REQUEST FOR PROPOSAL

OF

Flexible High Power S Band Cables

(SPACE QUALIFIED)

भारत सरकार / GOVERNMENT OF INDIA

अंतरिक्ष उपयोग केंद्र / SPACE APPLICATIONS CENTRE

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भारत / INDIA

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ANNEXURE-I

REQUEST FOR PROPOSAL (RFP) – RF SWITCHES

INTRODUCTION

The Indian Space Research Organization (ISRO) requests your company to submit quotation for space qualified **Flexible High Power S Band Cables**, as detailed in this document. These will be used in the Flight Models of the Communication / Broadcast Satellite Service Payloads of GEOSAT series operational space-crafts. This document consists of five sections:

ANNEXURE–I A: General background of the Project for which the units are required.

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ANNEXURE – I A

BACKGROUND

1.0 Space Applications Centre (SAC) is one of the major research and development Centre of the Indian Space Research Organization (ISRO). It is the lead Centre for satellite payload technology. The primary objective of SAC is to develop and operationalize indigenous satellite payloads and use space technology for socio-economic development of the country.

2.0 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 series Spacecraft.

3.0 For the fabrication of various satellites hardware, the Department of Space (DOS) of the Government of India, through its Indian Space Research Organization (ISRO), is planning to purchase certain spacecraft components, sub-systems and related services.

4.0 It is very important for our evaluation that your proposal also include sufficient technical data on form, fit and function for in-depth evaluation of your offer. If this technical data is not in public domain, we request that you may apply for appropriate license to your concern department in advance so that relevant technical data can be submitted with your proposal.

ANNEXURE – I B

GUIDELINES TO VENDORS

1.0 INTRODUCTION

The **Flexible High Power S Band Cables** supplied against this RFP should have space heritage or successfully completed qualification program meeting the requirements specified in this document.

FLIGHT MODEL:
Delivery of flight hardware fully tested as per **Annexure-II** requirements and Lot Acceptance tests carried out on samples.

2.0 GUIDELINES FOR PREPARING TECHNICAL DETAILS

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

a) Design, development and fabrication of Hi-Rel systems

AND

b) Qualification of such hardware for onboard Communication Satellites should respond and quote against this RFP.

2.2 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.

2.3 The vendor should provide details regarding **Space flight heritage with name of space program, overall as well as specific to the quoted part, Qualification status, and Qualification report summary along with the quote. Offers without the details of Space flight history, Qualification status and Qualification report summary will not be considered.**

2.4 The vendor should also submit compliance statement consisting of compliance / noncompliance with test philosophy, test plans and other requirements as per **Annexure-II** under “Reliability & Quality Assurance Requirements". Necessary details / documents in support of the compliance stated for each point shall be supplied in the quote. Offers without the compliance statements will not be considered. The vendor may submit the Screening / Lot Acceptance testing programme, which might have been used for supplying similar hardware for other space missions.

2.5 It is necessary for the vendor to furnish complete information as required in **Annexure-IB, IC, ID & Annexure-II** of this RFP for proper evaluation and assessment of his proposal.

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

2.7 The vendor may seek clarifications, if any, in advance before submitting the quotations. However, any clarification thus sent to the vendor will also sent to all other vendors.

3.0 GUIDELINES FOR PREPARING QUOTATIONS

3.1 The quotation shall include, in addition to unit cost, all the prices towards acceptance 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 breakup of overall cost also need to be indicated.

3.2 This requirement is for flight hardware. Each type of flight hardware shall be subjected to acceptance testing and lot-acceptance units on the representative basis.

3.3 The vendor is requested to acknowledge the receipt of this RFP and his willingness / inability to respond and quote against this RFP.

3.4 The vendor must ensure that his quotation along with all the details reaches SAC/ISRO before the due date.

3.5 The quotation shall consist of two parts:

a) PART-1: Detailed Technical Proposal' giving all details as required in **Annexure – IC & Annexure - II.** This part should not contain any price information. This should also include a copy of 'Cost & Management Proposal' **without price information**, i.e., price column should be left blank.

b) PART-2: Cost & Management Proposal' giving cost, payment terms and other financial details.

