ATB-101 Audio Trunk Board

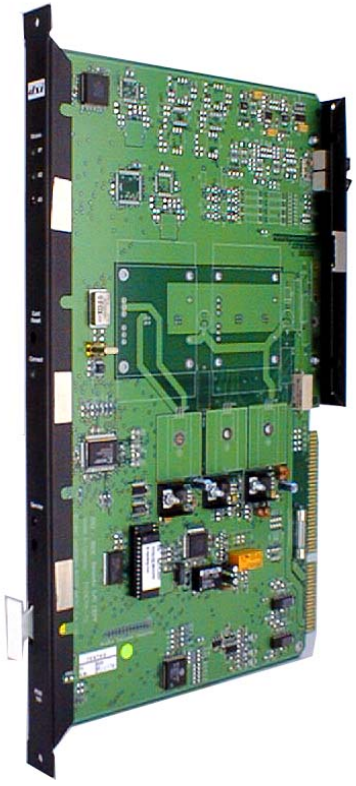
1. Intent & Scope

This document describes the installation procedure for the ATB-101 Audio Trunk Board. There are restrictions on the placement of these cards in the card cages (see note at bottom of page 2).

2. Description

The ATB-101 Audio Trunk Boards are used to add additional Digital Audio Trunks between card cages. The ATB-101 is designed for applications where a large number of audio paths are required between card cages, such as in video visitation applications.

Every card cage in a DXI system must have an ACB-101 Audio Control Board. All ACB-101's are connected together by a bi-directional CEPT loop (either copper or fiber optics) to form a Digital Audio Trunk. This digital trunk has the capacity to carry 60 concurrent digital audio channels between the card cages in the system. A second Digital Audio Trunk can be established with a group of card cages by installing an ATB-101 card in each one of the card cages in the group, and connecting these card cages in a bi-directional CEPT loop. Each ATB-101 trunk can carry 30 concurrent digital audio channels.



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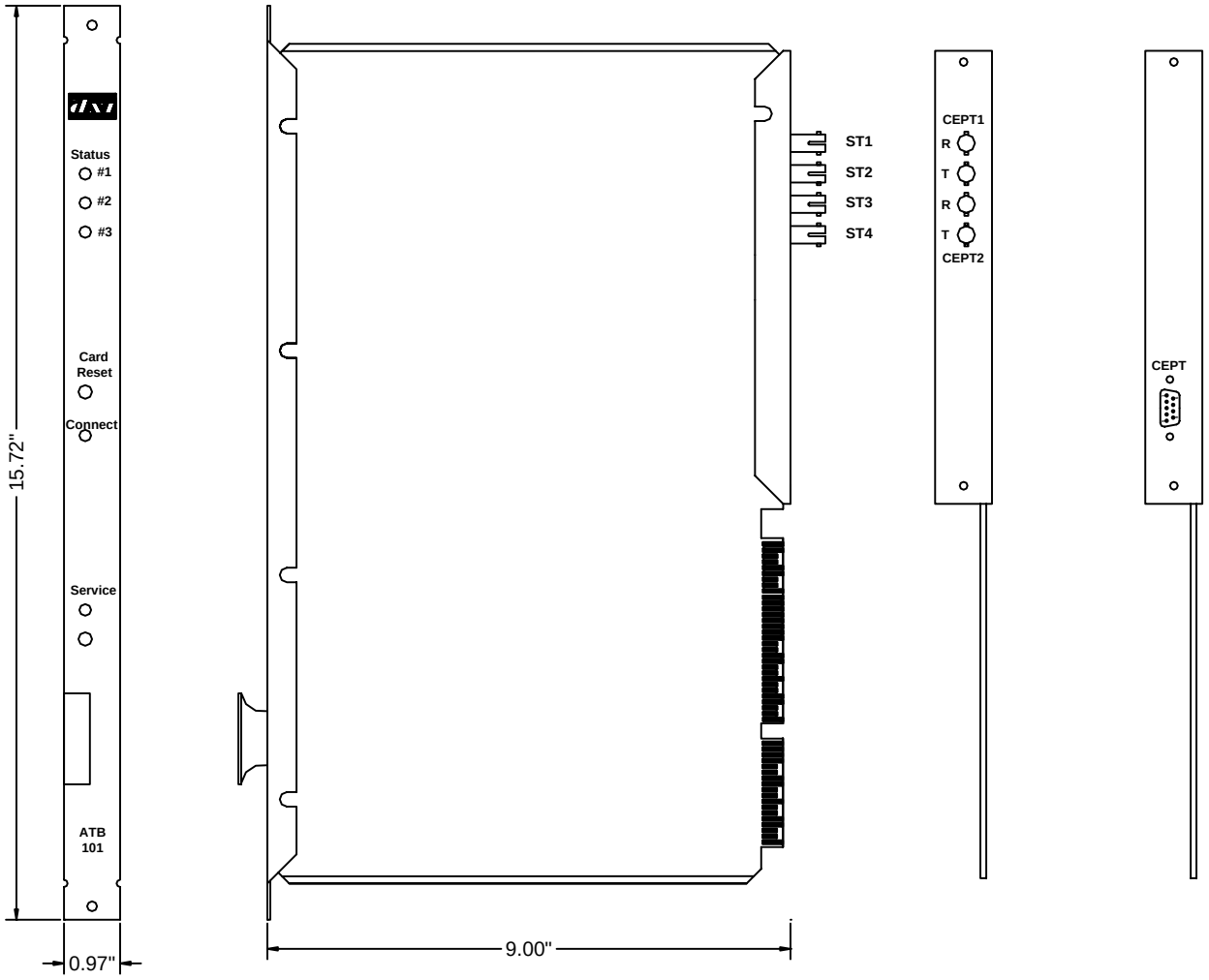


