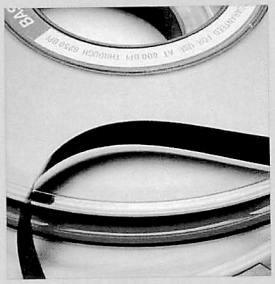
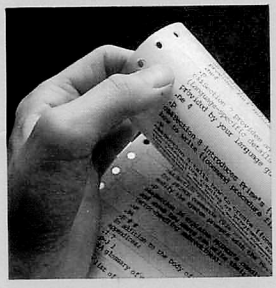
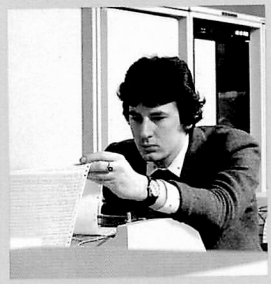
Prime Computer, Inc.

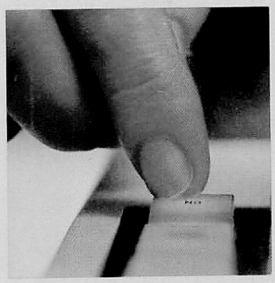
PRIME

DOC5029-3LA
Site Preparation Guide






Site Preparation Guide

Third Edition

This guide details computer room site preparation activities and specifications for the Prime 50 Series computer-room systems and associated peripherals, as of May, 1986.

Prime Computer, Inc.
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Natick, Massachusetts 01760

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CUSTOMER SUPPORT CENTER

Prime provides the following toll-free numbers for customers in the United States needing service:

1-800-322-2838 (within Massachusetts)
1-800-343-2320 (within other states)
1-800-541-8888 (within Alaska)
1-800-651-1313 (within Hawaii)

HOW TO ORDER TECHNICAL DOCUMENTS

Follow the instructions below to obtain a catalog, price list, and information on placing orders.

United States Customers

Call Prime Telemarketing, toll free, at 1-800-343-2533, Monday through Friday, 8:30 a.m. to 5:00 p.m. (EST).

International

Contact your local Prime subsidiary or distributor.

WARNING

This equipment generates and uses radio frequency energy and if not installed and used properly, i.e., in strict accordance with the instructions manual, may cause harmful interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Contents

APPENDIXES

About This Book

This book is a site preparation guide for the Prime 50 Series™ computer-room systems. It is written for the person coordinating the activities before the delivery and installation of the system. Some technical knowledge is helpful but not required.

HOW TO USE THIS BOOK

The purpose of this guide is to assist you in properly preparing your computer room before your computer system arrives. Chapters 1 through 4 contain information on the primary steps of site preparation concerning

- Evaluating and selecting a site
- Planning your site by using the templates in Appendix D
- Making any required electrical and environmental modifications to your proposed site

When you complete all these steps, your computer room should be ready for the delivery of your computer system, as described in Chapter 5.

Appendixes A through F contain specific information concerning

- Each Prime computer system and optional peripheral
- Site layout templates

- Cabling
- Site inspection procedures

Refer to Appendix F, SITE INSPECTION PROCEDURES, during the evaluation of your site. This appendix contains

- Site inspection guidelines
- Survey checklist
- Worksheets

HOW THIS GUIDE IS ORGANIZED

The following list outlines the organization of this guide.

Chapter	Description
1	Provides an overview of Prime computer systems and scheduling of site preparation activities.
2	Provides information on choosing the proper site for your computer system.
3	Describes the system cooling requirements and their effects on the environment.
4	Describes the system electrical requirements and electrical service.
5	Describes the system receiving and inspection procedures.

Appendix	Description
A	Provides specifications for the computer systems.
B	Provides specifications for cabinet-mounted peripherals.
C	Provides specifications for free-standing peripherals.
D	Contains the site layout templates.
E	Describes cable raceways and data cables.
F	Contains guidelines for site inspection survey checklists, and worksheets.

OTHER USEFUL BOOKS

Refer to the Guide to Prime User Documents, DOC6138-4PA, for complete Prime user document listings and descriptions.

Another helpful document is:

- Guideline on Electrical Power for ADP Installations (FIBS PUB 94), National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161.

1
Introduction

This chapter identifies the Prime computer room systems and site preparation participants.

PRIME COMPUTER ROOM SYSTEMS

Prime computer room systems are high-performance computer systems that consist of the following components:

- Control panel
- Central Processing Unit (CPU)
- Memory boards
- Peripheral and communication controllers

These computer systems consist of either one or two 53-inch (132.5 cm) high cabinets and require a computer-room environment. The available peripheral options are either mounted in a Prime peripheral cabinet or free-standing.

All Prime computer systems and peripherals meet the following safety standards:

- Underwriter's Laboratory (UL)
- Canadian Standards Association (CSA)

In addition, these systems comply with U.S. Federal Communications Commission (FCC) rules on Radio Frequency Interference (RFI) per Docket 20780.

Appendix A contains specifications for the computer-room systems, Appendix B contains specifications for cabinet-mounted peripherals, and Appendix C contains specifications for free-standing peripherals. Consult your Prime Marketing Representative about available options for your system.

SITE PREPARATION PARTICIPANTS

The site preparation participants are

- Your System Administrator
- Your Prime Marketing Representative
- Prime Customer Service

The following sections describe the role of each participant.

System Administrator

The System Administrator oversees

- System operation and maintenance
- Computer supply purchases
- System user education

During site preparation, the System Administrator monitors the site preparation time schedule to avoid any difficulties on your computer system's installation day. If you do not have a System Administrator, Prime recommends that you appoint a System Administrator at the beginning of site preparation.

Prime Marketing Representative

Your Marketing Representative assists you in selecting the following Prime services:

- Education
- Maintenance
- Software
- Technical documentation

Prime Customer Service

Prime Customer Service can provide the following services:

- Site survey planning
- System and peripheral installation
- Prime equipment maintenance

The Prime Customer Support Center is a part of Prime Customer Service. If you have any hardware or software problems, you can call your Support Center. If your problem requires a Customer Service Representative (CSR) at your site, your call initiates the appropriate action. The Support Center has telephone lines available 24 hours a day.

The Support Center telephone numbers are

In Massachusetts: 800-322-2838

In Hawaii: 800-651-1313

In Alaska: 800-541-8888

In the rest of the United States: 800-343-2320

If your location is outside the United States, contact your Prime Customer Service office for local procedures.

2
Site Selection

This chapter provides the following guidelines for selecting the site for your Prime computer-room system:

- Local code compliance
- Site access
- Site requirements

LOCAL CODE COMPLIANCE

Check with the appropriate authorities about requirements for the location and operation of computers. Ensure that your building complies with local laws concerning the following:

- Building construction
- Electrical distribution
- Fire protection

Arrange for a qualified contractor to make any necessary building modifications.

SITE ACCESS

Your Prime computer system must have access into and through your building. The following sections describe the exterior and interior access requirements for your system.

Note

If you have any access problems, contact your Prime Marketing Representative to make appropriate arrangements with the Prime Traffic Department.

Exterior Access

To evaluate the access to your building, answer the following questions.

Are any of the following truck obstacles on the route to your building:

[YES] [NO] Low bridges and overhangs

[YES] [NO] Narrow streets and alleys

[YES] [NO] No parking zones

[YES] [NO] Restricted districts for commercial vehicles

Does your building have the following

[YES] [NO] No loading dock

[YES] [NO] Specific delivery hours

If you answered Yes to any of the previous questions, contact your Prime Marketing Representative.

Interior Access

Your Prime equipment must be moved from your loading dock to your selected site. Determine whether any obstructions will hinder the movement of your equipment to your site. Compare the packaged computer system measurements with the width of all ramps, elevators, doors, and hallways along the route. Refer to Appendixes A through C for the shipping-carton dimensions of your computer system and peripheral

options (look under "Physical Specifications"). Answer the following questions to evaluate your route.

[YES] [NO] Is ample room available to transport your cartons through your building?

If you answered No, plan to unpack your system at a convenient spot near the problem area. Then you can roll the system to the site.

[YES] [NO] Does the delivery path avoid stairs?

If you answered No, additional people and equipment are needed.

If you answered No to either of the previous questions, contact your Prime Marketing Representative.

SITE REQUIREMENTS

Whether you are selecting a new site or modifying an existing area, the following considerations must be noted before installing your computer system:

- System location
- Safety and security precautions

The following sections detail these considerations.

System Location

Computer-room systems require specialized installation areas. Review the following factors concerning your computer system's location:

- Type of installation
- Floor space allocation
- Point-loading capacity
- Additional considerations
  - Floor covering
  - Printer location
  - Lighting
  - Storage area

Refer to Chapters 3 and 4 for information on environmental and electrical requirements.

Type of Installation

The types of Prime computer-room installations are

- Raised (false) floor
- Overhead access

Raised floor installation: A raised, or false, floor installation allows the routing of power outlets, power cords, and interface cable under the floor of the equipment. The raised floor space can also act as a plenum for equipment air conditioning.

If your system requires the installation of a raised floor:

- Allow for a minimum ceiling height of eight feet (2.4 meters).
- Install a ramp to allow access for personnel and equipment.

Overhead Access Installation: Usually, an overhead access installation consists of

- A suspended power distribution bus (600V maximum) and a step-down transformer/circuit breaker
- Peripheral interface cables covered with rampways or routed through overhead trays

Most national and local safety codes prohibit unprotected power and interface cables that are laid on the floor.

Usually, overhead access installation requires more planning. When considering this type of installation, check your local and national building safety and electrical codes.

Floor Space Allocation

Discuss your proposed computer system configuration with your Prime Marketing Representative. Your representative will explain the specific configuration rules that pertain to your system.

After meeting with your Prime Marketing Representative, determine the floor space requirements for your computer system. Make copies of the equipment templates from Appendix D and overlay the copies onto a floor plan of your computer room. Consider the following factors when allocating floor space:

- Safe and efficient operation access
- Service (maintenance) access
- Software media and general supply storage
- Printer area away from your computer system

Operations personnel must have unimpeded access to all your computer equipment. Most cabinet-mounted peripherals require room for opening the doors of tape drives or sliding out of Cartridge Module Disks. Printers require access in the front for loading paper and a paper-catching area in the rear. In addition, emergency exits must be clearly marked and must be unimpeded by equipment.

Service access requires that cabinet doors be able to swing out in a full arc and that service personnel have an adequate area to service your computer system.

Point-loading Capacity

Your site must support the total weight of your computer system and associated peripherals. Prime computer-room systems and peripheral cabinets stand on four casters that are located under each corner of the cabinet. The weight of the cabinet and its contents is distributed to these casters. Thus, the weight of the cabinet is exerted on only a four-point area instead of the entire width and depth of the cabinet. Contact a structural engineer to determine your site's point-loading capacity. Refer to Appendixes A through C for the respective weights of your computer system and associated peripherals.

Note

An example of maximum point-loading capacity is a 7564S peripheral cabinet configured with peripherals for a combined weight of 1000 lbs. The maximum point-loading capacity is 320 lbs. per caster.

Safety Precautions

Consider the following safety precautions in your computer facility:

- Fire protection
- Floor and wall obstructions
- Safety notices
- Electrical shutdown mechanism

The following sections detail these precautions.

Fire protection: The computer room must have a suitable number of fire extinguishers available. Use only Class C fire extinguishers. Prime and the National Fire Protection Association (USA) recommend the Halon model 1211 or 1301 fire extinguisher over dry chemical and carbon dioxide types. Instruct your staff on the correct use of fire extinguishers.

Note

Move or modify any sprinkler heads that may spray water on your computer system in the event of a fire. Water will seriously damage your computer system. Check your local community fire code requirements.

Designate exits in the case of fire or other emergency.

Floor and Wall Obstructions: Your computer room should have as few obstructions as possible on the floor and walls. Minimize the number of exposed cables and unguarded terminal strips on the floor. Computer-room doors should open outward rather than into the computer room. When your computer system cabinet is opened, its doors should not obstruct the flow of foot traffic in the computer room.

Safety Notices: Notices concerning the presence of electrical hazards must be prominently displayed to alert operation personnel. Mark all computer room exits. An evacuation path must be available for your personnel in case of emergency.

Shutdown Mechanism: Prime recommends an electrical shutdown mechanism that is smoke-, thermally-, and manually-activated. This mechanism must be accessible to all computer-room personnel.

Security Precautions

Safeguard your system from accidental or deliberate destruction. During working hours, the System Administrator or Operator should monitor the system. During non-working hours, arrange for your security personnel to monitor the system.

Limit access to the computer room. Visitors should be accompanied by authorized personnel. Access can be controlled by solenoid-activated or mechanical-pushbutton locks. Purchase only locks that will not impede your personnel from exiting the computer room in case of emergency.

Additional Considerations

When planning your site, review the following considerations:

- Floor covering
- Printer location
- Lighting
- Storage area

The following sections detail these considerations.

Floor Covering: Select hard-surfaced, conductive or antistatic tile flooring or special antistatic carpeting woven with conductive fibers to eliminate static electricity. Hard-surfaced tile flooring must be the no-wax type. Wax particles can lodge between disk drive heads and packs and cause damage to disk drives.

Printer Location: Printers should be installed in a room separate from the computer system. If this is not possible, the cooling air path must blow past the printer(s) and must be directed away from the CPU and disk drives.

> **Caution**
>
> Paper dust can lodge between disk heads and packs, causing severe damage to disk drives. Do not locate printers adjacent to disk drives.

Lighting: Lighting should be directed away from both the terminal display and the user. Supply all sun-facing windows with shades, drapes, or venetian blinds. Use artificial lighting that does not

glare into the terminal display or into the user's eyes. If these recommendations cannot be followed, allow sufficient slack on terminal cables for users to position the terminal display away from the light source.

The location, number, and type of windows (if any) in the computer room must be considered. Installed equipment, such as the system and free-standing peripherals, and media items, such as tapes and disk packs, must not be exposed to direct sunlight. The amount of heating caused by sunlight (solar gain) will affect the computer room Heating, Ventilation, and Air-conditioning (HVAC) requirements.

Storage Area: The following items require storage in or near your computer room:

- Media (disk packs and magnetic tapes)
- System documentation
- Computer system supplies

Prime computer systems use disk packs and 10-inch reel and streaming cartridge magnetic tape. Provide a storage cabinet in the computer room for this media when not in use. By storing the media in the computer room, you minimize problems that are caused by inadequate temperature stabilization. If your media can not be stored in the computer room, follow the manufacturer's recommendations for storage.

Keep storage media away from the following:

- Direct sunlight
- Heat sources
- Magnetic fields (disk drives, television sets, and electric alternators, motors, and transformers)

Archive backup tapes away from your system (if possible, in another building); in the event of a natural or man-made disaster, you can recover your data.

When planning a space for technical documentation, consider the following storage areas:

- Bookcases for technical manuals
- File cabinets for specifications and related documentation
- Tables and chairs for a reading area

Plan a storage area for computer supplies (printer paper, ribbons, and forms).

3
Environmental Requirements

This chapter contains the environmental guidelines and precautions to consider when evaluating your installation site. The following sections discuss these topics:

- Temperature
- Humidity
- Altitude
- External environment

Prime equipment is designed for operation in climate-controlled, dust-free environments.

Note

If your computer system is being accompanied by optional peripherals, review the specifications for both your system and peripherals. Their recommended environment requirements may vary. Use the specification range that will suit all your equipment.

TEMPERATURE

System failures tend to occur more frequently when you run your system at the high end of the operating temperature range. Refer to Appendixes A through C for individual equipment temperature requirements.

Your system, optional peripherals, and personnel will generate additional heat in your computer room. Use the following worksheet to calculate the total heat dissipation added to your computer room. Appendixes A through C contain the heat dissipation specifications for your computer system and peripherals.

Note

The Prime computer-system exhaust plume is horizontal. Monitoring equipment, such as temperature and humidity recorders, must not be placed within 6 ft (180 cm) of the exhaust plume.

Worksheet 1
Heating, Ventilation, and Air Conditioning

System Type	Quantity		Heat Dissipation (Btu/hr or Kcal/hr)		Subtotal
_____	____	X	_____	=	_____
_____	____	X	----------	=	_____
-------	----	X	_____	=	_____
Option					
_____	____	X	_____	=	_____
_____	____	X	_____	=	_____
Additional Personnel	____	X	250 BTU (65 Kcal)	=	_____
			Total Heat Dissipation (Add the subtotals)		_____

After completing the worksheet, give the results to your Facility Manager or Heat, Ventilation, and Air-Conditioning (HVAC) contractor. They will compare the results with your computer room cooling capacity.

Complete any necessary modifications to your site before your system arrives.

Air Conditioning

Proper cool air ducting prevents excessive temperature buildup in your computer system. Avoid placing your system in an enclosed area that lacks plenums and returns for air circulation.

Note

Heating, Ventilation, and Air-Conditioning (HVAC) systems for your computer system must be separate from the building's system. Do not assume that augmenting the building's HVAC will be adequate for your system's needs.

Carefully plan the location of HVAC inlets required by the proposed equipment. Installed equipment must not be exposed to the flow of warm, directly cold, humid, or dusty air.

Note

The air inlets for most products (including system cabinets) are at the bottom of the units, and, if possible, it is desirable to use the raised floor as a plenum for cooling air.

Local Heat Sources

Prevent the following heat sources from exceeding the equipment temperature requirements:

- Radiators
- Baseboard units
- Heating ducts
- Space heaters
- Hot water piping
- Solar gain from windows

HUMIDITY

Refer to Appendixes A through C for individual equipment humidity requirements. Extremes in relative humidity can cause equipment operational problems. Low humidity induces static electricity. Static electricity not only causes operational problems, but also can damage your equipment. Protection from static electricity has been built into the system. However, optional peripherals (terminals, printers) may not be tolerant to static electricity.

High humidity causes condensation and cooling-efficiency loss. Never allow the humidity to get so high that condensation occurs on your system.

Humidity also affects computer supplies. Some printer paper and continuous (tractor-feed) forms have specific environmental limits.

Note

A sudden change in humidity and temperature can warp or alter your computer paper, which causes misfeeds and stacking problems.

ALTITUDE

Prime computer systems operate at altitudes from sea level to 12000 feet (3500 meters). In elevated sites, lower air density affects cooling efficiency. Starting at sea level (0 feet, 0 meter), lower the recommended equipment temperature range by 1°F for every 1000 feet increase in altitude (2°C per 1000 meters). Equipment can be stored at altitudes up to 40,000 feet (12,000 meters). Refer to Appendixes A through C for your computer system and peripheral altitude limitations.

EXTERNAL ENVIRONMENT

If your facility is near a source of significant air pollution and/or dust, you must take special precautions to ensure proper ventilation and a dust-free environment. Many facilities overcome the dust problem by creating slight overpressure in the HVAC system to prevent the infiltration of outside dust.

4
Electrical Requirements

This chapter contains the following electrical requirements for the Prime computer systems.

- Electrical power distribution
- Electrical specifications
- Wiring
- Grounding

Information concerning power-line disturbances is provided at the end of this chapter.

ELECTRICAL POWER DISTRIBUTION

Prime domestic products operate on combinations of one or more single-phase, 120-volt circuits. Prime computer room CPU cabinets use two or three circuits. The peripherals use one 120-volt or 208|240-volt circuit. (The vertical bar signifies that the utilization voltage depends on the nature of the distribution system.)

Prime recommends a separately-derived installation in which a distribution transformer is installed locally and dedicated to the computer site. This ensures that equipment grounding can be controlled with all grounds brought to a single point at building steel; and uncontrolled equipment, such as coffee pots and floor polishers, cannot

gain direct connection to the computer mains power source. Controlled equipment grounding provides added immunity to damage or upset in the event of lightning-induced surges through the steel skeleton of the building. Refer to National Electrical Code (NEC) section 250-5 (d) for information on separately derived systems.

> Caution
>
> The electrical mains power distribution for the computer system is to be installed only by a licensed electrician or electrical contractor.

Equipment Requirements

CPUs can operate on 50 Hz or 60 Hz power, and can be configured for nominal service voltages of 120 volts or 240 volts, independent of mains frequency. Depending on the equipment specification, power distributions must be 5-wire three-phase wye, or 3- or 4-wire single phase. The following sections detail the domestic and export site requirements.

Domestic Sites: The nominal voltage for Prime domestic systems is 120 volts at 60 Hz, single phase. ANSI C84.1 recommends a utilization-voltage range of 104 to 127 volts. Figure F-1, in Appendix F, shows the standard National Electrical Manufacturers Association (NEMA) attachment plug used with each type of equipment. Each blade style is identified by a specific number of conductors, circuit configuration, and supply-voltage and -current rating.

Export Sites: Outside North America, the electrical mains distributions vary in topology, voltage, and frequency. The nominal voltage for Prime export CPUs is 415Y/240 wye, or 240 volts, single phase; and 220 to 240 volts, single phase is the nominal voltage for exported peripherals, depending on the individual device.

A survey of mains voltages in Prime's international marketing areas provides the following information:

Service V RMS	Operating Range V RMS	Major Market Area
380Y/220	191-233	Mainland Europe
415Y/240	209-254	United Kingdom
433Y/250	217-264	Australia

ELECTRICAL EQUIPMENT SPECIFICATIONS

Specifications for outlets, junction boxes, conductors and raceways are provided for the following sections.

Outlet and Junction Boxes

Outlets must be of insulated-ground type, by Hubbell, Leviton, or Arrow-Hart. For example, a Hubbell #IG-2710 NEMA L14-30R receptacle is the insulated-ground version of the generic #2710. Metal, either formed or cast, outlet and junction boxes are appropriate.

Conductors

Use only COPPER conductors of the appropriate diameter and insulation. Insulation colors are:

U.S. and Canada	Europe	Circuit Name
Green	Green/Yellow	Insulated grounding (earthing) conductor
White	Light Blue	Grounded (neutral) conductor
Black	Brown	Ungrounded (live) conductor
Red	Black	Second ungrounded (live) conductor, if required
Blue	Black	Third ungrounded (live) conductor, if required
(bare)	(bare)	Junction-box protective ground

Raceways

Any of the following are permitted:

- EMT thin-wall tubing
- Rigid (metal) conduit
- Greenfield

- Sealtight (for moist areas)
- BX

For BX, use the type with one more insulated conductor than required to conduct power; paint the insulation of the extra conductor green at both ends, and use the conductor as an insulated ground.

GENERAL WIRING CONSIDERATIONS

Where power-conditioning equipment is installed, ensure that the wiring which exits the power conditioner is dressed well away from other mains conductors and electrical devices. Stray coupling between neighboring power conductors may inject oscillatory transients into conditioned power circuits and nullify the effect of the power conditioner.

If power conductors must be spliced, use mechanical clamping devices or soldered splices.

GROUNDING/EARTHING

The insulated-ground scheme supported by this document is identical to the European "TN" system, in which the neutral conductor is grounded at the source (transformer secondary), and equipment cabinets are grounded by connection back to the same point. The following paragraphs detail good grounding practice for the majority of computer installations.

Grounds have two functions in a computer system. The principal function concerns human safety, and for that reason, all cabinets have a metallic connection to a grounding point. The second function is to provide a reference for signalling circuits which, if allowed to float, would settle at some potential determined by capacitive coupling to other signalling and power circuits. Since this potential would vary from instant to instant, receiving circuits would be hard put to distinguish these arbitrary voltage levels from true signalling levels, and the computer could not function reliably.

Selection of a grounding point is not arbitrary. In a modern building with a steel skeleton, it is convenient to choose a point on the building steel adjacent to the distribution transformer which provides power to the computer system. The neutral terminal on the secondary winding of the distribution transformer is connected to this grounding point. In other types of buildings, the system grounding point is a clamp secured to the cold-water pipe at the point at which it enters the building, that is, on the street side of the water meter.

Connection between the neutral terminal and earth ground is made using an insulated stranded copper conductor, having a diameter at least one wire-gauge larger than the largest power conductor in the mains power distribution system. The grounding wire is installed in one continuous

length, having neither splice nor joint. When the distribution system is fully installed, the connection between the insulated grounding conductor and the system grounding point shall be temporarily broken in order to measure the resistance between the grounding conductor and the ground point. An open circuit must be observed, otherwise the insulated-grounding scheme has been compromised.

Where distribution panels are used, protective grounds from outlet boxes are made through the conduit or other metallic raceway, and the distribution panel is grounded to the system grounding point by separate means as directed by the governing electrical code. The insulated-grounding scheme requires that all green-wire insulated grounds entering the distribution panel be connected together on a terminal block, which is in turn insulated from the panel, but connected to system ground by the special grounding conductor previously described.

> Caution
>
> Although the system grounding point may also be identical to the building grounding point and be used by the electrical service entrance equipment, remember that THE INSULATED-GROUNDING ARRANGEMENT IS TO BE DEDICATED TO THE COMPUTER SYSTEM, AND MUST NOT BE CORRUPTED BY ANY OTHER USE.

POWER-LINE DISTURBANCES

All electronic equipment is, to some degree, susceptible to upset by power-line disturbances (PLDs). The severity of the upset is related to the magnitude of the disturbance and is mitigated by the degree to which the equipment is designed to resist upset.

PLDs arise as a result of switching loads onto or away from the power mains, or by the onset and subsequent clearing of mains fault conditions. Within a customer's site, such disturbances may be related to:

- Fluorescent lighting
- Solid-state lamp dimmers
- Projection and photocopying equipment
- Thermostatically-controlled appliances
- HVAC equipment
- Elevators
- Medical and other electronic equipment

- Arc welders
- Floor polishers and other power tools

Outside the computer site, such disturbances may be caused by:

- Corroded connections to the utility mains
- Local industries
- Substation voltage regulation (tap-switching)
- Transmission compensation (capacitor switching)
- Lightning and/or corona discharge

Power-line disturbances include the following:

- Impulses
- Oscillatory transients
- Surges
- Sags
- Brownouts
- Outages (blackouts)

Impulses and Oscillatory Transients

These phenomena are variously referred to as spikes or glitches, and in all cases refer to disturbances whose energy content is small but not insignificant; whose duration is short relative to one cycle at power-line frequency; but whose amplitude commonly runs to hundreds of volts, and occasionally to a few thousand volts. They are also described as common-mode disturbances if the perturbing voltage appears on all conductors simultaneously, such as by induction from a local lightning strike; or as differential-mode disturbances if the perturbing voltage is applied to one conductor relative to another, such as might be generated by an arcing relay contact. Both impulse and oscillatory disturbances are characterized by extremely rapid rates-of-change of voltage.

These disturbances are insidious because they can cause damage as well as upset. Long-term effects include progressive deterioration of insulation, carbon deposits from past sparkovers, and punctured dielectrics in capacitors and semiconductor devices.

Follow the recommended procedure for conditioning mains power against transient phenomena:

- Provide good control of system grounds by eliminating any redundant ground paths, including intercabinet connections.
- Employ a local transformer-based appliance that arrests both common and differential-mode disturbances and that simultaneously redefines the system power-ground point.

The importance of providing a good electrical distribution system cannot be overemphasized. The cost of these special power-conditioning transformers is approximately 15 times the cost of a standard distribution transformer of comparable power-handling capability.

Sags and Power Outages

A power outage is a complete loss of utility power for one cycle or more. The distinction between zero and non-zero voltage becomes meaningless if its value is smaller than the attached equipment can use effectively. A severe sag, therefore, is as serious as an outage.

Sags constitute more than 85% of the mains disturbances, and the frequency of sags increases in areas where lightning activity is observed. The utility bulk-transmission networks, exposed to the natural elements, react to lightning-initiated sparkover by momentarily short-circuiting the transmission line; protective relays open, then automatically reclose, thereby protecting the network by generating a momentary local outage bounded by impulses. The impulses tend to be attenuated by the network loads and other overvoltage protectors, but the effect of the outage propagates to remote parts of the network as a sag. A similar effect results from utility load-switching.

