

**DIRECTOR GENERAL BORDER SECURITY FORCE
PROVISIONING DIRECTORATE (Mod Cell)**

The Sub group of Technical Experts on Surveillance Equipments constituted by MHA vide their letter No. IV 1017/18/2001-Prov-I dated 05th July 2002 held its meeting at BSF Headquarters on 15th Feb 2016, 21st Sep 2016, 20th March 2017, 13th June 2017, 03rd July 2017, 13th Oct 2017, 12th Jan 2018, 17th July 2018 and 30th Aug 2018 to revise the QRs of Global Positioning System.

After detail deliberation the referred Sub-group on 15th November 2018 has finalized the revised QRs of 'Global Positioning System (GPS)' as under:-

QUALITATIVE REQUIREMENT OF GLOBAL POSITIONING SYSTEM

S/No	PROPOSED QRs
Navigation Features :	
1.	Display : LCD Display size 2.6" minimum diagonal.
2.	Routes : Minimum 200 routes with compatible SD memory card.
3.	Way point: Unit must have capacity to store 5000 way points.
4.	Tracks : Must be able to store 10,000 track points and 200 tracks.
5.	Track back : Storage of track log files should be provided.
6.	Map Datum's : Should have the facility for user-defined datum with inbuilt standard datum's including Indian datum.
7.	Co-ordinates : Lat/ Lon, UTM, MGRS (Indian GR system (IGRS) with Auto IGRS zone selection) and other grid based on user defined requirements.
8.	Co-ordinates conversion : The system should have the provision to convert Co-ordinates from Lat-Lon to IGRS & vice versa.
9.	Safety : The system should have the provision of password protection for prevention of unauthorised user.
10.	Navigation screens: Should display battery status, Own position, altitude Compass, Graphical plot, Speed and Time, total distance covered and Cross track error.
11.	PC Interface: Should provide cable with software to upload and down load data with high speed USB port.
12.	Language : English for operation.
13.	Alarm : Off track visual indication and arrival audio alarm.
14.	Way point icons : Should be provided.
15.	Compass: Should have built in 3 axis electronic compass for real time direction indication without GPS fix.
16.	Radio Comn. Interface: Optional (To be defined by the user if required).
PERFORMANCE	
17.	Receiver : Min 12 Parallel channel receiver and should be compatible to receive signals from GPS, GLONASS, MSAS, GAGAN, WAAS. New equipment procured after operationalise IRNSS (NavIC) must be compatible to IRNSS (NavIC).
18.	Acquisition: ≤ 20 second hot, ≤ 60 seconds warm and 3 minutes cold.
19.	Mapping units and software: Loading of maps of user specific format in the GPS unit along with map loading software should be provided. Also an option to load satellite images into GPS unit. It should also support raster maps in Geo TIFF, JPG etc. formats, Vector maps or digital maps (Shape files).
20.	Unit to Unit transfer: Data can be transferred from one unit to another via Bluetooth.
21.	Update rate : One per second continuous.

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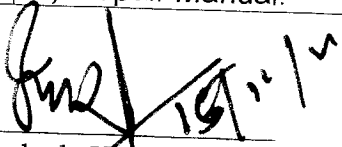
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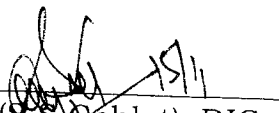
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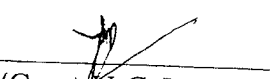
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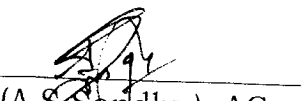
22.	Accuracy: <10 meters.
23.	Power (source): Rechargeable Batteries 'AA' size (NIMH or Lithium) and compatible battery charger. The battery should function for 10 hours minimum in operational mode and 36 hours minimum in standby mode.
24.	Operating system: The GPS software should be compatible with MS windows from Win XP onwards that normal personal computer and laptop use.
Physical	
25.	Weight : Max 350 grams with batteries
26.	Display : Sunlight-readable, High contrast colour display with backlight
27.	Keyboard : Should have keys or multi function keys or soft keys (touch screen) for easy & quick operations like.navigation, set up, illumination, Go to, point logging and marking.
28.	Case : Ruggedized and water resistance (30 minutes at 1 meter depth).
29.	Temperature: Operating - 20° C to + 55° C Storage -20° C to +55° C
30.	Memory Backup : Minimum 4 GB inbuilt memory must be provided along with additional memory of 32 GB through SD card.
31.	Shelf Life : 10 Years
32.	Warranty : The vendor will provide the AMC (including spare part if required) by the user for 05 years after expiry of warranty. Free warranty for 12 months with spares.
33.	Spare Battery : One set spare battery should be provided as mentioned in QRs Para. 23.
34.	Engineering Support Package : i) Technical literature. ii) Training manual and user hand book. iii) Illustrated spare part list duly priced. iv) Repair Manual.

