

adic

The AML/2 Library

Planning Guide

 Advanced Digital Information Corp

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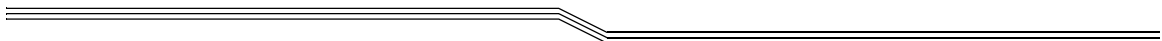
Contents

Introduction

| | |
|----------------------------|-----|
| Intended Audience | 1-1 |
| Organization | 1-1 |
| Associated Documents | 1-2 |
| Assistance | 1-2 |

Description

| | |
|---------------------------------|------|
| System Function | 2-2 |
| AML/2 Hardware Components | 2-2 |
| AML Management Unit (AMU) | 2-2 |
| AMU Hardware Components | 2-3 |
| AMU Software Components | 2-3 |
| AMU Basic Functions | 2-3 |
| Robot | 2-4 |
| Track Section | 2-5 |
| Storage Segment | 2-5 |
| Quadro Tower | 2-6 |
| AMU Control Cabinet | 2-8 |
| Robot Control Cabinet | 2-9 |
| Tower Control Cabinet | 2-10 |
| Universal Drive Cabinet | 2-11 |
| Manual Insert/Eject Unit | 2-12 |
| AML/2 Software Components | 2-13 |
| Mainframe Support | 2-13 |



| | |
|---|------|
| Open System Support | 2-14 |
| Distributed AML Server (DAS) Software | 2-14 |

Specification

| | |
|---|------|
| Physical Specifications | 3-2 |
| Dimensions | 3-2 |
| Electrical Specifications | 3-3 |
| Performance Specifications | 3-5 |
| Environmental Specifications | 3-5 |
| Clean Room Specification | 3-5 |
| Vibration | 3-6 |
| Dust | 3-6 |
| Dirt | 3-6 |
| Regulatory Specifications | 3-7 |
| Media Quantity Specifications | 3-8 |
| Floor Electrical Requirements | 3-10 |
| Barcode Requirements | 3-10 |
| Standard Drives Supported by ADIC | 3-11 |

Configuration

| | |
|-----------------------------------|-----|
| System Heights | 4-1 |
| Storage Types | 4-1 |
| Robot | 4-1 |
| Media Types | 4-2 |
| Drive Types | 4-3 |
| Insert/Eject Types | 4-3 |
| Insert/Eject Handling Boxes | 4-4 |
| Media Segments | 4-4 |
| Universal Drive Cabinets | 4-4 |
| Modem | 4-4 |
| Host Connection | 4-5 |

| | |
|-----------------------------------|-----|
| Communication Software | 4-5 |
| Special Engineering Request | 4-5 |
| Customer System Layout | 4-5 |

Survey

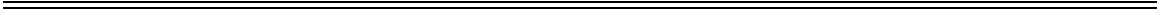
| | |
|--|------|
| Customer and Installation Site Information | 5-1 |
| Physical Environment Specifications | 5-2 |
| Customer Room Layout | 5-4 |
| Site Preparation | 5-5 |
| Power Circuits | 5-5 |
| Telephone Connection | 5-5 |
| Customer Building Layout | 5-6 |
| Access Conditions | 5-7 |
| Additional Comments | 5-10 |

Configuration Examples

| | |
|----------------------------|-----|
| Single Robot Example | A-1 |
|----------------------------|-----|

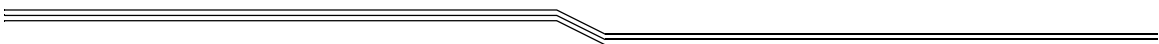
Actual Scenario

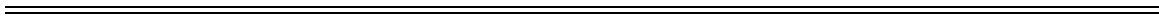
| | |
|--------------------------|-----|
| Vibration Scenario | B-1 |
| Dust Scenario | B-2 |



Figures

| | | |
|--------------------|---|------|
| Figure 2-1 | Basic AML/2 Configuration: One Quadro Tower and One Robot | 2-1 |
| Figure 2-2 | Robot Gripper with Barcode Scanner | 2-4 |
| Figure 2-3 | Track Section Shown with Cable Chain | 2-5 |
| Figure 2-4 | Quadro Tower - Side View | 2-6 |
| Figure 2-5 | Single AML/2 Quadro Tower (Top View) | 2-7 |
| Figure 2-6 | AMU Control Cabinet | 2-8 |
| Figure 2-7 | Robot Control Cabinet | 2-9 |
| Figure 2-8 | Tower Control Cabinet | 2-10 |
| Figure 2-9 | Universal Drive Cabinet | 2-11 |
| Figure 2-10 | Insert/Eject Unit | 2-12 |
| Figure 4-1 | Customer AML/2 Configuration Layout | 4-6 |
| Figure 4-2 | Example AML/2 Configuration | 4-7 |
| Figure 4-3 | Cutout Examples | 4-8 |
| Figure 5-1 | Room Layout | 5-4 |
| Figure 5-2 | Building Scale | 5-6 |
| Figure A-1 | AML/2 Dual Configuration | A-1 |





Tables

Table 3-1 AML/2 Component Physical Dimensions and Loading 3-2

Table 3-2 AML/2 Component Electrical Specifications 3-3

Table 3-3 AML/2 Performance Specifications 3-5

Table 3-4 AML/2 Environmental Specifications 3-5

Table 3-5 AML/2 Regulatory Specifications 3-7

Table 3-6 AML/2 Component Media Quantity Specifications 3-8

Table 3-7 Standard Drives Supported by the AML/2 Library System. 3-11

Table A-1 AML/2 Two Robots with One Tower - 2.05M A-1

Table A-2 AML/2 Two Robots with One Tower - 2.43M A-3

Table A-3 AML/2 Two Robots with One Tower - 2.8 M. A-4

Introduction

This manual contains information that outlines the AML/2 library ¹. The topics discussed in this section of the manual are:

- Overview
- Intended Audience
- Organization
- Associated Documents
- Assistance

Intended Audience

This manual is prepared for salespersons and prospective purchasers of the AML/2 library.

Organization

This publication contains chapters detailing the AML/2 library. The chapters include:

| | |
|-----------|--|
| Chapter 1 | Introduction - Describes the overview, intended audience, organization, associated documents, and where to acquire additional assistance. |
| Chapter 2 | System Description - Describes general information about the AML/2 library components. |
| Chapter 3 | System Specifications - Describes the physical and electrical specifications of the AML/2 library components. |
| Chapter 4 | System Configuration - Describes the structure of the basic AML/2 library and optional components available for the AML/2 library. |
| Chapter 5 | Survey Data - Provides space for planning physical, electrical, and environmental requirements. This information is required by the installation team. |

1. AML/2 is a trademark of ADIC. Throughout the remainder of this document, we refer to the AML/2 library as AML/2.

Associated Documents

| | |
|--------|---|
| 600043 | AML/2 Operator Guide |
| 600141 | AML/2 Maintenance Guide |
| 600300 | AML Hardware Configuration Information |
| 600302 | Product Order Information |

Assistance

If questions cannot be solved with the aid of this document or the immediate salesperson, contact the AMASS Technical Assistance Center (ATAC).

- United States 1-800-827-3822
- Germany +00.800.999.3822
- United Kingdom +00.800.999.3822

Description

The ADIC Automated Media Library/2 (AML/2) is a fully automated, robotic media library that offers an enterprise solution to data management and backup. Figure 2-1 shows the AML/2 in its basic configuration.

Consult the appendix for additional configuration examples.

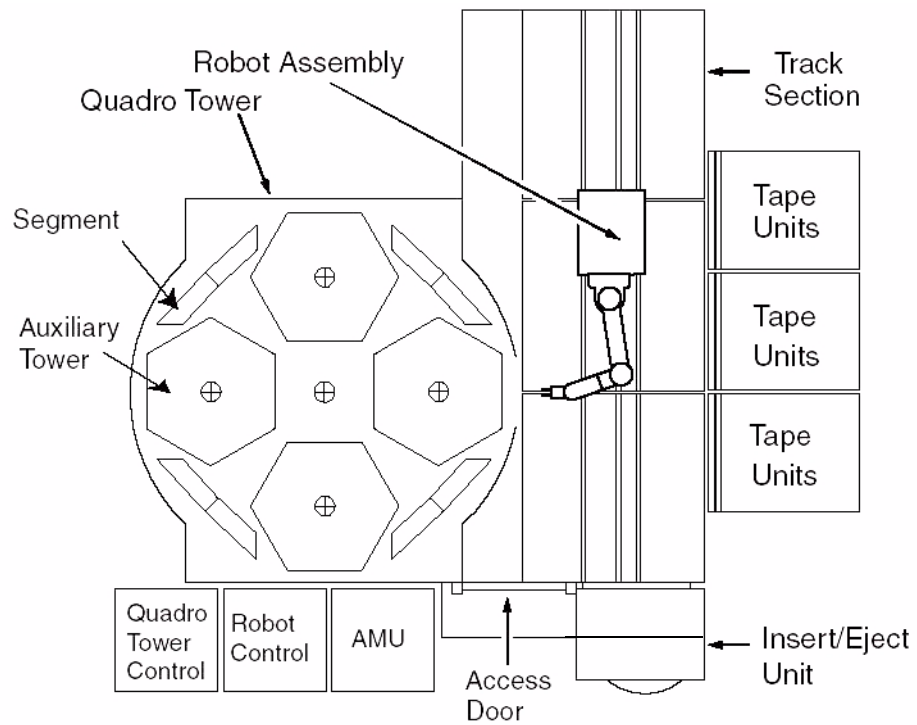


Figure 2-1 Basic AML/2 Configuration: One Quadro Tower and One Robot

System Function

Major system components include the following items:

- Host
- AMU
- Controllers

The basic operational philosophy of the AML/2 centers on the host system which sends all commands to the rest of the system.

When the host software determines that a specific media library action is necessary, it creates the appropriate command string and sends it to the AMU for processing. The AMU receives and interprets the host command, and then issues the appropriate command to the Robot and Storage Segment Controller hardware.

