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# IBM System/360 Installation Manual – Physical Planning

## Preface

This manual contains information necessary for planning the physical installation of the IBM System/360. It includes floor planning information, as well as electrical, environmental, and structural requirements. Detailed cable charts are also provided. In addition, the manual contains suggestions for planning an efficient and a pleasant installation.

The customer, in planning his installation, should make such arrangements as he deems necessary for the services of professional consultants. The installation must meet local and national code requirements.

The physical planning requirements of the system are subject to modification by engineering developments.

**Machine specifications in this manual are for those units unique to IBM System/360. For information pertaining to machines used on both IBM System/360 and System/370, refer to *IBM System/370 Installation Manual–Physical Planning*, GC22-7004.**

*Thirteenth Edition* (February 1974)
This is a major revision of GC22-6820-11, making it obsolete. In addition Technical Newsletter GN22-0441 has been incorporated in the base manual, making it obsolete. Because significant changes have been made throughout the manual, it should be reviewed in its entirety. Information pertinent to IBM System/360 system models and those machines that can be used *only* on System/360 is included in this manual. Before using this publication in connection with the installation and operation of IBM equipment, refer to the *IBM System/360 and System/370 Bibliography*, GA22-6822, for editions that are applicable and current.

Requests for copies of IBM publications should be made to your IBM representative or to the IBM branch office serving your locality.

This manual has been prepared by the IBM System Products Division, Product Publications, Dept. B98, PO Box 390, Poughkeepsie, N.Y. 12602. A form for readers' comments is provided at the back of this publication. If the form has been removed, comments may be sent to the above address. Comments become the property of IBM.

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The successful installation of a data processing system requires long-range planning and continuous supervision to ensure that the plans are followed. The customer assumes the responsibility of providing suitable space and facilities for the IBM system. IBM Installation Planning representatives are available for consultation in planning physical requirements of the installation.

Depending on the size of the system, the customer may establish a preinstallation consulting and service group that includes IBM representatives, accounting firms, engineering consultants, and other outside consultants. This group will consult with and advise the customer's data processing manager (or executive committee) on the course of action, objectives, and progress of the installation. The manager (or executive committee) will be in charge of the overall operation and will coordinate the physical planning with the procedures and general planning. When the actual order for the system is closed, most of the preliminary methods and procedures planning will have been completed because such planning often forms the basis for the detailed machine order. The customer's planning and programming staff will prepare a list of the actual components to be used in the installation. This list should include the system's components, other equipment or furniture, tape storage cabinets, worktables, chairs, and desks.

The customer must decide on a suitable location for the computer area. Suitable facilities for installation may exist in some customers' offices; while in others, minor or major changes to existing space will provide a suitable location. In other instances, the customer may desire a complete new building. The operation should follow a planned schedule so that the machine room will be ready when the system is delivered.

## SCHEDULE

Because each data processing system installation will differ in some respects from every other installation, it is not possible to provide a detailed schedule in this type of manual. However, the following suggested schedule should be adhered to as closely as possible:

**Twelve months** before system delivery:

1. Determine the machine components desired and review the order.
2. Read this Installation Manual–Physical Planning.
3. Determine the prospective location of the system. Make a preliminary layout of the proposed installation.
4. Request a visit by the IBM Installation Planning representative to discuss with the customer's planning staff and consulting group all phases of the proposed installation. The discussion should include: size of the proposed room, physical layout of the equipment, floor loadings, use of raised floors, electrical power and air conditioning requirements, and communications facilities (when required).
5. Advise IBM of security or other restrictions, and advise of any unusual housing requirements as a result of these restrictions.
6. The customer should study local delivery quotations on power, air conditioning, customer-supplied cable, and other equipment to determine when each item must be ordered.

**Six months** before system delivery, the air conditioning and power equipment requirements, and delivery and installation schedule should be reviewed.

**Four months** before system delivery, the final layout should be made and approved by the customer, Branch Manager, and Field Engineering Manager so that all cables can be ordered. The cable order will be prepared from the final layout by the IBM representative. *This is a critical point in the schedule.* After these cables are ordered, no changes should be made in the layout that will affect cable lengths. See "Cables Supplied."

A System/360 Model 85 or 195 customer should decide when he would prefer to have the 415-Hz motor generator delivered to the site for installation by his electricians. The motor generator may be delivered up to two months prior to delivery of the system so that all the fixed wiring is complete by system installation time.

**One month** before system delivery, a survey must be made by local IBM representatives to determine specific requirements for moving the machine components from the delivery platform to the machine room. The IBM Branch Office will notify the IBM plants of any special shipping instructions that are required to facilitate delivery within the customer's facilities.

**Two weeks** before system delivery:

1. Cables will be delivered to the machine room. It is the customer's responsibility to have the cables set in place by personnel of his selection. It is IBM's preference and practice, under normal circumstances, to set the cables in place at the customer's request. If other personnel are selected, IBM will supervise such work. It is IBM's responsibility to connect interconnecting cables to IBM components. Field Engineering furniture and equipment will be delivered.
2. If components are on order and scheduled to be shipped within three months of the original system, their cables may be included on the original cable order. In this case, they will be shipped with the system cables.

Components scheduled to be shipped later than three months after the original system require a separate cable order. These cables will be shipped to coincide with arrival of the individual units.

**One week** before system delivery, *all air conditioning equipment should be installed, tested, and ready for operation.* Electrical facilities, lighting, floor ramps, painting, plastering, and decorating should also be completed at this time. This includes the customer's electrical wiring of the motor generator to the system power distribution unit (PDU location), and necessary communications lines, data sets, etc.

Balancing of the air conditioning system and the water cooling system should be made as soon as possible after the machines have been completely installed.

## Building Requirements

An Installation Planning representative is available to assist in selecting a suitable area. If the installation of the system requires a new building design, or if the existing space is to be altered radically, a suggested machine layout should be made prior to any building planning.

In selecting a location for the computer installation, consideration should be given to the following:

1. Availability and location of proper and adequate power (including standby power where required).
2. Space to house air conditioning equipment (compressor and air handling location and placement of cooling tower or evaporative condenser).
3. Ceiling height, outside wall area, and glass area, because these factors will affect the ease of air conditioning the area, and maintaining the required humidity.
4. Work flow to other areas such as accounting department, etc.
5. Floor loading capacity.
6. Proper safety and fire prevention procedures.

### SPACE AND LAYOUT REQUIREMENTS

Space and layout requirements will differ for each system and depend on the customer's intended applications as well as the physical area available. A few general rules can be given.

The floor area required for the system will be determined by the specific components to be installed: length-to-width ratio of the room, location of columns, provision for future expansion, etc. To determine the exact area required for a specific group of components, a machine layout should be made using measurements of room under consideration.

Space should be provided for the daily storage of tape, cards, printed forms, etc., within the computer room. As provided by the National Fire Protection Association Standard, all other combustible materials such as permanent master documents, punched card records, magnetic tape, etc., should be stored in properly designed and protected storage areas. See NFPA* Standard No. 75, Sections 300 and 600, and "Safety and Fire Precautions" in this manual. Consideration should be given in locating storage areas to minimize both the amount of space required and the travel time between areas.

Space must also be planned for printer forms, carriers, storage cabinets, card and record files, worktables, desks, communications facilities, etc.

The integration of the computer work area with that of other associated areas and with storage areas should be considered. The work flow from other areas such as punched card equipment to and from the system should be considered when aisles and intermediate storage locations are planned. The CPU or other control consoles should not be placed directly on main aisles or in traffic centers.

At the option of IBM, test equipment may be assigned to the installation to maintain the equipment in the machine room. Some machines may be moved to the test area, depending on the type of work to be done. These areas should be, whenever possible, on the same floor level. If they are not, ramps should be provided for moving test equipment and machine components. See "CE Room and Test Area" for detailed requirements.

### SYSTEM LAYOUT

Before attempting to make a layout, it will be necessary to assign priority to the system channels and to the control units to be attached to the channels. The method for making these assignments is described under "Priority." The IBM Branch Office will provide necessary assistance.

Operational requirements should determine the specific location of the various components in the machine room. However, because the separate components are connected by cables of restricted length, and because of space limitations, priority, and the necessity for maintaining clearances between machines for servicing, work space, and aisles, the customer may need to prepare and analyze several tentative layouts before deciding on the final one.

Because each customer has different requirements such as room size, column spacing, a combination of machine components, and a procedure for using auxiliary input/output units, each installation should be considered individually to determine the best arrangement.

The customer should prepare a layout of the system with the advice of the salesman and Installation Planning representative. This layout must be finalized and approved by the customer prior to the ordering of the system cables. It is the responsibility of each IBM Branch Office to ensure that cables are ordered on schedule. The Installation Planning representatives are available for assistance in this ordering.

To make a layout, it is necessary to have an accurate drawing of the proposed area. Plastic templates, scaled at ¼ inch to 1 foot, will be available from IBM. See Appendix D

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60 Batterymarch Street
Boston, Massachusetts 02110

for order (form) numbers. Note that the plan views printed in this manual may not be scaled at ¼ inch to 1 foot. The templates show the clearances required to allow working room for the customer's operator and for the customer engineer to service the unit. Space is included for test or servicing equipment. The swinging radii of the component gates and machine covers and the caster and cable hole locations are shown. If the area layout is to scale, these templates may be used to position the machine equipment on the area drawing; in some cases, clearances shown on the templates may be overlapped as long as the larger clearance is maintained. The gate swing of an auxiliary unit must not interfere with the gate swing of its corresponding control unit.

Systems and machines must be located so that the length of connecting cables will not exceed maximum limits. These limits vary for each type of machine, and charts showing the limits are in Sections 2 and 3 of this manual.

To make a layout and order cables, it is necessary to consider the following information pertaining to the system configuration:

1. Control units to be assigned to each channel.
2. Channel sequence or priority.
3. Features on all units.
4. Physical and logical sequence of control units on each channel.
5. Number of input/output units or features attached to each control unit.

The priority sequence of units on each channel should be established by the customer to fit his application.

The final layout must be reviewed to ensure that cable limitations have not been violated and that proper clearances have been maintained. Copies of this layout must accompany the cable order.

After the cables have been ordered, any changes in the final layout that affect cable lengths must be accompanied by an RPQ (Request for Price Quotation).

When preparing a layout for a system, the following additional points should be considered:

1. There should be visual access between a control unit and at least one of its associated input/output devices.
2. There should be visual access between a channel (CPU on the smaller systems) and one of the attached control units, also, between a channel and the system console.

Significant servicing advantages can be realized by keeping the physical distances as short as practical to permit the CE test panels to be visible and recognizable between the units mentioned in items 1 and 2.

3. High-intensity lighting—over 50 footcandles (540 lumens/m$^2$)—should be avoided in areas where display devices are to be used.
4. When a unit requires external cables that must be purchased by the customer and installed through walls and/or floors, the purchase of this cable and the arrangements for its installation should be made with sufficient lead time to permit the cable facilities to be available to the computer system at installation time. This pertains to units such as the IBM 2260 Display Station, the IBM 3270 Information Display System, and the IBM 3705 Communications Controller.
5. Where teleprocessing equipment requiring common-carrier facilities is to be installed, arrangement for these facilities should be made in advance to permit these facilities to be available at the time of installation of the computer equipment. The IBM teleprocessing representative should be consulted regarding systems carrier requirements. See *IBM Planning and Installation of a Data Communications System Using IBM Line Adapters*, GA24-3435, for additional information.
6. The front of the IBM 2816 Switching Unit has a switch and display panel that requires periodic manual operations and should be accessible to and visible from the operator's position.
7. When an IBM machine without built-in convenience outlets is located remote from the computer room, power must be available adjacent to the unit for soldering irons, test equipment, and so forth.

## FLOOR CONSTRUCTION

The weight of each unit is listed on its specifications page. A structural engineer should be consulted to determine whether the floor is capable of supporting the system weight load as oriented on your layout.

IBM considers the following factors in determining floor loading:

1. If more than three machines are placed side by side, no allowance can be taken for side clearance at the ends of the machines.
2. Regardless of the actual service clearances required, clearances used in floor loading computations cannot be more than 30 inches (76 cm) in any direction from the machine.
3. Twenty pounds per square foot (98 kg/m$^2$) of service area used in calculation must be applied as live-load in floor loading computations.
4. If a false or raised floor is used, 10 pounds per square foot (49 kg/m$^2$) of total area used in calculation must be applied as false floor load in the floor loading computation.
5. The weight of cables has been considered as part of the machine weight.
6. Most office building floors rated at 50 pounds per square foot (250 kg/m$^2$) have an additional allowance of 20 to 25 pounds per square foot (98 to 130 kg/m$^2$) for partitions. The local building department should be contacted in reference to using this partition allowance in determining the floor loading capacity.

A raised floor will accomplish the following major objectives:

1. Allow for future layout change with minimum reconstruction cost.
2. Protect the interconnecting cables and power receptacles.
3. Provide personnel safety.
4. Permit the space between the two floors to be used to supply air to the equipment and/or area.

A raised floor can be constructed of steel, aluminum, or fire-resistant wood. The free-access type floor is preferred rather than the raceway type. The two general floor types are shown in Figure 1-1.

*IBM recommends:*

1. No metal should be exposed to the walking surface where a metallic raised floor structure is used. Such exposure is considered an electrical safety hazard and can also cause static discharge problems.
2. The raised floor height should be 12 inches (31 cm).
3. Minimum clearance must be adequate to accommodate IBM cables, chilled water piping, power distribution, etc., but should not be less than 4½ inches (11 cm) to allow for passage of cables and connectors.
4. When a raised floor panel is cut for cable entry, air register, etc., additional panel support may be required to restore the structural integrity of the panel.
5. Protective covering should be used to prevent damage to floor tiles, carpeting, and panels while equipment is being moved into or relocated within the installation.
6. Eliminate sharp edges on all floor cutouts where cables and hoses pass through these openings.

*Floor covering material* can contribute to the buildup of high static electrical charges as a result of the motion of people, carts, furniture, etc., in contact with the floor material. Abrupt discharge of these static charges to metallic surfaces or to other people cause discomfort to personnel and may cause malfunction of electronic equipment.

This static buildup and discharge can be minimized by:

1. Providing a conductive path to ground from metallic raised floor structure including the metal panels.
2. Ensuring that maximum resistance for floor surface material is 2 x $10^{10}$ ohms, measured between floor surface and building (or applicable ground reference). The procedure outlined in NFPA No. 56A, Chapter 25, Section 2522, should be used. Details of this procedure can be obtained from the IBM Installation Planning representative, if necessary. Floor material with a lower resistance will further decrease static buildup and discharge. The floor covering shall provide a resistance of not less than 150 kilohms when measured, from any point on the floor, by the methods described in NFPA 56A.

*Note:* Special attention must be given to floor panels constructed of metal facings and nonconductive core to ensure that the resistance requirements are met.

3. Maintaining the room humidity within control limits of design criteria as defined under "Temperature and Humidity Design Criteria" in this manual.

If carpet floor coverings are used, they should be of the variety marketed by carpet manufacturers as "antistatic." Two types are generally available: those with the antistatic properties manufactured into the material and those treated later with antistatic agents. Materials, depending on additives, may have short effective antistatic life without frequent retreatment of the carpet. Maintenance of all antistatic floor coverings (carpet, tile, etc.) should be in agreement with the individual supplier's recommendations.

Vacuuming equipment used in the machine area should have a nonconductive hose and nozzle assembly. This safety precaution minimizes any possibility of static discharge or electrical shock.

## FURNITURE

Furniture can provide a potential source of high static charge. Precautions should be taken to ensure that seat covers, etc., are made of materials resistant to static buildup. Many plastics will permit the buildup of high static charges. Cloth-covered chairs are normally less susceptible to generating static charges. Rubber or other insulating type of feet for equipment should be avoided. If casters, ball bearings, etc., are used, they should be lubricated with a graphite or other conductive grease. Rubber tread casters, wheels, etc., should contain conductive material.

The resistance of furniture hardware which touches the floor (such as casters, feet, etc.) should be below $10^9$ ohms from metal in the furniture frame to a metal test surface on which the unloaded furniture sample is placed.

## ACOUSTICAL TREATMENT OF COMPUTER ROOM

The entire field of noise reduction is complex. Acoustical treatment of the computer room is recommended to provide for more efficient and comfortable operation. Proper design of acoustic treatment of a computer room may require the services of an acoustical specialist.

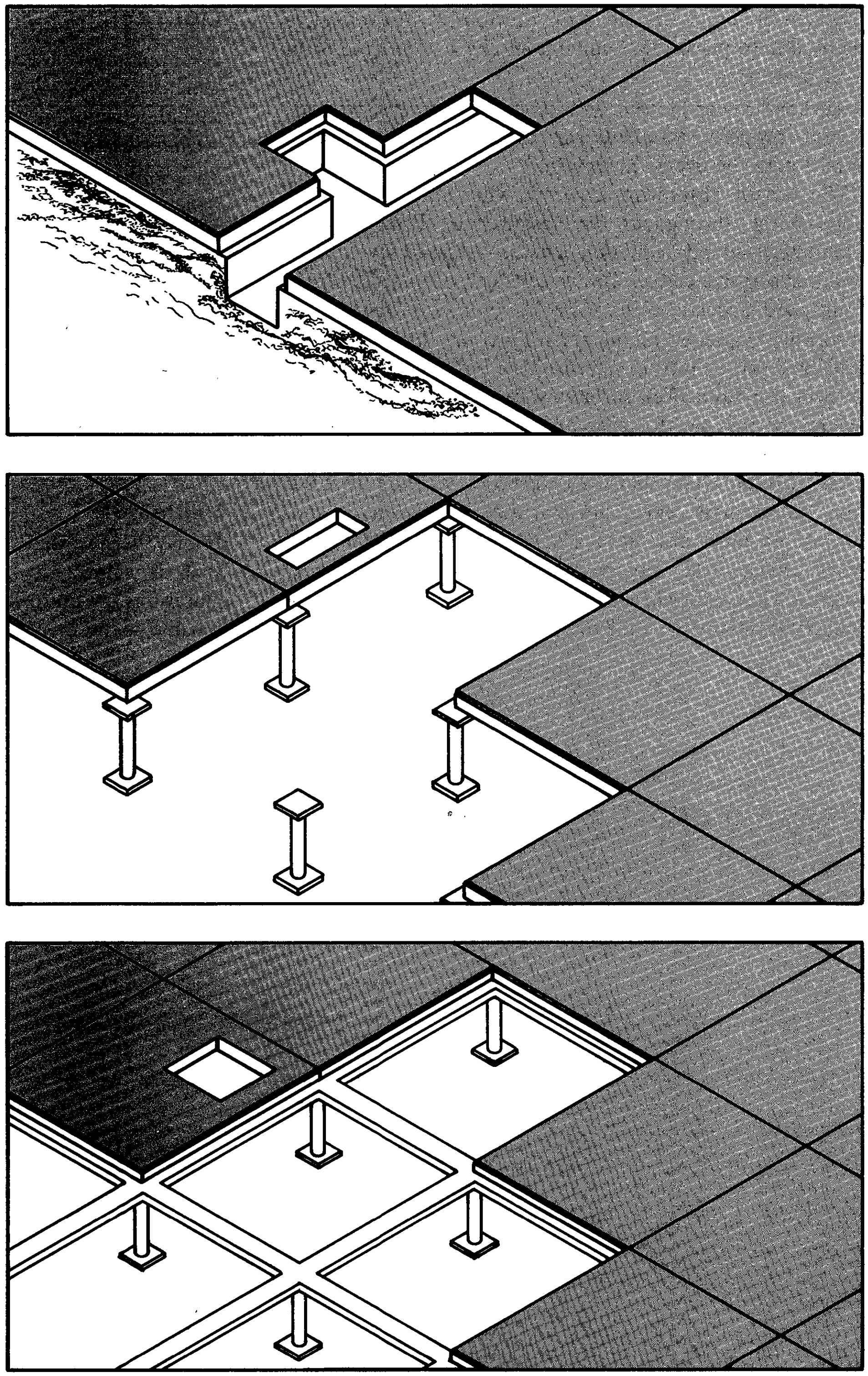
The total environmental noise level of a computer room is affected by all the noise sources in the room, the physical arrangement of the noise sources, and the sound reflective (or absorptive) characteristics of the room surfaces.

The noise level in an installation may be reduced by proper spacing and orientation of the various pieces of noise-emitting equipment. The principal noise sources of the system are the mechanical units such as card punch machines, printers, readers, sorters, and tape drives. Sufficient space should be provided around such units—the farther apart they can be placed the lower the overall room noise will be. When possible, place the noisier machines so that operators are not constantly working between them. Consider placing the quieter electronic units between the

Raceway Floor:
Covers Removable
Cutouts in Covers

Free-Access Floor:
Pedestal Supported Panels
Panels Removable
Cutouts in Panels

Free-Access Floor:
Subframing Supported Panels
Panels Removable
Cutouts in Panels



*Note:* A raised-floor-panel lifter should be made readily available in the computer room at a convenient location.

Figure 1-1. Types of Raised Flooring

mechanical units referred to previously. An effective method is to place these units at an angle to an aisle or an open work area.

Air conditioner blowers and other external noise sources, if not properly installed, can make a substantial contribution to the overall noise level.

The use of absorptive materials will reduce the overall noise level throughout an installation. Effective and economical sound reduction can be achieved by using a sound-absorptive ceiling. Best results can be expected from a dropped acoustic ceiling. For large rooms, the use of absorptive material (conductive rugs) on the floor will usually result in further significant reduction of the sound level in the room. Wall surfaces should be made absorptive wherever possible to prevent reflection of sound. To prevent computer room noise from reaching adjacent office areas, it is important that the walls be constructed from the floor to the base ceiling and that they be properly sealed. The doors must also have a good seal. If overhead duct work exists, noise may be transmitted to or from other rooms. The transmission of noise may be reduced by acoustical treatment of the ducts.

## LIGHTING

A minimum illumination of 50 footcandles (540 lumens/$m^2$), measured 30 inches (76 cm) above the floor, should be maintained in the machine room area.

Direct sunlight should be avoided, because lower levels of illumination are needed to observe the various console and signal lamps. Also, direct sunlight may cause devices that employ light sensing (such as certain magnetic tape units) to malfunction. The lights for general illumination should be sectionally controlled by switches so that a portion of the lighting can be turned off as desired. Lights should not be powered from the computer power panel. See "Power Distribution System" for details.

Provisions should be made for emergency lighting. See "Supporting Facilities" under "Safety and Fire Precautions."

## VIBRATION

It may be necessary to install the System/360 in an area that is subject to minor vibrations. The intensity of vibrations in an office environment will not affect the reliable operation of the System/360.

## Air Conditioning

The components of the machines are internally cooled by air circulated by blowers in most units. The air intake varies slightly from one unit to another, but generally is through the bottom and also through louvers along the bottom edge. One-inch (25,4-mm) dust filters are included at each air input. Warm air usually exhausts from the top of each unit.

To determine the air conditioning capacity necessary for an installation, the following factors must be considered:

Machine heat dissipation
Personnel
Latent load
Fresh air introduction
Infiltration of heat through outer walls
Ceiling
Floors
Door openings
Partitions
Glass wall area
Possible reheat

A separate air conditioning system is recommended for a data processing installation. Because of the amount of heat dissipated while this machine is in operation, it is necessary for the air conditioning system to maintain a cooling cycle year-round.

Machine heat dissipation loads are given on the specification page for each machine.

The air conditioning units should not be powered from the computer room power panel. The feeder for the air conditioning system and for the computer room power panel should not be in the same conduit.

### TEMPERATURE AND HUMIDITY DESIGN CRITERIA

The air conditioning system should be designed to operate at 75°F (24°C) and 50% relative humidity at altitudes up to 7,000 feet (2.150m). This design point provides for the largest buffer in terms of available system time. If the air conditioning system fails or malfunctions, the computer will be able to operate until it reaches its specified limits. This increases the possibility of effecting air conditioning repairs before the computer must be shut down. The design point has also been proven to be a generally acceptable personal comfort level.

In certain geographical areas, a design point of 50% relative humidity is not practical and a value of 45% should be used.

Air conditioning control instruments that respond to ±2°F (±1°C) and ±5% relative humidity should be installed.

Substantial deviations from the recommended design point in either direction, if maintained for long periods, will expose the system to malfunction from external conditions. High relative humidity levels may cause improper feeding of cards and paper, as well as operator discomfort and condensation on windows and walls when outside temperatures fall below room dew point. Low relative humidity levels alone will not cause static discharge. However, in combination with certain types of floor construction, floor coverings, furniture, etc., static charges which are generated by movement of people, carts, furniture, paper, etc., will be more readily stored on one or more of the objects. These charges may be high enough if discharged by contact with another person or object to be quite objectionable to operating personnel; and if discharged to or near data processing or other electronic equipment, these charges can cause intermittent interference.

Because deviations of only a few hours will permit the floors, desks, furniture, cards, tape, and paper to reach a condition that will readily permit the retention of a charge, it is recommended that the air conditioning system be automatically controlled and provided with a high/low alarm or a continuously recording device with the appropriate limits marked. In most areas, it will be necessary to add moisture to the room air to meet the design criteria.

### MACHINE OPERATING LIMITS

Some individual machines may require special consideration and have more or less restrictive requirements. See machine specification page for individual requirements.

| | *Machine Operating* | *Machine Nonoperating* | *Design Criteria* |
|---|---|---|---|
| Temperature | 60° to 90°F (16° to 32°C) | 50° to 110°F (10° to 43°C) | 75°F (24°C) |
| Relative Humidity | 20% to 80% | 8% to 80% | 50% |
| Max Wet Bulb | 78°F (26°C) | 80°F (27°C) | — |

*The air entering the machine must be at the conditions for machine operation before power is turned on.*

Under no condition of operation may the machine input air and room air exceed 90°F (32°C). *This is a maximum operating temperature limit and should not be considered a design condition.*

When conditioned air is supplied to the base of any unit by a duct or underfloor air supply, the relative humidity of the air entering a machine unit should not be greater than 80%. This specification is an absolute maximum. Air temperature in this duct or underfloor air supply should be kept above room dew point temperature to prevent condensation within or on the machines. When it is necessary to add moisture to the system for control of low relative humidity, one of the following methods should be used:

1. Steam grid or jets.
2. Steam cup.
3. Water atomizers.

Water treatment may be necessary in areas with high mineral content in the water to avoid contamination of the air.

*Note:* In localities where the outside temperature drops below freezing, condensation will form on single, glazed window panes. Also, if outside temperatures are considerably below freezing, the outside walls of the building should be waterproofed or vapor sealed on the inside; or, in time, structural damage will occur in the outside walls.

## AIR FILTRATION

A high-efficiency filter, rated according to the following specifications, should be installed to filter all air supplied to the computer room.

Mechanical and electrostatic air cleaners operate on two different principles; therefore, it is necessary to specify a different efficiency rating for each type.

### Mechanical Air Filter

The mechanical air filter must be rated at a minimum of 20% efficiency by the Bureau of Standards discoloration test using atmospheric dust. This rating applies to a clean filter and must be maintained throughout the life of the filter.

### Electrostatic Plate Filter

The electrostatic plate filter must be rated at a minimum of 85 to 90% efficiency by the Bureau of Standards discoloration test using atmospheric dust. Electrostatic air cleaners are designed to operate at 85 to 90% efficiency at a given face velocity. As you increase the face velocity through an electrostatic filter, its efficiency decreases. Therefore, an electrostatic filter operated at increased face velocities or below 85% efficiency would allow a greater number of particles charged by the ionizing wires to pass through the plate section and to enter the room. This would increase what is known as space charge. As the space charge increases, a greater voltage differential occurs between the positive charged particles and the negative surfaces in the room. This causes dust to accumulate rapidly on all surfaces, defeating the purpose of a high-efficiency filter.

Special air filtration is necessary only where installations are exposed to corrosive gases, salt air, or unusual dirt or dust conditions.

## TEMPERATURE AND HUMIDITY RECORDING INSTRUMENTS

It is recommended that all customers install temperature and humidity recording instruments. Recording instruments are necessary to provide a continuous record of temperature and humidity conditions in the machine area. Also, if the air conditioning requirements are not met, a record is available to indicate the extent and duration of the undesirable condition and to indicate whether a drying-out period is required. This may, in some cases, save machine downtime.

The record of temperature and humidity can be used:

1. To assure the customer that his air conditioning installation is continuously performing its job. Installation errors and loss of efficiency because of malfunction of some part of the air conditioning system can be quickly detected.
2. To determine whether a mandatory drying-out period is necessary when humidity limitations are exceeded. The drying-out period may be necessary if the excess humidity occurs either during periods of actual machine operation or during periods when the machine is down and unattended. The extent and duration of the excess humidity determines the duration of the drying-out period.
3. To determine whether the environment in the area meets the requirements for the machine.

A visual or an audible signal device should be incorporated into the instrument. It provides a visual or an audible indication that the temperature or humidity conditions to the computer area are nearing the maximum limitations stated in this manual. Action can then be taken by the customer's personnel to correct this situation.

Direct-reading instruments with a seven-day, electric-drive chart should be used for all installations to monitor the ambient room conditions. The recorder should be at a representative location within the room and adjacent to the control devices.

For use in monitoring the underfloor air conditions, a remote indicating instrument is recommended. This should also have a seven-day, electric-drive chart and can be the wet and dry bulb or electronic type if direct reading is not available. The recording instrument can be on the wall in the room or in the mechanical equipment room or in any other location convenient to the building engineer.

## Air Distribution and Types of Systems

The heat load of the computer system is concentrated in a relatively small area. For this reason, careful attention should be given to the method of air distribution to eliminate areas of excessive air motion.

Several types of air conditioning systems can be designed to satisfy the temperature and humidity requirements. The following are the most common types of systems in use with a brief description of each. In no case should these descriptions be considered complete, and the use of an experienced air conditioning design engineer is strongly recommended. All local building codes should be checked, including the electrical code, as some localities will not permit the use of the raised floor for air conditioning as described in the following text.

The system should use predominantly recirculated air with a set minimum for introduction of fresh air for personnel. This minimum fresh air introduction will enable the machine area to be pressurized so that air leakage is always outward. This will help prevent dust entry from adjacent areas.

### SINGLE DUCT (OVERHEAD SYSTEM)

In this system, the entire heat load of the room, including the heat generated by the computer system, is absorbed by the air supplied to the machine room. The air is generally supplied from either an overhead duct and diffuser system or by a ceiling plenum.

The return air to the air conditioning unit is taken from either ceiling return registers above the heat-producing units, or a fixed pattern of returns both in the ceiling or on the walls around the periphery of the room.

The temperature control system would consist of temperature and humidity controls placed in a representative location within the machine room. A temperature and humidity recorder (previously described) would be mounted adjacent to the controls to monitor the room conditions.

### UNDERFLOOR SYSTEM

In this system, the space between the regular building floor and the raised floor is used as a supply plenum. All air is discharged into the room through floor registers around the perimeter of the area. The air is returned to the air conditioning unit by means of ceiling registers located directly above the machine units.

A higher return temperature can be used in this system without affecting the design conditions of the overall room. The design of this system takes into consideration a heat transfer factor through the metal floor. This affords a certain amount of reheat to control relative humidity of air before it enters the room.

The temperature control system would consist of the same controls as described for the single duct system. In addition, the system must have controls of air temperature in the underfloor supply system to prevent an uncomfortably cold floor. Air entering the machine through the cable holes must be within stated machine specifications.

### TWO DUCT (TWO AIR CONDITIONING UNIT SYSTEM)

One air handling unit with separate controls supplies conditioned and filtered air to the area under the raised floor. The air is discharged into the room through the floor panels or the registers. This air absorbs the heat generated by the machine and is discharged from the top of the units into the room. Relative humidity of the air supplied to the units should be maintained below 80% and temperatures should be controlled to prevent condensation on or within the units.

To ensure a controlled relative humidity, it will be necessary to provide for a reheat system to operate in conjunction with the cooling unit. This unit is basically a sensible cooling operation.

The second air handling unit supplies air directly to the room through a separate duct system and should be large enough to absorb the remaining heat load in the computer area. It should be capable of maintaining room temperature and relative humidity as specified in this manual and give complete year-round air conditioning, ventilation, and heating.

### TWO DUCT (SINGLE AIR CONDITIONING UNIT SYSTEM)

This system is similar to the preceding system except in one respect: This system uses only one air handling unit to supply both air circuits. The air is filtered and the temperature and humidity are regulated before air is supplied to the room and the underfloor area.

A split coil with reheat and/or face and bypass dampers can be used to regulate the air to be supplied to the underfloor area. Relative humidity of this air should be maintained below 80% and temperature should be controlled to prevent condensation on or within the units.

The temperature control system for the air being supplied to the overhead system would be the same as for the single duct system. In addition, a control system would have to be installed in the discharge duct to regulate the air supply to the underfloor system. The controls would operate either the separate cooling and reheat coils or the face and bypass dampers to maintain the required conditions. A remote reading temperature and humidity recorder should be installed with the sensing elements in the discharge air to the underfloor system to monitor the air entering the machine units.

## Power Requirements

The computer system can be supplied to operate on either a 208V or a 230V (not both), 3-phase (1-phase for some machines; see individual machine specification pages), 3-wire, 4-conductor, 60-Hz supply. The four conductors consist of three phase wires and one insulated equipment grounding conductor (green or green with yellow trace).

Total system power demand depends on the system configuration, as well as on the type of operation. A quick summary can be obtained by adding the kVA values as shown on the individual machine specification pages.

### VOLTAGE LIMITS

The line-to-line, steady-state voltage must be maintained within *plus 10% or minus 8%* of the normal rated voltage, measured at the receptacle, when the system is operating.

### FREQUENCY LIMITS

The line frequency must be maintained at *60 Hz plus or minus ½ Hz.*

### LINE-TO-LINE VOLTAGE IMBALANCE

The value of any of the three line-to-line equipment voltages in a three-phase system shall not differ by more than 2.5% from the arithmetic average of the three voltages. All three line-to-line voltages shall be within the limits specified under "Voltage Limits."

### HARMONIC CONTENT

The maximum total harmonic content of the power system voltage waveforms on the equipment feeder shall not exceed 5% with the equipment not operating.

## Power Distribution System

### PRIMARY COMPUTER POWER SERVICE

For maximum system reliability, the computer power panel should connect to feeders that serve *no other loads*. Transient-producing devices, such as accounting machines, card punch machines, typewriters, desk calculators, and so forth, should be connected to separate panels from those feeding the computer units to eliminate potential sources of noise interference to the computer system.

### BRANCH CIRCUITS

The computer branch circuit panel should be in an unobstructed, well-lighted area in the computer room.

The individual branch circuits on the panel should be protected by suitable circuit breakers properly de-rated according to manufacturer specifications and applicable codes. Each circuit breaker should be labeled to identify the branch circuit it is controlling.

The grounding wire of the branch circuit must be insulated and equal in size to the phase conductors.

Branch circuits should terminate under the raised floor as close as possible [within 10 feet (3,05m)] to the machine they supply. The branch circuits should be run in metallic conduit, either rigid or nonrigid. This conduit system should be continuous and uninterrupted from the receptacle to the building or transformer ground. See Figure 1-2 for further details.

Power cords are supplied in 14-foot (427-cm) lengths, unless otherwise noted on the specification page. The length is measured from the symbol ⊕ on the plan views. Power plugs furnished by IBM that can be located under the computer floor will be watertight. The customer-supplied receptacle should be watertight or nonwatertight and can be either an inline or a fixed type, depending on local code requirements.

*Note:* The service ratings for the branch circuit connections are given in the "Specification Summary," Appendix E or F.

## GROUNDING

All IBM units are provided with an equipment ground wire (green or green with yellow trace). At the branch circuit panel, the green wire ground from all units must be tied into one main grounding conductor. This equipment grounding wire must be carried back to service ground or suitable building ground. *This is a noncurrent-carrying ground, not a neutral.* Conduit must not be used as the only grounding means.

Wherever possible, the system's power panel shall be mounted in contact with bare building steel or connected to it by a short length of cable. Where this is not possible, a metal area (power panel plus conduit plus plate) of at least 10 square feet (0,93m$^2$) in contact with masonry shall be connected to the green-wire common. The connection shall not be more than 5 feet (152 cm) long and shall consist of #12 AWG [0.0051 square inches (3,3 mm$^2$)] or larger wire.

## PHASE ROTATION

The three-phase power receptacles for use with the system must be wired for correct phase rotation. Looking at the face of the receptacle, and running counterclockwise from the ground pin, the sequencing will be phase 1, phase 2, and phase 3. See Figure 1-2.

## EMERGENCY POWER-OFF CONTROLS

As a safety precaution, in addition to emergency power-off switches for individual components or other units of equipment, controls for the disconnecting provided as a part of the main service wiring supplying the electronic computer equipment shall be convenient to the operator. These controls should also be next to each exit door to readily disconnect power to all electronic equipment in the computer area and to the air conditioning system. Provision should be made for emergency lighting. See "Supporting Facilities" under "Safety and Fire Precautions" and notes on motor-generator specification pages.

## LIGHTNING PROTECTION

It is recommended that the customer install lightning protection on his secondary power source when:

1. Primary power is supplied by an overhead power service.
2. The utility company installs lightning protectors on the primary power source.
3. The area is subject to electrical storms or equivalent type power surges.

The determination as to whether lightning protection is desirable, the selection of the service protector needed, and its proper installation are to be made by the customer.

## CONVENIENCE OUTLETS

A suitable number of convenience outlets should be installed in the computer room and CE room for use by building maintenance personnel, porter service, customer engineers, etc. Convenience outlets should be on the lighting or other building circuits, *not on the computer power panel or feeder*. See "CE Room and Test Area" for details of requirements in that area.

Under no circumstances are the system convenience outlets on IBM units to be used for any purpose other than normal servicing.

## PRIMARY POWER PROBLEM AREAS

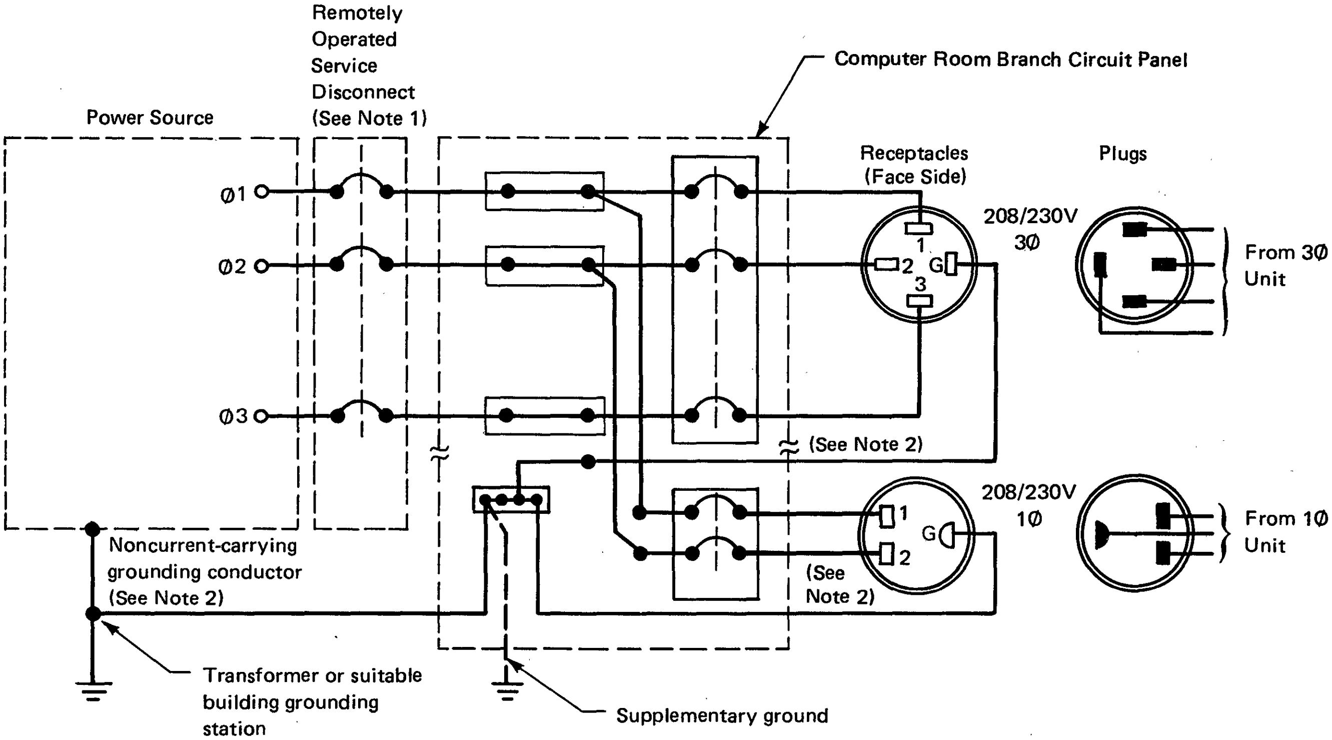
All reasonable efforts have been made in the machine design to ensure satisfactory operation from the normal power supplied by most power companies. There are, however, many outside variables over which neither your power company nor IBM has any control. To guard against possible computer malfunctions caused by outside (radiated or conducted) transient electrical noise signals being superimposed on the power supplying your computer, power distribution design should comply with the computer system requirements specified in this manual.

Failures caused by your power supply are basically of two types:

1. *Power Outages:* This includes short duration dips in voltage as well as prolonged outages. If the frequency of such power failures is not acceptable for your operation, it may be necessary to install static, rotary, or a combination of both types of standby power systems. The IBM Installation Planning representative will discuss your application requirement with you.

2. *Transient Electrical Noise Superimposed on Power Lines:* This type of problem may be caused by a wide variety of industrial, medical, communications, or other equipment in the vicinity of the power company's distribution lines, or within or adjacent to your facilities. Electromechanical equipment such as adding machines, card punch machines, etc., on the same power source as the computer, may, under certain conditions, cause intermittent electrical disturbances.

If transient-producing devices have been eliminated from the feeder and the computer room power panel and power line disturbances are still present, it may be necessary for the customer to install isolation equipment (for example, transformers, motor generators, and so forth).




*Notes:*

1. Remotely disengaged by an emergency device located near the console operator and next to the main exit door.
2. Ground wire (green or green with yellow trace).

Figure 1-2. Power Distribution System

## Safety and Fire Precautions

Safety is a vital factor in planning for a large computer installation. This consideration is reflected in the choice of a computer location, building materials used, fire prevention equipment, air conditioning and electrical systems, and personnel training.

### COMPUTER LOCATION

1. The computer area should be in a noncombustible or fire-resistive building or room.
2. The computer room should not be above, below, or adjacent to areas where inflammable or explosive materials or gases are stored, manufactured or processed. If the customer must locate near such an area, he should take precautions to safeguard the area.

### FIRE PREVENTION CONSIDERATIONS

1. Walls enclosing a computer area should be of noncombustible materials. These walls should extend from floor to ceiling. If walls are made of combustible material, they should be protected as prescribed by code.
2. If a computer area has one or more outside walls adjacent to a building that is susceptible to fire:
   a. Installation of shatterproof windows in the computer room would improve the safety of personnel and equipment from flying debris and water damage.
   b. Sprinklers could be installed externally over the windows to protect them with a blanket of water if a fire occurs in the adjacent area.
   c. Windows could be sealed with masonry.
3. Where a false (or hung) ceiling is to be added, it should be constructed of noncombustible or fire-resistant material. All ducts and insulating materials should be noncombustible and nondusting. If combustible materials are used in the space between the structural ceiling and the false ceiling, appropriate protection should be provided.
4. A raised floor, installed over the structural floor, should be constructed of noncombustible or fire-retardant materials. If the structural floor is of combustible material, it should be protected from the ceiling below, preferably by water sprinklers. (*Note:* Before the computer is installed, the space between the raised and the structural floors should be cleared of debris. Also, this space should be periodically checked after installation, to keep it free of accumulated dust and possible debris.)
5. The roof or floor above the computer and tape storage areas should be a watertight slab. If practical, the walls of the room should be sealed to the slab in such a manner as to prevent water entering from above.
6. Subfloor space should be provided with positive drainage.
7. When machines are connected to a system but are located in a different room from the CPU (or system EPO), a switch that is capable of disconnecting power to the machine(s) shall be provided in the remote location. Check with your IBM Installation Planning representative to determine whether the remote IBM units can provide this switch function or whether a wall switch is required.

### TYPE OF FIRE PREVENTION EQUIPMENT IN A COMPUTER AREA

1. An early-warning detection system should be installed to protect the computer and tape storage areas. This detection system should actuate an audible alarm.
2. Portable carbon dioxide fire extinguishers of suitable size [15 pounds (7 kg)] and number should be provided in the machine room. Carbon dioxide is a recommended nonwetting agent for electrical equipment (Class C Hazard). Extinguishers should be readily accessible to individuals in the area and extinguisher locations should be visibly marked overhead. Local codes govern the frequency of inspecting the cylinders.
3. Where portable carbon dioxide cylinders are used as the primary extinguishing agent, it is advisable to locate a standpipe or hose unit within effective range of the computer area as a secondary extinguishing agent or backup.
4. If the customer requires or prefers to have a room-flooding system installed, Halon 1301 (see NFPA No. 12A) can be considered on the basis of its excellent safety qualities.
5. In some cases, local codes and ordinances, or insurance regulations, require automatic water sprinklers. Pre-action sprinkler systems should be considered if they conform to such codes and ordinances. High temperatures actuate heat-sensitive devices, which open a control valve. This valve, located outside the room, admits water into the sprinkler piping before the sprinkler heads operate. This type of system minimizes the possibility of accidental discharge of water because of failure or mechanical breakage of the automatic sprinkler heads.

### DATA STORAGE

1. Any data stored in the computer room, whether in the form of magnetic tape, paper tape, cards, or paper forms, should be limited to the minimum needed for safe, efficient operation and should be enclosed in metal cabinets or fire-resistant containers.
2. For security purposes or for maintaining duplicates of master records, a separate storage room should be used. This room should be constructed of fire-resistant material and should contain the same type of fire prevention equipment as described in "Type of Fire Prevention Equipment in a Computer Area."

## SUPPORTING FACILITIES

### Air Conditioning Systems

1. In most installations, the computer area is controlled by a separate air conditioning system. In these cases, an emergency power-off switch should be placed in a convenient location, preferably near the console operator or next to the main exit door. Fusible-link dampers should be located at fire walls and at places as prescribed by local code.
2. Where the regular building air conditioning system is used, with supplemental units in the computer area, the supplemental units would then be handled as stated in item 1. The regular building air conditioning system should have an alarm in the regular building maintenance area to alert the maintenance personnel of an emergency. Air ducts serving other areas but passing through the computer room should contain fusible-link dampers at each wall of the computer room.
3. The air filters used as part of the air conditioning system should contain noncombustible or self-extinguishing material.

### Electrical Systems

1. The mainline breaker for the computer equipment should be remotely operated. The remote controls should be in a convenient location, preferably near the console operator and next to the main exit door. A light should be installed to indicate when power is on.
2. Some local codes require a special battery-operated lighting unit that will automatically illuminate an area if a power or lighting circuit failure occurs. These units are wired to and controlled by the lighting circuit. When not required by code, it is recommended that such lights be installed.
3. Watertight connectors should be used if they must be located where they may be exposed to excessive moisture. Proper drainage will guard against flooding or trapping water under the raised floor in the computer room. This is important in new buildings where the regular floor is recessed and the raised surface is on the level of the adjacent areas.
4. Where continuity of operation is essential, a standby power source should be installed.

## PREPLANNING TO CONTINUE OPERATION IN AN EMERGENCY

The continued operation of a customer's computer depends on information stored on cards, tapes, disks, drums, and so forth. Also, equipment must be available to process the information. Arrangements should be made for emergency use of other equipment and transportation of personnel, data, and supplies to a temporary location. Duplicate or master records should be maintained from which the necessary information can be taken to resume operation. These records should be stored in a remote area.

## GENERAL PRECAUTIONS AND PERSONNEL TRAINING

1. The computer room, air conditioning equipment room, and data storage room should be monitored during nonoperating hours.
2. Steampipes and waterpipes above the false ceiling should be inspected to guard against possible damage because of accidental breakage, leakage, or condensation.
3. Emergency exit doors should be located in the computer area. The number of doors depends on the size and location of the area.
4. Personnel should be trained in emergency measures such as:
   a. Method and sequence of shutting off all electrical power.
   b. Shutting off air conditioning system.
   c. Handling fire extinguishers in the approved manner.
   d. Operating a small-diameter fire hose.
   e. Evacuating records.
   f. Evacuating personnel.
   g. Calling fire company.
   h. First aid.

## ADDITIONAL REFERENCE MATERIAL

Consult NFPA Standard No. 75, "Protection of Electronic Computer/Data Processing Equipment."

## Storage of Tape, Disk Pack, Disk Cartridge, and Data Cell

Storage facilities for frequent or infrequent usage of magnetic tape should be maintained within the following limits:

*IBM Heavy-Duty Magnetic Tape*
Relative Humidity: 20% to 80%
Temperature: 40° to 90°F (4° to 32°C)

*Mylar* Tape–Long-Term Storage*
Relative Humidity: 20% to 80%
Temperature: 50° to 90°F (10° to 32°C)

Tape exposed to atmospheric conditions outside the preceding limits will require reconditioning before it is used. This is accomplished by permitting the tape to remain in the correct operating environment for a length of time equal to the storage time (up to maximum reconditioning period of 24 hours).

The tape should be stored in a dustproof container in a vertical position and should never come in contact with magnetic material at any time. Magnetic fields of greater than 50-oersted intensity can cause loss of information or introduction of noise.

When shipping magnetic tape, each reel should be sealed in a plastic bag and packed individually in stiff cardboard shipping boxes. These may be obtained from IBM.

* Trademark of E.I. du Pont de Nemours & Co. (Inc.)

The disk pack, disk cartridge, and data cell are precision instruments. Storage facilities should be maintained within the following limits:

*Disk Pack and Disk Cartridge*
Short-Term Storage:
Temperature: 60° to 90°F (16° to 32°C)
Relative Humidity: 10% to 80%

Long-Term Storage:
Temperature: 40° to 150°F (4° to 66°C)

*Data Cell*
Storage:
Temperature: 50° to 110°F (10° to 43°C)
Relative Humidity: 8% to 80%
Max Wet Bulb: 80°F (27°C)

Disk packs, disk cartridges, and data cells must be conditioned to the machine operating environment before use. This is accomplished by permitting the device to remain in the correct operating environment for a length of time equal to the time out of the operating environment (up to a maximum conditioning period of 2 hours).

These devices are equipped with dustproof covers which should be left in place, except when installed in the file. Storage should be in fire-resistant cabinets away from magnetic fields. Magnetic fields of greater than 50 oersteds can cause loss of information or introduction of noise.

Additional information concerning handling, operation, device dimensions, flammability characteristics, shipping requirements, and housekeeping is in *IBM Disk Pack Handling and Operating Procedures*, GA26-5756, and *IBM Data Cell Handling Guide*, GA26-3633.

## Priority

### INPUT/OUTPUT PRIORITY SEQUENCE

Channel capabilities are affected by the sequence in which I/O devices are attached to the channel. This sequence is called priority. This is most pronounced on the byte multiplexer channel. For assigning priorities, the devices are divided into three groups:

Class 1: Devices subject to overrun.
Class 2: Devices that require channel service in synchronization with their mechanical operations.
Class 3: Devices that do not require their channel service to be in synchronization with their operations.

#### Device Wait (Critical) Time

After a multiplex-mode device requests channel service, it has a fixed length of time that it can wait for service. If the channel provides service within this length of time, the device operates satisfactorily. If, however, the channel does not service the device within the device's wait time, either of two things happens: If the device is not subject to overrun, it continues waiting; if it is subject to overrun, it loses data and subsequently causes an I/O interruption condition. For example, when an IBM 1403 Printer on an overloaded byte multiplexer channel fails to receive data within its particular wait time, it merely waits until service is provided by the byte multiplexer channel. The delay does not cause an interruption condition, nor is a new start I/O instruction required for selecting the 1403. The only effect is a lessening in performance. If an IBM 1442 Card Read Punch read operation does not receive data service within its wait time, however, overrun occurs.

Wait (critical) time factors for multiplex-mode devices are listed in Appendix B.

In attaching devices to the byte multiplexer channel, the various classes are normally attached in numeric sequence (1, 2, and 3). Within each class, devices are usually attached in order of increasing critical time intervals. Differences in how individual I/O devices are programmed may require two I/O devices with either the same or nearly the same critical times to be swapped in priority for proper operation. No information can be lost with devices of class 2 or 3. A device not required to operate at its rated performance may be attached with a lower priority than normally assigned.

Devices that operate in burst mode may be attached to byte multiplexer channel in any physical location; from a performance standpoint, these units should be assigned lowest priority. On the selector or block multiplexer channel, devices are assigned priority according to data rate within class sequence.

In determining the attachment of I/O devices to selector or block multiplexer channels, the following guidelines generally apply. Class 1 devices with the highest data rates are normally attached to the lowest numbered channels (for example, channel 1). Because service to class 2 and 3 devices may be delayed without the loss of information, they usually are attached to the highest numbered channels (for example, channels 3 and 4).

In determining the priority of control units which operate multiple devices with different priority rules (for example, a 2821 that attaches both class 2 and class 3 devices and the 2702 or tape control units that may attach devices with different data rates), the highest priority for any of the attached devices is normally used.

The class designation, critical time, and data rates for various units and features are in Appendix B. For additional information, see the appropriate system or channel characteristics publication.

Control units are addressed by the channel via a cable that contains "select in" and "select out" lines. A particular control unit can be connected to either line. Control units may be in any physical sequence on these lines that will permit connection in accordance with the prescribed priority sequence. Several physical sequences of units are usually possible that will provide the same priority sequence.

Cables must be ordered by starting at the unit most remote from the CPU. Cables are then specified from unit to unit back to the channel or CPU. It is necessary that the proper sequence be observed to ensure receiving the proper length cables. The machine type numbers used in the "From" and "To" columns of the cable order form determine the amount of cable required to connect to the proper location inside the units at each end of the cable. When ordering a cable to attach from one location to another within the same unit (for example, SF #1850 on one channel to another channel within the same unit), specify an "X" length of "0" feet, unless otherwise directed.

## Cables

IBM supplies the necessary cables for the initial installation as specified in this manual. The cables are custom-made to the lengths required for each installation. Cables are measured in accordance with the approved layout. The group number and channel where required, along with the required cable length, must be submitted for each cable in the computer system. The required cable length is defined as the center-to-center distance between machine cable entry holes measured along the intended route of the cable as projected on the floor or other mounting surface. When machines are mounted on a raised floor, twice the height of the raised floor should be included in the required cable length. IBM makes allowance for the portion of each cable that is from the floor or mounting surface into the machine. For best electrical design and computer performance, all cable lengths should be kept as short as possible. External interconnecting cables should be installed under the raised floor. Where a raised floor is not used, these cables should be protected from mechanical damage, scuffing, and in a manner that will not present a safety hazard to operating personnel.

Orders for cables that exceed the maximum lengths specified for the system must be approved by IBM and may result in extra charges. Consult your IBM representative.

When a unit requires external cables which must be purchased by the customer and installed through walls and/or floors, the purchase of this cable and the arrangements for its installation should be made with sufficient lead time to permit the cable facilities to be available to the computer system at installation time. This pertains to units such as the IBM 2260, 3270, 3704, and 3705.

### CABLES SUPPLIED

#### Cables Related to Initial Installations

One cable or one "cable group" within standard specifications in accordance with an approved layout, required to install machines being delivered from IBM, will be supplied by IBM at no additional charge unless customer-supplied or a chargeable basis is indicated (such as for IBM 2260 cables). Orders for cables not within the standard specifications must be accompanied by an approved RPQ. For detailed instructions on entering cable orders, consult your IBM representative.

Changes in cable order specifications requested within three months of the scheduled date of shipment (or subsequent to any non-IBM-caused deferment within three months of scheduled date of shipment) may be subject to charge.

Any cables (of the type provided at no charge for an initial installation) required for rearrangement of previously installed IBM machines necessary to accommodate the installation of machines being delivered from IBM, will be supplied by IBM at no charge on an exchange basis. An explanation of why the cables are required must accompany the cable order. All replaced cables must be returned to IBM.

#### Other Cable Requests

Cables requested for other reasons (for example, additional or replacement cables for rearrangement not caused by installation of machines being delivered from IBM, cables to connect IBM and non-IBM equipment, etc.) will be considered only on an RPQ basis.

## Field Engineering Support Facilities

### CE ROOM AND TEST AREA

The customer engineers' test area for a single installation should contain between 70 and 400 square feet (7 and 38$m^2$) of space depending on the size of the system, and be air conditioned to the same specifications as the machine room.

The IBM Field Engineering Branch Manager will provide, on a scaled layout, the Field Engineering equipment which will be installed in the CE room to assist the customer in locating receptacles, lights, and so forth.

The test area should contain at least one 208V (or 230V), 3-phase, 20A power receptacle (Hubbell or Pass and Seymour type 7250 or equivalent) for operation of the tape unit testing equipment. At least two 115V, single-phase, 15A receptacles (convenience outlets) and other receptacles adequate to repair any unit that can be serviced in the CE room should be provided. The 115V receptacles (convenience outlets) should not be supplied power from the computer power panel.

### FURNITURE AND FIXTURES

The furniture and fixtures for the CE room will be determined by local Field Engineering management and will vary according to the size of the system or systems installed and the number of customer engineers required.

The following is a partial list of typical furniture and fixtures:

| | *Length* | | *Width* | | *Height* | |
|---|---|---|---|---|---|---|
| | *in.* | *cm* | *in.* | *cm* | *in.* | *cm* |
| Desk | 45 | 114 | 34 | 86 | 29 | 74 |
| Workbench | 72 | 183 | 30 | 76 | 35 | 89 |
| Shelf Cabinet | 36 | 91 | 18 | 46 | 72 | 183 |
| Parts Cabinet | 42 | 107 | 24 | 61 | 87 | 221 |
| File Cabinet | 18 | 46 | 28 | 71 | 60 | 152 |
| Bookcase | 33-1/4 | 84 | 15-1/4 | 39 | 42 | 107 |
| Study Table | 60 | 152 | 30 | 76 | 29 | 74 |
| Book Cart | 40 | 102 | 13 | 33 | 31 | 79 |
| Card File | 17 | 43 | 24 | 61 | 9 | 23 |
| Microfiche Viewer | 24 | 61 | 24 | 61 | 54 | 137 |
| Tool and Test Equipment Cart | 22 | 56 | 22 | 56 | 35 | 89 |

Templates for the furniture listed are available from IBM. See Appendix D for order (form) number.

### RETAIN/370 SERVICE

The IBM 2955 Field Engineering Data Adapter Unit (FE DAU) for RETAIN/370 is used on System/360 Model 195. The 2955 has the following specifications:

*Dimensions:* See plan view on the following page.

*Weight:* 600 lb (280 kg)

*Heat Output:* 3,000 BTU/hr (760 kcal/hr)

*Airflow:* 120 cfm (4 $m^3$/min)

*Power Requirements:* 1.0 kVA, single phase, 60 Hz

*Power Plug:* R&S, FS3720. Customer supplies either R&S, FS3743 receptacle or R&S, FS3913 connector.

*Cabling Schematic:* See Section 4.

*Note:* The FE DAU takes one control unit position on a byte multiplexer channel. It is a class 1 device with a critical time of 14.1/N.

### BASIC STORAGE MODULE (BSM) ANALYZER

Provision must be made for testing the spare BSM for IBM System/360 Models 85 and 195.

The spare BSM is within the frame of a mobile service cart. The physical dimensions and other specifications for the spare BSM and cart are:

*Dimensions:* See plan view on the following page.

*Weight:* 500 lb (230 kg)

| *Heat Output:* | *To Air* | *To Water* |
|---|---|---|
| BTU/hr | 3,100 | 2,500 |
| (kcal/hr) | (790) | (630) |

*Airflow:* 325 cfm (10 $m^3$/min)

For servicing, this cart must be near the analyzer.

For the Model 85 with IBM 2385 Processor Storage Model 1 or 2, the 415-Hz power for testing the spare BSM is supplied from the PDU (frame 14) via the analyzer. IBM furnishes the connector and up to 100 feet of cable to the analyzer. The 60-Hz power is supplied from the customer's wall outlet or inline connector. Coolant is supplied from the CDU (2385 frame 01) via 100 feet of hose.

The Model 85 test area will contain a BSM analyzer with the following specifications:

*Dimensions:* See plan view on the following page.

*Weight:* 1,040 lb (480 kg)

*Heat Output:* 12,900 BTU/hr (3.300 kcal/hr)

*Airflow:* 1,240 cfm (36 $m^3$/min)

*Power Requirements:* 4.5 kVA, 60 Hz
3.0 kVA, 415 Hz

For the Model 195, specifications for the BSM analyzer are identical, except that no customer-supplied power plug or receptacle is needed because both 415-Hz and 60-Hz power are supplied from the IBM 3085 Power Distribution Unit (PDU), frame 09. Coolant is supplied from the IBM 3086 Coolant Distribution Unit (CDU), frame 02, via 125 feet of hose.

