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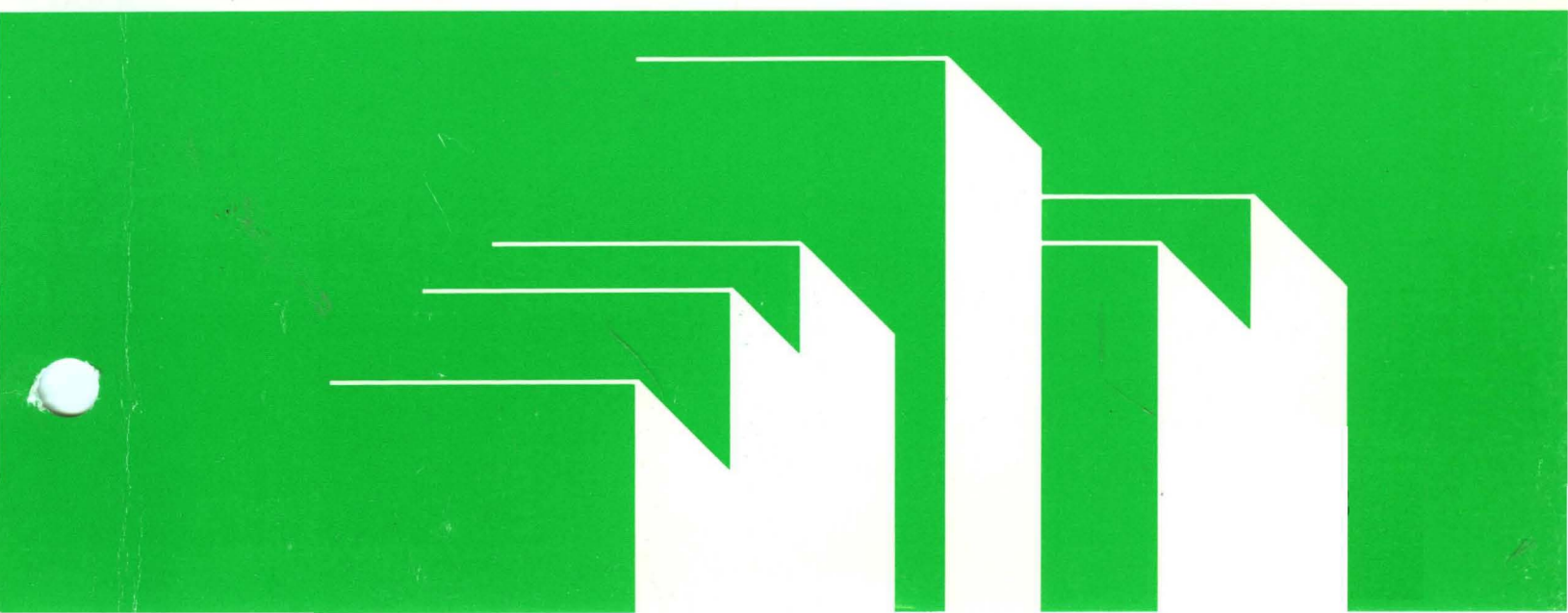
IBM System/370

Installation Manual–Physical Planning

IBM



IBM System/370

Installation Manual—Physical Planning

Publication Number
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File Number
S370-15

Federal Communications Commission (FCC) Statement

Warning: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

The preceding statement applies to equipment covered by this Installation Manual–Physical Planning (IM–PP). This equipment has been tested and found to comply with the limits for a Class A computing device as described.

For machines manufactured before January 1, 1981, the FCC does not require compliance. To determine the exact category of your machine, refer to the label attached to the machine.

CAUTION

The power attachment cable plug (when supplied) is approved for use with the particular machines and meets the relevant testing laboratory or country/test-house standards. For the user's safety, the plug must be connected to a properly wired and grounded receptacle. An improperly wired receptacle could place a hazardous voltage on accessible metal parts of the machine. The customer is responsible for receptacle wiring.

Fifteenth Edition (June 1985)

This major revision obsoletes GC22-7004-13 and the following Technical Newsletters:

GN22-2097
GN22-2098
GN22-2099

This edition deletes Section 1 of this manual and adds miscellaneous information and changes. The deleted material from this manual is now in *IBM General Information Manual Installation Manual–Physical Planning,* GC22-7072. Changes or additions to the text or to an illustration are indicated by a vertical line to the left of the change.

Changes are made periodically to the information herein; before using this publication in connection with the installation and operation of IBM equipment, refer to the latest *IBM System/370 and 4300 Processors Bibliography,* GC20-0001, for the editions that are applicable and current.

References in this publication to IBM products, programs, or services do not imply that IBM intends to make these available in all countries in which IBM operates. Any reference to an IBM program product in this publication is not intended to state or imply that only IBM's program product may be used. Any functionally equivalent program may be used instead.

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This manual contains information necessary for planning the physical installation of the IBM System/370.

The customer, in planning his installation, may request the assistance of an IBM Installation Planning representative.

This manual is divided into two sections with six reference appendixes.

- **Section 1** gives detailed specifications and cabling information for the various models of System/370.
- **Section 2** contains other general cabling information for the installation of System/370.

The six reference appendixes, which are listed in the Contents, contain additional information and cross-references.

The following publications may be used with this manual depending on the specific system configuration:

Assembly of Coaxial Cables and Accessories for Attachment to IBM Products, GA27-2805

IBM 3270 Information Display System Installation Manual–Physical Planning, GA27-2787

IBM 3790 Communication System Installation Manual–Physical Planning, GA27-2769

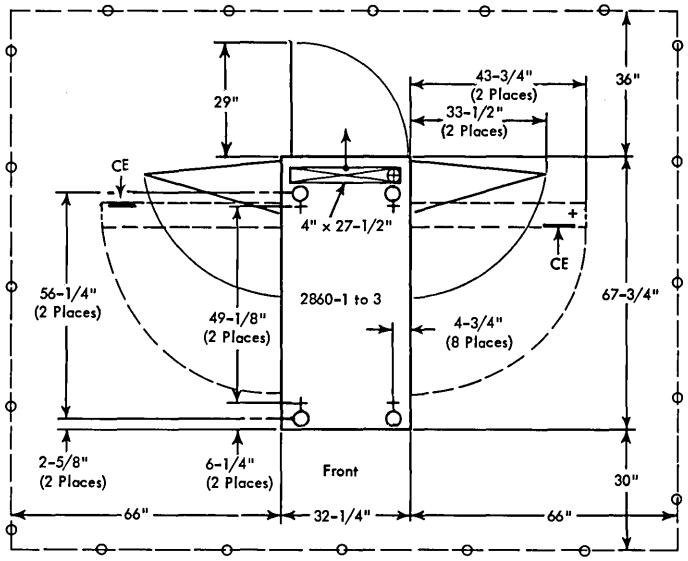
This manual is a companion to and should be used with *IBM Input/Output Equipment, Installation Manual–Physical Planning: System/360, System/370, and 4300 Processors*, GC22-7064, *IBM Input/Output Equipment Reference Installation Manual–Physical Planning: System/360, System/370, and 4300 Processors*, GC22-7069, and *IBM General Information Manual Installation Manual–Physical Planning*, GC22-7072.

Section 1. Specifications and Cabling Schematics

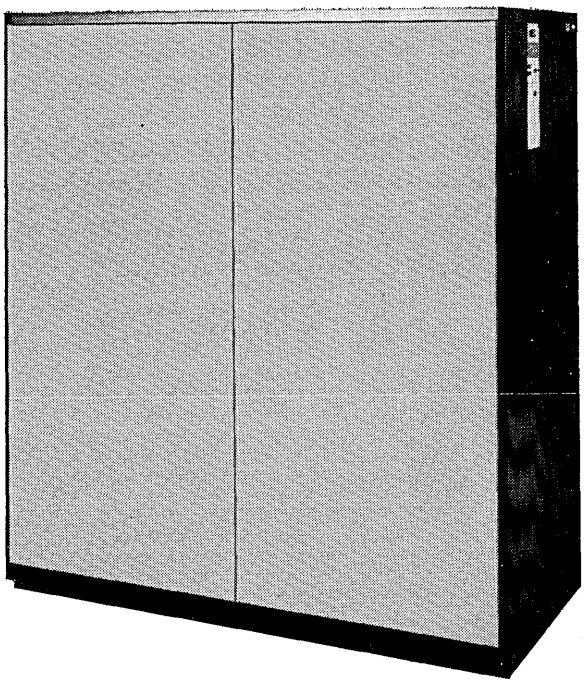
Section 1. Specifications and Cabling Schematics

2860 SELECTOR CHANNEL MODELS 1 TO 3

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Note: For cabling information, see host processor.



SPECIFICATIONS

Dimensions:

	F	S	H
Inches	32-1/4*	67-3/4*	70-3/4
(cm)	(82*)	(172*)	(180)

Service Clearances:

	F	R	Rt	L
Inches	30	36	66	66
(cm)	(76)	(91)	(168)	(168)

Weight:	*Model 1*	*Model 2*	*Model 3*
lb	1,150	1,450	1,750
(kg)	(530)	(660)	(800)

Heat Output:			
BTU/hr	4,200	4,400	4,700
(kcal/hr)	(1 100)	(1 150)	(1 200)

Airflow:			
cfm	420	740	1,060
(m^3/min)	(12)	(21)	(31)

Power Requirements:

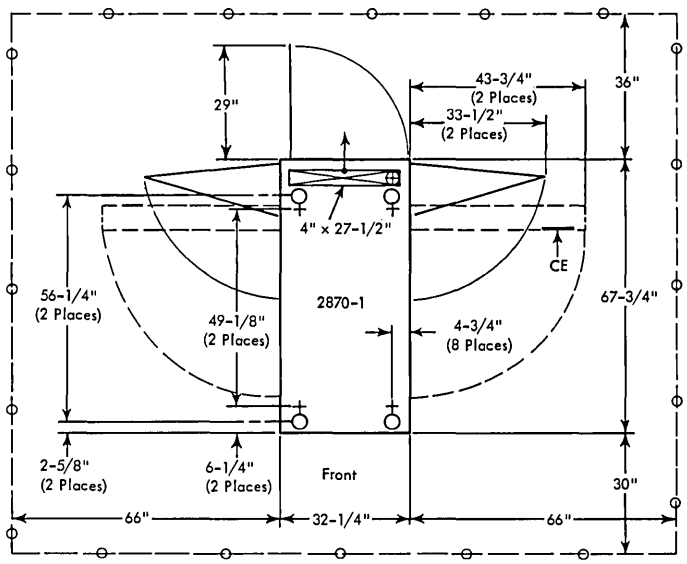
kVA	1.6	1.7	1.8
Phases	3	3	3
Plug	R&S, FS3730		
Connector	R&S, FS3914		
Receptacle	R&S, FS3744		
Power Cord Style	B1		

Notes:

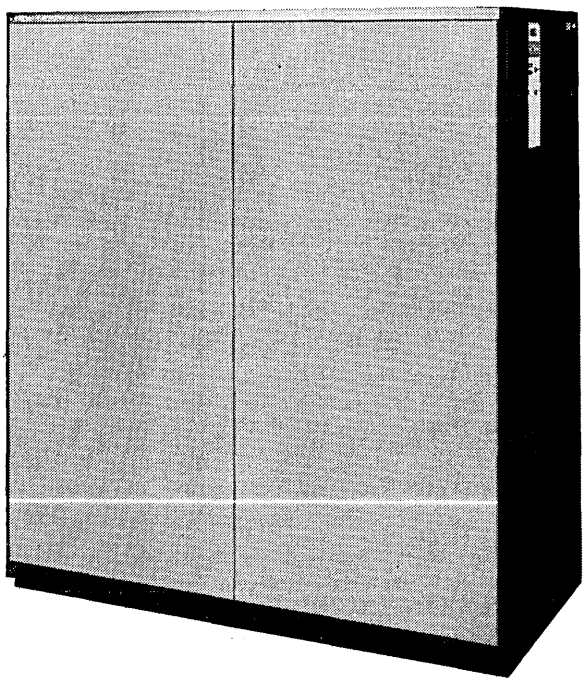
* Dimensions can be reduced to 29-1/2" (75 cm) x 60" (152 cm) for shipping.

2870 MULTIPLEXER CHANNEL MODEL 1

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Note: For cabling information, see host processor.



SPECIFICATIONS

Dimensions:

	F	S	H
Inches	32-1/4*	67-3/4*	70-3/4
(cm)	(82*)	(172*)	(180)

Service Clearances:

	F	R	Rt	L
Inches	30	36	66	66
(cm)	(76)	(91)	(168)	(168)

Weight: 1,450 lb (660 kg)

Heat Output:	*50 Hz*	*60 Hz*
BTU/hr	4,200	4,900
(kcal/hr)	(1 100)	(1 250)

Airflow:

cfm	1,060	1,060
(m^3/min)	(31)	(31)

Power Requirements:

kVA	1.6	1.9
Phases	3	3
Plug	R&S, FS3730**	
Connector	R&S, FS3914**	
Receptacle	R&S, FS3744**	
Power Cord Style	B1	

Notes:

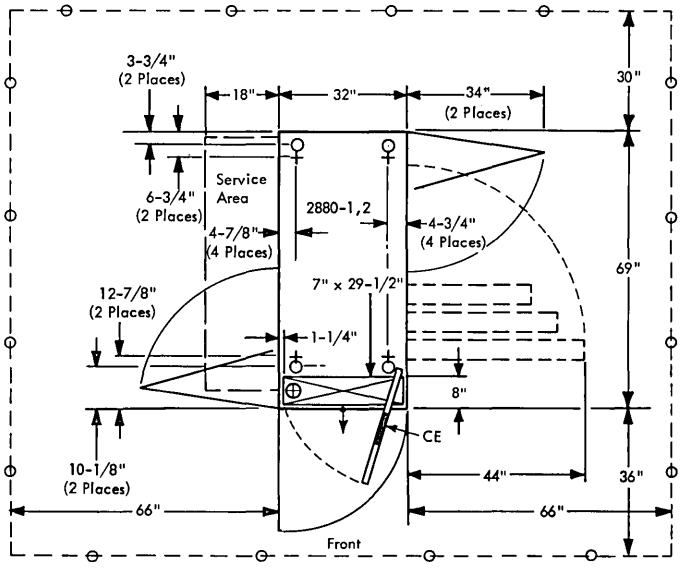
* Dimensions can be reduced to 29-1/2" (75 cm) x 60" (152 cm) for shipping.

** Applicable to serial number 70502 and higher. Prior units use:

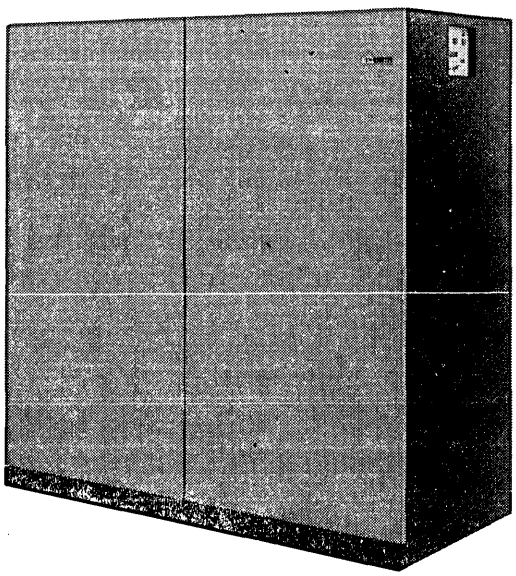
Plug	R&S, FS3760
Connector	R&S, FS3934
Receptacle	R&S, FS3754

2880 BLOCK MULTIPLEXER CHANNEL MODELS 1 AND 2

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Note: For cabling information, see host processor.



SPECIFICATIONS

Dimensions:

	F	S	H
Inches	32	69	71
(cm)	(81)	(175)	(180)

Service Clearances:

	F	R	Rt	L
Inches	36	30	66	66
(cm)	(91)	(76)	(168)	(168)

Weight:	*Model 1*	*Model 2*
lb	1,970	2,385
(kg)	(900)	(1 100)

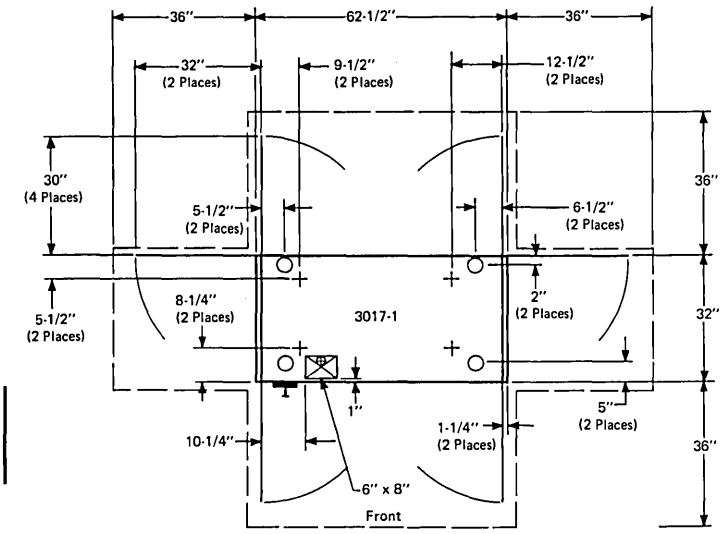
Heat Output:		
BTU/hr	13,660	22,200
(kcal/hr)	(3 450)	(5 600)

Airflow:		
cfm	550	900
(m^3/min)	(16)	(26)

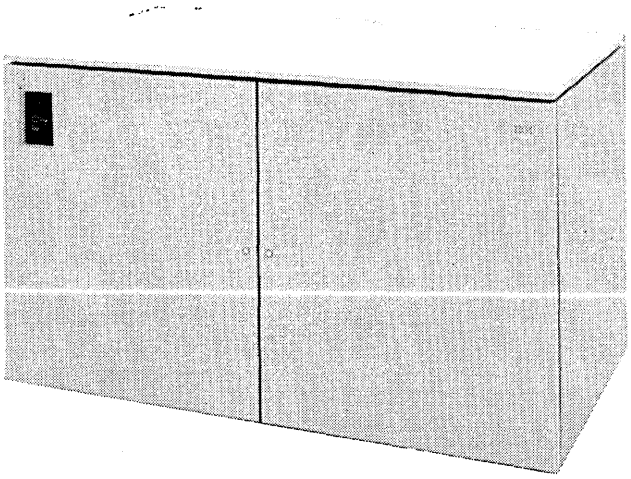
Power Requirements:		
kVA	4.8	7.3
Phases	3	3
Plug	R&S, FS3760	
Connector	R&S, FS3934	
Receptacle	R&S, FS3754	
Power Cord Style	D1	

3017 POWER UNIT MODEL 1

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Notes:
1. Caster and cable hole locating dimensions are measured from edge of frame, not cover.
2. For cabling information, see 3031 Processor.
3. Use one-half of the clearance distance, measured from the machine, for weight distribution.



SPECIFICATIONS

Dimensions:

	F	S	H
Inches	62-1/2	32	40
(cm)	(159)	(81)	(102)

Service Clearances:

	F	R	Rt	L
Inches	36	36	36	36
(cm)	(91)	(91)	(91)	(91)

Weight:	*50 Hz*	*60 Hz*
lb	965	900
(kg)	(440)	(410)

Heat Output:	*With 3031*	*With 3041*
BTU/hr	18,500	13,875
(kcal/hr)	(4 700)	(3 500)

Airflow:

cfm	380	380
(m^3/min)	(11)	(11)

Power Requirements:*

kVA	6.7	5.0
Phases	3	3
Plug	JPS1034H	
Connector	JCS1034H	
Receptacle	JRSA1034H	
Power Cord Style	F2	

Shipping Dimensions:

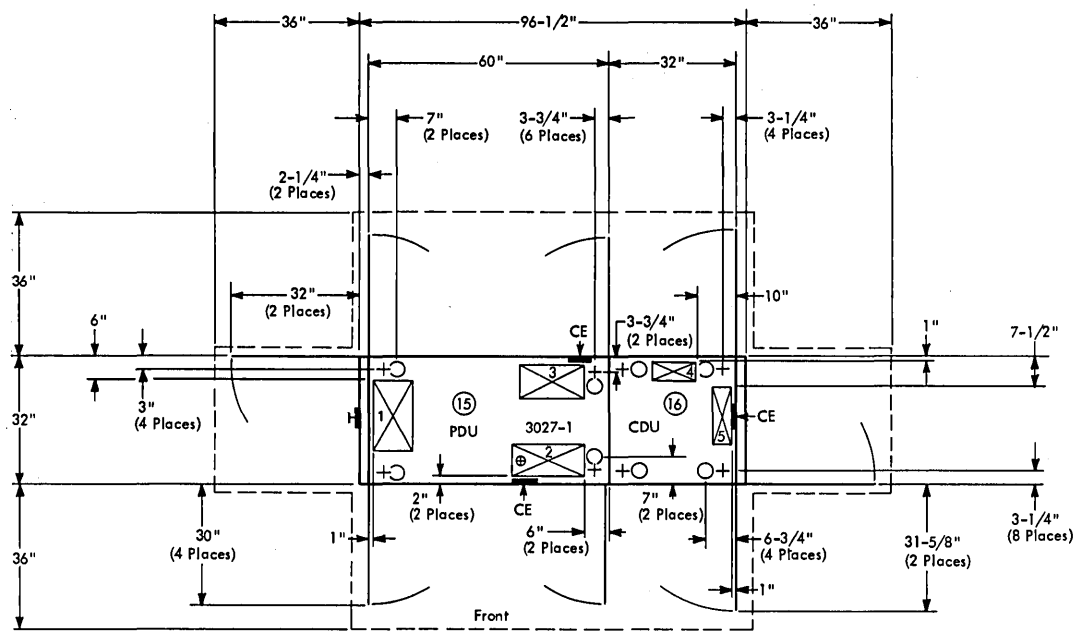
With Packing	*Outer Packing Removed*
62-1/2" x 32" (159 cm x 81 cm)	62-1/2" x 32" (159 cm x 81 cm)

Notes:

* Includes power used and dissipated as heat within the 3017-1. Does not include power used by 3031 or 3041. See 3031 or 3041 specification pages.

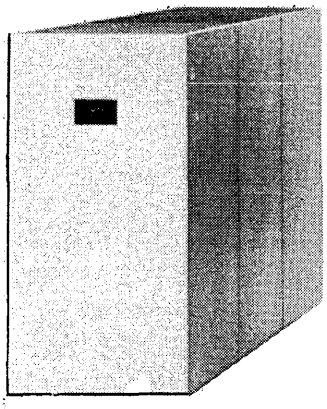
3027 POWER AND COOLANT DISTRIBUTION UNIT MODEL 1 FOR 3032 PROCESSOR COMPLEX

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Cable Entry/ Exit Number	Dimension (Inches)	Notes
1	10 x 17-1/2	
2	8 x 18	1
3	8 x 16	
4	5 x 11	2
5	5 x 14-1/2	3

Notes:
1. See Details A and B on page 3027.3.
2. Customer chilled water supply and return.
3. IBM supply and return.
4. For cabling information, see 3033 Processor or 3033 Processor Model Group N.
5. Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame, not cover. Frame side covers are 1-1/4" thick.
6. Use one-half of the clearance distance, measured from the machine, for weight distribution.



3027 POWER AND COOLANT DISTRIBUTION UNIT MODEL 1 FOR 3032 PROCESSOR COMPLEX

SPECIFICATIONS

Dimensions:

	F	S	H
Inches	96-1/2	32	70
(cm)	(245)	(81)	(178)

Service Clearances:

	F	R	Rt	L
Inches	36	36	36	36
(cm)	(91)	(91)	(91)	(91)

Weight: 2,825 lb (1 290 kg)

Heat Output:

Air	11,550 BTU/hr (2 950 kcal/hr)
Water	32,550 BTU/hr (8 250 kcal/hr)

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

Power Requirements:

	*kVA**	
3032 Models	*50/60 Hz*	*415/441 Hz*
2	4.9	44.1
4	4.9	45.5
6	4.9	47.1
8	4.9	48.9

	50/60 Hz	*415/441 Hz*
Phases	3	Refer to Appendix A, Part 6
Plug	R&S, FS3760	
Connector	R&S, FS3934	
Receptacle	R&S, FS3754	
Power Cord Style	B1	

The PCDU (frame 15):

1. Requires 3-phase, 200/220/235/380/408 V + 10%, –8%, 50-Hz ±0.5-Hz, or 200/208/230 V + 10%, –8%, 60-Hz ± 0.5-Hz customer service.
2. Receives 3-phase, 208 V, 415/441-Hz (nominal) power from the remote motor generator (hardwired) or other source. Refer to Appendix A, Part 6.