After completing the movement actions, the Robot and Storage Segment Controller Hardware return a status message to the AMU. When all Controller status messages are returned, the AMU reports the overall results to the host system.

AML/2 Hardware Components

The main hardware components of the AML/2 library are:

- AMU
- Robot
- Storage Segments
- Control and Drive Cabinets
- Manual Insert/Eject (I/E) Facility
- Modem (optional)

A description of each of these components is found in the following section.

AML Management Unit (AMU)

The AMU is the central interface of the AML/2 library, connecting the host computer to the robot system and the insert/eject unit. The AMU maintains a copy of the library drives and media information in a relational database. During normal operations, the host computer controls all functions of the AML/2 library. The AMU hardware and software components operate transparently.

AMU Hardware Components

AMU hardware consists of the following components:

- computer with a color monitor, a mouse, and a keyboard
- Token Ring, Ethernet, or FDDI Adapter, 3270 emulation adapter
- RS232 control interface card
— and/or —
- CAN-Bus Adapter

AMU Software Components

The AMU software components are:

- OS/2 Operating System
- Personal Communication Manager TCP/IP
- Database Manager (DB/2)
- AMU Archive Management Software. For additional information, refer to *AML/2 Software Components* on page 2-13.
- Distributed AML Server Software (DAS)

AMU Basic Functions

During normal operation in the “AUTO” mode, the host computer controls the system.

The AMU’s basic tasks are:

- host communication - interprets the incoming host commands and checks these commands for executability
- management of the archive catalog - saves the logical coordinates of the compartments, assigns the media to compartments and traces the status of compartments and drives
- conversion of logical coordinates into physical coordinates
- communication with the control units of the robots and storage towers
- provides operator interface for installation and service
- configuration (describes the specific structure of the system)



The AMU does not have access to the data content of the media.

Robot

 **Note**

The system configuration has available either one or two independently operated, separately tracked robots.

Media movements are performed by a robot equipped with a mixed-media gripper and a laser barcode scanner. See Figure 2-2.

Typical movements include the following:

- moving media into and out of the library
- storing and retrieving media within the library
- mounting and dismounting media from drive units
- scanning media barcode labels.

Mixed-media components of the robot system include:

- Gripper
- Laser barcode scanner
- Robot Y Axis platform
- Robot X Axis column
- rho 3 robot control
- Robot Circular Axis platform

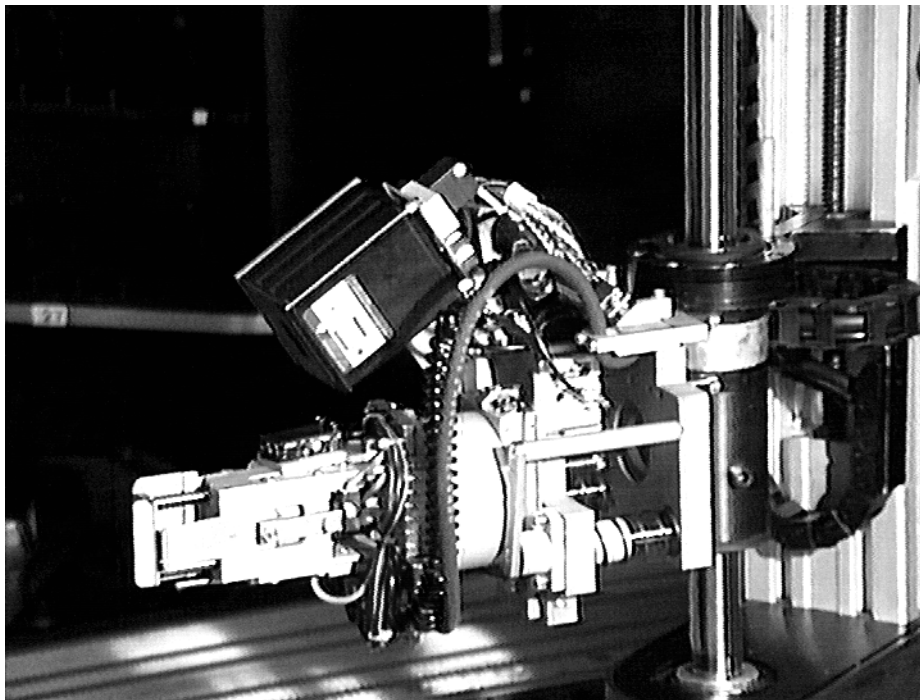


Figure 2-2 Robot Gripper with Barcode Scanner

Track Section

The robot travels on track sections that measure 3' 8" in length. A minimum of three track sections are required for each storage system because home position hard stops are located 5'3" from the home end of the track. Figure 2-3 shows a track section with cable chain.



Figure 2-3 Track Section Shown with Cable Chain

Storage Segment

The primary storage device for media on the AML/2 is the Quadro Tower. Each unit is described next.

Quadro Tower

The Quadro Tower provides the maximum media storage density with the minimum floor space required for a library system. The AML/2 can be configured with a maximum of nine Quadro Towers. See Figure 2-4.

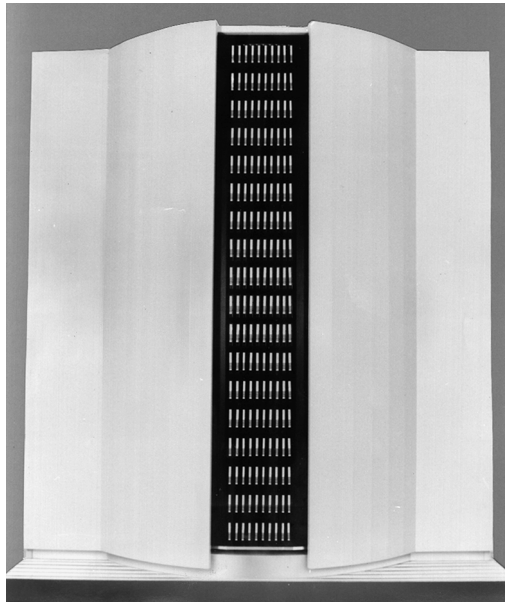


Figure 2-4 Quadro Tower - Side View

Quadro Tower Capacity

Each Quadro Tower consists of:

- eight storage surfaces within the main rotating tower
- 24 additional storage surfaces called segments, arrayed between four independent rotating auxiliary- or sub-towers.

The number of available positions per row depends on the media type.

Each Quadro Tower can store the following number of cartridges according to its height:

- **3 840 cartridges 3590** (2.05 m/6' 8-3/4" high)
- **4 800 cartridges 3590** (2.43 m/7' 11-11/16" high)
- **5 760 cartridges 3590** (2.80 m/9' 2-3/4" high)

in approximately 5 m² / 54 ft² floor surface area.

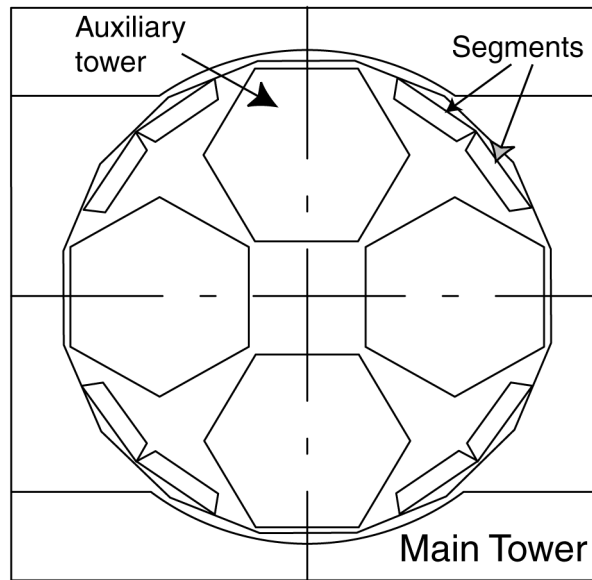


Figure 2-5 Single AML/2 Quadro Tower (Top View)

The average time to retrieve and mount a cassette is between 2.5 and 6 seconds. The Quadro Tower's performance is optimized through weight reduction of moving components and the use of composite materials. Computer-directed servo mechanisms control the movement of the main tower and its auxiliary towers. Figure 2-5 shows a top view of the Quadro Tower.

AMU Control Cabinet

The AMU Control Cabinet houses the electronics that link the host computer to the rest of the system. See Figure 2-6.

The control cabinet contains the following items:

- AMU with monitor/keyboard
- Power supply
- Power distribution panel
- Connector panel
- Dual AMU (optional)



Figure 2-6 AMU Control Cabinet

Robot Control Cabinet

The Robot Control Cabinet houses the electronics which control the robotics of the AML/2. The AMU sends commands to this unit, and status is returned to the AMU. See Figure 2-7.

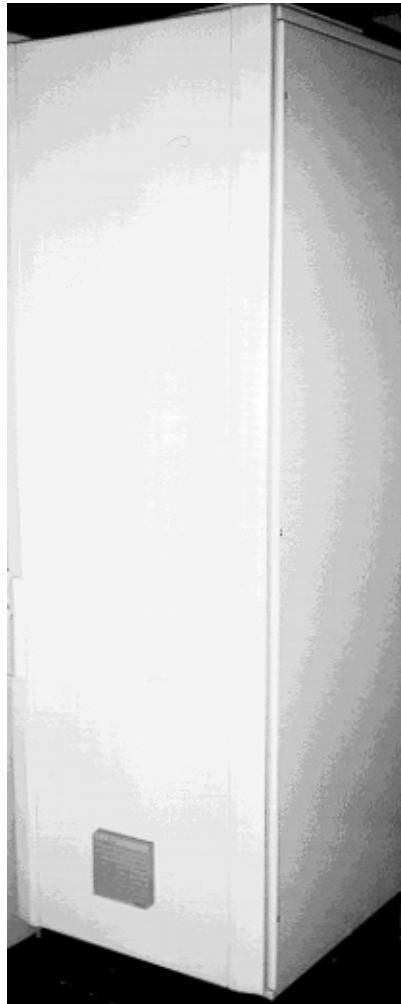


Figure 2-7 Robot Control Cabinet

Tower Control Cabinet

The Tower Control Cabinet houses the electronics which control the circular movement of the Quadro Tower. Commands are received from the AMU and status is returned to the AMU. One Tower Control Unit can control up to three Quadro Towers. See Figure 2-8.