## System/360 and System/370 Field Engineering Furniture and Test Equipment

### PLAN VIEWS

**Desk**

| | F | S | H |
|---|---|---|---|
| Inches | 45 | 34 | 29 |
| (cm) | (114) | (86) | (74) |

**Workbench**

| | F | S | H |
|---|---|---|---|
| Inches | 72 | 30 | 35 |
| (cm) | (183) | (76) | (89) |

**Shelf Cabinet**

| | F | S | H |
|---|---|---|---|
| Inches | 36 | 18 | 72 |
| (cm) | (91) | (46) | (183) |

**Shelf Cabinet**

| | F | S | H |
|---|---|---|---|
| Inches | 36 | 18 | 72 |
| (cm) | (91) | (46) | (183) |

**Parts Cabinet**

| | F | S | H |
|---|---|---|---|
| Inche: | 42 | 24 | 87 |
| (cm) | (107) | (61) | (221) |

**Parts Cabinet**

| | F | S | H |
|---|---|---|---|
| Inches | 42 | 24 | 87 |
| (cm) | (107) | (61) | (221) |

**File Cabinet**

| | F | S | H |
|---|---|---|---|
| Inches | 18 | 28 | 60 |
| (cm) | (46) | (71) | (152) |

**File Cabinet**

| | F | S | H |
|---|---|---|---|
| Inches | 18 | 28 | 60 |
| (cm) | (46) | (71) | (152) |

**File Cabinet**

| | F | S | H |
|---|---|---|---|
| Inches | 18 | 28 | 60 |
| (cm) | (46) | (71) | (152) |

**Bookcase**

| | F | S | H |
|---|---|---|---|
| Inches | 33-1/4 | 15-1/4 | 42 |
| (cm) | (84) | (39) | (107) |

**Study Table**

| | F | S | H |
|---|---|---|---|
| Inches | 60 | 30 | 29 |
| (cm) | (152) | (76) | (74) |

**Book Cart**

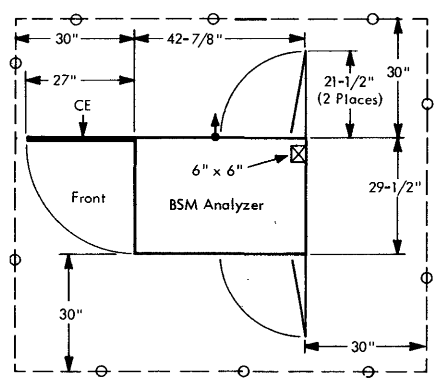
| | F | S | H |
|---|---|---|---|
| Inches | 40 | 13 | 31 |
| (cm) | (102) | (33) | (79) |

**Book Cart**

| | F | S | H |
|---|---|---|---|
| Inches | 40 | 13 | 31 |
| (cm) | (102) | (33) | (79) |

**Card File**

| | F | S | H |
|---|---|---|---|
| Inches | 17 | 24 | 9 |
| (cm) | (43) | (61) | (23) |




| | F | S | H |
|---|---|---|---|
| Inches | 29-1/2 | 42-7/8 | 70 |
| (cm) | (75) | (109) | (178) |

**Microfiche Viewer**

| | F | S | H |
|---|---|---|---|
| Inches | 24 | 24 | 54 |
| (cm) | (61) | (61) | (137) |

**BSM Cart**

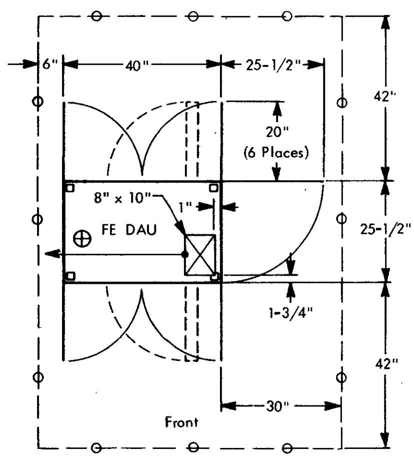
| | F | S | H |
|---|---|---|---|
| Inches | 52 | 29 | 70 |
| (cm) | (132) | (74) | (178) |

**BSM Cart**

| | F | S | H |
|---|---|---|---|
| Inches | 52 | 29 | 70 |
| (cm) | (132) | (74) | (178) |

**Tool and Test Equipment Cart**

| | F | S | H |
|---|---|---|---|
| Inches | 22 | 22 | 35 |
| (cm) | (56) | (56) | (89) |




| | F | S | H |
|---|---|---|---|
| Inches | 40 | 25-1/2 | 40 |
| (cm) | (102) | (65) | (102) |

## Standard Symbols

Figure 1-3 shows the symbols adopted as standard for the IBM System/360. Frame numbers are shown circled on plan views and cabling schematics, for example, 04.

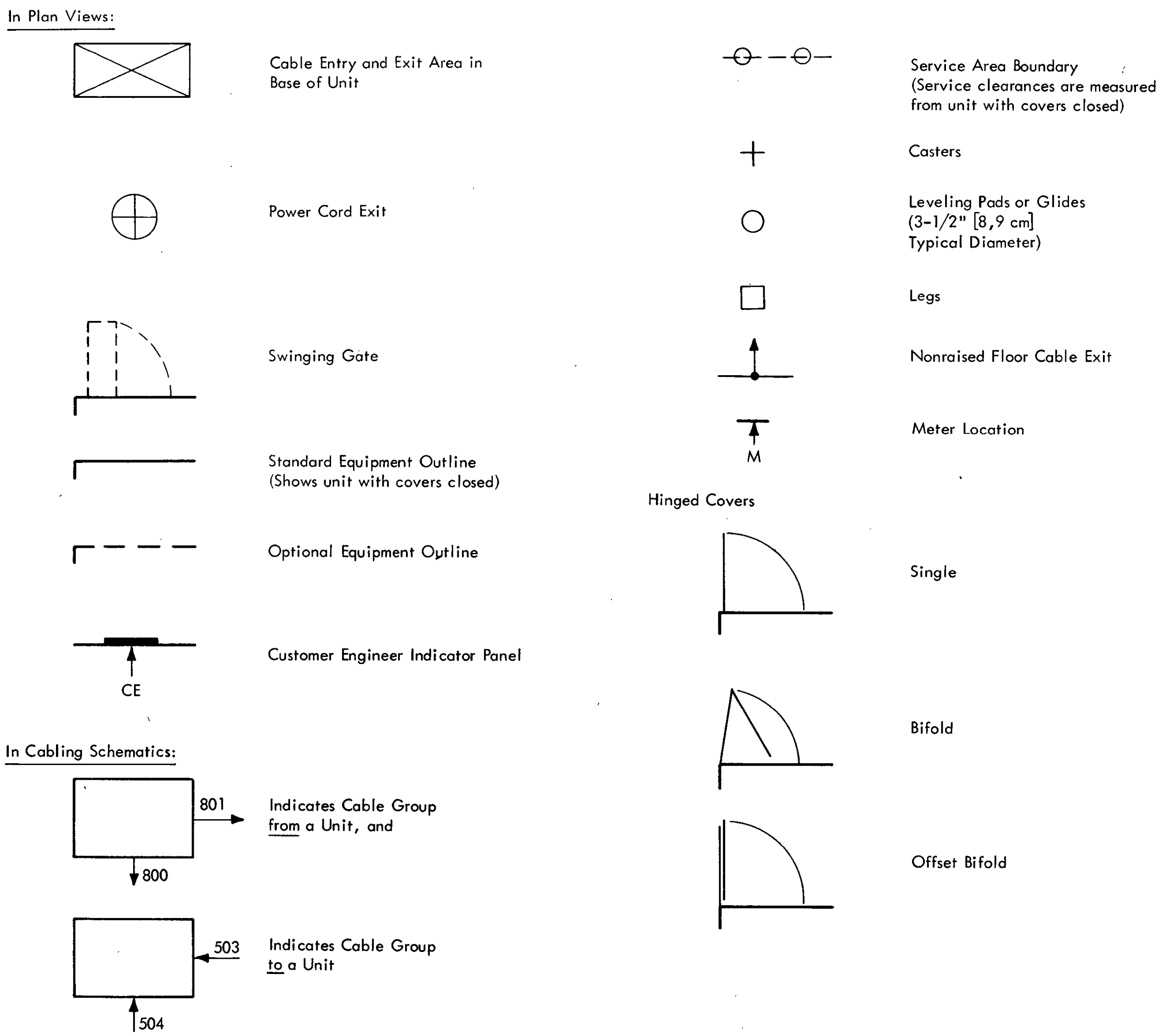



**Figure 1-3. Standard Symbols**

## Standard Specifications

### SHIPPING DIMENSIONS

Unless otherwise noted on individual specifications page, the following statement applies: All system components can be reduced to 29½" x 60" (75 cm x 152 cm) or smaller sections for shipment.

### ENVIRONMENTAL SPECIFICATIONS

Unless otherwise noted on individual specifications pages, the following environmental specifications apply:

| | |
|---|---|
| *Environment Operating:* | |
| Temperature | $60^{o}$-$90^{o}$F ($16^{o}$-$32^{o}$C) |
| Rel Humidity | 20%-80% |
| Max Wet Bulb | $78^{o}$F ($26^{o}$C) |
| *Environment Nonoperating:* | |
| Temperature | $50^{o}$-$110^{o}$F ($10^{o}$-$43^{o}$C) |
| Rel Humidity | 8%-80% |
| Max Wet Bulb | $80^{o}$F ($27^{o}$C) |
| *Environment Shipping:* | |
| Temperature | $-40^{o}$ to $140^{o}$F ($-40^{o}$ to $60^{o}$C) |
| Rel Humidity | 5%-100% (no condensation) |
| Wet Bulb Range | $33^{o}$-$80^{o}$F ($1^{o}$-$29^{o}$C) |

### METRIC CONVERSIONS

In this manual, English units converted into metric units are rounded to the nearest whole number or to the nearest decimal place given. Exceptions are kilograms (kg), kilocalories per hour (kcal/hr), cubic meters per minute ($m^3$/min), lumens per square meter (lumens/$m^2$), kilograms per square meter (kg/$m^2$) pertaining to floor loading, and meters (m) pertaining to altitude; these are rounded to the 1/10/50 rule.

To round according to the 1/10/50 rule:

1. When the number is less than 100, round up to the next unit, for example, 23,2 or 23,7 becomes 24.
2. When the number is greater than 100 and less than 1,000, round up to the next ten, for example, 163 becomes 170.
3. When the number is greater than 1,000, round up to the next 50, for example, 1.232 becomes 1.250.

Note that numbers expressed in metric units use commas in place of decimal points and decimal points in place of commas (for example, two thousand one hundred kilograms is expressed as 2.100 kg and one-half becomes 0,5).

### MANUFACTURERS OF PLUGS, RECEPTACLES, AND CONNECTORS

Hansen–Hansen Manufacturing Co.
Hubbell (H)–Harvey Hubbell, Inc.
Pass and Seymour (P&S)–Pass and Seymour, Inc.
Russell and Stoll (R&S)–Midland Ross Corp.

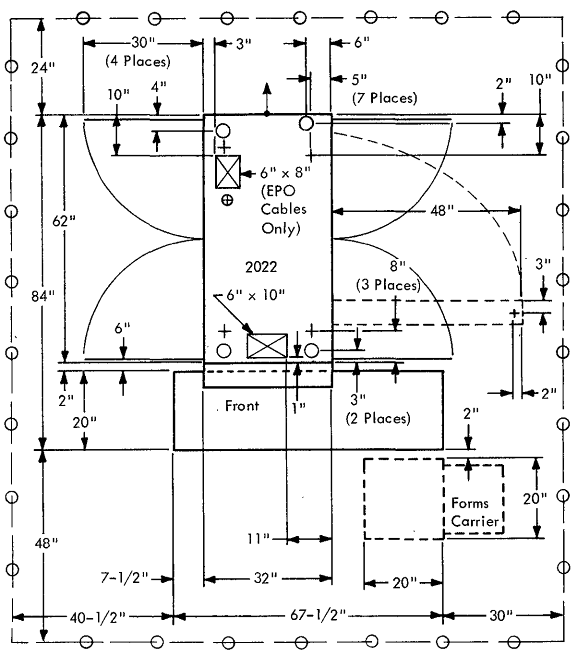
## ABBREVIATIONS AND DEFINITIONS

| | |
|---|---|
| A | ampere |
| ambient | environment |
| AWG | American wire gauge |
| blk mpxr | block multiplexer |
| bpi | bits per inch |
| bps | bits per second |
| BSM | basic storage module |
| BTU | British thermal unit |
| bus | one or more conductors used for transmitting signals or power |
| C | Celsius/coupler |
| CCITT | Consultant Committee of International Telephone & Telegraph (WT) |
| CDU | coolant distribution unit |
| CE | customer engineer |
| CER | customer engineering room |
| cfm | cubic feet per minute |
| ch | channel |
| cm | centimeter |
| conn | connector |
| CPU | central processing unit |
| CRT | cathode-ray tube |
| C-T-C | connector-to-connector |
| DAA | Data Access Arrangement |
| DAU | data adapter unit |
| dist | distribution |
| EIA | Electronic Industry Association |
| EPO | sequence and control |
| F | Fahrenheit/front |
| FE | field engineering |
| FE DAU | Field Engineering Data Adapter Unit |
| fr | frame |
| ft | feet |
| gpm | gallons per minute |
| H | height/Hubbell |
| hp | high pressure/horsepower |
| Hz | hertz |
| in. | inch |
| I/O | input/output |
| kcal/hr | kilocalories per hour |
| kg | kilogram |
| $kg/cm^2$ | kilograms per square centimeter |
| $kg/m^2$ | kilograms per square meter |
| kVA | kilovolt ampere |
| L | left |
| lb | pound |
| $lumens/m^2$ | lumens per square meter |
| m | meter |
| max | maximum |
| MCM | thousand circular mils |
| $m^3/min$ | cubic meter per minute |
| mfg | manufacturing |
| MG | motor generator |
| min | minimum/minute |
| mm | millimeter |
| MP | multiprocessing |
| mpxr | multiplexer |
| ms | millisecond |
| MTU | magnetic tape unit |
| N | in sorting, file size, the number of records to be processed by the sort |
| NEMA | National Electrical Manufacturers' Association |
| NFPA | National Fire Protection Association |
| No. | number |
| OD | outside diameter |
| oersted | centimeter-gram-second electromagnetic unit of magnetic intensity |
| ohm | practical meter-kilogram-second unit of electrical resistance equal to the resistance of a circuit in which a potential difference of 1 volt produces a current of 1 ampere |
| P&S | Pass and Seymour |
| PDU | power distribution unit |
| pH | hydrogen-ion concentration |
| ppm | parts per million |
| proc | processing |
| psi | pounds per square inch |
| psig | pounds per square inch gauge |
| pwr | power |
| R | rear |
| R&S | Russell & Stoll |
| rdr | reader |
| Rel | relative |
| RPQ | Request for Price Quotation |
| Rt | right |
| S | side |
| SCU | storage control unit |
| sec | second |
| service clearance | minimum space required to allow working room for the machine operator and/or the customer engineer for servicing the unit |
| SF | special feature |
| slr | selector |
| stg | storage |
| TNL | Technical Newsletter |
| UK | United Kingdom |
| U.S. | United States |
| V | volt |
| VFL | variable field length |
| WT | World Trade |

# Section 2. System Specifications and Cabling Schematics

## SYSTEM/360 MODEL 22, 2022 PROCESSING UNIT

### PLAN VIEW




### SPECIFICATIONS

**Dimensions:***

| | F | S | H |
|---|---|---|---|
| Inches | ** | ** | 60 |
| (cm) | (**) | (**) | (152) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | ** | ** | ** | ** |
| (cm) | (**) | (**) | (**) | (**) |

**Weight:** 1,500 lb (690 kg)

**Heat Output:** 6,900 BTU/hr (1.750 kcal/hr)

**Airflow:** 900 cfm (26 $m^3$/min)

**Power Requirements:**

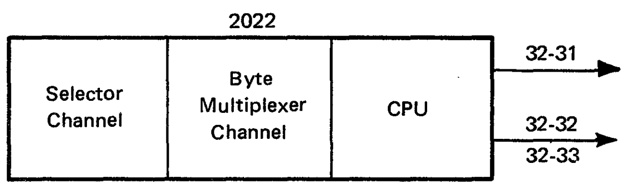
| | |
|---|---|
| kVA | 2.4 |
| Phases | 3 |
| Plug | R&S, FS3730 |
| Connector | R&S, FS3914 |
| Receptacle | R&S, FS3744 |
| Power Cord Style | D3 |

**Notes:**

* Unless otherwise specified, the shipping dimensions on the 2022 are 32" x 68" x 64" (81 cm x 173 cm x 163 cm). Removal of the side covers reduces the width to 29" (74 cm). If further reduction in length is required, see sales representative for method of specifying on the order. This modifies the unit to 29" x 60" x 70" (74 cm x 152 cm x 178 cm).

** See plan view.

## SYSTEM/360 MODEL 22 CABLING SCHEMATIC

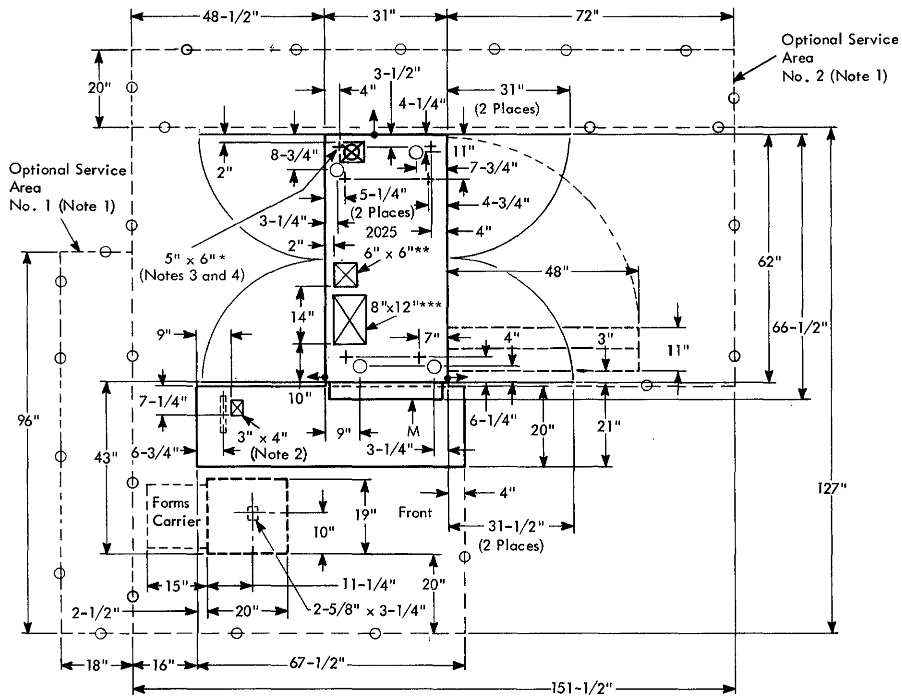



| *Group No.* | *No. of Cables* | *From* | *To* | *Max Length (ft)* | *Notes* |
|---|---|---|---|---|---|
| 32-31 | 1 | 2022 | System/360 CPU | 100 | 1 |
| 32-32 | 1 | 2022 | System/360 CPU | 100 | 2 |
| 32-33 | 1 | 2022 | System/360 CPU | 100 | 3 |

*Notes:*
1. For the interconnection of two System/360 CPUs (SF #3895); order one per feature.
2. To SF #3621, two-system EPO connection.
3. To SF #3622, multisystem EPO connection. See Note 2 in "System/360 Specification Summary."

## SYSTEM/360 MODEL 25, 2025 PROCESSING UNIT

### PLAN VIEW




* Line Cord
** Power Cables
*** Signal Cables

Notes:

1. Optional Service Area No. 1 or No. 2 required to ensure access to left side of machine for test equipment.
2. This cable opening is required when SF # 3622 is installed.
3. This caster is for shipping purposes. No damage occurs if this caster is over power cord exit hole when machine is installed.
4. The 5" x 6" cable opening is designed for the Russell and Stoll plug. Size may be adjusted to conform with other style plugs used on 50-Hz World Trade machines.

## SYSTEM/360 MODEL 25, 2025 PROCESSING UNIT

### SPECIFICATIONS

**Dimensions:***

| | F | S | H |
|---|---|---|---|
| Inches | ** | ** | 60 |
| (cm) | (**) | (**) | (152) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | ** | ** | ** | ** |
| (cm) | (**) | (**) | (**) | (**) |

**Weight:** 2,050 lb (930 kg)

**Heat Output:** 20,500 BTU/hr (5.200 kcal/hr)

**Airflow:** 800 cfm (23 $m^3$/min)

**Power Requirements:**

| | |
|---|---|
| kVA | 7.4 |
| Phases | 3 |
| Plug | R&S, SC7328 |
| Connector | R&S, SC7428 |
| Receptacle | R&S, SC7324 |
| Power Cord Style | E3 or E5*** |

**Environment Operating:**

| | |
|---|---|
| Temperature | 60°-90°F (16°-32°C) |
| Rel Humidity | 8%-80% |
| Max Wet Bulb | 78°F (26°C) |

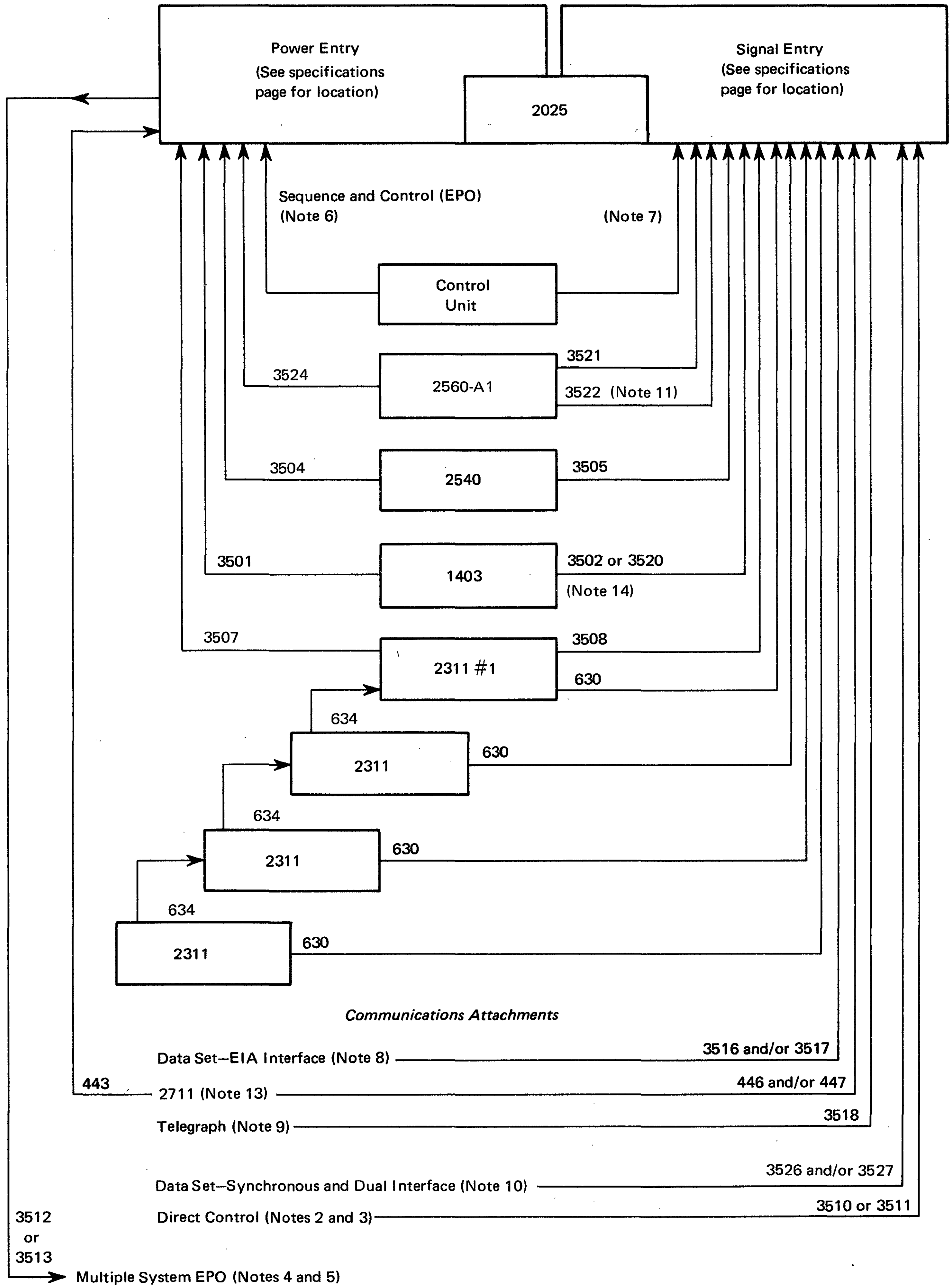
**Notes:**

* Unless otherwise specified, the shipping dimensions on the 2025 are 31" x 66-1/2" x 64" (79 cm x 169 cm x 163 cm). Removal of the side covers reduces the width to 29" (74 cm). If further reduction in length is required, request special shipping group. This modifies the unit to 29" x 60" x 70" (74 cm x 152 cm x 178 cm).

** See plan view.

*** For machines with serial numbers 10001 through 10105 and 10133 through 10160, use power cord style E3. For machines with serial numbers 10106, 10132, 10161, and higher, use power cord style E5.

## SYSTEM/360 MODEL 25 CABLING SCHEMATIC (WORLD TRADE)



## SYSTEM/360 MODEL 25 CABLING SCHEMATIC (WORLD TRADE)

| *Group No.* | *No. of Cables* | *From* | *2025 Cable Entry* | *To* | *Max Length (ft)* | *Notes* |
|---|---|---|---|---|---|---|
| 630 | 1 | 2311 | Signal | 2025 | 50 | 17, 20 |
| 634 | 2 | 2311 | – | 2311 | – | 1, 19, 20 |
| 3501 | 1 | 1403 | Power | 2025 | 25 | 15 |
| 3502 | 2 | 1403 | Signal | 2025 | 25 | 14, 15 |
| 3504 | 1 | 2540 | Power | 2025 | 25 | 18 |
| 3505 | 1 | 2540 | Signal | 2025 | 25 | 16 |
| 3507 | 1 | 2311 #1 | Power | 2025 | – | 1, 18, 20 |
| 3508 | 1 | 2311 #1 | Signal | 2025 | – | 1, 18, 20 |
| 3510 | 2 | Direct Control | Signal | 2025 | 50 | 2 |
| 3511 | 1 | System/360 CPU | Signal | 2025 | 100 | 3 |
| 3512 | 1 | 2025 | Power | System/360 CPU | 100 | 4 |
| 3513 | 1 | 2025 | Power | System/360 CPU | 100 | 5 |
| 3516 | 4 | Data Set | Signal | 2025 | 40 | 8, 12 |
| 3517 | 2 | Data Set | Signal | 2025 | 40 | 8, 12 |
| 3518 | 1 | Telegraph | Signal | 2025 | 40 | 9, 12 |
| 3520 | 2 | 1403 | Signal | 2025 | 25 | 14, 15 |
| 3521 | 3 | 2560-A1 | Signal | 2025 | 13 | – |
| 3522 | 1 | 2560-A1 | Signal | 2025 | 13 | 11 |
| 3524 | 2 | 2560-A1 | Power | 2025 | 13 | – |
| 3526 | 1 | Data Set Swedish PTT, Japanese NTT, or IBM 3976 or 3977 | Signal | 2025 | 40 | 10, 12 |
| 3527 | 1 | Data Set UK GPO or German PTT | Signal | 2025 | 40 | 10, 12 |

*Notes:*

1. Total length of groups 3507 or 3508 and 634(s) should not exceed 100 feet.
2. For SF #3274 (direct control) and #3895 (external interrupt) from non-IBM device.
3. For SF #3274 (direct control) and #3895 (external interrupt) to System/360 CPU; order one per feature.
4. To SF #3621, two-system EPO connection.
5. To SF #3622, multisystem EPO connection. See Note 2 in "System/360 Specification Summary."
6. See appropriate control unit for sequence and control (EPO) cable group numbers.
7. Channel I/O interface cable to attach up to eight control units is limited to 100 feet. See appropriate control unit for selector or multiplexer channel cable group numbers.
8. For each SF #7401 (EIA start/stop data adapter base), order data set cables as follows:

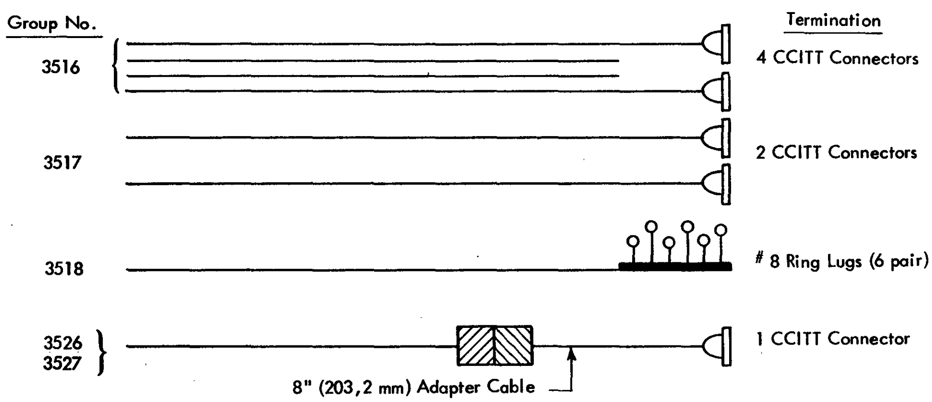
| *SF No.* | *Cable Group No.* |
|---|---|
| 7401 | 3517 |
| 7401 and 7402 | 3516 |
| 7401, 7402, and 7403 | 3516 *and* 3517 |

   Maximum of four of group 3516 and four of group 3517 for each 2025.
9. For each SF #7411 (telegraph start/stop data adapter base), order one cable group. Maximum of four of group 3518 for each 2025. *Note:* No cables are required for SF #7412 and #7413 because each group 3518 provides for six lines.
10. Order one group for each of SF #2727, #2728, #3461, #7551, and #7552. Maximum of three for each 2025.
11. Required when SF #1580 (card print control) is installed on the 2025 and SF #1575, #1576, or #1577 is installed on the 2560.
12. See "Cables from Non-IBM Devices" for cable specifications.
13. See "2711 Line Adapter Unit Cabling Schematic" in *IBM System/370 WT Installation Manual–Physical Planning,* GC19-0004, for cabling information.
14. For all machines shipped after March 1, 1969, use group 3520. If ordering cables to recable or replace existing cables, order the group number identical to that shown on the label of the existing cable. Consult your IBM representative for assistance.
15. The power cable (group 504C or 505C) from group 504 or 505 (1403) may be used in place of group 3501 if the 504C or 505C cable is the correct length. New cable group 3502 or 3520 (see note 14) *must* be ordered. The signal cables from group 504 or 505 are *not* to be used for the 1403-to-2025 integrated attachment feature. Cables from a 1403 to a 2020 are *not* interchangeable with cables to connect a 1403 to a 2025.

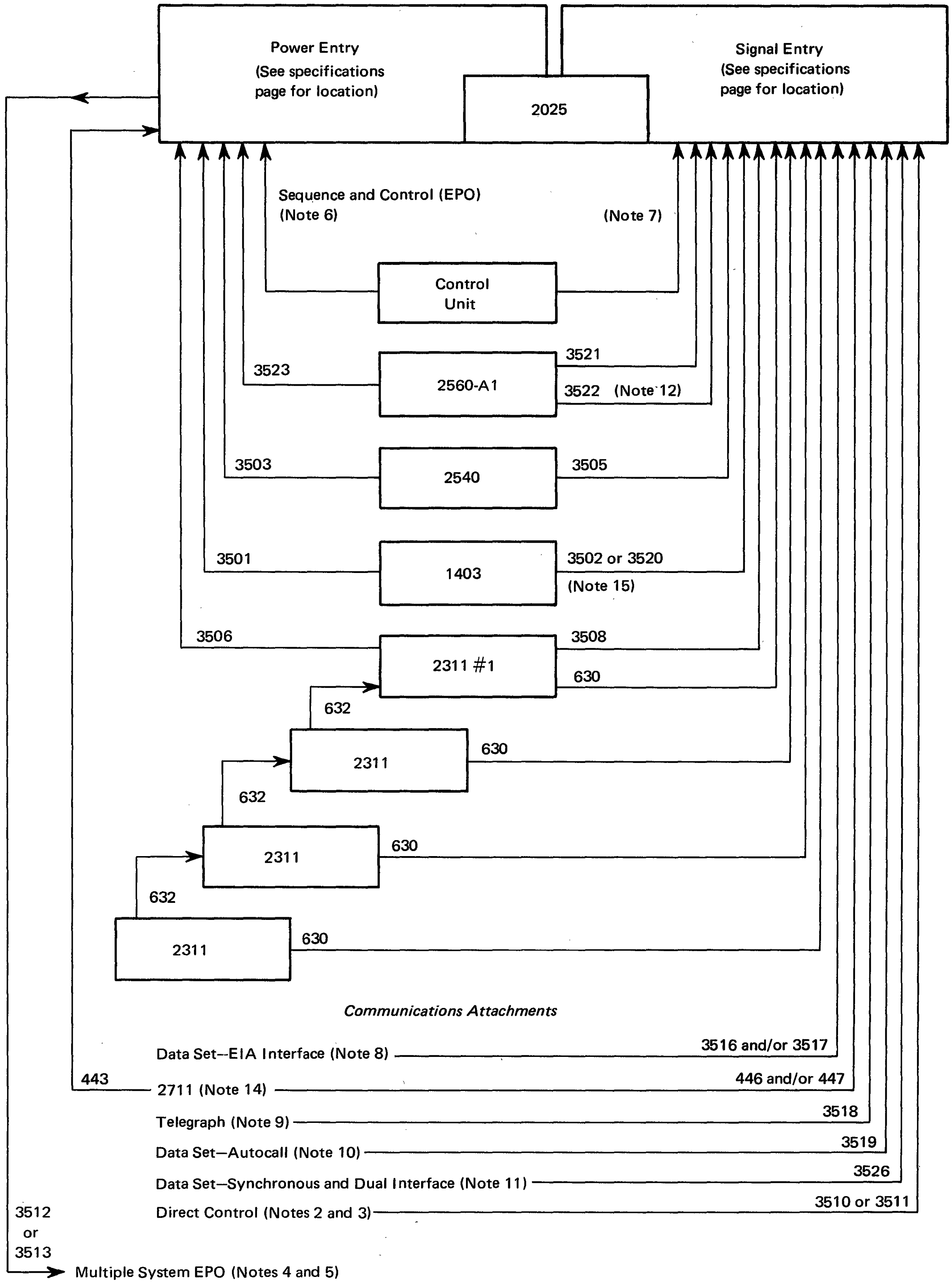
## SYSTEM/360 MODEL 25 CABLING SCHEMATIC (WORLD TRADE)

16. Power cable (group 510A) from group 510 (2540) may be used for power cable group 3504 if the 510A cable is the correct length. The signal cable (group 510B) may be used in place of signal cable group 3505 if it is the correct length *and* if it is at EC level 131840 or higher. Consult your IBM representative for assistance.
17. Group 604 must *not* be used when 2311s are attached to the 2025 through the integrated attachment feature. Group 630 *must* be ordered. Installations now using cable group 630 or 3509 may use existing cables if they are the correct length.
18. Cables from group 611 that are used between the 2311 #1 and the 2841 must *not* be used for direct attachment to the 2025. New cable groups 3507 and 3508 *must* be ordered. Cables from group 633 may be used in place of groups 3507 and 3508 if the existing cables are the correct length.
19. Cables from group 612 that are used between 2311 units must *not* be used on a System/360 Model 25. New cable group 634 *must* be ordered. Cables from existing group 634 or 3515 may be used if the cables are the correct length.
20. Cables used between 2311 units on a System/360 Model 20 or between 2311 units and the 2020 are *not* to be used on the System/360 Model 25.

### Cables from Non-IBM Devices



## SYSTEM/360 MODEL 25 CABLING SCHEMATIC (U.S.)



## SYSTEM/360 MODEL 25 CABLING SCHEMATIC (U.S.)

| *Group No.* | *No. of Cables* | *From* | *2025 Cable Entry* | *To* | *Max Length (ft)* | *Notes* |
|---|---|---|---|---|---|---|
| 630 | 1 | 2311 | Signal | 2025 | 50 | 18, 21 |
| 632 | 2 | 2311 | – | 2311 | – | 1, 20, 21 |
| 3501 | 1 | 1403 | Power | 2025 | 25 | 16 |
| 3502 | 2 | 1403 | Signal | 2025 | 25 | 15, 16 |
| 3503 | 1 | 2540 | Power | 2025 | 25 | 17 |
| 3505 | 1 | 2540 | Signal | 2025 | 25 | 17 |
| 3506 | 1 | 2311 #1 | Power | 2025 | – | 1, 19, 21 |
| 3508 | 1 | 2311 #1 | Signal | 2025 | – | 1, 19, 21 |
| 3510 | 2 | Direct Control | Signal | 2025 | 50 | 2 |
| 3511 | 1 | System/360 CPU | Signal | 2025 | 100 | 3 |
| 3512 | 1 | 2025 | Power | System/360 CPU | 100 | 4 |
| 3513 | 1 | 2025 | Power | System/360 CPU | 100 | 5 |
| 3516 | 4 | Data Set | Signal | 2025 | 40 | 8, 13 |
| 3517 | 2 | Data Set | Signal | 2025 | 40 | 8, 13 |
| 3518 | 1 | Telegraph | Signal | 2025 | 40 | 9, 13 |
| 3519 | 4 | Data Set (Autocall) | Signal | 2025 | 40 | 10, 13 |
| 3520 | 2 | 1403 | Signal | 2025 | 25 | 15, 16 |
| 3521 | 3 | 2560-A1 | Signal | 2025 | 13 | – |
| 3522 | 1 | 2560-A1 | Signal | 2025 | 13 | 12 |
| 3523 | 2 | 2560-A1 | Power | 2025 | 13 | – |
| 3526 | 1 | Data Set (Synchronous) | Signal | 2025 | 40 | 11, 13 |

*Notes:*

1. Total length of groups 3506 or 3508 and 632(s) should not exceed 100 feet.
2. For SF #3274 (direct control) and #3895 (external interrupt) from non-IBM device.
3. For SF #3274 (direct control) and #3895 (external interrupt) to System/360 CPU; order one per feature.
4. To SF #3621, two-system EPO connection.
5. To SF #3622, multisystem EPO connection. See Note 2 in "System/360 Specification Summary."
6. See appropriate control unit for sequence and control (EPO) cable group numbers.
7. Channel I/O interface cable to attach up to eight control units is limited to 100 feet. See appropriate control unit for selector or multiplexer channel cable group numbers.
8. For each SF #7401 (EIA start/stop data adapter base), order data set cables as follows:

| *SF No.* | *Cable Group No.* |
|---|---|
| 7401 | 3517 |
| 7401 and 7402 | 3516 |
| 7401, 7402, and 7403 | 3516 *and* 3517 |

   Maximum of four of group 3516 and four of group 3517 for each 2025.

9. For each SF #7411 (telegraph start/stop data adapter base), order one cable group. Maximum of four of group 3518 for each 2025. *Note:* No cables are required for SF #7412 and #7413 because each group 3518 provides for six lines.
10. For SF #1300 (autocall adapter base), order data set cables as follows:

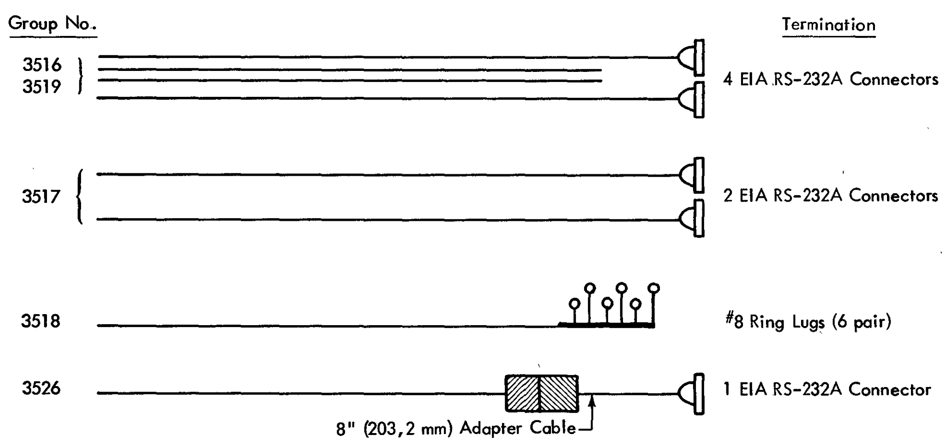
| *SF No.* | *Cable Group No.* |
|---|---|
| 1300 | One 3519 |
| 1300 and 1301 | One 3519 |
| 1300, 1301, and 1302 | Two 3519s |

11. Order one group for each of SF #2727, #2728, #3461, #7551, and #7552. Maximum of three for each 2025.
12. Required when SF #1580 (card print control) is installed on the 2025 and SF #1575, #1576, or #1577 is installed on the 2560.
13. See "Cables from Non-IBM Devices" for cable specifications.
14. See "2711 Line Adapter Unit Cabling Schematic" in *IBM System/370 Installation Manual–Physical Planning,* GC22-7004, for cabling information.
15. For all machines shipped after March 1, 1969, use group 3520. If ordering cables to recable or replace existing cables, order the group number identical to that shown on the label of the existing cable. Consult your IBM representative for assistance.
16. The power cable (group 504C or 505C) from group 504 or 505 (1403) may be used in place of group 3501 if the 504C or 505C cable is the correct length. New cable group 3502 or 3520 (see note 15) *must* be ordered. The signal cables from group 504 or 505 are *not* to be used for the 1403-to-2025 integrated attachment feature. Cables from a 1403 to a 2020 are *not* interchangeable with cables to connect a 1403 to a 2025.

## SYSTEM/360 MODEL 25 CABLING SCHEMATIC (U.S.)

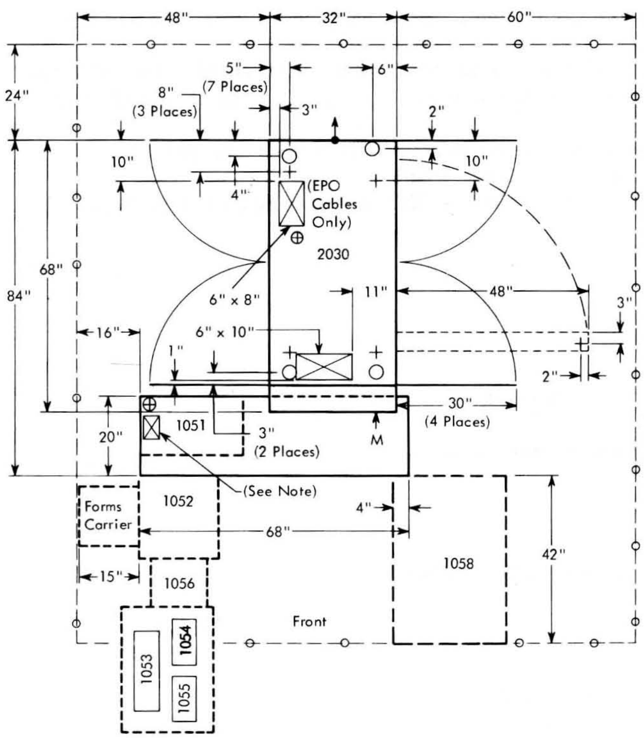
17. Power cable (group 503A) from group 503 (2540) may be used for power cable group 3503 if the 503A cable is the correct length. The signal cable (group 503B) may be used in place of signal cable group 3505 if it is the correct length *and* if it is at EC level 131840 or higher. Consult your IBM representative for assistance.
18. Group 604 must *not* be used when 2311s are attached to the 2025 through the integrated attachment feature. Group 630 *must* be ordered. Installations now using cable group 630 or 3509 may use existing cables if they are the correct length.
19. Cables from group 605 that are used between the 2311 #1 and the 2841 must *not* be used for direct attachment to the 2025. New cable groups 3506 and 3508 *must* be ordered. Cables from group 631 may be used in place of groups 3506 and 3508 if the existing cables are the correct length.
20. Cables from group 606 that are used between 2311 units must *not* be used on a System/360 Model 25. New cable group 632 *must* be ordered. Cables from existing group 632 or 3514 may be used if the cables are the correct length.
21. Cables used between 2311 units on a System/360 Model 20 or between 2311 units and the 2020 are *not* to be used on the System/360 Model 25.

### Cables from Non-IBM Devices

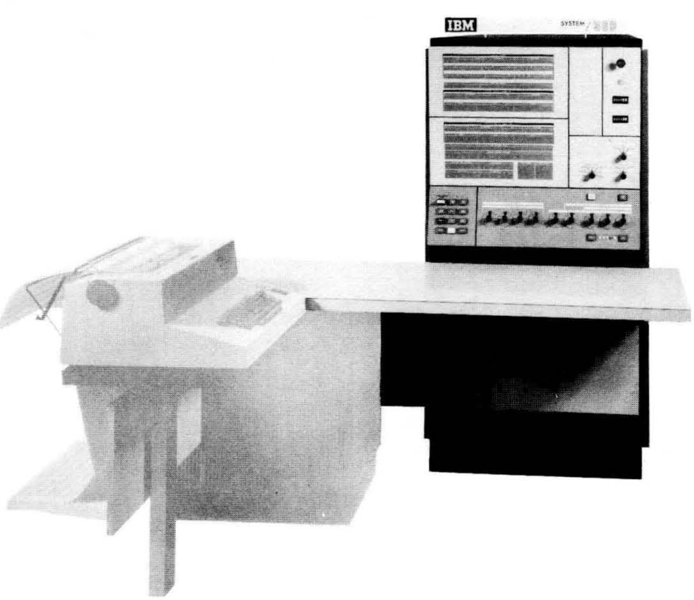


## SYSTEM/360 MODEL 30, 2030 PROCESSING UNIT

### PLAN VIEW




Note: This cable opening is required when SF # 3622 or 1051 is installed.



### SPECIFICATIONS

**Dimensions:** *

| | F | S | H |
|---|---|---|---|
| Inches | ** | ** | 60 |
| (cm) | (**) | (**) | (152) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | ** | ** | ** | ** |
| (cm) | (**) | (**) | (**) | (**) |

**Weight:** 1,700 lb (780 kg)

**Heat Output:** 10,000 BTU/hr (2.550 kcal/hr)

**Airflow:** 900 cfm (26 $m^3$/min)

**Power Requirements:**

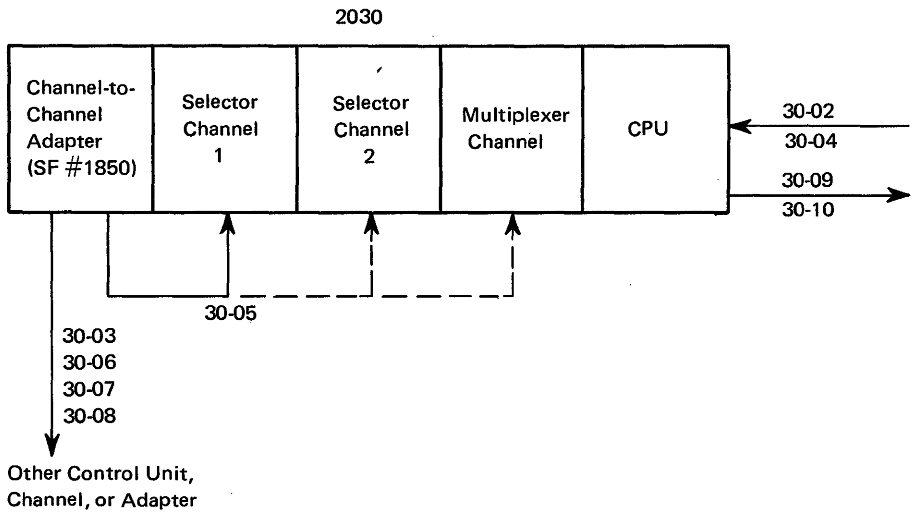
| | |
|---|---|
| kVA | 3.8 |
| Phases | 3 |
| Plug | R&S, FS3730 |
| Connector | R&S, FS3914 |
| Receptacle | R&S, FS3744 |
| Power Cord Style | D3 |

**Notes:**

* Unless otherwise specified, the shipping dimensions on the 2030 are 32" x 68" x 64" (81 cm x 173 cm x 163 cm). Removal of the side covers reduces the width to 29" (74 cm). If further reduction in length is required, see sales representative for method of specifying on the order. This modifies the unit to 29" x 60" x 70" (74 cm x 152 cm x 178 cm).

** See plan view.

## SYSTEM/360 MODEL 30 CABLING SCHEMATIC



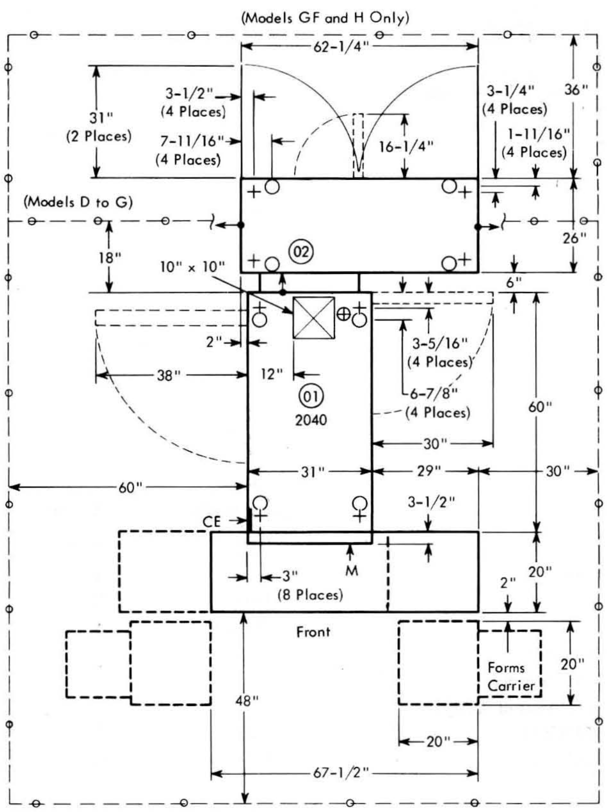

| *Group No.* | *No. of Cables* | *From* | *To* | *Max Length (ft)* | *Notes* |
|---|---|---|---|---|---|
| 30-02 | 2 | Direct Control | 2030 | 50 | 4 |
| 30-03 | 2 | 2030 | Control Unit | – | 1 |
| 30-04 | 1 | System/360 CPU | 2030 | 100 | 2 |
| 30-05 | 2 | 2030 | 2030 | (Fixed) | 3 |
| 30-06 | 2 | 2030 | Selector Channel | – | 1 |
| 30-07 | 2 | 2030 | Multiplexer Channel | – | 1 |
| 30-08 | 2 | 2030 | Channel-to-Channel Adapter | – | 1 |
| 30-09 | 1 | 2030 | System/360 CPU | 100 | 5 |
| 30-10 | 1 | 2030 | System/360 CPU | 100 | 6 |

*Notes:*

1. From channel-to-channel adapter (SF #1850); maximum cable length of 100 feet available to attach up to seven control units.
2. For the interconnection of two System/360 CPUs (SF #3274 and #3895); order one per feature.
3. Channel-to-channel adapter (SF #1850) to the channel within the same unit (maximum of one required).
4. For SF #3274 and #3895 from non-IBM device.
5. To SF #3621, two-system EPO connection.
6. To SF #3622, multisystem EPO connection. See Note 2 in "System/360 Specification Summary."

## SYSTEM/360 MODEL 40, 2040 PROCESSING UNIT

### PLAN VIEW




| Frame | Weight | | Heat Output | | Airflow | |
|---|---|---|---|---|---|---|
| | lb | kg | BTU/hr | kcal/hr | cfm | $m^3$/min |
| 01 | 1,700 | 780 | 7,000 | 1,800 | 300 | 9 |
| 02 | 610 | 280 | 3,500 | 890 | | |

### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | * | * | 60** |
| (cm) | (*) | (*) | (152**) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | * | * | * | * |
| (cm) | (*) | (*) | (*) | (*) |

| | *Models* | |
|---|---|---|
| **Weight:** | *D to G* | *GF and H* |
| lb | 1,700 | 2,310 |
| (kg) | (780) | (1.050) |
| **Heat Output:** | | |
| BTU/hr | 7,000 | 10,500 |
| (kcal/hr) | (1.800) | (2.650) |
| **Airflow:** | | |
| cfm | 300 | 300 |
| ($m^3$/min) | (9) | (9) |
| **Power Requirements:** | | |
| kVA | 2.5 | 3.7 |
| Phases | 3 | 3 |
| Plug | R&S, FS3760 | |
| Connector | R&S, FS3934 | |
| Receptacle | R&S, FS3754 | |
| Power Cord Style | B1 | |

**Environment Operating:**

- Temperature 60°-90°F (16°-32°C)
- Rel Humidity 10%-80%
- Max Wet Bulb 78°F (26°C)

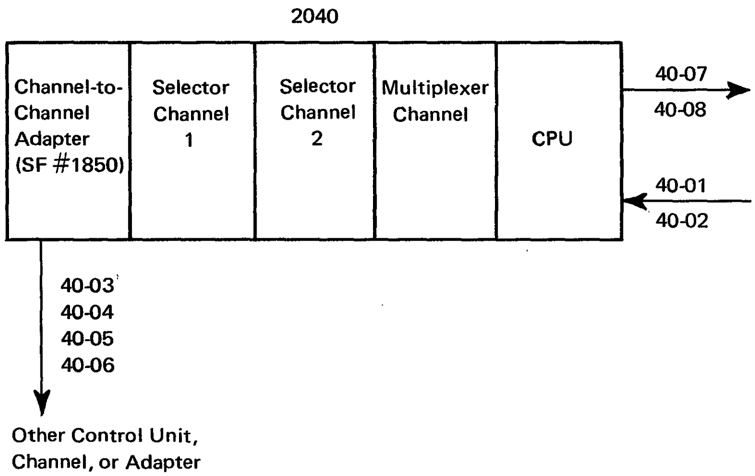
**Environment Nonoperating:**

- Temperature 50°-110°F (10°-43°C)
- Rel Humidity 10%-80%
- Max Wet Bulb 80°F (27°C)

**Notes:**

* See plan view.
** Shipping height is 70" (178 cm) for Models GF and H.

## SYSTEM/360 MODEL 40 CABLING SCHEMATIC



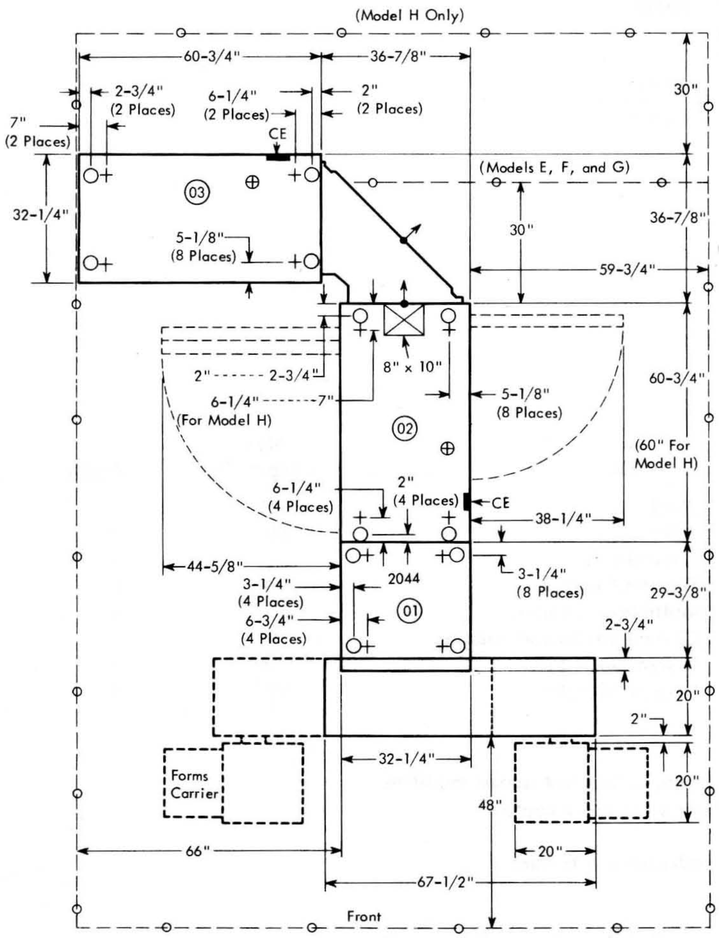

| *Group No.* | *No. of Cables* | *From* | *To* | *Max Length (ft)* | *Notes* |
|---|---|---|---|---|---|
| 40-01 | 2 | Direct Control | 2040 | 50 | 3 |
| 40-02 | 1 | System/360 CPU | 2040 | 100 | 2 |
| 40-03 | 2 | 2040 | Control Unit | – | 1 |
| 40-04 | 2 | 2040 | Selector Channel | – | 1 |
| 40-05 | 2 | 2040 | Multiplexer Channel | – | 1 |
| 40-06 | 2 | 2040 | Channel-to-Channel Adapter | – | 1 |
| 40-07 | 1 | 2040 | System/360 CPU | 100 | 5 |
| 40-08 | 1 | 2040 | System/360 CPU | 100 | 4 |

*Notes:*

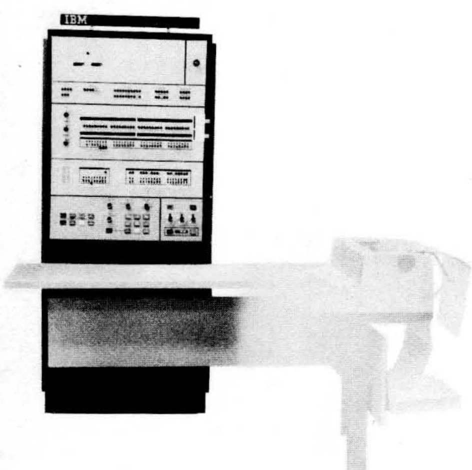
1. From channel-to-channel adapter (SF #1850); maximum cable length of 200 feet (unless modified by general control-to-channel cabling schematic) available to attach up to seven control units.
2. For the interconnection of two System/360 CPUs (SF #3274); order one per feature.
3. For SF #3274 from non-IBM device.
4. To SF #3621, two-system EPO connection.
5. To SF #3622, multisystem EPO connection. See Note 2 in "System/360 Specification Summary."

## SYSTEM/360 MODEL 44, 2044 PROCESSING UNIT

### PLAN VIEW




| Frame | Weight | | Heat Output | |
|---|---|---|---|---|
| | lb | kg | BTU/hr | kcal/hr |
| 01 | 700 | 320 | 2,500 | 640 |
| 02 | 2,200 | 1.000 | 16,500 | 4.200 |
| 03 | 1,300 | 590 | 9,000 | 2.300 |




### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | * | * | 72 |
| (cm) | (*) | (*) | (183) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | * | * | * | * |
| (cm) | (*) | (*) | (*) | (*) |

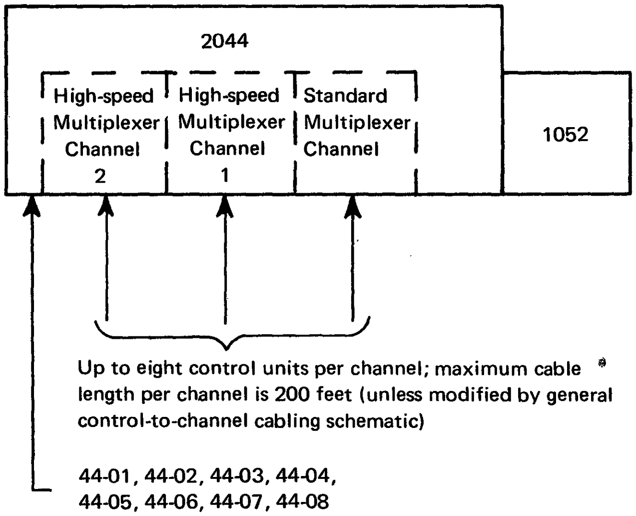
| | *Models* | | |
|---|---|---|---|
| | *E and F* | *G* | *H* |
| **Weight:** | | | |
| lb | 2,900 | 2,900 | 4,200 |
| (kg) | (1.350) | (1.350) | (1.950) |
| **Heat Output:** | | | |
| BTU/hr | 15,000 | 19,000 | 28,000 |
| (kcal/hr) | (3.800) | (4.800) | (7.100) |
| **Airflow:** | | | |
| cfm | 1,600 | 1,600 | 2,400 |
| ($m^3$/min) | (46) | (46) | (68) |
| **Power Requirements:**** | | | |
| kVA | 5.3 | 6.5 | 9.5 |
| Phases | 3 | 3 | 3 |
| Plug | R&S, FS3760 | | |
| Connector | R&S, FS3934 | | |
| Receptacle | R&S, FS3754 | | |
| Power Cord Style | E1 | | |

**Notes:**

* See plan view.

** Two identical electrical services are required for Model H only.

## SYSTEM/360 MODEL 44 CABLING SCHEMATIC

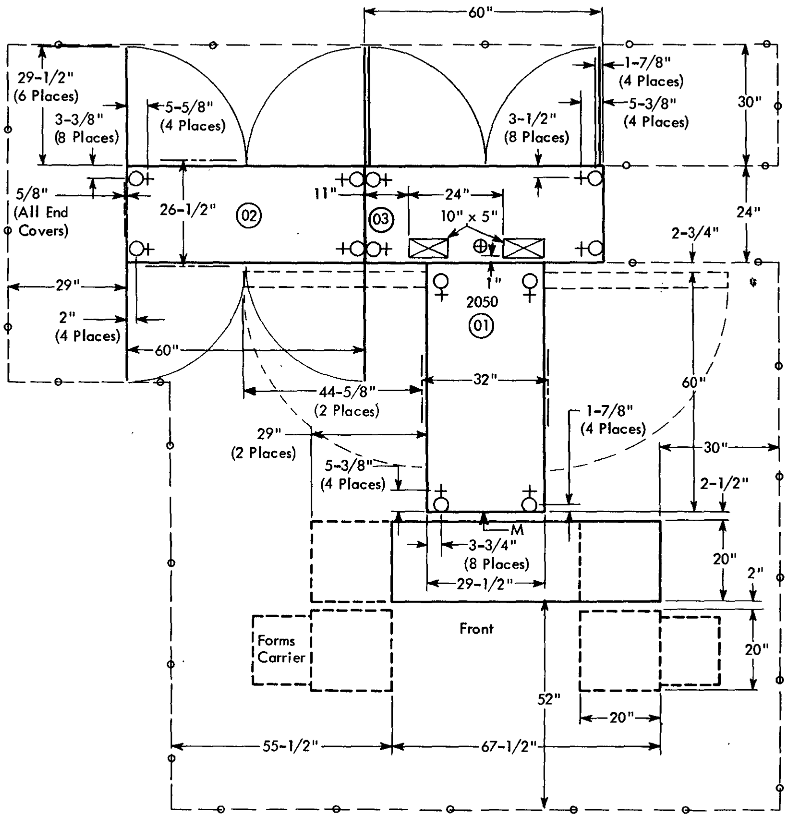



| *Group No.* | *No. of Cables* | *From* | *To* | *Max Length (ft)* | *Notes* |
|---|---|---|---|---|---|
| 44-01 | 1 | Non-IBM | 2044 | 100 | 1 |
| 44-02 | 1 | IBM | 2044 | 100 | 1 |
| 44-03 | 5 | 2044 | 2044 | 100 | 4 |
| 44-04 | 3 | Non-IBM | 2044 | 100 | 3 |
| 44-05 | 4 | Non-IBM | 2044 | 100 | 2 |
| 44-06 | 5 | Non-IBM | 2044 | 100 | 4 |
| 44-07 | 1 | 2044 | System/360 CPU | 100 | 5 |
| 44-08 | 1 | 2044 | System/360 CPU | 100 | 6 |

*Notes:*
1. For external interrupt feature (SF #3895) and/or direct word feature (SF #3288).
2. For direct data feature (SF #3275).
3. For priority interrupt feature (SF #5625).
4. For direct word feature (SF #3288).
5. To SF #3621, two-system EPO connection.
6. To SF #3622, multisystem EPO connection. See Note 2 in "System/360 Specification Summary."