Environment, Operating:

Temperature	60°F-90°F (16°C-32°C)
Rel Humidity	20%-80%
Max Wet Bulb	72°F (22°C)**

Environment, Nonoperating:

Temperature	50°F-110°F (10°C-43°C)
Rel Humidity	8%-80%
Max Wet Bulb	80°F (27°C)**

Shipping Dimensions:

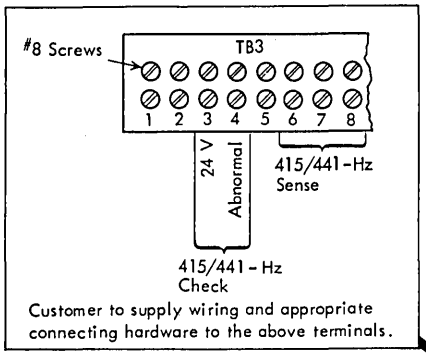
Frame	*With Packing*	*Outer Packing Removed*
15	65" x 32" (165 cm x 81 cm)	64" x 32" (163 cm x 81 cm)
16	36" x 32" (91 cm x 81 cm)	35" x 32" (89 cm x 81 cm)

Notes:

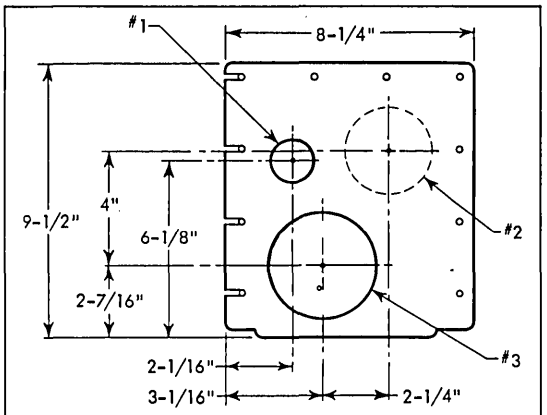
* For SF #3850, extended channels, add 0.2 kVA to 50/60-Hz power requirements and 4.3 kVA to 415/441-Hz power requirements.

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

3027 POWER AND COOLANT DISTRIBUTION UNIT MODEL 1

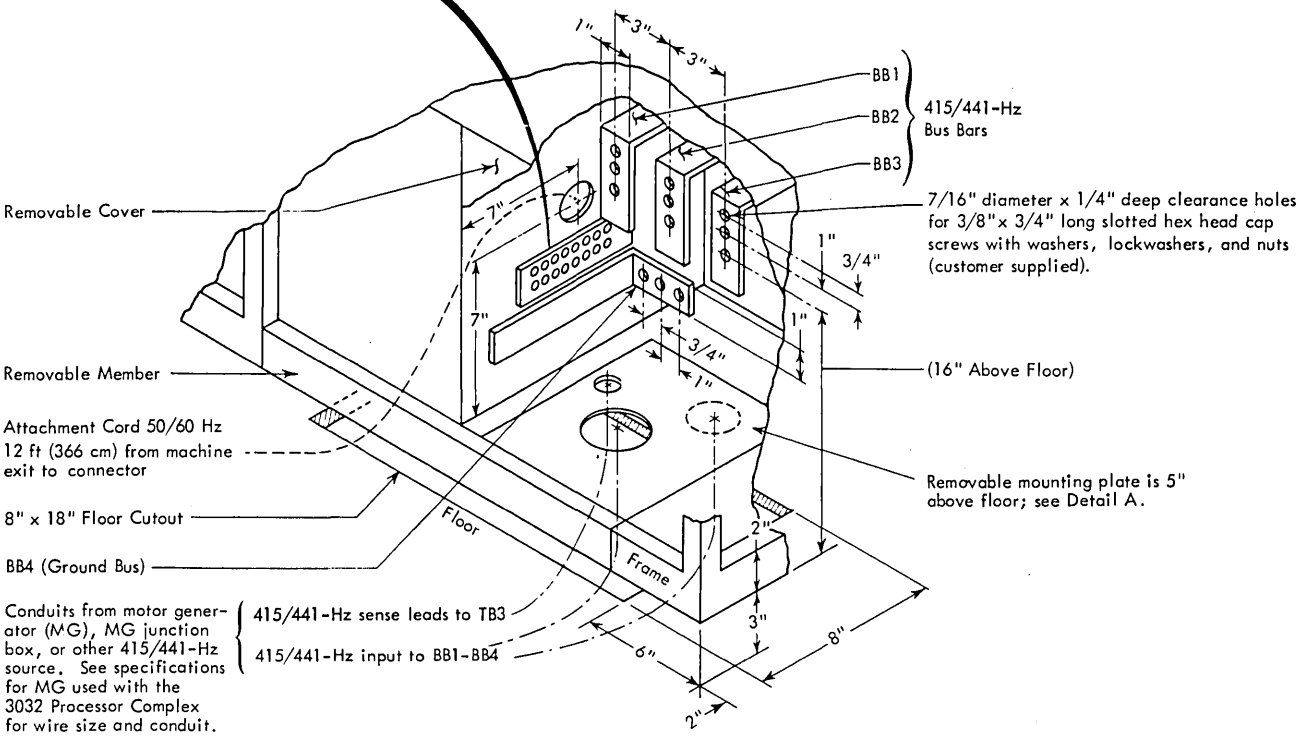


Customer to supply wiring and appropriate connecting hardware to the above terminals.



Mounting plate for conduit attachment.
#1: 1-3/8" diameter hole for 1" conduit.
#2: 3" diameter prefabricated knockout for 2-1/2" conduit.
#3: 2-1/2", 3", or 3-5/8" diameter hole for 2", 2-1/2", or 3" conduit, respectively.

Detail A



Detail B

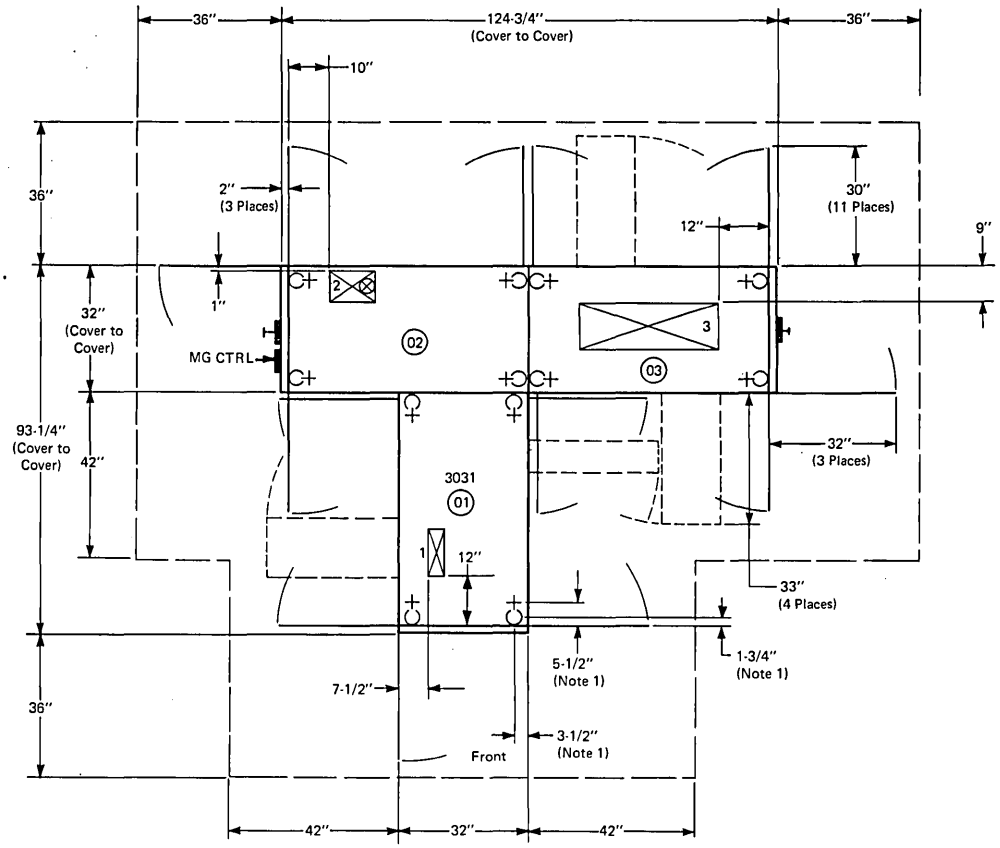
Note: If 415/441-Hz planned input source for the 3027 does not meet specifications for the MG used with 3032 Processor Complex as shown in this manual, contact your local IBM Installation Planning representative.

Inches	Millimeters
1/4	6.4
3/8	9.5
7/16	11.1
3/4	19.1
1	25.4
1-3/8	34.9
2	50.8
2-1/16	51.0
2-1/4	57.2
2-7/16	61.9
2-1/2	63.5
3	76.2

Inches	Millimeters
3-1/16	76.4
3-5/8	92.1
4	101.6
5	127.0
6	152.4
6-1/8	155.6
7	177.8
8	203.2
8-1/4	209.6
9-1/2	241.3
16	406.4
18	457.2

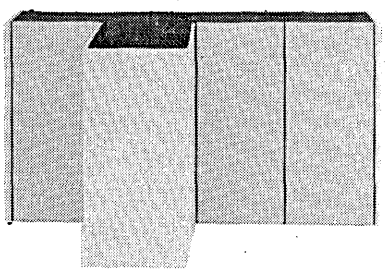
3031 PROCESSOR

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Cable Entry/Exit Number	Dimension (Inches)
1	4 x 12
2	8 x 12
3	12 x 36

Notes:
1. Typical dimensions for casters and leveling pads on frames 01, 02, and 03 are shown on frame 01.
2. Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame, not cover. Frame side covers are 1-1/4" thick.
3. Typical dimensions for frames 01, 02, and 03. Width of frames is 29-1/2", without covers; length of frames is 60", without covers.
4. Use one-half of the clearance distance, measured from the machine, for weight distribution.



Details (By Frame)

Frame	*Model*	*Weight lb (kg)*	*Airflow cfm (m^3/min)*	*Heat Output BTU/hr (kcal/hr)*	*kVA*
01	All	1,950 (890)	1,320 (37)	16,550 (4 200)	5.7
02	All	775 (350)	150 (4)	850 (220)	0.3
03	2	2,150 (980)	1,780 (50)	20,000 (5 100)	6.9
03	3	2,150 (980)	1,780 (50)	21,750 (5 500)	7.5
03	4	2,150 (980)	1,780 (50)	23,500 (6 000)	8.1
03	5	2,150 (980)	1,780 (50)	25,250 (6 400)	8.7
03	6	2,150 (980)	1,780 (50)	27,000 (6 900)	9.3
03	7	2,150 (980)	2,020 (57)	28,750 (7 250)	9.9
03	8	2,150 (980)	2,020 (57)	30,500 (7 700)	10.5

Details (By Model)

Model	*Weight lb (kg)*	*Airflow cfm (m^3/min)*	*Heat Output BTU/hr (kcal/hr)*	*Power Requirements*		
				*50/60 Hz**	*From** 3017-1*	*Total*
2	4,875 (2 250)	3,250 (92)	37,400 (9 450)	1.7	12.9	14.6
3	4,875 (2 250)	3,250 (92)	39,150 (9 900)	1.7	13.5	15.2
4	4,875 (2 250)	3,250 (92)	40,900 (10 350)	1.7	14.1	15.8
5	4,875 (2 250)	3,250 (92)	42,650 (10 750)	1.7	14.7	16.4
6	4,875 (2 250)	3,250 (92)	44,400 (11 200)	1.7	15.3	17.0
7	4,875 (2 250)	3,490 (99)	46,150 (11 650)	1.9	15.9	17.8
8	4,875 (2 250)	3,490 (99)	47,900 (12 100)	1.9	16.5	18.4

SPECIFICATIONS

Dimensions:

	F	S	H
Inches	***	***	70-1/2
(cm)	(***)	(***)	(179)

Service Clearances:

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

Power Requirements:

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

Environment, Operating:

Temperature	60^{o}F-90^{o}F (16^{o}C-32^{o}C)
Rel Humidity	20%-80%
Max Wet Bulb	73^{o}F (23^{o}C)

Shipping Dimensions:

Frame	*With Packing*	*Outer Packing Removed*
01, 02, 03	65-1/2" x 32" (166 cm x 81 cm)	63-1/2" x 32" (161 cm x 81 cm)

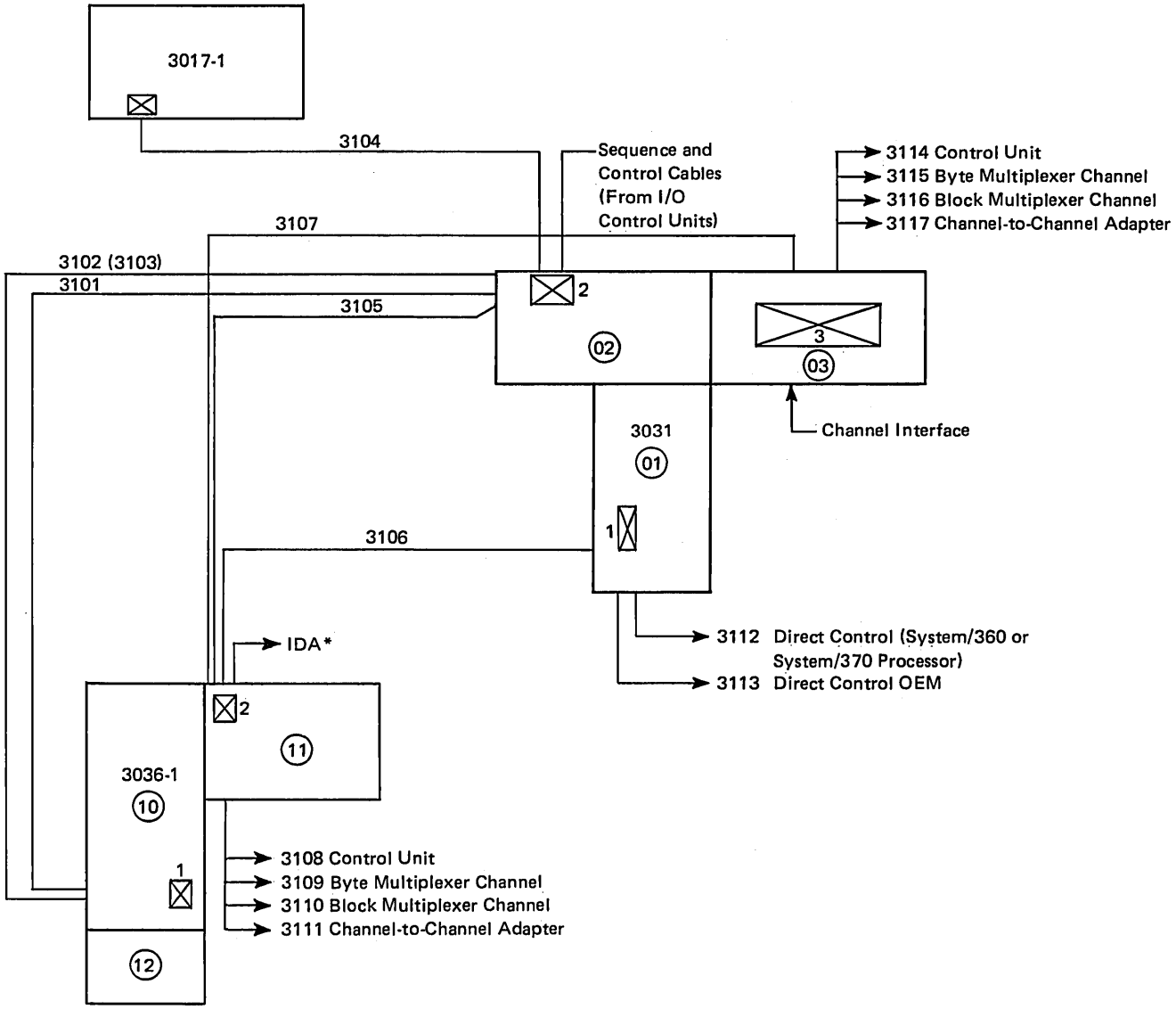
Notes:

*Includes 50/60-Hz power for the 3036 Console Model 1.

** Includes 415/441-Hz power for the 3036 Console Model 1. See 3017 Power Unit Model 1 for additional power requirements.

***See plan view.

3031 PROCESSOR COMPLEX CABLING SCHEMATIC



*For processors installed in U.S. and Canada, integrated data adapter (IDA) cable (provided with the processor) enters cable entry in frame 11. Data Access Arrangement (DAA) type CDT must be within 50 feet of cable entry in frame 11.

3031 PROCESSOR COMPLEX CABLING SCHEMATIC

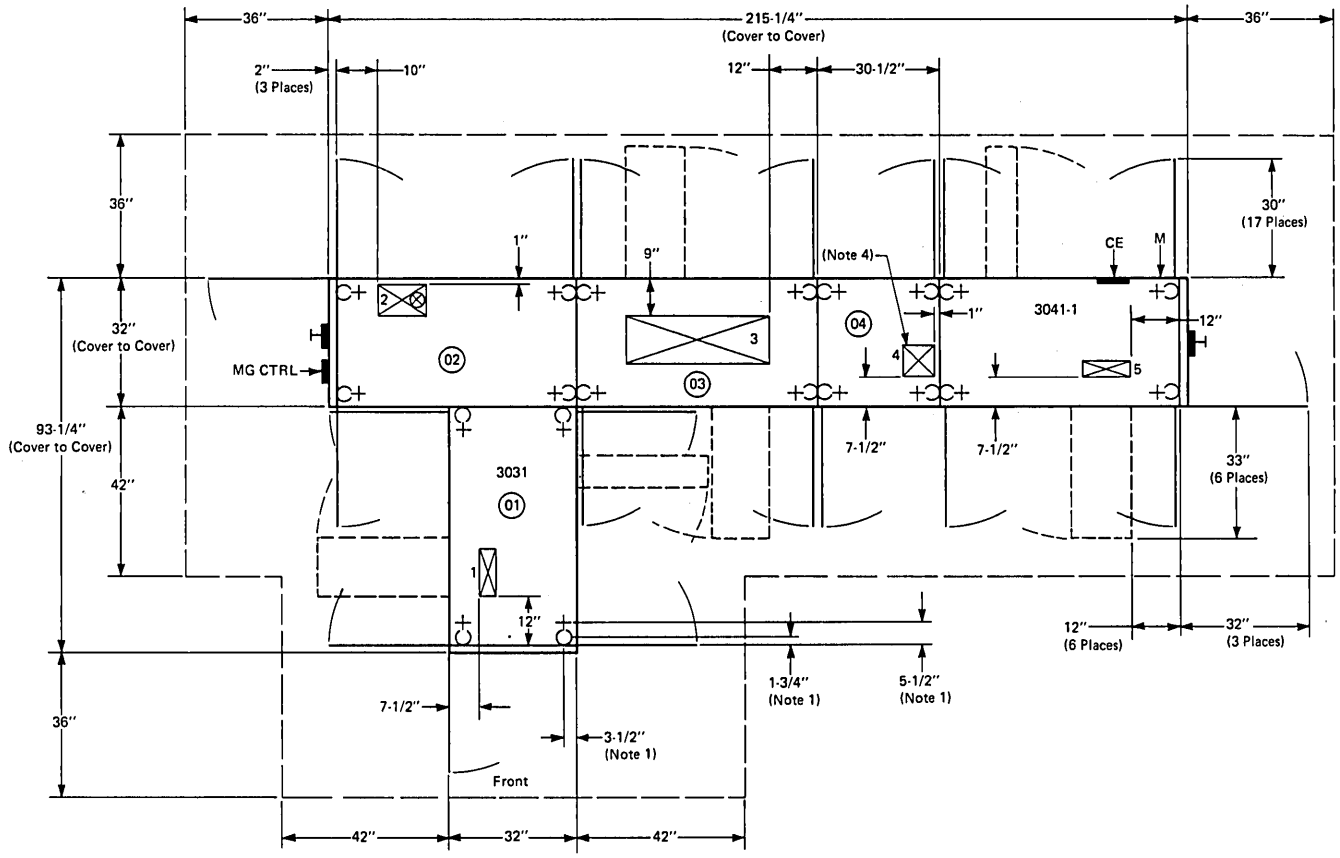
Group No.	*No. of Cables*	*From*	*Frame No.*	*To*	*Frame No.*	*Max Length (ft)*	*Notes*
3101	3	3036-1	10	3031	02	75	1, 2
3102 (3103)	1	3036-1	10	3031	02	75	1, 3
3104	2	3017-1	–	3031	02	50	1, 2
3105	1	3036-1	11	3031	02	75	2
3106	1	3036-1	11	3031	01	75	2
3107	1	3036-1	11	3031	03	75	2
3108	2	3036-1	11	Control Unit	–	–	4
3109	2	3036-1	11	Byte Multiplexer Channel	–	–	4
3110	2	3036-1	11	Block Multiplexer Channel	–	–	4
3111	2	3036-1	11	Channel-to-Channel Adapter	–	–	4
3112	1	3031	01	Direct Control	–	100	5
3113	2	3031	01	Direct Control	–	50	6
3114	2	3031	03	Control Unit	–	–	7
3115	2	3031	03	Byte Multiplexer Channel	–	–	7
3116	2	3031	03	Block Multiplexer Channel	–	–	7
3117	2	3031	03	Channel-to-Channel Adapter	–	–	7

Notes:

1. Power cabling.
2. Control cabling.
3. For 50-Hz machines, use group number in parentheses.
4. Any two of these cable groups are required for the total 3036-1 Console function. One cable group for the service support station and one for the operator station. Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) is available to attach up to eight control units.
5. Direct control (SF #3274) to other System/370 processors (excluding 3195); order one per feature.
6. Direct control (SF #3274) to non-IBM devices.
7. From channel-to-channel adapter (SF #1850); order two groups per feature (see Section 2). Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) is available to attach up to eight control units.

3031 PROCESSOR WITH 3041 ATTACHED PROCESSOR MODEL 1

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Cable Entry/Exit Number	Dimensions (Inches)
1	4 x 12
2	8 x 12
3	12 x 36
4	8 x 8
5	4 x 12

Notes:

1. Typical dimensions for casters and leveling pads on frames 01, 02, 03, 04, and 3041-1 are shown on frame 01.
2. Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame, not cover.
3. Typical dimensions for frames 01, 02, 03, and 3041-1.
   Width of frames is 29-1/2", without covers; length of frames is 60", without covers.
4. Used for cabling between 3031 frames.
5. Use one-half of the clearance distance, measured from the machine, for weight distribution.

