No. P-63013/13 (GPS)/2011-Ord/BSF 110-18
Government of India Ministry of Home Affairs
Directorate General Border Security Force
(Prov Dte: Mod Cell)
(Fax: 011-24367683)

Block No.10, CGO Complex,
Lodhi Road, New Delhi-03

Dated, the 14th Jan 2019

To,

DsG : AR (through LOAR), CISF, CRPF, ITBP, SSB, NSG & BPR&D

Sub: **Forwarding of QRs and Trial Directives of Through Wall Radar (2D) and Through Wall Radar (3D)**

Find enclosed herewith QRs and Trial Directives of "Through Wall Radar (2D) and Through Wall Radar (3D)" as per appendix 'A' and 'B' duly finalized by Sub group of technical experts and approved by DG BSF for your information and necessary action please.

Encl : As above

14/1/19.
(J K Rudola)
Dy. Inspector General (Prov)

Copy to :-

1. SO (IT), North Block MHA, New Delhi : You are requested to host the above QRs and TDs on MHA website please.

2. IT Cell FHQ BSF, New Delhi : You are requested to host the above QRs and TDs on BSF website please.

APPENDIX-'A' (266)

Directorate General Border Security Force
(Prov Dte: Mod Cell)

The Sub-group of technical experts on surveillance equipment constituted by MHA vide their letter No. IV-17017/18/2001-Prov-I dated 05 Jul 2002 held its meeting at BSF HQ 12th Nov 2018 and subsequent dates to formulate the QRs of Through Wall Radar (2D).

After detailed deliberation the referred Sub-group of technical experts has formulated the QRs and TDs of **Through Wall Radar (2D)** which are as under :-

QUALITATIVE REQUIREMENT OF THROUGH WALL RADAR (2D)

S/No	QUALITATIVE REQUIREMENTS		
1.	**Physical Characteristics**		
	(a)	Size	Compact, portable Hand held Video terminal operable by one soldier.
	(b)	Weight (in Kg) of Hand Held Unit.	4 Kgs (Max) including batteries for pulse/continuous wave. **(To be specified by the user department at the time of indent)**
2.	**Technical Characteristics**		
	(a)	Range	i) Brick, Cement, Stone Wall (upto 12") -20 m ii) Brick, Cement, Stone Wall (upto 18") – 13m iii) Concrete & Reinforced Concrete Wall (18")-8m
	(b)	Display	Should provide 2D view or better on a Colour display.
	(c)	Field of view	Should be $\geq 120^0$ in Azimuth and $>90^0$ Elevation.
	(d)	Range Resolution	50 cm or less at end of range can be achieved.
	(f)	Azimuth Resolution	Resolution at end of range will be worse than 50 cm @ 8 m. Resolution deteriorates linearly with range.
3.	**Capability required**		
	(a)	Should be able to detect static & Living objects amidst clutter (dust, smoke etc) on the other side of wall. (i) Capable of detecting person/persons or group of persons in a room. Should be able to locate & track the movement of person/persons on a continuous basis.	
	(b)	Wall Thickness/Materials	i) Brick, Cement, Stone Wall (upto 12") -20 m ii) Brick, Cement, Stone Wall (upto 18") – 13m iii) Concrete & Reinforced Concrete Wall (18")-8m except glass (treated) and metal sheet.
	(c)	Operating both, in-contact with the wall and in stand-off mode i.e from a distance away from the wall with in the op range of the radar.	
	(d)	Should have a simple user interface for easy interpretation of the scenario, which should be easily understood by a soldier.	
	(e)	**Ruggedization** : Should comply with MIL STD 810F or better i.e humidity, shock, vibration and high/low temperature.	
	(f)	System should comply IP 65 or better.	
	(g)	On board and/or remote recording both wired i.e 25 meter (Min) and Wifi mode 25 meter (Min) meter in open area **(To be specified by the user department at the time of indent).**	
	(h)	Should provide wireless remote control password enabled with the provision to change the password of device from a distance through laptop/ control unit **(If the user department asked for the same)**.	
	(j)	The equipment should be operational ready within 30 sec of turning ON.	

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	(k)	The equipment should be able to be mounted on a tripod (standard operation)
	(l)	Tripod should be part of the accessories of the main equipment and min adjustable height should be 4 feet or more.
	(m)	Radar should be able to display 05 targets (Min) simultaneously with a range resolution of 50 cm.
	(n)	Radar with Jamming resistant facility.
4.	**Power Supply**	
	(a)	Suitable rechargeable (Li-ion) batteries be provided to power this equipment along with battery charger.
	(b)	170-240 V AC Bty charger should be part of package.
	(c)	Battery life should be indicated/displayed on the screen of Through Wall Radar.
	(d)	Additional Battery be provided to sustain prolonged operation.
5.	Operating Time on Battery (in Hours)	Battery endurance-Min 3 hours continuous use.
6.	Safety	The radiation emission from the radar should comply with the international standards like IEEE/FCC standards for radiation safety worldwide.
7.	False Alarm/ Noise Detection	Should not be more than 10%.
8.	Probability of Detection	Should be 90%.

