No. IV-21011/9/2010-Prov-I
Government of India
Ministry of Home Affairs

26, Mansingh Road, Jaisalmer House,
New Delhi, 14 .3.2011

To,
DsG: AR/BSF/CISF/CRPF/ITBP/NSG/SSB/BRP&D

Subject:-QRs/Technical specifications of Wide Band Surveillance Receiver

Sir,

I am directed to forward herewith the QRs/ Specifications of the Wide Band Surveillance Receiver as per Annexure, as has been accepted by the Competent Authority in MHA, for record.

(S.B.Nanda)
Under Secretary

Copy to:-

DD(Procurement),MHA

Copy for information to:-

PS to JS(PM),MHA

BOARD PROCEEDINGS

Proceedings of	:	A Board of Officers.
Assembled at	:	Comn & IT Directorate, CGO Complex Block No-10 New Delhi- 110003
On the date of	:	10 March' 2011
By the order of	:	Comn & IT Dte order No. 37/08/2010/Comn /Eqpt/BSF/ 2151 dated 7th March' 2011.
For the purpose of	:	To submit the corrected/concluded QRs of Wideband Surveillance Receiver.

Composition of the Board:

Presiding Officer	Shri K K Sharma Dy Inspector General STS BSF , New Delhi
Member-I	Shri A C Thapliyal Dy Inspector General Comn & IT Dte, HQ, DG BSF , New Delhi
Member -II	Shri L M Pant , Asstt Commandant Comn & IT Dte, HQ, DG , BSF New Delhi
Member –III	Inspr (Tech) Mohan Singh STS , BSF New Delhi
Member-IV	SI(RM), N Moses STS, BSF, New Delhi
Member-V	ASI/RM Bijendra Singh Comn & IT Dte , FHQ BSF New Delhi

In pursuance of FHQ, Comn & IT Dte, Comn & IT Dte order No. 37/08/2010/ Comn /Eqpt/BSF/2151 dated 7th March' 2011.The Board after having been assembled at Comn & IT Directorate, HQ DG BSF, New Delhi- 110003 on 10th March 2011, proceeds to submit the corrected/concluded QRs of Wide Band Surveillance Receiver. While formulating the consolidated "QRs", evaluation report prepared by DIsG /Senior Comn officers of CRPF/AR/SSB/ITBP under the chairmanship of DIG(Comn) BSF and minutes of the meeting held with Director DCPW & their team , have been taken in to consideration. Consolidated QRs are appended below:-

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QUALITATIVE REQUIREMENT :- ANALOG AND DIGITAL HF, VHF& UHF WIDE BAND SURVEILLANCE RECEIVER

S No		Specification	HF	VHF & UHF
1	a	Frequency Range	0.15 MHZ to 30 MHz	30 MHZ to Minimum 2500 MHZ
		i. Freq setting by Key pad or roll key	Continuous tuning facilities for slow and fast tuning	Continuous tuning facilities as in HF
		ii. Freq digital read out in control panel	Should be provided	Should be provided
	b	Freq Stability	± 0.5 PPM or Better	±1 PPM or better
	c	Freq Resolution	1 Hz or Better	10 Hz or Better
	d	Scan Characteristics		
		i. Scanning Speed	40 Ch/Sec or more	100 Ch/Sec or more
		ii. Intercepting scanning speed	50 Mhz/Sec or better	1GHz/Sec or better
		iii. Automatic Memory scan	More than 10000 definable memory locations, up to 1000ch/Sec	More than 10000 definable memory locations, up to 1000ch/Sec
	e	Demodulation Mode	AM,FM, PM, USB,LSB,ISB, NBFM, WBFM,FSK,PCM, (OOK,AFSK,GFSK, BFSK, QPSK,BPSK,BMSK, MSKI, QAM,16 QAM (The requirement of additional hardware / software if required will be met by the firm in view of the PCM scheme)	AM,FM, PM, USB,LSB,ISB,NBFM, WBFM,FSK,PCM,OOK,AFSK, GFSK, BFSK, QPSK,BPSK, BMSK, MSK, QAM,16 QAM (The requirement of additional hardware/software if required will be met by the firm in view of the PCM scheme)
	f	Overall noise figure	10 db or better	8 db or better
	g	Sensitivity	CW:- 10db SINAD for 0.3 µ V or better , IF BAND width 100hz	-
			SSB: 1.0 µ V or better for 10 dB SINAD, IF bandwidth 3 KHZ	SSB: 2.0 µ V or better for 17 dB SINAD, IF bandwidth 15 KHZ
			AM:- 4.0 µV or better for 12dB SINAD , IF Bandwidth 6khz	-
	h	IF Filters	Unlimited	Unlimited
	j	IF Rejection	≥100db	≥100db
	k	Image Rejection	≥100db	≥80db
	l	Spurious Rejection	≥80db	≥80db
	m	Capability to detect Signals	100 millisec or less	100 millisec or less

