PRASAR BHARTI
(India's Public Service Broadcaster)
Directorate general of Doordarshan
Doordarshan Bhawan, Copernicus Marg
New Delhi -110001.

File No. 19(2)2020-21E1 (P) TV   Dated: **27/06/2020**

Subject: Draft Technical Specifications for High Quality Digital Intercom System for Broadcast TV Production.

The Draft specification of the upcoming tenders is enclosed herewith to offer comments if any by prospective bidders. Please also submit Budgetary quote of the item by due date at e-mail address ddpurchase401@yahoo.co.in or on following Address:

> Assistant Engineer
> Room No. 403,
> Directorate General: Doordarshan,
> Doordarshan Bhawan,
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> New Delhi -110 001 (India)
> Telephone: 011- **2311 4401**

Specification For: Draft Technical Specifications for High Quality Digital Intercom System for Broadcast TV Production.

Specification no: SD 02/2020 Dated: 26.06.2020

 Due Date to offer Comments: 11.07.2020

Encl.: As above (14 Pages)

Signature Not Verified

Digitally signed by PRABHAT KUMAR SINGH
Date: 2020.06.28 10:33:42 IST

Prabhat Kumar Singh
Assistant Engineer
For DG: DD

PRASAR BHARTI

INDIA'S PUBLIC SERVICE BROADCASTER

<u>DIRECTORATE GENERAL: DOORDARSHAN</u>

<u>SPECIFICATIONS FOR HIGH QUALITY DIGITAL INTERCOM SYSTEM</u>
<u>FOR BROADCAST TV PRODUCTION</u>

Specifications No.: SD 02/2020

Dated: 26.06.2020

1. **SCOPE**

   The specifications lay down the required performance characteristics of high quality Digital Intercom System to be used in TV studios of Doordarshan network.

2. **GENERAL:**

   a. **The offered equipment should be from an internationally reputed manufacturer and the quoted model should be field proven and in use by leading broadcasters. The bidder should essentially submit the list of the broadcasters to whom the quoted model has been supplied. The tenders without proper user list shall liable to be rejected out rightly.**

   b. The talkback system will be used in Doordarshan Network for intercommunication between producer/director, camera persons, floor manager/floor assistant, talent/anchor and other technical areas such as lighting, CCU, VCR etc. during program production in a Broadcasting TV studio

3. **ESSENTIAL FEATURES :**

   a. The talkback systems can be designed with/without central matrix with digital signal processing and self-contained power supply in 19" rack mounting. In case of a system without a central matrix all the functionality of the talkback system should be achieved as is being achieved with a central matrix with redundancy.

   b. In case of a system with Central Matrix, all the interconnections should be made through this central matrix and in case of matrix-free system, all the interconnections should be made through Enterprise class Network Switches in redundant mode that supports IGMP (Internet Group Management Protocol) for managing Multicast group traffic.

   c. The system should be Modular and scalable for future addition of ports, panels and interfaces. The interface cards populated in the matrix for the panels/IFBs/ Beltpacks/Cameras should have either 8 or 16 ports.

   d. Audio Signal Processing and Transmission up to the control panels should be digital.

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e. The control panels should have excellent ergonomics to give good look in the installed area.

f. All the control panels and headsets should be rugged in design to withstand professional use.

g. Belt packs and remote panels should be constructed of high grade Aluminium or Steel. These should be shielded against hum, RFI and Thyristor switched dimmer noise.

h. Dual muff Noise attenuating headsets with dynamic noise cancelling microphones should be used to reduce the ambient noise and minimize feedback.

i. The intercom unit should use apposite bandwidth to maximize the intelligibility of the human voice.

j. Apart from communication from Producer to Floor Manager/Floor Assistant/Anchor/Talent and Producer to Camera persons, it should have control panels for various areas like VTR, CCU, Audio, lighting console, Graphics etc.

k. Remote control panels should be equipped with wide frequency professional quality gooseneck microphones, built in amplifier and speaker, channel select buttons, intercom and program level volume control. Facility to connect headsets should also be available. The microphone preamplifier should have compressor/ limiter and speech bandwidth filters to improve intelligibility and reduce feedback.

