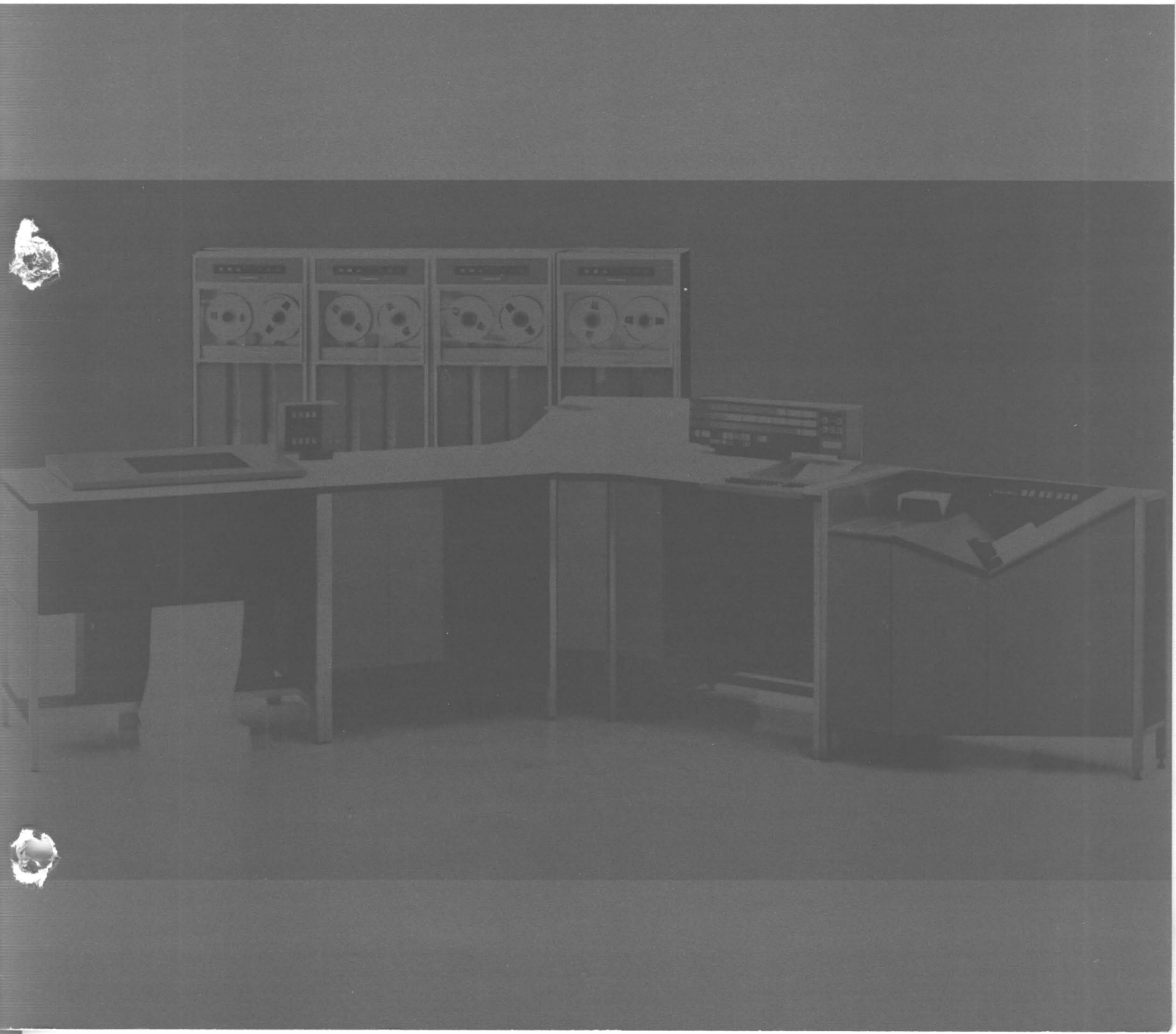
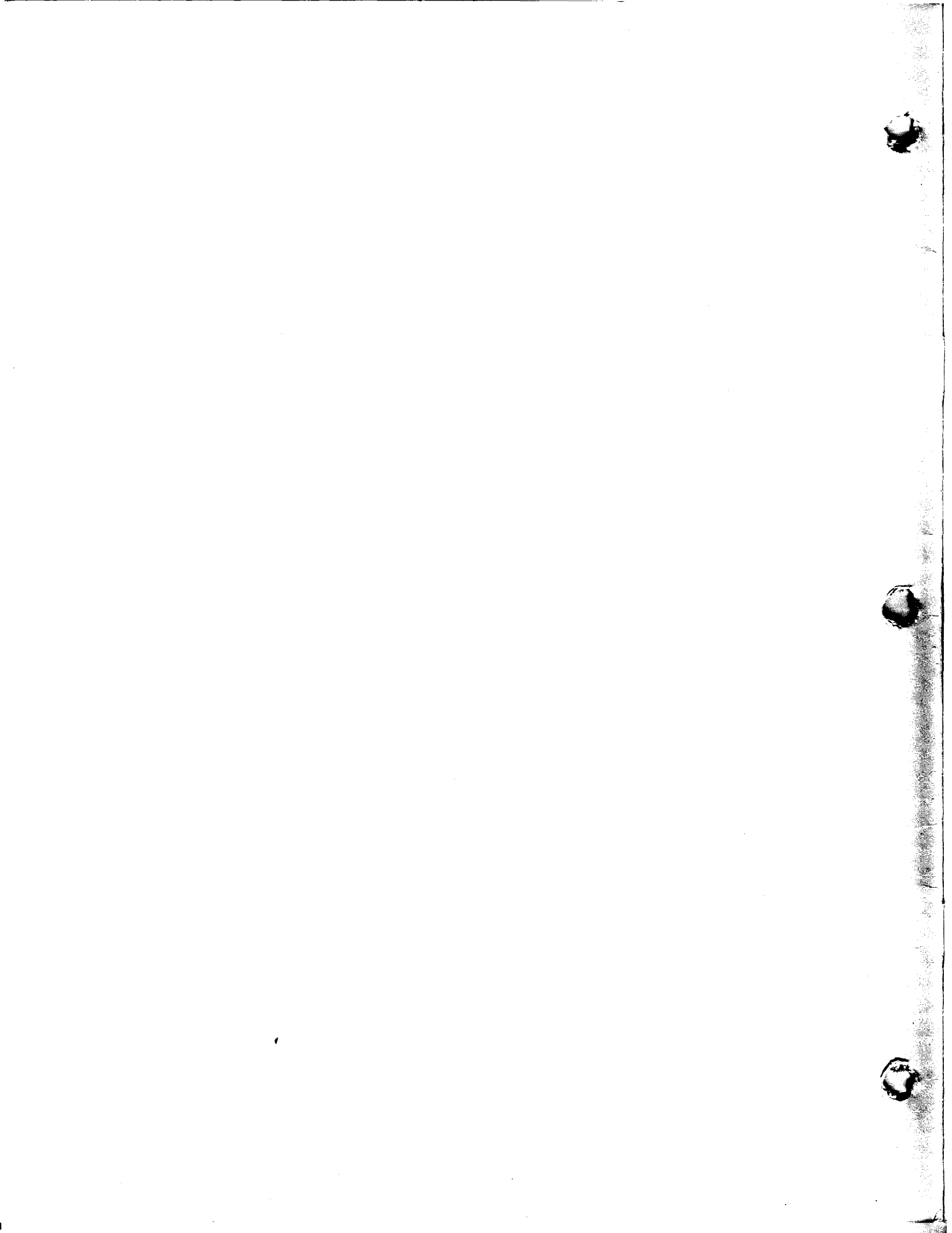


HONEYWELL SERIES 200 installation planning manual





HONEYWELL

200
SERIES

INSTALLATION PLANNING MANUAL

Honeywell
ELECTRONIC DATA PROCESSING

PRICE\$2.00

Questions and comments regarding this manual should be addressed to:

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Electronic Data Processing Division
Wellesley Hills, Massachusetts 02181

FOREWORD

This manual serves as an introduction to the general procedures of installation planning and site preparation for any model of the Honeywell Series 200. It includes a site preparation check list, an alphabetically arranged listing of general site specifications, system specifications, and typical layouts of the Series 200. Familiarization with this material will provide a basic understanding of computer site requirements and installation procedure.

