ADAM™

DBX

Dual Bus Expander

Telex®

Telex Communications, Inc. • 12000 Portland Ave South • Burnsville, MN 55337

9350-7532-000 Rev F, 07/2004

STOP!!!

You must have REV D of the DBX backplane!!!

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2- RG-59 Coax Cable	902072750
Plastic Bag	576027-000
4 - Panhead Screws 2.5x10.0	59000-240
1 - Front Card Assembly	90207532-501
1 - Bus Expansion Back Card Assy	90207557-500
1 - DBX User Manual	90357532-000

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Lincoln, NE 68505 U.S.A.
Attn: Service

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General Description of DBX Communication Scheme and Failure Modes

DBX Wiring and Communications

The DBX cards in all system are wired such that if you could unplug the DBX cards with their port wiring intact and lay them out on the ground untangled, the DBX cards and the wiring connections would form a giant circle.

If all the links in a DBX system are up and running, it is possible for a DBX card to send a message out its PORT A, and receive the same message back on its PORT B after the message had passed through every other DBX card in the system (assuming that every card that received a message on one port then transmitted the message on its other port).

The purpose of this configuration is to allow any DBX card to have at least two paths to every other DBX card using coax only. A card can transmit out either of its ports to reach another card as long as all links are up. If a single link goes down (a link being a pair of coax cables for TX and RX), every card can still reach every other card using coax only by going out either its PORT A or its PORT B since a broken circle still has all the points connected by a single line.

Only when two or more links are broken is it possible to isolate one or more DBX cards from other cards on the coax, but even in this case it is often possible to reach the isolated cards (which will be described later).

A DBX card can transmit and/or receive messages on either of its ports, as well as the control bus. However, a DBX card only transmits on the control bus to the destination card (the card who is the ultimate target of the message). All messages transmitted by a DBX card go out one of its ports, unless the target card is in the same frame as the DBX card, in which case the DBX card will use the control bus to make final delivery of the message.

This means that the “active” DBX card in the first frame can send a message to any DBX or AIO card in the system, as long as it has a coaxial path to the destination frame. If the “active” DBX card can reach the destination frame via coax hops, then the message can be delivered on the control bus by the DBX card in the destination frame.

This does NOT guarantee, however, that the destination card can send a message back to the “active” DBX card in the first frame. Each slave frame has an “active” DBX card who is responsible for polling the AIO cards and reporting status changes to the “active” DBX card in the first frame. All the AIO cards in a slave frame keep track of the “active” DBX card in their frame, and messages that need to go to the first frame are sent to the “active” DBX card in the slave frame for forwarding.

The asymmetry in message paths occurs because the DBX card in the slave frame, which delivered a message to the AIO card, may not be the “active” DBX card. The “active” DBX card may not have a coaxial path to the first frame, even though the “active” DBX card in the first frame does have a coaxial path to the destination frame. For this to occur, there has to be more than one link failure.

It might be possible to allow intermediary control bus hops in routing a message, however, the number of possible message routes becomes enormous, and it requires that every DBX card be aware of the link status of every other DBX card which becomes extremely difficult to do when you are trying to use link status to determine message routing, but you need to use message routing to pass link status back and forth.

An even worse consequence of allowing arbitrary message routing is that it becomes difficult to predict the order of arrival of transmitted message. In the case of crosspoint messages, the order is critical; suppose two messages are sent, one to turn a crosspoint on, the other to turn it off; now suppose the messages end up taking different routes because of a link status change, and the second message arrives first. The AIO card that receives the messages turns the crosspoint off (it already was off), and then turns it on, and the crosspoint is left in the wrong state!

Failure Modes

In general, communications between two frames (called control) can occur when the “active” DBX card in the first frame has a coaxial path to the destination frame, AND the “active” DBX card in the destination frame has a coaxial path to the first frame.

Audio between frames will exist as long as there is a single valid link between the two frames. In redundant systems, there are two links between each frame, so losing either one will not affect audio (aside from a small glitch as the fault is recognized and corrected). In non-redundant systems, there is only one link between each frame, so if it goes down, the audio between the two frames is lost.

Control in a frame (i.e. the ability to talk to keypanels and act on keypresses) will exist as long as there is a coaxial path between the frame and the “active” DBX in the first frame, AND, there is a coaxial path between the “active” DBX in local frame and the first frame.

If a frame loses contact with the first frame, the crosspoints that have already been made will stay. If contact is restored before any critical messages need to be sent (such as crosspoints or key presses), the frame will resume normal operation. If a critical message needed to be sent but couldn’t be delivered, the frame’s panels will go to (....) and come back when contact is finally restored.

In a redundant system, it is possible to pull any one DBX card, or cut any one link (RX or TX or both), and the system will continue to operate normally (other than a small glitch in audio as faults are detected and the redundant resources kick in). It is even possible to pull other DBX cards, and/or cut other links without adversely affecting system operation, as long as there is at least one link between each frame (to provide audio), and as long as the “active” DBX cards in each slave frame have a valid coaxial path to the first frame, and the “active” DBX card in the first frame has a valid coaxial path to each slave frame (to allow for control operations).

In a non-redundant system, the same rules for control apply, however every cut link causes the audio between the affected frames to be lost, and every pulled DBX card loses the audio between that frame and the two frames it was connected to. This is because every link in a non-redundant system carries audio.
If a frame was completely isolated because all its links were down, any crosspoints that already existed within the frame would stay made, but no new crosspoint changes could occur.
Lastly, every frame needs at least one DBX card to operate because the DBX cards provide the clock to the frame and, as with SBX systems, slave frames must have at least one link up that can trace its clock origin back to the first frame in order for the audio in that frame to be synched to the audio in other frames.

Definitions

Redundancy: We talk about DBX systems as being either “Redundant Audio”, or “Non-Redundant Audio” where we’ve defined redundant audio as meaning that it is possible to cut any one DBX coaxial link without losing any audio between frames.

In order for redundant audio to exist, there must be two coaxial links between every pair of frames. In a three frame system, that means two links between frames 1 and 2, two links between frames 2 and 3, and two links between frames 1 and 3 (or six links in total). A non-redundant three frame system needs only one link between each pair of frames, (1-2, 2-3, and 1-3, or three links in total).

When there are two links between a pair of frames, only one link is required to pass audio (although both carry the audio between frames, the audio is only used from one link). So, if one link is cut, the other link can immediately be used to provide the same audio.

Because a DBX card can connect to two other frames, both ports on a DBX card are only needed when there are an odd number of frames. When there are an even number of frames, there will be one DBX card in each frame that has a port that is unused. However, since our message passing scheme requires that all the DBX cards be connected in a big loop, the unused ports on the DBX cards are connected to each other anyway which leads to “Partial Redundancy” of audio in systems with an even number of frames.

For instance, the 4 frame “Non-Redundant Audio” system (480x480) is actually “Partially Redundant” because there are two links between frames 1 and 2, and two links between frames 3 and 4. Similarly the 6 frame “Non-Redundant Audio” system (672x672) is also partially redundant because there are two links between frames 1 and 2, between frames 3 and 4, and between frames 5 and 6.

These configurations are partially redundant because you can cut a link between frames 1 and 2 (or frames 3 and 4, or frames 5 and 6) without losing any audio, but cutting a link between frames 2 and 3 (for instance) would cause a loss of audio between those frames.

Link: A connection between two DBX cards consisting of 2 coaxial cables (one for TX and one for RX).

Path: A way to get from one DBX card to another by travelling only on links (not on the control bus). A path consists of a series of connected DBX cards. A message travels along a path when it is received by a DBX on one port, and transmitted by the same DBX card on its other port. The DBX intercom wiring scheme creates one long circular path between all the DBX cards. This allows the circular path to be broken (by removing one link), and yet still allow a continuous path between all the DBX cards. This gives us fault tolerance for messaging, in that any ONE link can fail without preventing any messages from being delivered.

Active DBX: One DBX card in each frame is the Active DBX. The Active DBX card will be in either slot 8 or slot 9. In the first frame, the Active DBX card is in charge of the entire intercom. It handles crosspoints, volumes, and all intercom functionality. It is the only DBX card which originates messages to AIO cards. In a DBX system, the Active DBX card in the first frame plays the role normally played by the Active MC in a standard intercom. In a slave frame, the Active DBX is the contact point for AIO cards trying to send messages back to the Active DBX in the first frame.

Control: The ability of the Active DBX in the main frame to send messages to, AND receive messages from, AIO cards in slave frames. In order to send a message from one frame to another, a DBX card must have a continuous coaxial path from its frame to the destination frame. Note that because, in most cases, there are more than one DBX card per frame, it is possible for a message to be received by a DBX card in the destination frame and delivered to the target AIO card on the control bus even if that DBX card isn’t the Active DBX card in that frame. A return message generated by the AIO card would be transmitted to the Active DBX card in its frame for delivery via a continuous coaxial path to a DBX card in the first frame who will then deliver the message to the Active DBX card in the first frame on the control bus (assuming that the DBX card in the first frame that received the message on one of its ports isn’t already the Active DBX). This means that the message routing between an AIO card in a slave frame and the Active DBX card in the first frame is not symmetrical. Depending on which links are up or down, it may be possible for the Active DBX card to transmit to an AIO card, but impossible for the AIO card to send a return message (or vice-versa). So, in order for there to be “Control” between the first frame and a slave frame, there must be a valid continuous coaxial path between the Active DBX card in the first frame and any DBX card in the slave frame, AND, a return path between the Active DBX card in the slave frame, and any DBX card in the first frame.

When there are at least two DBX cards per frame, we have “Redundant Control”, in that any ONE DBX card can fail, and another DBX card will take over for the failed card. In systems with only one DBX card per frame, there is no redundant control.

Audio Clock: There is only one master clock used for audio in the entire intercom. This clock is provided by one of the cards in slot 8 or slot 9 in the first frame (usually a DBX card, although it could be an AIO card in slot 8 in systems that have only 1 DBX card per frame). In order for stable audio to be present in a frame, it must have access to the master audio clock. The audio clock is passed from the first frame to slave frames via the links. A slave frame with a valid direct link to the first frame from a DBX card in slot 8 or slot 9 will always have access to the audio clock. The audio clock can also be passed from one slave frame to another if the link between the slave frames has the proper link master/slave relationship, and the link slave card is in slot 8 or slot 9 of the second slave frame (the DBX cards will always try to create links with the proper orientation of the links).

Audio: There will be stable audio between frames if both frames have a valid audio clock, AND there is a valid link between the frames

If both of the frames also have "control" (i.e. round-trip communications with the Active DBX card in the first frame), then the audio between frames is "dynamic", meaning that crosspoints between the two frames can change dynamically when keypanel keys are pressed or other intercom events occur. If one frame has "control", but the other doesn't, then ports in the frame with "control" will be able to listen to ports in the other frame, but not talk to them. The frame without control will have "static" audio, meaning that only crosspoints that existed before control was lost will still exist, and that no new crosspoints can be made until control is restored.

If "control" between the first frame and a slave frame disappears for more than about 5-10 seconds, then the panels in the slave frame will "go to stars". This will happen sooner if there are any "important" messages that need to be sent between frames, but that cannot be delivered. "Important" messages are things like key presses or crosspoint closures. The panels are forced to stars when "important" messages are missed in order to ensure that all crosspoints are in the correct state when "control" is restored. When there are two links between each frame we have "Redundant Audio", in that any ONE of the two links between two frames can fail and the audio between the frames can still be carried on the other link.

In a redundant audio system, it is possible to pull any one DBX card, or cut any one link, and the system will continue to operate normally (other than a small glitch in audio as faults are detected and the redundant resources kick in). It is even possible to pull other DBX cards, and/or cut other links without adversely affecting system operation, as long as there is at least one link between each frame (to provide audio), and as long as the Active DBX cards in each slave frame have a valid coaxial path to the first frame, and the Active DBX card in the first frame has a valid coaxial path to each slave frame (to allow for control operations).

In a non-redundant audio system, the same rules for control apply, however every cut link causes the audio between the affected frames to be lost, and every pulled DBX card loses the audio between that frame and the two frames it was connected to (because every link in a non-redundant system carries audio).

Test Audio: "Test Audio" is artificially generated audio by the SBX/DBX that it can produce, publish, forward, receive, and test. It is used by the SBX/DBX to ensure that the links are passing valid audio between frames. If the SBX/DBX detects that the link is up, but that the audio is corrupt (which does occur), the SBX/DBX tears down the link and builds it up again (which almost always solves the problem).

The need for Test Audio was discovered when the SBX was introduced. It was observed that it was possible to bring up the coax link with valid frame sync, but that no audio would be produced. The same situation occurs with the DBX cards. Test audio allows the SBX/DBX cards to detect when the link is not passing audio even when the frame sync is OK.

The use of Test Audio is necessary to ensure that the coax links are properly passing audio, however, the use of Test Audio also can affect the number of available ports in some system configurations.

An SBX/DBX link can forward 128 timeslots, but Test Audio requires 4 timeslots per link. In the 256x256 (2 frame SBX or DBX), and 384x384 (3 frame DBX) systems which have only 1 SBX/DBX card per frame, all timeslots per link are needed for real audio, but if Test Audio is enabled, the last 4 timeslots in each frame are not available, which means that only 124 timeslots of real audio can be passed between frames.

This means that the last four ports in each frame can listen to, but not talk to ports in other frames. Similarly, ports in other frames can talk to, but not listen to the last four ports in each frame. Within any frame, any port can talk or listen to any other port in that frame, the timeslots are only lost going between frames.

Partial Redundancy: (4 & 6 Frame Non-Redundant Systems only) Consider the 4-frame non-redundant system. Each frame requires 3 links - one to each of the other frames. That requires 2 DBX cards, which gives us 4 links, i.e. one spare link per frame. The wiring table is such that there will be 2 links between frames 1 & 2, and 2 links between frames 3 & 4; there is a single link between each other pair of frames.

Similarly, the same condition exists in the 6 frame non-redundant system. Looking at the wiring table it can be noticed there are 2 links between frames 1 & 2, 2 links between frames 3&4, and 2 links between frames 5&6 and single links between each other pair of frames.

The DBX system will handle these links automatically: if one link fails, the other link automatically provides the audio.

System Sizes:

2 Frame Non-Redundant
- 256 x 256 with Test Audio disabled.
- 248 x 248 with Test Audio enabled *.
  (256 ports, but only 124 ports per frame have full connectivity).
- 2 DBX cards total (1 per frame).
- 4 coax interconnections.
- this system actually has redundant audio on its two links.
- however it does not have redundant control.
- losing one link has no effect.
- losing the slave DBX means losing frame 2.
- losing the master DBX means losing the whole intercom.

2 Frame Redundant
- 240 x 240 with or without Test Audio.
- 4 DBX cards total (2 per frame).
- 8 coax interconnections.
- this system has both redundant control and redundant audio.
- any one of the four links can carry all the audio.
- losing one DBX in each frame has no effect.
- losing up to three links has no effect (as long as the Active DBX has at least one link up).

3 Frame Non-Redundant
- 384 x 384 with Test Audio disabled.
- 372 x 372 with Test Audio enabled *.
- (384 ports, but only 124 ports per frame have full connectivity).
- 3 DBX cards total (1 per frame).
- 6 coax interconnections.
- no redundant audio or control.
- losing a slave DBX card means losing a frame.
- losing the master DBX card means losing the whole intercom.
- losing a link means losing audio between two frames.

* The last 4 ports per frame are not available for normal intercom use due to Test Audio enabled. These ports, however, may be used as monitor outputs only if desired.

For all systems that follow, the failure modes are described in the previous discussion of Control and Audio.

3 Frame Redundant

- 360 x 360 with or without Test Audio.
- 6 DBX cards total (2 per frame).
- 12 coax interconnections.
- redundant control and audio
- Loosing any single DBX card has no effect.
- Loosing any single link has no effect.
- Loosing either Master Controller in primary frame has no effect.
- If both Master Controllers in primary frame are lost the intercom will remain functional, however, the following peripheral devices will be dysfunctional:

PAP(s)	Trunk Masters
UIO256s	AZedit
LCP(s)	Programming from keypads at panels

In general, any keypanel which was operational prior to a failure such as this will retain its functionality within the intercom.

The above also applies to any multi-frame redundant system.

4 Frame Non-Redundant

- 480 x 480 with or without Test Audio.
- 8 DBX cards total (2 per frame).
- redundant control.
- partially redundant audio.

(there are two links between frames 1 and 2, and also between frames 3 and 4).

4 Frame Redundant

- 448 x 448 with or without Test Audio.
- 12 DBX cards total (3 per frame).
- redundant control and audio.

5 Frame Non-Redundant

- 600 x 600 with or without Test Audio.
- 10 DBX cards total (2 per frame).
- redundant control.
- no redundant audio.

5 Frame Redundant

- 520 x 520 with or without Test Audio.
- 20 DBX cards total (4 per frame).
- redundant control and audio.

6 Frame Non-Redundant

- 672 x 672 with or without Test Audio.
- 18 DBX cards total (3 per frame).
- redundant control.
- partially redundant audio.

(there are two links between frames 1 and 2, frames 3 and 4, and also frames 5 and 6).

7 Frame Non-Redundant

- 784 x 784 with or without Test Audio.
- 21 DBX cards total (3 per frame).
- redundant control.
- no redundant audio.

8 Frame Non-Redundant

- 832 x 832 with or without Test Audio.
- 32 DBX cards total (4 per frame).
- redundant control.
- partially redundant audio (not detailed yet).
- NOT CURRENTLY SUPPORTED IN DBX FIRMWARE.
- NO WIRING TABLE HAS BEEN GENERATED.

9 Frame Non-Redundant

- 936 x 936 with or without Test Audio.
- 36 DBX cards total (4 per frame).
- redundant control.
- no redundant audio.
- NOT CURRENTLY SUPPORTED IN DBX FIRMWARE.
- NO WIRING TABLE HAS BEEN GENERATED.

An ADAM Intercom System can communicate with up to 3 separate AZedit sessions, all running on separate computers. Multiple sessions are not supported for ADAM CS or Zeus. To use this feature, you must configure the Advanced communications settings on the computer running the primary AZedit session. This is the computer connected to J1 of the XCP-ADAM-MC Master Controller Breakout Panel. Second and third computers can then be connected to J9 and J10 of the Master Controller Breakout Panel as explained below.

If you are running AZedit together, it is best to have AZedit on J1. This is because the J1 port has to be used to configure J9 and J10 (baud rate, which ports are enabled, and what protocols are supported), and only AZedit supports this. Once the primary AZedit has been configured, each AZedit port may be operated independently from one another.

The standard AZedit connection is via J1 of the ADAM breakout panel supporting baud rates of 9600 and 38.4K (selected via DIP switch 1-1 on each MC). The auxiliary ports also support 19.2K (configured by the AZedit session connected to J1).

There are limitations on the baud rates of the auxiliary ports.

In SBX and single frame ADAM intercoms, a baud rate of 38.4K for the auxiliary ports will usually work, but communications errors will occasionally cause AZedit to be bumped off-line. A baud rate of 19.2K is recommended for these ports.

In DBX intercoms, communications errors will occur on J9 and J10, even at 9600 baud. However, J7 and J8 can be used in place of J9 and J10, by closing DIP switch 1 position 6 on both peripheral controller cards (frame 1). These ports have FIFO buffers built into them, which significantly reduces the number of communications errors. However, communications errors can still occur if multiple AZedit sessions are active, which can cause AZedit to go off-line.

Note that J7 and J8 are RS-485 ports and require an external converter (e.g. a Telebyte model 285M or 365M) to connect each of these ports to a computer's RS-232 serial port.

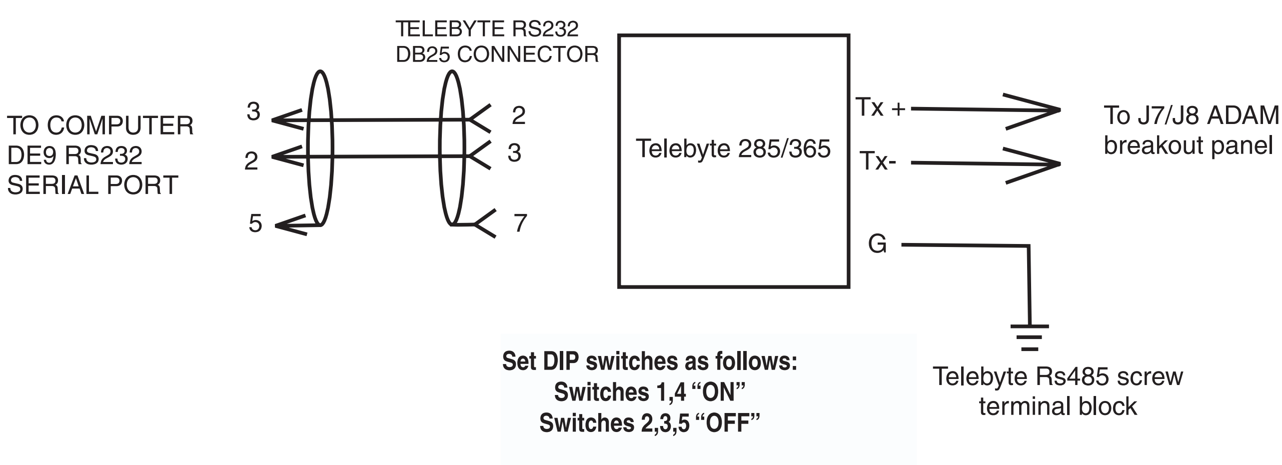
The following is a procedure for setting up AZedit communications with up to three separate computers in a DBX system.

PROCEDURE: **(see figures 1 & 2, AZedit Screen Views)**

Minimum Software Requirements:
AZedit = 2.06.02
Peripheral Controller (PC) = 10.2.x
DBX (U21, U22) = 1.1.1, Altera 1.1
AIO = 10.0.2

- Set dip switch S1-1 for each of the two PC cards in frame 1 to select desired baud rate for primary AZedit. (ON = 38.4k)
- Set dip switch S1-6 to "on" for each PC card in frame 1 to enable ports J7 & J8 AZedit support.
- Run AZedit and go on-line.
- Select "OPTIONS"
- Select "COMMUNICATIONS"
- Select "ADVANCED" – (must be connected to matrix to see this screen, see Figure 1.)
- Then Communication screen (see Figure 2.), Secondary AZedit Sessions J9/J10
- Advanced Settings (ADAM Only)

Remember, operationally J9 becomes J7 & J10 becomes J8 when PC dip switch S1-6 is "ON". AZedit will not change these port screen designations



Telebyte Interconnect

DBX Multiple AZedit Sessions

Baud Rate: Select the highest baud rate that will work correctly. Unlike the baud rate setting for the primary AZedit session, which is set by a master controller DIP switch, the baud rates for second and third computers are set in software, and there are no DIP switches for this.

This configuration information is stored in configuration flash, (U3/U5), so the intercom will remember it. However, if the intercom loses its config flash for any reason (e.g. it gets a 1st birthday, perhaps because a new version of firmware is downloaded to it), it will come up with J9 and J10 disabled by default.

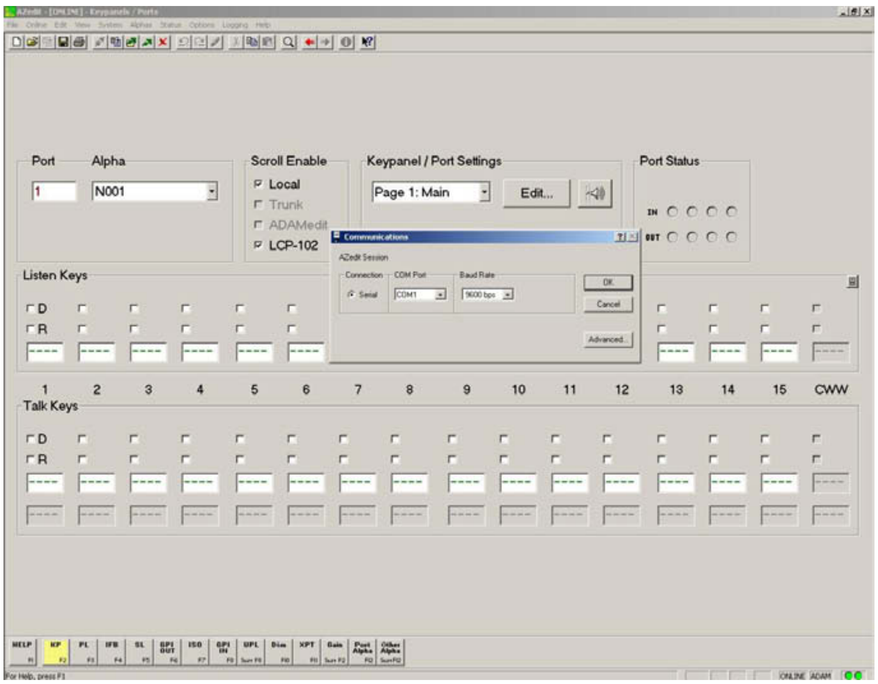


Figure 1

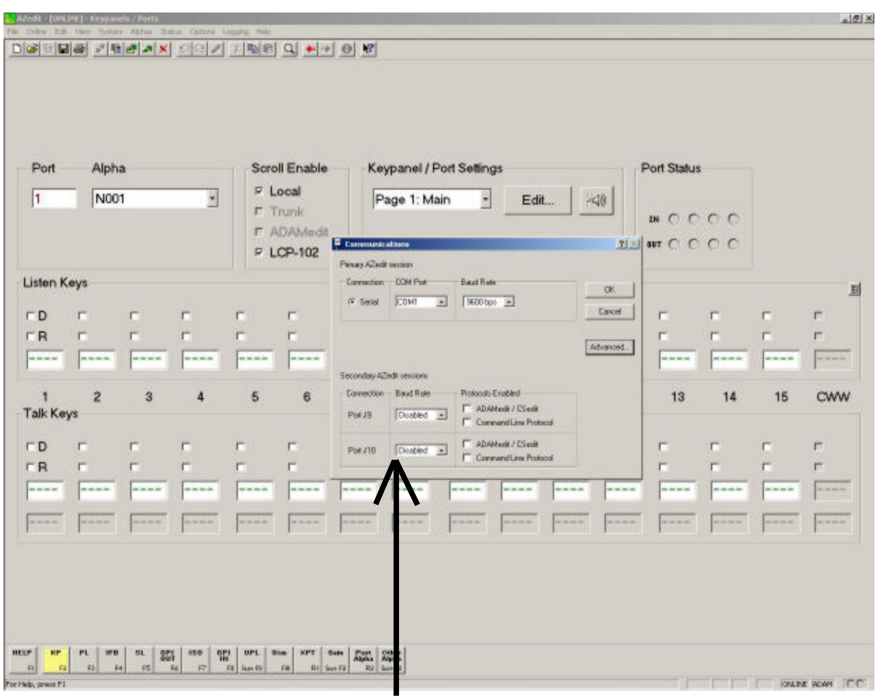


Figure 2   ***J9 &J10 are in reality J7 & J8 on ADAM controller breakout panel***

ADAM DBX Upgrade

Single frame ADAM to multi-frame ADAM DBX or existing multi-frame SBX to DBX

Caution: Read entire procedure before attempting upgrade

Important: Be aware there can be a 2 minute period for each group of cards selected during the download process where the master controller will take each Audio I/O card off line and reprogram its firmware. Any disruption during this period (loss of power, card removal, manually resetting cards) will result in I/O card failure! If this happens, you will either have to return the affected cards for replacement, or you will have to remove the EEPROM chips from the affected cards and manually reprogram them with an EEPROM programmer. Since this could potentially result in a major disruption in communications, we recommend that you only update a limited number of I/O cards at a time, and updating should be performed during non-critical periods of intercom usage.