An extensive industry study of the quality of electrical power in the United States noted that 75% of the effective outages lasted less than 0.24 seconds and that 90% lasted less than 0.53 seconds. Most computer installations can tolerate minor inconvenience in the event of a short power outage, so long as the interrupted processes can be restarted without severe penalty. This leaves only the economic and procedural effects of a longer outage to be weighed; the same study determined that no more than 4% of the power-line disturbances were attributable to power outages of 0.6 seconds duration or longer.

The only one way to protect against outages and severe sags is to provide an alternate energy source which will support the computer-system load when utility power fails. The following paragraphs discuss the two means of power buffering in common use.

The uninterruptible power system (UPS) provides immediate, alternate power for a duration limited only by the capability of the installed backup equipment, and by available fuel. Note that such systems are extremely expensive, should not be considered unless uninterrupted

operation is critical, and should be coordinated by a specialist who can interpret requirements and who is familiar with local building, fire, and electrical codes.

A motor-generator (MG) set buffers sags and short-term outages by inertial energy storage.

In a typical installation, all CPU power is provided through the MG set. The controls for the MG set include a relay which monitors the mains power, providing a contact closure when an outage occurs. During a power outage of short duration, the inertial energy stored in the MG set will make the outage transparent to the user, although the CPU will experience a power-fail interrupt which alerts it to the service interruption. The peripherals are powered from the utility mains, and each will react to the failure in its own way.

When an MG set is installed to buffer the mains power to a CPU, it will also protect the CPU from the high-frequency phenomena described earlier. If the computer system requires protection from both classes of power-line disturbances, then it is necessary to buffer the CPU power with an MG set, and to provide power to all of the rest of the devices in the central computer system via a transformer-type power conditioner.

5
Delivery

This chapter details the following procedures concerning the delivery of your Prime equipment:

- Shipping
- Inspection
- Claims
- Unpacking

SHIPPING PROCEDURES

Prime Computer ships its computer systems from either Framingham, Massachusetts, USA or Galway, Republic of Ireland. The Galway facility ships equipment within Europe and North Africa. The Framingham facility ships equipment to the rest of the world.

Before you receive your equipment, arrangements for the following must be completed:

- Transportation
- Shipping insurance
- Inside delivery

Transportation

Prime designates the air freight and trucking companies to deliver your equipment. The Prime shipping facilities ship equipment Free On Board (FOB), unless you make alternative arrangements with your Prime Marketing Representative.

Shipping Insurance

Your Prime equipment can be insured in the following two ways:

- Contracted by Prime through its designated carriers
- Purchased by your company (separate from the carrier)

Your choice affects the claims-handling procedure.

Prime Customer Service performs the following services for contractually qualified customers:

- Checking the equipment against the sales order and initiating action to obtain any missing items
- Checking the equipment for any hidden damages and obtaining any necessary replacement parts
- Providing assistance in determining the extent of damage for the insurance claim

Note

Freight insurance does not relieve you of responsibility for visually inspecting the equipment at delivery. Handle any insurance claims directly through the carrier and qualified damage-assessment personnel.

Inside Delivery

If you have properly scheduled the site modifications (HVAC and electrical) needed for your computer system, you can opt for inside delivery. Inside delivery includes

- Equipment delivery and unpacking at your selected installation site
- Disposal of packing material by the carrier

Note

Prime recommends that you retain your equipment packing material.

If the scheduled arrival date of your equipment is earlier than when your site is ready, you can either

- Contact your Prime Marketing Representative to arrange warehousing of your equipment
- Accept the equipment delivery and store the equipment in your building

These options involve added expense.

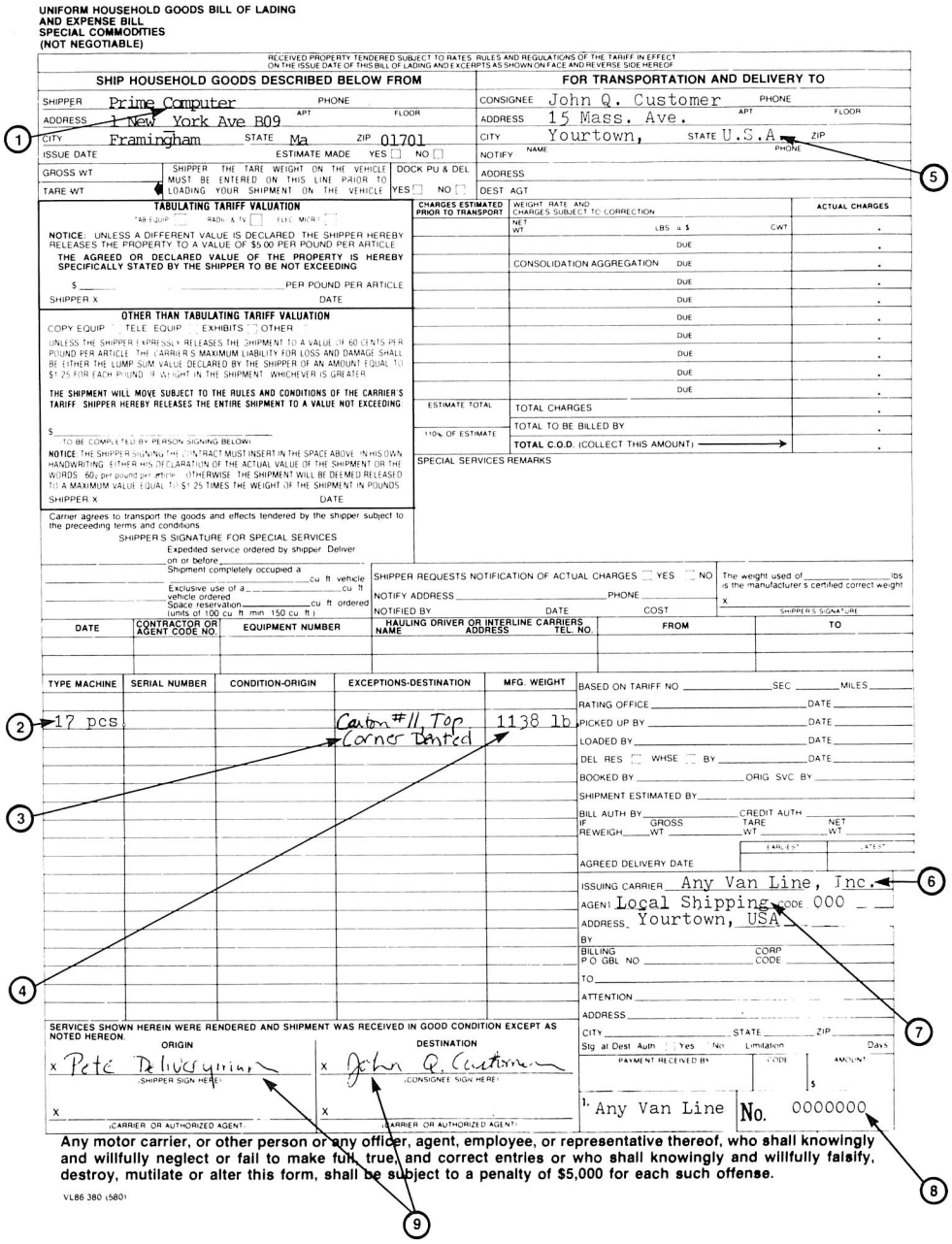
Note

Before the Customer Service Representative can install your Prime equipment, it must be moved to and unpacked at your selected installation site. If your site is not prepared when your equipment arrives, the carrier can return to your building to move and unpack your system for an additional fee.

If you waive inside delivery, not only are you responsible for moving and unpacking your equipment, but your insurance claims are affected. Contact your Prime Marketing Representative for more information on waiving inside delivery.

INSPECTION PROCEDURES

When your equipment arrives, the carrier requires that the receiving person sign the Bill of Lading. Figure 5-1 illustrates a typical Bill of Lading.



UNIFORM HOUSEHOLD GOODS BILL OF LADING
AND EXPENSE BILL
SPECIAL COMMODITIES
(NOT NEGOTIABLE)

RECEIVED PROPERTY TENDERED SUBJECT TO RATES, RULES AND REGULATIONS OF THE TARIFF IN EFFECT ON THE ISSUE DATE OF THIS BILL OF LADING AND EXCERPTS AS SHOWN ON FACE AND REVERSE SIDE HEREOF

SHIP HOUSEHOLD GOODS DESCRIBED BELOW FROM

SHIPPER Prime Computer PHONE
ADDRESS 1 New York Ave B09 APT FLOOR
CITY Framingham STATE Ma ZIP 01701
ISSUE DATE ESTIMATE MADE YES ☐ NO ☐
GROSS WT SHIPPER THE TARE WEIGHT ON THE VEHICLE MUST BE ENTERED ON THIS LINE PRIOR TO LOADING YOUR SHIPMENT ON THE VEHICLE DOCK PU & DEL YES ☐ NO ☐
TARE WT

FOR TRANSPORTATION AND DELIVERY TO

CONSIGNEE John Q. Customer PHONE
ADDRESS 15 Mass. Ave. APT FLOOR
CITY Yourtown, STATE U.S.A ZIP
NOTIFY NAME PHONE
ADDRESS
DEST AGT

TABULATING TARIFF VALUATION

TAPE EQUIP ☐ RADIO & TV ☐ TELEC MICRO ☐

NOTICE: UNLESS A DIFFERENT VALUE IS DECLARED THE SHIPPER HEREBY RELEASES THE PROPERTY TO A VALUE OF $5.00 PER POUND PER ARTICLE

THE AGREED OR DECLARED VALUE OF THE PROPERTY IS HEREBY SPECIFICALLY STATED BY THE SHIPPER TO BE NOT EXCEEDING

$ _____ PER POUND PER ARTICLE
SHIPPER X DATE

OTHER THAN TABULATING TARIFF VALUATION

COPY EQUIP ☐ TELE EQUIP ☐ EXHIBITS ☐ OTHER ☐

UNLESS THE SHIPPER EXPRESSLY RELEASES THE SHIPMENT TO A VALUE OF 60 CENTS PER POUND PER ARTICLE, THE CARRIER'S MAXIMUM LIABILITY FOR LOSS AND DAMAGE SHALL BE EITHER THE LUMP SUM VALUE DECLARED BY THE SHIPPER OF AN AMOUNT EQUAL TO $1.25 FOR EACH POUND OF WEIGHT IN THE SHIPMENT, WHICHEVER IS GREATER

THE SHIPMENT WILL MOVE SUBJECT TO THE RULES AND CONDITIONS OF THE CARRIER'S TARIFF. SHIPPER HEREBY RELEASES THE ENTIRE SHIPMENT TO A VALUE NOT EXCEEDING

$ _____
TO BE COMPLETED BY PERSON SIGNING BELOW)

NOTICE: THE SHIPPER SIGNING THE CONTRACT MUST INSERT IN THE SPACE ABOVE, IN HIS OWN HANDWRITING, EITHER HIS DECLARATION OF THE ACTUAL VALUE OF THE SHIPMENT OR THE WORDS "60¢ per pound per article." (OTHERWISE THE SHIPMENT WILL BE DEEMED RELEASED TO A MAXIMUM VALUE EQUAL TO $1.25 TIMES THE WEIGHT OF THE SHIPMENT IN POUNDS.

SHIPPER X DATE

Carrier agrees to transport the goods and effects tendered by the shipper subject to the preceeding terms and conditions

SHIPPER'S SIGNATURE FOR SPECIAL SERVICES

Expedited service ordered by shipper. Deliver on or before _____
Shipment completely occupied a _____ cu ft vehicle
Exclusive use of a _____ cu ft vehicle ordered
Space reservation _____ cu ft ordered (units of 100 cu ft min. 150 cu ft.)

CHARGES ESTIMATED PRIOR TO TRANSPORT	WEIGHT, RATE AND CHARGES SUBJECT TO CORRECTION	ACTUAL CHARGES
	NET WT LBS @ $ CWT	.
	DUE	.
	CONSOLIDATION AGGREGATION DUE	.
	DUE	.
	DUE	.
	DUE	.
	DUE	.
	DUE	.
	DUE	.
	DUE	.
ESTIMATE TOTAL	TOTAL CHARGES	.
110% OF ESTIMATE	TOTAL TO BE BILLED BY	.
	TOTAL C.O.D. (COLLECT THIS AMOUNT) →	.

SPECIAL SERVICES REMARKS

SHIPPER REQUESTS NOTIFICATION OF ACTUAL CHARGES ☐ YES ☐ NO
NOTIFY ADDRESS _____ PHONE _____
NOTIFIED BY DATE COST

The weight used of _____ lbs is the manufacturer's certified correct weight
X _____ SHIPPER'S SIGNATURE

DATE	CONTRACTOR OR AGENT CODE NO.	EQUIPMENT NUMBER	HAULING DRIVER OR INTERLINE CARRIERS NAME ADDRESS TEL. NO.	FROM	TO

TYPE MACHINE	SERIAL NUMBER	CONDITION-ORIGIN	EXCEPTIONS-DESTINATION	MFG. WEIGHT
17 pcs.			Carton #11, Top Corner Dented	1138 lb.

BASED ON TARIFF NO. _____ SEC _____ MILES _____
RATING OFFICE _____ DATE _____
PICKED UP BY _____ DATE _____
LOADED BY _____ DATE _____
DEL RES ☐ WHSE ☐ BY _____ DATE _____
BOOKED BY _____ ORIG SVC BY _____
SHIPMENT ESTIMATED BY _____
BILL AUTH BY _____ CREDIT AUTH _____
IF REWEIGH GROSS WT _____ TARE WT _____ NET WT _____
AGREED DELIVERY DATE EARLIEST _____ LATEST _____
ISSUING CARRIER Any Van Line, Inc.
AGENT Local Shipping CODE 000
ADDRESS Yourtown, USA
BY
BILLING P.O. GBL NO. _____ CORP CODE _____
TO
ATTENTION
ADDRESS
CITY _____ STATE _____ ZIP _____
Stg at Dest Auth ☐ Yes ☐ No Limitation _____ Days
PAYMENT RECEIVED BY _____ CODE _____ AMOUNT $ _____

SERVICES SHOWN HEREIN WERE RENDERED AND SHIPMENT WAS RECEIVED IN GOOD CONDITION EXCEPT AS NOTED HEREON.

ORIGIN
x Pete Driverman
(SHIPPER SIGN HERE)
x _____
(CARRIER OR AUTHORIZED AGENT)

DESTINATION
x John Q. Customer
(CONSIGNEE SIGN HERE)
x _____
(CARRIER OR AUTHORIZED AGENT)

1. Any Van Line No. 0000000

Any motor carrier, or other person or any officer, agent, employee, or representative thereof, who shall knowingly and willfully neglect or fail to make full, true, and correct entries or who shall knowingly and willfully falsify, destroy, mutilate or alter this form, shall be subject to a penalty of $5,000 for each such offense.

VL86 380 (580)

A Bill of Lading
Figure 5-1

Key for Figure 5-1

Reference Number	Description	Reference Number	Description
1	Point of origin	6	Issuing carrier
2	Number of pieces	7	Local transport agent
3	Exceptions		
4	Weight	8	Waybill number
5	Destination	9	Signatures

Note any damage to the skid and carton in the Exceptions column. If more writing space is needed, write in the adjacent columns.

Occasionally, an Inventory Sheet accompanies the Bill of Lading. The Inventory Sheet lists each skid and carton individually. Figure 5-2 illustrates an Inventory Sheet.

FOR INTERSTATE SHIPMENTS

PAGE 1 OF PAGES

Consignee's Name

Agreed Delivery Date or Period of Time (MUST conform with order for service.)

Vehicle Numbers

Interlining Carrier (If Any)

Address

Shipper's Name

Shipper Requests Notification of Actual Charges No Yes
If Yes
Notify at Phone

Destination City State

ESTIMATED CHARGES For COD shipments charges are payable in cash, certified check, travelers check, or bank check payable to Bekins Van Lines before delivery.

Notification Name Phone

110% of Estimated Charges

Address

TARE WEIGHT 1138 lbs ← SHIPPER

The tare weight of the vehicle must be entered on this line prior to loading your shipment on the vehicle

GROSS WEIGHT
NET WEIGHT

DESCRIPTIVE SYMBOLS

CP	CARRIER PACKED	PBO	PACKED BY OWNER
CD	CARRIER DIS ASSEMBLED	DBO	DISASSEMBLED BY OWNER
C	TV COLOR	B&W	TV BLACK & WHITE

EXCEPTION SYMBOLS

BE	BENT	F	FADED	RU	RUSTED
BR	BROKEN	G	GOUGED	SC	SCRATCHED
BU	BURNED	L	LOOSE	SH	SHORT
CH	CHIPPED	M	MARRED	SO	SOILED
CU	CONTENTS & CONDITION UNKNOWN	MI	MILDEW	T	TORN
		MO	MOTHEATEN	W	BADLY WORN
D	DENTED	R	RUBBED	Z	CRACKED

NOTE THE OMISSION OF THESE SYMBOLS INDICATES GOOD CONDITION EXCEPT FOR NORMAL WEAR

LOCATION SYMBOLS

1	ARM	7	REAR
2	BOTTOM	8	RIGHT
3	CORNER	9	SIDE
4	FRONT	10	TOP
5	LEFT	11	VENEER
6	LEG	12	EDGE

	A	B	C	D	ARTICLE (List Each Article Separately)	Condition When Received at Origin (STAY WITHIN COLUMN)	Condition When Delivered at Destination (STAY WITHIN COLUMN)
1					Skid		
2					Skid		
3					Carton		
4					" "		
5					" "		
6					" "		
7					" "		
8					" "		
9					" "		
0					" "		
1					" "	Top Corner Dented	
2					" "		
3					" "		
4					" "		
5					" "		
6					" "		
7					" "		
8							
9							
0							

SUPPORT CLAIMS FOR LOSS AND EXTERIOR DAMAGE BY LISTING EXCEPTIONS HERE

GOODS RECEIVED AND LISTED BY _____ AT _____

I acknowledge that the goods listed above were in the condition described when delivered to the carrier.

This receipt is accepted at the time of loading in lieu of the bill of lading which shall be furnished at destination when all weights, rates, and charges have been determined. This shipment shall be governed by the applicable tariff rates and rules and the Interstate Commerce Commission regulations. Excerpts of the tariff rules are on the reverse side of this list.

X _____
SHIPPER AGENT WAREHOUSEMAN

The weight used of _____ lbs. is the manufacturer's certified correct wt.

X _____
SHIPPER'S SIGNATURE

DRIVER MUST SIGN

	LOAD	UNLOAD	DATE	CITY	ACKNOWLEDGING SIGNATURE
A					
B					
C					
D					

EACH LOADING & UNLOADING MUST BE RECORDED IN THE ABOVE SECTION

WAREHOUSE RESIDENCE _____ PICKUP DATE _____
(CHECK ONE) (City) (State)

I acknowledge receipt of goods in shipment listed and numbered _____ to _____ except as noted, and shown on this descriptive inventory at time of delivery by carrier.

X _____
CONSIGNEE AGENT OR WAREHOUSEMAN

AT DELIVERY CONSIGNEE (OR HIS AGENT) SIGN ONE THAT APPLIES

DRIVER UNPACKED SATISFACTORILY
X

UNPACKING NOT DESIRED
X

Any Van Line, Inc

BILL OF LOADING NO _____

Any motor carrier, or other person or any officer, agent, employee, or representative thereof, who shall knowingly and willfully neglect or fail to make full, true, and correct entries or who shall knowingly and willfully falsify, destroy, mutilate or alter this form, shall be subject to a penalty of $5,000 for each such offense.

Inventory Sheet
Figure 5-2

Prime assigns a number to each piece, such as "1 of 3." If a piece is damaged, write a short damage description next to the assigned line for the carton or skid. Complete an inspection before signing the Bill of Lading.

Notes

List all damages on both the Inventory Sheet and the Bill of Lading. Never refuse a shipment because of damages. If a carrier refuses to deliver because of damage, perform a joint inspection on the spot. If the carrier refuses, do not sign the Bill of Lading, and contact your Prime Customer Service Representative. Under no circumstances should a driver ever leave your premises with your equipment.

Sign the Bill of Lading only after you have inspected all the cartons and skids, the carrier has unpacked all the cartons and skids, and both you and the carrier have reviewed the Exceptions column on the Bill of Lading.

Inspection of your shipment entails

- Checking for short shipment
- Performing a visual inspection
- Checking for pilferage
- Checking for hidden damages

Short Shipment

When your shipment arrives, check the number of pieces delivered from the Point of Origin (Prime Computer, Inc.) against the number of pieces specified on the Bill of Lading. If the delivery does not include all the shipped pieces, note this in the Exceptions column and have the driver sign the same exception on your copy of the bill. Keep that copy for claims purposes.

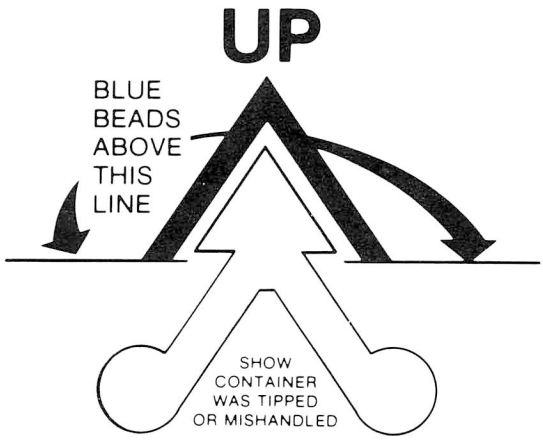
Visual Inspection of the Cartons

While the equipment is still packaged, inspect each carton for signs of damage. Shipping damage includes:

- Scrapes, cuts, and punctures
- Dents

- Crushed cartons
- Wet cartons (including those with dried water marks)

The skids contain "tip-N-tell" indicators on the side of the packaging. Figure 5-3 illustrates a tip indicator. This indicator reveals mishandling or tipping of the skids. Note any tipped skids on the Bill of Lading.



Tip-N-Tell Indicator
Figure 5-3

Note

If any internal damage is evident, you may have the packaging removed, even though you did not contract for inside delivery.

Pilferage

If any cartons show signs of pilferage (opening, retaping, or tearing), you and the carrier must inventory the carton contents against the packing slip. This is found in the first piece of packaged equipment ("1 of ...."), which is usually on a skid. Note the following on the Bill of Lading:

- Carton number
- Carton items
- Any damaged items

If you cannot inventory the carton at the time of delivery, note the pilferage in the Exceptions column. If you are a contractually qualified customer, call your Prime Customer Service Representative.

Hidden Damages

If the carrier unpacks your equipment and you discover that it is damaged, note this on the Bill of Lading.

Fifteen-day Inspection Period

If you either did not wish or were not able to specify inside delivery, you must unpack and inspect your equipment within 15 days of delivery. This protects your rights to make a claim against a carrier. If you discover damage after you signed the Bill of Lading, refer to the following section.

CLAIM PROCEDURE

If you discover something amiss with your shipment after you have signed the Bill of Lading and the carrier has left your premises, you can still make a claim. Claims can be made for the following reasons:

- Fewer delivered pieces than stated on the invoice
- Concealed damage not evident from carton inspection
- Missing items in the carton

The following sections detail the steps to take before you make a claim and the claim process itself.

Pre-Claim Process

If you must make a claim, the following five steps will assist you:

- Save all the packing material for the carton in question.
- Do not move the equipment further than an adjacent area.

- Do not attempt any repairs on the equipment.
- Retain your copy of the Bill of Lading.
- If possible, take photographs of the damage.

The Claim Process

Notify the carrier's local office about the shipping problem as soon as possible. Most offices have either a Freight Damage or Over, Short, and Damage (OS&D) Department to handle inspection requests.

Note

A Prime Customer Service Representative assists contractually qualified customers in assessing the damage.

Give the carrier the following information:

- The date of delivery
- The Waybill number on the Bill of Lading
- A brief description of the damage
- The value of the damaged merchandise

If the equipment value is small, the carrier may waive the inspection. Request written confirmation of the waiver and present the confirmation with your claim.

For your records, note the name of the individual to whom you spoke. Follow your request for inspection with a written notice to the carrier's local office. The carrier's claim representative must meet with you to perform a joint inspection within five working days.

When the carrier's claim representative arrives, a joint inspection is performed by both of you before the signing of the report. Read the report thoroughly to ensure that you are not agreeing to eliminate the carrier's liability. The following examples might limit the carrier's responsibility:

"Damage was of such nature that could not be noted at the time of delivery."

"Inadequate or no interior packaging."

"Defective cartoning"

You do not have to sign the report if you disagree with the representative's opinion. However, you are allowed to record your own opinion on the inspection form.

If the carrier does not respond by the sixth working day, you may inspect the damage yourself and determine the cause to the best of your ability.

UNPACKING THE EQUIPMENT

If you specified inside delivery, the carrier is reponsible for moving and unpacking your system at your selected site. If you waived inside delivery, you are responsible for moving and unpacking your system.

APPENDIX

A

Computer System Specifications

This appendix provides

- A startup current summary for Prime computer systems
- The physical, electrical, and environmental specifications for Prime computer systems that are installed in a computer-room environment

STARTUP CURRENT

Startup current consists of turning on the blowers and charging up the energy-storage capacitors in the CPU power supply. Inrush or startup current is given for each active circuit as two values: a fixed nominal value such as 30 or 60 amperes for the blowers and a variable, given as I, for the power supplies. The value I is the peak surge value, which lies between 100 and 170 amperes and is given for each power supply on a circuit. This surge decays to steady state value within two power frequency cycles. Time-delay devices sequence startup of multiple active circuits with a delay of approximately 600 milliseconds between each surge. The following examples describe the startup process:

Example 1: This shows the inrush requirements of a single cabinet 60 Hz 750F.

```
Inrush or Startup
Current per Circuit
 (RMS Amperes)
  #1       #2

   60
   I        I

   I        I
```

The blower (60 amperes) is located on circuit 1. After it is powered up, sequenced inrush surges occur on circuits 1 and 2.

Example 2: This shows the startup sequence of a 50 Hz 750F. On 50 Hz single cabinet systems only circuit 1 is active:

```
Inrush or Startup
Current per Circuit
 (RMS Amperes)
  #1       #2

   30

   2I
   2I
```

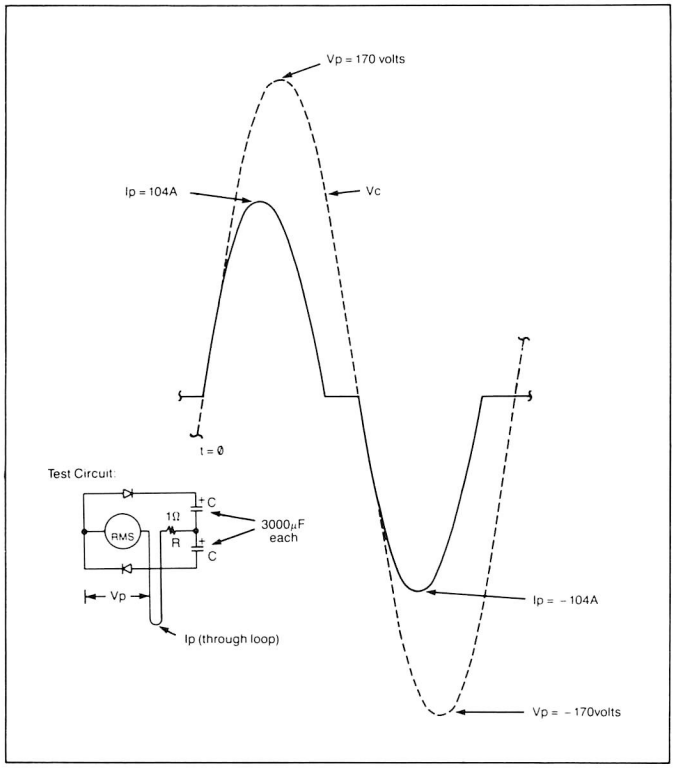
After the blower (30 amperes) powers up, two sequenced power surges occur on circuit 1.