(Ashok Kumar Sharma)
ADG (Log) BSF

(Aseem Vyas), DIG
SIW BSF

(Ms. D Anuradha)
Sc 'G', DRDO

(Rajnish Kumar), PSO
BPR&D

(Abhiram Pankaj),2IC
CRPF

(Maj A Arun),Sqn Cdr
NSG

(R K Meel),DC
CISF

(Padam Singh Meena)
AC, SSB

(Arvinder Singh), AC
SIW BSF

(SI/RM Subhas Roy)
SIW, BSF

(WO/GD Balbir Singh)
Assam Rifle

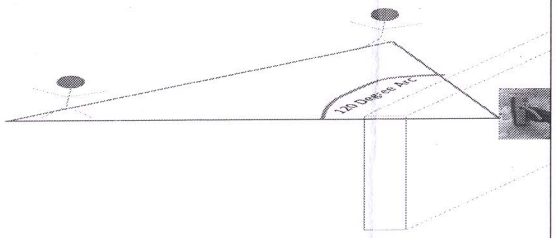
(SI/Tele Mahabir Singh)
ITBP

APPROVED/~~NOT APPROVED~~

(Rajni Kant Mishra) IPS
DIRECTOR GENERAL
BORDER SECURITY FORCE

TRIAL DIRECTIVE OF THROUGH WALL RADAR (2D)

Ser No	Qualitative Requirements			Trial Methodology	Result desired/expected
1.	**Physical Characteristics**				
	(a)	Size	Compact, portable and operable by one soldier.	To be physically checked by BOO.	The size should be compact, portable and operable by one soldier
	(b)	Weight (in Kg) of Hand Held Unit	4 Kg (Max) including batteries for pulse/continuous wave **(To be specified by the user department at the time of indent)**	To be physically checked by BOO by measuring the weight with the help of weighing Machine.	The weight should be 04 kgs (Max) including batteries for pulse/continuous wave.
2.	**Technical Characteristics**				
	(a)	Range	i) Brick, Cement, Stone Wall (upto 12") -20 m ii) Brick, Cement, Stone Wall (upto 18") – 13m iii) Concrete & Reinforced Concrete Wall (18")-8m	*To be physically checked by BOO. i) Human Target to be placed at 20 m behind a wall from the radar and detection of the same by eqpt should be ascertained. ii) Human Target to be placed at 13 m behind a wall from the radar and detection of the same by eqpt should be ascertained. iii) Human Target to be placed at 8 m behind a wall from the radar and detection of the same by eqpt should be ascertained * Wall Should be dry.	The Range should be as per the following :- (i) Brick, Cement, Stone Wall (upto 12") -20 m ii) Brick, Cement, Stone Wall (upto 18") – 13m iii) Concrete & Reinforced Concrete Wall (18")-8m
	(b)	Display	Should provide 2D view or better on a Colour display.	All the display modes to be physically verified by BOO.	The display should provide 2D view or better on a Colour display.

	(c)	Field of view	Should be ≥ 120^0 in Azimuth and ≥90^0 in elevation.	* To be checked Physically by BOO. * Horizontal and vertical angular arc representing ≥ 120^0 and ≥90^0 respectively to be marked by BOO. * Human Target should be made to stand on each edge of the arc while eqpt placed at vertex of arc behind wall. * Eqpt should be able to detect the human target both in horizontal and vertical angle ≥ 120^0 and ≥ 90^0 respectively without moving the eqpt. 	The field of view should be ≥ 120^0 in Azimuth and ≥90^0 in elevation.
	(d)	Range Resolution	50 cm or less at end of range can be achieved.	To be physically checked by BOO. Target to be placed physically separated by a distance of 50 cm. The target to be resolved distinguishably.	The range resolution should be 50 cm or less at end of range can be achieved.
	(e)	Azimuth Resolution	Resolution at end of range will be worse than 50 cm @ 8 m. Resolution deteriorates linearly with large.	To be physically checked by BOO. Target to be placed physically separated by a distance of 50 cm @ 8m. The target to be resolved distinguishably.	The azimuth resolution should be worse than 50 cm @ 8 m. Resolution deteriorates linearly with large
3.	**Capability required**				
	(a)	Should be able to detect static & Living objects amidst clutter (dust, smoke etc) on the other side of wall. (i) Capable of detecting person/persons or group of persons in a room. Should be able to locate & track the movement of person/persons on a continuous basis.		* To be physically checked by BOO. * Human Target to be placed at behind a wall and detection of the same by Eqpt should be ascertained.	The system should be able to detect static & Living objects amidst clutter (dust, smoke etc) on the other side of wall. (i) Capable of detecting person/persons or group of persons in a room. Should be able to locate & track the movement of person/persons on a continuous basis.

