



- (b) Mains and UPS Power Supply status (Aural & Visual) indication should be made available in the Operational Area through **Remote Monitoring Facility**. It should be clearly visible and audible.
- (c) Power Distribution Rack with Metering facilities should be provided in the OB Van.
- (d) Internal lighting suitable for both TV Production and Operation & Maintenance should be provided in the OB Van.
- (e) Air Conditioners of adequate tonnage capacity especially concentrated for the equipment racks and comfortable for the Operators etc. will be part of the offer.
- (f) The OB Van should be equipped with equipment bays for Production, Recording, Super Slow Motion/Slow Motion Area, CCU, Monitoring and Test Equipment with an ease of access while servicing.
- (g) The OB Van should be provided with ergonomically & aesthetically designed Production, CCU, Audio, Recording, Super Slow Motion/Slow Motion Area, End Control Desks and Video Monitoring walls etc.
- (h) Technical Furniture including Operator chairs etc. will also be part of the offer.
- (i) The OB Van should be provided with suitable storage area in the rear and both sides of the vehicle for Cameras, Lens, various cable drums and miscellaneous equipment etc.
- (j) The OB Van should have hydraulic stabilization jacks.
- (k) Portable Fire Fighting Extinguishers of suitable type in each partition should also be provided.
- (l) Provision of First Aid Kit is also required to be made in the offer.

## **2.2 Customization of the Vehicle:**

- (a) The Production Van should be built on chassis not exceeding to overall vehicle length of **12 meters**. Vehicle from reputed manufactures in the field of automobiles such as Tata Motors, Ashok Leyland and Volvo will only be acceptable.
- (b) The vehicle should be equipped with suitable capacity diesel engine with enough head room conforming to BS/Euro emission norms for Delhi and Mumbai.
- (c) The vehicle should have air suspension system both for rear and front to absorb any jerks and shocks while on movement.

- (d) The offered vehicle should also meet pollution control requirement of Mumbai, Delhi and NCR region.
- (e) The interior and exterior of the OB van should be ergonomically & aesthetically designed to meet the physical and environmental conditions as well as comfortable for working personnel.
- (f) The chassis of the van should have load-bearing capacity to withstand the weight of all the Video & Audio equipment, A/C units, Various Cable Drums, Camera Stands, Packaging Boxes, UPS, Power Distribution Panels, Furniture, Equipment Racks, Personnel, and the weight of the Van Body itself.
- (g) The chassis size of the van should be such that all the Production, Recording, Monitoring, Air Conditioning, Power Supply Equipment, Various Equipment Racks, Technical and Operational Furniture and their storage etc. be accommodated easily without any hindrance to operational staff in the Van.
- (h) All storage compartments provided in the external body of the OB van should be properly illuminated. Binding straps/belts should be provided for holding the equipment in position while the vehicle is on move.
- (i) The Van should broadly have Production, Computer Graphics, Audio, recording, super slow & slow motion playbacks, CCU/ Engineering areas etc.
- (j) Since the Vehicle has to carry a large number of sophisticated and costly equipment, utmost care should be taken while selecting the chassis and designing the body of the van. Therefore, vehicle customization shall include all aspects including Structural Analysis, System Design, Coach Building, proper heat insulation, Equipment Installation etc. and Field Testing. Adequate care should be taken in the OB Van design for proper working of the Van in the tropical/sub-tropical conditions where ambient temperature may vary from sub zero to 50 deg. Celsius. **Shock absorbers should be provided on the mounting of equipment wherever necessary so as to avoid them from being damaged during the vehicle movement.**
- (k) Body size and height of the van should conform to local Transport Authority regulations. The successful bidder is required to complete the formalities of registration of vehicle with the appropriate transport authority in India. Vehicle is to be registered in the name of Doordarshan. The van is meant for Doordarshan centres given in **Appendix III**.
- (l) Latest technology materials should be used for heat and noise insulation of the walls, ceiling and floor operational areas.

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- (m) The vehicle conversion should use lightweight carbon fiber/ aluminum to minimize the overall weight of the OB Van.
- (n) All necessary certifications which are required from different Central/State Government & Regulatory Authorities shall be provided by the successful bidder.
- (o) The system shall be designed to allow rapid transportation in the Indian environment, quick and easy deployment, lower running cost and easy serviceability.
- (p) **The van should have equipment as given in the Appendix-II and as defined elsewhere in the specifications.** All the equipment envisaged should be accommodated inside the van leaving enough working space for production/ operational crew.
- (q) The installed equipment should have quick access to front and back panels for ease of maintenance.
- (r) Layout drawing of the Equipments, Racks, Production Desks, Air Conditioning, Power Supply, Video and Audio Schematic etc. are of prime concern and are to be submitted by bidders along with the bid. The successful bidder will be required to prepare the final layout of the van and its equipment and will get it approved from Director General of Doordarshan immediately after getting the order. The layout & facility design and selection of equipment should be done keeping in view the broadcast quality production and professional workflow requirements for HDTV production and requirements as described in these specifications.
- (s) The layout should be so designed as to maximize the utilization of the available space without compromising with the functional requirement.
- (t) The production areas should have sufficient seating for required number of operational and production staff. The operational crew's seating should have easy-to-reach controls in the panel.
- (u) Retractable Awnings on all sides except the Front side of the Van may be provided which can be unfolded while working in sunny & rainy climate conditions.
- (v) Part of the roof of the vehicle is to be made strong enough for camera mounting and antenna for microwave link in future.
- (w) Fold down hand rails and ladder should also be provided with the OB Van.
- (x) **Rear Connection and Stowage Area of the OB Van should have the provision for the following:**
  - i. Upto 12 motorized cable drums for long length OFC cables,

- ii. Under floor storage boxes with side access should be provided
  - iii. Multi pair audio, video and monitor cables,
  - iv. Flexible mains copper cables of suitable rating of 100 meters length
  - v. Termination panels for external in/ out connections for Video (HD-SDI, SD-SDI and Composite), Audio (Analog and AES/EBU) and Power Supply.
  - vi. Input power switchboard and outlets for external equipment such as DSNG, microwave links etc.
- (y) The equipment layout should be such that the van should be balanced from all sides.
- (z) The successful bidder has to obtain the approval of Directorate General of Doordarshan for the Colour Scheme of interior and exterior of the van immediately after getting order.

### **2.3 Power Supply and Air Conditioning:**

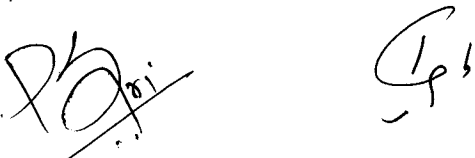
- a) The van should be able to operate on three phase (phase to neutral 230 volt  $\pm$  5%, @50 Hz) commercial power Supply.
- b) The offer should also include one 20KVA On - line UPS having 3-phase input & 3-phase output with 15 minutes backup at 100% load for all equipment and internal lighting load except Air conditioning plant.
- c) The battery bank of the UPS should be suitably placed for easy accessibility during the maintenance and servicing.
- d) The interior of the van should be fitted with aesthetically designed script lights. Adequate quantity of compact fluorescent light (CFL) fittings to give proper illumination needed for operation and maintenance.
- e) The Mains AC and DG Power feeding terminal block should be provided external to the Van suitably located to avoid direct exposure to rain water. The connectors & cables should be of the best quality & adequate capacity with enough headroom.
- f) The offer should also include aesthetically designed, high quality Power Distribution Panel(s) with on load Change-over Switch with provision of operating on mains and DG supply, Digital Metering & Monitoring Panels, Separate Circuits & Switch Gears for equipment racks, internal lighting and air conditioning according to the estimated load requirements.