## SYSTEM/360 MODEL 50 F, G, AND H, 2050 PROCESSING UNIT

## PLAN VIEW




| Frame | Table | | Frame | | Covers | |
|---|---|---|---|---|---|---|
| | lb | kg | lb | kg | lb | kg |
| 01 | 175 | 80 | 1,900 | 870 | 200 | 91 |
| 02 | | | 1,150 | 530 | 250 | 120 |
| 03 | | | 1,560 | 710 | 150 | 69 |

## SPECIFICATIONS

**Dimensions:**

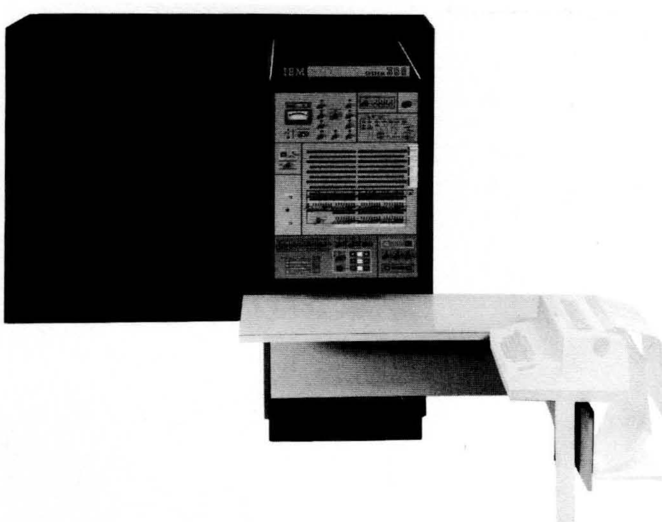
| | F | S | H |
|---|---|---|---|
| Inches | * | * | 72-1/2 |
| (cm) | (*) | (*) | (184) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | * | * | * | * |
| (cm) | (*) | (*) | (*) | (*) |

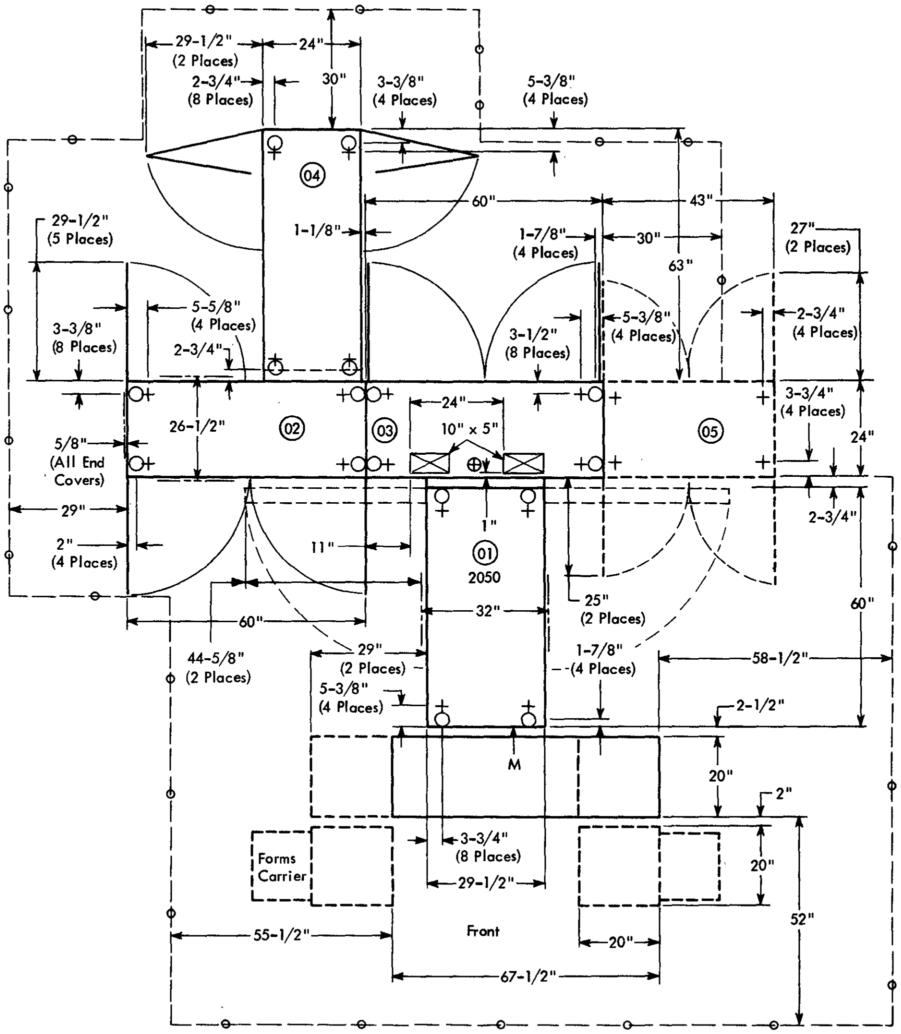
| | *Models* | |
|---|---|---|
| **Weight:** | *F and G* | *H* |
| lb | 4,700 | 5,385 |
| (kg) | (2.150) | (2.450) |
| **Heat Output:** | | |
| BTU/hr | 20,410 | 21,350 |
| (kcal/hr) | (5.150) | (5.400) |
| **Airflow:** | | |
| cfm | 2,350 | 2,990 |
| ($m^3$/min) | (67) | (85) |
| **Power Requirements:** | | |
| kVA | 6.5 | 6.8 |
| Phases | 3 | 3 |
| Plug | R&S, SC7328 | |
| Connector | R&S, SC7428 | |
| Receptacle | R&S, SC7324 | |
| Power Cord Style | E3 | |

**Notes:**
* See plan view.



## SYSTEM/360 MODEL 50 HG AND I, 2050 PROCESSING UNIT

## PLAN VIEW




Note: Frame 05 may be used on some Model I systems.

| Frame | Table | | Frame | | Covers | |
|---|---|---|---|---|---|---|
| | lb | kg | lb | kg | lb | kg |
| 01 | 175 | 80 | 1,900 | 870 | 200 | 91 |
| 02 | | | 1,150 | 530 | 250 | 120 |
| 03 | | | 1,560 | 710 | 150 | 69 |
| 04 | | | 1,500 | 690 | 250 | 120 |
| 05 | | | | | | |

## SYSTEM/360 MODEL 50 HG AND I, 2050 PROCESSING UNIT

### SPECIFICATIONS

**Dimensions:**

| | **F** | **S** | **H** |
|---|---|---|---|
| Inches | * | * | 72-1/2 |
| (cm) | (*) | (*) | (184) |

**Service Clearances:**

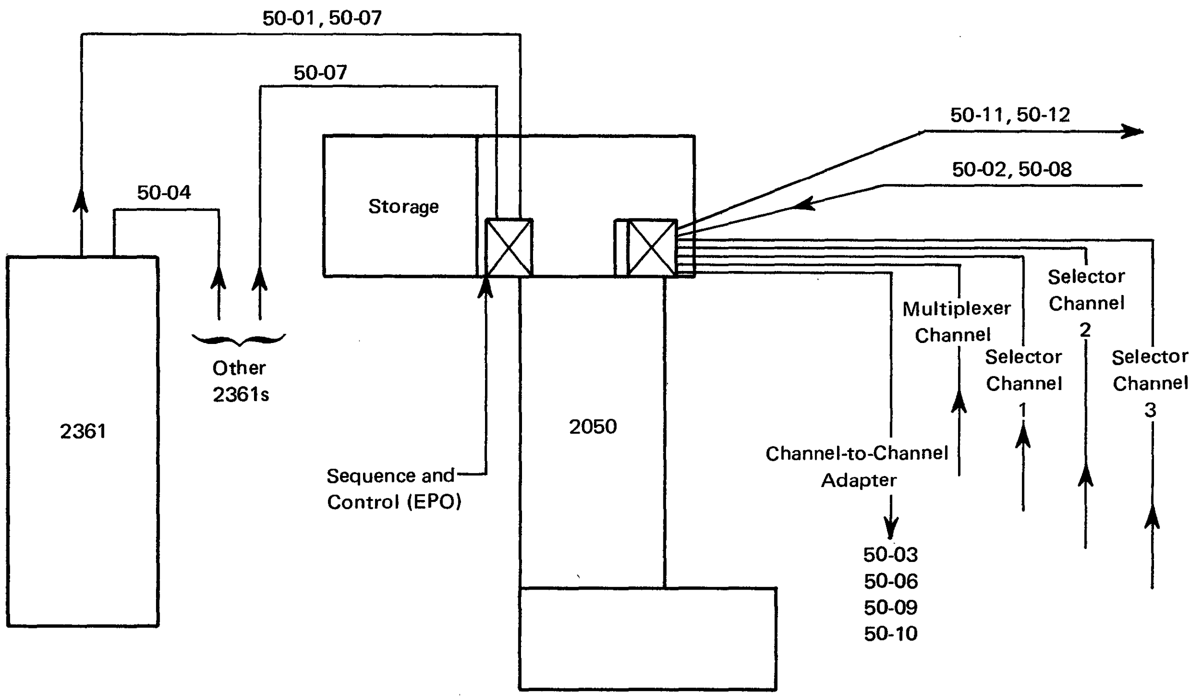
| | **F** | **R** | **Rt** | **L** |
|---|---|---|---|---|
| Inches | * | * | * | * |
| (cm) | (*) | (*) | (*) | (*) |

**Weight:** 7,135 lb (3.250 kg)

| | *Models* | |
|---|---|---|
| **Heat Output:** | *HG* | *I* |
| BTU/hr | 24,000 | 25,000 |
| (kcal/hr) | (6.050) | (6.350) |
| **Airflow:** | | |
| cfm | 4,600 | 4,600 |
| ($m^3$/min) | (140) | (140) |
| **Power Requirements:** | | |
| kVA | 7.0 | 7.6 |
| Phases | 3 | 3 |
| Plug | R&S, SC7328 | |
| Connector | R&S, SC7428 | |
| Receptacle | R&S, SC7324 | |
| Power Cord Style | E3 | |

**Notes:**
* See plan view.

## SYSTEM/360 MODEL 50 CABLING SCHEMATIC

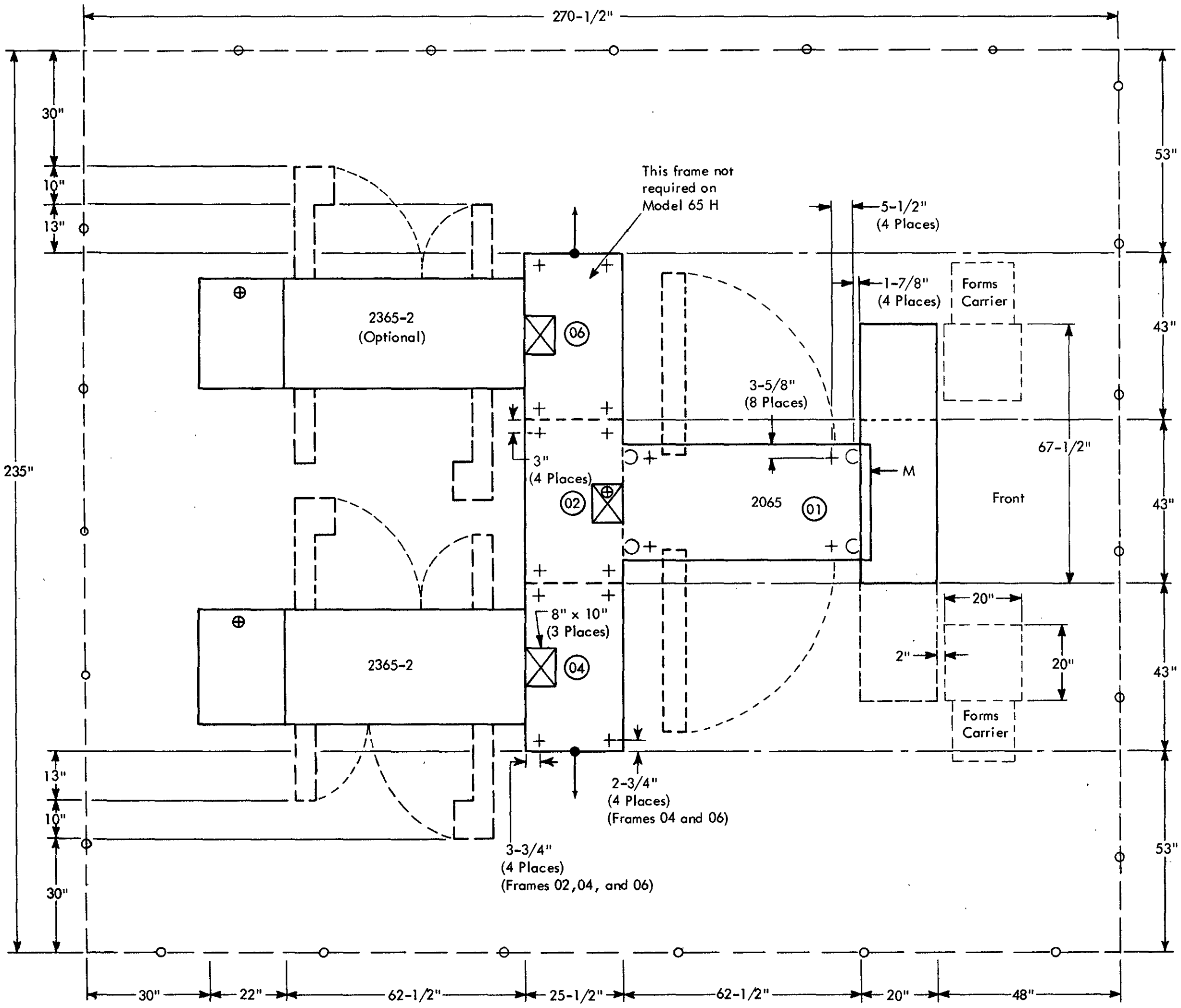



| *Group No.* | *No. of Cables* | *From* | *To* | *Max Length (ft)* | *Notes* |
|---|---|---|---|---|---|
| 50-01 | 7 | 2361 | 2050 | 20 | 5 |
| 50-02 | 2 | Direct Control | 2050 | 50 | 4 |
| 50-03 | 2 | 2050 | Control Unit | – | 1 |
| 50-04 | 7 | 2361 | 2361 | – | 5 |
| 50-06 | 2 | 2050 | Selector Channel | – | 1 |
| 50-07 | 2 | 2361 | 2050 | – | 2, 5 |
| 50-08 | 1 | System/360 CPU | 2050 | 100 | 3 |
| 50-09 | 2 | 2050 | Multiplexer Channel | – | 1 |
| 50-10 | 2 | 2050 | Channel-to-Channel Adapter | – | 1 |
| 50-11 | 1 | 2050 | System/360 CPU | 100 | 6 |
| 50-12 | 1 | 2050 | System/360 CPU | 100 | 7 |

*Notes:*
1. For channel-to-channel adapter (SF #1850). Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) available to attach up to eight control units.
2. One per 2361.
3. To other System/360 CPU (SF #3274); order one per feature.
4. For SF #3274 from non-IBM device.
5. The sum of groups 50-07 and (50-01 plus 50-04) should not exceed 150 feet for any 2361.
6. To SF #3621, two-system EPO connection.
7. To SF #3622, multisystem EPO connection. See Note 2 in "System/360 Specification Summary."

## SYSTEM/360 MODEL 65 H AND I, 2065 PROCESSING UNIT

## PLAN VIEW




| Frame | Weight | |
|---|---|---|
| | lb | kg |
| 01 | 2,400 | 1,100 |
| 02 | 1,020 | 470 |
| 04 | 540 | 250 |
| 06 | 330 | 150 |

## SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | * | * | 72-1/2 |
| (cm) | (*) | (*) | (184) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | * | * | * | * |
| (cm) | (*) | (*) | (*) | (*) |

**Weight:** 4,290 lb (1.950 kg)

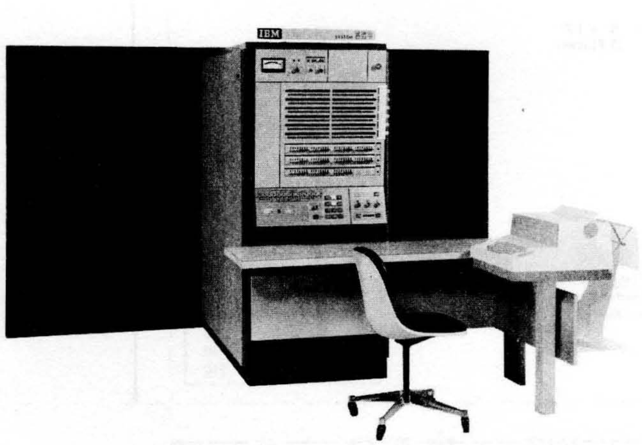
**Heat Output:** 15,800 BTU/hr (4.000 kcal/hr)

**Airflow:** 2,100 cfm (60 $m^3$/min)

**Power Requirements:**

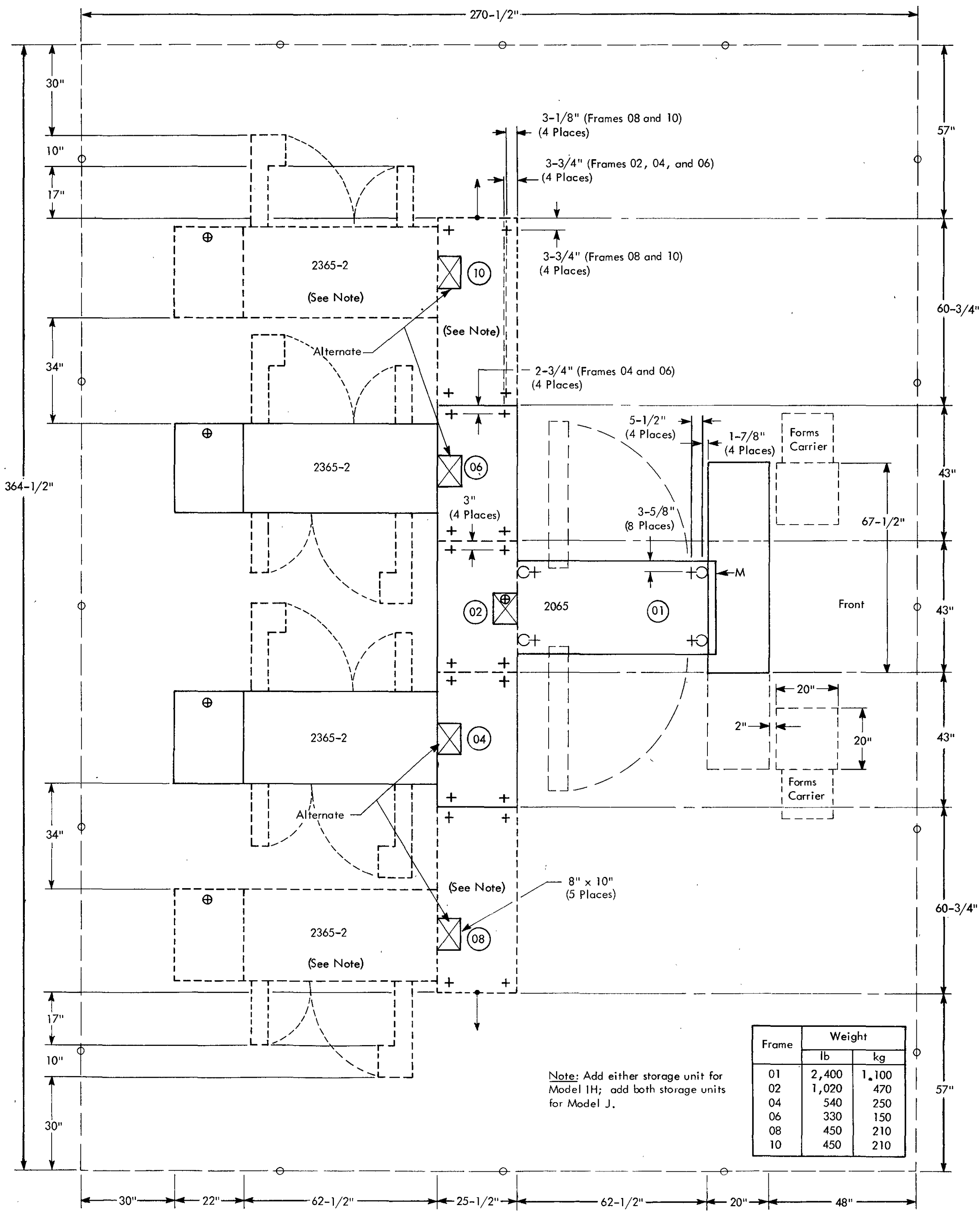
| | |
|---|---|
| kVA | 5.4 |
| Phases | 3 |
| Plug | R&S, SC7328 |
| Connector | R&S, SC7428 |
| Receptacle | R&S, SC7324 |
| Power Cord Style | E1 |

**Notes:**
* See plan view.



## SYSTEM/360 MODEL 65 IH AND J, 2065 PROCESSING UNIT

## PLAN VIEW




Note: Add either storage unit for Model IH; add both storage units for Model J.

| Frame | Weight | |
|---|---|---|
| | lb | kg |
| 01 | 2,400 | 1,100 |
| 02 | 1,020 | 470 |
| 04 | 540 | 250 |
| 06 | 330 | 150 |
| 08 | 450 | 210 |
| 10 | 450 | 210 |

**SYSTEM/360 MODEL 65 IH AND J, 2065 PROCESSING UNIT**

**SPECIFICATIONS**

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | * | * | 72-1/2 |
| (cm) | (*) | (*) | (184) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | * | * | * | * |
| (cm) | (*) | (*) | (*) | (*) |

**Weight:** 5,190 lb (2.400 kg)

**Heat Output:** 15,800 BTU/hr (4.000 kcal/hr)

**Airflow:** 2,100 cfm (60 $m^3$/min)

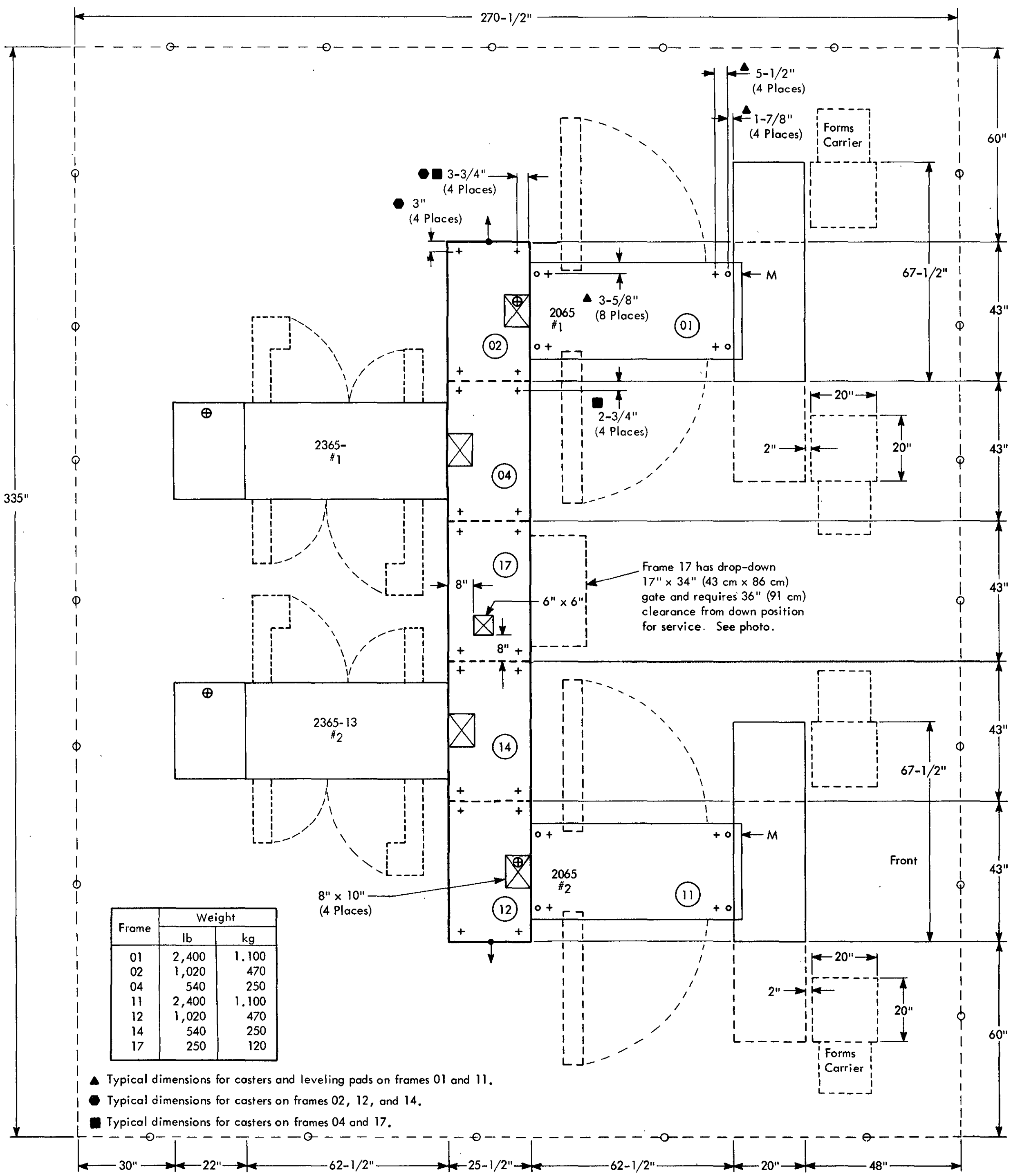
**Power Requirements:**

| | |
|---|---|
| kVA | 5.4 |
| Phases | 3 |
| Plug | R&S, SC7328 |
| Connector | R&S, SC7428 |
| Receptacle | R&S, SC7324 |
| Power Cord Style | E1 |

**Notes:**
* See plan view.

# SYSTEM/360 MODEL 65 I, MULTIPROCESSING UNIT

## PLAN VIEW




| Frame | Weight | |
|---|---|---|
| | lb | kg |
| 01 | 2,400 | 1.100 |
| 02 | 1,020 | 470 |
| 04 | 540 | 250 |
| 11 | 2,400 | 1.100 |
| 12 | 1,020 | 470 |
| 14 | 540 | 250 |
| 17 | 250 | 120 |

▲ Typical dimensions for casters and leveling pads on frames 01 and 11.

⬢ Typical dimensions for casters on frames 02, 12, and 14.

■ Typical dimensions for casters on frames 04 and 17.

## SYSTEM/360 MODEL 65 I, MULTIPROCESSING UNIT

### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | * | * | 72-1/2 |
| (cm) | (*) | (*) | (184) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | * | * | * | * |
| (cm) | (*) | (*) | (*) | (*) |

**Weight:** 8,170 lb (3.750 kg)

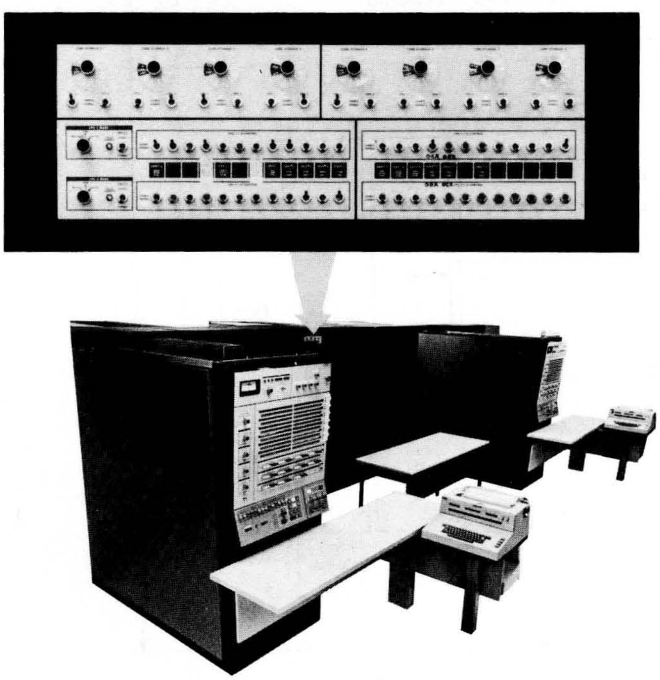
**Heat Output:** 15,800 BTU/hr per 2065
(4.000 kcal/hr per 2065)

**Airflow:** 2,100 cfm per 2065
(60 $m^3$/min per 2065)

**Power Requirements:**

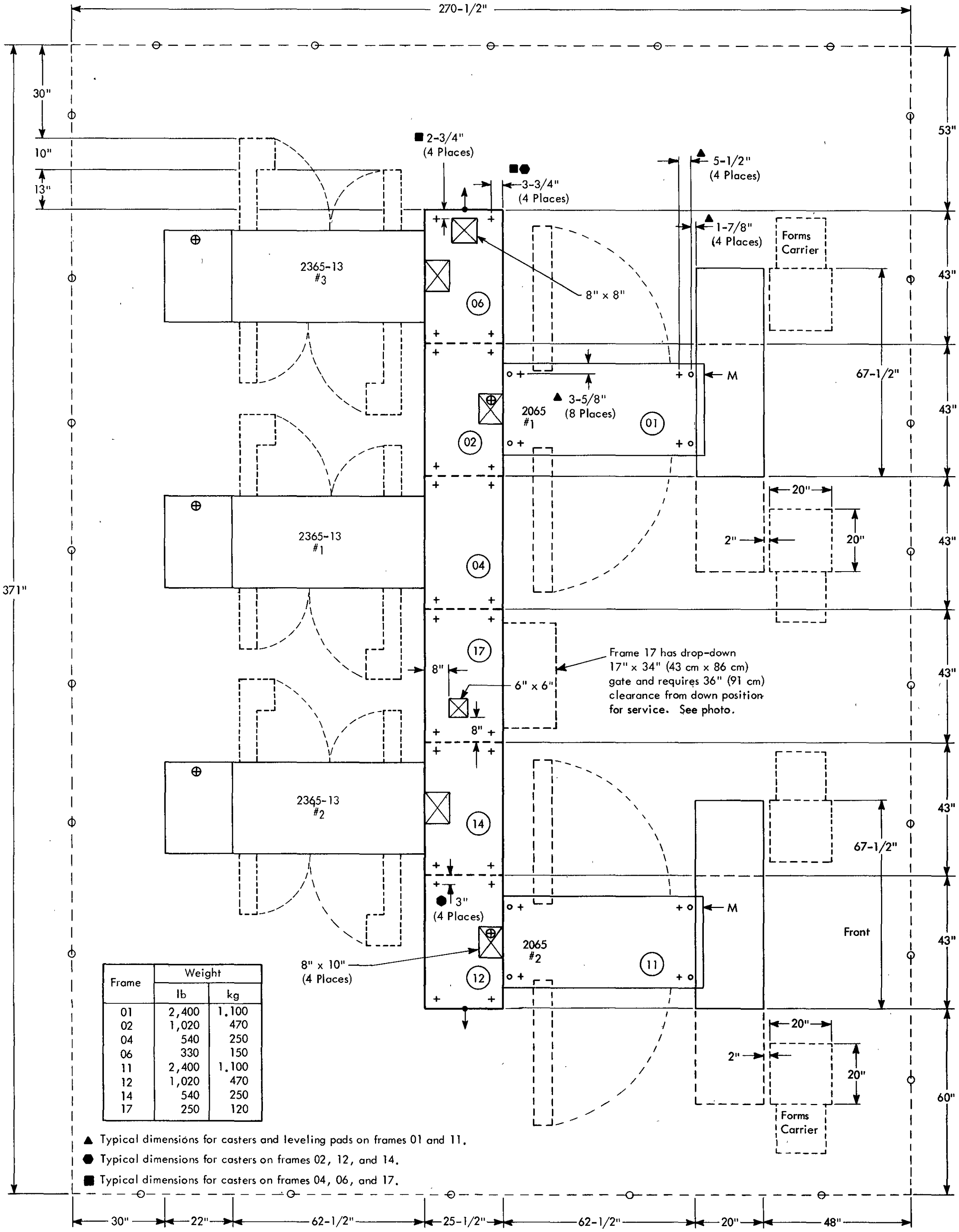
| | | |
|---|---|---|
| kVA | 5.4 per 2065 | |
| Phases | 3 | |
| Plug | R&S, SC7328 | Per 2065 |
| Connector | R&S, SC7428 | Per 2065 |
| Receptacle | R&S, SC7324 | Per 2065 |
| Power Cord Style | E1 | |

**Notes:**
* See plan view.



## SYSTEM/360 MODEL 65 IH, MULTIPROCESSING UNIT

## PLAN VIEW



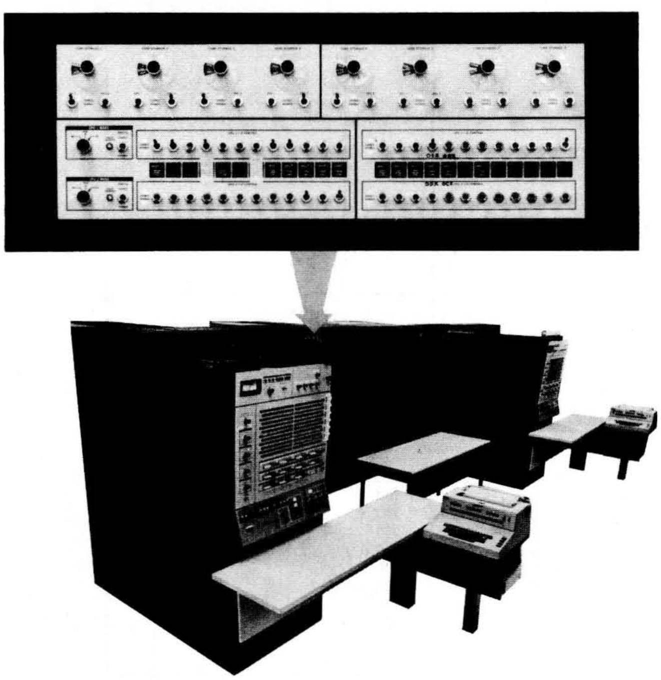

| Frame | Weight lb | Weight kg |
|---|---|---|
| 01 | 2,400 | 1,100 |
| 02 | 1,020 | 470 |
| 04 | 540 | 250 |
| 06 | 330 | 150 |
| 11 | 2,400 | 1,100 |
| 12 | 1,020 | 470 |
| 14 | 540 | 250 |
| 17 | 250 | 120 |

▲ Typical dimensions for casters and leveling pads on frames 01 and 11.

● Typical dimensions for casters on frames 02, 12, and 14.

■ Typical dimensions for casters on frames 04, 06, and 17.

## SYSTEM/360 MODEL 65 IH, MULTIPROCESSING UNIT



### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | * | * | 72-1/2 |
| (cm) | (*) | (*) | (184) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | * | * | * | * |
| (cm) | (*) | (*) | (*) | (*) |

**Weight:** 8,500 lb (3.900 kg)

**Heat Output:** 15,800 BTU/hr per 2065
(4.000 kcal/hr per 2065)

**Airflow:** 2,100 cfm per 2065
(60 $m^3$/min per 2065)

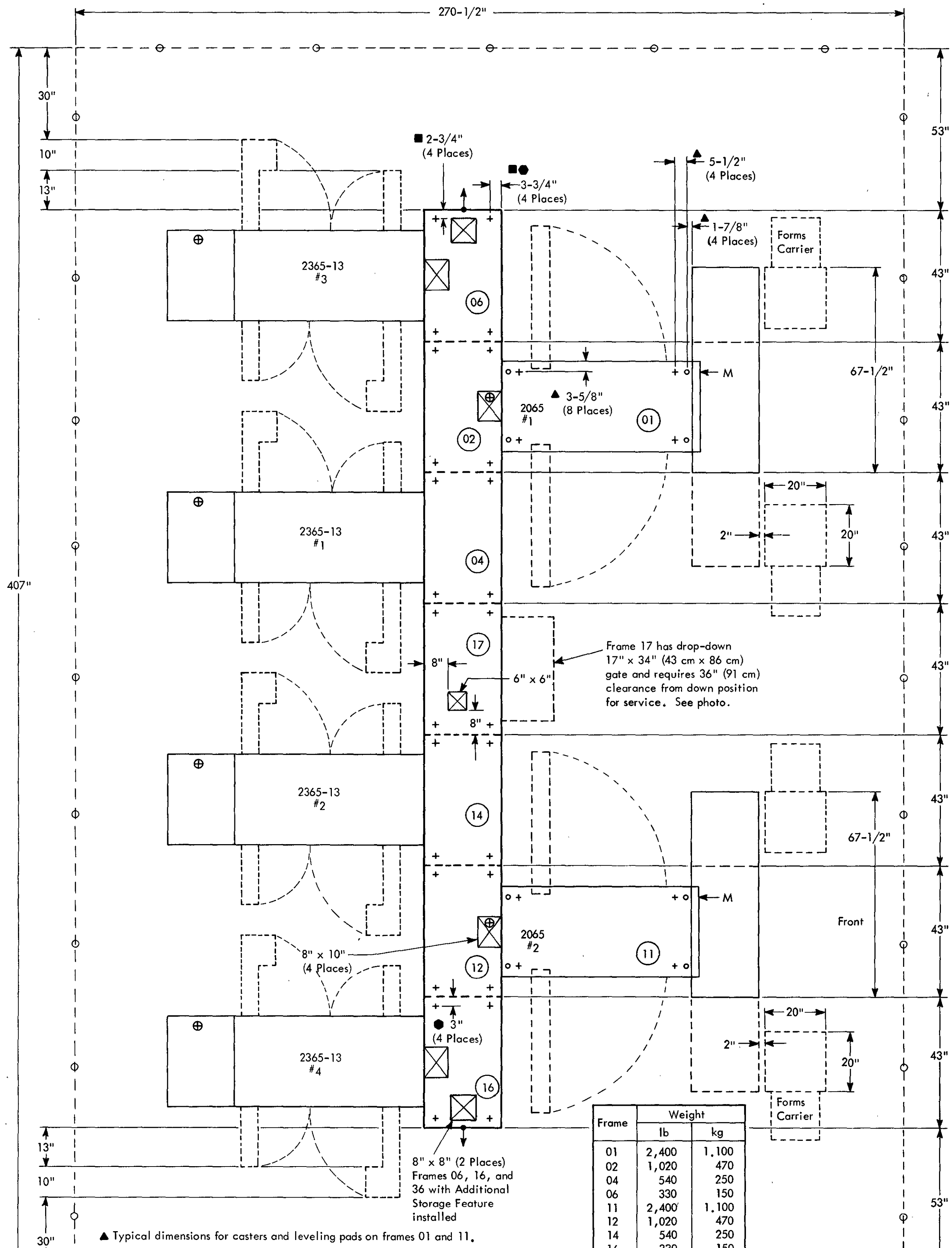
**Power Requirements:**

| | | |
|---|---|---|
| kVA | 5.4 per 2065 | |
| Phases | 3 | |
| Plug | R&S, SC7328 | Per 2065 |
| Connector | R&S, SC7428 | Per 2065 |
| Receptacle | R&S, SC7324 | Per 2065 |
| Power Cord Style | E1 | |

**Notes:**
* See plan view.

## SYSTEM/360 MODEL 65 J, MULTIPROCESSING UNIT

### PLAN VIEW




| Frame | Weight lb | Weight kg |
|---|---|---|
| 01 | 2,400 | 1,100 |
| 02 | 1,020 | 470 |
| 04 | 540 | 250 |
| 06 | 330 | 150 |
| 11 | 2,400 | 1,100 |
| 12 | 1,020 | 470 |
| 14 | 540 | 250 |
| 16 | 330 | 150 |
| 17 | 250 | 120 |

## SYSTEM/360 MODEL 65 J, MULTIPROCESSING UNIT

### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | * | * | 72-1/2 |
| (cm) | (*) | (*) | (184) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | * | * | * | * |
| (cm) | (*) | (*) | (*) | (*) |

**Weight:** 8,830 lb (4.050 kg)

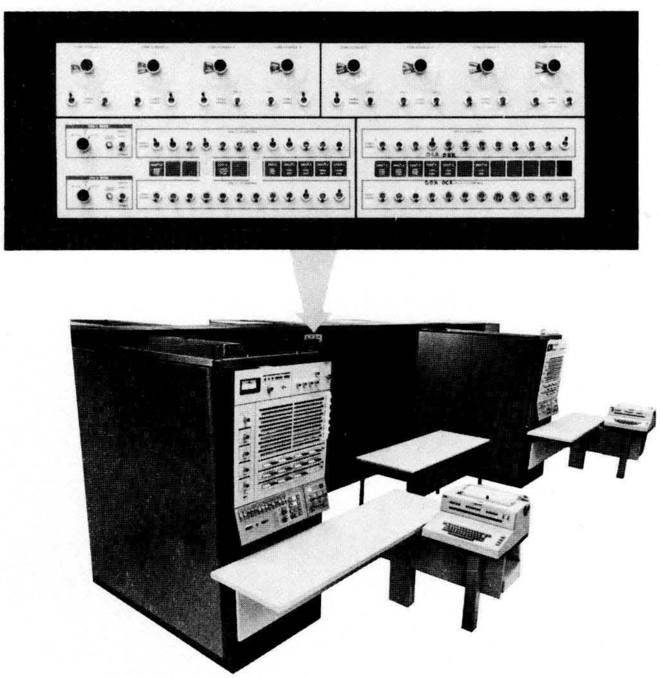
**Heat Output:** 15,800 BTU/hr per 2065
(4.000 kcal/hr per 2065)

**Airflow:** 2,100 cfm per 2065
(60 $m^3$/min per 2065)

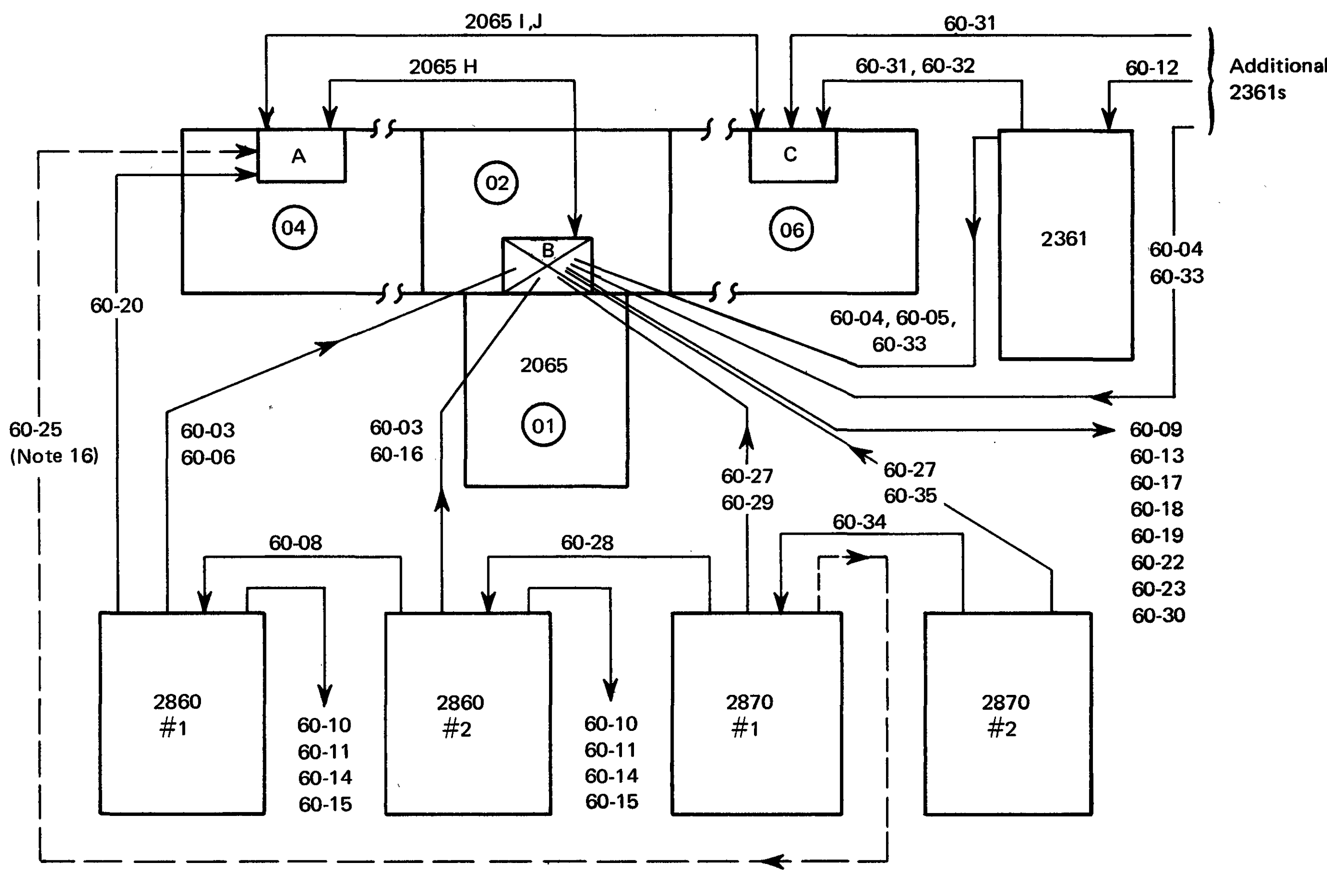
**Power Requirements:**

| | | |
|---|---|---|
| kVA | 5.4 per 2065 | |
| Phases | 3 | |
| Plug | R&S, SC7328 | Per 2065 |
| Connector | R&S, SC7428 | Per 2065 |
| Receptacle | R&S, SC7324 | Per 2065 |
| Power Cord Style | E1 | |

**Notes:**
* See plan view.



## SYSTEM/360 MODEL 65 CABLING SCHEMATIC



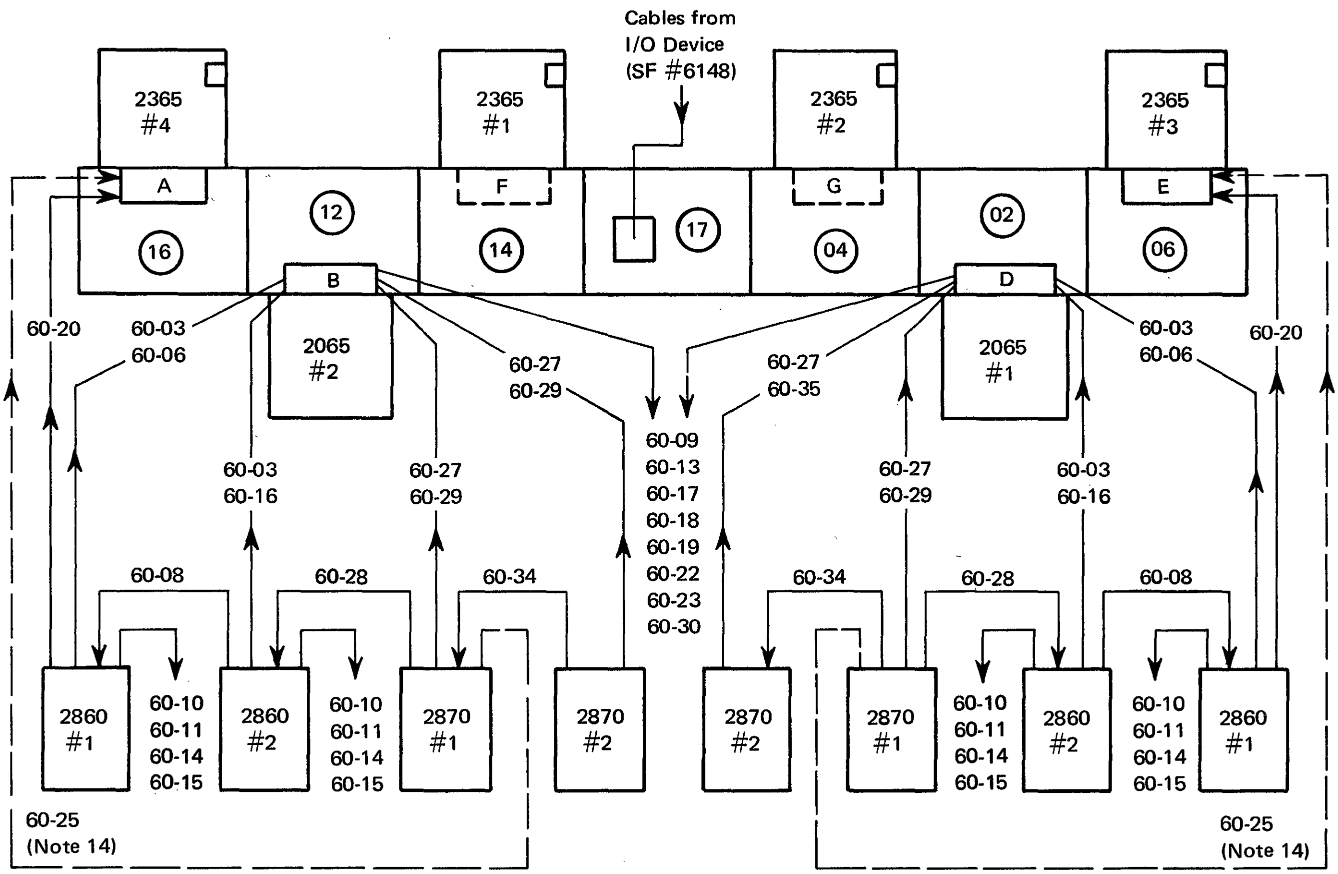
## SYSTEM/360 MODEL 65 CABLING SCHEMATIC

| *Group No.* | *No. of Cables* | *From* | *To* | *Max Length (ft)* | *Notes* |
|---|---|---|---|---|---|
| 60-03 | 1 | 2860 | 2065 (B) | 50 | 2 |
| 60-04 | 1 | 2361 | 2065 H (B) | 50 | 4 |
| 60-05 | 12 | 2361 #1 | 2065 H (B) | 20 | 3 |
| 60-06 | 1 | 2860 #1 | 2065 (B) | 40 | 6 |
| 60-08 | 13 | 2860 #2 | 2860 #1 | 20 | 3, 5 |
| 60-09 | 2 | Direct Control | 2065 (B) | 50 | 11 |
| 60-10 | 2 | 2860 (SF #1850) | Control Unit | – | 1, 9 |
| 60-11 | 2 | 2860 (SF #1850) | Channel-to-Channel Adapter | – | 8, 9 |
| 60-12 | 12 | 2361 | 2361 #1 | 20 | 3 |
| 60-13 | 1 | Direct Control | 2065 (B) | 100 | 7 |
| 60-14 | 2 | 2860 (SF #1850) | Multiplexer Channel | – | 1, 9 |
| 60-15 | 2 | 2860 (SF #1850) | Selector Channel | – | 1, 9 |
| 60-16 | 1 | 2860 #2 | 2065 (B) | – | 6 |
| 60-17 | 2 | SF #7920/#7921 | Selector Channel | – | 9 |
| 60-18 | 2 | SF #7920/#7921 | Control Unit | – | 9 |
| 60-19 | 2 | SF #7920/#7921 | Channel-to-Channel Adapter | – | 9 |
| 60-20 | 13 | 2860 #1 | 2065 (A) | 25 | 3, 5 |
| 60-22 | 1 | 2065 (B) | System/360 CPU | 100 | 10 |
| 60-23 | 1 | 2065 (B) | System/360 CPU | 100 | 12 |
| 60-25 | 13 | 2870 #1 | 2065 (A) | 25 | 16 |
| 60-27 | 1 | 2870 | 2065 (B) | – | 13, 14 |
| 60-28 | 13 | 2870 #1 | 2860 #2 | 20 | 3, 5 |
| 60-29 | 1 | 2870 #1 | 2065 (B) | 65 | 6 |
| 60-30 | 2 | SF #7920/#7921 | Multiplexer Channel | – | 9 |
| 60-31 | 1 | 2361 | 2065 I, J (C) | – | 4 |
| 60-32 | 12 | 2361 #1 | 2065 I, J (C) | 20 | 3 |
| 60-33 | 1 | 2361 | 2065 (B) | – | 4 |
| 60-34 | 13 | 2870 #2 | 2870 #1 | 20 | 5 |
| 60-35 | 1 | 2870 #2 | 2065 (B) | 65 | 6, 15 |

*Notes:*

1. From channel-to-channel adapter (SF #1850).
2. One per channel.
3. The sum of group 60-20 plus 60-05 or 60-32 plus 60-08 plus 60-28 plus 60-34 plus 60-12(s) must not exceed 140 feet for Models H and I; 120 feet for Model J.
4. One per 2361.
5. At no time may the sum of groups 60-20 plus 60-08 plus 60-28 plus 60-34 exceed 65 feet.
6. Sequence and control (EPO).
7. For the interconnection of two System/360 CPUs (SF #3274); order one per feature.
8. For the interconnection of two channel-to-channel adapter features (SF #1850).
9. Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) available to attach up to eight control units.
10. To SF #3621, two-system EPO connection.
11. For SF #3274 to non-IBM device.
12. To SF #3622, multisystem EPO connection. See Note 2 in "System/360 Specification Summary."
13. Maximum "X" length:
    25 feet for one channel frame
    45 feet for two channel frames
    65 feet for three or four channel frames.
14. When used with 2870 #2 and 2870 #2 is the fourth channel frame, "X" length must equal sum of groups 60-20 plus 60-08 plus 60-28 plus 60-34; but length should not exceed 65 feet.
15. Use group 60-29 for 2870 #2 if total number of channel frames is less than four.
16. Use group 60-25 in place of groups 60-28 and 60-20 when 2870 is the only channel.

## SYSTEM/360 MODEL 65 MULTIPROCESSING CABLING SCHEMATIC



## SYSTEM/360 MODEL 65 MULTIPROCESSING CABLING SCHEMATIC

| *Group No.* | *No. of Cables* | *From* | *To* | *Max Length (ft)* | *Notes* |
|---|---|---|---|---|---|
| 60-03 | 1 | 2860 | 2065 | 50 | 2 |
| 60-06 | 1 | 2860 #1 | 2065 | 40 | 6 |
| 60-08 | 13 | 2860 | 2860 #1 | 20 | 5 |
| 60-09 | 2 | Direct Control | 2065 | 50 | 11 |
| 60-10 | 2 | 2860 (SF #1850) | Control Unit | – | 1, 9 |
| 60-11 | 2 | 2860 (SF #1850) | Channel-to-Channel Adapter | – | 8, 9 |
| 60-13 | 1 | Direct Control | 2065 | 100 | 7 |
| 60-14 | 2 | 2860 (SF #1850) | Multiplexer Channel | – | 1, 9 |
| 60-15 | 2 | 2860 (SF #1850) | Selector Channel | – | 1, 9 |
| 60-16 | 1 | 2860 #2 | 2065 | – | 6 |
| 60-17 | 2 | SF #7920/#7921 | Selector Channel | – | 9 |
| 60-18 | 2 | SF #7920/#7921 | Control Unit | – | 9 |
| 60-19 | 2 | SF #7920/#7921 | Channel-to-Channel Adapter | – | 9 |
| 60-20 | 13 | 2860 #1 | 2065 | 25 | 3, 4, 5 |
| 60-22 | 1 | 2065 | System/360 CPU | 100 | 10 |
| 60-23 | 1 | 2065 | System/360 CPU | 100 | 12 |
| 60-25 | 13 | 2870 #1 | 2065 | 25 | 14 |
| 60-27 | 1 | 2870 | 2065 | – | 13, 15 |
| 60-28 | 13 | 2870 #1 | 2860 #2 | 20 | – |
| 60-29 | 1 | 2870 | 2065 | 65 | 6 |
| 60-30 | 2 | SF #7920/#7921 | Multiplexer Channel | – | 9 |
| 60-34 | 13 | 2870 #2 | 2870 #1 | 20 | 5 |
| 60-35 | 1 | 2870 #2 | 2065 #1 | 65 | 6, 16 |

*Notes:*

1. From channel-to-channel adapter (SF #1850).
2. One per channel.
3. When 2365 #4 is absent, route the cables to cable entry F instead of A.
4. When 2365 #3 is absent, route the cables to cable entry G instead of E.
5. At no time may the sum of groups 60-20 plus 60-08 plus 60-28 plus 60-34 exceed 65 feet.
6. Sequence and control (EPO).
7. For the interconnection of two System/360 CPUs (SF #3274); order one per feature.
8. For the interconnection of two channel-to-channel adapter features (SF #1850).
9. Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) available to attach up to eight control units.
10. To SF #3621, two-system EPO connection.
11. For SF #3274 to non-IBM device.
12. To SF #3622, multisystem EPO connection. See Note 2 in "System/360 Specification Summary."
13. Maximum "X" length:
    25 feet for one channel frame
    45 feet for two channel frames
    65 feet for three or four channel frames.
14. Use group 60-25 in place of groups 60-28 and 60-20 when 2870 is the only channel.
15. When used with 2870 #2 and 2870 #2 is the fourth channel frame, "X" length must equal sum of groups 60-20 plus 60-08 plus 60-28 plus 60-34; but length should not exceed 65 feet.
16. Use group 60-29 for 2870 #2 if total number of channel frames is less than four on 2065 #1.

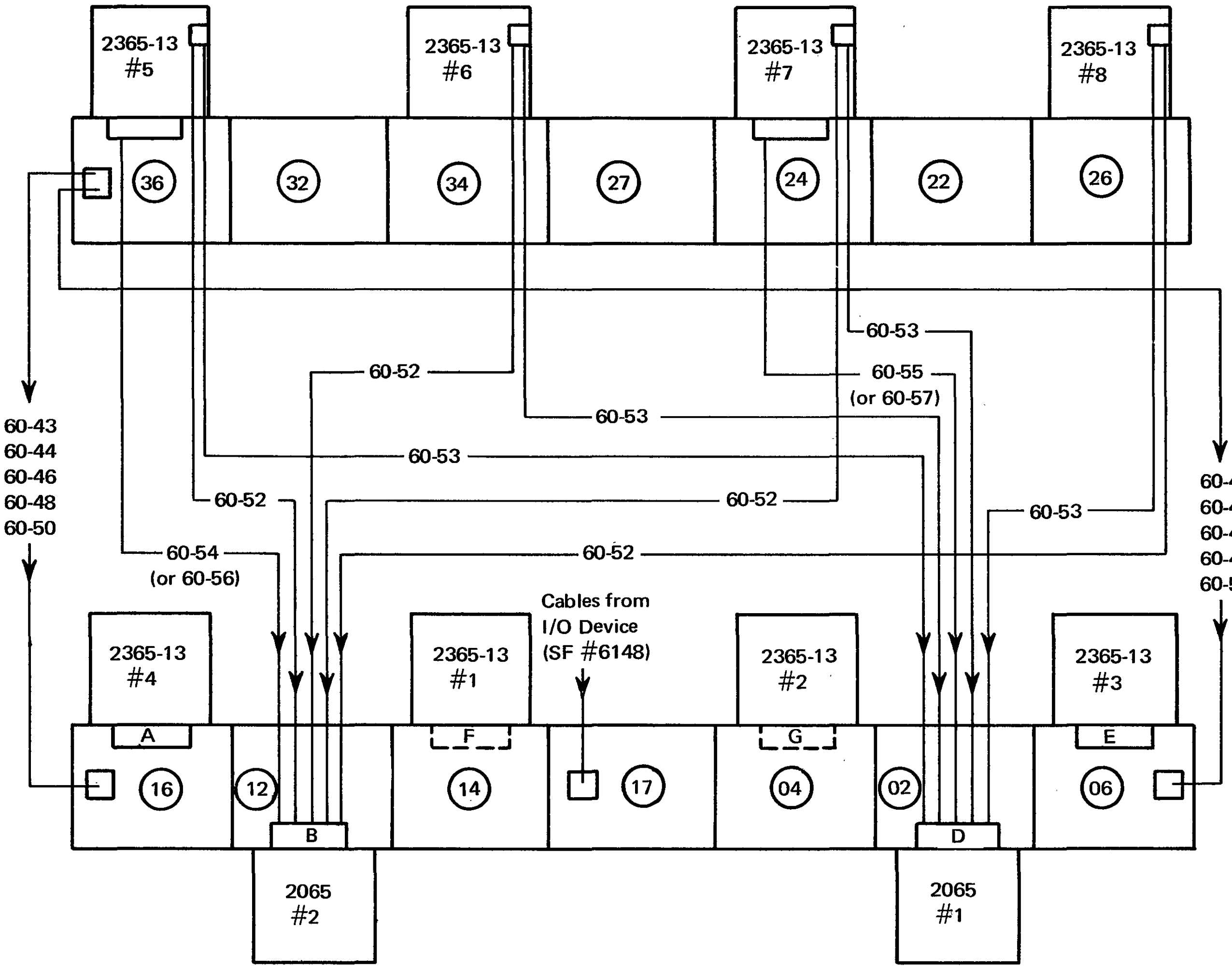
## SYSTEM/360 MODEL 67 CONFIGURATIONS

The IBM System/360 Model 67 configuration varies, depending on the units that are ordered by the customer to make up his system.