Example 3: This shows the inrush requirements of a multi-cabinet 850F. Both 50 and 60 Hz multi-cabinet CPUs operate on multi-phase AC power with all circuits active:

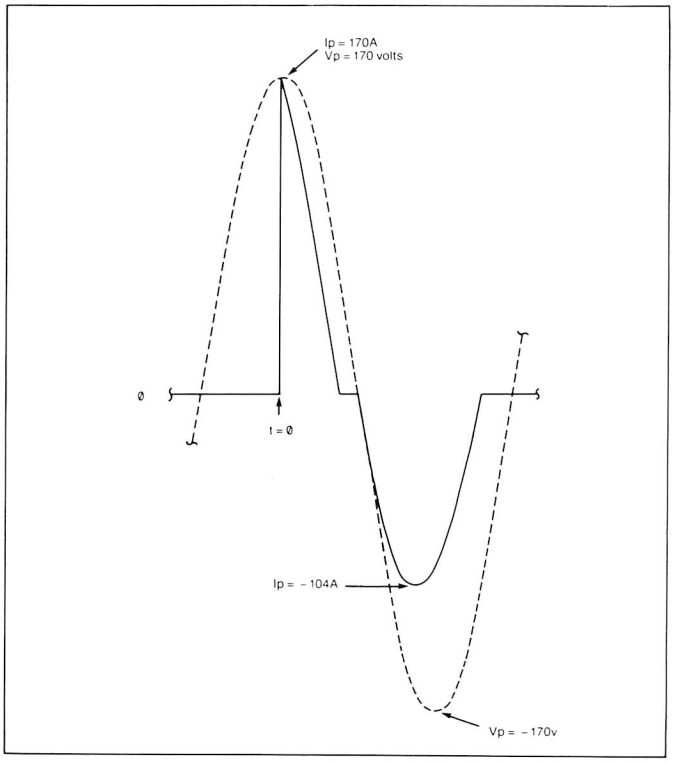
```
Inrush or Startup
Current per Circuit
 (RMS Amperes)
  #1     #2      #3

         60      60
   I     I       I
   I     I
```

After the blowers (60 amperes) located on circuits 2 and 3 power up, sequenced inrush surges occur on each active circuit until all power supplies are powered up. Figure A-1 illustrates the minimum and maximum worst case startup surges for all power supplies.



Minimum Startup Power Surge



Maximum Startup Power Surge

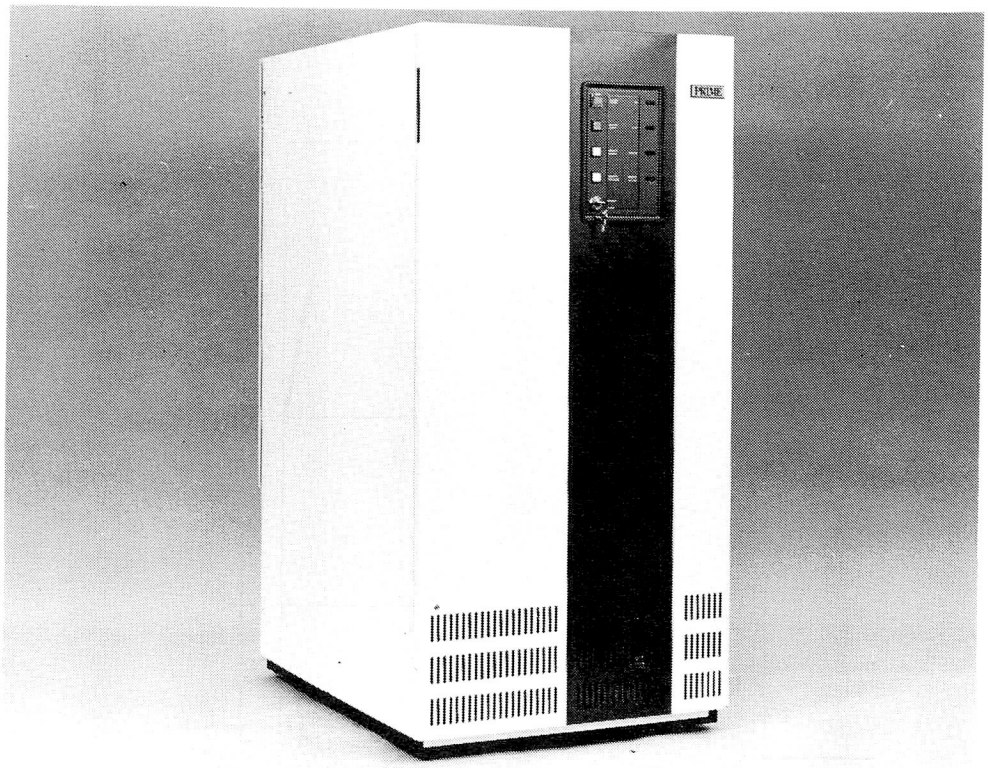
Startup Power Surges
Figure A-1

PRIME COMPUTER SYSTEMS

The following sections provide the specifications for the following computer systems:

- 250F ™
- 550F ™
- 750F ™
- 850F ™
- 9650 ™
- 9655 ™
- 9750 ™
- 9755 ™
- 9950 ™
- 9955 ™
- 9955II ™

Prime 250F Computer System



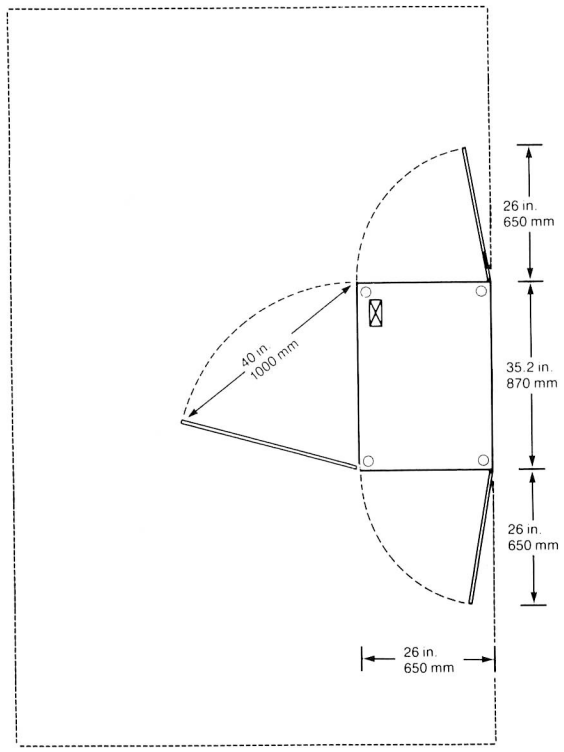
Prime 250F

Physical Specifications: Prime 250F

Dimensions	Installed	Shipped
Height	53.0 in. (1346 mm)	54.5 in. (1384 mm)*
Width	26.25 in. (667 mm)	37.5 in. (953 mm)
Depth	35.25 in. (895 mm)	43.0 in. (1092 mm)
		*Without skid
Weight	525 lb (238 kg)	

Access Dimensions

Front	44.0 in. (1118 mm)
Side	53.0 in. (1346 mm)
Back	44.0 in. (1118 mm)



Prime 250F Access Dimensions

Electrical Specifications: Prime 250F

Power Requirements

Circuit Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand per Circuit #1	Steady State KVA Demand per Circuit #2	Inrush or Startup Current per Circuit (RMS Amperes) #1	Inrush or Startup Current per Circuit (RMS Amperes) #2
120 (104-127)	60 (59-61)	1.5	1.0	I	60
240 (208-254)	50 (49-51)	2.5		30 I	

Power Connections

	Cord Length	Rating	Plugs	Wires
250F	9 ft	30A	NEMA L14-30P	4
250F-A	2.7 m	30A	Supplied with NEMA L6-30P	3

On-site replacement required

Environmental Specifications: Prime 250F

	Heat Dissipation
250F	5700 Btu
250F-A	1430 Kcal

Prime 550F Computer System

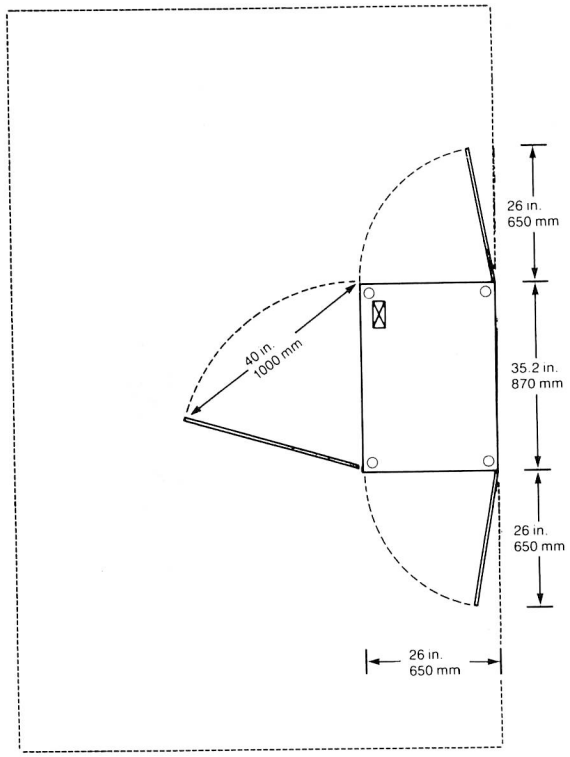
Prime 550F

Physical Specifications: Prime 550F

Dimensions	Installed	Shipped
Height	53.0 in. (1346 mm)	54.5 in. (1384 mm)*
Width	26.25 in. (667 mm)	37.5 in. (953 mm)
Depth	35.25 in. (895 mm)	43.0 in. (1092 mm)
		*Without skid
Weight	600 lb (272 kg)	

Access Dimensions

Front	44.0 in. (1118 mm)
Side	53.0 in. (1346 mm)
Back	44.0 in. (1118 mm)



Prime 550F Access Dimensions

Electrical Specifications: Prime 550F

Power Requirements

Circuit Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand per Circuit #1	Steady State KVA Demand per Circuit #2	Inrush or Startup Current per Circuit (RMS Amperes) #1	Inrush or Startup Current per Circuit (RMS Amperes) #2
120 (104-127)	60 (59-61)	0.9	1.8	I	60 I
240 (208-254)	50 (49-51)	2.7		30 2I	

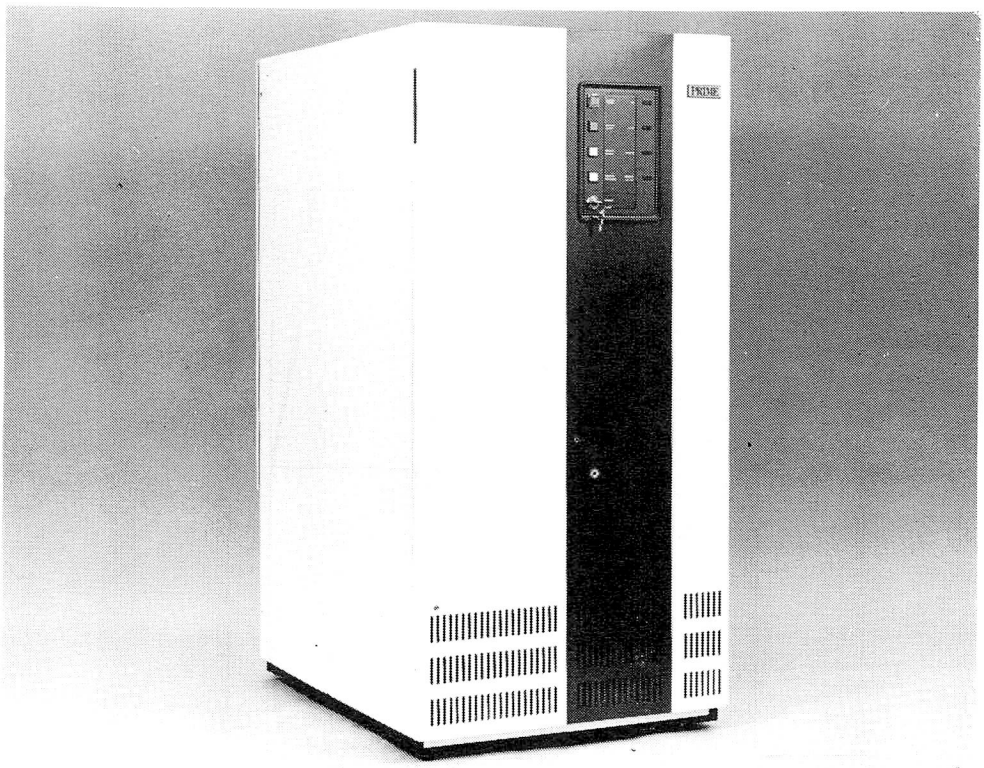
Power Connections

	Cord Length	Rating	Plugs	Wires
550F	9 ft	30A	NEMA L14-30P	4
550F-A	2.7 m	30A	Supplied with NEMA L6-30P On-site replacement required	3

Environmental Specifications: Prime 550F

	Heat Dissipation
550F	6600 Btu
550F-A	1700 Kcal

Prime 750F Computer System



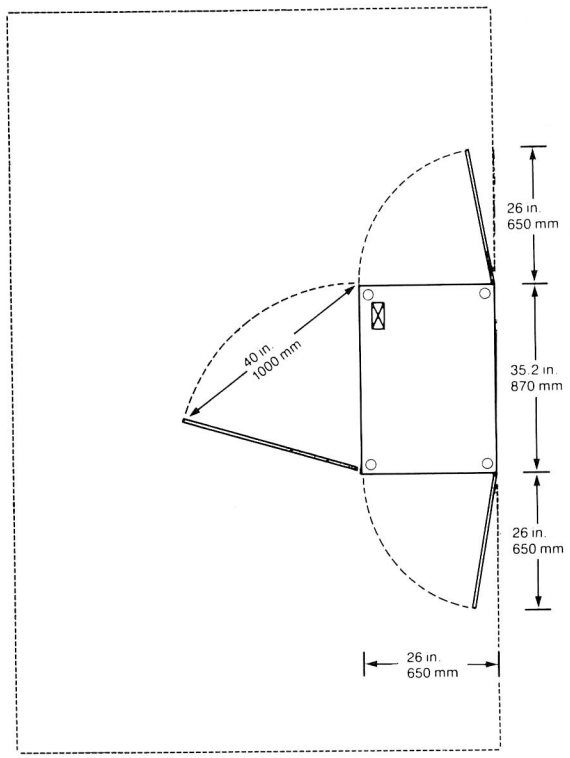
Prime 750F

Physical Specifications: Prime 750F

Dimensions	Installed	Shipped
Height	53.0 in. (1346 mm)	54.5 in. (1384 mm)*
Width	26.25 in. (667 mm)	37.5 in. (953 mm)
Depth	35.25 in. (895 mm)	43.0 in. (1092 mm)
		*Without skid
Weight	790 lb (359 kg)	

Access Dimensions

Front	44.0 in. (1118 mm)
Side	53.0 in. (1346 mm)
Back	44.0 in. (1118 mm)



Prime 750F Access Dimensions

Electrical Specifications: Prime 750F

Power Requirements

Circuit Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand per Circuit #1	Steady State KVA Demand per Circuit #2	Inrush or Startup Current per Circuit (RMS Amperes) #1	Inrush or Startup Current per Circuit (RMS Amperes) #2
120 (104-127)	60 (59-61)	2.0	1.7	60 I I	 I I
240 (208-254)	50 (49-51)	3.7		30 2I 2I	

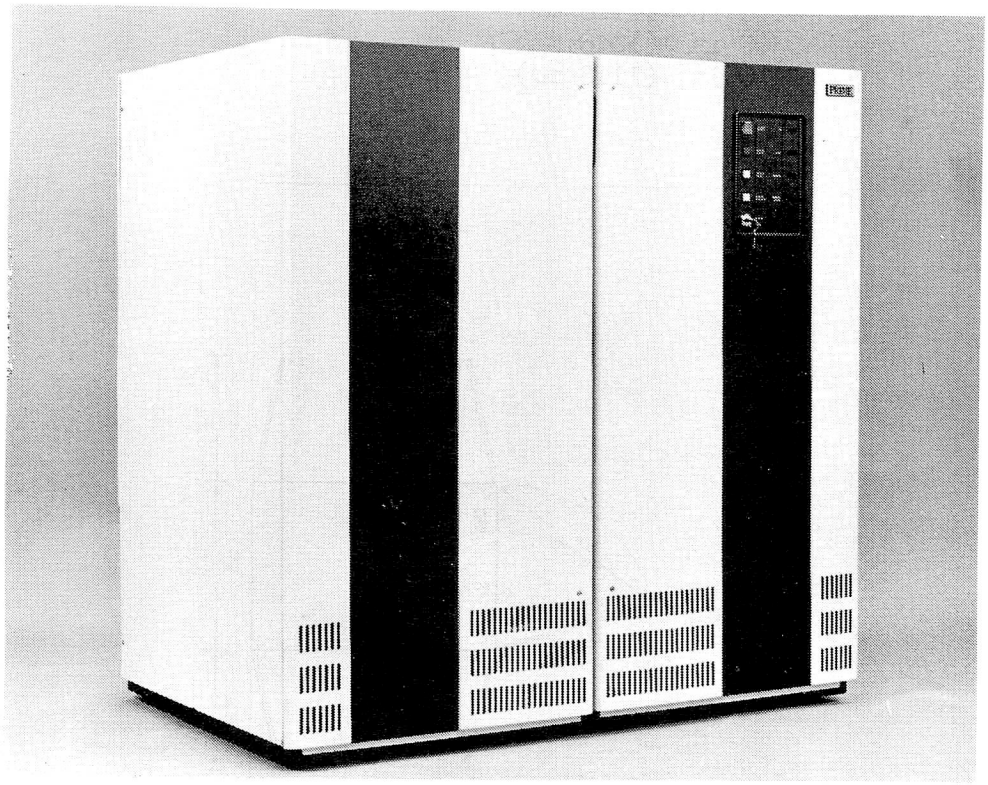
Power Connections

	Cord Length	Rating	Plugs	Wires
750F	9 ft	30A	NEMA L14-30P	4
750F-A	2.7 m	30A	Supplied with NEMA L6-30P. On-site replacement required	3

Environmental Specifications: Prime 750F

	Heat Dissipation
750F	9200 Btu
750F-A	2320 Kcal

Prime 850F Computer System



Prime 850F

Physical Specifications: Prime 850F

Dimensions	Installed	Shipped
Height	53.0 in. (1346 mm)	54.5 in. (1384 mm)**
Width	52.5 in. (1334 mm)*	37.5 in. (953 mm)
Depth	35.25 in. (895 mm)	43.0 in. (1092 mm)

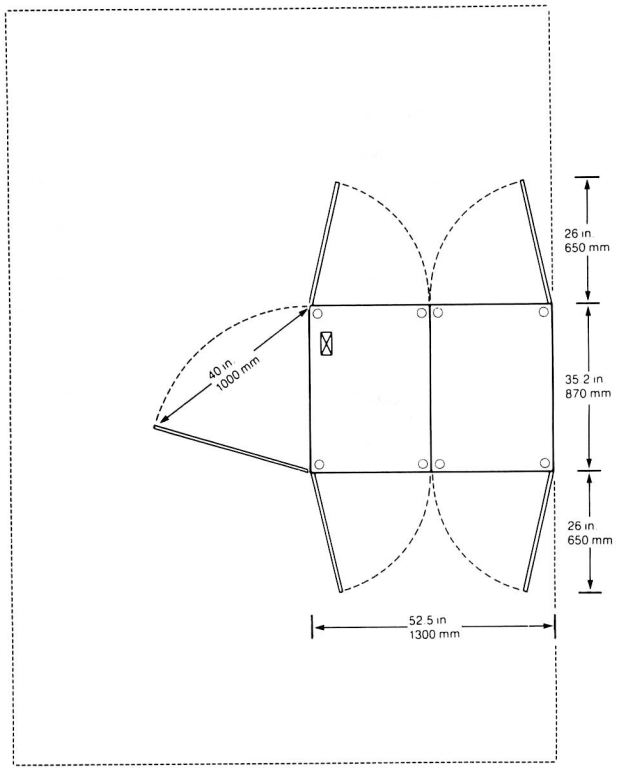
*Combined width of cabinets 1 and 2.

**Without skid

Weight	Right Cabinet	Left Cabinet
	584 lb (265 kg)	707 lb (321 kg)

Access Dimensions

Front	44.0 in. (1118 mm)
Side	53.0 in. (1346 mm)
Back	44.0 in. (1118 mm)



Prime 850F Access Dimensions

Electrical Specifications: Prime 850F

Power Requirements

Circuit Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand per Circuit #1	#2	#3	Inrush or Startup Current per Circuit (RMS Amperes) #1	#2	#3
120 (104-127)	60 (59-61)	1.9	2.1	1.2	I I	60 I I	60 I
240 (208-254)	50 (49-51)	1.9	2.1	1.2	I I	30 I I	30 I

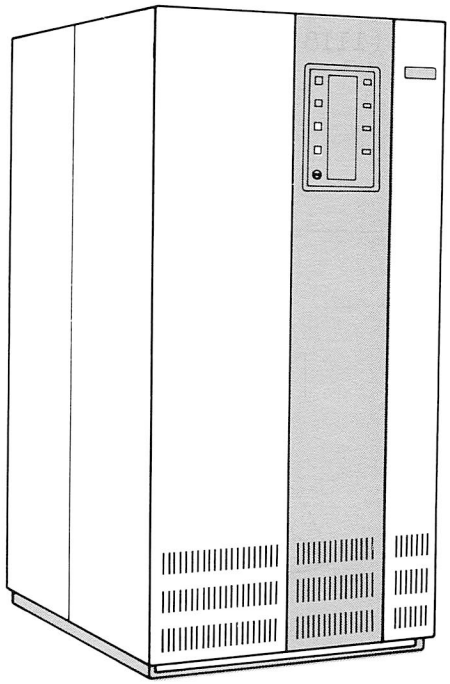
Power Connections

	Cord Length	Rating	Plugs	Wires
850F	9 ft	30A	NEMA L21-30P	5
850F-A	2.7 m	20A	Supplied with NEMA L22-20P. On-site replacement required	5

Environmental Specifications: Prime 850F

	Heat Dissipation
850F	12040 Btu
850F-A	3040 Kcal

Prime 9650 and 9655 Computer System



Prime 9650 and 9655 System

Physical Specifications: 9650 and 9655 Systems

Dimensions	Installed	Shipped
Height	53.0 in. (134.6 cm)	54.5 in. (138.4 cm)*
Width	26.25 in. (66.7 cm)	37.5 in. (95.3 cm)
Depth	35.25 in. (89.5 cm)	43.0 in. (109.2 cm)

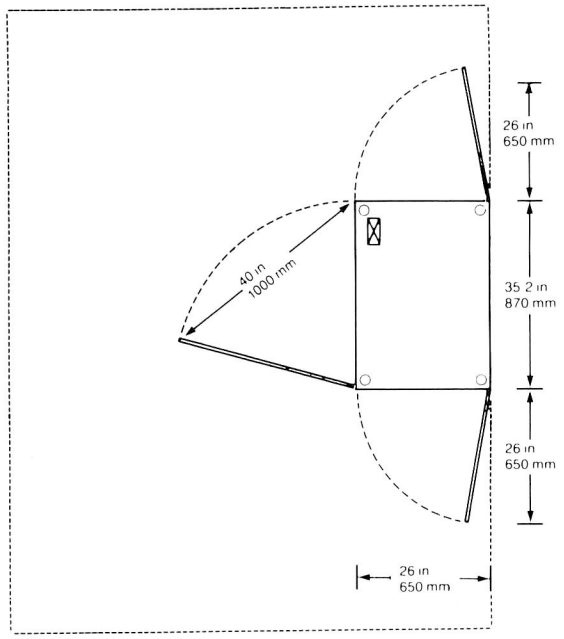
*Without skid

Weight** 600 lbs. (272 kg)

**approximate weight

Access Dimensions

Front	44.0 in. (1118 mm)
Side	53.0 in. (1346 mm)
Back	44.0 in. (1118 mm)



Prime 9650 and 9655 Access Dimensions

Electrical Specifications: 9650 and 9655 Systems

Power Requirements

Circuit Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand per Circuit #1	#2	#3	Inrush or Startup Current per Circuit (RMS Amperes) #1	#2	#3
120 (104-127)	60 (59-61)	1.60	.88		M* I** I**	M* I**	
240 (208-254)	50 (49-51)	2.5			M/2* I** I**		

* M = Startup surges of cabinet blower, 60 amp/.6 secs
** I = Inrush current of power supply, 170A peak, 3 AC cycles

	Input Power (KW) #1	#2	#3
60Hz Version	1.16	.54	N/A
50Hz Version	1.7	N/A	N/A

Power Connections

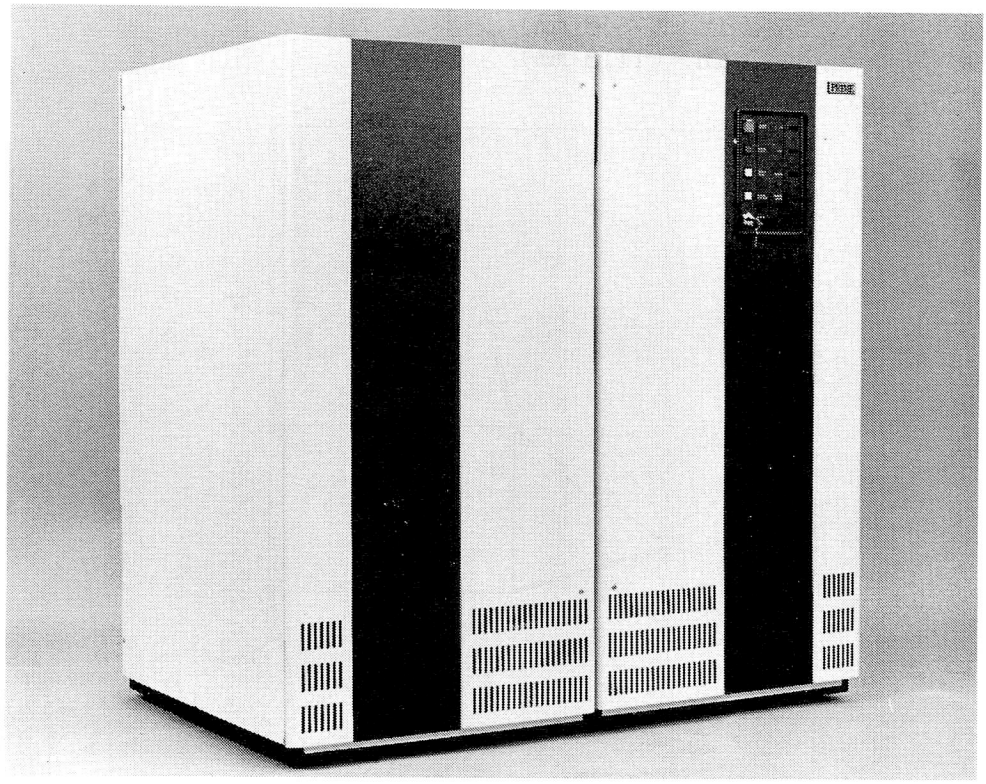
	Cord Length	Rating	Plugs	Wires
60Hz	9 ft	30A	NEMA L14-30P	4
50Hz	2.7 m	30A	Supplied with NEMA L6-30 On-site conversion required	3

Environmental Specifications: 9650 and 9655 Systems

Heat Dissipation 5700 Btu/hr (1450 Kcal/hr)

Cooling: Internal blower

Prime 9750 Computer System



Prime 9750

Physical Specifications: Prime 9750

Dimensions	Installed	Shipped
Height	53.0 in. (1346 mm)	54.0 in. (1372 mm)**
Width	52.5 in. (1334 mm)*	37.5 in. (953 mm)
Depth	35.25 in. (895 mm)	43.0 in. (1092 mm)

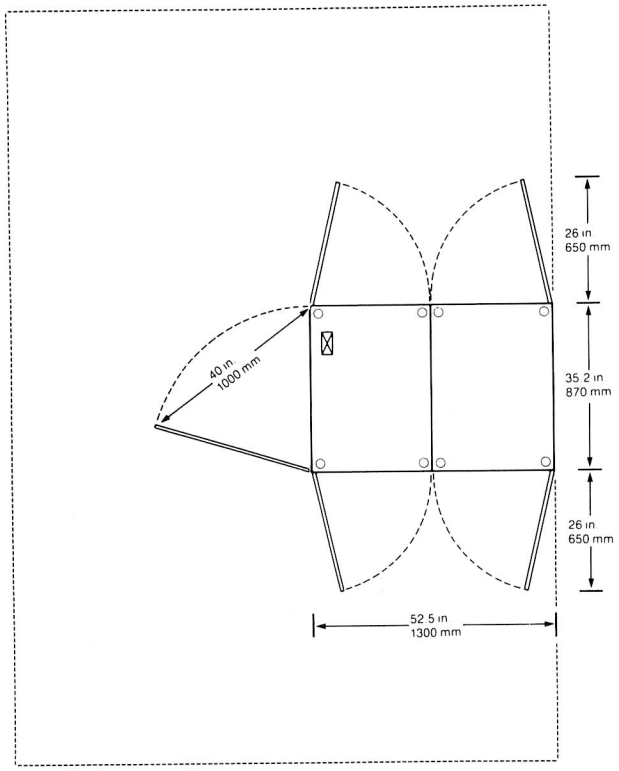
*Combined width of cabinets 1 and 2.

