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'

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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 on 20th June 2018 and subsequent dates to formulate the QRs of Through Wall Radar (3D).

After detailed deliberation the referred Sub-group of technical experts has formulated the QRs and TDs of **Through Wall Radar (3D)** which are as under :-

QUALITATIVE REQUIREMENTS OF THROUGH WALL RADAR (3D)

S/ No.	QUALITATIVE REQUIREMENTS		
1.	**Physical Characteristics**		
	(a)	Size	Compact, portable and operable by one soldier
	(b)	Weight of system with all Accessories excluding tripod and tripod mount.	(Max) 14.5 Kgs in man pack role both for impulse as well as continuous wave. (To be specified by the user 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 in terms of depth, angular disposition and height of the target.	Should provide 3D view on a colour display.
	(c)	Field of view	≥ 80^0 in both azimuth and elevation.
	(d)	Resolution	i) Range Resolution : 50 cm or less at the end of the range. ii) Azimuth Resolution : 100 cm + 10% tolerance at the end of range @ 8m.
3.	**Capability required**		
	(a)	Detecting and Tracking living being amidst clutter on other side of wall. (i) It should be possible to detect up to 4-5 number of persons in room. (ii) It should have a GUI which initially gives indication to the operator about the kind of activity in the room i.e. whether person is standing/lying etc.	
	(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.
	(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.	
	(e)	On board recording and/or wired remote terminal should be Min 25 meter away from main unit **(To be specified by the user department at the time of indent).**	
	(f)	Should provide wired remote control of device from a distance of Min 25 meter through laptop/ control unit **(If user department has asked for the same).**	

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4.	Power Supply	Suitable batteries to be provided to power the equipment for 2 hrs or better. Additional battery with battery charger be provided to sustain prolong operation.
5.	System should comply IP 65 or better.	
6.	Safety	The radiation emission from the radar should comply with the international standards like IEEE/FCC standards for radiation safety worldwide.
7.	Ruggedization	Should comply with MIL STD 810F or better i.e humidity, shock, vibration and high/low temperature.
8.	Tripod	Suitable Tripod to mount the device.
9.	Data Recording	Either on board data recording of 4 GB (Min) or recording on external control unit to be provided for evidence collection and training.
10.	False Alarm/Noise Detection	Should not be more than 10%.
11.	Probability of Detection	Should be 90%.
12.	Radar with Jamming resistant facility.	

(Ashok Kumar Sharma)
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(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

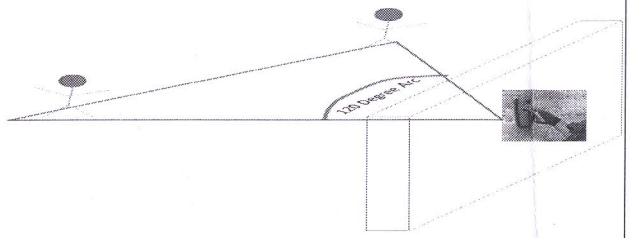
APPROVED/~~NOT APPROVED~~

(Rajni Kant Mishra) IPS
DIRECTOR GENERAL
BORDER SECURITY FORCE

Appendix –'B'

TRIAL DIRECTIVE OF THROUGH WALL RADAR (3D)

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 of system with all Accessories excluding tripod and tripod mount.	(Max) 14.5 Kg in man pack role both for impulse as well as continuous wave. (To be specified by the user 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 (Max) 14.5 Kg in man pack role both for impulse as well as continuous wave.
2.	**Technical Characteristics**			
(a)	Range	i) Brick, Cement, Stone Wall (upto 12") -20 m ii) Brick, Cement, Stone Wall (upto 18") -13 m iii) Concrete & Reinforced Concrete Wall (18") -8 m	*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 of radar should be as per the requirement mentioned in the QR's.
(b)	Display in terms of depth, angular disposition and height of the target.	Should provide 3D view on a colour display.	All the display modes to be physically verified by BOO	The display should provide 3D view of a colour display.
(c)	Field of view	≥ 80^0 in both azimuth and elevation.	* To be checked Physically by BOO. * Horizontal and vertical angular arc representing 80 degrees or better to be marked by BOO. * Human Target should be made to	The field of view should be as per the requirement mentioned in the QR's.

			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 80 degree angle or better, without moving the eqpt.  	
(d)	Resolution	i) Range Resolution : 50 cm or less at the end of the range. ii) Azimuth Resolution : 100 cm + 10% tolerance at the end of range @ 8 m.	To be physically checked by BOO Targets to be placed. Physically separated by a distance of 50 cm. The target to be resolved distinguishably.	The resolution should be as per the requirement mentioned in the QR's.
3.	**Capability required**			
	(a) Detecting and Tracking living being amidst clutter on other side of wall. (i) It should be possible to detect up to 4-5 number of persons in room. (ii) It should have a GUI which initially gives indication to the operator about the kind of activity in the room i.e. whether person is standing/lying etc.		* 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 detection and tracking capability should be as per requirement mentioned in the QRs.
	(b) Wall Thickness/ Materials	i) Brick, Cement, Stone Wall (upto 12") -20 m ii) Brick, Cement, Stone Wall (upto 18") -13 m iii) Concrete & Reinforced Concrete Wall (18") -8 m except glass (treated) and metal.	*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	The wall thickness/materials should be as per requirement in the QRs.

				behind a wall from the radar and detection of the same by eqpt should be ascertained * Wall Should be dry.	
	(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 radar 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.		To be physically checked by BOO.	The radar should have a simple user interface for easy interpretation of the scenario.
	(e)	On board recording on wired remote terminal should be Min 25 meter away from main unit **(To be specified by the user department at the time of indent).**		To be physically checked by BOO.	The radar should on wired remote terminal as per requirement in the QRs.
	(f)	Should provide wired remote control of device from a distance of Min 25 meter through laptop/ control unit **(If user department has asked for the same).**		To be physically checked by BOO.	The radar should provide wired remote control of device as per requirement in the QRs.
4.	Power Supply		Suitable batteries to be provided to power the equipment for 2 hrs or better. Additional battery with battery charger be provided to sustain prolong operation.	To be physically checked by BOO.	The power supply as per requirement in the QRs.
5.	System should complied IP 65 or better.			NABL national/international lab certificate. BOO to check the authenticity, validity and correctness of such document	The system should complied IP 65 or better.
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 lab certificate. BOO to check the authenticity, validity and correctness of such document	The safety of radar as per requirement in the QRs
7.	Ruggedization		Should comply with MIL STD 810 F or better i.e. humidity, shock, vibration and high/low temperature.	NABL national/international lab certificate. BOO to check the authenticity, validity and correctness of such document	The ruggedization of radar as per the requirement in the QRs.
8.	Tripod		Suitable Tripod to mount the device.	To be physically checked by BOO	The tripod should suitable to mount on the device.

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9.	Data Recording	Either on board data recording up to 4 GB (Min) or recording on external control unit to be provided for evidence collection and training.	To be physically checked by BOO	The data recording should be either on board data recording up to 4 GB (Min) or recording on external control unit to be provided for evidence collection and training.
10.	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%.
11.	Probability of Detection	Should be 90%.	To be physically checked by BOO.	The probability of detection should be 90%.
12.	Radar with Jamming resistant facility		To be physically checked by BOO.	The Radar should have Jamming resistant facility.

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