The following rules are to be observed in the arrangement of the system and peripheral units:

1. The configurations of the System/360 Model 67-1 are limited by features to those shown on the following page. The IBM 2365 Processor Storage units are to be numbered as shown in Examples 12 through 15.
2. The configurations of the System/360 Model 67-2 are shown on Examples 16 through 23. The 2365 Processor Storage units and 2067 Processing Units are to be numbered as shown in Examples 16 through 23. The 2365 Processor Storage units in Example 23 would always be numbered 5 through 8 from left to right, regardless of whether the configuration was located to the left or right of the configuration with the processors.
3. The 2365 Processor Storage units are installed to the right and/or left of the 2067 or side by side in a contiguous wall section with an expansion feature (SF #3846) between them. This feature (SF #3846) must always be between two adjacent 2365 units when a 2067 is not between them.
4. The 2365 Processor Storage Model 2 units require SF #8035 when installed with a 2067.
5. The power sequence feature (SF #5518) is required for a system with two or more 2067 Processing Units. SF #5518 is installed in one of the expansion features (SF #3846) that will be required for the two-processor system.
6. Subfloor cable entry capability is a requirement.

**SYSTEM/360 MODEL 65 J MULTIPROCESSING**
**ADDITIONAL STORAGE FEATURE CABLING SCHEMATIC**



## SYSTEM/360 MODEL 65 J MULTIPROCESSING
## ADDITIONAL STORAGE FEATURE CABLING SCHEMATIC

| *Group No.* | *No. of Cables* | *From Unit-Frame* | *To Unit-Frame* | *Max Length (ft)* | *Notes* |
|---|---|---|---|---|---|
| 60-42 | 12 | 2365-13 Fr 36 | 2065 Fr 06 | 35 | 1, 2 |
| 60-43 | 12 | 2365-13 Fr 36 | 2065 Fr 16 | 35 | 1, 2 |
| 60-44 | 3 | 2365-13 Fr 36 | 2065 Fr 16 | 35 | 1, 2 |
| 60-45 | 3 | 2365-13 Fr 36 | 2065 Fr 06 | 35 | 1, 2 |
| 60-46 | 3 | 2365-13 Fr 36 | 2065 Fr 16 | 35 | 2, 3 |
| 60-47 | 3 | 2365-13 Fr 36 | 2065 Fr 06 | 35 | 2, 3 |
| 60-48 | 3 | 2365-13 Fr 36 | 2065 Fr 16 | 35 | 2, 4 |
| 60-49 | 3 | 2365-13 Fr 36 | 2065 Fr 06 | 35 | 2, 4 |
| 60-50 | 3 | 2365-13 Fr 36 | 2065 Fr 16 | 35 | 2, 5 |
| 60-51 | 3 | 2365-13 Fr 36 | 2065 Fr 06 | 35 | 2, 5 |
| 60-52 | 1 | 2365-13 | 2065 Fr 12 | 60 | 6 |
| 60-53 | 1 | 2365-13 | 2065 Fr 02 | 60 | 6 |
| 60-54 (or 60-56) | 1 | 2365-13 Fr 36 | 2065 Fr 12 | 40 | 7, 9 |
| 60-55 (or 60-57) | 1 | 2365-13 Fr 24 | 2065 Fr 02 | 40 | 8, 9 |

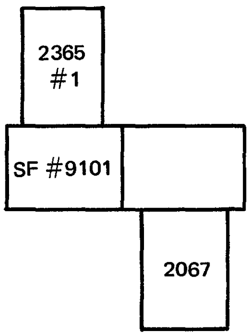
*Notes:*

1. These cable groups are required for first additional storage unit.
2. Total "X" length must not exceed 50 feet for cable groups (60-42 plus 60-43), (60-44 plus 60-45), (60-46 plus 60-47), 60-48 plus 60-49), and (60-50 plus 60-51).
3. These cable groups are required for second additional storage unit.
4. These cable groups are required for third additional storage unit.
5. These cable groups are required for fourth additional storage unit.
6. One cable group is required for each additional storage unit.
7. One cable group is required for first additional storage unit.
8. One cable group is required for third additional storage unit.
9. For 50-Hz machines, use group number in parentheses.

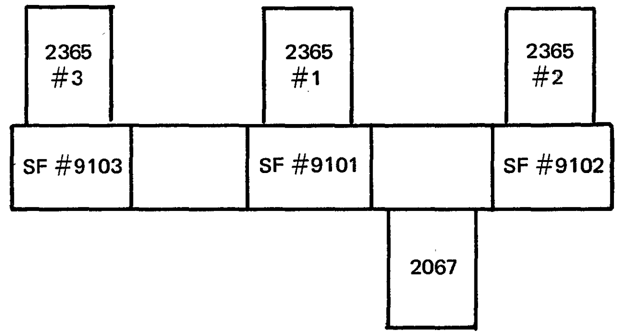
## SYSTEM/360 MODEL 67 CONFIGURATION FEATURES

The *IBM Sales Manual* lists the special features that must be ordered to make up the various configurations of the 2365 Processor Storage units and the 2067 Processing Units.

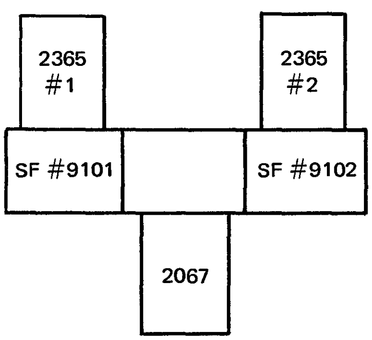
### System/360 Model 67-1



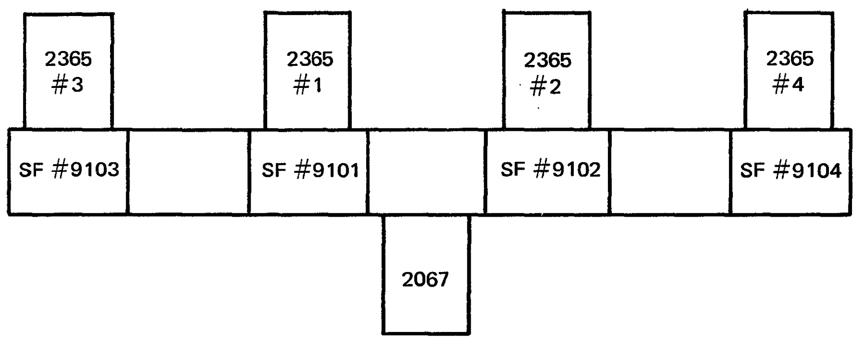

Example 12—SF #9101 attaches 2365 Model 2 #1 to 2067 Model 1.




Example 14—SF #9103 attaches 2365 Model 2 #3 to 2067 Model 1 (2365 Model 2 with SF #9102 is a prerequisite).




Example 13—SF #9102 attaches 2365 Model 2 #2 to 2067 Model 1 (2365 with SF #9101 is a prerequisite).




Example 15—SF #9104 attaches 2365 Model 2 #4 to 2067 Model 1 (2365 Model 2 with SF #9103 is a prerequisite).

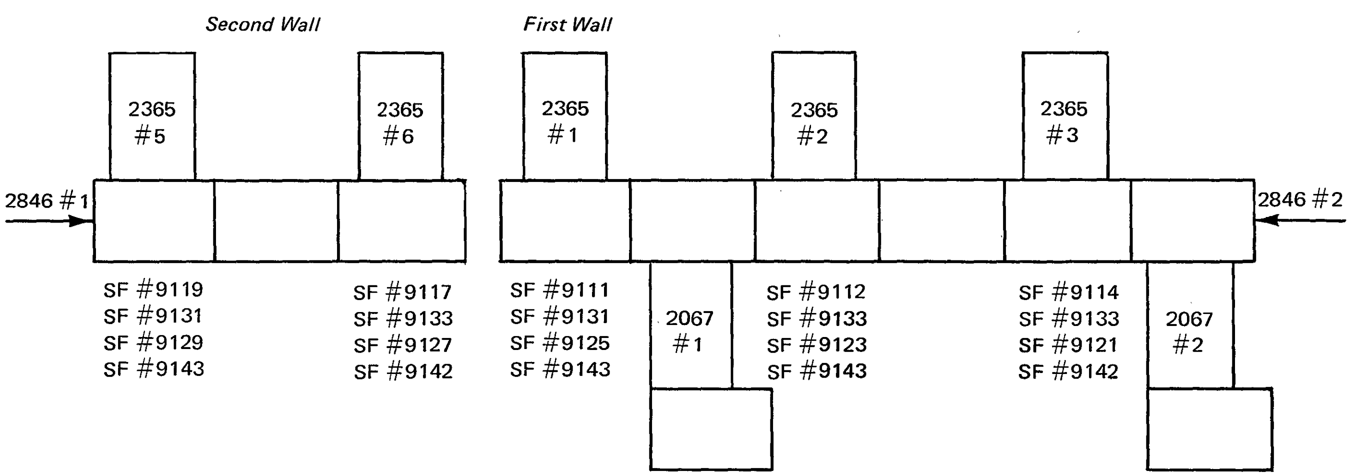
### System/360 Model 67-2

The following feature listing and example represent typical configurations:

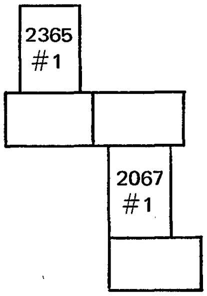
| Special Feature (SF #) | Function |
|---|---|
| 9111* | Required to attach 2365 Model 12 #1 to 2067 Model 2 #1. Plant installation only. |
| 9112* | Required to attach 2365 Model 12 #2 to 2067 Model 2 #1. Plant installation only. |
| 9114* | Required to attach 2365 Model 12 #3 to 2067 Model 2 #1. Plant installation only. |
| 9116* | Required to attach 2365 Model 12 to #4 to 2067 Model 2 #1. Plant installation only. |
| 9117 | Required on the right-end 2365 of the second wall to connect 2067 #1 from the right. |
| 9118 | Required on the left-end 2365 of the second wall to connect 2067 #1 from the left. |
| 9119 | Required on each 2365, except the first of the second wall, for 2067 #1. Prerequisite is either SF #9117 or SF #9118 on the first 2365. |
| 9121* | Required to attach 2365 Model 12 #3 to 2067 Model 2 #2. |
| 9122* | Required to attach 2365 Model 12 #4 to 2067 Model 2 #2. |
| 9123* | Required to attach 2365 Model 12 #2 to 2067 Model 2 #2. |
| 9125* | Required to attach 2365 Model 12 #1 to 2067 Model 2 #2. |

| Special Feature (SF #) | Function |
|---|---|
| 9127 | Required on the right-end 2365 of the second wall to connect 2067 #2 from the right. |
| 9128 | Required on the left-end 2365 of the second wall to connect 2067 #2 from the left. |
| 9129 | Required on each 2365, except the first of the second wall, for 2067 #2. Prerequisite is either SF #9127 or SF #9128 on the first 2365. |
| 9131 | Required on the left-end 2365 of each wall when 2846 #1 attaches on the left. |
| 9132 | Required on the right-end 2365 of each wall when 2846 #1 attaches on the right. |
| 9133 | Required on each 2365 on a wall, except the first, for 2846 #1. Prerequisite is either SF #9131 or SF #9132 on the first 2365 on each wall. |
| 9141 | Required on the left-end 2365 of each wall when 2846 #2 attaches on the left. |
| 9142 | Required on the right-end 2365 of each wall when 2846 #2 attaches on the right. |
| 9143 | Required on each 2365 on a wall, except the first, for 2846 #2. Prerequisite is either SF #9141 or SF #9142 on the first 2365 on each wall. |

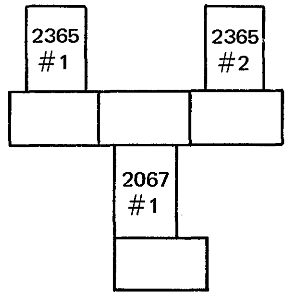
*Model 12 only.



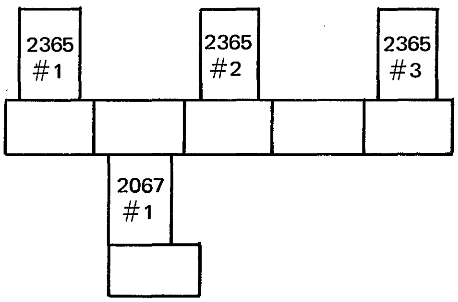
*System/360 Model 67-2 Configurations With One Processor*



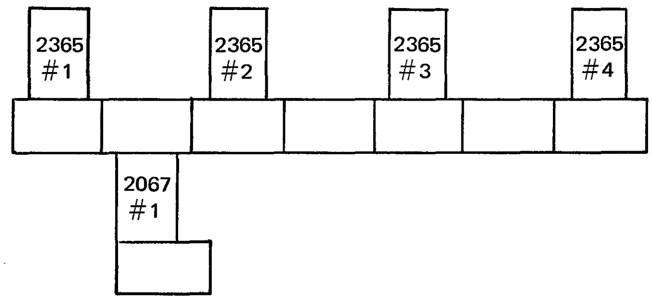

Example 16




Example 18

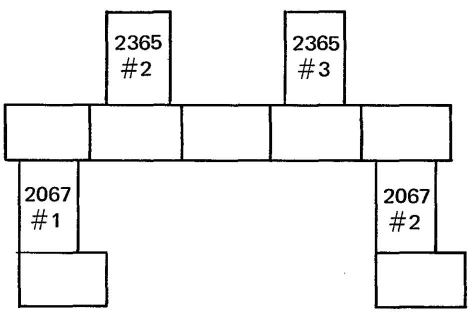



Example 17

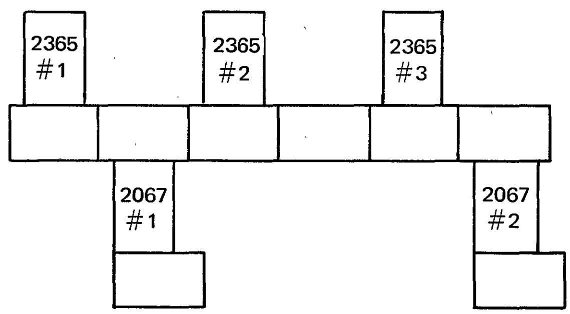



Example 19

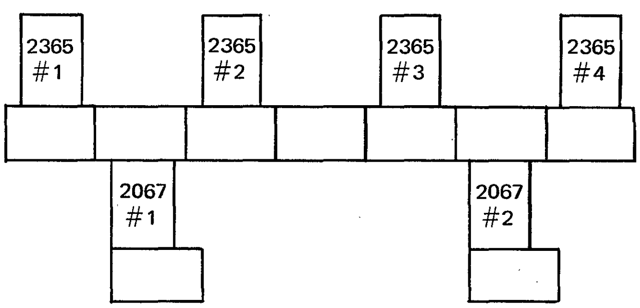
*System/360 Model 67-2 Configurations With Two Processors*



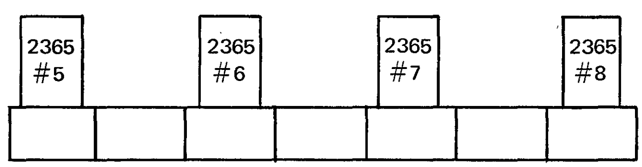

Example 20




Example 22




Example 21

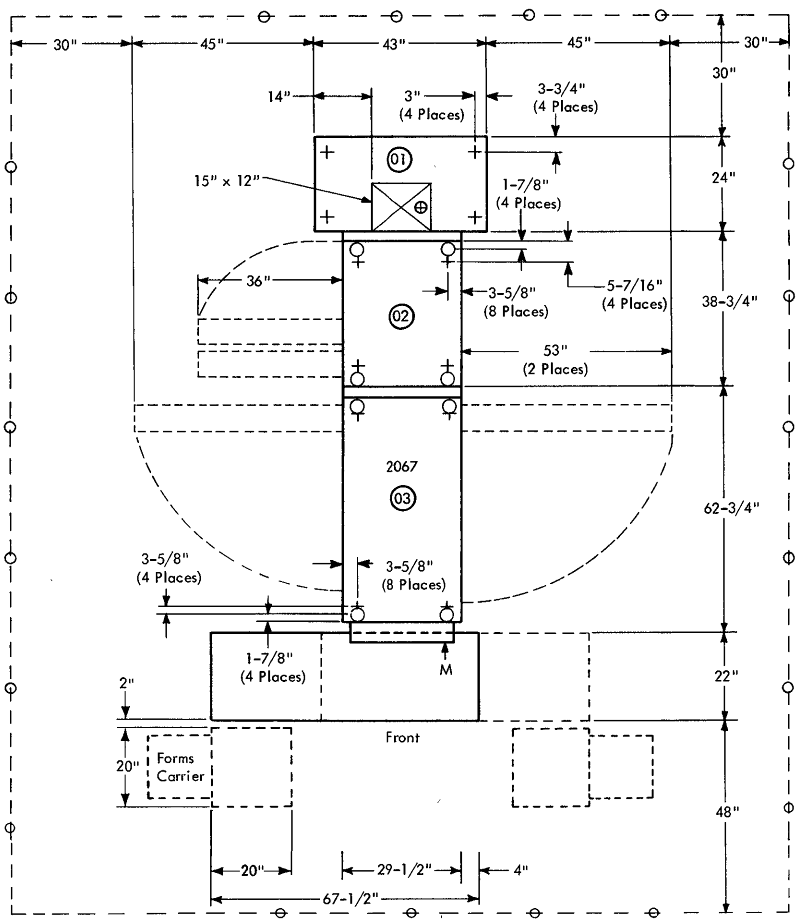



Example 23

*Note:* Additional 2365 Processor Storage units (maximum of four) may be ordered with any of the two-processor configurations.

## SYSTEM/360 MODEL 67, 2067 PROCESSING UNIT

## PLAN VIEW




| Frame | Weight | |
|---|---|---|
| | lb | kg |
| 01 | 1,914 | 870 |
| 02 | 860 | 400 |
| 03 | 900 | 410 |

## SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | * | * | 72-1/2 |
| (cm) | (*) | (*) | (184) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | * | * | * | * |
| (cm) | (*) | (*) | (*) | (*) |

**Weight:** 3,674 lb (1.700 kg)

**Heat Output:** 20,000 BTU/hr (5.050 kcal/hr)

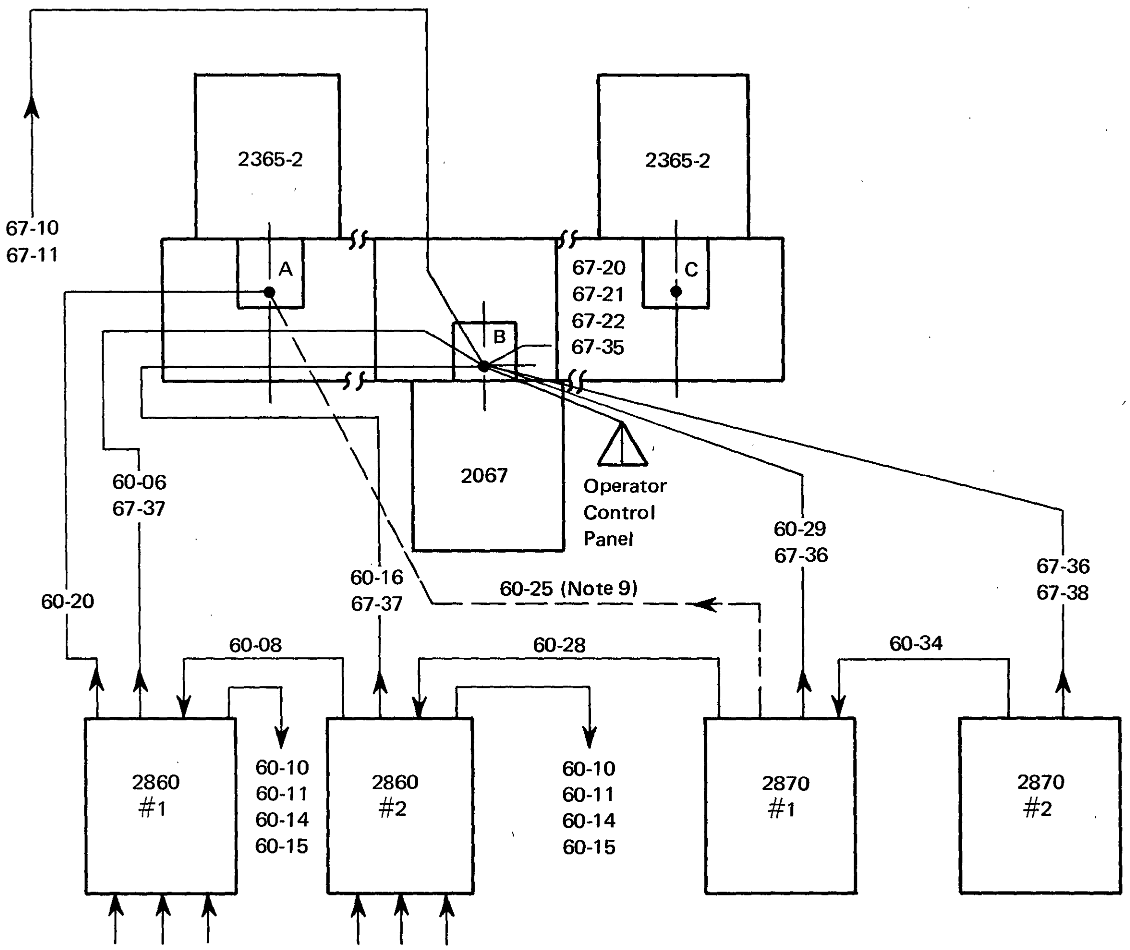
**Airflow:** 4,620 cfm (140 $m^3$/min)

**Power Requirements:**

| | |
|---|---|
| kVA | 6.85 |
| Phases | 3 |
| Plug | R&S, SC7328 |
| Connector | R&S, SC7428 |
| Receptacle | R&S, SC7324 |
| Power Cord Style | E1 |

**Notes:**
* See plan view. Dimensions are frame size; add 1-3/8" (4 cm) for each cover.

## SYSTEM/360 MODEL 67-1 CABLING SCHEMATIC



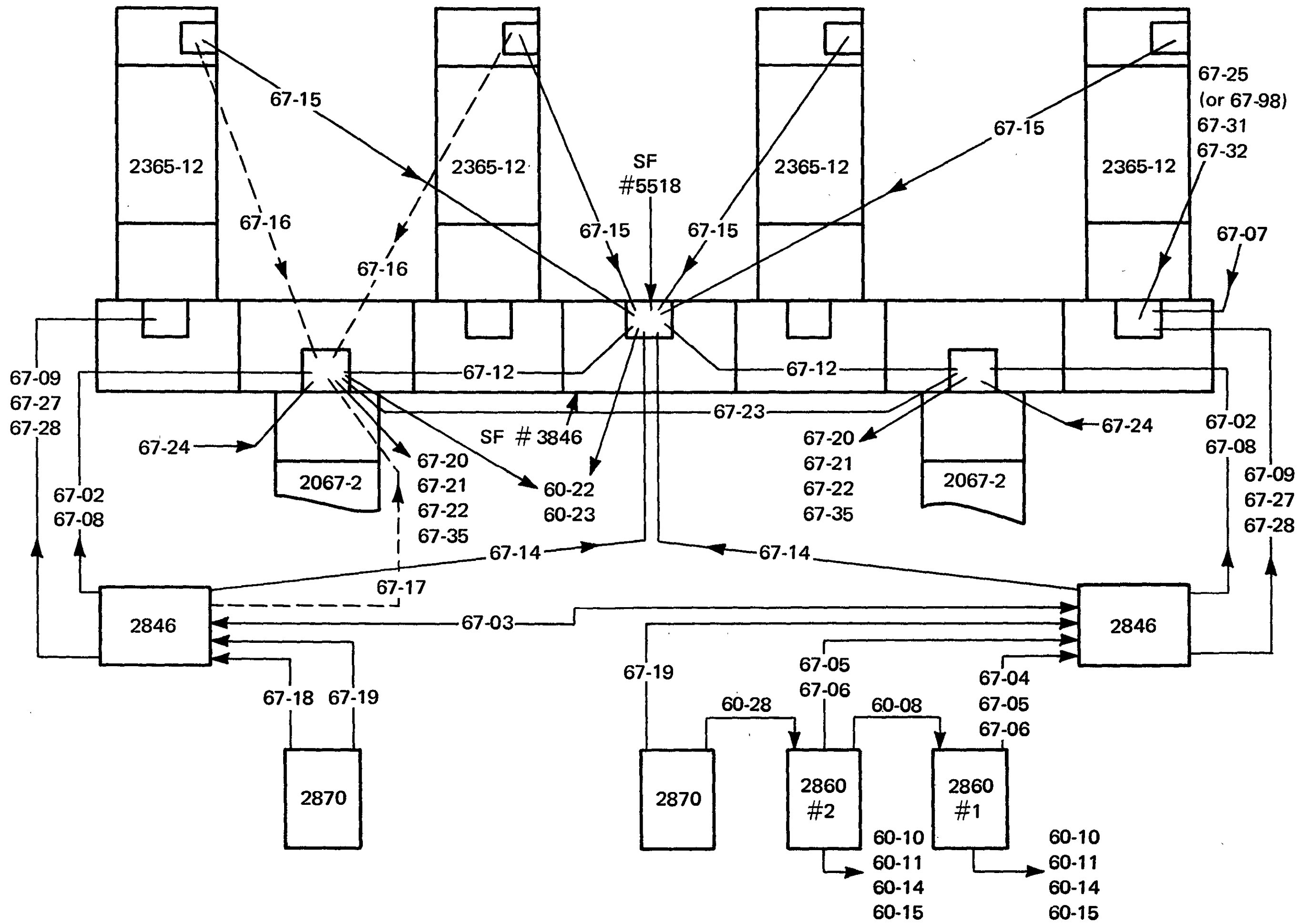
## SYSTEM/360 MODEL 67-1 CABLING SCHEMATIC

| *Group No.* | *No. of Cables* | *From* | *To* | *Max Length (ft)* | *Notes* |
|---|---|---|---|---|---|
| 60-06 | 1 | 2860 #1 | 2067 | 40 | 4 |
| 60-08 | 13 | 2860 #2 | 2860 #1 | 20 | 3 |
| 60-10 | 2 | 2860 (SF #1850) | Control Unit | – | 1, 7 |
| 60-11 | 2 | 2860 (SF #1850) | Channel-to-Channel Adapter | – | 6, 7 |
| 60-14 | 2 | 2860 (SF #1850) | Multiplexer Channel | – | 1, 7 |
| 60-15 | 2 | 2860 (SF #1850) | Selector Channel | – | 1, 7 |
| 60-16 | 1 | 2860 #2 | 2067 | – | 4 |
| 60-20 | 13 | 2860 #1 | 2365-2 | 25 | 3 |
| 60-25 | 13 | 2870 #1 | 2365-2 | 25 | 9 |
| 60-28 | 13 | 2870 #1 | 2860 #2 | 20 | 3 |
| 60-29 | 1 | 2870 #1 | 2067 | – | 4 |
| 60-34 | 13 | 2870 #2 | 2870 #1 | – | 3 |
| 67-10 | 1 | Direct Control | 2067 | 100 | 5 |
| 67-11 | 2 | Direct Control | 2067 | 50 | 10 |
| 67-20 | 2 | SF #7920 | 2860 | – | 7 |
| 67-21 | 2 | SF #7920 | Control Unit | – | 7 |
| 67-22 | 2 | SF #7920 | Channel-to-Channel Adapter | – | 7 |
| 67-35 | 2 | SF #7920 | 2870 | – | 7 |
| 67-36 | 1 | 2870 | 2067 | – | 8, 11 |
| 67-37 | 1 | 2860 | 2067 | – | 2 |
| 67-38 | 1 | 2870 #2 | 2067 | – | 4, 12 |

*Notes:*

1. From channel-to-channel adapter (SF #1850).
2. One per channel.
3. At no time may the sum of groups 60-20 plus 60-08 plus 60-28 plus 60-34 exceed 65 feet.
4. Sequence and control (EPO).
5. For the interconnection of two System/360 CPUs (SF #3274); order one per feature.
6. For the interconnection of two channel-to-channel adapter features (SF #1850).
7. Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) available to attach up to eight control units.
8. Maximum "X" length:
   25 feet for one channel frame
   45 feet for two channel frames
   65 feet for three or four channel frames.
9. Use group 60-25 in place of groups 60-28 and 60-20 when 2870 is the only channel.
10. For SF #3274 to non-IBM device.
11. When used with 2870 #2 and 2870 #2 is the fourth channel frame, "X" length must equal sum of groups 60-20 plus 60-08 plus 60-28 plus 60-34; but length should not exceed 65 feet.
12. Use group 60-29 for 2870 #2 if total number of channel frames is less than four.

## SYSTEM/360 MODEL 67-2 CABLING SCHEMATIC




| *Group No.* | *No. of Cables* | *From* | *To* | *Max Length (ft)* | *Notes* |
|---|---|---|---|---|---|
| 60-08 | 13 | 2860 #2 | 2860 #1 | 20 | 7 |
| 60-10 | 2 | 2860 (SF #1850) | Control Unit | – | 9, 10 |
| 60-11 | 2 | 2860 (SF #1850) | Channel-to-Channel Adapter | – | 9, 10, 11 |
| 60-14 | 2 | 2860 (SF #1850) | Multiplexer Channel | – | 9, 10 |
| 60-15 | 2 | 2860 (SF #1850) | Selector Channel | 20 | 9, 10 |
| 60-22 | 1 | 2067 | System/360 CPU | 100 | 24 |
| 60-23 | 1 | 2067 | System/360 CPU | 100 | 25 |
| 60-28 | 13 | 2870 | 2860 #1 | 20 | 7 |
| 67-02 | 3 | 2846 | 2067 | 40 | 19 |
| 67-03 | 3 | 2846 | 2846 | 115 | 2 |
| 67-04 | 14 | 2860 #1 | 2846 | 25 | 8 |
| 67-05 | 1 | 2860 | 2846 | 35 | 3 |
| 67-06 | 1 | 2860 | 2846 | – | 4 |
| 67-07 | 12 | 2365-12 | 2365-12 | 30 | 5 |
| 67-08 | 1 | 2846 | 2067 | 100 | 6 |
| 67-09 | 1 | 2846 | 2365-12 | 125 | 12 |
| 67-12 | 1 | 2067 | Sequence Control (SF #5518) | 45 | 13 |
| 67-14 | 1 | 2846 | Sequence Control (SF #5518) | 60 | 15 |
| 67-15 | 1 | 2365-12 | Sequence Control (SF #5518) | 60 | 16 |
| 67-16 | 1 | 2365-12 | 2067 | 60 | 17 |
| 67-17 | 1 | 2846 | 2067 | 60 | 18 |

## SYSTEM/360 MODEL 67-2 CABLING SCHEMATIC

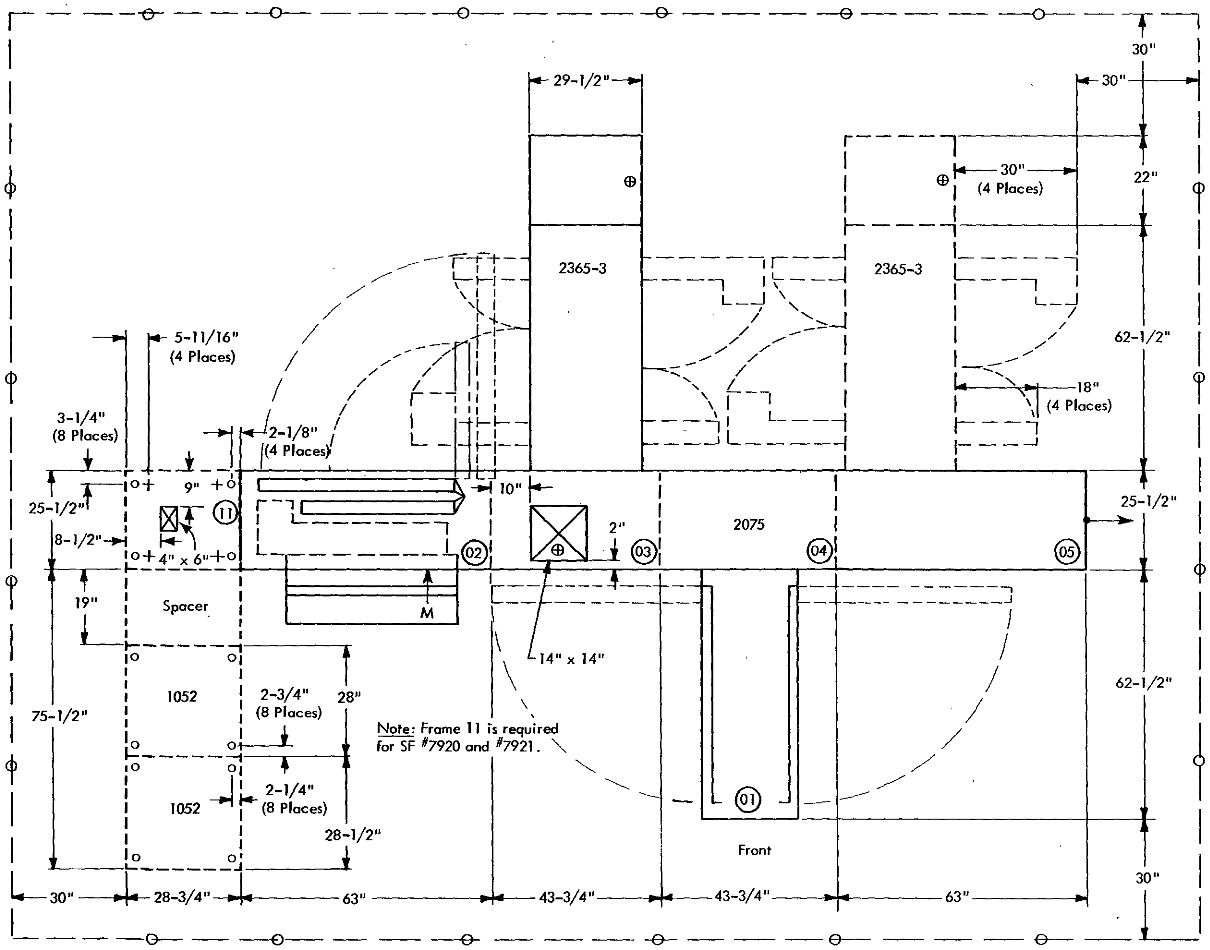
| *Group No.* | *No. of Cables* | *From* | *To* | *Max Length (ft)* | *Notes* |
|---|---|---|---|---|---|
| 67-18 | 13 | 2870 | 2846 | – | 7, 8 |
| 67-19 | 2 | 2870 | 2846 | – | 3, 4, 8 |
| 67-20 | 2 | 2067 (SF #7920) | Selector Channel | – | 10 |
| 67-21 | 2 | 2067 (SF #7920) | Control Unit | – | 10 |
| 67-22 | 2 | 2067 (SF #7920) | Channel-to-Channel Adapter | – | 10 |
| 67-23 | 1 | 2067 | 2067 | – | 20, 23 |
| 67-24 | 1 | 2365-12 | 2067 | 75 | 21 |
| 67-25 (or 67-98) | 1 | 2365-12 | 2365-12 | – | 22 |
| 67-27 | 11 | 2846 | 2365-12 | 25 | 1 |
| 67-28 | 11 | 2846 | 2365-12 | 25 | 1 |
| 67-31 | 11 | 2365-12 | 2365-12 | 45 | 14 |
| 67-32 | 11 | 2365-12 | 2365-12 | 45 | 14 |
| 67-35 | 2 | 2067 (SF #7920) | Multiplexer Channel | – | 10 |

*Notes:*

1. May connect to first 2365 at either end of the system wall.
2. Total cable length to attach up to three 2846 units is 115 feet. One group 67-03 is required for each 2067 connected to the 2846s.
3. Sequence and control (EPO).
4. One per channel. Maximum cable length of 25 feet to first channel frame; 85 feet to any other channel.
5. May be used to connect one contiguous wall section to another. One group 67-07 is required for each 2067 in the configuration.
6. One to each 2067.
7. Channel-frame-to-channel-frame interconnecting cable length should not exceed 60 feet for up to three channel frames.
8. Cable length from 2846 to first channel should not exceed 25 feet.
9. From channel-to-channel adapter (SF #1850).
10. Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) available to attach up to eight control units.
11. For the interconnection of two channel-to-channel adapter features (SF #1850).
12. One to each 2365.
13. Multisystem EPO connection (SF #3622); one per 2067. See Note 2 in "System/360 Specification Summary."
14. May be used to connect one contiguous wall section to another. Use group 67-31 for 2846 #1 and group 67-32 for 2846 #2.
15. One per 2846. Power sequence (EPO).
16. One per 2365 in multiple 2067 system. Power sequence (EPO).
17. One per 2365 in single 2067 system. Power sequence (EPO).
18. Required when system has 2365 Model 12s and only one 2067.
19. All the 67-02 cable groups may be routed from any one of the 2846 units to each 2067 in the system or from separate 2846 units as shown.
20. One group is required between first 2067 and second 2067 when both have SF #3800 (extended direct control feature).
21. Required for the connection of the 2365s of one contiguous wall section to the 2067s of a second contiguous wall section. One is required from each 2365 to each 2067.
22. Required to connect second contiguous wall section with the first for convenience outlet power when second wall section has no 2067. For 50-Hz machines, use group number in parentheses.
23. Maximum "X" length of group 67-23 cannot exceed 100 feet.
24. To SF #3621, two-system EPO connection, to 2067 for single processor; SF #5518 for dual processor.
25. To SF #3622, multisystem EPO connection, to 2067 for single processor; SF #5518 for dual processor. See Note 2 in "System/360 Specification Summary."

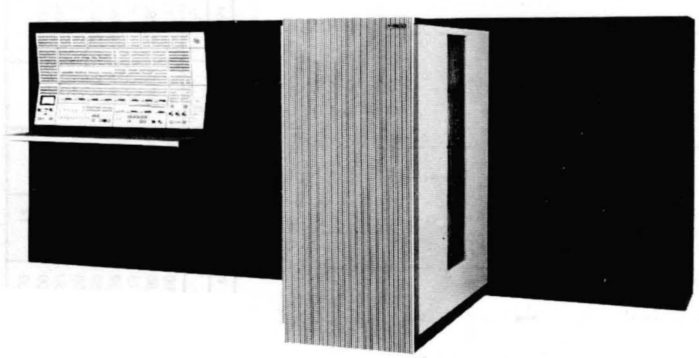
## SYSTEM/360 MODEL 75 H AND I, 2075 PROCESSING UNIT

### PLAN VIEW




| Frame | Weight | | Airflow | | Heat Output | |
|---|---|---|---|---|---|---|
| | lb | kg | cfm | $m^3$/min | BTU/hr | kcal/hr |
| 01 | 1,700 | 780 | 1,700 | 49 | 13,800 | 3,500 |
| 02 | 2,200 | 1,000 | 1,050 | 30 | 8,280 | 2,100 |
| 03 | 125 | 57 | 0 | 0 | 0 | 0 |
| 04 | 550 | 250 | 300 | 9 | 2,760 | 700 |
| 05 | 550 | 250 | 300 | 9 | 2,760 | 700 |
| 11 | 250 | 120 | | | 550 | 140 |
| 1052 | 100 | 46 | | | 335 | 85 |
| Spacer | 30 | 14 | | | | |

## SYSTEM/360 MODEL 75 H AND I, 2075 PROCESSING UNIT



### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | * | * | 72-1/2 |
| (cm) | (*) | (*) | (184) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | * | * | * | * |
| (cm) | (*) | (*) | (*) | (*) |

**Weight:** 5,125 lb (2.350 kg)

**Heat Output:** 27,600 BTU/hr (7.000 kcal/hr)

**Airflow:** 3,350 cfm (95 $m^3$/min)

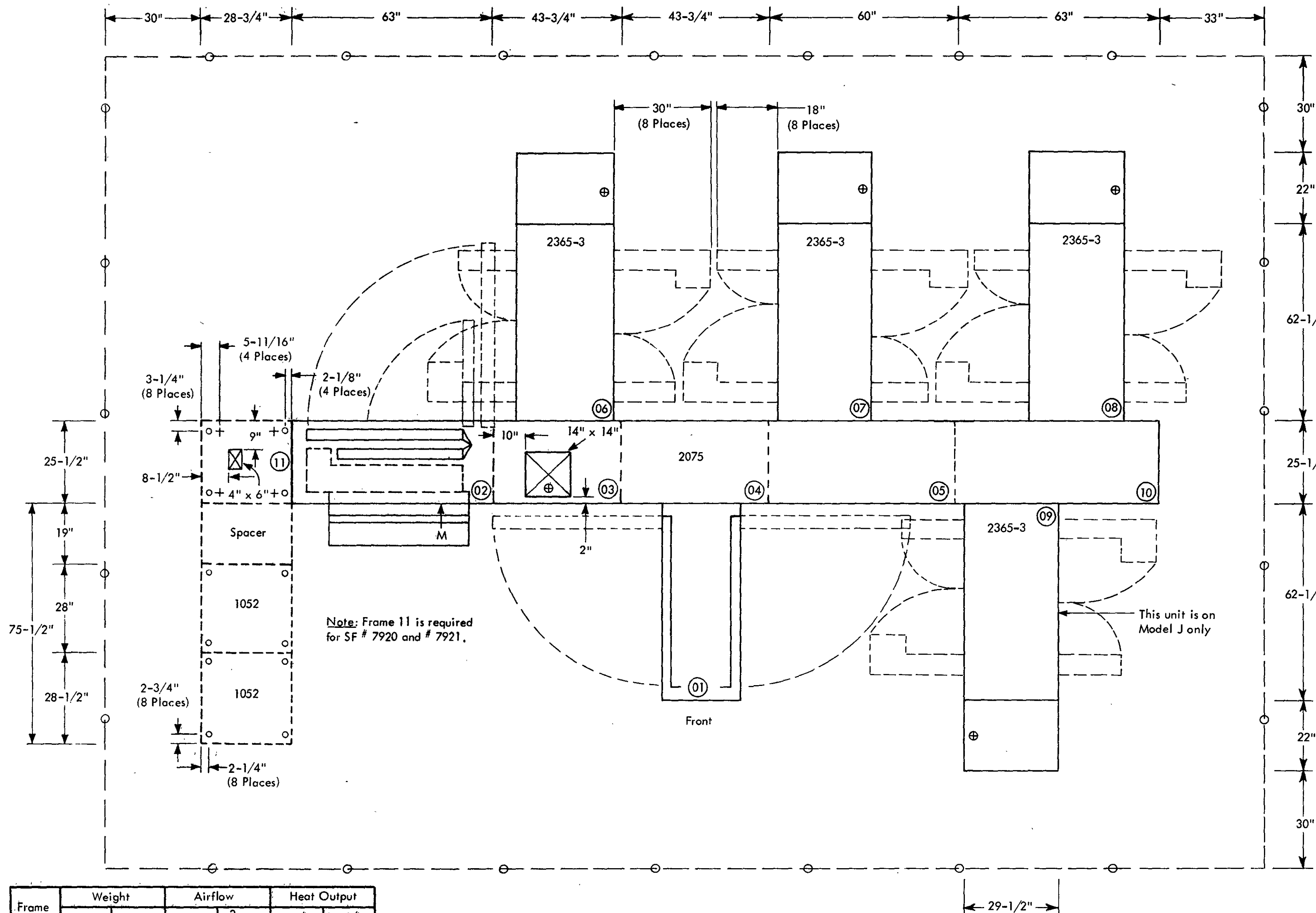
**Power Requirements:**

| | | | |
|---|---|---|---|
| Voltage | 208/230 | 220 | 408 |
| kVA | 8.6 | 6.9 | 11.2 |
| Phases | 3 | 3 | 3 |
| Plug | R&S, SC7328 | | |
| Connector | R&S, SC7428 | | |
| Receptacle | R&S, SC7324 | | |
| Power Cord Style | E3 | | |

**Notes:**
* See plan view.

# SYSTEM/360 MODEL 75 IH AND J, 2075 PROCESSING UNIT

## PLAN VIEW




| Frame | Weight | | Airflow | | Heat Output | |
|---|---|---|---|---|---|---|
| | lb | kg | cfm | $m^3/min$ | BTU/hr | kcal/hr |
| 01 | 1,700 | 780 | 1,700 | 49 | 13,800 | 3,500 |
| 02 | 2,200 | 1,000 | 1,050 | 30 | 8,280 | 2,100 |
| 03 | 125 | 57 | 0 | 0 | 0 | 0 |
| 04 | 550 | 250 | 300 | 9 | 2,760 | 700 |
| 05 | 550 | 250 | 300 | 9 | 2,760 | 700 |
| 10 | 200 | 91 | 0 | 0 | 0 | 0 |
| 11 | 250 | 120 | | | 550 | 140 |
| 1052 | 100 | 46 | | | 335 | 85 |
| Spacer | 30 | 14 | | | | |

## SYSTEM/360 MODEL 75 IH AND J, 2075 PROCESSING UNIT

### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | * | * | 72-1/2 |
| (cm) | (*) | (*) | (184) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | * | * | * | * |
| (cm) | (*) | (*) | (*) | (*) |

**Weight:** 5,325 lb (2.450 kg)

**Heat Output:** 27,600 BTU/hr (7.000 kcal/hr)

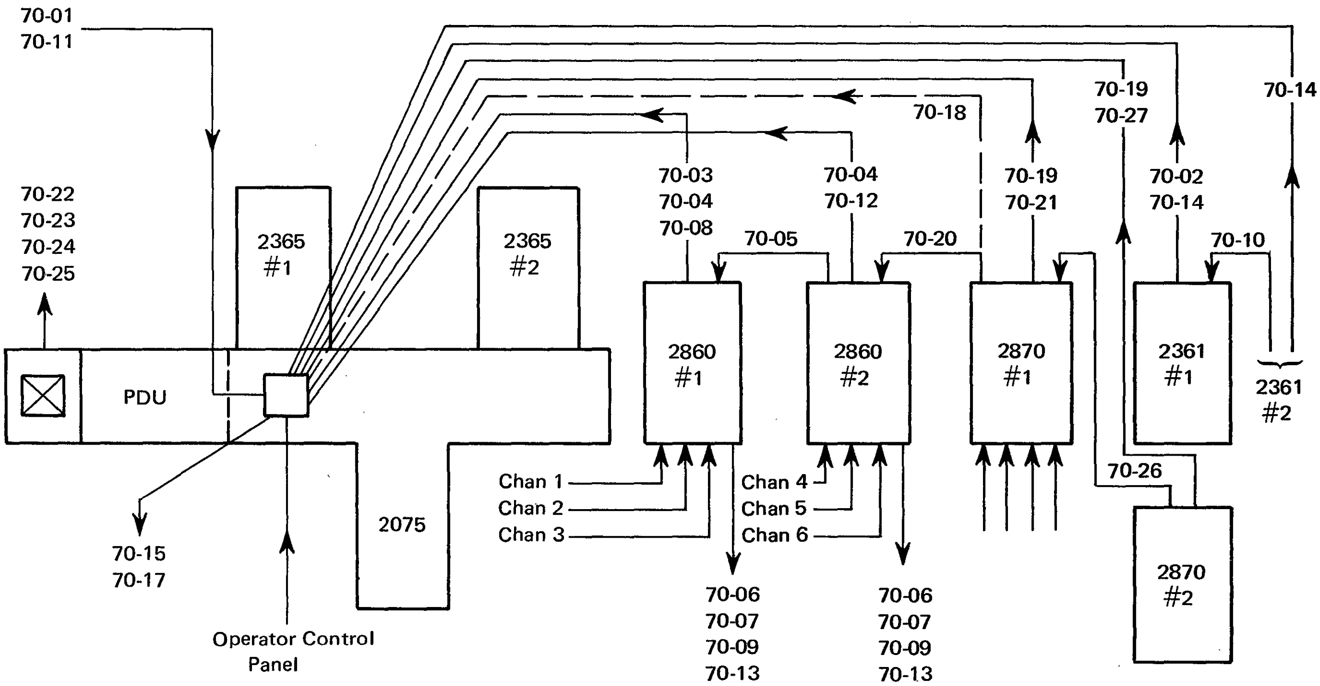
**Airflow:** 3,350 cfm (95 $m^3$/min)

**Power Requirements:**

| | | | |
|---|---|---|---|
| Voltage | 208/230 | 220 | 408 |
| kVA | 8.6 | 6.9 | 11.2 |
| Phases | 3 | 3 | 3 |
| Plug | R&S, SC7328 | | |
| Connector | R&S, SC7428 | | |
| Receptacle | R&S, SC7324 | | |
| Power Cord Style | E3 | | |

**Notes:**
* See plan view.

## SYSTEM/360 MODEL 75 CABLING SCHEMATIC



## SYSTEM/360 MODEL 75 CABLING SCHEMATIC

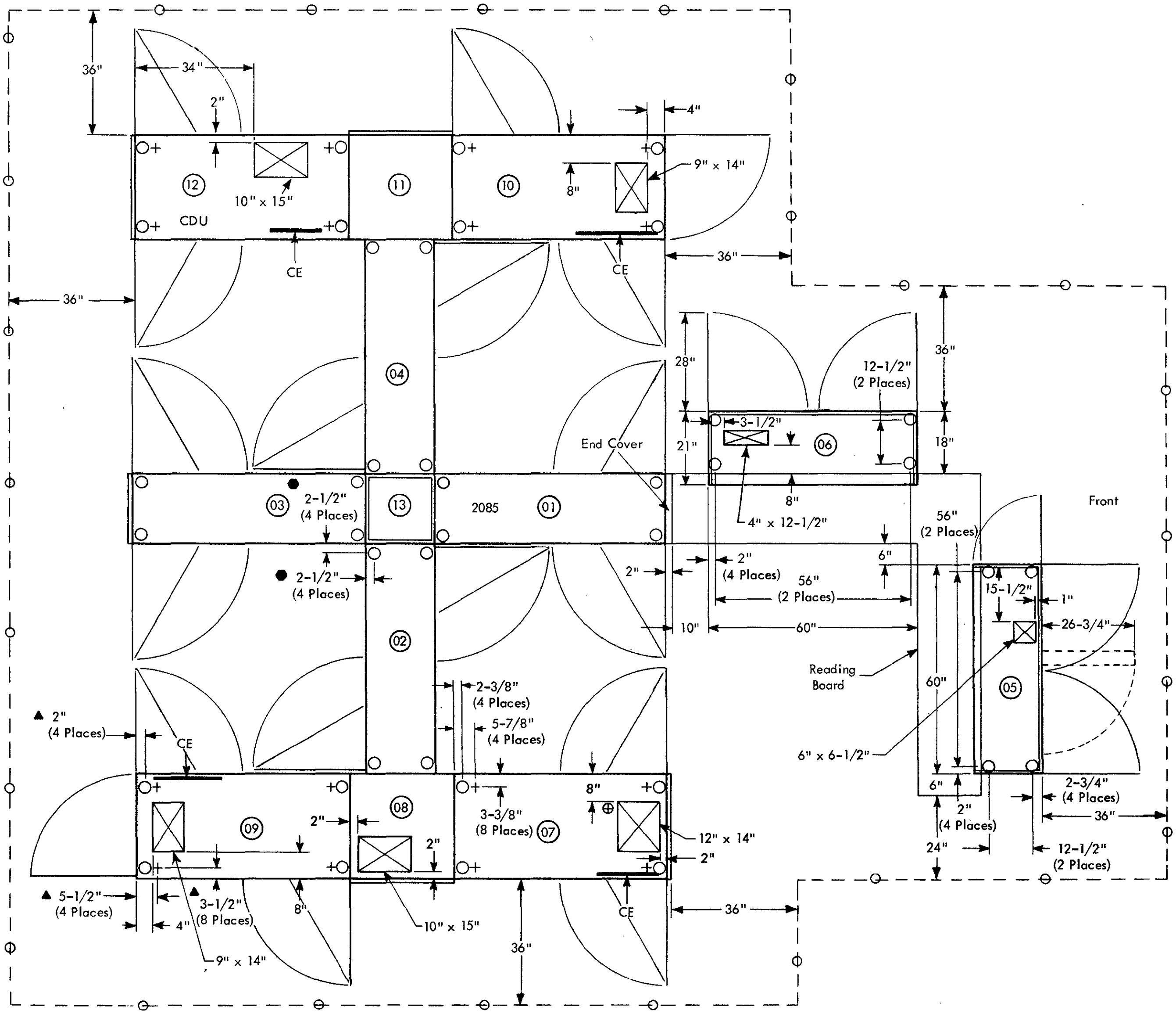
| *Group No.* | *No. of Cables* | *From* | *To* | *Max Length (ft)* | *Notes* |
|---|---|---|---|---|---|
| 70-01 | 2 | Direct Control | 2075 | 50 | 7 |
| 70-02 | 8 | 2361 #1 | 2075 | 40 | 11 |
| 70-03 | 7 | 2860 #1 | 2075 | 40 | 1 |
| 70-04 | 1 | 2860 | 2075 | – | 4, 13 |
| 70-05 | 13 | 2860 #2 | 2860 #1 | – | 1 |
| 70-06 | 2 | 2860 (SF #1850) | Channel-to-Channel Adapter | – | 2, 3 |
| 70-07 | 2 | 2860 | Multiplexer Channel | – | 2, 5 |
| 70-08 | 1 | 2860 #1 | 2075 | 40 | – |
| 70-09 | 2 | 2860 (SF #1850) | Control Unit | – | 2, 5 |
| 70-10 | 12 | 2361 #2 | 2361 #1 | – | 11 |
| 70-11 | 1 | Direct Control | 2075 | 100 | 8 |
| 70-12 | 1 | 2860 #2 | 2075 | – | – |
| 70-13 | 2 | 2860 | Selector Channel | – | 2, 5 |
| 70-14 | 2 | 2361 | 2075 | – | 6, 11 |
| 70-15 | 1 | 2075 | System/360 CPU | – | 9 |
| 70-17 | 1 | 2075 | System/360 CPU | – | 10 |
| 70-18 | 7 | 2870 #1 | 2075 | 40 | – |
| 70-19 | 1 | 2870 | 2075 | – | 4 |
| 70-20 | 13 | 2870 #1 | 2860 #2 | 20 | 1 |
| 70-21 | 1 | 2870 #1 | 2075 | – | – |
| 70-22 | 2 | 2075 | Selector Channel | – | 2, 12 |
| 70-23 | 2 | 2075 | Multiplexer Channel | – | 2, 12 |
| 70-24 | 2 | 2075 | Control Unit | – | 2, 12 |
| 70-25 | 2 | 2075 | Channel-to-Channel Adapter | – | 2, 5, 12 |
| 70-26 | 13 | 2870 #2 | 2870 #1 | – | 1 |
| 70-27 | 1 | 2870 #2 | 2075 | – | 13, 14 |

*Notes:*

1. The sum of groups 70-03 plus 70-05 plus 70-20 plus 70-26 may not exceed 50 feet for two channel frames, 70 feet for three channel frames, or 65 feet for four channel frames.
2. Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) available to attach up to eight control units.
3. For the interconnection of two channel-to-channel adapter features (SF #1850).
4. One cable per channel. Cable length may not be less than 15 feet for first channel frame; 30 feet for second, third, and fourth channel frames.
5. Channel-to-channel adapter feature (SF #1850).
6. One per 2361.
7. Direct control to non-IBM device (SF #3274).
8. Direct control to other System/360 CPU (SF #3274); order one per feature.
9. To SF #3621, two-system EPO connection.
10. To SF #3622, multisystem EPO connection. See Note 2 in "System/360 Specification Summary."
11. The sum of groups 70-02 plus 70-10 may not exceed 100 feet for one to three 2361s and 80 feet for four 2361s. Group 70-14 may not exceed the sum of groups 70-02 plus 70-10s for any one 2361.
12. For SF #7920 and #7921.
13. One cable per channel frame. Maximum "X" length is 40 feet for one channel frame, 50 feet for two channel frames, and 70 feet for three and four channel frames.
14. Use group 70-21 for 2870 #2 if total number of channel frames is less than four.

## SYSTEM/360 MODEL 85, 2085 PROCESSING UNIT

## PLAN VIEW




| Frame | Size (With Covers) Inches | Centimeters |
|---|---|---|
| 07, 09, 10, 12 | 30 x 61 | 76 x 155 |
| 01, 02, 04 | 20 x 66 | 51 x 168 |
| 03 | 20 x 67 | 51 x 170 |
| 08, 11 | 30 x 30 | 76 x 76 |
| 13 | 20 x 20 | 51 x 51 |

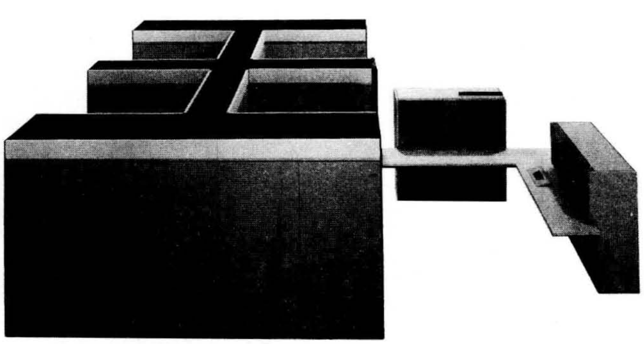
▲ Typical dimensions for casters and leveling pads on frames 09, 10, and 12.

⬣ Typical dimensions for leveling pads on frames 01, 02, 03, and 04.

## SYSTEM/360 MODEL 85, 2085 PROCESSING UNIT

### Details (By Frame)

| Frame | Weight lb (kg) | Airflow cfm ($m^3$/min) | Heat Output BTU/hr (kcal/hr) To Air | Heat Output BTU/hr (kcal/hr) To Water |
|---|---|---|---|---|
| 01 | 1,116 (510) | 400 (12) | 2,910 (740) | 16,340 (4.150) |
| 02 | 1,622 (740) | 400 (12) | 6,990 (1.800) | 18,050 (4.550) |
| 03 | 1,191 (550) | 400 (12) | 4,690 (1.200) | 30,250 (7.650) |
| 04 | 1,634 (750) | 400 (12) | 5,880 (1.500) | 31,800 (8.050) |
| 05 | 816 (380) | 200 (6) | 2,000 (510) | 0 (0) |
| 06 | 1,004 (460) | 200 (6) | 5,100 (1.300) | 0 (0) |
| 07 | 1,145 (520) | 500 (15) | 3,140 (800) | 0 (0) |
| 08 | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| 09 | 2,035 (930) | 300 (9) | 2,320 (590) | 45,090 (11.400) |
| 10 | 2,035 (930) | 300 (9) | 640 (170) | 22,310 (5.650) |
| 11 | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| 12 | 1,830 (840) | 0 (0) | 3,500 (890) | 0 (0) |



### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | * | * | 78** |
| (cm) | (*) | (*) | (198**) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | * | * | * | * |
| (cm) | (*) | (*) | (*) | (*) |

**Weight:** 14,428 lb (6.550 kg)

**Heat Output:**
Air 37,170 BTU/hr (9.400 kcal/hr)
Water 163,840 BTU/hr (41.300 kcal/hr)

**Airflow:** 3,100 cfm (88 $m^3$/min)

**Power Requirements:** ***

| | |
|---|---|
| kVA | 2.0 (To Frame 07) |
| Phases | 3 |
| Plug | R&S, FS3760 |
| Connector | R&S, FS3934 |
| Receptacle | R&S, FS3754 |
| Power Cord Style | D3 |

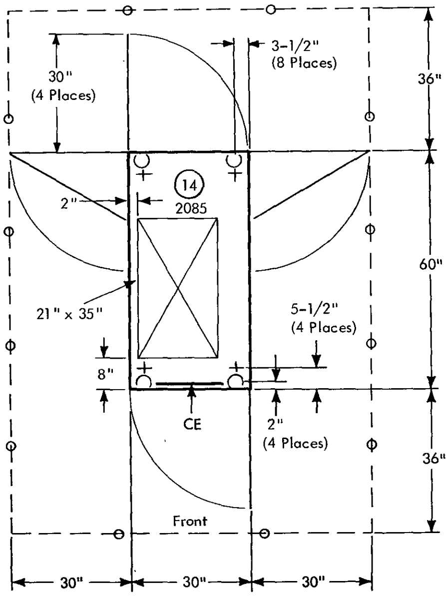
**Environment Operating:**

| | |
|---|---|
| Temperature | 65°-80°F (18°-27°C) |
| Rel Humidity | 20%-80% |
| Max Wet Bulb | 73°F (23°C)† |

Notes:
* See plan view.
** Height dimension can be reduced to 70" (178 cm) by removing top blowers.
*** Powered from PDU (2085 frame 14).
† See "Liquid Coolant System" in Appendix A.