3031 PROCESSOR WITH 3041 ATTACHED PROCESSOR MODEL 1

Details (By Frame)

Frame	*Model*	*Weight lb (kg)*	*Airflow cfm (m^3/min)*	*Heat Output BTU/hr (kcal/hr)*	*kVA*
01	All	1,950 (890)	1,320 (37)	16,550 (4 200)	5.7
02	All	775 (350)	150 (4)	850 (220)	0.3
03	A2	2,150 (980)	1,780 (50)	20,000 (5 100)	6.9
03	A3	2,150 (980)	1,780 (50)	21,750 (5 500)	7.5
03	A4	2,150 (980)	1,780 (50)	23,500 (6 000)	8.1
03	A5	2,150 (980)	1,780 (50)	25,250 (6 400)	8.7
03	A6	2,150 (980)	1,780 (50)	27,000 (6 900)	9.3
03	A7	2,150 (980)	2,020 (57)	28,750 (7 250)	9.9
03	A8	2,150 (980)	2,020 (57)	30,500 (7 700)	10.5
04	All	250 (115)	–	–	–
See 3041 Attached Processor Model 1 Specification Page for Details					

Details (By Model)

Model	*Weight lb (kg)*	*Airflow cfm (m^3/min)*	*Heat Output BTU/hr (kcal/hr)*	*Power Requirements*		
				*50/60 Hz**	*From** 3017-1*	*Total*
A2	5,125 (2 350)	3,250 (92)	37,400 (9 450)	1.7	12.9	14.6
A3	5,125 (2 350)	3,250 (92)	39,150 (9 900)	1.7	13.5	15.2
A4	5,125 (2 350)	3,250 (92)	40,900 (10 350)	1.7	14.1	15.8
A5	5,125 (2 350)	3,250 (92)	42,650 (10 750)	1.7	14.7	16.4
A6	5,125 (2 350)	3,250 (92)	44,400 (11 200)	1.7	15.3	17.0
A7	5,125 (2 350)	3,490 (99)	46,150 (11 650)	1.9	15.9	17.8
A8	5,125 (2 350)	3,490 (99)	47,900 (12 100)	1.9	16.5	18.4
See 3041 Attached Processor Model 1 Specification Page for Details						

SPECIFICATIONS

Dimensions:

	F	S	H
Inches	***	***	70-1/2
(cm)	(***)	(***)	(179)

Service Clearances:

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

Power Requirements:

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

Environment, Operating:

Temperature	60°F-90°F (16°C-32°C)
Rel Humidity	20%-80%
Max Wet Bulb	73°F (23°C)

Shipping Dimensions:

Frame	*With Packing*	*Outer Packing Removed*
01, 02, 03	65-1/2" x 32" (166 cm x 81 cm)	63-1/2" x 32" (161 cm x 81 cm)
04	30-1/2" x 32-1/4" (77 cm x 82 cm)	30" x 32" (76 cm x 81 cm)

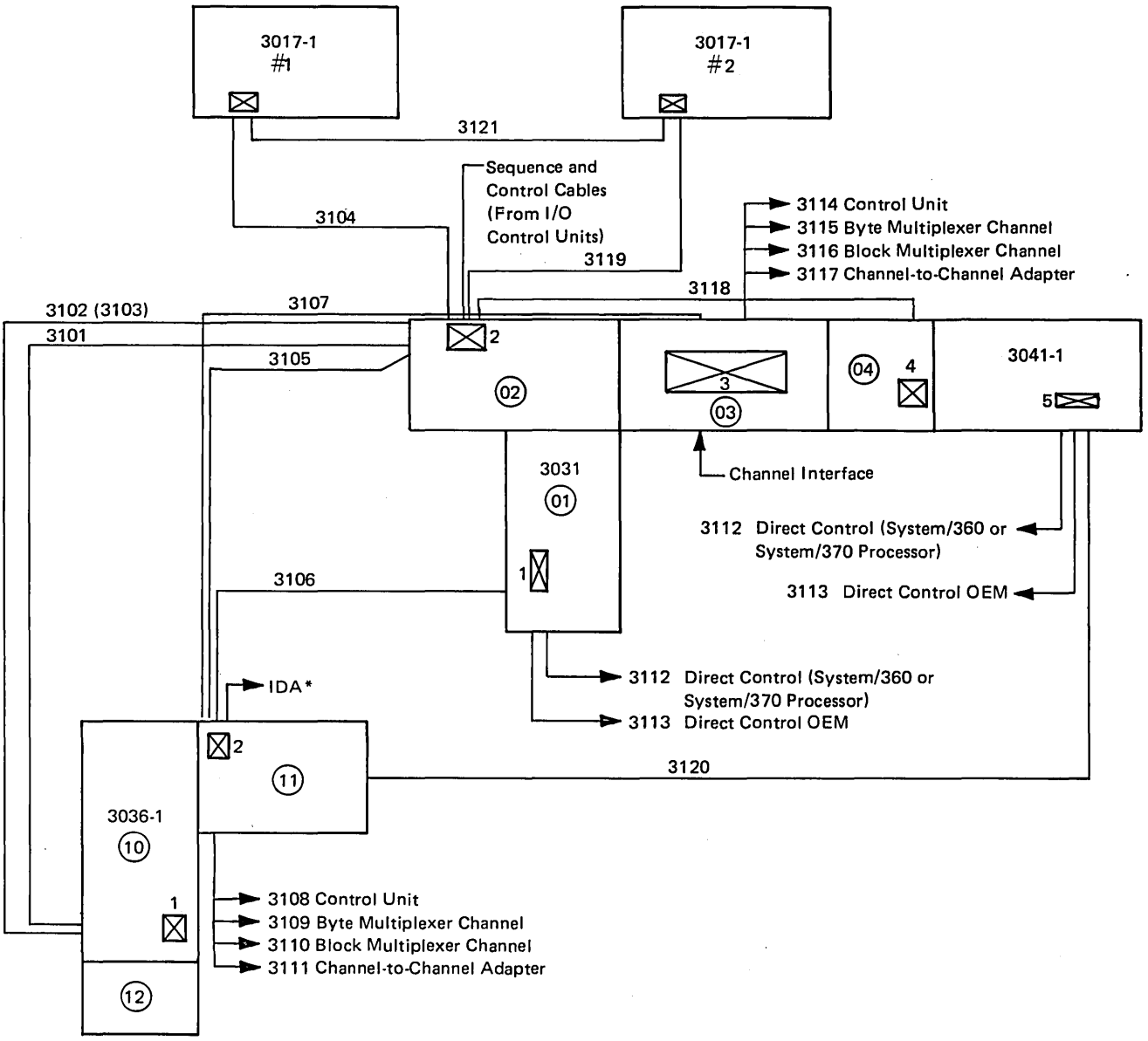
Notes:

*Includes 50/60-Hz power for the 3036 Console Model 1.

** Includes 415/441-Hz power for the 3036 Console Model 1. The 3031 Attached Processor Complex requires two 3017 Power Units. See 3017 Power Unit Model 1 for power requirements.

***See plan view.

3031 ATTACHED PROCESSOR COMPLEX CABLING SCHEMATIC



*For processors installed in U.S. and Canada, integrated data adapter (IDA) cable (provided with the processor) enters cable entry in frame 11. Data Access Arrangement (DAA) type CDT must be within 50 feet of cable entry in frame 11.

3031 ATTACHED PROCESSOR COMPLEX CABLING SCHEMATIC

Group No.	*No. of Cables*	*From*	*Frame No.*	*To*	*Frame No.*	*Max Length (ft)*	*Notes*
3101	3	3036-1	10	3031	02	75	1, 2
3102 (3103)	1	3036-1	10	3031	02	75	1, 3
3104	2	3017-1 #1	–	3031	02	50	1, 2
3105	1	3036-1	11	3031	02	75	2
3106	1	3036-1	11	3031	01	75	2
3107	1	3036-1	11	3031	03	75	2
3108	2	3036-1	11	Control Unit	–	–	4
3109	2	3036-1	11	Byte Multiplexer Channel	–	–	4
3110	2	3036-1	11	Block Multiplexer Channel	–	–	4
3111	2	3036-1	11	Channel-to-Channel Adapter	–	–	4
3112	1	3031/3041-1	01 (3031)	Direct Control	–	100	5
3113	2	3031/3041-1	01 (3031)	Direct Control	–	50	6
3114	2	3031	03	Control Unit	–	–	7
3115	2	3031	03	Byte Multiplexer Channel	–	–	7
3116	2	3031	03	Block Multiplexer Channel	–	–	7
3117	2	3031	03	Channel-to-Channel Adapter	–	–	7
3118	2	3041-1	–	3031	02	20	1, 8, 9
3119	2	3017-1 #2	–	3031	02	50	1, 2, 8
3120	1	3041-1	–	3036-1	11	75	2, 8
3121	1	3017-1 #2	–	3017-1 #1	–	100	1, 2, 8

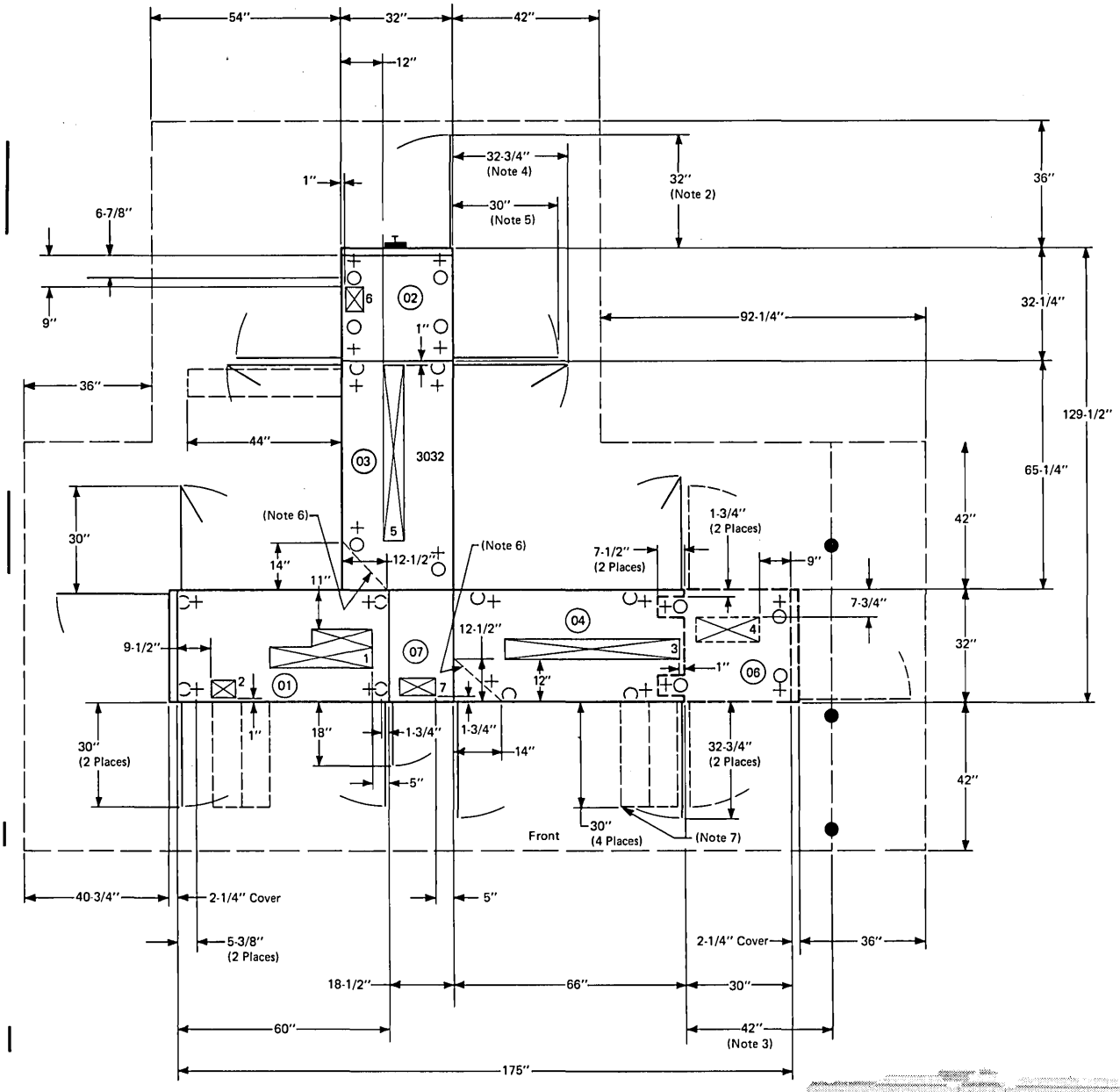
Notes:

1. Power cabling.
2. Control cabling.
3. For 50-Hz machines, use group number in parentheses.
4. Any two of these cable groups are required for the total 3036-1 Console function. One cable group for the service support station and one for the operator station. Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) is available to attach up to eight control units.
5. Direct control (SF #3274) to other System/370 processors (excluding 3195); order one per feature.
6. Direct control (SF #3274) to non-IBM devices.
7. From channel-to-channel adapter (SF #1850); order two groups per feature (see Section 2). Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) is available to attach up to eight control units.
8. Required for 3041 Attached Processor.
9. Routed from 3041 through cable entry/exit 4.

3032 PROCESSOR

PLAN VIEW (English Scale: 1/4 in. = 1 ft)

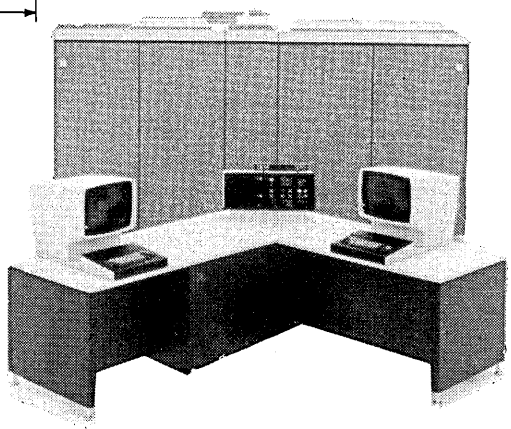
IBM 3032 Processor Floor Cutout Aid, GC22-7068, is available



Cable Entry/ Exit Number	Dimension (Inches)
1	5 x 17 and 6 x 29
2	5 x 7
3	6 x 50
4	7 x 18
5	6 x 50
6	4 x 7
7	5 x 10

Notes:

1. Caster, cable hole, and leveling pad locating dimensions are measured from the edge of frame, not cover. Frame side covers are 1-1/4" thick.
2. Typical dimension for end cover on frames 01, 02, and 06. End cover dimension as shown applies to frame 04 when frame 06 is not installed.
3. Service clearance for frame 04 when frame 06 is not installed.
4. Typical dimension for bifold cover on frames 03 and 04.
5. Typical dimension for cover on frames 02 and 06.
6. Dashed corner area of frames 03 and 04 can be removed for shipping.
7. These gates are an integral part of frame 06 and are self-supporting with the outer packing removed.
8. Use one-half of the clearance distance, measured from the machine, for weight distribution.



Details (By Frame)

Frame	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	kVA
01	All	2,000 (950)	950 (27)	16,500 (4 200)	16,300 (4 150)	**
02	2	800 (370)	200 (6)	4,450 (1 150)	—	**
	4	925 (420)	200 (6)	6,700 (1 700)	—	**
	6	925 (420)	200 (6)	9,350 (2 400)	—	**
	8	925 (420)	200 (6)	10,500 (2 650)	—	**
03	2	1,900 (900)	1,200 (34)	12,350 (3 150)	31,100 (7 850)	**
	4	2,050 (950)	1,200 (34)	14,600 (3 700)	31,100 (7 850)	**
	6	2,050 (950)	1,200 (34)	16,800 (4 250)	31,100 (7 850)	**
	8	2,125 (970)	1,200 (34)	18,700 (4 750)	32,200 (8 150)	**
04	All	1,600 (750)	500 (14)	5,400 (1 400)	19,650 (5 000)	**
	All*		500 (14)	8,000 (2 050)	—	**
06	All*	1,025 (475)	200 (6)	7,550 (1 950)	—	**
07	All	175 (80)	—	—	—	—

Details (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
2	6,475 (2 950)	2,850 (81)	38,700 (9 800)	67,050 (16 900)
4	6,750 (3 100)	2,850 (81)	43,200 (10 900)	67,050 (16 900)
6	6,750 (3 100)	2,850 (81)	48,050 (12 150)	67,050 (16 900)
8	6,825 (3 100)	2,850 (81)	51,100 (12 900)	68,150 (17 200)

SPECIFICATIONS

Dimensions:

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

Service Clearances:

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

Environment, Operating:

Temperature	60°F-90°F (16°C-32°C)
Rel Humidity	20%-80%
Max Wet Bulb	72°F (22°C)†

Environment, Nonoperating:

Temperature	50°F-110°F (10°C-43°C)
Rel Humidity	8%-80%
Max Wet Bulb	80°F (27°C)†

Shipping Dimensions:

Frame	With Packing	Outer Packing Removed
01	69" x 32" (175 cm x 81 cm)	68" x 32" (173 cm x 81 cm)
02	34" x 32" (86 cm x 81 cm)	32" x 32" (81 cm x 81 cm)
03	84" x 32" (213 cm x 81 cm)	83" x 32" (211 cm x 81 cm)
04	75" x 32" (191 cm x 81 cm)	74" x 32" (188 cm x 81 cm)
06	72" x 34" (183 cm x 86 cm)	69" x 32" (175 cm x 81 cm)

Notes:

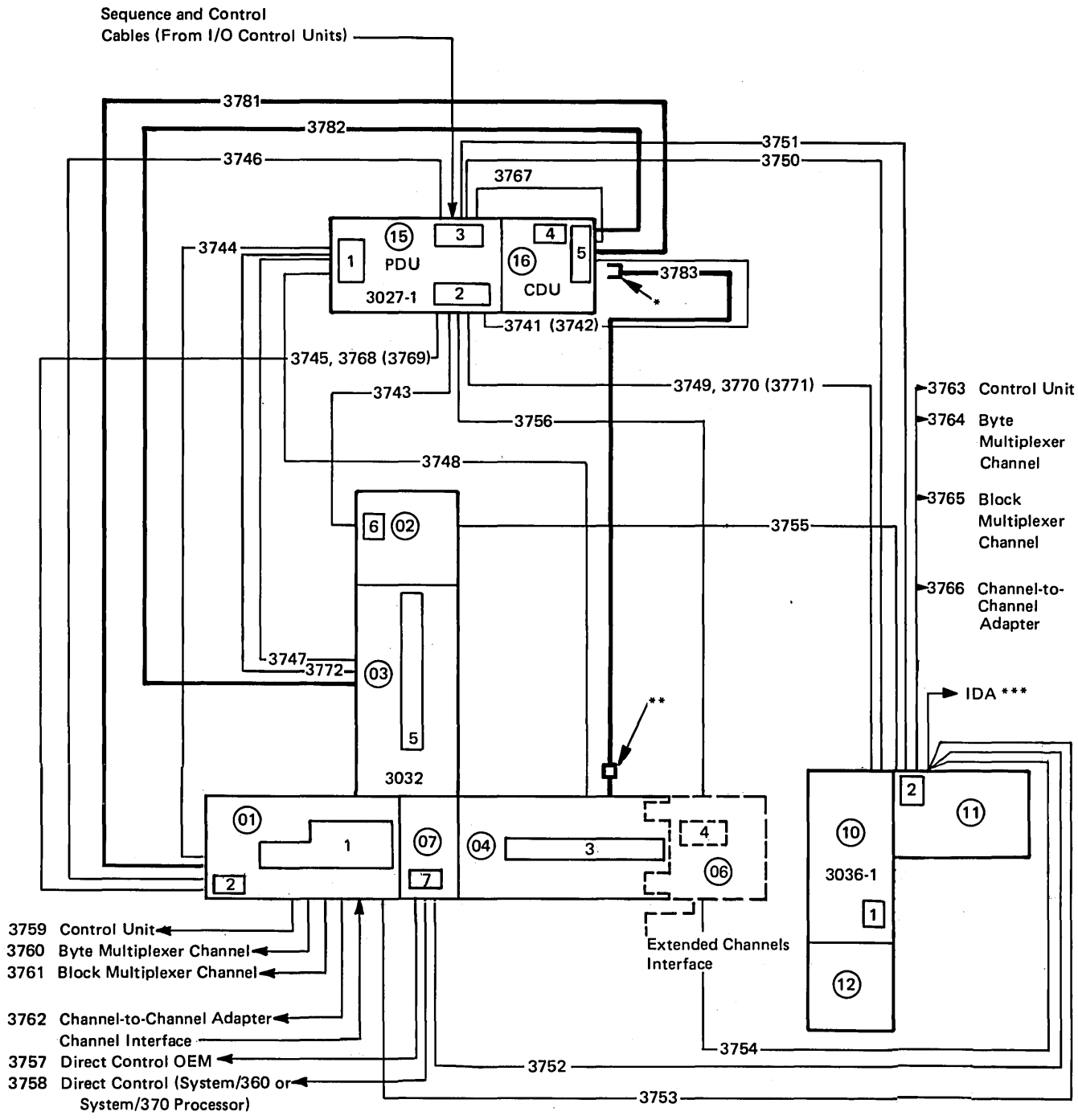
* For SF #3850, extended channels, add details (by frame) to model totals.

** Receives power from 3027 PCDU (frame 15).

*** See plan view.

† See "Liquid Coolant System" in Appendix A.

3032 PROCESSOR COMPLEX CABLING SCHEMATIC—CABLES AND COOLANT HOSES



Legend:

——— Coolant hoses. (Only supply hoses are shown; assume one return hose for each supply hose.)

——— Cables

*Quick-connect sockets are on supply hoses at 3027-1 CDU end. Quick-connect plugs are on return hoses at 3027-1 CDU end.

**Quick-connect plugs are on supply hoses at end away from 3027-1 CDU. Quick-connect sockets are on return hoses at end away from 3027-1 CDU.

***For processors installed in U.S. and Canada, integrated data adapter (IDA) cable (provided with the processor) enters cable entry in frame 11. Data Access Arrangement (DAA) type CDT must be within 50 feet of cable entry in frame 11.

3032 PROCESSOR COMPLEX CABLING SCHEMATIC—CABLES AND COOLANT HOSES

Cables

Group No.	*No. of Cables*	*From*	*Frame No.*	*To*	*Frame No.*	*Max Length (ft)*	*Notes*
3741 (3742)	1	3027-1	15	3027-1	16	13	1, 3
3743	1	3027-1	15	3032	02	40	1
3744	5	3027-1	15	3032	01	40	1
3745	2	3027-1	15	3032	01	40	2
3746	1	3027-1	15	3032	01	40	2
3747	8	3027-1	15	3032	03	40	1
3748	8	3027-1	15	3032	04	40	1
3749	2	3027-1	15	3036-1	10	100	1
3750	1	3027-1	15	3036-1	10	100	2
3751	1	3036-1	11	3027-1	15	100	2
3752	2	3036-1	11	3032	07	75	2
3753	1	3036-1	11	3032	01	75	2
3754	1	3032	06	3036-1	11	75	2, 4
3755	1	3036-1	11	3032	02	75	1
3756	1	3032	06	3027-1	15	100	4
3757	2	3032	07	Direct Control	–	50	5
3758	1	3032	07	Direct Control	–	100	6
3759	2	3032	01	Control Unit	–	–	7
3760	2	3032	01	Byte Multiplexer Channel	–	–	7
3761	2	3032	01	Block Multiplexer Channel	–	–	7
3762	2	3032	01	Channel-to-Channel Adapter	–	–	7
3763	2	3036-1	11	Control Unit	–	–	8
3764	2	3036-1	11	Byte Multiplexer Channel	–	–	8
3765	2	3036-1	11	Block Multiplexer Channel	–	–	8
3766	2	3036-1	11	Channel-to-Channel Adapter	–	–	8
3767	1	3027-1	15	3027-1	16	10	1
3768 (3769)	1	3027-1	15	3032	01	100	1, 3
3770 (3771)	1	3027-1	15	3036-1	10	100	1, 3
3772	1	3027-1	15	3032	03	40	9

Coolant Hoses

Group No.	*No. of Hoses*	*From*	*Frame No.*	*To*	*Frame No.*	*Max Length (ft)*	*Notes*
3781	2	3027-1	16	3032	01	55	–
3782	4	3027-1	16	3032	03	55	–
3783	4	3027-1	16	3032	04	55	–

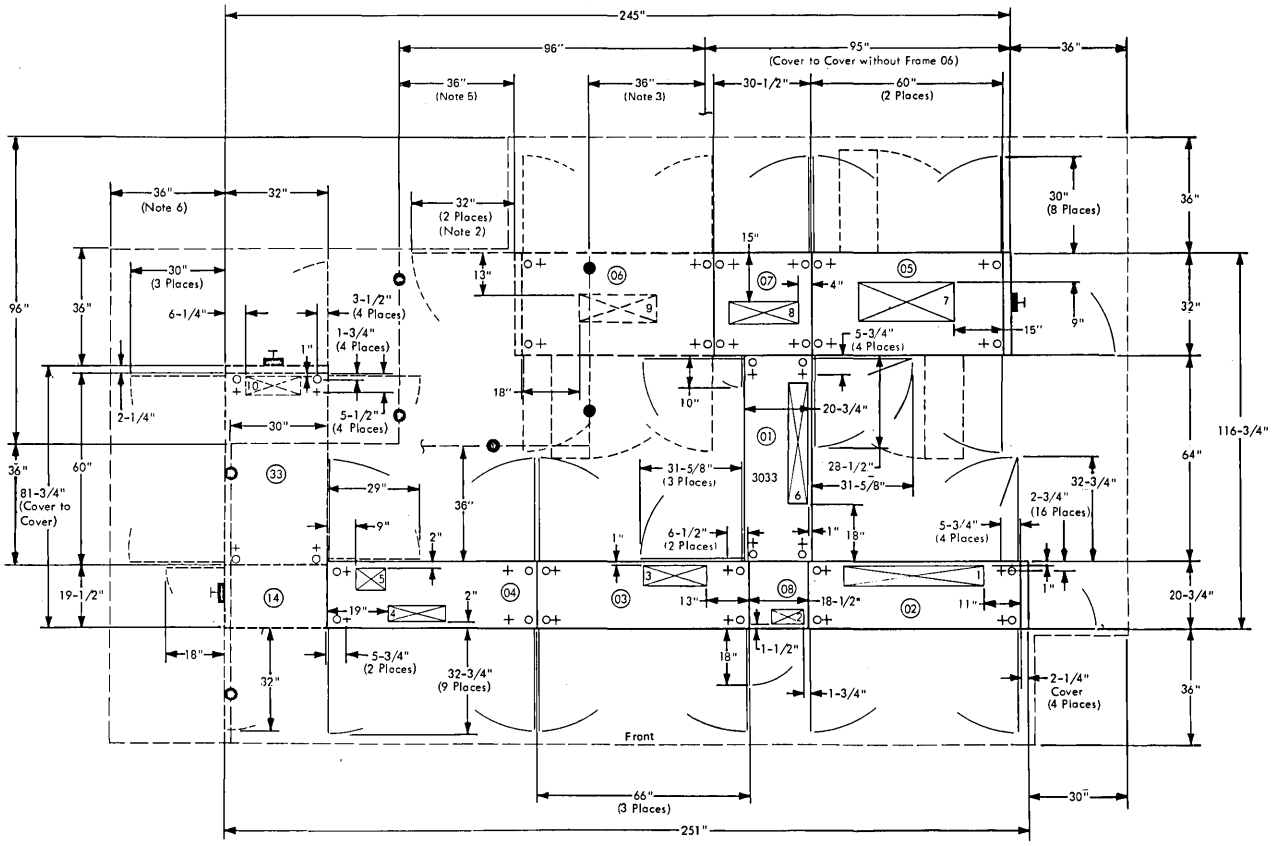
Notes:

1. Power cabling.
2. Control cabling.
3. For 50-Hz machines, use group numbers in parentheses.
4. Required for extended channels feature (SF # 3850).
5. Required for direct control (standard feature) to non-IBM devices.
6. Direct control (standard feature) to other System/370 processors (excluding 3195).
7. From channel-to-channel adapter (SF #1850). Order two groups per feature (see Section 2). Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) is available to attach up to eight control units.
8. Any two of these cable groups are required for the total 3036 Console function. One cable group for the service support station and one for the operator station. Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) is available to attach up to eight control units.
9. Required for 8M-byte storage.

