



# SIN 332

Issue 1.3

May 2008

## Suppliers' Information Note

*For The BT Network*

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### **BT Broadcast Services, Audio Broadcast Network Service Description**

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## 1. Introduction

This Suppliers Information Note (SIN 332) describes the Audio Broadcast Network service which is an aggregated service based upon the BT MusicLine One and BT MusicLine 2000 services. MusicLine 2000 interfaces are used to provide the **contribution** elements of the service, and MusicLine One interfaces are used to provide the **distribution** elements of the service. The nominal end-to-end bandwidth of the service is 20 Hz to 7.5 kHz.

## 2. Service Outline

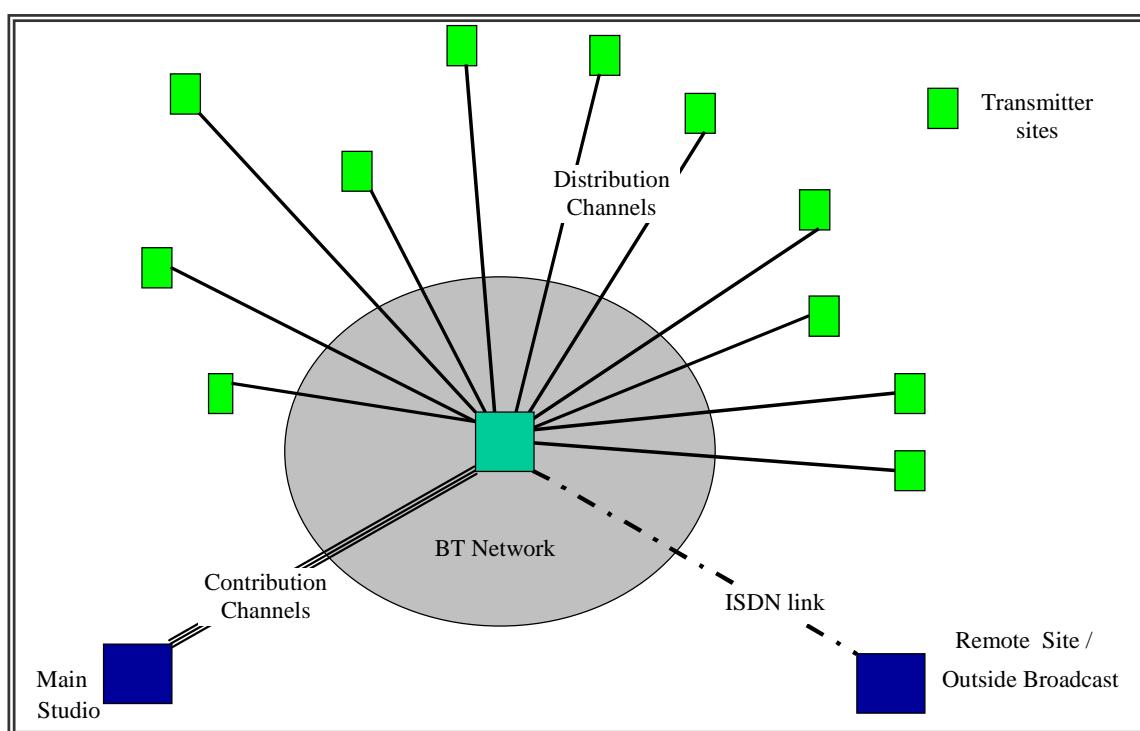


Figure 1 Service Schematic

### 2.1 Service Topology

This service is available within BT's licensed area in the UK and provides a transmission path connecting customer locations within the UK.

The service makes available a maximum of ten contribution channels carried over a high quality audio path in one direction, delivered to a maximum of thirty-four distribution channels. The number of contribution channels used will be dependent on the number of individual programme feeds the customer requires, to be sourced from the main studio.

Subject to customer configuration requirements, the service offers the option of a monitor path (or paths) in the reverse direction. The number of return monitoring paths is directly dependant on the number of contribution channels the customer requires. For example if the customer chooses to have eight contribution channels, the service allows for the possibility of only 2 return monitor paths. The aggregate number of contribution channels and monitor paths cannot exceed ten

The distribution service is analogue presented to the customer via a female XLR-3 connectors and uses digital compression technology, apt-X100. **The apt-X™ algorithm has been designed to permit wide-band audio or mono to be carried over lower capacity digital telecommunications networks.**

This service uses Network Terminating Equipment (NTE) configured to deliver the customers chosen requirements.