## SYSTEM/360 MODEL 85, POWER DISTRIBUTION UNIT (PDU)–2085 FRAME 14

### PLAN VIEW




### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | 30 | 60 | 70 |
| (cm) | (76) | (152) | (178) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | 36 | 36 | 30 | 30 |
| (cm) | (91) | (91) | (76) | (76) |

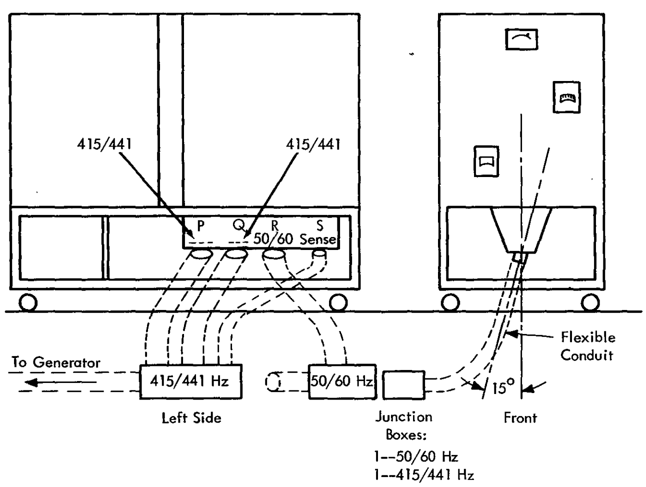
**Weight:** 1,500 lb (690 kg)

**Heat Output:** Negligible

**Airflow:** 0 cfm (0 $m^3$/min)

**Power Requirements (kVA):**

| | *Models* | | | |
|---|---|---|---|---|
| | *I* | *J* | *K* | *L* |
| 50/60 Hz | 14.5 | 18.0 | 27.0 | 36.0 |
| 415/441 Hz | 81.0 | 87.0 | 105.0 | 132.0 |



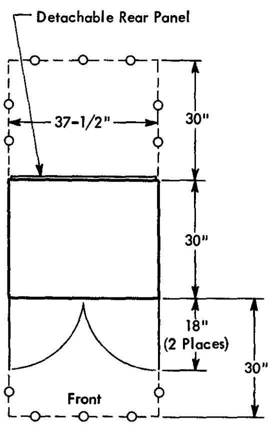

Notes:
1. Flexible conduits to P, Q, and R are 3 inches (8 cm).
2. Flexible conduit to S is 1 inch (3 cm).
3. Pigtail cable is provided from each conduit location (8-foot [244-cm] length from exit).
4. Flexible conduit and junction boxes are provided by the customer.
5. Clamp fittings for flexible conduit are provided.

| | Entry | | | |
|---|---|---|---|---|
| | P | Q | R | S |
| No. of Wires and Size (AWG) | 6--#2/0<br>1--#6 | 6--#2/0<br>1--#6 | 6--#1/0<br>1--#6 | 3--#10<br>2--#12 |

**Junction Box Connection Details**

## MOTOR-GENERATOR STARTER (REMOTE) FOR SYSTEM/360 MODEL 85 (50-HZ INPUT)

### PLAN VIEW




### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| 408V | | | |
| Inches | 37-1/2 | 30 | 90 |
| (cm) | (95) | (76) | (229) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | 30 | 30 | 0 | 0 |
| (cm) | (76) | (76) | (0) | (0) |

**Weight:**

NEMA Size #6: 220, 380, and 408V
2,000 lb (910 kg)

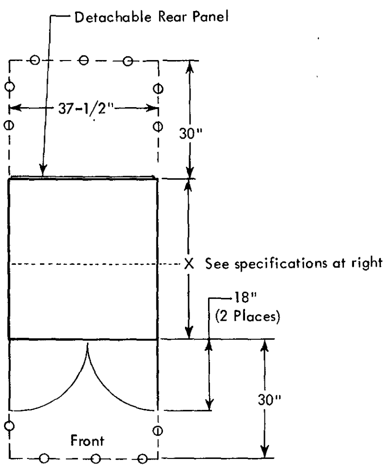
**Power Requirements:**

Motor starter can be set at one of the following:

| *Starting Current* | | | *Starting Time (sec)* | *Tap Setting (percent)* |
|---|---|---|---|---|
| *220V (A)* | *380V (A)* | *408V (A)* | | |
| 3,110 | 1,800 | 1,950 | 7.0 | 100 |
| 1,980 | 1,190 | 1,245 | 9.5 | 80 |
| 1,304 | 760 | 822 | 14.5 | 65 (factory setting) |
| 776 | 450 | 487 | 25.0 | 50 |

## MOTOR-GENERATOR STARTER (REMOTE) FOR SYSTEM/360 MODEL 85 (60-HZ INPUT)

### PLAN VIEW




### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| 208/230V | | | |
| Inches | 37-1/2 | 30 | 90 |
| (cm) | (95) | (76) | (229) |
| 440V | | | |
| Inches | 37-1/2 | 20 | 80 |
| (cm) | (95) | (51) | (203) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | 30 | 30 | 0 | 0 |
| (cm) | (76) | (76) | (0) | (0) |

**Weight:**

NEMA Size #6: 208/230V
2,000 lb (910 kg)

NEMA Size #5: 440V
800 lb (370 kg)

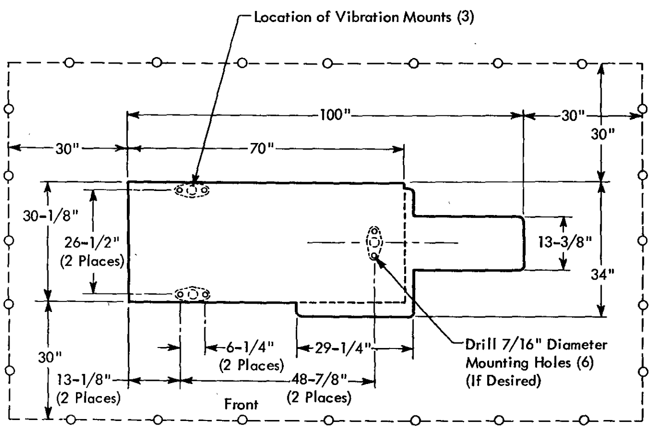
**Power Requirements:**

Motor starter can be set at one of the following:

| *Starting Current* | | *Starting Time (Approximate) (sec)* | *Tap Setting (percent)* |
|---|---|---|---|
| *208/230V (A)* | *440V (A)* | | |
| 2,760 | 1,460 | 7 | 100 |
| 1,760 | 935 | 10 | 80 |
| 1,160 | 615 | 15 | 65 (factory setting) |
| 690 | 365 | 25 | 50 |

## MOTOR GENERATOR (REMOTE) FOR SYSTEM/360 MODEL 85 (50-HZ INPUT)

### PLAN VIEW




### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | 100 | 34 | 53 |
| (cm) | (254) | (86) | (135) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | 30 | 30 | 30 | 30 |
| (cm) | (76) | (76) | (76) | (76) |

**Weight:** 4,630 lb (2.100 kg)

**Heat Output (Max):** 102,000 BTU/hr (25.750 kcal/hr)

**Power Requirements:**

*Input:*

Induction Motor–225 hp, 380/408V, 50 Hz, 284/305A full load, code F, 40°C maximum ambient, dripproof enclosure

*Output:*

Synchronous Generator–175 kVA, 208V, 3 phase, 441 Hz, 485A full load, 70°C temperature rise, dripproof enclosure

**Notes:**

The installation and maintenance of the motor-generator (including starter) unit will be the responsibility of the customer.

*At time of installation:*

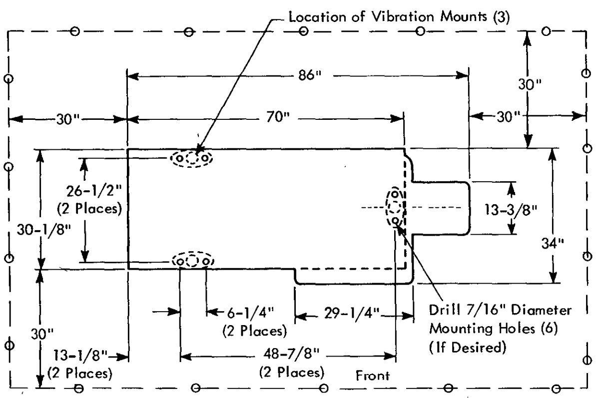
1. An overvoltage circuit is provided in the motor-generator regulator. This must be adjusted to remove generator output when the 441-Hz line voltage reaches 220 ± 2V (rms).
2. The generator output voltage must be set so that the voltage measured by the meter located on the power distribution unit (2085 frame 14) reads between the center and upper scribe marks.
3. Consult motor-generator manufacturer's instruction manual for further installation procedures and maintenance.

*Customer to supply the following wiring:*

1. Input feeders to the motor.
2. Wiring between motor-generator unit and motor starter.
3. Output feeders from generator to PDU (frame 14); if in conduit, this must be a nonferrous conduit. Maximum voltage drop at the PDU should not exceed 5%.
4. Five remote leads required from generator to PDU: three leads for sensing (2-ohm maximum resistance) and two leads for indicator lights.
5. The EPO pushbutton in computer room must remotely cut off power to the motor and output of the generator. Shunt trips are provided for this purpose in both circuit breakers.

## MOTOR GENERATOR (REMOTE)
## FOR SYSTEM/360 MODEL 85 (60-HZ INPUT)

### PLAN VIEW




### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | 86 | 34 | 53 |
| (cm) | (218) | (86) | (135) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | 30 | 30 | 30 | 30 |
| (cm) | (76) | (76) | (76) | (76) |

**Weight:** 4,200 lb (1.950 kg)

**Heat Output (Max):**
208/230V: 86,000 BTU/hr (21.700 kcal/hr)
440V: 102,000 BTU/hr (25.750 kcal/hr)

**Power Requirements:**

*Input:*

Induction Motor–200 hp, 208/230V or 440V, 60 Hz, 240A full load, NEMA design B, code F, 40°C maximum ambient, dripproof enclosure

*Output:*

Synchronous Generator–175kVA, 208V, 3 phase, 415 Hz, 485A full load, 70°C temperature rise, dripproof enclosure

**Notes:**

The installation and maintenance of the motor-generator (including starter) unit will be the responsibility of the customer.

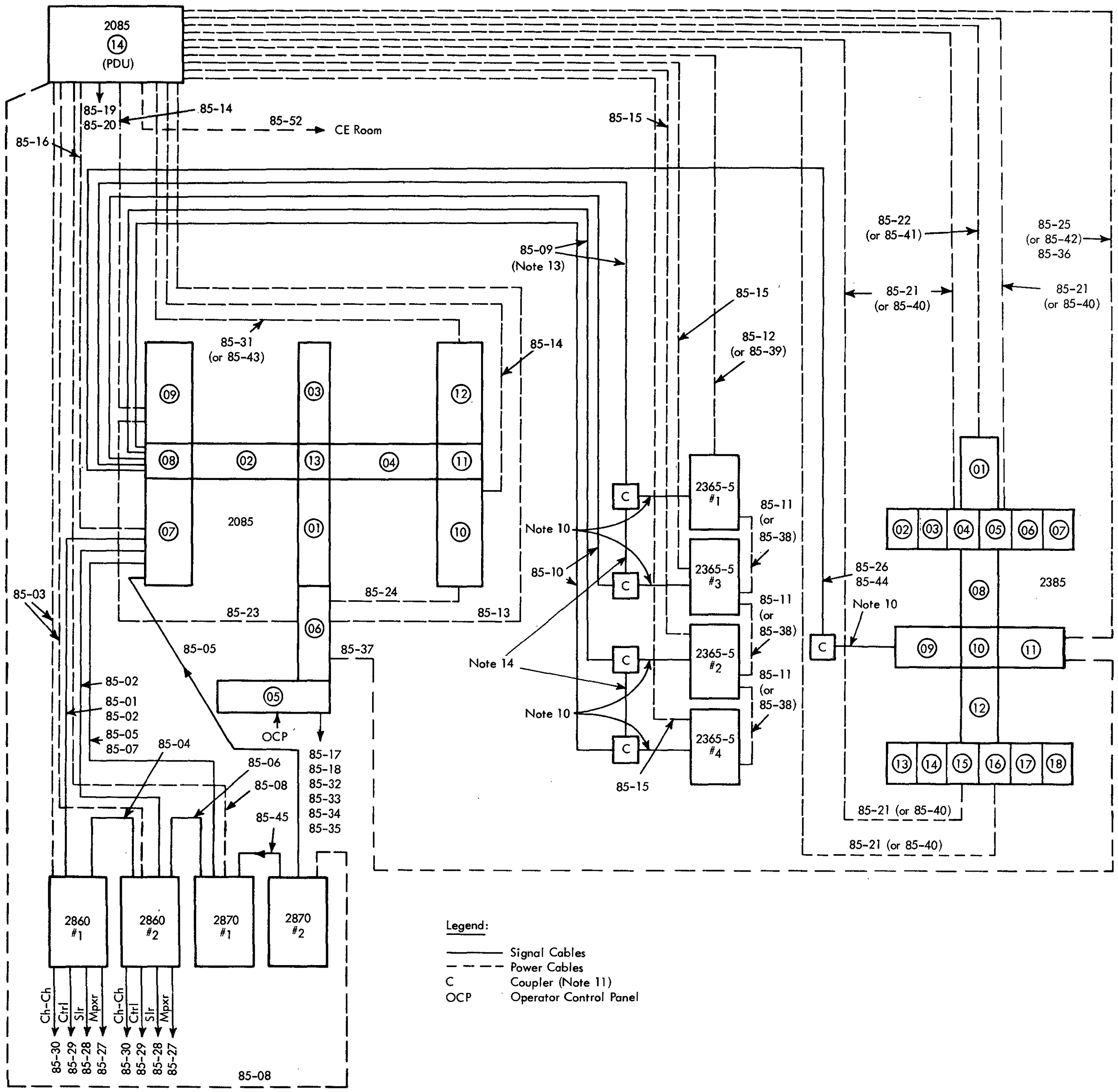
*At time of installation:*

1. An overvoltage circuit is provided in the motor-generator regulator. This must be adjusted to remove generator output when the 415-Hz line voltage reaches 220 ± 2V (rms).
2. The generator output voltage must be set so that the voltage measured by the meter located on the power distribution unit (2085 frame 14) reads between the center and upper scribe marks.
3. Consult motor-generator manufacturer's instruction manual for further installation procedures and maintenance.

*Customer to supply the following wiring:*

1. Input feeders to the motor.
2. Wiring between motor-generator unit and motor starter.
3. Output feeders from generator to PDU (frame 14); if in conduit, this must be a nonferrous conduit. Maximum voltage drop at the PDU should not exceed 5%.
4. Five remote leads required from generator to PDU: three leads for sensing (2-ohm maximum resistance) and two leads for indicator lights.
5. The EPO pushbutton in computer room must remotely cut off power to the motor and output of the generator. Shunt trips are provided for this purpose in both circuit breakers.

## SYSTEM/360 MODEL 85 CABLING SCHEMATIC



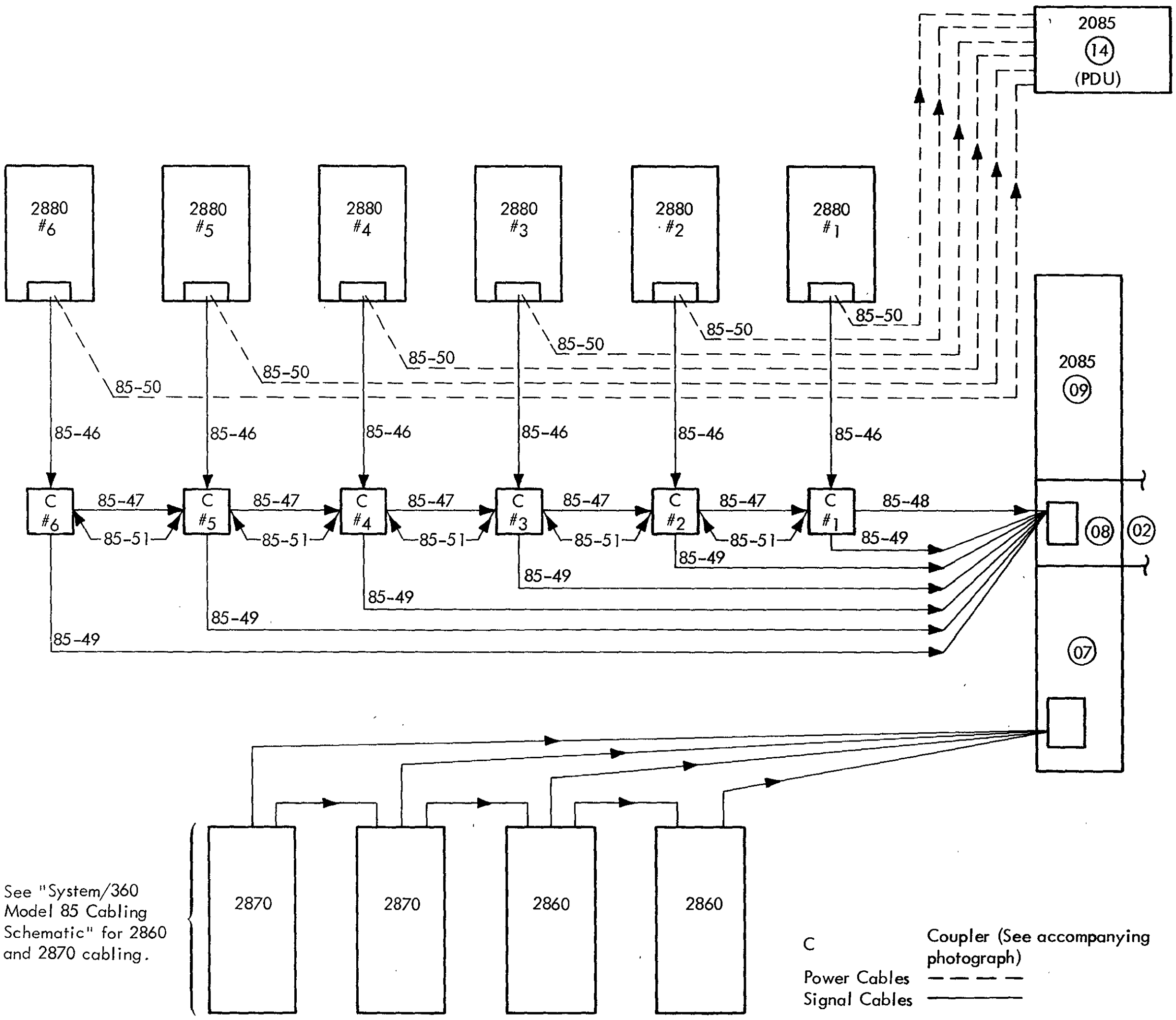
## SYSTEM/360 MODEL 85 CABLING SCHEMATIC

| *Group No.* | *No. of Cables* | *From* | *Frame No.* | *To* | *Frame No.* | *Max Length (ft)* | *Notes* |
|---|---|---|---|---|---|---|---|
| 85-01 | 13 | 2860 | 01 | 2085 | 07 | 25 | 3 |
| 85-02 | 1 | 2860 | | 2085 | 07 | 45 | 2, 15 |
| 85-03 | 1 | 2860 | | 2085 | 14 | 100 | 1 |
| 85-04 | 13 | 2860 # 2 | 02 | 2860 #1 | | 20 | 3 |
| 85-05 | 1 | 2870 #1 | | 2085 | 07 | 65 | 15 |
| 85-06 | 13 | 2870 #1 | | 2860 #2 | | 20 | 3 |
| 85-07 | 13 | 2870 #1 | | 2085 | 07 | 25 | 4 |
| 85-08 | 1 | 2870 #1 | | 2085 | 14 | 100 | 1 |
| 85-09 | 14 | Coupler | | 2085 | 08 | 30 | 11, 18 |
| 85-10 | 1 | Coupler | | 2085 | 08 | – | 11, 13 |
| 85-11 (or 85-38) | 1 | 2365-5 | | 2365-5 | | 20 | 12, 20 |
| 85-12 (or 85-39) | 1 | 2365-5 | | 2085 | 14 | 80 | 12, 20 |
| 85-13 | 6 | 2085 | 06 | 2085 | 14 | 75 | – |
| 85-14 | 4 | 2085 | | 2085 | 14 | 100 | – |
| 85-15 | 3 | 2365-5 | | 2085 | 14 | 80 | – |
| 85-16 | 1 | 2085 | 07 | 2085 | 14 | 100 | – |
| 85-17 | 1 | System/360 CPU | | 2085 | 05 | 100 | 5 |
| 85-18 | 2 | Non-IBM | | 2085 | 05 | 50 | 5 |
| 85-19 | 1 | 2085 | 14 | System/360 CPU | | 100 | 6 |
| 85-20 | 1 | 2085 | 14 | System/360 CPU | | 100 | 7 |
| 85-21 (or 85-40) | 2 | 2385 | | 2085 | 14 | 100 | 20 |
| 85-22 (or 85-41) | 1 | 2385 | 01 | 2085 | 14 | 100 | 20 |
| 85-23 | 1 | 2085 | 06 | 2085 | 09 | 50 | – |
| 85-24 | 1 | 2085 | 06 | 2085 | 10 | 50 | – |
| 85-25 (or 85-42) | 5 | 2385 | 11 | 2085 | 14 | 100 | 20 |
| 85-26 | 24 | Coupler | | 2085 | 08 | 30 | 11 |
| 85-27 | 2 | 2860 | | Multiplexer Channel | | – | 8, 9 |
| 85-28 | 2 | 2860 | | Selector Channel | | – | 8, 9 |
| 85-29 | 2 | 2860 | | Control Unit | | – | 8, 9 |
| 85-30 | 2 | 2860 | | Channel-to-Channel Adapter | | – | 8, 9 |
| 85-31 (or 85-43) | 2 | 2085 | 12 | 2085 | 14 | – | 12, 20 |
| 85-32 | 2 | 2085 | 05 | Selector Channel | | – | 9, 16 |
| 85-33 | 2 | 2085 | 05 | Multiplexer Channel | | – | 9, 16 |
| 85-34 | 2 | 2085 | 05 | Control Unit | | – | 9, 16 |
| 85-35 | 2 | 2085 | 05 | Channel-to-Channel Adapter | | – | 8, 9, 16 |
| 85-36 | 1 | 2385 | 11 | 2085 | 14 | 100 | – |
| 85-37 | 1 | 2385 | 11 | 2085 | 06 | 100 | – |
| 85-44 | 1 | Coupler | | 2085 | 08 | 30 | 11, 17 |
| 85-45 | 13 | 2870 #2 | | 2870 #1 | | 20 | 3 |
| 85-52 | 1 | 2085 | 14 | CE Room | | 100 | 19 |

*Notes:*

1. One per channel unit (power control).
2. One per channel.
3. The sum of groups 85-01 plus 85-04 plus 85-06 plus 85-45 should not exceed 65 feet.
4. Required for 2870 when no 2860s are present.
5. To direct control (SF #3274).
6. To SF #3621, two-system EPO connection.
7. For SF #3622, multisystem EPO connection. See Note 2 in "System/360 Specification Summary."
8. For channel-to-channel adapter (SF #1850).
9. Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) available to attach up to seven control units.
10. Cable from 2365 or 2385 is fixed length and is shipped with storage unit. Cable couplers may be located within 6 feet radius of cable exit (6 feet includes height of floor).
11. Three couplers each for 2365; five for 2385. See "System/360 Model 85 Cabling Schematic (2880 Attachment)" for size. Couplers should be accessible.
12. Sequence and control (EPO).
13. Required only on 2365 #3 and #4 (J configuration). Cable length must equal 85-09 plus 9 feet.
14. Fixed-length cable (4 feet) is shipped with machine.
15. Maximum "X" length:
    - 25 feet for one channel frame
    - 45 feet for two channel frames
    - 65 feet for three or four channel frames.
16. For operator console feature (SF #5450).
17. Required for 2385 Model 2 only.
18. The "X" dimension for both 85-09 groups must be the same.
19. From BSM analyzer located in CE room (CER).
20. For 50-Hz machines, use group number in parentheses.

## SYSTEM/360 MODEL 85 CABLING SCHEMATIC (2880 ATTACHMENT)




See "System/360 Model 85 Cabling Schematic" for 2860 and 2870 cabling.

| *Group No.* | *No. of Cables* | *From* | *To* | *Frame No.* | *Max Length (ft)* | *Notes* |
|---|---|---|---|---|---|---|
| 85-46 | 9 | 2880 | Coupler | | – | 1, 2, 5 |
| 85-47 | 8 | Coupler | Coupler | | – | 2 |
| 85-48 | 8 | Coupler | 2085 | 08 | – | 1, 2, 5 |
| 85-49 | 1 | Coupler | 2085 | 08 | – | 2, 3 |
| 85-50 | 1 | 2880 | 2085 | 14 | 250 | – |
| 85-51 | 1 | Coupler | Coupler | | – | 4 |

*Notes:*

1. Cable length must be a minimum of 10 feet (C-T-C). All cables, except 85-50, are ordered connector-to-connector (C-T-C); that is, when a 10-foot cable is ordered, the order department will send a cable with a total length of 10 feet from connector to connector.
2. Cable dimensions and number of couplers, for each 2880, must satisfy *both* the following equations:
   a. Maximum attenuation equation (based on circuit performance characteristics):

   $$1.5(X1) + X2 + 35(N-1) \leqslant 287$$

   b. Maximum delay equation (based on system data rate performance characteristics):

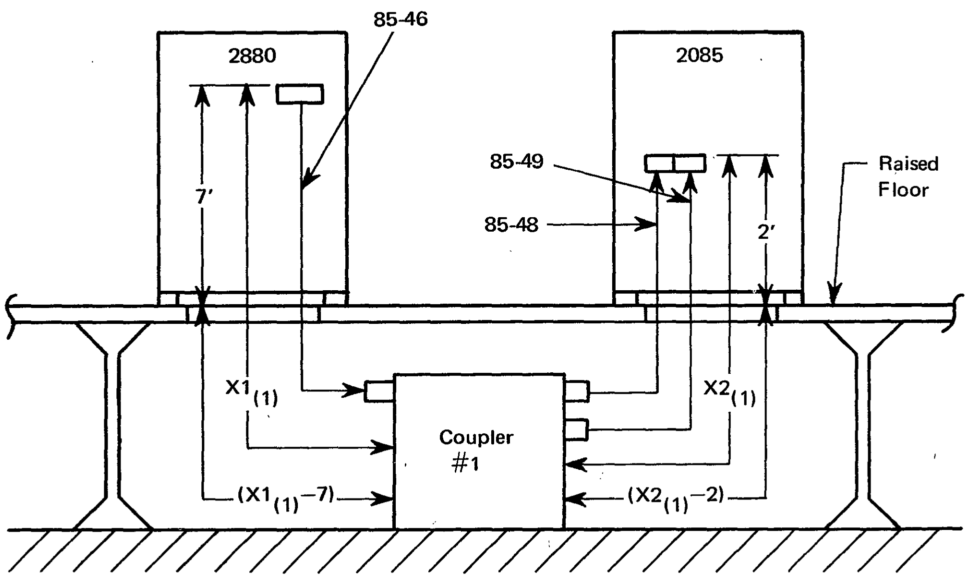
   $$X1 + X2 \leqslant 105$$

## SYSTEM/360 MODEL 85 CABLING SCHEMATIC (2880 ATTACHMENT)

Where:

- X1 = the C-T-C length (in feet) of cable group 85-46 between the 2880 and its associated coupler.
- X2 = the C-T-C length (in feet) of the sum of all intervening cable groups 85-47 and 85-48 between the 2880's associated coupler and the 2085.
- N = the number of couplers between the 2880 and the 2085.

See Examples 1 and 2.




*Example 1:*

Assume $X2_{(1)}$ = 10 feet (C-T-C).

Find maximum length (C-T-C) of $X1_{(1)}$. Note 5 may apply.

Note 2, equation a: $1.5(X1) + X2 + 35(N-1) = 287$

$1.5(X1) = 287 - 10$

$X1 = \frac{277}{1.5} = 184$ feet (C-T-C)

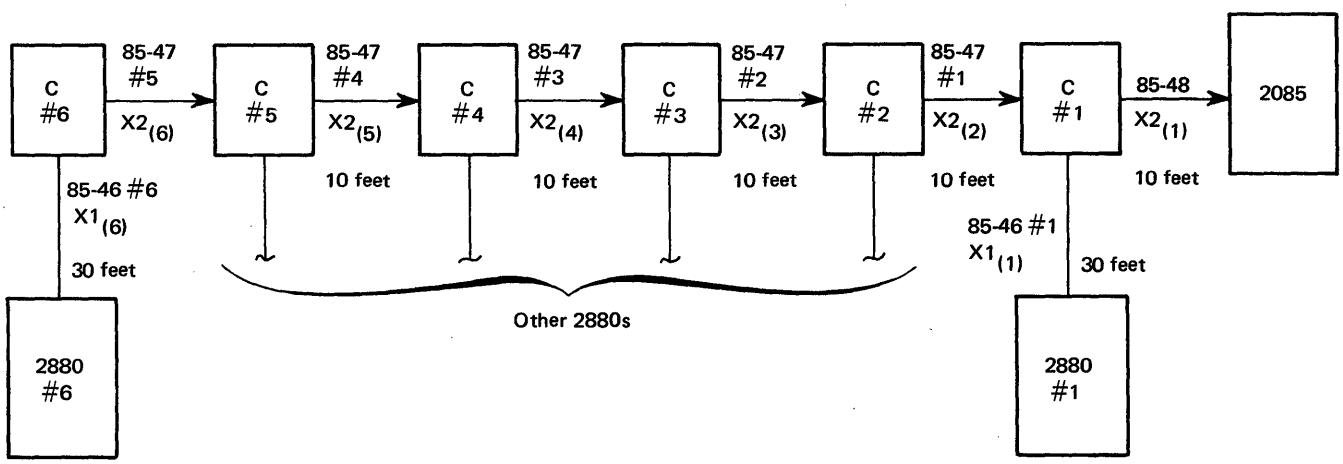
Note 2, equation b: $X1 + X2 = 105$

$X1 = 105 - 10 = 95$ feet (C-T-C)

Maximum length to satisfy both equations is 95 feet (C-T-C) from equation b. However, in those cases specified in note 5, it would be further restricted to 10 feet (C-T-C) when those special control units were attached to the 2880.

The floor-to-connector distance in the 2880 is 7 feet and in the 2085 it is 2 feet. For planning purposes in Example 1, the maximum "X" distance for group 85-46 ($X1_{(1)}$) is 95 feet – 7 feet = 88 feet and for group 85-48 ($X2_{(1)}$) is 10 feet – 2 feet = 8 feet.

**SYSTEM/360 MODEL 85 CABLING SCHEMATIC (2880 ATTACHMENT)**




*Example 2:*

Assume $X2_{(1)}$, $X2_{(2)}$, $X2_{(3)}$, $X2_{(4)}$, and $X2_{(5)}$ all equal 10 feet (C-T-C); $X1_{(6)}$ equals 30 feet (C-T-C).
Find maximum length (C-T-C) of $X2_{(6)}$. Note 5 does not apply.

Note 2, equation a:

$$1.5(X1) + X2 + 35(N-1) = 287$$
$$1.5(30) + X2 + 35(5) = 287$$
$$45 + X2 + 175 = 287$$
$$X2 = 287 - (45 + 175) = 67$$
$$X2_{(1)} + X2_{(2)} + X2_{(3)} + X2_{(4)} + X2_{(5)} + X2_{(6)} = 67$$
$$X2_{(6)} = 67 - 50 = 17 \text{ feet (C-T-C)}$$

Note 2, equation b:

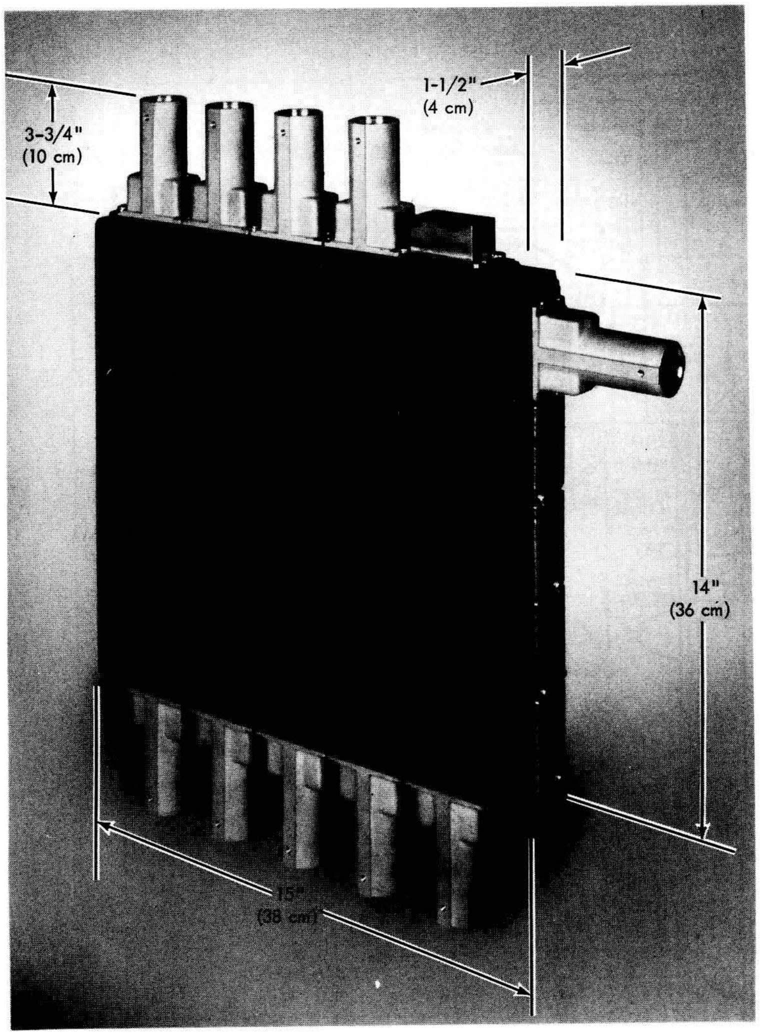
$$X1 + X2 = 105$$
$$X2 = 105 - 30 = 75$$
$$X2_{(6)} = 75 - 50 = 25 \text{ feet (C-T-C)}$$

Maximum length to satisfy both equations is 17 feet (C-T-C) from equation a.

For planning purposes in Example 2, group 85-46 #6 ($X9_{(6)}$), the maximum "X" dimension is 30 feet – 7 feet = 23 feet. The maximum "X" dimension for group 85-47 #5 is 17 feet because the C-T-C equals the "X" dimension for this group.

3. Cable C-T-C length of group 85-49 must always equal the sum of the C-T-C lengths of intervening groups 85-47 and 85-48 plus 6 additional feet for each intervening coupler. This provides equal delay along the simplex path (85-49) and the multiplex path (85-47, 85-48, and couplers).
4. Length of group 85-51 must be equal to the length of the group 85-47 cables between the couplers.
5. A 2835 Model 1, 2835 Model 2, or a 2820 must be attached to the first 2880; the maximum length for cable group 85-46 is 10 feet (C-T-C) and the maximum length for cable group 85-48 is 20 feet (C-T-C).

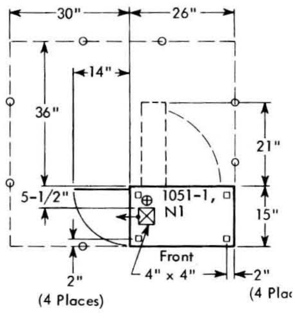
## SYSTEM/360 MODEL 85 CABLING SCHEMATIC (2880 ATTACHMENT)

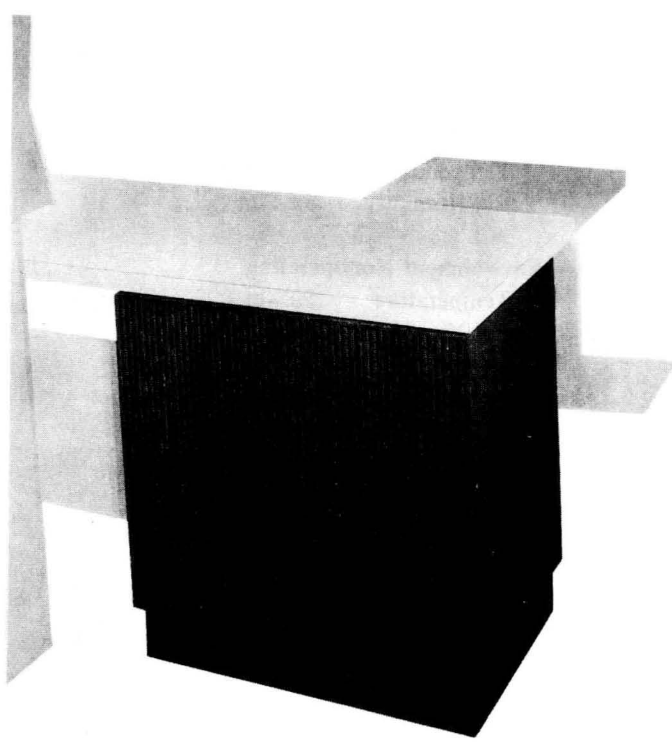



Memory (Storage) Bus Coupler (2365/2385)

## 1051 CONTROL UNIT MODELS 1 AND N1

### PLAN VIEW



### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | 26 | 15 | 27 |
| (cm) | (66) | (38) | (69) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | 0 | 36 | 0 | 30 |
| (cm) | (0) | (91) | (0) | (76) |

**Weight:** 195 lb (89 kg)

**Heat Output:** 670 BTU/hr (170 kcal/hr)

**Airflow:** 0 cfm (0 $m^3$/min)

**Power Requirements:**

| | |
|---|---|
| kVA | 0.2 |
| Phases | 1 |
| Plug | R&S, FS3720 |
| Connector | R&S, FS3913 |
| Receptacle | R&S, FS3743 |
| Power Cord Style | A5 |

**Environment Operating:**

| | |
|---|---|
| Temperature | $50^o$-$110^o$F ($10^o$-$43^o$C) |
| Rel Humidity | 10%-80% |
| Max Wet Bulb | $80^o$F ($27^o$C) |

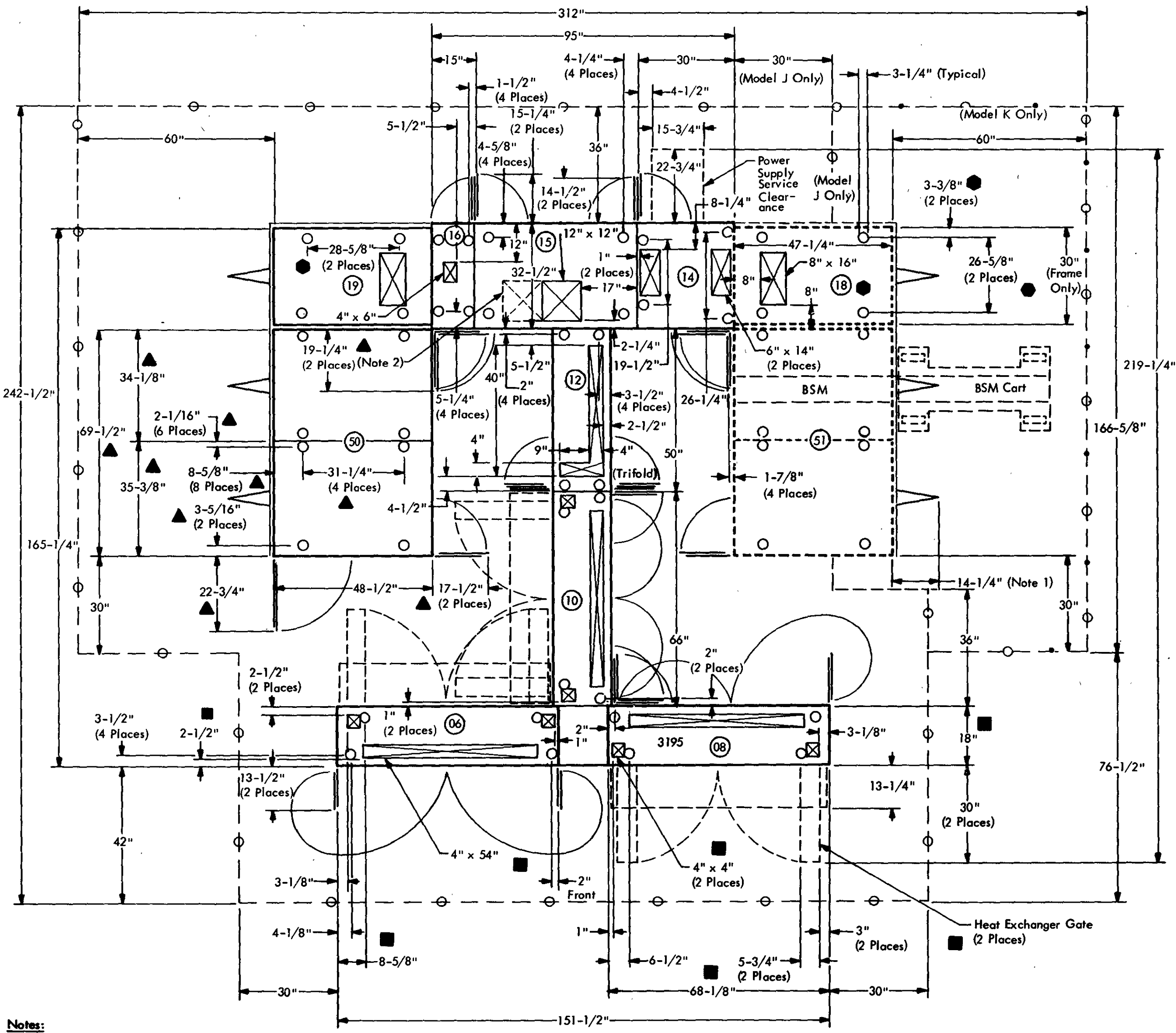
**Environment Nonoperating:**

| | |
|---|---|
| Temperature | $50^o$-$110^o$F ($10^o$-$43^o$C) |
| Rel Humidity | 10%-80% |
| Max Wet Bulb | $80^o$F ($27^o$C) |

**Cable Limitations:**
Fixed length to 2030.

## SYSTEM/360 MODEL 195 J AND K–3195 PROCESSING UNIT AND STORAGE

**PLAN VIEW (Not 1/4" = 1' Scale)**




Notes:

1. The two-section covers at the left of frame 19 and the associated main storage frames fold away from the machine to a fixed angle when unlatched. The folded sections can slide on a continuous track the length of the left edge of the referenced frames. The covers at the right of frame 18 and the associated main storage frames work the same way on the right edge.
2. Enlarged opening 12" x 24" (30 cm x 61 cm) is required for additional cables for the extended channels feature (SF #3851).

▲ Typical dimensions on frames 50 and 51.

● Typical dimensions on frames 18 and 19.

■ Typical dimensions on frames 06, 08, and 10.

## SYSTEM/360 MODEL 195 J AND K–3195 PROCESSING UNIT AND STORAGE

### Details (By Frame, Without Covers)

| Frame | *Dimensions F x S x H inches (cm)* | *Weight lb (kg)* | *Airflow cfm ($m^3$/min)* | *Heat Output BTU/hr (kcal/hr)* | |
|---|---|---|---|---|---|
| | | | | *To Air* | *To Water* |
| 06 | 66 x 15 x 70 (168 x 38 x 178) | 1,400 (640) | 400 (12) | 7,000 (1.800) | 7,000 (1.800) |
| 08 | 66 x 15 x 70 (168 x 38 x 178) | 1,400 (640) | 400 (12) | 5,000 (1.300) | 5,000 (1.300) |
| 10 | 15 x 66 x 70 (38 x 168 x 178) | 1,400 (640) | 400 (12) | 6,500 (1.650) | 6,500 (1.650) |
| 12 | 15 x 50 x 70 (38 x 127 x 178) | 1,000 (460) | 250 (8) | 7,800 (2.000) | 2,500 (640) |
| 14 | 30 x 30 x 70 (76 x 76 x 178) | 1,300 (590) | – | – | 21,000 (5.300) |
| 15 | 50 x 30 x 70 (127 x 76 x 178) | 1,000 (460) | 300 (9) | 3,000 (760) | – |
| 16 | 15 x 30 x 70 (38 x 76 x 178) | 650 (300) | 150 (5) | 2,000 (510) | – |
| 18 | 46 x 30 x 70 (117 x 76 x 178) | 1,800 (820) | – | – | – |
| 19 | 46 x 30 x 70 (117 x 76 x 178) | 1,800 (820) | – | – | – |
| 50 | 46 x 68* x 70 (117 x 173* x 178) | 3,500* (1.600*) | 2,800 (80) | 25,000 (6.350) | 20,000 (5.050) |
| 51 | 46 x 68* x 70 (117 x 173* x 178) | 3,500* (1.600*) | 2,800 (80) | 25,000 (6.350) | 20,000 (5.050) |

### CPU Totals (By Model)

| Model | *Weight lb (kg)* | *Airflow cfm ($m^3$/min)* | *Heat Output BTU/hr (kcal/hr)* | | Remarks |
|---|---|---|---|---|---|
| | | | *To Air* | *To Water* | |
| J | 13,450 (6.150) | 4,700 (140) | 56,300 (14.200) | 62,000 (15.650) | Omit frames 18 and 51 |
| K | 18,750 (8.550) | 7,500 (220) | 81,300 (20.500) | 82,000 (20.700) | |

### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | ** | ** | 70 |
| (cm) | (**) | (**) | (178) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | ** | ** | ** | ** |
| (cm) | (**) | (**) | (**) | (**) |

**Power Requirements:**
The Model 195 J and K receive 50/60-Hz and 415/441-Hz power from 3080 Models 1, 2, and 3 and 3085 PDU.

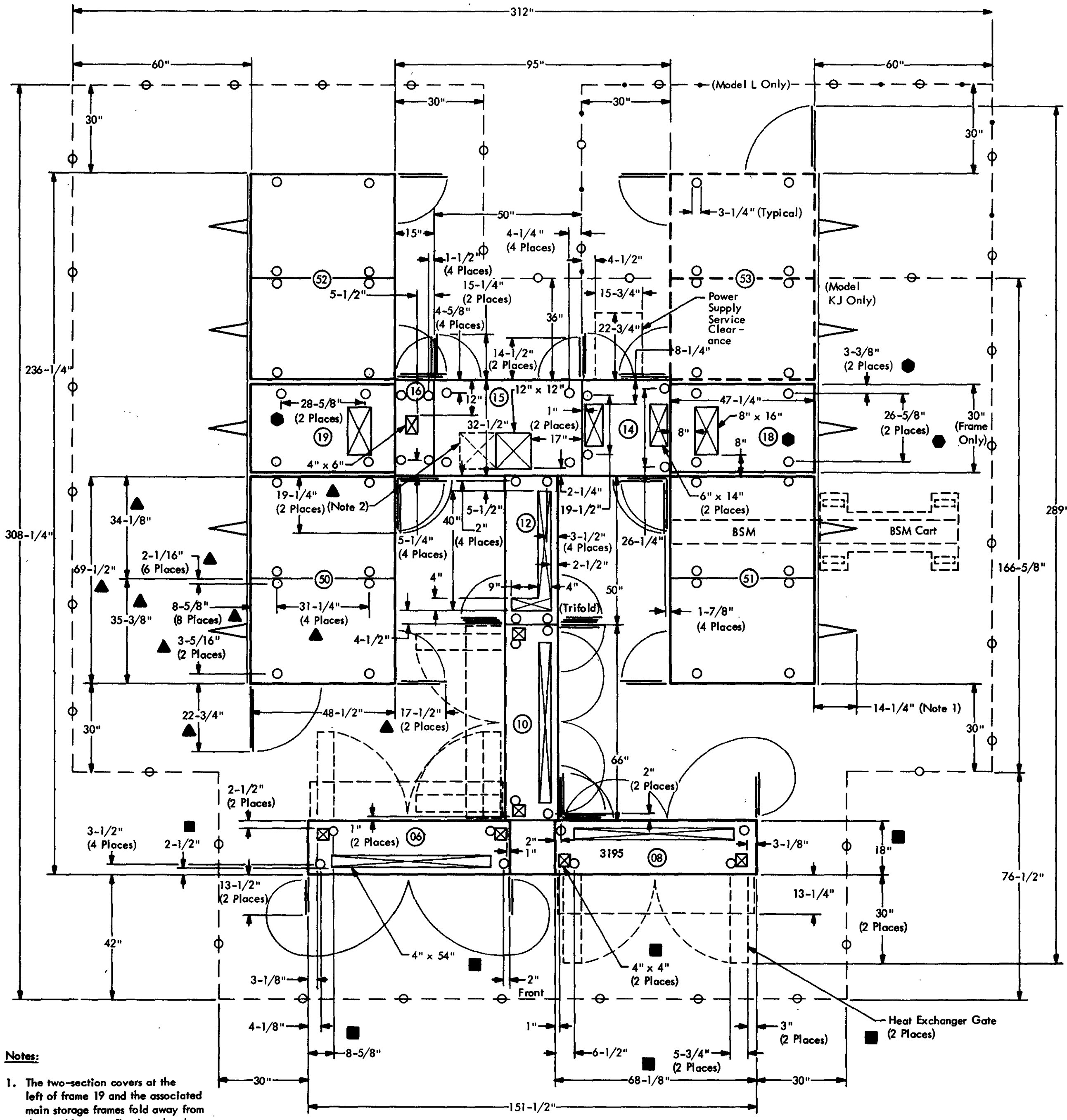
**Environment Operating:**

| | |
|---|---|
| Temperature | $65^{\circ}$-$80^{\circ}$F ($18^{\circ}$-$27^{\circ}$C) |
| Rel Humidity | 20%-80% |
| Max Wet Bulb | $75^{\circ}$F ($24^{\circ}$C)*** |

**Notes:**
* The 68 inches (173 cm) represents width of two 34-inch (86-cm) wide subframes, each weighing 1,750 lb (800 kg).
** See plan view.
*** See "Liquid Coolant System" in Appendix A.

## SYSTEM/360 MODEL 195 KJ AND L–3195 PROCESSING UNIT AND STORAGE

### PLAN VIEW (Not 1/4" = 1' Scale)




**Notes:**

1. The two-section covers at the left of frame 19 and the associated main storage frames fold away from the machine to a fixed angle when unlatched. The folded sections can slide on a continuous track the length of the left edge of the referenced frames. The covers at the right of frame 18 and the associated main storage frames work the same way on the right edge.
2. Enlarged opening 12" x 24" (30 cm x 61 cm) is required for additional cables for the extended channels feature (SF #3851).

▲ Typical dimensions on frames 50, 51, 52, and 53.

⬢ Typical dimensions on frames 18 and 19.

■ Typical dimensions on frames 06, 08, and 10.

## SYSTEM/360 MODEL 195 KJ AND L–3195 PROCESSING UNIT AND STORAGE

### Details (By Frame, Without Covers)

| *Frame* | *Dimensions F x S x H inches (cm)* | *Weight lb (kg)* | *Airflow cfm ($m^3$/min)* | *Heat Output BTU/hr (kcal/hr) To Air* | *Heat Output BTU/hr (kcal/hr) To Water* |
|---|---|---|---|---|---|
| 06 | 66 x 15 x 70 (168 x 38 x 178) | 1,400 (640) | 400 (12) | 7,000 (1.800) | 7,000 (1.800) |
| 08 | 66 x 15 x 70 (168 x 38 x 178) | 1,400 (640) | 400 (12) | 5,000 (1.300) | 5,000 (1.300) |
| 10 | 15 x 66 x 70 (38 x 168 x 178) | 1,400 (640) | 400 (12) | 6,500 (1.650) | 6,500 (1.650) |
| 12 | 15 x 50 x 70 (38 x 127 x 178) | 1,000 (460) | 250 (8) | 7,800 (2.000) | 2,500 (640) |
| 14 | 30 x 30 x 70 (76 x 76 x 178) | 1,300 (590) | – | – | 21,000 (5.300) |
| 15 | 50 x 30 x 70 (127 x 76 x 178) | 1,000 (460) | 300 (9) | 3,000 (760) | – |
| 16 | 15 x 30 x 70 (38 x 76 x 178) | 650 (300) | 150 (5) | 2,000 (510) | – |
| 18 | 46 x 30 x 70 (117 x 76 x 178) | 1,800* (820*) | – | – | – |
| 19 | 46 x 30 x 70 (117 x 76 x 178) | 3,100 (1.450) | – | – | – |
| 50 | 46 x 68** x 70 (117 x 173** x 178) | 3,500** (1.600**) | 2,800 (80) | 25,000 (6.350) | 20,000 (5.050) |
| 51 | 46 x 68** x 70 (117 x 173** x 178) | 3,500** (1.600**) | 2,800 (80) | 25,000 (6.350) | 20,000 (5.050) |
| 52 | 46 x 68** x 70 (117 x 173** x 178) | 3,500** (1.600**) | 2,800 (80) | 25,000 (6.350) | 20,000 (5.050) |
| 53 | 46 x 68** x 70 (117 x 173** x 178) | 3,500** (1.600**) | 2,800 (80) | 25,000 (6.350) | 20,000 (5.050) |

### CPU Totals (By Model)

| *Model* | *Weight†† lb (kg)* | *Airflow cfm ($m^3$/min)* | *Heat Output BTU/hr (kcal/hr) To Air* | *Heat Output BTU/hr (kcal/hr) To Water* | *Remarks* |
|---|---|---|---|---|---|
| KJ | 24,850 (11.300) | 10,300 (300) | 106,300 (26.800) | 102,000 (27.750) | Omit frame 53 |
| L | 28,350 (12.900) | 13,100 (380) | 131,300 (33.100) | 122,000 (30.800) | |

### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | *** | *** | 70 |
| (cm) | (***) | (***) | (178) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | *** | *** | *** | *** |
| (cm) | (***) | (***) | (***) | (***) |

**Power Requirements:**
The Model 195 KJ and L receive 50/60-Hz and 415/441-Hz power from 3080 Models 1, 2, and 3 and 3085 PDU.

**Environment Operating:**

| | |
|---|---|
| Temperature | 65°-80°F (18°-27°C) |
| Rel Humidity | 20%-80% |
| Max Wet Bulb | 75°F (24°C)† |

**Notes:**

* The 1,800 lb (820 kg) is increased to 3,100 lb (1.450 kg) for Model L.

** The 68 inches (173 cm) represents width of two 34-inch (86-cm) wide subframes, each weighing 1,750 lb (800 kg).

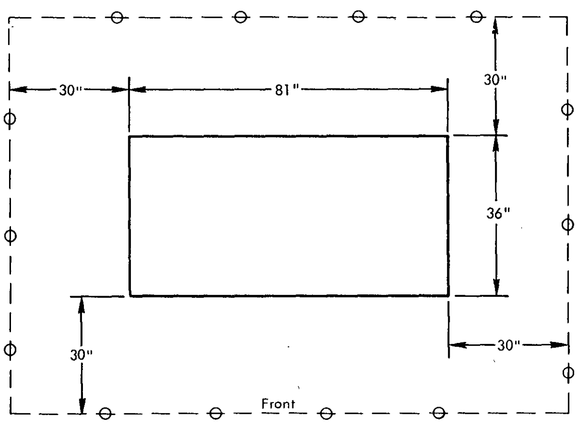
*** See plan view.

† See "Liquid Coolant System" in Appendix A.

†† Based on IBM's method of calculating floor loading, the Model 195 exceeds 75 pounds per square foot (370 kg/$m^2$) distributed floor loading. The installation site, therefore, should be reviewed by a qualified consultant.

## MOTOR GENERATOR (REMOTE)
## FOR SYSTEM/360 MODEL 195 (50-HZ INPUT)

### PLAN VIEW




**Distribution Guide for Motor-Generator Output to 3085 PDU**

Information in this guide accommodates a 208A full-load rating. Note that the conduit quantity column refers to the number of conduits recommended, each conduit containing all three phases in the wire size shown (three conductors per conduit) plus one AWG #2 insulated copper conductor in one of the conduits (the larger, if used) for ground. It is important that local and national wiring codes be followed.

| | Conduit | | | Maximum Run Lengths by Conduit Type--ft (meters†) | | |
|---|---|---|---|---|---|---|
| Copper Wire Size | Quantity | Size (inches) | 3195 Model | Ferrous | Nonferrous | Nonmetallic†† |
| 250 MCM* | 1 | 3 | L | 105** (32**) | 130** (40**) | 155*** (47***) |
| | | | KJ | 130** (40**) | 155** (47**) | 180*** (55***) |
| | | | K | 145** (44**) | 170** (52**) | 195*** (59***) |
| | | | J | 160** (49**) | 185** (59**) | 210*** (64***) |
| 2/0 AWG | 2 | 2 | L | 190 (58) | 230 (70) | 265 (81) |
| | | | KJ | 230 (70) | 270 (82) | 305 (93) |
| | | | K | 255 (78) | 295 (90) | 330 (101) |
| | | | J | 280 (85) | 320 (98) | 355 (108) |
| 250 MCM | 1<br>1 | 2-1/2<br>3 | L | 210 (64) | 260 (79) | 310 (94) |
| | | | KJ | 250 (76) | 300 (91) | 350 (107) |
| | | | K | 275 (84) | 325 (99) | 375 (114) |
| | | | J | 300 (91) | 350 (107) | 400 (122) |

*Single runs with conductors smaller than 250 MCM should not be used. MCM = thousand circular mils, where a circular mil is the cross-sectional area of a 0.001" (0,0254 mm) diameter wire ($7.854(10)^{-7}$ in$^2$ or $5,067(10)^{-4}$ mm$^2$).

**90°C insulation required.

***75°C insulation required.

†Lengths are rounded to the nearest unit meter.

††Or cabled in air, where codes allow.

**MOTOR GENERATOR (REMOTE)**
**FOR SYSTEM/360 MODEL 195 (50-HZ INPUT)**

## SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | 81 | 36 | 51 |
| (cm) | (206) | (91) | (130) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | 30 | 30 | 30 | 30 |
| (cm) | (76) | (76) | (76) | (76) |

**Weight:** 3,600 lb* (1.650 kg*)

**Heat Output (Approximate):**
55,250 BTU/hr (14.000 kcal/hr)

**Power Requirements:**
Phases 3

*Input:*
Induction Motor–100 hp, type K, class B, 220/240V or 380/408V, 50 ± 0.5 Hz

| *Input (V)* | *Locked Rotor Current (A)* | *Full Load Current (A)* |
|---|---|---|
| 220 | Special start winding. | 245 |
| 240 | Less than 200% of full load. | 230 |
| 380 | | 142 |
| 408 | | 134 |

*Output:*
Synchronous Generator–75 kVA, 208V ± 2%, 441 Hz ± 6%

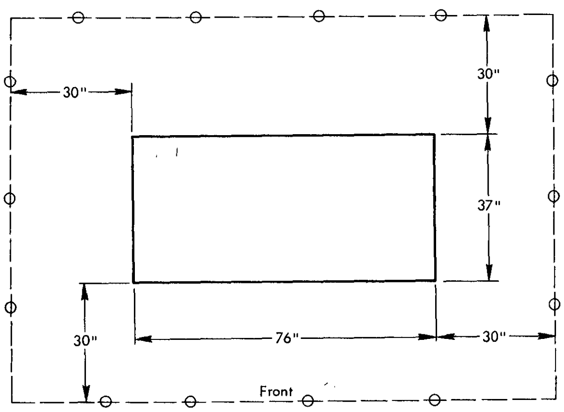
**Notes:**
* Starter circuitry is included in the generator.

The installation and maintenance of the motor-generator (including starter) unit will be the responsibility of the customer. Consult motor-generator manufacturer's instruction manual for further installation procedures and maintenance.

*Customer to supply the following wiring:*
1. Input feeders to the motor.
2. Output feeders from generator to PDU junction box. Maximum voltage drop at the PDU should not exceed 5%.
3. Five remote leads required from generator to PDU junction box: three AWG #14 leads for sensing and two AWG #16 leads for indicator lights.
4. The EPO pushbutton in the computer room must remotely cut off power to motor and output of the generator. Shunt trips are provided for this purpose in both circuit breakers.

## MOTOR GENERATOR (REMOTE) FOR SYSTEM/360 MODEL 195 (60-HZ INPUT)

### PLAN VIEW




### Distribution Guide for Motor-Generator Output to 3085 PDU

Information in this guide accommodates a 208A full-load rating. Note that the conduit quantity column refers to the number of conduits recommended, each conduit containing all three phases in the wire size shown (three conductors per conduit) plus one AWG #2 insulated copper conductor in one of the conduits (the larger, if used) for ground. It is important that local and national wiring codes be followed.

| | Conduit | | | Maximum Run Lengths by Conduit Type--ft (meters†) | | |
|---|---|---|---|---|---|---|
| Copper Wire Size | Quantity | Size (inches) | 3195 Model | Ferrous | Nonferrous | Nonmetallic†† |
| 250 MCM* | 1 | 3 | L | 105** (32**) | 130** (40**) | 155*** (47***) |
| | | | KJ | 130** (40**) | 155** (47**) | 180*** (55***) |
| | | | K | 145** (44**) | 170** (52**) | 195*** (59***) |
| | | | J | 160** (49**) | 185** (59**) | 210*** (64***) |
| 2/0 AWG | 2 | 2 | L | 190 (58) | 230 (70) | 265 (81) |
| | | | KJ | 230 (70) | 270 (82) | 305 (93) |
| | | | K | 255 (78) | 295 (90) | 330 (101) |
| | | | J | 280 (85) | 320 (98) | 355 (108) |
| 250 MCM | 1<br>1 | 2-1/2<br>3 | L | 210 (64) | 260 (79) | 310 (94) |
| | | | KJ | 250 (76) | 300 (91) | 350 (107) |
| | | | K | 275 (84) | 325 (99) | 375 (114) |
| | | | J | 300 (91) | 350 (107) | 400 (122) |

*Single runs with conductors smaller than 250 MCM should not be used. MCM = thousand circular mils, where a circular mil is the cross-sectional area of a 0.001" (0,0254 mm) diameter wire ($7.854(10)^{-7}$ in$^2$ or $5,067(10)^{-4}$ mm$^2$).
**90°C insulation required.
***75°C insulation required.
†Lengths are rounded to the nearest unit meter.
††Or cabled in air, where codes allow.

## MOTOR GENERATOR (REMOTE) FOR SYSTEM/360 MODEL 195 (60-HZ INPUT)

### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | 76 | 37 | 54 |
| (cm) | (193) | (94) | (137) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | 30 | 30 | 30 | 30 |
| (cm) | (76) | (76) | (76) | (76) |

**Weight:** 3,000 lb (1.400 kg)

**Heat Output (Approximate):**
40,000 BTU/hr (10.100 kcal/hr)

**Power Requirements:***

Phases 3

*Input:*

Induction Motor–90 hp, type K, NEMA design A, 208/230V or 440V ± 10%, 60 Hz ± 5%, $40^{o}$C maximum ambient

*Starting Inrush Current:*

208V–460A
230V–424A
440V–200A

*Running Current at Full Load:*

208V–235A
230V–212A
440V–106A

*Output:*

Synchronous Generator–75 kVA, 208V ± 2%, 415 Hz ± 6%

**Notes:**

* Starter circuitry is included in the generator.

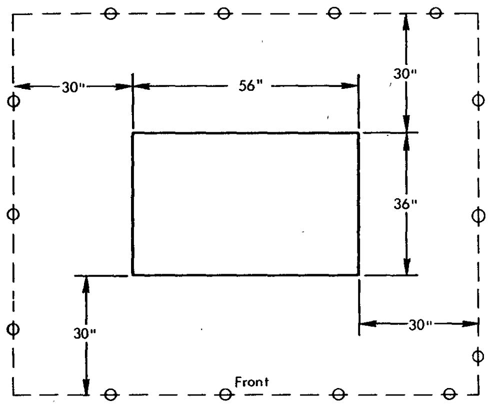
The installation and maintenance of the motor-generator (including starter) unit will be the responsibility of the customer. Consult motor-generator manufacturer's instruction manual for further installation procedures and maintenance.