**Without skid

Weight	Right Cabinet	Left Cabinet
	584 lb (265 kg)	750 lb (340 kg)

Access Dimensions

Front	44.0 in. (1118 mm)
Side	53.0 in. (1346 mm)
Back	44.0 in. (1118 mm)



Prime 9750 Access Dimensions

Electrical Specifications: Prime 9750

Power Requirements

Circuit Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand per Circuit #1	#2	#3	Inrush or Startup Current per Circuit (RMS Amperes) #1	#2	#3
120 (104-127)	60 (59-61)	1.04	1.9	1.3		60	60
					I		I
						I	I
240 (208-254)	50 (49-51)	1.04	1.9	1.3		30	30
					I		I
					I	I	

	Input Power (Kw)
9750	3.2
9750-A	3.2

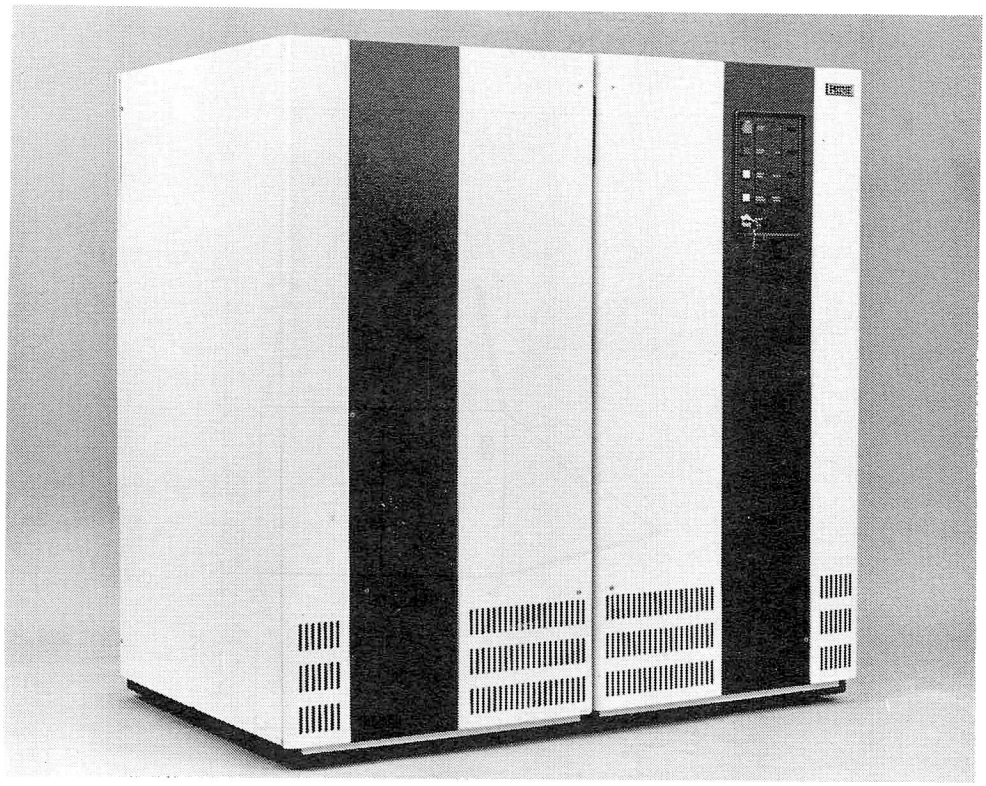
Power Connections

	Cord Length	Rating	Plugs	Wires
9750	9 ft	30A	NEMA L21-30P	5
9750-A	2.7 m	20A	Supplied with NEMA L22-20P On-site replacement required	5

Environmental Specifications: Prime 9750

	Heat Dissipation
9750	10800 Btu/hr
9750-A	2700 Kcal/hr

Prime 9755 Computer System



Physical Specifications: Prime 9755

Dimensions	Installed	Shipped
Height	53.0 in. (134.6 cm)	54.5 in. (138.4 cm)*
Width	52.5 in. (133.4 cm)	37.5 in. (95.3 cm)**
Depth	35.25 in. (89.5 cm)	43.0 in. (109.2 cm)

*Without skid

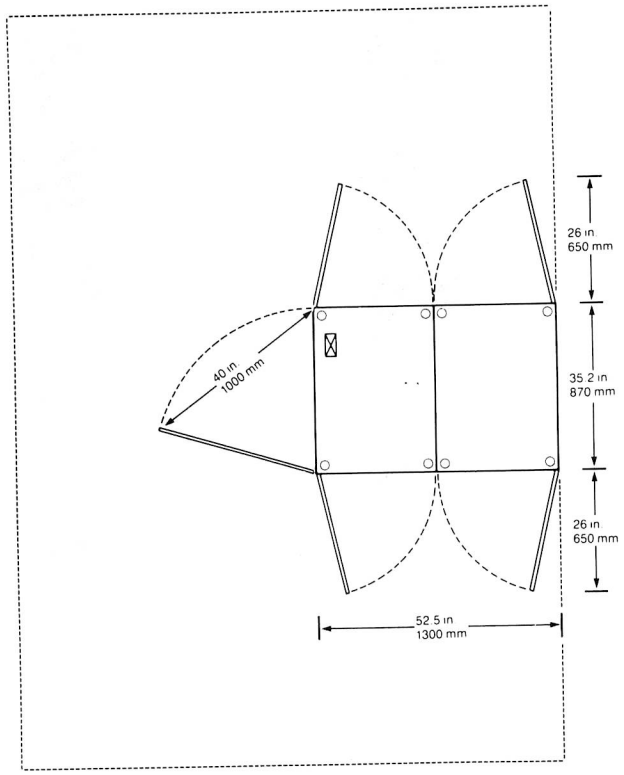
** Reflects individual carton dimensions.
Prime 9755 is shipped in two cartons.

Weight*** 1334 lbs. (605 kg)

***approximate weight

Access Dimensions

Front	44.0 in. (1118 m)
Side	53.0 in. (1346 mm)
Back	44.0 in. (1118 mm)



Prime 9755 Computer System Access Dimensions

Electrical Specifications: Prime 9755

Power Requirements

Circuit Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand per Circuit #1	#2	#3	Inrush or Startup Current per Circuit (RMS Amperes) #1	#2	#3
120 (104-127)	60 (59-61)	10.5	16.2	12.4	I**	M* I** I**	M* I** I**
240 (208-254)	50 (49-51)	5.7	8.1	6.2	I** I**	M*/2 I** I**	M*/2 I**

* M = Startup surges of cabinet blower, 60 amp/.6 secs
** I = Inrush current of power supply, 170A peak, 3 AC cycles

	Input Power (KW) per Circuit #1	#2	#3
60Hz Version	.87	1.4	1.2
50Hz Version	.87	1.4	1.2

Power Connections

	Cord Length	Rating	Plugs	Wires
60Hz	9 ft	30A	NEMA L21-30P	5
50Hz	2.7 m	30A	Supplied with NEMA L22-20P On-site conversion required	3

Environmental Specifications: Prime 9755

Heat Dissipation:	11900 Btu/hr (2998.8 Kcal/hr)
Cooling:	Internal blower

Electrical Specifications: Prime 9755

Power Requirements

Circuit Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand per Circuit #1	#2	#3	Inrush or Startup Current per Circuit (RMS Amperes) #1	#2	#3
120 (104-127)	60 (59-61)	1.5	1.9	1.5	I**	M* I** I**	M* I** I**
240 (208-254)	50 (49-51)	1.5	1.9	1.5	I** I**	M*/2 I** I**	M*/2 I**

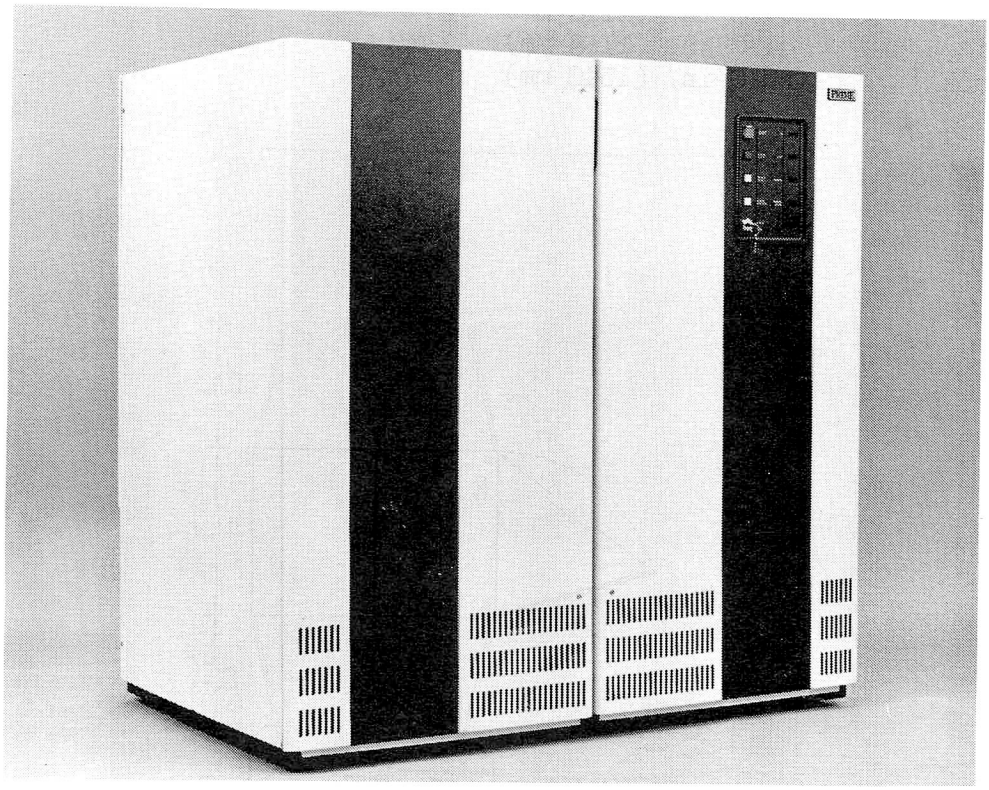
* M = Startup surges of cabinet blower, 60 amp/.6 secs
** I = Inrush current of power supply, 170A peak, 3 AC cycles

	Input Power (KW) per Circuit #1	#2	#3
60Hz Version	.87	1.4	1.2
50Hz Version	.87	1.4	1.2

Power Connections

	Cord Length	Rating	Plugs	Wires
60Hz	9 ft	30A	NEMA L21-30P	5
50Hz	2.7 m	30A	Supplied with NEMA L22-20P On-site conversion required	3

Prime 9950 Computer System



Prime 9950

Physical Specifications: Prime 9950

Dimensions	Installed	Shipped
Height	53.0 in. (1346 mm)	54.0 in. (1372 mm)**
Width	52.5 in. (1334 mm)*	37.5 in. (953 mm)
Depth	35.25 in. (895 mm)	43.0 in. (1092 mm)

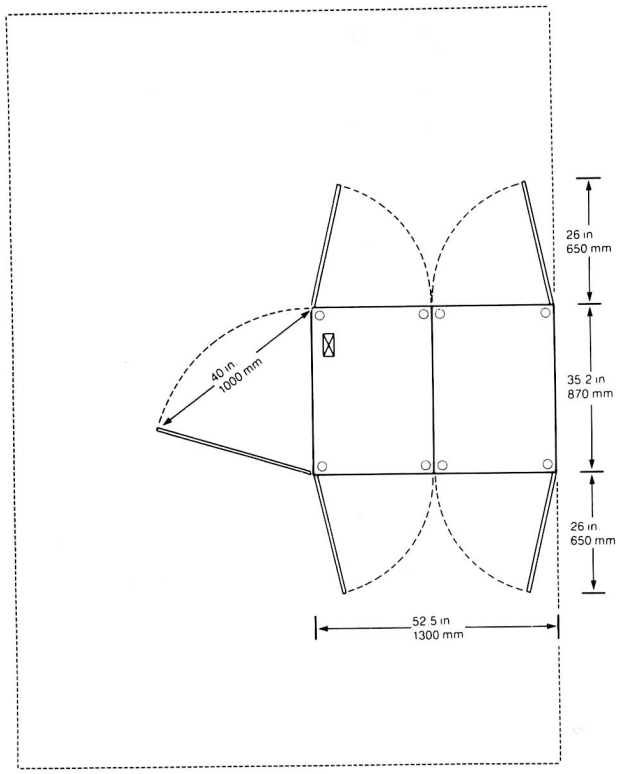
*Combined width of cabinets 1 and 2.

**Without skid

Weight	Right Cabinet	Left Cabinet
	584 lb (265 kg)	750 lb (340 kg)

Access Dimensions

Front	44.0 in. (1118 mm)
Side	44.0 in. (1118 mm)
Back	53.0 in. (1346 mm)



Prime 9950 Access Dimensions

Electrical Specifications: Prime 9950

Power Requirements

Circuit Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand per Circuit #1	#2	#3	Inrush or Startup Current per Circuit (RMS Amperes) #1	#2	#3
120 (104-127)	60 (59-61)	1.3	1.9	1.5		60	60
					I	I	I
						I	I
240 (208-254)	50 (49-51)	1.3	1.9	1.5		30	30
					I	I	I
					I	I	

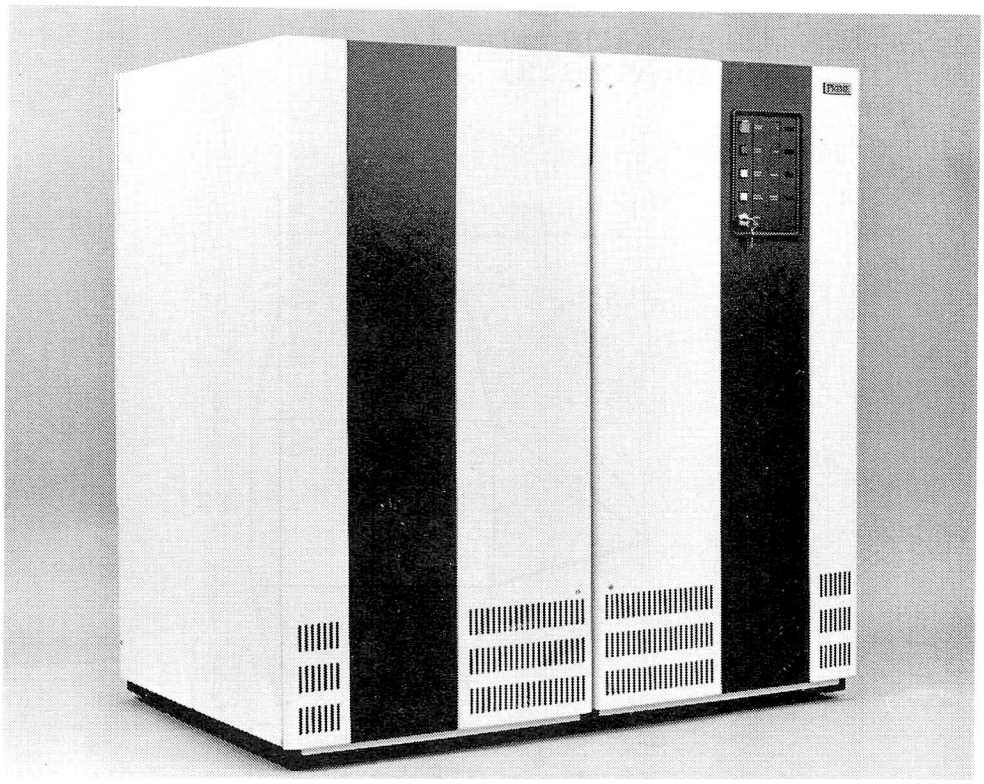
Power Connections

	Cord Length	Rating	Plugs	Wires
9950	9 ft	30A	NEMA L21-30P	5
9950-A	2.7 m	20A	Supplied with NEMA L22-20P. On-site replacement required	5

Environmental Specifications: Prime 9950

	Heat Dissipation
9950	11700 Btu
9950-A	2950 Kcal

Prime 9955 Computer System



Prime 9955

Physical Specifications: Prime 9955

Dimensions	Installed	Shipped
Height	53.0 in. (1346 mm)	54.0 in. (1372 mm)**
Width	52.5 in. (1334 mm)*	37.5 in. (953 mm)
Depth	35.25 in. (895 mm)	43.0 in. (1092 mm)

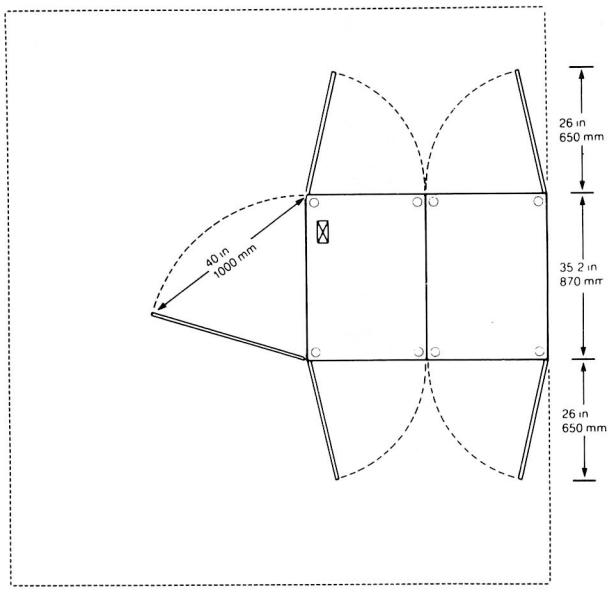
*Combined width of cabinets 1 and 2.

**Without skid

Weight	Right Cabinet	Left Cabinet
	584 lb (265 kg)	750 lb (340 kg)

Access Dimensions

Front	44.0 in. (1118 mm)
Side	44.0 in. (1118 mm)
Back	53.0 in. (1346 mm)



Prime 9955 Access Dimensions

Electrical Specifications: Prime 9955

Power Requirements

Circuit Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand per Circuit #1	#2	#3	Inrush or Startup Current per Circuit (RMS Amperes) #1	#2	#3
120 (104-127)	60 (59-61)	1.5	1.8	1.99		60	60
					I	I	I
						I	I
240 (208-254)	50 (49-51)	1.5	1.8	1.99		30	30
					I	I	I
					I	I	

	Input Power (Kw)
9955	3.9
9955-A	3.9

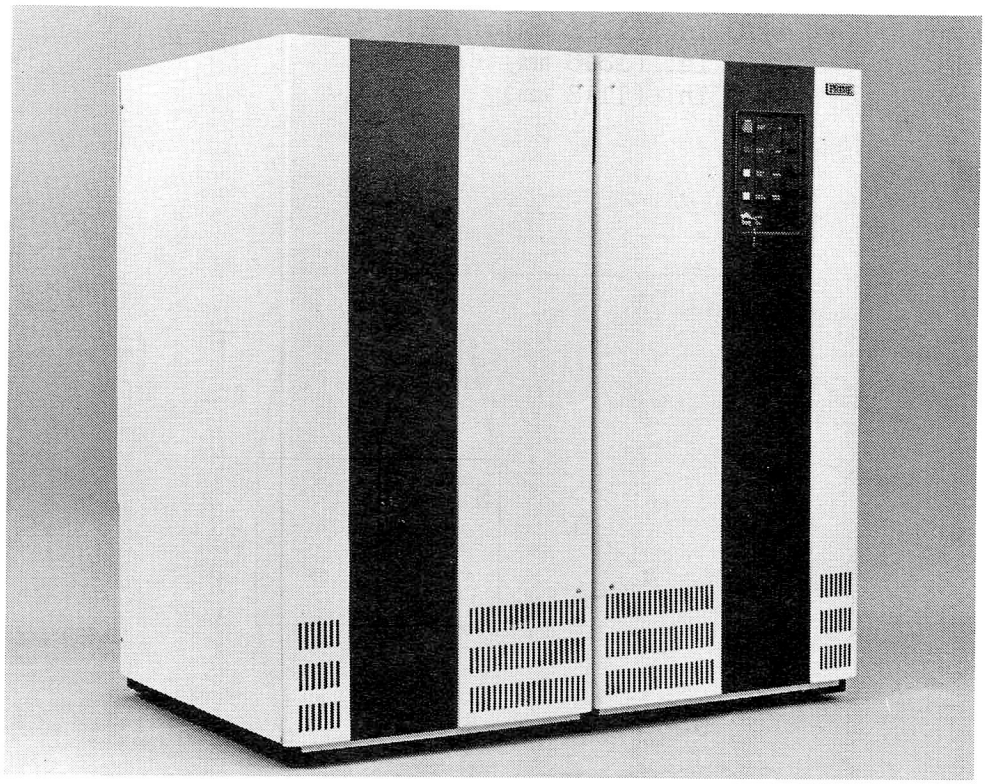
Power Connections

	Cord Length	Rating	Plugs	Wires
9955	9 ft	30A	NEMA L21-30P	5
9955-A	2.7 m	20A	Supplied with NEMA L22-20P On-site replacement required	5

Environmental Specifications: Prime 9955

	Heat Dissipation
9955	13300 Btu/hr
9955-A	13300 Btu/hr

Prime 9955II Computer System



Prime 9955II Computer System

Physical Specifications: Prime 9955II

Dimensions	Installed	Shipped
Height	53.0 in. (134.6 cm)	54.5 in. (138.4 cm)*
Width	52.5 in. (133.4 cm)	37.5 in. (95.3 cm)**
Depth	35.25 in. (89.5 cm)	43.0 in. (109.2 cm)

*Without skid

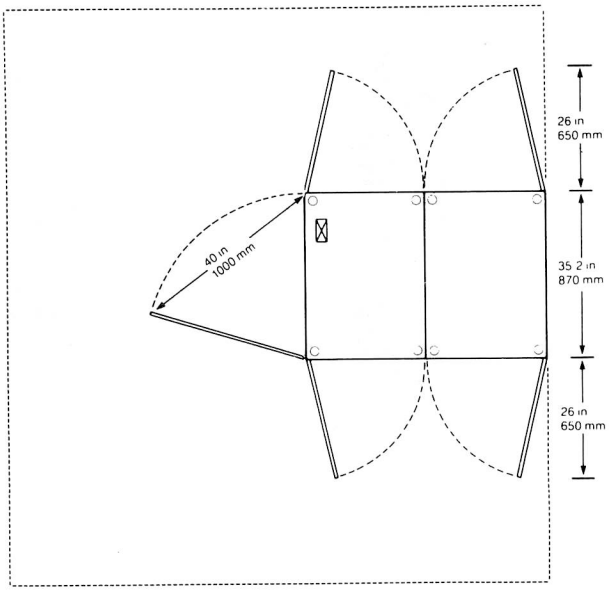
** Reflects individual carton dimensions.
Prime 9955II is shipped in two cartons.

Weight*** 1334 lbs. (605 kg)

***approximate weight

Access Dimensions

Front	44.0 in. (1118 mm)
Side	53.0 in. (1346 mm)
Back	44.0 in. (1118 mm)



Prime 9955II Access Dimensions

Electrical Specifications: Prime 9955II

Power Requirements

Circuit Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand per Circuit #1	#2	#3	Inrush or Startup Current per Circuit (RMS Amperes) #1	#2	#3
120 (104-127)	60 (59-61)	9.32	15.18	10.8		M*	M*
					I**	I**	I**
						I**	I**
240 (208-254)	50 (49-51)	4.7	7.6	5.4		M*/2	M*/2
					I**	I**	I**
						I**	I**

* M = Startup surges of cabinet blower, 60 amp/.6 secs
** I = Inrush current of power supply, 170A peak, 3 AC cycles

	Input Power (KW) per Circuit #1	#2	#3
60Hz Version	1.12	1.8	1.3
50Hz Version	1.12	1.8	1.3

See next

Power Connections

	Cord Length	Rating	Plugs	Wires
60Hz	9 ft	30A	NEMA L21-30P	5
50Hz	2.7 m	30A	Supplied with NEMA L22-20P On-site conversion required	3

Environmental Specifications: Prime 9955II

Heat Dissipation:	11000 Btu/hr (2772 Kcal/hr)
Cooling:	Internal blower

Electrical Specifications: Prime 9955II

Power Requirements

Circuit Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand per Circuit #1	#2	#3	Inrush or Startup Current per Circuit (RMS Amperes) #1	#2	#3
120 (104-127)	60 (59-61)	1.12	1.8	1.3		M*	M*
					I**	I**	I**
						I**	I**
240 (208-254)	50 (49-51)	1.12	1.8	1.3		M*/2	M*/2
					I**	I**	I**
						I**	I**

* M = Startup surges of cabinet blower, 60 amp/.6 secs
** I = Inrush current of power supply, 170A peak, 3 AC cycles

	Input Power (KW) per Circuit #1	#2	#3
60Hz Version	1.12	1.8	1.3
50Hz Version	1.12	1.8	1.3

Power Connections

	Cord Length	Rating	Plugs	Wires
60Hz	9 ft	30A	NEMA L21-30P	5
50Hz	2.7 m	30A	Supplied with NEMA L22-20P On-site conversion required	3

B

Cabinet-mounted Peripheral Specifications

This appendix provides the physical, electrical, and environmental specifications for the Prime peripheral cabinets and cabinet-mounted peripherals.

PERIPHERAL CABINETS

The Prime 7651F and 7564S peripheral cabinets have the same external dimensions as the 7650F CPU cabinet and are designed to meet FCC RFI standards. The 7651F cabinet features

- An FCC-compliant interface bulkhead
- A NEMA L5-30P plug (60 Hz sites) or NEMA L7-30P plug (50 Hz sites)
- A 9-ft (2.7 m), 30-ampere power cable
- A four-outlet power distribution unit (PDU)

The 7564S peripheral cabinet features

- An FCC-compliant, hinged-door interface bulkhead
- A NEMA L14-30 plug, 60 Hz sites (A power cord without a plug connector is supplied to 50 Hz sites. On-site conversion is required.)
- An eight-outlet PDU

The 7564S peripheral cabinet requires a 240-volt (180V to 264V), four-wire Edison single-phase electrical distribution system for domestic sites and a 240-volt (180V to 264V), three-wire single-phase electrical distribution system for international sites.