The Honeywell 200 Installation Planning Manual (DSI-284) is hereby superseded.

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SECTION I
INSTALLATION PLANNING

What You Do	What Honeywell Does To Help You
1. You select the site for your system.	1. Honeywell's installation specialists help you check the selected site for computer applicability. Using the building specifications you supply, Honeywell drafts computer equipment layouts.
2. You prepare the site.	2. Honeywell furnishes complete specifications, including all necessary purchasing specifications, for the use of your consultants in installing the air conditioning and electrical power required for the system.
3. You predetermine the time of shipment when you sign the contract.	3. Every system component is carefully packed and readied for safe shipment from the factory to your site to meet the predetermined delivery date. Honeywell's installation specialists arrange for methods of shipping and carriers to suit your particular situation.
4. You accept delivery of equipment at the completed site.	4. When the system arrives at your site, Honeywell engineers install it. They check the placement of system components and their interconnections, making sure that all components are installed according to established specifications. After the system has been checked out and pronounced operable, it is turned over to you.

SITE PREPARATION SCHEDULE

As soon as the configuration of a Honeywell Series 200 computer, tailored to your data processing needs, has been determined, a definitive schedule incorporating all phases of site preparation and system installation should be established. Honeywell's installation specialists help you generate such a schedule along the lines of the following:

Ninety Days Before Delivery

A layout drawing showing the intended arrangement of the equipment at the selected site should be established for preliminary consideration.

SECTION I. INSTALLATION PLANNING

- Verify site dimensions and building access dimensions.
- Insure that the proposed floor loading agrees with the building specifications and applicable city ordinances.
- Ascertain the location and type of the primary-power source (in-plant diesel generator, public utility, etc.) and the length of power runs.
- Determine the need, if any, for additional electrical power and arrange for its installation.
- Determine the voltage fluctuations at the power service entrance over a sufficient period of time. A strip-recorder is excellent for this purpose. If these fluctuations are greater than 10%,¹ a voltage regulator is required.
- Determine the need for additional air conditioning and arrange for its installation.

Forty-Five Days Before Delivery

Definite system layout drawings and specifications, approved by you, should be in the hands of the Honeywell Site Preparation Department.

- Order power panels and raised flooring (or surface metal raceway, as the case may be).
- Establish a plan to vacate the selected area prior to site preparation.
- Arrange for insurance, if desired.

Thirty Days Before Delivery

- Install primary-power equipment.
- Install wiring.
- Install air conditioning.
- Install raised floor or surface metal raceway.

Seven Days Before Delivery

All electrical and structural elements of the site should have been installed, including air conditioning and, if required, raised flooring.

- Complete the computer room decor including painting, drapes, etc.
- Clean the computer room thoroughly.

¹5% if magnetic tape units are planned.

SECTION II
SITE SPECIFICATIONS

During selection and preparation of a site for installation of any model of the Honeywell Series 200, you must consider such factors as the accessibility of related work areas and the locations of air conditioning equipment, columns, doors, electrical outlets, elevators, and windows.

ACCESS

Existing corridors (including turns) and elevators facilities should be large enough to accommodate equipment of at least the following dimensions:

Width	5'11"	-	1.80 m	
Depth	4' 0"	-	1.21 m	(on floor - not including sills, etc.)
Height	7' 0"	-	2.13 m	(includes height of shipping dolly)

Doors being newly installed at the site should be of at least the following dimensions:

Single Doors			Double Doors			
Width	3'0"	-	0.91 m	6'0"	-	1.82 m
Height	7'0"	-	2.13 m	7'0"	-	2.13 m

Single doors should be 4 feet (1.21 m) in width if type 270 units are planned. Saddles and sills should be omitted to permit unhindered movement of dollies through doorways. Elevator capacity should be 3000 lbs. (1,361 kgs.).

ACOUSTICS

Some acoustic treatment of the data processing area is advisable to insure a noise level that permits a comfortable working environment. In some installations the walls may require acoustic material, and in other cases treatment of the ceiling will suffice.

AIR CONDITIONING

Individual units of the system are internally cooled by small blowers which circulate air through louvers in the cabinetry. To insure proper cooling of the entire system, however, air conditioning is necessary. The configuration of your system will determine how much. A standard commercial air conditioning unit may accomplish this economically.

SECTION II. SITE SPECIFICATIONS

The specified total heat gain for a system (as indicated in your computer layout) does not include an allowance for loads from lighting, personnel, fresh air, the building, or unanticipated equipment. An allowance for expansion of the data processing system, usually ranging between 20% and 30% of the initial cooling required, is recommended.

In humid climates, a stand-by air conditioning system may be advisable to handle peak loads on days when normal refrigeration equipment might be overburdened.

Humidity and Temperature Monitoring

It is recommended that you install direct-reading dry-bulb and wet-bulb thermometers and temperature and humidity recording instruments for continuous monitoring of the installation.

Normally, temperature should be regulated as follows (measured at the air input to each unit):

68°F - 78°F (20°C - 26°C) Dry Bulb
40% - 60% Relative Humidity

However, the limits for relative humidity depend on the characteristics of cards and paper to be used, comfort of operating personnel, etc.

Filtering

Standard air filters will suffice unless the installation is subjected to corrosive gases, salt air, or other unusual conditions.

CABLES

Honeywell supplies all of the necessary computer cables for the initial installation of the data processing system. However, since all cables are custom-made to a specific configuration of equipment, it is essential that an approved system layout drawing be received by Honeywell Field Service at least 45 days prior to machine delivery (see Check List in Section I). This enables Honeywell's installation engineers to prepare and submit a cable order to manufacturing. All cable orders must be submitted to manufacturing at least 45 days prior to machine delivery.

Any revisions to the approved layout drawings after the preparation of a cable order will be considered on an RPQ basis only. This is necessary since these revisions result in the preparation of a second cable order.

CEILING

Acoustic treatment of the ceiling is advisable. Any commercial grade of fire-resistant ceiling tile (which complies with NFPA No. 75, Section 2301¹) will serve adequately and produce an attractive, clean appearance. Honeywell's installation specialists will recommend ceilings which not only require minimal maintenance, but also reduce costs in heating, lighting, and air conditioning. For aesthetic reasons, the ceiling should be at least eight feet high (2.4 m).

FIRE PROTECTION

Adequate fire protection is an important aspect of the installation. Greatest protection is realized when the computer is housed in a fire-resistant building. The ceiling, floor, and walls of the computer room should be of noncombustible material. The room may be separated from adjoining areas by double fire doors, and automatic fire-or smoke-detection system should be considered. An emergency disconnect button for disconnecting all electrical power to the computer and to the air conditioning system is recommended. The air conditioning system should be provided with fire dampers, and its ducts should be independent of all other ducts in the building. All wiring should be carefully checked for its capacity to carry the loads required, and fuses and circuit breakers must have a sufficiently low amperage rating to prevent overload. The specific recommendations for a data processing site are contained in Electronic Computer Systems (NFPA No. 75). Consult the latest edition.