Note: Part-2 shall be submitted in a separate sealed envelope. This requirement shall be strictly adhered to. However, both parts shall be submitted together in a sealed envelope.

ANNEXURE – I C

TECHNICAL SPECIFICATIONS

The technical details of the switch are given in this annexure.

TABLE-1: Flexible High Power Coaxial Cables Technical Specifications:

S. No.	DESCRIPTION				
	CABLE TYPE	CONNECTOR 1	CONNECTOR 2	LENGTH (Mtr.)	ESA/ESCC Description
1	FLEXIBLE , DIA 7.6 mm	TNC,VERY HIGH POWER, STRAIGHT PLUG	TNC,VERY HIGH POWER, STRAIGHT PLUG	0.60	3408 001 040.60
2				1.20	3408 001 041.20
3	FLEXIBLE , DIA 7.6 mm	TNC,VERY HIGH POWER, STRAIGHT PLUG	TNC,VERY HIGH POWER, RIGHT-ANGLE PLUG	0.30	3408 001 050.30
4				0.60	3408 001 050.60
5				0.90	3408 001 050.90
6				1.50	3408 001 051.50
7	FLEXIBLE , DIA 7.6 mm	TNC,VERY HIGH POWER, RIGHT-ANGLE PLUG	TNC,VERY HIGH POWER, RIGHT-ANGLE PLUG	0.60	3408 001 060.60
8				0.90	3408 001 060.90
9	POWER HANDLING TEST AS PER ANNEXURE-II				
10	LOT VALIDATION TEST (LVT) [WITH HIGH POWER] AS PER ANNEXURE-II				

ANNEXURE – 1 D

QUANTITIES AND SCHEDULE

1. QUANTITIES

The vendor shall quote for the switches as per following quantity slabs.

STEPS OF QUANTITIES

1.1 FLIGHT UNITS 1-5, 6-10, 11-15, 16-20

PLEASE QUOTE IN FOLLOWING FORMAT ONLY

Type	Connector Types	Cable Length	Slab (Nos.)	Unit cost	Slab (Nos.)	Unit cost	Slab (Nos.)	Unit cost	Slab (Nos.)	Unit cost
1	**ST-RT**	300mm	1-5		6-10		11-15		16-20	
2	**ST-RT**	600mm	1-5		6-10		11-15		16-20	
3	**ST-RT**	900mm	1-5		6-10		11-15		16-20	
4	**ST-RT**	1500mm	1-5		6-10		11-15		16-20	
5	**ST-ST**	600mm	1-5		6-10		11-15		16-20	
6	**ST-ST**	1200mm	1-5		6-10		11-15		16-20	
7	**RT-RT**	600mm	1-5		6-10		11-15		16-20	
8	**RT-RT**	900mm	1-5		6-10		11-15		16-20	

Where,

Cable Type	Flexible, DIA 7.6mm
ST	TNC,VERY HIGH POWER, STRAIGHT PLUG
RT	TNC,VERY HIGH POWER, RIGHT-ANGLE PLUG

2. ORDERING

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

3 DELIVERY SCHEDULES

Flight Model: Within 45 weeks after ARO
LAT model: Within 12 months after ARO

1. SAC may allow prior/partial shipment of FM units prior to completion of LAT testing; however, final acceptance of FM is subject to successful completion of LAT. If LAT unit fails during testing, entire FM units should be replaced.

2. Maximum three partial shipments are allowed.

4 WARRANTY

The vendor shall provide Warranty as given below:

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

2. This warranty shall run for a period of **12 months** 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 **12 months** after the date of final acceptance by SAC/ISRO of the corrected or replaced Switches.