l. The system should allow two way communications between all remote control panels, producer station and Floor Manager/Floor Assistant belt packs.

m. The Producer Panel should be equipped with electronically latching push ON and push OFF selector switches to enable hands free operation and sigma mode of calling (All select). Switches may be lever or push button type.

n. Other Remote Control Panels should be equipped with 'push to talk' selector switches.

o. The Producer Control panel should have 32 button/switches and other remote control panels should have at least 16 button/switches.

p. The Producer Control panel could be a single unit 32 button panel or created with combination of main and expansion panel for simultaneous display and operation on 32 buttons. The software support for installation of expansion panels, shift key enable, audio I/O should be offered for all the required control panels.

q. The system should have facility to create groups and party-line communication interface.

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r. The system should have Wired belt pack unit and headset for Floor Manager/ Floor Assistant for two way communication with the producer.

s. The system should have IFB (Interruptible fold back) configurable Wired belt packs to provide communication to the talent/anchor in the studio through earphone.

t. The bidder should also quote for Wireless Beltbacks (for Floor Manager and Anchors) operating in License Free 2.4 GHz, IEEE 802.11b/g/n WLAN technology.

u. The system should be able to interface with CCUs/base stations via 4-wire/2-wire systems.

v. Talkback system should be designed to ensure that remote control panels can be situated at about 175 meters.

w. The software for system configuration should be easy to learn and use and should also have facility of Drag and drop operation, intuitive graphical user interface.

x. The firm should certify the completeness of the offered system. It will be the sole responsibility of the bidder to offer all the items including software, hardware (Interface & I/O cards and Network switches), cables & connectors that are necessary to complete the system.

y. The firm should also provide the schematic depicting all the talkback stations of the offered system to help understand the completeness of the system.

z. The matrix should have auto switchable redundant power supply. The system should be operational on mains 230V AC 50 Hz power supply.

aa. The talkback system should operate in temperature ranging from 0° C to 40° C.

bb. The bidder has to offer two configurations of systems as per clause 4 are to be offered.

cc. The Bill of Material required is given in **Appendix-I.**

dd. The equipment are being procured for various Doordarshan centres as per **Appendix-II**.

ee. The indicative distribution of equipment along with approximate distance between the Central Matrix and other items for System-I (DD News) & System-II (CPC) are depicted in **Appendix-III** & **Appendix-IV** respectively.

4. **Two systems as detailed below should be offered:**

a) **System - I (To be installed at DD News, Doordarshan Kendra, New Delhi)**

i. The Central Matrix based System should have at least 64 ports for panel connections. In Distributed Network System (Matrix-free) Enterprise class Network switches with PoE should be used for creating 48 Ports.

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ii. The system should have redundant CPU and redundant power supply.

iii. The system should have 4-wire connectivity to connect camera mixes for four studios, each studio having six to eight cameras. In addition, one number of Camera mix unit as a spare unit has to be offered.

iv. The system should have 4 Nos. of 32 button panels and 25 Nos. of 16 button panels.

v. The system should have facility of connecting 4 Nos. of wired Beltpacks & 4 Nos. of weireless Beltpacks along with 8 earplugs to facilitate IFB for talent/Anchor and 4 Nos. of wired Beltpacks & Nos. of wireless Beltpacks along with 8 dual muff headsets for Floor manager.

vi. The Wireless Beltbacks with accessories (for Floor Manager and Anchors) should be operating on License Free 2.4 GHz, IEEE 802.11b/g/n WLAN technology.

b) **System -II (To be installed at CPC, New Delhi)**

i. The Central Matrix based system should have at least 48 ports for panel connections. In Distributed Network System (Matrix-free) Enterprise class Network switches with PoE should be used for creating at least 32 Ports.

ii. The system should have redundant CPU and power supply.

iii. The system should have 4-wire connectivity to connect camera mixes for three studios, each studio having six to eight cameras. In addition, one number of Camera mix unit as a spare unit has to be offered.

iv. The system should have facility of connecting 4 Nos. of wired Beltpacks & 4 Nos. of wireless Beltpacks along with 8 earplugs to facilitate IFB for talent/Anchor and 4 Nos. of wired Beltpacks & Nos. of wireless Beltpacks along with 8 dual muff headsets for Floor manager.

v. The system should have 21 Nos. of 16 button panels.

vi. The wireless Beltbacks with accessories (for Floor Manager and Anchors) should be operating on License Free 2.4 GHz, IEEE 802.11b/g/n WLAN technology.