Make sure AZedit is the active window, and not the help file. (Click anywhere on the AZedit window to make it the active window.) Then, press Ctrl+Shift+D on the computer keyboard. This will open the Firmware Download dialog.

Note: If Ctrl+Shift+D does not work, firmware download may be disabled. To enable this feature, go to the Options menu and select Preferences. Then, click on the Advanced tab. In the Advanced settings, place a check next to Allow firmware download, then click Apply. Click OK to exit. You should now be able to use the firmware download feature.

UPGRADE PROCEDURE

Minimum requirements:

a) Master Controller cards must have Altera ver 4.1 or higher and RAM installed in U10-U13 & U15-U18. If Master Controllers have ver 8.x firmware, a M/C card swap is necessary to bring the Masters up to the level capable of a DBX upgrade.
b) DBX cards must have firmware ver 1.2.1 or higher and Altera ver 1.1 or higher.
c) AIO cards ver 10.0.3 (or higher).
d) UIO256 requires firmware ver 2.0 (checksum 78b5, wired in a multi-drop mode, dip switch S1-2 closed and RS485 data going to J2 of each UIO256 (or higher).
e) PAP940, 951, 952 requires firmware ver 7.3.x (or higher).
f) Trunking, requires firmware ver 7.4.0 and CStrunk ver 7.3.1 (or higher). Trunking should be upgraded first before the DBX's.
g) LCP102's require ver 1.4 (or higher).
h) AZedit ver 1.07.06 (or higher).

DBX Upgrade

1. Save current intercom setup file to disk (very important).
2. If trunking, disconnect from Trunk Master.
3. Download ver 10.0.2 or higher AIO firmware to all AIO cards half a frame at a time with older existing SBX controller cards still in frames. Confirm successful download with AZedit in Status/Software Versions/AIO Cards. (fig. 1)

- If physically changing MC and DBX flash, continue with steps 4-16. If downloading, skip these steps and proceed to steps 17-28.

4. Power down entire system.
5. Change existing back cards in the appropriate frame slots to DBX back cards. See frame layout drawings relating to DBX system size and install coax links per cable diagram.
6. Remove all slave frame Master Controller cards and back cards. These slots will remain blank and never used again. DO NOT use for spare card storage.
7. In frame 1 only, change Master and Standby Controller flash U2 & U4 to new DBX Peripheral Controller flash ver 10.2.x. These cards will be heretofore referred to as “Peripheral Controllers” (PC).

8. Put only one DBX card in frame 1, slot 9 (turn on DIP 7), and one PC card in frame 1, slot 19 (also needs dip 7 on).
9. Power up frame 1 ONLY and ensure AZedit goes on line. Resize to new final system size under Options/Intercom Configuration. Default is 3 frame redundant audio system. (fig. 2)
10. Check "use DBX cards" in Options/Intercom Configuration/Resources, if not already detected, always check "use test audio". You can also "use redundant audio" only if it is appropriate for the system being set up]. (fig. 2) Also check Options page to be sure number of talk levels, remote trunk master (*not to be confused with local trunking*), and other options are set now, otherwise the system will first birthday again if you need to change them later. (fig 4)
11. If applicable, select "Apply" and the system will reconfigure itself and re-start.
12. After system has settled down, plug in the standby DBX into slot 8 of frame 1 and let it update. Next plug in the standby PC into slot 20 of frame 1, (remember both dips 7 need to be on) and let it update.
13. Insert all remaining DBX cards in each slave frame (dips 7 must be off) and power up all frames. This may take a little time - be patient. Verify I/O cards can be seen with proper versions in Status/Software Versions/AIO Cards. (fig. 1)
14. Check DBX Link Status. (fig 3)
15. Send saved intercom setup file from step 1 above if necessary.
16. Re-connect Trunk Master if appropriate.

If Downloading PC's and DBX Cards

(If steps 1-16 above have been performed, ignore this section)

17. Pull MC #1 (slot 19), ensure AZedit is on line, and download MC #2 (slot 20). Pull MC #2 (slot 20) and put back MC #1 (slot 19), ensure AZedit is on line, and download it.
18. After downloading both MC's (now PC's), <u>leave only PC #1 in slot 19</u>.
19. Power down system and install DBX back cards in the appropriate card slots in frame 1.
20. Install a DBX card in slot 9 of frame 1 and power up. Download this card and when completed, remove it and install another in the same slot 9 and download it.
21. Resize to new final system size under Options/Intercom Configuration. Default is 3 frame redundant audio system. (fig. 2)
22. Check "use DBX cards" in Options/Intercom Configuration/Resources, if not already detected, always check "use test audio". You can also "use redundant audio" only if it is appropriate for system being set up].(fig. 2) Also check Options page to be sure number of talk levels, remote trunk master (*not to be confused with local trunking*), and other options are set now, otherwise the system will first birthday again if you need to change them later. (fig. 4)
23. If applicable, select "Apply" and the system will reconfigure itself and re-start.
24. When the resize is done, you can install the first downloaded DBX into slot 8 and plug in the second PC into slot 20 as well.
25. Install DBX back cards and DBX controller cards in all slave frames, power up these frames and download all slave DBX's. Verify I/O cards can be seen with proper versions in Status/Software Versions/AIO Cards. (fig. 1)

Note: Switch 7 should be in the OFF position for the slave frames on the DBX card.

26. Check DBX Link Status. (fig 3)
27. Re-send saved setup file from step 1 if required.
28. Re-connect Trunk Master if appropriate.

Special Note: In 2 & 3 frame non-redundant systems, the last 4 ports in each frame will be unusable due to test audio. This will affect overall system layout breakout cabling.

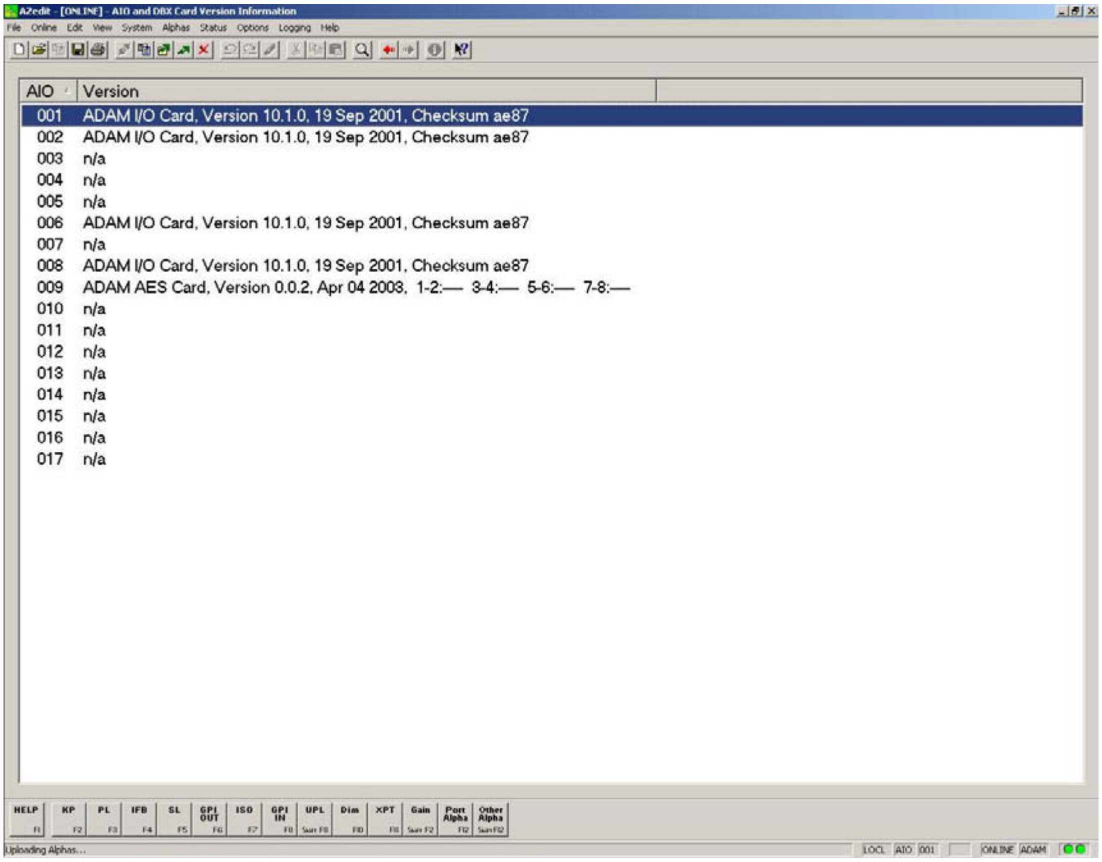


Figure 1. Verify software versions (steps 3,13, 25)

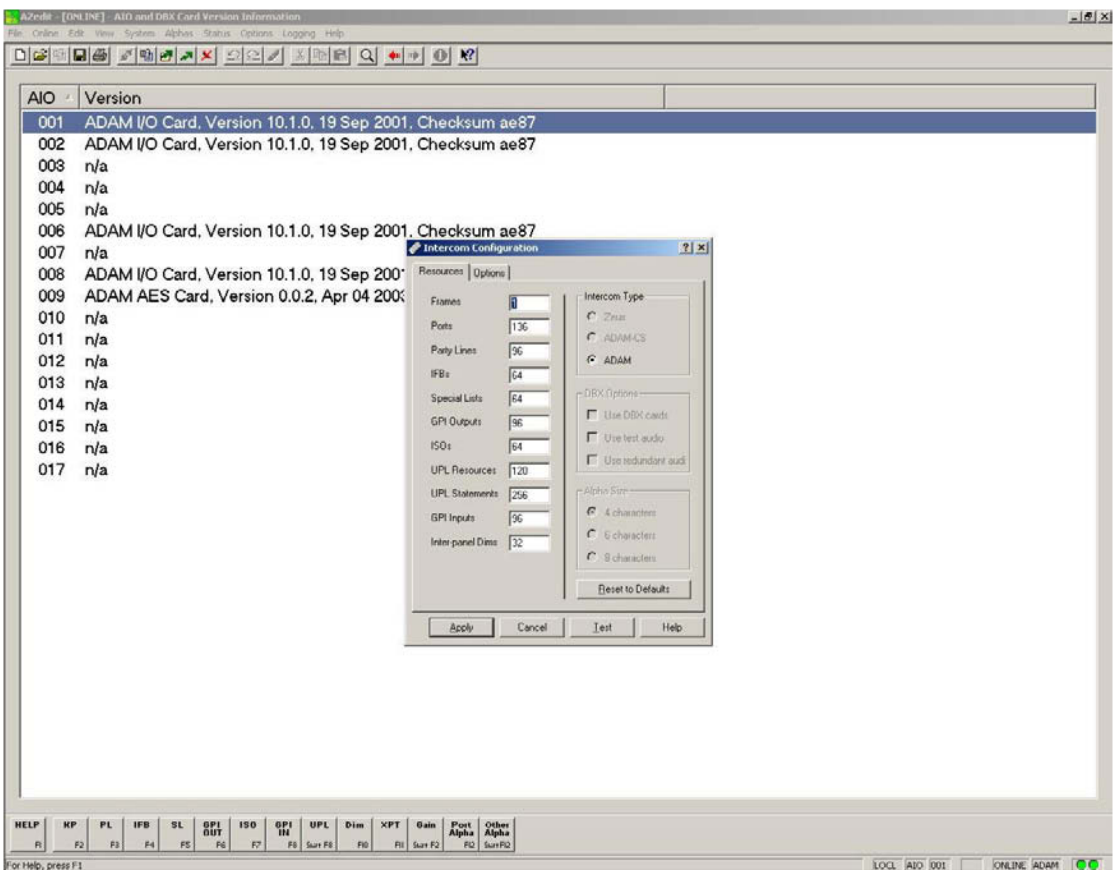


Figure 2. Set up frame size and DBX options (steps 9,19, 20)

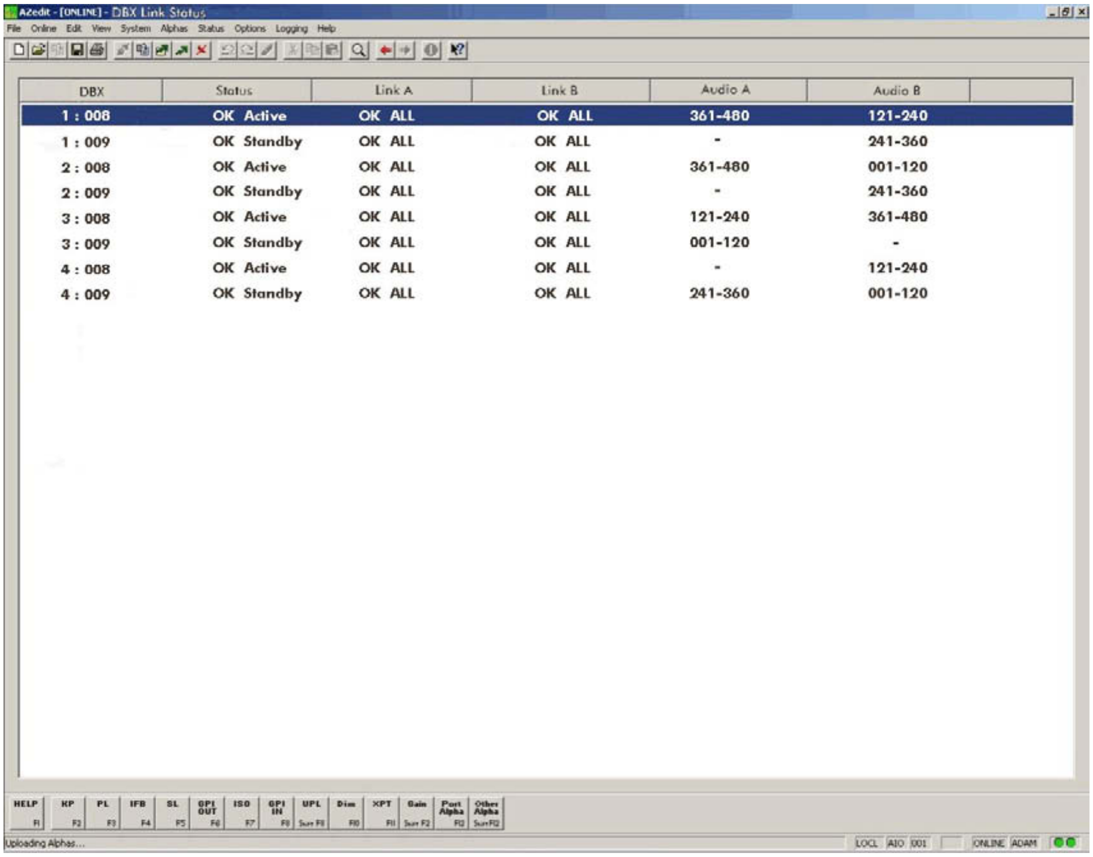


Figure 3. DBX Link Status (steps 14)

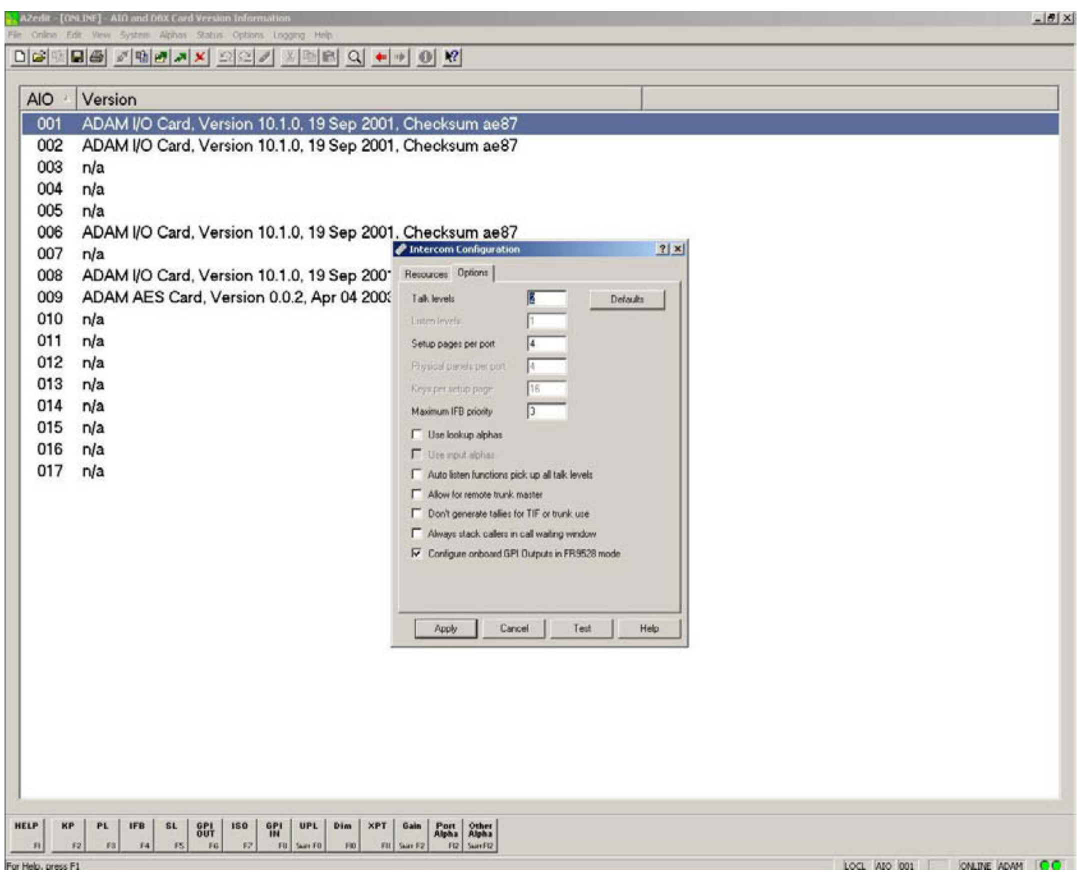


Figure 4. Set up Options page (steps 10, 20)

ADAM Intercom Size vs. SBX/DBX and AIO Card Population

DBX Card Population.XLS
7/2/2000

Number of Slots	17
Number of Panels Per I/O Card	8

Single Bus Expanders with 8 port Analog I/O Cards

Number	Ports		Bus Expanders			IO Cards			Timeslots	Notes
of Frames	Total	Per Frame	Number/Frme	Total/Sys.	Slots Used	Number/Frme	Total/Sys.	Increase	Forwarded	
1	136	136	0	0	0	17	17	17		No BXs
2	256	128	1	2	9	16	32	15		
3	360	120	2	6	8,9	15	45	13		
4	448	112	3	12	8,9,10	14	56	11		

Number of Slots	17
Number of Panels Per I/O Card	8

Dual Bus Expanders (no Redundant Audio) with 8 port Analog I/O Cards

Number	Ports		Bus Expanders			IO Cards			Timeslots	Notes
of Frames	Total	Increase	Number/Frme	Total/Sys.	Slots Used	Number/Frme	Total/Sys.	Increase	Forwarded	
1	136	136	0	0	0	17	17	17	N/A	No BXs
2	256	120	1	2	9	16	32	15	128	
3	384	128	1	3	9	16	48	16	128	
4	480	96	2	8	8,9	15	60	12	120	
5	600	120	2	10	8,9	15	75	15	120	
6	672	72	3	18	8,9,10	14	84	9	112	
7	784	112	3	21	8,9,10	14	98	14	112	
8	832	48	4	32	7,8,9,10	13	104	6	104	
9	936	104	4	36	7,8,9,10	13	117	13	104	
10	960	24	5	50	7,8,9,10,11	12	120	3	96	
11	1056	96	5	55	7,8,9,10,11	12	132	12	96	

Note: 2 and 3 frame systems above loose 4 ports per frame due to Test Audio enabled. 2 Frame = 248 ports, 3 Frame = 372 ports.

Number of Slots	17
Number of Panels Per I/O Card	8

Dual Bus Expanders (Redundant Audio) with 8 port Analog I/O Cards and Single Bus Expanders with 8 port Analog I/O Cards

Number	Ports		Bus Expanders			IO Cards			Timeslots	Notes
of Frames	Total	Increase	Number/Frme	Total/Sys.	Slots Used	Number/Frm	Total/Sys.	Increase	Forwarded	
1	136	136	0	0		17	17	17	N/A	No BXs
2	240	120	2	4	8,9	15	30	13	120	
3	360	104	2	6	8,9	15	45	15	120	
4	448	88	3	12	8,9,10	14	56	11	112	
5	520	72	4	20	7,8,9,10	13	65	9	104	
6	576	56	5	30	7,8,9,10,11	12	72	7	96	
7	616	40	6	42	6,7,8,9,10,11	11	77	5	88	

ADAM DBX LINK MAPPING

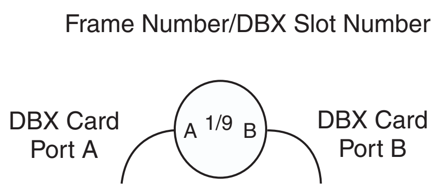
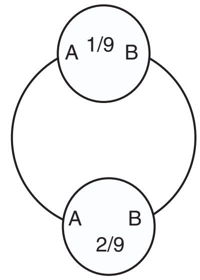
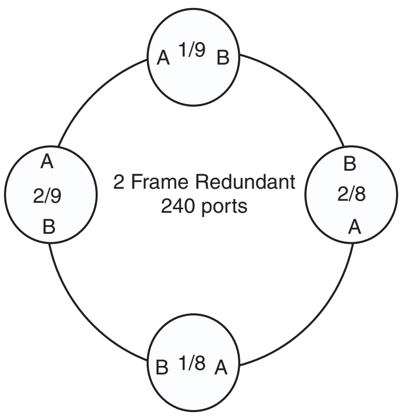
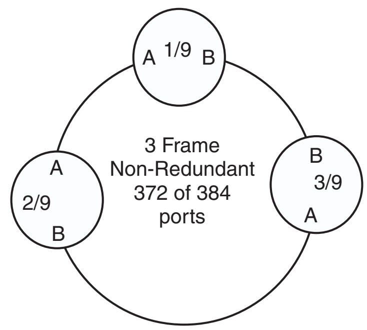