*Customer to supply the following wiring:*

1. Input feeders to the motor.
2. Output feeders from generator to PDU junction box. Maximum voltage drop at the PDU should not exceed 5%.
3. Five remote leads required from generator to PDU junction box: three AWG #14 leads for sensing and two AWG #16 leads for indicator lights.
4. The EPO pushbutton in the computer room must remotely cut off power to motor and output of the generator. Shunt trips are provided for this purpose in both circuit breakers.

## ROTARY CONVERTER (REMOTE) FOR SYSTEM/360 MODEL 195 (WORLD TRADE ONLY)

### PLAN VIEW




### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | 56 | 36 | 37 |
| (cm) | (142) | (91) | (94) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | 30 | 30 | 30 | 30 |
| (cm) | (76) | (76) | (76) | (76) |

**Weight:** 1,550 lb (710 kg)

**Heat Output:** 22,915 BTU/hr (5.800 kcal/hr)

**Power Requirements:**

Phases 3

*Input:*

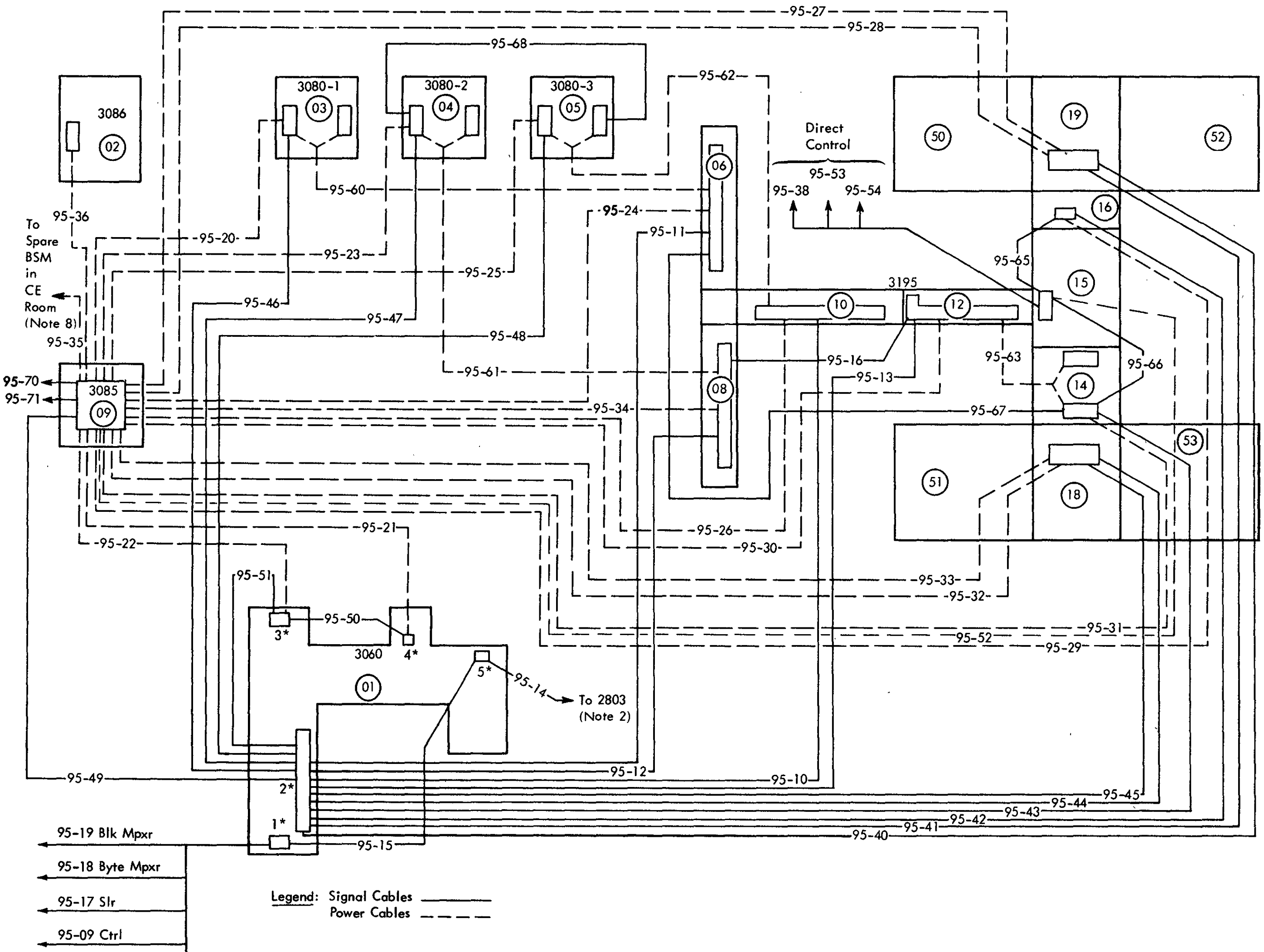
Induction Motor–50 hp, 220/240V or 380/408V, 50 Hz ± 0.5 Hz

| *Input (V)* | *Locked Rotor Current (A)* | *Full Load Current (A)* |
|---|---|---|
| 220 | 760 | 123 |
| 240 | 830 | 113 |
| 380 | 460 | 71 |
| 408 | 500 | 68 |

*Output:*

Synchronous generator coupled to motor with timing belts, 208V, 60 Hz, 37.5 kVA

## SYSTEM/360 MODEL 195 CABLING SCHEMATIC–CPU




*Numbers for cable holes; see 3060 plan view.

| *Cable No.* | *No. of Cables* | *From Unit-Frame* | *To Unit-Frame* | *Max Length (ft)* | *Notes* |
|---|---|---|---|---|---|
| 95-09 | 2 | 3060 Fr 01 | Control Unit | – | 9 |
| 95-10 | 49 | 3060 Fr 01 | 3195 Fr 10 | 26 | 3 |
| 95-11 | 35 | 3060 Fr 01 | 3195 Fr 06 | 26 | 3 |
| 95-12 | 26 | 3060 Fr 01 | 3195 Fr 08 | 26 | 3 |
| 95-13 | 12 | 3060 Fr 01 | 3195 Fr 12 | 25 | 3 |
| 95-14 | 2 | 3060 Fr 01 | 2803 | 96 | 2 |
| 95-15 | 2 | 3060 Fr 01 | 3060 Fr 01 | 14 | 3 |
| 95-16 | 3 | 3195 Fr 08 | 3195 Fr 12 | 17 | 3 |
| 95-17 | 2 | 3060 Fr 01 | Selector Channel | – | 9 |
| 95-18 | 2 | 3060 Fr 01 | Byte Multiplexer Channel | – | 9 |
| 95-19 | 2 | 3060 Fr 01 | Block Multiplexer Channel | – | 9 |
| 95-20 | 4 | 3085 Fr 09 | 3080 Fr 03 | 68 | – |
| 95-21 | 2 | 3085 Fr 09 | 3060 Fr 01 | 68 | – |
| 95-22 | 4 | 3085 Fr 09 | 3060 Fr 01 | 68 | – |
| 95-23 | 3 | 3085 Fr 09 | 3080 Fr 04 | 68 | – |
| 95-24 | 2 | 3085 Fr 09 | 3195 Fr 06 | 68 | – |
| 95-25 | 4 | 3085 Fr 09 | 3080 Fr 05 | 68 | – |
| 95-26 | 1 | 3085 Fr 09 | 3195 Fr 10 | 68 | – |

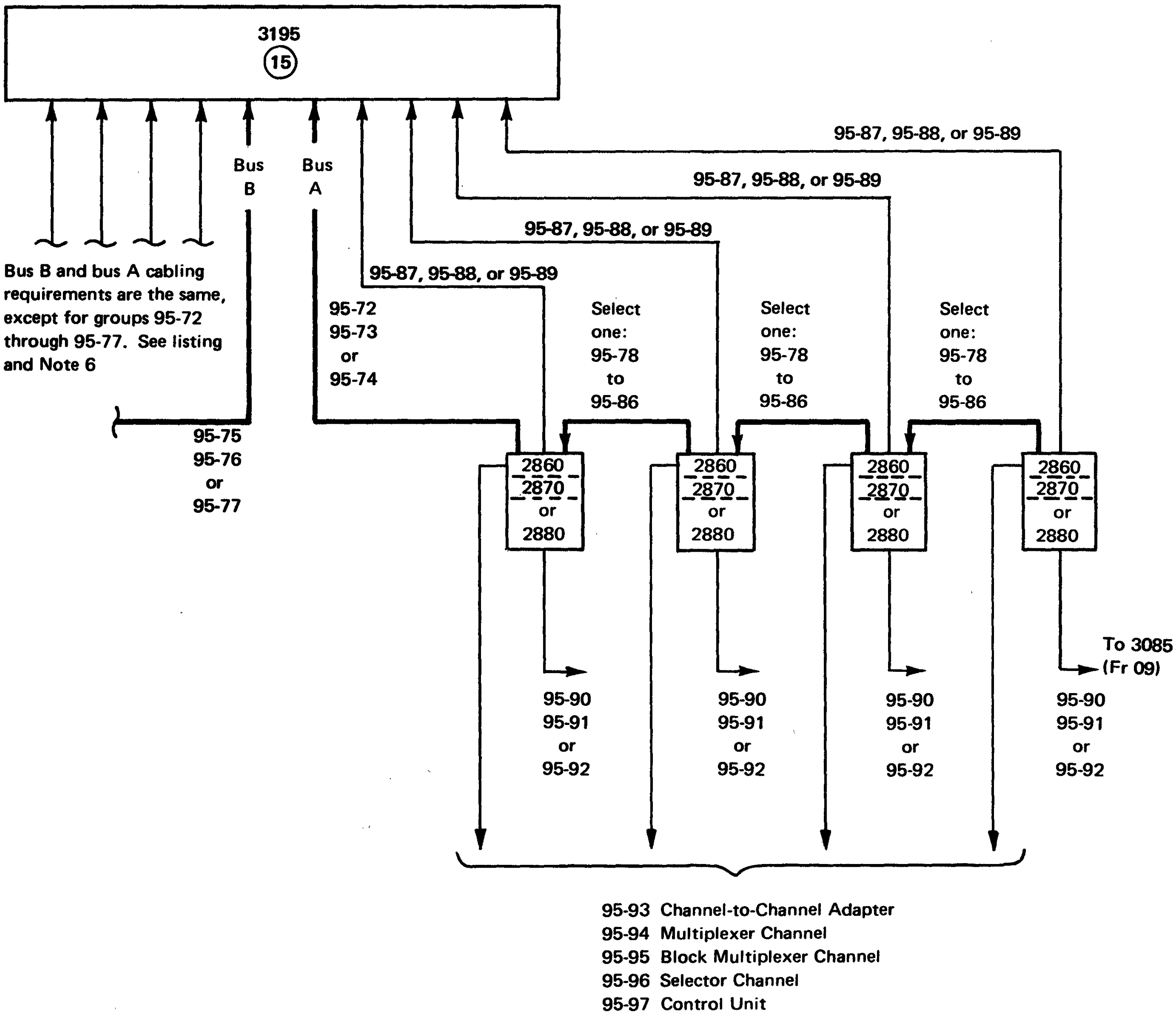
## SYSTEM/360 MODEL 195 CABLING SCHEMATIC–CPU

| *Cable No.* | *No. of Cables* | *From Unit-Frame* | *To Unit-Frame* | *Max Length (ft)* | *Notes* |
|---|---|---|---|---|---|
| 95-27 | 3 | 3085 Fr 09 | 3195 Fr 19 | 68 | – |
| 95-28 | 3 | 3085 Fr 09 | 3195 Fr 19 | 68 | 5 |
| 95-29 | 4 | 3085 Fr 09 | 3195 Fr 16 | 68 | – |
| 95-30 | 1 | 3085 Fr 09 | 3195 Fr 12 | 68 | – |
| 95-31 | 3 | 3085 Fr 09 | 3195 Fr 14 | 68 | – |
| 95-32 | 3 | 3085 Fr 09 | 3195 Fr 18 | 68 | 4 |
| 95-33 | 3 | 3085 Fr 09 | 3195 Fr 18 | 68 | 6 |
| 95-34 | 2 | 3085 Fr 09 | 3195 Fr 08 | 68 | – |
| 95-35 | 2 | 3085 Fr 09 | CER (CE Room) | 100 | 8 |
| 95-36 | 2 | 3085 Fr 09 | 3086 Fr 02 | 55 | – |
| 95-37 | 2 | 3060 Fr 01 | Channel-to-Channel Adapter | – | 9 |
| 95-38 | 2 | Direct Control | 3195 Fr 15 | 100 | 10 |
| 95-40 | 1 | 3060 Fr 01 | 3195 Fr 19 | 96 | – |
| 95-41 | 1 | 3060 Fr 01 | 3195 Fr 19 | 96 | 5 |
| 95-42 | 2 | 3060 Fr 01 | 3195 Fr 16 | 96 | – |
| 95-43 | 1 | 3060 Fr 01 | 3195 Fr 14 | 96 | – |
| 95-44 | 1 | 3060 Fr 01 | 3195 Fr 18 | 96 | 6 |
| 95-45 | 1 | 3060 Fr 01 | 3195 Fr 18 | 96 | 4 |
| 95-46 | 1 | 3060 Fr 01 | 3080 Fr 03 | 96 | – |
| 95-47 | 1 | 3060 Fr 01 | 3080 Fr 04 | 96 | – |
| 95-48 | 1 | 3060 Fr 01 | 3080 Fr 05 | 96 | – |
| 95-49 | 2 | 3085 Fr 09 | 3060 Fr 01 | 96 | – |
| 95-50 | 3 | 3060 Fr 01 | 3060 Fr 01 | 8 | 3 |
| 95-51 | 1 | 3060 Fr 01 | 3060 Fr 01 | 12 | 3 |
| 95-52 | 1 | 3085 Fr 09 | 3195 Fr 15 | 68 | – |
| 95-53 | 2 | Direct Control | 3195 Fr 15 | 100 | 11 |
| 95-54 | 2 | Direct Control | 3195 Fr 15 | 100 | 1 |
| 95-60 | 21 | 3080 Fr 03 | 3195 Fr 06 | 24 | 7 |
| 95-61 | 22 | 3080 Fr 04 | 3195 Fr 08 | 24 | 7 |
| 95-62 | 21 | 3080 Fr 05 | 3195 Fr 10 | 24 | 7 |
| 95-63 | 19 | 3195 Fr 14 | 3195 Fr 12 | 10 | 3 |
| 95-65 | 1 | 3195 Fr 16 | 3195 Fr 15 | 8 | 3 |
| 95-66 | 1 | 3195 Fr 15 | 3195 Fr 14 | 8 | 3 |
| 95-67 | 1 | 3195 Fr 14 | 3195 Fr 06 | 24 | – |
| 95-68 | 1 | 3080 Fr 05 | 3080 Fr 04 | 68 | – |
| 95-70 | 1 | 3085 Fr 09 | System/360 or System/370 CPU | 100 | 12 |
| 95-71 | 1 | 3085 Fr 09 | System/360 or System/370 CPU | 100 | 13 |

*Notes:*

1. Direct control to other System/360 or System/370 CPUs (excluding 3195).
2. With more than one 2803 on a system, route to "last" 2803 (containing terminators).
3. Fixed-length cables.
4. For 3195 Model L configuration only.
5. For 3195 Model KJ and L configurations only.
6. For 3195 Model K, KJ, and L configurations only.
7. Cables in this group are divided between the two cutouts in the 3080. Measure from the 3195 cutout to the farther 3080 cutout.
8. From BSM analyzer located in CE room (CER).
9. Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) available to attach up to eight control units.
10. Direct control to non-IBM devices.
11. Direct control to another 3195.
12. To SF #3621, two-system EPO connection.
13. To SF #3622, multisystem EPO connection. See Note 2 in "System/360 Specification Summary."

## SYSTEM/360 MODEL 195 CABLING SCHEMATIC–CHANNELS



## SYSTEM/360 MODEL 195 CABLING SCHEMATIC–CHANNELS

| *Cable Function* | *Group No.* | *No. of Cables* | *From* | *To* | *Max Length (ft)* | *Notes* |
|---|---|---|---|---|---|---|
| Multiplex | 95-72 | 13 | 2860 | 3195 Fr 15 | – | 1,4,6 |
| | 95-73 | 13 | 2870 | 3195 Fr 15 | – | 1,4,6 |
| | 95-74 | 13 | 2880 | 3195 Fr 15 | – | 1,4,6 |
| | 95-75 | 13 | 2860 | 3195 Fr 15 | – | 1,5,6 |
| | 95-76 | 13 | 2870 | 3195 Fr 15 | – | 1,5,6 |
| | 95-77 | 13 | 2880 | 3195 Fr 15 | – | 1,5,6 |
| | 95-78 | 13 | 2860 | 2860 | – | 1 |
| | 95-80 | 13 | 2860 | 2880 | – | 1 |
| | 95-81 | 13 | 2870 | 2860 | – | 1 |
| | 95-82 | 13 | 2870 | 2870 | – | 1 |
| | 95-83 | 13 | 2870 | 2880 | – | 1 |
| | 95-84 | 13 | 2880 | 2860 | – | 1 |
| | 95-86 | 13 | 2880 | 2880 | – | 1 |
| Simplex | 95-87 | 1 | 2860 | 3195 Fr 15 | – | 2,3 |
| | 95-88 | 1 | 2870 | 3195 Fr 15 | – | 2,3 |
| | 95-89 | 1 | 2880 | 3195 Fr 15 | – | 2,3 |
| Control | 95-90 | 1 | 2860 | 3085 Fr 09 | 90 | – |
| | 95-91 | 1 | 2870 | 3085 Fr 09 | 90 | – |
| | 95-92 | 1 | 2880 | 3085 Fr 09 | 90 | – |
| Channel-to-Channel Adapter | 95-93 | 2 | 2860 | Channel-to-Channel Adapter | – | 7,8 |
| | 95-94 | 2 | 2860 | Multiplexer Channel | – | 7,8 |
| | 95-95 | 2 | 2860 | Block Multiplexer Channel | – | 7,8 |
| | 95-96 | 2 | 2860 | Selector Channel | – | 7,8 |
| | 95-97 | 2 | 2860 | Control Unit | – | 7,8 |

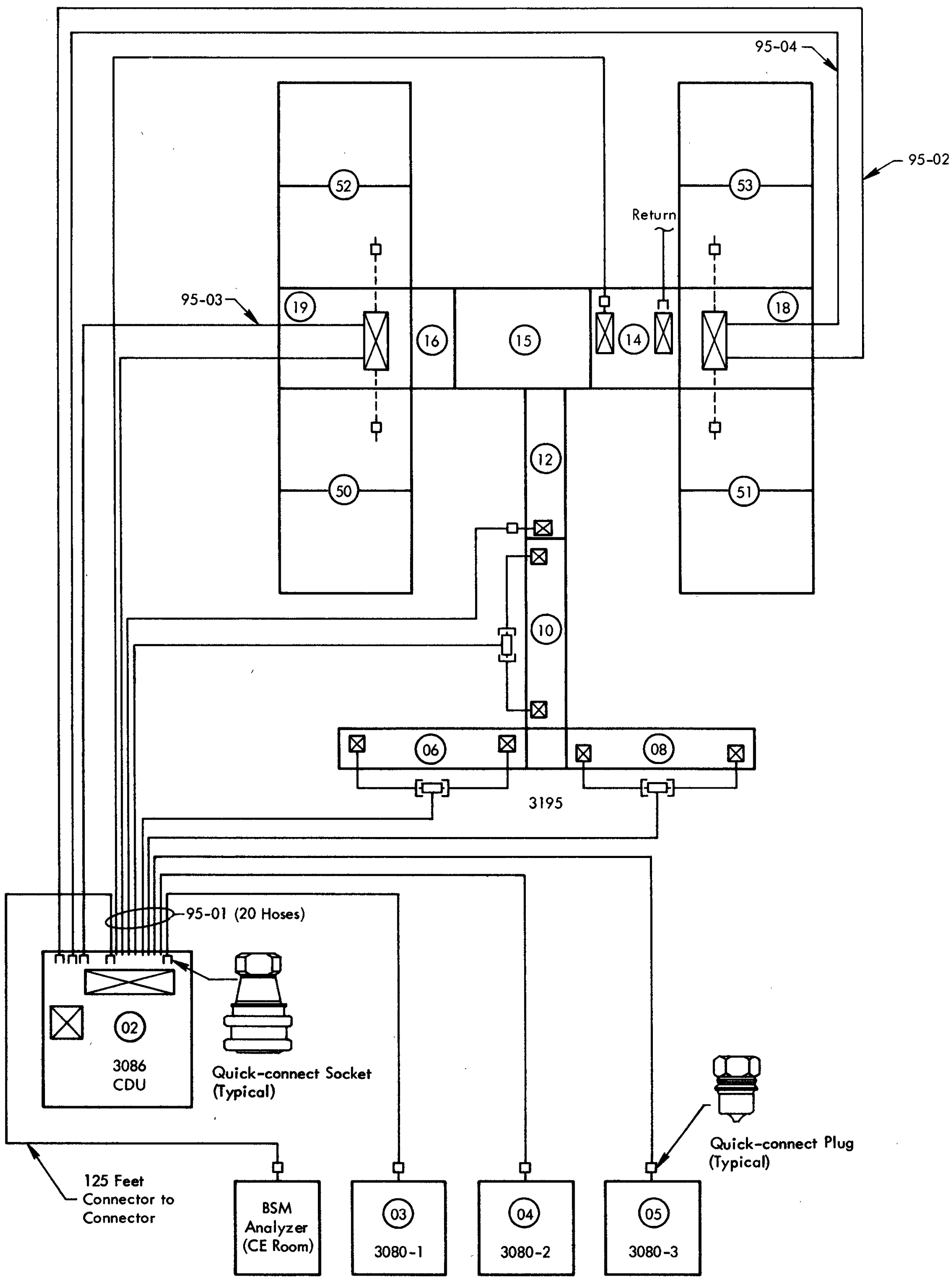
*Notes:*

1.

| *Bus Arrangement* | *Max "X" cable lengths (feet) per bus to connect:* 1 Unit | 2 Units | 3 Units | 4 Units |
|---|---|---|---|---|
| With 2880s only | 129 | 115 | 102 | 88 |
| Combinations of 2860s, 2870s, and 2880s with a 2880 last unit on bus | | 111 | 91 | 74 |
| Combinations of 2860s, 2870s, and 2880s with either a 2860 or 2870 last unit on bus | | 77 | 60 | 47 |
| With 2860s and/or 2870s only on a bus | 95 | 76 | 57 | 39 |

2. One group per channel.
3. The total (T) length of simplex group must be within +0% and −3% of the accumulated total length of multiplex group(s) between that particular channel and 3195.
4. For bus A only.
5. For bus B only.
6. *General Information:* Maximum of two buses (A and B) per system; divide channel frames between buses A and B when both buses are used. Intermix of 2860, 2870, and 2880 frames on either bus is allowed. *Limitation:* Maximum of four channel frames on one bus.
   *Basic System:* Maximum of seven frames or seven logical channels, whichever occurs first.
   If two 2870s are attached, additional intermixed 2860s and 2880s may be attached up to a maximum of five frames or five logical channels of 2860 and/or 2880.
   If one 2870 is attached, additional intermixed 2860s and 2880s may be attached up to a maximum of six frames or six logical channels of 2860 and/or 2880.
   If no 2870s are attached, the restrictions are the same as for one attached 2870.
   *With Extended Channels (SF #3851):* Maximum of 8 frames or 14 logical channels, whichever occurs first.
   If two 2870s are attached, additional intermixed 2860s and 2880s may be attached up to a maximum of 5 frames or 5 logical channels of 2860 or a maximum of 6 frames or 12 logical channels of 2880.
   If one 2870 is attached, additional intermixed 2860s and 2880s may be attached up to a maximum of 6 frames or 6 logical channels of 2860 or a maximum of 7 frames or 13 logical channels of 2880.
   If no 2870s are attached, the restrictions are the same as for one attached 2870.
7. For channel-to-channel adapter (SF #1850).
8. Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) available to attach up to eight control units.

## SYSTEM/360 MODEL 195 CABLING SCHEMATIC–COOLANT HOSES



## SYSTEM/360 MODEL 195 CABLING SCHEMATIC—COOLANT HOSES

| *Group No.* | *No. of Hoses* | *From* | *To 3195 Frame* | *Fixed Length (ft)* | *Notes* |
|---|---|---|---|---|---|
| 95-01 | 20 | 3086 | See Schematic | – | 1,2,3 |
| 95-02 | 2 | 3086 | 51 | 50 | 1,3 |
| 95-03 | 2 | 3086 | 52 | 50 | 1,3 |
| 95-04 | 2 | 3086 | 53 | 50 | 1,3 |

*Notes:*

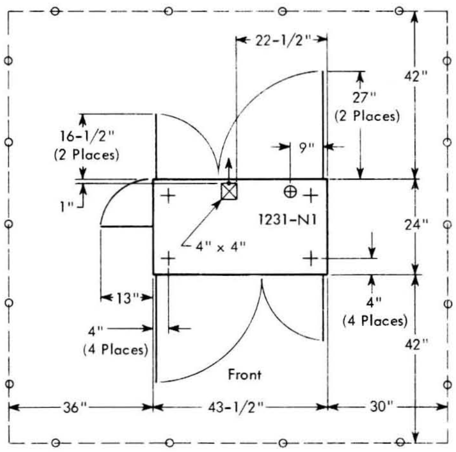
1. Supply hoses have quick-connect plug fittings on end away from CDU and socket fittings on end going into CDU. (Supply hoses only are shown on this schematic; assume one return hose for each supply hose.) Return hoses have quick-connect socket fittings on end away from CDU and plug fittings going into CDU. (Exceptions are BSM analyzer hoses, which have socket connectors on both ends of the supply and return hoses.)
2. Hoses are 50 feet (fixed length), except where otherwise noted.
3. Coolant hoses are ordered by group number only.

   *Specify:*

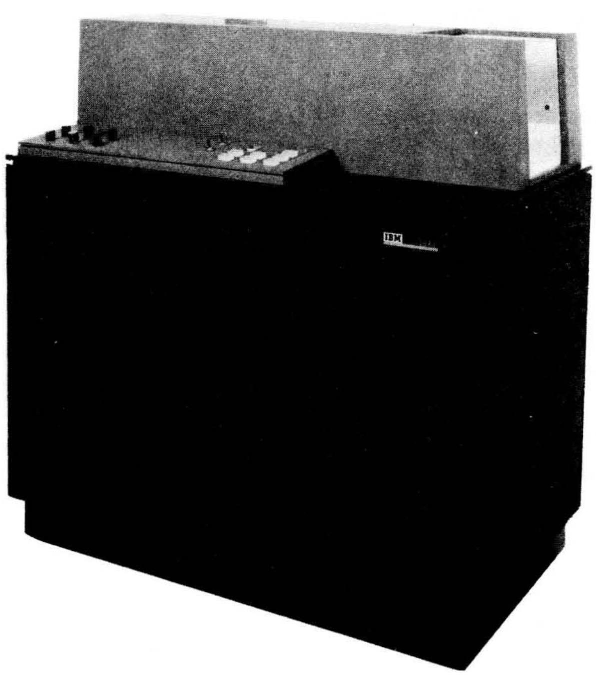
   Group number 95-01 for Model J
   Group numbers 95-01 and 95-02 for Model K
   Group numbers 95-01, 95-02, and 95-03 for Model KJ
   Group numbers 95-01, 95-02, 95-03, and 95-04 for Model L.

## 1231 OPTICAL MARK PAGE READER MODEL N1

### PLAN VIEW




*Note:* For cabling information, see Section 4, "Units with Integral or Abutted Controls."



### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | 43-1/2 | 24 | 44-3/4 |
| (cm) | (110) | (61) | (114) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | 42 | 42 | 30 | 36 |
| (cm) | (107) | (107) | (76) | (91) |

**Weight:** 620 lb (290 kg)

**Heat Output:** 3,700 BTU/hr (940 kcal/hr)

**Airflow:** 300 cfm (9 $m^3$/min)

**Power Requirements:**

| | |
|---|---|
| kVA | 1.2 |
| Phases | 1 |
| Plug | R&S, FS3720 |
| Connector | R&S, FS3913 |
| Receptacle | R&S, FS3743 |
| Power Cord Style | A1 |

**Environment Operating:**

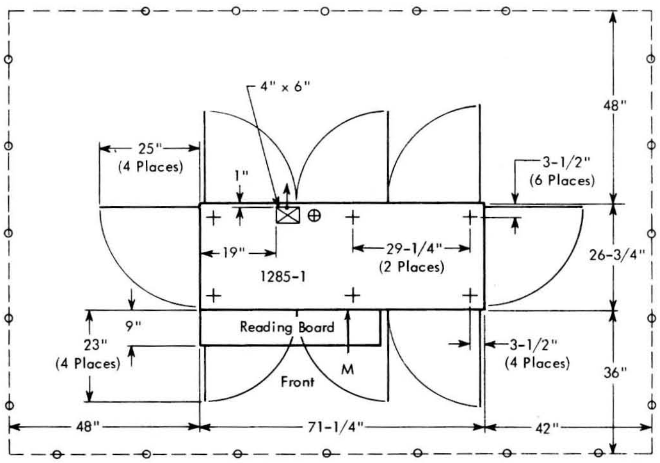
| | |
|---|---|
| Temperature | $50^{o}$-$110^{o}$F ($10^{o}$-$43^{o}$C) |
| Rel Humidity | 8%-80% |

**Environment Nonoperating:**

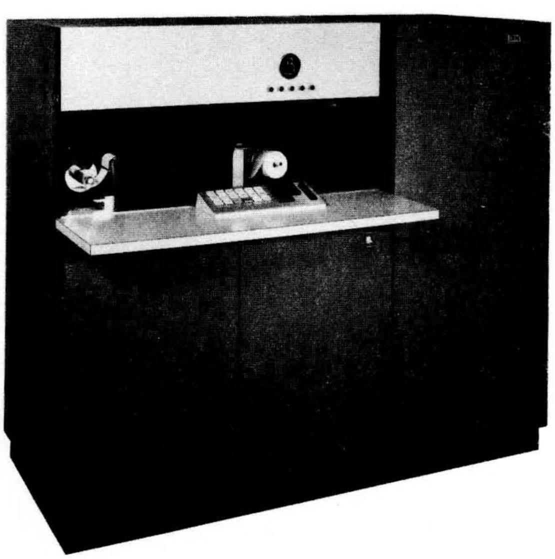
| | |
|---|---|
| Temperature | $50^{o}$-$110^{o}$F ($10^{o}$-$43^{o}$C) |
| Rel Humidity | 8%-80% |

## 1285 OPTICAL READER MODEL 1

### PLAN VIEW




*Note:* For cabling information, see Section 4, "Units with Integral or Abutted Controls."



### SPECIFICATIONS

**Dimensions:**

| | F | S* | H |
|---|---|---|---|
| Inches | 71-1/4** | 35-3/4** | 60 |
| (cm) | (181**) | (91**) | (152) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | 36 | 48 | 42 | 48 |
| (cm) | (91) | (122) | (107) | (122) |

**Weight:** 1,600 lb (730 kg)

**Heat Output:** 5,000 BTU/hr (1.300 kcal/hr)

**Airflow:** 600 cfm (17 $m^3$/min)

**Power Requirements:**

| | |
|---|---|
| kVA | 1.8 |
| Phases | 3 |
| Plug | R&S, FS3760 |
| Connector | R&S, FS3934 |
| Receptacle | R&S, FS3754 |
| Power Cord Style | D1 |

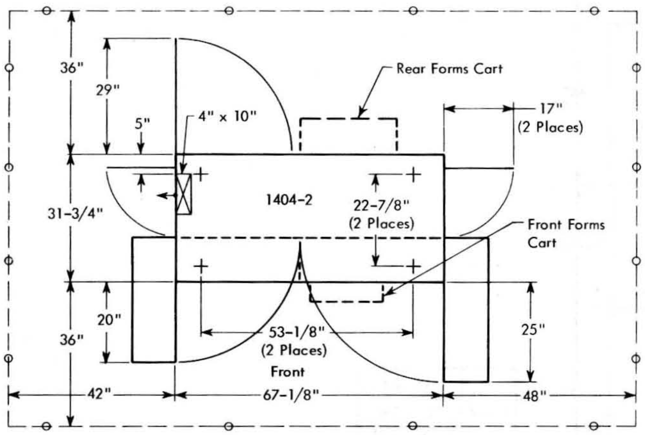
**Notes:**

* Dimension includes 9" (23 cm) for reading board projection. Reading board is removed for shipment.

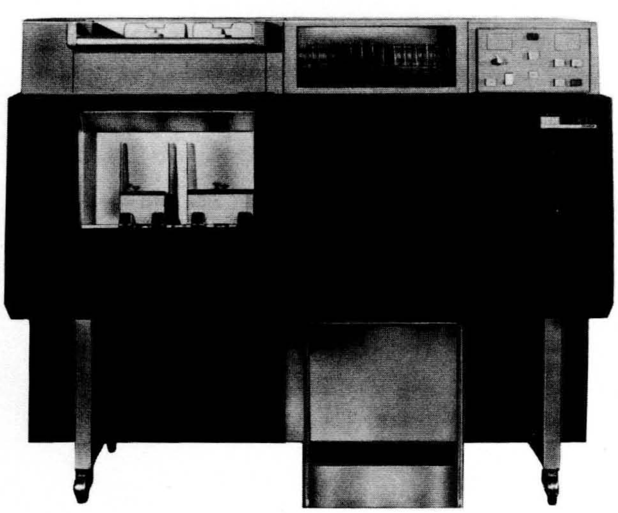
** Dimensions can be reduced to 70" x 29" (178 cm x 74 cm) for shipping.

## 1404 PRINTER MODEL 2

### PLAN VIEW




***Note:*** **For cabling information, see 2821 in *IBM System/370 Installation Manual—Physical Planning.***



### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | 67-1/8* | 31-3/4* | 53-1/2* |
| (cm) | (170*) | (81*) | (136*) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | 36 | 36 | 48 | 42 |
| (cm) | (91) | (91) | (122) | (107) |

**Weight:** 1,600 lb (730 kg)

**Heat Output:** 3,800 BTU/hr (960 kcal/hr)

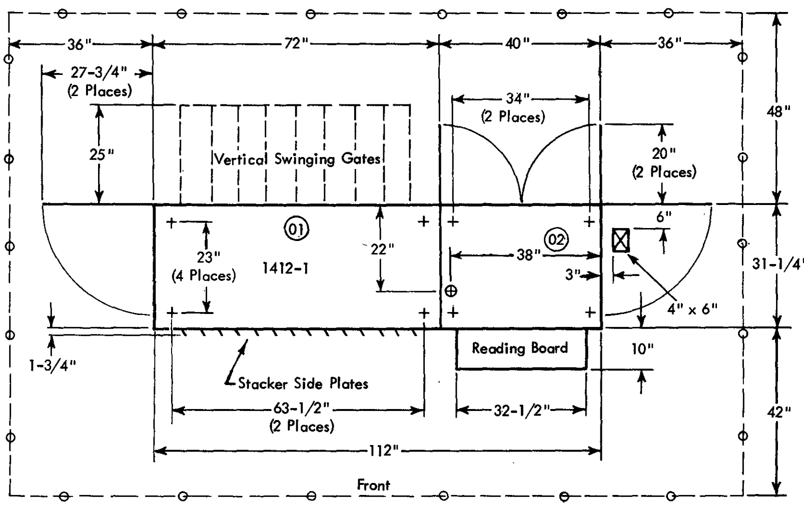
**Airflow:** 280 cfm (8 $m^3$/min)

**Power Requirements:** **
kVA 1.5

**Notes:**
* *Front Forms Cart:* 18-1/4" x 25" x 21-1/4" (46 cm x 64 cm x 54 cm).
*Rear Forms Cart:* 24-1/2" x 23" x 21-1/4" (62 cm x 58 cm x 54 cm).
*Maximum Forms Cart Projection:* front 5" (13 cm) and rear 9" (23 cm).
** Powered from 2821-4.

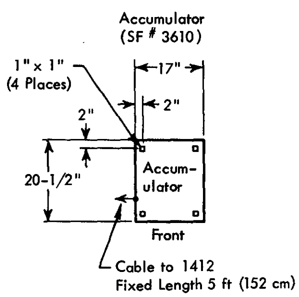
## 1412 MAGNETIC CHARACTER READER MODEL 1

## PLAN VIEW

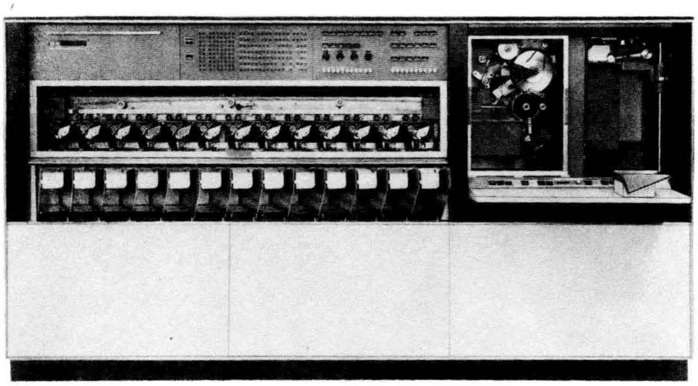


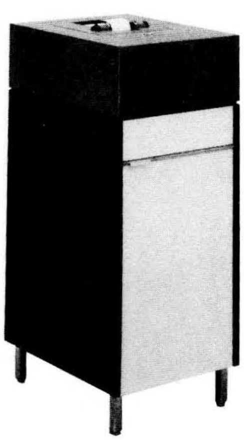

| Frame | Weight | |
|---|---|---|
| | lb | kg |
| 01 | 1,600 | 730 |
| 02*** | 875 | 400 |

*Note:* For cabling information, see Section 4, "Units with Integral or Abutted Controls."



## 1412 MAGNETIC CHARACTER READER MODEL 1





Accumulator (SF #3610)

### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| *Reader-Sorter** | | | |
| Inches | 112 | 41-1/4** | 60-1/4 |
| (cm) | (284) | (105**) | (153) |
| *Accumulator* | | | |
| Inches | 17 | 20-1/2 | 38-1/2 |
| (cm) | (43) | (52) | (98) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| *Reader-Sorter* | | | | |
| Inches | 42 | 48 | 36 | 36 |
| (cm) | (107) | (122) | (91) | (91) |

*Accumulator*

None required, except provide for operator access at front.

**Weight:**

*Reader-Sorter*

2,475 lb *** (1.150 kg***)

*Accumulator*

105 lb (48 kg)

**Heat Output:** 8,100 BTU/hr*** (2.050 kcal/hr***)

**Airflow:** 320 cfm*** (10 $m^3$/min***)

**Power Requirements:*****

| | |
|---|---|
| kVA | 3.39 |
| Phases | 1 |
| Plug | R&S, FS3750 |
| Connector | R&S, FS3933 |
| Receptacle | R&S, FS3753 |

Accumulator is powered from 1412.

Power Cord Style D1

**Environment Operating:**

| | |
|---|---|
| Temperature | $65^{\circ}$-$80^{\circ}$F ($18^{\circ}$-$27^{\circ}$C) |
| Rel Humidity | 20%-65% |

**Notes:**

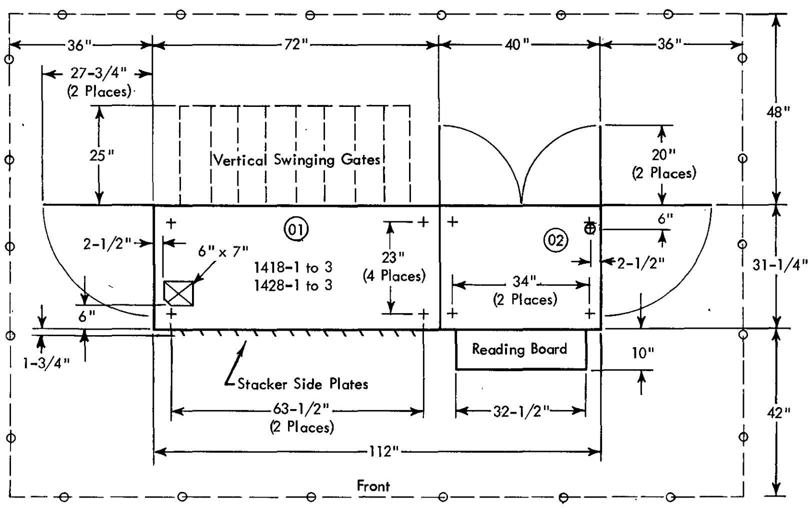
* Machine is shipped in two sections.

** Dimension includes 10" (25 cm) for reading board projection.

*** For endorser unit, add 0.6 kVA, 1,400 BTU/hr (360 kcal/hr), 110 cfm (4 $m^3$/min), and 75 lb (35 kg).

## 1418 OPTICAL CHARACTER READER MODELS 1 TO 3
## 1428 ALPHAMERIC OPTICAL READER MODELS 1 TO 3

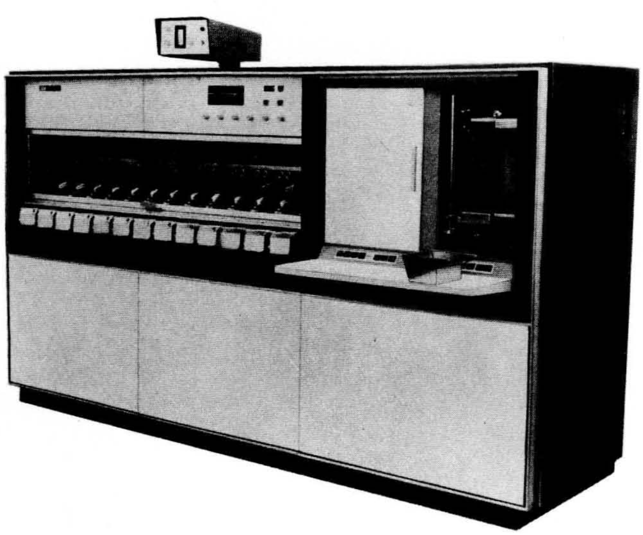
### PLAN VIEW




*Note:* For cabling information, see Section 4, "Units with Integral or Abutted Controls."

| | Weight lb (kg) | | | |
|---|---|---|---|---|
| | Models 1 and 3 | | Model 2 | |
| Frame | 1418 | 1428 | 1418 | 1428 |
| 01 | 1,680 (770) | 1,780 (810) | 1,730 (790) | 1,830 (840) |
| 02 | 970 (440) | 970 (440) | 970 (440) | 970 (440) |

**1418 OPTICAL CHARACTER READER MODELS 1 TO 3**
**1428 ALPHAMERIC OPTICAL READER MODELS 1 TO 3**



1418

## SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | 112* | 41-1/4** | 60-1/4*** |
| (cm) | (284*) | (105**) | (153***) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | 42 | 48 | 36 | 36 |
| (cm) | (107) | (122) | (91) | (91) |

| **Weight:** | *1418 Models 1, 3* | *1428 Models 1, 3* | *1418 Model 2* | *1428 Model 2* |
|---|---|---|---|---|
| lb | 2,650 | 2,750 | 2,700 | 2,800 |
| (kg) | (1.250) | (1.250) | (1.250) | (1.300) |

**Heat Output:** 10,500 BTU/hr (2.650 kcal/hr)

**Airflow:** 575 cfm (17 $m^3$/min)

**Power Requirements:**

| | |
|---|---|
| kVA | 4.6 |
| Phases | 3 |
| Plug | R&S, FS3760 |
| Connector | R&S, FS3934 |
| Receptacle | R&S, FS3754 |
| Power Cord Style | D1 |

**Environment Operating:**

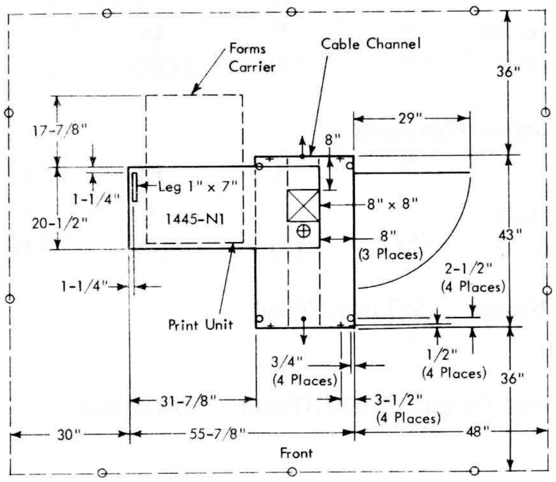
| | |
|---|---|
| Temperature | $65^{o}$-$80^{o}$F ($18^{o}$-$27^{o}$C) |
| Rel Humidity | 20%-65% |

**Notes:**

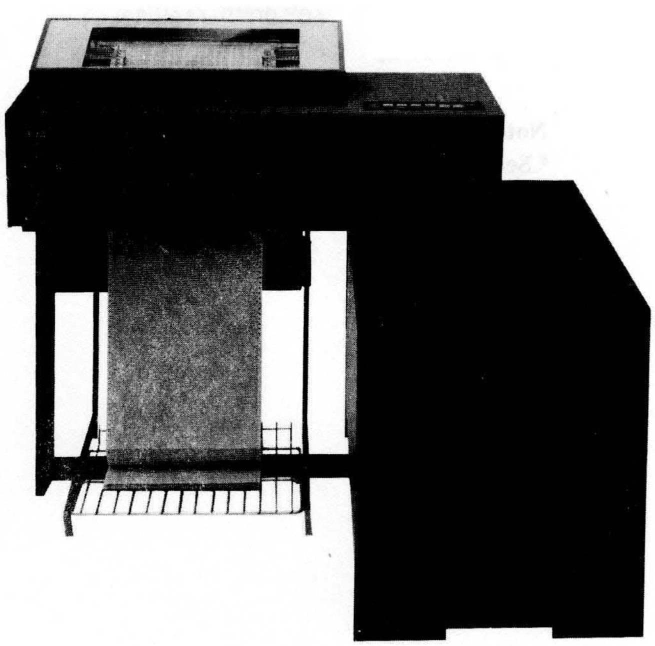
* Machine is shipped in two sections.
** Dimension includes 10" (25 cm) for reading board projection.
*** Add 7-3/8" (19 cm) to height for CRT on the 1418.

## 1445 PRINTER MODEL N1

### PLAN VIEW




*Note:* For cabling information, see Section 4, "Units with Integral or Abutted Controls."



### SPECIFICATIONS

**Dimensions:***

| | F | S | H |
|---|---|---|---|
| Inches | 55-7/8 | 43 | 46 |
| (cm) | (142) | (109) | (117) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | 36 | 36 | 48 | 30 |
| (cm) | (91) | (91) | (122) | (76) |

**Weight:** 825 lb (380 kg)

**Heat Output:** 3,200 BTU/hr (810 kcal/hr)

**Airflow:** 50 cfm (2 $m^3$/min)

**Power Requirements:**

| | |
|---|---|
| kVA | 1.1 |
| Phases | 1 |
| Plug | R&S, FS3720 |
| Connector | R&S, FS3913 |
| Receptacle | R&S, FS3743 |
| Power Cord Style | A1 |

**Environment Operating:**

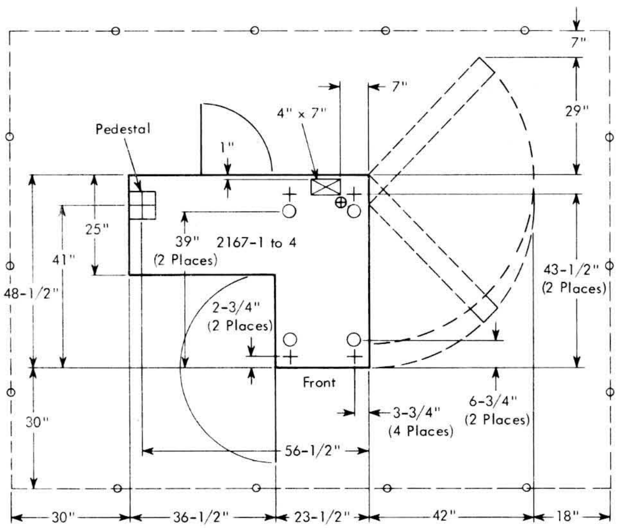
Temperature $60^o$-$90^o$F ($16^o$-$32^o$C)
Rel Humidity 10%-80%

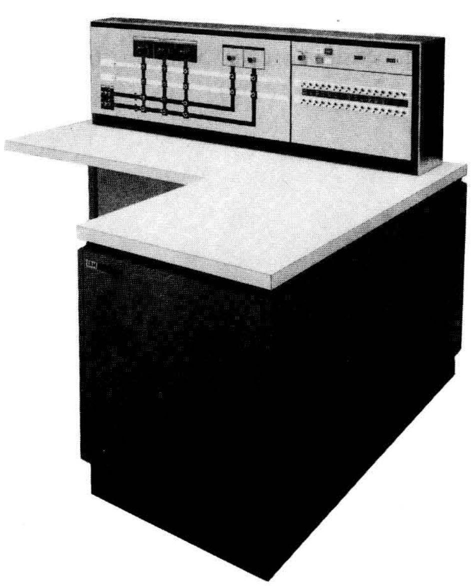
Notes:

* Shipping dimensions are 49" x 25" x 50" (124 cm x 64 cm x 127 cm).

## 2167 CONFIGURATION UNIT MODELS 1 TO 4

### PLAN VIEW



### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | * | * | 46 |
| (cm) | (*) | (*) | (117) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | * | * | * | * |
| (cm) | (*) | (*) | (*) | (*) |

**Weight:** 583 lb (270 kg)

**Heat Output:** 2,000 BTU/hr (510 kcal/hr)

**Airflow:** 500 cfm (15 $m^3$/min)

**Power Requirements:**

| | |
|---|---|
| kVA | 0.65 |
| Phases | 1 |
| Plug | R&S, FS3720 |
| Connector | R&S, FS3913 |
| Receptacle | R&S, FS3743 |
| Power Cord Style | A2 |

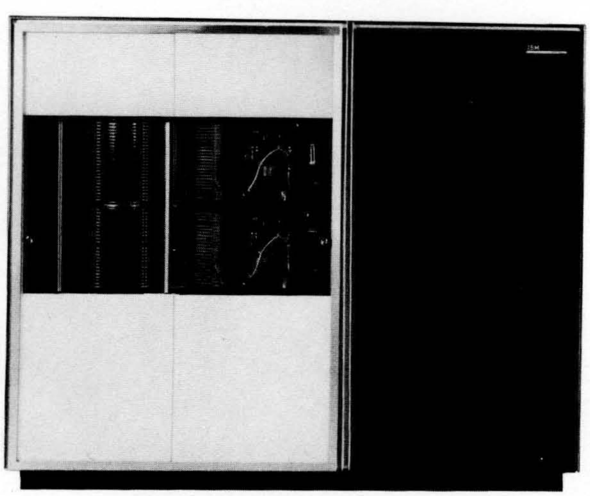
**Environment Operating:**

| | |
|---|---|
| Temperature | $60^{\circ}$-$90^{\circ}$F ($16^{\circ}$-$32^{\circ}$C) |
| Rel Humidity | 8%-80% |

**Notes:**

* See plan view.

## 2302 DISK STORAGE MODELS 3 AND 4



### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | 85-1/2* | 33 | 68-3/4 |
| (cm) | (217*) | (84) | (175) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | 60 | 60 | 60 | 60 |
| (cm) | (152) | (152) | (152) | (152) |

| | *Model 3* | *Model 4* |
|---|---|---|
| **Weight:** | | |
| lb | 4,025 | 4,425 |
| (kg) | (1.850) | (2.050) |
| **Heat Output:** | | |
| BTU/hr | 20,000 | 28,000 |
| (kcal/hr) | (5.050) | (7.100) |
| **Airflow:** | | |
| cfm | 2,210 | 2,210 |
| ($m^3$/min) | (63) | (63) |
| **Power Requirements:** | | |
| kVA | 9.0 | 12.6 |
| Phases | 3 | 3 |
| Plug | R&S, SC7328 | |
| Connector | R&S, SC7428 | |
| Receptacle | R&S, SC7324 | |
| Power Cord Style | E– | |

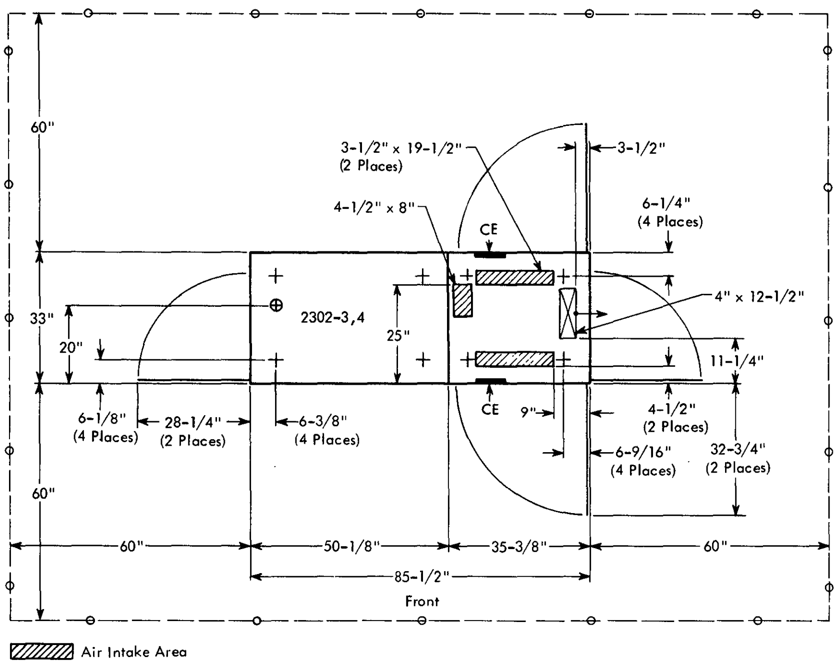
**Environment Operating:**

| | |
|---|---|
| Temperature | $65^{o}$-$90^{o}$F ($18^{o}$-$32^{o}$C) |
| Rel Humidity | 10%-80% |
| Max Wet Bulb | $78^{o}$F ($26^{o}$C) |

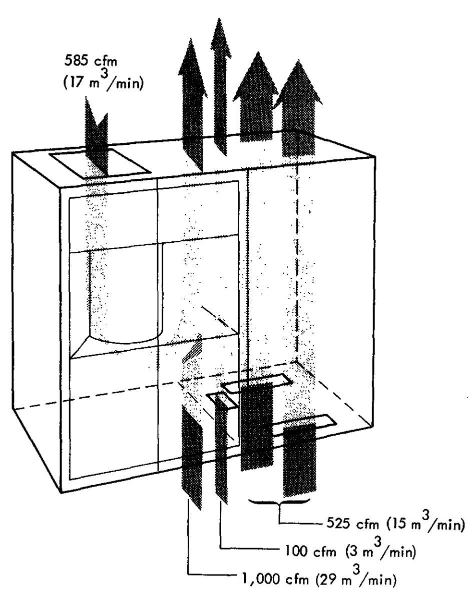
**Notes:**
* Machine is shipped in two sections.

## 2302 DISK STORAGE MODELS 3 AND 4

### PLAN VIEW

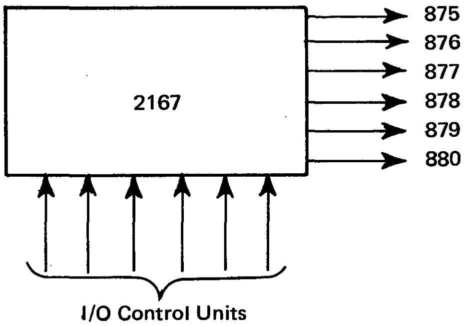



*Note:* For cabling information, see 2841 in *IBM System/370 Installation Manual—Physical Planning.*




Airflow

## 2167 CONFIGURATION UNIT CABLING SCHEMATIC

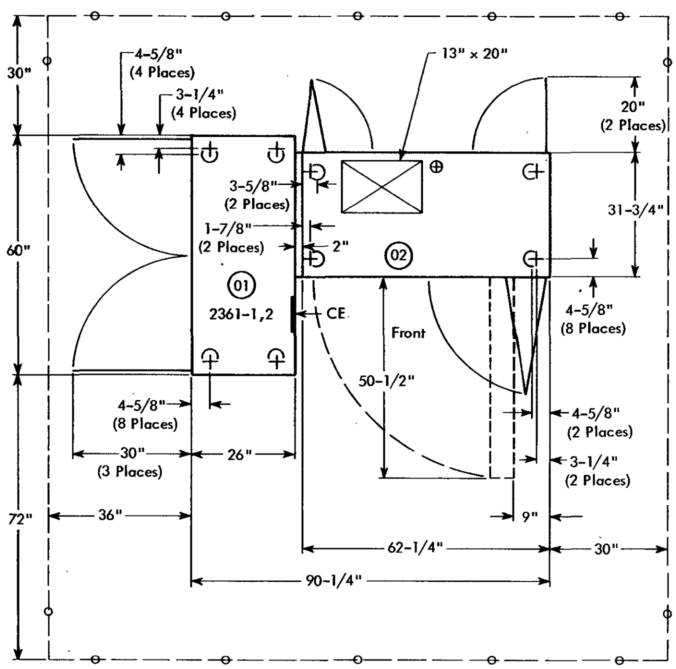



| Group No. | No. of Cables | From | To | Max Length (ft) | Notes |
|---|---|---|---|---|---|
| 875 | 4 | 2167 | 2067 | 75 | 1, 6 |
| 876 | 1 | 2167 | 2365-12 | 75 | 2 |
| 877 | 1 | 2167 | SF #5518 in SF #3846 | 75 | 3 |
| 878 | 1 | 2167 | 2846 | 75 | 4 |
| 879 | 1 | 2167 | 2067 | 75 | 5 |
| 880 | 3 | 2167 | 2067 | 75 | 6 |

*Notes:*
1. One required to each 2067 when 2167 is used.
2. One required to each 2365 Model 12 when 2167 is used.
3. One required for each 2167 (EPO).
4. One required to each 2846 for up to four 2365 Model 12s. Two required to each 2846 for five or more 2365 Model 12s.
5. One required to 2067 (without SF #5518), EPO.
6. For systems with more than four 2365s, add one group 880 to each 2067.

## 2361 CORE STORAGE MODELS 1 AND 2

### PLAN VIEW




***Note:*** For cabling information, see host CPU.

| Frame | Weight | | Airflow | | Heat Output | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | BTU/hr | | kcal/hr | |
| | lb | kg | cfm | $m^3/min$ | Model 1 | Model 2 | Model 1 | Model 2 |
| 01<br>02 | 625<br>1,500 | 290<br>690 | 275<br>930 | 8<br>27 | 2,750<br>8,250 | 4,200<br>13,200 | 700<br>2.100 | 1.100<br>3.350 |

### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | 90-1/4 | 31-3/4 | 70-1/2 |
| (cm) | (229) | (81) | (179) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | 72 | 30 | 30 | 36 |
| (cm) | (183) | (76) | (76) | (91) |

**Weight:** 2,125 lb (970 kg)

| **Heat Output:** | *Model 1* | *Model 2* |
|---|---|---|
| BTU/hr | 11,000 | 17,400 |
| (kcal/hr) | (2.800) | (4.400) |

**Airflow:**

| | | |
|---|---|---|
| cfm | 1,205 | 1,205 |
| ($m^3$/min) | (35) | (35) |

**Power Requirements:**

| | | |
|---|---|---|
| kVA | 4.5 | 7.0 |
| Phases | 3 | 3 |
| Plug | R&S, SC7328 | |
| Connector | R&S, SC7428 | |
| Receptacle | R&S, SC7324 | |
| Power Cord Style | E3 | |

**Environment Operating:**

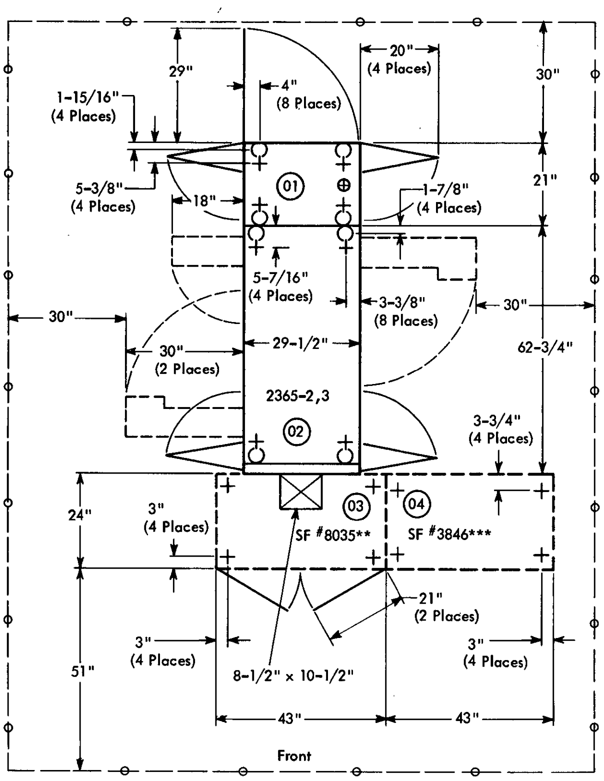
- Temperature $60^{o}$-$90^{o}$F ($16^{o}$-$32^{o}$C)
- Rel Humidity 8%-80%
- Max Wet Bulb $78^{o}$F ($26^{o}$C)

**Environment Nonoperating:**

- Temperature $50^{o}$-$110^{o}$F ($10^{o}$-$43^{o}$C)
- Rel Humidity 8%-80%
- Max Wet Bulb $78^{o}$F ($26^{o}$C)

## 2365 PROCESSOR STORAGE MODELS 2 AND 3

### PLAN VIEW




*Note:* For cabling information, see host CPU.

| Frame | Weight lb | Weight kg |
|---|---|---|
| 01 | 870 | 400 |
| 02 | 1,200 | 550 |
| 03 | 430 | 200 |
| 04 | 220 | 100 |

### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | * | * | 72-1/2 |
| (cm) | (*) | (*) | (184) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | * | * | * | * |
| (cm) | (*) | (*) | (*) | (*) |

**Weight:** 2,720 lb (1.250 kg)

**Heat Output:** 25,300 BTU/hr (6.400 kcal/hr)

**Airflow:** 1,495 cfm (43 $m^3$/min)

**Power Requirements:**

| | |
|---|---|
| kVA | 7.4 |
| Phases | 3 |
| Plug | R&S, SC7328 |
| Connector | R&S, SC7428 |
| Receptacle | R&S, SC7324 |
| Power Cord Style | E3 |

**Environment Operating:**

| | |
|---|---|
| Temperature | $60^o$-$90^o$F ($16^o$-$32^o$C) |
| Rel Humidity | 8%-80% |
| Max Wet Bulb | $78^o$F ($26^o$C) |

Notes:

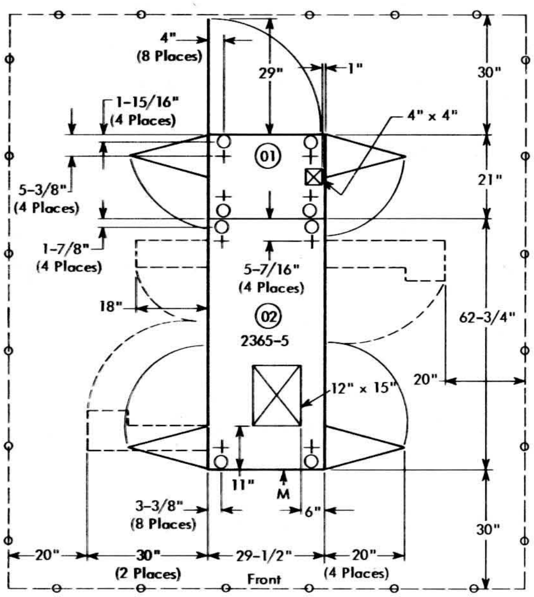
* See plan view. Dimensions are for frame size; add 1-3/8" (4 cm) for each cover.

