

THEJAM Accelerometer (THEJAM-II)

Technology Overview:

1. THEJAM-II Accelerometer is designed and developed by RCI.
2. THEJAM-II Accelerometer is majorly meant for INS and IMU systems.
3. THEJAM-II Accelerometer provides a very high input range and excellent long-term repeatability. With the advantages of enhanced bias stability, improved scale factor and axis misalignment, the THEJAM-II is a perfect solution for high accuracy strap down INS in Missile applications.
4. Expression of Interest (Eoi) is requested from competent firms for transfer of THEJAM-II Accelerometer technology for production.
5. The terms and conditions of EOI are detailed below.
 - (a) Industries can submit applications with in 21 days from the date of publication on DRDO website.
 - (b) The firm's turnover should be greater than Rs. 37.5 Cr. per annum.
 - (c) Documents to be submitted with EOI: - The firm must provide details about firm and documents in support of their claim as per Appendix- A. Any additional documents as required by DRDO shall be sought based on request received from the interested industries.
 - (d) The THEJAM Accelerometers technology is highly complex technology and requires inter disciplinary knowledge of Optics, high precision manufacturing, electro-magnetic assembly, critical mechanical assembly equipment, clean room facilities, electronic instrumentation and testing capabilities. The participating firms shall meet following essential criterion:
 - (i) The industry should have prior experience of at least 3 years in development /manufacturing, assembly and testing of Multi-disciplinary, High precision navigation sensor systems similar to Accelerometers qualified and delivered for Defense/ Aerospace applications. (S.O. copies for the delivery of similar systems should be provided with EOI).
 - (ii) Clean room of ISO class 100 – 1,00,000 for optics processing, Electro Magnetic Device assembly, integration and testing is essential. ISO class 100 cleanroom of min area 150 m² for Optics processing and assembly, ISO class 1000 cleanroom of min area 100 m² for chemical cleaning, gold sputtering & metrology, ISO class 10,000 cleanroom of min area 200 m² for electrical & electronics assembly and integration, ISO class 1,00,000 clean room of min area 100 m² for service area is essential with standard operating protocols.

- (iii) Adequate qualified human resources, infrastructure, and test equipment to carry out the fabrication, assembly and integration of Optical systems, electromagnetic sub-assemblies, PCB assembly, testing, screening and functional testing as per the process document are essential. Relevant infrastructure such as Laminar flow benches for assembly, soldering work station, chemical cleaning/ chemical etching set ups, anti-static work benches, digital multi meters, regulated power supplies, data acquisition system, Electrostatic discharge (ESD) protection, Uninterrupted power supply with backup systems provisions etc. are essentially required.
 - (iv) Previous and on-going experience of delivery of systems with clearance by Defence QA agencies like RCMA/CEMILAC, DGAQA, MSQAA, R&QA, SSQAG, CQA etc. is essential.
 - (v) It is essential that the participating firms shall have ISO 9001:2015 & AS 9100D certification.
 - (vi) The firm should allow DRDO Technical Team to visit and inspect the above mandatory requirements.
 - (vii) Further details like requirements of machines, metrology and testing equipment, human resources requirement will be provided on submission of NDA to Director, RCI.
- (e) Technical Assessment Committee (TAC) of DRDO will be responsible for shortlisting technically competent and financially competent industries which could successfully absorb the technology leading to production of the products based on the technology while maintaining the requisite quality standards.
- (f) TAC will verify the claims made by the industry as per the information submitted in their Expression of Interest (EOI) and shortlist the industry meeting the requirement for absorption of the technology.
- (g) TAC shall seek additional document from the industry and or may visit the industry to verify the claims made by the industry.
- (h) The evaluation criteria given in Appendix-B - "Evaluation criterion for review by TAC" with supporting documents has to filled and submitted along with the Eoi without which the Eoi will not be considered.
- (i) The other terms and conditions are as per the 'DRDO Policy for ToT' and 'DRDO Procedures for ToT' for Category 'A' available at DRDO website.
- (j) Requirements to be fulfilled by ToT licensee for obtaining Technology Absorption (TA) certificate: After LATOT is signed by the firm, the firm is required to produce at least 20

Nos. of THEJAM-II Accelerometer based on Technology Transfer documents (TTD) received from DRDO for carrying out functional demonstration to DRDO and complete the Qualification and acceptance testing at their own cost and submit a compliance report. The Firm also should have established essential production facility with equipment, test setup infrastructure as required and indicated in EOI. DRDO team may visit for inspection of established facilities. On completion of above task satisfactorily, RCI will recommend to issue Technology Absorption certificate by DIITM. The firm should take necessary steps to retain trained manpower for the execution of production orders. The firm is solely responsible for the Quality of the product. The firm shall have qualified QA/QC team. Technology absorption certificate needs to be obtained within a period of 3 years after signing of LAToT by licensee.