5. **TECHNICAL SPECIFICATIONS:**

A. **Matrix based Intercom System**

Sl. No.	Specification	Parameter
CENTRAL MATRIX		
1	No. of Ports: System – I System – II	64 ports or more 48 ports or more
2	Chassis	3RU or more, Rack mountable
3	No. of CPU boards	2 nos.

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4	No. of Power Supply boards	2 nos.
5	Sample Rate	48 kHz or better
6	Resolution	24 bit or more
7	Operating Temperature	0ºC to 50ºC
8	Power Supply	240 V AC 50 Hz or DC INPUT with Power Adapter
DIGITAL KEY PANELS		
1	Panel chassis	2 RU or 1 RU Rack mountable
2	No. of Push buttons: System – I (Producer)	32 Individual Push buttons or more
3	No. of Push buttons: System – I (All Panels except Producer) System – II (All Panels)	16 Individual Push buttons or more
4	Display type	High Contrast LED display
5	Panel Microphone	Electret Gooseneck Microphone
6	Headset	Binaural Headset with Microphone
7	Loudspeaker	Integrated Dynamic Speaker
8	Volume Level control	1 or more
9	Rear Panel connectors: To Matrix To Expansion Panel	RJ 45 connector RJ 45 connector
10	Audio Sample Rate	48 kHz or better
11	Resolution	24 bit or more
12	Power Supply	230 V AC 50 Hz or DC INPUT with Power Adapter
WIRED BELTPACKS FOR FLOOR MANAGER & ANCHOR(IFB)		
1	Beltpack connectivity	Wired
2	No. of channels	1 or more
3	Type of connector	RJ45 or MC12 or XLR
4	Power Supply	DC supply on XLR/PoE (Power on Ethernet)
5	Closed Headset with Mic	Mini XLR or XLR or similar
6	Anchor Earplug without Mic	3.5mm EP Jack or similar
WIRELESS BELTPACKS FOR FLOOR MANAGER & ANCHOR		
1	Beltpack connectivity	WiFi connectivity 802.11 ac / a / b / g / n
2	Wireless frequency	License free 2.4GHz
3	Headset with Mic	Mini XLR/mini DIN or similar
4	Power Supply	Rechargeable battery – capacity for minimum 15 hours of operation
5	Beltpack Power charger	As required.

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B. Matrix-free Intercom System

Sl. No.	Specification	Parameter
CORE NETWORK SWITCH		
1	Chassis	1RU, Half rack width form factor, Rack mountable
2	SFP Gigabit Ports	2 Nos. or more on RJ-45
3	1000BASE-T Copper Ports	2 Nos. or more on RJ-45
4	100BASE-T Ports	8 Nos. or more on RJ-45 PoE available at least on 4 Ports.
5	Supported Protocols	IPv4, IGMP Version 2, HTTP, 802.1p
6	IGMP Snooping Parameters	Router present time out: 400s or better Query Response Interval: 10s or better
7	Operating Temperature	0°C to 40°C
8	Power Supply	100 V to 240 V AC 50 Hz
DIGITAL KEY PANELS		
1	Panel chassis	2 RU or 1 RU Rack mountable
2	No. of Push buttons: System – I (Producer)	32 Individual Push buttons or more
3	No. of Push buttons: System – I (All Panels except Producer) System – II (All Panels)	16 Individual Push buttons or more
4	Display type	Multi-colour display
5	Panel Microphone	Electret Gooseneck Microphone
6	Headset	Binaural Headset with Microphone
7	Loudspeaker	Integrated Dynamic Speaker
8	Volume Level control	1 or more
9	Rear Panel connectors: To Matrix To Expansion Panel	RJ 45 connector RJ 45 connector
10	Audio Sample Rate	48 kHz or better
11	Resolution	24 bit or more
12	Power Supply	PoE (Power over Ethernet) or 12 V DC INPUT with Power Adapter
WIRED BELTPACKS FOR FLOOR MANAGER & ANCHOR(IFB)		
1	Beltpack connectivity	Wired
2	No. of channels	1 or more
3	Type of connector	RJ45 or similar
4	Power Supply	DC supply on PoE (Power over Ethernet)
5	Closed Headset with Mic	Mini XLR or XLR or similar