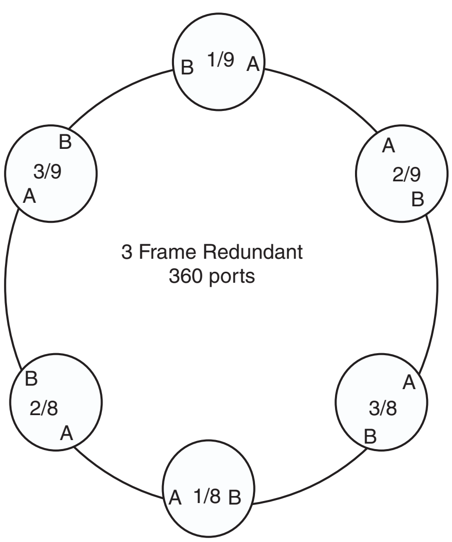
DIAGRAM KEY

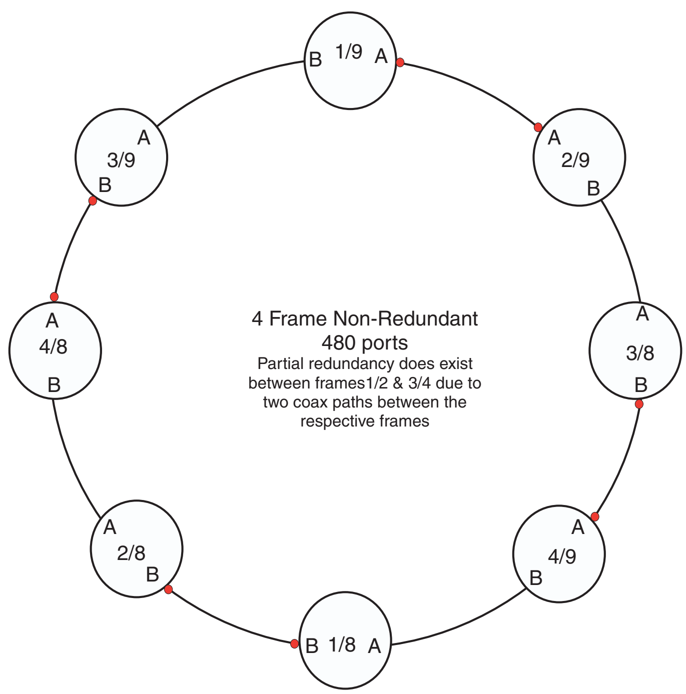


2 Frame Non-Redundant
248 - 256 ports

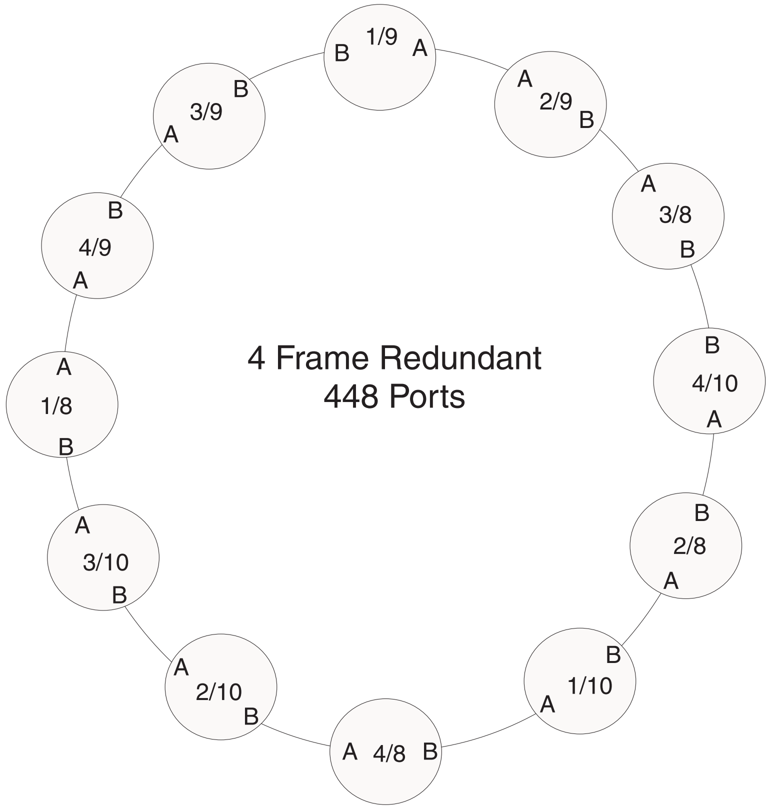


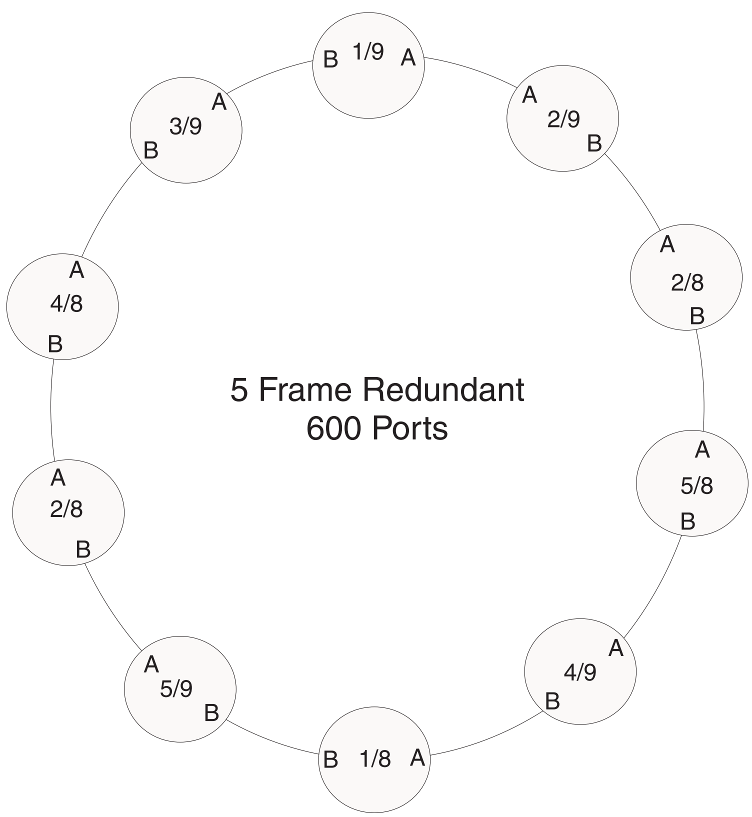




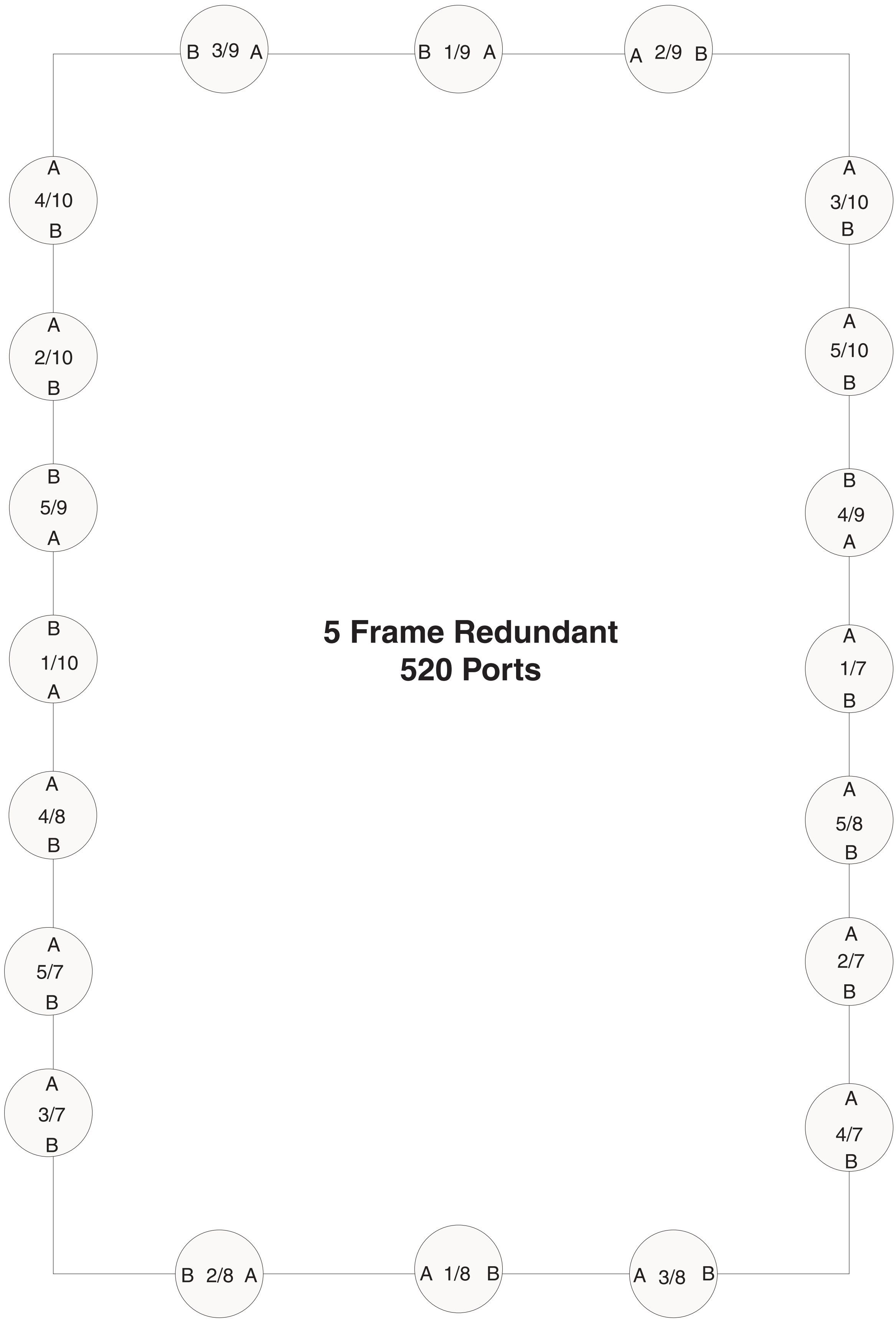


ADAM DBX LINK MAPPING

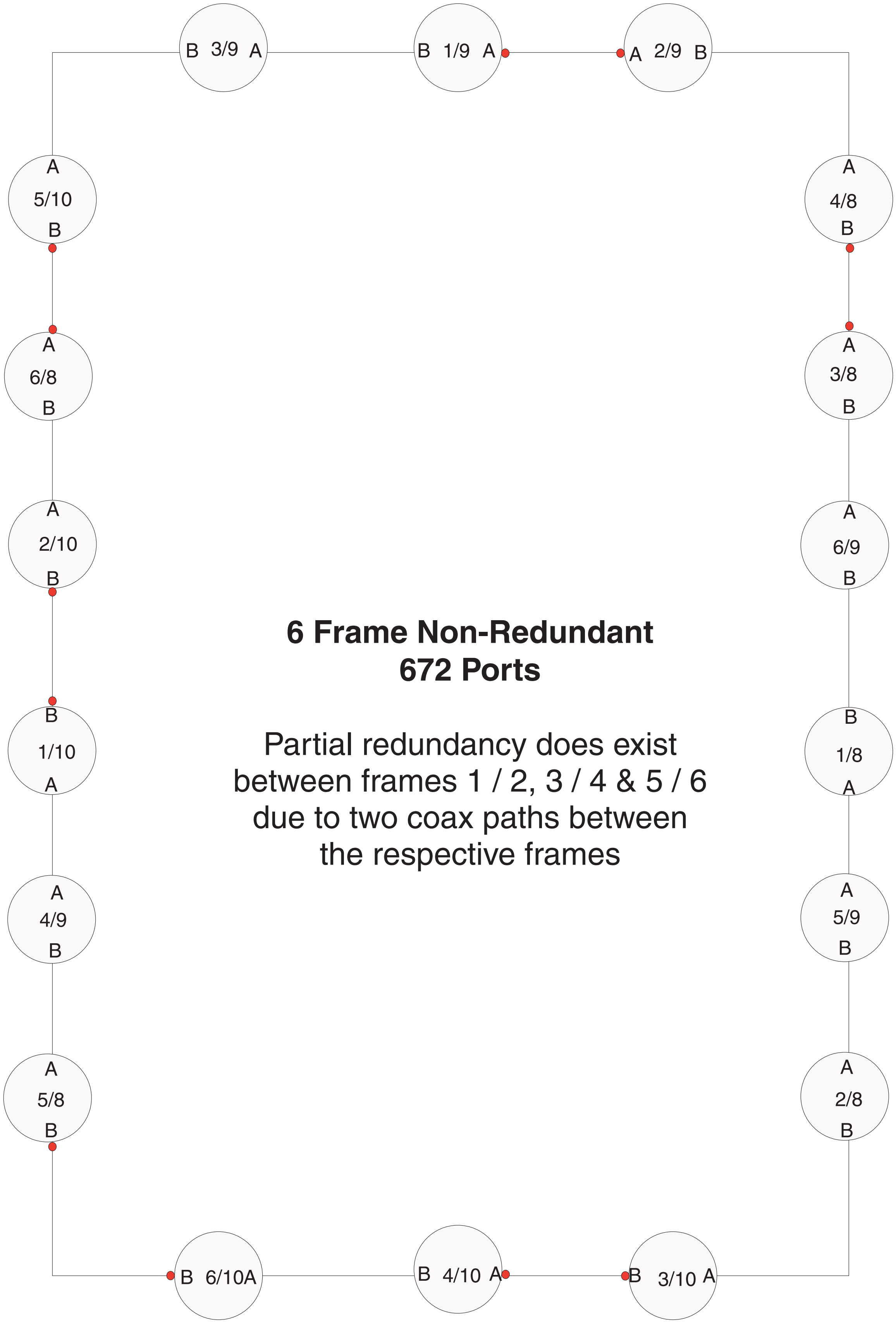




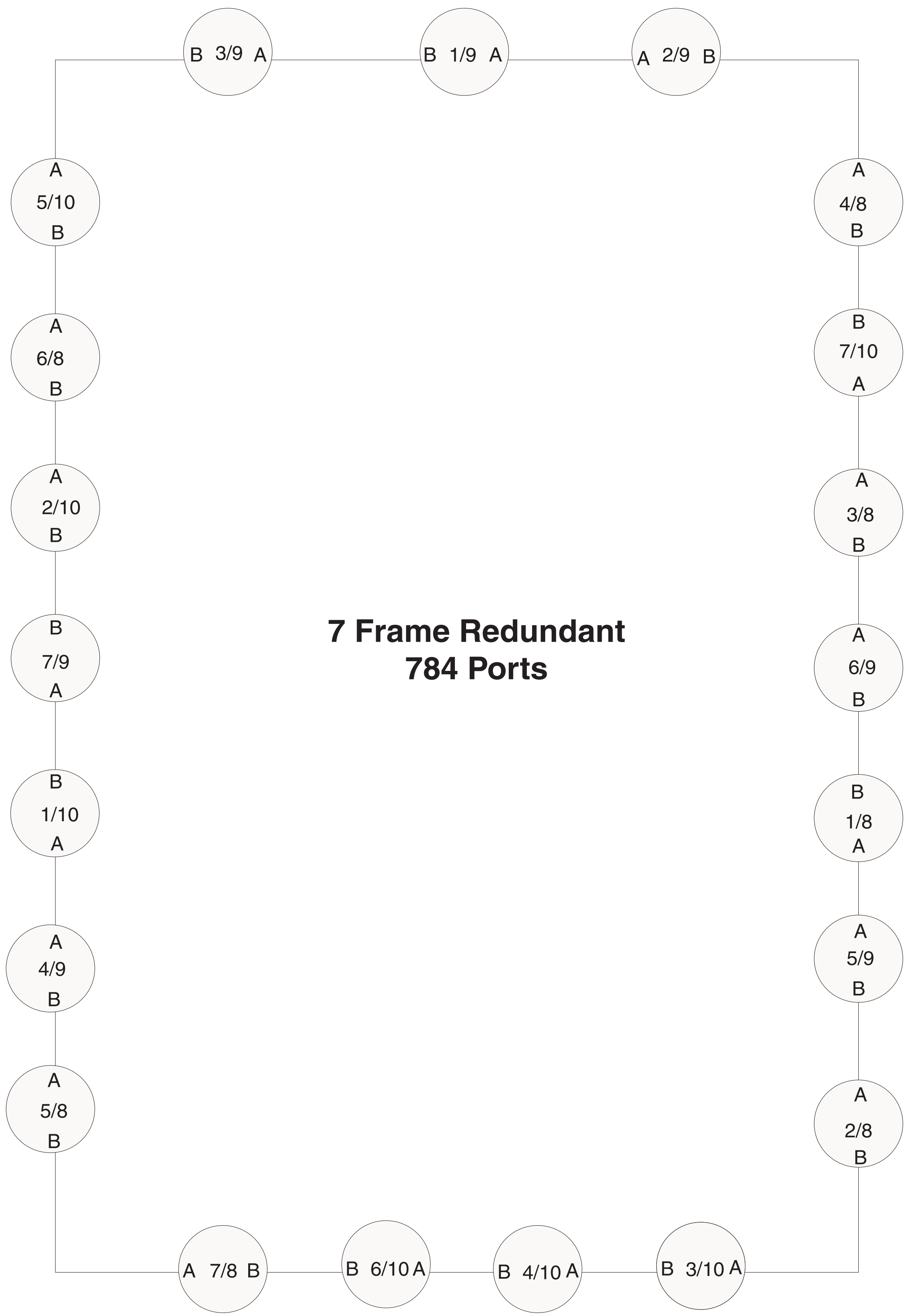
ADAM DBX LINK MAPPING



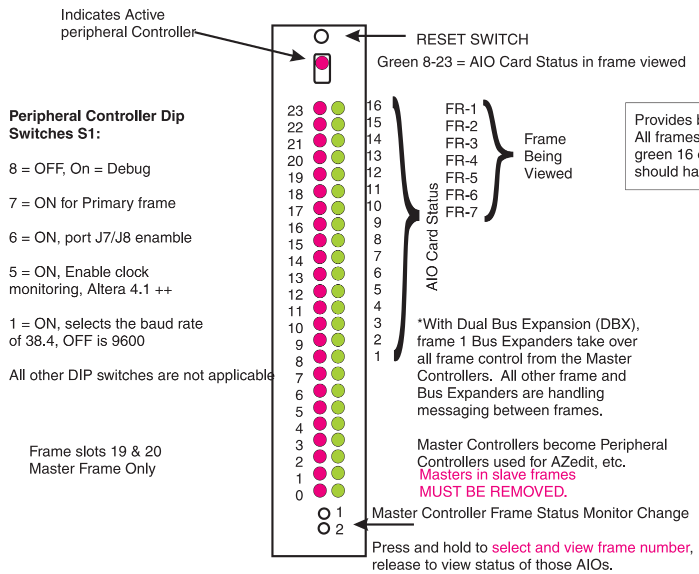
ADAM DBX LINK MAPPING



ADAM DBX LINK MAPPING

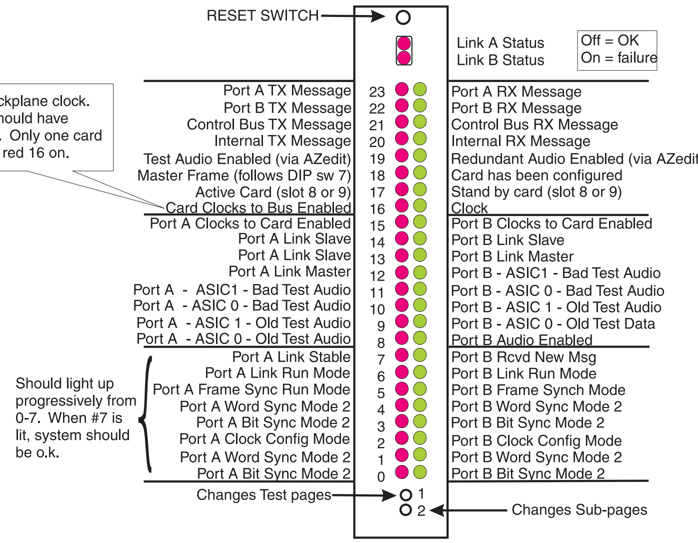


Dual Bus Expander (DBX) LED Diagnostics



Peripheral Controller
Status Display
ver 10.x Master Controller Firmware
was old Master Controller Card

Page 1 (power up default) will always have LEDs 13 or 14 on as well as one #17 from either card (active or standby) in slot 9
There should never be both 13 & 14 in either green or red.



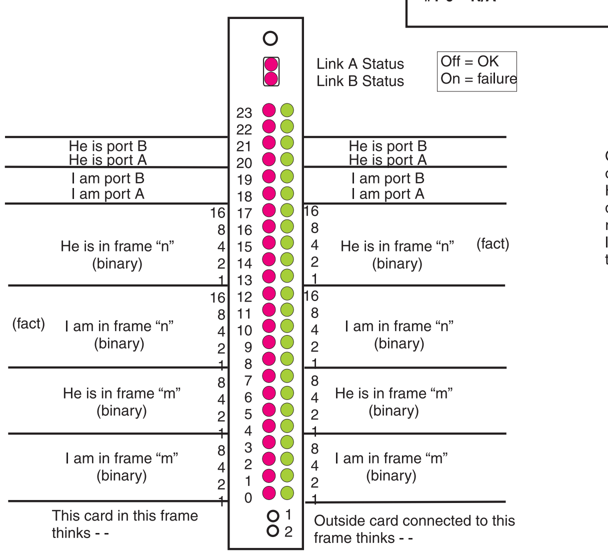
DBX Port Status Display
(page 1)

DBX DIP Switch Settings (each card)
Set DIP #7 on all DBXs as respective Master or Slave Frames

#7 ON = Master Frame, OFF = Slave Frame

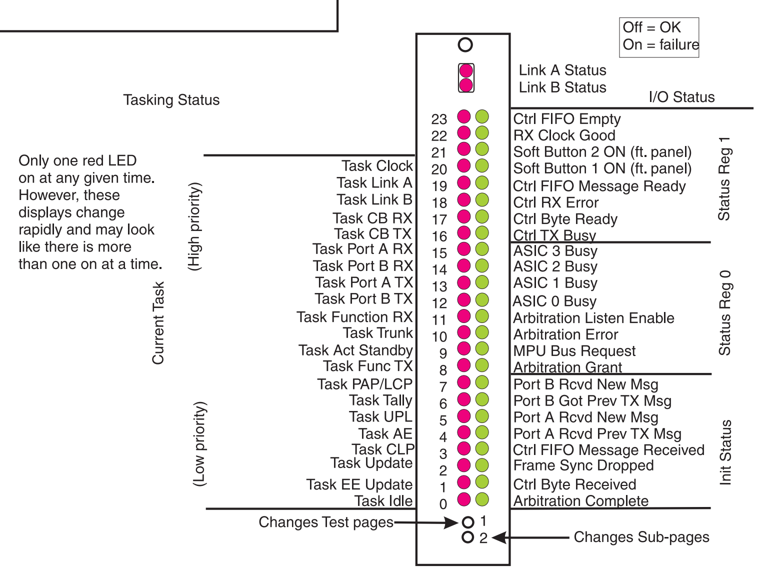
#8 ON = Debug Mode

#1-6 = N/A



DBX
Frame Wiring Problem
Diagnostic Display

"I" refers to the card that is showing this display and "He refers to the card connected to the port indicated by red LED 18 or 19.



DBX Port Status Display
(page 2)

Note: If there is a wiring problem, the DBX cards should indicate it, as they know which cards they shoul be connected to. If a problem is detected, the DBX card will halt and alternately flash the fail LEDs. The chart above will show where the miswire has occurred. However, the DBX cards cannot detect TX to TX or RX to RX miswiring.

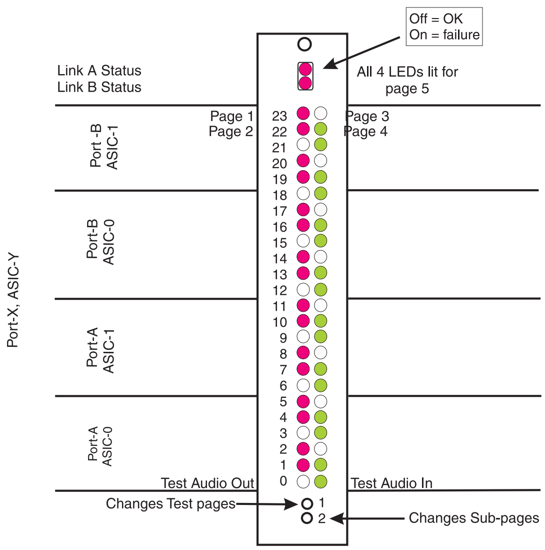
Press and hold the reset button to note the error LEDs, otherwise they will clear.

* No RED LED should be on continuously (without any other RED LEDs flashing). If it is, the DBX may have crashed and the lit RED LED will indicate which task was running when the system crashed.

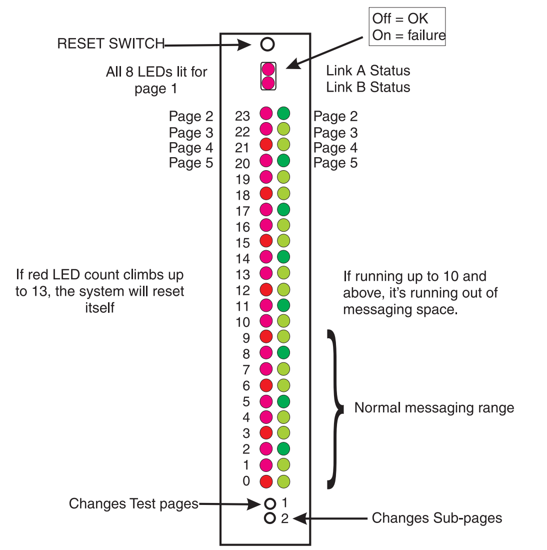
Dual Bus Expander (DBX) LED Diagnostics

Depicted in combined waterfall mode (page 5)

Bits 0-7 will not be displayed in pages 1-4



DBX Test Audio Display
(page 3)



DBX Message Queue Display
(page 4)

Red	Sub-Pages	Green
Port-A, ASIC 0 Audio Out	page 1	Port-A, ASIC 0 Audio In
Port-A, ASIC 1 Audio Out	page 2	Port-A, ASIC 1 Audio In
Port-B, ASIC 0 Audio Out	page 3	Port-B, ASIC 0 Audio In
Port-B, ASIC 1 Audio Out	page 4	Port-B, ASIC 1 Audio In
Combined Audio Out (folded)	page 5	Combined Audio In (folded)

Red	Sub-Pages	Green
Max Messages Allowed	page 1	Messages Currently in Use (real time)
Queue to Port A	page 2	Queue to Port B
Queue to Local MC	page 3	Queue to Local AIO Cards
Queue to AZedit	page 4	Queue to Command Line Protocol
Queue to PAP/LCP	page 5	Queue to This Card

Note: In the combined display, the 24 bit audio samples of each ASIC are "folded" twice, (i.e. upper 12 bits or'd with lower 12 bits, then upper 6 bits of the 12 or'd with the lower 6 bits), and displayed as 6 bits per ASIC as indicated by the legend of the right side of the above chart.

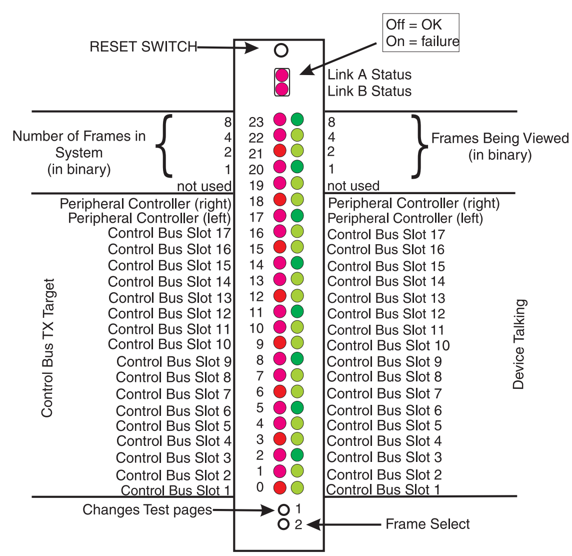
Use the bottom button to select sub-pages.
<u>Sub-page number is displayed on bits 22-23 while bottom is pressed and held in.</u>

Use the bottom button to select sub-pages.
<u>Sub-page number is displayed on bits 22-23 while bottom is pressed and held in.</u>

Control Bus TX Target is only shown when frame being viewed is your frame.

Slave frames only display its own frame. Frame 1 can display any frame in the system.

Pages 1, 3, 5 are very useful in determining link status. Links can be displayed as up on page 1 but if a control bus problem exists, that will be displayed on page 5.