3033 PROCESSOR (U-SERIES) AND 3033 PROCESSOR MODEL GROUPS N AND S

PLAN VIEW (Not to Scale)

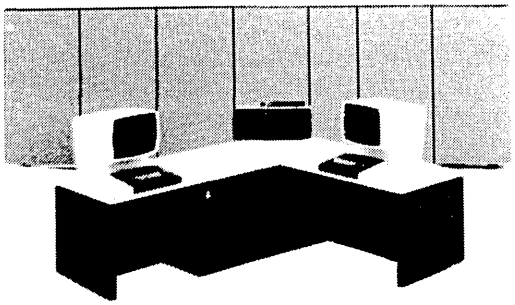
IBM 3033 Processor Floor Cutout Aid, GC22-7067, is available



Cable Entry/ Exit Number	Dimension (Inches)
1	6 x 44
2	4-1/2 x 10
3	6 x 20
4	5 x 18
5	7 x 9
6	6 x 38
7	12 x 30
8	7 x 22
9	8 x 24
10	6 x 17

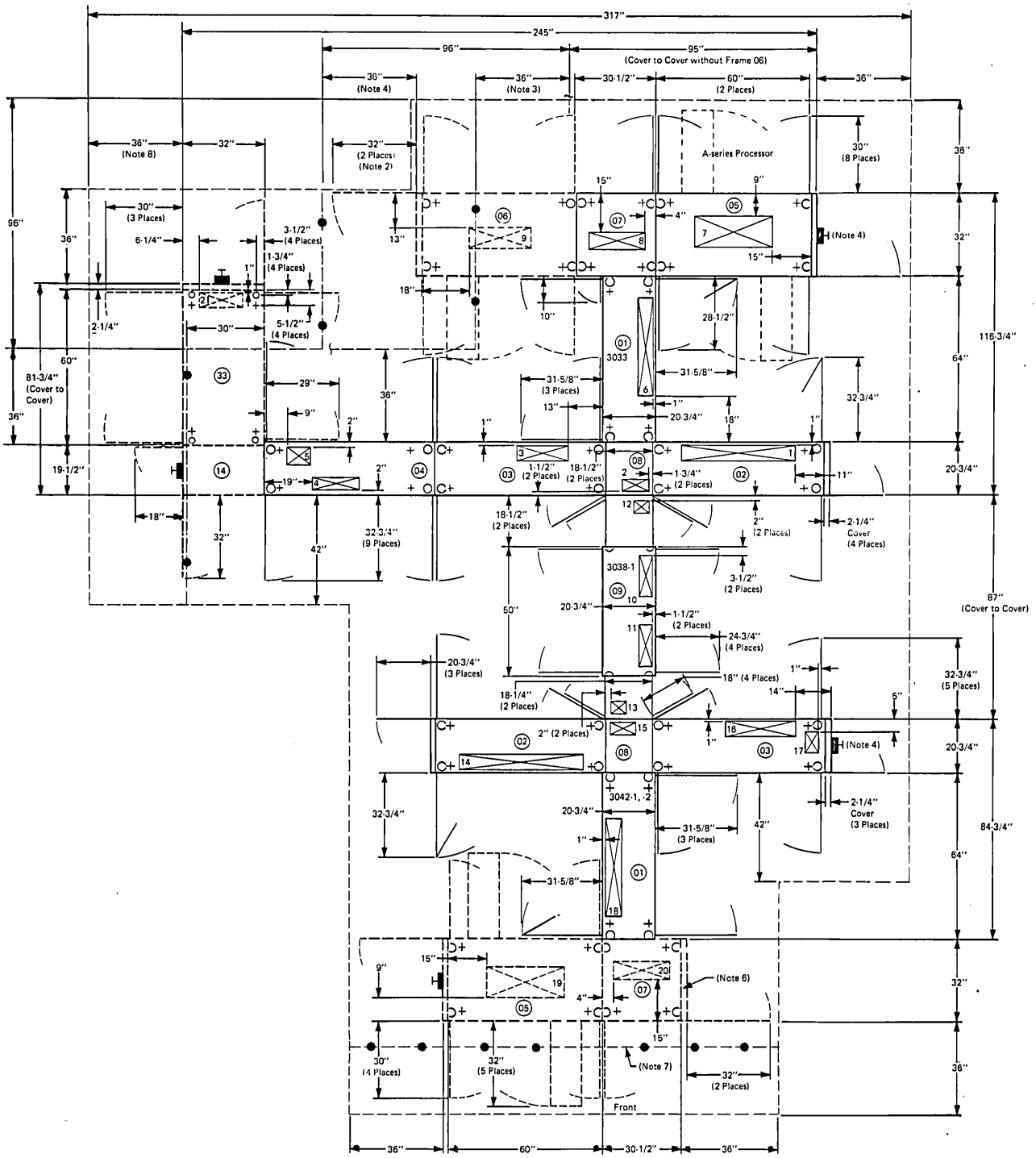
Notes:

1. Cable hole locating dimensions are measured from edge of frame, not cover. Frame side covers are 1-1/4" thick.
2. End cover swing dimensions as shown apply to frame 07 when frame 06 is not installed.
3. Service clearance for frame 07 when frame 06 is not installed (for 3033 Processor Model Groups N and S and 3033 Processor without SF #3850).
4. Use one-half of the clearance distance, measured from the machine, for weight distribution.
5. Includes service clearance required when frame 06 is installed (for 3033 Processor with SF #3850).
6. Service clearance with frames 14 and 33 installed. Does not apply to 3033 Processor Model Groups N and S.



3033 PROCESSOR (A-SERIES)

PLAN VIEW (Not to scale)



Cable Entry/ Exit Number	Dimensions (Inches)
1	6 x 44
2	4-1/2 x 10
3	6 x 20
4	5 x 18
5	7 x 9
6	6 x 38
7	12 x 30
8	7 x 22
9	8 x 24
10	5 x 16

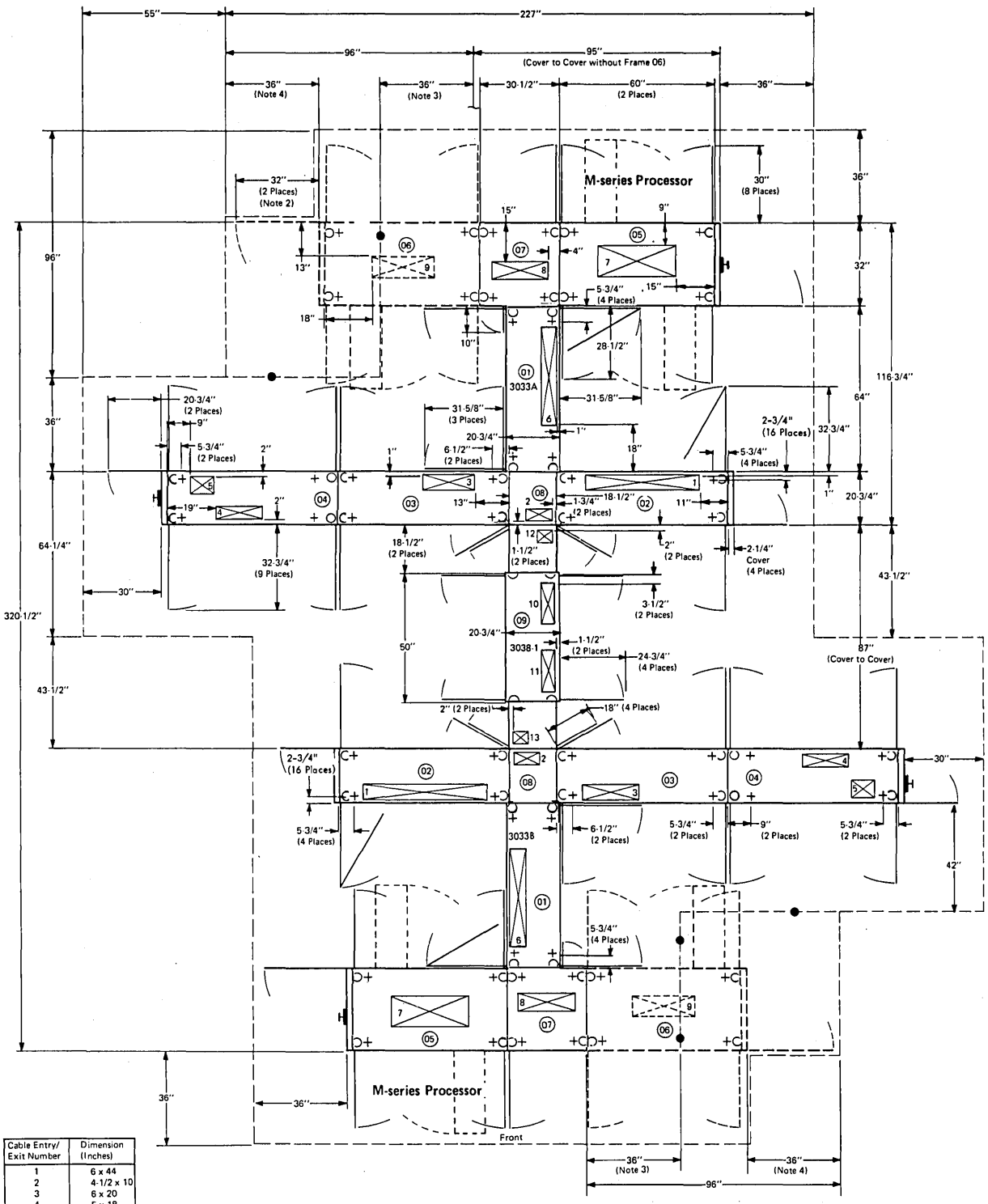
Cable Entry/ Exit Number	Dimensions (Inches)
11	5 x 16
12	5 x 6
13	5 x 6
14	6 x 48
15	5 x 10
16	6 x 27
17	5 x 8
18	6 x 38
19	12 x 30
20	7 x 22
21	8 x 17

Notes:

1. Cable hole locating dimensions are measured from edge of frame, not cover. Frame side covers are 1-1/4" thick.
2. End cover swing dimensions as shown apply to frame 07 when frame 06 is not installed.
3. Service clearance for frame 07 when frame 06 is not installed.
4. Includes service clearance required when frame 06 is installed.
5. Use one-half of the clearance distance, measured from the machine, for weight distribution.
6. Frames 05 and 07 are required for 3042 Model 2 only.
7. Service clearance without 3042 Model 2.
8. Service clearance with frames 14 and 33 installed.

3033 PROCESSOR (M-SERIES)

PLAN VIEW (Not to scale)



Cable Entry/ Exit Number	Dimension (Inches)
1	6 x 44
2	4-1/2 x 10
3	6 x 20
4	5 x 18
5	7 x 9
6	6 x 38
7	12 x 30
8	7 x 22
9	8 x 24
10	5 x 16
11	5 x 16
12	5 x 6
13	5 x 6

Notes:

1. Cable hole locating dimensions are measured from edge of frame, not cover.
2. End cover swing dimensions as shown apply to frame 07 when frame 06 is not installed.
3. Service clearance for frame 07 when frame 06 is not installed.
4. Includes service clearance required when frame 06 is installed.

3033 PROCESSOR (U-SERIES, A-SERIES, AND M-SERIES) AND 3033 PROCESSOR MODEL GROUPS N AND S

SPECIFICATIONS

Dimensions:

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

Service Clearances:

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

Environment, Operating:

Temperature	60°F-90°F (16°C-32°C)
Rel Humidity	20%-80%
Max Wet Bulb	72°F (22°C)**

Environment, Nonoperating:

Temperature	50°F-110°F (10°C-43°C)
Rel Humidity	8%-80%
Max Wet Bulb	80°F (27°C)**

Shipping Dimensions:

Frame	*With Packing*	*Outer Packing Removed*
01, 03	79-1/2" x 20-3/4" (202 cm x 50 cm)	76-1/2" x 20-3/4" (194 cm x 50 cm)
02, 04	75-1/2" x 20-3/4" (192 cm x 50 cm)	72" x 20-3/4" (183 cm x 50 cm)
05[1], 06	65-1/2" x 32" (166 cm x 81 cm)	63-1/2" x 32" (161 cm x 81 cm)
07[1]	34" x 32" (86 cm x 81 cm)	34" x 32" (86 cm x 81 cm)
14	20" x 32" (51 cm x 81 cm)	20" x 32" (51 cm x 81 cm)
33	63" x 32" (160 cm x 81 cm)	63" x 32" (160 cm x 81 cm)

[1]Frames 05 and 07 are normally shipped separately. However, when the frames are shipped bolted together the shipping dimensions are 95" x 32" (241 cm x 81 cm).

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

3033 PROCESSOR (U-SERIES, A-SERIES, AND M-SERIES) AND 3033 PROCESSOR MODEL GROUPS N AND S

Details (By Frame)

Frame	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	kVA
01	All except S	1,225 (560)	650 (19)	5,250 (1 350)	18,350 (4 650)	‡
01	S4, S8, S12, S16	1,200 (550)	650 (19)	4,850 (1 250)	17,050 (4 300)	‡
02	All except S	1,450 (660)	650 (19)	9,800 (2 500)	32,400 (8 200)	‡
02	S4, S8, S12, S16	1,425 (650)	650 (19)	9,100 (2 300)	30,150 (7 600)	‡
03	U4, A4, M4, N4, S4	1,200 (550)	450 (13)	5,500 (1 400)	10,850 (2 750)	‡
03	U6, A6, M6	1,200 (550)	450 (13)	5,800 (1 500)	12,200 (3 100)	‡
03	U8, A8, M8, N8, S8	1,200 (550)	450 (13)	6,150 (1 550)	12,850 (3 250)	‡
03	U12, A12, M12, N12, S12	1,200 (550)	450 (13)	7,600 (1 950)	15,300 (3 900)	‡
03	U16, A16, M16, N16, S16	1,200 (550)	450 (13)	9,450 (2 400)	17,500 (4 450)	‡
04	U4, A4, M4, N4	1,230 (560)	360 (10)	10,550 (2 700)	–	‡
04	U6, A6, M6	1,230 (560)	360 (10)	12,150 (3 100)	–	‡
04	U8, A8, M8, N8	1,230 (560)	360 (10)	13,750 (3 500)	–	‡
04	U12, A12, M12, N12	1,350 (620)	360 (10)	15,900 (4 050)	–	‡
04	U16, A16, M16, N16	1,350 (620)	360 (10)	18,300 (4 650)	–	‡
04	S4	1,120 (510)	360 (10)	8,500 (2 150)	–	‡
04	S8	1,120 (510)	360 (10)	11,700 (2 950)	–	‡
04	S12	1,240 (565)	360 (10)	13,850 (3 500)	–	‡
04	S16	1,240 (565)	360 (10)	16,250 (4 100)	–	‡
05 ***	All	2,275 (1 050)	1,530 (44)	31,000 (7 850)	–	‡
05†	3033 Model Groups N, S	1,725 (790)	800 (23)	16,000 (4 050)	–	‡
06††	††	1,725 (790)	800 (23)	16,000 (4 050)	–	‡
07	All	650 (300)	100 (3)	100 (25)	–	‡
08	All	150 (70)	0 (0)	–	–	–
09†††	AP & MP	See 3038 Specification Page for Details				
14	U24, A24	250 (115)	0 (0)	–	–	–
33	U24, A24	1,800 (820)	1,100 (31)	35,150 (8 860)	–	‡
†††	AP Only	See 3042 Specification Page for Details				

Details (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
U4, A4 M4	8,030 (3 650)	4,540 (130)	62,100 (15 650)	61,600 (15 500)
U6, A6, M6	8,030 (3 650)	4,540 (130)	64,000 (16 150)	62,950 (15 900)
U8, A8, M8	8,030 (3 650)	4,540 (130)	65,950 (16 650)	63,600 (16 050)
U12, A12, M12	8,150 (3 700)	4,540 (130)	69,550 (17 550)	66,050 (16 650)
U16, A16, M16	8,150 (3 700)	4,540 (130)	73,800 (18 600)	68,300 (17 250)
U24, A24	10,200 (4 630)	5,640 (160)	108,950 (27 460)	68,300 (17 250)
N4	7,630 (3 500)	4,540 (130)	47,100 (11 900)	61,600 (15 500)
N8	7,630 (3 500)	4,540 (130)	50,950 (12 850)	63,600 (16 100)
N12	7,750 (3 550)	4,540 (130)	54,550 (13 750)	66,050 (16 750)
N16	7,750 (3 550)	4,540 (130)	58,800 (14 850)	68,250 (17 300)
S4	7,470 (3 390)	3,010 (87)	44,050 (11 175)	58,050 (14 650)
S8	7,470 (3 390)	3,010 (87)	47,900 (12 125)	60,050 (15 150)
S12	7,590 (3 445)	3,010 (87)	51,500 (13 075)	62,500 (15 800)
S16	7,590 (3 445)	3,010 (87)	55,750 (14 125)	64,700 (16,350)

Notes:

***Except for 3033 Processor Model Groups N and S.

†Applies to 3033 Processor Model Groups N and S. For SF #3851, extended channels, on the 3033 Processor Model Groups N and S, add 550 lb (248 kg), 730 cfm (21 m^3/min), and 15,000 BTU/hr (3 800 kcal/hr) to model totals.

††For SF #3850, extended channels, add details (by frame) to model totals. Frame 06 applies to 3033 U-, A-, and M-series and Model Group N only.

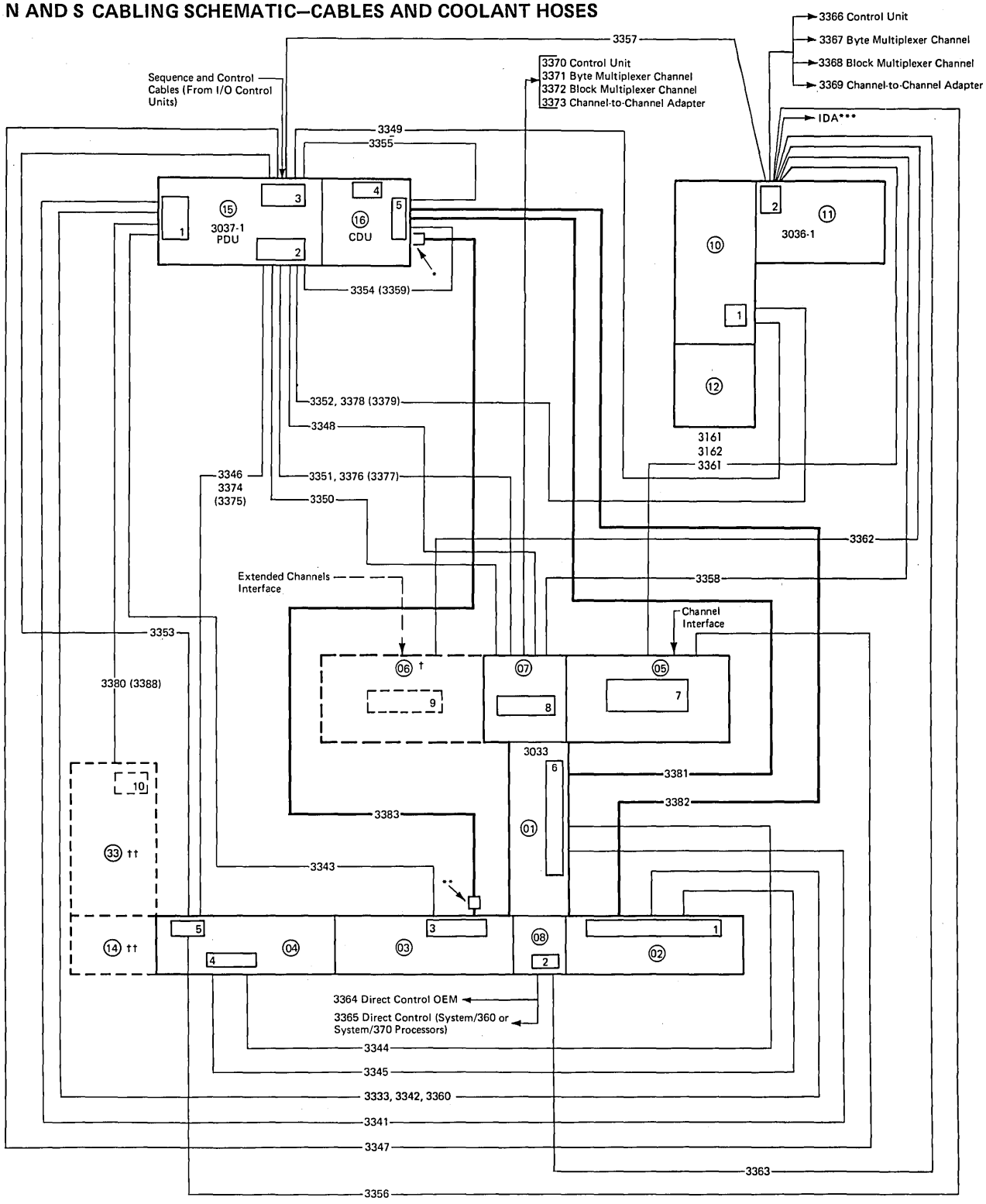
†††For 3033 Multiprocessor Complex, add 3038 details to M-series model totals.

For 3033 Attached Processor Complex, add 3038 and 3042-1 details to A-series model totals.

For 3033 Attached Processor Complex with 3042-2, add 3038 and 3042-2 details to A-series model totals.

‡ Receives power from 3037 PCDU.