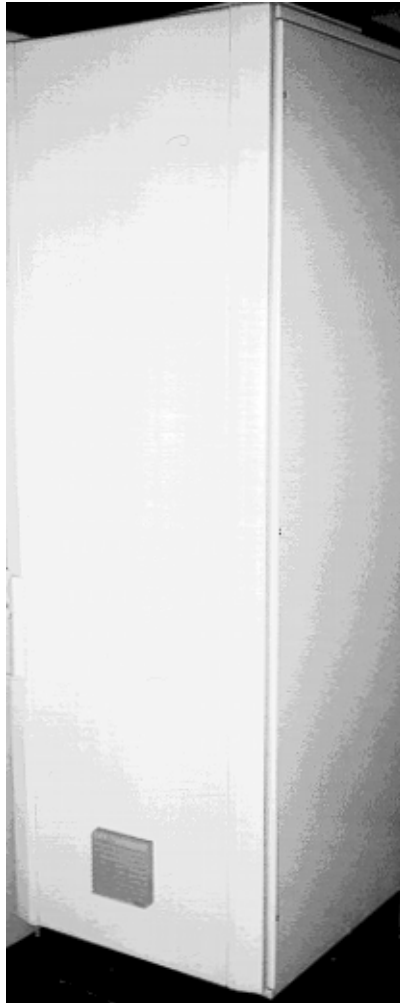


Figure 2-8 Tower Control Cabinet

Universal Drive Cabinet

The Universal Cabinet contains drive units and optional drive controllers. See Figure 2-9.

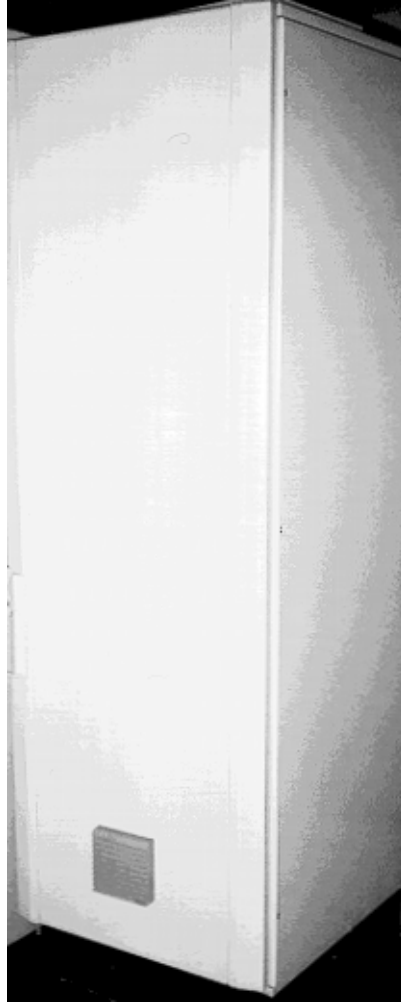


Figure 2-9 Universal Drive Cabinet

Manual Insert/Eject Unit

Media are inserted into the AML/2 system and ejected through the Insert/Eject Unit. The operator loads media from the outside into removable magazines. The capacity of the removable magazines is determined by the type of media.

The I/E unit incorporates a media depository that stores unidentified volumes, defective media, and used cleaning cartridges.

The I/E unit consists of either two or four handling boxes located behind the access door. Figure 2-10 shows the Insert/Eject Unit.



Figure 2-10 Insert/Eject Unit

AML/2 Software Components

ADIC software controls all functions in the AML/2, making automated data backup possible while operating simultaneously with the host system. ADIC software automatically receives messages, coordinates tasks, manages and updates the library database, and provides recovery from media errors.

ADIC software can be tailored specifically for use with different library configurations. In addition, it can be reconfigured to accommodate an expanding library system.

Software access to media libraries is implemented through the UNIX virtual file system layer.

Mainframe Support

The ADIC software supports the following mainframe systems:

- BS 2000: FSC Software ROBAR
- TANDEM: Twinsoft, TwinATL
- MVS: ADIC HACC/MVS (Europe only)

Open System Support

Distributed AML Server (DAS) Software

DAS software operates with both client and server components. The server software modules support the OS/2 operating system platform, and the client software modules support UNIX/Windows operating system platforms. They communicate from the UNIX/Windows clients to the OS/2 DAS server (AMU controller PC) across a TCP/IP connected network.

DAS allows client systems to request actions on selected media within the AML system. DAS performs the following requested actions:

- mounts media in a driver
- dismounts media from a drive
- inserts media into the library
- ejects media from the library

Requirements to support DAS software are platform dependent.

This interface is supported by the ADIC software products:

- StorNext Management Suite
- AMASS
- VolServ

This interface is also supported by other backup and archiving applications through other vendors:

- Veritas Netbackup
- SUN SAM-FS
- Legato Networker
- HP Data Protector (Omniback II)
- IBM TSM (with Gresham EDT Software)

Specification

This section contains information about the following aspects of the AML/2 library:

- Physical Specifications
 - Dimensions
 - Inside the crate
 - Outside of the crate
 - Planning for System Arrival
 - Dock space
 - Hardware
 - Unpacking
 - Assembly Location
 - Tools
 - Weight
 - Construction Requirements for the AML/2 System
 - Fire Extinguishing System / Flooding
- Electrical Specifications
- Performance Specifications
- Environmental Specification
- Regulatory Specifications
- Media Quantity Specifications
- Flooring Requirements
- Barcode Requirements
- Standard Drives Supported by ADIC Storage Systems

Physical Specifications

Dimensions

Table 3-1 provides information for the physical size, weight and loading of ALM/2 library components.

Table 3-1 AML/2 Component Physical Dimensions and Loading

| Height | Width | Depth | Maximum Wt. | Floor Load | Point Load ^a |
|------------------------------|-------------------|-------------------|------------------------|--|--|
| AMU Control Cabinet | | | | | |
| 6.08 ft 1.85 m | 2.00 ft 0.61 m | 2.00 ft 0.61 m | 549.78 lb 249.90 kg | 137.34 lb/ft ² 671.59 kg/ m ² | 78 lb/in ² 5.48 k/cm ² |
| Robot Control Cabinet | | | | | |
| 6.08 ft 1.85 m | 2.00 ft 0.61 m | 2.00 ft 0.61 m | 549.78 lb 249.90 kg | 137.34 lb/ft ² 671.59 kg/ m ² | 78 lb./in ² 5.48 kg/cm ² |
| Tower Control Cabinet | | | | | |
| 6.08 ft 1.85 m | 2.00 ft 0.61 m | 2.00 ft 0.61 m | 549.78 lb 249.90 kg | 137.34 lb/ft ² 671.59 kg/ m ² | 78 lb/in ² 5.48 kg/cm ² |
| Track Sections | | | | | |
| N/A | 3.41 ft 1.04 m | 3.67 in 1.12 m | 329.34 lb 149.70 kg | 26.30 lb/ft ² 128.63 kg/ m ² | 46.7 lb/in ² 3.28 kg/cm ² |
| 6.72 ft/2.05 m Robot | | | | | |
| 6.72 ft 2.05 m | 1.31 ft 0.40 m | 1.31 ft 0.40 m | 704 lb 320 kg | 408.98 lb/ft ² 2000 kg/m ² | N/A |
| 7.97 ft/2.43 m Robot | | | | | |
| 7.97 ft 2.43 m | 1.31 ft 0.40 m | 1.31 ft 0.40 m | 770 lb 350 kg | 447.32 lb/ft ² 2187.50 kg/ m ² | N/A |
| 9.18 ft/2.80 m Robot | | | | | |
| 9.18 ft 2.80 m | 1.31 ft 0.40 m | 1.31 ft 0.40 m | 836 lb 380 k | 485.67 lb/ft ² 2375 kg/m ² | N/A |

Table 3-1 AML/2 Component Physical Dimensions and Loading

| Height | Width | Depth | Maximum Wt. | Floor Load | Point Load ^a |
|------------------------------------|-------------------|-------------------|---------------------|---|---|
| I/E Unit | | | | | |
| 6.89 ft 2.10 m | 2.62 ft 0.80 m | 1.65 ft 0.50 m | 352 lb 160 kg | 81.80 lb/ft ² 400 kg/m ² | N/A N/A |
| 6.72 ft/2.05 m Quadro Tower | | | | | |
| 6.72 ft 2.05 m | 7.33 ft 2.24 m | 7.33 ft 2.24 m | 71720 lb 3260 kg | 133.46 lb/ft ² 652.62 kg/m ² | 1017 lb/in ² 71.50 kg/cm ² |
| 7.97 ft/2.43 m Quadro Tower | | | | | |
| 7.97 ft 2.43 m | 7.33 ft 2.24 m | 7.33 ft 2.24 m | 7920 lb 3600 kg | 147.37 lb/ft ² 720.69 kg/m ² | 1124 lb/in ² 79.02 kg/cm ² |
| 9.80 ft/2.80 m Quadro Tower | | | | | |
| 9.18 ft 2.80 m | 7.33 ft 2.24 m | 7.33 ft 2.24 m | 8668 lb 3940 kg | 161.29 lb/ft ² 788.75 kg/m ² | 1229 lb/in ² 86.40 kg/cm ² |
| Universal Drive Cabinet | | | | | |
| 6.56 ft 2.00 m | 1.97 ft 0.60 m | 2.62 ft 0.80 m | 990 lb 450 kg | 191.71 lb/ft ² 937.50 kg/m ² | 140 lb/in ² 9.48 kg/cm ² |

a. Calculated with 3-1/8" diameter round foot located in normal floor configuration under towers or flat surfaces.