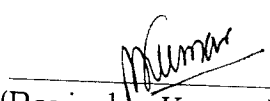

 (Ashok Kumar Sharma)
 ADG (Log) BSF

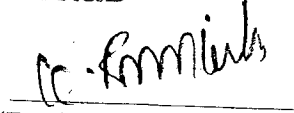

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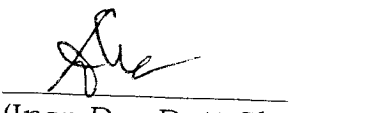

 (Dhananjay Mishra)
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 BPR&D

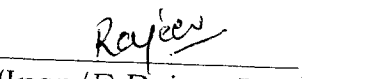

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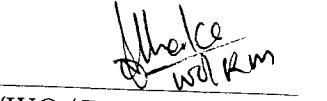

 (Ravindra Kumar), AC
 SSB


 (Radha Krishnan)
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 (Insp Dev Datt Sharma)
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APPROVED/ NOT APPROVED


 (Rajni Kant Mishra) IPS
 DIRECTOR GENERAL
 BORDER SECURITY FORCE

TRIAL DIRECTIVES OF GLOBAL POSITIONING SYSTEM (GPS)

SL NO	PARAMETER	SPECIFICATIONS	Trial procedure suggested for BOOs	Result expected / desired	Complied / Not Complied
Navigation Features :					
1	Display	LCD Display size 2.6" minimum diagonal.	To be physically checked by BOO. Measure the LCD Display size diagonally with the help of scale or measuring tape.	LCD Display size must be 2.6" minimum diagonally.	
2	Routes	Minimum 200 routes with compatible SD memory card.	To be physically checked by BOO. Switch 'ON' the GPS and create 200 routes.	The GPS must have the memory to save minimum 200 routes with compatible SD memory card.	
3	Way points	Unit must have capacity to store 5000 way points.	The firm has to submit National/International accredited lab report/OEM certificate in respect of ability to store 5000 way points. To be physically checked by BOO for storing 100 way points approximately.	The GPS must have capacity and memory to store 5000 way points.	
4	Tracks	Must be able to store 10,000 track points and 200 tracks.	The firm has to submit National/International accredited lab report/OEM certificate in respect of ability to store 10000 track points and 200 tracks. To be physically checked by BOO for storing 100 track points and 100 tracks approximately physically in GPS or by unloading from PC	.The GPS must be able to store 10,000 track points and 200 tracks.	

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5	Track back	Storage of track log files should be provided.	To be Physically checked by BOO. Create a route and then activate it after reaching destination, check the back track log in the GPS as per the procedure provided in the GPS.	The GPS must have provision for storage of track log files.	
6	Map Datum's	Should have the facility for user-defined datum with inbuilt standard datum's including Indian datum.	To be Physically checked by BOO. Check the GPS for standard Map datum's including Indian datum, WGS-84 & user defined datum provided in the system.	The system must have the facility for user-defined datum with inbuilt standard datum's including Indian datum.	
7	Co-ordinates	Lat/ Lon, UTM, MGRS (Indian GR system (IGRS) with Auto IGRS zone selection) and other grid based on user defined requirements.	To be Physically checked by BOO. Check the GPS for Co-ordinate system including Lat/Lon, UTM, MGRS (Indian GR system (IGRS) with Auto IGRS zone selection) and other grid based on user defined requirements. Check the facility of selecting Indian GR system including options of pre loaded nine zones of Indian grid reference coordinate system.	The GPS must have coordinate system including Lat/ Lon, UTM, MGRS (Indian GR system (IGRS) with Auto IGRS zone selection) and other grid based on user defined requirements.	