- g) Technical and power earthing for Video, Audio and Power equipment should be properly done as per the standard.
- h) The van should be fitted with ceiling mounted cassette type split Air conditioners of sufficient tonnage capacity to provide adequate cooling necessary for all the equipment and operators. The temperature inside the OB Van should be maintained at **21±1** degree Celsius. The offered air conditioners should have multi-flow air distribution systems for uniform cooling throughout the OB Van. Each outdoor unit of the offered air conditioners should be capable of driving two or more indoor units. Each technical area should be provided with more than one number of indoor units driven by different outdoor units to facilitate redundancy in the event of failure of one of the outdoor units.
- i) **The requirement of air conditioning is estimated to be about 8 TR. However, it is essentially required from the integrator to give the calculation of the estimated heat load and give the full design of the A/C system for the OB Van. In case bidder feels that 8 TR capacity is inadequate, a higher capacity A/C system may be offered.**
- j) Multiple outdoor and multiple indoor A/C units should be provided to ensure the stand-by operations in case of the failure.
- k) The distribution of conditioned air in various cabins should be planned in such a way that each outdoor A/C unit will cater to multiple cabins so that conditioned air is available in all the cabins even in case of failure of any unit.
- l) The hot air path of the air conditioning plants should be obstruction free.
- m) The mounting of air-conditioning equipment should be such that it should not cause any hindrance to movement and parking of van.
- n) The bidder must ensure and certify that service support for the offered UPS and air conditioning equipment is locally available where the van is to be supplied.

#### **2.4 Turnkey Implementation and Commissioning:**

- a) The complete project consists of Supply, Installation, Testing and Commissioning (SITC) of the OB van. The project will be carried out on turnkey basis. **Training on all major equipments including Cameras, Production Switcher, Audio Console, CG, Server, UPS, A/C plants, Intercom system etc. should also be the part of the offer.**

- b) It will be the responsibility of the bidder to ensure after-sale service and guarantee/ warranty for the equipment from various manufacturers. In case of the firms that are dealing with the turnkey implementation of the project only, they can be considered only if the manufacturer(s) of different major equipment such as Camera chains, Production Switcher, Severs, Audio Mixers, Character Generator, Intercom system, UPS etc. extend and ensure all Guarantee / Warrantee with respect to their equipment to the bidder and in turn to the procurement authorities i.e., Doordarshan.
- c) The Bidder will be required to use only high quality HD video/audio cables, connectors and other accessories. The HD video cable should be similar to Belden 1855 for rack wiring and Belden 1505 & 1694A for other applications. The HD BNC connectors of high quality should be used. XLR connectors should be of high quality and similar to Neutrik.
- d) The Bidder should use video/audio cables of different colors for ease of identification. The standard cable identification should also be used.
- e) The system integrator should display in vantage positions in the OB Van the Technical Block and Line diagrams of the Video, Audio and Power chain.
- f) The essential input and output routing of video signals to and from the production switchers and routing switcher will be through sufficient number of HD video patch panels. Only high quality digital patch panels which support high bandwidth should be offered. The patch panels should be straight through with 75 ohm termination.
- g) **The bidder should have a proven track record of design and fabrication of HDTV OB Van. The bidder should have work experience of two similar projects in the last four years prior to the submission of the bid. The bidder not having work experience may tie up with other experienced partner with similar work experience. In this case, the experienced partner will be responsible for carrying out design, fabrication and installation of the facility. The agreement of partnership to this effect should be submitted along with the bid. However, this agreement does not absolve the bidder from successful completion of the SITC job as per the terms and conditions of the tender. The list of similar turnkey works done by the bidder/partner in the past 4 years along with the full details should be enclosed along with the bid for the consideration of Doordarshan. The offer(s) from the bidder not having work experience of two similar projects in the past 4 years prior to submission of the bid will not be considered.**
- h) A pre bid conference will be held at an appropriate time before the last date of the submission of the bid to bring clarity to all the prospective



bidders in respect of the requirement of tender specifications. The date and venue will be intimated to all the prospective bidders. The prospective bidders are required to submit their queries (if any) in writing so as to reach Doordarshan at least three working days before the pre-bid conference.

- i) The number of inputs, outputs and performance parameters mentioned in the specifications for various equipment required for the OB van are suggestive and minimum only. The bidder can offer better parameters and more I/Os.

### **3. Complement of equipment for the OB Van:**

- a) This OB Van should have the entire supportive infrastructure like Monitoring, Routing, Communication, Distribution of Reference Sync Signal (Genlocking) etc.
- b) The bidder must ensure the completeness of the system. All the required accessories must also be quoted.
- c) The Van must however offer enough flexibility in adapting changing requirements from the technical and operational point of view.
- d) In order to ensure the completeness of the system, any additional equipment/accessories which bidder feels necessary to complete the configuration should also be quoted as optional item. However, in such case they should provide proper justification for the additional equipment required.

#### **3.1 OB Camera Chains:**

- a) The OB Van should be designed and wired for 12 cameras (apart from robotically controlled cameras) but initially will be equipped with 10 HD cameras only. Complete camera chain including HD lenses, CCU, Camera Support Systems etc. should be part of the offer. Provision for 2 additional cameras will be done for future. However, the necessary cabling for these 2 cameras from the wall box to the equipment rack should be done.
- b) 08 nos. of HDTV OB cameras and 02 nos. of 3X Super slow motion cameras are to be offered. All HDTV OB cameras should be of same make and model. The necessary support for large lenses, if required, should also be provided.
- c) All cameras should be of broadcast quality and should have 3 nos. of 2/3" (FIT/FT/AIT) CCDs, 16:9 Aspect Ratio, 1920 x 1080 or better native resolution sensors, 2.2 Mega pixel or better, 14-bit

A/D conversion, supporting 1920 x1080/50/1 HDTV standard, with 54dB (50 dB for Super Slow Motion) or better S/N Ratio, 1000 Horizontal TV Lines or better. All the cameras should be offered with high resolution colour LCD view finders. Apart from these view finders, the bidder should also additionally offer **4 nos. of eyepiece View Finder** for shoulder operations.