3033 PROCESSOR COMPLEX AND 3033 PROCESSOR COMPLEX MODEL GROUPS N AND S CABLING SCHEMATIC—CABLES AND COOLANT HOSES



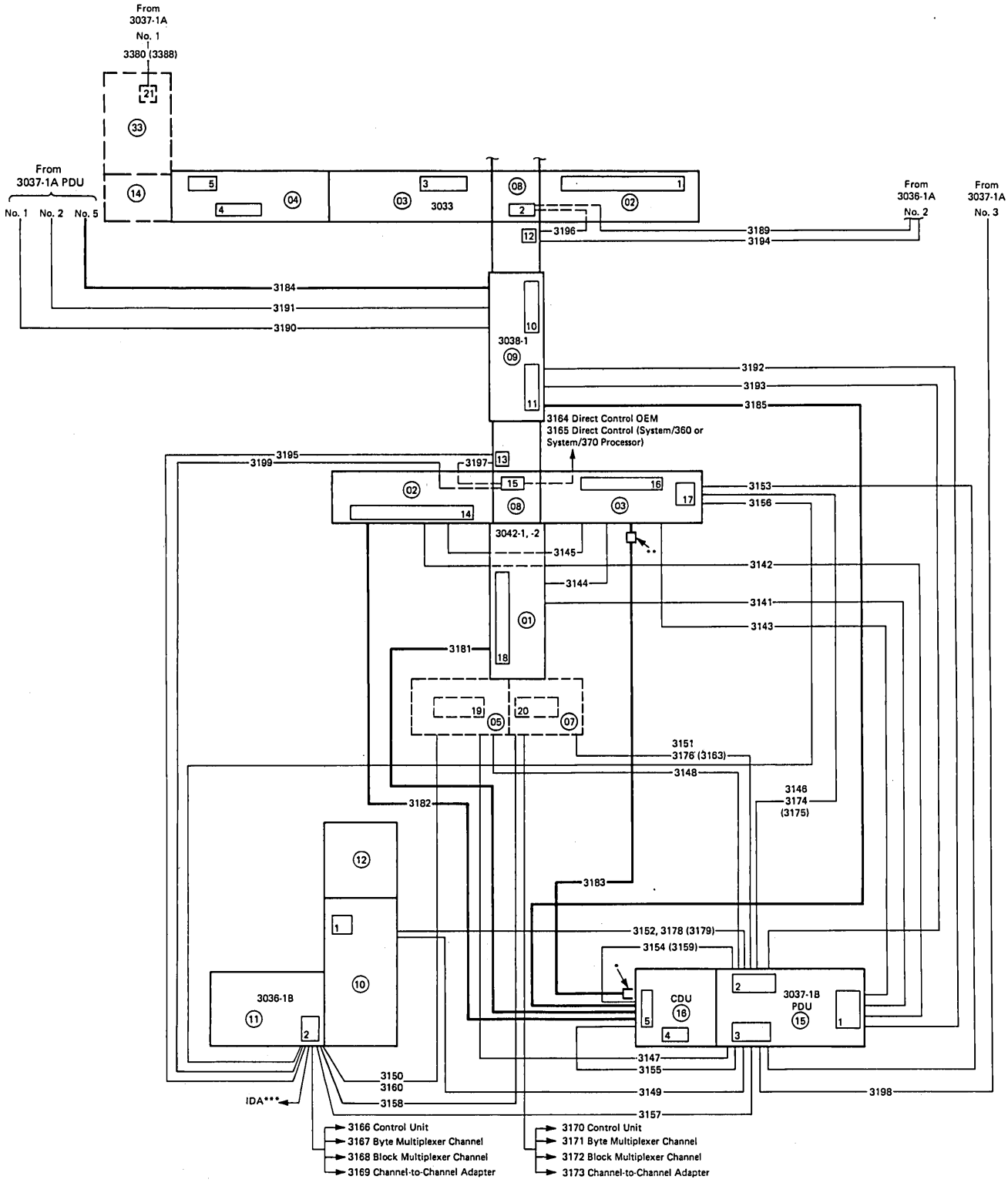
*Quick-connect sockets are on supply hoses at 3037 CDU end.
Quick-connect plugs are on return hoses at 3037 CDU end.
**Quick-connect plugs are on supply hoses at end away from 3037 CDU.
Quick-connect sockets are on return hoses at end away from 3037 CDU.
***For processors installed in U. S. and Canada, integrated data adapter (IDA) cable (provided with the processor) enters cable entry in frame 11. Data Access Arrangement (DAA) type CDT must be within 50 feet of cable entry in frame 11.
†Does not apply to 3033 Processor Model Group S.
††Does not apply to 3033 Processor Model Groups N and S.

Legend:

Coolant hoses. (Only supply hoses are shown; assume one return hose for each supply hose.)

Cables

3033 ATTACHED PROCESSOR COMPLEX CABLING SCHEMATIC–CABLES AND COOLANT HOSES



*Quick-connect sockets are on supply hoses at 3037 CDU end.
Quick-connect plugs are on return hoses at 3037 CDU end.

**Quick-connect plugs are on supply hoses at end away from 3037 CDU.
Quick-connect sockets are on return hoses at end away from 3037 CDU.

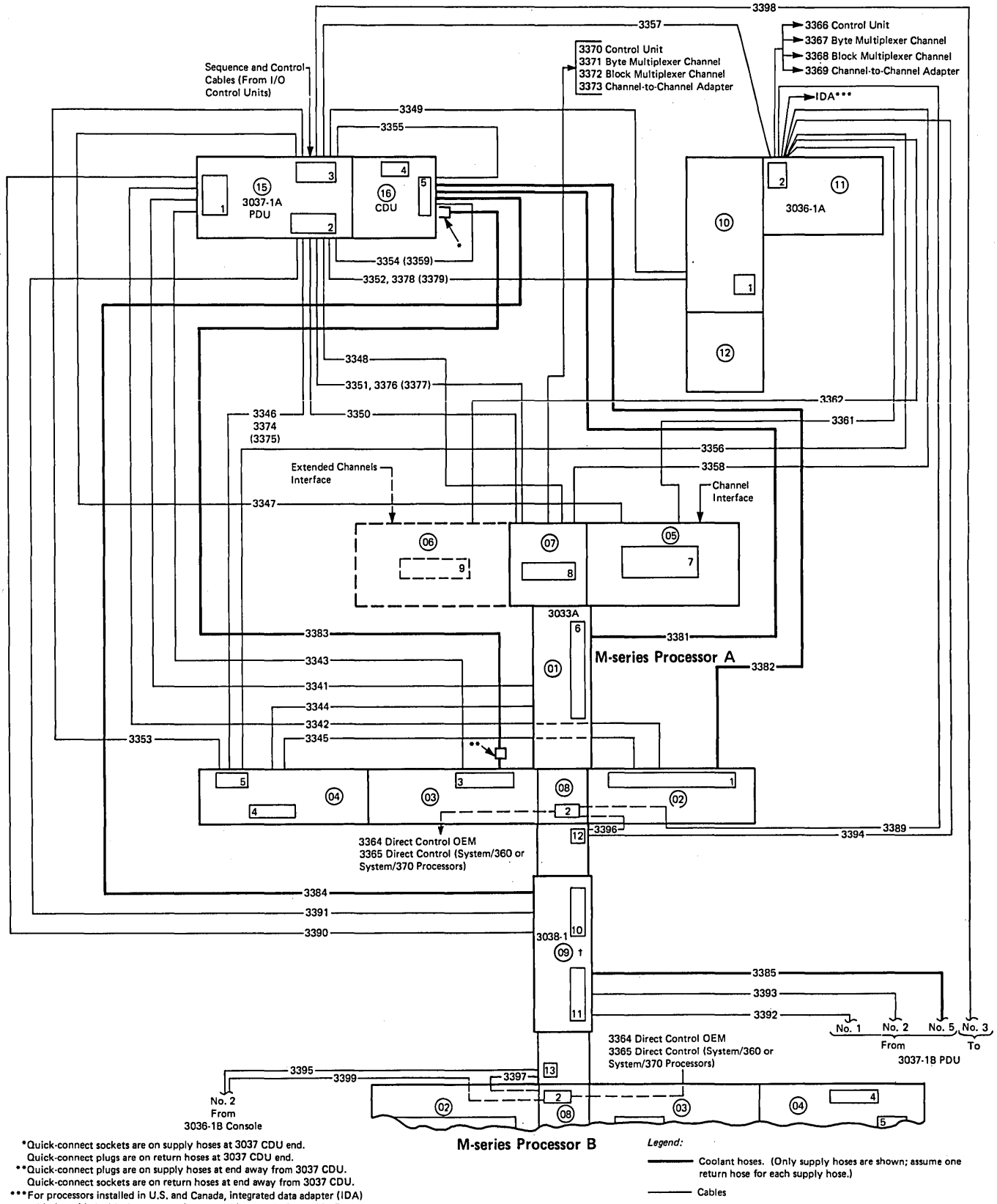
***For processors installed in U.S. and Canada, integrated data adapter (IDA) cable (provided with the processor) enters cable entry in frame 11. Data Access Arrangement (DAA) type CDT must be within 50 feet of cable entry in frame 11.

Legend:

——— Coolant hoses. (Only supply hoses are shown; assume one return hose for each supply hose.)

——— Cables

3033 MULTIPROCESSOR COMPLEX CABLING SCHEMATIC–CABLES AND COOLANT HOSES



*Quick-connect sockets are on supply hoses at 3037 CDU end. Quick-connect plugs are on return hoses at 3037 CDU end.

**Quick-connect plugs are on supply hoses at end away from 3037 CDU. Quick-connect sockets are on return hoses at end away from 3037 CDU.

***For processors installed in U.S. and Canada, integrated data adapter (IDA) cable (provided with the processor) enters cable entry in frame 11. Data Access Arrangement (DAA) type CDT must be within 50 feet of cable entry in frame 11.

†Frame 09 is considered part of 3033 Processor (M-series). See 3033.6 page for B processor cabling.

3033 PROCESSOR COMPLEX, 3033 PROCESSOR COMPLEX MODEL GROUPS N AND S, 3033 ATTACHED PROCESSOR COMPLEX, AND 3033 MULTIPROCESSOR COMPLEX CABLING SCHEMATIC—CABLES AND COOLANT HOSES

Cables

Group No.	*No. of Cables*	*From*	*Frame No.*	*To*	*Frame No.*	*Max Length (ft)*	*Notes*
3141	6	3037	15	3042-1, 2	01	40	1,2,11
3142	13	3037	15	3042-1, 2	02	40	1,2,11
3143	3	3037	15	3042-1, 2	03	40	1,2,11
3144	2	3042-1, 2	01	3042-1, 2	03	18	1,11
3145	2	3042-1, 2	02	3042-1, 2	03	18	1,11
3146	2	3037	15	3042-1, 2	03	100	2,11
3147	1	3037	15	3042-2	05	100	2,11
3148	1	3037	15	3042-2	05	100	2,11
3149	1	3037	15	3036	10	100	2,11
3150	1	3036	11	3042-2	05	75	9,11,14
3151	1	3037	15	3042-2	07	100	2,11
3152	2	3037	15	3036	10	100	2,11
3153	1	3037	15	3042-1, 2	03	100	2,11
3154 (3159)	1	3037	15	3037	16	13	1,3,11
3155	1	3037	15	3037	16	13	1,11
3156	1	3036	11	3042-1, 2	03	75	9,11
3157	1	3036	11	3037	15	100	9,11
3158	1	3036	11	3042-2	07	75	9,11
3160	1	3036	10	3042-2	05	75	9,11
3161	1	3036	11	3033	05	75	9,20,22
3162	1	3036	11	3033	05	75	9,14,20
3164	2	3042-1, 2	08	Direct Control	–	50	5,11
3165	1	3042-1, 2	08	Direct Control	–	100	6,11
3166	2	3036	11	Control Unit	–	–	8,11
3167	2	3036	11	Byte Multiplexer Channel	–	–	8,11
3168	2	3036	11	Block Multiplexer Channel	–	–	8,11
3169	2	3036	11	Channel-to-Channel Adapter	–	–	8,11
3170	2	3042-2	07	Control Unit	–	200	7,11
3171	2	3042-2	07	Byte Multiplexer Channel	–	200	7,11
3172	2	3042-2	07	Block Multiplexer Channel	–	200	7,11
3173	2	3042-2	07	Channel-to-Channel Adapter	–	200	7,11
3174 (3175)	1	3037	15	3042-1, 2	03	100	1,3,11
3176 (3163)	1	3037	15	3042-2	07	100	1,3,11
3178 (3179)	1	3037	15	3036	10	100	1,3,11
3189	1	3036	11	3033	08	75	11,16
3190	3	3037	15	3038	09	40	1,2,11
3191	1	3037	15	3038	09	50	1,11
3192	3	3037	15	3038	09	40	1,2,11
3193	1	3037	15	3038	09	50	1,11
3194	1	3036	11	3038	09	75	11
3195	1	3036	11	3038	09	75	11
3196	1	3033	08	3038	09	4	11
3197	1	3042-1, 2	08	3038	09	4	11
3198	1	3037	15	3037	15	100	11
3199	1	3036	11	3042-1, 2	08	75	11,16
3333	1	3037	15	3033	02	40	1,21
3341	6	3037	15	3033	01	40	1,2
3342	13	3037	15	3033	02	40	1,2, 17,22
3343	4	3037	15	3033	03	40	1,2
3344	2	3033	04	3033	01	18	1,17,21
3345	2	3033	04	3033	02	18	1
3346	2	3037	15	3033	04	100	2
3347	1	3037	15	3033	05	100	2
3348	1	3037	15	3033	07	100	2
3349	1	3037	15	3036	10	100	2

3033 PROCESSOR COMPLEX, 3033 PROCESSOR COMPLEX MODEL GROUPS N AND S, 3033 ATTACHED PROCESSOR COMPLEX, AND 3033 MULTIPROCESSOR COMPLEX CABLING SCHEMATIC–CABLES AND COOLANT HOSES

Cables

Group No.	*No. of Cables*	*From*	*Frame No.*	*To*	*Frame No.*	*Max Length (ft)*	*Notes*
3350	1	3033	07	3037	15	100	4,17
3351	1	3037	15	3033	07	100	2
3352	2	3037	15	3036	10	100	2
3353	1	3037	15	3033	04	100	2
3354 (3359)	1	3037	15	3037	16	13	1,3
3355	1	3037	15	3037	16	13	1
3356	1	3036	11	3033	04	75	9
3357	1	3036	11	3037	15	100	9
3358	1	3036	11	3033	07	75	9
3360	12	3037	15	3033	02	40	1,2,18
3361	2	3036	11	3033	05	75	9,15, 17,22
3362	1	3036	11	3033	06	75	4,9
3363	2	3036	11	3033	08	75	9,12
3364	2	3033	08	Direct Control	–	50	5
3365	1	Direct Control	–	3033	08	100	6
3366	2	3036	11	Control Unit	–	–	8
3367	2	3036	11	Byte Multiplexer Channel	–	–	8
3368	2	3036	11	Block Multiplexer Channel	–	–	8
3369	2	3036	11	Channel-to-Channel Adapter	–	–	8
3370	2	3033	07	Control Unit	–	–	7
3371	2	3033	07	Byte Multiplexer Channel	–	–	7
3372	2	3033	07	Block Multiplexer Channel	–	–	7
3373	2	3033	07	Channel-to-Channel Adapter	–	–	7
3374 (3375)	1	3037	15	3033	04	100	1,3
3376 (3377)	1	3037	15	3033	07	100	1,3
3378 (3379)	1	3037	15	3036	10	100	1,3
3380 (3388)	3	3037	15	3033	33	100	19
3389	1	3036	11	3033	08	75	10,16
3390	3	3037	15	3038	09	40	1,2,10
3391	1	3037	15	3038	09	50	1,10
3392	3	3037	15	3038	09	40	1,2,10
3393	1	3037	15	3038	09	50	1,10
3394	1	3036	11	3038	09	75	10
3395	1	3036	11	3038	09	75	10
3396	1	3033	08	3038	09	4	10
3397	1	3033	08	3038	09	4	10
3398	1	3037	15	3037	15	100	10
3399	1	3036	11	3033	08	75	10,16

3033 PROCESSOR COMPLEX, 3033 PROCESSOR COMPLEX MODEL GROUPS N AND S, 3033 ATTACHED PROCESSOR COMPLEX, AND 3033 MULTIPROCESSOR COMPLEX CABLING SCHEMATIC—CABLES AND COOLANT HOSES

Coolant Hoses

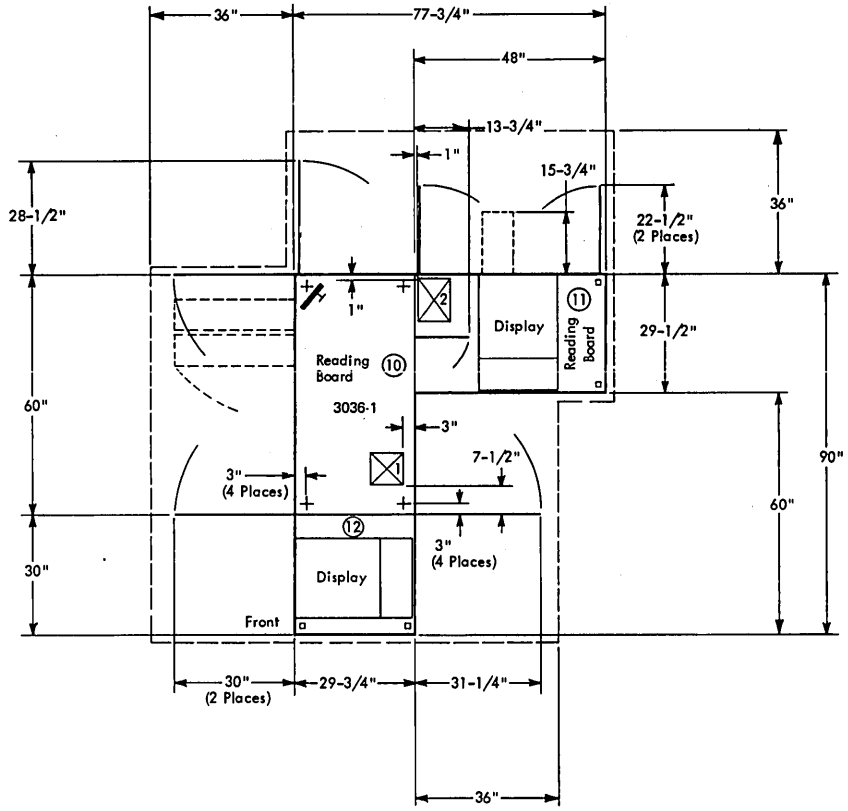
Group No.	*No. of Hoses*	*From*	*Frame No.*	*To*	*Frame No.*	*Max Length (ft)*	*Notes*
3181	4	3037	16	3042-1	01	55	11
3182	4	3037	16	3042-1	02	55	11
3183	2	3037	16	3042-1	03	55	11
3184	2	3037	16	3038	09	55	11
3185	2	3037	16	3038	09	55	11
3381	4	3037	16	3033	01	55	–
3382	4	3037	16	3033	02	55	–
3383	4	3037	16	3033	03	55	–
3384	2	3037	16	3038	09	55	10
3385	2	3037	16	3038	09	55	10

Notes:

1. Power cabling.
2. Control cabling.
3. For 50-Hz machines, use group numbers in parentheses.
4. Required for extended channels feature (SF #3850).
5. Required for direct control (standard feature) to non-IBM devices.
6. Direct control (standard feature) to other processors (excluding 3195).
7. From channel-to-channel adapter 1 on 3033 Processor and 3033 Processor Model Groups N and S with SF #1850. From channel-to-channel adapter 2 on 3033 Processor with SF #1851 and 3033 Processor Model Groups N and S with SF #1851 and #3851. Order two groups per feature (see Section 2). Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) is available to attach up to eight control units.
8. Any two of these cable groups are required for the total 3036 Console function: one cable group for the service support station and one for the operator station. Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) is available to attach up to eight control units.
9. Signal cabling.
10. Required for 3033 Multiprocessor Complex.
11. Required for 3033 Attached Processor Complex.
12. Required for 3033 Processor Complex only. Cable group is replaced by groups 3194 and 3195 on 3033 Attached Processor Complex and groups 3394 and 3395 on 3033 Multiprocessor Complex.
13. Required for 3033 Processor Model Group N.
14. Required for extended channels feature (SF #3851).
15. Not required for 3033 Processor Model Group N.
16. Group 3363 has two cables of part 4488328; groups 3189, 3199, 3389, and 3399 have one cable of part 4872897. When a UP is field upgraded to an AP or MP complex, group 3363 may be split and used in place of group 3189, 3199, 3389, or 3399, if the 3363 is long enough to reach each console from frame 08.
17. Not required for 3033 Processor Model Group S.
18. Required only for 3033 Processor Model Group S.
19. Required for 3033 Processor Models U24 and A24.
20. Required only for 3033 Processor Model Group N or S.
21. Order for 3033 Processor Model Group S to Model Group N or to Model U conversion.
22. Do not order for 3033 Processor Model Group S to Model Group N or to Model U conversion.

3036 CONSOLE MODEL 1 FOR 3031, 3032, 3033 PROCESSOR COMPLEXES AND 3033 PROCESSOR COMPLEX MODEL GROUPS N AND S, 3031 AND 3033 ATTACHED PROCESSOR COMPLEXES, AND 3033 MULTIPROCESSOR COMPLEX

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Cable Entry/ Exit Number	Dimensions (Inches)
1	8 x 8
2	8 x 10-3/4

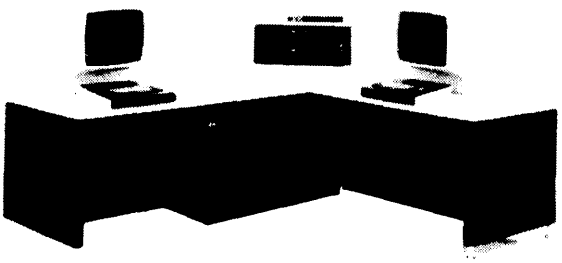
Notes:

1. Caster and cable hole locating dimensions are measured from edge of frame, not cover. Frame side covers are 1-1/4" thick.
2. For cabling information, see 3031 Processor, 3032 Processor, 3033 Processor, or 3033 Processor Model Groups N and S.
3. Use one-half of the clearance distance, measured from the machine, for weight distribution.

3036 CONSOLE MODEL 1 FOR 3031, 3032, 3033 PROCESSOR COMPLEXES AND 3033 PROCESSOR COMPLEX MODEL GROUPS N AND S, 3031 AND 3033 ATTACHED PROCESSOR COMPLEXES, AND 3033 MULTIPROCESSOR COMPLEX

Input/Output Device Priority Considerations

I/O	*Class*	*Critical Time*
3036 (2955 Emulate)	1	7.5 ms (Byte Multiplexer Only)
3036	3	Not Applicable (Byte Multiplexer Only)



SPECIFICATIONS

Dimensions:

	F	S	H
Inches	*	*	49**
(cm)	(*)	(*)	(124**)

Service Clearances:

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

Weight: 1,375 lb (630 kg)

Heat Output: 6,900 BTU/hr (1 750 kcal/hr)

Airflow: 300 cfm (8.5 m^3/min)

Power Requirements:

The 3036 Console Model 1 receives power from:

1. The 3027 Power and Coolant Distribution Unit Model 1 when used with the 3032 Processor.
2. The 3037 Power and Coolant Distribution Unit Model 1 when used with the 3033 Processor, 3033 Processor Model Groups N and S or 3042 Attached Processor.
3. The 3031 Processor (frame 02).

Shipping Dimensions:

Frame	*With Packing*	*Outer Packing Removed*
10 & 12 Connected[1]	93" x 31" (236 cm x 79 cm)	90" x 29-3/4" (229 cm x 76 cm)

[1]Dimensions can be reduced if necessary for shipping to 62" x 29-3/4" (157 cm x 76 cm).