Note

If the peripheral cabinet is mounted on the left of the system cabinet, allow a minimum 48-inch (1.2 m) access space to the system cabinet bulkhead.

When computing the total weight of a loaded 7651F or 7564S cabinet, add an extra 280 lbs. (127 Kg) empty cabinet weight to the individual peripheral weight.

CABINET-MOUNTED PERIPHERALS

The Prime cabinet-mounted peripherals are

- Tape drives with the following model numbers
  - 4520
  - 4550
  - 4560
  - 4590
- Disk drives with the following model numbers
  - 44xx Series (Cartridge Module Drives)
  - 4475
  - 4480
  - 4735
- Intelligent Communications Subsystem 2 (ICS2)

Prime 4520 Tape Drive

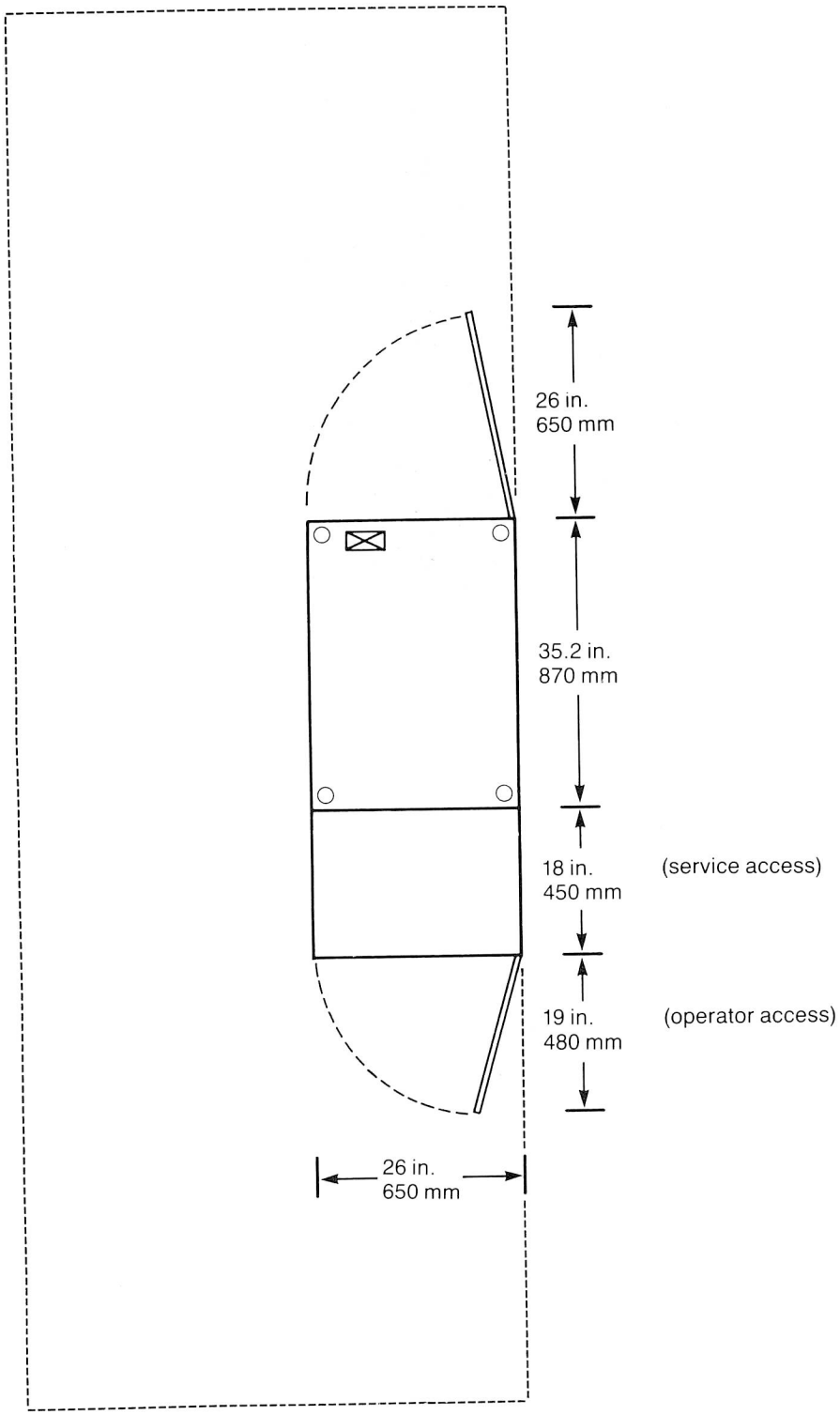
Prime 4520 Tape Drive

Physical Specifications: Prime 4520 Tape Drive

Dimensions	Component	Installed
Height	24.5 in. (622 mm)	53.0 in. (1346 mm)
Width	19.0 in. (483 mm)	26.25 in. (667 mm)
Depth	21.6 in. (549 mm)	35.25 in. (895 mm)
Weight	150 lb (68 Kg)	

Access Dimensions

Front	44 in. (1118 mm)
Back	44 in. (1118 mm)



Prime 4520 Access Dimensions

Electrical Specifications: Prime 4520 Tape Drive

Power Requirements

Voltage (RMS)	Frequency (Hz)	Steady State KVA Demand
115	60±1	.8
220 240	50±1	.8

Environmental Specifications: Prime 4520 Tape Drive

	Heat Dissipation
4520	1200 Btu
4520-A	300 Kcal

Prime 4550 Tape Drive

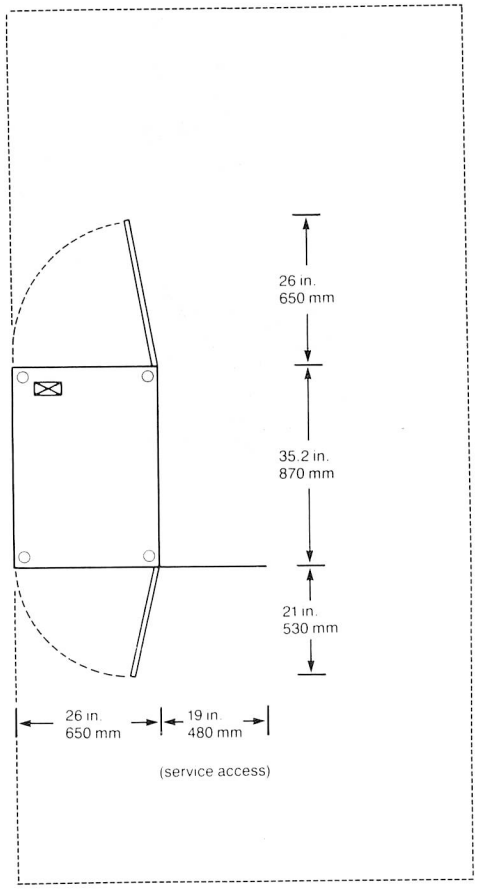
Prime 4550 Tape Drive

Physical Specifications: Prime 4550 Tape Drive

Dimensions	Component	Installed
Height	35.0 in. (889 mm)	53.0 in. (1346 mm)
Width	19.0 in. (483 mm)	26.25 in. (667 mm)
Depth	22.5 in. (572 mm)	35.25 in. (895 mm)
Weight	400 lb (182 Kg)	602 lb (273 Kg)

Access Dimensions

	Installed
Front	44 in. (1118 mm)
Back	44 in. (1118 mm)



Prime 4550 Access Dimensions

Electrical Specifications: Prime 4550 Tape Drive

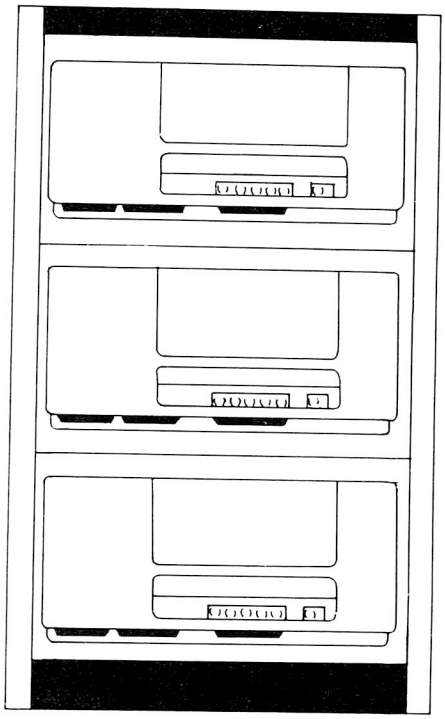
Power Requirements

	Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand
4550	120 (108-132)	60 (51-63)	1.8
	125 (113-137)	60 (51-63)	
4550-A	200 (180-220)	50 (47-53)	1.8
	220 (198-242)	50 (47-53)	
	230 (207-253)	50 (47-53)	
	240 (216-264)	50 (47-53)	
	250 (225-275)	50 (47-53)	

Environmental Specifications: Prime 4550 Tape Drive

	Heat Dissipation
4550	4500 Btu
4550-A	1130 Kcal

Prime 4560 Tape Drive



Prime 4560 Tape Drive

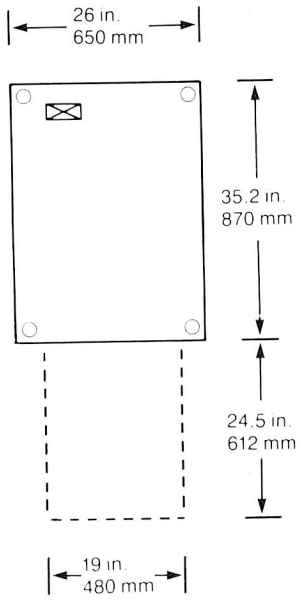
Physical Specifications: Prime 4560 Tape Drive

Dimensions	Component	Installed
Height	9.0 in. (230 mm)	53.0 in. (1340 mm)
Width	19.0 in. (483 mm)	20.5 in. (520 mm)
Depth	22.0 in. (560 mm)	31.0 in. (790 mm)

Weight	Component	Installed
	80 lb (36.4 kg)	282-442 lb (128-200 kg)

Access Dimensions

	Installed
Front	44 in. (1118 mm)
Back	44 in. (1118 mm)



Prime 4560 Access Dimensions

Electrical Specifications: Prime 4560 Tape Drive

Power Requirements

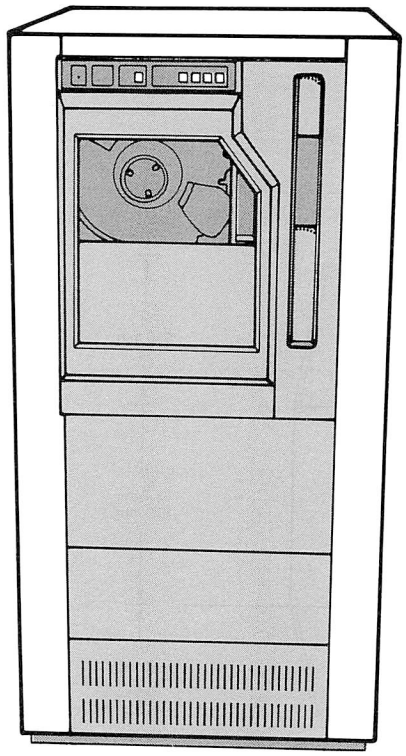
	Voltage (Tolerance)	Frequency (Hz) (Tolerance)	Steady State KVA Demand
4560	120 (102-132)	60 (48-61)	.36
4560-A	220 (187-242) 230 (207-253) 240 (204-264)	50 (48-61)	

Environmental Specifications: Prime 4560 Tape Drive

	Heat Dissipation
4560	950 Btu/hr
4560-A	235 Kcal/hr

Cooling: Internal fans

Prime 4590 Tape Drive



Prime 4590 Tape Drive

Physical Specifications: 4590 Tape Drive

Dimensions	Component	Installed
Height	24.5 in. (62.2 cm)	53.0 in. (134.6 cm)
Width	19.0 in. (48.3 cm)	26.25 in. (66.7 cm)
Depth	17.0 in. (43.2 cm)*	35.25 in. (89.5 cm)

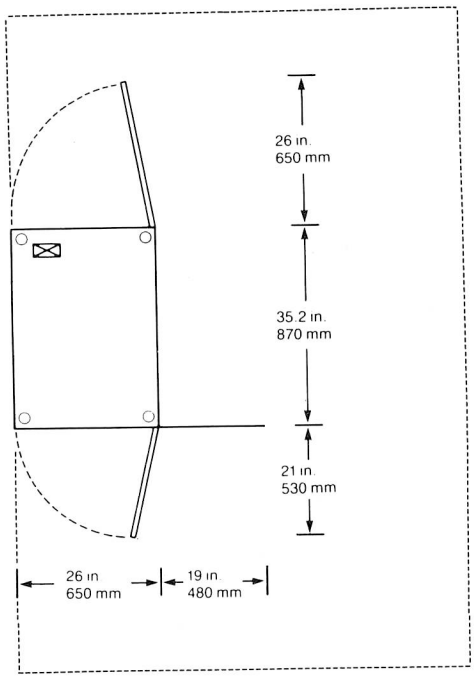
* This dimension combined the following measurements: 5 inches in front of the mounting rail and 12 inches to the rear.

Weight** 140 lbs. (63 kg)

**approximate weight

Access Dimensions

Front	44 in. (110 cm)
Back	44 in. (110 cm)



Prime 4590 Access Dimensions

Electrical Specifications: 4590 Tape Drive

Voltage (VAC)	Frequency (Hz)	Steady State Demand (KVA)
115 ± 10% (230 ± 10%)	60 ± .5% (50 ± .5 %)	.8

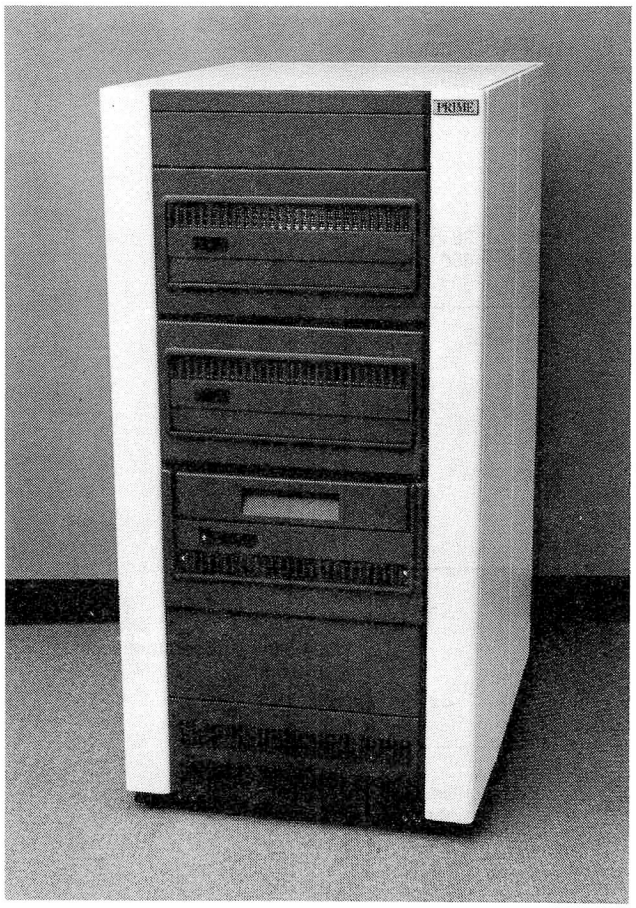
Inrush Current (maximum)

45A for 10 msec after power-up
(Current stabilizes 60 msec after power-up)

Environmental Specifications: 4590 Tape Drive

Heat Dissipation	Temperature	Humidity	Altitude
1160 Btu/hr (395 Kcal/hr)	65° to 75° F (18° to 23° C)	40 to 60 %	0 to 8000 ft (0 to 2.4 km)

Prime 44XX Cartridge Disk Drive Series



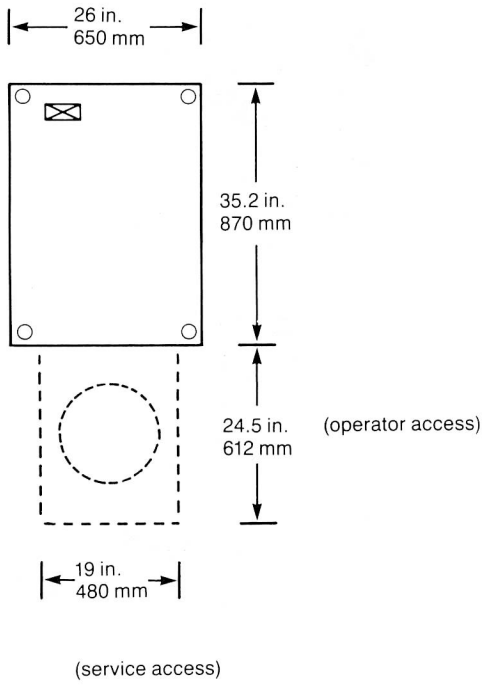
Prime 44XX Cartridge Disk Drive

Physical Specifications: Prime 44XX Cartridge Disk Drive

Dimensions	Component	Installed
Height	10.2 in. (258 mm)	53.0 in. (1346 mm)
Width	19.0 in. (483 mm)	26.25 in. (667 mm)
Depth	30.5 in. (775 mm)	35.25 in. (895 mm)
Weight	170 lbs. (77.3 kg)	

Access Dimensions

Front	18.0 in (457 mm)
Side	NA
Top	14.0 in (483 mm)



Prime 44XX Cartridge Disk Drive Access Dimensions

Electrical Specifications: Prime 44XX Cartridge Disk Drive

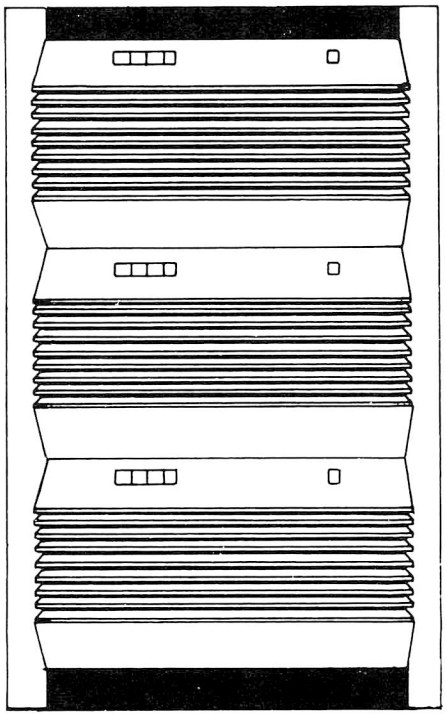
Power Requirements

	Voltage (Tolerance	Frequency Hz (Tolerance)	Steady State KVA Demand	Startup Amp/Seconds
44xx	120 (102-128)	60 (59-60.8)	1	20/30
44xx-A	120 (104-137)	50 (49-50.6)	1	7.5/30
	220 (191-235)	50 (49-50.6)	1	7.5/30
	230 (199-245)	50 (49-50.6)	1	7.5/30
	240 (208-256)	50 (49-50.6)	1	7.5/30

Environmental Specifications: Prime 44XX Cartridge Disk Drive

	Heat Dissipation
44xx	3240 Btu
44xx-A	810 Kcal

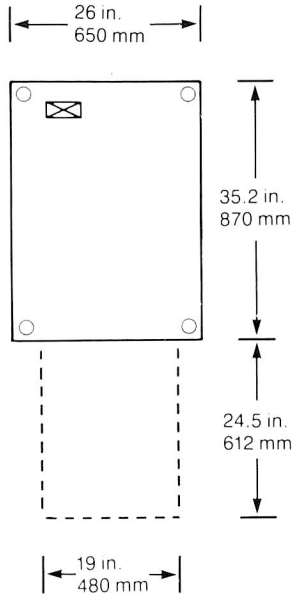
Prime 4475 Fixed Media Disk Drive



Prime 4475 Fixed Media Disk Drive

Physical Specifications: Prime 4475 Disk Drive

Dimensions	Component	Installed
Height	10.5 in. (267 mm)	53.0 in. (1340 mm)
Width	19.0 in. (483 mm)	20.5 in. (520 mm)
Depth	30.0 in. (762 mm)	31.0 in. (790 mm)
Weight	Component	Installed
	115 lb (52.3 kg)	317-547 lb (144-288 kg)



Prime 4475 Access Dimensions

Electrical Specifications: Prime 4475 Disk Drive

Power Requirements

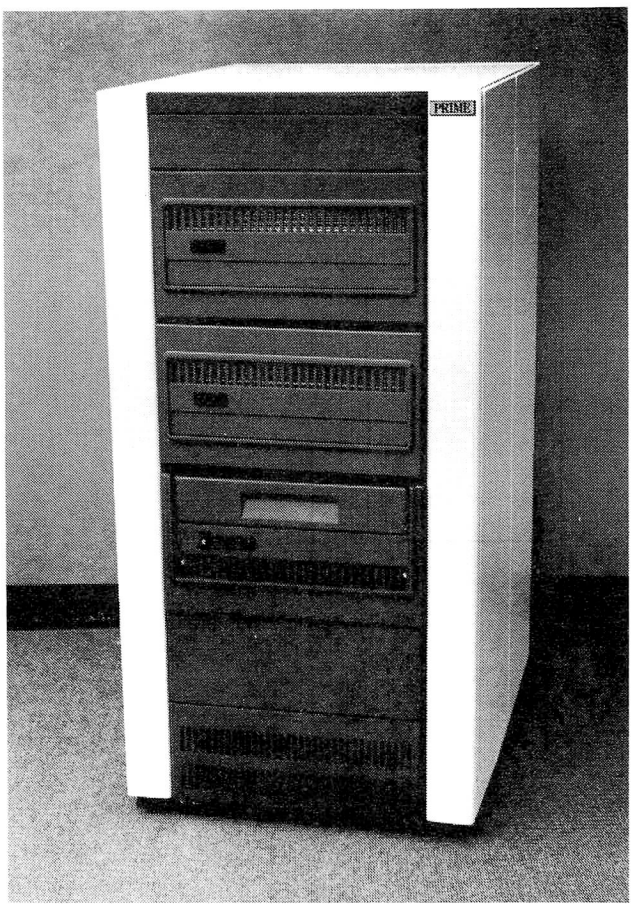
	Voltage (Tolerance)	Frequency (Hz) (Tolerance)	Steady State KVA Demand	Startup Amp/Seconds
4475	120 (98-126)	60 (59-60.6)	.72	16/12
4475-A	200 (170-220) 220 (187-242) 240 (204-264)	50 (49-50.6)		11/12

Environmental Specifications: Prime 4475 Disk Drive

	Heat Dissipation
4475	1800 Btu/hr
4475-A	450 Kcal/hr

Cooling: Internal fans

Prime 4480 Fixed Cartridge Module Disk Drives



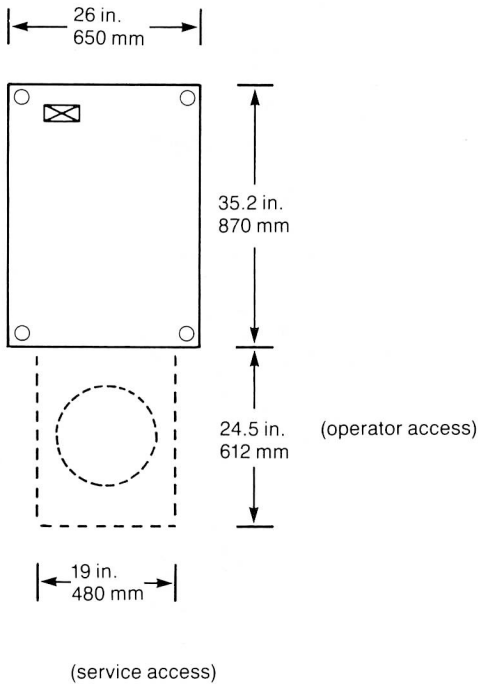
Prime 4480 Fixed Cartridge Module Disk Drives

Physical Specifications: Prime 4480 Disk Drive

Dimensions	Component	Installed
Height	10.2 in. (259 mm)	53.0 in. (1346 mm)
Width	19.0 in. (483 mm)	26.25 in. (667 mm)
Depth	30.5 in. (765 mm)	35.25 in. (895 mm)
Weight	125 lbs. (56.7 kg)	

Access Dimensions (service only)

Front	18.0 in. (457 mm)
Side	N/A
Top	14.0 in. (483 mm)



Prime 4480 Access Dimensions

Electrical Specifications: Prime 4480 Disk Drive

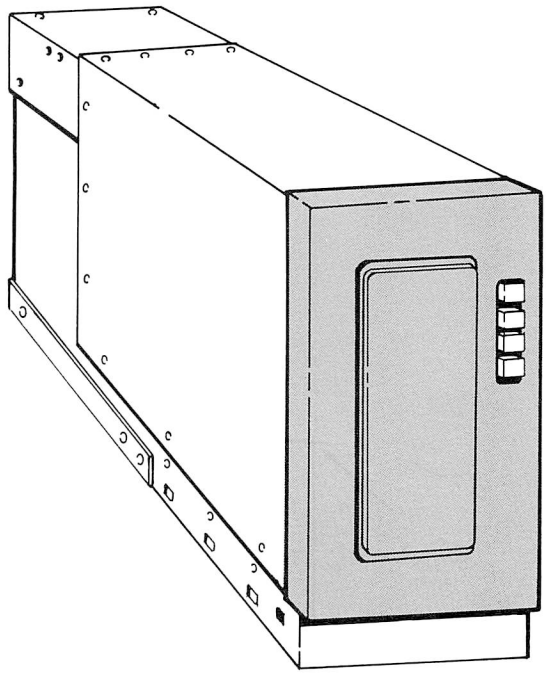
Power Requirements

	Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand	Startup Amp/Seconds
4480	120 (102-128)	60 (59-60.6)	.62	23/7
4480-A	220 (195-235)	50 (49-50.6)	.65	14/7
4480-A	240 (213-257)	50 (49-50.6)	.65	14/7

Environmental Specifications: Prime 4480 Disk Drive

	Heat Dissipation
4480	1770 Btu
4480-A	450 Kcal

Prime 4735 Disk Drive



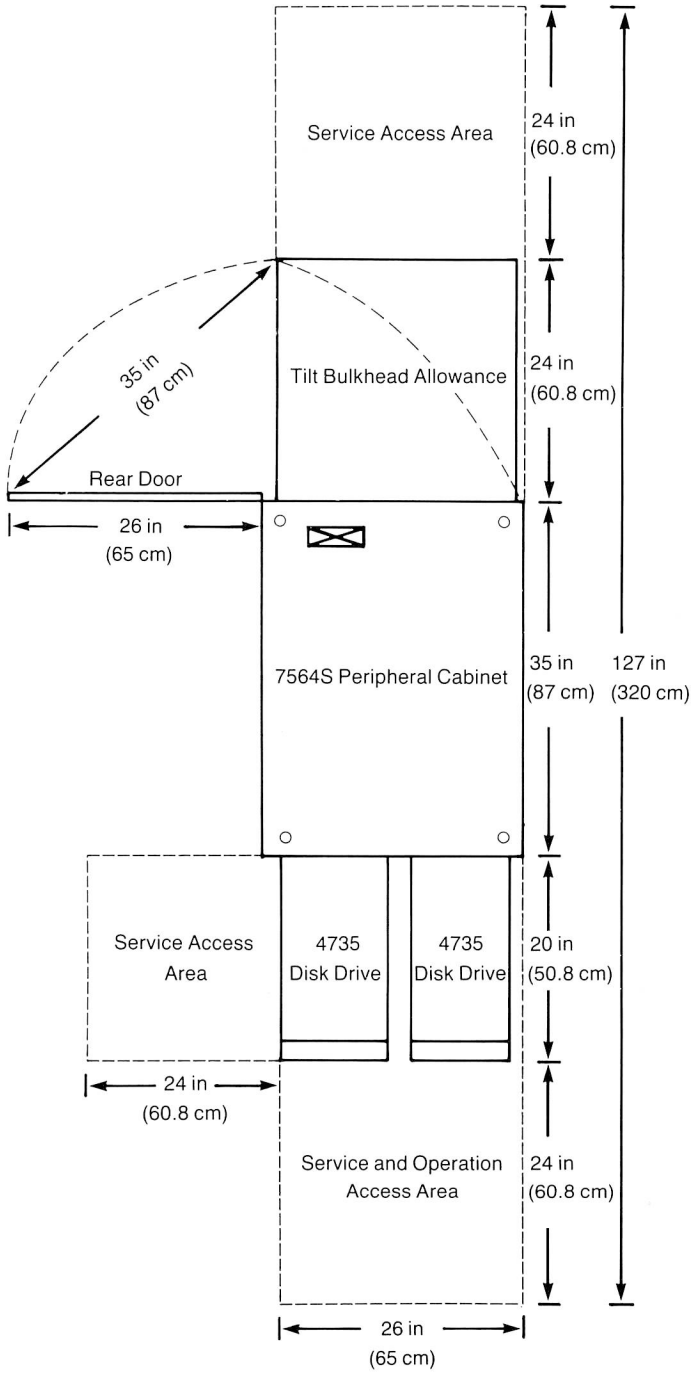
Prime 4735 Disk Drive

Physical Specifications: Prime 4735 Disk Drive

Dimensions	Component	Cabinet
Height	10.2 in. (26 cm)	53.0 in. (134.6 cm)
Width	8.5 in. (21.7 cm)	26.25 in. (66.7 cm)
Depth	29.64 in. (75.2 cm)	35.25 in. (89.5 cm)
Weight	82 lbs. (37 kg)	280 lbs. (127 kg)

Access Dimensions (service only)

Front	48.0 in. (121 cm)
Back	48.0 in. (121 cm)



Prime 4735 Access Dimensions

Electrical Specifications: Prime 4735 Disk Drive

Voltage (VAC)	Frequency (Hz)	Steady State Demand (KVA)	Current (Amps)
120* (87-128)	48-62	.41	3.4
240** (179-256)	48-62	.5	2.1

* The 120-volt 4735 disk drive is mounted in a 7651F peripheral cabinet. A maximum of two drives can be configured in this cabinet.