- d) The bidder has to provide 14 nos. of HD lenses as detailed below:
- (i) 22 X or better (minimum focal length 7.3 to 7.6 mm): 5 nos. with 2X built in extender, servo zoom and servo focus.
  - (ii) 86 X or better (minimum focal length from 8.8 to 9.3 mm): 2 nos. with 2X built in extender, servo focus and servo zoom with quick zoom facility, built-in optical image stabilizer and suitable lens supporters. **The lens should have auto focus or precision focus assistance system with its control module.**
  - (iii) 86X or better (minimum focal length from 8.8 to 9.3 mm): 2 nos. with 2X built in extender; servo focus and servo zoom with quick zoom facility, built-in optical image stabilizer and suitable large lens adapters for the offered cameras.
  - (iv) 86X or better telephoto lens (minimum focal length from 12.5 to 13.5 mm): 2 nos. with 2X built in extender; servo focus and servo zoom with quick zoom facility, built-in optical image stabilizer and suitable large lens adapters for the offered cameras.
  - (v) 14X Wide Angle Lens (minimum focal length from 4.3 to 4.5 mm): 3 nos. with 2X built in extender; servo focus and servo zoom with quick zoom facility.
- e) 10 nos. of camera support systems should be offered after calculating the full payload as above from reputed make such as Vinten, Sachtler or similar.
- f) All the cameras, Lenses and tripods should be offered along with suitable hard carrying cases and rain cover.

### **3.2 Wireless Camera System:**

- a) The OB Van should also include one no. of COFDM based (DVB-T compliant) Ultra portable HD camera dockable MW link suitable for ENG/OB applications with collinear Omni directional antenna of 6 dBi gain. The system should operate in license free frequency band **2.4 Gz to 2.4835 GHz** with maximum transmitter output power of 1 watt (4 Watt effective radiated power) with spectrum spread of 10 MHz or higher.



- b) Matching diversity receiver with maximum ratio combining system should also be offered. Receiver Head System should be supplied with **high gain** Omni directional Antenna, mounting assembly i/c tripod and required triax or similar cables of 100 meter length with matching connector at both the ends.
- c) The transmitter of the offered system should be dockable on Anton Bauer gold mount battery adapter. For powering the camera and the transmitter it should be fitted with Anton Bauer battery adapter. **ENG camera will not be part of the offer.**
- d) The whole system should be compact, light weight, rugged and excellent thermal characteristics for operations in tropical/sub-tropical climatic conditions.
- e) The output of the receiver should be HD-SDI meeting 1080/50/I standard. In addition to HD SDI output the system should also provide monitoring output. Further, the receiver should also have genlocking facility.
- f) The offered system should have low latency/delay for Live Broadcast applications.

### 3.3 Robotic Camera System:

In addition to 8 nos. of HDTV Cameras and 2 nos. of super slow HDTV cameras, the OB Van should be equipped with two numbers of **multi-purpose box type HD Cameras with suitable Pan- Tilt head** for remote control operation. The offered system should meet the following specifications:

- a) The offered camera should have 3 Chips of 2/3 inch CCDs, 2.2 mega pixels resolutions, 14 bit A/D conversion and 1920 x 1080/50/I HDTV standard.
- b) The offered camera should have colour correction & neutral density filters.
- c) The offered system should provide HD-SDI output and should accept bi level/tri-level sync signal for genlocking purposes.
- d) The camera should be supplied with suitable/ matching remote controlled HD lens of 17X with minimum focal length of 7.6 mm.
- e) Two nos. of remote controlled Pan & Tilt Head with pay load capacity of approximately 4 Kg has been envisaged. However, firm should provide the suitable Pan and Tilt head matching with the camera and lens weight.
- f) The pan operation should provide  $\pm 150$  deg. or better movement and tilt operation should provide  $\pm 95$  deg. or better movement.

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- g) The offered remote control panel should allow pan and tilt movement of Pan-Tilt heads and zoom, focus and iris of lens system.
- h) The bidder should also offer camera RCPs along with cable and matching connectors at both ends for controlling various camera parameters required for colour matching etc. in multi-camera production.
- i) The offered remote control unit for Pan-Tilt head should work satisfactorily upto 500 meter cable length. The necessary control cable of 100 meter length should also be offered alongwith the system.
- j) The whole system should be rugged, compact, light in weight and ergonomically designed for broadcast applications.
- k) All the required accessories including suitable mounting assembly to make the system fully functional should be offered.

#### **3.4 Super Slow Motion & Slow Motion Servers:**

- a) The bidder should also offer 2 nos. of 6-channel Multi-cam live slow motion and super slow motion (3x) HD video Server.
- b) The offered each server should have 12 nos. of 300GB internal SAS drive storage in RAID3 configuration for Super Slow Motion and slow motion applications.
- c) Each offered server should have auto-switchable redundant power supply units.
- d) The server should have 6 independent High Definition channels and should be capable of replaying sequences while recording is in progress. All the channels should be bi-directional and should be user configurable for input or output.
- e) The offered server should ingest 3 parallel streams from one of the Super Slow motion Cameras & two streams from the 8 normal cameras and playback the output in the sixth port.
- f) The system should also have play list editing features with cut & paste facility.
- g) The server should also have mix and wipe facilities.
- h) The servers should be equipped with high bandwidth media sharing network for allowing all Video and Audio sources recorded on any server to be instantly available to all the operators without any interruption with the recording process.
- i) The Video servers should also be offered along with suitable controllers for super slow motion and slow motion applications.




### **3.5 VCRs/Deck:**

The design should also accommodate 2 HDTV format VCRs/Decks (to be provided by Doordarshan). The rack space & I/O cabling for the above two VCRs should be planned accordingly.

### **3.6 Character Generator & Graphics:**

The Van should be designed for accommodating one HDTV Character Generators with 2D & 3D graphics capabilities. The offered character generator should have dual channel and it should be possible to edit all features on preview channel while the program output is on air. The offered Character Generator should have HD-SDI and SD-SDI I/Os.

### **3.7 Digital Production Switcher and Router:**

- a) The firm should offer 32 input HD-SDI Multi-format Digital Production Switcher with control panel having following facilities:
  - (i) The switcher should support 1080/50/I format.
  - (ii) The offered switcher should have 32 multi-format inputs and 24 multi-format outputs.
  - (iii) The offered switcher should have HD/SD SDI up/down/cross converters on 8 inputs and 2 outputs.
  - (iv) The switcher should have compact control panel of 24 directly accessible inputs and remaining through shift operation.
  - (v) The offered production switcher should have 2.5 M/E. Each full function M/E should have 4 full function Keyers and 0.5 M/E should have 2 keyers. Each keyer in full function M/E should also have chroma keying facility. Each 0.5 M/E keyer should also have down-stream keying facility.
  - (vi) The switcher should have 4 channels of 3D DVE.
  - (vii) It should have clip/image/frame/still store for approximately 800 frames in HD-SDI 1080/I format.
  - (viii) It should have 6 nos. of RS 422 external device control ports to control external VCRs/Decks/DDRs.
  - (ix) The switcher should have 16 GPI inputs and 32 tally/GPI outputs.
  - (x) The switcher should provide at least 8 Aux. outputs. The switcher should have dedicated AUX control panel for source selection on Aux buses.