Electrical Specifications

Table 3-2 lists the basic electrical specifications for the components of the AML/2 library.

Table 3-2 AML/2 Component Electrical Specifications

| Device | Voltage | kVA | AMP | BTU | Receptacle |
|-----------------------|--------------------|-----|-----|------|---------------------|
| AMU Control Cabinet | 208 VAC 3 phase | 1.2 | 1.2 | 762 | L21-20R |
| Robot Control Cabinet | 208 VAC 1 phase | 0.8 | 1.9 | 1219 | AMU Control Cabinet |

Table 3-2 AML/2 Component Electrical Specifications (Continued)

| Device | Voltage | kVA | AMP | BTU | Receptacle |
|------------------------------------|--------------------|------------|------------|------------|-----------------------|
| Tower Control Cabinet | 208 VAC 1 phase | 0.4 | 1.9 | 1219 | AMU Control Cabinet |
| Manual I/E Facility | 208 VAC 1 phase | 0.01 | 0.05 | 30 | AMU Control Cabinet |
| Robot | | 0.8 | 0.5 | 305 | Robot Control Cabinet |
| Quadro Tower | | 0.2 | 0.14 | 91 | Tower Control Cabinet |
| Linear Rack | Not Applicable | | | | |
| Robot Track Section | Not Applicable | | | | |
| Universal Drive Cabinet (no drive) | 208 VAC 1 phase | 0.01 | 0.05 | 30 | L6-15R |
| Universal Drive Cabinet (no drive) | 120 VAC 1 phase | 0.01 | 0.05 | 30 | L5-15R |

Performance Specifications

Table 3-3 lists performance specifications for the AML/2 library. Actions refer to "PUT," "GET," and "LOOK."

Table 3-3 AML/2 Performance Specifications

| Avg Actions per Hour | Peak Actions per Hour | Avg Time to Present Media | Max Time to Present Media | Pick Time |
|----------------------|-----------------------|---------------------------|---------------------------|-----------|
| 300 | 400 | 2.5 seconds | 6 seconds | 3 seconds |

Environmental Specifications

Table 3-4 lists xxxx" "environmental specifications for the AML/2 library.

Table 3-4 AML/2 Environmental Specifications

| Temperature | Humidity | Altitude |
|---|--|----------|
| Minimum to Maximum: 60° - 90° F (16° - 32° C) Recommended: 70° - 75° F (21° - 24° C) | Minimum to Maximum: 15 - 75 percent Recommended: 45 -65 percent | No limit |

Clean Room Specification

The following items can cause damage when present in excess. The most vulnerable component in the AML configuration is the tape drive and media.

- Vibration
- Dust
- Dirt

Vibration

Significant vibration (high amplitude) occurring while drives are writing will result in drives having to rewrite data, thereby reducing individual cartridge capacity and overall throughput. Vibration during reading will slow the data rate, due to retries, but will have no effect on cartridge capacity. Low amplitude vibration of short duration will not affect the robot/library. Cartridges in their storage slots will not have problems with vibration. The vibration of a mortar drill will not be a problem. The vibration of a jackhammer may introduce problems if located beside a drive cabinet.

The robot is far less susceptible to vibration. The amplitude would have to be very large before the gripper would have targeting accuracy problems.

Dust

The AML will not have problems with slight dust. The AML library does not actively circulate air. Simple ambient air movement (from air conditioning units) will not move dirt into the library, but can carry dust. ADIC recommends cleaning the barcode reader at the first sign of errors. Or, schedule a night cleaning session during or after your construction.

Both airborne dust and airborne dirt can get into tape drives if the air in front of a drive has both in sufficient concentration because the drives draw air from the front of the drive and push it out the rear of the drive. While inside the drives, dust and dirt can contaminate the tape path, resulting in accelerated head and tape wear causing the drives to show changes in performance.

Dirt

The difference between dust and dirt is determined by the size and weight of the particle. Except in the case of significant air movement, dirt will readily settle to the ground. As long as it settles out before it reaches the library, then there is no problem. Excessive amounts of gritty dirt will have an abrasive effect on the moving parts and can also impact the barcode reader on the robot.

Regulatory Specifications

Table 3-5 lists the key safety and electromagnetic regulatory specifications for the AML/2 library.

Table 3-5 AML/2 Regulatory Specifications

| Safety | | | EMC - EMI | |
|---------------|------------|---------------|---------------|---------|
| North America | | Europe | North America | Europe |
| UL | CSA | TUV Rhineland | FCC, Part 15 | CE Mark |
| UL1950 - ITE | C22.2 #950 | EN60950 | Class A | Class A |

Media Quantity Specifications

Table 3-6 lists the number of cassette media by type that can be stored in Quadro Towers and Linear Racks for the AML/2 library. Refer to the part number *600300 AML Hardware Configuration Information* manual for the amount of data that can be stored.

Table 3-6 AML/2 Component Media Quantity Specifications

| Media | Device Height (inches) | Media Quantity Quadro Tower |
|--|---------------------------------|-----------------------------|
| Half-Inch Cartridge 3590, 9840, LTO, D3 | 80 ³ / ₄ | 3840 |
| | 95 ⁵ / ₈ | 4800 |
| | 110 ³ / ₄ | 5760 |
| D-2 small Cassette | 80 ³ / ₄ | 1344 |
| | 95 ⁵ / ₈ | 1728 |
| | 110 ³ / ₄ | 2112 |
| D-2 Medium Cassette | 80 ³ / ₄ | 960 |
| | 95 ⁵ / ₈ | 1152 |
| | 110 ³ / ₄ | 1344 |
| VHS Cassette | 80 ³ / ₄ | 1792 |
| | 95 ⁵ / ₈ | 2048 |
| | 110 ³ / ₄ | 2560 |
| DLT Cartridge SDLT | 80 ³ / ₄ | 3456 |
| | 95 ⁵ / ₈ | 4320 |
| | 110 ³ / ₄ | 5184 |
| AIT Cartridge DvcPro Small | 80 ³ / ₄ | 5376 |
| | 95 ⁵ / ₈ | 7168 |
| | 110 ³ / ₄ | 8512 |
| Optical Disk 512 | 80 ³ / ₄ | 3168 |
| | 95 ⁵ / ₈ | 3872 |
| | 110 ³ / ₄ | 4576 |

Table 3-6 AML/2 Component Media Quantity Specifications (Continued)

| Media | Device Height (inches) | Media Quantity Quadro Tower |
|----------------------------|-----------------------------------|--|
| Optical Disk Reflection | 80 ³ / ₄ | 3456 |
| | 95 ⁵ / ₈ | 4224 |
| | 110 ³ / ₄ | 4992 |
| DTF small | 80 ³ / ₄ | 2048 |
| | 95 ⁵ / ₈ | 2560 |
| | 110 ³ / ₄ | 3072 |
| DTF medium | 80 ³ / ₄ | 1280 |
| | 95 ⁵ / ₈ | 1536 |
| | 110 ³ / ₄ | 1792 |

Floor Electrical Requirements

Flooring must meet specifications for being dust-free, and physically, chemically, and acoustically certified.

In addition, the flooring must meet the insulation resistance requirements for electrical current of 1×10^5 to 1×10^8 ohms between the floor surface and earth ground. This will prevent system failure or electrical shock. Sufficient resistance is achieved by using antistatic, nonconducting floor tile with a resistance of 1×10^6 to 1×10^9 ohms. Provide an appropriate connection to the metal portion of the ground plate in order to ensure proper insulation resistance.

Barcode Requirements

Increased accuracy in barcode scanning of individual media labels can be assured if the labels are in compliance with the ANSI MH10.8M-1983 standard, and meet the following requirements:

- ANSI MH10.8M-1983 Standard:
 - Number of digits: 6
 - Background reflection: at least 25 percent
 - Print contrast: at least 75 percent
 - Ratio: at least 2.2
 - Module: 250 μ m
 - Print tolerance: ± 57 μ m
- Additional Requirements:
 - Length of the rest zones: 5.25 mm \pm 0.25 mm
 - No black marks can be present in the intermediate spaces or rest zones
 - No white areas may be present on the bars
 - Bars should read in a uniform direction. Nonuniform reading directions are feasible in principle, but have a detrimental effect on performance
 - Each label should be applied in the upper right corner of the tape cartridge recess (when oriented vertically)
- Quality Testing

Compliance with these specifications can be checked and documented with the Ergilaser 3000 High Density bar code measuring device that is manufactured by the Laetus Company.

Standard Drives Supported by ADIC

Several different drives types can be used with the AML/2 Library system. Consult with an ADIC Customer Engineer before purchase or installation.

