


PRASAR BHARATI
(BROADCASTING CORPORATION OF INDIA)
DIRECTORATE GENERAL: DOORDARSHAN

Spec: No: SATD/ Ku Band receive Setup/Oct_2008

SPECIFICATIONS
FOR
SITC of Ku-band Receive Setup along with Electronics &
Accessories


12/10/08
प्रसार भारती कनिष्ठ
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1. INTRODUCTION

The Ku band receive system is to be used for receiving the signal from Ku band Flyaway/ Drive-away DSNGs. The basic system consists of a Parabolic Dish Antenna, Digital LNBCs, and Active RF splitter to split the LNBC signal to two IRDs (already available at site) along with other accessories to complete the system. Power supply for LNBC is to be supplied through Active splitter unit.

The scope of the project is to supply, Installation, Testing and commissioning of complete Receive systems at 32 places in Doordarshan Network. The IRDs will be given by respective Kendras. The names of the locations where this system will be installed is given at annexure-I.

The specifications of items to be supplied in this project are given in

Sl.	Equipment	Specs	Page
1.	INTRODUCTION	SATD/ Ku Band receive Setup /2008	2
2.	ANTENNA	SATD/Receive Antenna/2008	3
3.	FEED	SATD/Feed/2008	4
4.	LNBC	SATD/LNBC /2008	5
5.	CABLE & SPLITTER UNIT	SATD/Cable & Splitter Unit/2008	6
6.	ENVIRONMENTAL	SATD/Environmtal/2008	6
7.	DOCUMENTATION	SATD/Documentation/2008	7
8.	GENERAL	SATD/General/2008	7
9.	EQUIPMENT LIST	SATD/List of Equipment/2008	10

The integrated system should satisfy the overall performance of the TVRO system, specially the end results, including cables etc. One LNBC should be given on each port of the feed with separate low loss cable. Each item should be quoted separately. Any other item that is not mentioned in the document, but is needed for optimum performance of the system should also be mentioned / quoted by the tenders.

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1.1 Technical Specifications of the equipment

The technical specification for the various equipment that would be used for receiving Ku-band Digital signal from DSNGs are given below. The basic system consists of a Parabolic Dish Antenna, LNBC and accessories like cable and connectors.

2. Specifications for ANTENNA

- | | |
|---------------------------------|--|
| 1. Antenna Type | : Parabolic prime/offset focus, segmented reflector, molded type with minimum 8 swg sheet thickness. Painted with white heat diffusing and UV protective paint / powder coating. |
| 2. Size | : Min 4.5 to max 5.0 meters circular equivalent dia. |
| 3. Gain | : Mid band gain minimum 51dBi (at 11.8 GHz) |
| 4. Polarization | : 2 Port Dual Linear orthogonal |
| 5. Antenna Noise Temperature | : $\leq 45^{\circ}$ K at 20° Elevation |
| 6. Mount | : Azimuth - elevation |
| 7. Drive System | : Manual and should be able to be operated by single person.
Design to be confirmed by Doordarshan |
| 8. Steer ability | : Manual |
| a) Azimuth (Manual) | : 120 degrees continuous |
| b) Elevation (Manual) | : 15 deg to 90 deg continuous |
| c) Polarization (Motorized) | : -5 degree to + 95 degree |
| 9. Operating Freq. | : 10.95 GHz to 12.7 GHz |
| 10. Feed Impedance | : 50 ohms |
| 11. Feed VSWR | : better than 1.4: 1 |
| 12. Polarization discrimination | : 30 dB (min) on axis |

13. Indication for Azimuth, Elevation and Polarization offset angles (Calibrated and absolute) should be available at the base of the antenna for ease of operation.

14. Provision for fine correction of polarization offset and focal length should be made.

15. Repeat accuracy of the performance should be ensured by the manufacturer.

16. All the petals and struts are to be marked by stamping for proper placing during reassembling.

17. Strict measures should be taken to ensure that no major field alignment is required at the site for getting the specified performance.

18. Descriptive details of the antenna installation should be provided, along with antenna foundation details, including bar bending schedule, bill of materials and procedure to be followed in the installation.