- (xi) The switcher should have enough memory to store various effects, time line and macro control settings. These settings can be recalled and edited any time.
  - (xii) The main frame of the switcher electronics should not exceed 6 RU. The offered switcher should have auto switchable redundant power supply units in both, the main frame and the control panel.
- b) One 32 x 32 HD-SDI/SD-SDI type Digital Routing Switcher should also be provided with 3 nos. of X-Y RCPs and 4 nos. of single bus RCPs. These panels will be used for routing inputs to recording machines, slow motion servers, for standby switching and for technical monitoring. The offered Routing switcher should have redundant power supply units.

### 3.8 Monitoring Equipment:

The following provisions of various types of video monitors and Waveform monitors are required to be made in the OB Van:

- a) Provision of 38 nos. of 8.4"/9" HD SDI, SD SDI & Analog input LCD/TFT video monitors with wide screen & Anti-glare/Anti-reflection protection, 800 x 480 resolutions, high contrast ratio, high brightness, tally etc. is to be made for the sources monitoring at various locations as detailed below:

Sr. Nos.	Description	Qty.
<b>(I) Production Control Area</b>		
(i)	Cameras	12 nos. ( 8 for normal cameras, 2 for Super Slow Motion Cameras and 2 spare for future cameras)
(ii)	VCRs/Decks	2 nos.
(iii)	Slow Motion/Super Slow Motion Output Channels	2 nos.
(iv)	Frame Synchronizers	4 nos.
(v)	CG	1 no.
(vi)	Router Outputs	2 nos.
(vii)	Off Air	1 no. <b>(with built-in speaker)</b>
<b>(II) CCU Area</b>		
(i)	Cameras	12 nos.
(ii)	VCRs/Decks	2 nos.
	<b>TOTAL</b>	<b>38 nos.</b>

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- b) Provision of 10 nos. of 17" HD SDI & SD SDI input LCD/TFT video monitors with wide screen & Anti-glare/Anti-reflection protection, 1920 x 1080 resolutions, high contrast ratio, high brightness, tally etc. is to be made for the monitoring at various locations as detailed below:

<b>Sr. Nos.</b>	<b>Description</b>	<b>Qty.</b>
<b>(I) Production Control Area</b>		
(i)	Program	1 no.
(ii)	Preview	1 no.
(iii)	ME-1 Preview	1 no.
(iv)	ME-2 Preview	1 no.
<b>(II) Audio Area</b>		
(i)	Program Output	1 no.
<b>(III) CCU Area</b>		
(i)	Cameras (one per 4 cameras)	3 nos.
<b>(III) Commentator Booth</b>		
(i)	PGM Monitoring	2 nos. <b>(with standalone Desktop stand)</b>
<b>TOTAL</b>		<b>10 nos.</b>

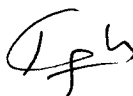
- c) The slow/ super slow motion area should have 12 nos. of 6.5" TFT HD-SDI & SD-SDI video monitors with wide screen & Anti-glare/Anti-reflection protection, 800 x 480 resolutions, high contrast ratio, high brightness, tally etc. for monitoring of all the 12 record/play-out channels of both the servers.
- d) 6 nos. of Dual Input HD/SD Digital Wave form Monitor alongwith cabinet having facility of simultaneous display of waveforms of both the input signals should be offered. These WFM are required to be integrated at CCUs Desk. These WFMs should be wired so that all the 12 cameras can be monitored simultaneously using dual input provision and simultaneous monitoring facilities of both the inputs of WFMs.
- e) One no. of HD/SD Digital Wave form Monitor with cabinet and following display facilities should also be offered additionally for maintenance purpose:
- (i) Eye/Jitter pattern display
  - (ii) Audio display capability
  - (iii) Data Analysis capability
- f) Two nos. of Audio and Video Monitoring Stations having 5.1 surround sound encoded in Dolby E with video monitor, audio bar graph and speaker should be included in the offer.

### **3.9 Peripherals & Other Video Equipments:**

- a) One set of Dual SPG with Auto Change-over facility should be included in the offer. The offered System should be able to work as Master/Slave SPG. It should have HD Tri-level, Bi Polar Sync, Analog Black Burst, VITC, LTC Time code and HD Test Signal outputs.
- b) Four nos. of digital Frame Synchronizers with HD-SDI and SD-SDI Input/Output are also required to be offered to integrate the external sources with the Production Switcher in the Van. The offered digital Frame Synchronizers should also function as up/down/cross converters. The offered system should be of size 1RU and standalone type.
- c) The adequate nos. of digital & analog peripherals including Re-clocking type of digital distribution amplifiers including Embedders and De-embedders are required to be included in the offer. Multiple nos. of outputs of PGM and AUX buses in SD-SDI, HD-SDI, Composite Video, Analog & AES/EBU audios etc are required to be brought at the tail board of the OB Van. Sufficient nos. of digital and analog peripherals should be offered for these purposes.
- d) All the card type peripheral equipment should be housed in redundant power supply rack frame.
- e) The bidder should offer one HD Logo Generator/Inserter along with requisite HD SDI Distribution amplifier to feed channel branded video for local Monitoring feed.
- f) The tender should include one number of Palm held SD/HD SDI Video & AES Test Generator for testing Video and Audio cables in the field.

### **3.10 Audio Mixer and other Audio Equipment:**

- a) The Broadcast Quality Digital Audio Mixer should have 24 non-motorized 100 mm fader modules along with input assign facility. The following features are required in the mixer:
  - i) The offered digital audio mixer should be fully modular in design and should have auto-switchable redundant power supply unit.
  - ii) The mixer should have excellent frequency response, low Total Harmonic Distortion, and high S/N ratio.
  - iii) The mixer should have PFL facility. It should also have built in test oscillator.
  - iv) It should have monitoring and talkback facility
  - v) Should have built-in multi-band Graphic equalizer with dedicated control knobs.



- vi) Should have dedicated control knobs/buttons for Gain control, balancing, PFL, AUX routing, EQ etc.
  - vii) Should have Mix-minus busses configurable as AUX send
  - viii) It should have 5.1 surround sound recording facility and necessary hardware and software for this should be offered.
  - ix) The mixer should have following Inputs/Outputs:
    - 20 mono mic/line inputs on XLR with switchable 48V phantom power
    - 8 x Analog line inputs on XLR
    - 4 x Analog inserts on mic/line inputs
    - 8 Stereo AES/EBU inputs (on XLR with Break out cable)
    - 2 Speaker outputs (for PCR, Audio cabins)
    - 8 analog line outputs on XLR
    - 8 Stereo AES/EBU outputs (on XLR with Break out cable)
    - Headphone Out
- b) The bidder should also offer six nos. of good quality near field Ampli-speakers having AES/EBU and analog audio inputs for PGM audio monitoring in various production areas of the OB Van.
  - c) The bidder should offer a broadcast quality Digital Audio Level processor which removes the abrupt audio level changes in between the program.
  - d) The bidder should also offer adequate no. of ADAs for source/PGM audio distribution in various production areas of the OB Van. All the outputs of the offered ADAs should have an individual level control on each output.
  - e) The bidder should quote **10 Channel Portable Audio Line Ident Unit** through which a RAM recorded Audio clip/messages will be played on loop on multiple outputs for enabling automatic audio cable/chain test.