Contact Details

1. The desirous industries should send their Expression of Interest (EOI) to Director, RCI on the following address: -

**Director,
Research Centre Imarat (RCI)
Vignyana Kancha
Hyderabad- 500 069
Fax:040-24306002
E-Mail: director[dot]rci@gov[dot]in**

Copy to:-

**Director,
Directorate of Industry Interface and Technology Management (DIITM),
DRDO Headquarters,
DRDO Bhawan, Rajaji Marg,
New Delhi- 110011.
Fax: 011-23793008.E-Mail: diitm@hqr[dot]drdo[dot]in tot@hqr[dot]drdo[dot]in**

Appendix-A

List of support documents to be attached with EOI

- a) Memorandum and Articles of Association (Should be incorporated as per Indian Companies Act, as amended time to time)
- b) Certificates of registration as a manufacturing unit, if any.
- c) Audited Balance Sheet and turnover of the company for the preceding three years. Company shall submit latest net worth certificate by a statutory auditor
- d) Income Tax returns for the preceding three-year period
- e) Details of shareholding / ownership pattern especially foreign partners / shareholders, foreign employees, directors, etc. The company must adhere to the prevailing Govt. of India policies and regulations on Foreign Direct Investment (FDI) / DIPP norms as applicable.
- f) Annual budget (if any) for R&D during last three years.
- g) Numbers and details of IPR or patents, etc., held by the company.
- h) Number of technically or professionally qualified personnel and internal Quality Control team.
- i) Record of past performance (e.g., Supply orders executed against of Ministry of Defence orders, Public Sectors and Paramilitary Forces, if any).
- j) Availability of adequate infrastructure (List of machines and their production capacities) and technical expertise to fabricate, assemble and test the units.
- k) List of Testing and Support equipment
- l) ISO / AS9100D certification or any other certification (if any).
- m) Relevant clearances from the authorities / ministries (if any).
- n) Capacity and capability to undertake developmental work and to accept attendant financial and commercial risks.
- o) Capacity / capability to market the product through the marketing network, sales and service network, reliability to maintain confidentiality.
- p) Industrial license for defence manufacturing issued by DPIIT (if any).
- q) PESO and DPIIT license for explosive handling if ToT is for high energy Material, explosives, propellants, and component/ system dealing with it etc.
- r) Undertaking from company seeking ToT that none of its Directors, Independent Directors, non-executive Directors, and Key management personnel are involved in any corrupt practices, unfair means and illegal activities.
- s) Undertaking from Company seeking ToT in respect of (g) and (h) of EOI. (s). Brief description of R&D facilities and certificates recognised by any Govt. agencies.
- t) Application cum Industry Assessment Form

Application cum Industry Assessment Form

PART-1

General Information

(Please enclose documents in support of information provided)

1.	Name of the Technology requested for Technology Transfer (Technology name and concerned Lab, Category)	
2.	Name of the industry/organization	
3.	Complex Address and other details	
	Registered Office State Phone No Fax Email Website	
	Factory State Phone No Fax Email Website	
4.	Point of Contact Name Designation Address Mobile No Ph No Email ID	
5.	NAME OF CMD/MD/PARTNERS/PROPRIETOR/etc Name Designation Address Mobile No Ph No Email ID	
6.	Date of Incorporation of company	
7.	Foreign Direct Investment in company (if any in %)	
8.	Shareholding pattern	
9.	Turn over as per Audited Balance Sheet for the preceding three years. Year _____ Year _____ Year _____	

