## GOVERNMENT OF INDIA (Ministry of Home Affairs) DIRECTORATE GENERAL

E-220 07/05/2019

## CENTRAL RESERVE POLICE FORCE

## EAST BLOCK-7, SEC-1, R.K. PURAM, NEW DELHI-110066

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No. B.V-7/2019-20-C (QRs) To Dated, the 66 May 2019

- DIG (Comn), ITBP
   Block No. 2, CGO Complex
   Lodhi Road, New Delhi-03
- DIG (Comn), NSG
   Meharam Nagar
   Palam, New Delhi-37
- 3. DIG (Comn), SSB East Block-V, R.K Puram New- Delhi-66
- 4. AIG (Comn), CISF
  Block No. 13, CGO, Complex
  Lodhi Road, New Delhi-03
- 5. DIG (Prov), BSF Block No. 10, CGO Complex Lodhi Road, New Delhi-03
- 6. Liaison Office, Assam Rifle Room No-171, North Block, MHA New Delhi -01

#### Subject: Regarding QRs/TDs of Communication Equipments.

Please find enclosed herewith QRs and TDs of Nano UAV & X-BIS Simulator System as Annexure-A & Annexure-B respectively duly approved by the competent authority for further necessary action.

Encl: (QRs & TDs of subject items)

{P.R.Jha, DC (Comn)}

For DIG (Equipment)
Directorate General, CRPF

# ORe of Nano UAV/UAS

i deli Baldhi i m			Of Nano Carry		
	Nano UAV/UAS system should consist of the following sub-systems:				
, 1	Nanc	UAV/UAS syste	em should consist to		
1	TIAV	Bird with batter	y pack		
~ 1	C=01	and Control State	on with		
.2	Dovi	ylight & night Camera Payload versal Battery Charger with Power Supply System iversal Battery Charger with Power Supply System			
.3		iversal Battery Charger with Power Supply			
	UIIIV	o IIAV characte	Personal soldier Surveillance, air platform of very  Personal soldier Surveillance and detection		
2	Role	0 0.21	ersonal soldier Surveillance and detection		
2.1	Kore		Personal soldier Surveillance, air platerians small size of close range surveillance and detection small size of close range surveillance and detection		
	1		during day and night.  i) Vertical Take Off and Landing (VTOL) or  i) Polley landing within an area of		
~ ~	Tou	inch and	i) Vertical Take Off and Landing (V102) of Hand Launch and Belly landing within an area of		
2.2	Dec	covery mode	Hand Launch and Belly lands		
	Rec	,000	10m x 10m clearing or 100		
			ii) Payload should not get damaged during recovery		
			ii) Payload should not get damaged and		
			of UAV		
		1 Giomoture	<40dB: at 50 feet Above Ground Development (EO) for		
2.3	Au	ral Signature yloads carrying	Should have capability to carry some at a time.		
2.4	Pa		day and Thermal Imager (TI) for hight one of the order of		
	ca	pability	OR Integrated day & The		
			requirement) vertical takeoff or hand		
		· L. Modes	al Fully autonomous vertical		
2.5	F1	ight Modes	launch. b) Fully autonomous vertical landing or belly landing.		
			b) Fully autonomous vertical landing of		
			c) Hover at defined way point in the pre-defined as		
	1		c)Hover at defined waypoint d) Autonomous waypoint navigation (pre-defined as well as dynamically adjustable waypoints during		
1			well as dynamicany		
1			flight) e) Remote Piloted mode for video based user		
١			el Remote Piloted mode loi video		
1			navigation. Target Tracking of fixed		
1			A Vision based Autonomous Tago		
			and moving targets.  g) Should be controllable in real time from the GCS		
1	1		g) Should be controllable in real differences		
	1		up to recovery.		
			up to recovery.  h) Fully autonomous and stabilized.  h) Fully autonomous and stabilized.		
_		Endurance	h) Fully autonomous and stabilized.  20 minutes or more with all payloads at Mean Sea		
2	.6	Enquiance			
		A 14:4	- Ground Level) of more		
2	2.7	Operating Altitu			
12	2.8	Launch Altitude	1 1-m line of Sigill		
	2.9	Range	of Minimum 1 kill life of organi		
.   1		Operation	11		
+	2.10	Cruise Speed	18 km/h or more		
2.10 Cluide of Wind a) Take 0		7	Wind a) Take off: 10 knots or more		
	2.11	Operación	b) Landing: 10 knots or more		
		Conditions	and the own more		
			Poturn to Home on communication		
	2.12	Fail safe featur			
			to Home M Allu Ull IOW Ducco.		
}			b) Automatic Return to Home, c) Multiple GPS on-board for GPS failure redundan		
/			c) Multiple of 5 51		
N 5 1 "					

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"Pay"