** The 240-volt 4735 disk drive is mounted in a 7564S peripheral cabinet. A maximum of eight drives can be configured in this cabinet.

The 7564S peripheral cabinet requires a 240V (180V to 264V), four-wire Edison single-phase electrical distribution system for domestic sites and a 240V (180V to 264V), three-wire single-phase electrical distribution system for international sites.

Environmental Specifications: Prime 4735 Disk Drive

Heat Dissipation	Temperature	Humidity	Altitude
890 Btu/hr (214 Kcal/hr)	50° to 104° F (10° to 40° C)	20% to 80 %	0 to 8000 ft (0 to 2.4 Km)

Prime Intelligent Communications Subsystem 2 (ICS2)

Physical Specifications: Prime ICS2

Dimensions	Component	Installed
Height	5.5 in. (140 mm)	53.0 in. (1346 mm)
Width	19.0 in. (483 mm)	26.25 in. (667 mm)
Depth	18.5 in. (470 mm)	35.25 in. (895 mm)
Weight	22 lb (10kg)	

Electrical Specifications: Prime ICS2

Power Requirements

	Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand
ICS2	120 (104-127)	60 (59-61)	.15*
ICS2-A	240 (208-254)	50 (49-51)	.15*

*Per 32-line buffer.

Environmental Specifications: Prime ICS2

	Heat Dissipation
ICS2	435 Btu*
ICS2-A	110 Kcal*

*Per 32-line buffer.

C

Free-standing Peripheral Specifications

This appendix contains the physical, electrical, and environmental specifications for Prime free-standing peripherals.

FREE-STANDING PERIPHERALS

The free-standing peripherals are

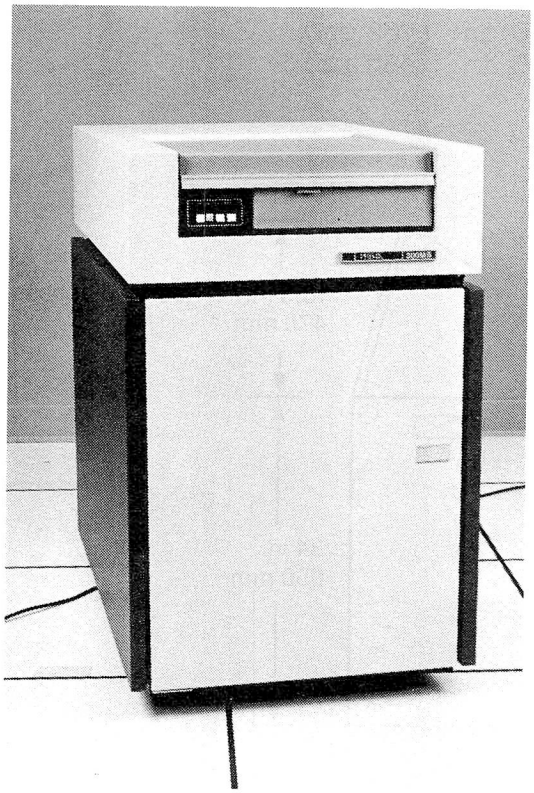
- Disk drive subsystems
  - 4460
  - 4470
  - 4490
- 103J modem
- Video display terminals
  - PST 100
  - PT200
- 4585F tape drive subsystem
- 3115 through 3351 printer subsystems
- 3159 card reader subsystem

These peripherals plug into individual outlets. Most of these peripherals contain large induction-type motors that require a multisecond startup period. The start-up current is given as amperes/second where applicable.

Note

Do not install a free-standing peripheral within 48 inches (1.2 m) of the left-hand side of the system cabinet.

Prime 4460 Disk Drive



Prime 4460 Disk Drive

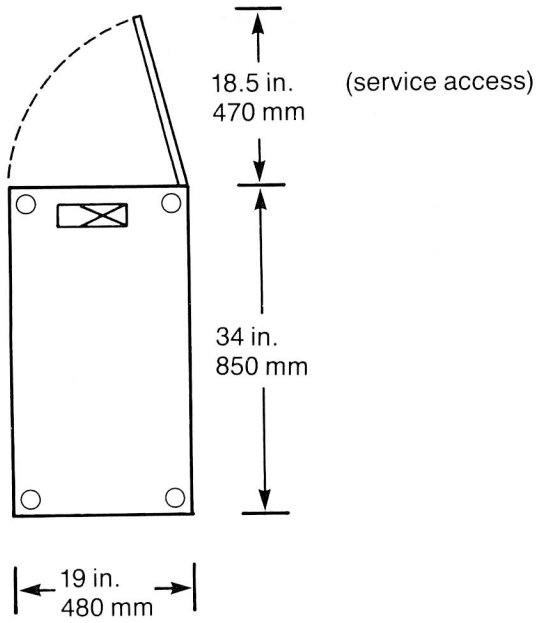
Physical Specifications: Prime 4460 Disk Drive

Dimensions	Component	Shipped
Height	34.0 in. (864 mm)	41.0 in. (1041 mm)
Width	19.0 in. (483 mm)	23.5 in. (597 mm)
Depth	34.0 in. (864 mm)	39.0 in. (991 mm)

Weight	Installed	Shipped
4460	250 lb	285 lb
4460-A	113 kg	130 kg

Access Dimensions

Front	NA
Back	30.0 in. (762 mm)
Top	19.0 in. (483 mm)



Prime 4460 Access Dimensions

Electrical Specifications: Prime 4460 Disk Drive

Power Requirements

	Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand	Startup Amp/Seconds
4460	120 (102-132)	60 (59-60.5)	1	30/13
4460-A	220 (187-242)	50 (49-50.5)	1	15/10
	240 (204-264)	50 (49-50.5)	1	15/10

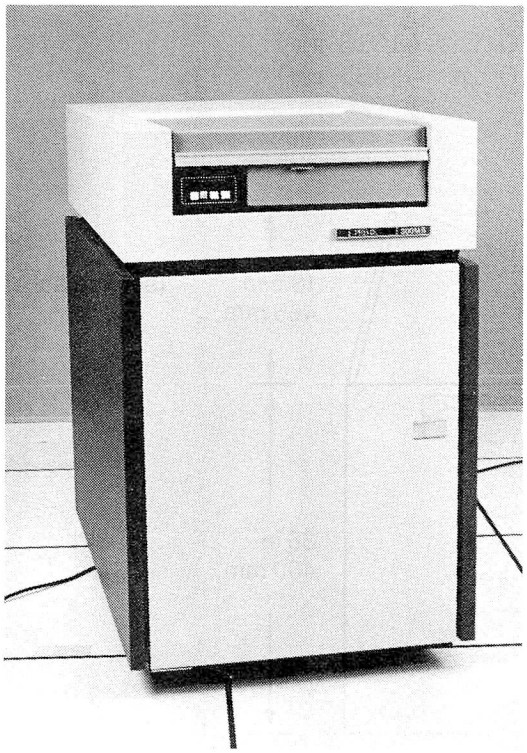
Power Connections

	Cord Length	Rating	Plugs
4460	6 ft (180 cm)	30A	NEMA 5-15P
4460-A		30A	NEMA 5-15P installed On-site replacement required

Environmental Specifications: Prime 4460 Disk Drive

	Heat Dissipation
4460	2600 Btu
4460-A	650 Kcal

Prime 4470 Disk Drive



Prime 4470 Disk Drive

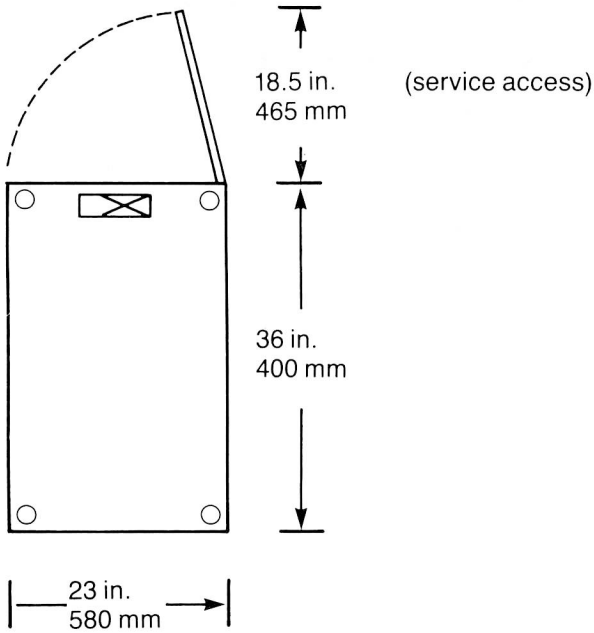
Physical Specifications: Prime 4470 Disk Drive

Dimensions	Component	Shipped
Height	36.0 in. (914 mm)	44.0 in. (1118 mm)
Width	23.0 in. (584 mm)	28.5 in. (724 mm)
Depth	36.0 in. (914 mm)	42.0 in. (1067 mm)

Weight	Installed	Shipped
4470	550 lb	615 lb
4470-A	249.5 kg	280 kg

Access Dimensions

Front	NA
Back	40.0 in. (1016 mm)
Top	19.0 in. (483 mm)



Prime 4470 Access Dimensions

Electrical Specifications: Prime 4470 Disk Drive

Power Requirements

	Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand	Startup Amp/Seconds
4470	208 (179-223)	60 (59-60.6)	1.7	40/10
	230 (198-245)	60 (59-60.6)	1.7	40/10
4470-A	220 (195-235)	50 (49-50.6)	1.7	40/8
	240 (213-257)	50 (49-50.6)	1.7	40/8

Power Connections

	Cord Length	Rating	Plugs
4470	6 ft	20A	NEMA L6-20P
4470-A	1.8 m	20A	Supplied with NEMA L6-20P On-site replacement required

Environmental Specifications: Prime 4470 Disk Drive

	Heat Dissipation
4470	4200 Btu
4470-A	1060 Kcal

Prime 4490 Disk Drive

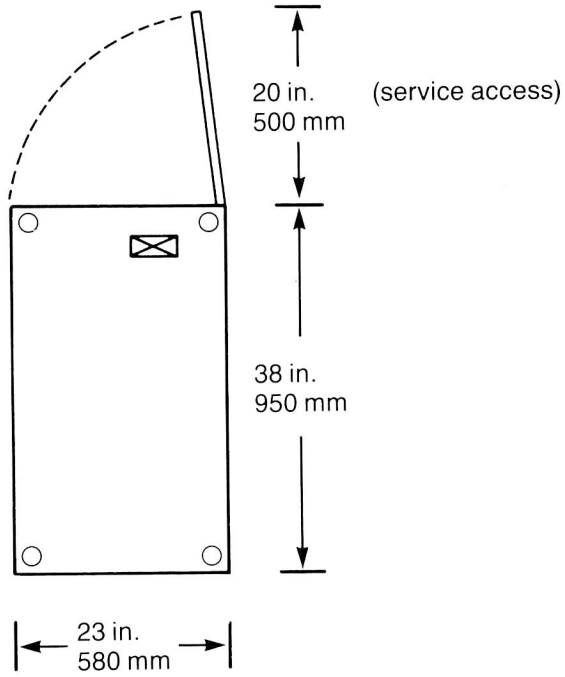
Physical Specifications: Prime 4490 Disk Drive

Dimensions	Component	Shipped
Height	36.2 in. (919 mm)	44.0 in. (1118 mm)
Width	23.0 in. (584 mm)	28.0 in. (711 mm)
Depth	35.8 in. (910 mm)	46.0 in. (1168 mm)
Weight	635 lb (288 kg)	

Access Dimensions

Front	NA
Back	30.0 in. (762 mm)*
Top	NA

*Service only.



Prime 4490 Access Dimensions

Electrical Specifications: Prime 4490 Disk Drive

Power Requirements

	Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand	Startup Amp/Seconds
4490	208 (179-223)	60 (59-60.6)	1.6	40/8
	230 (198-246)	60 (59-60.6)	1.6	40/8
4490-A	220 (198-235)	50 (49-50.5)	1.6	40/8
	240 (216-257)	50 (49-50.5)	1.6	40/8

Power Connections

	Cord Length	Rating	Plugs
4490	6 ft	20A	NEMA L6-20P
4490-A	1.8 m	20A	Supplied with NEMA L6-20P On-site replacement required

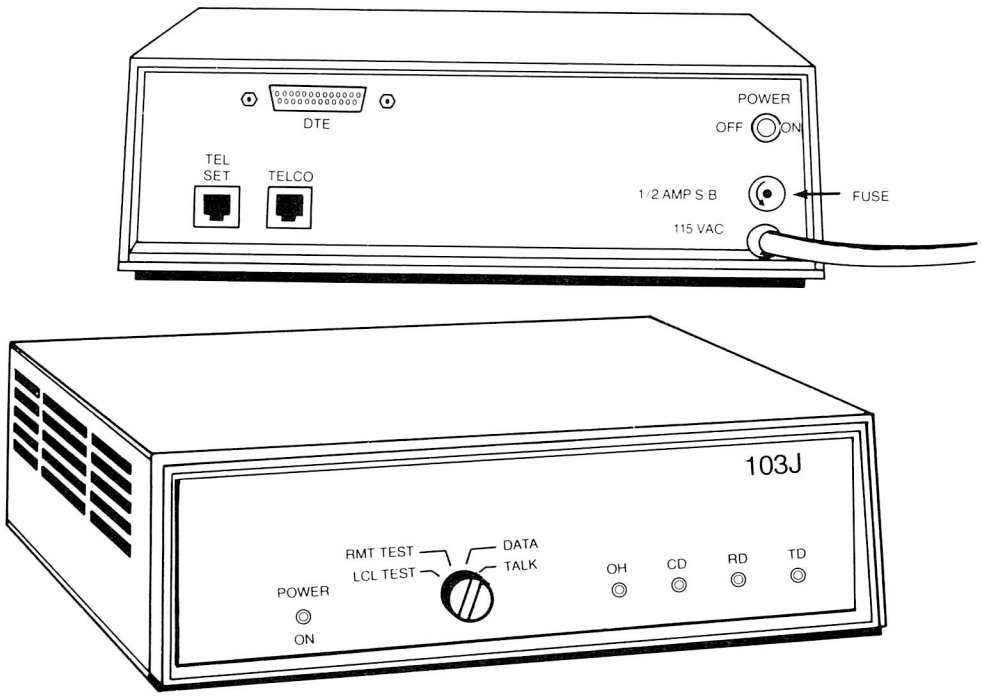
Environmental Specifications: Prime 4490 Disk Drive

	Heat Dissipation
4490	4740 Btu
4490-A	1190 Kcal

Note

When installing 4490 drives, do not turn the power on until the units have been in.the computer room for a minimum of 24 hours. If a power failure occurs, allow one hour for the blower to purge the air in.the disk assembly before operating again.

Prime Remote Diagnostic Modem



Prime Remote Diagnostic Modem, Front and Rear Views

The Prime remote diagnostic modem allows remote diagnosis of Prime systems equipped with a VCPIII diagnostic processor. A dedicated phone line is required, which must not be more than 50 feet (15 m) from the modem. The small size and light weight allow this unit to be placed on top of a system or peripheral cabinet.

Physical Specifications: Prime Remote Diagnostic Modem

Dimensions	Component	
Height	3.0 in.	(76 mm)
Width	10.0 in.	(254 mm)
Depth	11.0 in.	(279 mm)
Weight	4.00 lb	(1.8 kg)

Electrical Specifications: Prime Remote Diagnostic Modem

Power Requirements

	Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand
103J	115 (104-126)	60 (47-63)	.04

Environmental Specifications: Prime Remote Diagnostic Modem

Heat Dissipation
100 Btu

Prime PST 100 Video Display Terminal

Prime PST 100 Video Display Terminal

Physical Specifications: Prime PST 100 Terminal

Dimensions

	Base	Monitor	Keyboard
Height	3.0 in. (76 mm)	12.5 in. (318 mm)	3.0 in. (76 mm)
Width	19.5 in. (495 mm)	15.25 in. (387 mm)	19.5 in. (490 mm)
Depth	16.0 in. (406 mm)	16.0 in. (406 mm)	8.25 in. (210 mm)
Weight	8.0 lb (3.6 kg)	22.0 lb (10.0 kg)	7.0 lb (3.2 kg)

Electrical Specifications: Prime PST 100 Terminal

Power Requirements

	Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand
PST 100	120 (104-127)	60 (47-63)	.1
PST 100-A	240 (208-254)	50 (47-63)	.1

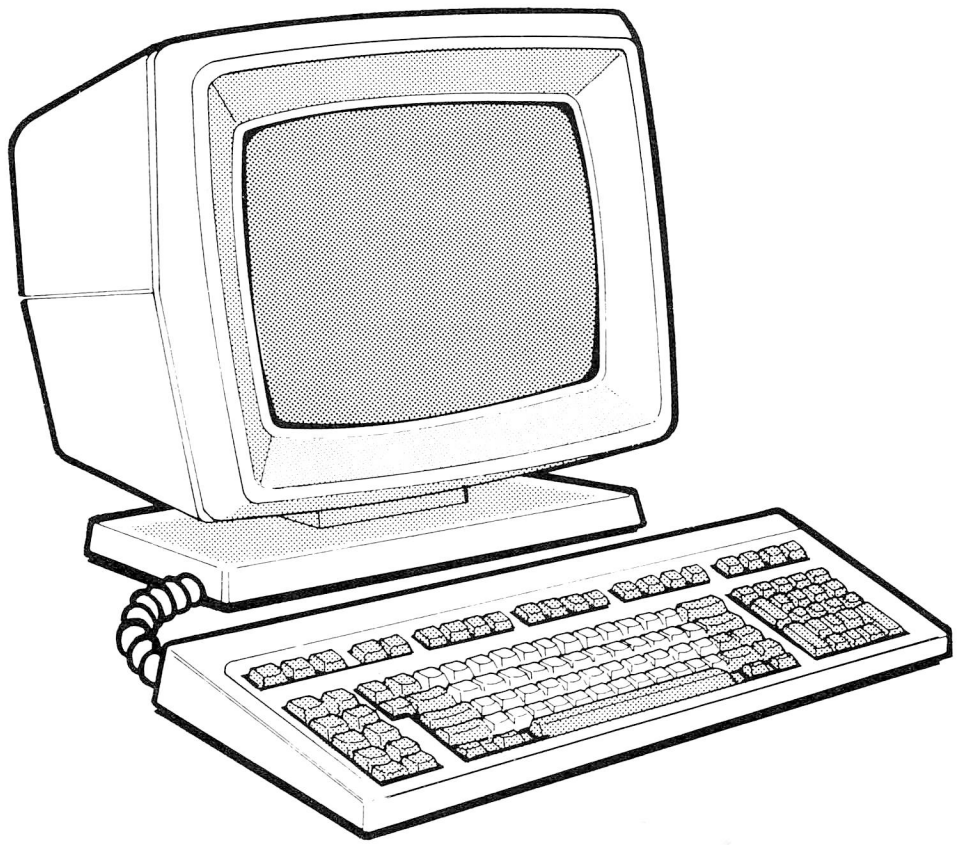
Power Connections

	Cord Length	Plugs
PST 100	7.5 ft	NEMA 5-15P
PST 100-A	2.3 m	CEE-7-7

Environmental Specifications: Prime PST 100 Terminal

	Heat Dissipation
PST 100	250 Btu
PST 100-A	60 Kcal

Prime PT200 Video Display Terminal



Prime PT200 Video Display Terminal

Physical Specifications: PT200 Terminal

Unit	Height	Width	Depth	Weight
Display/ Logic	15 in. (31.8 cm)	15 in. (31.8 cm)	16 in. (40.64 cm)	27 lb (12.3 Kg)
Keyboard	1.5 in. (5.9 cm)	19.5 in. (43.2 cm)	7.5 in. (29.6 cm)	7 lb* (3 Kg)*

* Estimated weight

Electrical Specifications: PT200 Terminal

Power Requirements

Voltage (Vrms)	Frequency (Hz)	Steady State Demand (KVA)
90-132	47-63	.1
(180-264)	(47-63)	.1

Power Connections

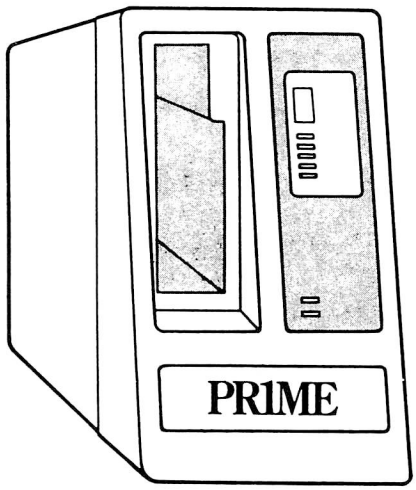
Cord Length	Plug Type
7.5 ft (2.3 m)	NEMA 5-15P (CEE-7-7)

Environmental Specifications: PT200 Terminal

Heat Dissipation	Temperature	Humidity	Altitude
170 Btu/hr (45 Kcal/hr)	50° to 104° F (10° to 40° C)	10% to 90%	10,000 ft * (3046 m)*

* Maximum altitude

Prime 4585F Tape Drive Subsystem



Prime 4585F Tape Drive Subsystem

Physical Specifications: Prime 4585F Tape Drive Subsystem

Height	Width	Depth	Weight
7 in. (18 cm)	3.88 in. (10 cm)	15.62 in. (40 cm)	11.5 lbs (5.2 Kg)

Electrical Specifications: Prime 4585F Tape Drive Subsystem

	Specifications	
Specifications	120V, 60 Hz Unit	220V, 50 Hz Unit
Current	.5A	.25A
Power Consumption	.06 KVA	.06 KVA
Voltage	120V (+10%, -15%)	220V (+10%, -15%)
Frequency Range	47 to 63 Hz	47 to 63 Hz
Phase	Single	Single
Power plug	NEMA 5-15P	*
Cord Length	14 ft	4.3 m

* 220V, 50 Hz units have a variety of plug types. Consult your Prime Marketing Representative for more information.

