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Ref.: BARC/APPD/AB/2020/ 148

Date: 10-11-2020

Subject: Inviting quotations for fabrication and supply of remote controlled battery based high speed motors mounted on polymer arms incorporated with remotely operated image capturing and transfer system (as per Annexure 1), at Engineering Hall No. 4, APPD, BARC, Trombay, Mumbai. Quantity: 4 sets.

S. no.	Description	Quantity	Dimensional Accuracy
1.	Motor	16 piece	as per Annexure 1
2.	Microprocessor based with handheld remote control	4 piece	as per Annexure 1
3.	Battery	4 piece	as per Annexure 1
4.	Battery Charger	2 piece	as per Annexure 1
5.	Remotely operated image capturing and transfer system	4 piece	as per Annexure 1

Quotations are invited limited to the suppliers having experience in manufacturing of micro-controller based remotely operated image accusation system capable of maneuvering over a certain distance.

For any clarifications the supplier can contact Sh. Ankan Basak SO/C, APPD / Dr. Amitava Roy, SO/G, APPD on any working day (Monday to Friday) on telephone Nos. 25595037/5145 or email: [ankanb@barc.gov.in](mailto:ankanb@barc.gov.in).

Fabricator must have prior experience in the respective field.

1. Payment for the above work will be made after satisfactory completion of job and on production of bill & advanced stamped receipt along with the copy of registration. No advance payment will be made for this work since ours is a Government organization. Income-tax @2% & surcharge on Income-tax @15% will be deducted from the bill and a TDS (tax deducted at source) certificate will be issued as per Income-tax rules. Suppliers should submit their offers along with the following information.

(a) period of validity, terms & conditions of the offer, (b) Approximate period of completion of the task and (c) copy of the registration and income-tax clearance certificate.

Additional Information:

Your sealed quotation (in your letter head) including all details, like taxes to be paid, transport charges etc., duly indicating our reference number mentioned above, due date on the envelop, may be sent to "Head, APPD, Engg. Hall No.4, Trombay, MUMBAI-400085", by **27<sup>th</sup> November, 2020**. It is mandatory that the tender must be sent by Speed-post only. The quotations received after the due date & by FAX/email/courier will not be considered.

*Amitava Das*

Yours faithfully,

*Archana*  
12-11-2020

( Dr. Archana Sharma )

Head, APPD, BARC

Copy to: A.A.O., Work Section, Central Complex, BARC.

डॉ. (श्रीमती) अर्चना शर्मा / Archana Sharma  
सह निदेशक / Associate Director  
किरणपुंज प्रौद्योगिकी विकास वर्ग  
Beam Technology Development Group



## ANNEXURE 1

Fabrication and supply of remote controlled battery based high speed motors mounted on polymer arms incorporated with remotely operated image capturing and transfer system

### (A) Motor Specifications:

Motor Type	:	Brushless type, 12 Volt 3 phase AC motors
Rotation Speed	:	7400 to 14800 rpm
Input voltage range	:	7.4V to 16.8V AC
Watt	:	296 Watt
Stator size	:	22mm x 12mm
Polymer arm dimension:		220mm x 40mm X 50mm

Each unit equipped with four motors, specified should be mounted on four polymer arms.

(B) Microprocessor based with handheld remote control unit must be provided for speed control to support 8 individual output control lines and 5 input control lines with +5V/1A capacity. The control signal relaying frequency may be in range of 2.4GHz, 1400 meter.

A 16 bit, Microcontroller based motor controller unit supporting 6 PWM output with I/P = 5 PWM lines, O/P = 5V, 1 A DC combined to compatible speed control of these motors has to be provided for each unit.

Each unit should contain a receiver unit that includes a dipole antenna with omnidirectional radiation pattern. The assembly unit should be controlled with a centre frequency = 2.4 GHz transmitter unit.