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	n	Capability to detect FH Signals	50 hops/Sec or better	300 hops/Sec or better
	o	Spurious Free Dynamic Range	≥ 80 db	≥75 db
	p	AF Out Put	LS: ≥2 watt across 8 ohm impedance to be specified by the bidder	LS: ≥2 watt across 8 ohm. impedance to be specified by the bidder
			HP:- 0Dbm, 600 ohm	HP:- 0Dbm, 600 ohm
	q	Audio Distortion	Less than1 % for rated audio out put	Less than 1% for rated audio out put
	r	AGC	Better than 90 db	Better than 90 db
	s	AFC	Digital tuning facilities for signals of unstable strength	Digital tuning facilities for signals of unstable strength
	t	Antenna	Omni directional Wide band antenna as per specification at Annexure I	Motorised directional and Omni directional antenna with selection facility as per specification at Annexure I
2	Environmental requirement		As per JSS 55555 specification, revised version 2000 or better /MIL std 810 D or higher	As per JSS 55555 specification, revised version 2000 or better /MIL std 810 D or higher
	a	EMC	486C or equivalent	486C or equivalent
	b	Operating Temperature	-10^0 C to +50^0 C	-10^0 C to +50^0 C
	c	Storage Temperature	-30^0 C to +70^0 C	-30^0 C to +70^0 C
	d	Relative Humidity	95% Maximum non condensing at 40^0 C	95% Maximum non condensing at 40^0 C
3	Power Supply			
	I	Power Supply	i) AC 230 V ± 10%, 50 HZ ±3. Over voltage protected	AC 230 V ± 10%, 50 HZ ±3. Over voltage protected
			ii) 12V/24 V DC operated or both reverse polarity protected	12V/24 V DC operated or both reverse polarity protected
4	Other characteristic Features		The Receiver should have all demodulation schemes and digital filtering incorporated within software as per JTRS recommendation	
	a	Real time spectrum display of all data (time domain and freq domain display) with recording capabilities.		
	b	Built in test equipment (BITE) facilities to locate faulty module and card.		
	c	Accurate measurements of Mod. Depth / range with various modulation frequencies in AM, FM , PM and other digital mode, signal level & field strength.		
	d	System operation should be performed through PC compatible workstations having user friendly man-machine interface executing menu driven commands either through mouse or keyboard operations, application software operating under window version 2000 upward & Linux .		
	e	System should provide facilities for skipping atleast 100 friendly spots frequency settable by the operator .		
	g	operator posts should be able to configure HF or VHF/UHF as per requirement independently and should receive both digital and analog signals. All Posts should be provided with recording and listening facility.		
	h	System function will include the following facilities in predetermined frequency bands and predetermined geographic region _ Automatic rejection of Known/ not interested signal. Very fast scan of useful signals of short transmission (less than 10 milliseconds) for frequency hopping sets .		