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6	Anchor Earplug without Mic	3.5mm EP Jack or similar
WIRELESS BELTPACKS FOR FLOOR MANAGER & ANCHOR		
1	Beltpack connectivity	WiFi connectivity 802.11 ac / a / b / g / n
2	Wireless frequency	License free 2.4GHz
3	Headset with Mic	Mini XLR/mini DIN or similar
4	Power Supply	Rechargeable battery – capacity for minimum 15 hours of operation
5	Beltpack Power charger	As required.

6. SOFTWARE:

All the necessary software required for Control Panels, Matrix and other required ancillary interfacing units should be supplied for proper working of the system in original and should be licensed to Doordarshan with perpetual validity.

7. COMPLIANCE:

(a) Any substandard equipment included in the offer may cause the rejection of complete offer with the sole responsibility of bidder.

(b) 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.

(c) **A point-by-point compliance statement from the principal manufacturer in respect of all the points laid down in these specifications is to be enclosed along with the offer in the format given below. Mere signature on the copy of the specifications 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 reqd. to make the sys. Compliant to DD specs.	Features in the offered Product which exceeds DD

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8. **ACCESSORIES**

All the essential accessories such as various types of connectors, power cord etc. are required to be quoted essentially. Various types of interconnecting cables along with matching connectors at both ends, required with the system for its completeness, should also be included in the offer. All the **Optional items** may be quoted separately. The firm must provide enough details about optional items to decide its utility.

9. **DOCUMENTATION**

One set of printed technical and operation & maintenance manuals for all the equipment are 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.

10. **GUARANTEE**

(a) The system should be guaranteed for **three years** of trouble free operation from the date of supply. 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.

11. **DEMONSTRATION**

If necessary, the firm may be asked for demonstration of the offered system as part of the technical evaluation. In such case the firm will have to make suitable arrangement for the demonstration of the offered system at Doordarshan Bhawan, New Delhi, on notice of 7 days. Accordingly the firm should be in readiness for demonstration on a notice of 7 days.

12. **TRAINING**

The bidder has to arrange comprehensive operation and maintenance training by the OEM or by their certified Trainer(s) on the Intercom system at **one consignee location** for a period of 2(Two) working days. The bidder has to provide comprehensive training material in the form of hard copies as well as soft copies to the trainees during the training session.

13. **DELIVERY PERIOD**

The delivery period for the project including training will be 03 (Three) months.

14. **INSPECTION**

The equipment shall be subjected to inspection by Doordarshan officials at New Delhi.

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15. **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.

(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) Technical manuals/Detailed technical literature/catalogues for all the offered products for substantiating the model no. and technical specifications.

(d) The schematic depicting all the talkback stations of the offered system to help understand the completeness of the system.