Table 3-7 Standard Drives Supported by the AML/2 Library System

| Manufacturer | Type | Interface | Number of Drives per: | | Shelf Construction partition |
|--------------|-------------------------------|---------------------------|-----------------------|---------------|------------------------------|
| | | | Bay | Drive Cabinet | |
| IBM | 3590 B1A, 128 track | SCSI-2 (DE), (F/ W) | 2 | 8 | 4 |
| IBM | 3590 E1A, 256 track | SCSI-3 (DE), (UW) | 2 | 8 | 4 |
| FUJITSU | M8100 DIANA-4,36 track | SCSI-3 (DE) | 2 | 12 | 6 |
| Media: 9840 | | | | | |
| STK | 9840 - L01 TX30 (EAGLE) | SCSI-3 | 2 | 14 | 7 |
| STK | 9840 - L02 TX30 (EAGLE) | ESCON | 2 | 14 | 7 |
| Media: DLT | | | | | |
| ADIC (OEM) | DLT 4001* | SCSI-2 (DE), (F) | 2 | 12 | 6 |
| ADIC (OEM) | DLT 4002* | SCSI-2 (DE), (F) | 1 | 6 | 6 |

Table 3-7 Standard Drives Supported by the AML/2 Library System

| Manufacturer | Type | Interface | Number of Drives per: | | Shelf Construction partition |
|--|-----------------------------------|--------------------|-----------------------|---------------|------------------------------|
| | | | Bay | Drive Cabinet | |
| ADIC (OEM) | DLT 7001* | SCSI-2 (DE), (F/W) | 2 | 12 | 6 |
| ADIC (OEM) | DLT 7001S* Low Profile | SCSI-2 (DE), (F/W) | 2 | 24 | 4 - 6 |
| ADIC (OEM) | DLT 8001S* Low Profile SDLT | SCSI-2 (DE), (F/W) | 2 | 24 | 4 - 6 |
| Media: LTO | | | | | |
| ADIC | LTO1 | SCSI | 2 | 24 | 4 - 6 |
| IBM | LTO2 | SCSI | 2 | 24 | 4 - 6 |
| IBM | LTO2 | FC | 2 | 24 | 4-6 |
| Media: VHS | | | | | |
| SONY | SVO-5800P/ SVP-5600P | Video | 1 | 6 | 6 |
| SONY | SVO-9620 | Video | 1 | 6 | 6 |
| SONY | SVP-9020 | Video | 1 | 6 | 6 |
| Media: D2 Medium and D2 Small | | | | | |
| AMPEX | DST 312 | SCSI-2 (DE), (F) | 1 | 4 | 4 |
| Media: DTF Large and DTF Small | | | | | |
| SONY | GY-2120 | SCSI-2 (DE/SE) | 1 | 6 | 6 |
| Media: BetaCAM Small and BetaCAM Large | | | | | |

Table 3-7 Standard Drives Supported by the AML/2 Library System

| Manufacturer | Type | Interface | Number of Drives per: | | Shelf Construction partition |
|-------------------------|---------------------------------|-----------------------|-----------------------|---------------|------------------------------|
| | | | Bay | Drive Cabinet | |
| SONY | BVW-75P | Video | 1 | 4 | 4 |
| Media: 8mm | | | | | |
| ADIC (IBM OEM) | LT01 | SCSI | 2 | 24 | 4 - 6 |
| | LT02 | SCSI | 2 | 24 | 4 - 6 |
| | LT03 | SCSI | 2 | 24 | 4 - 6 |
| EXABYTE | 8900T Mammoth | SCSI-2 (DE/SE) | 2 | 12 | 6 |
| Media: AIT 8mm | | | | | |
| ADIC (OEM) | AIT 3102* Low Profile | SCSI-2 (DE), (F/W) | 2 | 24 | 4 - 6 |
| Media: AIT-2 8mm | | | | | |
| ADIC (OEM) | AIT 5002* LVD Low Profile AIT/3 | SCSI-3 (UW), (SE-LVD) | 2 | 24 | 4 - 6 |
| ADIC (OEM) | AIT 5102* Low Profile | SCSI-3 (UW), (DE) | 2 | 24 | 4 - 6 |
| Media: AIT-3 8mm | | | | | |
| SONY | SDX700C AIT-3 | SCSI-3 | 2 | 24 | 4 - 6 |
| Media: Optical Disc 512 | | | | | |
| HP | SureStore 5200ex/ 9100ex | SCSI-2 (SE) | 2 | 16 | 8 |

Table 3-7 Standard Drives Supported by the AML/2 Library System

| Manufacturer | Type | Interface | Number of Drives per: | | Shelf Construction partition |
|--|----------------------|------------------|-----------------------|---------------|------------------------------|
| | | | Bay | Drive Cabinet | |
| Media: CD-Caddy | | | | | |
| PLEXTOR | Plexwriter PX-R412Ce | SCSI-2 (SE), (F) | 2 | 30 | 5 |
| Media: NCTP | | | | | |
| PHILIPS | NCTP-L-DE W | SCSI-3 (DE/SE) | 1 | 6 | 6 |
| Media: Digital BetaCAM Small and Digital BetaCAM Large | | | | | |
| SONY | DVW-500P | Video | 1 | 4 | 4 |
| SONY | DVW-510 | Video | 1 | 4 | 4 |
| SONY | DVW-A500P | Video | 1 | 4 | 4 |

* The following drives are composed of three different types of installation units.

- 1 mounting kit (2 drives/kit) = 1 level= 2 drives
- 1 mounting kit (2 drives/kit) + 1 add-on kits (2 drives/kit) = 2 levels= 4 drives
- 1 mounting kit (2 drives/kit) + 2 add-on kits (2 drives/kit) = 3 levels= 6 drives

This results in the following configurations for the installation of linear shelves:

- L1/4 = 1x 2 levels
- L2/4 = 1x 3 levels + 1x 2 levels
- L3/4 = 2x 3 levels + 1x 2 levels
- L4/4 = 4x 3 levels

Configuration

The purpose of this chapter is to assist prospective customers and new owners in planning for an AML/2 library system installation. Detailed information about drive, media, and storage support for the AML/2 is located in the part number 600300 *AML Hardware Configuration Information* manual. Order information for the AML/2 components is located in the part number 600302 *Product Order Information* manual.

System Heights

Check (✓) the requested system height.

_____ 80 ³/₄ inches (2.05 meters)

_____ 95 ⁵/₈ inches (2.43 meters)

_____ 110 ³/₄ inches (2.8 meters)

Storage Types

Enter the quantity of the desired storage type.

_____ Quadro Tower (maximum 9)

_____ Linear Rack (3 sections each per track section)

Robot

Enter the desired number of robots (maximum 2).

_____ Robot(s)

Media Types

Enter the quantity of the desired media type (maximum 5).

| | | |
|-------|---------------------------|-------|
| _____ | 3480/3490E/3590/9840/9940 | |
| _____ | OD512 | |
| _____ | OD-R | |
| _____ | D2S | |
| _____ | D2M | |
| _____ | VHS | |
| _____ | DLT/SDLT | |
| _____ | DvcPro small/AIT | |
| _____ | DvcPro large | |
| _____ | DTF small/Betacam | |
| _____ | DTF medium | |
| _____ | LTO | |
| _____ | | _____ |
| _____ | | _____ |
| _____ | | _____ |
| _____ | | _____ |
| _____ | | _____ |

Drive Types

Enter the desired quantity of drive types (maximum 5), and state if the drives require rack mounting.

| Quantity | Type | Supported (Yes or No) | Rack Mount (Yes or No) |
|----------|-------------------|--------------------------|---------------------------|
| _____ | Fujitsu 3490E | Yes | _____ |
| _____ | ADIC 8490 | Yes | _____ |
| _____ | IBM 3490 C1A | Yes | _____ |
| _____ | IBM 3490 C2A | Yes | _____ |
| _____ | ADIC 8590 | Yes | _____ |
| _____ | MountainGate 2150 | Yes | _____ |
| _____ | ER90 HiPPI | Yes | _____ |
| _____ | ER90 IPI | Yes | _____ |
| _____ | Exabyte 8mm | Yes | _____ |
| _____ | Exabyte 4mm | Yes | _____ |
| _____ | HP OD | Yes | _____ |
| _____ | ADIC 4002 | Yes | _____ |
| _____ | OTR | Yes | _____ |
| _____ | DTF 1242 | Yes | _____ |
| _____ | non-ADIC drive | _____ | _____ |
| _____ | DLT 7000 | _____ | _____ |
| _____ | DLT 8000 | _____ | _____ |
| _____ | SDLT 220 | _____ | _____ |
| _____ | LTO1 | _____ | _____ |
| _____ | LTO2 | _____ | _____ |

Insert/Eject Types

Check (✓) the requested type of Insert/Eject Facility.

- _____ 4 box (Standard)
 _____ 4 box (D2/DTF)
 _____ 2 box (D2/DTF)

Insert/Eject Handling Boxes

Enter the quantity of the media type handling racks. Refer to *Media Types* on page 4-2 for the chosen media types.

_____ Media type 1
_____ Media type 2
_____ Media type 3

Media Segments

Enter the quantity of the media segments. Refer to *Media Types* on page 4-2 for the chosen media type.

_____ Media type 1
_____ Media type 2
_____ Media type 3

Universal Drive Cabinets

Enter the quantity of the desired drive cabinets.

_____ Drive Cabinet(s)

Modem

Check (✓) if a modem is desired.

_____ Yes _____ No

Host Connection

Check (✓) the requested type of connection.

- Ethernet
- Token Ring
- Coax (3270 emulation)
- FDDI
- Special _____

Communication Software

Check (✓) if Remote Access communication software is desired.

- Remote Access

Special Engineering Request

Check (✓) any desired special engineering requirements.

- None
- Hardware
- Software

Customer System Layout

Sketch the customer's system layout or cut and paste from the examples in Figure 4-3 on page 4-8. Figure 4-2 on page 4-7 represents a configuration example.