DBX Card Status Display
(page 5)

2 FRAME NON-REDUNDANT DBX SYSTEM

MATRIX FRAME & AIO SLOT #	SYSTEM AIO CARD NUMBER	MATRIX PORT / DIP SWITCH TABLE - ADAM 256 KEYPANEL & TIF REAR DIP SWITCH SETTINGS (DS-4 thru DS-7) DUUU I.D.-1	UDUU I.D.-2	DDUU I.D.-3	UUDU I.D.-4	DUDU I.D.-5	UDDU I.D.-6	DDDU I.D.-7	U=up D=down UUUD I.D.-8
1-1	1	1	2	3	4	5	6	7	8
1-2	2	9	10	11	12	13	14	15	16
1-3	3	17	18	19	20	21	22	23	24
1-4	4	25	26	27	28	29	30	31	32
1-5	5	33	34	35	36	37	38	39	40
1-6	6	41	42	43	44	45	46	47	48
1-7	7	49	50	51	52	53	54	55	56
1-8	8	57	58	59	60	61	62	63	64
1-10	9	65	66	67	68	69	70	71	72
1-11	10	73	74	75	76	77	78	79	80
1-12	11	81	82	83	84	85	86	87	88
1-13	12	89	90	91	92	93	94	95	96
1-14	13	97	98	99	100	101	102	103	104
1-15	14	105	106	107	108	109	110	111	112
1-16	15	113	114	115	116	117	118	119	120
1-17	16	121	122	123	124	125	126	127	128
2-1	17	129	130	131	132	133	134	135	136
2-2	18	137	138	139	140	141	142	143	144
2-3	19	145	146	147	148	149	150	151	152
2-4	20	153	154	155	156	157	158	159	160
2-5	21	161	162	163	164	165	166	167	168
2-6	22	169	170	171	172	173	174	175	176
2-7	23	177	178	179	180	181	182	183	184
2-8	24	185	186	187	188	189	190	191	192
2-10	25	193	194	195	196	197	198	199	200
2-11	26	201	202	203	204	205	206	207	208
2-12	27	209	210	211	212	213	214	215	216
2-13	28	217	218	219	220	221	222	223	224
2-14	29	225	226	227	228	229	230	231	232
2-15	30	233	234	235	236	237	238	239	240
2-16	31	241	242	243	244	245	246	247	248
2-17	32	249	250	251	252	253	254	255	256

DBX card in frame slot 9

2 FRAME REDUNDANT DBX SYSTEM

MATRIX FRAME & AIO SLOT #	SYSTEM AIO CARD NUMBER	MATRIX PORT / DIP SWITCH TABLE - ADAM 240 KEYPANEL & TIF REAR DIP SWITCH SETTINGS (DS-4 thru DS-7) DUUU I.D.-1	UDUU I.D.-2	DDUU I.D.-3	UUDU I.D.-4	DUDU I.D.-5	UDDU I.D.-6	DDDU I.D.-7	U=up D=down UUUD I.D.-8
1-1	1	1	2	3	4	5	6	7	8
1-2	2	9	10	11	12	13	14	15	16
1-3	3	17	18	19	20	21	22	23	24
1-4	4	25	26	27	28	29	30	31	32
1-5	5	33	34	35	36	37	38	39	40
1-6	6	41	42	43	44	45	46	47	48
1-7	7	49	50	51	52	53	54	55	56
1-10	8	57	58	59	60	61	62	63	64
1-11	9	65	66	67	68	69	70	71	72
1-12	10	73	74	75	76	77	78	79	80
1-13	11	81	82	83	84	85	86	87	88
1-14	12	89	90	91	92	93	94	95	96
1-15	13	97	98	99	100	101	102	103	104
1-16	14	105	106	107	108	109	110	111	112
1-17	15	113	114	115	116	117	118	119	120
2-1	16	121	122	123	124	125	126	127	128
2-2	17	129	130	131	132	133	134	135	136
2-3	18	137	138	139	140	141	142	143	144
2-4	19	145	146	147	148	149	150	151	152
2-5	20	153	154	155	156	157	158	159	160
2-6	21	161	162	163	164	165	166	167	168
2-7	22	169	170	171	172	173	174	175	176
2-10	23	177	178	179	180	181	182	183	184
2-11	24	185	186	187	188	189	190	191	192
2-12	25	193	194	195	196	197	198	199	200
2-13	26	201	202	203	204	205	206	207	208
2-14	27	209	210	211	212	213	214	215	216
2-15	28	217	218	219	220	221	222	223	224
2-16	29	225	226	227	228	229	230	231	232
2-17	30	233	234	235	236	237	238	239	240

DBX card in frame slots 8 & 9

Yellow shaded ports not available due to Test Audio enabled
Green shading indicates presence of bus expanders

3 FRAME NON-REDUNDANT DBX SYSTEM

MATRIX FRAME & AIO SLOT #	SYSTEM AIO CARD NUMBER	MATRIX PORT / DIP SWITCH TABLE - ADAM 384 KEYPANEL & TIF REAR DIP SWITCH SETTINGS (DS-4 thru DS-7) DUUU I.D.-1	UDUU I.D.-2	DDUU I.D.-3	UUDU I.D.-4	DUDU I.D.-5	UDDU I.D.-6	DDDU I.D.-7	U=up D=down UUUD I.D.-8
1-1	1	1	2	3	4	5	6	7	8
1-2	2	9	10	11	12	13	14	15	16
1-3	3	17	18	19	20	21	22	23	24
1-4	4	25	26	27	28	29	30	31	32
1-5	5	33	34	35	36	37	38	39	40
1-6	6	41	42	43	44	45	46	47	48
1-7	7	49	50	51	52	53	54	55	56
1-8	8	57	58	59	60	61	62	63	64
1-10	9	65	66	67	68	69	70	71	72
1-11	10	73	74	75	76	77	78	79	80
1-12	11	81	82	83	84	85	86	87	88
1-13	12	89	90	91	92	93	94	95	96
1-14	13	97	98	99	100	101	102	103	104
1-15	14	105	106	107	108	109	110	111	112
1-16	15	113	114	115	116	117	118	119	120
1-17	16	121	122	123	124	125	126	127	128
2-1	17	129	130	131	132	133	134	135	136
2-2	18	137	138	139	140	141	142	143	144
2-3	19	145	146	147	148	149	150	151	152
2-4	20	153	154	155	156	157	158	159	160
2-5	21	161	162	163	164	165	166	167	168
2-6	22	169	170	171	172	173	174	175	176
2-7	23	177	178	179	180	181	182	183	184
2-8	24	185	186	187	188	189	190	191	192
2-10	25	193	194	195	196	197	198	199	200
2-11	26	201	202	203	204	205	206	207	208
2-12	27	209	210	211	212	213	214	215	216
2-13	28	217	218	219	220	221	222	223	224
2-14	29	225	226	227	228	229	230	231	232
2-15	30	233	234	235	236	237	238	239	240
2-16	31	241	242	243	244	245	246	247	248
2-17	32	249	250	251	252	253	254	255	256
3-1	33	257	258	259	260	261	262	263	264
3-2	34	265	266	267	268	269	270	271	272
3-3	35	273	274	275	276	277	278	279	280
3-4	36	281	282	283	284	285	286	287	288
3-5	37	289	290	291	292	293	294	295	296
3-6	38	297	298	299	300	301	302	303	304
3-7	39	305	306	307	308	309	310	311	312
3-8	40	313	314	315	316	317	318	319	320
3-10	41	321	322	323	324	325	326	327	328
3-11	42	329	330	331	332	333	334	335	336
3-12	43	337	338	339	340	341	342	343	344
3-13	44	345	346	347	348	349	350	351	352
3-14	45	353	354	355	356	357	358	359	360
3-15	46	361	362	363	364	365	366	367	368
3-16	47	369	370	371	372	373	374	375	376
3-17	48	377	378	379	380	381	382	383	384

DBX card in frame slot 9

yellow shaded ports not available due to Test Audio enabled.
Green shading indicates presence of bus expanders

3 FRAME REDUNDANT DBX SYSTEM

MATRIX FRAME & AIO SLOT #	SYSTEM AIO CARD NUMBER	MATRIX PORT / DIP SWITCH TABLE - ADAM 360 KEYPANEL & TIF REAR DIP SWITCH SETTINGS (DS-4 thru DS-7) DUUU I.D.-1	UDUU I.D.-2	DDUU I.D.-3	UUDU I.D.-4	DUDU I.D.-5	UDDU I.D.-6	DDDU I.D.-7	U=up D=down UUUD I.D.-8
1-1	1	1	2	3	4	5	6	7	8
1-2	2	9	10	11	12	13	14	15	16
1-3	3	17	18	19	20	21	22	23	24
1-4	4	25	26	27	28	29	30	31	32
1-5	5	33	34	35	36	37	38	39	40
1-6	6	41	42	43	44	45	46	47	48
1-7	7	49	50	51	52	53	54	55	56
1-10	8	57	58	59	60	61	62	63	64
1-11	9	65	66	67	68	69	70	71	72
1-12	10	73	74	75	76	77	78	79	80
1-13	11	81	82	83	84	85	86	87	88
1-14	12	89	90	91	92	93	94	95	96
1-15	13	97	98	99	100	101	102	103	104
1-16	14	105	106	107	108	109	110	111	112
1-17	15	113	114	115	116	117	118	119	120
2-1	16	121	122	123	124	125	126	127	128
2-2	17	129	130	131	132	133	134	135	136
2-3	18	137	138	139	140	141	142	143	144
2-4	19	145	146	147	148	149	150	151	152
2-5	20	153	154	155	156	157	158	159	160
2-6	21	161	162	163	164	165	166	167	168
2-7	22	169	170	171	172	173	174	175	176
2-10	23	177	178	179	180	181	182	183	184
2-11	24	185	186	187	188	189	190	191	192
2-12	25	193	194	195	196	197	198	199	200
2-13	26	201	202	203	204	205	206	207	208
2-14	27	209	210	211	212	213	214	215	216
2-15	28	217	218	219	220	221	222	223	224
2-16	29	225	226	227	228	229	230	231	232
2-17	30	233	234	235	236	237	238	239	240
3-1	31	241	242	243	244	245	246	247	248
3-2	32	249	250	251	252	253	254	255	256
3-3	33	257	258	259	260	261	262	263	264
3-4	34	265	266	267	268	269	270	271	272
3-5	35	273	274	275	276	277	278	279	280
3-6	36	281	282	283	284	285	286	287	288
3-7	37	289	290	291	292	293	294	295	296
3-10	38	297	298	299	300	301	302	303	304
3-11	39	305	306	307	308	309	310	311	312
3-12	40	313	314	315	316	317	318	319	320
3-13	41	321	322	323	324	325	326	327	328
3-14	42	329	330	331	332	333	334	335	336
3-15	43	337	338	339	340	341	342	343	344
3-16	44	345	346	347	348	349	350	351	352
3-17	45	353	354	355	356	357	358	359	360

DBX cards in frame slots 8 & 9

4 FRAME NON-REDUNDANT DBX SYSTEM

MATRIX FRAME & AIO SLOT #	SYSTEM AIO CARD NUMBER	MATRIX PORT / DIP SWITCH TABLE - ADAM 480							U=up D=down
		KEYPANEL & TIF REAR DIP SWITCH SETTINGS (DS-4 thru DS-7)							
		DUUU	UDUU	DDUU	UUDU	DUDU	UDDU	DDDU	UUUD
		I.D.-1	I.D.-2	I.D.-3	I.D.-4	I.D.-5	I.D.-6	I.D.-7	I.D.-8
1-1	1	1	2	3	4	5	6	7	8
1-2	2	9	10	11	12	13	14	15	16
1-3	3	17	18	19	20	21	22	23	24
1-4	4	25	26	27	28	29	30	31	32
1-5	5	33	34	35	36	37	38	39	40
1-6	6	41	42	43	44	45	46	47	48
1-7	7	49	50	51	52	53	54	55	56
1-10	8	57	58	59	60	61	62	63	64
1-11	9	65	66	67	68	69	70	71	72
1-12	10	73	74	75	76	77	78	79	80
1-13	11	81	82	83	84	85	86	87	88
1-14	12	89	90	91	92	93	94	95	96
1-15	13	97	98	99	100	101	102	103	104
1-16	14	105	106	107	108	109	110	111	112
1-17	15	113	114	115	116	117	118	119	120
2-1	16	121	122	123	124	125	126	127	128
2-2	17	129	130	131	132	133	134	135	136
2-3	18	137	138	139	140	141	142	143	144
2-4	19	145	146	147	148	149	150	151	152
2-5	20	153	154	155	156	157	158	159	160
2-6	21	161	162	163	164	165	166	167	168
2-7	22	169	170	171	172	173	174	175	176
2-10	23	177	178	179	180	181	182	183	184
2-11	24	185	186	187	188	189	190	191	192
2-12	25	193	194	195	196	197	198	199	200
2-13	26	201	202	203	204	205	206	207	208
2-14	27	209	210	211	212	213	214	215	216
2-15	28	217	218	219	220	221	222	223	224
2-16	29	225	226	227	228	229	230	231	232
2-17	30	233	234	235	236	237	238	239	240

MATRIX FRAME & AIO SLOT #	SYSTEM AIO CARD NUMBER	MATRIX PORT / DIP SWITCH TABLE - ADAM 480							U=up D=down
		KEYPANEL & TIF REAR DIP SWITCH SETTINGS (DS-4 thru DS-7)							
		DUUU	UDUU	DDUU	UUDU	DUDU	UDDU	DDDU	UUUD
		I.D.-1	I.D.-2	I.D.-3	I.D.-4	I.D.-5	I.D.-6	I.D.-7	I.D.-8
3-1	31	241	242	243	244	245	246	247	248
3-2	32	249	250	251	252	253	254	255	256
3-3	33	257	258	259	260	261	262	263	264
3-4	34	265	266	267	268	269	270	271	272
3-5	35	273	274	275	276	277	278	279	280
3-6	36	281	282	283	284	285	286	287	288
3-7	37	289	290	291	292	293	294	295	296
3-10	38	297	298	299	300	301	302	303	304
3-11	39	305	306	307	308	309	310	311	312
3-12	40	313	314	315	316	317	318	319	320
3-13	41	321	322	323	324	325	326	327	328
3-14	42	329	330	331	332	333	334	335	336
3-15	43	337	338	339	340	341	342	343	344
3-16	44	345	346	347	348	349	350	351	352
3-17	45	353	354	355	356	357	358	359	360
4-1	46	361	362	363	364	365	366	367	368
4-2	47	369	370	371	372	373	374	375	376
4-3	48	377	378	379	380	381	382	383	384
4-4	49	385	386	387	388	389	390	391	392
4-5	50	393	394	395	396	397	398	399	400
4-6	51	401	402	403	404	405	406	407	408
4-7	52	409	410	411	412	413	414	415	416
4-10	53	417	418	419	420	421	422	423	424
4-11	54	425	426	427	428	429	430	431	432
4-12	55	433	434	435	436	437	438	439	440
4-13	56	441	442	443	444	445	446	447	448
4-14	57	449	450	451	452	453	454	455	456
4-15	58	457	458	459	460	461	462	463	464
4-16	59	465	466	467	468	469	470	471	472
4-17	60	473	474	475	476	477	478	479	480

Green shading indicates presence of bus expanders DBX cards in frame slots 8 & 9

4 FRAME REDUNDANT DBX SYSTEM

MATRIX FRAME & AIO SLOT #	SYSTEM AIO CARD NUMBER	MATRIX PORT / DIP SWITCH TABLE - ADAM 448 KEYPANEL & TIF REAR DIP SWITCH SETTINGS (DS-4 thru DS-7) DUUU I.D-1	UDUU I.D-2	DDUU I.D-3	UUDU I.D-4	DUDU I.D-5	UDDU I.D-6	DDDU I.D-7	U=up D=down UUUD I.D-8
1-1	1	1	2	3	4	5	6	7	8
1-2	2	9	10	11	12	13	14	15	16
1-3	3	17	18	19	20	21	22	23	24
1-4	4	25	26	27	28	29	30	31	32
1-5	5	33	34	35	36	37	38	39	40
1-6	6	41	42	43	44	45	46	47	48
1-7	7	49	50	51	52	53	54	55	56
1-11	8	57	58	59	60	61	62	63	64
1-12	9	65	66	67	68	69	70	71	72
1-13	10	73	74	75	76	77	78	79	80
1-14	11	81	82	83	84	85	86	87	88
1-15	12	89	90	91	92	93	94	95	96
1-16	13	97	98	99	100	101	102	103	104
1-17	14	105	106	107	108	109	110	111	112
2-1	15	113	114	115	116	117	118	119	120
2-2	16	121	122	123	124	125	126	127	128
2-3	17	129	130	131	132	133	134	135	136
2-4	18	137	138	139	140	141	142	143	144
2-5	19	145	146	147	148	149	150	151	152
2-6	20	153	154	155	156	157	158	159	160
2-7	21	161	162	163	164	165	166	167	168
2-11	22	169	170	171	172	173	174	175	176
2-12	23	177	178	179	180	181	182	183	184
2-13	24	185	186	187	188	189	190	191	192
2-14	25	193	194	195	196	197	198	199	200
2-15	26	201	202	203	204	205	206	207	208
2-16	27	209	210	211	212	213	214	215	216
2-17	28	217	218	219	220	221	222	223	224

MATRIX FRAME & AIO SLOT #	SYSTEM AIO CARD NUMBER	MATRIX PORT / DIP SWITCH TABLE - ADAM 448 KEYPANEL & TIF REAR DIP SWITCH SETTINGS (DS-4 thru DS-7) DUUU I.D-1	UDUU I.D-2	DDUU I.D-3	UUDU I.D-4	DUDU I.D-5	UDDU I.D-6	DDDU I.D-7	U=up D=down UUUD I.D-8
3-1	29	225	226	227	228	229	230	231	232
3-2	30	233	234	235	236	237	238	239	240
3-3	31	241	242	243	244	245	246	247	248
3-4	32	249	250	251	252	253	254	255	256
3-5	33	257	258	259	260	261	262	263	264
3-6	34	265	266	267	268	269	270	271	272
3-7	35	273	274	275	276	277	278	279	280
3-11	36	281	282	283	284	285	286	287	288
3-12	37	289	290	291	292	293	294	295	296
3-13	38	297	298	299	300	301	302	303	304
3-14	39	305	306	307	308	309	310	311	312
3-15	40	313	314	315	316	317	318	319	320
3-16	41	321	322	323	324	325	326	327	328
3-17	42	329	330	331	332	333	334	335	336
4-1	43	337	338	339	340	341	342	343	344
4-2	44	345	346	347	348	349	350	351	352
4-3	45	353	354	355	356	357	358	359	360
4-4	46	361	362	363	364	365	366	367	368
4-5	47	369	370	371	372	373	374	375	376
4-6	48	377	378	379	380	381	382	383	384
4-7	49	385	386	387	388	389	390	391	392
4-11	50	393	394	395	396	397	398	399	400
4-12	51	401	402	403	404	405	406	407	408
4-13	52	409	410	411	412	413	414	415	416
4-14	53	417	418	419	420	421	422	423	424
4-15	54	425	426	427	428	429	430	431	432
4-16	55	433	434	435	436	437	438	439	440
4-17	56	441	442	443	444	445	446	447	448

DBX cards in frame slots 8, 9 & 10

Green shading indicates presence of bus expanders

5 FRAME NON-REDUNDANT DBX SYSTEM

MATRIX FRAME & AIO SLOT #	SYSTEM AIO CARD NUMBER	MATRIX PORT / DIP SWITCH TABLE - ADAM 600 KEYPANEL & TIF REAR DIP SWITCH SETTINGS (DS-4 thru DS-7)							U=up D=down
		DUUU	UDUU	DDUU	UUDU	DUDU	UDDU	DDDU	UUUD
		I.D.-1	I.D.-2	I.D.-3	I.D.-4	I.D.-5	I.D.-6	I.D.-7	I.D.-8
1-1	1	1	2	3	4	5	6	7	8
1-2	2	9	10	11	12	13	14	15	16
1-3	3	17	18	19	20	21	22	23	24
1-4	4	25	26	27	28	29	30	31	32
1-5	5	33	34	35	36	37	38	39	40
1-6	6	41	42	43	44	45	46	47	48
1-7	7	49	50	51	52	53	54	55	56
1-10	8	57	58	59	60	61	62	63	64
1-11	9	65	66	67	68	69	70	71	72
1-12	10	73	74	75	76	77	78	79	80
1-13	11	81	82	83	84	85	86	87	88
1-14	12	89	90	91	92	93	94	95	96
1-15	13	97	98	99	100	101	102	103	104
1-16	14	105	106	107	108	109	110	111	112
1-17	15	113	114	115	116	117	118	119	120
2-1	16	121	122	123	124	125	126	127	128
2-2	17	129	130	131	132	133	134	135	136
2-3	18	137	138	139	140	141	142	143	144
2-4	19	145	146	147	148	149	150	151	152
2-5	20	153	154	155	156	157	158	159	160
2-6	21	161	162	163	164	165	166	167	168
2-7	22	169	170	171	172	173	174	175	176
2-10	23	177	178	179	180	181	182	183	184
2-11	24	185	186	187	188	189	190	191	192
2-12	25	193	194	195	196	197	198	199	200
2-13	26	201	202	203	204	205	206	207	208
2-14	27	209	210	211	212	213	214	215	216
2-15	28	217	218	219	220	221	222	223	224
2-16	29	225	226	227	228	229	230	231	232
2-17	30	233	234	235	236	237	238	239	240
3-1	31	241	242	243	244	245	246	247	248
3-2	32	249	250	251	252	253	254	255	256
3-3	33	257	258	259	260	261	262	263	264
3-4	34	265	266	267	268	269	270	271	272
3-5	35	273	274	275	276	277	278	279	280
3-6	36	281	282	283	284	285	286	287	288
3-7	37	289	290	291	292	293	294	295	296
3-10	38	297	298	299	300	301	302	303	304
3-11	39	305	306	307	308	309	310	311	312
3-12	40	313	314	315	316	317	318	319	320
3-13	41	321	322	323	324	325	326	327	328
3-14	42	329	330	331	332	333	334	335	336
3-15	43	337	338	339	340	341	342	343	344
3-16	44	345	346	347	348	349	350	351	352
3-17	45	353	354	355	356	357	358	359	360

MATRIX FRAME & AIO SLOT #	SYSTEM AIO CARD NUMBER	MATRIX PORT / DIP SWITCH TABLE - ADAM 600 KEYPANEL & TIF REAR DIP SWITCH SETTINGS (DS-4 thru DS-7)							U=up D=down
		DUUU	UDUU	DDUU	UUDU	DUDU	UDDU	DDDU	UUUD
		I.D.-1	I.D.-2	I.D.-3	I.D.-4	I.D.-5	I.D.-6	I.D.-7	I.D.-8
4-1	46	361	362	363	364	365	366	367	368
4-2	47	369	370	371	372	373	374	375	376
4-3	48	377	378	379	380	381	382	383	384
4-4	49	385	386	387	388	389	390	391	392
4-5	50	393	394	395	396	397	398	399	400
4-6	51	401	402	403	404	405	406	407	408
4-7	52	409	410	411	412	413	414	415	416
4-10	53	417	418	419	420	421	422	423	424
4-11	54	425	426	427	428	429	430	431	432
4-12	55	433	434	435	436	437	438	439	440
4-13	56	441	442	443	444	445	446	447	448
4-14	57	449	450	451	452	453	454	455	456
4-15	58	457	458	459	460	461	462	463	464
4-16	59	465	466	467	468	469	470	471	472
4-17	60	473	474	475	476	477	478	479	480
5-1	61	481	482	483	484	485	486	487	488
5-2	62	489	490	491	492	493	494	495	496
5-3	63	497	498	499	500	501	502	503	504
5-4	64	505	506	507	508	509	510	511	512
5-5	65	513	514	515	516	517	518	519	520
5-6	66	521	522	523	524	525	526	527	528
5-7	67	529	530	531	532	533	534	535	536
5-10	68	537	538	539	540	541	542	543	544
5-11	69	545	546	547	548	549	550	551	552
5-12	70	553	554	555	556	557	558	559	560
5-13	71	561	562	563	564	565	566	567	568
5-14	72	569	570	571	572	573	574	575	576
5-15	73	577	578	579	580	581	582	583	584
5-16	74	585	586	587	588	589	590	591	592
5-17	75	593	594	595	596	597	598	599	600

DBX cards in frame slots 8 & 9

Green shading indicates presence of bus expanders

5 FRAME REDUNDANT DBX SYSTEM

MATRIX FRAME & AIO SLOT #	SYSTEM AIO CARD NUMBER	MATRIX PORT / DIP SWITCH TABLE - ADAM 520							U=up D=down
		KEYPANEL & TIF REAR DIP SWITCH SETTINGS (DS-4 thru DS-7)							
		DUUU	UDUU	DDUU	UUDU	DUDU	UDDU	DDDU	UUUD
		I.D.-1	I.D.-2	I.D.-3	I.D.-4	I.D.-5	I.D.-6	I.D.-7	I.D.-8
1-1	1	1	2	3	4	5	6	7	8
1-2	2	9	10	11	12	13	14	15	16
1-3	3	17	18	19	20	21	22	23	24
1-4	4	25	26	27	28	29	30	31	32
1-5	5	33	34	35	36	37	38	39	40
1-6	6	41	42	43	44	45	46	47	48
1-11	7	49	50	51	52	53	54	55	56
1-12	8	57	58	59	60	61	62	63	64
1-13	9	65	66	67	68	69	70	71	72
1-14	10	73	74	75	76	77	78	79	80
1-15	11	81	82	83	84	85	86	87	88
1-16	12	89	90	91	92	93	94	95	96
1-17	13	97	98	99	100	101	102	103	104
2-1	14	105	106	107	108	109	110	111	112
2-2	15	113	114	115	116	117	118	119	120
2-3	16	121	122	123	124	125	126	127	128
2-4	17	129	130	131	132	133	134	135	136
2-5	18	137	138	139	140	141	142	143	144
2-6	19	145	146	147	148	149	150	151	152
2-11	20	153	154	155	156	157	158	159	160
2-12	21	161	162	163	164	165	166	167	168
2-13	22	169	170	171	172	173	174	175	176
2-14	23	177	178	179	180	181	182	183	184
2-15	24	185	186	187	188	189	190	191	192
2-16	25	193	194	195	196	197	198	199	200
2-17	26	201	202	203	204	205	206	207	208
3-1	27	209	210	211	212	213	214	215	216
3-2	28	217	218	219	220	221	222	223	224
3-3	29	225	226	227	228	229	230	231	232
3-4	30	233	234	235	236	237	238	239	240
3-5	31	241	242	243	244	245	246	247	248
3-6	32	249	250	251	252	253	254	255	256
3-11	33	257	258	259	260	261	262	263	264
3-12	34	265	266	267	268	269	270	271	272
3-13	35	273	274	275	276	277	278	279	280
3-14	36	281	282	283	284	285	286	287	288
3-15	37	289	290	291	292	293	294	295	296
3-16	38	297	298	299	300	301	302	303	304
3-17	39	305	306	307	308	309	310	311	312

MATRIX FRAME & AIO SLOT #	SYSTEM AIO CARD NUMBER	MATRIX PORT / DIP SWITCH TABLE - ADAM 520							U=up D=down
		KEYPANEL & TIF REAR DIP SWITCH SETTINGS (DS-4 thru DS-7)							
		DUUU	UDUU	DDUU	UUDU	DUDU	UDDU	DDDU	UUUD
		I.D.-1	I.D.-2	I.D.-3	I.D.-4	I.D.-5	I.D.-6	I.D.-7	I.D.-8
4-1	40	313	314	315	316	317	318	319	320
4-2	41	321	322	323	324	325	326	327	328
4-3	42	329	330	331	332	333	334	335	336
4-4	43	337	338	339	340	341	342	343	344
4-5	44	345	346	347	348	349	350	351	352
4-6	45	353	354	355	356	357	358	359	360
4-11	46	361	362	363	364	365	366	367	368
4-12	47	369	370	371	372	373	374	375	376
4-13	48	377	378	379	380	381	382	383	384
4-14	49	385	386	387	388	389	390	391	392
4-15	50	393	394	395	396	397	398	399	400
4-16	51	401	402	403	404	405	406	407	408
4-17	52	409	410	411	412	413	414	415	416
5-1	53	417	418	419	420	421	422	423	424
5-2	54	425	426	427	428	429	430	431	432
5-3	55	433	434	435	436	437	438	439	440
5-4	56	441	442	443	444	445	446	447	448
5-5	57	449	450	451	452	453	454	455	456
5-6	58	457	458	459	460	461	462	463	464
5-11	59	465	466	467	468	469	470	471	472
5-12	60	473	474	475	476	477	478	479	480
5-13	61	481	482	483	484	485	486	487	488
5-14	62	489	490	491	492	493	494	495	496
5-15	63	497	498	499	500	501	502	503	504
5-16	64	505	506	507	508	509	510	511	512
5-17	65	513	514	515	516	517	518	519	520

