



# All India Radio

Internet  Services

**PRASAR BHARATI  
(BROADCASTING CORPORATION OF INDIA)  
ALL INDIA RADIO  
(TELECOM CELL)**

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## **SPECIFICATIONS COVER SHEET**

TITLE : ISDN CODECS at AIR Stations

SPECIFICATION NO. : TC/SPEC/08/03/CODECS

DATE OF LAST UPDATION : Jan, 2007

NO.OF PAGES : 12

SCHEME : Provision of ISDN Connectivity for OB Coverage  
at AIR stations

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**No. *TC/SPEC/08/03/CODECS***

**Subject : Specification for CODECS for OB Coverages through ISDN connectivity at AIR Stations.**

**INTRODUCTION :**

AIR requires ISDN Codecs for all major Stations in the Network for use in outside Broadcast Coverages through ISDN Connectivity.

The General requirements for the procurement of the codecs including configuration , scope, etc., are detailed in Section 'A'.

The technical specification/requirements of the codecs are detailed in Section 'B'.

The Draft ATP for codecs is given in Section - 'C'

## SECTION – A

### 1. CONFIGURATION :

The supply of codecs with associated accessories would be as per details below :

Item No.	Equipment	Quantity	Specs Reference
1.	<b>Portable</b> Stereo ISDN Codecs with cable, connectors and accessories	66 Nos.	Section B (i)
2.	<b>Rack mounted</b> ISDN Codecs with Digital line interface, cable, connectors and accessories	132 Nos.	Section B (ii)
3.	ISDN feature Phone	132 Nos.	Section B (iii)
4.	Training as per tender requirement for each of the item no 1 and 2 above <b>separately</b> (Optional)		
5.	Inspection as per ATP for each of the item no 1, 2 and 3 above <b>separately</b>		

The Portable Codecs are to be used for OB Side and Rack Mounted Codecs will be used at studio side. Compatibility between both the units is to be ensured so that the system works in a smooth and error free manner.

### 2. LOCATION FOR SUPPLY:

List of AIR Stations is given in the Annexure. At each location one no of item no. 1 and two nos. each of items No. 2 and 3 shall be supplied.

### 3. SCOPE:

3.1 The Scope of this tender supply includes

- i) Supply of the equipment as per specifications and requirements given in Section 'A' and Section 'B' and for quantities detailed in the tender.
- ii) Acceptance testing of the equipment as per Draft ATP given in Section 'C'.

3.2 The indenter will provide

- i) Technical requirements
- ii) Standard Mains Power supply

3.3 The tenderer should also provide full

- i) Detailed configuration of the equipment being supplied.
- ii) Details of input/output requirements of the equipment being supplied.
- iii) Details of power supply - AC/ DC
- iv) Mechanical mounting/installation details of the equipment.

- 3.4 The tenderer shall ensure that the equipment offered fully incorporate the standard feature for safety and protection.
- 3.5 After the acceptance of the tender by the intender, the supplier will have to supply the equipment and arrange for its testing as per the mutually accepted Acceptance Test Procedure. The draft ATP is enclosed in **Section – C**.
- 3.6 Inspection will be carried out at Manufacturer's Works (Optional) / Suppliers' Works by engineers (minimum two) of All India Radio for five working days. The expenses towards to and fro journey, DA and lodging as per Govt. of India norms will be borne by Prasar Bharati. The supplier shall put up all the equipment for test on the test bench at his premises before the AIR Representative and shall provide electric energy, consumable materials, tools, testing instruments, labour and assistance of every kind for carrying out acceptance tests. All the individual factory test reports of the complete lot of codecs being supplied shall be made available. Inspection of minimum twenty five percent of the lot as per ATP will be done taking random samples out of the complete lot. Supplier has to ensure that the complete lot of codecs is made available to the inspecting authority for taking the random samples. However, functionality test of all the codecs will be done. Complete specifications & details will be checked and all parameters values will be measured. Typical details are enclosed in draft ATP. The inspection will be carried out on those lines. Prior intimation for carrying out Inspection at Works is to be given by the Supplier to the Indenter at least six weeks in advance. Inspection charges are to be quoted separately.
- 3.7 The technical offer of the tender should contain, apart from the technical compliance statement, all original data sheets of the manufacturer in support of the technical compliance statement. The tenders containing only technical compliance statement without the original data sheet/pamphlets of the equipment offered in full are likely to be rejected.
- 3.8 The firms may be asked to demonstrate the equipment to show compliance to AIR's specification at the technical evaluation stage. The tenderer are also required to furnish the list of customers where similar equipment has been supplied by the tenderer/ manufacturer.