N 13			
13	Paramete		Specifications ectrical with rechargeable batteries
	Propulsion sy		
3.	Payload char	acteristic	es:-
<del>-</del>	Payloads requ		
.1	Payloaus 1040		m - mod Imager (11) Of IK 101 Ingit
		()	Integrated day & night payload.
		(A	s per user requirement)
	- 1 1 and		s per user requirement) Video output should be digitally stabilized at all
3.2	Payload and	71000 20	oom levels.
	Stabilization	h	oom levels.  Quality of video should not be affected by UAV
		i .	1 4:000
			o 1 O more with 90° pan / uit.
3.3	Electro optio	, ,	- 1-4:-m, 1080 X /20 DIXCLUI DOCCO
	Daylight Pay	yload   0	Optical Zoom: 4X zoom. Digital zoom: 4X  Optical Zoom: 4X zoom. Digital zoom: 4X
		C	Optical Zoom: 4X zoom. Digital zoom.  Should be able to detect human size target at 100
	}	1 '	-last or more
			neter slant or more.
3.4	Thermal	Imager a	Thermal Camera with 90° pan/ tilt  Thermal Camera with 90° pan/ tilt
J. I	(TI) Night		
	Payload	(	White/Black Hot modes for 11 Pay
	(As per	user	d) Digital Zoom: 4X or more e) Should be able to detect human size target at 70
	requirement	n G	e) Should be able to detect numer see
	1cquiross	1	meter slant or more
		Pacovery	Switchable (from GCS) LED light which operates
3.5			with Night Payloau
	Beacon	-41 Sto	tion characteristics:-
4. Ground Contro			TIDII CHAIGO TO THE PART OF MARKET
4.	Ground Co	ntroi Sta	tion characteristics:- ld have MIL-STD-810G or better and IP51 or better,
4.1	Option-1: (	GCS shou	tion characteristics:- ld have MIL-STD-810G or better and IP51 or better,
	Option-1: (	3CS shou d laptop.	Id have MID-SID Cross
	Option-1: (	3CS shou d laptop.	ld have MID-SID Close
	Option-1: (	3CS shou d laptop.	ld have MID-SID Close
	Option-1: Osemi rugge	GCS shou d laptop. GCS shou top.	ld have MIL-STD-810G or better and IP65 or better,
	Option-1: ( semi rugge Option-2: ( rugged lap	GCS shound laptop.  GCS shound top.  er requires	ald have MIL-STD-810G or better and IP65 or better,
4.1	Option-1: ( semi rugge Option-2: ( rugged lap	GCS shound laptop.  GCS shound top.  er requires	ald have MIL-STD-810G or better and IP65 or better,
	Option-1: ( semi rugge  Option-2: ( rugged lap (As per use	GCS shound laptop.  GCS shound top.  er requires	ald have MIL-STD-810G or better and IP65 or better,
4.1	Option-1: ( semi rugge Option-2: ( rugged lap	GCS shound laptop.  GCS shound top.  er requires	Id have MIL-STD-810G or better and IP65 or better,  ment)  re:- Intel Core i5 v Pro Processor, 2.3 GHz or equivalent /better
4.1	Option-1: Osemi rugged Option-2: Orugged lap (As per use Computin CPU	GCS shound laptop.  GCS shound top.  er requires	Id have MIL-STD-810G or better and IP65 or better,  ment)  re:- Intel Core i5 v Pro Processor, 2.3 GHz or equivalent /better
4.1	Option-1: (semi rugge) Option-2: (rugged lap) (As per use) Computin CPU Storage	GCS shound laptop.  GCS shound top.  er requires	ald have MIL-STD-810G or better and IP65 or better,  ment)  re:- Intel Core i5 v Pro Processor, 2.3 GHz or equivalent /better  Minimum 500 GB
4.1	Option-1: ( semi rugge  Option-2: ( rugged lap (As per use  Computin  CPU  Storage  Memory	GCS shound laptop.  GCS shound top.  er requires	Id have MIL-STD-810G or better and IP65 or better,  ment).  re:- Intel Core i5 v Pro Processor, 2.3 GHz or equivalent /better Minimum 500 GB  2GB or more Minimum 10 inch - 1024 x 768 XGA sunlight
4.1	Option-1: (semi rugge) Option-2: (rugged lap) (As per use) Computin CPU Storage	GCS shound laptop.  GCS shound top.  er requires	Id have MIL-STD-810G or better and IP65 or better,  ment).  re:- Intel Core i5 v Pro Processor, 2.3 GHz or equivalent /better Minimum 500 GB  2GB or more Minimum 10 inch - 1024 x 768 XGA sunlight
4.1	Option-1: Osemi rugged Option-2: Orugged lap (As per use Computin CPU Storage Memory Display	GCS shou d laptop. GCS shou top. er require: g Hardwa	Id have MIL-STD-810G or better and IP65 or better,  ment)  re:- Intel Core i5 v Pro Processor, 2.3 GHz or equivalent /better Minimum 500 GB  2GB or more Minimum 10 inch - 1024 x 768 XGA sunlight readable screen, anti-glare.
4.1	Option-1: (semi rugged) Option-2: (rugged lap) (As per use) Computin CPU Storage Memory Display Keyboard	GCS shou d laptop. GCS shou top. er require g Hardwa	Id have MIL-STD-810G or better and IP65 or better,  ment)  re:- Intel Core i5 v Pro Processor, 2.3 GHz or equivalent /better Minimum 500 GB  2GB or more Minimum 10 inch - 1024 x 768 XGA sunlight readable screen, anti-glare.
4.1	Option-1: ( semi rugge  Option-2: ( rugged lap (As per use  Computin  CPU  Storage  Memory  Display  Keyboard  Battery O	CS should laptop.  GCS shoultop.  er requires  g Hardwa  & input peration	Id have MIL-STD-810G or better and IP65 or better,  ment)  re:- Intel Core i5 v Pro Processor, 2.3 GHz or equivalent /better  Minimum 500 GB  2GB or more  Minimum 10 inch - 1024 x 768 XGA sunlight readable screen, anti-glare.  Touch screen  Minimum two hours at peak utilisation.
4.1	Option-1: ( semi rugge  Option-2: ( rugged lap (As per use  Computin  CPU  Storage  Memory  Display  Keyboard  Battery O	CS should laptop.  GCS shoultop.  er requires  g Hardwa  & input peration	Id have MIL-STD-810G or better and IP65 or better,  ment)  re:- Intel Core i5 v Pro Processor, 2.3 GHz or equivalent /better  Minimum 500 GB  2GB or more  Minimum 10 inch - 1024 x 768 XGA sunlight readable screen, anti-glare.  Touch screen  Minimum two hours at peak utilisation.  Should be less than 3.5 hours
4.1	Option-1: ( semi rugge  Option-2: ( rugged lap (As per use  Computin CPU  Storage  Memory Display  Keyboard  Battery O  Battery	& input peration Charging	Id have MIL-STD-810G or better and IP65 or better,  ment)  re:- Intel Core i5 v Pro Processor, 2.3 GHz or equivalent /better  Minimum 500 GB  2GB or more  Minimum 10 inch - 1024 x 768 XGA sunlight readable screen, anti-glare.  Touch screen  Minimum two hours at peak utilisation.  Should be less than 3.5 hours
4.1	Option-1: (semi rugged) Option-2: (rugged lap) (As per use) Computin CPU Storage Memory Display Keyboard 3 Battery 0 4 Battery time of Ge	& input peration CS shou top. er require: g Hardwa	Id have MIL-STD-810G or better and IP65 or better,  ment)  re:- Intel Core i5 v Pro Processor, 2.3 GHz or equivalent /better  Minimum 500 GB  2GB or more  Minimum 10 inch - 1024 x 768 XGA sunlight readable screen, anti-glare.  Touch screen  Minimum two hours at peak utilisation.  Should be less than 3.5 hours  Ports for data transfer to external secondary storage
