirements. This will be verified by the ISTRAC team as and when maintenance is carried out.

6. Methodology for problem reporting & resolution with time line:

a) Complaints from remote nodes: will be reported from ISTRAC or from Hub team or by a remote-user. The mode of communication will be either on an e-mail or over telephone or messaging or on a vender's e-portal. Vendor need to provide the details for such communications, point of contacts and escalation matrix.

b) Problem acknowledgement & resolution time-line shall be as follows.

   i) Response time for acknowledgement: maximum one working day.

   ii) The maximum time for resolving any issue shall be seven working days after spare made available.

   iii) However, on special cases like force-majeure, natural calamities, law & order issues, health & physical injuries this time may get extended to a nominal period with an advance intimation & approval.

c) ISTRAC will provide all feasible assistance in resolving the issue.

d) The problems which are un-foreseen and typical in nature are exempted from this dead line based on the technical explanation and certification from ISTRAC.

7. Termination clause:

ISTRAC has a right to terminate the contract during any time of the contract period i.e. after six month of services with a notice period of three months, based on the requirements and/or performance of vender during AMC.

8. Terms and Conditions:

a) Documentary evidence to be furnished with customer satisfactory certificate (at least from two organizations) along with this tender response w.r.t. to the following:
    i) Vender shall have experience in maintaining C & Ext.-Band Communication Network that consists of 2.4 m & above (remote nodes) in India for a period of past five years.
    ii) Vender shall have experience in Operation & configuration of communication equipment like BUCs, LNBs, L-band line amplifiers & Digital Satellite Modems (FDMA & TDMA type).
    iii) Offers without the above certifications/evidences are liable for rejection.

b) The AMC contract period is initially for three years from the date of the Purchase Order (PO) extendable for two more years with the same terms and conditions

c) During AMC period, vendor is responsible to ensure functionality of IDU and ODUs before making any replacements.

d) Vendor to note that payment towards the services will be made on quarterly basis with certification by Manager / system engineer SATCOM, approved by component authority of the entity

e) The vendor shall enclose a compliance table matrix for ISTRAC requirements.

ANNEXURE-2

Specification of 2.4m Remote Antenna

S.No	Parameters	Specifications
1.	Antenna Optics	Offset feed
2.	Rx Freq	3700-4200 MHz
3.	Tx Freq	5850-6425 MHz
4.	Antenna Gain (Mid Band)±0.5dBi	Rx: 37 dBi Tx: 41 dBi
5.	G/T	18 dB/K with 30K LNA at 40 deg
6.	Cross Pol. Discrimination / Isolation	> 35 dB (on Axis)
7.	Radiation Pattern	As per ITU R.S.580-6

Specification of 7.5m Hub Antenna (For Info)

S.No	Parameters	Specifications
1.	Antenna Optics	Shaped Parabolic Cassegrain system
2.	Feed Type (2 port)	Composite, Conical Horn feed Sub-Reflector , Linear Frequency of operation
3.	Rx Freq	3700-4200 MHz
4.	Tx Freq	5850-6425 MHz
5.	Antenna Gain (Mid Band)±0.5dBi	Rx: 47.5 dBi Tx: 51.5 dBi
6.	G/T(Typical)	29 dB/K with 30K LNA at 40deg
7.	Cross Pol. Discrimination / Isolation	> 35 dB (on Axis)
8.	Feed VSWR (Max)	1.25:1 in any port
9.	Radiation Pattern	As per ITU R.S 580 – 6

Satellite – Salient Parameters (For Info)

S.No	Parameters	GSAT-18
1.	Transponder	C band
2.	Transponder bandwidth	18 MHz
3.	Uplink Start & Stop	6190 MHz -6208 MHz
4.	Downlink Start & Stop	3965 MHz – 3983 MHz
5.	EIRP (For 18MHz Capacity)	32.5 dBW
6.	Polarization	U/L – Linear Horizontal D/L – Linear Vertical