## **4 GENERAL REQUIREMENTS**

### **4.1 ENVIRONMENTAL & POWER SUPPLY**

- a) Ambient Temperature : 0°C to +45°C
- b) Relative Humidity : 95% non condensing
- c) Safety : Standard features for safety & protection
- d) Power supply : (I) 220 V AC±10%, Single phase, 48- 52 Hz  
(II) 12 V DC for Portable Unit in addition to AC

### **4.2 After Sales Service**

The Tenderer should have a service centre in India for the equipment offered and ensure repair / replacement within 72 Hours after receipt of the equipment at the service centre within warranty period and after sales service is to be provided post warranty period.

### **4.3 Manual**

Original manuals (Both Soft copy and hard copy) for installation, operation, maintenance & Servicing of complete system alongwith sub-system and accessories, drawings & wiring diagram for the layout etc. are to be supplied as per quantity detailed below :

- 2 Sets for each location
- 2 Sets for Directorate (Telecom Division)
- 2 Sets for each of the five Zonal offices
- 1 Set for STI (T)
- 1 Set for CE(R&D)

### **4.4 Technical/General Details**

The tender/offer should also include the following details :

- i) Sufficient information should be furnished with the tender to technically evaluate the offer and to assess full merits/demerits of the same.
- ii) Apart from printed technical data/specs of the equipment, Block schematic upto the sub-system, interconnection and wiring diagram and the photograph etc. should also be attached with the offer.

#### **4.5 Spares (Optional)**

Tenderer should quote for recommended essential spares including their quantities and cost (per unit).

#### **4.6 Training ( Optional)**

- (i) Two days training of 15 engineers in each zone in operation and maintenance of the equipment will be required to be arranged at a centralised location in the zone.
- (ii) Specialised training of two engineers in servicing and repair of codecs equipment at manufacturer's / supplier's work for two working days.

#### **4.7 Compliance**

While complying to our specifications, it may please be noted that just mentioning 'complied' will **NOT** suffice. The compliance should be supported by proper data/documentation from original equipment manufacturer substantiating the compliance in respect of the specs. Deviations, if any, may be brought out clearly in the compliance statement.

#### **4.8 Schedule of Material**

A comprehensive schedule of material offered should be attached with the offer in the same format as given in para 1 of Section A minus the price. Price bid should also be submitted in the same format.

#### **4.9 Maintenance support**

Maintenance support including availability of spares is to be ensured for at least 10 years.

#### **4.10 General Clauses**

- (i) The supplier shall intimate the source of supply and technical parameters for major and critical components/ spares so that no difficulty is encountered later on in procuring the spares for maintenance / repair of these equipment.
- (ii) If at any stage during next ten years the manufacturer stops production of these equipment, he shall intimate AIR in advance to enable AIR to stock the critical items of spares for the life of the equipment.
- (iii) Warranty and guarantee clause will be as per the terms and conditions specified in the commercial section of the tender in this respect.
- (iv) All **optional items** mentioned in the tender **must be quoted**.