4.1	Option-1: ( semi rugge  Option-2: ( rugged lap (As per use  Computin CPU  Storage  Memory Display  Keyboard  Battery O  Battery	& input peration CS shou top. er require: g Hardwa	Id have MIL-STD-810G or better and IP65 or better,  ment)  re:- Intel Core i5 v Pro Processor, 2.3 GHz or equivalent /better  Minimum 500 GB  2GB or more  Minimum 10 inch - 1024 x 768 XGA sunlight readable screen, anti-glare.  Touch screen  Minimum two hours at peak utilisation.  Should be less than 3.5 hours  Ports for data transfer to external secondary storage
4.1	Option-1: (semi rugged) Option-2: (rugged lap) (As per use) Computin CPU Storage Memory Display Keyboard Battery O 4 Battery time of Ge .5 Data port	& input peration Charging CS	Id have MIL-STD-810G or better and IP65 or better,  ment)  re:- Intel Core i5 v Pro Processor, 2.3 GHz or equivalent /better  Minimum 500 GB  2GB or more  Minimum 10 inch - 1024 x 768 XGA sunlight readable screen, anti-glare.  Touch screen  Minimum two hours at peak utilisation.  Should be less than 3.5 hours  Ports for data transfer to external secondary storage devices
4.1	Option-1: (semi rugged) Option-2: (rugged lap) (As per use) Computin CPU Storage Memory Display Keyboard Battery O 4 Battery time of Ge .5 Data port .6 Interface	& input peration Charging CS cability	Id have MIL-STD-810G or better and IP65 or better,  ment).  Fe:- Intel Core i5 v Pro Processor, 2.3 GHz or equivalent /better Minimum 500 GB  2GB or more Minimum 10 inch - 1024 x 768 XGA sunlight readable screen, anti-glare.  Touch screen Minimum two hours at peak utilisation.  Should be less than 3.5 hours  Ports for data transfer to external secondary storage devices  VGA/HDMI, USB, 10/100/1000 Ethernet.
4.1	Option-1: (semi rugged) Option-2: (rugged lap) (As per use) Computin CPU Storage Memory Display Keyboard Battery O 4 Battery time of Ge .5 Data port	& input peration Charging CS cability	Id have MIL-STD-810G or better and IP65 or better,  ment).  Ire:- Intel Core i5 v Pro Processor, 2.3 GHz or equivalent /better Minimum 500 GB  2GB or more Minimum 10 inch - 1024 x 768 XGA sunlight readable screen, anti-glare.  Touch screen Minimum two hours at peak utilisation.  Should be less than 3.5 hours  Ports for data transfer to external secondary storage devices  VGA/HDMI, USB, 10/100/1000 Ethernet.  a) Transmit control commands to UAV.
4.1	Option-1: (semi rugged) Option-2: (rugged lap) (As per use) Computin CPU Storage Memory Display Keyboard Battery O 4 Battery time of Ge .5 Data port .6 Interface	& input peration Charging CS cability	Id have MIL-STD-810G or better and IP65 or better,  ment).  Ire:- Intel Core i5 v Pro Processor, 2.3 GHz or equivalent /better Minimum 500 GB  2GB or more Minimum 10 inch - 1024 x 768 XGA sunlight readable screen, anti-glare.  Touch screen Minimum two hours at peak utilisation.  Should be less than 3.5 hours  Ports for data transfer to external secondary storage devices  VGA/HDMI, USB, 10/100/1000 Ethernet.  a) Transmit control commands to UAV.
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4.1	Option-1: (semi rugged) Option-2: (rugged lap) (As per use) Computin CPU Storage Memory Display Keyboard Battery O 4 Battery time of Ge .5 Data port .6 Interface	& input peration Charging CS cability	Id have MIL-STD-810G or better and IP65 or better,  ment)  re:- Intel Core i5 v Pro Processor, 2.3 GHz or equivalent /better Minimum 500 GB  2GB or more Minimum 10 inch - 1024 x 768 XGA sunlight readable screen, anti-glare.  Touch screen Minimum two hours at peak utilisation.  Should be less than 3.5 hours  Ports for data transfer to external secondary storage devices  VGA/HDMI, USB, 10/100/1000 Ethernet.  a) Transmit control commands to UAV. b) Receive UAV flight and propulsion parameters. c) Receive, display and record real time day and
4.1	Option-1: (semi rugged) Option-2: (rugged lap) (As per use) Computin CPU Storage Memory Display Keyboard Battery O 4 Battery time of Ge .5 Data port .6 Interface	& input peration Charging CS cability	Id have MIL-STD-810G or better and IP65 or better,  ment)  re:- Intel Core i5 v Pro Processor, 2.3 GHz or equivalent /better Minimum 500 GB  2GB or more Minimum 10 inch - 1024 x 768 XGA sunlight readable screen, anti-glare.  Touch screen Minimum two hours at peak utilisation.  Should be less than 3.5 hours  Ports for data transfer to external secondary storage devices  VGA/HDMI, USB, 10/100/1000 Ethernet.  a) Transmit control commands to UAV. b) Receive UAV flight and propulsion parameters. c) Receive, display and record real time day and night video from UAV.
4.1	Option-1: Computing CPU  Storage Memory Display  Keyboard Battery time of Go Total Capabilit	& input peration Charging CS ability	Id have MIL-STD-810G or better and IP65 or better,  ment)  re:-  Intel Core i5 v Pro Processor, 2.3 GHz or equivalent /better  Minimum 500 GB  2GB or more  Minimum 10 inch - 1024 x 768 XGA sunlight readable screen, anti-glare.  Touch screen  Minimum two hours at peak utilisation.  Should be less than 3.5 hours  Ports for data transfer to external secondary storage devices  VGA/HDMI, USB, 10/100/1000 Ethernet.  a) Transmit control commands to UAV. b) Receive UAV flight and propulsion parameters. c) Receive, display and record real time day and night video from UAV. d) Capability to control UAV while on the move.  War along with UAV location, UA
4.1	Option-1: (semi rugged) Option-2: (rugged lap) (As per use) Computin CPU  Storage Memory Display  Keyboard  Battery O  Battery time of Ge  Data port  Interface  Capabilit	& input peration Charging CS ability	Id have MIL-STD-810G or better and IP65 or better,  ment)  re:-  Intel Core i5 v Pro Processor, 2.3 GHz or equivalent /better  Minimum 500 GB  2GB or more  Minimum 10 inch - 1024 x 768 XGA sunlight readable screen, anti-glare.  Touch screen  Minimum two hours at peak utilisation.  Should be less than 3.5 hours  Ports for data transfer to external secondary storage devices  VGA/HDMI, USB, 10/100/1000 Ethernet.  a) Transmit control commands to UAV. b) Receive UAV flight and propulsion parameters. c) Receive, display and record real time day and night video from UAV. d) Capability to control UAV while on the move.  War along with UAV location, UA
4.1	Option-1: Computing CPU  Storage Memory Display  Keyboard Battery time of Go Total Capabilit	& input peration Charging CS ability	Id have MIL-STD-810G or better and IP65 or better,  ment)  re:-  Intel Core i5 v Pro Processor, 2.3 GHz or equivalent /better  Minimum 500 GB  2GB or more  Minimum 10 inch - 1024 x 768 XGA sunlight readable screen, anti-glare.  Touch screen  Minimum two hours at peak utilisation.  Should be less than 3.5 hours  Ports for data transfer to external secondary storage devices  VGA/HDMI, USB, 10/100/1000 Ethernet.  a) Transmit control commands to UAV. b) Receive UAV flight and propulsion parameters. c) Receive, display and record real time day and night video from UAV. d) Capability to control UAV while on the move.