(e) **Model specific broadcast user list of the offered product.**

(f) 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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Appendix-I

Bill of Material

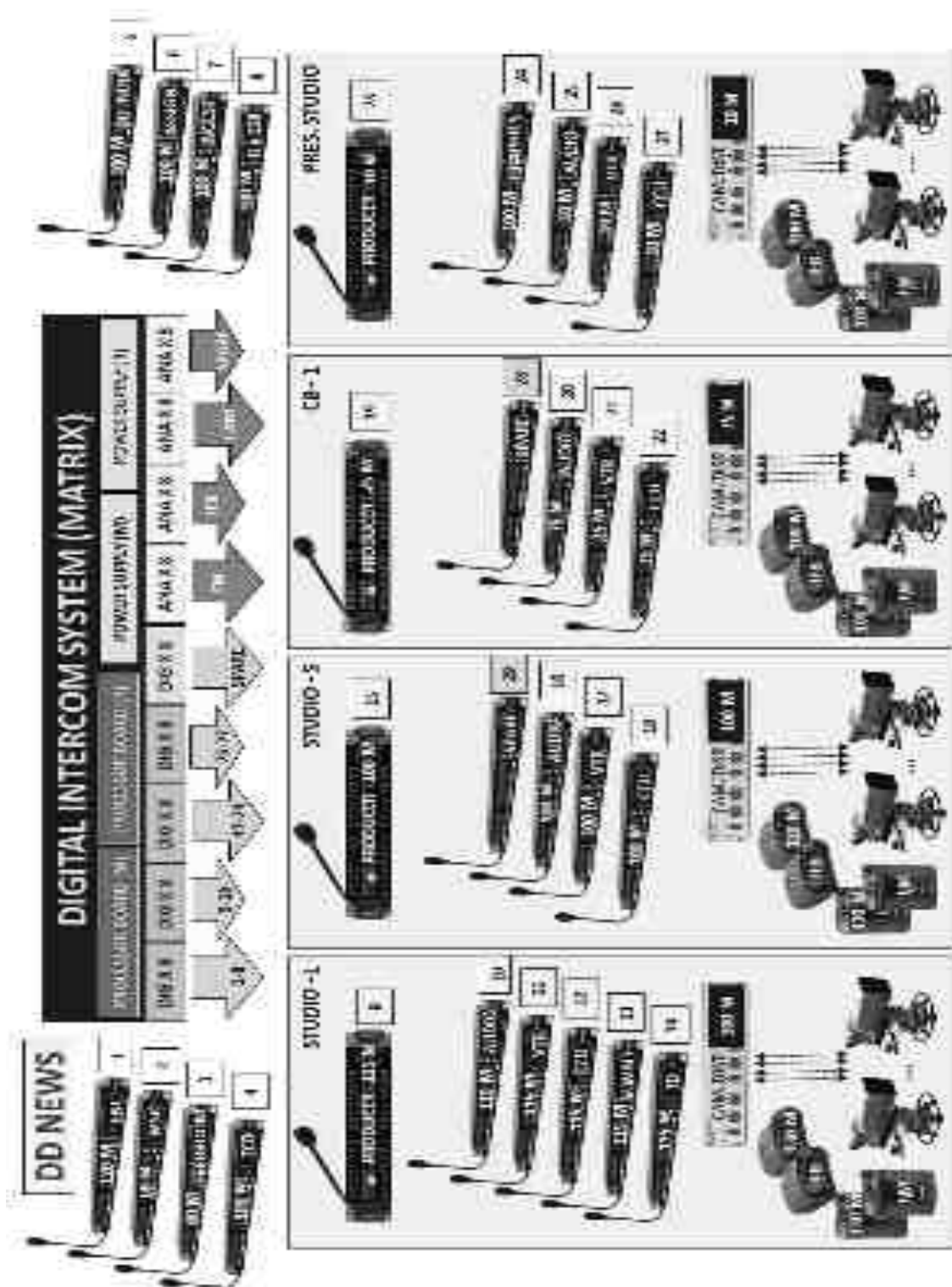| Sl. No.	Items	Qty.
System – I (for catering to 4 (Four) Studios of DD News HQ, Delhi)		
1.	64 ports Matrix with redundant CPU and Power supply or 48 ports Distributed Network System (Matrix-less) with redundant Enterprise class IGMP enabled Network switches.	1 Set
2.	32 button/switch Producer Station with gooseneck microphone and built in speaker and power supply (May be configured with expansion panels)	4 Nos.
3.	16 button/switch Remote Control Panel with gooseneck microphone and built in speaker and power supply unit	25 Nos.
4.	Headset with connectors for using with remote panels	12 Nos.
5.	Digital Interface card for connecting remote panels catering at least 8-Digital Audio ports (including 1 No. of spare interface card)	5 Nos.
6.	Analog Interface card for connecting Camera Mix unit, FM Belt pack & IFB Belt pack catering at least 8-Analog Audio ports (including 1 No. of spare interface card)	4 Nos.
7.	Camera mix and distribution boards/units for minimum 8 cameras (including 1 No. of spare board/unit)	5 Nos.
8.	Wired Belt pack with dual muff Headset for Floor Manager/Floor Assistant	4 Nos.
9.	Wireless Belt pack with dual muff Headset for Floor Manager /Floor Assistant	4 Nos.
10.	Wired Belt pack (IFB) with earpiece for Anchors	4 Nos.
11.	Wireless Belt pack (IFB) with earpiece for Anchors	4 Nos.
12.	Other accessories for Wireless Beltpacks	1 Lot
13.	Interconnecting cables with necessary matching connectors	1 Lot.
(a)	Cables for remote panel, Camera Base Station and Belt pack connections	5800 m.
(b)	Matching connectors for Remote Panel cable connections.	1 Lot
(c)	Matching connectors for Belt pack connections	1 Lot.
(d)	Any other type of cable, connector, breakout panel etc., if required.	1 Set
14.	Any other item, including interface cards, Network switches etc. to make the system fully functional	1 Lot
15.	Operation manual/User Guide/Technical Manual/ Installation Manual etc.	1 Lot
16.	Service & Maintenance Manuals	1 Lot