### **3.11 Commentator Units & Other Miscellaneous Items:**

- a) Two numbers of internationally renowned 3 channel Commentator unit with all accessories and cables should also be offered in the OB Van.
- b) The bidder should offer one number of rack mountable Hi-Quality DVD Recorder/Player of reputed brand.
- c) The OB Van should be provided with a reputed brand GPS Clock with digital clock display.

- d) The bidder should offer a latest **Laptop computer with 15" Wide view TFT Screen** and all accessories with latest hardware configuration. The offered laptop should be supplied & installed with rack mountable sliding tray. The Operating System software should be available in original media and licensed to Doordarshan. This laptop should have and support the required ports and connectors for connecting various equipment for configuration and diagnostic purposes. The soft copies of operation and maintenance manuals of all the equipment should also be loaded in this Laptop in another partition of HDD.

### **3.12 Intercommunication System:**

- a) The firm should offer a Digital Intercommunication System. The offered digital matrix should be of 32 ports with redundant power supply unit.
- b) 19" rack mountable Producer Station and other remote control panels should be provided within the OB van wherever required as per the design and lay out of the van. The Producer Station and other remote control panels should have alphanumeric electronic displays for various keys. All the panels should be with gooseneck microphones. **Additionally two remote control panels including connecting cables and other accessories should also be provided for use in remote control locations located at the distance up to 200 meters from the van.**
- c) **One audio output of the Director/Producer command from intercom system should be available on XLR/free end cable for embedding into the final Program Output for sending the Director/Producer command to the Broadcast Station through DSNG/MW/OFC.**
- d) Six numbers of wired belt packs with miniature dual muff headsets should be offered for FMs.
- e) Six numbers of wired belt packs with IFB should also be offered for anchors/talents.
- f) Six numbers of dual wireless (trans/receive) belt packs along with all essential accessories operating on license free frequency in India should also be offered along with the Intercom system.
- g) All the belt packs should be individually addressable.
- h) The Commentator unit should also be integrated with the Intercom System.

### **3.13 Power Supply System:**

- a) Power Distribution Panel with the required switchgears like On load Change Over Switches, Bypass switches, MCCBs, MCBs, Phase



sequence switch, digital Phase sequence meters, digital Volt and Ampere Meters, digital frequency meters etc. should be provided. The required numbers of Sub Distribution Panels should also be provided. The entire Switch Gears should be of high quality and should be of reputed brands such as L&T, Siemens etc.

- b) The van should have the provision of connecting external mains power supply and diesel generator supply with the necessary on load changeover facilities. There should be a provision to bypass the UPS in case of any failure.
- c) The power cables to be used for internal wiring for various purposes should be of adequate rating with sufficient headroom, fire retardant and of the best quality.
- d) Flexible mains 4 core copper cables of suitable rating of 100 meters length should also be included in the offer.

#### **4. Technical Specifications:**

The General specifications of the System applicable to all the equipment are given in the **Appendix-I**.

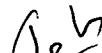
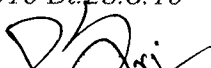
#### **5. General Terms & Conditions:**

##### **5.1 Completeness of the System & Complement Of Equipment:**

- (a) A list of the equipment is enclosed at **Appendix-II**.
- (b) The OB Vans are being procured for the Doordarshan centres as per **Appendix-III**.
- (c) Completeness of the system is the responsibility of the bidder.
- (d) The successful bidder will be solely responsible for commissioning and operationalisation of the system to the satisfaction of Doordarshan.
- (e) If the firm feels that the system required as per the specifications may need additional hardware & software for better functionality, the firm may quote the items as an **Optional item** and provide full justification to decide its utility.

##### **5.2 Software:**

**The software of the all the equipment including Operating Systems, application softwares etc. are required to be supplied in original media and should be licensed to Doordarshan with perpetual validity.**



**A certificate to this effect is also required to be submitted by the bidder, along with the bid.**

**5.3 Compliance:**

- (a) A full compliance statement in respect to all the parameters related to concerned equipment laid down in the specification is to be enclosed. Offers without compliance statements are liable to be rejected. Any deviation from the specification should be highlighted.
- (b) All the equipment in the offer should be from internationally reputed and leading manufacturers of their respective industry, who have proven records of offering high class, high MTBF equipment.
- (c) The specifications relating to some of the equipment are not fully detailed here. The bidders are at the liberty to quote such equipment as per their choice. However, as a word of caution, such equipments should be proven products and from reputed manufacturers meeting the highest broadcasting standards. The offer should also include the detailed technical brochure and technical manual containing all the technical specifications of such equipment.
- (d) Any substandard equipment included in the offer may cause rejection of the complete offer with the sole responsibility of the bidder.
- (e) The firm should provide the offered un-priced bill of material in electronic form also in addition to the hard copy for ease of technical evaluation.
- (f) **A point-by-point compliance statement from the principal manufacturer in respect of all the points laid down in this specification is to be enclosed along with the offer in the format given below. Mere signature on the copy of our specification shall not be accepted as a compliance statement.**

**The figures so mentioned should be supported by record of these in the technical literature enclosed with the tender and reference to the page number of enclosed literature for all features and technical specifications should be mentioned in the relevant column. Offers without the compliance statement or with incomplete compliance statement will liable to be rejected with the sole responsibility of the bidder. Any deviation from the specification detailed in the compliance statement is to be highlighted separately.**

Sr. No of DD specs.	DD specs.	Compliance (Yes/No)	Performance Fig. of equipment Offered.	Reference to the Page Number of enclosed literature	Deviations, in case of non-compliance	Optional items if any required to make the system Compliant to DD specs.	Features in the offered Product which exceeds DD

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#### 5.4 Technical Literature:

One set of printed technical and operation & maintenance manuals for all the equipments is to be provided on non-returnable basis along with the tender to facilitate the technical evaluation, otherwise the tender is liable to be ignored. The successful bidder will have to supply one set of printed operation, service and maintenance manuals with respect to each equipment, alongwith the van.

#### 5.5 Guarantee

- (a) All the equipment including vehicle & chassis should be guaranteed for two years of trouble free operation from the date of commissioning. In case of any equipment failure including software and hardware within this period, the same shall be rectified or replaced free of cost to Doordarshan.
- (b) The guarantee should cover all hardware, software and modules of the complete system, including vehicle.
- (c) The firm will provide up gradation of all the offered software free of charge during the warranty period. **The firm will be required to give undertaking to this effect, alongwith the bid.**

#### 5.6 Inspection:

The equipment shall be subjected to inspection by Doordarshan officials.

#### 5.7 Enclosures:

The bidder must necessarily submit the following enclosures along with the technical bid:

- (a) Compliance statement with respect to all the points of the specifications duly signed by the OEM should be submitted for all the equipment.
- (b) The reference to the page number of enclosed literature for all features and technical specifications should be essentially mentioned in the relevant column of the compliance statement.
- (c) Certificate as required vide clause no. 5.2.
- (d) An undertaking as required vide clause no. 5.5.(c).
- (e) OB Van layout indicating all operational areas such as production, CCU, VTR, slow motion and audio etc.
- (f) Detailed Video and Audio schematics including block diagrams etc.