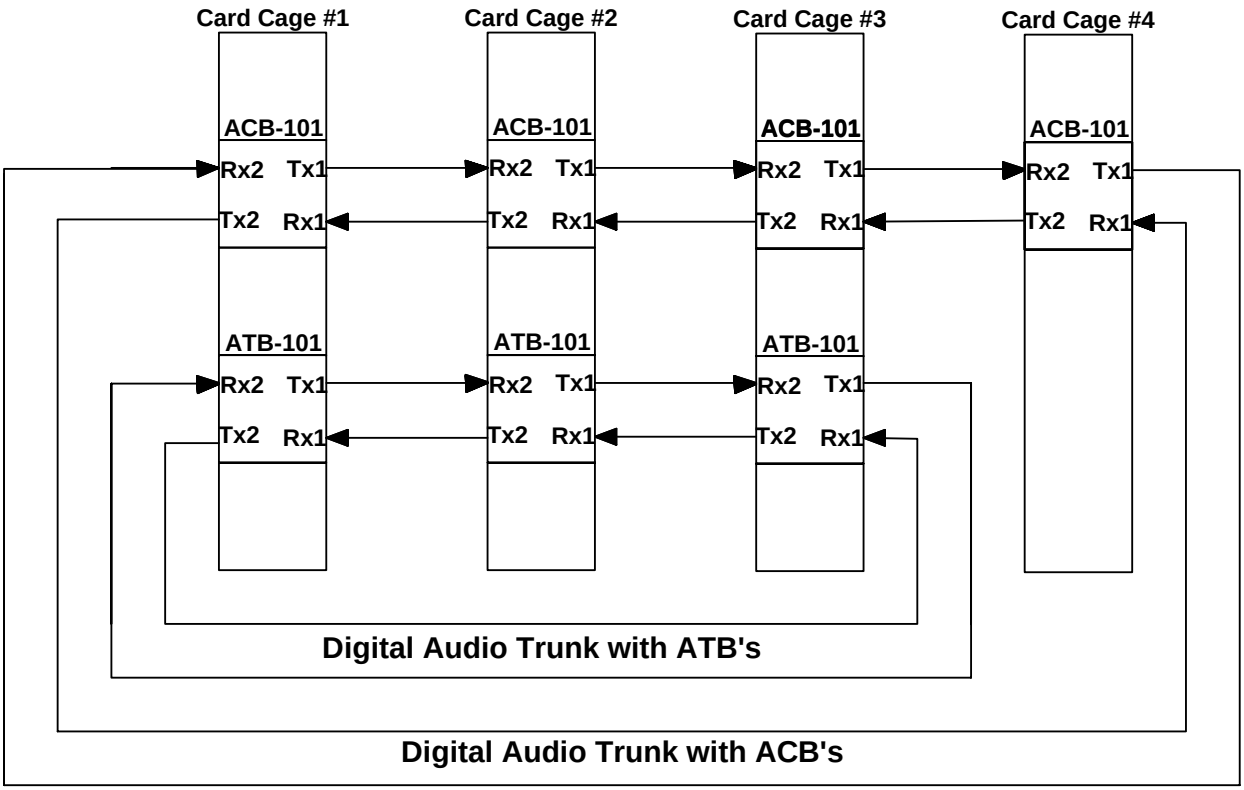
ATB-101 Showing Fiber Optics and Copper Interface

3. Digital Audio Trunk with ATB Cards

The following block diagram shows a 4-card cage DXI system, with each card cage containing an ACB-101 board. Shown in the diagram are the connections necessary to form a Digital Audio Trunk (a bi-directional CEPT loop) among all the card cages in the system. If 3 of the card cages also contain an ATB-101 board linking the ATB-101 boards together either by a fiber optics or copper interface can form a second Digital Audio Trunk.

