

**REQUEST FOR PROPOSAL
FOR
HIGH FLEXURES FEXIBLE CABLES**

(SAC/CPUR/2020010222)

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SPACE APPLICATIONS CENTRE
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INTRODUCTION

The Indian Space Research Organization (ISRO) requests your company to submit quotation for space qualified **FLEXIBLE CABLES WITH HIGH FLEXURES** as detailed in this document. These will be used in the Flight Models of the Communication /Broadcast Satellite Service Payloads of GEOSAT AND IDRSS series of Operational Space crafts. This document consists of five sections:

ANNEXURE-I A: Gives the general background of the Project for which the units are required.

ANNEXURE-I B: Gives the details which vendor shall follow for preparing the response against this RFP.

ANNEXURE-I C: Gives the Electrical Specifications.

ANNEXURE-I D: Gives the details on quantity, delivery schedules and warranty.

ANNEXURE-II: Gives the Reliability & Quality Assurance requirements.

ANNEXURE –I A

BACKGROUND

- 1.0** The Geostationary Satellite System (GEOSAT) is a domestic multipurpose system, using satellites in geo-stationary orbit, for long distance telecommunications, Radio and TV program distribution, meteorological earth-observation, data relay, search and rescue. The Department of Space of the Government of India, which has the responsibility for establishing and maintaining the GEOSAT space segment, has embarked on development and fabrication of GEOSAT and IDRSS series Space-crafts.

- 2.0** The GEOSAT and IDRSS satellite series is designed to be compatible with most of the commercially available launchers and also the Indian Geosynchronous Launch Vehicle (GSLV). The items under procurement are to be used for the development/fabrication of GEOSAT and IDRSS satellites.

- 3.0** For fabrication of these GEOSAT Space-crafts, the Department of Space of the Government of India, through its Indian Space Research Organization (ISRO), is planning to purchase certain spacecraft components and related services. Since your company is a supplier of components for our/other satellite projects, we are requesting, proposals from you for similar products and services for the GEOSAT projects.

- 4.0** It is very important for our evaluation of offer that your proposal also includes sufficient technical data on form, fit and function. If this technical data is not in public domain, we request that you apply in advance to your Department of State for a license to export this technical data in your proposals.

ANNEXURE –I B
GUIDELINES TO VENDORS

1.0 GUIDELINES FOR PREPARING TECHNICAL DETAILS

1.1 These are very special hardware and ONLY THOSE VENDORS who have adequate experience in

- a) Design, development and fabrication of Hi-Rel systems
- b) Qualification & Delivery of such hardware for onboard communication satellites should respond and quote against this RFP.

1.2 The vendor is requested to examine the RFP thoroughly and offer **compliance/non-compliance** point by point. In case of non-compliance, the deviation from the specified parameter shall be furnished and for complied parameters the **vendor specification** (better or same) shall be provided.

1.3 The vendor should also submit compliance statement consisting of compliance / noncompliance with test philosophy, test plans and other requirements as detailed in Annexure –II under "Reliability &Quality Assurance Requirements". The vendor may submit the Screening /Lot Acceptance testing program which might have been used for supplying similar hardware for other space missions. If compliance statement is not supplied along with the relevant documents, the offer will not be considered.

1.4 It is necessary for the vendor to furnish complete information as required in various annexure (I A to I D & II) of this RFP for proper evaluation and assessment of his proposal.

1.5 The vendor can attach additional information, if any, which may provide more information on these products.

1.6 The vendor shall give complete qualification status, flight history, space program details and failure data etc. along with the response.

2.0 GUIDELINES FOR PREPARING QUOTATIONS

2.1 The quotation shall include, in addition to unit cost, all the prices towards screening, and lot-acceptance testing etc. The cost break up should include charges for each test to enable SAC in deciding to include/exclude any test depending on the cost and schedule constraints. The break-up of overall cost in terms of Phase-1 and 2 (as defined in para 1.0) also needs to be indicated.