			Specifications general display
SN	Pa	rameter	b) Real-time video from the UAV with on-screen display
			of important parameters like:-
	1		l . alimate of ISTECL )
	\ .		1 14:41 do of target
			- rest Desition
	Ì		and above ground label
	1		at 11AV from GCS
			, (A :+b) of TIAV from GCS
	1		a annead of UAV
	-		1: - / True North Hulcauon
	•		viii. UAV Heading/ 11 de 1867 de 1
	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		ix. Mission time c) Geographic map and real-time video should be
	-		c) Geographic map and real distributions the flight.
1	Ì		displayed at all times during the flight.  d) Geographic map and real-time video views window  d) Geographic map and real-time video views window  and or switchable to allow user to
	\		d) Geographic map and real-time vides
1.	1		d) Geographic map and real-time that do allow user to should be resizable and/or switchable to allow user to should be resizable and/or switchable and small map/big
	- }		her man/sillall vidoo v=="
			through a sitigle chert of the
	1		
<u></u>		Man Formats	e) Artificial Horizon indicating CAV description
4	.9	Map Formats	a) Should have the capability to integrate good raster maps provided in at least one of the commonly raster maps provided in at least one of the commonly raster maps provided in at least one of the commonly raster maps (GIF, TIFF, DTED and SRTM)
			used digital map lorinats (cm, see
	}		etc.) etc.) application
- }	}		b) Should be able to work with Good download maps should have the capability to download maps of contracts.
	. }		should the live ofter specifying location GPS co-ordinates.
- }			a) Selection and switch on/off of payload
T	4.10	Payload	b) Pan/tilt/Zoom Controls
		Controls	The making on / Off
			d) Switch on off Night Recovery Beacon
-		Tourists	i. Full Camera Control-
	4.11	Joystick Controls	a) Pan/tilt
-		Controls	1.07 m In $/0.11$
			c).Black/White Hot(only in case of TI)
1			ii. RPV Mode
			iii. Altitude Control  a) Video should be recorded in any commonly portable  (AVII / MPEG / MP4 etc.)
ļ	4.12	2 Video	
			b) Video of the full flight should be recorded b) Video of the full flight to take image snapshots at any
		1	c) Should have capability to take 222-78
	1		time during flight
Y	}	_	time during flight  d) Software should be provided that will facilitate  the recorded video post flight
)			
7	1	3 Pre-flight	Self-test of UAV system, Output: go/no go
	4. J	checks	