Extinguishers

At least two carbon-dioxide fire extinguishers shall be present in each room where computer equipment is located. If a sprinkler system is used, some precaution should be taken against accidental discharge of water. In this regard, the following types of sprinkler systems are recommended:

1. Pre-Action Sprinkler System. In this type of system, a high ambient temperature in the data processing room causes a heat sensor to open a master valve. The valve admits water to the sprinkler piping for discharge through the sprinkler heads. This minimizes the possibility of accidental discharge of water resulting from failure or mechanical breakage of the heads.
2. Fusible Sprinkler Heads. If there is no master valve in the sprinkler system, standard fusible sprinkler heads should be replaced with high-temperature heads - preferably rated in the intermediate range of 175°F(79°C). High-temperature heads minimize the possibility of accidental discharge of water resulting from a slight rise in ambient temperature.

¹Handbook available from the National Fire Protective Association, 60 Batterymarch Street, Boston, Mass., 02110.

FLOORING

Either a surface metal raceway or a raised floor should be used to protect the interconnecting cables from damage and displacement (see Figures 2-1 and 2-2). Drawings and details of raceways and vendor information of both raceways and flooring will be supplied by Honeywell engineers.

Vinyl tile is recommended for use on the floor because it is attractive, durable, and easily maintained. The use of carpeting is not advisable. However, if it is used, it should be treated to eliminate lint and static.

Raised Flooring

The raised floor is sometimes referred to as an "elevated floor." There are a number of manufacturers of approved raised floors for computers. They also provide brochures and specifications which can be utilized by your architect. The most generally acceptable raised floor consists of tile-covered panels supported by a rigid grid system of pedestal-supported stringers. An alternate method consists of panels with a built-in support frame in each panel. Each frame, in turn, is supported by pedestals.

Subfloor

The load bearing capacity of the subfloor should be at least 75 pounds per square foot (365 Kgs/sq. m). This is the minimum and allows the stacking of cards or paper to be concentrated in one area near their peripheral unit without danger of overloading. When a normal amount of space has been allocated to aisles, equipment, and furniture, the floor loading ranges from 30 to 50 pounds per square foot (145 - 245 Kgs/sq. m). If the load bearing capacity of the subfloor is found to be inadequate, it may be possible to make changes in the layout.

Surface Metal Raceway

A surface metal raceway may be required in order to conform to local electrical codes. Honeywell engineers will assist you in the purchase of this equipment. Generally, the surface metal raceway (or "trough" as it is sometimes called) is divided into two channels within a single run. One channel contains signal cables; the other, power cables.

Cleaning

Regardless of the type of floor covering used, a continuing program to keep it clean must be a part of your maintenance schedule. A tightly sealed vacuum cleaner with a good filter is recommended for cleaning the computer room.