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	(b)	Wall Thickness/ Materials	i) Brick, Cement, Stone Wall (upto 12") -20 m ii) Brick, Cement, Stone Wall (upto 18") – 13m iii) Concrete & Reinforced Concrete Wall (18")- 8m except glass (treated) and metal sheet.	*To be physically checked by BOO. i) Human Target to be placed at 20 m behind a wall from the radar and detection of the same by eqpt should be ascertained. ii) Human Target to be placed at 13 m behind a wall from the radar and detection of the same by eqpt should be ascertained. iii) Human Target to be placed at 8 m behind a wall from the radar and detection of the same by eqpt should be ascertained * Wall Should be dry.	The wall thickness/materials should be as under i) Brick, Cement, Stone Wall (upto 12") -20 m ii) Brick, Cement, Stone Wall (upto 18") – 13m iii) Concrete & Reinforced Concrete Wall (18")- 8m except glass (treated) and metal sheet.
	(c)	Operating both, in-contact with the wall and in stand-off mode i.e. from a distance away from the wall with in the op range of the radar.		To be physically checked by BOO.	The system should operate both in-contact with the wall and in stand-off mode i.e. from a distance away from the wall with in the op range of the radar
	(d)	Should have a simple user interface for easy interpretation of the scenario, which should be easily understood by a soldier.		To be physically checked by BOO.	The system should have a simple user interface for easy interpretation of the scenario, which should be easily understood by a soldier
	(e)	Ruggedization : Should comply with MIL STD 810F or better i.e. humidity, shock, vibration and high/low temperature.		NABL national/international certificate to be submitted by the firm. BOO to check the authenticity, validity and correctness of such document.	The system should comply with MIL STD 810F or better i.e. humidity, shock, vibration and high/low temperature.
	(f)	System should comply IP 65 or better.		NABL national/international certificate to be submitted by the firm. BOO to check the authenticity, validity and correctness of such document.	The system should comply IP 65 or better.
	(g)	On board and/or remote recording both wired i.e 25 meter (Min) and WiFi mode upto 25 meter (Min) in open area **(To be specified by the user department at the time of indent).**		To be physically checked by BOO.	Should board and/or remote recording both wired i.e 25 meter (Min) and WiFi mode upto 25 meter (Min) in open area.

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	(h)	Should provide wireless remote control password enabled with the provision to change the password of device from a distance through laptop/ control unit **(If the user department asked for the same).**	To be physically checked by BOO.	The system should Should provide wireless remote control password enabled with the provision to change the password of device from a distance through laptop/ control unit
	(j)	The equipment should be operation ready within 30 sec of turning ON.	To be physically checked by BOO.	The equipment should be operation ready within 30 sec of turning ON.
	(k)	The equipment should be able to be mounted on a tripod (standard operation)	To be physically checked by BOO.	The equipment should be able to be mounted on a tripod (standard operation)
	(l)	Tripod should be part of the accessories of the main equipment and min adjustable height should be 4 feet or more.	To be physically checked by BOO.	Tripod should be part of the accessories of the main equipment and min adjustable height should be 4 feet or more.
	(m)	Radar should be able to display 05 targets simultaneously with a range resolution of 50 cm.	To be physically checked by BOO.	Radar should be able to display 05 targets simultaneously with a range resolution of 50 cm.
	(n)	Radar with Jamming resistant facility	To be physically checked by BOO.	Radar should have Jamming resistant facility
4.	**Power Supply**			
	(a)	Suitable rechargeable (Li-ion) batteries be provided to power this equipment along with battery charger.	To be physically checked by BOO.	The radar should have Suitable rechargeable (Li-ion) batteries along with battery charger.
	(b)	170-240 V AC Bty charger should be part of package.	To be physically checked by BOO.	The radar should have 170-240 V AC Bty charger
	(c)	Battery life should be indicated/displayed on the screen of Through Wall Radar.	To be physically checked by BOO.	Battery life should be indicated/displayed on the screen of Through Wall Radar.
	(d)	Additional Battery bank be provided to sustain prolong operation.	To be physically checked by BOO.	Additional Battery bank should be provided to sustain prolong operation.

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5.	Operating Time on Battery (in Hours)	Battery endurance-Min 3 hours continuous use.	* To be physically checked by BOO. * Operating the eqpt continuously for 3 hrs with fully charged batteries.	The battery endurance should be able for Min 03 hours continuous use.
6.	Safety	The radiation emission from the radar should comply with the international standards like IEEE/FCC standards for radiation safety worldwide.	NABL national/international certificate to be submitted by the firm. BOO to check the authenticity, validity and correctness of such document.	The radar should comply with the international standards like IEEE/FCC standards for radiation safety worldwide.
7.	False Alarm/Noise Detection	Should not be more than 10%.	To be physically checked by BOO.	The False Alarm/Noise Detection Should not be more than 10%.
8.	Probability of Detection	Should be 90%.	To be physically checked by BOO.	The Probability of Detection Should be 90%.

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