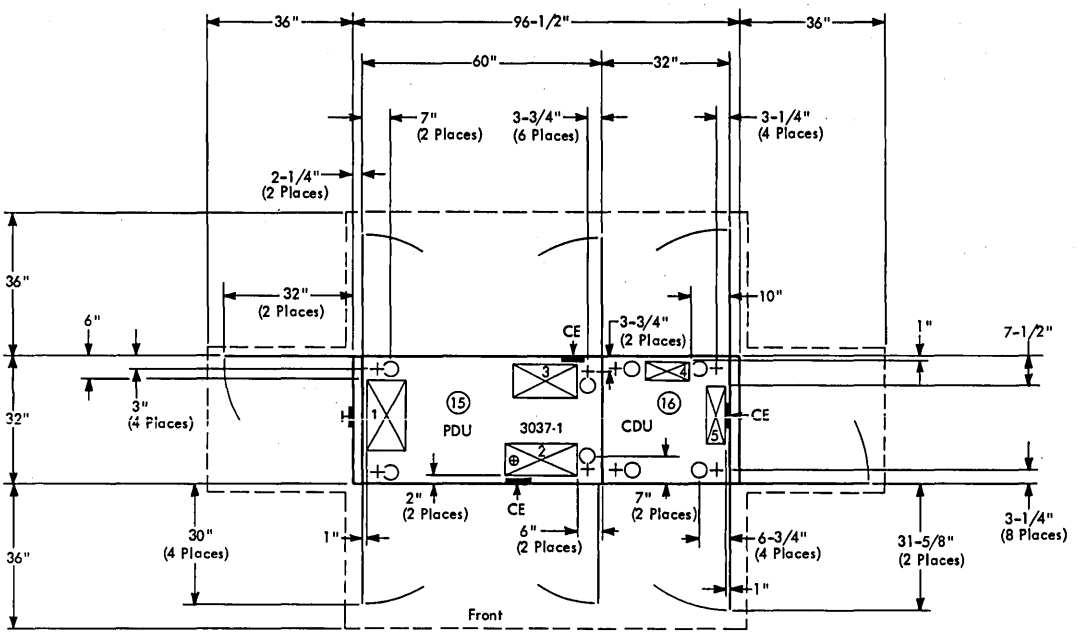
Notes:

*See plan view.

**Measured from floor to top of the display.

3037 POWER AND COOLANT DISTRIBUTION UNIT MODEL 1 FOR 3033 PROCESSOR COMPLEX AND 3033 PROCESSOR COMPLEX MODEL GROUPS N AND S, 3033 ATTACHED PROCESSOR COMPLEX, AND 3033 MULTIPROCESSOR COMPLEX

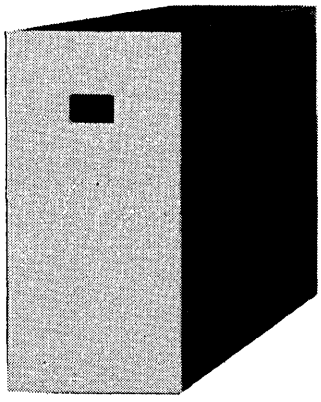
PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Cable Entry/ Exit Number	Dimension (Inches)	Notes
1	10 x 17-1/2	
2	8 x 18	1
3	8 x 16	
4	5 x 11	2
5	5 x 14-1/2	3

Notes:

1. See Details A and B on page 3037.3.
2. Customer chilled water supply and return.
3. IBM supply and return.
4. For cabling information, see 3033 Processor or 3033 Processor Model Groups N and S.
5. Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame, not cover. Frame side covers are 1-1/4" thick.
6. Use one-half of the clearance distance, measured from the machine, for weight distribution.



3037 POWER AND COOLANT DISTRIBUTION UNIT MODEL 1 FOR 3033 PROCESSOR COMPLEX AND 3033 PROCESSOR COMPLEX MODEL GROUPS N AND S, 3033 ATTACHED PROCESSOR COMPLEX, AND 3033 MULTIPROCESSOR COMPLEX

SPECIFICATIONS

Dimensions:

	F	S	H
Inches	96-1/2	32	70
(cm)	(245)	(81)	(178)

Service Clearances:

	F	R	Rt	L
Inches	36	36	36	36
(cm)	(91)	(91)	(91)	(91)

Weight: 2,825 lb (1 290 kg)

Heat Output:

3033	*Air BTU/hr (kcal/hr)**	*Water BTU/hr (kcal/hr)**
UP, MP, AP Frame 15	8,800 (2 250)	17,500 (4 450)
Groups N & S Frame 15	8,800 (2 250)	16,300 (4 150)
Frame 16	4,200 (1 100)	4,200 (1 100)

Airflow: 50 cfm (2 m^3/min) (Frame 15, all models)

Power Requirements:

	*kVA***	
3033 and 3042 Models	*50/60 Hz*	*415/441 Hz†*
U4, A4, M4	5.5	49.0
U6, A6, M6	5.5	50.0
U8, A8, M8	5.5	52.0
U12, A12, M12	5.5	54.5
U16, A16, M16	5.5	57.0
U24, A24	7.2	61.7
N4	4.7	43.3
N8	4.7	46.5
N12	4.7	49.0
N16	4.7	51.5
S4	4.7	42.0
S8	4.7	45.0
S12	4.7	47.5
S16	4.7	50.0
3042-1	5.0	33.3
3042-2	5.3	38.5

	50/60 Hz	*415/441 Hz*
Phases	3	Refer to Appendix A, Part 6.
Plug	R&S, FS3760	
Connector	R&S, FS3934	
Receptacle	R&S, FS3754	
Power Cord Style: B1		

The PCDU (frame 15):

1. Requires 3-phase, 200/220/235/380/408 V + 10%, −8%, 50-Hz ± 0.5-Hz, or 200/208/230 V + 10%, −8%, 60-Hz ± 0.5-Hz customer service.
2. Receives 3-phase, 208 V, 415/441-Hz (nominal) power from the remote motor generator (hardwired) or other source. Refer to Appendix A, Part 6.

Environment, Operating:

Temperature	60°F-90°F (16°C-32°C)
Rel Humidity	20%-80%
Max Wet Bulb	72°F (22°C)***

Environment, Nonoperating:

Temperature	50°F-110°F (10°C-43°C)
Rel Humidity	8%-80%
Max Wet Bulb	80°F (27°C)***

Shipping Dimensions:

Frame	*With Packing*	*Outer Packing Removed*
15	65" x 32" (165 cm x 81 cm)	64" x 32" (163 cm x 81 cm)
16	36" x 32" (91 cm x 81 cm)	35" x 32" (89 cm x 81 cm)

Notes:

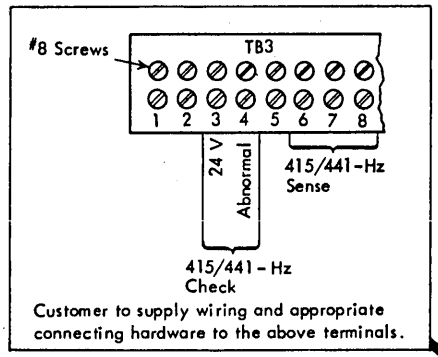
*For the 3033 Attached Processor Complex and the 3033 Multiprocessor Complex, add 300 BTU/hr (8 kcal/hr) to air and 2,500 BTU/hr (630 kcal/hr) to water.

**For SF #3850, extended channels, add 0.8 kVA to 50/60-Hz power requirements and 4.5 kVA to 415/441-Hz power requirements. For the 3033 Attached Processor Complex and the 3033 Multiprocessor Complex, add 0.4 kVA to 50/60-Hz power requirements and 2.2 kVA to 415/441-Hz power requirements.

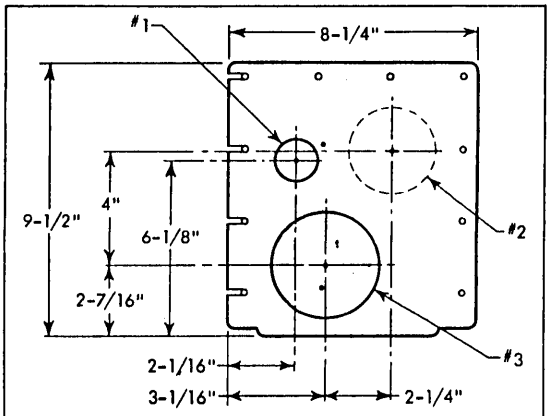
***See "Liquid Coolant System" in Appendix A.

† For SF #3851, extended channels, add 5.5 kVA.

3037 POWER AND COOLANT DISTRIBUTION UNIT MODEL 1 FOR 3033 PROCESSOR COMPLEX AND 3033 PROCESSOR COMPLEX MODEL GROUPS N AND S, 3033 ATTACHED PROCESSOR COMPLEX, AND 3033 MULTIPROCESSOR COMPLEX

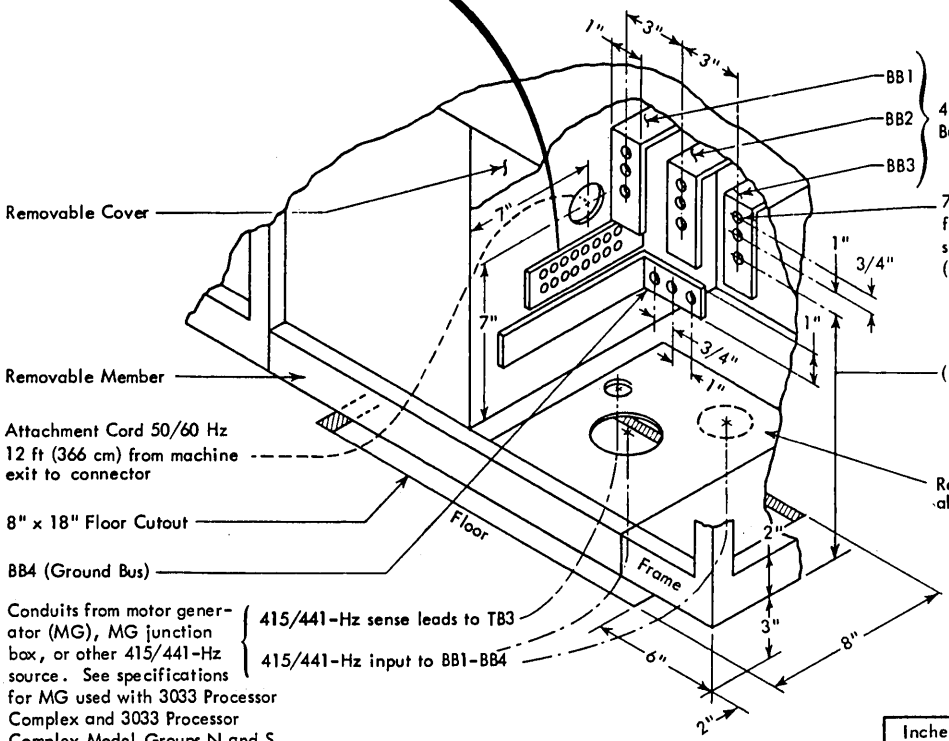


Customer to supply wiring and appropriate connecting hardware to the above terminals.



Mounting plate for conduit attachment.
#1: 1-3/8" diameter hole for 1" conduit.
#2: 3" diameter prefabricated knockout for 2-1/2" conduit.
#3: 3-5/8" diameter hole for 3" conduit.

Detail A



Detail B

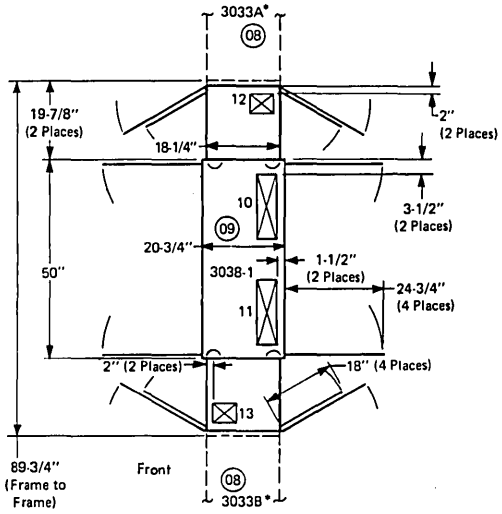
Inches	Millimeters
1/4	6.4
3/8	9.5
7/16	11.1
3/4	19.1
1	25.4
1-3/8	34.9
2	50.8
2-1/16	51.0
2-1/4	57.2
2-7/16	61.9
2-1/2	63.5
3	76.2

Inches	Millimeters
3-1/16	76.4
3-5/8	92.1
4	101.6
5	127.0
6	152.4
6-1/8	155.6
7	177.8
8	203.2
8-1/4	209.6
9-1/2	241.3
16	406.4
18	457.2

Note: If 415/441-Hz planned input source for the 3037 does not meet specification for the MG used with 3033 Processor Complex, 3033 Processor Complex Model Groups N and S, 3033 Attached Processor Complex, and 3033 Multiprocessor Complex as shown in this manual, contact your local IBM Installation Planning representative.

3038 MULTIPROCESSOR COMMUNICATION UNIT MODEL 1 FOR 3033 ATTACHED PROCESSOR AND MULTIPROCESSOR COMPLEXES

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Cable Entry/Exit Number	Dimension (Inches)
10	5 x 16
11	5 x 16
12	5 x 6
13	5 x 6

Notes:

1. For cabling information, see the "3033 Attached Processor Complex Cabling Schematic" and "3033 Multiprocessor Complex Cabling Schematic."
2. Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame, not cover.
3. Frame side covers are 1-1/4" thick.

Shipping Dimensions:

Frame	*With Packing*	*Outer Packing Removed*
09	79" x 29-1/2" (201 cm x 75 cm)	75" x 29-1/2" (191 cm x 75 cm)

Dimensions can be reduced if necessary for shipping to 54" x 29-1/2" (137 cm x 75 cm).

SPECIFICATIONS

Dimensions:

	F	S	H
Inches	18-1/4	89-3/4	78
(cm)	(47)	(228)	(198)

Service Clearances: **

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

Weight: 1,200 lb (550 kg)

Heat Output: †

Air	7,500 BTU/hr (1 900 kcal/hr)
Water	4,500 BTU/hr (1 150 kcal/hr)

Airflow: 150 cfm (5 m^3/min)

Power Requirements:

The 3038 (frame 09) receives 50/60-Hz power and 415/441-Hz power from the two 3037 PCDUs (frame 15).

Environment, Operating:

Temperature	60°F-90°F (16°C-32°C)
Rel Humidity	20%-80%
Max Wet Bulb	72°F (22°C)††

Environment, Nonoperating:

Temperature	50°F-100°F (10°C-43°C)
Rel Humidity	8%-80%
Max Wet Bulb	80°F (27°C)††

Notes:

* The 3038 attaches between the 3033s (frame 08) in the 3033 Multiprocessor Complex.

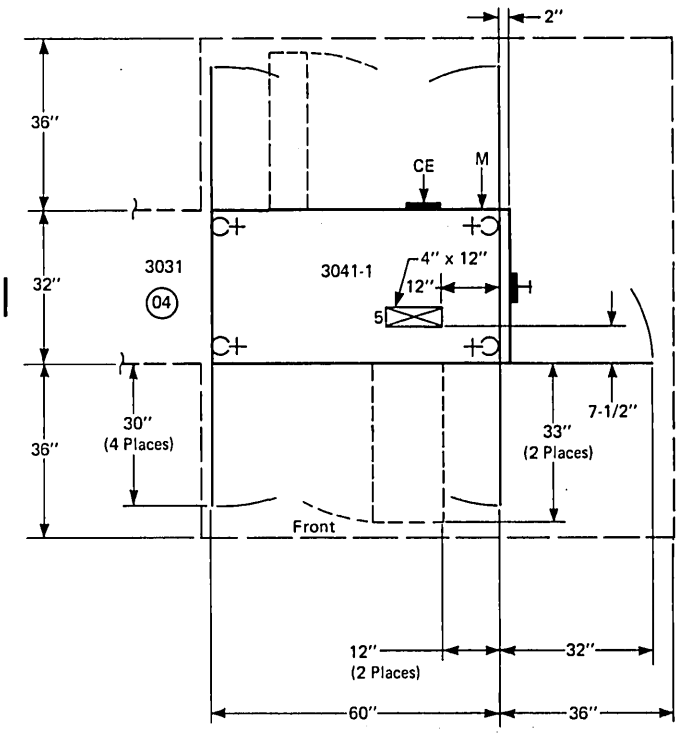
** Refer to 3033 Processor A-series and M-series plan views for service clearances.

† One-half of the heat output for the 3038 is associated with each 3033 Processor A-series and M-series in the 3033 Attached Processor and Multiprocessor Complexes.

†† See "Liquid Coolant System" in Appendix A.

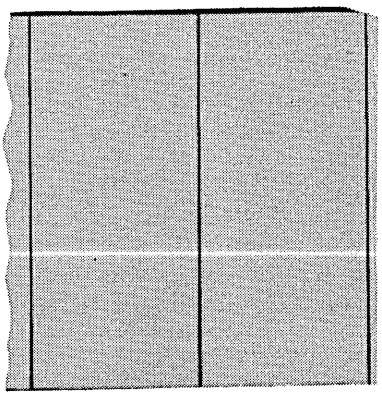
3041 ATTACHED PROCESSOR MODEL 1 FOR 3031 ATTACHED PROCESSOR COMPLEX

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Notes:

1. The 3041-1 abuts to the right side of the 3031 frame 04.
2. Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame, not cover.
3. Frame side covers are 1-1/4" thick.



SPECIFICATIONS

Dimensions:

	F	S	H
Inches	62	32	70-1/2
(cm)	(157)	(81)	(179)

Service Clearances:

	F	R	Rt	L
Inches	42	42	36	0
(cm)	(114)	(114)	(91)	(0)

Weight: 1,960 lb (890 kg)

Heat Output: 16,550 BTU/hr (4 200 kcal/hr)

Airflow: 1,320 cfm (37 m^3/min)

Power Requirements: *	*50/60 Hz*	*415/441 Hz*
kVA	0.6	5.1
Phases	3	3

Environment, Operating:

Temperature	60°F-90°F (16°C-32°C)
Rel Humidity	20%-80%
Max Wet Bulb	73°F (23°C)

Shipping Dimensions:

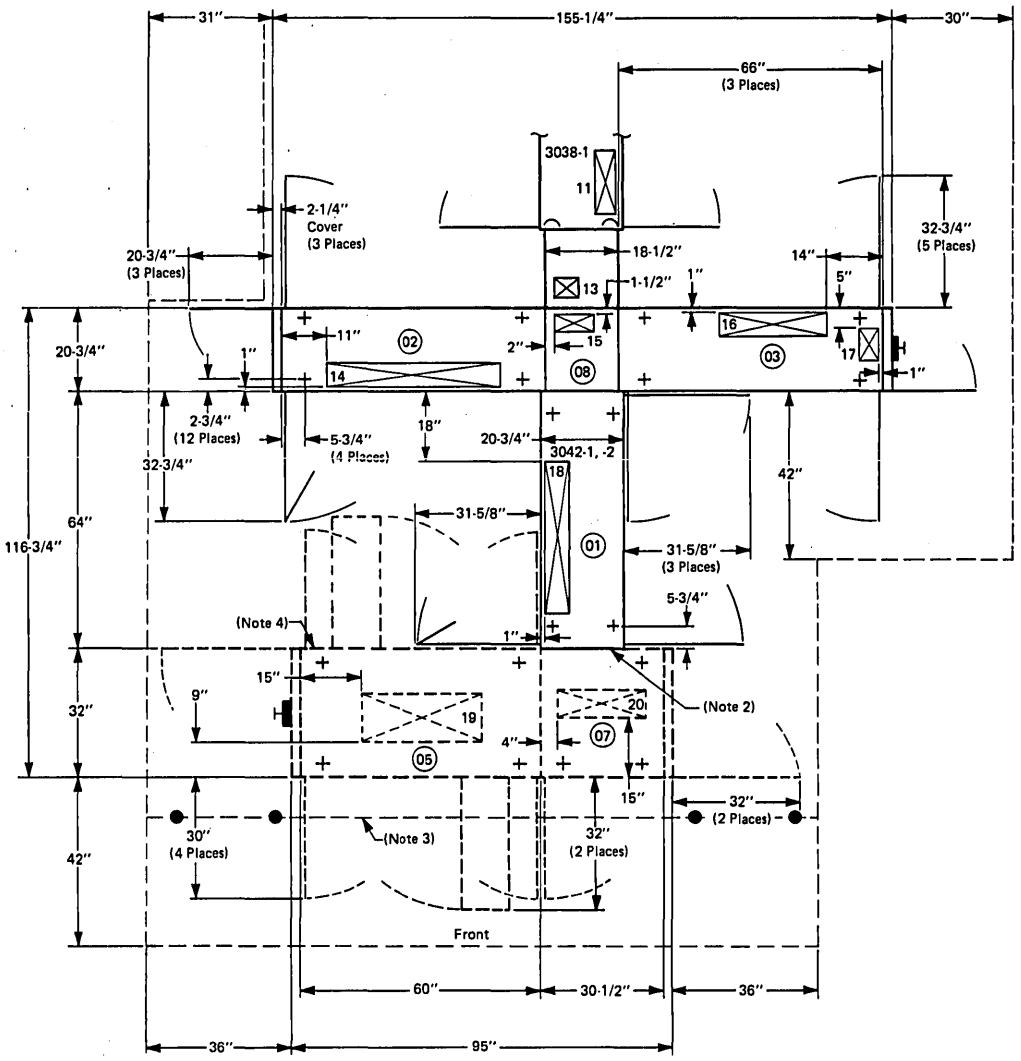
With Packing	*Outer Packing Removed*
65-1/2" x 32" (166 cm x 81 cm)	63-1/2" x 32" (161 cm x 81 cm)

Notes:

*Powered from 3031 frame 02.

3042 ATTACHED PROCESSOR MODELS 1 AND 2 FOR 3033 ATTACHED PROCESSOR COMPLEX

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Cable Entry/ Exit Number	Dimension (Inches)
14	6 x 44
15	4-1/2 x 10
16	6 x 27
17	5 x 8
18	6 x 38
19	12 x 30
20	7 x 22

Notes:
1. Cable hole locating dimensions are measured from edge of frame, not cover. Frame side covers are 1-1/4" thick.
2. Two-inch end cover added for 3042 Model 1.
3. Service clearance for 3042 Model 1 (42" beyond frame 01 end cover).
4. Frames 05 and 07 required for 3042 Model 2 only.

3042 ATTACHED PROCESSOR MODELS 1 AND 2 FOR 3033 ATTACHED PROCESSOR COMPLEX

Details (By Frame)

Frame	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	kVA
01	1	1,225 (560)	330 (10)	4,950 (1 250)	15,750 (4 000)	*
02	1	1,450 (660)	330 (10)	9,800 (2 500)	32,050 (8 100)	*
03	1	1,000 (460)	130 (5)	6,850 (1 750)	4,900 (1 250)	*
05	2	1,725 (790)	600 (17)	16,000 (4 050)	–	*
07	2	650 (300)	100 (3)	–	–	*
08	1	150 (70)	0 (0)	–	–	–

Details (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
1	3,825 (1 750)	790 (23)	21,700 (5 500)	53,050 (13 400)
2	6,200 (2 850)	1,490 (43)	37,700 (9 500)	53,050 (13 400)

SPECIFICATIONS

Dimensions: **

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

Service Clearances:

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

Weight: See Details (By Model).

Heat Output:
Air See Details (By Model).
Water See Details (By Model).

Airflow: See Details by Model.

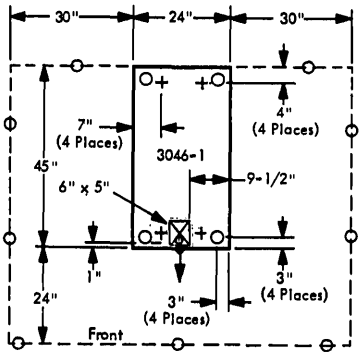
Environment, Operating:
Temperature 60°F-90°F (16°C-32°C)
Rel Humidity 20%-80%
Max Wet Bulb 72°F (22°C)†

Environment, Nonoperating:
Temperature 50°F-110°F (10°C-43°C)
Rel Humidity 8%-80%
Max Wet Bulb 80°F (27°C)†

Notes:
*Receives power from 3037 PCDU.
**Maximum dimensions of frames 01, 02, and 03 with protective end caps and covers removed are 29-1/2", with outriggers, x 72" (183 cm x 75 cm).
***See plan view.
†See "Liquid Coolant System" in Appendix A.