## SECTION - B

### TECHNICAL SPECIFICATIONS / REQUIREMENTS

#### I) PORTABLE STEREO CODEC :

This is a portable stereo ISDN codec suitable for operation on BRI – ISDN lines. It should be lightweight and battery operatable. It should be supplied with a carrying case. The Codec should have front panel control and should be supplied complete with cable, connectors and accessories. It should have both microphone and line input. It should be compatible with the reputed make codecs all over the world. The Codec should have following features and specifications :

Features	
1	High quality, bi-directional, Digital audio codec
2	Built – in high quality mixer.
3	Built-in ISDN terminal adapter, with S/T interface (U interface may also be quoted as option)
4	Capability for 64 and 128 Kbps communication.
5	Capability of independent operation over both B channels.
6	Codec should have the feature of Automatically Receiving the audio after detecting the configuration and parameters of incoming audio.
7	Codec should have the capability of sending audio using one coding algorithm and receiving audio in different coding algorithm over same ISDN B Channel.
8	Codec should have the capability of sending and receiving audio programme in dual mono / stereo mode.
9	Multiplexing between two ISDN "B" channels for 128 kbps operation.
10	Headphone monitoring and microphone inputs.
11	Codec should be software upgradable and software upgradation must be free of cost.
12	Memory for storing phonebook entries.
13	Visual Monitoring of Send Audio through VU meter or LED Bar graph etc.

<b>Technical Specifications</b>		
1.	Analog Audio Input (i) Microphone channel (ii) Line Channel	2 Nos 1 No.
2.	Microphone Input sensitivity	Upto -70 dBm
3.	Line input level (nominal)	0 dBu
4.	Line input level (Max.)	10 dB above nominal
5.	Input connector	XLR –F
6.	Nominal output level	0 dBu
7.	Maximum output level	10 dB above nominal level
8.	Output impedance	Less than 100 $\Omega$
9.	ISDN Interface	ETSI ISDN S/T interface ANSI ISDN U interface (Optional)
10.	ISDN Connector	RJ 45
11.	Coding Algorithm	G711, G722, (64 kbps) MPEG 1 Layer II & Layer III (128 kbps)
12.	Analogue to Digital Conversion	16 bits minimum.
13.	Freq. Response ( $\pm 0.2$ dB)	50 Hz to 15 KHz for MPEG 1 Layer II and Layer III 50 Hz to 7 KHz for G722 50 Hz to 3 KHz for G711
14.	Distortion at maximum level	Less than 0.2%
15.	Dynamic range	> 85 dB
16.	Cross talk	< -70 dB
17.	Data rate	64 /128 kbps
18.	Mode	Mono, Dual Mono, Stereo
19.	Display	Back lit Alphanumeric LCD Screen

## II) CODEC FOR RECEIVE SIDE : (For use at studio site on ISDN line)

This is a Rack Mounted (19 inch standard rack) unit suitable for operation over BRI – ISDN lines. The codec should also have **V.35 interface option**. It should be compatible with reputed make codecs all over the world. The Codec should have following features and specifications :

Features	
1.	High quality, bi-directional, Digital stereo audio codec
2.	Built-in ISDN terminal adapter, with Euro ISDN S/T interface.
3.	Capability for 64 and 128 Kbps communication <b>over both ISDN and V.35 interface Link.</b>
4.	Capability of independent operation over both B channels.
5.	<b>Over ISDN Link</b> , Codec should have the feature of Automatically receiving the audio after detecting the configuration and parameters of incoming audio.
6.	Codec should have the capability of sending audio using one coding algorithm and receiving audio in different coding algorithm.
7.	<b>Auto switching between V.35 interface link and ISDN link in case of failure of either of the link.</b>
8.	Multiplexing between two ISDN "B" channels for 128 kbps operation.
9.	Headphone monitoring.
10.	Monitoring of Send and Receive Audio through VU Meter or LED Bar graph etc.
11.	Codec should be software upgradable and software upgradation must be free of cost.
12.	Memory for storing phonebook entries.