## **2.2 Application**

Audio Broadcast Network is a configurable point-to-point service that meets the needs of Radio broadcasters who require comprehensive audio networking services. A typical use would be high quality contribution links from the studio to a network hub, and AM links to several transmitter sites from the network hub.

This service delivers an audio circuit with a nominal bandwidth of 20 Hz to 7.5 kHz and a loss/frequency response of:  $\pm 1.0$  dB across the frequency range.

## **3. Contribution Element of the Service**

### **3.1 Audio Channels**

Up to ten forward direction 15 kHz audio channels are supported with the basic service, for the delivery of audio signals from the studio to the network hub for onward distribution to customer sites. The nominal end-to-end bandwidth of the service is 20 Hz to 7.5kHz.

#### **3.1.1 Co-Location**

It is possible for the hub and studio to be co-located, in this scenario the contribution channels do not use MusicLine 2000 circuits. The hub presents the functionality described in 3.1.2 and interfaces described in 3.2.1. and has the same power supply and earthing requirements as described in 3.2.2.1 & 3.2.2.2.

#### **3.1.2 Functionality**

##### **3.1.2.1 Monitoring**

The customer may choose to use one or more of these contribution channels to facilitate monitoring of the distribution signal, this facility is subject to the overall configuration of the customer service.

##### **3.1.2.2 Emergency signal input**

Provision of a temporary input should the studio cease transmitting due to perhaps a power failure or similar event. This allows for the connection of suitable equipment, such as a CD player, to be connected to an interface conforming to that described in paragraph 4.2.1 below.

##### **3.1.2.3 Emergency signal input (from a remote site)**

Provision of a temporary input should the studio cease transmitting due to perhaps a power failure or similar event. This offers the ability to use an ISDN dial up connection to deliver signals into the transmitter network. The call will be terminated on an ISDN interface which will require the incoming call to be configured for a 64 kbit/s Unrestricted Bearer Service connection and be carrying an apt-X100 coded signal for onward transmission.

## 3.2 Technical Specification

### 3.2.1 Interface Presentation

The following interfaces are provided by the Network Terminating Equipment (NTE):

NTE Interfaces	Electrical presentation	Physical presentation
Audio Inputs Each Channel  <b>Contribution</b>  <i>note 3</i>	Balanced pair 600 Ohms Termination Impedance Max level +12 dBm <i>note 2</i> Nominal Bandwidth: 20 Hz to 15 kHz Loss/Frequency for any single frequency: ±0.5 dB; Range: 20 Hz to 14 kHz ±0.75 dB; Range: 14 kHz to 15 kHz	Customer connection - solder tags Test access - 2 by 4 mm U links <i>note 1</i>
Audio Outputs Each Channel  <b>Monitoring</b>  <i>note 3</i>	Balanced pair 600 Ohms Source Impedance Max level +12 dBm <i>note 2</i> Nominal Bandwidth: 20 Hz to 15 kHz Loss/Frequency for any single frequency: ±0.5 dB; Range: 20 Hz to 14 kHz ±0.75 dB; Range: 14 kHz to 15 kHz	Customer connection - solder tags Test access - 2 by 4 mm U links <i>note 1</i>

**Table 1 Contribution Electrical & Physical Interfaces**

*Note 1: These services are presented to the customer by means of a front mounted test 19 inch practice access panel occupying up to 3 RU of space.*

*Note 2: Maximum level - total power level over the range 20Hz to 15kHz is not to exceed +12dBm*

*Note 3: Available end-to-end nominal bandwidth is limited to 20Hz to 7.5kHz.*

### 3.2.2 Network Terminating Equipment (NTE)

#### 3.2.2.1 Power Requirements

The rack/cabinet requires a customer supplied local mains 10 amp un-switched fused spur 50 Hz AC power source within 2 metres of the equipment.

NOTE: A 13 amp socket from a technical supply for test equipment in close proximity to the rack/cabinet should be supplied.

#### 3.2.2.2 Earthing Arrangements

- A quiet earth will be required for the equipment.
- The normal mains supply earth should not be connected to the BT rack/cabinet in addition to the Quiet ( Technical ) Earth.
- Inter-Rack earthing (i.e.: between the BT rack and any customer rack). Customer rack earth must not be mains earth. The resistance between the BT rack and the Customer rack, must be less than 0.25 Ohms.
- The mains safety earth should not be connected to the quiet / technical earth as this will compromise noise performance and introduce earth loops.

## 3.3 Customer Accommodation

The service requires the customer to provide accommodation (including space, power, security and environmental control) for terminating equipment.

The NTE is rack/cabinet mounted using standard 19 inch mounting practice.