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System – II (for catering to 4 (Four) Studios of Central Production Centre, Delhi)		
Sl. No.	Items	Qty.
1.	48 ports Matrix with redundant CPU and Power supply or 32 ports Distributed Network System (Matrix-less) with redundant Enterprise class IGMP enabled Network switches.	1 Set
2.	16 button/switch Remote Control Panel with gooseneck microphone and built in speaker and power supply unit	21 Nos.
3.	Headset with connectors for using with remote panels	10 Nos.
4.	Digital Interface card for connecting remote panels catering at least 8-Digital Audio ports (including 1 No. of spare interface card)	4 Nos.
5.	Analog Interface card for connecting Camera Mix unit, FM Belt pack & IFB Belt pack catering at least 8-Analog Audio ports (including 1 No. of spare interface card)	3 Nos.
6.	Camera mix and distribution boards/units for minimum 8 cameras (including 1 No. of spare board/unit)	4 Nos.
7.	Wired Belt pack with dual muff Headset for Floor Manager/Floor Assistant	4 Nos.
8.	Wireless Belt pack with dual muff Headset for Floor Manager /Floor Assistant	4 Nos.
9.	Wired Belt pack (IFB) with earpiece for Anchors	4 Nos.
10.	Wireless Belt pack (IFB) with earpiece for Anchors	4 Nos.
11.	Other accessories for Wireless Beltpacks	1 Lot
12.	Interconnecting cables with necessary matching connectors	1 Lot.
(a)	Cables for remote panel, Camera Base Station and Belt pack connections	2000 m.
(b)	Matching connectors for Remote Panel cable connections.	1 Lot
(c)	Matching connectors for Belt pack connections	1 Lot.
(d)	Any other type of cable, connector, breakout panel etc., if required.	1 Set
13.	Any other item, including interface cards, Network switches etc. to make the system fully functional	1 Lot
14.	Operation manual/User Guide/Technical Manual/ Installation Manual etc.	1 Lot
15.	Service & Maintenance Manuals	1 Lot
16.	Comprehensive Operation & Maintenance training for 2 working days at one consignee Kendra (Comprehensive Training material has to be supplied to the participants)	1 Lot