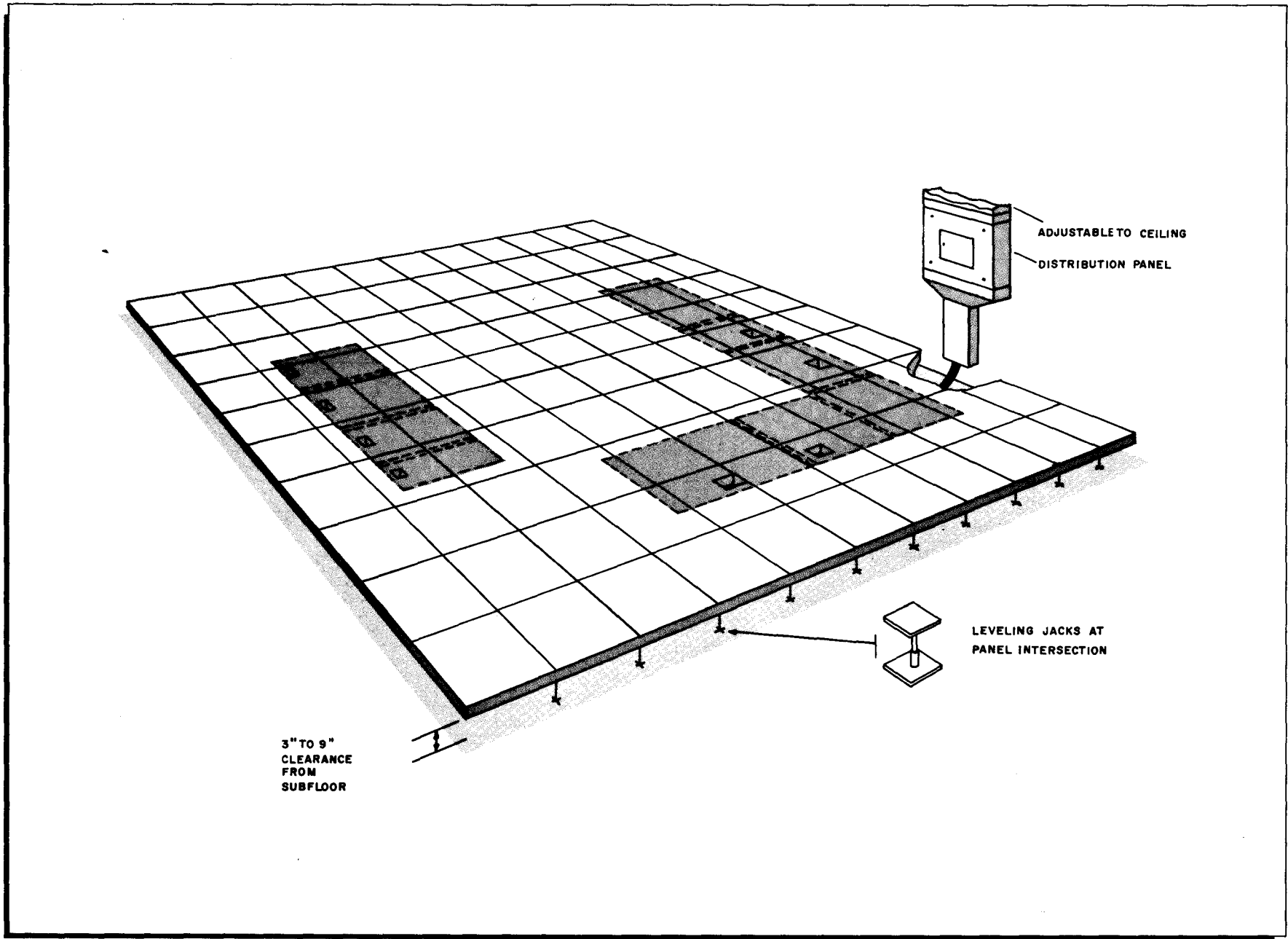


Figure 2-1. Raised Floor

2-6

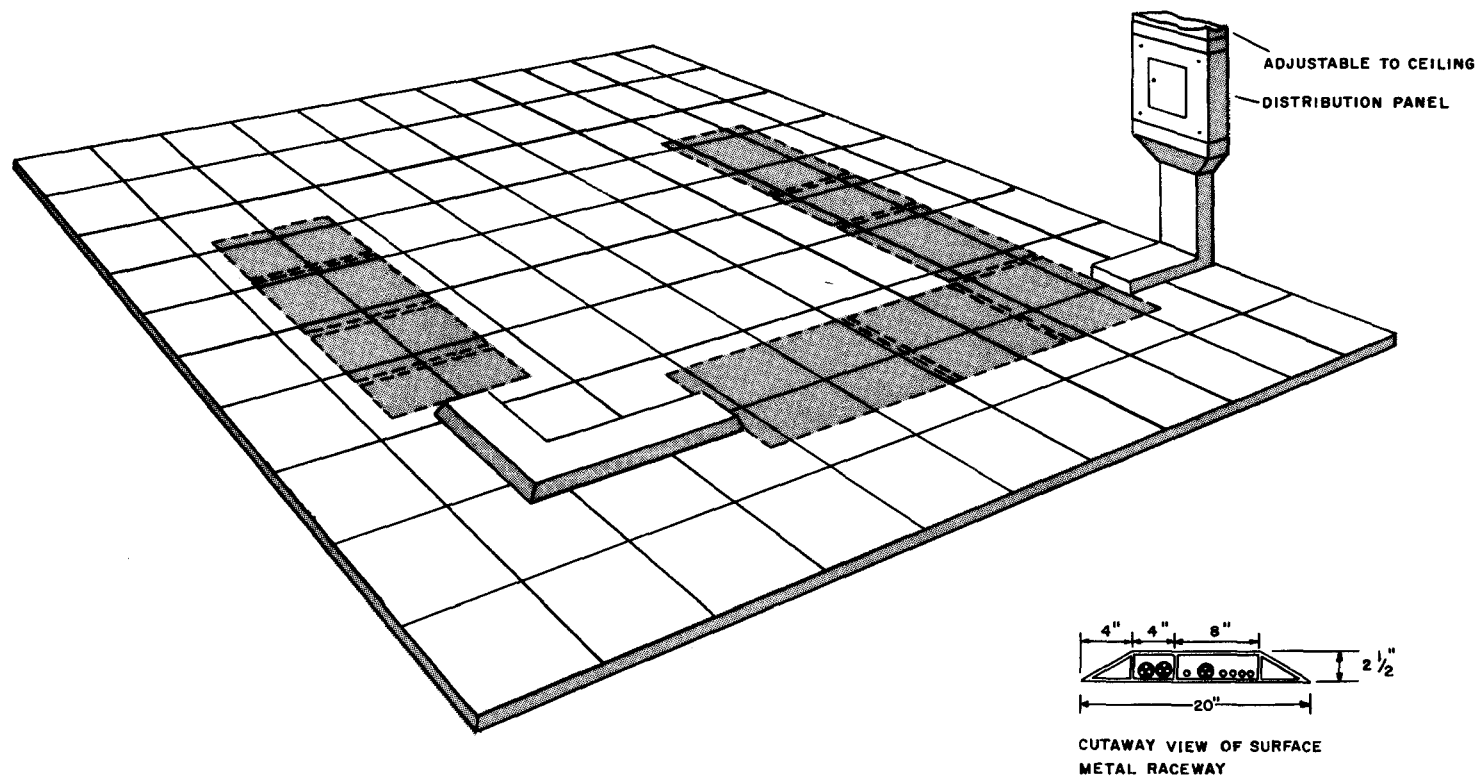


Figure 2-2. Surface Metal Raceway

LIGHTING

Normal office lighting with a minimum average intensity of 40 foot candles, measure 30 inches (76. cm) above the floor, is adequate for the data processing area. Fluorescent lighting is preferred because it generates little heat and illuminates the work area evenly. Flush-fitting or recessed fixtures are suggested, since they make a good appearance and are less likely to collect dust than hanging fixtures. Direct sunlight should be avoided because a lower level of illumination is needed to observe indicator lights on the equipment. Emergency lighting can be of the ordinary battery-operated type that turns on automatically when power to the main lighting system is interrupted.

MAGNETIC TAPE STORAGE

Honeywell recommends Mylar¹ tape as one of the most satisfactory because it tolerates a wide range of temperature and humidity (there is reliable evidence that data can be recovered from Mylar tape which has been subjected to temperatures up to 150°F, or 65°C). However, this is an extreme case and magnetic tape should be protected from magnetic fields, rough handling, dust, and extremes of humidity and temperature (see "Fire Protection" above). Reels of tape should be stored in dustproof containers for protection and support.

Handling

Violent shock and exposure to strong magnetic fields may introduce undesirable "noise" and some loss of data. Reasonable care in handling will prevent this.

Humidity

Relative humidity (RH) of the tape storage area should be maintained between 20% and 80%. When shipping magnetic tape, the reel and its storage container should be hermetically sealed in a moisture-proof plastic bag. If the shipping container is not hermetically sealed, the tape should not be used until it has been returned to a conditioned area for a length of time equal to the duration of its removal; tapes removed for longer than 24 hours need only 24 hours' conditioning.

PAINTING

To avoid dust, the paint used in the computer room and on the subfloor should be of a type that will neither powder nor flake.

¹Mylar is a registered trademark of E.I. du Pont de Nemours Co., Inc.

PARTITIONS

Floor-to-ceiling partitions are recommended to minimize dust and noise in the computer room. Partitions installed between adjacent raised-floor areas should have a clearance from the subfloor of at least 5-1/2 inches (14. cm) along their bases except at post locations, or they should rest on the raised floor.

POWER

It is required that you furnish and install power for the system in accordance with the following specifications. It is also your responsibility to furnish and install the electrical equipment for the installation, including raceways, fittings, distribution panel, and, if required, transformer and voltage regulator (see Figure 2-3).

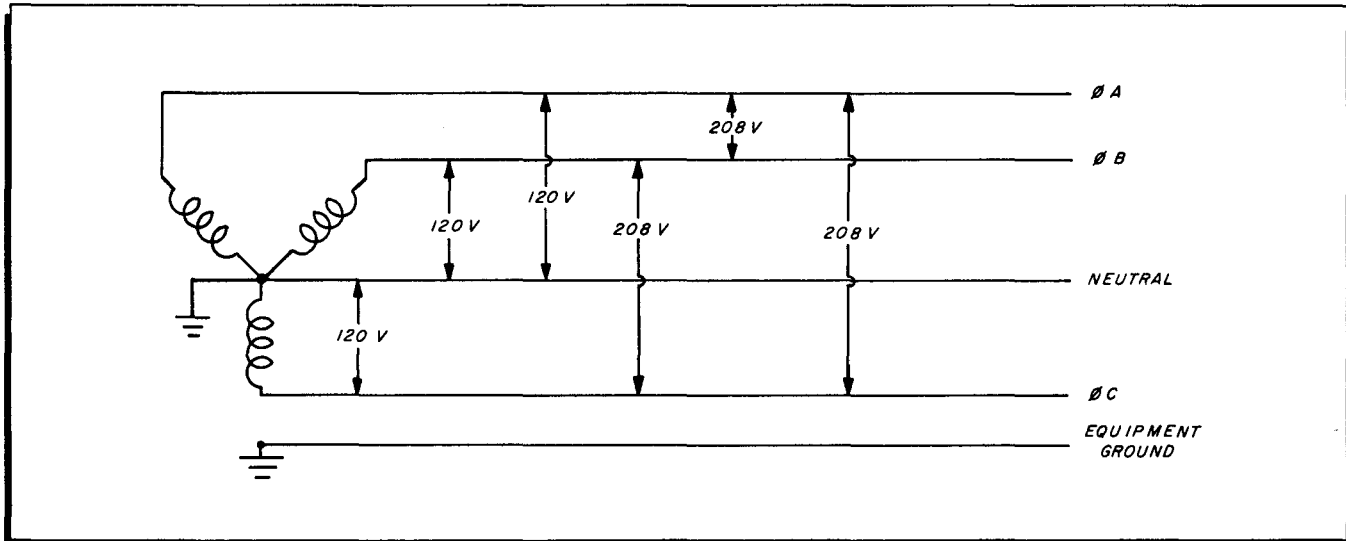


Figure 2-3. Y-Connection Showing Phase and Voltage Relationships

Power Source

The power source shall be of sufficient capacity to handling present computer loads and any loads likely to be imposed by future expansion of the system. The source shall be independent of all other loads. That is, it shall not provide power for air conditioning equipment, convenience outlets, lighting, or office equipment. As illustrated in Figure 2-3, the power source shall be 120/208-volt, three-phase, 60 cps $\pm 1/2$ cycle, with four wires Y-connected and a fifth wire for equipment ground. The voltage shall be stable varying by not more than $\pm 10\%$ (5% if magnetic tape units are in the system) of the rated voltage, including transient and steady state (measured at the power unit with the system operating). In the unusual cases wherein the power company does not regulate its power this closely, you are advised to furnish and install a voltage regulator.