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8	Co-Ordinates conversion	The system should have the provision to convert Co-Ordinates from Lat-Lon to IGRS & vice versa.	<p>To be Physically checked by BOO.</p> <p>Check the GPS for converting Co-ordinates. Get Co-ordinate in Lat/Lon of a point and feed it in the GPS for getting the IGRS value of the same.</p> <p>Again feed the IGRS co-ordinate of a point in the GPS and get the Lat/Lon value of the same point through GPS.</p>	<p>The system must have the provision to convert Co-ordinates from Lat/Lon to IGRS & vice versa.</p>	
9	Safety	The System should have the provision of password protection for prevention of unauthorised user.	<p>To be Physically checked by BOO.</p> <p>Check the system for the provision of setting password in the start when the system will be switched 'ON'.</p> <p>The firm has to submit National / international accredited Lab report / certificate in respect of encryption of data stored.</p> <p>Check the national/ international accredited lab test report for the same. In case of any doubt in the test report, the veracity of the same may be checked from the concerned lab.</p> <p>Store co-ordinates of a way-point in the GPS with different sheet number.</p>	<p>The System must have the provision of password protection for prevention of unauthorized user.</p> <p>It should also have provision for encryption of stored data in memory card to deny unauthorised access.</p> <p>System should also have provision for validation of Co-ordinates. It must create alert in case of wrong entry of co-ordinates and map sheet number during storage of way point</p>	

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10	Navigation screens	Should display battery status, Own position, Altitude, Compass, Graphical plot, Speed & Time, Total distance covered and Cross track error.	To be physically checked by BOO. Switch 'ON' the GPS and check the display screens for battery Status, own position altitude, compass, graphical plot, speed & time and verify its functionality. Set the GPS to navigate a way point far away (≥200 meters) from the own position and start navigation. Check the total distance covered and cross track error display screen during the navigation.	The system must have provision of on screen display regarding battery status, own position, Altitude, Compass, Graphical plot, Speed & Time, total distance covered and Cross track error.	
11	PC Interface	Should provide cable with software to upload and down load data with high speed USB Port.	To be physically checked by BOO. Store 5 to 10 way points and create two routes having 3 to 4 legs in the GPS. Install the software in the PC and connect the GPS with the help of cable provided through USB port. Create & store 5 to 10 way points and two routes having 3 to 4 legs in the PC. Down load the way points and routes created in the GPS to the PC and upload way points & routes from PC to GPS.	GPS must have cable with software to upload and down load data with high speed USB Port.	
	Language	English for operation.	To be physically checked by BOO.	GPS must have English language for operation.	

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13	Alarm	Off track visual indication and arrival audio alarm.	<p>To be physically checked by BOO.</p> <p>Switch 'ON' the GPS and navigate to a way point ≥ 200 meters away.</p> <p>Check the GPS navigation screen for 'OFF track' visual indication and arrival at destination audio alarm.</p>	GPS must have Off track visual indication and arrival audio alarm.	
14	Way point icons	Should be provided	<p>To be physically checked by BOO.</p> <p>Switch 'ON' the GPS and store 10 way points by allotting icons from the icon bank provided in the database of GPS.</p>	GPS must have way point icon bank.	
15	Compass	Should have built in 3 axis electronic compass for real time direction indication without GPS fix.	<p>To be physically checked by BOO.</p> <p>Check the GPS for built in 3 axis electronic compass for real time direction indication without GPS fix i.e. inside a building where the satellite signals are not accessible.</p>	GPS must have built in 3 axis electronic compass for real time direction indication without GPS fix.	
16	Radio Comm. Interface	Optional (to be defined by the user if required).	<p>To be physically checked by BOO.</p> <p>The facilities of Radio communication interface should be checked as per the user requirement.</p>	GPS must have Radio Comm interface in case required/defined by user.	