ANNEXURE-II

R & QA REQUIREMENTS FOR ESCC QUALIFIED (QPL) VERY HIGH-POWER FLEXIBLE CABLE ASSEMBLIES, TNC, ESCC DETAILED SPECIFICATION NO. 3408/001

Doc No: SAC/RF/QARQMT56, Issue: ***D***

1. Part Description and ESCC part number

1.1 Part description and ESCC part number shall be as specified in SAC technical requirements.

2. Quality and test requirements

2.1 The parts **(ESCC Generic Specifications No. 3408, variants and lengths as described in SAC technical requirements)** shall be on latest ESCC QPL. The parts shall be qualified to, manufactured and tested as per the latest ESCC Generic Specification No. 3408, with production control per Chart F2, screening tests as per Chart F3 and Lot validation testing as per Chart F4B of ESCC generic specification No. 3408.

2.2 Lot validation testing on **FOUR Test vehicles (TV)** as per Chart F4B shall include RF power handling test per para 8.33 of ESCC generic specification No. 3408. Lot validation testing as per Chart F4B of ESCC Generic Specification No. 3408, shall be performed on following variant(s):

2.2.1 TNC, VERY HIGH POWER, STRAIGHT PLUG- RIGHT-ANGLE PLUG, 1.5 m length

2.3 In addition to Para 2.1 and Para 2.2 defined above, RF power handling test as per Para 8.33 of ESCC generic specification No. 3408 shall be performed on total **THREE (3)** FM units as below:

2.3.1 Variant type TNC, VERY HIGH POWER, STRAIGHT PLUG-STRAIGHT PLUG, longest length as per SAC requirements: Test at 400W CW, 2 GHz, on one FM unit

2.3.2 Variant type TNC, VERY HIGH POWER, STRAIGHT PLUG- RIGHT-ANGLE PLUG, longest length as per SAC requirements: Test at 400W CW, 2 GHz, on one FM unit

2.3.3 Variant type TNC, VERY HIGH POWER, RIGHT-ANGLE PLUG- RIGHT-ANGLE PLUG, longest length as per SAC requirements: Test at 400W CW, 2 GHz, on one FM unit

3. Marking of Parts

3.1 The marking of all deliverable parts shall be in accordance with the requirements of ESCC Basic Specification No. 21700, as defined in ESCC Generic Specification No. 3408.

3.2 All deliverable parts must have ESCC marking (as specified).

3.3 All deliverable parts must have ESCC qualified component symbol (ESA logo).

4. Packaging and dispatch

4.1 The packaging and dispatch of components to this specification shall be in accordance with the requirements of ESCC Basic Specification No. 20600.

4.2 These components are intended for manual/individual handling. It is preferred that these components are individual packed, with primary package enclosing one unit.

5. General requirements

5.1 The parts supplied by the manufacturer shall preferably be from a single date code and should not be older than 2 years from the date of shipment to SAC.

6. Technical details/reports required along with proposal

6.1 Compliance to ESCC technical specifications indicating electrical, mechanical and environmental specifications

6.2 Heritage test reports of high power and multipaction test for technical reference

6.3 Summary of multipaction analysis and margins with respect to and upto rated power at following frequencies:

- **6.3.1** 200 MHz
- **6.3.2** 2.5 GHz
- **6.3.3** 3.7 GHz

6.4 Latest ESCC QPL certification and current status

6.5 In case the offer is from an authorized representative/distributor, a copy of the authorization letter from the original part manufacturer (QPL listed vendor) for source/sell in INDIA(SAC) shall be supplied.

6.6 Technical compliance including compliance to R & QA requirements (to be supplied along with quote) shall be endorsed (approved) from original part manufacturer (QPL listed vendor), in case the quote is from authorized representative/ distributor.

6.7 Details of marking on components and marking of component bag

6.8 Details on packing and dispatch of units

7. Technical details/reports along with deliverables

7.1 Certificate of Conformity (including range of delivered serial numbers), as per applicable ESCC specifications

7.2 Test documentation, as per applicable ESCC specifications, covering all tests defined through final purchase order

7.3 All FM units, defined through final purchase order

7.4 All units subjected to lot validation testing, defined through final purchase order

7.5 All other technical requirement, specified through final purchase order