If the electric power at the installation site is not of the required voltage, one or more transformers shall be purchased and installed. Either a three-phase transformer, or a bank of three single-phase transformers of identical rating and characteristics can be used. The capacity required depends upon your equipment complement and is specified by Honeywell's Field Service Department.

Grounding

You are required to furnish and install the fifth wire of the power source - the equipment ground wire. It shall be connected to the metallic raceway system and/or metal enclosure in accordance with the National Electrical Code.¹ It shall not be connected to the neutral wire except at the service entrance. The size of the ground wire, whether the wire is to be installed in armor, cable sheath, conduit, raceway, or other enclosure, shall be as specified in Table 250-95 of the National Electrical Code, but in no case shall it be smaller than number 12 AWG.

Convenience Outlets

For power for the vacuum cleaner, floor buffer, etc., you may want to install auxiliary, 120-volt, single-phase, 60-cycle wall outlets in the data processing area. Recommended circuit capacities are 15-20 amperes; individual outlet capacities, 15 amperes. The quantity and location of these outlets should be indicated on your approved system layout drawing.

Interconnecting Cable

Control, power, and signal transfer between units of the system are made by means of multi-conductor cable assemblies which are furnished and installed by Honeywell.

OFFICE SPACE

The system supervisor and the programming staff should be allocated office space adjacent to the data processing area.

SERVICE ENGINEERING AREA

For larger models of the Series 200, it may be necessary to provide a Service Engineering area of approximately 200 square feet (18.6 sq. m) near the computer room. Honeywell supplies all the equipment and furniture for this room.

¹Handbook available from the National Board of Fire Underwriters, 85 John St., NY, NY, or 222 W. Adams St., Chicago, Ill., or 465 California St., San Francisco, Calif.

STORAGE AREA

Some storage area for magnetic tapes, paper tapes, punched cards, and printer paper should be provided. For the most efficient operation, the storage area should be located in the data processing room. The amount of space needed depends on the computer configuration and on any anticipated expansion.

WORK FLOW

Some thought should be given to facilitating work flow between the data processing area and the related offices and tabulating equipment. Corridor traffic should be considered, including normal traffic and visitors who may be admiring your computer.

COLOR SPECIFICATIONS

Honeywell uses colors listed in the Container Corporation of American Color Harmony Manual, a nationally recognized standard wherein each color is represented by a colored celluloid chip printed with an alphanumeric Ostwald code. These chips are available from Honeywell, should you wish to refer to them when selecting floor tiles, fixtures, and wall paint. Besides color chips, Honeywell can supply their own standard finish chip, indicating the texture of the cabinetry. The colors used correspond to these Ostwald and Honeywell numbers:

COLOR	OSTWALD NUMBER	HONEYWELL STANDARD FINISH CHIP NO.
Black	p	S15-11-3013
Blue	15 na	S15-11-3014
White	a	S15-11-3016
White Formica #949	a	S15-11-1007

SECTION III
SYSTEM SPECIFICATIONS

This section contains an optimum standard system layout for each model of the Honeywell Series 200. The total power and air conditioning requirements for each of these layouts have been calculated by Honeywell Site Preparation Engineers. They are presented in order to provide you with a yardstick by which you can gauge requirements for your system.

Due to the variable nature of the following items, note that the power and heat gain figures do not account for:

<u>POWER</u>	<u>HEAT GAIN</u>
1. Power required for lighting.	1. Heat gain from lighting.
2. Power required for air conditioning.	2. Heat gain from building and personnel.
3. Power required for convenience outlets.	3. Fresh air requirements.

Possible storage facilities (for cards, tape, paper, etc.) are not included in area totals. The area totals include only the space needed for the equipment and clearances. However, even within these figures, there may be room for a single storage cabinet. For example, in the Model 120 layout, a small storage cabinet could be placed on the left side of the layout without interfering with the operators or unit clearances, but for further storage, more area would be needed.

Figure 3-1 illustrates the drawer action (for ease in maintenance) of a typical four-drawer logic cabinet (the action is similar in a six-drawer cabinet). This cabinet is utilized on all models of the Series 200 with the exception of the Model 120 which has a six-drawer cabinet. Both the four-drawer and the six-drawer cabinets are used in the Model 4200, as shown in the basic layout in this section. The drawers may contain either memory planes or control circuitry, or both. As a system is expanded, additional cabinet modules may be plugged in directly.