DBX cards in frame slots 7, 8, 9, & 10
Green shading indicates presence of bus expanders

6 FRAME NON-REDUNDANT DBX SYSTEM

MATRIX FRAME & AIO SLOT #	SYSTEM AIO CARD NUMBER	MATRIX PORT / DIP SWITCH TABLE - ADAM 672 KEYPANEL & TIF REAR DIP SWITCH SETTINGS (DS-4 thru DS-7) DUUU I.D.-1	UDUU I.D.-2	DDUU I.D.-3	UUDU I.D.-4	DUDU I.D.-5	UDDU I.D.-6	DDDU I.D.-7	U=up D=down UUUD I.D.-8
1-1	1	1	2	3	4	5	6	7	8
1-2	2	9	10	11	12	13	14	15	16
1-3	3	17	18	19	20	21	22	23	24
1-4	4	25	26	27	28	29	30	31	32
1-5	5	33	34	35	36	37	38	39	40
1-6	6	41	42	43	44	45	46	47	48
1-7	7	49	50	51	52	53	54	55	56
1-11	8	57	58	59	60	61	62	63	64
1-12	9	65	66	67	68	69	70	71	72
1-13	10	73	74	75	76	77	78	79	80
1-14	11	81	82	83	84	85	86	87	88
1-15	12	89	90	91	92	93	94	95	96
1-16	13	97	98	99	100	101	102	103	104
1-17	14	105	106	107	108	109	110	111	112
2-1	15	113	114	115	116	117	118	119	120
2-1	16	121	122	123	124	125	126	127	128
2-3	17	129	130	131	132	133	134	135	136
2-4	18	137	138	139	140	141	142	143	144
2-5	19	145	146	147	148	149	150	151	152
2-6	20	153	154	155	156	157	158	159	160
2-7	21	161	162	163	164	165	166	167	168
2-11	22	169	170	171	172	173	174	175	176
2-12	23	177	178	179	180	181	182	183	184
2-13	24	185	186	187	188	189	190	191	192
2-14	25	193	194	195	196	197	198	199	200
2-15	26	201	202	203	204	205	206	207	208
2-16	27	209	210	211	212	213	214	215	216
2-17	28	217	218	219	220	221	222	223	224
3-1	29	225	226	227	228	229	230	231	232
3-2	30	233	234	235	236	237	238	239	240
3-3	31	241	242	243	244	245	246	247	248
3-4	32	249	250	251	252	253	254	255	256
3-5	33	257	258	259	260	261	262	263	264
3-6	34	265	266	267	268	269	270	271	272
3-7	35	273	274	275	276	277	278	279	280
3-11	36	281	282	283	284	285	286	287	288
3-12	37	289	290	291	292	293	294	295	296
3-13	38	297	298	299	300	301	302	303	304
3-14	39	305	306	307	308	309	310	311	312
3-15	40	313	314	315	316	317	318	319	320
3-16	41	321	322	323	324	325	326	327	328
3-17	42	329	330	331	332	333	334	335	336

Green shading indicates presence of bus expanders

MATRIX FRAME & AIO SLOT #	SYSTEM AIO CARD NUMBER	MATRIX PORT / DIP SWITCH TABLE - ADAM 672 KEYPANEL & TIF REAR DIP SWITCH SETTINGS (DS-4 thru DS-7) DUUU I.D.-1	UDUU I.D.-2	DDUU I.D.-3	UUDU I.D.-4	DUDU I.D.-5	UDDU I.D.-6	DDDU I.D.-7	U=up D=down UUUD I.D.-8
4-1	43	337	338	339	340	341	342	343	344
4-2	44	345	346	347	348	349	350	351	352
4-3	45	353	354	355	356	357	358	359	360
4-4	46	361	362	363	364	365	366	367	368
4-5	47	369	370	371	372	373	374	375	376
4-6	48	377	378	379	380	381	382	383	384
4-7	49	385	386	387	388	389	390	391	392
4-11	50	393	394	395	396	397	398	399	400
4-12	51	401	402	403	404	405	406	407	408
4-13	52	409	410	411	412	413	414	415	416
4-14	53	417	418	419	420	421	422	423	424
4-15	54	425	426	427	428	429	430	431	432
4-16	55	433	434	435	436	437	438	439	440
4-17	56	441	442	443	444	445	446	447	448
5-1	57	449	450	451	452	453	454	455	456
5-2	58	457	458	459	460	461	462	463	464
5-3	59	465	466	467	468	469	470	471	472
5-4	60	473	474	475	476	477	478	479	480
5-5	61	481	482	483	484	485	486	487	488
5-6	62	489	490	491	492	493	494	495	496
5-7	63	497	498	499	500	501	502	503	504
5-11	64	505	506	507	508	509	510	511	512
5-12	65	513	514	515	516	517	518	519	520
5-13	66	521	522	523	524	525	526	527	528
5-14	67	529	530	531	532	533	534	535	536
5-15	68	537	538	539	540	541	542	543	544
5-16	69	545	546	547	548	549	550	551	552
5-17	70	553	554	555	556	557	558	559	560
6-1	71	561	562	563	564	565	566	567	568
6-2	72	569	570	571	572	573	574	575	576
6-3	73	577	578	579	580	581	582	583	584
6-4	74	585	586	587	588	589	590	591	592
6-5	75	593	594	595	596	597	598	599	600
6-6	76	601	602	603	604	605	606	607	608
6-7	77	609	610	611	612	613	614	615	616
6-11	78	617	618	619	620	621	622	623	624
6-12	79	625	626	627	628	629	630	631	632
6-13	80	633	634	635	636	637	638	639	640
6-14	81	641	642	643	644	645	646	647	648
6-15	82	649	650	651	652	653	654	655	656
6-16	83	657	658	659	660	661	662	663	664
6-17	84	665	666	667	668	669	670	671	672

DBX cards in frame slots 8, 9, & 10

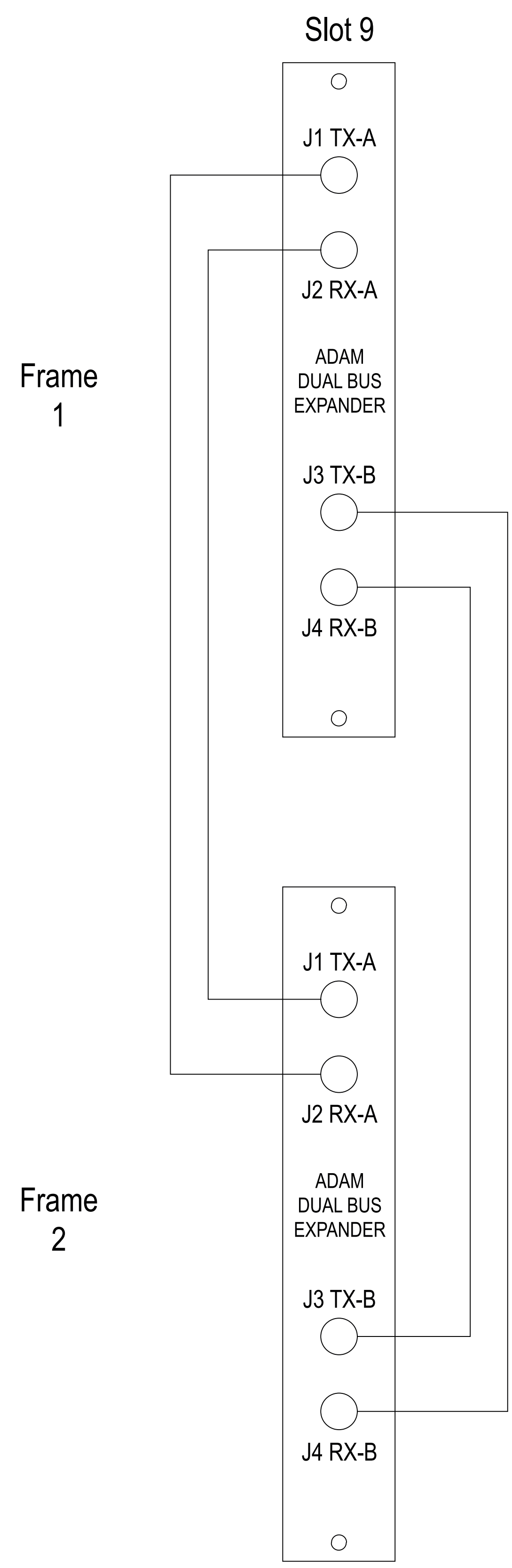
7 FRAME NON-REDUNDANT DBX SYSTEM

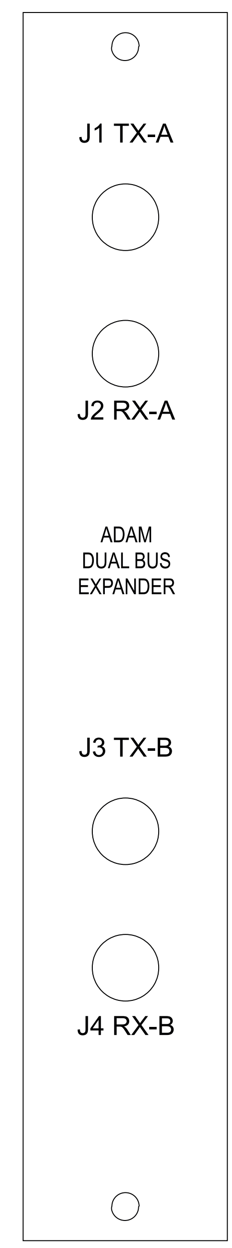
MATRIX FRAME & AIO	SYSTEM AIO CARD	MATRIX PORT / DIP SWITCH TABLE - ADAM 784							U=up
		KEYPANEL & TIF REAR DIP SWITCH SETTINGS (DS-4 thru DS-7)							D=down
		DUUU	UDUU	DDUU	UUDU	DUDU	UDDU	DDDU	UUUD
SLOT #	NUMBER	I.D.-1	I.D.-2	I.D.-3	I.D.-4	I.D.-5	I.D.-6	I.D.-7	I.D.-8
1-1	1	1	2	3	4	5	6	7	8
1-2	2	9	10	11	12	13	14	15	16
1-3	3	17	18	19	20	21	22	23	24
1-4	4	25	26	27	28	29	30	31	32
1-5	5	33	34	35	36	37	38	39	40
1-6	6	41	42	43	44	45	46	47	48
1-7	7	49	50	51	52	53	54	55	56
1-11	8	57	58	59	60	61	62	63	64
1-12	9	65	66	67	68	69	70	71	72
1-13	10	73	74	75	76	77	78	79	80
1-14	11	81	82	83	84	85	86	87	88
1-15	12	89	90	91	92	93	94	95	96
1-16	13	97	98	99	100	101	102	103	104
1-17	14	105	106	107	108	109	110	111	112
2-1	15	113	114	115	116	117	118	119	120
2-1	16	121	122	123	124	125	126	127	128
2-3	17	129	130	131	132	133	134	135	136
2-4	18	137	138	139	140	141	142	143	144
2-5	19	145	146	147	148	149	150	151	152
2-6	20	153	154	155	156	157	158	159	160
2-7	21	161	162	163	164	165	166	167	168
2-11	22	169	170	171	172	173	174	175	176
2-12	23	177	178	179	180	181	182	183	184
2-13	24	185	186	187	188	189	190	191	192
2-14	25	193	194	195	196	197	198	199	200
2-15	26	201	202	203	204	205	206	207	208
2-16	27	209	210	211	212	213	214	215	216
2-17	28	217	218	219	220	221	222	223	224
3-1	29	225	226	227	228	229	230	231	232
3-2	30	233	234	235	236	237	238	239	240
3-3	31	241	242	243	244	245	246	247	248
3-4	32	249	250	251	252	253	254	255	256
3-5	33	257	258	259	260	261	262	263	264
3-6	34	265	266	267	268	269	270	271	272
3-7	35	273	274	275	276	277	278	279	280
3-11	36	281	282	283	284	285	286	287	288
3-12	37	289	290	291	292	293	294	295	296
3-13	38	297	298	299	300	301	302	303	304
3-14	39	305	306	307	308	309	310	311	312
3-15	40	313	314	315	316	317	318	319	320
3-16	41	321	322	323	324	325	326	327	328
3-17	42	329	330	331	332	333	334	335	336
4-1	43	337	338	339	340	341	342	343	344
4-2	44	345	346	347	348	349	350	351	352
4-3	45	353	354	355	356	357	358	359	360
4-4	46	361	362	363	364	365	366	367	368
4-5	47	369	370	371	372	373	374	375	376
4-6	48	377	378	379	380	381	382	383	384
4-7	49	385	386	387	388	389	390	391	392
4-11	50	393	394	395	396	397	398	399	400

MATRIX FRAME & AIO	SYSTEM AIO CARD	MATRIX PORT / DIP SWITCH TABLE - ADAM 784							U=up
		KEYPANEL & TIF REAR DIP SWITCH SETTINGS (DS-4 thru DS-7)							D=down
		DUUU	UDUU	DDUU	UUDU	DUDU	UDDU	DDDU	UUUD
SLOT #	NUMBER	I.D.-1	I.D.-2	I.D.-3	I.D.-4	I.D.-5	I.D.-6	I.D.-7	I.D.-8
4-12	51	401	402	403	404	405	406	407	408
4-13	52	409	410	411	412	413	414	415	416
4-14	53	417	418	419	420	421	422	423	424
4-15	54	425	426	427	428	429	430	431	432
4-16	55	433	434	435	436	437	438	439	440
4-17	56	441	442	443	444	445	446	447	448
5-1	57	449	450	451	452	453	454	455	456
5-2	58	457	458	459	460	461	462	463	464
5-3	59	465	466	467	468	469	470	471	472
5-4	60	473	474	475	476	477	478	479	480
5-5	61	481	482	483	484	485	486	487	488
5-6	62	489	490	491	492	493	494	495	496
5-7	63	497	498	499	500	501	502	503	504
5-11	64	505	506	507	508	509	510	511	512
5-12	65	513	514	515	516	517	518	519	520
5-13	66	521	522	523	524	525	526	527	528
5-14	67	529	530	531	532	533	534	535	536
5-15	68	537	538	539	540	541	542	543	544
5-16	69	545	546	547	548	549	550	551	552
5-17	70	553	554	555	556	557	558	559	560
6-1	71	561	562	563	564	565	566	567	568
6-2	72	569	570	571	572	573	574	575	576
6-3	73	577	578	579	580	581	582	583	584
6-4	74	585	586	587	588	589	590	591	592
6-5	75	593	594	595	596	597	598	599	600
6-6	76	601	602	603	604	605	606	607	608
6-7	77	609	610	611	612	613	614	615	616
6-11	78	617	618	619	620	621	622	623	624
6-12	79	625	626	627	628	629	630	631	632
6-13	80	633	634	635	636	637	638	639	640
6-14	81	641	642	643	644	645	646	647	648
6-15	82	649	650	651	652	653	654	655	656
6-16	83	657	658	659	660	661	662	663	664
6-17	84	665	666	667	668	669	670	671	672
7-1	85	673	674	675	676	677	678	679	680
7-2	86	681	682	683	684	685	686	687	688
7-3	87	689	690	691	692	693	694	695	696
7-4	88	697	698	699	700	701	702	703	704
7-5	89	705	706	707	708	709	710	711	712
7-6	90	713	714	715	716	717	718	719	720
7-7	91	721	722	723	724	725	726	727	728
7-11	92	729	730	731	732	733	734	735	736
7-12	93	737	738	739	740	741	742	743	744
7-13	94	745	746	747	748	749	750	751	752
7-14	95	753	754	755	756	757	758	759	760
7-15	96	761	762	763	764	765	766	767	768
7-16	97	769	770	771	772	773	774	775	776
7-17	98	777	778	779	780	781	782	783	784

Green shading indicates presence of bus expanders
DBX cards in frame slots 8, 9, & 10

ADAM DBX Coax Interconnect



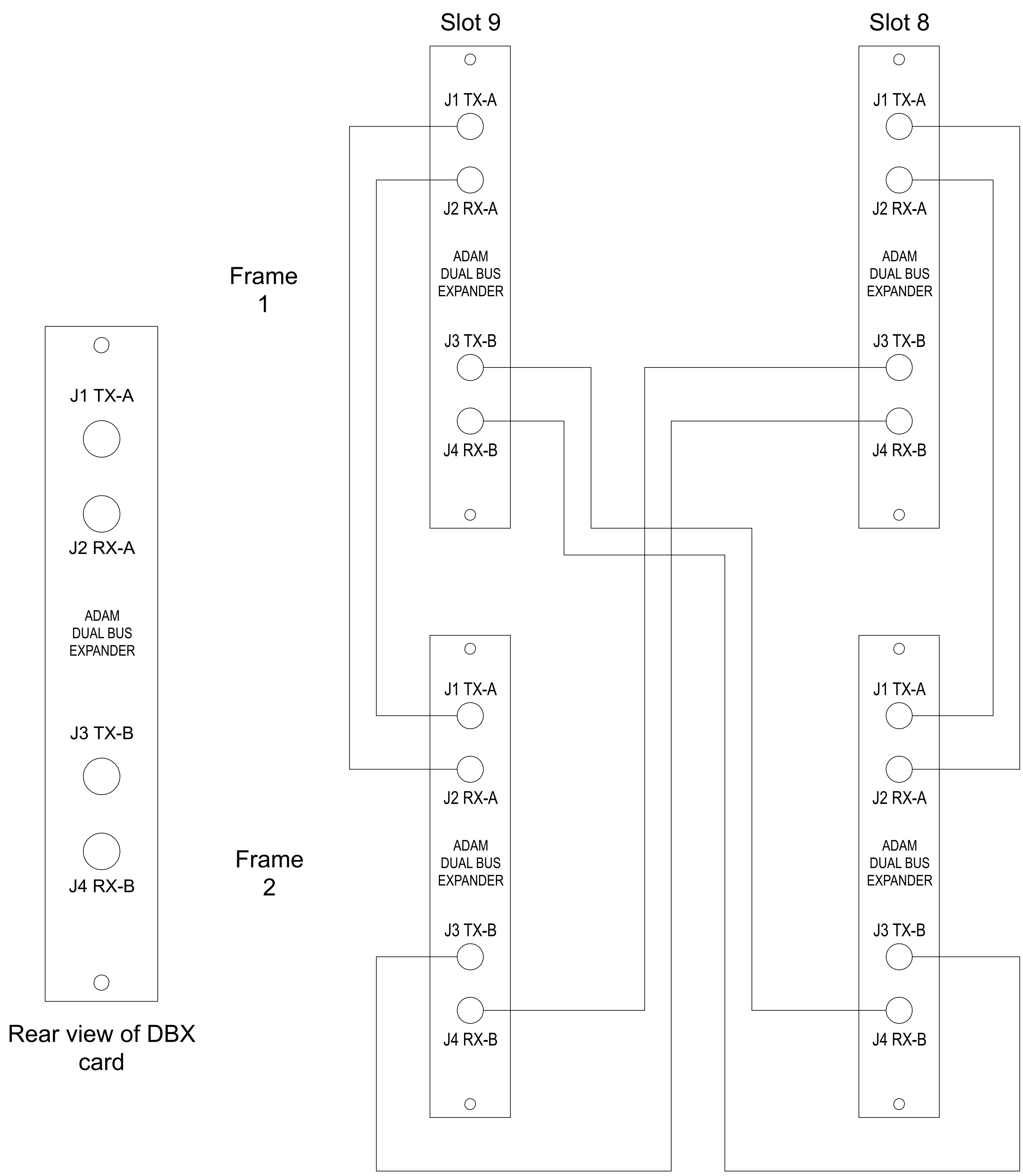


Rear view of DBX card

ADAM Two Frame Non-Redundant Audio DBX

2 - DBX Cards (1 per frame)
16 - AIO Cards per Frame (248 of 256 ports)
(last 4 ports of each frame not available due to test audio enable)
4 - 75 W Coax Interconnect Cables

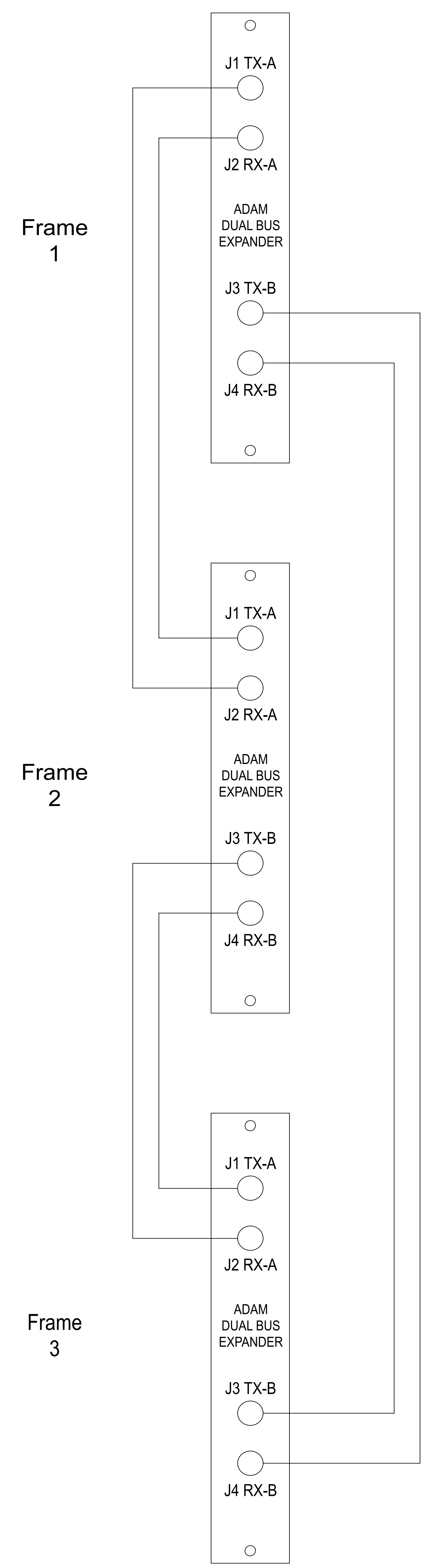
ADAM DBX Coax Interconnect

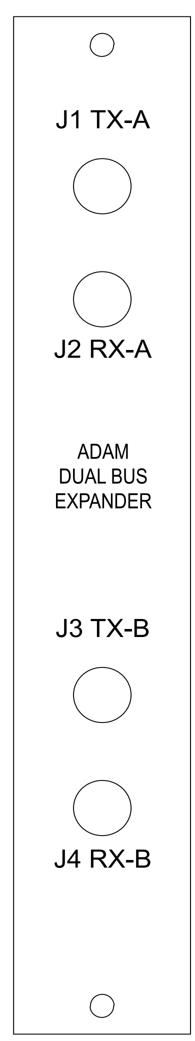


ADAM Two Frame Redundant Audio DBX

4 - DBX Cards (2 per frame)
15 - AIO Cards per Frame (240 ports)
8 - 75 W Coax Interconnect Cables

ADAM DBX Coax Interconnect



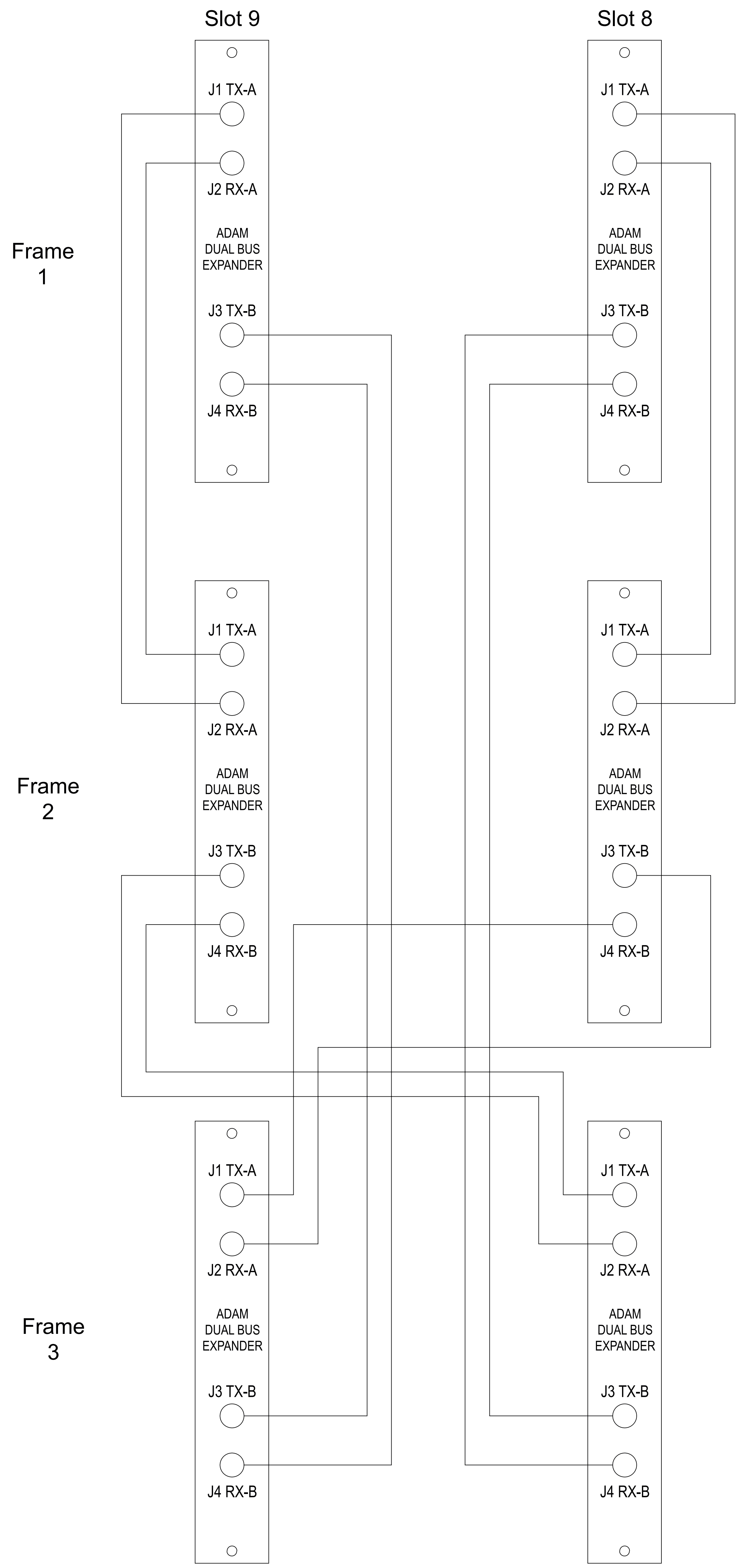


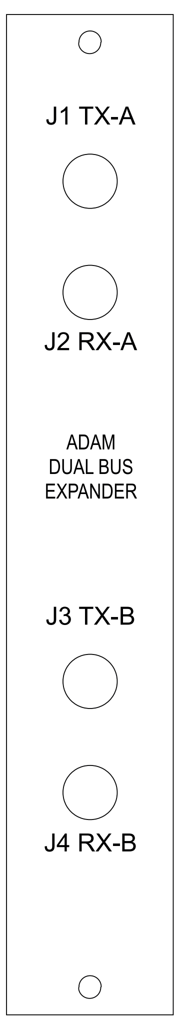
Rear view of DBX card

ADAM Three Frame Non-Redundant Audio DBX

3 - DBX Cards (1 per frame)
16 - AIO Cards per Frame (372 of 384 ports)
(last 4 ports of each frame not available due to test audio enable)
6 - 75 W Coax Interconnect Cables