2.2 The quotation shall consist of two parts:

a) PART-1: `Detailed Technical Proposal'

Giving all details as required in Annexure –I C & II

b) PART-2: `Cost & Management Proposal'

Giving cost, payment terms and other financial details

ANNEXURE – I C TECHNICAL SPECIFICATIONS

The Electrical Specifications are shown in the following Table:

FLEXIBLE CABLES WITH HIGH FLEXURES

Specifications for Flexible Co-axial cable Assembly					
S.No.	Parameter		Unit	Specifications	Compliance (YES/NO) With values
<u>1</u>	Frequency (Max)		GHz	<u>30</u>	-
<u>2</u>	Nominal Impedance		Ohm	50	
<u>3</u>	VSWR (Max) @ freq.	18 GHz		1.3:1	
		26.5 GHz		1.35:1	
		30 GHz		1.4:1	
<u>4</u>	Shielding Effectiveness (Min)		dB	≥90	
<u>5</u>	Attenuation @ 30 GHZ	For Type-1 Length-600mm	dB	1.3	
		For Type-2 Length-800mm		1.7	
		For Type-3 cable-1000mm		2.1	
		For Type-4 cable-1400mm		2.8	
<u>6</u>	CW Power @ 30GHz (Min)		in Watts	10	
<u>7</u>	Minimum Bend Radius		mm	25.4	
<u>8</u>	Amplitude Stability with flexure (max) (According to IEC966-1, bending method n°2)		dB	≤±0.4 Max	
<u>9</u>	Amplitude Stability with temperature		-	0.002 dB/°C	
<u>10</u>	Input & Output Connector		-	3.5 mm / 2.9 mm Male Straight	
<u>11</u>	Flexure Life Cycles (as per IEC 966-1 section 9.3)		nos.	50000 Cycles @ 6" radius	
<u>12</u>	Mating Cycles		nos.	500	
<u>13</u>	Weight		grms.	< 70 gram/Meter	
<u>14</u>	Radiation Resistance		MRAD	100	
<u>15</u>	Dia. Of the cable		mm.	<5.5	

Note-1: Suitable VENTING HOLES to be provided

Note-2: Parts Should Meet All Electrical Specifications in all environment conditions simultaneously.

Note-3: Vendor to provide ICD at following stages:

1.Heritage ICD from vendor at technical offer stage for review by SAC.

2.Updated ICD (updates only if required) from vendor before Cables manufacturing, to be approved by SAC for final implementation.

Note-4 : Date of delivery will be considered from date of Placing the purchase order.

ANNEXURE –I D

QUANTITIES, SCHEDULE AND WARRANTIES

1.0 QUANTITIES

The vendor shall quote in step quantities for **FLEXIBLE CABLES WITH HIGH FLEXURES**. As clarified earlier, the requirement is primarily for Flight hardware.

1.1 FLIGHT UNITS QUANTITY

Please quote in quantity **slabs** as given below: **11-15, 16-20, 21-25 (AS PER INDENT)**

1.2 LAT Units : 5% of FM quantity

PLEASE QUOTE IN FOLLOWING FORMAT ONLY

SR NO	ITEM/ TEST CHARGES	QTY (SLABS)	EACH COST	TOTAL COST
1	FM INCLUDING SCREENING (FROM TOTAL FM ORDERED , 5% WILL BE USED AS LAT units)	10-20, 21-30, 31-40	XXXX XXXX XXXX	XXXX XXXX XXXX
2	2.1. Lot acceptance test charges excluding "LAT unit" cost. 2.2. LAT test to be done on approximate 5% units (to be rounded off to next Higher integer value e.g. 6.4 to be rounded off to 7) Vendor to note that No of units in one lot of LAT are computed on the basis of 5% of the indented slabs as per Sr no 1	Per Lot LAT slab a) 1 lot comprising of 1 unit b) 1 lot comprising of 2 units	XXXX	XXXX
3	OTHER CHARGES IF ANY WITH BREAKUP		XXXX	XXXX

2.0 ORDERING

The order will be placed for total requirement including Lot Acceptance and Flight models.

3.0 DELIVERY SCHEDULES

Flight Model: WITHIN 5 months after ARO

LAT Model: WITHIN 7 months after ARO

4.0 WARRANTY

(a) The vendor shall provide warranty as given below:

“The units supplied here upon shall be free from any defects in material or workmanship and in accordance with the applicable specifications and drawings”.

(b) This warranty shall run for period of One year from the date of final acceptance by SAC/ISRO and shall be in addition to any other rights available to SAC/ISRO. This warranty shall continue to be valid for corrected or replaced units until four years after the date of final acceptance by SAC/ISRO of the corrected or replaced parts.