4.13 Pre-flight checks

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Specifications			
N	Parar	neter	
5.	Com		ink:- i) Transmit control commands from GCS to UAV i) Transmit control commands from GCS to UAV
$\frac{0}{1}$	Comi	nunication	i) Transmit control commands from GCS to GCS ii) Transmit parameter of UAV and payload to GCS iii) Transmit day and night video from UAV to GCS
* - 1	link equipment i		ii) Transmit parameter
		bility	ii) Transmit parameter of UAV and payton iii) Transmit day and night video from UAV to GCS iii) Transmit day and night video from UAV to GCS iii) Transmit day and night video from UAV to GCS
	Tapa	e of link	iii) Transmit day and night video from order iii) Transmit day and
5.2	Typ	C 01 1111-1	encryption.
	\ <del></del>	quency Band	encryption.  System should operate on S & C frequency Band  System should operate on S in the Color of
5.3	Fre	quency 2	1:-1- and dOWI IIIIA, Page
			band i.e 2.4 GHz of 3.0 GHz
	1_	1 System	
6.	Ge	neral System	The maximum all up weight (including payload)
$\frac{1}{6.1}$	Wei	ight	should be ≤ 250 gms.
•			
60	Ass	sembly/	≤5 minutes
	Dis	sassembly time	The total technical life of Nano UAV should not be
	3 Lif	e of Nano UAV	The total technical me of the first than 750 flights (250 flying hours).  less than 750 flights (250 flying hours).
٠ <b>٠</b> ٠٠			less than 750 flights (250 flying flour).  The UAV and associated systems should be and storage for following
_	4 5	nvironmental	The UAV and associated systems certified for operation and storage for following
6.	4 61	onditions for	certified for operation and
		paration and	environment conditions.
Operation and Storage  environment conditions.  environment conditions.  i) Damp Heat: 40 °C at RH not less than 95%  ii) Damp Heat: 40 °C at RH not less than 95%		i) Damp Heat: 40 °C at RH not least temp: -10°C	
Storage ii) Operating temperature & Storage temp:		i) Damp Heat: 40 °C at RH not less that ii) Operating temperature & Storage temp: -10°C	
1	1		to +55°C iii) Ability to withstand dust, drizzle and humid
	\		iii) Ability to withstand dust, drizzle and
	1		1:4:000
١	. \_		
1	6.5	Fortability	
1		Operation	portable, light in weight, compact, and night surveillance, capable of being carried and
1			operated by two men.
<b> </b>	6.6	Battery of AV	the backup of minimum 20 minutes.
-			oro -b orono CVCIES.
ŀ	6.7	Life of AV Bat	tery Minimum 250 charging cyclestocharger to charge the
}	6.8	Battery Cha	rger   Suitable universal battery
\	0.0	of AV battery	batteries within two hours.
	-	Accessories	a) Water proof Back I del
	6.9	Accessorios	b) Field Repair kit: I No's
			c) Battery packs; 3No's
	1		1) Spore propeller Sets: 2 1008
	[		e) Associated Cables & Mountings: 1set
			e) Associated Capito & Iset
			f) Hard transportation boxe 1set
Λ_		<b>7</b>	g) User, Technical & Mainte ance Manual: set
7		•	h) Log book: 1 set