ADAM DBX Coax Interconnect



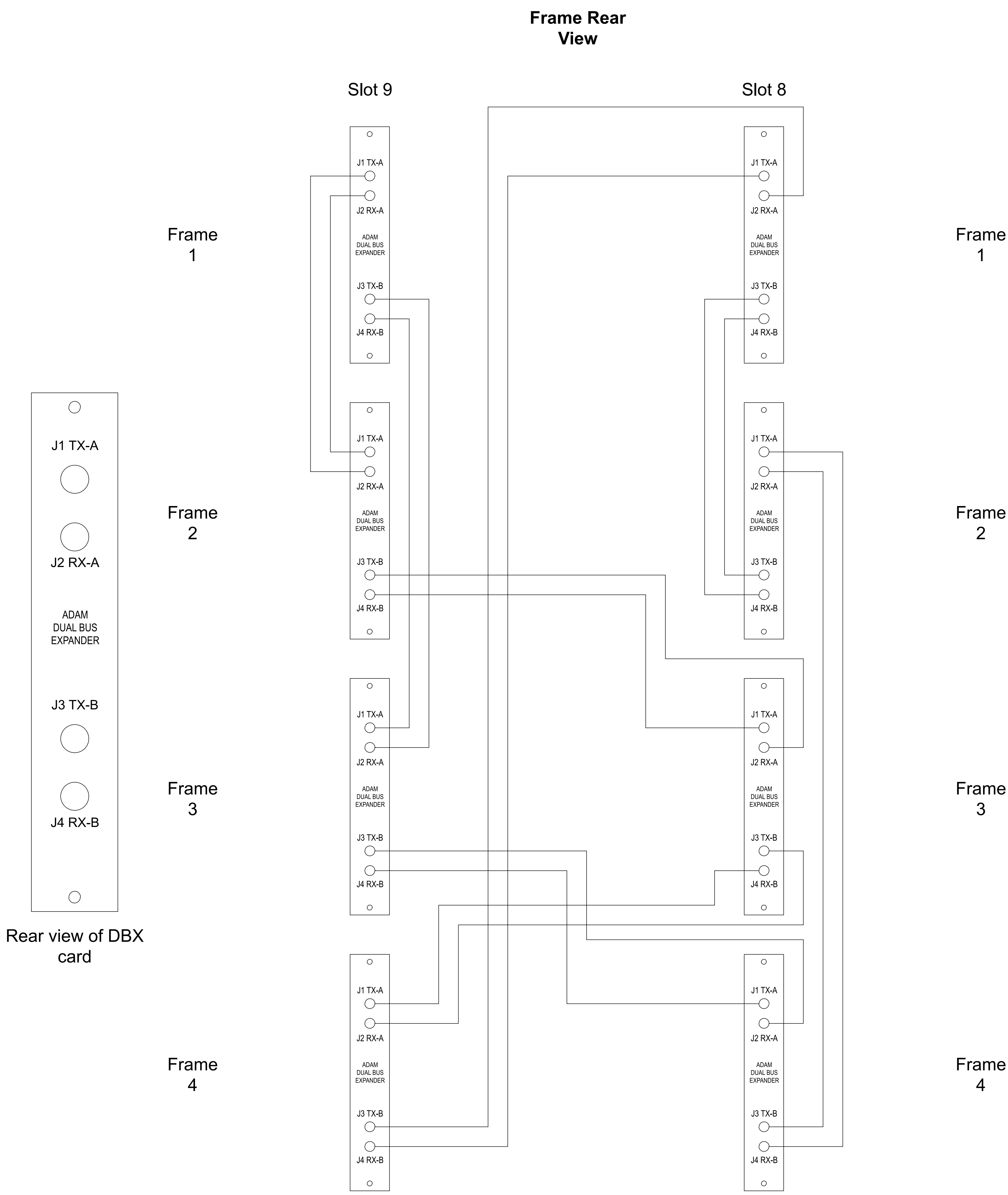


Rear view of DBX card

ADAM Three Frame Redundant Audio DBX

6 - DBX Cards (2 per frame)
15 - AIO Cards per Frame (360 ports)
12 - 75 W Coax Interconnect Cables

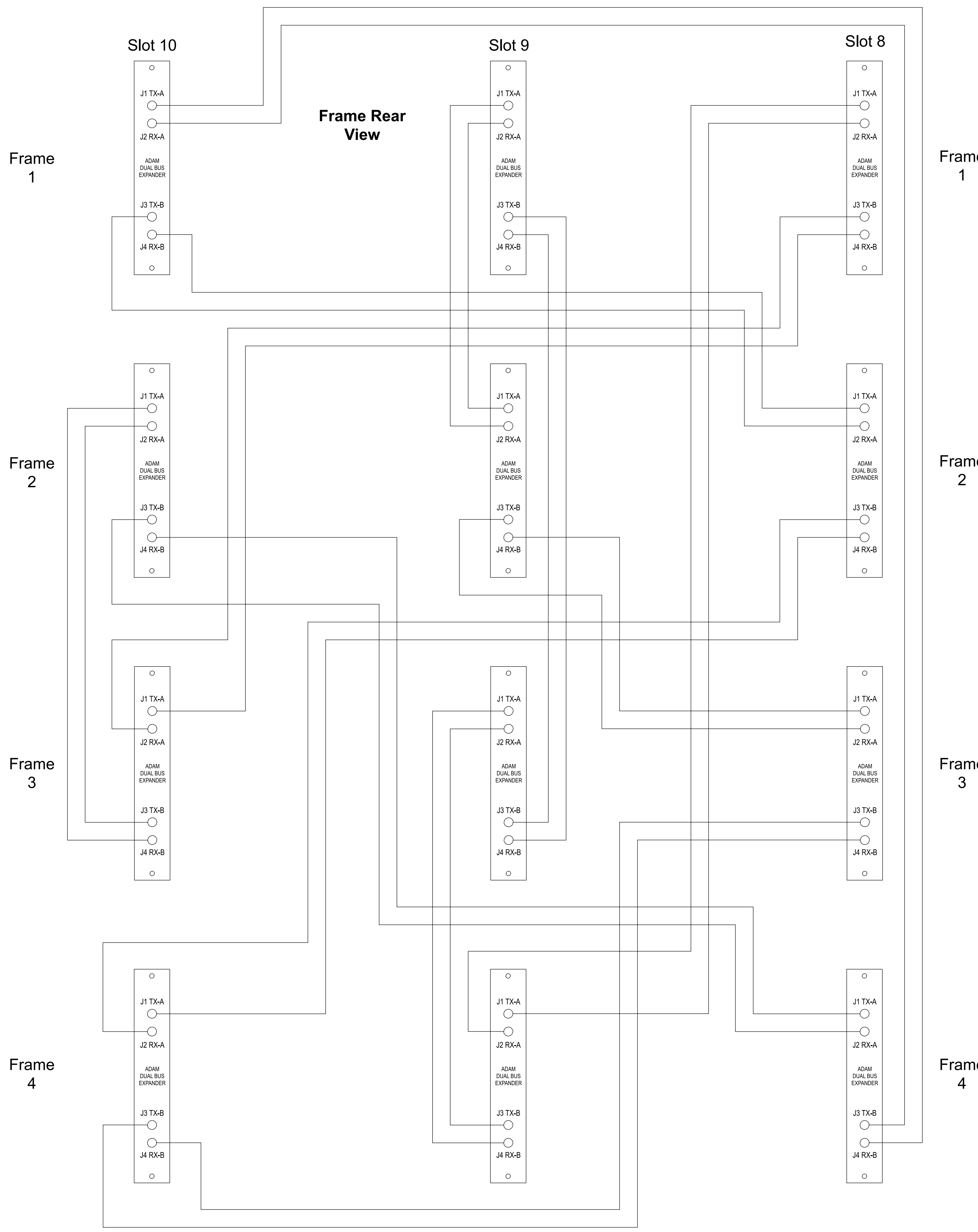
ADAM DBX Coax Interconnect

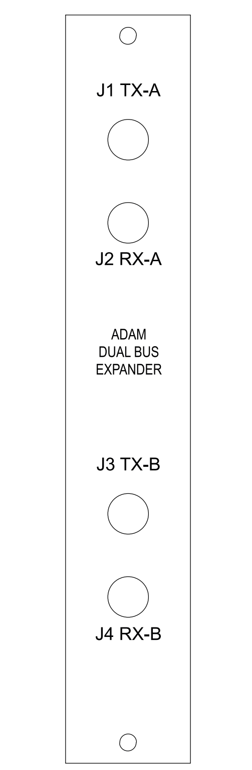


ADAM Four Frame Non-Redundant Audio DBX

8 - DBX Cards (2 per frame)
15 - AIO Cards per Frame (480 ports)
16 - 75 W Coax Interconnect Cables

ADAM DBX Coax Interconnect



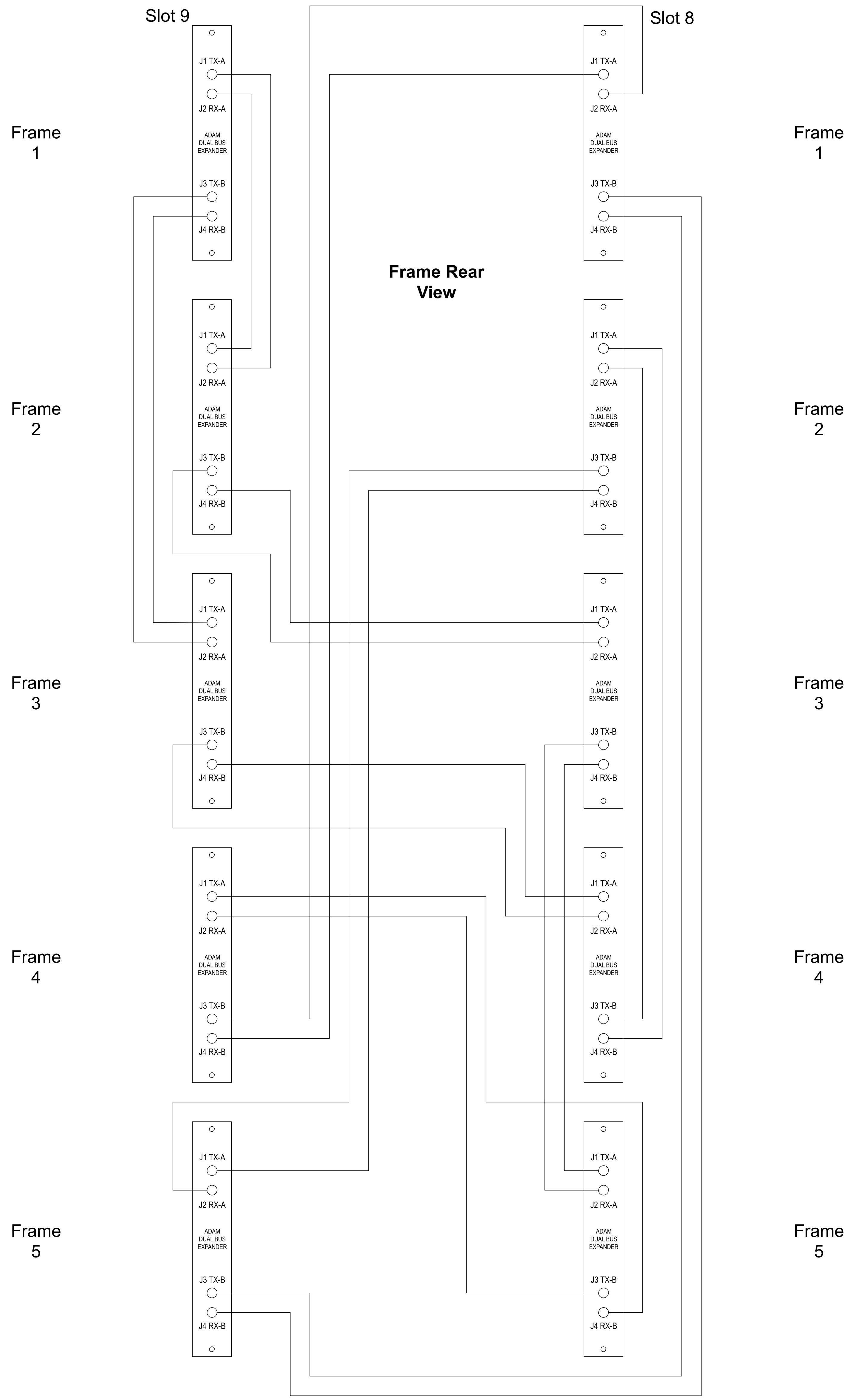


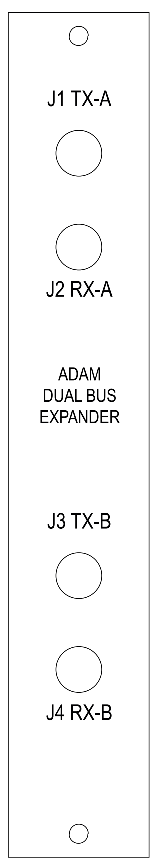
Rear view of DBX card

ADAM Four Frame Redundant Audio DBX

12 - DBX Cards (3 per frame)
14 - AIO Cards per Frame (448 ports)
24 - 75 W Coax Interconnect Cables

ADAM DBX Coax Interconnect



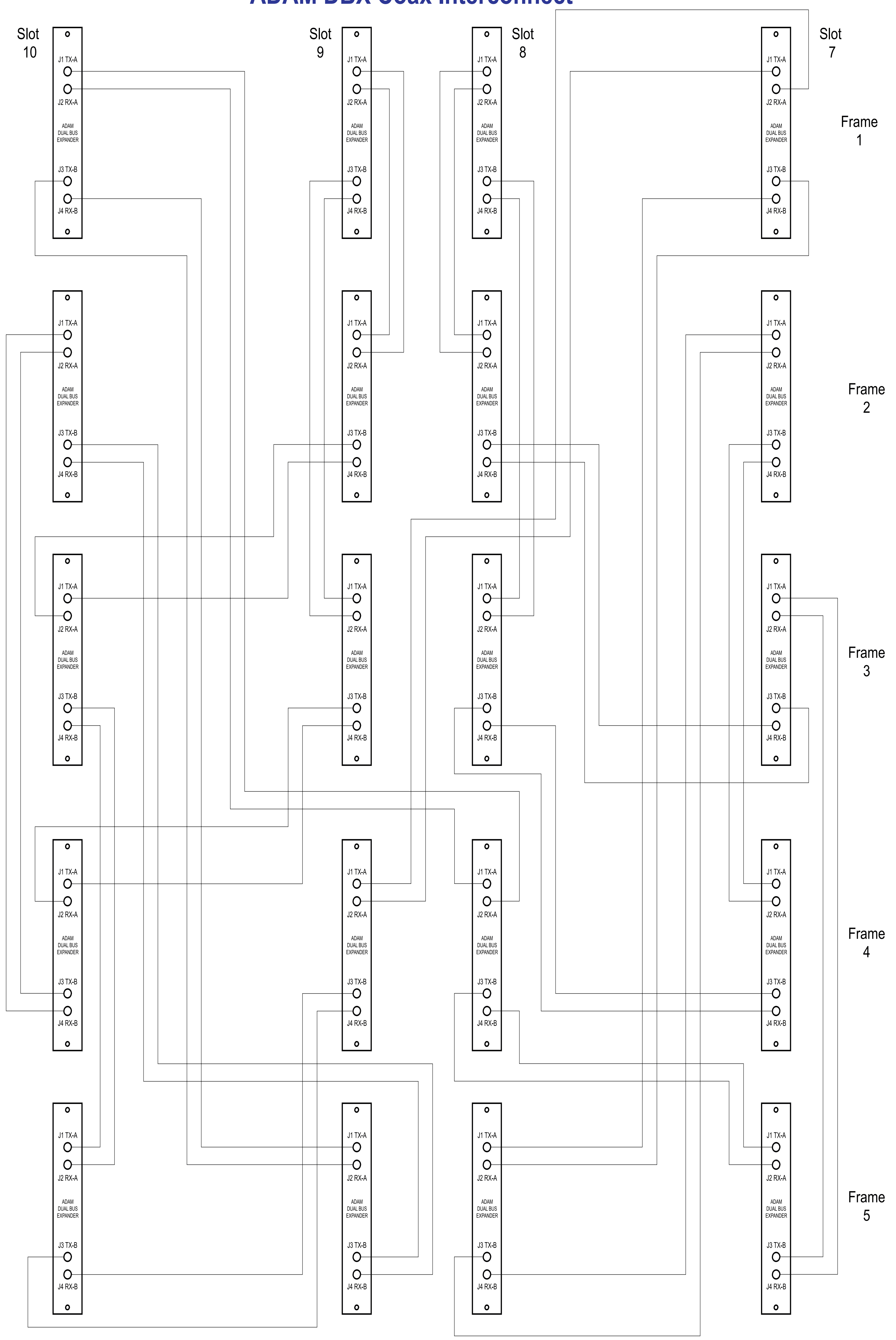


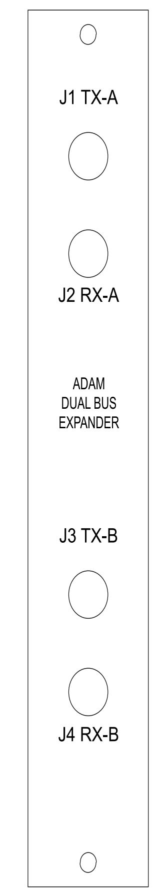
Rear view of DBX card

ADAM Five Frame Non-Redundant Audio DBX

10 - DBX Cards (2 per frame)
15 - AIO Cards per Frame (600 ports)
20 - 75 W Coax Interconnect Cables

ADAM DBX Coax Interconnect



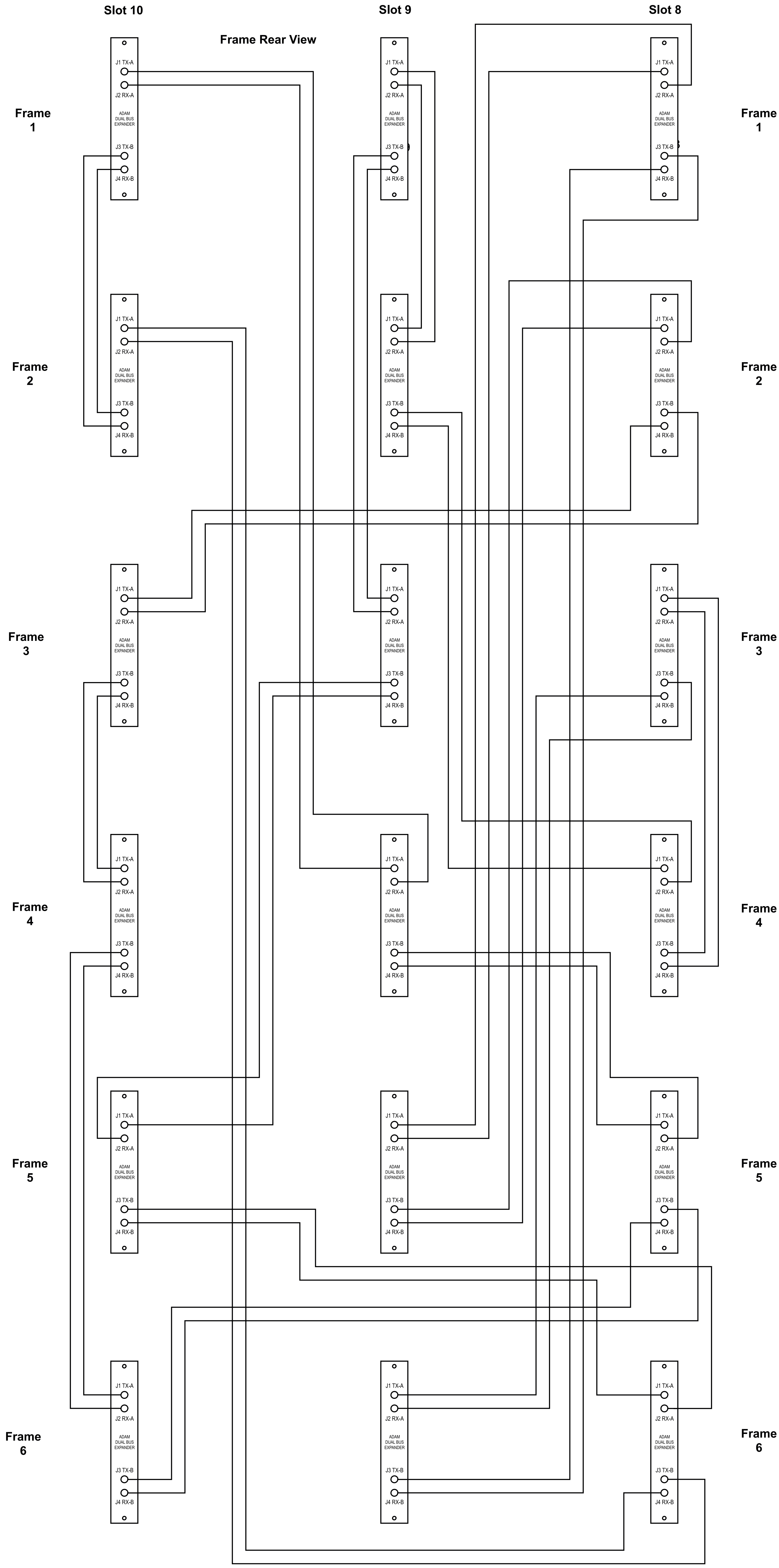


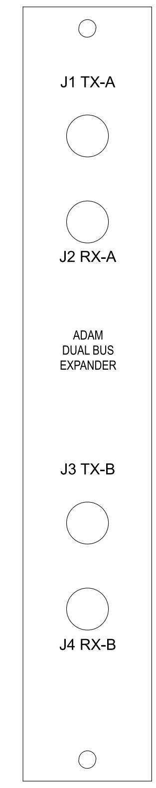
Rear view of DBX card

ADAM Five Frame Redundant Audio DBX

20 - DBX Cards (4 per frame)
13 - AIO Cards per Frame (520 ports)
40 - 75 W Coax Interconnect Cables

ADAM DBX Coax Interconnect



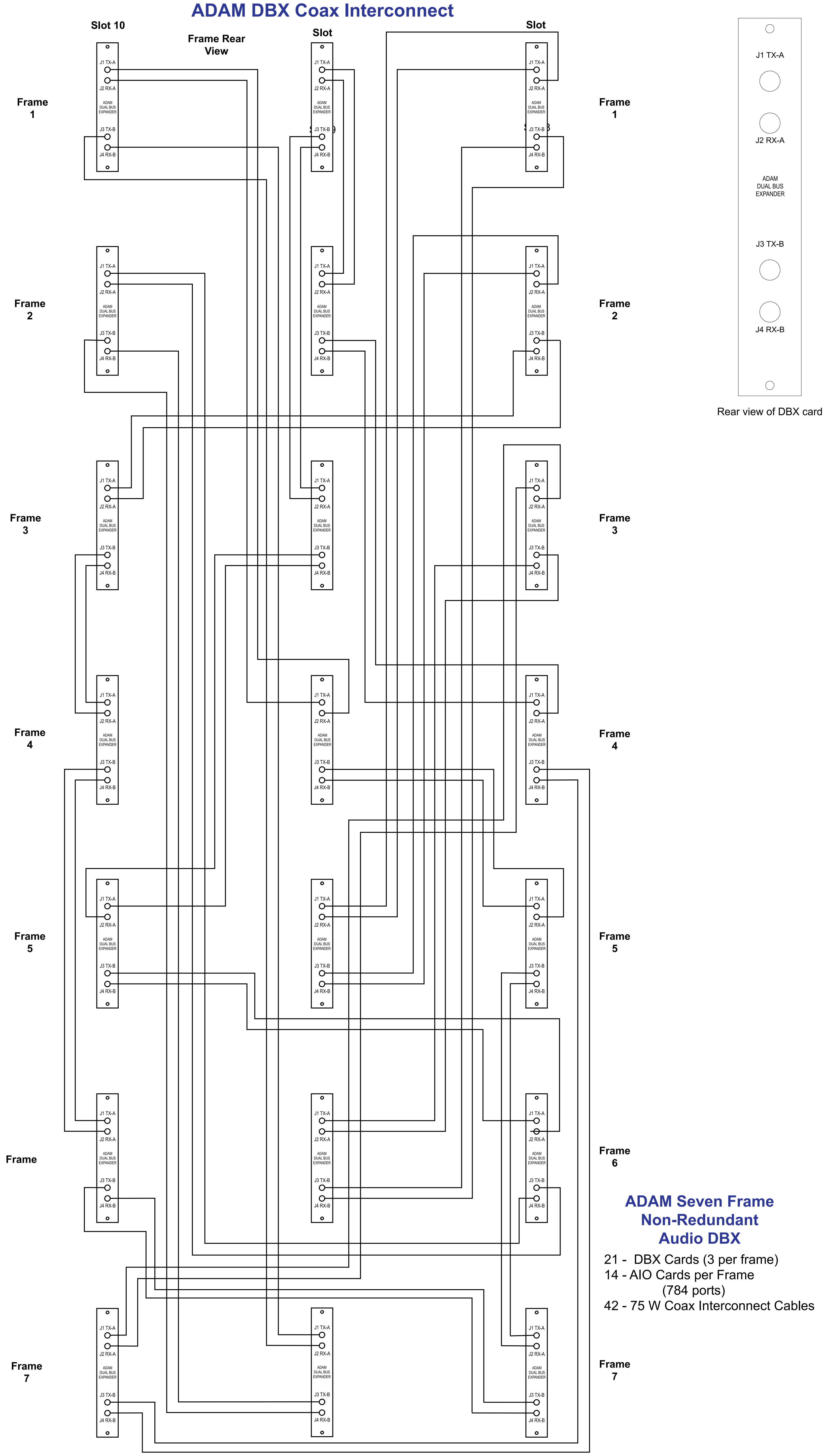


Rear view of DBX card

ADAM Six Frame Non-Redundant Audio DBX

18 - DBX Cards (3 per frame)
14 - AIO Cards per Frame (672 ports)
36 - 75 W Coax Interconnect Cables