ANNEXURE-1

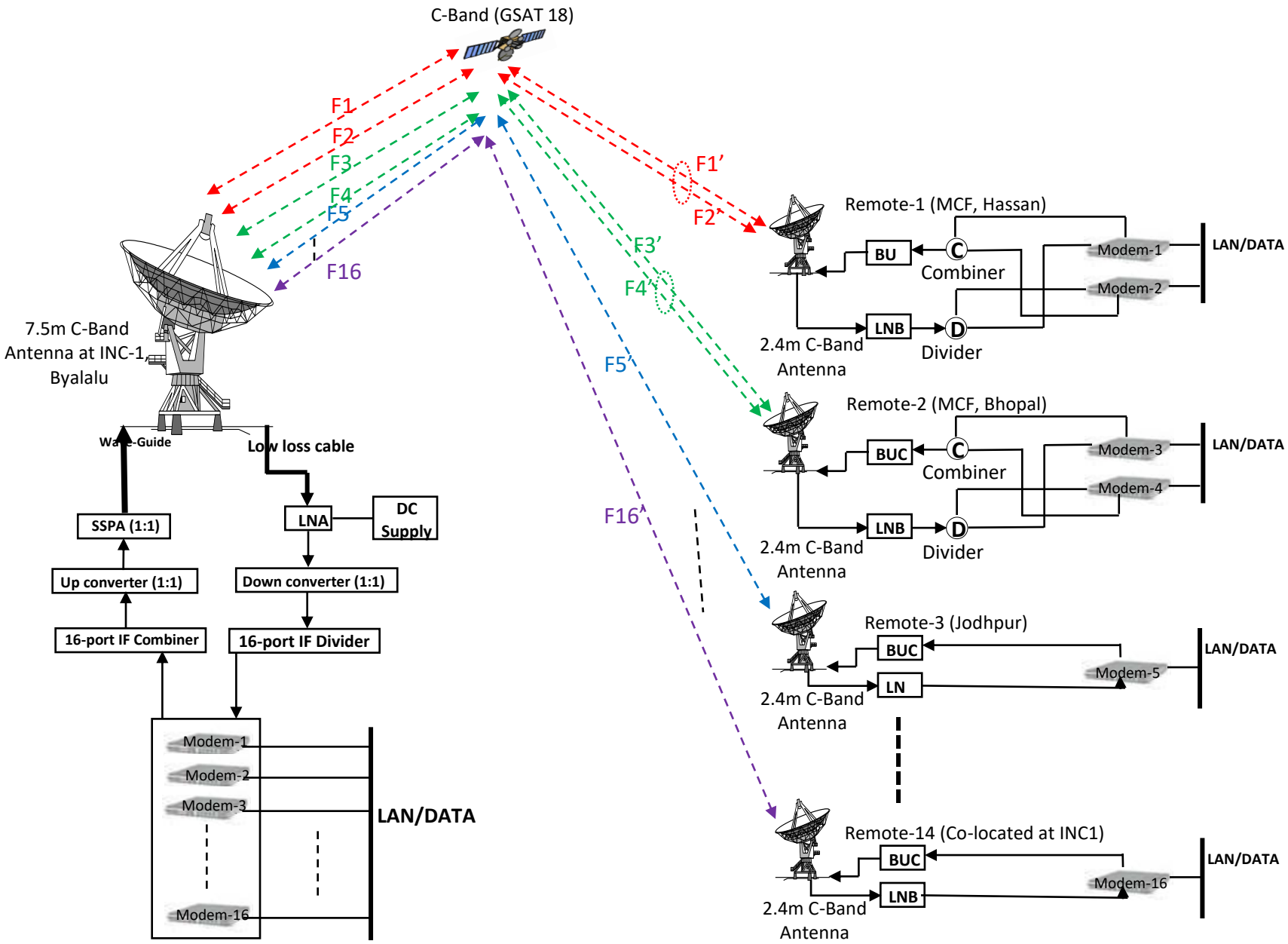
Address and Locations of IRDCN Remote Nodes - Table 1