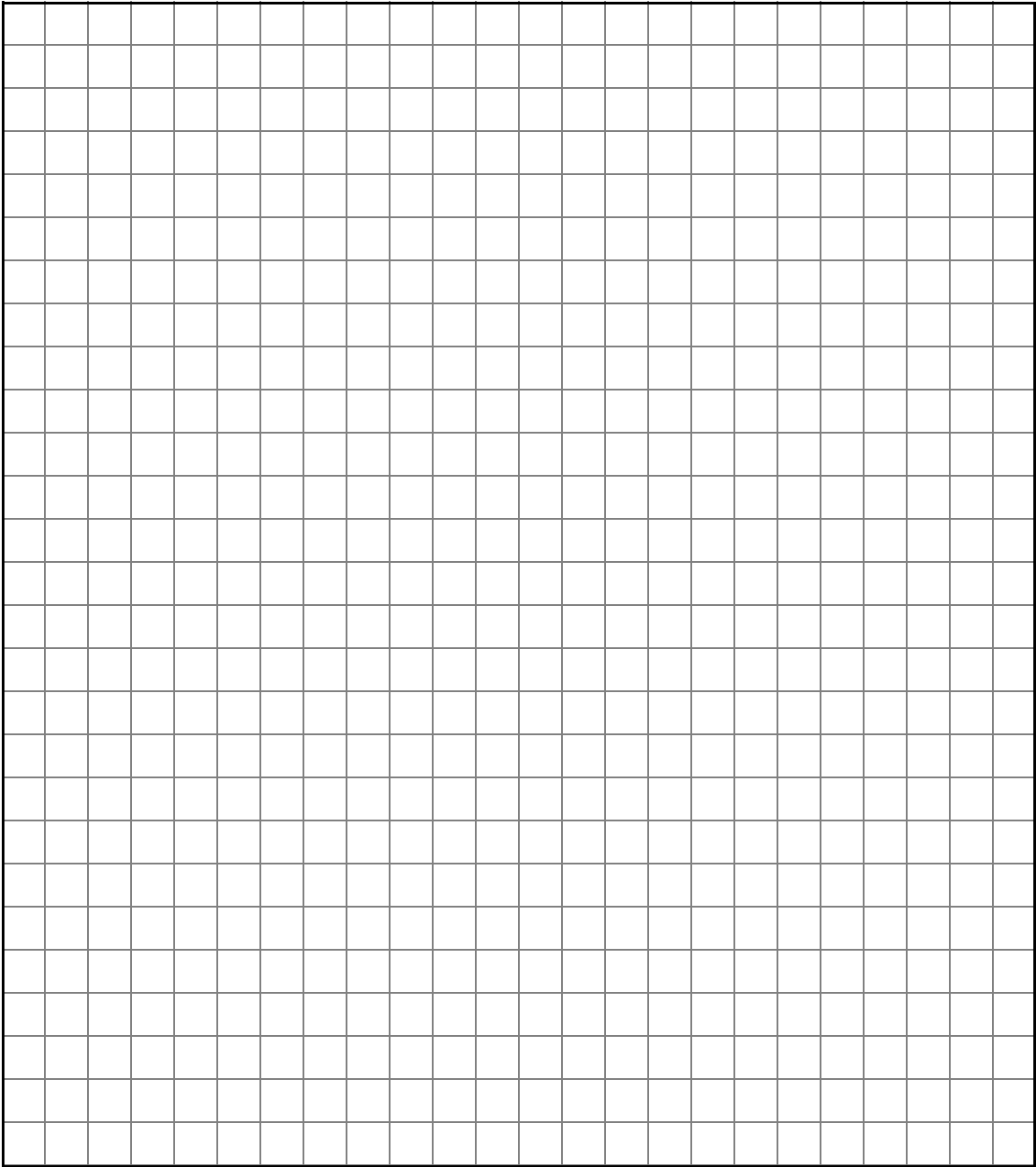


Figure 4-1 Customer AML/2 Configuration Layout

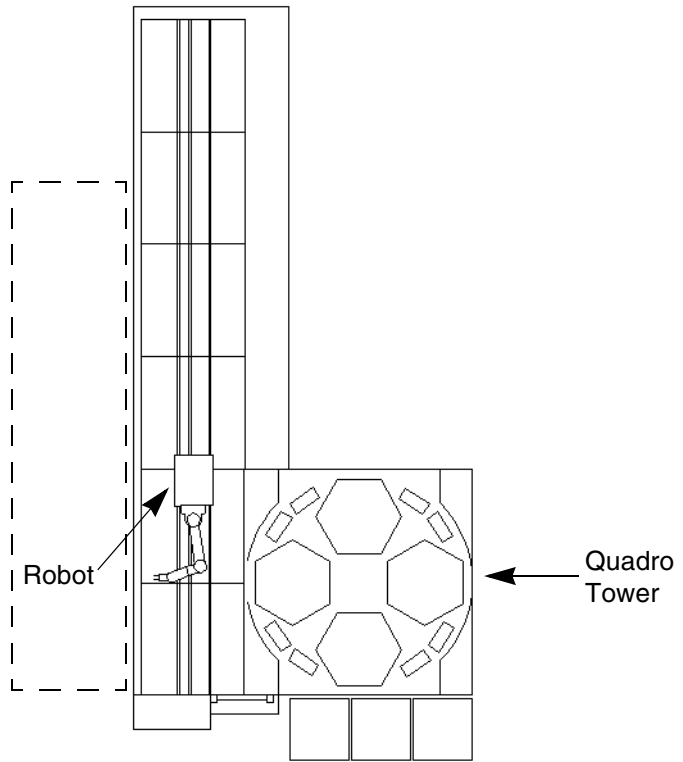


Figure 4-2 Example AML/2 Configuration

Scale: 1/4" = 1'

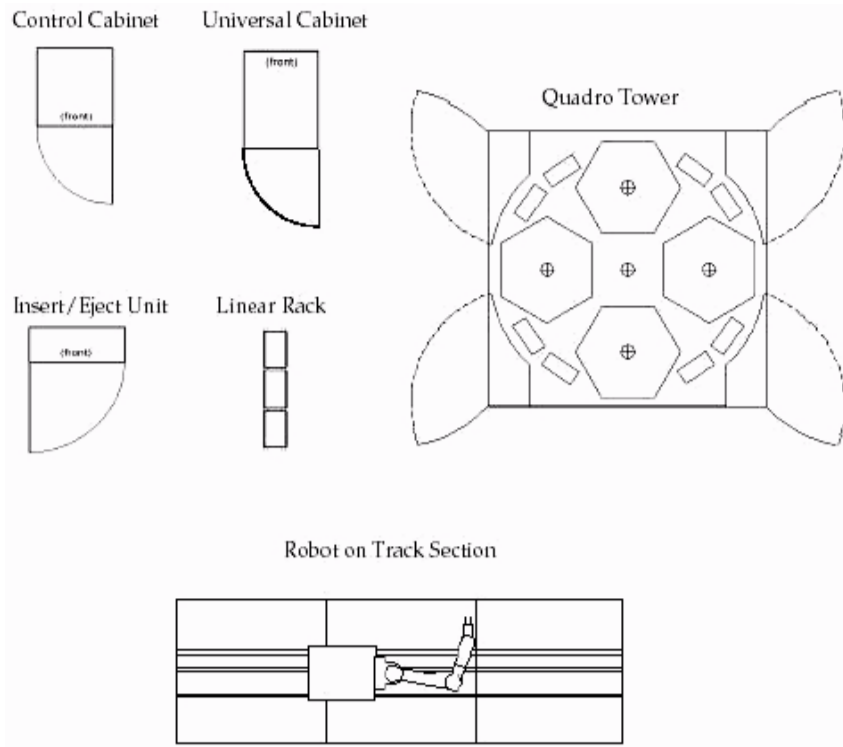


Figure 4-3 Cutout Examples

Scale: 1/4" = 1'

Survey

Use this section to record relevant information about the delivery site and associated issues. Record all requested information, if possible.

Customer and Installation Site Information

Record any additional information in *Additional Comments* on page 5-10.

Customer Name:

Mailing Address:

Sales Contact:

Telephone:

ADIC Sales Rep:

ADIC Account Mgr:

Shipping Address:

Installation Contact: #1

Installation Contact: #2

Telephone:

Fax

Email Address

Target Installation Date:

Target Operational Date:

Physical Environment Specifications

Record any additional information in *Additional Comments* on page 5-10.

Room Dimension:

Ceiling Height:

Ceiling Projection:

Floor Type:

Floor Load Capacity:

Fire Protection:

Other Issues to Consider::

Customer Room Layout

Sketch the approximate measurements of the AML/2 library room and any obstructions. Establish your own grid scale.

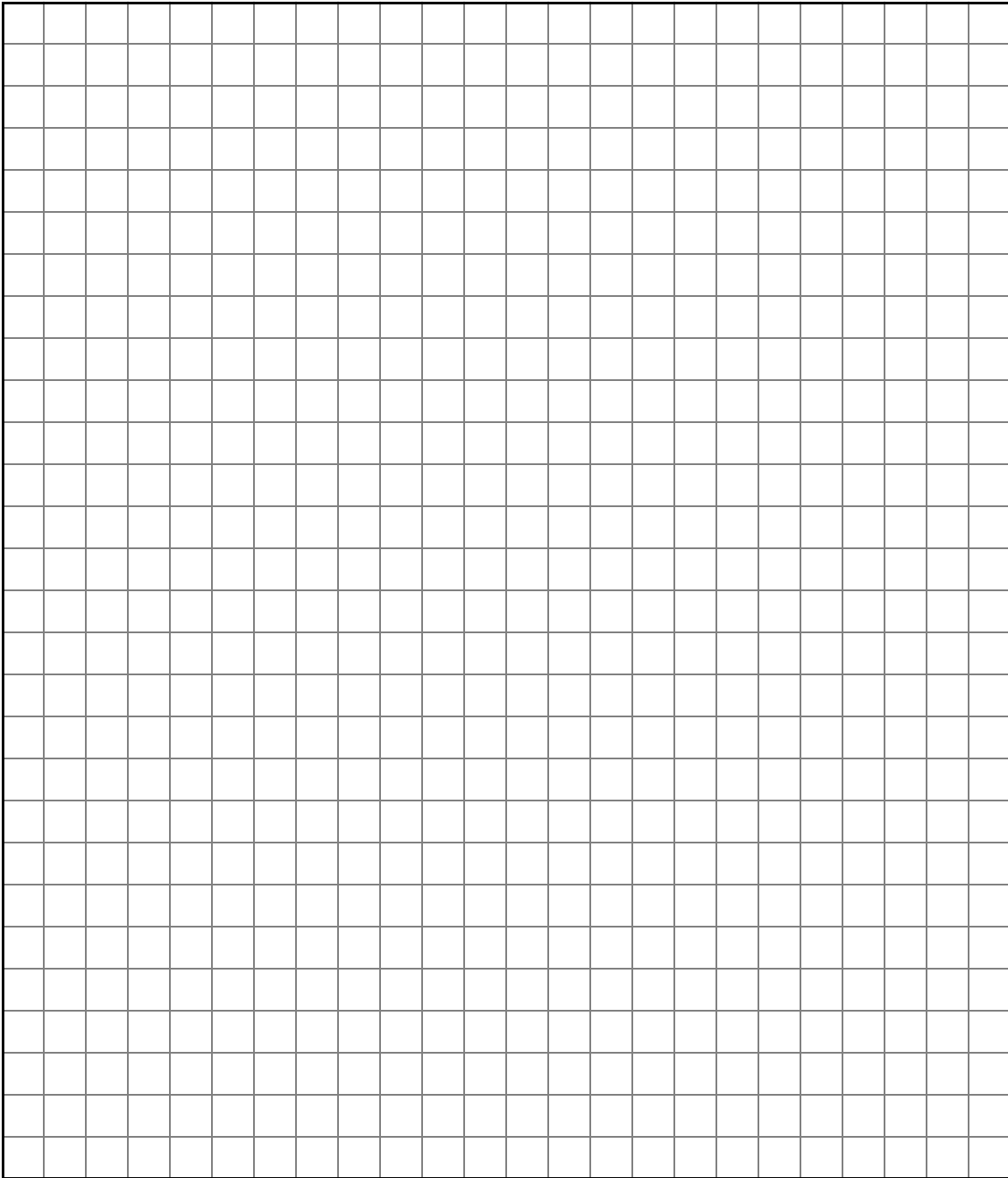


Figure 5-1 Room Layout

Scale: 1/4" = 1'

Site Preparation

The following customer supplied circuits are necessary for the proper installation and operation of the AML/2 library.