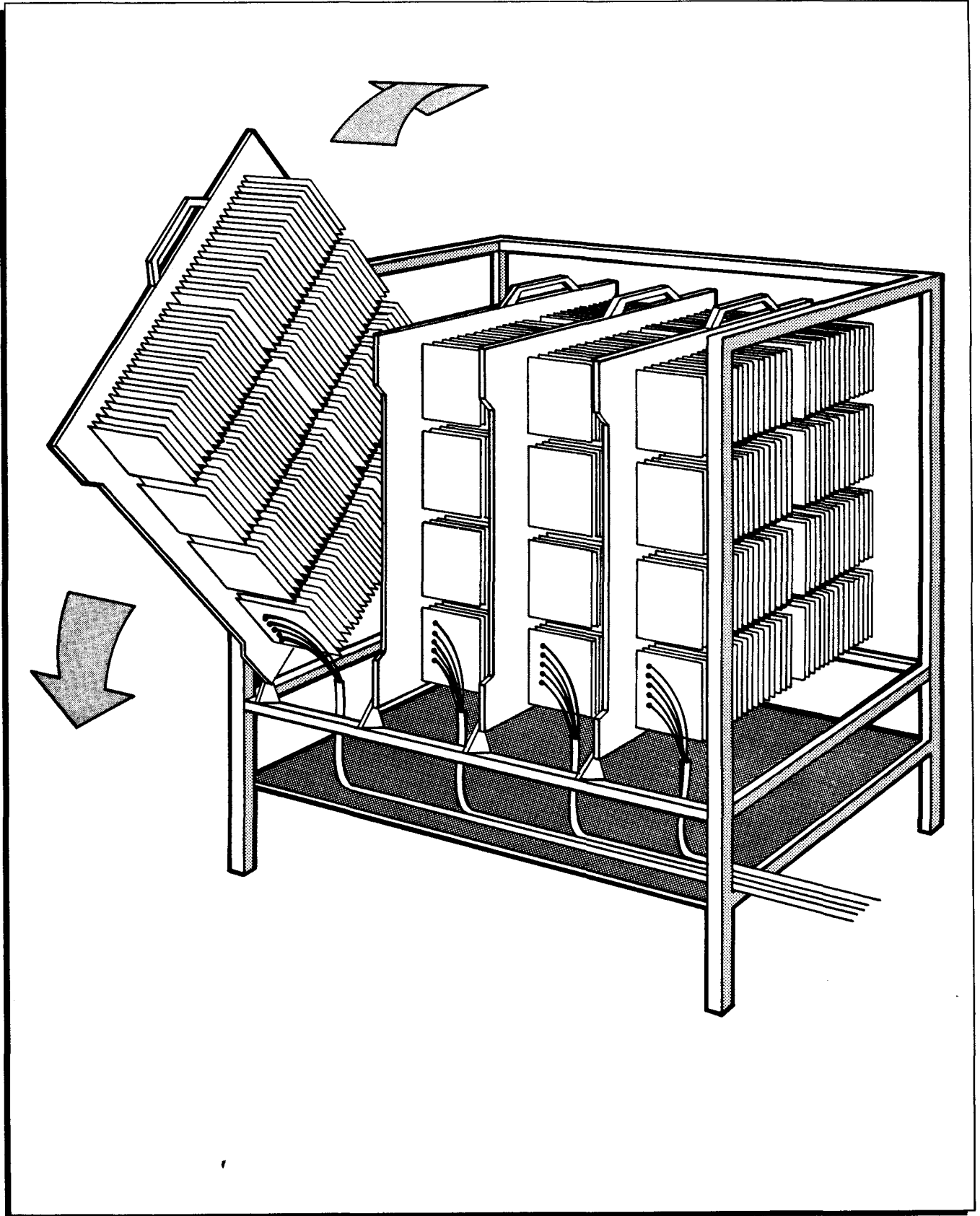
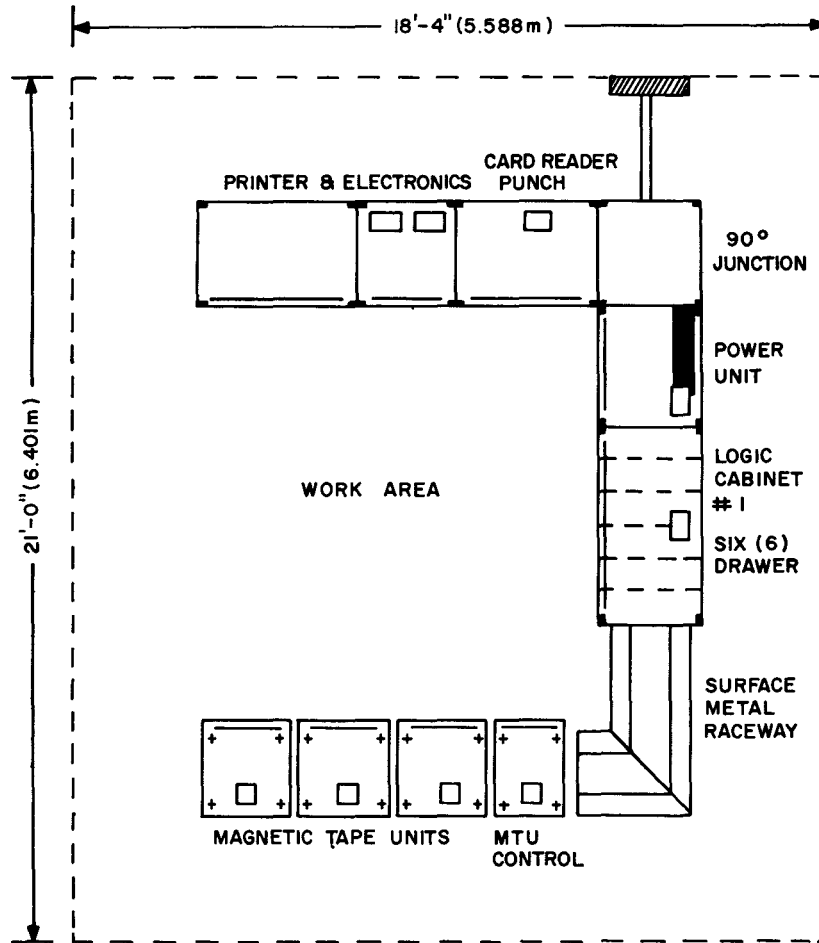


Figure 3-1. Interior of a Four-Drawer Logic Cabinet



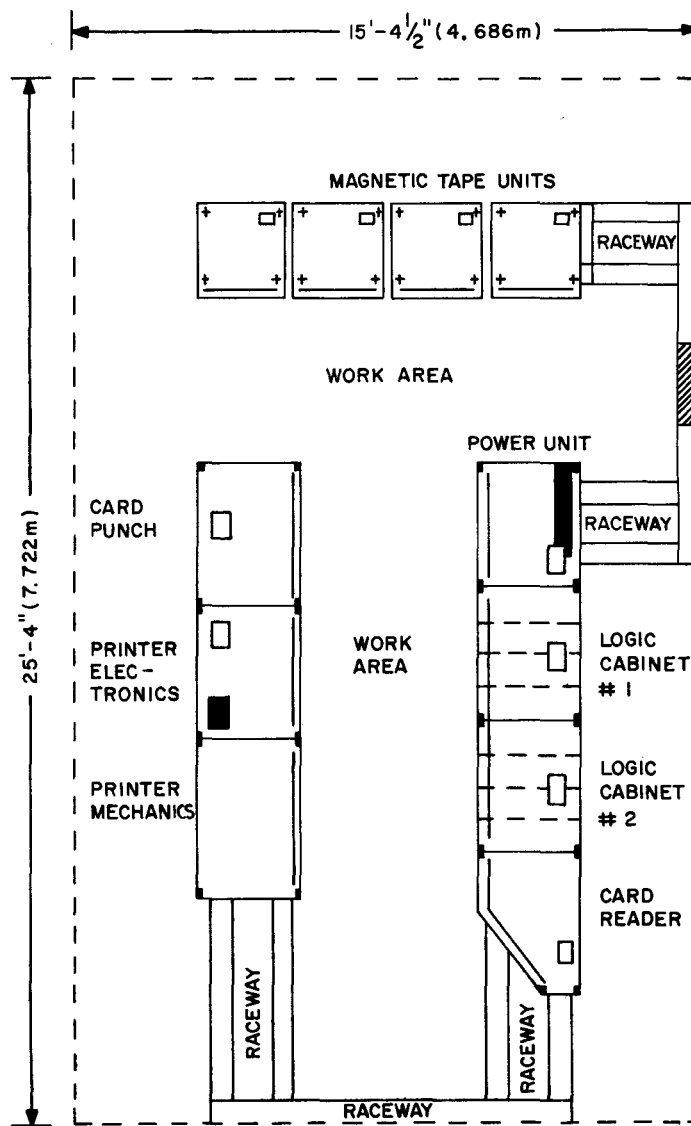
LEGEND

- FRONT OF UNIT
- FLOOR CUTOUT
- POST OR LEGS
- CASTERS
- CONTROL PANEL
- POWER PANELBOARD

Model 120 Equipment Characteristics

	Power KVA	Heat Gain BTU/Hr.	Total Area Sq. Ft.	Weight Lbs.
SYSTEM TOTALS:	13.79	37,713	385	6,225
30% GROWTH FACTOR:	4.14	11,314	115	1,868
RECOMMENDED TOTALS:	17.39	49,027	500	8,093