Environmental Specifications: Prime 4585F Tape Drive Subsystem

		Specifications	
Specifications		120V, 60 Hz Unit	220V, 50 Hz Unit
Temperature:	Operation	41° to 113°F	5° to 45°C
	Storage	22° to 140°F	-30° to 60°C
Humidity:	Operation	20% to 80%	20% to 80%
	Storage	0% to 99%	0% to 99%
Altitude:	Operation	0 to 15000 ft	0 to 4572 m
	Storage	0 to 50000 ft	0 to 15220 m
Heat Dissipation		150 Btu/hr	150 Btu/hr

Prime 3350 and 3351 Serial Matrix Printers

Physical Specifications:
Prime 3350 and 3351 Serial Matrix Printers

Dimensions	Height	Width	Depth
3350(3350-A)	8.5 in. (216 mm)	25.5 in. (648 mm)	19.5 in. (495 mm)
3351(3351-A)	8.5 in. (216 mm)	25.5 in. (648 mm)	27.6 in. (701 mm)

Weight	Installed
3350	64 lb (29 kg)
3351	68.5 lbs (31.1 kg)

Electrical Specifications: Prime 3350 and 3351 Printers

Power Requirements

	Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand
3350	120 (90-132)	60 (58-62)	.25
3351	120 (90-132)	60 (58-62)	.25
3350-A	240 (187-264)	50 (48-62)	.25
3351-A	240 (187-264)	50 (48-62)	.25

Power Connections

	Cord Length	Rating	Plugs
3350	6 ft	10A	NEMA 5-15R
3351		10A	NEMA 5-15R
3350-A		10A	Supplied with NEMA 5-15R
3351-A	1.8 m	10A	On-site replacement required

Environmental Specifications: Prime 3350 and 3351 Printers

	Heat Dissipation
3350	690 Btu
3351	690 Btu
3350-A	174 Kcal
3351-A	174 Kcal

Prime 3115 Serial Matrix Printer

Physical Specifications: Prime 3115 Serial Matrix Printer

Dimensions	Installed
Height	5.5 in. (140 mm)
Width	22.0 in. (559 mm)
Depth	18.5 in. (470 mm)
Weight	22.0 lb (10.0 kg)

Electrical Specifications: Prime 3115 Serial Matrix Printer

Power Requirements

	Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand
3115	120 (98-129)	60 (55-65)	.05
3115-A	240 (198-264)	50 (48-55)	.05

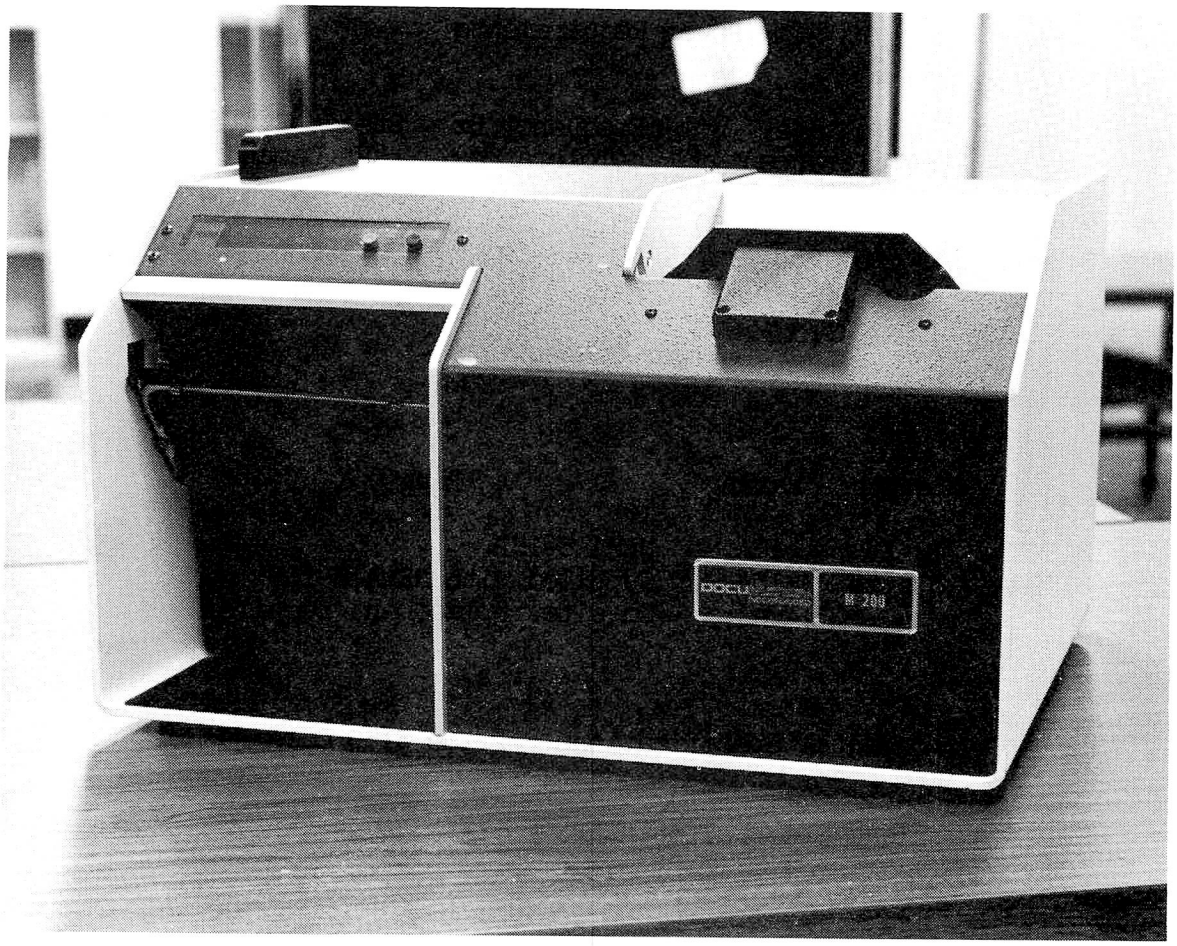
Power Connections

	Cord Length	Rating	Plugs
3115	6 ft	10A	NEMA 5-15P
3115-A	1.8 m	10A	Supplied with NEMA 5-15P On-site replacement required

Environmental Specifications: Prime 3115 Serial Matrix Printer

	Heat Dissipation
3115	140 Btu
3115-A	35 Kcal

Prime 3159 Card Reader



Prime 3159 Card Reader

Physical Specifications: Prime 3159 Card Reader

Dimensions	Component
Height	11.0 in. (279 mm)
Width	19.25 in. (489 mm)
Depth	14.0 in. (356 mm)

Weight	Installed	Shipped
3159	60.0 lb	120.0 lb
3159-A	27.3 kg	54.4 kg

Electrical Specifications: Prime 3159 Card Reader

Power Requirements

	Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand	Start Amp/Second
3159	115 (103.5-126.5)	60 (58-62)	.65	12/3
3159-A	230 (207-253)	50 (48-52)	.65	6/3

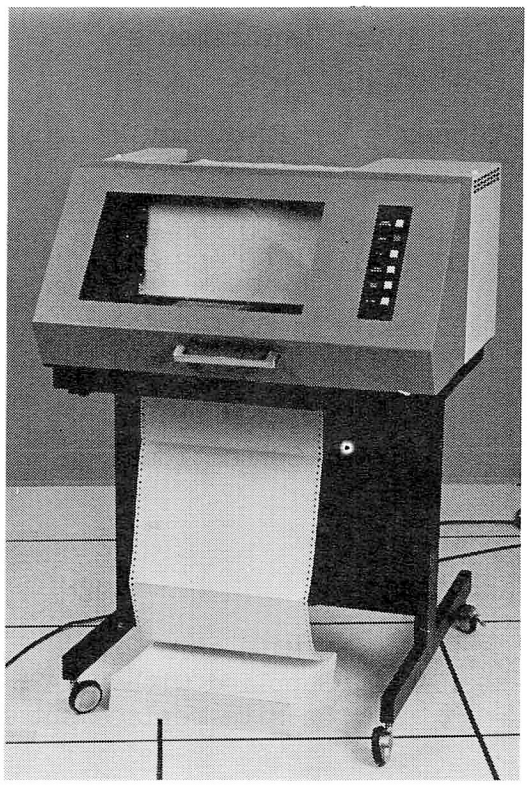
Power Connections

	Cord Length	Rating	Plugs
3159	12 ft	15A	NEMA 5-15P
3159-A	3.6 mm	15A	Supplied with NEMA 5-15P On-site replacement required

Environmental Specifications: Prime 3159 Card Reader

	Heat Dissipation
3159	1800 Btu
3159-A	450 Kcal

Prime 3173 Matrix Line Printer



Prime 3173 Matrix Line Printer

Physical Specifications: Prime 3173 Matrix Line Printer

Dimensions	Installed	Shipped
Height	46.5 in. (1181 mm)*	28.0 in. (711 mm)**
Width	30.0 in. (762 mm)	37.0 in. (940 mm)
Depth	24.25 in. (616 mm)	37.0 in. (940 mm)
	*Mounted on Pedestal.	**Pedestal shipped separately.

Weight	Installed
3173	185 lb
3173-A	83.9 kg

Electrical Specifications: Prime 3173 Matrix Line Printer

Power Requirements

	Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand
3173	110 (93.5-121)	60 (58-62)	1
	120 (102-132)	60 (58-62)	1
3173-A	220 (187-242)	50 (48-52)	1
	240 (204-264)	50 (48-52)	1

Power Connections

	Cord Length	Rating	Plugs
3173	6 ft	10A	NEMA 5-15P
3173-A	1.8 m	10A	Supplied with NEMA 5-15P On-site replacement required

Environmental Specifications: Prime 3173 Matrix Line Printer

	Heat Dissipation
3173	2750 Btu
3173-A	690 Kcal

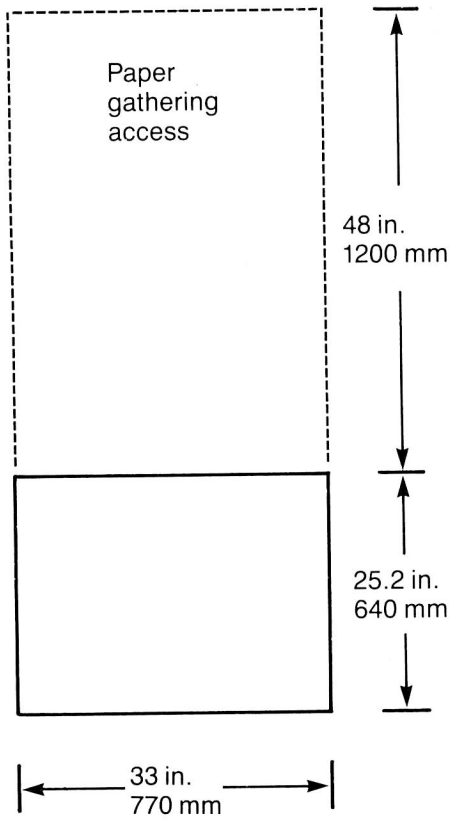
Prime 3320 and 3324 Band Printers

Physical Specifications: Prime 3320 and 3324 Band Printers

Dimensions	Installed
Height	43.5 in. (1105 mm)*
Width	30.3 in. (770 mm)
Depth	25.2 in. (640 mm)

*Includes pedestal.

Weight	Component
3320 and 3324	185 lb
3320-A, 3324-A	83.9 kg



Prime 3320 and 3324 Band Printer Access Dimensions

Electrical Specifications: Prime 3320 and 3324 Band Printers

Power Requirements

	Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand
3320	115 (90-132)	60 (58-62)	.5
3324	115 (90-132)	60 (58-62)	.5
3320-A	230 (180-250)	50 (48-52)	.5
3324-A	230 (180-250)	50 (48-52)	.5

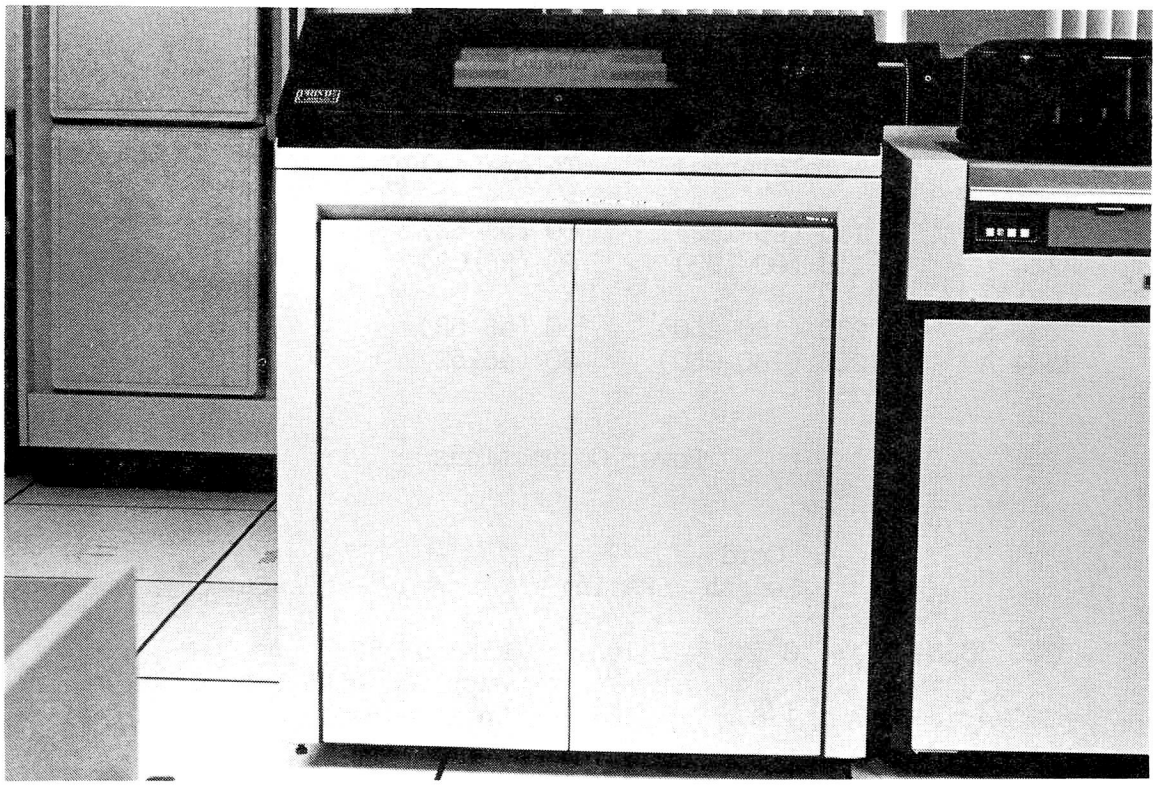
Power Connections

	Cord Length	Rating	Plugs
3320 and 3324	6 ft	10A	NEMA 5-15P
3320-A, 3324-A	1.8 m	10A	Supplied with NEMA 5-15P On-site replacement required

Environmental Specifications: Prime 3320 and 3324 Band Printers

	Heat Dissipation
3320 and 3324	1400 Btu
3320-A, 3324-A	350 Kcal

Prime 3330 and 3334 Band Printers



Prime 3330 and 3334 Band Printers

Physical Specifications: Prime 3330 and 3334 Band Printers

Dimensions	Installed
Height	44.5 in. (1130 mm)
Width	34.3 in. (871 mm)
Depth	29.7 in. (754 mm)

Weight	Installed
3330, 3334	350 lb
3330-A, 3334-A	158.8 kg

Electrical Specifications: Prime 3330 and 3334 Band Printers

Power Requirements

	Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand
3330	115 (90-132)	60 (58-62)	.5
3334	115 (90-132)	60 (58-62)	.5
3330-A	230 (180-250)	50 (48-52)	.5
3334-A	230 (180-250)	50 (48-52)	.5

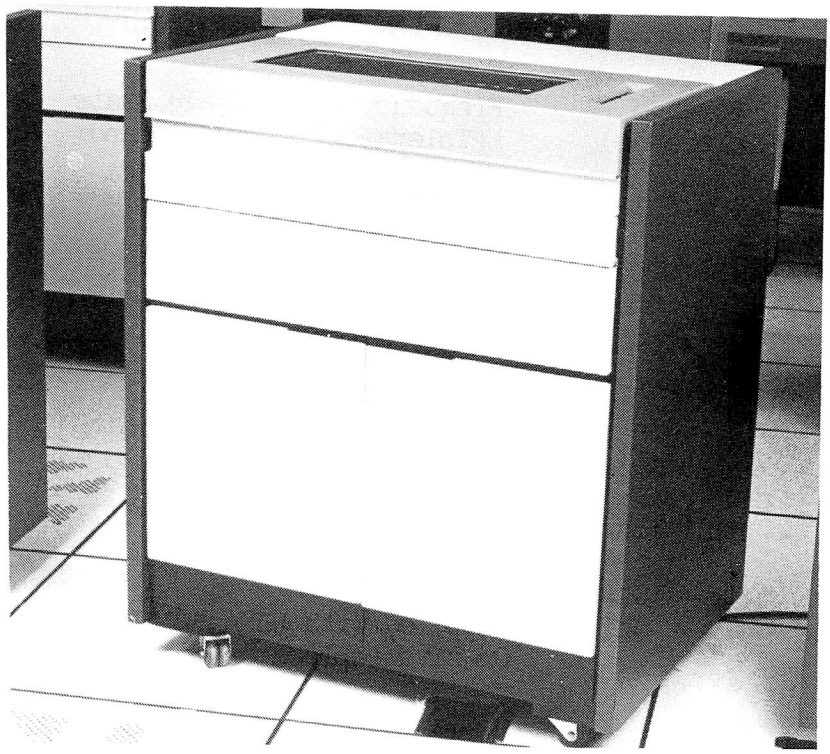
Power Connections

	Cord Length	Rating	Plugs
3330, 3334	6 ft	10A	NEMA 5-15P
3330-A, 3334-A	1.8 m	10A	Supplied with NEMA 5-15P On-site replacement required

Environmental Specifications: Prime 3330 and 3334 Band Printers

	Heat Dissipation
3330, 3334	1400 Btu
3330A, 3334-A	350 Kcal

Prime 3166, 3167 Line Printers Subsystem



Prime 3166, 3167 Line Printers Subsystem

Physical Specifications: Prime 3166, 3167 Line Printers Subsystem

Dimensions	Component	Shipped
Height	42.0 in. (1067 mm)	54.0 in. (1372 mm)
Width	36.5 in. (927 mm)	42.0 in. (1067 mm)
Depth	39.0 in. (990 mm)	33.0 in. (838 mm)

Weight	Installed	Shipped
316x	570 lb	684 lb
316x-A	258.6 kg	310.3 kg

Electrical Specifications: Prime 3166, 3167 Line Pritners Subsystem

Power Requirements

	Voltage (Tolerance)	Frequency Hz (Tolerance)	Steady State KVA Demand	Start Amp/Second
316x	115 (103.5-126.5)	60 (59-61)	1	15/.2
316x-A	200 (180-220)	50 (49-51)	1	10/.2
	230 (203-253)	50 (49-51)	1	10/.2

Power Connections

	Cord Length	Rating	Plugs
316x	10 ft	20A	NEMA 5-15P
316x-A	3 m	20A	Supplied with NEMA 5-15P On-site replacement required

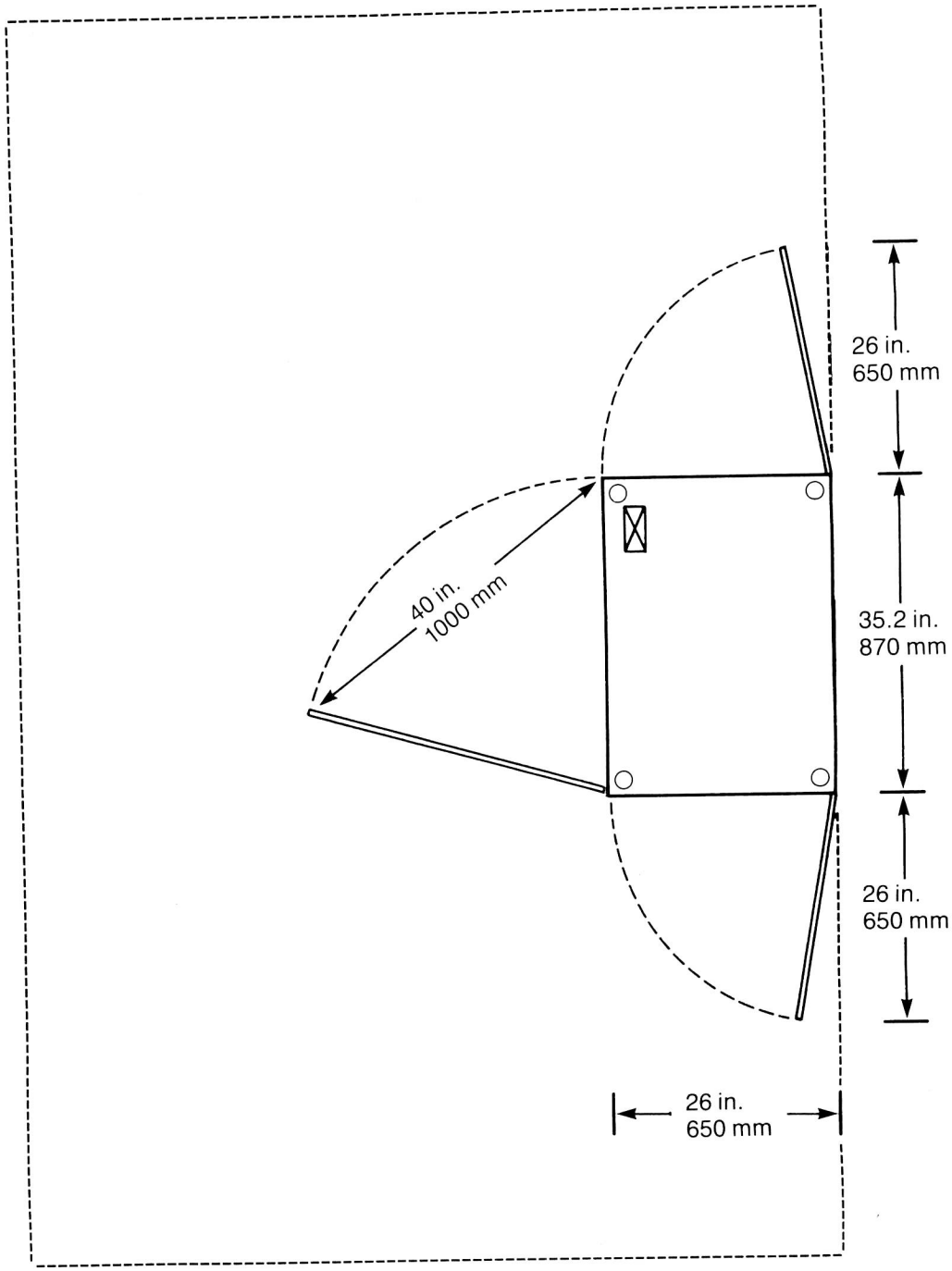
Environmental Specifications: Prime 3166, 3167 Line Printers Subsystem

	Heat Dissipation
3166, 3172	2700 Btu
3166-A 3172-A	680 Kcal

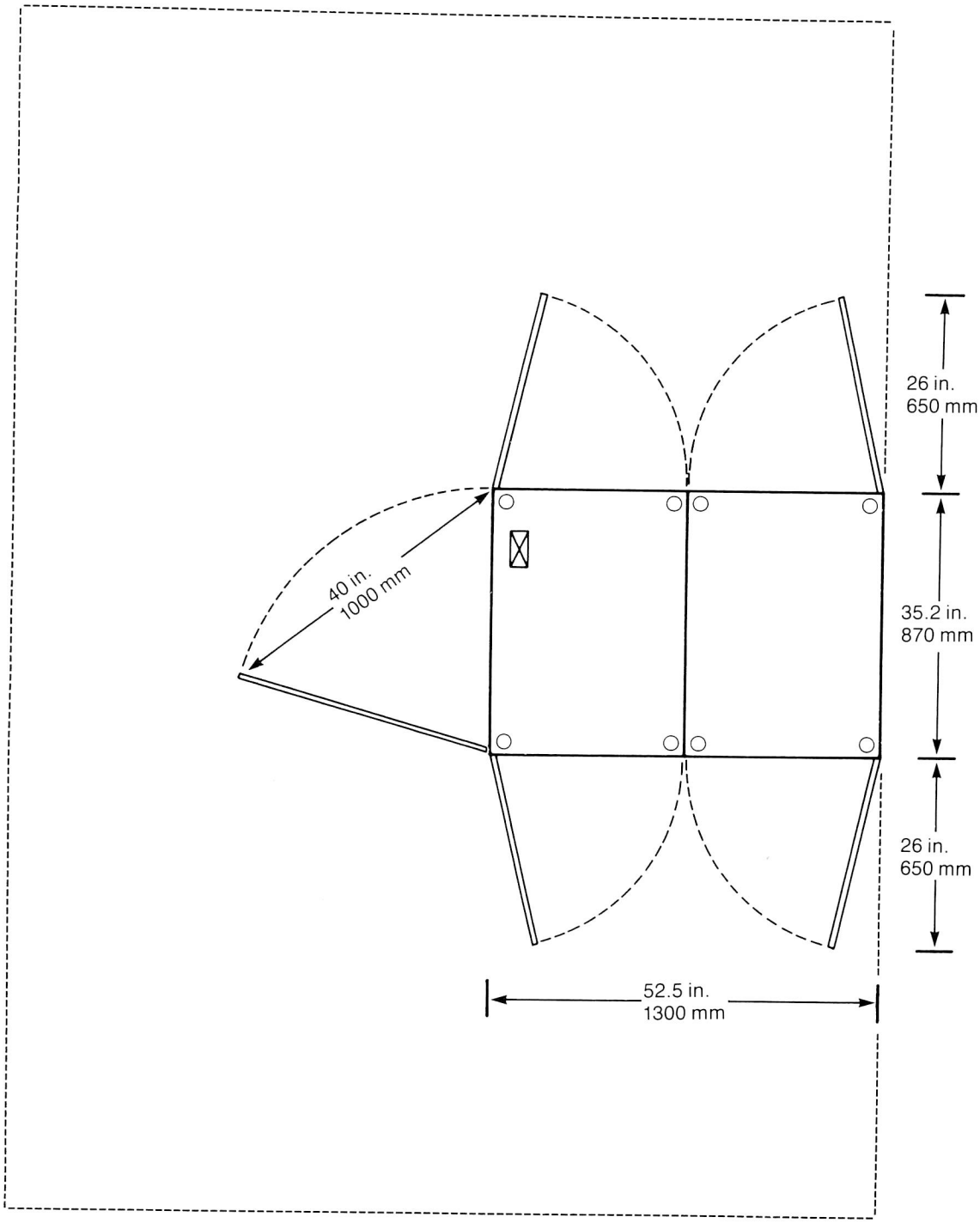
D
Equipment Templates

This appendix contains scale representations for the components described in this document. When preparing the site layout, select a matrix grid that represents the layout and dimensions of the computer room, or use your computer room's floor plan. Photocopy the appropriate templates and superimpose them on the floor plan. These templates represent a 1/20 scale reduction of the components. A minimum of 48 in. (1.2 m) is recommended for system bulkhead clearance and paper gathering access for printers.

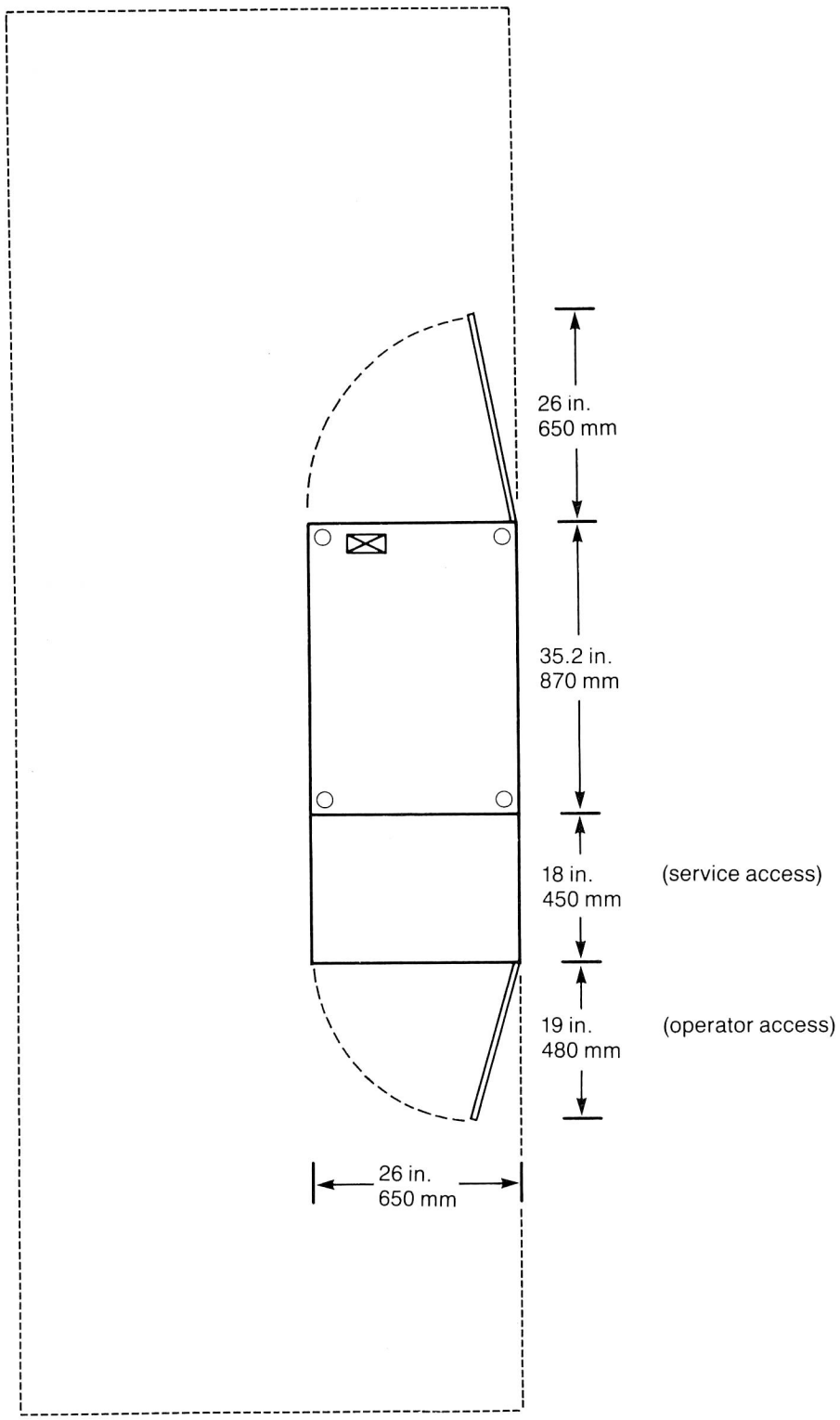
Figure D-1 supplies templates for system cabinets. Figure D-2 supplies peripheral cabinet templates, and Figure D-3 supplies free-standing peripheral templates. When using graph paper, the scale is 1 inch equals 20 inches and 10 mm equals 200 mm.