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	j	Multi Channel (At least 4 channels) audio recording and data accumulation and analysis facilities . Recording capability of minimum 320 GB or more. System software support higher recording capacity if required (software should make it possible to record and play back the received signals). Provision for CD back up should also be available .
	k	Multiple mode function display in PC with SVGA high definition screen . System software should be able to control the function of the receiver for scanning automatic station identification, memory channel management s, spectrum and frequency display decoder control and other function required for effective monitoring of the transmission.
	l	System should have high sensitivity and dynamic range for processing of low level signals in dense radio environments. Minimum signal presence of 100 milliseconds should be sufficient for capturing the signal.
	m	The system should have remote killing feature
	n	Provision of visual / audible alarm for operator when some target freq activated
	o	Facility for panoramic display
	p	Should have MTBF of more than 10000 hrs
5	**General Condition**	
	a	The Bidders should quote separately for AMC (annual maintenance contract) of at least six years after Warranty / Guaranty period of 2 years
	b	Should have experience in maintaining similar type of equipment.
	c	The supplier should give undertaking for supply of spare parts for at least 10 years
	d	*Fault finding & general operational training will be provided by the firm at frontier HQ location for a duration of at least one week*
	e	Necessary accommodation, civil works Antenna mast and power back up for installation of Wide band surveillance receiver will be provided by the users . Bidders to provide these details.
	f)	Weight 16.0 Kgs or less excluding antenna system/ Decoder etc for which prospective bidders should mention their dimension separately
	g	Dimension (WxHxD) 450 mm x300mm x 900 mm or less excluding antenna system / decoder etc
	h	*One technical manual required between 2 nos wide band surveillance receiver*
6.		The system should have flexibility depending on SDR (Software defined radio)architecture

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Annexure 1 of QRS

OMNI DIRECTIONAL WIDE BAND ANTENNA

S NO	Specification	
1.	Frequency Range	2 MHZ to Minimum 2500 Mhz
2.	Polarization	Vertical
3.	Normal Impedance	50 Ohm
4.	VSWR	2 to 300 Mhz – 3:1 or Better 30 to 2500 Mhz – 2.5 :1 or better
5.	Antenna Gain	6 dBi or less
6.	Power Supply	230 V ±10v, 50 Hz
7.	Length	1.5 Meter or Less
8.	Operating Temperature	-10^0 C to +55^0 C
9.	Permissible Wind Speed	160 Km/ hour

VHF/UHF DISCON ANTENNA

S NO	Specification	
1.	Frequency Range	30 MHZ to Minimum 2500 Mhz to be covered in single or two antenna
2.	Impedance	50 Ohm nominal
3.	VSWR	2.3:1 or better
4.	Gain	2 dBi or better
5.	Horizontal Radiation pattern	Circular
6.	Deviation of circulatory	±3 db Maximum
7.	Dimension	
	i) Length of sloping radials	830mm Maximum
	ii) Length of Horizontal radials	290mm Maximum
8.	Operating Temperature	-10^0 C to +55^0 C
9.	Permissible Wind Speed	160 Km/ hour

Log Periodic Antenna

S NO	Specification	
1.	Frequency Range	30 MHZ to Minimum 2500 Mhz to be covered in single or two antenna
2.	Configuration	Log periodic Dipole Array (LPDA)
3.	Gain	Minimum 4 dBi to 9 dBi depending on frequency bands
4.	VSWR	3:1 Maximum
5.	E Plane beam width	$75^0 \pm 15^0$
6.	H Plane Beam width	$100^0 \pm 25^0$
7.	FBR	10 dB Minimum
8.	Dimension	Boom length 5 Meter maximum largest element length 2 meter maximum
9.	Mounting	Central mounting bracket with provision for vertical / horizontal mounting
10.	Operating Temperature	-10^0 C to $+55^0$ C
11.	Permissible Wind Speed	160 Km/hour

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Recommendations of the Board

The BOOs having been gone through the present and future requirements of Wide Band Surveillance Receivers in the force, recommends that the specifications which have been listed above in the form of concluded QRs should be considered for approval.

Presiding Officer

K K Sharma Dy Inspector General 10/8/11
BSF ~~STS~~ BSF , New Delhi

Member-I

A C Thapliyal , Dy Inspector General
Comn & IT Dte HQ DG BSF, New Delhi

Member -II

L M Pant Asstt Commandant
Comn & IT Dte, HQ DG BSF New Delhi

Member –III

Insp (Tech) Mohan Singh
CEW, STS , BSF New Delhi

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