Figure 3-2. Model 120 Basic Layout



LEGEND

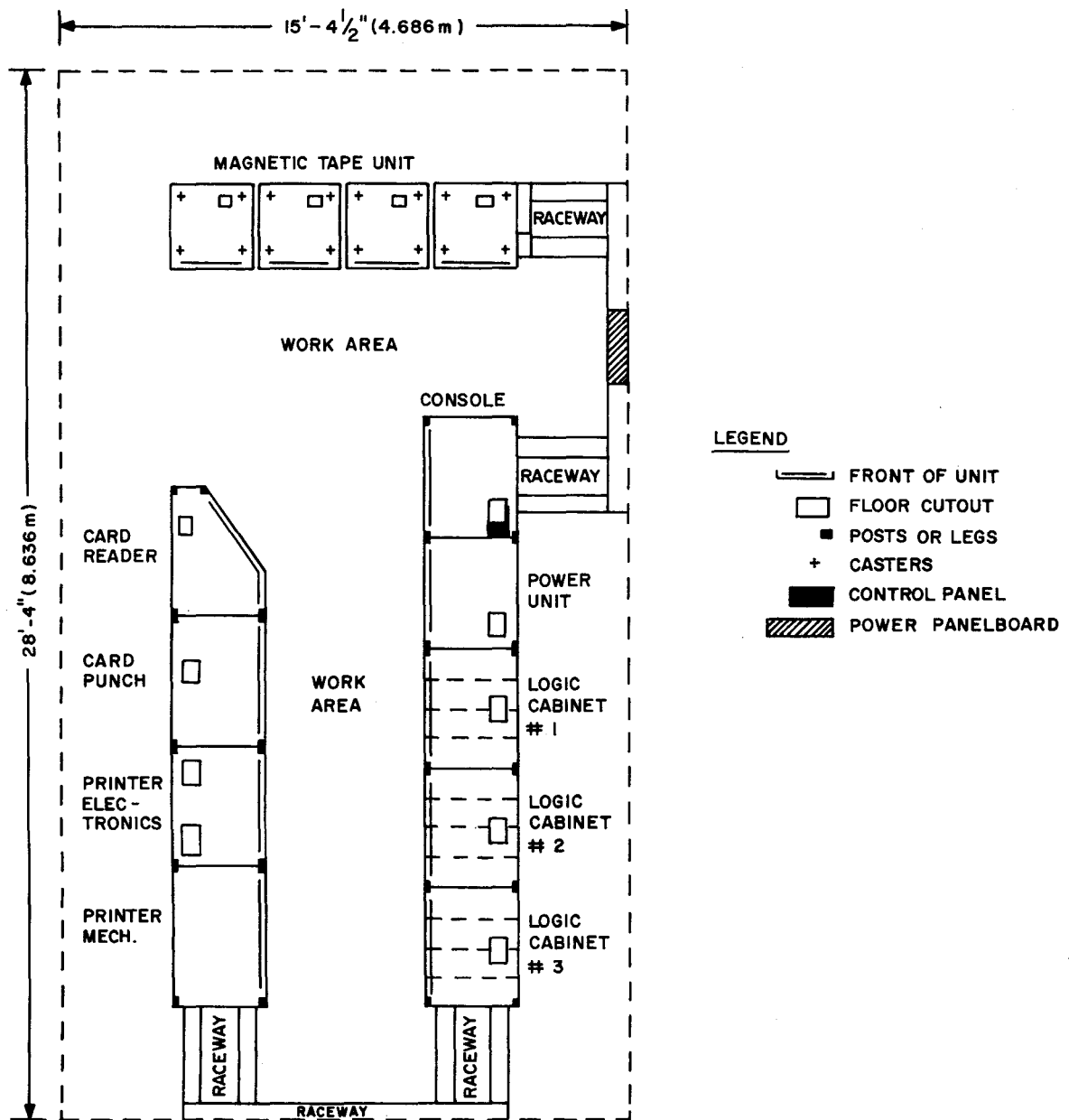
- FRONT OF UNIT
- FLOOR CUTOUT
- POSTS OR LEGS
- CASTERS
- CONTROL PANEL
- POWER PANELBOARD

Model 200

Equipment Characteristics

	Power KVA	Heat Gain BTU/Hr.	Total Area Sq. Ft.	Weight Lbs.
SYSTEM TOTALS:	17.93	48,496	390	7,435
30% GROWTH FACTOR:	5.38	14,548	117	2,230
RECOMMENDED TOTALS:	23.31	73,044	507	9,665

Figure 3-3. Model 200 Basic Layout



Model 1200 Equipment Characteristics

	Power KVA	Heat Gain BTU/Hr.	Total Area Sq. Ft.	Weight Lbs.
SYSTEM TOTALS:	19.63	53,301	435	8,105
30% GROWTH FACTOR:	5.89	15,990	130	2,431
RECOMMENDED TOTALS:	25.52	69,291	565	10,536

Figure 3-4. Model 1200 Basic Layout

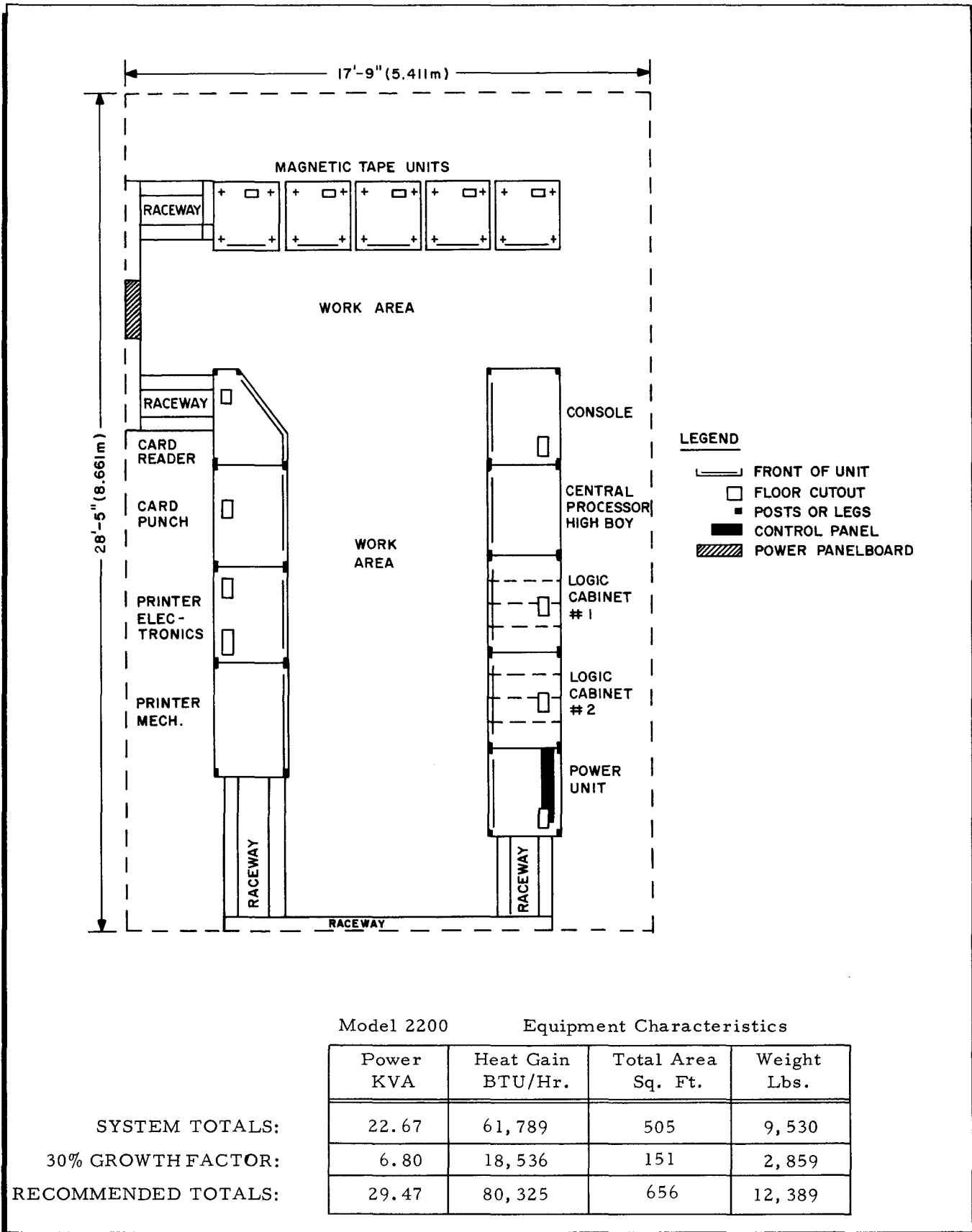
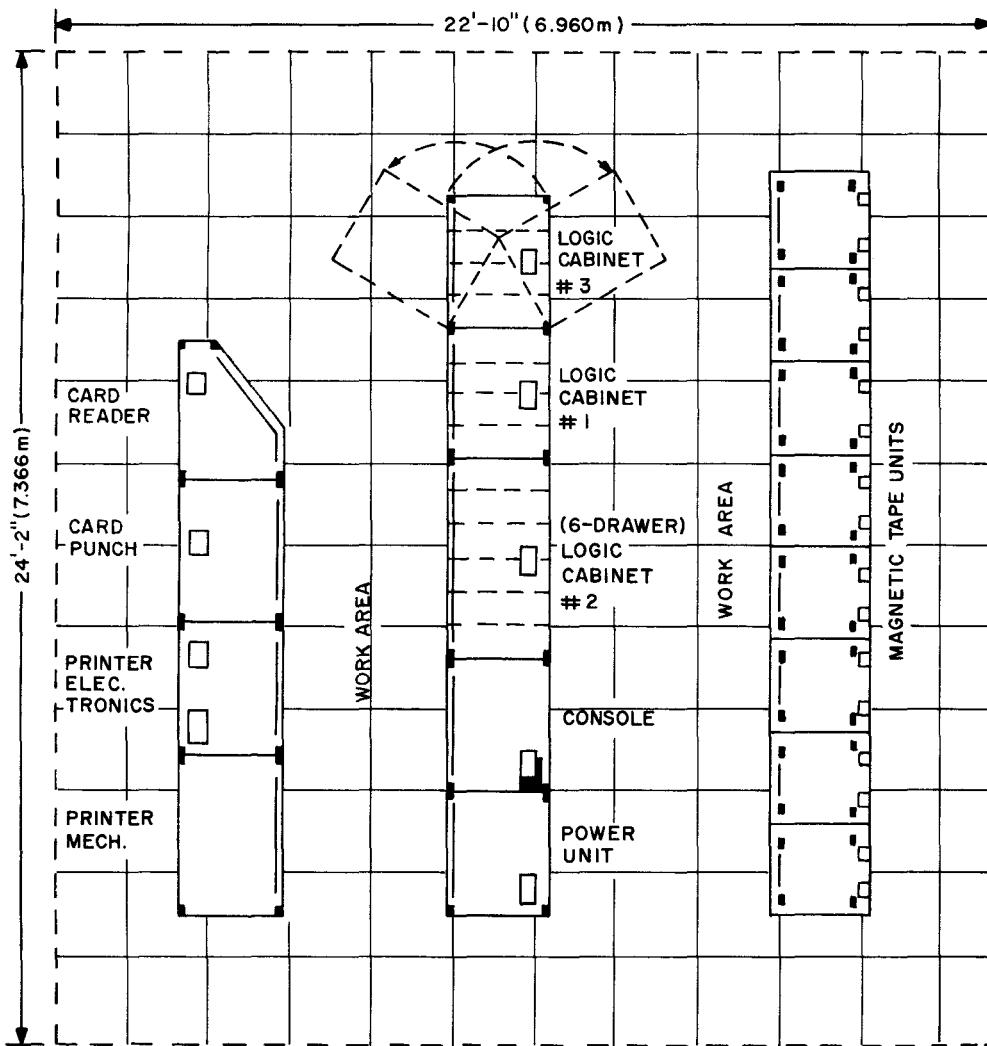