- (g) Power supply schematic with the layout of power switchgears, PDP etc.
- (h) Intercommunication schematic.
- (i) Power supply load calculation sheet. Power supply schematic with the layout of power switchgears, PDP etc.
- (j) The details of the offered vehicle and design details of the vehicle.
- (k) Air-conditioning details including heat load calculation.
- (l) Details of the stowage area.
- (m) Technical manuals/Detailed technical literature/catalogues for all the offered products for substantiating the model no. and technical specification.
- (n) **Product/Model specific User list of the offered product.**
- (o) Work experience with details including contact details of the clients.
- (p) Any other document mentioned elsewhere in the tender document.

**The tender is liable to be rejected in the absence of the above enclosures with the sole responsibility of the bidder.**

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**GENERAL TECHNICAL SPECIFICATIONS APPLICABLE TO ALL EQUIPMENT**

- 1. System** : **HDTV** 1920x1080/50/I conforming to SMPTE 292M and ITU-R BT. 709 (CIF) (HD-SDI: 1.485 Gb/s) and **SDTV** 625/50i (4:3 aspect ratio) conforming to SMPTE 259M and ITU-R BT. 601 (SDI: 270 Mb/s, PAL, 2:1 Interlace, 25 frames/s, 50 fields/s).  
The video in both the systems is associated with embedded audio.
- 2. Digital processing** : **HDTV**: 4:2:2, Y: 74.25 MHz, Pr: 37.125 MHz, Pb: 37.125 MHz Sampling rate, 10 bit quantization.  
**SDTV**:4:2:2, Y:13.5 MHz, Pr:6.75 MHz, Pb:6.75 MHz Sampling rate, 10 bit quantization.
- 3. Power supply** : 230 Volts  $\pm$ 5%, 50 Hz
- 4. Operating temperature** : 5 to 40 Deg. Celsius
- 5. Relative humidity** : 30% to 85%
- 6. Mounting/Dimensions** : Standard 19" Rack mount in case of Stand alone units. Otherwise 19" Rack mounting frame housing the units with auto switchable Redundant power supply unit.
- 7. Connectors**
  - a) Video : 75  $\Omega$  BNC
  - b) Audio : 3 Pin XLR/75  $\Omega$  BNC
  - c) Control : BNC, Mini XLR, RS-422, GPI, Ethernet
- 8. Video Signal**
  - a) Digital Video : 0.8 Vp-p  $\pm$  10%, across 75 ohms.
  - b) Reference signal : 1080/50/I HDTV Tri-level sync and PAL black burst
- 9. Audio** : a) Embedded audio unless specified otherwise.  
b) AES/ EBU  
c) Dolby-E for 5.1 surrounds Sound Capability
- 10. Time code** : VITC on black and LTC



**Complement of Equipment in each OB Van**

S. No.	Description	Qty.	Remarks
<b>(A)</b>	<b>Video Equipment consisting of :</b>		
<b>(I)</b>	<b>OB Camera Chains:</b>		
1.	Digital HD Camera Chain including Base Station / Camera Control Unit, individual RCP, Tripod Adaptor, 7" HD B/W CRT Viewfinders with the following major specifications : 2/3" CCDs (FIT/AIT/FT) 16:9 Aspect Ratio, Supporting 1080/50i Format 14 bit A/D Conversion or better, 2.2 Mega Pixel or better F10 at 2000 lx (3200K, 89.9% reflectance) 54dB S/N Ratio or better, 1000 Horizontal TV lines or better, Gain : (-6 dB to + 12 dB) Bayonet lens mount, All cameras should be provided with necessary Hard Carrying Case and rain covers 19" Rack Mountable Base Stations should also be quoted. Optical Fiber configuration is to be offered	8 nos.	Similar to Sony's HDC 1500, Ikegami's HDK 79EXIII, Thomson's LDK 8000 Elite
2.	2" HD eye piece Viewfinder for the cameras quoted in <b>A.(I).1</b>	4 Nos.	
3.	Digital <b>HD Super Slow Motion Camera</b> Chain including Base Station / Camera Control Unit, individual RCP, Tripod Adaptor, 7" HD B/W CRT Viewfinders with the following major specifications : 2/3" CCDs 16:9 Aspect Ratio, Supporting 1080/50i Format 14 bit A/D Conversion or better, 2.2 Mega Pixel or better For 1X speed - f 7 at 2000 lx (3200K, 89.9% reflectance) or better 50dB S/N Ratio or better, 1000 Horizontal TV lines or better,	2 Nos.	Similar to Sony's HDC 3300, Thomson's LDK 8300

Specifications for SITC of Multi-Camera Mobile Van for Outdoor Production in HDTV Format: SD  
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	<p>Minimum Modulation Depth 45% at 27 MHz  Minimized flicker in slow-motion image  Bayonet lens mount,  All cameras should be provided with necessary Hard Carrying Case and rain covers  19" Rack Mountable Base Stations should also be quoted.  Optical Fiber configuration is to be offered</p>		
4.	<p>Broadcast Quality EFP HD Digital Zoom Lens 22X or higher (minimum focal length 7.3 to 7.6 mm) with  Built in 2X Zoom Extender,  Servo Zoom and  Servo Focus</p>	5 nos.	<p>Similar to Fujinon HA 22X 7.3 B, Canon HJ22ex7.6B,  Essentially quote other accessories such as Zoom and Focus Demand Units.</p>
5.	<p>Broadcast Quality HD Digital Zoom Lens 86 X or better (minimum focal length from 8.8 to 9.3 mm) with Built in 2X Extender,  Servo Focus,  Servo Zoom,  with quick zoom facility,  Built in Optical Image Stabilizer,  Large Lens Adapter &amp; Support for the offered cameras.  The lens should have autofocus or precision focus assistance system with its control module.</p>	2nos.	<p>Similar to Fujinon XA88 x 8.8B with PF feature, Canon XJ86 x 9.3B AF  Essentially quote other accessories such as Zoom and Focus Demand Units.</p>
6.	<p>Broadcast Quality HD Digital Zoom Lens 86 X or better (minimum focal length from 8.8 to 9.3 mm) with Built in 2X Extender,  Servo Focus,  Servo Zoom,  with quick zoom facility,  Built in Optical Image Stabilizer,  Large Lens Adapter &amp; Support for the offered cameras.</p>	2nos.	<p>Similar to Fujinon XA88 x 8.8B, Canon XJ86 x 9.3B  Essentially quote other accessories such as Zoom and Focus Demand Units.</p>
7.	<p>Broadcast Quality HD Digital telephoto Zoom Lens 86 X or better (minimum focal length from 12.5 to 13.5 mm) with Built in 2X Extender,  Servo Focus,  Servo Zoom,  with quick zoom facility,  Built in Optical Image Stabilizer,  Large Lens Adapter &amp; Support for the offered cameras.</p>	2nos.	<p>Similar to Fujinon XA88 x 12.5B, Canon XJ86 x 13.5B  Essentially quote other accessories such as Zoom and Focus Demand Units.</p>