10.	Annual budget for R&D during last three years (if any). Year _____ Year _____ Year _____	
11.	Income Tax returns for the preceding three years period. Year _____ Year _____ Year _____	
12.	Nature of company DPSU, Private Limited, Public Limited, Partnership, Proprietary, Ex-Serviceman Unit	
13.	Category of industry Large Scale, Medium Scale, Small Scale, Micro Startup	
14.	MSME Registration Number	
15.	Certificates of registration as a manufacturing unit, if any.	
16.	If Startup, DPIIT Registration No	
17.	UDYOG AADHAR No	
18.	PAN Number	
19.	Details of Industrial license for defence manufacturing issued by DPIIT (if any)	
20.	Details of PESO license (if any)	
21.	GST Number	
22.	Nature of Business Manufacturing / Sole selling or Authorized Agent/ Assembler/ Traders/ Dealers/ Processor/ Repacker/ Others	
23.	Details of current products and services Products and services Supplied (please specify Govt/ Domestic market/ Export)	
24.	Record of past performance (e.g., Supply orders execute against of Ministry of Defence orders, Public Sectors and Paramilitary Forces, if any).	
25.	Details of registration with NSIC / SSI, DGS&D, other Defence Department, other Govt. Dept, membership of FICCI/ASSOCHAM/CII or other industrial Association (Attach relevant copies of registration letters)	
26.	Have you already taken any technology from DRDO (If yes, give details attaching separate sheet). Name of the Technology, Lab, Year, License number & Status	
27.	ISO/ISI Certification or any other certification (If yes, give details)	

28.	Relevant clearance from the authorities/ ministries (if any)	
29.	Capacity and capability to undertake development work and to accept attendant financial and commercial risks.	
30.	Capacity/Capability to market the product through the marketing network, sales and services network, reliability to maintain confidently.	
31.	Production capacity/month or capability to expand capacity	

PART-2

Infrastructure and other Information

1.	Total area of factory Covered (m ²), Uncovered (m ²), Bonded space available (m ²)	
2.	Ownership of factory Self-owned, partnership, rental	
3.	Electric power Sanctioned Installed Standby (if any)	
4.	Availability of adequate infrastructure (List of machines and their production capacities) and technical expertise	
5.	Name of bank & A/c No Name of bank A/c type A/c no Address of the bank Phone: Email:	

7. Details of current production:

S. No	Type	Description	Licensed/installed capacity	Annual production for preceding 3 years

8. Details of foreign collaboration, if any

S. No	Product	Name and address of collaborator	Year	Remarks

9. Details of products developed for services

S. No	Nomenclature of stores	Order No. and date	Remarks

10. Please give details of important facilities & infrastructure as per following format for:

- a. Production
- b. Unconventional, special m/c
- c. Testing & quality control facilities

11. Furnish the following details with relevant certificates and documents

- a. R&D facilities available:
- b. Inspection quality control of raw material components:
- c. Assistance from central agency for testing / calibration etc:
- d. Laboratory and drawing office facility:

12. Principal customers:

S.No	Name & address	S.O No and date	Date of last supply	Products supplied	Value

13. Future plans (if any) in respect of expansion programme/installation of additional machines/test facilities etc.

14. Name of the technology requested for transfer

(Give self-assessment of your capability to absorb the technology)

15. Details of employee as on date on firm's pay roll

PERMANENT				
Category	Post Held	Number	Qualification	Total Service
Technical	Prod. Manager			
	Q.C. Manager Supervisor Testing Staff (QC) Skilled workers Unskilled workers, etc			
Administrative	Purchase Manager Accounts Officer Office Superintendent Clerical			
	Others, etc			

TEMPORARY				
Category	Post Held	Number	Qualification	Total Service
Technical	Prod. Manager			
	Q.C. Manager Supervisor Testing Staff (QC) Skilled workers Unskilled workers, etc			
Administrative	Purchase Manager Accounts Officer Office Superintendent Clerical			
	Others, etc			

DECLARATION :

I / we confirm that the information furnished in Part 1 & 2 above is correct. In the event of any information given by me / us is found incorrect / false at any time, I / we understand our EoI for ToT will be cancelled/ rejected without notice, beside any other appropriate action against me / us.