Power Circuits

Refer to *Electrical Specifications* on page 3-3

 **Note**

This information must be conveyed to the customer to enable site preparation before installation.

_____ 208 VAC, three phase, 20A circuit terminated in a NEMA L21-20R receptacle.

_____ 208 VAC, single phase, 15A circuit terminated in a NEMA L6-15R receptacle.

_____ 120 VAC, single phase, 15A circuit terminated in a NEMA L5-15R receptacle

Telephone Connection

Refer to *Modem* on page 4-4.

 **Note**

This information must be conveyed to the customer to enable site preparation before installation.

_____ Standard B1 analog telephone line terminating in an RJ-11 connector. Each AMU requires a separate line for the diagnostic modem.

 **Customer Building Layout**

Sketch the building layout that indicates the route from the loading dock to equipment final destination. Indicate obstructions.

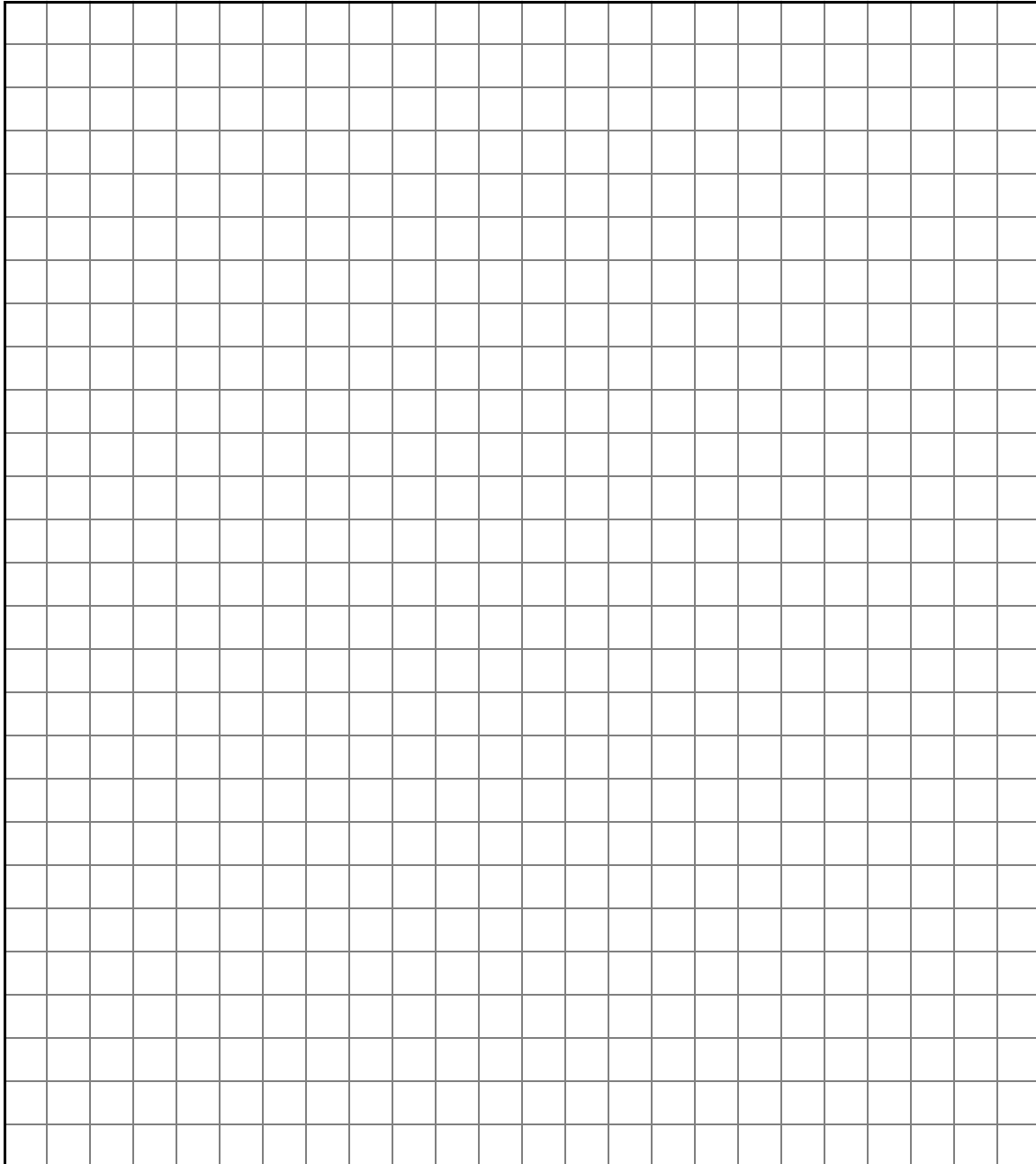


Figure 5-2 Building Scale

Grid = 1/4", No Scale

Access Conditions

Access to AML/2 library room (elevator, stairs, door widths, etc.):

Dimensions and Location of Smallest Door or Opening to be used:

Loading Dock Specifications (dock height, type of ramps, weather protection, etc.):

Semitrailer Accessibility (Y or N): _____

Preferred/Required Local Carrier Company:

Where Can Trailer Be Left for Staging?

Availability of Material Handling Equipment:

Location for Uncrating:

Preferred Time of Day for Unloading and Moving Materials:

Off Hours/Weekends Accessibility for Installation Team:

Procedure for Obtaining Building Passes:

Procedure for Scheduling Use of Elevator, Loading Dock, etc.:

Waste Disposal Considerations:

Bargaining Unit Considerations:

Other Considerations:



Additional Comments

Record any additional information that pertains to the installation. Note the page number of topics in this document which need further clarification or discussion.

Configuration Examples

The ADIC Automated Media Library/2 (AML/2) is a fully automated, robotic media library that offers an enterprise solution to data management and backup.

Single Robot Example

Figure A-1 shows the AML/2 in its single configuration.

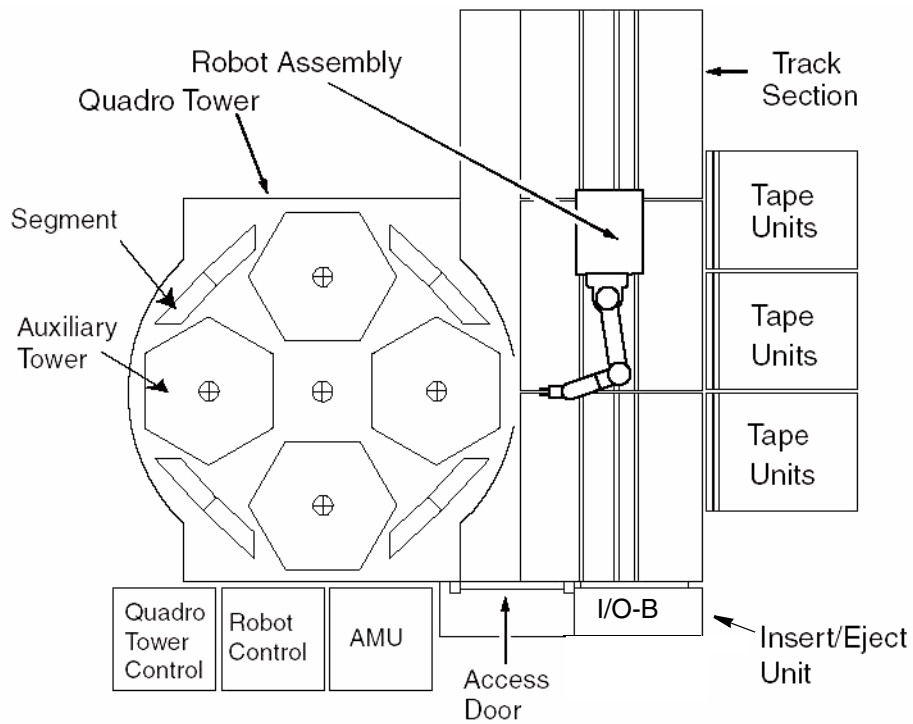


Figure A-1 AML/2 Dual Configuration

Table A-1 AML/2 Two Robots with One Tower - 2.05M

| Crate # | Size | Description | Qty |
|---------|----------|----------------|-----|
| S1-1 | 66X41X60 | Bases, Spiders | 1 |
| S1-2 | 72X34X53 | Gears | 1 |