3046 POWER UNIT MODEL 1

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



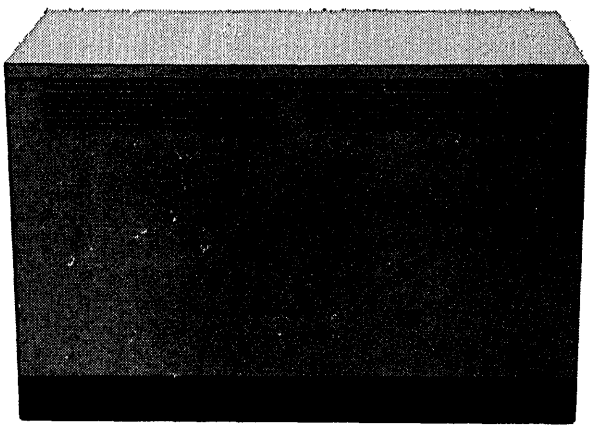
Note: For cabling information, see 3135, 3138, or 3145.

Branch Circuit Requirements

Voltage*	200	208	220	230	235	380	408
Ampacity	50	60	50	60	50	30	30
Max Cont Load (A)**							
With 3345-1, 4	24	23	22	21	21	13	12
With 3345-2; 5	34	32	31	29	29	18	17
With 3135	44	42	39	38	37	23	21
With 3138	37	35	32	31	30	16	14
Plug	R&S, SC7328						
Connector	R&S, SC7428						
Receptacle	R&S, SC7324						
Power Cord Style UK: E8 Europe (except UK): E4 Japan: E9 Other: E–							

Branch Circuit Protection***

200/208/220 230/235 V		*380/408 V*	
Sec	*A*	*Sec*	*A*
2.0	330	2.0	150
Continuous	55/60†	Continuous	30
Adjustable	500	Adjustable	300
Trip		Trip	



SPECIFICATIONS

Dimensions:

	F	S	H
Inches	24	45	29
(cm)	(61)	(114)	(74)

Service Clearances:

	F	R	Rt	L
Inches	24	0	30	30
(cm)	(61)	(0)	(76)	(76)

Weight: 815 lb (370 kg)

Heat Output:	*With 3345-1, 4*	*With 3345-2, 5*	*With 3135*	*With 3138*
BTU/hr	10,900	11,050	11,950	11,300
(kcal/hr)	(2 750)	(2 800)	(3 050)	(2 850)

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

Power Requirements:†††				
kVA	3.6	3.8	4.4	4.4
Phases	3	3	3	3

Notes:

* 200 V applies to 50-Hz and 60-Hz World Trade systems. 200/235/380/408 V apply to 50-Hz World Trade systems.

** Includes power for the 3046-1, the 3345, and the 3135 or 3138.

*** Because of the nature of inrush currents, the branch circuit protection device requires characteristics that are equal to or slower than those specified in the Branch Circuit Protection table.

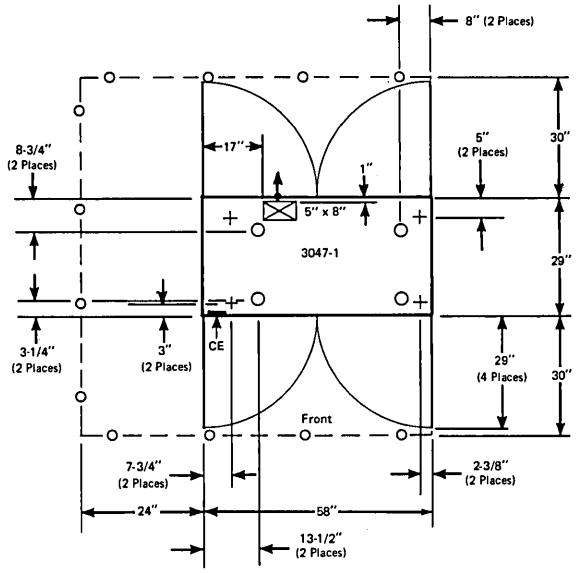
† Systems installed in U.S. and Canada require 60 A when 60 A R&S plug is used.

†† Air may be exhausted either to right or left by interchanging the right and left covers.

††† Includes power used and dissipated as heat within the 3046-1. Does not include power passed on to the 3345 or the 3135 or the 3138. For current drawn, see Branch Circuit Requirements.

3047 POWER UNIT MODEL 1

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Note: For cabling information, see 3145 or 3148.

SPECIFICATIONS

Dimensions:

	F	S	H
Inches	58	29	40
(cm)	(147)	(74)	(102)

Service Clearances:

	F	R	Rt	L
Inches	30	30	0	24
(cm)	(76)	(76)	(0)	(61)

Weight:	*50 Hz*	*60 Hz*
lb	915	850
(kg)	(420)	(390)

Heat Output: 18,500 BTU/hr (4 700 kcal/hr)

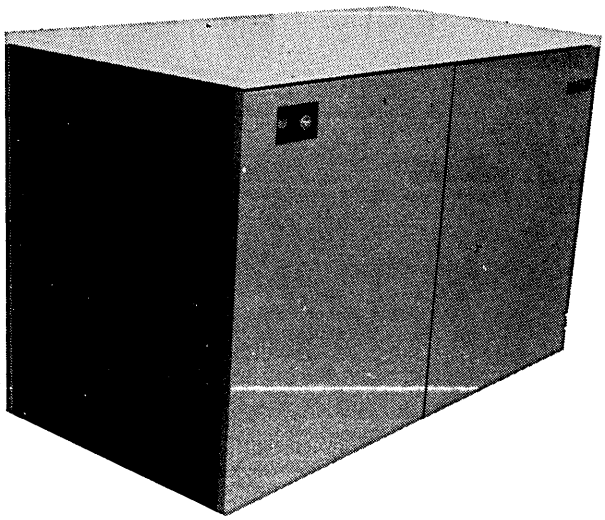
Airflow: 380 cfm (11 m^3/min)

Power Requirements:*

kVA	6.7
Phases	3

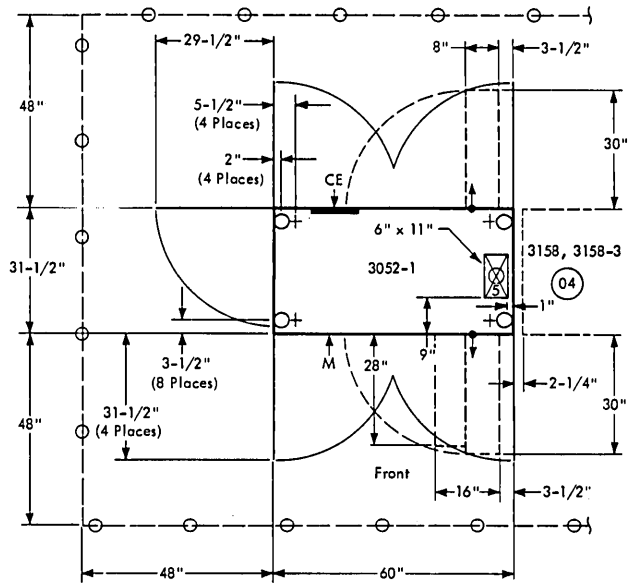
Notes:

*Powered from 3145 or 3148.



3052 ATTACHED PROCESSING UNIT MODEL 1 FOR SYSTEM/370 MODEL 158 ATTACHED PROCESSOR (3158 AND 3158-3 PROCESSING UNITS)

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Notes:

1. Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame, not cover.
2. The 3052-1 abuts to the left side of a 3158 or 3158-3 frame 04.

SPECIFICATIONS

Dimensions:

	F	S	H
Inches	60	31-1/2	60
(cm)	(152)	(80)	(152)

Service Clearances:

	F	R	Rt	L
Inches	48	48	0	48
(cm)	(122)	(122)	(0)	(122)

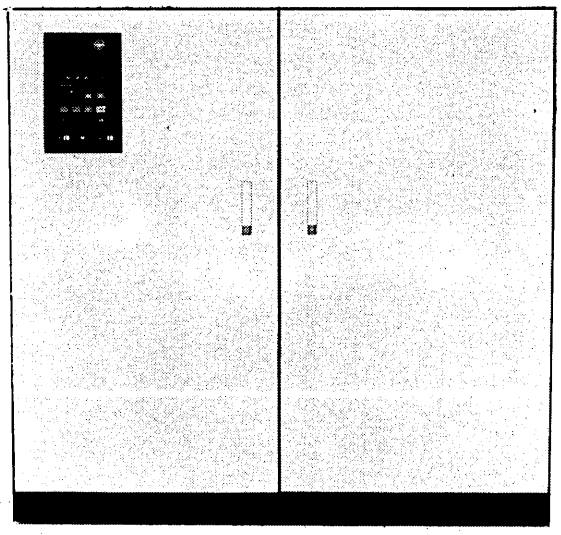
Weight:	*50 Hz*	*60 Hz*
lb	1,600	1,200
(kg)	(730)	(550)

Heat Output: 17,800 BTU/hr (4 500 kcal/hr)

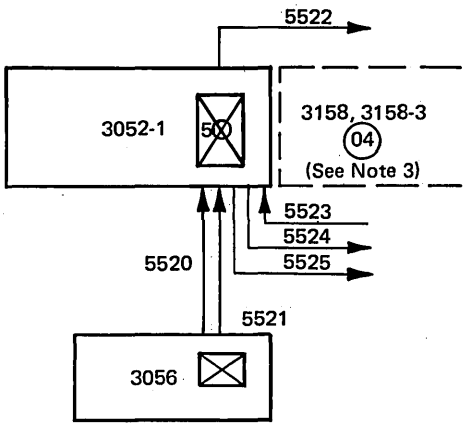
Airflow: 910 cfm (26 m^3/min)

Power Requirements:

kVA	6.0
Phases	3
Plug	R&S, FS3760
Connector	R&S, FS3934
Receptacle	R&S, FS3754
Power Cord Style	D1



3052 ATTACHED PROCESSING UNIT MODEL 1 CABLING SCHEMATIC



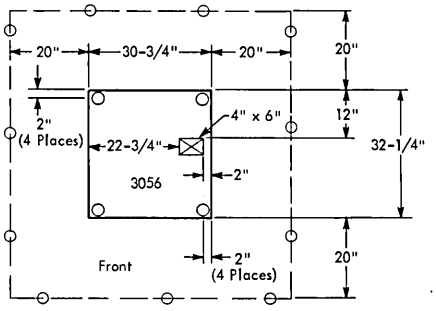
Group No.	*No. of Cables*	*From*	*To*	*Max Length (ft)*	*Notes*
5520	2	3056	3052-1	20	1
5521	1	3056	3052-1	20	2
5522	1	3052-1	Modem	50	4
5523	2	Direct Control	3052-1	50	5
5524	1	3052-1	System/360 or System/370 Processor	100	6
5525	1	3052-1	System/360 or System/370 Processor	100	3

Notes:

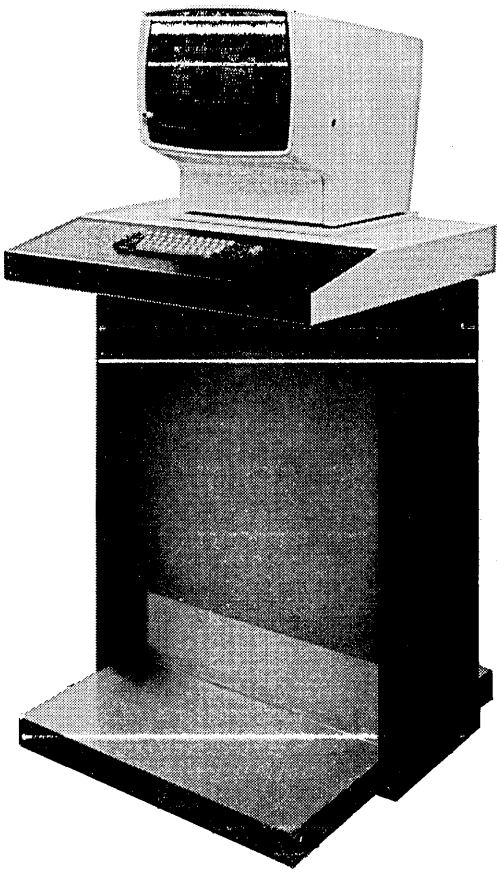
1. Power sequence and control (EPO) for 3056.
2. Signal cable.
3. The 3052-1 uses the two system EPO connections on the host processor via an internal cable. If the 3158 or 3158-3 is to be connected by EPO to another system, SF #3622, multisystem EPO connection, is required on the host processor and group 5525 must be ordered to connect 3052-1 to multisystem EPO connection on the host processor.
4. For 50-Hz machines (modem).
5. For SF #3274 from non-IBM device.
6. For the interconnection of two System/360 or System/370 processors (SF #3274); order per feature.

3056 REMOTE SYSTEM CONSOLE FOR SYSTEM/370 MODEL 158

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Note: For cabling information, see 3158, 3158-3, or 3052



SPECIFICATIONS

Dimensions: *

	F	S	H
Inches	30-3/4	32-1/4	62**
(cm)	(78)	(82)	(157**)

Service Clearances:

	F	R	Rt	L
Inches	20	20	20	20
(cm)	(51)	(51)	(51)	(51)

Weight: 150 lb (69 kg)

Heat Output: 550 BTU/hr (140 kcal/hr)

Airflow: Convection only

Power Requirements: ***

kVA	0.2

Environment, Operating:

Temperature	50°F-110°F (10°C-43°C)
Rel Humidity	8%-80%
Max Wet Bulb	85°F (29°C)

Environment, Nonoperating:

Temperature	50°F-125°F (10°C-52°C)
Rel Humidity	8%-80%
Max Wet Bulb	85°F (29°C)

Notes:

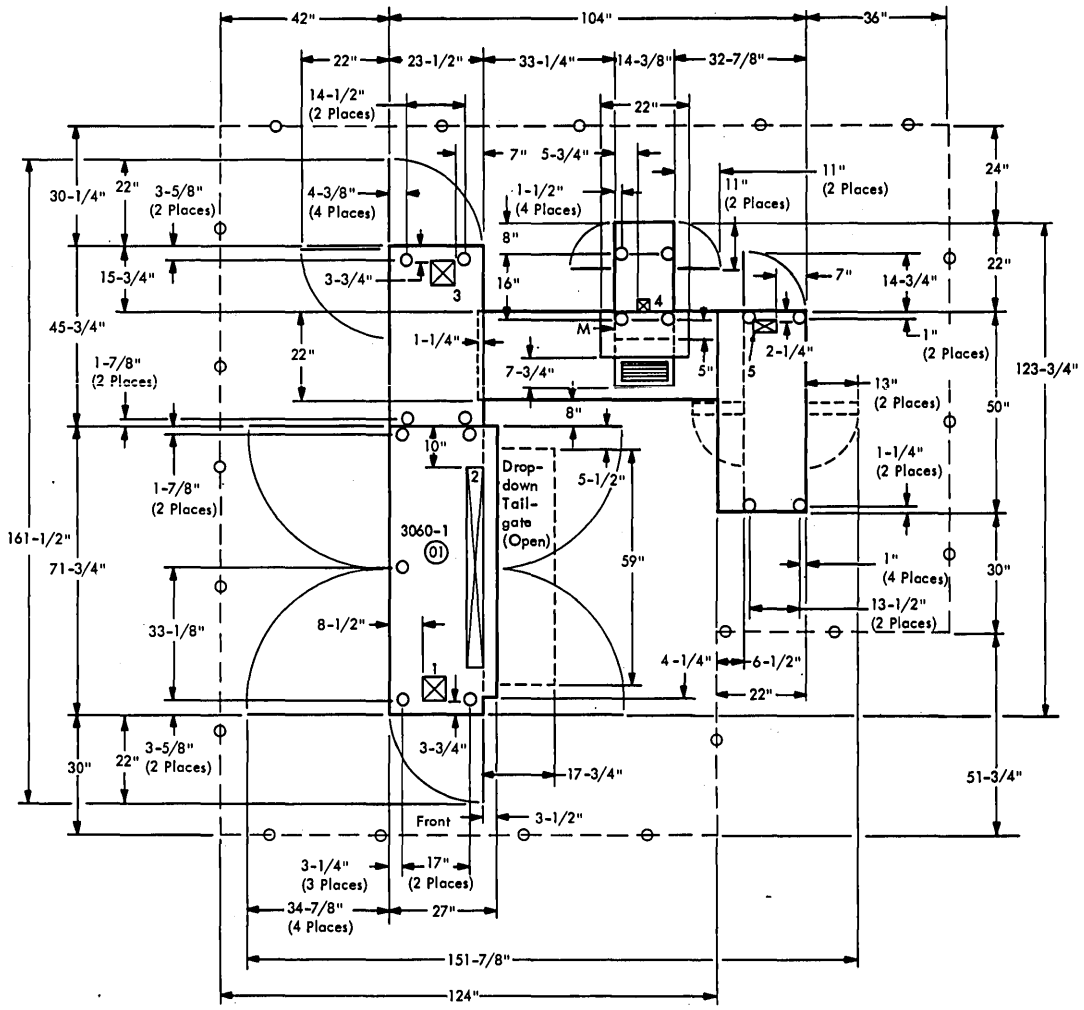
* Machine can be reduced to 30" x 32-1/4" x 44" (76 cm x 82 cm x 112 cm) for shipment.

** To top surface of keyboard unit is 44" (112 cm).

*** Powered from the 3158 or 3158-3 when SF #7820 is installed or from 3052 Attached Processing Unit.

3060 SYSTEM CONSOLE MODEL 1
FOR SYSTEM/370 MODEL 195

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Cable Entry/Exit Number	Dimensions (Inches)
1	6 x 6
2	4 x 50
3	6 x 6
4	3 x 3
5	3 x 6

Note: For cabling information, see 3195

3060 SYSTEM CONSOLE MODEL 1
FOR SYSTEM/370 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)

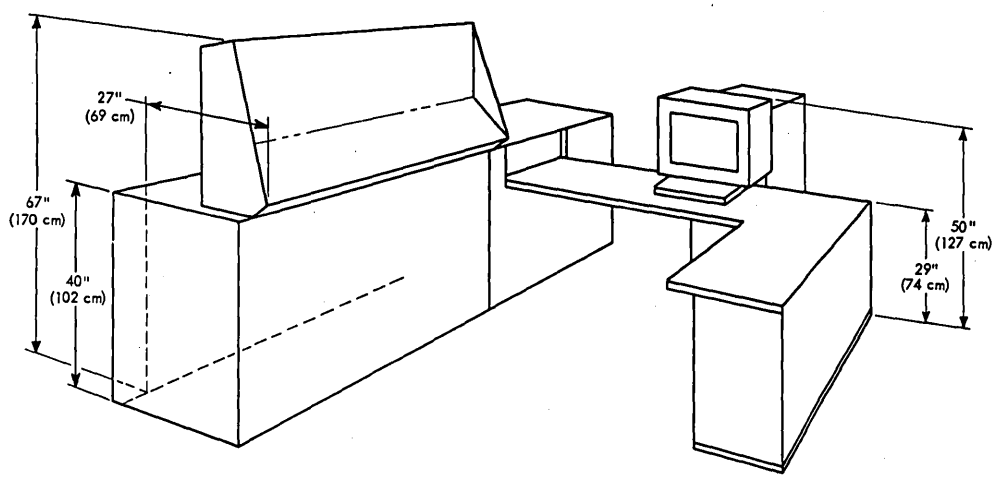
Weight: 2,500 lb (1 150 kg)

Heat Output: 14,000 BTU/hr (3 550 kcal/hr)

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

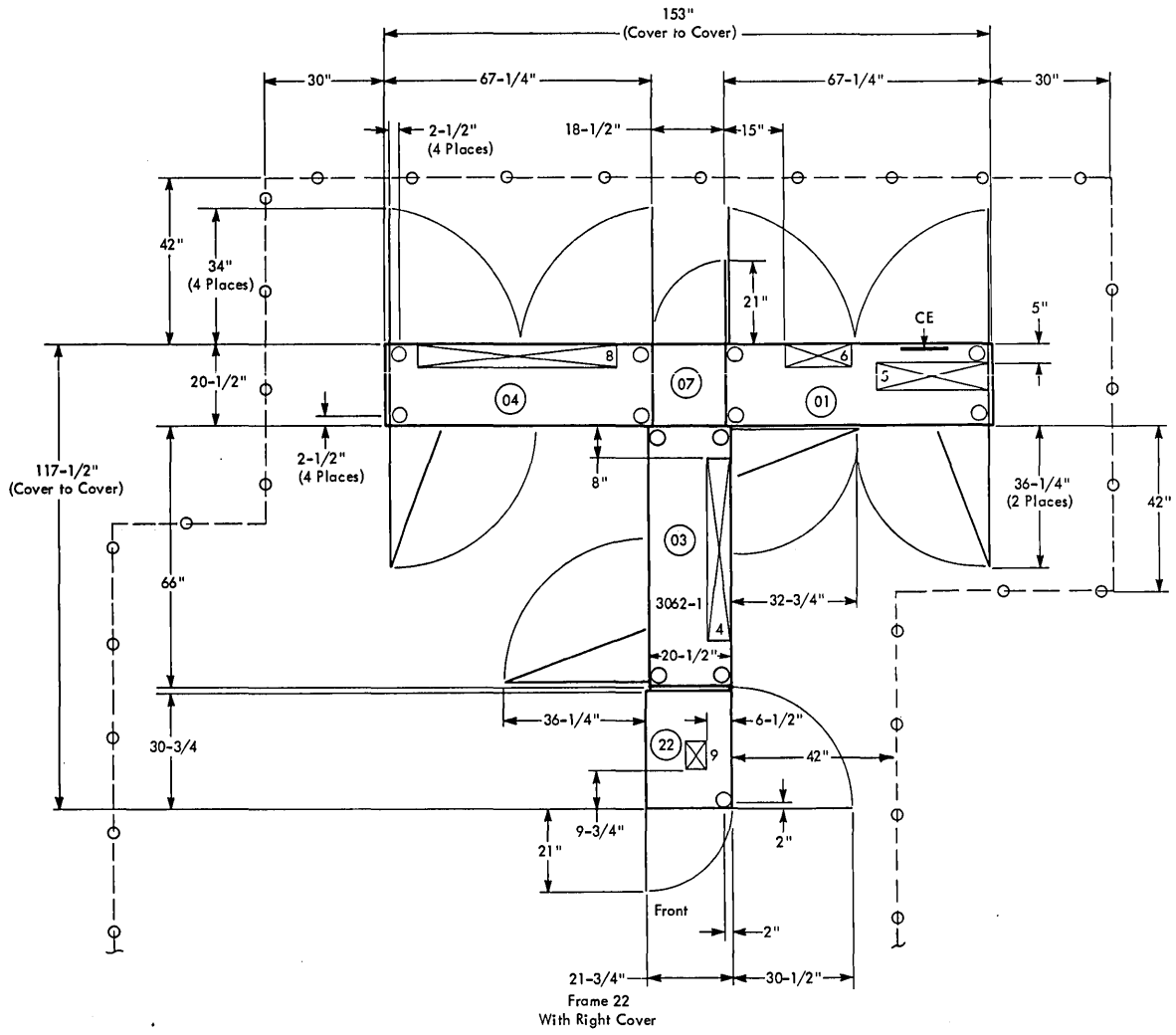
Power Requirements:
The 3060 (frame 01) receives power from the 3085 PDU (frame 09).

Notes:
* See plan view.



3062 ATTACHED PROCESSING UNIT MODEL 1 FOR SYSTEM/370 MODEL 168 ATTACHED PROCESSOR (3168-3 PROCESSING UNIT)

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Notes:
1. Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame, not cover.
2. Typical dimensions for leveling pads on frames 01, 03, and 04.
3. Frame 22 abuts to frame 02 of 3168-3.