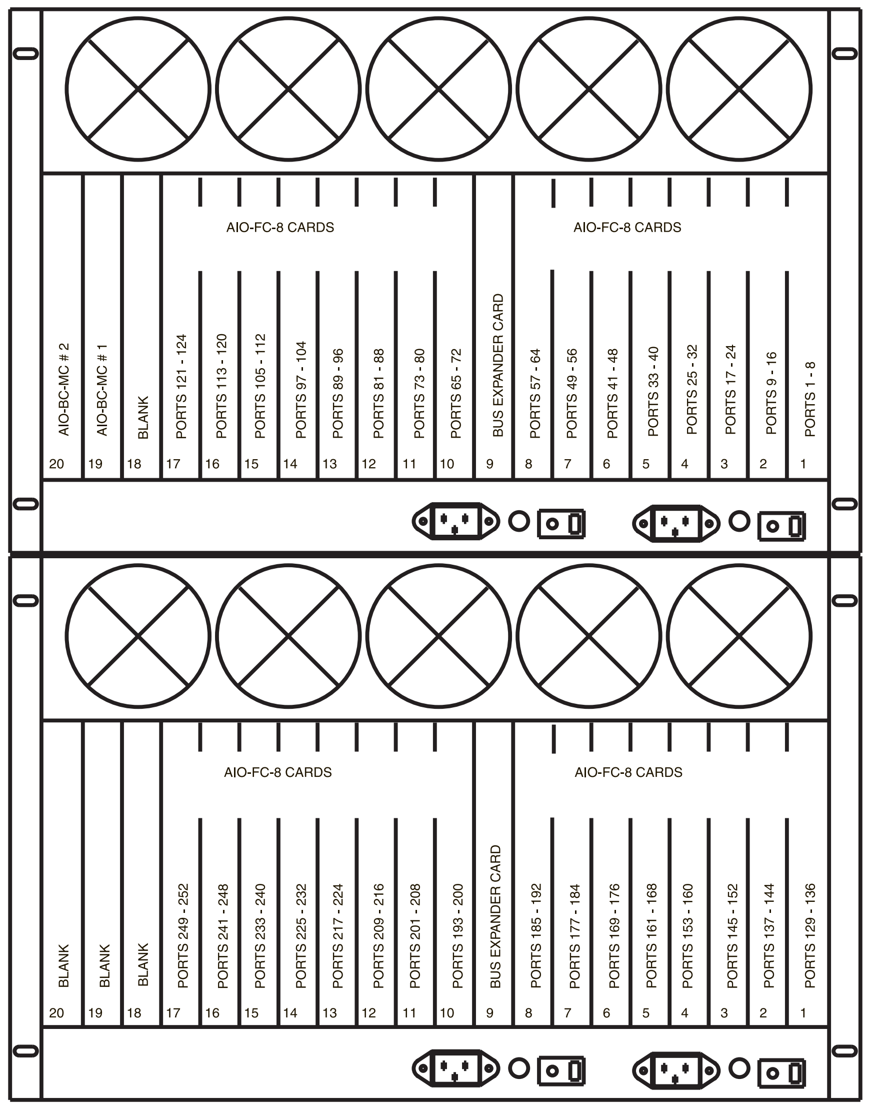
ADAM DBX Coax Interconnect



ADAM Seven Frame Non-Redundant Audio DBX

21 - DBX Cards (3 per frame)
14 - AIO Cards per Frame
(784 ports)
42 - 75 W Coax Interconnect Cables

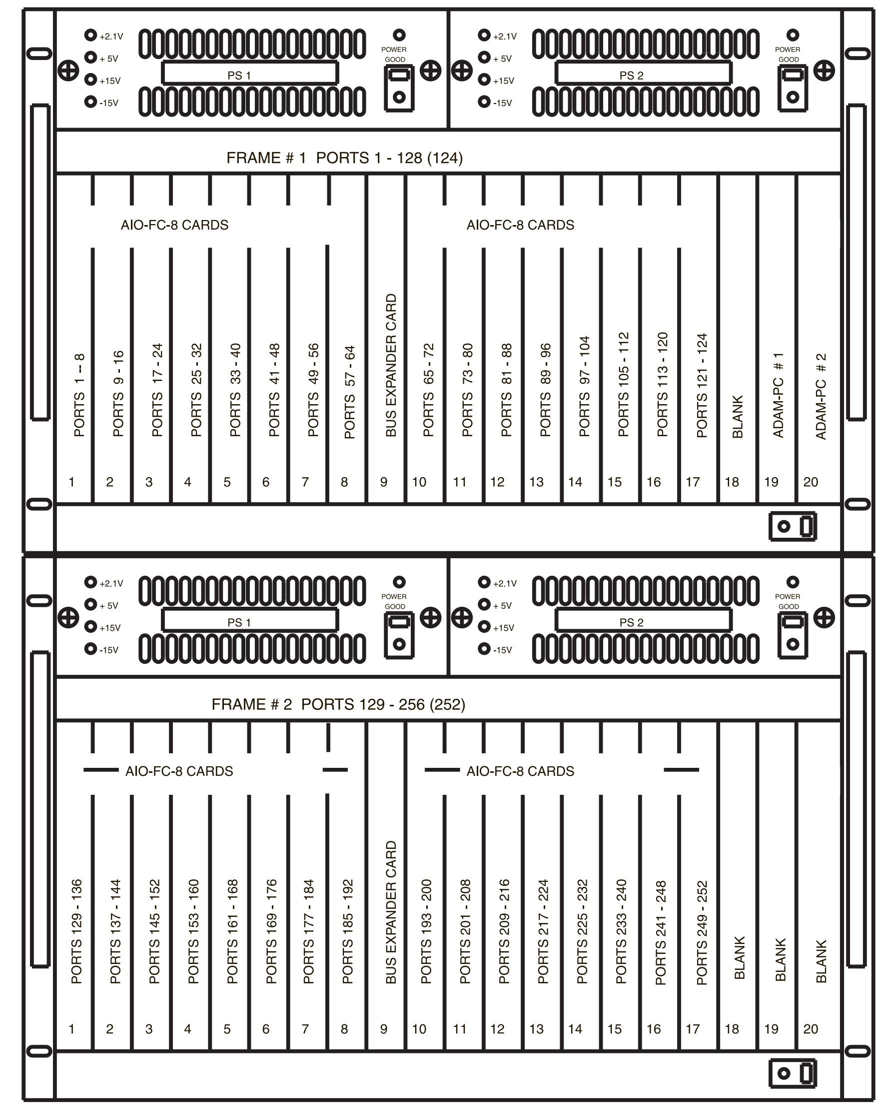
ADAM MATRIX FRAMES
REAR VIEW



FRAME 1
MASTER FRAME

FRAME 2
SLAVE FRAME

ADAM MATRIX FRAMES
FRONT VIEW



FRAME 1
MASTER FRAME

FRAME 2
SLAVE FRAME

Last 4 ports in each frame not available due to Test Audio enabled.

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

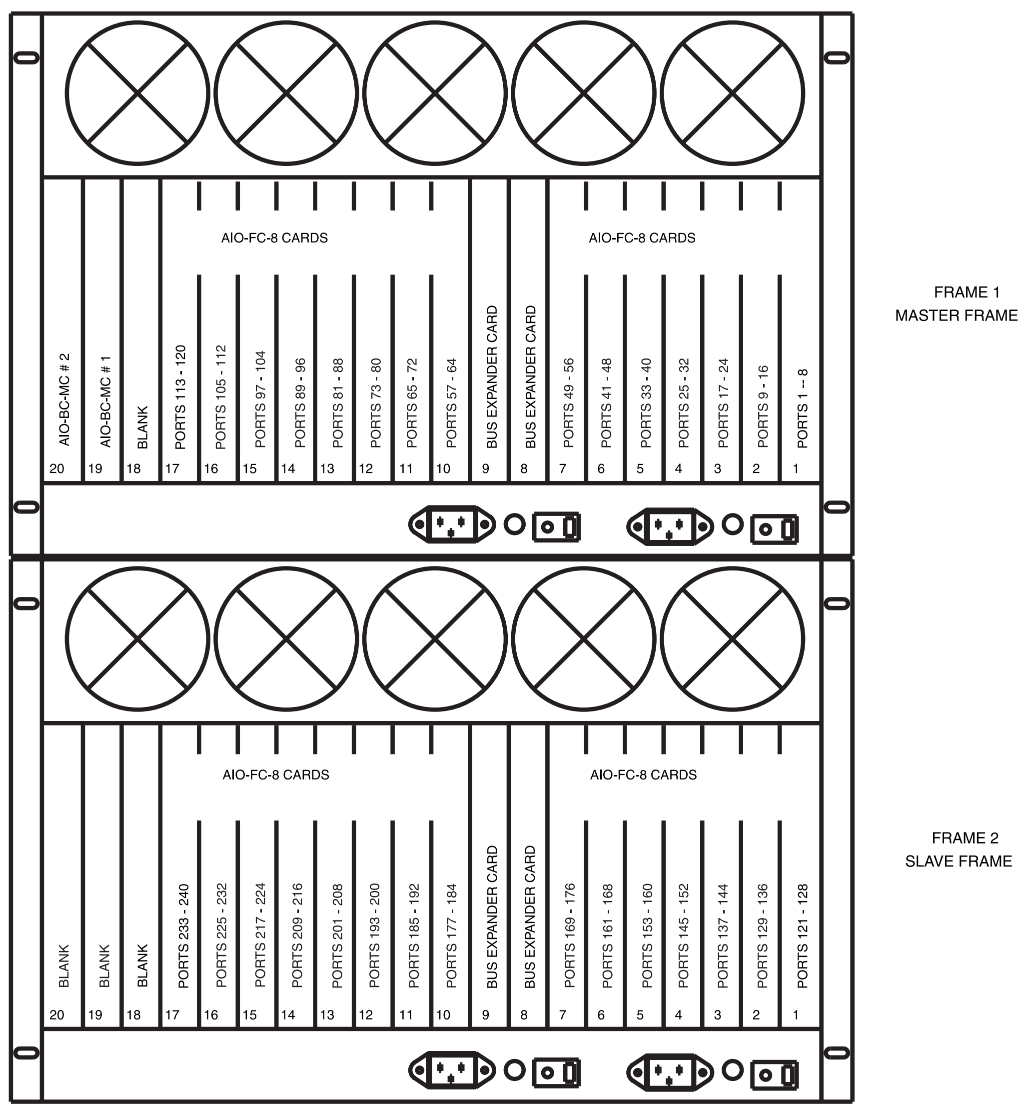
UNLESS OTHERWISE SPECIFIED REMOVE ALL BURRS & BREAK SHARP EDGES HOLE TOLERANCES PER ANSI B94.11-1967, R1972 DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS P1/16 DECIMALS .X P.060 .XX P.030 .XXXP.010 ANGLES P30D	CONTRACT NO.		RTS SYSTEMS BURBANK, CALIFORNIA, USA
	APPROVALS	DATE	ADAM 2 FRAME DBX SYSTEM NON-REDUNDANT AUDIO PORT vs CARD LAYOUT 248 x 248
	DRAWN G. BEHREND	12 JUNE 00	
MATERIAL	CHECKED G. BEHREND	12 JUNE 00	
FINISH	MODIFIED	26 APR 99	SIZE D · FSCM NO. · DWG NO. ADAM-901 · REV D
	ADAM-901		SCALE NO · SHEET

NEXT ASSY	USED ON
APPLICATION	

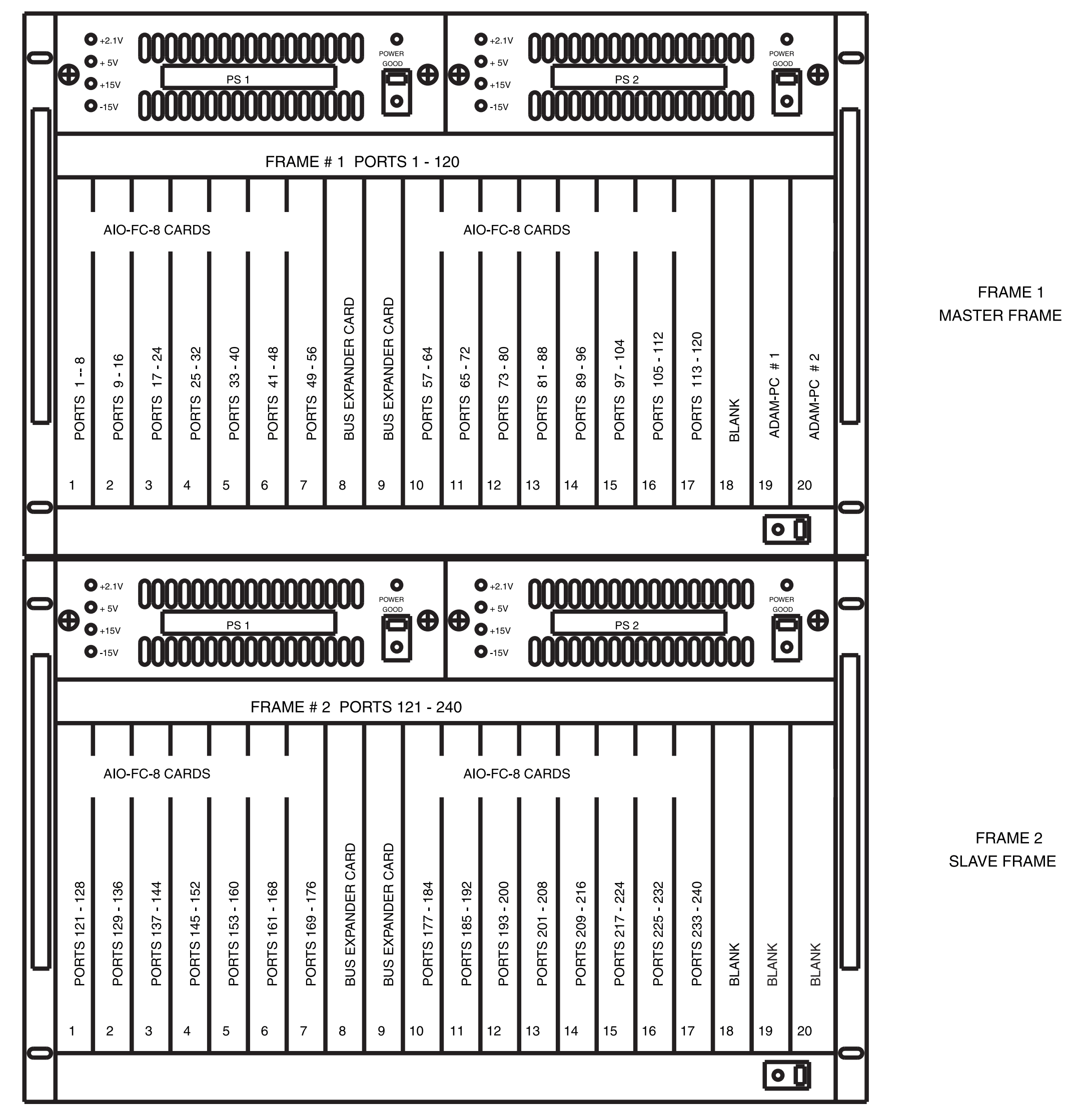
REVISIONS

ZONE	REV	DESCRIPTION	DATE	APPROVED

ADAM MATRIX FRAMES
REAR VIEW



ADAM MATRIX FRAMES
FRONT VIEW



UNLESS OTHERWISE SPECIFIED
REMOVE ALL BURRS & BREAK SHARP EDGES
HOLE TOLERANCES PER ANSI B94.11-1967, R1972
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

FRACTIONS	DECIMALS	ANGLES
P1/16	.X P.060	P30D
	.XX P.030	
	.XXXP.010	

MATERIAL

FINISH

NEXT ASSY | USED ON

APPLICATION

CONTRACT NO.

APPROVALS	DATE
DRAWN G. BEHREND	12 MAY 97
CHECKED G. BEHREND	12 MAY 97
MODIFIED	26 APR 99

ADAM-902

RTS SYSTEMS BURBANK, CALIFORNIA, USA

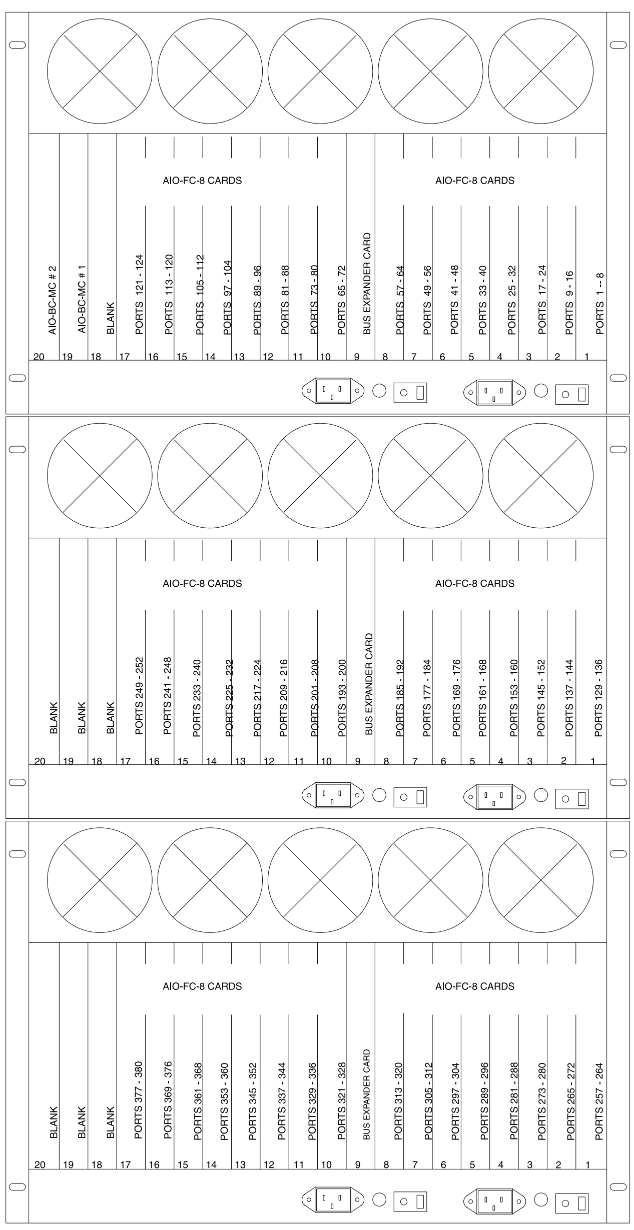
ADAM 2 FRAME DBX SYSTEM
REDUNDANT AUDIO
PORT vs CARD LAYOUT
240 x 240

SIZE	FSCM NO.	DWG NO.	REV
D		ADAM-902	D

SCALE NO | SHEET

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

ADAM MATRIX FRAMES
REAR VIEW

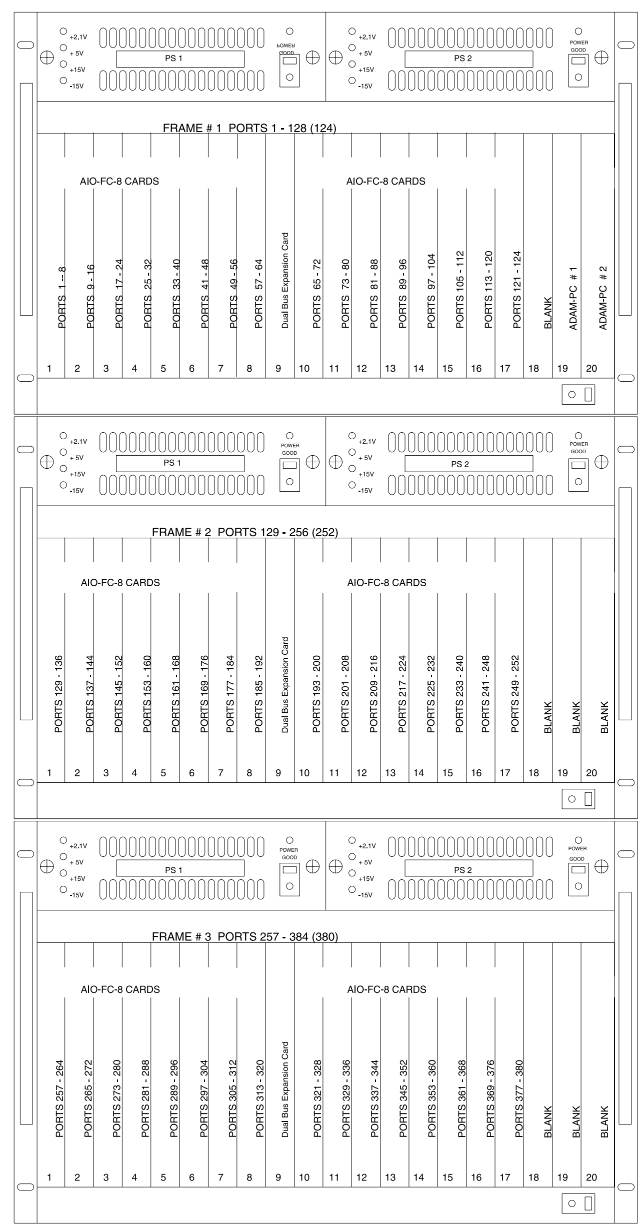


FRAME 1
MASTER FRAME

FRAME 2
SLAVE FRAME

FRAME 3
SLAVE FRAME

ADAM MATRIX FRAMES
FRONT VIEW



Last 4 ports in each frame not available due to Test Audio enabled.

UNLESS OTHERWISE SPECIFIED
REMOVE ALL BURRS & BREAK SHARP EDGES
HOLE TOLERANCES PER ANSI B94.11-1967, R1972
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ±1/16 DECIMALS .X ±.060 .XX ±.030 .XXX ±.010 ANGLES ±.300

MATERIAL

FINISH

NEXT ASSY | USED ON

APPLICATION

CONTRACT NO.