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8.	EFP HD Digital Wide Angle Zoom Lens 14X or better (minimum focal length from 4.3 to 4.5 mm) with Built in 2X Extender, Servo Zoom and Servo Focus	3 Nos.	Similar to Fujinon HA 14 x 4.5 B, Canon HJ14e x 4.3B, Essentially quote other accessories such as Zoom and Focus Demand Units.
9.	Camera Support System with 150mm Ball base supporting above mentioned cameras and 22X EFP type lens along with Two stage Tripods, Matching Dolly for OB applications Necessary Hard carrying case should also be provided.	4 nos.	Similar to Vision 250 of Vinten and Video 25 Plus of Sachtler along with suitable slide plate to mount 22X HD lenses.
10.	Heavy duty camera support system with 150mm Ball base, suitable tripod and elevation/ hand crank column, matching dolly for OB application Necessary Hard carrying case should also be provided.	6 nos.	Similar to Vector 750 of Vinten and Video 60 plus of Sachtler with 150mm Ball base supporting above mentioned cameras with 86/88 x Box type lenses
<b>(II) Wireless Camera System:</b>			
1.	COFDM based (DVB-T compliant) Ultra portable HD camera dockable MW link suitable for ENG/OB applications with collinear Omni directional antenna of 6 dBi gain, operating on license free frequency band <b>2.4 Gz to 2.4835 GHz</b> with maximum transmitter output power of 1 watt (4 Watt effective radiated power) with spectrum spread of 10 MHz or higher, as specified in the specifications.	1 Set	Similar to Gigawave and Nucomm make
<b>(III) Robotic Camera System:</b>			
1.	Robotic Control Camera System comprising of following and as specified in the specifications.		
(a)	compact box type multi-purpose HD camera system with RCP, cable and connector at both ends etc.	2 Sets	Similar to Sony HDC-P1 and Ikegami HDL-45A with matching RCPs
(b)	17 X remote control Zoom lens with minimum focal length 7.6 mm	2 Sets	Similar to Canon HJ17ex 7.6B and Fujinon ZA17x7.6 BMD
(c)	Pan-Tilt head with Remote Control Unit and 100 meter cable with connector at both ends	2 Sets	Similar to Fujinon EPT-7G, Telemetrics PT-CP-S4 with

Specifications for SITC of Multi-Camera Mobile Van for Outdoor Production in HDTV Format: SD  
11/2010 Dt.25.5.10

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			matching remote control unit
(d)	Any other accessories to make the system fully functional	2 Sets	As above
<b>(IV) Super Slow Motion &amp; Slow Motion Servers:</b>			
1.	6-channel Multi-cam live slow motion and super slow motion (3x) HD video Server with 12 nos. of 300GB internal SAS drive storage in RAID3 configuration in each server for Super Slow Motion and slow motion applications with high bandwidth networking option and LSM Controller	2 nos.	Similar to EVS HD LSM XT[2]+
<b>(V) Character Generator &amp; Graphics:</b>			
1.	Dual channel Character Generator with HD-SDI and SD-SDI I/Os, Separate HD SDI Preview and HD SDI Program output and Support for Indian Regional Languages.	1 no.	Similar to Insciber/Harris G7, Avid Deko 3000 HD, with 3 D Graphics
<b>(VI) Digital Production Switcher and Router:</b>			
1.	Digital Production Switcher with 32 HD SDI Input 10 bit Processing or better, Multi format HD/SD Support, 2.5 M/E, 3D DVE, Image Store, 6 Aux. Outputs and Redundant Power Supply for both Control Panel & Main Frame etc. as specified in the specifications.	1 no.	Similar to Sony's MVS-8000G, Snell & Wilcox's Kahuna CF, Grass Valley's Kayenne
2.	32 x 32 HD-SDI and SD-SDI Digital Routing Switcher with redundant power supply along with 3 nos. of X-Y RCPs and 4 nos. of single bus RCPs.	1 set	Similar to Harris, Evertz, Miranda, Snell & Wilcox, Grassvalley make
<b>(VII) Monitoring Equipment:</b>			
1.	17" HD SDI & SD SDI input LCD/TFT video monitors with wide screen & Anti-glare/Anti-reflection protection, 1920 x 1080 resolutions, high contrast ratio, high brightness, tally etc. <b>Note: out of 10 Monitors, 2 monitors should be provided with standalone desktop mount for Commentator Booth</b>	10 Nos.	Similar to SONY, Tamuz, Marshall make
2.	8.4"/9" HD SDI & SD SDI input LCD/TFT video monitors with wide screen & Anti-glare/Anti-reflection protection, 800 x 480 resolutions, high contrast ratio, high brightness, tally etc. <b>Note: One monitor should be with built-in speaker for off-air monitoring</b>	38 Nos.	Similar to KROMA, SONY, Panasonic, JVC Marshal make

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3.	6.5" TFT HD-SDI & SD-SDI video monitors with wide screen & Anti-glare/Anti-reflection protection, 800 x 480 resolutions, high contrast ratio, high brightness, tally etc. for monitoring of all the 12 record/play-out channels.	12 Nos.	Similar to Marshal make
4.	Dual Input HD/SD Digital Wave form Monitor alongwith cabinet having facility of simultaneous display of waveforms of both the input signals.	6 nos.	Similar to WFM 7120 of Tektronix or LV 5800 of Leader
5.	HD/SD Digital Wave form Monitor with cabinet and following display facilities: Eye/Jitter pattern display Audio display capability Data Analysis capability	1 no.	Similar to WFM 7120 of Tektronix or LV 5800 of Leader
6.	Audio and Video Monitoring Station having 5.1 surround sound encoded in Dolby E with video monitor, audio bar graph and speaker	2 no.	similar to Wohler AMP1-E16-3G, TSL make PAM2-3G16
<b>(VIII) Peripherals &amp; Other Video Equipments</b>			
1.	Dual SPG with Auto Change-over facility and should be able to work as Master/Slave SPG. It should have HD Tri-level, Bi Polar Sync, Analog Black Burst, VITC, LTC Time code and HD Test Signal outputs	1 set	Similar to Tektronix TG 700 with ECO422D SD/HD, Evertz 5600 MSC with 5600 ACO
2.	Digital Frame Synchronizer with HD-SDI & SD-SDI I/Os and Up/Down/Cross - conversion facilities.	4 nos.	Similar to Harris X85HD-AV-2PS or FOR-A FA-9100RPS.
3.	HD Logo Generator/Inserter	1 no.	Similar to Evertz HD9725LGA
4.	Digital Peripheral Equipment as per the requirement including Embedders and De-Embedders, Re-clocking type Digital Distribution Amplifiers etc. All frames should have redundant power suppliers.	1 Lot	Similar to Snell & Wilcox, ROSS, GVG, Miranda, Evertz, Probel, Crystal Vision make
5.	SD/HD SDI Video & AES Audio Test Generator	1 no.	Similar to LYNX make
<b>(B) Audio Mixer and Other Audio Equipment:</b>			
1.	24 fader broadcast quality Digital Audio Mixing Console with 5.1 Surround Sound capability as detailed in the specifications.	1 Set	Similar to Studer On Air 3000, Lawo Zircon, Calrec Zeta
2.	Compact size Ampli-speakers with AES/EBU and analog audio inputs	6 nos.	Similar to Genelec, JBL make
3.	Digital Audio Level Processor	1 No.	Similar to Junger, Orban make