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PERFORMANCE

17	Receiver	<p>Receiver : Min 12 Parallel channel receiver and should be compatible to receive signals from GPS, GLONASS, MSAS, GAGAN, WAAS. New equipment procured after operationalise IRNSS (NavIC) must be compatible to IRNSS (NavIC).</p>	<p>To be physically checked by BOO. Check minimum receiver channel available in the GPS by switching 'ON' it under open sky. The firm has to submit National / international accredited Lab report / certificate in r/ o compatibility to receive signals from GPS, GLONASS, MSAS, GAGAN, WAAS. IRNSS National / international accredited Lab report / certificate in r/ o compatibility to receive signals from IRNSS (NavIC) after IRNSS (NavIC) is made operational.</p>	<p>The system must have 12 channel receiver and able to receive signal from GPS, GLONASS, MASA, GAGAN & WASS. New equipment procured after operationalise IRNSS (NavIC) must be compatible to IRNSS (NavIC).</p>	
18	Acquisition	<p>≤ 20 second hot, ≤ 60 seconds warm and 3 minutes cold.</p>	<p>To be physically checked by BOO. Insert the battery or cells in the GPS and switch it 'ON'. Count the time taken to fix the position by the GPS during following conditions: When GPS is in switched 'OFF' condition from last 3 to 4 hours. While walking on ground in open space with GPS position fixed and pass through a overhead obstacle (where satellite signal is not accessible) then move again to the open space (count the time from crossing the Overhead obstacles to open space till GPS fix).</p>	<p>The acquisition time taken by the GPS to fix the position must be as under:</p> <p>3 minutes in cold.</p> <p>≤ 60 seconds in warm</p> <p>≤ 20 second hot</p>	

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19	Mapping units and software	Loading of maps of user specific format in the GPS unit along with map loading software should be provided. Also an option to load satellite images into GPS unit. It should also support raster maps in Geo TIFF, JPG etc. formats, Vector maps or digital maps (Shape files).	<p>To be physically checked by BOO.</p> <p>Check the GPS display with map in background by loading military map in the system with the help of map loading software (if required) provided with the GPS.</p> <p>Check the GPS by loading satellite map images from web site into the system through PC.</p> <p>Note: user must know about the specific format of the maps available with the concerned CAPFs and provide a soft copy of an area as a sample to board at the time of evaluation. So that firm may arrange demonstration to load the map in the GPS.</p>	<p>The GPS must have the map loading software to load the map of user specific format in the system.</p> <p>It must also have option to load satellite images in to GPS unit.</p> <p>It must also support raster maps in Geo TIFF, JPG etc. formats, Vector maps or digital maps (Shape files).</p>	
20	Unit to Unit transfer	Data can be transferred from one unit to another via Bluetooth.	<p>To be physically checked by BOO.</p> <p>Create limited data base of way points and routes in two GPS.</p> <p>Transfer the data (from data base) from one system to another and vice versa via Bluetooth.</p> <p>Note: 02 GPS to be provided by the firm as tender sample for evaluation.</p>	The GPS must have the facility to transfer the data from one unit to another unit via Bluetooth.	
21	Update rate	One per second continuous.	To be physically checked by BOO.	Update rate of GPS must be one per second continuous.	

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22	Accuracy	<10 meters.	To be physically checked by BOO. Select a prominent point whose GR is known. Take the GPS to the point and check the positional data of that positional point through GPS. Compare both the values.	The accuracy of the GPS must be less than 10 meters.
23	Power (Source)	Rechargeable Batteries 'AA' size (NIMH or Lithium) and compatible battery charger. The battery should function for 10 hours minimum in operational mode and 36 hours minimum in standby mode.	To be physically checked by BOO.	The System must have rechargeable batteries of 'AA' size (Ni-MH or Lithium) and compatible battery charger. The battery should function for 10 hours minimum in operational mode and 36 hours minimum in standby mode.
24.	Operating system	The GPS software should be compatible with MS Windows from Win XP onwards that normal personal computer and Laptop use.	To be physically checked by BOO. Check the compatibility of GPS software with Microsoft Windows from Win XP onwards by installing on Desktop & Laptop and transferring the GPS data from PC to GPS & vice versa. In addition, an assurance certificate in r/o the same should also be obtained from the firm.	The GPS software must be compatible with MS Windows from Win XP onwards operating system that normal Personal Computer and Laptop use.