	Parameter	Value
1	Vehicle including propellers and batteries	1000 to 1500 grams
2	Maximum ascent speed	4 m/s
3	Maximum descent speed	2.5 m/s
4	Maximum speed	23 mph (37 kph)
5	Maximum tilt angle	27 °
6	Maximum angular speed	84° /s
7	Wind speed resistance	13 m/s
8	Maximum transmission distance (unobstructed, free of interference)	1400 m
9	Operating Frequency	2.4-2.48 GHz
10	Operating temperature range	0-45° C
11	Transmitter power	2.4-2.48 GHz , < 20dBm
12	Satellite poisoning system	GPS
13	RC size	L = 525 mm , W = 525 mm, H= 100 mm

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14	Altitude	50m
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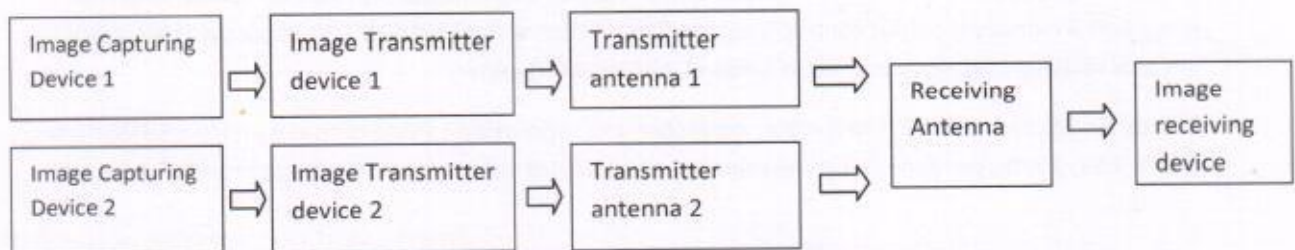
(C) Battery 11V/182A 57Wh, rechargeable lithium polymer battery to be supplied along with compatible rapid charger.

Fabricator should provide a demonstration for speed control of 3 phase AC motors as above mentioned in specifications with their controllers, connections, winding configuration of brushless motors and troubleshooting. Safety precautions should also be illustrated at the time of demonstration.

	Parameter	Value
1	Battery charger	12.6 V, 30 W
2	Battery	5500 mAh, 12.6 V
3	Charging Time	1 hr 15 minute
4	Max Flight Time	12 minutes

(D) Remotely operated image capturing and transfer system

Representation of Image capturing and Transfer System



Detailed specification of Image capturing and Transfer system

Detailed specification of image capturing and Transfer System

(a) Specification of Image capturing device

1000 TVL 1/3 CCD 110 Degree 2.8mm Lens

Input voltage : 5-20Volt

Power Consumption : 27mA – 105mA

Lux : 0.07 – 0.08 Lux

Sensor : 1/3" CCD

Format : NTSC/PAL (Free Switch)

Resolution : Ultra high definition 1000TVL

- PAL : 976H x 494V Vertical

- NTSC : 976H x 494V

FOV : 100-120 degree

Operating Temperature : 5 to 60 degree

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Camera Size : (26-28) x (24-25) x (17-18)mm  
Net weight : approx 10 gram  
Camera : 12MP, 1080p

(b) Specification of Image Transmitter device

Input Voltage : 6V to 28V  
Peak Max : 31V  
Voltage Output : 5V to 0.5A max  
Output power : 14dBm / 23 dBm optional  
Operating Frequency : 5.6 - 5.8 GHz  
Power Consumption : 25mW  
Transmitter Antenna Connector : SMA  
Dimension : 22(H) x 30(W) x 4(D) mm typical  
Weight : typical 7 grams

(c) Specification of Image Transmitter antenna

Frequency Range : 5.5-6.0 GHz  
Polarisation : RHCP/omnidirectional  
Gain : 1.26dBi  
Weight : typical 12g  
Height : 70-80 mm typical  
Connector : SMA

(d) Specification of Image Receiver antenna

Center frequency : 5.8GHz  
Polarisation : RHCP/omnidirectional  
Bandwidth : 500MHz  
VSWR : < 1.5(at centre frequency)  
Gain : 1.08dBi  
Weight : typical 12g  
Connector : RP-SMA

(e) Specification of Image Receiver device

USB image receiver  
Channel : 150 Channel  
Frequency Range : 5.6GHz ~ 5.9GHz  
Sensitivity : -90dBm  
Operating Current : 200mA/5V

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Operating Temperature : -10 to 60 degree  
Connector : RP-SMA  
Weight : typical 30g  
Size typical : 60 x 30 x 1mm  
Latency : 90-100 mili – second

Scope of Work

Supplier has to provide necessary cable accessories, connectors for the image capturing and transfer system and a transfer system and a demonstration has to be provided.

Fabricator should go through the details of above specification fully, before quoting the budgetary offer.

Quantity Required : 4 sets

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