S. No	Station	Address	Focal Point	Antenna Size (m)	Location details	
					Latitude (DD: MM:SS)	Longitude (DD: MM:SS)
1	INC-1 Byalalu & Co-Located	ISTRAC , Indian Navigation Center-1 Byalalu, Bangalore	Mrs. Pragati Manager SATCOM Ph : 080-28094452 Mob No:97390 62795 Fax: 08028094468	7.5 & 2.4	N 12 53 56	E 77 22 12
2	MCF Bhopal	Director, Master Control Facility, Ayodhya Nagar, N Sector, Bhopal-462041, Madhya Pradesh	Shri. Javed Qureshi GH-TNB, MCF-Bhopal Ph : 0755-2667702 Fax : 0755-16912904 Mob: 09425301948	2.4	N 23 17 21	E 77 27 60
3	IIRS Dehradun	Director, Indian Institute of Remote Sensing, No.4, Kalidas Road, Post Box. No. 135, Dehradun-248001, Uttarakhand	Shri. Kamal Pandey Sci/Engr'SE' Ph :0135-2524123, Fax :0135-2748041/ 0135-2741987	2.4	N 30 20 23	E 78 02 37
4	MCF Hassan	Director, Master Control Facility, Post Box No.66, Slagame Road, HASSAN - 573201, KARNATAKA	Shri. Giresh Manager COH Ph: 08172-276255 Fax: 08172-239018 Mob:09448993704	2.4	N 13 04 23	E 76 06 04
5	Jodhpur	Engr. In charge ISRO complex, RRSC-W, New campus, Sector-9, ,Kudi housing board ,Kudi bhagtasani, Jodhpur-342005	Shri. Paresh Sompura Sci/Engr'SD' Ph :0291-2785204 Fax:0291-2786516 Mob: 09461776676/09414031326	2.4	N 26 12 23	E 73 01 26
6	IPRC Mahendragiri	Director, IPRC Mahendragiri, Tamilnadu	Shri Krishna Diwakar, Engr-SF, Dy Division Head, PPED Contact: 04637271745 / 04637271825	2.4	N 08 17 05	E 77 33 46
7	NESAC Shillong	Director, North Eastern Space Application Centre, Department of Space, Govt. of India, UMIAM-793103, Meghalaya	Shri. Sumit Singh Rana IRCDR, Shillong Ph :0364-2308700 Mob:086388 16737 Fax :0364-2570139	2.4	N 25 40 27	E 91 54 49
8	Udaipur	Director, Udaipur Solar Observatory, PRL	Shri.Kushagra Ph no:02942457221 Mob:6375973051	2.4	N 26 36 50	E 73 40 15

S. No	Station	Address	Focal Point	Antenna Size (m)	Location details	
					Latitude (DD: MM:SS)	Longitude (DD: MM:SS)
		P.B.No-198, Devali, Badi Road, Udaipur, Rajasthan-313001	Email: kushagra@prl.res.in			
9	NRSC Shadnagar	Director National Remote Sensing Centre, Department of Space, ISRO, Annaram Village, Shadnagar, Mahboob Nagar(Dist.), AP-509216	Head SATCOM Ph : 040-23884340 team_csf@nrsc.gov.in	2.4	N 10 02 18	E 78 11 17
10	RRSC Kolkata	General Manager RRSC-East, NRSC, ISRO, Plot No. BG-2, Action Area 1 B(AA1), Near Home Town, Jyoti Basu Nagar, Kolkata-700156	General Manager Ph-033-23410001 sharmista_b@nrsc.gov.in	2.4	N 22 34 58	E 88 27 26
11	GMRT Pune	Dean, GMRT Observatory Khodad Village, NarayangaonTaluk Junnar, Dist-Pune, Maharashtra-410504	1. Shri.S.Suresh Kumar Telephone : (02132)-258420 (02132)-258431 Mob:08686025433 2.Shri.Praveen Royble Mob:09960184782	2.4	N 19 05 32	E 74 02 47
12	Port-blair	Manager, IPF Port Blair Department of Space, Dolly Gunj P.O, PORT BLAIR-744103	Shri DEVDAS PAIK Ph :03192-250595 ,Fax : 4604/4628 Mob: 9476005669	2.4	N 11 38 14	E 92 42 44
13	Kavaratti	Director, DST, Kavaratti, Lakshadweep	1. Shri.Idressbabu Mobile no.9446037060 2. Shri.Pookoya Mobile no.9446370881	2.4	N 10 33 29	E 72 38 16
14	Gaggal	Airport Director, Airport Authority of India, Kangra Airport, Dharmashala, Himachal Pradesh-176209	Shri.Mayank Yadav Senior Manager Airport Authority of India, Gaggal Airport, Ph-08192-2233430 Mob- 9351427139	2.4	N 32 09 55	E 76 15 35
15	INC-2 Lucknow Co-Located	Manager, ISTRAC Ground Station Kursi Road, Lucknow-226021	Shri.SK Pandey Mob: 9415314742 Ph : 0522-2361390/394 Fax : 0522-361391	7.5 & 2.4	N 26 54 43	E 80 57 22

ANNEXURE-3

IRDCN INC-1 Network architecture



IRDCN INC-2 Network architecture