Physical

25.	Weight	Max 350 grams with batteries.	To be physically checked by BOO.	The weight of the GPS must be Max. 350 Gms with batteries.
26.	Display	Sunlight-readable, High contrast colour display with backlight.	To be physically checked by BOO.	Display of the GPS must be Sunlight- readable, high contrast colour display with backlight.

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27.	Keyboard	Should have keys or multi function keys or soft keys (touch screen) for easy & quick operations like navigation, set up, illumination, Go to, point logging and marking.	To be physically checked by BOO.	GPS must have keys or multi function keys or soft keys (touch screen) for easy & quick operations like navigation, set up, illumination, Goto, point logging and marking.	
28.	Case	Ruggedized and water resistance (30 minutes at 1 meter depth).	To be physically checked by BOO. Immerse GPS in water up to a depth of 1 meter for 30 minutes. Check the national/ international accredited lab test report for the same. In case of any doubt in the test report, the veracity of the same may be checked from the concerned lab. r/ o ruggedness.	The case of the GPS must be be ruggedized and water resistance.	
29	Temperature	Operating : -20° C to +55° C Storage: -20° C to +55° C	The firm has to submit National / international accredited Lab report / certificate in respect of the same. Check the national/ international accredited lab test report for the same. In case of any doubt in the test report, the veracity of the same may be checked from the concerned lab.	GPS must be operable in Operating temperature: -20°C to ±55°C . Storage Temperature : -20°C to ±55°C .	
30	Memory Backup	Minimum 4 GB inbuilt memory must be provided along with additional memory of 32 GB through SD card.	To be physically checked by BOO.	GPS must have minimum 4 GB inbuilt memory along with additional memory of 32 GB through SD card.	
31	Shelf Life	10 Years	Not applicable at the time of physical evaluation.	-NA-	
32	Warranty	The vendor will provide the AMC (including spare part if required) by the user for 05 years after expiry of warranty. Free warranty for 12 months with spares	Not applicable at the time of physical evaluation as it is a commercial issue.	-NA-	

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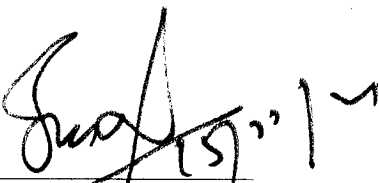
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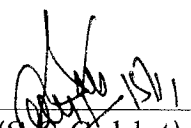
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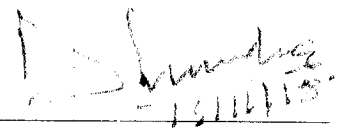
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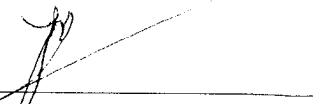
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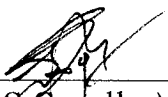
33	Spare Battery	One set spare battery should be provide as mentioned in QRs Para 23.	Not applicable at the time of physical evaluation.	--NA--	
34	Engineering Support Package i) Technical literature. ii) Training manual and user hand book. iii) Illustrated spare part list duly priced. iv) Repair manual.		Not applicable at the time of physical evaluation.	-NA-	

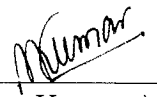

 (Ashok Kumar Sharma)
 ADG (Log) BSF

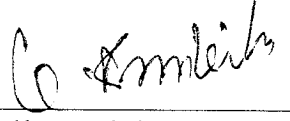

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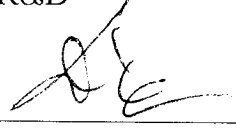

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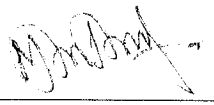

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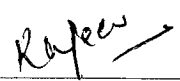

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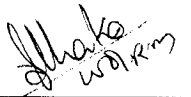

 (Ravindra Kumar), AC
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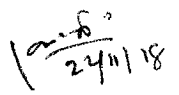

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(Rajni Kant Mishra) IPS
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