** SF # 8035 is required with each 2365 Model 2 in a Model 67 system.

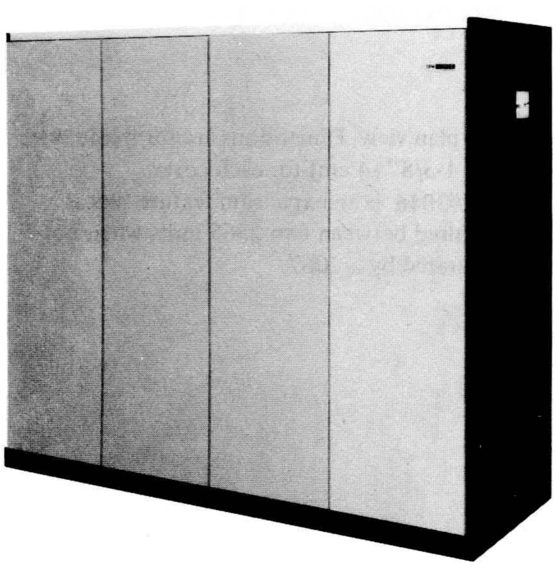
*** SF # 3846 is an expansion feature that is required between two 2365 units when not separated by a 2067.

## 2365 PROCESSOR STORAGE MODEL 5

### PLAN VIEW




*Note:* For cabling information, see host CPU.



### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | 29-1/2 | 83-3/4 | 72-1/2 |
| (cm) | (75) | (213) | (184) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | 30 | 30 | * | * |
| (cm) | (76) | (76) | (*) | (*) |

**Weight:** 2,500 lb (1.150 kg)

**Heat Output:** 15,000 BTU/hr (3.800 kcal/hr)

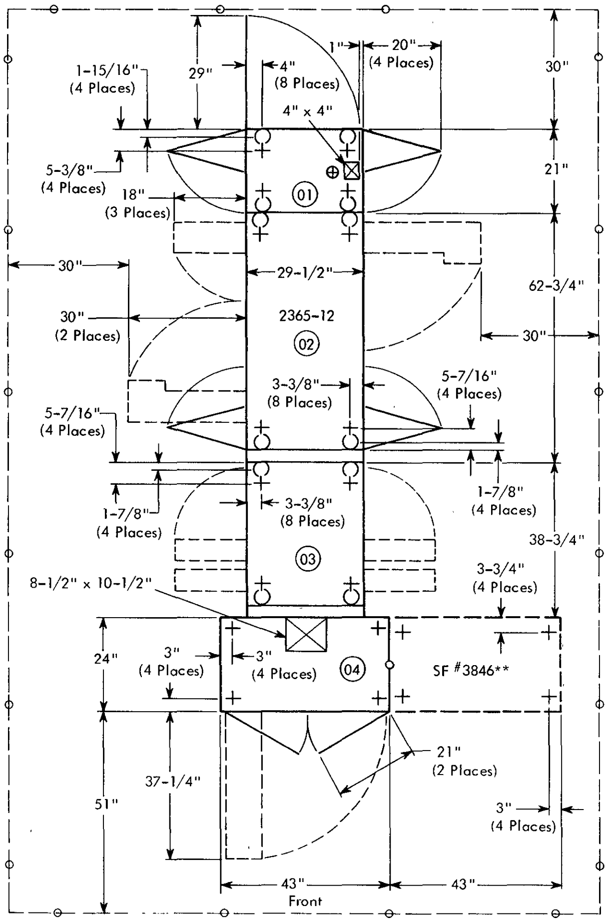
**Airflow:** 750 cfm (22 $m^3$/min)

**Power Requirements:** **
kVA 4.0

**Notes:**
* See plan view.
** Powered from PDU (2085 frame 14).

## 2365 PROCESSOR STORAGE MODEL 12

### PLAN VIEW




*Note:* For cabling information, see host CPU.

| Frame | Weight lb | Weight kg |
|---|---|---|
| 01 | 870 | 400 |
| 02 | 1,200 | 550 |
| 03 | 800 | 370 |
| 04 | 430 | 200 |

### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | * | * | 72-1/2 |
| (cm) | (*) | (*) | (184) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | * | * | * | * |
| (cm) | (*) | (*) | (*) | (*) |

**Weight:** 3,300 lb (1.500 kg)

**Heat Output:** 29,000 BTU/hr (7.350 kcal/hr)

**Airflow:** 2,345 cfm (67 $m^3$/min)

**Power Requirements:**

| | |
|---|---|
| kVA | 8.5 |
| Phases | 3 |
| Plug | R&S, SC7328 |
| Connector | R&S, SC7428 |
| Receptacle | R&S, SC7324 |
| Power Cord Style | E3 |

**Environment Operating:**

| | |
|---|---|
| Temperature | 60°-90°F (16°-32°C) |
| Rel Humidity | 8%-80% |
| Max Wet Bulb | 78°F (26°C) |

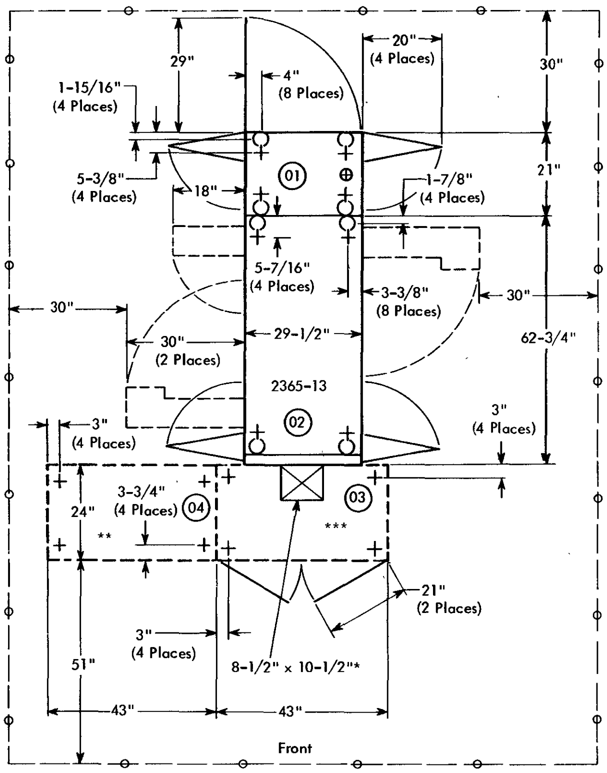
**Notes:**

* See plan view. Dimensions are for frame size; add 1-3/8" (4 cm) for each cover.

** SF #3846 is an expansion feature that is required between two 2365 units when not separated by a 2067.

## 2365 PROCESSOR STORAGE MODEL 13

### PLAN VIEW




*Note:* For cabling information, see host CPU.

| Frame | Weight | |
|---|---|---|
| | lb | kg |
| 01 | 870 | 400 |
| 02 | 1,200 | 550 |
| 03 | 430 | 200 |
| 04 | 220 | 100 |

### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | † | † | 72-1/2 |
| (cm) | (†) | (†) | (184) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | † | † | † | † |
| (cm) | (†) | (†) | (†) | (†) |

**Weight:** 2,720 lb (1.250 kg)

**Heat Output:** 25,300 BTU/hr (6.400 kcal/hr)

**Airflow:** 1,495 cfm (43 $m^3$/min)

**Power Requirements:**

| | |
|---|---|
| kVA | 7.4 |
| Phases | 3 |
| Plug | R&S, SC7328 |
| Connector | R&S, SC7428 |
| Receptacle | R&S, SC7324 |
| Power Cord Style | E3 |

**Environment Operating:**

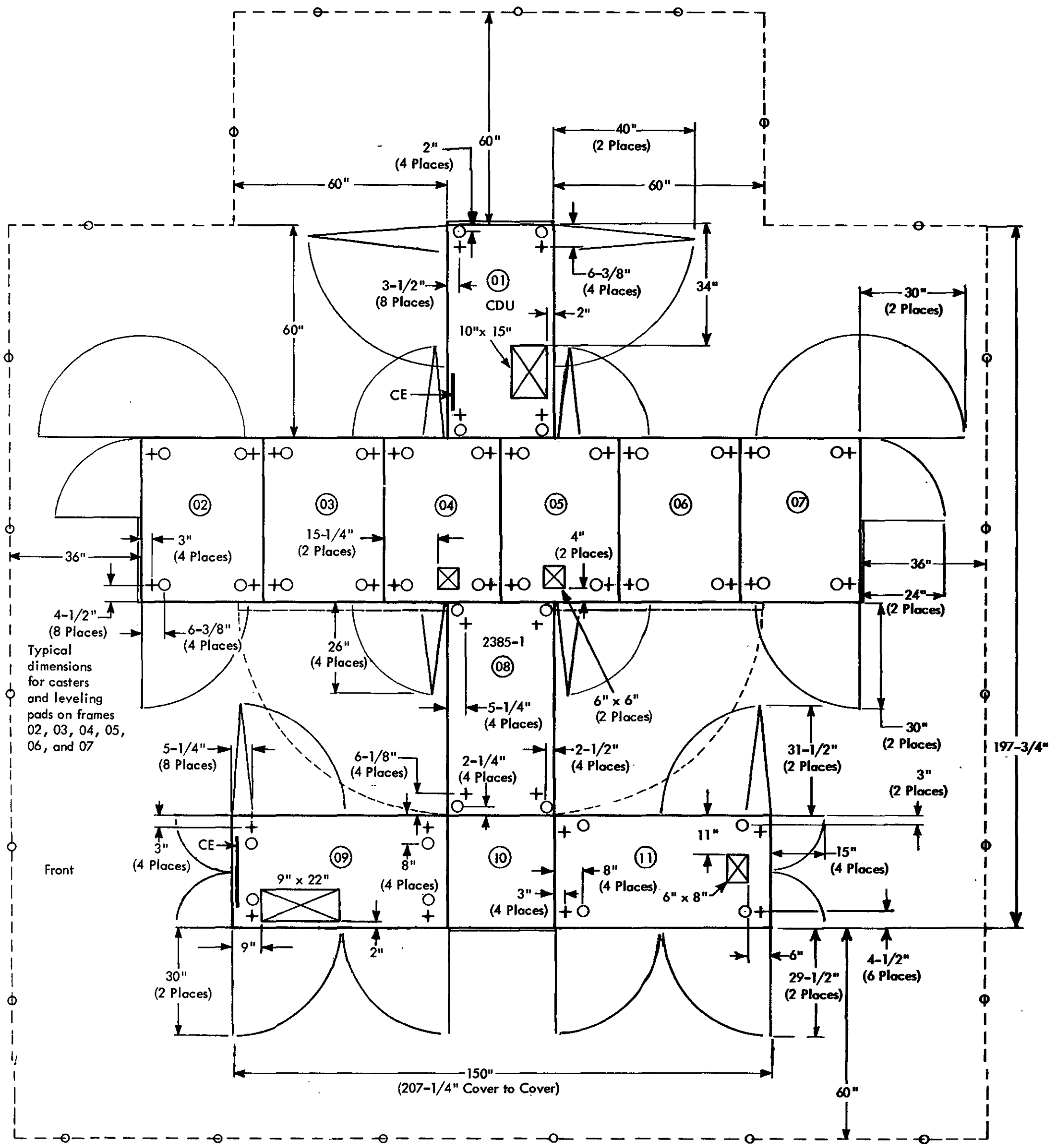
| | |
|---|---|
| Temperature | $60^o$-$90^o$F ($16^o$-$32^o$C) |
| Rel Humidity | 8%-80% |
| Max Wet Bulb | $78^o$F ($26^o$C) |

**Notes:**

* See Model 65 Multiprocessing Unit cabling schematic for required usage.
** Required only for 2365 #6, #7, and #8.
*** Required only for 2365 #5 through #8.
† See plan view. Dimensions are for frame size; add 1-3/8" (4 cm) for each cover.

## 2385 PROCESSOR STORAGE MODEL 1

## PLAN VIEW (Not 1/4" = 1' Scale)



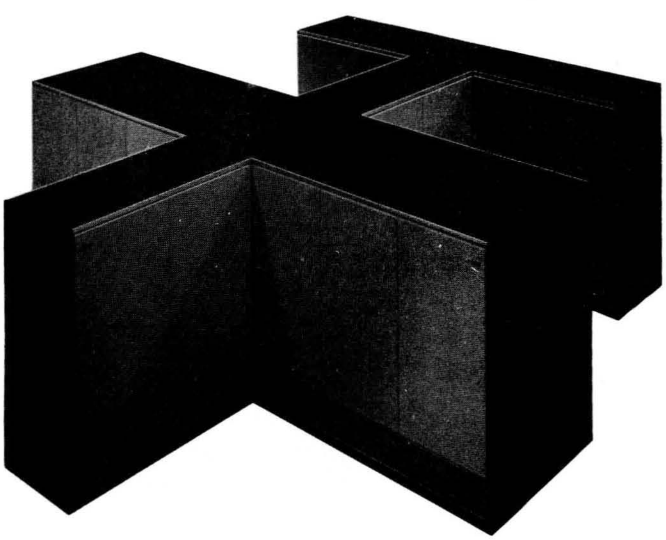

| Frame | Size (With Covers) | |
|---|---|---|
| | Inches | Centimeters |
| 02, 03, 04, 05, 06, 07 | 34 x 46 | 86 x 117 |
| 01, 08, 09, 11 | 30 x 60 | 76 x 152 |

*Note:* For cabling information, see host CPU.

## 2385 PROCESSOR STORAGE MODEL 1

### Details (By Frame)

| Frame | *Weight lb (kg)* | *Airflow cfm ($m^3$/min)* | *BTU/hr (kcal/hr)* | |
|---|---|---|---|---|
| | | | *To Air* | *To Water* |
| 01 | 1,819 (830) | – | 3,500 (890) | – |
| 02* | 1,888 (860) | 1,400 (40) | 12,500 (3.200) | 10,000 (2.550) |
| 03* | 1,679 (770) | 1,400 (40) | 12,500 (3.200) | 10,000 (2.550) |
| 04* | 1,881 (860) | 280 (8) | 12,500 (3.200) | 0 (0) |
| 05* | 1,881 (860) | 280 (8) | 12,500 (3.200) | 0 (0) |
| 06* | 1,679 (770) | 1,400 (40) | 12,500 (3.200) | 10,000 (2.550) |
| 07* | 1,888 (860) | 1,400 (40) | 12,500 (3.200) | 10,000 (2.550) |
| 08 | 1,581 (720) | 820 (24) | 6,400 (1.650) | 22,300 (5.650) |
| 09 | 1,246 (570) | 450 (13) | 1,640 (420) | 4,750 (1.200) |
| 10 | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| 11 | 1,679 (770) | 240 (7) | 1,210 (310) | 5,050 (1.300) |



### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | ** | ** | 78 |
| (cm) | (**) | (**) | (198) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | ** | ** | ** | ** |
| (cm) | (**) | (**) | (**) | (**) |

**Weight:** See Details (By Frame)

**Heat Output:**
Air 87,750 BTU/hr (22.150 kcal/hr)
Water 72,100 BTU/hr (18.200 kcal/hr)

**Airflow:** 7,670 cfm (220 $m^3$/min)

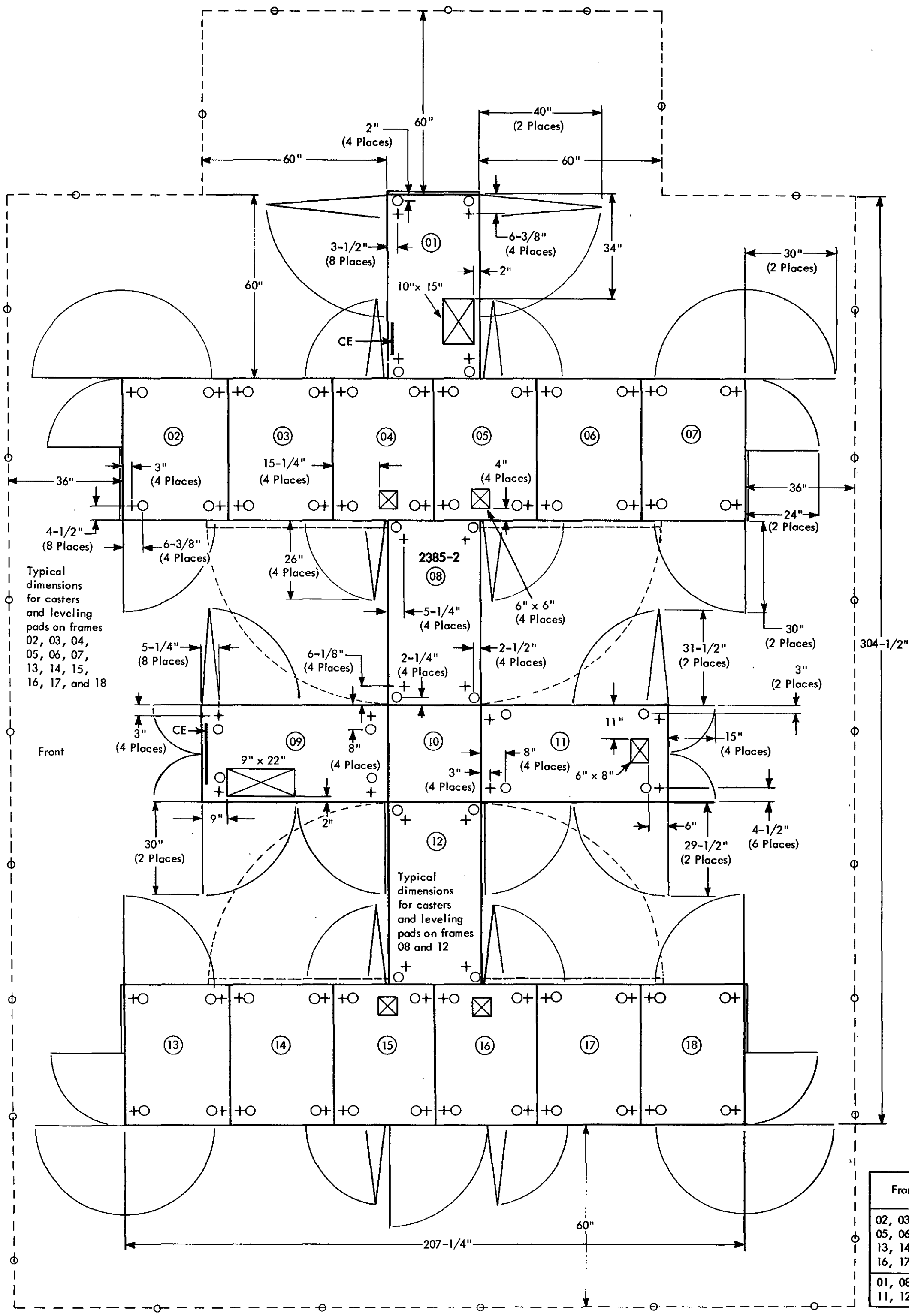
**Power Requirements:**
The 2385 Model 1 receives 50/60-Hz and 415/441-Hz power from the PDU (2085 frame 14).

**Environment Operating:**
Temperature 65°-80°F (18°-27°C)
Rel Humidity 20%-80%
Max Wet Bulb 73°F (23°C)***

**Notes:**
* The 34" x 46" (86 cm x 117 cm) frames *cannot* be reduced to 29-1/2" (75 cm) for shipping.
** See plan view.
*** See "Liquid Coolant System" in Appendix A.

## 2385 PROCESSOR STORAGE MODEL 2

### PLAN VIEW (Not 1/4" = 1' Scale)




| Frame | Size (With Covers) | |
|---|---|---|
| | Inches | Centimeters |
| 02, 03, 04, 05, 06, 07, 13, 14, 15, 16, 17, 18 | 34 x 46 | 86 x 117 |
| 01, 08, 09, 11, 12 | 30 x 60 | 76 x 152 |

***Note:*** For cabling information, see host CPU.

## 2385 PROCESSOR STORAGE MODEL 2

### Details (By Frame)

| *Frame* | *Weight lb (kg)* | *Airflow cfm ($m^3$/min)* | *BTU/hr (kcal/hr) To Air* | *To Water* |
|---|---|---|---|---|
| 01 | 1,819 (830) | – | 3,500 (890) | – |
| 02* | 1,888 (860) | 1,400 (40) | 12,500 (3.200) | 10,000 (2.550) |
| 03* | 1,679 (770) | 1,400 (40) | 12,500 (3.200) | 10,000 (2.550) |
| 04* | 1,881 (860) | 280 (8) | 12,500 (3.200) | 0 (0) |
| 05* | 1,881 (860) | 280 (8) | 12,500 (3.200) | 0 (0) |
| 06* | 1,679 (770) | 1,400 (40) | 12,500 (3.200) | 10,000 (2.550) |
| 07* | 1,888 (860) | 1,400 (40) | 12,500 (3.200) | 10,000 (2.550) |
| 08 | 1,581 (720) | 820 (24) | 6,400 (1.650) | 22,300 (5.650) |
| 09 | 1,246 (570) | 450 (13) | 3,280 (830) | 9,500 (2.400) |
| 10 | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| 11 | 2,049 (930) | 240 (7) | 2,420 (610) | 10,100 (2.550) |
| 12 | 1,581 (720) | 820 (24) | 6,400 (1.650) | 22,300 (5.650) |
| 13* | 1,888 (860) | 1,400 (40) | 12,500 (3.200) | 10,000 (2.550) |
| 14* | 1,679 (770) | 1,400 (40) | 12,500 (3.200) | 10,000 (2.550) |
| 15* | 1,881 (860) | 280 (8) | 12,500 (3.200) | 0 (0) |
| 16* | 1,881 (860) | 280 (8) | 12,500 (3.200) | 0 (0) |
| 17* | 1,679 (770) | 1,400 (40) | 12,500 (3.200) | 10,000 (2.550) |
| 18* | 1,888 (860) | 1,400 (40) | 12,500 (3.200) | 10,000 (2.550) |

### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | ** | ** | 78 |
| (cm) | (**) | (**) | (198) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | ** | ** | ** | ** |
| (cm) | (**) | (**) | (**) | (**) |

**Weight:** See Details (By Frame)

**Heat Output:**
Air 172,000 BTU/hr (43.350 kcal/hr)
Water 144,200 BTU/hr (36.350 kcal/hr)

**Airflow:** 14,650 cfm (420 $m^3$/min)

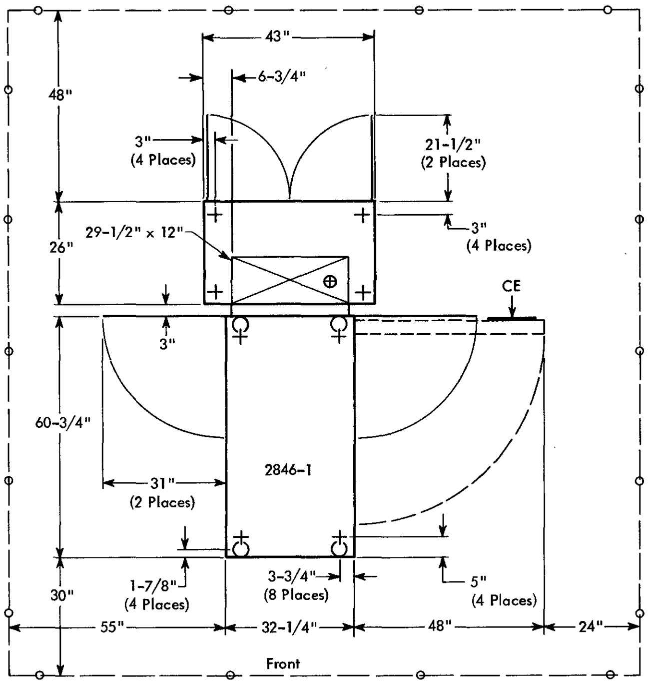
**Power Requirements:**
The 2385 Model 2 receives 50/60-Hz and 415/441-Hz power from the PDU (2085 frame 14).

**Environment Operating:**
Temperature 65°-80°F (18°-27°C)
Rel Humidity 20%-80%
Max Wet Bulb 73°F (23°C)***

**Notes:**
* The 34" x 46" (86 cm x 117 cm) frames *cannot* be reduced to 29-1/2" (75 cm) for shipping.
** See plan view.
*** See "Liquid Coolant System" in Appendix A.

## 2846 CHANNEL CONTROLLER MODEL 1

### PLAN VIEW




*Note:* For cabling information, see host CPU.

### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | * | * | 72-1/2 |
| (cm) | (*) | (*) | (184) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | 30 | 48 | 72 | 55 |
| (cm) | (76) | (122) | (183) | (140) |

**Weight:** 2,000 lb (910 kg)

**Heat Output:** 2,600 BTU/hr (660 kcal/hr)

**Airflow:** 900 cfm (26 $m^3$/min)

**Power Requirements:**

| | |
|---|---|
| kVA | 0.88 |
| Phases | 1 |
| Plug | R&S, FS3720 |
| Connector | R&S, FS3913 |
| Receptacle | R&S, FS3743 |
| Power Cord Style | A2 |

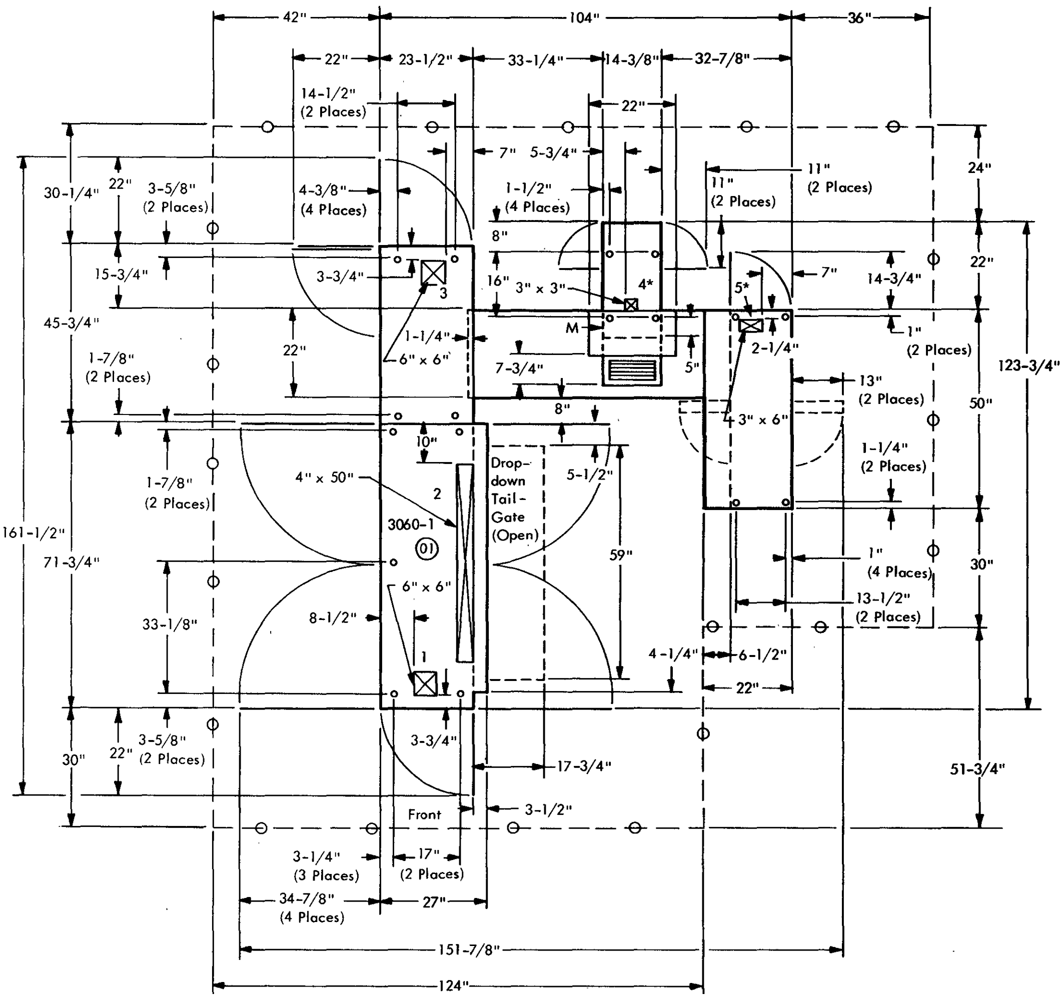
**Environment Operating:**

| | |
|---|---|
| Temperature | $60^{o}$-$90^{o}$F ($16^{o}$-$32^{o}$C) |
| Rel Humidity | 8%-80% |
| Max Wet Bulb | $78^{o}$F ($26^{o}$C) |

**Notes:**
* See plan view.

## 3060 SYSTEM CONSOLE MODEL 1
## FOR SYSTEM/360 MODEL 195

### PLAN VIEW




*Note:* For cabling information, see 3195.

**3060 SYSTEM CONSOLE MODEL 1**
**FOR SYSTEM/360 MODEL 195**

## SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | * | * | 67 |
| (cm) | (*) | (*) | (170) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | 30 | 24 | 36 | 42 |
| (cm) | (76) | (61) | (91) | (107) |

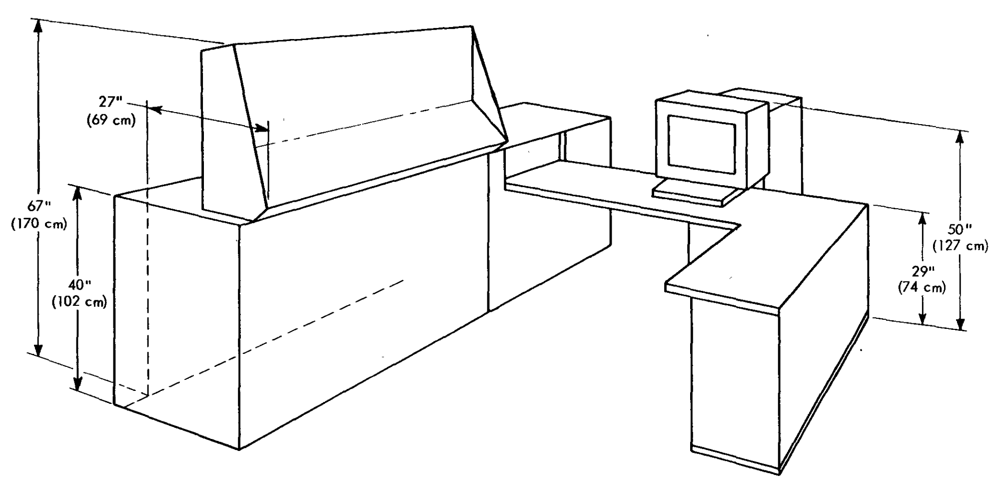
**Weight:** 2,500 lb (1.150 kg)

**Heat Output:** 14,000 BTU/hr (3.550 kcal/hr)

**Airflow:** 1,100 cfm (32 $m^3$/min)

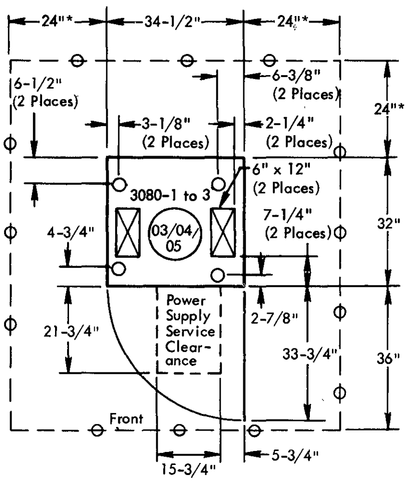
**Power Requirements:**
The 3060 (frame 01) receives power from the 3085 PDU (frame 09).

**Notes:**
* See plan view.



## 3080 POWER UNIT MODELS 1 TO 3 FOR SYSTEM/360 MODEL 195

### PLAN VIEW




*Note:* For cabling information, see 3195.

### SPECIFICATIONS

**Dimensions: (All Models)**

| | F | S | H |
|---|---|---|---|
| Inches | 34-1/2 | 32 | 60 |
| (cm) | (88) | (81) | (152) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | 36 | 24* | 24* | 24* |
| (cm) | (91) | (61*) | (61*) | (61*) |

**Weight:** 1,300 lb (590 kg) per unit

**Heat Output:**

| | *Water* | | |
|---|---|---|---|
| | *Model 1* | *Model 2* | *Model 3* |
| BTU/hr | 20,000 | 14,000 | 19,000 |
| (kcal/hr) | (5.050) | (3.550) | (4.800) |

**Airflow:** 0 cfm (0 $m^3$/min) per unit

**Power Requirements:**
The 3080 (frames 03, 04, and 05) receives power from 3085 PDU (frame 09).

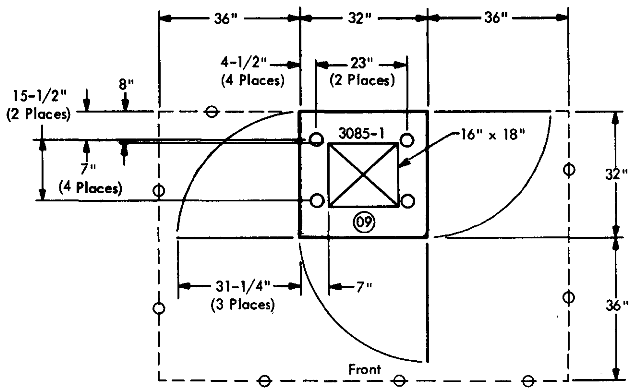
**Notes:**
One 3195 Processing Unit requires one each of 3080 Power Unit Models 1, 2, and 3.

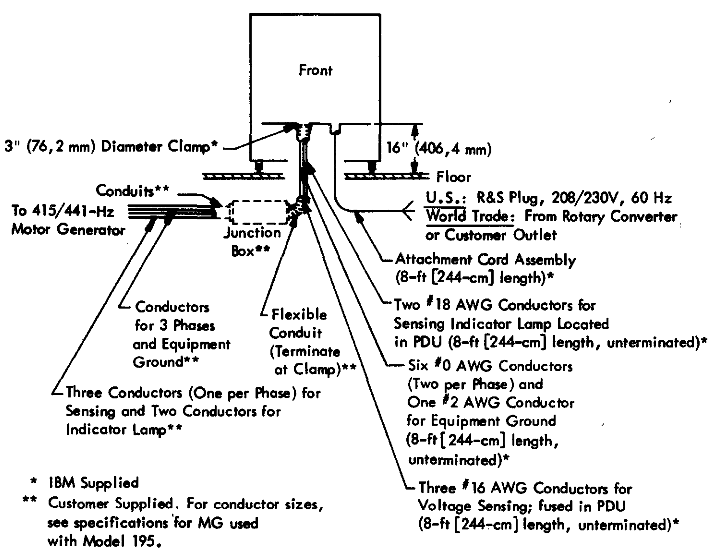
| *3080 Model* | *Frame* | *Supplies Power for Frame* |
|---|---|---|
| 1 | 03 | 06 (Floating Point) |
| 2 | 04 | 08 (Fixed Point and VFL Decimal) |
| 3 | 05 | 10 (I-unit and SCU) |

* No service access required. The 24-inch (61-cm) clearance is shown to assist in distributing machine weight for 75 pounds per square foot (370 kg/$m^2$) floor loading.

## 3085 POWER DISTRIBUTION UNIT (PDU) MODEL 1 FOR SYSTEM/360 MODEL 195

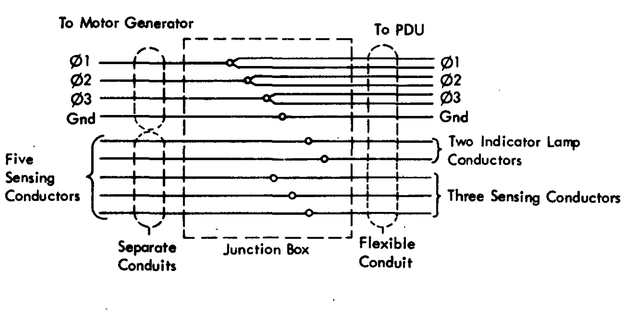
### PLAN VIEW




* IBM Supplied

** Customer Supplied. For conductor sizes, see specifications for MG used with Model 195.




**Junction Box Connection Details**

### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | 32 | 32 | 60 |
| (cm) | (81) | (81) | (152) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | 36 | 0 | 36 | 36 |
| (cm) | (91) | (0) | (91) | (91) |

**Weight:** 1,000 lb (460 kg)

**Heat Output:** Negligible

**Airflow:** 0 cfm (0 m$^3$/min)

**Power Requirements:**
The PDU (frame 09):

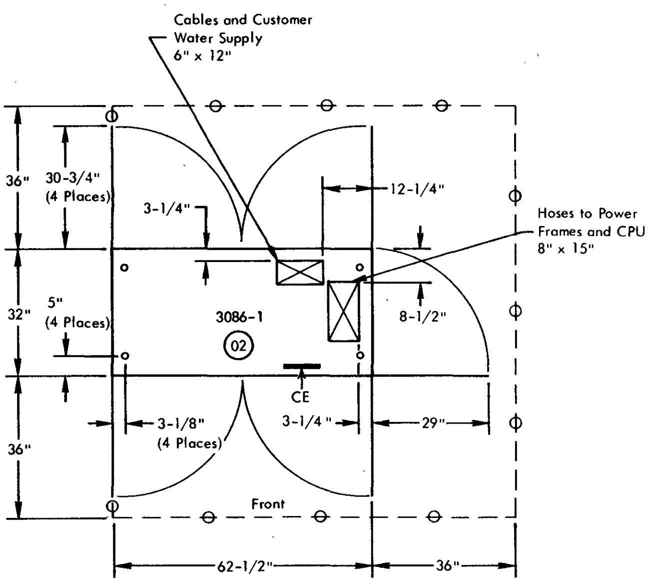
1. Receives 208V, 415/441-Hz power from remote motor generator.
2. *U. S.*
   Requires 208V or 230V, 60-Hz ± 0.5-Hz power from customer power panel:
   For Model J or K, use 60A service.
   For Model KJ or L, use 100A service.
   *World Trade*
   Receives 208V, 60-Hz power from remote rotary converter or customer outlet.

| *Requirements* | *System Model* | |
|---|---|---|
| | *J and K* | *KJ and L* |
| Plug | R&S, SC7328 | R&S, JPS1034H |
| Connector | R&S, SC7428 | R&S, JCS1034H |
| Receptacle | R&S, SC7324 | R&S, JRSR1034H |

| *System Model* | *50/60 Hz* | | *415/441 Hz* | |
|---|---|---|---|---|
| | *kVA* | *A/Phase* | *kVA* | *A/Phase* |
| *J* | 10.4 | 30 | 47.25 | 131 |
| *K* | 16.2 | 45 | 54.25 | 151 |
| *KJ* | 21.6 | 60 | 64.25 | 179 |
| *L* | 27.0 | 75 | 74.25 | 206 |

## 3086 COOLANT DISTRIBUTION UNIT (CDU) MODEL 1 FOR SYSTEM/360 MODEL 195

### PLAN VIEW




### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | 62-1/2 | 32 | 70 |
| (cm) | (159) | (81) | (178) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | 36 | 36 | 36 | 0 |
| (cm) | (91) | (91) | (91) | (0) |

**Weight:** 1,450 lb (660 kg)

**Heat Output:**
- Air 2,800 BTU/hr (710 kcal/hr)
- Water 9,000 BTU/hr (2.300 kcal/hr)

**Airflow:** 0 cfm (0 $m^3$/min)

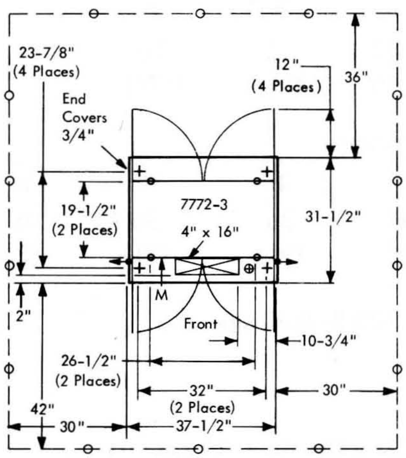
**Environment Operating:**
- Temperature $65^o$-$90^o$F ($18^o$-$32^o$C)
- Rel Humidity 20%-80%
- Max Wet Bulb $72^o$F ($22^o$C)*

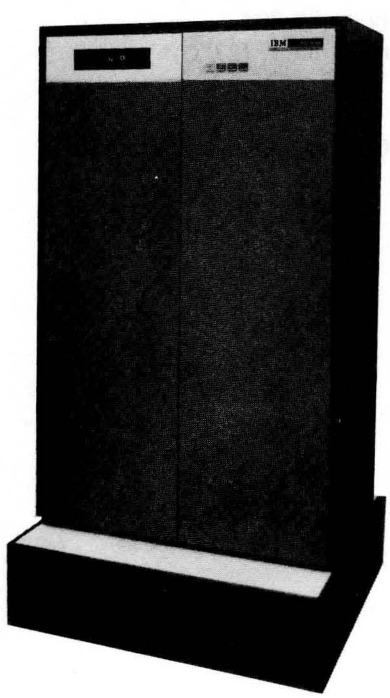
**Environment Nonoperating:**
- Temperature $50^o$-$110^o$F ($10^o$-$43^o$C)
- Rel Humidity 8%-80%
- Max Wet Bulb $80^o$F ($27^o$C)*

**Notes:**
* See "Liquid Coolant System" in Appendix A.

## 7772 AUDIO RESPONSE UNIT MODEL 3

### PLAN VIEW



### SPECIFICATIONS

**Dimensions:**

| | F | S | H |
|---|---|---|---|
| Inches | 37-1/2 | 31-1/2 | 70 |
| (cm) | (95) | (80) | (178) |

**Service Clearances:**

| | F | R | Rt | L |
|---|---|---|---|---|
| Inches | 42 | 36 | 30* | 30* |
| (cm) | (107) | (91) | (76*) | (76*) |

**Weight:** 600 lb (280 kg)

**Heat Output:** 5,100 BTU/hr (1.300 kcal/hr)

**Airflow:** 1,800 cfm (51 $m^3$/min)

**Power Requirements:**

| | |
|---|---|
| kVA | 2.0 |
| Phases | 1 |
| Plug | R&S, FS3720 |
| Connector | R&S, FS3913 |
| Receptacle | R&S, FS3743 |
| Power Cord Style | A3 |

**Environment Operating:**

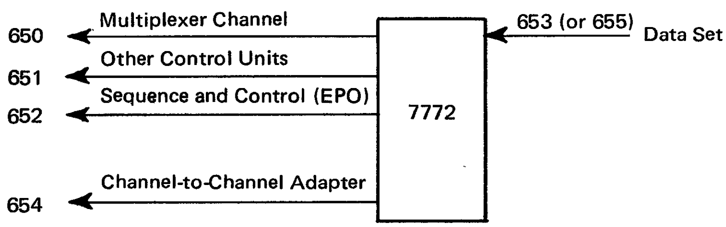
| | |
|---|---|
| Temperature | $60^o$-$90^o$F ($16^o$-$32^o$C) |
| Rel Humidity | 8%-80% |
| Max Wet Bulb | $78^o$F ($26^o$C) |

**Environment Nonoperating:**

| | |
|---|---|
| Temperature | $50^o$-$110^o$F ($10^o$-$43^o$C) |
| Rel Humidity | 0%-90% |
| Max Wet Bulb | $80^o$F ($27^o$C) |

**Notes:**
* When not abutted to another similar module.

## 7772 AUDIO RESPONSE UNIT CABLING SCHEMATIC

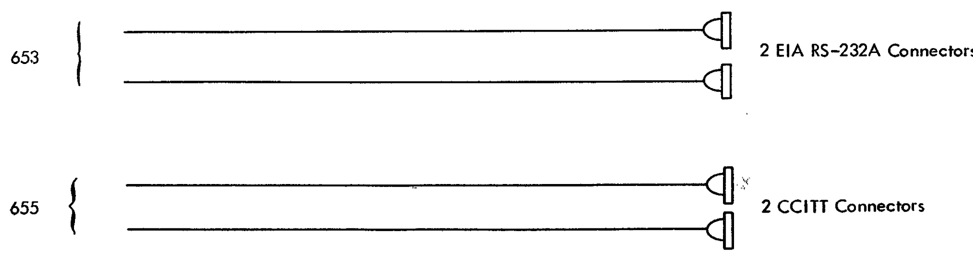



| *Group No.* | *No. of Cables* | *From* | *To* | *Max Length (ft)* | *Notes* |
|---|---|---|---|---|---|
| 650 | 2 | 7772 | Multiplexer Channel | – | 1 |
| 651 | 2 | 7772 | Control Unit | – | 1 |
| 652 | 1 | 7772 | Channel | 100 | 2 |
| 653 (or 655) | 2 | Data Set | 7772 | 40 | 4, 5, 6 |
| 654 | 2 | 7772 | Channel-to-Channel Adapter | – | 1, 3 |

*Notes:*

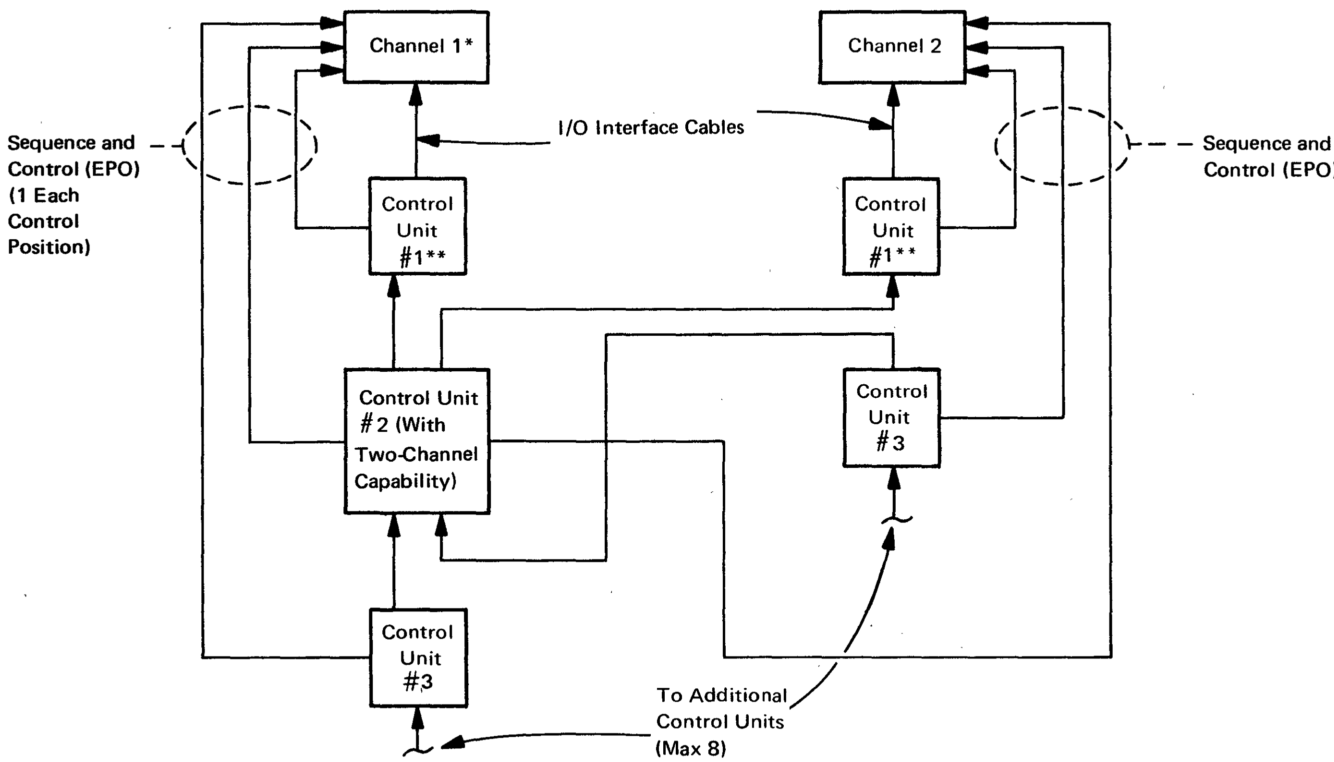
1. Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) available to attach up to eight control units.
2. Sequence and control (EPO).
3. To channel-to-channel adapter (SF #1850).
4. One group for each pair of data sets.
5. See "Cables from Non-IBM Devices" for cable specifications.
6. For 50-Hz machines, use group number in parentheses.

### Cables from Non-IBM Devices



## GENERAL CONTROL-TO-CHANNEL CABLING

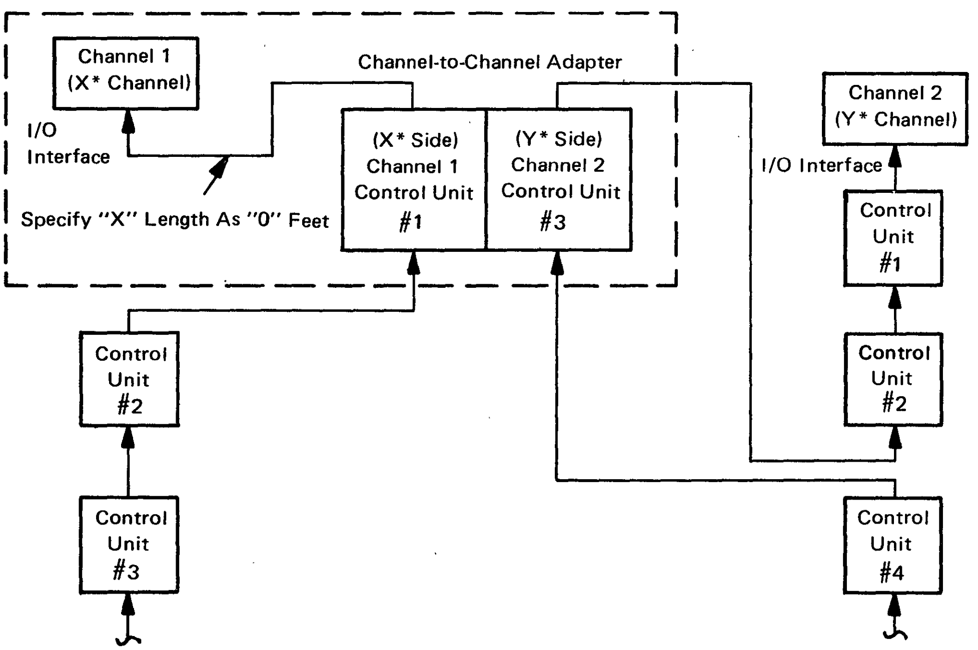
Generally, the cable available to connect up to eight control units to a channel is limited to 200 feet (100 feet for System/360 Models 22, 25, and 30). Exceptions to this are noted on the cabling schematics for the individual control units. All control units are connected to the channels serially. All channels exceeding 100 feet must be reviewed and approved by the Installation Planning representative.




*The channel may be a separate unit (such as the IBM 2860) or integral to the system processing unit.
**Units with two-byte interface feature must be installed first on the channel.

## CHANNEL-TO-CHANNEL ADAPTER CABLING

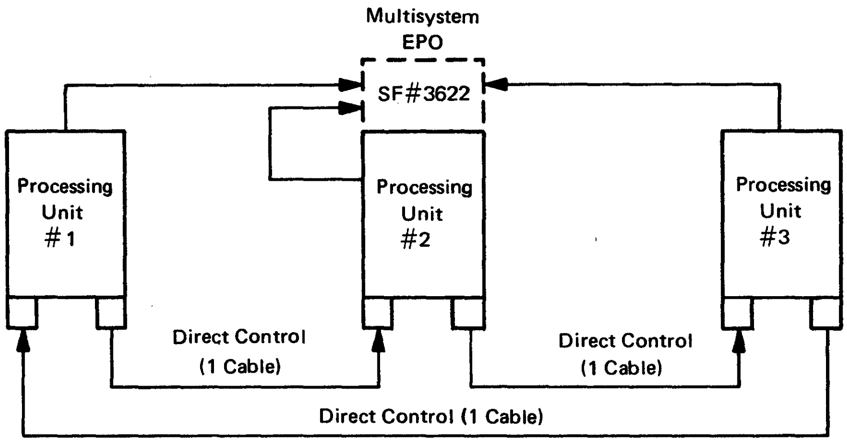
The channel-to-channel adapter (SF #1850) is considered as though it were a control unit on each of the channels involved. The adapter requires external cables to a control unit or channel of the second system. The adapter is installed with the channel, either in a separate unit (such as the 2860) or physically in the central processing unit. It may be assigned to any control unit position on the guest channel. The adapter is assigned to the first control unit position on the host channel; the cable attaching it to the channel is specified as "X" length of "0" feet.



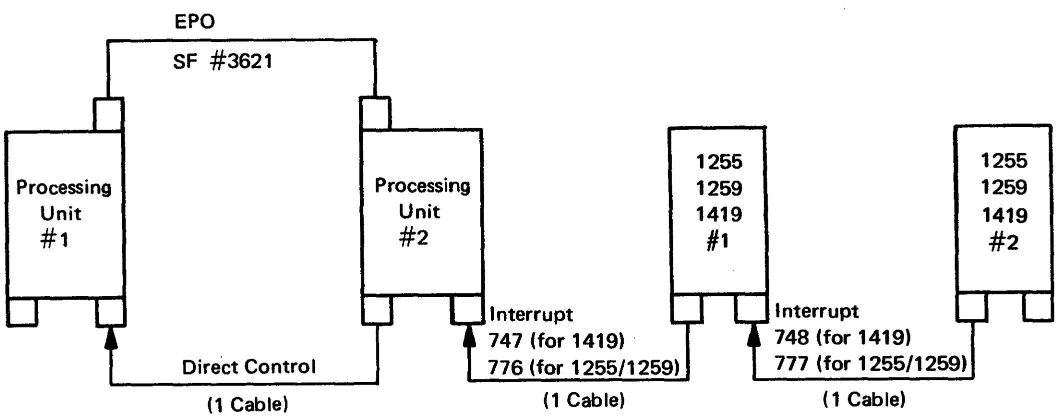

*X refers to the host channel; Y refers to the guest channel.

## DIRECT CONTROL CABLING

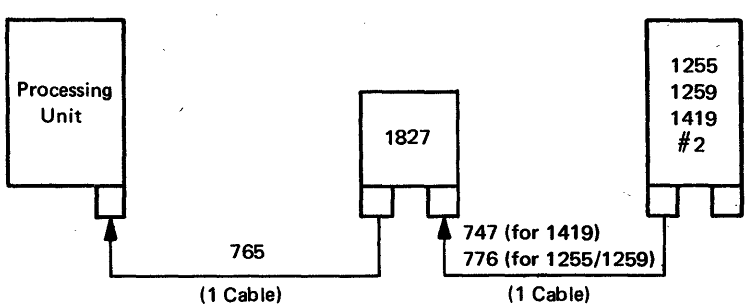
### Multiple Processing Units (Notes 1 and 2)




### Two Processing Units With External Devices (Notes 1, 2, and 3)




### External Interrupt (Notes 1, 2, and 3)



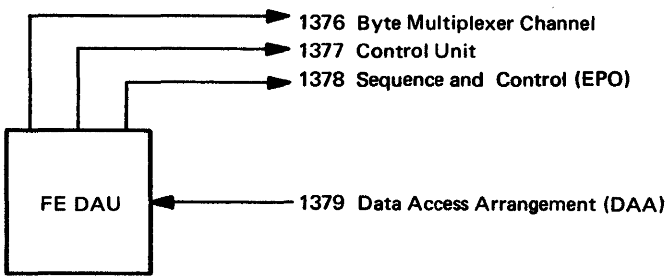

*Notes:*

1. Cabling shown above is in addition to basic channel requirements.
2. Processing unit may be System/370 or System/360.
3. The total length of 747 or 776 plus 748 or 777 must not exceed 200 feet (100 feet for System/360 Models 22, 25, and 30). The length of 765 plus 747 or 776 is similarly restricted.

## FIELD ENGINEERING TEST EQUIPMENT CABLING

### 2955 Field Engineering Data Adapter Unit (FE DAU)

Cables must be ordered as part of the channel to which the FE DAU is attached.

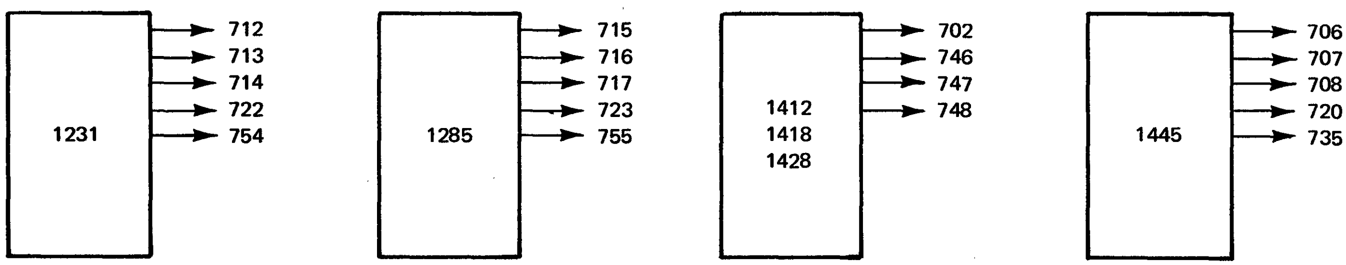



| *Group No.* | *No. of Cables* | *From* | *To* | *Max Length (ft)* | *Notes* |
|---|---|---|---|---|---|
| 1376 | 2 | FE DAU | Byte Multiplexer Channel | – | 1,3 |
| 1377 | 2 | FE DAU | Control Unit | – | 1,3 |
| 1378 | 1 | FE DAU | Channel | 150 | 2 |
| 1379 | 1 | Data Access Arrangement | FE DAU | 50 | 4 |

*Notes:*

1. Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) available to attach up to eight control units.
2. Sequence and control (EPO).
3. One cable group plus EPO required for each CPU attached.
4. Customer must provide the interface to customer-provided telephone line. The interface consists of a Data Access Arrangement with a telephone, as designated by USOC Code CDT. Cable terminates in two ring lugs at customer-provided telephone end.

## UNITS WITH INTEGRAL OR ABUTTED CONTROLS




| *Group No.* | *No. of Cables* | *From* | *To* | *Max Length (ft)* | *Notes* |
|---|---|---|---|---|---|
| 702 | 1 | Reader Unit | Channel | 150 | 2 |
| 706 | 2 | 1445 | Selector Channel | – | 1 |
| 707 | 2 | 1445 | Control Unit | – | 1 |
| 708 | 1 | 1445 | Channel | 150 | 2 |
| 712 | 2 | 1231 | Multiplexer Channel | – | 1 |
| 713 | 2 | 1231 | Control Unit | – | 1 |
| 714 | 1 | 1231 | Channel | 150 | 2 |
| 715 | 2 | 1285 | Multiplexer Channel | – | 1 |
| 716 | 2 | 1285 | Control Unit | – | 1 |
| 717 | 1 | 1285 | Channel | 150 | 2 |
| 720 | 2 | 1445 | Channel-to-Channel Adapter | – | 1, 3 |
| 722 | 2 | 1231 | Channel-to-Channel Adapter | – | 1, 3 |
| 723 | 2 | 1285 | Channel-to-Channel Adapter | – | 1, 3 |
| 735 | 2 | 1445 | Multiplexer Channel | – | 1 |
| 746 | 2 | Reader Unit | Selector Channel | – | 1, 6 |
| 747 | 1 | Reader Unit | System/360 CPU | – | 4, 5 |
| 748 | 1 | Reader Unit | Reader Unit | – | 4, 5 |
| 754 | 2 | 1231 | Selector Channel | – | 1 |
| 755 | 2 | 1285 | Selector Channel | – | 1 |

*Notes:*
1. Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) available to attach up to eight control units.
2. Sequence and control (EPO).
3. To channel-to-channel adapter (SF #1850).
4. For SF #3895 or SF #3274 on System/360 CPU.
5. 200 feet (unless modified by direct control cabling schematic) total length of 747 plus 748.
6. For use with all 1412, 1418, and 1428 machines with SF #7720 (single address).

## COMPUTER ROOM ENVIRONMENT LIMITS

### Temperature and Humidity Criteria

Under no condition shall condensation be allowed to occur within the IBM equipment.

Temperature and relative humidity requirements are as stated on the specifications pages.

## LIQUID COOLANT SYSTEM

### General Requirements

The liquid coolant system is a closed-recirculation system. The loop should have a capacity to accept the heat rejected by the computer at the temperature level specified and to provide proper coolant distribution to individual computer frames.

To prevent condensation on the internal portions of water-cooled units, it is recommended that room recorders with audible alarms be installed to alert operating personnel of impending out-of-specification conditions. Relative humidity recorders should be set at 75%; wet bulb recorders should be set at 72°F (22°C).

### Customer-supplied Chilled Water Specifications

*Note:* When the computer system is inoperative (power off), there shall be no customer coolant circulating.

The customer-supplied chilled water may vary 15% in flow rate and ±7.5°F (±4,2°C) in temperature. However, the 60°F (16°C) maximum temperature may *not* be exceeded.