The Digital Audio Trunk is formed by connecting the transmit and receive port of a CEPT pair to the opposite ports of the next ATB in the loop i.e. TX1 of the first ATB is connected to Rx2 of the next ATB, while TX2 of the second ATB is connected to Rx1 of the first ATB. In the Digital Audio Trunk shown the ATB's are connected so that one loop is in a clockwise direction, while the second loop is connected in a counterclockwise direction. With this configuration if one link is broken digital audio can still be transmitted from one ATB to any other ATB by switching to the second loop.

Note: The following restriction applies to the placement of ATB cards. ATB cards in a Digital Audio Trunk (CEPT loop) must reside in the same card slot position in each of the card cages.



Block Diagram showing Digital Audio Trunks

3.1 ATB-101-1 Copper CEPT Network Interface

For the copper conductor interface version of the CEPT trunk a CBL-160 cable connects to the female DB-9 connector on the rear of the ATB board. The CBL-160 cable has four twisted pair cables that are used to connect the ATB's DB-9 connector to a terminal block. From the terminal block unshielded twisted #22 awg wire pairs are used to connect the ATB to the remote ATB. Signals indicated in the following table are from the board's perspective.

Female DB 9 Connector **Male DB 9 Connector**

The maximum distance between ATB cards for a 22 gauge (unshielded) twisted pair is 8,200 ft (2.5 km).

Pin	CEPT Signal	Wire Color
1	RTIP1	White/Blue Stripe
6	RRING1	Solid Blue
2	TTIP1	White/Orange Stripe
7	TRING1	Solid Orange
3	Ground	Shield
8	RTIP2	White/Green Stripe
4	RRING2	Solid Green
9	TTIP2	Solid Brown
5	TRING2	White/Brown Stripe

DB-9 Terminal Connector

3.2 ATB-101-2 Fiber Optic CEPT Network Interface

The fiber optic CEPT interface version of the audio trunk board is provided with four ST type fiber optic connectors. The top pair is the CEPT 1 connections and the bottom pair is the CEPT 2 connections. The labeling Tx (Transmit) and Rx (Receive) are from the board's perspective.

The maximum signal strength power loss in a fiber optics CEPT link must not exceed 13 db. The length of cable, number of connectors, and number of patch panels determines the loss of signal strength in fiber optic cables. With only one pair of connectors between ACM cards for a 62.5/125 multimode fiber optic cable the maximum distance between ATB's is 12,500 ft (3.8 km).

Typically, every connector reduces the signal by 0.3 db, and every 3,300 ft (1 km) of cable reduces the signal by 3.2 db, assuming a perfect connection. You should allow for some extra margin for field-grade connections.

4. Status Lights

Similar to all other DXI boards the ATB-101 has three service LED's, which are used to determine the operational status of the ATB.

Status Lights for ATB-101

Card Status	Status #1 (GREEN)	Status #2 (GREEN)	Status #3 (RED)	Connect (GREEN)
unbound/not configured (not in service)	Flash (1/2 duty cycle)	Off	Off	On
bound but not configured (lost LonWorks connection)	Flash (1/2 duty cycle)	Off	Off	On or Off[#1]
bound and configured (normal operation)	Flash (1/8 duty cycle)	Flashes when receiving commands from SAC	Card Fault Status[#2]	On

1. The ATB makes an initial connection attempt and listens for the network ping. If does not receive a ping within 16 seconds it disconnects itself from the network (turns off the CONNECT LED) for 24 seconds. After this disconnect time has expired it again performs a connection attempt. If the attempt fails an additional 8 seconds is added to the disconnect time. This procedure is repeated until a maximum disconnect time of 34 minutes is reached.
2. The Status LED #3 indicates the status of the CEPT controllers. If all CEPT controllers are functioning LED #3 is off. If all the CEPT controllers are not functioning LED #3 will be on. If some of the controllers are not functioning but not all LED #3 will flash on and off.