19. All iron parts should be galvanized (Minimum 100 microns).

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3. Specification for the motorized Feed

- | | |
|--------------------------------|--|
| 1. Focus | : Prime/offset focus, |
| 2. Frequency | : Ku- band (10.95 GHz to 12.7 GHz) |
| 3. Ports | : 2 port, for receiving both linear
Orthogonal polarization signals |
| 4. Polarization discrimination | : ≥ 30 dB on axis |
| 5. Polarization Adjustment | : -5degree to 95degree |

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4. Specifications for LNBC (Digital PLL Ku-band)

These LNBCs are to be used for the reception of digital video/audio signals through the satellite:

1. Input frequency range	10.95 GHz to 11.7 GHz 11.7 GHz to 12.7 GHz
2. Local Oscillator frequency	LO Freq of LNBC should be such that the O/P freq of LNBC is between 950 to 2150MHz
3. L.O. Stability	+/- 150 KHz
4. L.O. Phase noise	Better than 75 dBc/Hz @ 1 KHz
5. Output frequency	between 950 MHz to 2150MHz
6. Conversion gain	52 dB (min)
7. Output level at 1dB compression point	8 dBm
8. Input VSWR/Output VSWR	Better than 2.2:1
9. Noise figure	1dB (Max)
10. Power supply requirement	should work between + 15V to +24V with Current consumption of about 200 mA (Max)
11. Output Connector	F Type
12. Input flange	WR 75



5.1 Specifications for Cable & Connectors

An interconnecting low loss cable of length of 75 meters the cable should be quoted in denomination of 50m & 25m, which can be used independently (i.e. as 50m or 25m) or collectively i.e. as a 75m length using a coupler (I-Connector) in between the 50m & 25m cables to provide connection between outdoor and indoor units. The total insertion Loss for cable should not exceed 15dB at 1450 MHz. Two sets of cables are to be quoted.

5.2 Specifications for Active Splitter Unit

An active splitter unit of 1:4 (1 input and 4 outputs with DC blocking) is to be provided each receive ports. The splitter unit should supply +15 V to +24 V with maximum 300 mA current to LNBC. The unit should operate on normal AC power supply (220 V and 50Hz). These splitter units should be 19" Rack mountable.

Spec: No: SATD/ Environmental/2008

6. Environmental Specifications

1. Ambient Operating temp. : -5 Deg C to 50 Deg C
2. Humidity : 95% RH at 40 Deg C.
3. Protection : From rains, dust and corrosion.
4. Wind Operational : ≥ 65 KMPH
5. Wind Survival : ≥ 150 KMPH
6. Lightning protection : should be provided.

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7. Documentation

7.1 Documentation

Offer should include the supply of four complete (including manuals for options, if any) set of documents (in original) of operation and maintenance (wherever applicable) i.e. two with the equipment with each unit, one additional set for Design Directorate and one each for respective zonal offices. All the documents should also be supplied in CD-ROM with each set of document. The CD ROMs supplied should have full features of find & search of Microsoft. Cost if any may be included in the offer. One set of the above manuals for all equipment should be enclosed along with the tender for technical evaluation. Offers without the manuals for evaluation are liable to be rejected.

7.2 Guarantee

7.2.1 The equipment shall be guaranteed against any manufacturing defects for a period of **24 months** from date of commissioning.

7.2.2 As it is an SITC Project, any parts failing during the guarantee period shall be repaired/replaced free of charge by the supplier at site i.e. no transportation charge would be paid by Doordarshan for transporting the defective/ repaired items if required to be removed from site during the guarantee period.

7.2.3 Guarantee period will be extended corresponding to the outage period if the fault rectification takes more than 30 days from the date of reporting of fault.

7.3 Demonstration

Demonstration of Sample at Delhi for compliance of specs is to be provided, if required, during evaluation of tender. Tenderer has to provide a fully functional unit, same as quoted for demonstration / verification of technical parameters. Technical datasheet from OEM should also be submitted along with the sample. Demonstration should be given within 15 days from the date of request by Doordarshan for demonstration purpose.

Spec: No: SATD/ General/2008

8 General

8.1 General Requirement

1. Supplier should give a certificate for providing spares and maintenance support for this system for the next 5 years.
2. Since it is an SITC all the essential items which the manufacturer feels are necessary to complete the equipment/chain for the full exploitation of all the features of the equipment offered, should also be quoted and stated clearly.
3. Equipment from renowned and well-known firms of the industry with proven track record only will be accepted. The tenderer should enclose a list of organizations to which same type of equipment as quoted in this tender has been supplied.
4. System/equipment (motor controllers etc.) should be offered along with its frame/housing and other accessories which are necessary to meet the specifications/requirement and for the full exploitation of the equipment.
5. Cost of all the optional equipment which are necessary to complete the configuration to meet the specifications/requirement should be very clearly specified and will be included for commercial evaluation.
6. The system offered should be complete in all respects even if missed in the specification.
7. The offer incomplete in any respect is liable to be rejected.

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8. If required, one sample of system/sub system complete in all respects along with Operation & Technical manuals may be required for technical evaluation.

8.2 General information

A point-by-point compliance statement from the principal manufacturer in respect of all the points, sub-points and paras laid down in this specification from page 2 onwards is to be enclosed along with the offer. Mere signature on a copy of our specification shall not be accepted as a compliance statement. Page no. of location of data sheet should be given in page no. column. One copy of compliance statement and Bill of material (in MS Excel format) should also be given on CD-ROM.