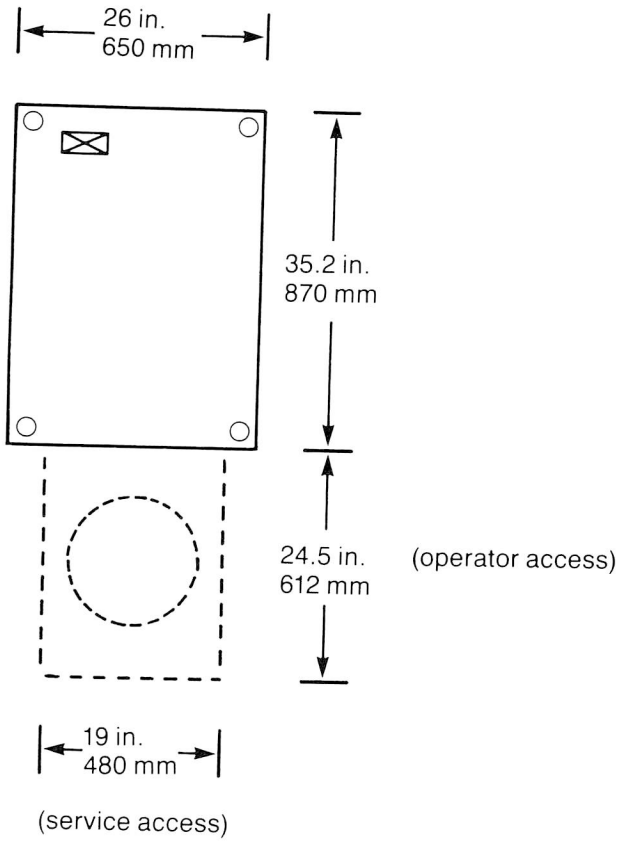
System Cabinet Templates
Figure D-1 (Sheet 1 of 2)



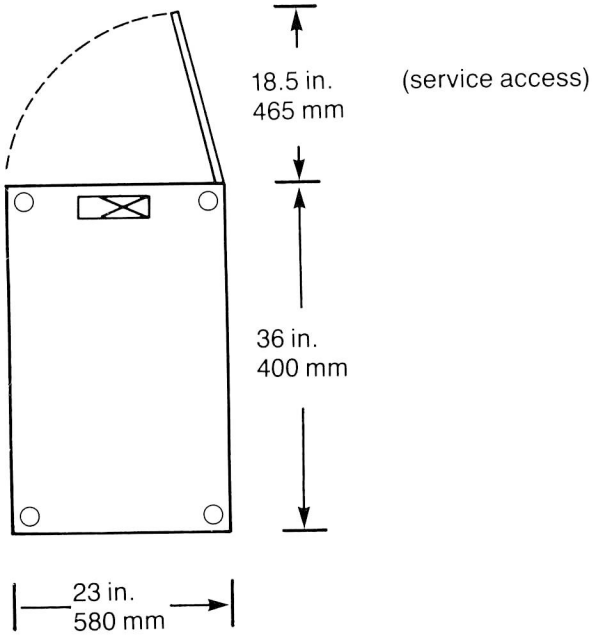
System Cabinet Templates
Figure D-1 (Sheet 2 of 2)



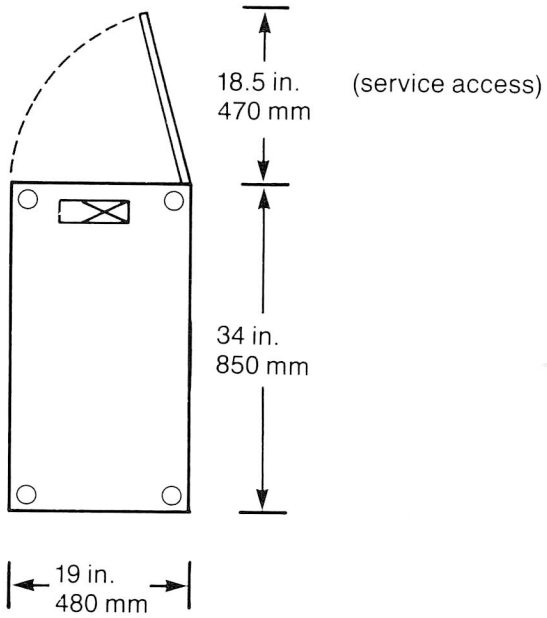
Peripheral Cabinet Templates
Figure D-2 (Sheet 1 of 2)



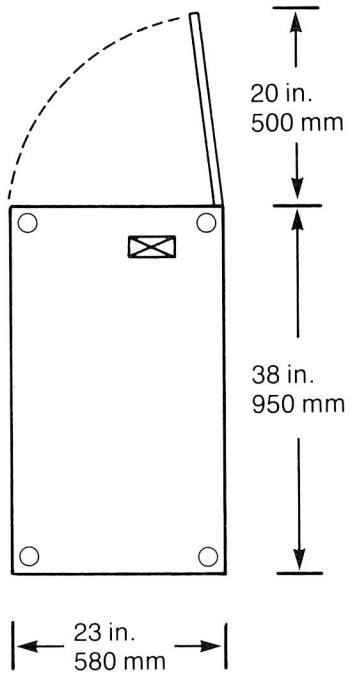
Peripheral Cabinet Templates
Figure D-2 (Sheet 2 of 2)



Free-standing Peripherals
Figure B-3 (Sheet 1 of 3)



Free-standing Peripherals
Figure B-3 (Sheet 2 of 3)



Free-standing Peripherals
Figure B-3 (Sheet 3 of 3)

E
Interface Cabling

This appendix lists the interface (signal) cable specifications for Prime systems and Prime-supplied peripherals. These specifications state cable number and length; in addition, controller board, bulkhead location, and device are listed where applicable. The information is given in five tables:

- Table E-1 specifies internal cables used between the I/O controller boards and the CPU cabinet bulkhead.
- Table E-2 specifies internal cables used from the CPU cabinet bulkhead to the peripheral cabinet bulkhead or to free-standing devices.
- Table E-3 specifies internal cables used between the peripheral cabinet bulkhead and a cabinet-mounted peripheral device.
- Table E-4 specifies external daisy-chain cables used to add successive similar devices under the control of the same peripheral controller board.
- Table E-5 specifies special application cables.

Table E-1

Cables Internal to the CPU Cabinet:
Controller Board to Bulkhead

Cable Number	Cable Length	Controller Board	Connector Type	Bulkhead Location	Notes
CBL6125-902	3 ft(900mm)	ICS1	25 pin	J1	Used by synchronous modem.
CBL6126-902	3 ft(900mm)	ICS1	9 pin	J13-J20	Used by terminals.
CBL6126-902	3 ft(900mm)	AMLC	9 pin	J10	Used by terminals.
CBL6117-902	3 ft(900mm)	MDLC	25 pin	J2-J9	Synchronous lines.
CBL6267-901	3 ft(900mm)	ICS2	50 pin	J72-J75	Double buffer.
CBL6268-901	3 ft(900mm)	ICS2	50 pin	J72-J75	Single buffer.
CBL6797-901	2 ft(600mm)	VCP	9 pin	J43,J49 J50,J51	250F and 850F.
CBL6797-902	4 ft (1.2m)	VCP	9 pin	J43,J49 J50,J51	550F and 750F.
CBL6604-901	2 1/2 ft (750mm)	VCPIII	25 pin	J43,J49 J50	Used by 9950.
CBL3265-001	2 ft(600mm)	PNC	10 pin		Attaches to PNC junction box.
CBL3533-902	4 ft (1.2m)	NA	2 pin coaxial	J85,J86	Attaches from PNC to bulkhead.
CBL6736-901	2 1/2 ft (750mm)	Power Up control	9 pin	J93	Used for automatic power-on.
CBL6113-907	3 ft (900mm)	Tape controller	50 pin	J56,J57 J58,J59	Used by 4510 and 4520 tape units.
CBL6358-901	3 ft (900mm)	4005 Disk controller	25 pin	J76,J77 J78,J81 J83,J79 J70,J82	Used by cabinet-mounted and free-standing disks.
CBL6361-901	3 ft (900mm)	4005 Disk controller	62 pin	J71	Used by cabinet-mounted and free-standing disks.

Table E-1 (continued)

Cables Internal to the CPU Cabinet:
Controller Board to Bulkhead

Cable Number	Cable Length	Controller Board	Connector Type	Bulkhead Location	Notes
CBL6363-901	3 ft (900mm)	GCR controller (4550)	62 pin	J45,J46 J47,J48	Used by 4550 formatter.
CBL6364-901	3 ft (900mm)	URC	50 pin	J52,J53 J89,J90	Used by line printers.
CBL6473-901	3 ft (900mm)	URC	50 pin	J54,J92	Used by card reader.

Table E-2

Cables From CPU Cabinet Bulkhead to Peripheral Cabinet Bulkheads or to Free-Standing Devices

Cable Number	Cable Length	Device Type	Connector Type	Bulkhead Port	Notes
CBL6109-XXX	NA	Asynchronous modem	9-pin bulkhead 25-pin device		XXX indicates a variable length.
CBL6124-XXX	NA	Terminal or asynchronous device	9-pin bulkhead 25-pin device		XXX indicates a variable length.
CBL6127-XXX	NA	Synchronous modem	25-pin bulkhead 25-pin device	J1(ICS1) J2,J3,J4 J5,J6,J7 J8,J9	XXX indicates a variable length.
CBL6360-001	35 ft (10.5m)	Cabinet-mounted and free-standing disks	25-pin bulkhead 25-pin device	J70,J71 J76,J78 J79,J81 J82,J83	Cabinet-mounted devices interface to peripheral bulkhead. Freestanding devices connect to device bulkhead.
CBL6382-001	15 ft (4.5m)	GRC formatter first position and disk drives	62-pin bulkhead 62-pin device or bulkhead	J45,J47 J46,J48	Formatter interfaces to peripheral bulkhead.
CBL6445-001	40 ft (12m)	Line printers	50-pin bulkhead 50-pin device	J52,J89 J53,J90	J53-J90 for device 1 or 3. J52-J89 for device 2 or 4.
CBL6474-001	30 ft (9m)	Card readers	50-pin bulkhead 38-pin device	J54,J92	
CBL6796-001	15 ft (4.5m)	Peripheral bulkheads	50-pin bulkhead 50-pin peripheral bulkhead	J56,J58 J57,J59	

Table E-2

Cables From CPU Cabinet Bulkhead to Peripheral Cabinet Bulkheads or to Free-Standing Devices (continued)

CBL7033-001	10 ft (3m)	Power-up sequence control, cabinet-to-cabinet	9-pin system bulkhead 9-pin peripheral bulkhead	J93 A4	J93 for system. A4 for peripheral

Table E-3

Cables Internal to the Peripheral Cabinet:
Cabinet Bulkhead to Device

Cable Number	Cable Length	Connector Type	Device Type	Notes
CBL6205-902	3 ft (900mm)	9-pin device 9-pin bulkhead	ICS2	Each device location supports 4 bulkhead locations.
CBL6267-901	3 ft (900mm)	50-pin bulkhead 50-pin device	ICS2	Connects dual buffer card edges to bulkhead.
CBL6268-901	3 ft (900mm)	50-pin bulkhead 50-pin device	ICS2	Connects single buffer card edges to bulkhead.
CBL6359-902	2 ft (600mm)	25-pin bulkhead 26-pin device	Cabinet-mounted disk drives	Used with CBL6362-901.
CBL6362-901	3.5 ft (1.05m)	62-pin bulkhead 60-pin device	Cabinet-mounted disk drives	Used with CBL6359-902.
CBL6736-901	3 ft (900mm)	9-pin bulkhead 4-pin device	Peripheral cabinet PDU	Daisy chain applications.
CBL7273-901	5 ft (1.5m)	50-pin bulkhead 50-pin device	4510, 4520 tape drives	First device only.
CBL7267-901	6 ft (1.8m)	50-pin bulkhead 50-pin device	4550 drive	Devices 2 thru 4
CBL7268-901	3 1/2 ft (1.15m)	50-pin bulkhead 50-pin device	4510, 4520 tape drives	Devices 2 thru 4
CBL7269-901	6 ft (1.8m)	50-pin bulkhead 50-pin device	4550 tape drive	First device only.

Table E-4
Daisy Chain Cables

Cable Number	Cable Length	Connector Type	Device Type	Notes
CBL3713-901	6 ft (1.8m)	60 pin	CMD and 4480	
CBL6367-901	8 ft (2.4m)	50 pin	4510, 4520	Requires CON5677-003 on each cable.
CBL6367-001				Molded version.
CBL6382-901		62 pin	4460, 4470 4490 disks	
CBL6382-001				Molded version.
CBL6796-001	10 ft (3m)	50 pin	4550 tape drive	

Table E-5
Special Application Cables

Cable Number	Cable Length	Application
CBL1470-XXX	NA	PST100 interface with CBL6596-XXX cables.
CBL6109-XXX	NA	Asynchronous terminals with CBL6596-XXX.
CBL6124-XXX	NA	Terminals and other asynchronous devices.
CBL6366-001	3 ft (900mm)	Converts any 25-pin male "D" cable end to a 25-pin "D" female cable end with #4-40 screws at final hookup.
CBL6366-002	3 ft (900mm)	Converts 25-pin male "D" cable end to a 25-pin female "D" cable end with 3 mm screws at final hookup.
CBL6366-003	3 ft (900mm)	Converts any 25-pin male "D" cable end to a 25-pin female "D" cable end and accepts another 25-pin male "D" Device Cable. #4-40 standoff at both ends.
CBL6596-XXX	NA	Used with CBL1470-XXX and CBL6109-XXX described above.
CBL7507-901	3 in (75mm)	Adapts 300-lpm cable to bulkhead.
CBL7508-001	3 ft (900mm)	Adapts existing 44-pin edge connector card cables to bulkhead parts in support of AMLC and ICS2.
CBL7515-001	3 ft (900mm)	Used to connect one-line 20 mA current loop to system bulkhead. Converts 9-pin male "D" to a 5-wire interface with ring-tongue terminations.

F

Site Inspection Procedures

Use this appendix to evaluate your site and to pinpoint any problems that may arise before, during, or after installation. It consists of a set of inspection guidelines, a survey checklist, and worksheets for evaluating HVAC, electrical outlet, and power requirements. The survey questions are worded so that NO answers always denote inadvisable operating conditions.

ACCOMMODATION REQUIREMENTS

The correct environment for your computer system depends upon the configuration chosen. A pre-installation visit will be made by a Prime Customer Service Representative to advise you of any necessary improvements or alterations, and to discuss the layout of the equipment.

The various factors relating to the environment have been highlighted in Chapter 3.

GUIDELINES FOR SITE INSPECTION

1. The room/site should be structurally complete and decorated in readiness to accept the system.

2. Windows should be kept closed and sealed where necessary.

3. There should be suitable shading on all windows that are likely to cause a temperature problem.

4. There should be suitable cleaning arrangements made to keep the computer room in satisfactory condition. Power receptacles for floor-cleaning machines should be supplied from a source other than that supporting the computer site.

5. Some form of trunking or void should be used to protect cables if a false floor is not present.

6. There should be some form of enclosed cabinet for the storage of media, either in the computer room or in some other reasonably controlled and clean environment.

7. All the system and its associated equipment except terminals and other remote devices should be housed in their own completely enclosed room, isolated from paper-handling equipment such as printers, etc.

8. There should be adequate illumination to enable maintenance of the machine.

9. There should be a separately-derived electrical system of adequate capacity to power the computer site.

10. An insulated-ground distribution system must be installed at the computer site.

11. An emergency shutdown mechanism should be provided.

12. There must be suitable power points for maintenance test equipment.

13. The room should be kept within the temperature range of 68 to 78 degrees F (20 to 26 degrees C) at all times.

14. An approved fire-extinguishing system must be available in the computer site.

SITE INSPECTION CHECKLIST AND RECOMMENDATIONS

NAME OF CUSTOMER _____

ADDRESS OF CUSTOMER _____

_____

TELEPHONE NUMBER _____

PERSONS TO CONTACT _____

PRIME MARKETING REPRESENTATIVE _____

DELIVERY DATE OF SYSTEM _____

PRIME CUSTOMER SERVICE REPRESENTATIVE RESPONSIBLE FOR SITE VISIT _____

EXACT LOCATION OF SYSTEM _____

Note

If the answer to any question is NO please explain the details, restrictions, problems, etc., in the space provided at the end of this checklist (item 37).

1. Is there adequate parking for the delivery truck? YES/NO

2. Is there adequate parking near the system site for Prime Customer Service Personnel? YES/NO

3. Will it be possible to move components from the delivery truck to the computer room? Consider the weight and shipping dimensions of the components when answering the following:

   a. Width of lift doors adequate . . . . . YES/NO/NA
   b. Carrying weight of lift adequate . . . . . YES/NO/NA
   c. Width of corridors adequate. . . . . YES/NO/NA
   d. Width of stairs adequate . . . . . YES/NO/NA
   e. Width of doors adequate. . . . . YES/NO/NA

4. If the site described above is not to be the final site:

   a. Where is the final site? _____
   b. How long is this temporary site to be used? _____
   c. Has a pre-installation checklist been filled in for the final site? YES/NO

5. Is there ready access for Customer Service Representatives? YES/NO

6. What is the general environment where the system is to be installed? (indicate which)

___ a. Office
___ b. Factory
___ c. Laboratory
___ d. Computer Room
___ e. Other (explain _____)

7. Dimensions of room with small plan.

8. Is the room/site structurally complete, and is decoration finished in readiness to accept the system? YES/NO

9. Is there suitable shading on windows where sunlight could cause a temperature problem? YES/NO

10. Will there be suitable cleaning arrangements for the computer room? YES/NO

11. Are the floor, ceiling, and wall materials such that they will cause no dust or thermal problems for the system? YES/NO

12. What is the floor material? _____

13. Is the floor raised? _____

14. If carpets are used, are they anti-static? YES/NO

15. If a false floor is not used, is there any trunking to take cables? YES/NO

16. If there is false flooring, have suitable cutouts been made for cabling? YES/NO

17. Is there provision for the proper storage of disk packs? YES/NO

18. Is the room used for Prime equipment only? YES/NO

19. Are all heating sources in the room (radiators, underfloor heating, etc.) fully controllable? YES/NO

20. Is air conditioning installed? YES/NO

21. What is the rating of the air-conditioning unit? _____ Btus

22. Are standard dust avoidance methods being used?

    Mats YES/NO

    Filters YES/NO

    Enclosing room YES/NO

23. Is there adequate illumination in the room to enable maintenance? YES/NO

24. Are the room and environment suitable to accept the computer? YES/NO

25. Has a separately-derived main power source with insulated-ground distribution been provided? YES/NO

26. Can the whole system be shut down from one switch? YES/NO

27. What is the total power to be drawn by the system?
(Use figures from worksheet)
_____ KVA

28. What is the rating of the supply provided?
_____ KVA

29. Are the power receptacles properly located for the system?
YES/NO

30. Are suitable power points available for Customer Service test equipment? YES/NO

31. If a standby generator is being used, give details:

_____

_____

_____

_____

32. Are the data cables entering and exiting the building properly equipped with lightning protection devices? YES/NO

33. Has suitable storage been made available for software media and documentation? YES/NO

34. Is a fire extinguisher available near the system? YES/NO

35. Can Prime accept maintenance responsibility without any special customer preparation? YES/NO

36. Is the site free of special access requirements? (One-way streets, restricted access, low overhead, etc.) YES/NO

37. Additional Information

Please include question number:

38. Fill in schedule of equipment below.

Model	Description	Quantity

SYSTEM CONFIGURATION WORKSHEET

Use Table F-1 as a worksheet to determine your system configuration's HVAC and electrical outlet requirements. Heat dissipation is given in both British Thermal Units (Btus) and kilocalories (kcals). Power receptacles are designated by NEMA styles. Refer to Figure F-1, Electrician's Worksheet, for the power plug diagrams.

Use the worksheet in Table F-2 to determine your system configuration's power consumption. Power ratings are given in kilovoltamperes (KVA).

Table F-1
HVAC and Electrical Outlet Worksheet

	Heat Dissipation Btu/hr (Kcal/hr)		Power Receptacles	
	Quantity	Totals	Quantity	Totals
CPUs				
250F	_____X 5,600 (1,425) =	_____	_____X L14-30 =	_____
550F	_____X 6,500 (1,650) =	_____	_____X L14-30 =	_____
750F	_____X 9,200 (2,325) =	_____	_____X L14-30 =	_____
850F	_____X 12,000 (3,025) =	_____	_____X L21-30 =	_____
9650	_____X 5,700 (1,450) =	_____	_____X L14-30 =	_____
9655	_____X 5,700 (1,450) =	_____	_____X L14-30 =	_____
9750	_____X 10,800 (2,725) =	_____	_____X L21-30 =	_____
9950	_____X 11,700 (2,950) =	_____	_____X L21-30 =	_____
9955	_____X 13,300 (3,355) =	_____	_____X L21-30 =	_____

Table F-1 (continued)
HVAC and Electrical Outlet Worksheet

	Heat Dissipation Btu/hr (Kcal/hr)		Power Receptacles	
	Quantity	Totals	Quantity	Totals
Disks				
44XX	_____X 3,200 (810) =	_____	_____X L5-30 =	_____
4460	_____X 2,600 (660) =	_____	_____X L5-30 =	_____
4470	_____X 4,200 (1,060) =	_____	_____X L6-20 =	_____
4475*	_____X 1,800 (460) =	_____	_____X L5-30 =	_____
4480*	_____X 1,800 (460) =	_____	_____X L5-30 =	_____
4490	_____X 4,700 (1,185) =	_____	_____X L6-20 =	_____
Tape Drives				
4520*	_____X 1,200 (310) =	_____	_____X L5-30 =	_____
4550*	_____X 4,500 (1,135) =	_____	_____X L5-30 =	_____
4560*	_____X 950 (250) =	_____	_____X L5-30 =	_____
4590*	_____X 1,160 (395) =	_____	_____X L5-30 =	_____

*The PDU powers these 7651F cabinet peripherals. One external NEMA L5-30P connector powers the PDU.

Table F-1 (continued)
HVAC and Electrical Outlet Worksheet

	Heat Dissipation Btu/hr (Kcal/hr)		Power Receptacles	
	Quantity	Totals	Quantity	Totals
Other				
ICS2*	_____X	435 = _____ (110)	_____X L5-30	= _____
PT200	_____X	170 = _____ (45)	_____X 5-15	= _____
Line Printers				
3115	_____X	140 = _____ (36)	_____X 5-15	= _____
3173	_____X	2,750 = _____ (695)	_____X 5-15	= _____
3320	_____X	1,400 = _____ (355)	_____X 5-15	= _____
3330	_____X	1,400 = _____ (355)	_____X 5-15	= _____
3350	_____X	700 = _____ (180)	_____X 5-15	= _____
Card Reader				
3159	_____X	1,800 = _____ (460)	_____X 5-15	= _____

*The PDU powers these 7651F cabinet peripherals. One external NEMA L5-30P connector powers the PDU.

Table F-1 (continued)
HVAC and Electrical Outlet Worksheet

Summary:

A. Total component heat dissipation — Btu/hr (Kcal/hr) _____

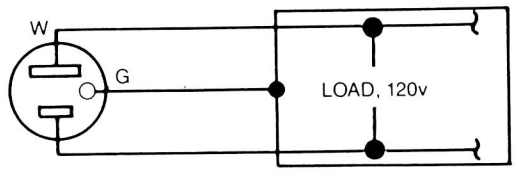
B. Personnel and lighting factor for heat dissipation: 10% of component total — Btu/hr (Kcal/hr) _____

Total heat dissipation for configuration (add A and B) — Btu/hr (Kcal/hr) _____

Number of Power Receptacles Needed:

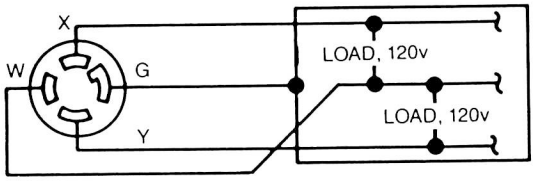
5-15 _____
L5-30 _____
L6-2R _____
L14-30 _____
L21-30 _____

(a) NEMA 5-15P
QTY



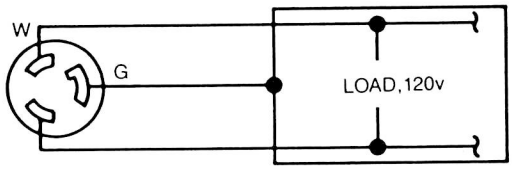
TERMINALS, ETC.
120v @ 15A

(b) NEMA L14-30P
QTY



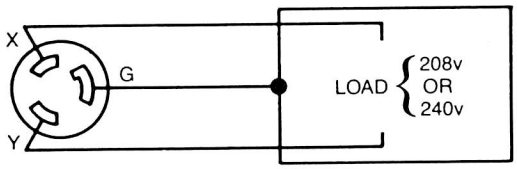
MAINFRAME CABINETS
LOADS DISTRIBUTED
ACROSS TWO
120v@30A
CIRCUITS

(c) NEMA L5-30P
QTY



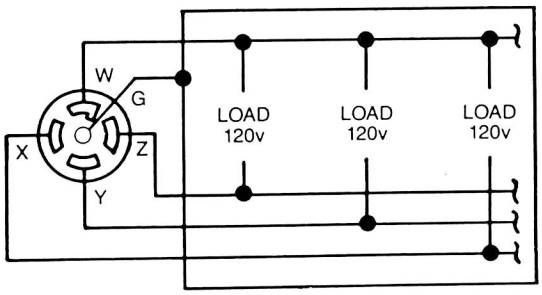
PERIPHERALS IN CABINET
ALL LOADS SHARE SINGLE
120v@30A CIRCUIT

(d) NEMA L6-20P
QTY



LARGER PERIPHERALS
WIRE FOR
208v OR 240v
CIRCUIT ACCORDING TO
INSTALLATION

(e) NEMA L21-30P
QTY



LARGE MAINFRAME CABINETS
UTILIZING 3-PHASE
208Y/120v
30A DISTRIBUTION

Electrician's Worksheet
Figure F-1

Table F-2
Component Power Consumption Worksheet

	Quantity		Power Consumption (KVA)		Totals
CPUs					
250F	_____	X	2.5	=	_____
550F	_____	X	2.7	=	_____
750F	_____	X	3.7	=	_____
850F	_____	X	5.2	=	_____
9650	_____	X	2.5	=	_____
9655	_____	X	2.5	=	_____
9750	_____	X	4.3	=	_____
9950	_____	X	4.7	=	_____
9955	_____	X	5.3	=	_____
Disks					
44XX	_____	X	1.0	=	_____
4460	_____	X	1.0	=	_____
4470	_____	X	1.9	=	_____
4475	_____	X	.72	=	_____
4480	_____	X	.62	=	_____
4490	_____	X	1.9	=	_____

Table F-2 (continued)
Component Power Consumption Worksheet

	Power Consumption (KVA) Quantity		Totals
Tape Drives			
4520	_____X	1.5 =	_____
4550	_____X	1.5 =	_____
4560	_____X	.36 =	_____
4590	_____X	.8 =	_____
Other			
ICS2	_____X	.1 =	_____
PT200	_____X	.1 =	_____
Printers			
3115	_____X	.3 =	_____
3173	_____X	.5 =	_____
3320	_____X	.4 =	_____
3330	_____X	.4 =	_____
3350	_____X	.3 =	_____
Card Reader			
3159	_____X	.5 =	_____

Summary: Total KVAs _____

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D

E

SURVEY

READER RESPONSE FORM

DOC5029-3LA Site Preparation Guide Third Edition

Your feedback will help us continue to improve the quality, accuracy, and organization of our user publications.

1. How do you rate the document for overall usefulness?

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Illustrations: ___too many ___about right ___too few

3. What features did you find most useful? _____

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_____

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