<b>Technical Specifications</b>		
1.	Analog Inputs / Outputs	Two independent electronically balanced channels
2.	<b>Connectors for Analog Audio</b>	XLR
3.	Input Level (nominal)	0 dBu
4.	Input Level (Max.)	10 dB above nominal level
5.	Output Level (nominal)	0 dBu
6.	Output Level (Max.)	10 dB above nominal level
7.	Digital Audio interface	AES / EBU
8.	Output impedance	Less than 100 $\Omega$
9.	ISDN Interface	ETSI ISDN S/T interface
10.	ISDN Connector	RJ 45
11.	PSTN connector (Optional)	RJ 11
12.	<b>Other Digital Interface</b>	<b>V.35</b>
13.	Coding Algorithm	G711, G722, (64 kbps) MPEG 1 Layer II & Layer III (128 kbps) MPEG 4 AAC-LD
14.	Analogue to Digital Conversion	Upto 24 bits.
15.	Sampling Frequency	16, 32, 48 KHz selectable
16.	Freq. Response ( $\pm 0.2$ dB)	50 Hz to 15 KHz for MPEG 1 L II 20 Hz to 20 KHz for MPEG 1 Layer III and MPEG 4 AAC-LD 50 Hz to 7 KHz for G722 50 Hz to 3 KHz for G711
17.	Distortion at maximum level	Less than 0.2%
18.	Dynamic range	> 95 dB
19.	Cross talk	< -70 dB
20.	Data rate	64 /128 kbps
21.	Mode	Mono, Dual Mono, Joint Stereo
22.	Display	Back lit LCD Screen

### III) FEATURE PHONE :

TEC approved ISDN feature phone of good quality having LCD Display, Caller ID feature, Phone book memory, hands free operation etc. should be quoted.

## **SECTION C**

### **DRAFT ATP FOR ISDN CODECS**

#### **1 INTRODUCTION**

This document describes the Acceptance Test Procedure (ATP) for testing the ISDN Codecs under procurement. It covers the details of the item to be tested, list of equipment required for testing and the tests required to be carried out.

#### **2 ITEMS TO BE TESTED**

The items to be tested individually are as follows :-

- i) Portable Type ISDN Codec
- ii) Rack Mounted Type ISDN Codec
- iii) ISDN Feature Phone

#### **3 TEST EQUIPMENT**

- a) All requisite test equipment conforming to the required standard for testing and commissioning shall have to be provided by the supplier.

#### **4. TESTS REQUIRED TO BE CARRIED**

(NOTE: This is a tentative list, Additional items of tests may be specified by the indenter if needed.)

##### **4.1 ISDN Codecs: The tests for Portable and Rack mounted ISDN Codecs will include:**

- i) Codec functionality test as per details given in the specifications.
- ii) Audio Frequency Response.
- iii) Distortion
- iv) Cross Talk between Channels
- v) O/P level stability
- vi) Coding standard, data rates check
- vii) Any other test to check the conformity to the specs.

##### **4.2 ISDN Feature Phone:**

Functionality test on the phone will be done.

## Annexure

List of AIR stations where ISDN endlink equipment is to be provided:

S.N.	Name of the Station	Qty (Sets)	S.N.	Name of the Station	Qty. (Sets)
<b>North Zone</b>					
1.	Delhi	12	2.	Zonal Office, Delhi	2
3.	Chandigarh	1	4.	Dehradun	1
5.	Jaipur	1	6.	Jammu	1
7.	Jalandhar	1	8.	Lucknow	2
9.	Shimla	1	10.	Srinagar	1
<b>South Zone</b>					
11.	Chennai	4	12.	Zonal Office, Chennai	2
13.	Bangalore	2	14.	Port Blair	1
15.	Hyderabad	2	16.	Trivandurm	1
17.	Pondicherry	1			
<b>West Zone</b>					
18.	Mumbai	4	19.	Zonal Office, Mumbai	2
20.	Ahmedabad	1	21.	Nagpur	1
22.	Bhopal	2	23.	Panaji	1
24.	Raipur	1			
<b>East Zone</b>					
25.	Calcutta	4	26.	Zonal Office, Calcutta	2
27.	Cuttack	1	28.	Ranchi	1
29.	Patna	1			
<b>North East Zone</b>					
30.	Agartala	1	31.	Guwahati	1
32.	Aizwal	1	33.	Imphal	1
34.	Itanagar	1	35.	Shillong	1
36.	Kohima	1	37.	Zonal Office, Guwahati	2

**Each Set consists of 2 Nos of Rack Mount and 1 Nos of Portable Stereo Codec and 2 Nos. of Feature Phones.**