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		Specifications
		Peremeter
	.N	Noneque:
7	7	Miscelland Miscelland Will be provided to the
7	7.1	Miscellaneous:-  Training: 5 working days training will be provided to 04 pilots.  Training: 5 working days training will be provided to 04 pilots.
1	7.2	Training: 5 working days training will be provided to  Training: 5 working days training will be provided to the pr
		F.No.05-13/2014-AED VOILE
L		
	ě	J. K. Sharma, DC SSB
يرق	4	Maior, Alterial Prince
y Cł	roud	ihary Major. Ajit Kumer ITBP
3SF		// , , land
		Why is abu Sharma is
	_	
DC	١	P.R.Jha,DC(Comn) Sanjay Sharma, BPR&D Assam Rines
DC DC		CRPF

NSP. B.C. Roy

R.K. Meel, DC

CRPF CISF

Harjinder Singh, DIG(Eqpt) CRPF

lav, IPS, IGP(Comn &IT) CRPF

IPS, ADG (Comn) Md. Javed CRPF

D.S.Rawat, DIG(Comn)

CRPF

Approved/Not Approved

Rajeev Rai Bhatnagar, IPS DG, CRPF

		TDs of Nano UAV/UAS	
SN	Parameter	. Specifications	Trial directives
1	Nano UAV/	UAS system should consist of the	following sub-systems:-
1.1	UAV Bird wi	th battery pack	Board will check it practically
1.2	Ground Co	ontrol station with data link	and will ensure that items
	equipment		are available as per tender
1.3	Daylight &	night Camera Payload	publication.
1.4	Universal B	attery Charger with Power Supply	
	System		
2	Nano UAV	:haracteristics:-	
2.1	Role	Personal soldier Surveillance,	Board will check it practically
		air platform of very small size of	during day and night and will
		close range surveillance and	ensure that UAV equipped with these features.
		detection during day and night.	
2.2	Launch	i) Vertical Take Off and Landing	Board will check practically by within the shown area
	and	(VTOL) or	and will ensure that payload
	Recovery	Hand Launch and Belly landing	should not get damaged
	mode	within an area of 10m x 10m	during recovery of UAV.
	1	clearing or less	during recovery or one.
		ii) Payload should not get	
		damaged during recovery of	
		UAV	The firm will submit
2.3		≤40dB3 at 50 feet Above Ground	certificate of Govt. Lab. or
	Signature	Level	DRDO or NABL accredited or
			ILAC accredited laboratory.
-		Should have capability to carry	
2.4		electro Optic (EO) for day and	Board win cheek practically.
	carrying capability	Thermal Imager (TI) for night	
	capability	one at a time. OR Integrated day	
		& Night payload.(As per user	
		requirement)	
2.5	Flight	a) Fully autonomous vertical	Board will check practically.
2.0	Modes	takeoff or hand launch.	
		b) Fully autonomous vertical	:
		landing or belly landing.	
		c)Hover at defined waypoint	
		d) Autonomous waypoint	
	į	navigation (pre-defined as well	
		as dynamically adjustable	·
		waypoints during flight)	
		e) Remote Piloted mode for	
		video based user navigation.	
		f) Vision based Autonomous	]
		Target Tracking of fixed and	
		moving targets.	
		g) Should be controllable in real	
		time from the GCS up to	
		recovery.	-
1.		h) Fully autonomous and	
		stabilized.	T 1 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
2.6	Endurance		Board will check practicall
		payloads at Mean Sea Level.	with maximum payload up to launch altitude of 1000
			meter Above Mean Sea Leve
			(AMSL).
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SN	Parameter	Specifications	Trial directives	
2.7	Operating	100 feet AGL (Above	Board will check practically by	
	Altitude	Ground Level) or more.	flying the UAV.	
2.8	Launch	2000m AMSL (Above	Firm will submit OEM	
	Altitude	Mean Sea Level) or more	certificate.	
2.9	Range of	Minimum 1 km line of	Board will check practically.	
	Operation	sight	·	
2.10	Cruise Speed	18 km/h or more	Board will check practically and firm will submit OEM certificate.	
2.11	Operating Wind	a) Take off: 10 knots or	Board will check it practically	
	Conditions	more	or firm certificate will be	
		b) Landing: 10 knots or	accepted in this regard.	
		more		
		c) gust: 15 knots or more		
2.12	Fail safe	a) Automatic Return to	Board will check it	
	features	Home on communication failure	practically.	
		b)Automatic Return to Home/ Land on low battery		
	·	c) Multiple GPS on-board for GPS failure redundancy	certificate.	
2.13	Propulsion	Electrical with	Board will check it practically.	
	system	rechargeable batteries		
3.	Payload charact	teristics:-		
3.1	Payloads	a) Electro Optic (EO) for	Board will check practically	
	required	day (colour)	after fitting the required	
	_	b) Thermal Imager (TI) or IR for night c) Integrated day & night	payloads and ensure that UAV working satisfactorily.	
		payload.		
0.0	D-d-d and	(As per user requirement) a) Video output should	Board will check practically all	
3.2	Payload and Video	be digitally stabilized at all zoom levels.	parameters	
	Stabilization	b) Quality of video should not be affected by UAV vibrations.		
3.3	Electro optic	a) Color Camera with 90°	Board will check it practically	
	(EO) Daylight	pan / tilt.	and ensure daylight payload	
	Payload	b) Resolution: 1280 X 720 pixel or better	working as per their parameters and firm will submit OEM certificate for	
		- · · · · · · · · · · · · · · · · · · ·	resolution and FOV.	