Figure 3-5. Model 2200 Basic Layout



LEGEND

- FRONT OF UNIT
- FLOOR CUTOUT
- POST OR LEGS
- CONTROL PANEL
- ▨ POWER PANEL BOARD
- ⊞ RAISED FLOOR PANELS (2' X 2' - .61m X .61m)

Model 4200 Equipment Characteristics

	Power KVA	Heat Gain BTU/Hr.	Total Area Sq. Ft.	Weight Lbs.
SYSTEM TOTALS:	35.67	94,431	552	13,455
30% GROWTH FACTOR:	10.70	28,329	166	4,036
RECOMMENDED TOTALS:	46.37	122,760	718	17,491

Figure 3-6. Model 4200 Basic Layout

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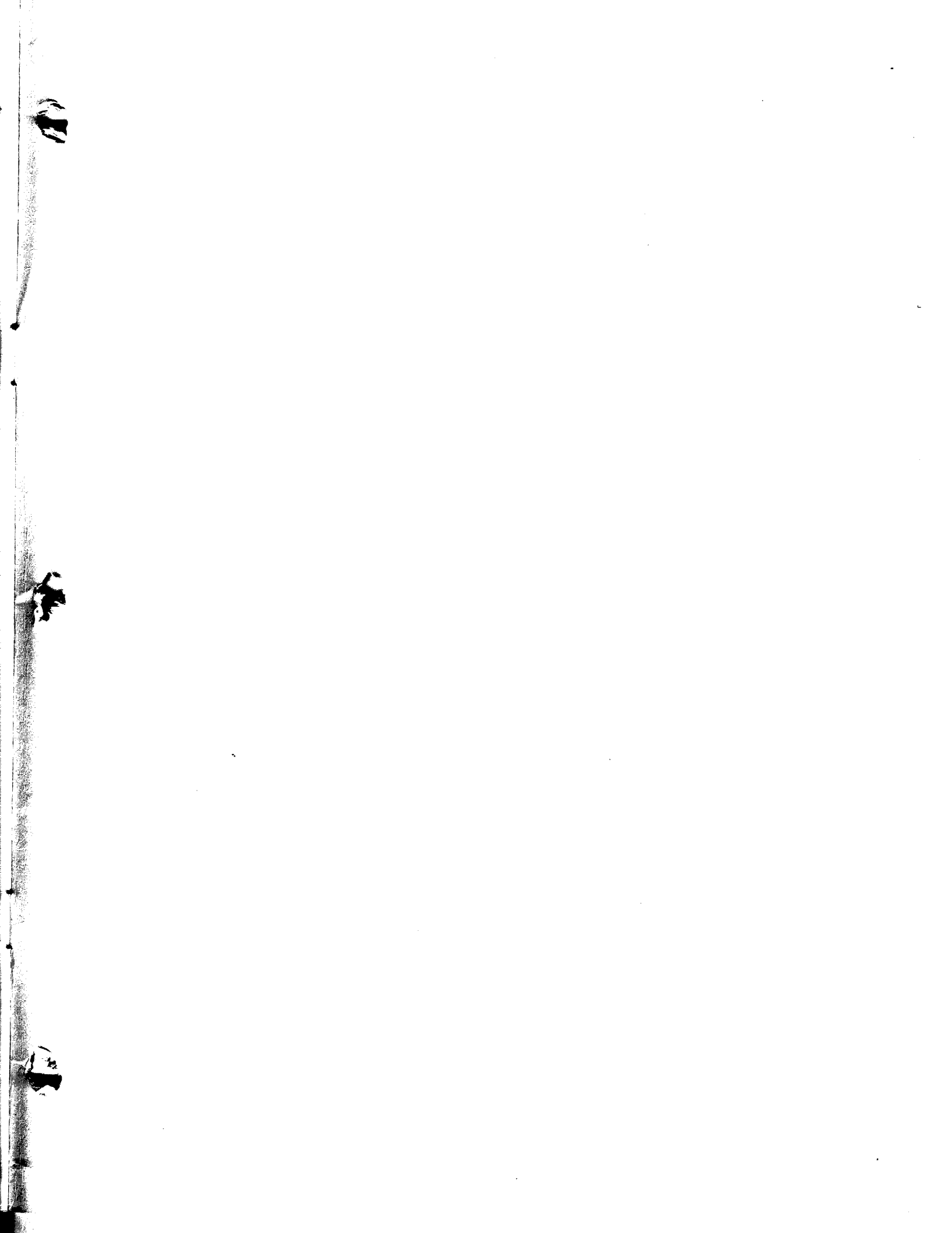
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