Customer-supplied chilled water should be as free of particulate matter as feasible. A filtering system of dual-basket type water strainers (size 50 mesh) is recommended. This allows switching from one strainer to another for cleaning, maintenance, and replacement. A means of reverse flushing the heat exchanger in the CDU should be considered. The frequency of reverse flushing depends on the quality of the customer's chilled water.

Hardness of water shall not exceed 200 ppm calcium and magnesium. Water pH shall be between 7 and 9.

Supply lines should be terminated with three Hansen (Hansen Mfg. Co., Cleveland, Ohio 44735) HK series B6-K31 plugs; return lines should be terminated with three Hansen HK series B6-H31 sockets. Fittings should be horizontal. Nine-inch (228,6-mm) long insulators are provided by IBM to cover these fittings.

Customer water connections must be accessible.

The maximum coolant hose length supplied by IBM from floor cutout (CDU) to customer fitting is 5 feet (152 cm).

Maximum pressure on customer-supplied, chilled-water lines should not exceed 75 psig (5,3 kg/cm$^2$).

### Customer-supplied Chilled Water Requirements

These specifications are valid for the chilled-water temperature range of 60°F (16°C) to 45°F (7°C) and for altitudes up to 3,000 feet (920m). For installations using other temperature ranges and at altitudes above 3,000 feet (920m), consult your Installation Planning representative.

*Model 85*

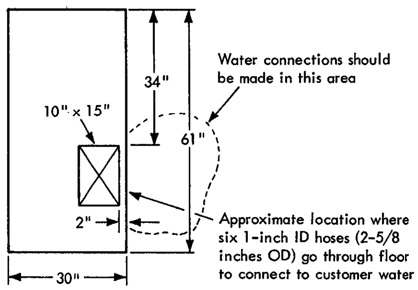
| | *2085* | | *2385* | |
|---|---|---|---|---|
| *Parameter* | *Max Unit** | *Min Unit** | *Model 2* | *Model 1* |
| Max Water Temp °F (°C) | 60 (16) | 60 (16) | 60 (16) | 60 (16) |
| Min Water Temp °F (°C) | 45 (7) | 45 (7) | 45 (7) | 45 (7) |
| Pressure Drop psig (kg/cm$^2$) | 20 (1,4) | 10 (0,7) | 20 (1,4) | 10 (0,7) |
| Flow Rate gpm (liters/min) | 35 (133) | 25 (95) | 35 (133) | 25 (95) |

* Maximum and minimum refer to the smallest and the largest configuration of system model and installed features.

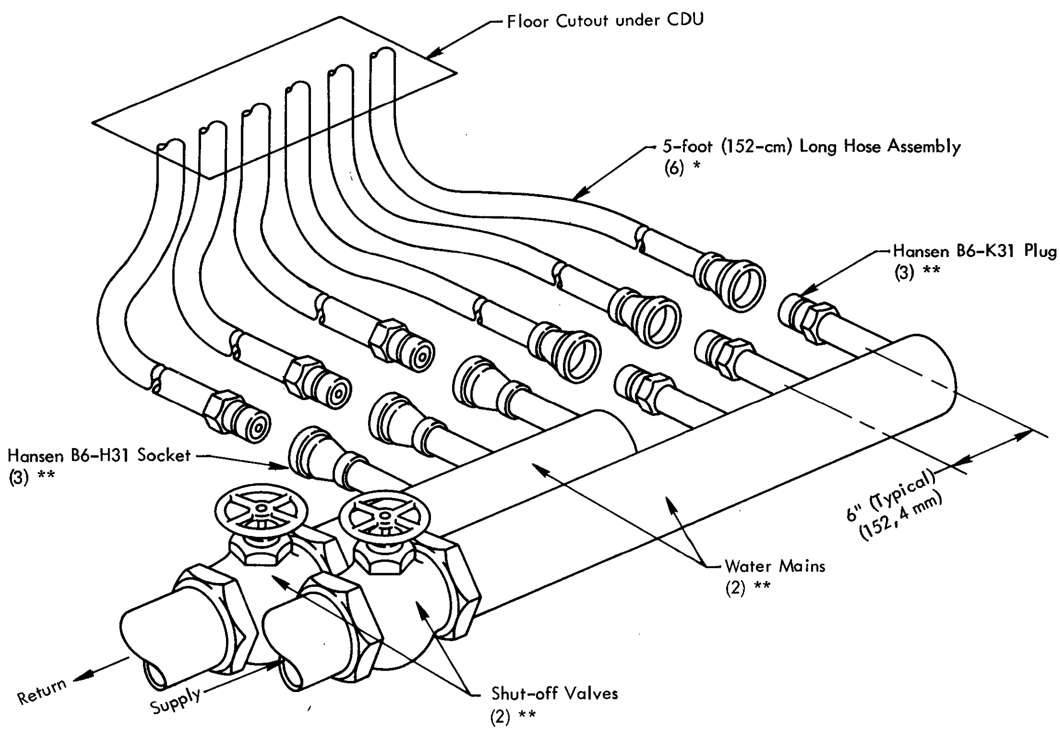
*Model 195*

| | *Model* | | | |
|---|---|---|---|---|
| *Parameter* | *J* | *K* | *KJ* | *L* |
| Flow Rate gpm (liters/min) | 25 (95) | 30 (114) | 35 (133) | 40 (151) |
| Pressure Drop psig (kg/cm$^2$) | 10 (0,7) | 15 (1,1) | 20 (1,4) | 25 (1,8) |
| Max Water Temp °F (°C) | 60 (16) | 60 (16) | 60 (16) | 60 (16) |
| Min Water Temp °F (°C) | 45 (7) | 45 (7) | 45 (7) | 45 (7) |

## COOLANT DISTRIBUTION UNIT FOR SYSTEM/360 2085 AND 2385




## Typical Connections for Customer-supplied Chilled Water for Models 85 and 195




* IBM Supplied
** Customer Supplied

# Appendix B. Input/Output Device Priority Considerations

| *I/O Device* | *Class* | *Byte Multiplexer Channel Critical Time (ms)* | *Block Multiplexer and Selector Channel Burst Mode Data Rate (per second)* | *Notes (Listed at End of Table)* |
|---|---|---|---|---|
| 1231-N1 | 1 | 11.00 | 150 characters | |
| 1285 | 1 | 0.40 | 760 characters | |
| 1412 | 1 | 0.86 | Mpxr only | 2, 3 |
| 1418 | 1 | – | Mpxr only | 2, 3 |
| 1428 | 1 | – | Mpxr only | 2 |
| 1445 | 3 | 18.50 | 90,000 characters | |
| 2955 | 1 | 14.1/N | Mpxr only | |
| 7772 | 1 | *Input* — *Manual* No.*: 3.30; *IBM 1001*: 1.48 | Mpxr only | 1 |

* Manual = pushbutton; manual dialing telephone.

*Notes:*

1. Is generally attached to the lowest priority (highest numbered) selector channel. The adapter must be the first control device on the channel to which it is assigned and must also have first priority.
2. In general, this device should be placed in highest channel priority. However, because of the load imposed on the channel by one or more of these devices as a function of how the device is programmed, it may be necessary for another device to be placed in higher priority.
3. Only one per system.

## Appendix C. Power Cord Style Specifications and Plug Installation (World Trade Reference)

**CABLE SPECIFICATIONS**

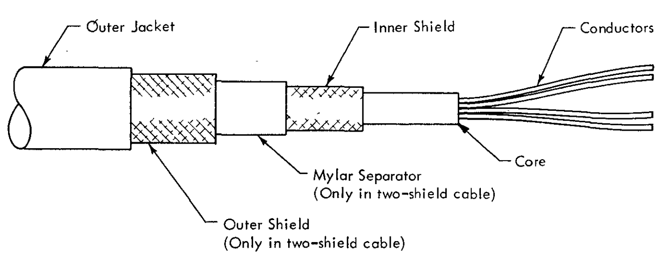
| *Power Cord Style* | *Cable Nominal OD inches (mm)* | *Number of Shields* | *Conductors* | | |
|---|---|---|---|---|---|
| | | | *Quantity* | *Nominal OD* inches (mm)* | *AWG No.* |
| A1 | 0.520 (13,2) | 1 | 3 | 0.064 (1,6) | 14 |
| A2 | 0.510 (13,0) | 1 | 3 | 0.081 (2,1) | 12 |
| A3 | 0.570 (14,5) | 1 | 3 | 0.102 (2,6) | 10 |
| A4 | 0.375 (9,5) | 1 | 3 | 0.051 (1,3) | 16 |
| A5 | 0.390 (9,9) | 0 | 3 | 0.051 (1,3) | 16 |
| A6 | 0.560 (14,2) | 0 | 3 | 0.064 (1,6) | 14 |
| A8 | 0.390 (9,9) | 0 | 3 | 0.064 (1,6) | 14 |
| A9 | 0.374 (9,5) | 0 | 3 | 0.040 (1,0) | 18 |
| B1 | 0.713 (18,1) | 0 | 5 | 0.102 (2,6) | 10 |
| B2 | 0.693 (17,6) | 1 | 5 | 0.064 (1,6) | 14 |
| D1 | 0.792 (20,1) | 2 | 5 | 0.102 (2,6) | 10 |
| D2 | 0.750 (19,0) | 1 | 5 | 0.102 (2,6) | 10 |
| D3 | 0.642 (16,3) | 2 | 5 | 0.064 (1,6) | 14 |
| E1 | 1.024 (26,0) | 1 | 5 | 0.129 (3,3) | 8 |
| E2 | 1.400 (35,6) | 0 | 5 | 0.232 (5,9) | 4 |
| E3 | 1.200 (30,5) | 2 | 5 | 0.184 (4,7) | 6 |
| E4 | 1.200 (30,5) | 0 | 5 | 0.184 (4,7) | 6 |
| E5 | 1.200 (30,5) | 1 | 5 | 0.184 (4,7) | 6 |
| E6 | 1.240 (31,5) | 2 | 4 | 0.184 (4,7) | 6 |
| E7 | 1.440 (36,6) | 1 | 5 | 0.232 (5,9) | 4 |
| E8 | 0.974 (24,7) | 0 | 5 | 0.129 (3,3) | 8 |
| E9 | 0.949 (24,1) | 1 | 4 | 0.184 (4,7) | 6 |
| E10 | 1.340 (34,0) | 1 | 4 | 0.232 (5,9) | 4 |
| F1 | 1.400 (35,6) | 0 | 5 | 0.292 (7,4) | 2 |
| F2 | 1.646 (41,8) | 1 | 5 | 0.292 (7,4) | 2 |
| F3 | 1.646 (41,8) | 0 | 5 | 0.292 (7,4) | 2 |
| F4 | 1.293 (32,8) | 1 | 4 | 0.292 (7,4) | 2 |
| G1 | | | 3 | 0.040 (1,0) | 18 |
| G2 | | | | | |
| G3 | 0.360 (9,1) | 0 | – | 0.051 (1,3) | 16 |
| G4 | 0.365 (9,3) | 1 | – | 0.040 (1,0) | 18 |

* This diameter refers to solid, bare wire.

### HOW TO INSTALL A POWER PLUG ON SHIELDED CABLE

To make power cable shielding effective, the shield or shields must be properly terminated at the plug end of the cable. Because different plugs are used in different countries, slight changes to the following instructions may be needed.

#### Names of Bulk Cable Components

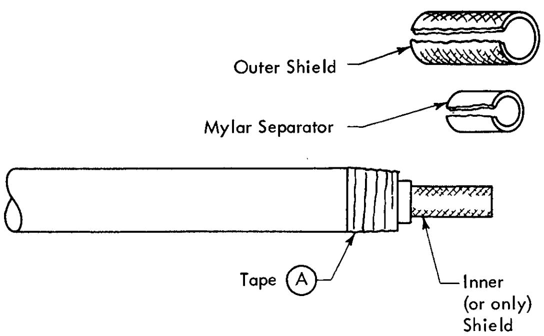



#### Preparing Bulk Cable End for the Plug

Dimensions given are for reference only. The installer is to use his own discretion to assure proper assembly of the cable and plug.

*Step 1:* Remove outer jacket for 1-1/2 inches (38 mm) from end for 15A-30A cables or 2-3/4 inches (70 mm) from end for 45A-60A cables. If this is a one-shield cable, go to step 4.

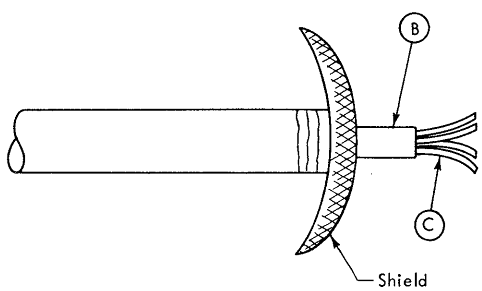
*Step 2:* (For two-shield cables only.) Remove the outer shield as far back as the outer jacket. The Mylar separator is exposed. Wrap one full turn of electrical tape over the separator and another full turn of tape over the cut end of the outer shield; overlap onto the outer jacket. This tape is used to assure complete electrical isolation between the inner and the outer shields. (See A.)




*Step 3:* (For two-shield cables only.) Remove Mylar separator for 1 inch (25 mm) from end for 15A-30A cables or 2-1/4 inches (57 mm) from end for 45A-60A cables. Do not cut the inner shield.

*Step 4:* Do not cut the inner (or only) shield. Unbraid and carefully comb out the shield for 1 inch (25 mm) from end for 15A-30A cables or 2-1/4 inches (57 mm) from end for 45A-60A cables. The core is exposed. (See B.)

*Step 5:* Remove cable core for a minimum of 3/4 inch (19 mm) from the end; the conductors are exposed. (See C.)

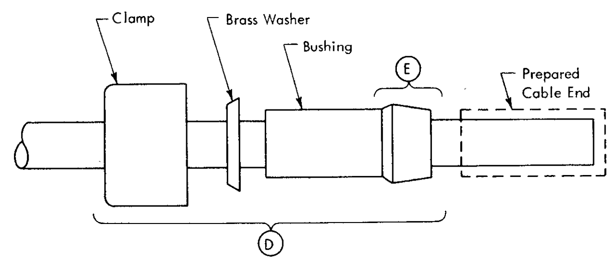



*Step 6:* Carefully lay the shield back over the cable outer jacket; wrap tape around the shield for temporary protection. Note that on two-shield cables, the outer shield must be insulated from the plug cap, equipment ground (earth) wire, conduit, and so on; the outer shield is grounded at the machine end only. The inner (or only) shield should be grounded through the shell of the plug to the branch circuit conduit. Three-hundred-sixty-degree grounding of the shield to the plug shell is desirable; that is, making contact between the shield and the shell at all points around the edge, not just at one point.

**Installing the Plug**

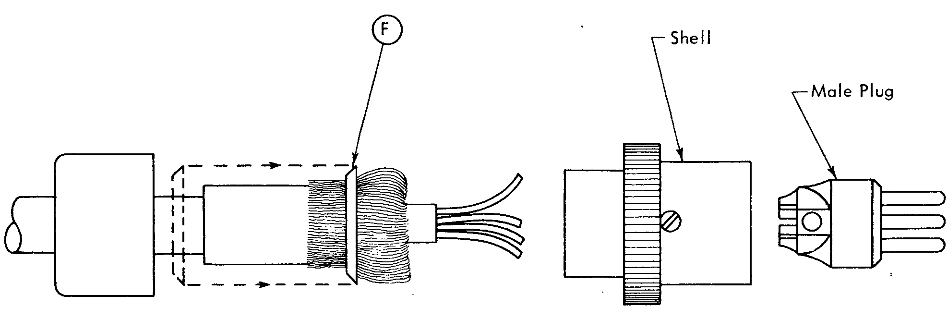
These steps show the attachment of one type of plug; modifications will be needed to allow for the different physical designs of plugs used in various countries.

Install the clamp, brass washer, and bushing over the prepared cable end as shown at D. Take the protective tape off the shield and slide the bushing over against the shield. Carefully lay the shield back over E of the bushing; be sure to spread the strands of the shield evenly over the bushing surface.




Slide the brass washer over the shield and up against the mating surface of the bushing at F. Wrap tape around the shield for one full turn and trim off the remaining shield strands. Install the clamp and be sure that the mating surface is tightly against the brass washer.

Install the proper terminals and put the rest of the plug assembly together.



## Appendix D. Template Index

| Type | Model | Order (Form) Number |
|---|---|---|
| 360 and 370 | Field Engineering Furniture and Test Equipment | GX22-6925 |
| 360 | 22 | *See* 2022 |
| 360 | 25 | *See* 2025 |
| 360 | 30 | *See* 2030 |
| 360 | 40 | *See* 2040 |
| 360 | 44 E-H | *See* 2044 E-H |
| 360 | 50 F-H | *See* 2050 F-H |
| 360 | 50 HG, I | *See* 2050 HG, I |
| 360 | 65 H, I | *See* 2065 H, I |
| 360 | 65 IH, J | *See* 2065 IH, J |
| 360 | 65 I (MP) | *See* 2065 I (MP) |
| 360 | 65 IH (MP) | *See* 2065 IH (MP) |
| 360 | 65 J (MP) | *See* 2065 J (MP) |
| 360 | 67 | *See* 2067 |
| 360 | 75 H, I | *See* 2075 H, I |
| 360 | 75 IH, J | *See* 2075 IH, J |
| 360 | 85 | *See* 2085 |
| 360 | 195 J, K, KJ, L | *See* 3195 |
| 1051 | 1, N1 | GX22-6894 |
| 1231 | N1 | GX22-6860 |
| 1285 | 1 | GX22-6860 |
| 1404 | 2 | GX22-6834 |
| 1412 | 1 | GX22-6860 |
| 1418 | 1-3 | GX22-6860 |
| 1428 | 1-3 | GX22-6860 |
| 1445 | N1 | GX22-6834 |
| 2022 | | GX22-6894 |
| 2025 | | GX22-6894 |
| 2030 | | GX22-6894 |
| 2040 | | GX22-6894 |
| 2044 | E-H | GX22-6914 |
| 2050 | F-H | GX22-6914 |
| 2050 | HG, I | GX22-6914 |
| 2065 | H, I | GX22-6856 |
| 2065 | IH, J | GX22-6856 |
| 2065 | I (MP) | GX22-6924 |
| 2065 | IH (MP) | GX22-6924 |
| 2065 | J (MP) | GX22-6924 |
| 2067 | | GX22-6905 |
| 2075 | H, I | GX22-6856 |
| 2075 | IH, J | GX22-6856 |
| 2085 | | GX22-6923 |
| 2167 | 1-4 | GX22-6905 |
| 2302 | 3, 4 | GX22-6858 |
| 2361 | 1, 2 | GX22-6856 |
| 2365 | 2, 3 | GX22-6856<br>GX22-6905 |
| 2365 | 5 | GX22-6923 |
| 2365 | 12 | GX22-6905 |
| 2365 | 13 | GX22-6924 |
| 2385 | 1, 2 | GX22-6923 |
| 2846 | 1 | GX22-6905 |
| 3060 | 1 | GX22-6981 |
| 3080 | 1-3 | GX22-6981 |
| 3085 | 1 | GX22-6981 |
| 3086 | 1 | GX22-6981 |
| 3195 | J, K, KJ, L | GX22-6981 |
| 7772 | 3 | GX22-6857 |

# Appendix E. System/360 Specification Summary (English Units)

| | Type | Model | Description | kVA | Electrical: Pwr Cord Style | Electrical: Conn Note | Environmental: BTU/hr | Environmental: cfm | Environmental: Weight (lb) | Dimensions (inches): Front | Dimensions (inches): Side | Dimensions (inches): Height | Service Clearances (inches): F | Service Clearances (inches): R | Service Clearances (inches): Rt | Service Clearances (inches): L | Notes (Listed at End of Table) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 360 | 22 | 2022 Processing Unit | 2.4 | D3 | B | 6,900 | 900 | 1,500 | | | 60 | | | | | 1,2 |
| | 360 | 25 | 2025 Processing Unit | 7.4 | E- | E | 20,500 | 800 | 2,050 | | | 60 | | | | | 1,2 |
| | 360 | 30 | 2030 Processing Unit | 3.8 | D3 | B | 10,000 | 900 | 1,700 | | | 60 | | | | | 1-3 |
| | 360 | 40D-G | 2040 Processing Unit | 2.5 | B1 | D | 7,000 | 300 | 1,700 | | | 60 | | | | | 1-3 |
| | 360 | 40GF,H | 2040 Processing Unit | 3.7 | B1 | D | 10,500 | 300 | 2,310 | | | 70 | | | | | 1-3 |
| | 360 | 44E,F | 2044 Processing Unit | 5.3 | E1 | D | 15,000 | 1,600 | 2,900 | | | 72 | | | | | 1-3 |
| | 360 | 44G | 2044 Processing Unit | 6.5 | E1 | D | 19,000 | 1,600 | 2,900 | | | 72 | | | | | 1-3 |
| | 360 | 44H | 2044 Processing Unit | 9.5 | E1(2) | D(2) | 28,000 | 2,400 | 4,200 | | | 72 | | | | | 1-3,6 |
| | 360 | 50F,G | 2050 Processing Unit | 6.5 | E3 | E | 20,410 | 2,350 | 4,700 | | | 72-1/2 | | | | | 1,2 |
| | 360 | 50H | 2050 Processing Unit | 6.8 | E3 | E | 21,350 | 2,990 | 5,385 | | | 72-1/2 | | | | | 1-3 |
| | 360 | 50HG | 2050 Processing Unit | 7.0 | E3 | E | 24,000 | 4,600 | 7,135 | | | 72-1/2 | | | | | 1-3 |
| | 360 | 50I | 2050 Processing Unit | 7.6 | E3 | E | 25,000 | 4,600 | 7,135 | | | 72-1/2 | | | | | 1-3 |
| | 360 | 65H,I | 2065 Processing Unit | 5.4 | E1 | E | 15,800 | 2,100 | 4,290 | | | 72-1/2 | | | | | 1,2 |
| | 360 | 65IH,J | 2065 Processing Unit | 5.4 | E1 | E | 15,800 | 2,100 | 5,190 | | | 72-1/2 | | | | | 1,2 |
| | 360 | 65I | Multiprocessing Unit | 5.4 | E1 | E | 15,800 | 2,100 | 8,170 | | | 72-1/2 | | | | | 1,2 |
| | 360 | 65IH | Multiprocessing Unit | 5.4 | E1 | E | 15,800 | 2,100 | 8,500 | | | 72-1/2 | | | | | 1,2 |
| | 360 | 65J | Multiprocessing Unit | 5.4 | E1 | E | 15,800 | 2,100 | 8,830 | | | 72-1/2 | | | | | 1,2 |
| | 360 | 67 | 2067 Processing Unit | 6.85 | E1 | E | 20,000 | 4,620 | 3,674 | | | 72-1/2 | | | | | 1,2 |
| | 360 | 75H,I | 2075 Processing Unit | | E3 | E | 27,600 | 3,350 | 5,125 | | | 72-1/2 | | | | | 1-3 |
| | 360 | 75IH,J | 2075 Processing Unit | | E3 | E | 27,600 | 3,350 | 5,325 | | | 72-1/2 | | | | | 1-3 |
| | 360 | 85 | 2085 Processing Unit | | D3 | D | | 3,100 | 14,428 | | | 78 | | | | | 1-3 |
| | 360 | 85 | Power Dist Unit (2085) | | | | | 0 | 1,500 | 30 | 60 | 70 | 36 | 36 | 30 | 30 | 1-3 |
| WT | 360 | 85 | MG Starter (Remote) | | | | | | | | | 30 | 30 | 0 | 0 | 1 | |
| US | 360 | 85 | MG Starter (Remote) | | | | | | | | | 30 | 30 | 0 | 0 | 1 | |
| WT | 360 | 85 | MG (Remote) | | | | 102,000 | | 4,630 | 100 | 34 | 53 | 30 | 30 | 30 | 30 | 1 |
| US | 360 | 85 | MG (Remote) | | | | | | 4,200 | 86 | 34 | 53 | 30 | 30 | 30 | 30 | 1 |
| | 360 | 195J | 3195 Proc Unit & Stg | | | | | 4,700 | 13,450 | | | 70 | | | | | 1-3 |
| | 360 | 195K | 3195 Proc Unit & Stg | | | | | 7,500 | 18,750 | | | 70 | | | | | 1-3 |
| | 360 | 195KJ | 3195 Proc Unit & Stg | | | | | 10,300 | 24,850 | | | 70 | | | | | 1-3 |
| | 360 | 195L | 3195 Proc Unit & Stg | | | | | 13,100 | 28,350 | | | 70 | | | | | 1-3 |
| WT | 360 | 195 | MG (Remote) | | | | 55,250 | | 3,600 | 81 | 36 | 51 | 30 | 30 | 30 | 30 | 1 |
| | 360 | 195 | MG (Remote) | | | | 40,000 | | 3,000 | 76 | 37 | 54 | 30 | 30 | 30 | 30 | 1 |
| WT | 360 | 195 | Rotary Conv (Remote) | | | | 22,915 | | 1,550 | 56 | 36 | 37 | 30 | 30 | 30 | 30 | 1 |
| | 1051 | 1,N1 | Control Unit | 0.2 | A5 | A | 670 | 0 | 195 | 26 | 15 | 27 | 0 | 36 | 0 | 30 | |
| | 1231 | N1 | Optical Mark Page Rdr | 1.2 | A1 | A | 3,700 | 300 | 620 | 43-1/2 | 24 | 44-3/4 | 42 | 42 | 30 | 36 | 3 |
| | 1285 | 1 | Optical Reader | 1.8 | D1 | D | 5,000 | 600 | 1,600 | 71-1/4 | 35-3/4 | 60 | 36 | 48 | 42 | 48 | |
| | 1404 | 2 | Printer | 1.5 | | | 3,800 | 280 | 1,600 | 67-1/8 | 31-3/4 | 53-1/2 | 36 | 36 | 48 | 42 | 4 |
| | 1412 | 1 | Magnetic Character Rdr | 3.39 | D1 | C | 8,100 | 320 | 2,475 | 112 | 41-1/4 | 60-1/4 | 42 | 48 | 36 | 36 | 5 |
| | 1418 | 1,3 | Optical Character Rdr | 4.6 | D1 | D | 10,500 | 575 | 2,650 | 112 | 41-1/4 | 60-1/4 | 42 | 48 | 36 | 36 | 5 |
| | 1418 | 2 | Optical Character Rdr | 4.6 | D1 | D | 10,500 | 575 | 2,700 | 112 | 41-1/4 | 60-1/4 | 42 | 48 | 36 | 36 | 5 |
| | 1428 | 1,3 | Alphameric Optical Rdr | 4.6 | D1 | D | 10,500 | 575 | 2,750 | 112 | 41-1/4 | 60-1/4 | 42 | 48 | 36 | 36 | 5 |
| | 1428 | 2 | Alphameric Optical Rdr | 4.6 | D1 | D | 10,500 | 575 | 2,800 | 112 | 41-1/4 | 60-1/4 | 42 | 48 | 36 | 36 | 5 |
| | 1445 | N1 | Printer | 1.1 | A1 | A | 3,200 | 50 | 825 | 55-7/8 | 43 | 46 | 36 | 36 | 48 | 30 | |
| | 2167 | 1-4 | Configuration Unit | 0.65 | A2 | A | 2,000 | 500 | 583 | | | 46 | | | | | 1 |
| | 2302 | 3 | Disk Storage | 9.0 | E- | E | 20,000 | 2,210 | 4,025 | 85-1/2 | 33 | 68-3/4 | 60 | 60 | 60 | 60 | 3-5,7 |
| | 2302 | 4 | Disk Storage | 12.6 | E- | E | 28,000 | 2,210 | 4,425 | 85-1/2 | 33 | 68-3/4 | 60 | 60 | 60 | 60 | 3-5,7 |
| | 2361 | 1 | Core Storage | 4.5 | E3 | E | 11,000 | 1,205 | 2,125 | 90-1/4 | 31-3/4 | 70-1/2 | 72 | 30 | 30 | 36 | 3 |
| | 2361 | 2 | Core Storage | 7.0 | E3 | E | 17,400 | 1,205 | 2,125 | 90-1/4 | 31-3/4 | 70-1/2 | 72 | 30 | 30 | 36 | 3 |
| | 2365 | 2,3 | Processor Storage | 7.4 | E3 | E | 25,300 | 1,495 | 2,720 | | | 72-1/2 | | | | | 1 |
| | 2365 | 5 | Processor Storage | 4.0 | | | 15,000 | 750 | 2,500 | 29-1/2 | 83-3/4 | 72-1/2 | 30 | 30 | | | 1,4 |
| | 2365 | 12 | Processor Storage | 8.5 | E3 | E | 29,000 | 2,345 | 3,300 | | | 72-1/2 | | | | | 1 |
| | 2365 | 13 | Processor Storage | 7.4 | E3 | E | 25,300 | 1,495 | 2,720 | | | 72-1/2 | | | | | 1 |
| | 2385 | 1 | Processor Storage | | | | | 7,670 | | | | 78 | | | | | 1 |
| | 2385 | 2 | Processor Storage | | | | | 14,650 | | | | 78 | | | | | 1 |
| | 2846 | 1 | Channel Controller | 0.88 | A2 | A | 2,600 | 900 | 2,000 | | | 72-1/2 | 30 | 48 | 72 | 55 | 1 |
| | 3060 | 1 | System Console | | | | 14,000 | 1,100 | 2,500 | | | 67 | 30 | 24 | 36 | 42 | 1,3,4 |
| | 3080 | 1-3 | Power Unit | | | | | 0 | 1,300 | 34-1/2 | 32 | 60 | 36 | | | | 1,3,4 |
| | 3085 | 1 | Power Dist Unit | | | | | 0 | 1,000 | 32 | 32 | 60 | 36 | 0 | 36 | 36 | 1,3 |
| | 3086 | 1 | Coolant Dist Unit | | | | | 0 | 1,450 | 62-1/2 | 32 | 70 | 36 | 36 | 36 | 0 | 1,3 |
| | 7772 | 3 | Audio Response Unit | 2.0 | A3 | A | 5,100 | 1,800 | 600 | 37-1/2 | 31-1/2 | 70 | 42 | 36 | 30 | 30 | |

Notes:

1. Parameters not shown may be found in the system/machine specifications.
2. When SF #3622 is installed, an additional receptacle (for power cord style A or connector note A) is required.
3. This unit is equipped with radio interference control circuits and requires a good insulated wired earth or building ground. Total resistance of the ground conductor, measured between the receptacle and the building grounding point, must not exceed 3 ohms. For proper operation, all components of the system or systems to which this unit is attached must have the same ground reference. Conduit is not a satisfactory means of grounding.
4. Powered from another unit.
5. Shipped in sections. See specifications page.
6. Two identical electrical services are required.
7. For airflow, see specifications page for 2302 Disk Storage.

Power Cord Notes:

See Appendix C for power cord specifications. For service size ratings, see the following connector notes which can also be applied to 200/220/235V, 50-Hz units. For 380/408V, 50-Hz units, the rating should be decided by using power cord specifications in Appendix C.

Connector Notes:

| | Plug | Connector | Receptacle | Service Rating* |
|---|---|---|---|---|
| A | Russell and Stoll, FS3720 | FS3913 | FS3743 | 15A, 1 phase, 3 wire |
| B | Russell and Stoll, FS3730 | FS3914 | FS3744 | 15A, 3 phase, 4 wire |
| C | Russell and Stoll, FS3750 | FS3933 | FS3753 | 30A, 1 phase, 3 wire |
| D | Russell and Stoll, FS3760 | FS3934 | FS3754 | 30A, 3 phase, 4 wire |
| E | Russell and Stoll, SC7328 | SC7428 | SC7324 | 60A, 3 phase, 4 wire |
| F | Russell and Stoll, JPS1034H | JCS1034H | JRSR1034H | 100A, 3 phase, 4 wire |
| G | 115V Hubbell or Pass and Seymour, 5266 (nonlocking) | 5269 | 5261 or 5262 | 15A, 1 phase, 3 wire |
| H | 208/230V Hubbell or Pass and Seymour, 5666 (nonlocking) | 5669 | 5661 or 5662 | 15A, 1 phase, 3 wire |
| J | 115V Hubbell or Pass and Seymour, 4720/4723 (locking) | 4730 | 4700 or 4710 | 15A, 1 phase, 3 wire |
| K | 208/230V Hubbell or Pass and Seymour, 4770 (locking) | 4780 | 4750 or 4760 | 15A, 1 phase, 3 wire |
| L | Russell and Stoll, FS3720-20 | FS3913-20 | FS3743-20 | 20A, 1 phase, 3 wire |

*The plugs, connectors, and receptacles listed are for use on 208V or 230V services. The 115V options are not available unless noted. The number of wires includes one insulated grounding conductor (green or green with yellow trace).

# Appendix F. System/360 Specification Summary (Metric Units)

| Type | Model | Description | kVA | Electrical: Pwr Cord Style | Electrical: Conn Note | Environmental: kcal/hr | Environmental: $m^3$/min | Environmental: Weight (kg) | Dimensions (cm): Front | Dimensions (cm): Side | Dimensions (cm): Height | Service Clearances (cm): F | Service Clearances (cm): R | Service Clearances (cm): Rt | Service Clearances (cm): L | Notes (Listed at End of Table) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 360 | 22 | 2022 Processing Unit | 2,4 | D3 | B | 1.750 | 26 | 690 | | | 152 | | | | | 1,2 |
| 360 | 25 | 2025 Processing Unit | 7,4 | E- | E | 5.200 | 23 | 930 | | | 152 | | | | | 1,2 |
| 360 | 30 | 2030 Processing Unit | 3,8 | D3 | B | 2.550 | 26 | 780 | | | 152 | | | | | 1-3 |
| 360 | 40D-G | 2040 Processing Unit | 2,5 | B1 | D | 1.800 | 9 | 780 | | | 152 | | | | | 1-3 |
| 360 | 40GF,H | 2040 Processing Unit | 3,7 | B1 | D | 2.650 | 9 | 1.050 | | | 178 | | | | | 1-3 |
| 360 | 44E,F | 2044 Processing Unit | 5,3 | E1 | D | 3.800 | 46 | 1.350 | | | 183 | | | | | 1-3 |
| 360 | 44G | 2044 Processing Unit | 6,5 | E1 | D | 4.800 | 46 | 1.350 | | | 183 | | | | | 1-3 |
| 360 | 44H | 2044 Processing Unit | 9,5 | E1(2) | D(2) | 7.100 | 68 | 1.950 | | | 183 | | | | | 1-3,6 |
| 360 | 50F,G | 2050 Processing Unit | 6,5 | E3 | E | 5.150 | 67 | 2.150 | | | 184 | | | | | 1,2 |
| 360 | 50H | 2050 Processing Unit | 6,8 | E3 | E | 5.400 | 85 | 2.450 | | | 184 | | | | | 1-3 |
| 360 | 50HG | 2050 Processing Unit | 7,0 | E3 | E | 6.050 | 140 | 3.250 | | | 184 | | | | | 1-3 |
| 360 | 50I | 2050 Processing Unit | 7,6 | E3 | E | 6.350 | 140 | 3.250 | | | 184 | | | | | 1-3 |
| 360 | 65H,I | 2065 Processing Unit | 5,4 | E1 | E | 4.000 | 60 | 1.950 | | | 184 | | | | | 1,2 |
| 360 | 65IH,J | 2065 Processing Unit | 5,4 | E1 | E | 4.000 | 60 | 2.400 | | | 184 | | | | | 1,2 |
| 360 | 65I | Multiprocessing Unit | 5,4 | E1 | E | 4.000 | 60 | 3.750 | | | 184 | | | | | 1,2 |
| 360 | 65IH | Multiprocessing Unit | 5,4 | E1 | E | 4.000 | 60 | 3.900 | | | 184 | | | | | 1,2 |
| 360 | 65J | Multiprocessing Unit | 5,4 | E1 | E | 4.000 | 60 | 4.050 | | | 184 | | | | | 1,2 |
| 360 | 67 | 2067 Processing Unit | 6,85 | E1 | E | 5.050 | 140 | 1.700 | | | 184 | | | | | 1,2 |
| 360 | 75H,I | 2075 Processing Unit | | E3 | E | 7.000 | 95 | 2.350 | | | 184 | | | | | 1-3 |
| 360 | 75IH,J | 2075 Processing Unit | | E3 | E | 7.000 | 95 | 2.450 | | | 184 | | | | | 1-3 |
| 360 | 85 | 2085 Processing Unit | | D3 | D | | 88 | 6.550 | | | 198 | | | | | 1-3 |
| 360 | 85 | Power Dist Unit (2085) | | | | | 0 | 690 | 76 | 152 | 178 | 91 | 91 | 76 | 76 | 1-3 |
| WT 360 | 85 | MG Starter (Remote) | | | | | | | | | | 76 | 76 | 0 | 0 | 1 |
| US 360 | 85 | MG Starter (Remote) | | | | | | | | | | 76 | 76 | 0 | 0 | 1 |
| WT 360 | 85 | MG (Remote) | | | | 25.750 | | 2.100 | 254 | 86 | 135 | 76 | 76 | 76 | 76 | 1 |
| US 360 | 85 | MG (Remote) | | | | | | 1.950 | 218 | 86 | 135 | 76 | 76 | 76 | 76 | 1 |
| 360 | 195J | 3195 Proc Unit & Stg | | | | | 140 | 6.150 | | | 178 | | | | | 1-3 |
| 360 | 195K | 3195 Proc Unit & Stg | | | | | 220 | 8.550 | | | 178 | | | | | 1-3 |
| 360 | 195KJ | 3195 Proc Unit & Stg | | | | | 300 | 11.300 | | | 178 | | | | | 1-3 |
| 360 | 195L | 3195 Proc Unit & Stg | | | | | 380 | 12.900 | | | 178 | | | | | 1-3 |
| WT 360 | 195 | MG (Remote) | | | | 14.000 | | 1.650 | 206 | 91 | 130 | 76 | 76 | 76 | 76 | 1 |
| US 360 | 195 | MG (Remote) | | | | 10.100 | | 1.400 | 193 | 94 | 137 | 76 | 76 | 76 | 76 | 1 |
| WT 360 | 195 | Rotary Conv (Remote) | | | | 5.800 | | 710 | 142 | 91 | 94 | 76 | 76 | 76 | 76 | 1 |
| 1051 | 1,N1 | Control Unit | 0,2 | A5 | A | 170 | 0 | 89 | 66 | 38 | 69 | 0 | 91 | 0 | 76 | |
| 1231 | N1 | Optical Mark Page Rdr | 1,2 | A1 | A | 940 | 9 | 290 | 110 | 61 | 114 | 107 | 107 | 76 | 91 | 3 |
| 1285 | 1 | Optical Reader | 1,8 | D1 | D | 1.300 | 17 | 730 | 181 | 91 | 152 | 91 | 122 | 107 | 122 | |
| 1404 | 2 | Printer | 1,5 | | | 960 | 8 | 730 | 170 | 81 | 136 | 91 | 91 | 122 | 107 | 4 |
| 1412 | 1 | Magnetic Character Rdr | 3,39 | D1 | C | 2.050 | 10 | 1.150 | 284 | 105 | 153 | 107 | 122 | 91 | 91 | 5 |
| 1418 | 1,3 | Optical Character Rdr | 4,6 | D1 | D | 2.650 | 17 | 1.250 | 284 | 105 | 153 | 107 | 122 | 91 | 91 | 5 |
| 1418 | 2 | Optical Character Rdr | 4,6 | D1 | D | 2.650 | 17 | 1.250 | 284 | 105 | 153 | 107 | 122 | 91 | 91 | 5 |
| 1428 | 1,3 | Alphameric Optical Rdr | 4,6 | D1 | D | 2.650 | 17 | 1.250 | 284 | 105 | 153 | 107 | 122 | 91 | 91 | 5 |
| 1428 | 2 | Alphameric Optical Rdr | 4,6 | D1 | D | 2.650 | 17 | 1.300 | 284 | 105 | 153 | 107 | 122 | 91 | 91 | 5 |
| 1445 | N1 | Printer | 1,1 | A1 | A | 810 | 2 | 380 | 142 | 109 | 117 | 91 | 91 | 122 | 76 | |
| 2167 | 1-4 | Configuration Unit | 0,65 | A2 | A | 510 | 15 | 270 | | | 117 | | | | | 1 |
| 2302 | 3 | Disk Storage | 9,0 | E- | E | 5.050 | 63 | 1.850 | 217 | 84 | 175 | 152 | 152 | 152 | 152 | 3-5,7 |
| 2302 | 4 | Disk Storage | 12,6 | E- | E | 7.100 | 63 | 2.050 | 217 | 84 | 175 | 152 | 152 | 152 | 152 | 3-5,7 |
| 2361 | 1 | Core Storage | 4,5 | E3 | E | 2.800 | 35 | 970 | 229 | 81 | 179 | 183 | 76 | 76 | 91 | 3 |
| 2361 | 2 | Core Storage | 7,0 | E3 | E | 4.400 | 35 | 970 | 229 | 81 | 179 | 183 | 76 | 76 | 91 | 3 |
| 2365 | 2,3 | Processor Storage | 7,4 | E3 | E | 6.400 | 43 | 1.250 | | | 184 | | | | | 1 |
| 2365 | 5 | Processor Storage | 4,0 | | | 3.800 | 22 | 1.150 | 75 | 213 | 184 | 76 | 76 | | | 1,4 |
| 2365 | 12 | Processor Storage | 8,5 | E3 | E | 7.350 | 67 | 1.500 | | | 184 | | | | | 1 |
| 2365 | 13 | Processor Storage | 7,4 | E3 | E | 6.400 | 43 | 1.250 | | | 184 | | | | | 1 |
| 2385 | 1 | Processor Storage | | | | | 220 | | | | 198 | | | | | 1 |
| 2385 | 2 | Processor Storage | | | | | 420 | | | | 198 | | | | | 1 |
| 2846 | 1 | Channel Controller | 0,88 | A2 | A | 660 | 26 | 910 | | | 184 | 76 | 122 | 183 | 140 | 1 |
| 3060 | 1 | System Console | | | | 3.550 | 32 | 1.150 | | | 170 | 76 | 61 | 91 | 107 | 1,3,4 |
| 3080 | 1-3 | Power Unit | | | | | 0 | 590 | 88 | 81 | 152 | 91 | | | | 1,3,4 |
| 3085 | 1 | Power Dist Unit | | | | | 0 | 460 | 81 | 81 | 152 | 91 | 0 | 91 | 91 | 1,3 |
| 3086 | 1 | Coolant Dist Unit | | | | | 0 | 660 | 159 | 81 | 178 | 91 | 91 | 91 | 0 | 1,3 |
| 7772 | 3 | Audio Response Unit | 2,0 | A3 | A | 1.300 | 51 | 280 | 95 | 80 | 178 | 107 | 91 | 76 | 76 | |

Notes:

1. Parameters not shown may be found in the system/machine specifications.
2. When SF #3622 is installed, an additional receptacle (for power cord style A or connector note A) is required.
3. This unit is equipped with radio interference control circuits and requires a good insulated wired earth or building ground. Total resistance of the ground conductor, measured between the receptacle and the building grounding point, must not exceed 3 ohms. For proper operation, all components of the system or systems to which this unit is attached must have the same ground reference. Conduit is not a satisfactory means of grounding.
4. Powered from another unit.
5. Shipped in sections. See specifications page.
6. Two identical electrical services are required.
7. For airflow, see specifications page for 2302 Disk Storage.

Power Cord Notes:

See Appendix C for power cord specifications. For service size ratings, see the following connector notes which can also be applied to 200/220/235V, 50-Hz units. For 380/408V, 50-Hz units, the rating should be decided by using power cord specifications in Appendix C.

Connector Notes:

| | Plug | Connector | Receptacle | Service Rating* |
|---|---|---|---|---|
| A | Russell and Stoll, FS3720 | FS3913 | FS3743 | 15A, 1 phase, 3 wire |
| B | Russell and Stoll, FS3730 | FS3914 | FS3744 | 15A, 3 phase, 4 wire |
| C | Russell and Stoll, FS3750 | FS3933 | FS3753 | 30A, 1 phase, 3 wire |
| D | Russell and Stoll, FS3760 | FS3934 | FS3754 | 30A, 3 phase, 4 wire |
| E | Russell and Stoll, SC7328 | SC7428 | SC7324 | 60A, 3 phase, 4 wire |
| F | Russell and Stoll, JPS1034H | JCS1034H | JRSR1034H | 100A, 3 phase, 4 wire |
| G | 115V Hubbell or Pass and Seymour, 5266 (nonlocking) | 5269 | 5261 or 5262 | 15A, 1 phase, 3 wire |
| H | 208/230V Hubbell or Pass and Seymour, 5666 (nonlocking) | 5669 | 5661 or 5662 | 15A, 1 phase, 3 wire |
| J | 115V Hubbell or Pass and Seymour, 4720/4723 (locking) | 4730 | 4700 or 4710 | 15A, 1 phase, 3 wire |
| K | 208/230V Hubbell or Pass and Seymour, 4770 (locking) | 4780 | 4750 or 4760 | 15A, 1 phase, 3 wire |
| L | Russell and Stoll, FS3720-20 | FS3913-20 | FS3743-20 | 20A, 1 phase, 3 wire |

*The plugs, connectors, and receptacles listed are for use on 208V or 230V services. The 115V options are not available unless noted. The number of wires includes one insulated grounding conductor (green or green with yellow trace).

## Appendix G. Inch-to-Centimeter Conversion Table

| in. | cm | in. | cm | in. | cm | in. | cm | in. | cm | in. | cm | in. | cm | in. | cm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1/8 | 0,318 | 48 | 122 | 98 | 249 | 148 | 376 | 198 | 503 | 248 | 630 | 298 | 757 | 348 | 884 |
| 1/4 | 0,635 | 48-1/2 | 123 | 98-1/2 | 250 | 148-1/2 | 377 | 198-1/2 | 504 | 248-1/2 | 631 | 298-1/2 | 758 | 348-1/2 | 885 |
| 3/8 | 0,953 | 49 | 124 | 99 | 251 | 149 | 378 | 199 | 505 | 249 | 632 | 299 | 759 | 349 | 886 |
| 1/2 | 1,270 | 49-1/2 | 126 | 99-1/2 | 253 | 149-1/2 | 380 | 199-1/2 | 507 | 249-1/2 | 634 | 299-1/2 | 761 | 349-1/2 | 888 |
| 5/8 | 1,588 | 50 | 127 | 100 | 254 | 150 | 381 | 200 | 508 | 250 | 635 | 300 | 762 | 350 | 889 |
| 3/4 | 1,905 | 50-1/2 | 128 | 100-1/2 | 255 | 150-1/2 | 382 | 200-1/2 | 509 | 250-1/2 | 636 | 300-1/2 | 763 | 350-1/2 | 890 |
| 7/8 | 2,223 | 51 | 130 | 101 | 257 | 151 | 384 | 201 | 511 | 251 | 638 | 301 | 765 | 351 | 892 |
| 1 | 2,540 | 51-1/2 | 131 | 101-1/2 | 258 | 151-1/2 | 385 | 201-1/2 | 512 | 251-1/2 | 639 | 301-1/2 | 766 | 351-1/2 | 893 |
| 1-1/2 | 4 | 52 | 132 | 102 | 259 | 152 | 386 | 202 | 513 | 252 | 640 | 302 | 767 | 352 | 894 |
| 2 | 5 | 52-1/2 | 133 | 102-1/2 | 260 | 152-1/2 | 387 | 202-1/2 | 514 | 252-1/2 | 641 | 302-1/2 | 768 | 352-1/2 | 895 |
| 2-1/2 | 6 | 53 | 135 | 103 | 262 | 153 | 389 | 203 | 516 | 253 | 643 | 303 | 770 | 353 | 897 |
| 3 | 8 | 53-1/2 | 136 | 103-1/2 | 263 | 153-1/2 | 390 | 203-1/2 | 517 | 253-1/2 | 644 | 303-1/2 | 771 | 353-1/2 | 898 |
| 3-1/2 | 9 | 54 | 137 | 104 | 264 | 154 | 391 | 204 | 518 | 254 | 645 | 304 | 772 | 354 | 899 |
| 4 | 10 | 54-1/2 | 138 | 104-1/2 | 265 | 154-1/2 | 392 | 204-1/2 | 519 | 254-1/2 | 646 | 304-1/2 | 773 | 354-1/2 | 900 |
| 4-1/2 | 11 | 55 | 140 | 105 | 267 | 155 | 394 | 205 | 521 | 255 | 648 | 305 | 775 | 355 | 902 |
| 5 | 13 | 55-1/2 | 141 | 105-1/2 | 268 | 155-1/2 | 395 | 205-1/2 | 522 | 255-1/2 | 649 | 305-1/2 | 776 | 355-1/2 | 903 |
| 5-1/2 | 14 | 56 | 142 | 106 | 269 | 156 | 396 | 206 | 523 | 256 | 650 | 306 | 777 | 356 | 904 |
| 6 | 15 | 56-1/2 | 144 | 106-1/2 | 271 | 156-1/2 | 398 | 206-1/2 | 525 | 256-1/2 | 652 | 306-1/2 | 779 | 356-1/2 | 906 |
| 6-1/2 | 17 | 57 | 145 | 107 | 272 | 157 | 399 | 207 | 526 | 257 | 653 | 307 | 780 | 357 | 907 |
| 7 | 18 | 57-1/2 | 146 | 107-1/2 | 273 | 157-1/2 | 400 | 207-1/2 | 527 | 257-1/2 | 654 | 307-1/2 | 781 | 357-1/2 | 908 |
| 7-1/2 | 19 | 58 | 147 | 108 | 274 | 158 | 401 | 208 | 528 | 258 | 655 | 308 | 782 | 358 | 909 |
| 8 | 20 | 58-1/2 | 149 | 108-1/2 | 276 | 158-1/2 | 403 | 208-1/2 | 530 | 258-1/2 | 657 | 308-1/2 | 784 | 358-1/2 | 911 |
| 8-1/2 | 22 | 59 | 150 | 109 | 277 | 159 | 404 | 209 | 531 | 259 | 658 | 309 | 785 | 359 | 912 |
| 9 | 23 | 59-1/2 | 151 | 109-1/2 | 278 | 159-1/2 | 405 | 209-1/2 | 532 | 259-1/2 | 659 | 309-1/2 | 786 | 359-1/2 | 913 |
| 9-1/2 | 24 | 60 | 152 | 110 | 279 | 160 | 406 | 210 | 533 | 260 | 660 | 310 | 787 | 360 | 914 |
| 10 | 25 | 60-1/2 | 154 | 110-1/2 | 281 | 160-1/2 | 408 | 210-1/2 | 535 | 260-1/2 | 662 | 310-1/2 | 789 | 360-1/2 | 916 |
| 10-1/2 | 27 | 61 | 155 | 111 | 282 | 161 | 409 | 211 | 536 | 261 | 663 | 311 | 790 | 361 | 917 |
| 11 | 28 | 61-1/2 | 156 | 111-1/2 | 283 | 161-1/2 | 410 | 211-1/2 | 537 | 261-1/2 | 664 | 311-1/2 | 791 | 361-1/2 | 918 |
| 11-1/2 | 29 | 62 | 157 | 112 | 284 | 162 | 411 | 212 | 538 | 262 | 665 | 312 | 792 | 362 | 919 |
| 12 | 30 | 62-1/2 | 159 | 112-1/2 | 286 | 162-1/2 | 413 | 212-1/2 | 540 | 262-1/2 | 667 | 312-1/2 | 794 | 362-1/2 | 921 |
| 12-1/2 | 32 | 63 | 160 | 113 | 287 | 163 | 414 | 213 | 541 | 263 | 668 | 313 | 795 | 363 | 922 |
| 13 | 33 | 63-1/2 | 161 | 113-1/2 | 288 | 163-1/2 | 415 | 213-1/2 | 542 | 263-1/2 | 669 | 313-1/2 | 796 | 363-1/2 | 923 |
| 13-1/2 | 34 | 64 | 163 | 114 | 290 | 164 | 417 | 214 | 544 | 264 | 671 | 314 | 798 | 364 | 925 |
| 14 | 36 | 64-1/2 | 164 | 114-1/2 | 291 | 164-1/2 | 418 | 214-1/2 | 545 | 264-1/2 | 672 | 314-1/2 | 799 | 364-1/2 | 926 |
| 14-1/2 | 37 | 65 | 165 | 115 | 292 | 165 | 419 | 215 | 546 | 265 | 673 | 315 | 800 | 365 | 927 |
| 15 | 38 | 65-1/2 | 166 | 115-1/2 | 293 | 165-1/2 | 420 | 215-1/2 | 547 | 265-1/2 | 674 | 315-1/2 | 801 | 365-1/2 | 928 |
| 15-1/2 | 39 | 66 | 168 | 116 | 295 | 166 | 422 | 216 | 549 | 266 | 676 | 316 | 803 | 366 | 930 |
| 16 | 41 | 66-1/2 | 169 | 116-1/2 | 296 | 166-1/2 | 423 | 216-1/2 | 550 | 266-1/2 | 677 | 316-1/2 | 804 | 366-1/2 | 931 |
| 16-1/2 | 42 | 67 | 170 | 117 | 297 | 167 | 424 | 217 | 551 | 267 | 678 | 317 | 805 | 367 | 932 |
| 17 | 43 | 67-1/2 | 171 | 117-1/2 | 298 | 167-1/2 | 425 | 217-1/2 | 552 | 267-1/2 | 679 | 317-1/2 | 806 | 367-1/2 | 933 |
| 17-1/2 | 44 | 68 | 173 | 118 | 300 | 168 | 427 | 218 | 554 | 268 | 681 | 318 | 808 | 368 | 935 |
| 18 | 46 | 68-1/2 | 174 | 118-1/2 | 301 | 168-1/2 | 428 | 218-1/2 | 555 | 268-1/2 | 682 | 318-1/2 | 809 | 368-1/2 | 936 |
| 18-1/2 | 47 | 69 | 175 | 119 | 302 | 169 | 429 | 219 | 556 | 269 | 683 | 319 | 810 | 369 | 937 |
| 19 | 48 | 69-1/2 | 177 | 119-1/2 | 304 | 169-1/2 | 431 | 219-1/2 | 558 | 269-1/2 | 685 | 319-1/2 | 812 | 369-1/2 | 939 |
| 19-1/2 | 50 | 70 | 178 | 120 | 305 | 170 | 432 | 220 | 559 | 270 | 686 | 320 | 813 | 370 | 940 |
| 20 | 51 | 70-1/2 | 179 | 120-1/2 | 306 | 170-1/2 | 433 | 220-1/2 | 560 | 270-1/2 | 687 | 320-1/2 | 814 | 370-1/2 | 941 |
| 20-1/2 | 52 | 71 | 180 | 121 | 307 | 171 | 434 | 221 | 561 | 271 | 688 | 321 | 815 | 371 | 942 |
| 21 | 53 | 71-1/2 | 182 | 121-1/2 | 309 | 171-1/2 | 436 | 221-1/2 | 563 | 271-1/2 | 690 | 321-1/2 | 817 | 371-1/2 | 944 |
| 21-1/2 | 55 | 72 | 183 | 122 | 310 | 172 | 437 | 222 | 564 | 272 | 691 | 322 | 818 | 372 | 945 |
| 22 | 56 | 72-1/2 | 184 | 122-1/2 | 311 | 172-1/2 | 438 | 222-1/2 | 565 | 272-1/2 | 692 | 322-1/2 | 819 | 372-1/2 | 946 |
| 22-1/2 | 57 | 73 | 185 | 123 | 312 | 173 | 439 | 223 | 566 | 273 | 693 | 323 | 820 | 373 | 947 |
| 23 | 58 | 73-1/2 | 187 | 123-1/2 | 314 | 173-1/2 | 441 | 223-1/2 | 568 | 273-1/2 | 695 | 323-1/2 | 822 | 373-1/2 | 949 |
| 23-1/2 | 60 | 74 | 188 | 124 | 315 | 174 | 442 | 224 | 569 | 274 | 696 | 324 | 823 | 374 | 950 |
| 24 | 61 | 74-1/2 | 189 | 124-1/2 | 316 | 174-1/2 | 443 | 224-1/2 | 570 | 274-1/2 | 697 | 324-1/2 | 824 | 374-1/2 | 951 |
| 24-1/2 | 62 | 75 | 191 | 125 | 318 | 175 | 444 | 225 | 572 | 275 | 699 | 325 | 826 | 375 | 953 |
| 25 | 64 | 75-1/2 | 192 | 125-1/2 | 319 | 175-1/2 | 446 | 225-1/2 | 573 | 275-1/2 | 700 | 325-1/2 | 827 | 375-1/2 | 954 |
| 25-1/2 | 65 | 76 | 193 | 126 | 320 | 176 | 447 | 226 | 574 | 276 | 701 | 326 | 828 | 376 | 955 |
| 26 | 66 | 76-1/2 | 194 | 126-1/2 | 321 | 176-1/2 | 448 | 226-1/2 | 575 | 276-1/2 | 702 | 326-1/2 | 829 | 376-1/2 | 956 |
| 26-1/2 | 67 | 77 | 196 | 127 | 323 | 177 | 450 | 227 | 577 | 277 | 704 | 327 | 831 | 377 | 958 |
| 27 | 69 | 77-1/2 | 197 | 127-1/2 | 324 | 177-1/2 | 451 | 227-1/2 | 578 | 277-1/2 | 705 | 327-1/2 | 832 | 377-1/2 | 959 |
| 27-1/2 | 70 | 78 | 198 | 128 | 325 | 178 | 452 | 228 | 579 | 278 | 706 | 328 | 833 | 378 | 960 |
| 28 | 71 | 78-1/2 | 199 | 128-1/2 | 326 | 178-1/2 | 453 | 228-1/2 | 580 | 278-1/2 | 707 | 328-1/2 | 834 | 378-1/2 | 961 |
| 28-1/2 | 72 | 79 | 201 | 129 | 328 | 179 | 455 | 229 | 582 | 279 | 709 | 329 | 836 | 379 | 963 |
| 29 | 74 | 79-1/2 | 202 | 129-1/2 | 329 | 179-1/2 | 456 | 229-1/2 | 583 | 279-1/2 | 710 | 329-1/2 | 837 | 379-1/2 | 964 |
| 29-1/2 | 75 | 80 | 203 | 130 | 330 | 180 | 457 | 230 | 584 | 280 | 711 | 330 | 838 | 380 | 965 |
| 30 | 76 | 80-1/2 | 204 | 130-1/2 | 331 | 180-1/2 | 458 | 230-1/2 | 585 | 280-1/2 | 712 | 330-1/2 | 839 | 380-1/2 | 966 |
| 30-1/2 | 77 | 81 | 206 | 131 | 333 | 181 | 460 | 231 | 587 | 281 | 714 | 331 | 841 | 381 | 968 |
| 31 | 79 | 81-1/2 | 207 | 131-1/2 | 334 | 181-1/2 | 461 | 231-1/2 | 588 | 281-1/2 | 715 | 331-1/2 | 842 | 381-1/2 | 969 |
| 31-1/2 | 80 | 82 | 208 | 132 | 335 | 182 | 462 | 232 | 589 | 282 | 716 | 332 | 843 | 382 | 970 |
| 32 | 81 | 82-1/2 | 210 | 132-1/2 | 337 | 182-1/2 | 464 | 232-1/2 | 591 | 282-1/2 | 718 | 332-1/2 | 845 | 382-1/2 | 972 |
| 32-1/2 | 83 | 83 | 211 | 133 | 338 | 183 | 465 | 233 | 592 | 283 | 719 | 333 | 846 | 383 | 973 |
| 33 | 84 | 83-1/2 | 212 | 133-1/2 | 339 | 183-1/2 | 466 | 233-1/2 | 593 | 283-1/2 | 720 | 333-1/2 | 847 | 383-1/2 | 974 |
| 33-1/2 | 85 | 84 | 213 | 134 | 340 | 184 | 467 | 234 | 594 | 284 | 721 | 334 | 848 | 384 | 975 |
| 34 | 86 | 84-1/2 | 215 | 134-1/2 | 342 | 184-1/2 | 469 | 234-1/2 | 596 | 284-1/2 | 723 | 334-1/2 | 850 | 384-1/2 | 977 |
| 34-1/2 | 88 | 85 | 216 | 135 | 343 | 185 | 470 | 235 | 597 | 285 | 724 | 335 | 851 | 385 | 978 |
| 35 | 89 | 85-1/2 | 217 | 135-1/2 | 344 | 185-1/2 | 471 | 235-1/2 | 598 | 285-1/2 | 725 | 335-1/2 | 852 | 385-1/2 | 979 |
| 35-1/2 | 90 | 86 | 218 | 136 | 345 | 186 | 472 | 236 | 599 | 286 | 726 | 336 | 853 | 386 | 980 |
| 36 | 91 | 86-1/2 | 220 | 136-1/2 | 347 | 186-1/2 | 474 | 236-1/2 | 601 | 286-1/2 | 728 | 336-1/2 | 855 | 386-1/2 | 982 |
| 36-1/2 | 93 | 87 | 221 | 137 | 348 | 187 | 475 | 237 | 602 | 287 | 729 | 337 | 856 | 387 | 983 |
| 37 | 94 | 87-1/2 | 222 | 137-1/2 | 349 | 187-1/2 | 476 | 237-1/2 | 603 | 287-1/2 | 730 | 337-1/2 | 857 | 387-1/2 | 984 |
| 37-1/2 | 95 | 88 | 224 | 138 | 351 | 188 | 478 | 238 | 605 | 288 | 732 | 338 | 859 | 388 | 986 |
| 38 | 97 | 88-1/2 | 225 | 138-1/2 | 352 | 188-1/2 | 479 | 238-1/2 | 606 | 288-1/2 | 733 | 338-1/2 | 860 | 388-1/2 | 987 |
| 38-1/2 | 98 | 89 | 226 | 139 | 353 | 189 | 480 | 239 | 607 | 289 | 734 | 339 | 861 | 389 | 988 |
| 39 | 99 | 89-1/2 | 227 | 139-1/2 | 354 | 189-1/2 | 481 | 239-1/2 | 608 | 289-1/2 | 735 | 339-1/2 | 862 | 389-1/2 | 989 |
| 39-1/2 | 100 | 90 | 229 | 140 | 356 | 190 | 483 | 240 | 610 | 290 | 737 | 340 | 864 | 390 | 991 |
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