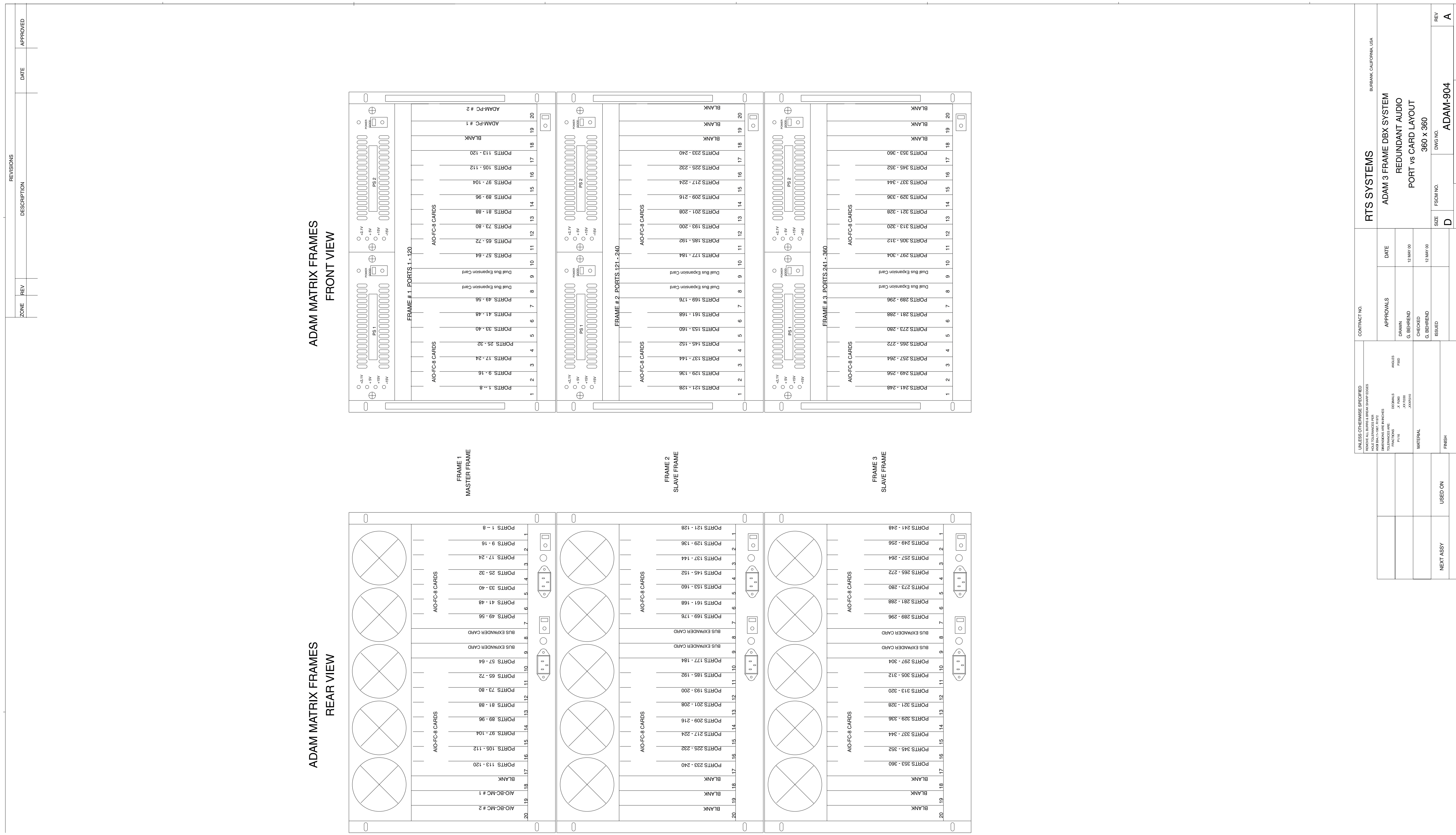
APPROVALS	DATE
DRAWN G. BEHREND	12 MAY 00
CHECKED G. BEHREND	12 MAY 00
ISSUED	

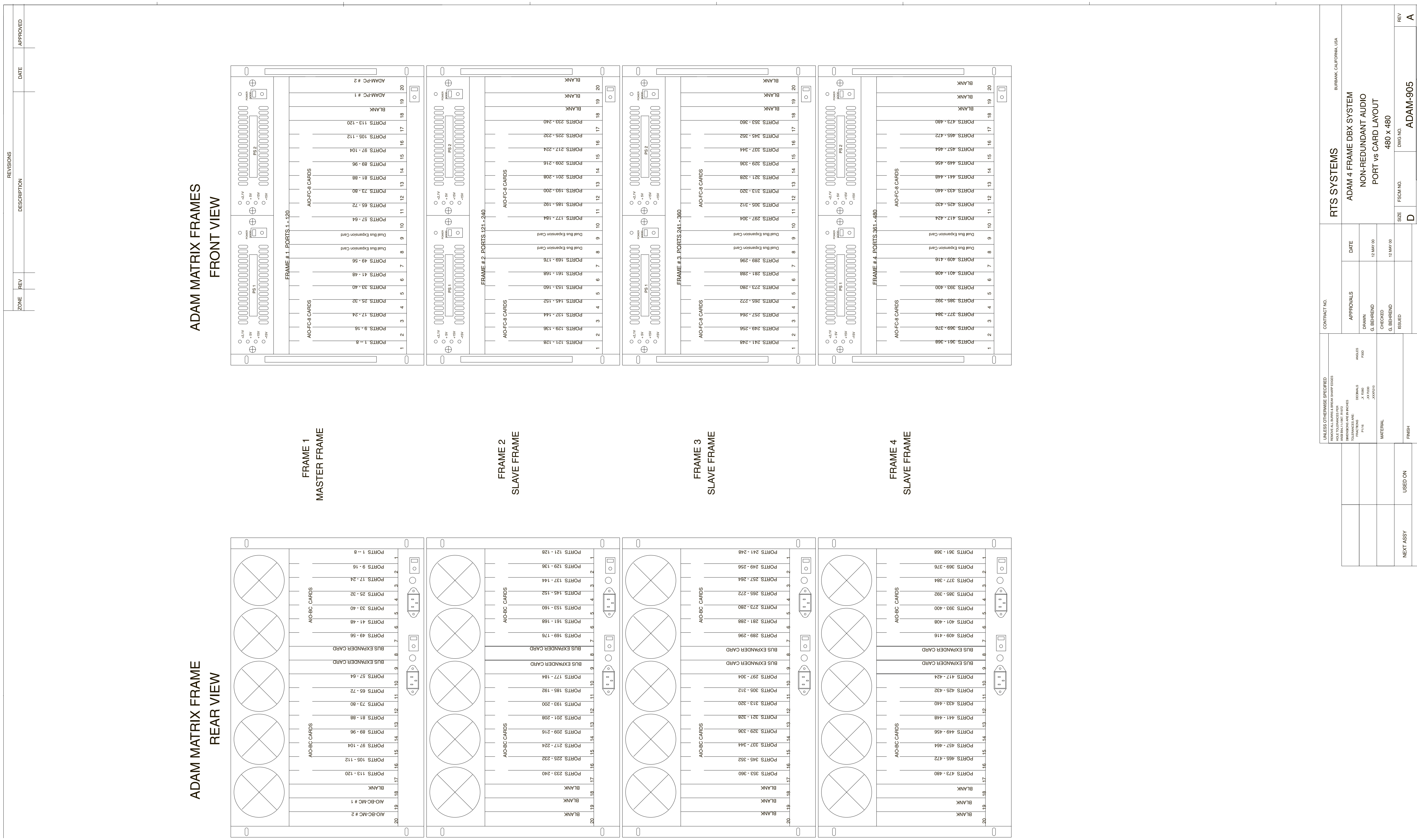
ADAM903.DWG

RTS SYSTEMS
BURBANK, CALIFORNIA, USA

ADAM 3 FRAME DBX SYSTEM
NON-REDUNDANT AUDIO
PORT vs CARD LAYOUT
372 x 372

SIZE D | FSCM NO. | DWG NO. ADAM-903 | REV A
SCALE NO | SHEET 1 of 1


ADAM MATRIX FRAMES
FRONT VIEW
ADAM MATRIX FRAMES
REAR VIEW
FRAME # 1 PORTS 1 - 120
FRAME # 2 PORTS 121 - 240
FRAME # 3 PORTS 241 - 360
FRAME 1
MASTER FRAME
FRAME 2
SLAVE FRAME
FRAME 3
SLAVE FRAME
AIO-FC-8 CARDS
Dual Bus Expansion Card
BUS EXPANDER CARD
ADAM-PC # 1
ADAM-PC # 2
AIO-BC-MC # 1
AIO-BC-MC # 2
BLANK
PS 1
PS 2
REVISIONS
ZONE
REV
DESCRIPTION
DATE
APPROVED
RTS SYSTEMS
BURBANK, CALIFORNIA, USA
ADAM 3 FRAME DBX SYSTEM
REDUNDANT AUDIO
PORT vs CARD LAYOUT
360 x 360
UNLESS OTHERWISE SPECIFIED
CONTRACT NO.
APPROVALS
DATE
DRAWN
G. BEHRENDE
12 MAY 00
CHECKED
G. BEHRENDE
12 MAY 00
ISSUED
MATERIAL
FINISH
NEXT ASSY
USED ON
APPLICATION
SIZE
D
FSCM NO.
DWG NO.
ADAM-904
REV
A
SCALE
NO
SHEET
1 of 1
ADAM904.DWG



ADAM MATRIX FRAMES
FRONT VIEW
ADAM MATRIX FRAME
REAR VIEW
FRAME 1
MASTER FRAME
FRAME 2
SLAVE FRAME
FRAME 3
SLAVE FRAME
FRAME 4
SLAVE FRAME
FRAME # 1 PORTS 1 - 120
FRAME # 2 PORTS 121 - 240
FRAME # 3 PORTS 241 - 360
FRAME # 4 PORTS 361 - 480
AIO-FC-8 CARDS
AIO-8C CARDS
Dual Bus Expansion Card
BUS EXPANDER CARD
ADAM-PC # 1
ADAM-PC # 2
AIO-8C-MC # 1
AIO-8C-MC # 2
BLANK
PS 1
PS 2
REVISIONS
ZONE
REV
DESCRIPTION
DATE
APPROVED
RTS SYSTEMS
BURBANK, CALIFORNIA, USA
ADAM 4 FRAME DBX SYSTEM
NON-REDUNDANT AUDIO
PORT vs CARD LAYOUT
480 x 480
SIZE
D
FSCM NO.
DWG NO.
ADAM-905
REV
A
SCALE
NO
SHEET
1 of 1
ADAM905.DWG
CONTRACT NO.
APPROVALS
DATE
DRAWN
G. BEHREND
12 MAY 00
CHECKED
G. BEHREND
12 MAY 00
ISSUED
UNLESS OTHERWISE SPECIFIED
MATERIAL
FINISH
NEXT ASSY
USED ON
APPLICATION

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

UNLESS OTHERWISE SPECIFIED
REMOVE ALL BURRS & BREAK SHARP EDGES
HOLE TOLERANCES PER
ANSI B94,11 1967, R1972
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS P1/16 DECIMALS .X P.060 .XX P.030 .XXX P.010 ANGLES P30D

MATERIAL

FINISH

NEXT ASSY	USED ON
APPLICATION	

CONTRACT NO.

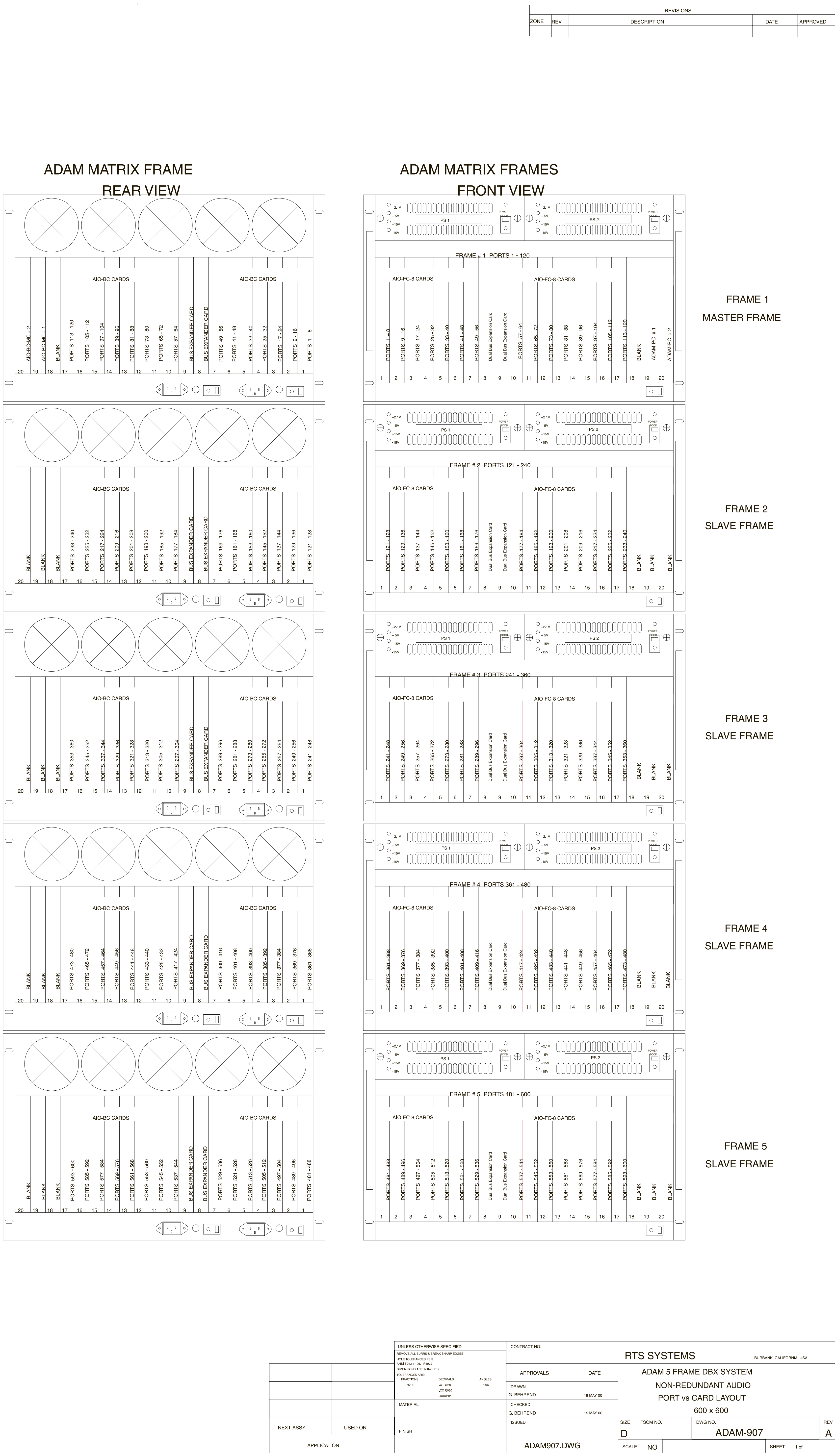
APPROVALS	DATE
DRAWN G. BEHREND	6/21/00
CHECKED G. BEHREND	6/21/00
ISSUED	

ADAM906.DWG

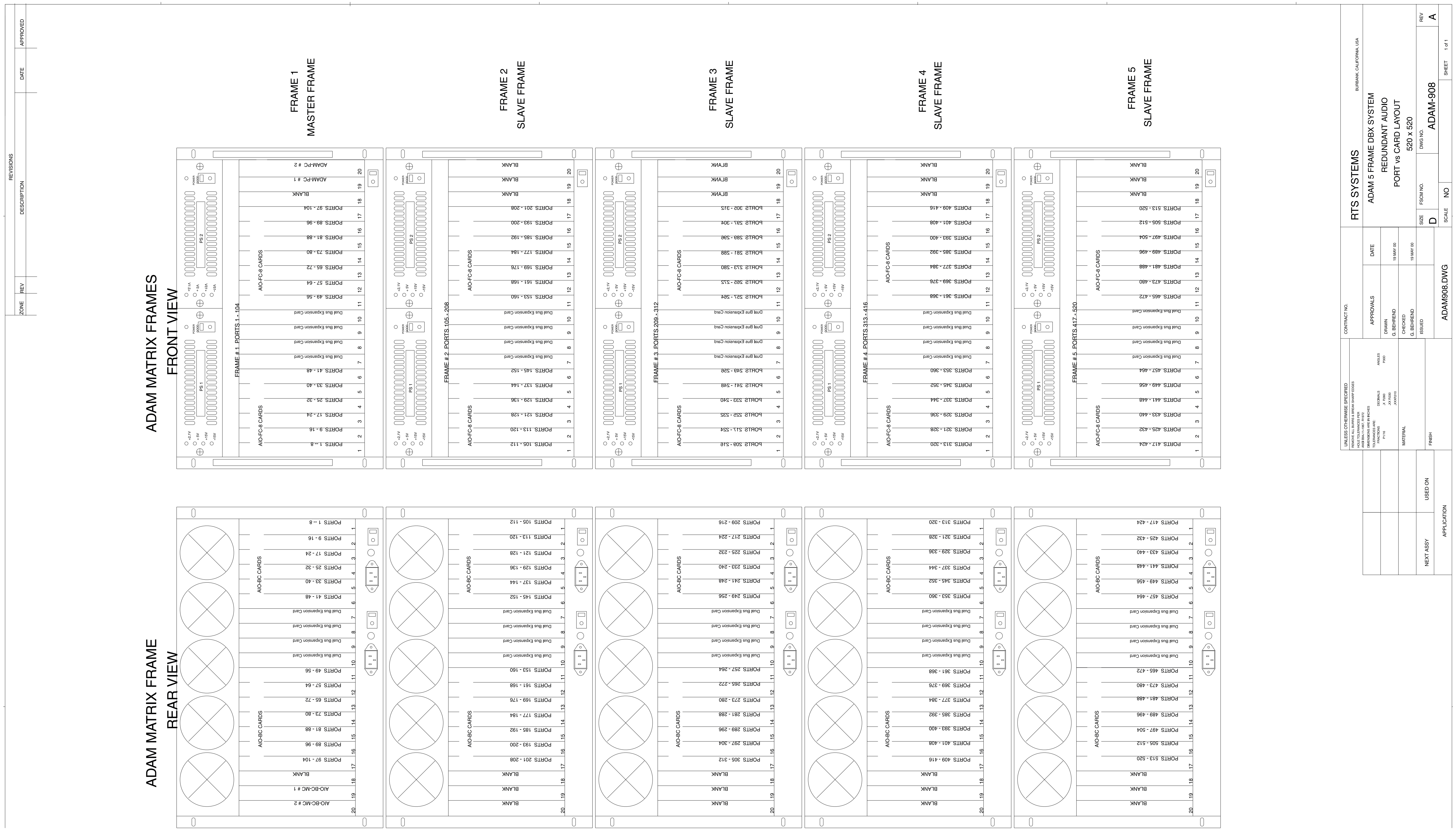
RTS SYSTEMS BURBANK, CALIFORNIA, USA

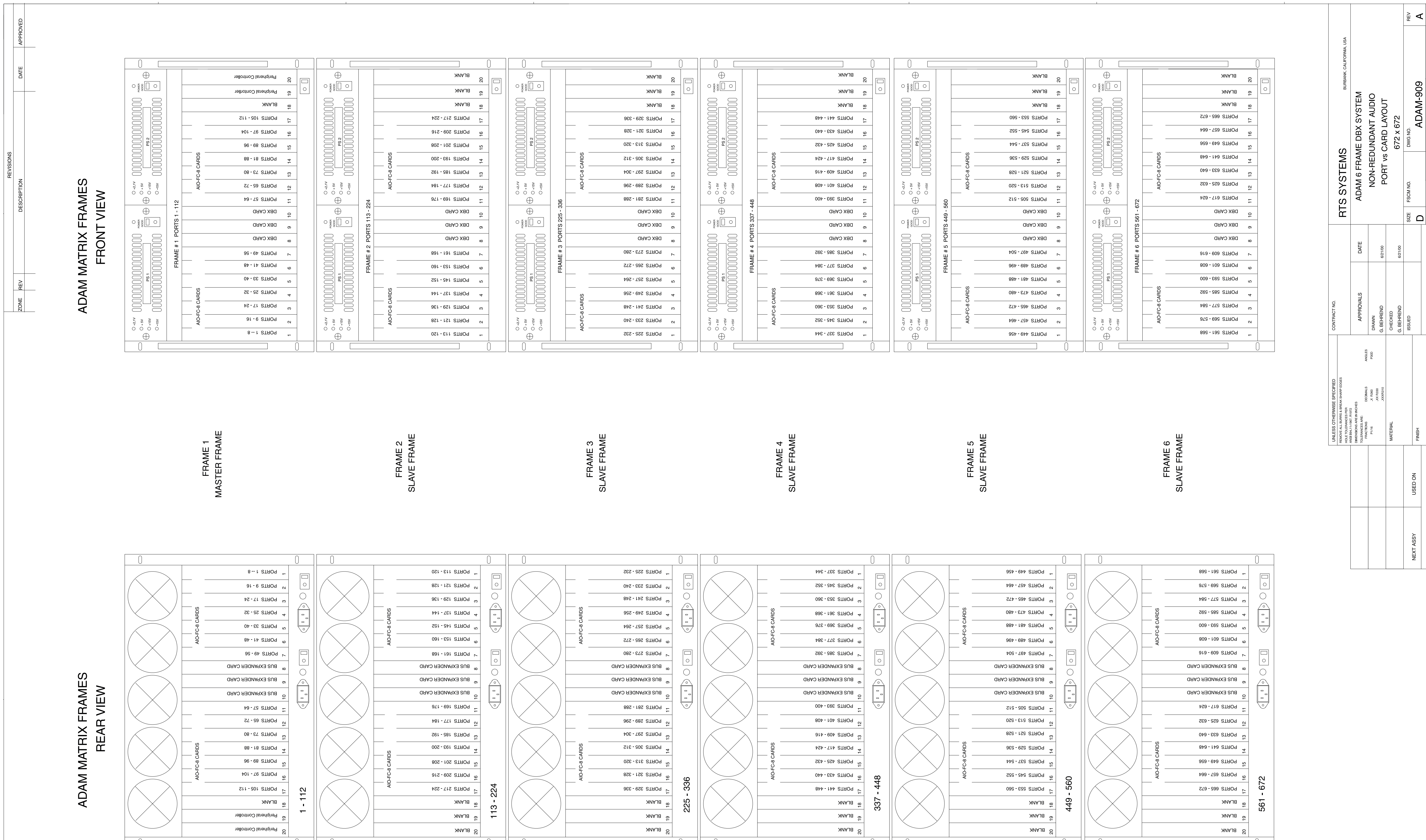
ADAM 4 FRAME DBX SYSTEM
REDUNDANT AUDIO
PORT vs CARD LAYOUT
448 x 448

SIZE	FSCM NO.	DWG NO.	REV
D		ADAM-906	A
SCALE NO		SHEET 1 of 1	

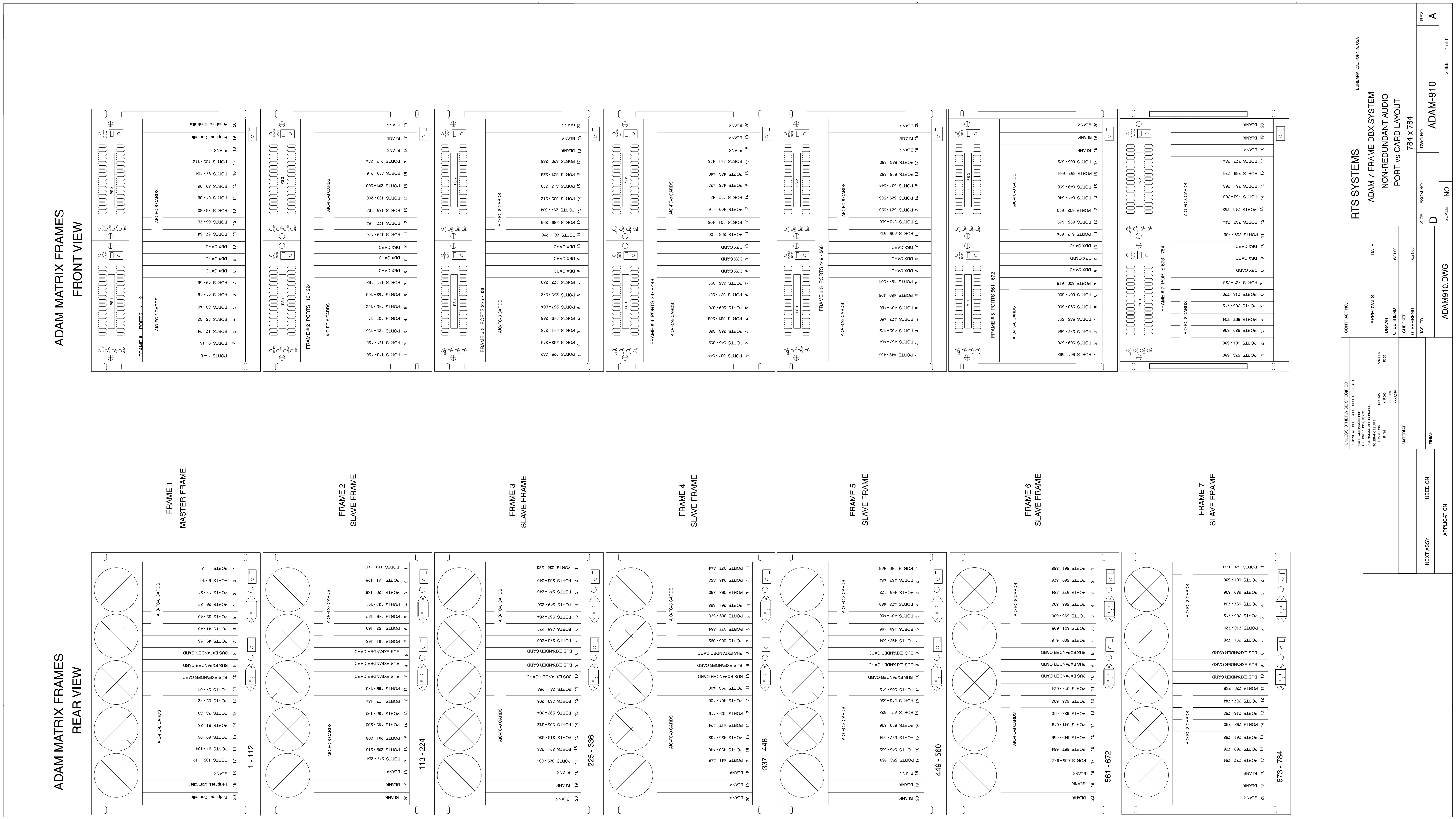


REVISIONS
ZONE
REV
DESCRIPTION
DATE
APPROVED
ADAM MATRIX FRAME
REAR VIEW
ADAM MATRIX FRAMES
FRONT VIEW
FRAME # 1 PORTS 1 - 120
FRAME 1
MASTER FRAME
FRAME # 2 PORTS 121 - 240
FRAME 2
SLAVE FRAME
FRAME # 3 PORTS 241 - 360
FRAME 3
SLAVE FRAME
FRAME # 4 PORTS 361 - 480
FRAME 4
SLAVE FRAME
FRAME # 5 PORTS 481 - 600
FRAME 5
SLAVE FRAME
AIO-BC CARDS
AIO-FC-8 CARDS
BUS EXPANDER CARD
Dual Bus Expansion Card
UNLESS OTHERWISE SPECIFIED
CONTRACT NO.
RTS SYSTEMS
BURBANK, CALIFORNIA, USA
APPROVALS
DATE
ADAM 5 FRAME DBX SYSTEM
NON-REDUNDANT AUDIO
PORT vs CARD LAYOUT
600 x 600
DRAWN
G. BEHREND
19 MAY 00
CHECKED
G. BEHREND
19 MAY 00
MATERIAL
ISSUED
NEXT ASSY
USED ON
FINISH
SIZE
D
FSCM NO.
DWG NO.
ADAM-907
REV
A
APPLICATION
ADAM907.DWG
SCALE
NO
SHEET
1 of 1


ADAM MATRIX FRAMES
FRONT VIEW
ADAM MATRIX FRAME
REAR VIEW
FRAME 1
MASTER FRAME
FRAME 2
SLAVE FRAME
FRAME 3
SLAVE FRAME
FRAME 4
SLAVE FRAME
FRAME 5
SLAVE FRAME
FRAME # 1 PORTS 1 - 104
FRAME # 2 PORTS 105 - 208
FRAME # 3 PORTS 209 - 312
FRAME # 4 PORTS 313 - 416
FRAME # 5 PORTS 417 - 520
AIO-FC-8 CARDS
AIO-BC CARDS
Dual Bus Expansion Card
BLANK
RTS SYSTEMS
BURBANK, CALIFORNIA, USA
ADAM 5 FRAME DBX SYSTEM
REDUNDANT AUDIO
PORT vs CARD LAYOUT
520 x 520
ADAM-908
ADAM908.DWG
DRAWN G. BEHREND 19 MAY 00
CHECKED G. BEHREND 19 MAY 00



ADAM MATRIX FRAMES
FRONT VIEW
ADAM MATRIX FRAMES
REAR VIEW
FRAME 1
MASTER FRAME
FRAME 2
SLAVE FRAME
FRAME 3
SLAVE FRAME
FRAME 4
SLAVE FRAME
FRAME 5
SLAVE FRAME
FRAME 6
SLAVE FRAME
FRAME # 1 PORTS 1 - 112
FRAME # 2 PORTS 113 - 224
FRAME # 3 PORTS 225 - 336
FRAME # 4 PORTS 337 - 448
FRAME # 5 PORTS 449 - 560
FRAME # 6 PORTS 561 - 672
AIO-FC-8 CARDS
DBX CARD
BUS EXPANDER CARD
Peripheral Controller
BLANK
1 - 112
113 - 224
225 - 336
337 - 448
449 - 560
561 - 672
RTS SYSTEMS
BURBANK, CALIFORNIA, USA
ADAM 6 FRAME DBX SYSTEM
NON-REDUNDANT AUDIO
PORT vs CARD LAYOUT
672 x 672
UNLESS OTHERWISE SPECIFIED
REMOVE ALL BURRS & BREAK SHARP EDGES
HOLE TOLERANCES PER
ANSI B94.11-1967, R1972
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS P1/16
DECIMALS .X P.060 .XX P.030 .XXXP.010
ANGLES P30D
MATERIAL
FINISH
CONTRACT NO.
APPROVALS
DATE
DRAWN G. BEHREND 6/21/00
CHECKED G. BEHREND 6/21/00
ISSUED
ADAM909.DWG
SIZE D
FSCM NO.
DWG NO. ADAM-909
REV A
SCALE NO
SHEET 1 of 1
NEXT ASSY
USED ON
APPLICATION
ZONE
REV
DESCRIPTION
DATE
APPROVED
REVISIONS


ADAM MATRIX FRAMES
FRONT VIEW
ADAM MATRIX FRAMES
REAR VIEW
FRAME 1
MASTER FRAME
FRAME 2
SLAVE FRAME
FRAME 3
SLAVE FRAME
FRAME 4
SLAVE FRAME
FRAME 5
SLAVE FRAME
FRAME 6
SLAVE FRAME
FRAME 7
SLAVE FRAME
1 - 112
113 - 224
225 - 336
337 - 448
449 - 560
561 - 672
673 - 784
RTS SYSTEMS
BURBANK, CALIFORNIA, USA
ADAM 7 FRAME DBX SYSTEM
NON-REDUNDANT AUDIO
PORT vs CARD LAYOUT
784 x 784
ADAM-910
ADAM910.DWG
SIZE D
SCALE NO
REV A
SHEET 1 of 1
DRAWN G. BEHREND 6/21/00
CHECKED G. BEHREND 6/21/00
NEXT ASSY
USED ON
APPLICATION