## 4. Distribution Element of the Service

### 4.1 Audio Channels

Up to thirty-four 7.5 kHz audio distribution channels are supported with the basic service, for the delivery of audio signals from the network hub for onward distribution to customer sites. The nominal end-to-end bandwidth of the service is 20 Hz to 7.5kHz.

### 4.2 Technical Specification

#### 4.2.1 Interface Presentation

The following interfaces are provided by the Network Terminating Equipment (NTE):

Interfaces at the NTE	Electrical presentation	Physical presentation
Audio Programme Output	Balanced Audio (Mono) 600 Ohms Impedance  Max Level + 12 dBm <i>note 3</i>	XLR-3 Female (BT Equipment) XLR-3 Male (Customer Cable)

**Table 2 Distribution Electrical & Physical Interfaces**

The audio circuit offers:-

20 Hz to 7.5 kHz nominal bandwidth

a loss/frequency response for any single frequency of:-

±1.0 dB over the frequency range 20 Hz to 40 Hz;

±0.5 dB over the frequency range 40 Hz to 6.3 kHz;

±1.0 dB over the frequency range 6.3 kHz to 7.5 kHz.

*Note 3:-Maximum level - total power level over the range 20 Hz to 7.5 kHz is not to exceed +12 dBm.*

#### 4.2.2 Distribution Connector Details

##### 4.2.2.1 XLR-3 Audio connections

Pin No.	Description
1	Screen/Signal Common
2	+ve signal leg of balanced pair
3	-ve signal leg of balanced pair

**Table 3 Distribution, XLR-3 connections**

*NOTE: XLR is an ITT Cannon Standard which has become the defacto standard for the professional audio industry.*

#### 4.2.3 Network Terminating Equipment (NTE)

##### 4.2.3.1 AC Power Requirements

The NTE is locally powered and will require a local mains 50 Hz AC supply within 2 metres of the NTE. The power consumption of the NTE will be approximately 25 watts.

#### 4.2.3.2 Earthing Arrangements

- A quiet earth will be required for the equipment.
- The normal mains supply earth should not be connected to the BT rack/cabinet in addition to the Quiet ( Technical ) Earth.
- Inter-Rack earthing (i.e.: between the BT rack and any customer rack). Customer rack earth must not be mains earth. The resistance between the BT rack and the Customer rack, must be less than 0.25 Ohms.
- The mains safety earth should not be connected to the quiet / technical earth as this will compromise noise performance and introduce earth loops.

### 4.3 **Customer Accommodation**

The service requires the customer to provide accommodation (including space, power, security and environmental control) for terminating equipment.

The NTE can be mounted within equipment cabinets capable of accommodating standard 19 inch mounting practice.

## 5. **Compression Technology**

The service has analogue interfaces presented to the customer, and uses digital compression technology, apt-X100 to convey the broadcast material across the network.

The apt-X™ algorithm has been designed to permit wide-band audio or mono to be carried over lower capacity digital telecommunications networks.

Further information regarding APT Technology is available from <http://www.aptx.com/index.html>

## 6. **Line Monitoring**

The signal is transmitted from the **Contribution** end to the **Distribution** end of the circuit, at the **Distribution** end (the far end) the analogue signal is re-presented to the customer for their use.

The monitoring circuit enables the monitoring of the signal at the output of the **NTP** at the **Distribution** end, and returns the monitored signal to the **Contribution** end of the circuit.

This ability is subject to the customer's circuit configuration and utilisation, i.e. if all **ten contribution circuits** are **used for contribution** there will be no opportunity to provide monitoring within this service.

The round trip delay from the signal being sent at the **Contribution** end and the monitored signal being returned to the **Contribution** end should not exceed 10ms.

## 7. **Further Information**

For further information please go to: <http://www.broadcast.bt.com/contact-us.html>

If you have enquiries relating to this document then please contact: [help@sinet.bt.com](mailto:help@sinet.bt.com)

## 8. References

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SIN 290            BT MusicLine One

SIN 320            BT MusicLine 2000

BT SInS are available from <http://www.sinet.bt.com>

## 9. Glossary

NTE	Network Terminating Equipment
NTP	Network Terminating Point
SIN	Suppliers' Information Note
Technical Supply	A quiet /filtered mains supply
XLR-3	“Broadcast Industry” Standard audio connector

## 10. History

Issue 1.0	December 1999	First issued.
Issue 1.1	February 2002	Co-location added & document format updated.
Issue 1.2	September 2003	Approval Requirements statement removed, information available via SINet Useful Contacts page.
Issue 1.3	9 May 2008	Inserted new references for further information

**-END-**

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