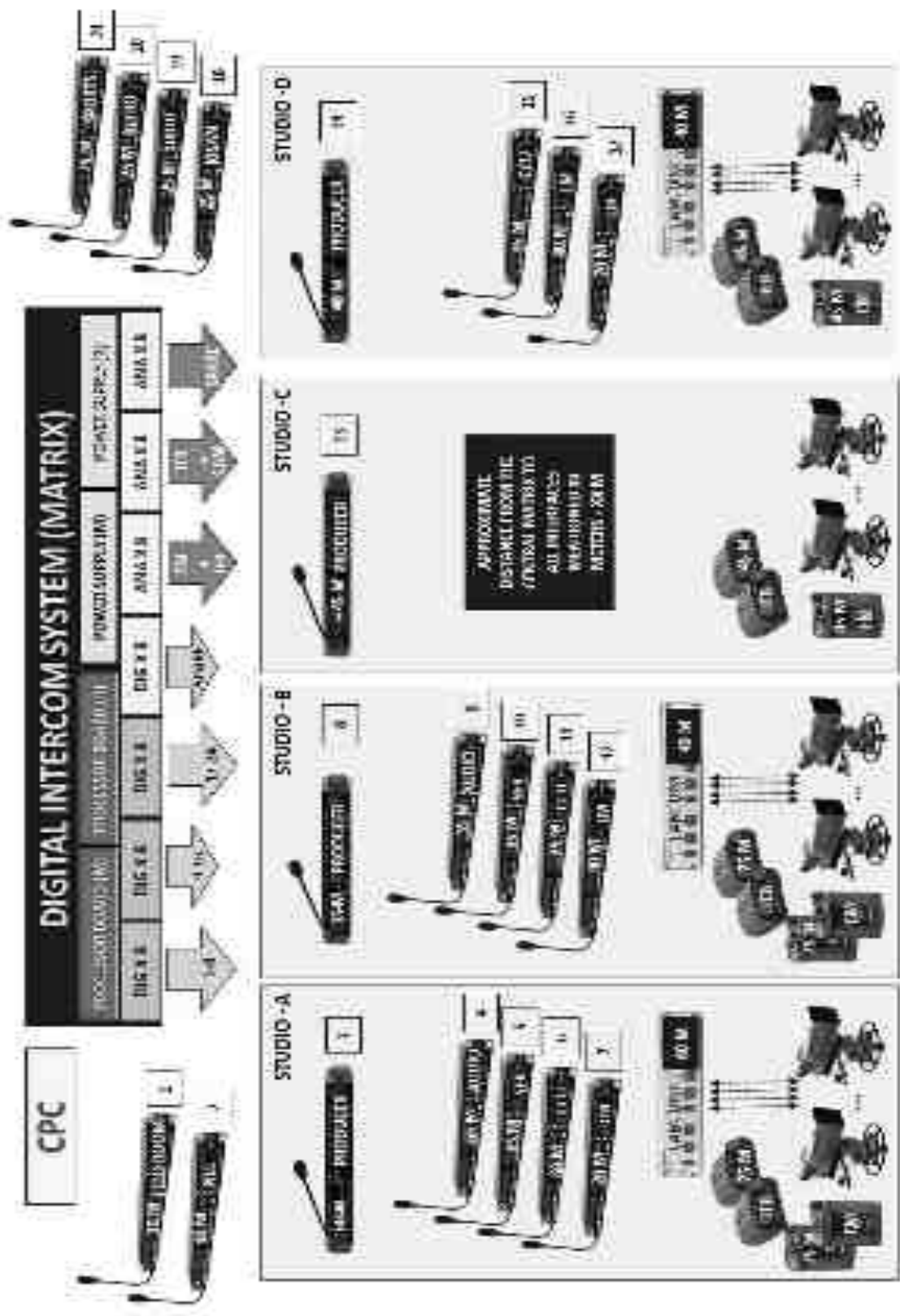*Specifications for High Quality Digital Intercom System: SD 02/2020 Dt. 26.06.2020*

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<u>**Appendix-II**</u>

EQUIPMENT ARE BEING PROCURED FOR THE FOLLOWING DOORDARSHAN CENTRES

Sl. No.	Zone	Location of Doordarshan Centre	Qty.
1.	North Zone (NZ)	DD News, New Delhi	1 set
2.		CPC	1 set

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Appendix – IV

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