Industry seal

Authorized signatory

Name(s) in capital

Designation and seal of
authorized signatory

Dated:

Place:

Appendix-B

Evaluation criterion for review by TAC

- I. The following checklist has to be filled and submitted along with the EOI
- II. For the purpose of evaluation, the participating firm shall mean the company/group of companies of Indian origin.
- III. For the purpose of evaluation, Systems/Sub-systems delivered on or after 01 January 2018 will only be considered.
- IV. The participating firm, if involves sub-contractors for Test facilities, they shall provide the full information (name, Address, Turn-over, Product/Service subcontracted, certifications, SO copy etc.) of sub-contractors during the submission of EOI.
- V. Parameters of evaluation for technical assessment along with the marking scheme is given below. The evaluation and marking scheme is indicative in nature and DRDO reserves the right to modify the marking scheme if needed.

Sl.no.	Parameter		Supporting Documents
1.	Expertise in development, manufacturing, assembly and testing of Multidisciplinary, High precision navigation sensors or systems.	Corresponding Details to be filled	Relevant Purchase Order (PO) copies with technical specifications/ Scope of work to be submitted
	No. of Purchase Orders executed and delivered for each of the following systems		
	a) Navigation Sensors like RLG, FOG, HRG & MEMS		
	b) Aerospace Grade Sensors similar to accelerometers		
	c) Electro-Magnetic devices for aerospace & defence application		
	d) Electro-Optical systems for defence application		
2.	Manufacturing Experience: Experience in manufacturing defense systems of similar type, No. of POs executed for similar type of product in last 5 years	Corresponding Details to be filled	Purchase Order (PO) copies and associated delivery challan within last 5 years to be submitted
	No. of POs in last 5 years Specify Customer Names:		
3.	Green cards / I Notes / Clearance Certificates from Defence QA/QC agencies	Corresponding Details to be filled	Defence QA/QC agencies issued Green Cards/ I Notes /Clearance Certificates/ Boarding

	(RCMA/CEMILAC, DGAQA, MSQAA, R&QA, SSQAG, CQA) for five different similar Systems / Sub-systems		Pass of different sub-systems to be submitted
	No. of Green cards/ I Notes/ Clearance Certificates		
4.	ISO 9001:2015 and AS 9100D certification	Corresponding Details to be filled	Valid certificates to be submitted
	Certificate Nos. and Details		
5.	In-house Manufacturing capability: Mandatory facilities requirement	Corresponding Details to be filled	Test Facility Specifications, Photos and calibration certificates to be submitted
	a) Clean room of ISO class 100 for optics processing & assembly		
	b) Clean room of ISO class 1000 for optics processing & assembly		
	c) Clean room of ISO class 10000 for optics integration & testing		
	d) Clean room of ISO class 100,000 for testing		
	e) High precision metrology equipment (CMM & Optical profilometer)		
	f) High precision magnetron Gold sputtering equipment		
	g) chemical cleaning & chemical etching equipment for quartz processing		
	h) High precision CNC machines		
	i) High precision Laser cutting machine		
	j) Coil Winding machine (machine should wind 30 to 50 microns dia. wire)		
6.	In house Test facilities	Corresponding Details to be filled	• Test Facility Specifications, Photos and calibration certificates to be submitted if in-house.
	a) Automated Accelerometer		

	Calibration and test facility to verify performance characteristics at various temperatures.		<ul style="list-style-type: none"> The participating firm, if involves sub-contractors for Test facilities, they shall provide the full information (name, Address, Turn-over, Product/Service subcontracted, certifications, SO copy etc.) of sub-contractors during the submission of EOI.
	b) Endurance and reliability testing setup, including thermal cycling, vibration, and position tests.		
	c) Helium Leak detection / measurement systems		
	d) Dynamic performance evaluation system with high-speed data acquisition systems compliant with aerospace standards		
	e) Magnetic field measuring equipment		
	f) Magnetization & Demagnetization equipment		
	g) Vacuum system for Soldering and Sealing station		
	h) Gold wire bonding machine (machine should bond the wire thermally of 30 microns diameter)		
	i) Ultra-Vacuum Drying Ovens		
	j) High accuracy & precision 3D Printer for waxing		
	k) Precision LCR meters		
	l) Stereo zoom microscopes		
7.	Willingness to invest in establishment of essential infrastructure / test facilities and Timelines for establishment of the same.	Corresponding Details to be filled	
8.	Existing Man power strength	Corresponding Details to be filled	Valid IPC certificates to be submitted. Certificate by Firm to be submitted citing the
	a) Internal Firm QC		