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4.	Audio Distribution Amplifier (ADA) with individual Level control on each output	1 lot	Similar to Snell & Wilcox, ROSS, GVG, , Miranda, Evertz, Probel, Crystal Vision make
5.	10 Channel Portable Audio Line Ident Unit	1 no.	Similar to Glensound GS1U-028
<b>(C) Commentator Units &amp; Other Miscellaneous Items:</b>			
1.	3 channel Commentator's Unit	2 nos.	Similar to Glensound, AEQ make
2.	Hi-quality rack mountable HD DVD Recorder/ Player	1 no.	
3.	GPS Clock with digital clock display.	1 Lot	
4.	Laptop Computer with latest configuration	1 no.	Similar to HP, Dell make
<b>(D) Intercommunication System:</b>			
1.	32 Ports High Quality Intercom System with wired and wireless belt packs, Producer Station & required nos. of other remote control panels as per the system requirement	1 set	Similar to Triology, Telex, Reidel, Kroma make
2.	Additionally, wired remote control panels including 200 meters connecting cables and other accessories for use in remote locations at the distance from the van.	2 Sets	-Do-
3.	Six numbers of wired belt packs with miniature dual muff headsets should be offered for FMs		-Do-
4.	Six numbers of wired belt packs with IFB should also be offered for anchors/talents.		-Do-
5.	Six numbers of dual wireless (trans/receive) belt packs along with all essential accessories operating on license free frequency in India should also be offered along with the Intercom system		Similar to HME make
<b>(E) Microphones:</b>			
1.	Long Shotgun Microphones with operation on both battery and phantom with stand.	4 set	Similar to MKH 70 of Sennheiser
2.	Shot Gun Microphones with narrow acceptance angle for long distance sound pick up; Good sound rejection from the sides and rear of microphone, switchable low frequency roll off. Microphones should operate on battery and phantom supply	6 set	Similar to MKH 416 of Sennheiser
3.	Lapel Microphone	10 nos.	Similar to MKE2PC of Sennheiser

4.	Noise Canceling Lip Microphone with Lip guard	6 Nos.	Similar to Coles Electroacoustics 4104 Commentators Ribbon Microphone
5.	Reporter's microphone with omni-directional pick-up pattern.	4 nos.	Similar to MD 42 of Sennheiser
6.	Reporter's microphone with cardioid pick-up pattern.	4 nos.	Similar to MD 46 of Sennheiser
<b>(F) Installation Materials:</b>			
1.	All kinds of Installation Materials i/c HD Patch Panels with 2.5 GHz bandwidth & Normal through type, Audio/ Video/OFC/ Triax/ Data/Control/Power Cables, Audio/ Video Racks, Tail Boards, Connection Terminals etc.	1 Lot	
<b>(G) Power Supply &amp; Air-conditioning Equipment:</b>			
1.	20 KVA, 3phase-input and 3 phase output On Line UPS system with 15 minutes backup	1 Set	Similar to APC, Pillar, Eaton make
2.	Power Distribution Panel	1 Set	
3.	Mains/DG Distribution Panel	1 Set	
4.	On load Change over Switches, MCCBs, MCBs, Phase Reversal Switch, Digital meters for phase sequence, frequency, Voltage, Ampere, Terminal Blocks, Power Cables, Amphinols and Other Installation Materials etc.	1 Lot	Switchgears similar to L&T, Siemens make
5.	Ceiling mounted cassette type split Air conditioners with multiple Outdoor and Indoor units	1 Set	Similar to Daikin, Hitachi make
<b>(H) OFC &amp; Audio-Video Cables etc.</b>			
1.	Optical Fiber cable 10 mtrs. Of length with necessary connectors at both ends <b>for bench test</b>	2 nos.	
2.	Optical Fiber cable 150 mtrs. Of length with necessary connectors at both ends	4 nos.	
3.	Optical Fiber cable 200 mtrs. Of length with necessary connectors at both ends	4 nos.	
4.	Optical Fiber cable 300 mtrs. Of length with necessary connectors at both ends	8 nos.	
5.	OFC cable jointers and other essential accessories like splicer, cleaner etc.	2 sets	
6.	4 pair flexible low loss microphone cables similar to Belden make (each roll of 300 meters)	4 nos.	

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7.	4 pair flexible low loss microphone cables similar to Belden make (each roll of 200 meters)	6 nos.	
8.	Assorted audio/ video cables, 4x100 mtrs, 4x50 mtrs, 4x25 mtrs, 10x1 mtr, 10X60cm	1 Lot	
9.	Motorized Cable Drums for Audio/Video/ OFC cables.	1 Lot	
<b>(I) Vehicle, Body Building &amp; Technical Furniture etc.:</b>			
1.	Van Chassis and Body Building etc.	1 Lot	
2.	Modular, Sturdy and Ergonomically designed Production Desk, Audio Desk, CCU Desk, Super Slow Motion/Slow Motion Desk, Recording Desk and Engineering Desk along with other Technical Furniture including revolving chairs for operator etc.	1 Lot	
3.	Portable Fire Fighting Equipment for various cabins including Driver's cabin	1 for each Cabin	
4.	Digital Thermometer in each cabin	1 lot	
5.	Aluminum ladder	3 nos.	
6.	Tool bag consisting of essential Mechanical & Electrical tools, Cable Crimping tools (Video, Data), Soldering station, Digital Multi meter, Clip-on Meter etc.	1 Lot	
<b>(J) Any Other Essential item(s) required:</b>			
1.	Any other essential item(s) required to make the system complete in all respect	1 Lot	
<b>(K) Training:</b>			
1.	Operational and Maintenance training on all the equipment such as Cameras, Switcher, Servers, CG, Audio Console etc. for two weeks.	1Job	
<b>(L) Software &amp; Documentation:</b>			
1.	The software of the all the equipment including Operating Systems and application software etc. are required to be supplied in original media and should be licensed to Doordarshan with perpetual validity.	1 Lot	
2.	Operation & Maintenance Manuals of each & every equipment	1 Set	

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**OB VANS ARE BEING PROCURED FOR THE FOLLOWING  
DOORDARSHAN CENTRES**

<b>Sl. No.</b>	<b>Zone</b>	<b>Location of Doordarshan Centre</b>	<b>Qty.</b>
1.	<b>North Zone (NZ)</b>	Delhi	1 Set
2.	<b>West Zone (WZ)</b>	Mumbai	1 Set
<b>TOTAL</b>			<b>2 Sets</b>