Table A-1 AML/2 Two Robots with One Tower - 2.05M

| Crate # | Size | Description | Qty |
|---------|-----------|--|-----|
| S1-3 | 72X78X23 | Top Plate, Struts, Columns | 1 |
| S1-4 | 98X51X61 | Bins | 1 |
| S1-5 | 94X25X47 | QT Doors, Enclosure, Profiles, Step Plates | 1 |
| S1-6 | 46X50X53 | I/E Boxes, Robot Igus 1 & 2, Cables | 1 |
| S1-7 | 105X41X45 | Robot Track Enclosure, Ceiling | 1 |
| S1-8 | 93X27X29 | Robot Column #1 | 1 |
| S1-9 | 93X27X29 | Robot Column #1, Star Rail, Gear Rack | 1 |
| S1-10 | 84X33X37 | EIF 1 & 2 | 1 |
| S1-11 | 93X35X24 | Entry Doors 1 & 2 | 1 |
| S1-12 | 31X60X86 | Robot 1 & 2 Controllers | 1 |
| S1-13 | 31X60X86 | AMU & Tower Controllers | 1 |
| S1-14 | 32X28X36 | Robot Arm # 2 | 1 |
| S1-151 | 32X28X36 | Robot Arm # 1 | 1 |
| S1-16 | 45X35X86 | Drive Cabinet | 1 |
| S1-17 | 45X35X86 | Drive Cabinet | 1 |
| S1-18 | 45X35X86 | Drive Cabinet | 1 |
| S1-19 | 93X31X49 | Walkways, PC & Monitor | 1 |
| S1-20 | 44X44X44 | Pallet of Tapes | 1 |
| S1-21 | 48X42X45 | Robot Track # 1 & 2 | 1 |
| S1-22 | 42X25X23 | DST-312 Drives | 1 |
| S1-23 | 42X25X23 | DST-312 Drives | 1 |
| S1-24 | 42X25X23 | DST-312 Drives | 1 |
| S1-25 | 42X25X23 | DST-312 Drives | 1 |
| S1-26 | 42X25X23 | DST-312 Drives | 1 |
| S1-27 | 42X25X23 | DST-312 Drives | 1 |
| S1-28 | 42X25X23 | DST-312 Drives | 1 |
| S1-29 | 42X25X23 | DST-312 Drives | 1 |

Table A-1 AML/2 Two Robots with One Tower - 2.05M

| Crate # | Size | Description | Qty |
|---------|----------|----------------|-----|
| S1-30 | 42X25X23 | DST-312 Drives | 1 |
| T1-1 | 72X36X72 | Tool Box | 1 |

Table A-2 AML/2 Two Robots with One Tower - 2.43M

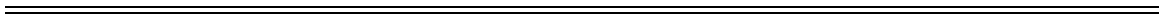
| Crate # | Size | Description | Qty |
|---------|-----------|--|-----|
| S1-1 | 66X41X60 | Bases, Spiders | 1 |
| S1-2 | 72X34X53 | Gears | 1 |
| S1-3 | 72X78X23 | Top Plate, Struts, Columns | 1 |
| S1-4 | 98X51X61 | Bins | 1 |
| S1-5 | 94X25X47 | QT Doors, Enclosure, Profiles, Step Plates | 1 |
| S1-6 | 46X50X53 | I/E Boxes, Robut Igus 1 & 2, Cables | 1 |
| S1-7 | 105X41X45 | Robot Track Enclosure, Ceiling | 1 |
| S1-8 | 93X27X29 | Robot Column #1 | 1 |
| S1-9 | 93X27X29 | Robot Column #1, Star Rail, Gear Rack | 1 |
| S1-10 | 84X33X37 | EIF 1 & 2 | 1 |
| S1-11 | 93X35X24 | Entry Doors 1 & 2 | 1 |
| S1-12 | 31X60X86 | Robot 1 & 2 Controllers | 1 |
| S1-13 | 31X60X86 | AMU & Tower Controllers | 1 |
| S1-14 | 32X28X36 | Robot Arm # 2 | 1 |
| S1-151 | 32X28X36 | Robot Arm # 1 | 1 |
| S1-16 | 45X35X86 | Drive Cabinet | 1 |
| S1-17 | 45X35X86 | Drive Cabinet | 1 |
| S1-18 | 45X35X86 | Drive Cabinet | 1 |
| S1-19 | 93X31X49 | Walkways, PC & Monitor | 1 |
| S1-20 | 44X44X44 | Pallet of Tapes | 1 |
| S1-21 | 48X42X45 | Robot Track # 1 & 2 | 1 |
| S1-22 | 42X25X23 | DST-312 Drives | 1 |

| Crate # | Size | Description | Qty |
|---------|----------|----------------|-----|
| S1-23 | 42X25X23 | DST-312 Drives | 1 |
| S1-24 | 42X25X23 | DST-312 Drives | 1 |
| S1-25 | 42X25X23 | DST-312 Drives | 1 |
| S1-26 | 42X25X23 | DST-312 Drives | 1 |
| S1-27 | 42X25X23 | DST-312 Drives | 1 |
| S1-28 | 42X25X23 | DST-312 Drives | 1 |
| S1-29 | 42X25X23 | DST-312 Drives | 1 |
| S1-30 | 42X25X23 | DST-312 Drives | 1 |
| T1-1 | 72X36X72 | Tool Box | 1 |

Table A-3 AML/2 Two Robots with One Tower - 2.8 M

| Crate # | Size | Description | Qty |
|---------|-----------|--|-----|
| S1-1 | 66X41X60 | Bases, Spiders | 1 |
| S1-2 | 72X34X53 | Gears | 1 |
| S1-3 | 72X78X23 | Top Plate, Struts, Columns | 1 |
| S1-4 | 98X51X61 | Bins | 1 |
| S1-5 | 94X25X47 | QT Doors, Enclosure, Profiles, Step Plates | 1 |
| S1-6 | 46X50X53 | I/E Boxes, Robot Igus 1 & 2, Cables | 1 |
| S1-7 | 105X41X45 | Robot Track Enclosure, Ceiling | 1 |
| S1-8 | 93X27X29 | Robot Column #1 | 1 |
| S1-9 | 93X27X29 | Robot Column #1, Star Rail, Gear Rack | 1 |
| S1-10 | 84X33X37 | EIF 1 & 2 | 1 |
| S1-11 | 93X35X24 | Entry Doors 1 & 2 | 1 |
| S1-12 | 31X60X86 | Robot 1 & 2 Controllers | 1 |
| S1-13 | 31X60X86 | AMU & Tower Controllers | 1 |
| S1-14 | 32X28X36 | Robot Arm # 2 | 1 |
| S1-151 | 32X28X36 | Robot Arm # 1 | 1 |
| S1-16 | 45X35X86 | Drive Cabinet | 1 |

| Crate # | Size | Description | Qty |
|---------|----------|------------------------|-----|
| S1-17 | 45X35X86 | Drive Cabinet | 1 |
| S1-18 | 45X35X86 | Drive Cabinet | 1 |
| S1-19 | 93X31X49 | Walkways, PC & Monitor | 1 |
| S1-20 | 44X44X44 | Pallet of Tapes | 1 |
| S1-21 | 48X42X45 | Robot Track # 1 & 2 | 1 |
| S1-22 | 42X25X23 | DST-312 Drives | 1 |
| S1-23 | 42X25X23 | DST-312 Drives | 1 |
| S1-24 | 42X25X23 | DST-312 Drives | 1 |
| S1-25 | 42X25X23 | DST-312 Drives | 1 |
| S1-26 | 42X25X23 | DST-312 Drives | 1 |
| S1-27 | 42X25X23 | DST-312 Drives | 1 |
| S1-28 | 42X25X23 | DST-312 Drives | 1 |
| S1-29 | 42X25X23 | DST-312 Drives | 1 |
| S1-30 | 42X25X23 | DST-312 Drives | 1 |
| T1-1 | 72X36X72 | Tool Box | 1 |



Actual Scenario

The following Scenario was based on an actual event. The user was preparing for major construction work at the site where the equipment was located and was very concerned about the effects the resultant dust, dirt, and vibration could have on the current equipment.

Vibration Scenario

Concerns: The vibration concern is “what if” if an above the floor steel I-beam bracing is placed on top of the slab in the adjacent bay and is accidentally dropped? The concern is not for say a height of 5 feet, but the last inch or so when it is being released. The distance can vary from between 15’ to 60’ away. However, the actual placing of steel can be scheduled.

ADIC Questions: With regard to the “what if” vibration scenario:

- Is this above-floor I-beam bracing being installed on top of the floor you reinforced with I-beams prior to installing the AML/2?
- How long is the steel I-beam? (To get an idea of point pressure and floor response.)
- How heavy is the steel I-beam?
- How much “give” is there in the floor that this I-beam might land on?
- What extent (amplitude and duration) of vibration do you anticipate? Enough to vibrate a coffee cup off a desk? Will you be using jackhammers?

If the supporting floor is supported such that you’re not expecting significant horizontal or vertical displacement (and a consequent “ringing wave” action back to the slab’s equilibrium point), then any vibration resulting from an I-beam drop would be low amplitude short duration and of no concern.

The principal concern is whether the library and/or the drives will be operating during the “what if” scenario. The vibration is the major concern because high amplitude vibration while the library is moving would mainly affect the robots and the tape drives. Robot elements could become bent, resulting in extended repairs and drives could come out of alignment, resulting in extensive reteaching resulting in extended downtime.

ADIC recommends that the movement and placement of the steel be scheduled to coincide with the time that the robots and all tape drives are in a quiescent state during steel movement.

ADIC consensus on reteaching drive position: If there is no significant vibration, the reteaching will most likely not be necessary.

ADIC Question: Should the robotic arms be braced during the time the steel is being moved?

Dust Scenario

The user's plan states: The work planned is the construction of a plastic sheet wall, slab to slab near the ODC library. This will protect the equipment from dust while a sheetrock slab to slab wall is built parallel to it that will comprise a UPS system. The plastic wall will remain until the sheetrock wall is 100% complete.

ADIC Question:

- Do you have plenum cooling in the AML areas?
- Are there plenum cooling vents under the drive cabinets or under the library?