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SN	Parameter	Specifications	Trial directives
-		c) Optical Zoom: 4X zoom. Digital	
		zoom: 4X	
	<u> </u>	d) Should be able to detect human	,
		size target at 100 meter slant or	
		more	
3.4	Thermal	a. Thermal Camera with 90° pan /	Board will check it
3.4	Imager (TI)		practically and ensure
	Night or IR	b. Resolution: 320 X 240 pixels or	daylight payload working
	Payload	better	as per their parameters
	(As per user	TI for TI	and firm will submit
	requirement)	payload	OEM certificate for
	requirement,	d) Digital Zoom: 4X or more	resolution.
		e) Should be able to detect human	
Ì		size target at 70 meter slant or more	
<u> </u>	N' 1.4 Decement	Switchable (from GCS) LED light	Board will check it
3.5		when operating with Night Payload	practically.
	Beacon	Station characteristics:	
4.	Ground Control	Station characteristics:- should have MIL-STD-810G or better	Firm will submit
4.1	Option-1: GCS	an acmi magged lanton	certificate of Govt. Lab.
	and IP51 or bett	er, semi rugged laptop.	or NABL accredited or
	2 000	-1-51d have MII_STD_810G or better	ILAC accredited
-	Option-2: GCS	should have MIL-STD-810G or better	laboratory.
	and IP65 or bett	er, rugged laptop.	1420243025
	(As per user requ	direment)	
4.2	Computing Har	Intel Core i5 v Pro Processor, 2.3	BOO will check it
	CPU	Intel Core 15 V Pro Processor, 2.0	practically one by one all
		GHz or equivalent /better	parameter, and supplier
1	Storage	Minimum 500 GB	will also provide OEM
1	Memory	2GB or more	11.1
	Display	Minimum 10 inch – 1024 x 768	regards. Ensure all
1		XGA sunlight readable screen, anti-	parameters are available
		glare.	in the equipment.
	Keyboard &	Touch screen	
	input	Minimum two hours at peak	Board will check
4.3	1	Militaria	practically
	Operation	utilisation.	Board will check
4.4	, –	Should be less than 3.5 hours	practically
	Charging time	• •	practically
	of GCS	S. to outomol	Board will check
4.5	Data portability	Ports for data transfer to external	Dotta
-		secondary storage devices	practically
ĺ		10/100/1000	Board will check
4.6	Interface	VGA/HDMI, USB, 10/100/1000	Dom's
1		Ethernet.	practically
			Board will check
4.7	Capability	a) Transmit control commands to	Dom'd
		UAV.	capability of the system
		b) Receive UAV flight and	
N		propulsion parameters.	mentioned parameters.
		c) Receive, display and record real	_
		C) Receive, display and record road	
		time day and night video from UAV.	
		d) Capability to control UAV while	` <b> </b>
		on the move.	
		4	

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	r	Specifications	Trial directives
SN	Parameter	a) Geographic Map along with UAV	Board will check it
4.8	GCS	location, UAV trajectory, camera view	practically and ensure
	Application	polygon, waypoints and flight plan.	that all application is
	Software	polygon, waypoints and ingre pre-	working properly.
Ì		b) Real-time video from the UAV with	Board will check it
	1.	l'.	practically and ensure
		OII, Scicoii and Party	that all application is
		parameters like:-  i. Coordinate of target	working properly.
		1	
		2 77477 1 morrad	
		iv. Height of UAV above ground label	1
		D' to a of TIAN from GCS	1
		C TTAX7 Comm	
		vi. Bearing (Azimuth) of UAV from GCS	
1		4 677477	
	1		
		VIII. Offv Housing/	
		indication	
Ì		ix. Mission time	-
		c) Geographic map and real-time video	
1		should be displayed at all times during	
		the flight.	-
		d) Geographic map and real-time video	
		views window should be resizable	
		and/or switchable to allow user to	
	•	switch between big map/small video	<u> </u>
		and small map/big video views through	•
		a single click/button input.	,-
		e) Artificial Horizon indicating UAV	
		altitude.	Board will check
4.9		a) Should have the capability to	D002 W
	Formats	integrate geo-referenced raster maps provided in at least one of the	
		commonly used digital map formats	1 <del>-</del>
		(GIF, TIFF, DTED and SRTM etc.)	
		b) Should be able to work with Google	
		Maps, application should have the	
		canability to download maps	
ł		automatically after specifying location	
		GPS co-ordinates.	