	No. of IPC certified QC with minimum 3years experience in relevant field		experience details duly signed by authorized signatory of the firm
	No. of Mechanical QC with B.E/BTech. With minimum 3yrs experience in relevant field		
b)For PCB & Integration			
	No. of IPC certified Electronics/ Electrical Diploma / ITI persons for soldering process(JSTD001) and integration, IPC trainer for Acceptance (IPC600/610/620)		
c)For Mechanical sub assemblies and Final integration activity			
	No. of Mechanical Engineers B.E / B.Tech with domain expertise of Precision integration and manufacturing.		
	No. of Mechanical Diploma for Sub Assembly and sealing activity		
	No. of Mechanical ITI fitter for Chemical cleaning, chemical etching, waxing integration and testing activity		
d)For Inspection, Testing and Documentation			
	No. of Mechanical & One Electronic Engineers B.E/BTech. /MTech. with minimum domain expertise of 3yrs for Inspection, Testing and Documentation		
9.	DPIIT License & certifications like AFQMS etc.	Corresponding Details to be filled	a) Valid Defence License issued by DIIPT Note: If applied for DPIIT License, mention time frame by which it will be available b)The supply order of System/ sub-system corresponding to the year mentioned in DPIIT License along with detailed technical specifications of the sub-system to be submitted.
	Relevant DPIIT License (Applied, Not Applied or Not submitted)		
	Available AFQMS certifications (with details)		
10.	On-time Delivery: Delivery of similar product executed within PDC of original Purchase Order (PO)	Corresponding Details to be filled	

	No. of POs within last 5 years		PO, delivery challan and PDC extension letter copies
11.	Whether Already involved in development of the similar systems mentioned in EOI and completed its Qualification Testing QT)		
	i)Yes/No ii)If Yes, QT Completed or not completed and QC letter approval No.		PO copy, Green card (QC clearance) and QT Conformance report to be submitted
12.	Experience in Sensor assembly & Testing		
	Number of sensors for which assembly & Testing carried out		PO copy involving assembly & testing of sensors, number of sub-systems for which assembly & Testing carried out
13.	Banned/black-listed from any Central Govt./State Govt./UT organization. The applicant firm should not be bankrupt..		Self-Certificate to this effect with duly signed by authorized signatory of the firm

VI. The following annexures should be enclosed otherwise the Firm will not be considered for ToT

Sl.No	Technical Parameters	Supporting Documents Enclosed in Annexure reference no.	Supporting Documents as mentioned above
1	Expertise in development, manufacturing, assembly and testing of Multidisciplinary, High precision navigation sensors or similar systems.	Annexure-I	Enclosed/not enclosed
2	Manufacturing Experience: Experience in manufacturing defence systems of similar type, No. of POs executed for similar type of product in last 5 years	Annexure-II	Enclosed/not enclosed
3	Green cards from Defense QA/QC agencies (RCMA/CEMILAC, DGAQA, MSQAA, R&QA, SSQAG, CQA) for five different Sub-systems	Annexure-III	Enclosed/not enclosed
4	ISO 9001:2015 and AS 9100D certification	Annexure-IV	Enclosed/not enclosed
5	In-house Manufacturing capability: Mandatory facilities requirement	Annexure-V	Enclosed/not enclosed
6	In house Test facilities	Annexure-VI	Enclosed/not enclosed
7	Willingness to invest in establishment of essential infrastructure / test facilities and Timelines for establishment of the same.	Annexure-VII	Enclosed/not enclosed
8	Existing Man power strength	Annexure-VIII (a,b,c)	Enclosed/not enclosed
9	Relevant DPIIT License & certifications like AFQMS etc.	Annexure-IX	Enclosed/not enclosed
10	On-time Delivery: Delivery of similar product executed within PDC of original Purchase Order (PO)	Annexure-X	Enclosed/not enclosed
11	Already involved in development of the similar systems mentioned in EOI and completed its Qualification Testing QT)	Annexure-XI	Enclosed/not enclosed
12	Experience in Sensor assembly & Testing	Annexure-XII	Enclosed/not enclosed
13	Banned/black-listed from any Central Govt./State Govt./UT organization. The applicant firm should not be bankrupt.	Annexure-XIII	Enclosed/not enclosed