(a) Compliance statement in the format as indicated below only shall be accepted.

Sr. No.	DD Specs	Compliance Yes/No	Performance Fig of Eqpt. offered	Deviation in case of non-compliance	Optional item if any required to make the system compliant to DD specs	Features in the system offered which exceed DD specs	Page No	Remarks
1	Introduction							
2	Specifications							
3	Essential Features							

- (b) The manufacturer should also record the performance figures of the equipment offered in the quote for which the compliance statement is enclosed.
- (c) The compliance statement should be supported by highlighted record of these in the technical literature/data sheets enclosed with the tender and a clear reference to the attached supporting document should be given in the remarks column against each & every specs. Any offer without proper supporting document of each & every specs and containing only a commercial hand out/pamphlet will be rejected. In case the parameters given in the data sheet / technical literature is different from the one mentioned any where else or in the compliance statement of the offer, the one mentioned in the data sheet / technical literature will be considered to be authentic.
- (d) Any deviation from the specifications detailed in the compliance statement is to be highlighted separately. Offers without the proper & duly completed compliance statement are likely to be rejected with the sole responsibility of tenderer and no further claim/correspondence will be entertained.

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8.3 Ordering Information

One soft copy of ordering information / Bill of material should be provided along with the quote.

8.4 SPARES

1. Necessary spares required for the maintenance of the equipment offered should be quoted separately. The total value of the order for spares will be 5% of the cost of the equipment.
2. A complete recommended spare list with quote should be offered, along with the bid.

8.5 ACCESSORIES

1. All essential accessories like cables, connectors and power cord etc. should be included in the offer. Optional accessories should be quoted separately.

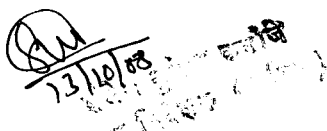
8.6 INSPECTION

1. All the equipment to be supplied against the supply order for this tender shall be subjected to inspection at New Delhi/manufactures facility by Doordarshan.

9. Equipment List

Sl.	Equipment	Quantity (each Site)	Total Quantity
1	Receive System for reception of Ku-band Signal from DSNG consisting of:	1 set	32 sets
a.	4.5 to 5.0 meter PDA with Associated accessories	1 set	
b.	Motorized 2 port linear orthogonal feed with necessary mounting hardware and control cable	1 set	
c.	Ku-band LNBC <u>1 set consist of</u> i) 10.95 GHz to 11.70 GHz - 1 no. ii) 11.70 GHz to 12.70 GHz – 1 no.	2 sets	
d.	Low loss RF cables <u>1 set consist of</u> i) 50 meter length -1 no. ii) 25 meter length -1 no. iii) F-connectors for both cables - 4nos. iv) I-connector - 2 nos.	2 sets	
e.	Terminations 75 Ohms	4 nos.	
f.	Active splitter unit (1: 4 with DC block) along with interconnecting cables from splitter to IRD	2 set.	
g.	Any other item to complete the Ku-band receive setup on SITC basis	1 set	
h.	Installation & Commission of PDA at each place (i.e. laying of foundation and assembling of Antenna)	1 set	

Note: IRDs available at Kendra are to be integrated with system during the installation of Ku-band receive system.



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Ku band Receive set up

Sr No	Zone	State Capital / RNU of Doordarshan Network	State	QTY.
1	E	BHUBNESHWAR	ORS	1
2	E	KOLKATTA	WB	1
3	E	PATNA	Bihar	1
4	E	RANCHI	JHRK	1
5	N	CHANDIGARH		1
6	N	CPC	Delhi	1
7	N	DEHRADUN	Uttar	1
8	N	HISSAR	HAR	1
9	N	JAIPUR	RAJ	1
10	N	JALLANDHAR	Punjab	1
11	N	LUCKNOW	UP	1
12	N	NEW DELHI	DELHI	1
13	N	SHIMLA	HP	1
14	N	SRINAGAR	J & K	1
15	NE	AGARTALA	Tripura	1
16	NE	AIZWAL	MIZ	1
17	NE	GANGTOK	Sikkim	1
18	NE	GUWHATI	Assam	1
19	NE	IMPHAL	MNP	1
20	NE	ITANAGAR	Arun. P	1
21	NE	KOHIMA	NAG	1
22	NE	SHILLONG	MEGH	1
23	S	BANGALORE	KAR	1
24	S	CHENNAI	TN	1
25	S	HYDERABAD	AP	1
26	S	PONDICHERRY (int.)		1
27	S	TRIVANDRAUM	Kerala	1
28	W	AHEMDABAD	Guj	1
29	W	BHOPAL	MP	1
30	W	MUMBAI	MAH	1
31	W	PANAJI	Goa	1
32	W	RAIPUR	Chhatt.	1
		TOTAL		32