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SN	Parameter	Specifications	Trial directives
	Payload	a) Selection and switch	Board will check capability of
4.10	Controls	on/off of payload	the system practically
	Controls	b) Pan/tilt/Zoom Controls	according the mentioned
		c) Recording on/off	parameters.
1		d) Switch on/off Night	
		Recovery Beacon	
4.11	Joystick	i. Full Camera Control-	Board will check practically.
	Controls	a).Pan/ tilt	· · · · · · · · · · · · · · · · · · ·
		b). Zoom In/Out	
		c).Black/White Hot(only in	
<b>.</b>		case of TI)	
		ii. RPV Mode	
		iii. Altitude Control	
4.12	Video	a) Video should be recorded	
		in any commonly portable	the system practically
		video formats (AVI/MPEG/	according the mentioned
		MP4 etc)	parameters.
		b) Video of the full flight	
		should be recorded	
		c) Should have capability to	
		take image snapshots at any	
		time during flight	
-		d) Software should be	
		provided that will facilitate	
		extraction of imagery from	
		the recorded video post flight	
4 12	Pre-flight	Self-test of UAV system,	Board will check capability of
7.13	checks	Output: go/no go	the system practically
	cnecks	Output. go/no go	1
			parameters.
5.	Communicatio		- 1 91 1 1 1 191 C
5.1	Communication	1 '	Board will check capability of
		commands from GCS to UAV	•
	capability	ii) Transmit parameter of	according the mentioned
		UAV and payload to GCS	parameters
1		iii) Transmit day and night	•
		video from UAV to GCS	
5.2	Type of link	Secured digital uplink &	Firm will produce OEM
0.2	Type of min	downlink with AES	
			COLUMNICATION.
		encryption.	Disconnection of the control of the
5.3	Frequency	System should operate on S	_
	Band	& C frequency Band uplink	certificate.
		and down link, preferably on	
		license free band i.e 2.4 GHz	
		or 5.8 GHz.	
<u> </u>	1		<u> </u>

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SN	Parameter	Specifications	Trial directives
6.		tem requirements:-	
6.1		The maximum all up	Board will measure weight of
· ·		weight (including	UAV birds with the help of
		payload) should be ≤ 250	weighing machine.
		gms.	
6.2	2 Assembly/	≤5 minutes.	Board will check practically.
	Disassembly		
	time		OF M
6.	3 Life of Na		
	UAV	Nano UAV should not be	certificate.
		less than 750 flights (250	
		flying hours).	=
6.	1		Firm will submit certificate of
.	Conditions for		Govt. Lab. or NABL or ILAC
	Operation and		
	Storage	and storage for following	·
		environment conditions.	
		i) Damp Heat: 40 °C at	
		RH not less than 95%	
		ii) Operating temperature & Storage temp: -10°C	
1		a Storage To	
		to +55°C	· ·
		iii) Ability to withstand	
		dust, drizzle and humid	
_	= D + 1:1:4		Board will check practically. That
6	.5 Portability a	battery operated	
	Operation	portable, light in weight,	
		compact, for day and	
		night surveillance,	
		capable of being carried	
1		and operated by two	· ·
		men .	
-	.6 Battery of A		Board will check practically and
10	.0 Dattery of 12	battery pack should have	
İ	·	the backup of minimum	1
		20 minutes.	
6	.7 Life of	AV Minimum 250 charging	Firm will produce OEM certificate
	Battery	cycles.	
6	.8 Battery	Suitable universal	
"	Charger of		charging battery and will ensure
	0		
	battery	the batteries within two	battery within two hours.

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SN	Parameter	Specifications	Trial directives
6.9	Accessories	a) Water proof Back Packs IP66: 1 set	Board will check physically and firm will
		b) Field Repair kit: 1 No's	submit certificate of
		c) Battery packs; 3No's d) Spare propeller Sets: 2 No's	Govt. Lab. or NABL accredited or ILAC
		e) Associated Cables & Mountings: 1set	accredited laboratory for IP66.
		f) Hard transportation boxes: 1set	,
		g) User, Technical & Maintenance Manual: 1set	
		h) Log book: 1 set	
7	Miscellaneo	us :-	
7.1	Training: 5	working days training will be	Firm will submit
	provided to 0	94 pilots.	undertaking certificate in
			this regard.
7.2	Nano UAV	must complied all relevant	
	parameters	as per DGCA F.No.05-13/2014-	
	AED Vol.IV d	ated 27.08.2018	
		4	<i>t</i> 1 _ 1

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