Cable Entry/Exit Number	Dimensions (Inches)
4	6 x 46
5	7 x 28
6	6 x 17
8	6 x 50
9	5 x 7

3062 ATTACHED PROCESSING UNIT MODEL 1 FOR SYSTEM/370 MODEL 168 ATTACHED PROCESSOR (3168-3 PROCESSING UNIT)

Details (By Frame)

Frame	*Weight lb (kg)*	*Airflow cfm (m^3/min)*	*Heat Output BTU/hr (kcal/hr)*		*kVA*
			To Air	*To Water*	
01	1,275 (580)	250 (8)	4,230 (1 100)	22,060 (5 600)	*
03	1,450 (660)	500 (15)	7,620 (1 950)	29,820 (7 550)	*
04	1,275 (580)	500 (15)	5,835 (1 500)	22,105 (5 600)	*
07	150 (68)	–	–	–	–
22	225 (110)	–	–	–	–

SPECIFICATIONS

Dimensions:

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

Service Clearances:

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

Environment, Operating:

Temperature	65°F-90°F (18°C-32°C)
Rel Humidity	20%-80%
Max Wet Bulb	72°F (22°C)***

Environment, Nonoperating:

Temperature	50°F-110°F (10°C-43°C)
Rel Humidity	8%-80%
Max Wet Bulb	80°F (27°C)***

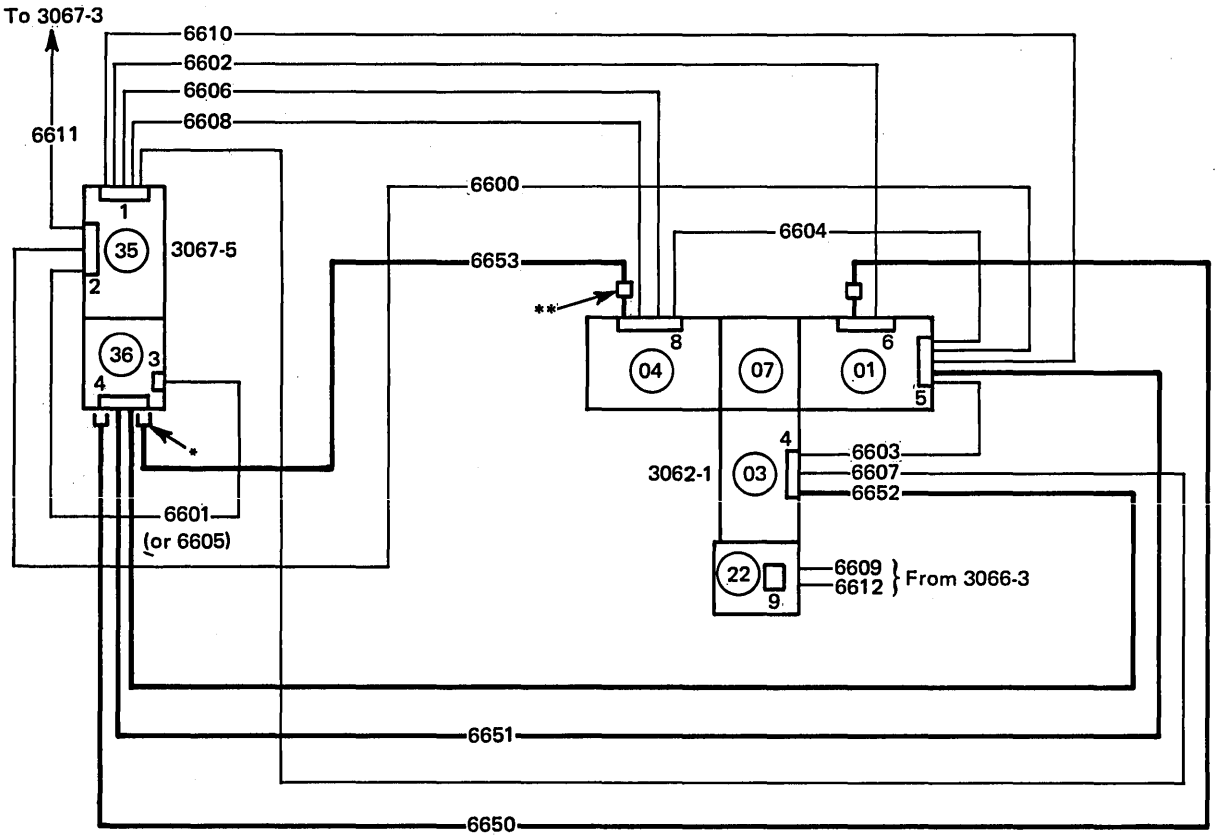
Notes:

*Receives power from the 3067 PCDU Model 5 (frame 35).

**See plan view.

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

3062 ATTACHED PROCESSING UNIT MODEL 1 CABLING SCHEMATIC—CABLES AND COOLANT HOSES



Legend:

Coolant Hoses. (Only supply hoses are shown; assume one return hose for each supply hose.)

Cables

*Quick-connect sockets are on supply hoses at 3067-5 CDU end. Quick-connect plugs are on return hoses at 3067-5 CDU end.

**Quick-connect plugs are on supply hoses at end away from 3067-5 CDU. Quick-connect sockets are on return hoses at end away from 3067-5 CDU.

3062 ATTACHED PROCESSING UNIT MODEL 1 CABLING|SCHEMATIC—CABLES AND COOLANT HOSES

Cables

Group No.	*No. of Cables*	*From*	*Frame No.*	*To*	*Frame No.*	*Max Length (ft)*	*Notes*
6600	3	3067-5	35	3062-1	01	40	1
6601 (6605)	2	3067-5	35	3067-5	36	13	1, 3
6602	3	3067-5	35	3062-1	01	40	1
6603	1	3062-1	01	3062-1	03	10	1
6604	1	3062-1	01	3062-1	04	10	1
6606	1	3067-5	35	3062-1	04	40	1, 2
6607	8	3067-5	35	3062-1	03	40	1
6608	4	3067-5	35	3062-1	04	40	1
6609 [6576]	15	3066-3	05	3062-1	22	30	4,5
6610	7	3067-5	35	3062-1	01	40	1
6611	1	3067-5	35	3067-3	15	150	1
6612	1	3066-3	05	3062-1	22	30	4,6

Coolant Hoses

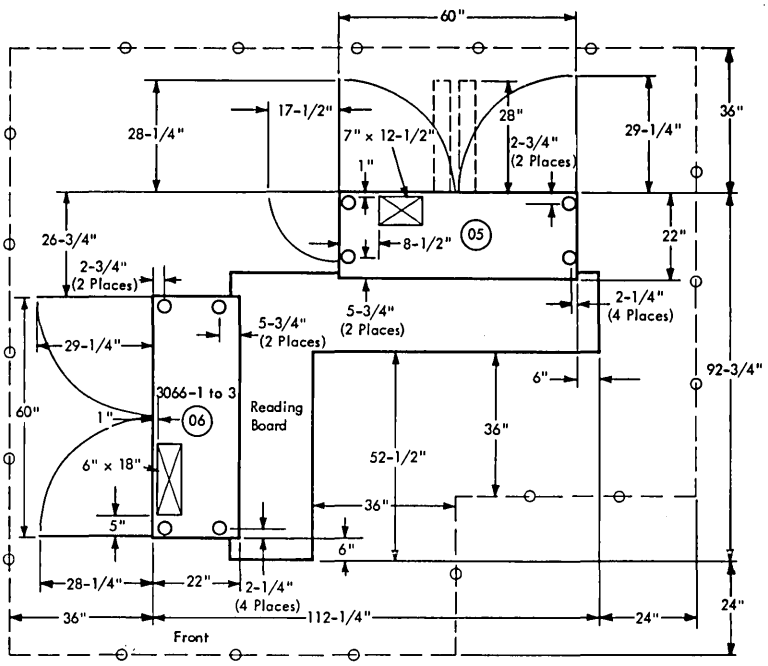
Group No.	*No. of Hoses*	*From*	*Frame No.*	*To*	*Frame No.*	*Max Length (ft)*	*Notes*
6650	2	3067-5	36	3062-1	01	55	–
6651	2	3067-5	36	3062-1	01	55	–
6652	4	3067-5	36	3062-1	03	55	–
6653	4	3067-5	36	3062-1	04	55	–

Notes:

1. Power cabling.
2. Required for high-speed multiply feature (SF #4525).
3. For 50-Hz machines, use group number in parentheses.
4. Required for attachment of 3066-3 to 3062-1 on 3168-3.
5. Group 6576 (in brackets) can be used in place of 6609 where "X" length is satisfactory by rerouting the "to" end of 6576 from frame 07 on 3168 to frame 22 on 3062.
6. "X" length of group 6612 must equal "X" length of 6576 if 6576 is used, or must equal "X" length of 6609 if 6609 is used.

3066 SYSTEM CONSOLE MODEL 1 FOR SYSTEM/370 MODEL 165, MODEL 2 FOR SYSTEM/370 MODEL 168 AND MODEL 168 MULTIPROCESSING, AND MODEL 3 FOR SYSTEM/370 MODEL 168 ATTACHED PROCESSOR

PLAN VIEW (English Scale: 1/4 in. = 1 ft)

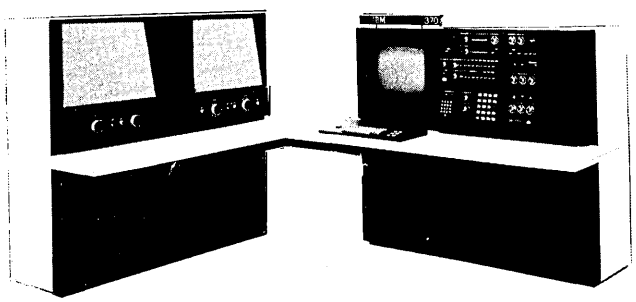


Frame	Weight lb	(kg)
05	1,000	(460)
06	1,000	(460)

Note: For cabling information, see 3165, 3168, and 3168-3.

Input/Output Device Priority Considerations

The 3066 is a class 3 device with a burst mode rate of 240 kilobytes per second.



SPECIFICATIONS

Dimensions:

	F	S	H
Inches	112-1/4	92-3/4	56*
(cm)	(285)	(236)	(142*)

Service Clearances:

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

Weight: 2,000 lb (920 kg)

Heat Output: 9,530 BTU/hr (2 450 kcal/hr)

Airflow: 440 cfm (13 m^3/min)

Power Requirements:

The 3066 Models 1 to 3 (frames 05 and 06) receive power from the 3067 PCDU Models 1 to 3 (frame 15).

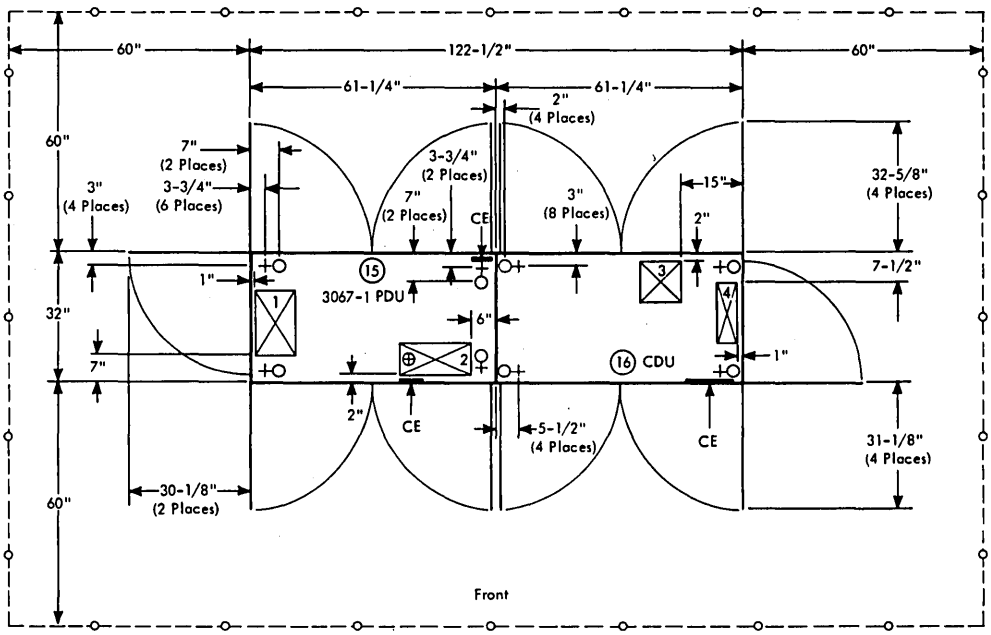
Notes:

* 52 inches (132 cm) for frame 05.

** See plan view.

3067 POWER AND COOLANT DISTRIBUTION UNIT MODEL 1 FOR SYSTEM/370 MODEL 165

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



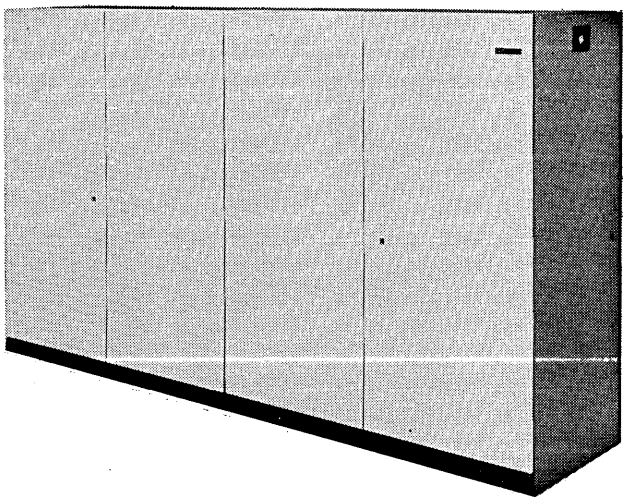
Frame	Weight	
	lb	(kg)
15	2,125	(970)
16	1,600	(730)

Cable Entry/Exit Number	Dimensions (Inches)	Notes
1	10 x 16	
2	8 x 18	1
3	10 x 10	2
4	5 x 14-1/2	3

Notes:

1. See Details A and B on page 3067.9.
2. Customer chilled water supply and return.
3. IBM supply and return.
4. For cabling information, see 3165.

3067 POWER AND COOLANT DISTRIBUTION UNIT MODEL 1 FOR SYSTEM/370 MODEL 165



SPECIFICATIONS

Dimensions:

	F	S	H
Inches	122-1/2	32	70
(cm)	(311)	(81)	(178)

Service Clearances:

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

Weight: 3,725 lb (1 690 kg)

Heat Output:

Air	5,550 BTU/hr (1 400 kcal/hr)
Water*	26,300 BTU/hr (6 650 kcal/hr)

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

Power Requirements:

	50/60 Hz	*415/441 Hz*
kVA	6.0	Refer to Appendix A, Part 5.
Phases	3	
Plug	R&S, FS3760	
Connector	R&S, FS3934	
Receptacle	R&S, FS3754	
Power Cord Style	B1	

The PCDU (frame 15):

1. Requires 3-phase, 200/220/235/380/408 V + 10%, −8%, 50-Hz ±0.5-Hz, or 200/208/230 V + 10%, −8%, 60-Hz ±0.5-Hz customer service.
2. Receives 3-phase, 208 V, 415/441-Hz (nominal) power from the remote motor generator (hardwired) or other source. Refer to Appendix A, Part 5.

Environment, Operating:

Temperature	65°F-90°F (18°C-32°C)
Rel Humidity	20%-80%
Max Wet Bulb	72°F (22°C)**

Environment, Nonoperating:

Temperature	50°F-110°F (10°C-43°C)
Rel Humidity	8%-80%
Max Wet Bulb	80°F (27°C)**

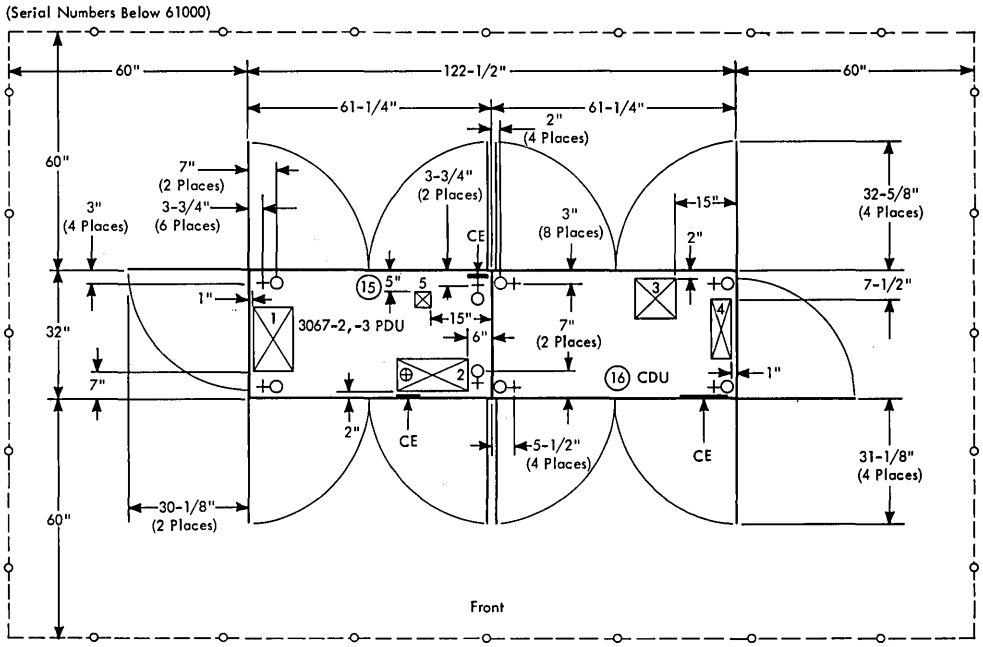
Notes:

* For maximum-feature Model 165, add 5,780 BTU/hr (1 500 kcal/hr).

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

3067 POWER AND COOLANT DISTRIBUTION UNIT MODELS 2* AND 3* FOR SYSTEM/370 MODEL 168, MODEL 168 ATTACHED PROCESSOR, AND MODEL 168 MULTIPROCESSING

PLAN VIEW (English Scale: 1/4 in. = 1 ft)

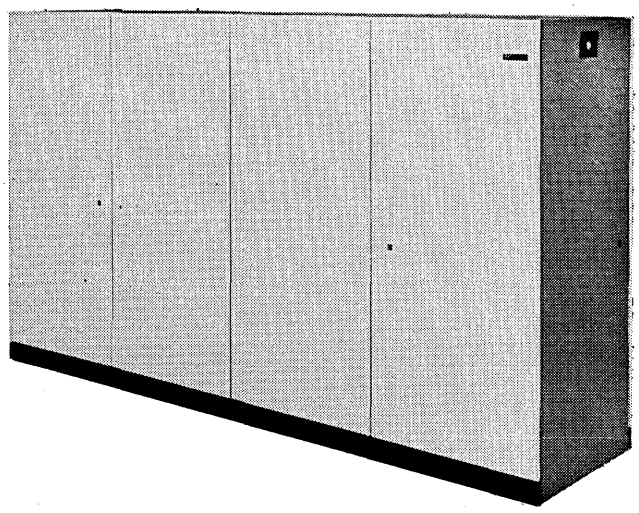


Frame	Weight	
	lb	(kg)
15	2,125	(970)
16	1,600	(730)

Cable Entry/Exit Number	Dimensions (Inches)	Notes
1	10 x 16	
2	8 x 18	1
3	10 x 10	2
4	5 x 14-1/2	3
5	4 x 4	4

Notes:

1. See Details A and B on page 3067.9.
2. Customer chilled water supply and return.
3. IBM supply and return.
4. Required for 415/441-Hz power frame 08.
5. For cabling information, see 3168 and 3168-3.



3067 POWER AND COOLANT DISTRIBUTION UNIT MODELS 2* AND 3* FOR SYSTEM/370 MODEL 168, MODEL 168 ATTACHED PROCESSOR, AND MODEL 168 MULTIPROCESSING

SPECIFICATIONS

Dimensions:

	F	S	H
Inches	122-1/2	32	70
(cm)	(311)	(81)	(178)

Service Clearances:

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

Weight: 3,725 lb (1 690 kg)

Heat Output:	*3168 and 3168-3*	*3168 MP and 3168-3 MP*
Air		
BTU/hr	8,580	8,900
(kcal/hr)	(2 200)	(2 300)
Water**		
BTU/hr	36,900	39,400
(kcal/hr)	(9 300)	(9 950)

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

Power Requirements:

3168 Model	*50/60-Hz kVA*	*415/441-Hz kVA*	
		Model J-M	*Model MP1-8*
J,MP1	7.3	55.5	60.2
K,MP2	7.3	56.0	60.7
KJ,MP3	7.3	56.5	61.2
L,MP4	7.3	57.0	61.7
LJ,MP5	7.5	57.5	62.2
LK,MP6	7.5	58.0	62.7
LKJ,MP7	7.5	58.5	63.2
M,MP8	7.5	59.0	63.7

3168-3 Model	*50/60-Hz kVA*	*415/441-Hz kVA*	
		Model U31-U38 A31-A38	*Model M31-M38*
U31, A31, M31	7.3	55.5	58.0
U32, A32, M32	7.3	56.0	58.5
U33, A33, M33	7.3	56.5	59.0
U34, A34, M34	7.3	57.0	59.5
U35, A35, M35	7.5	57.5	60.0
U36, A36, M36	7.5	58.0	60.5
U37, A37, M37	7.5	58.5	61.0
U38, A38, M38	7.5	59.0	61.5

	50/60 Hz	*415/441 Hz*
Phases	3	Refer to Appendix A, Part 5
Plug	R&S, FS3760	
Connector	R&S, FS3934	
Receptacle	R&S, FS3754	
Power Cord Style	B1	

The PCDU (frame 15):

1. Requires 3-phase, 200/220/235/380/408 V + 10%, –8%, 50-Hz ± 0.5-Hz, or 200/208/230 V + 10%, –8%, 60-Hz ± 0.5-Hz customer service.
2. Receives 3-phase, 208 V, 415/441-Hz (nominal) power from the remote motor generator (hardwired) or other source. Refer to Appendix A, Part 5.

Environment, Operating:

Temperature	65°F-90°F (18°C-32°C)
Rel Humidity	20%-80%
Max Wet Bulb	72°F (20°C)***

Environment, Nonoperating:

Temperature	50°F-110°F (10°C-43°C)
Rel Humidity	8%-80%
Max Wet Bulb	80°F (27°C)***

Notes:

*Use these specifications for machines with serial numbers below 61000.

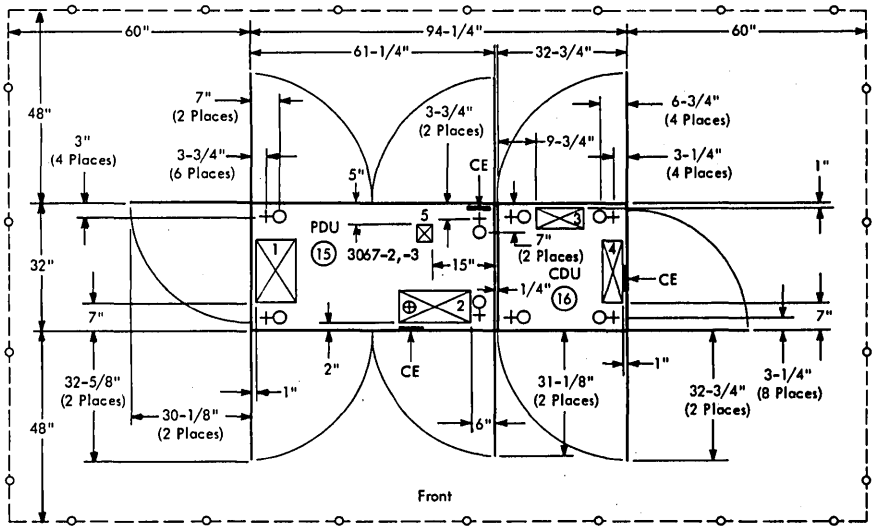
**For maximum-feature Model 168, Model 168 Attached Processor, or Model 168 Multiprocessing, add 5,780 BTU/hr (1 500 kcal/hr).

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

3067 POWER AND COOLANT DISTRIBUTION UNIT MODELS 2* AND 3* FOR SYSTEM/370 MODEL 168, MODEL 168 ATTACHED PROCESSOR, AND MODEL 168 MULTIPROCESSING

PLAN VIEW (English Scale: 1/4 in. = 1 ft)

(Serial Numbers 61000 and Above)



Frame	Weight	
	lb	(kg)
15	2,075	(950)
16	1,000	(460)

Cable Entry/Exit Number	Dimensions (Inches)	Notes
1	10 x 16	
2	8 x 18	1
3	5 x 12	2
4	5 x 15-1/2	3
5	4 x 4	4

Notes:

1. See Details A and B on page 3067.9.
2. Customer chilled water supply and return.
3. IBM supply and return.
4. Required for 415/441-Hz power frame 08.
5. For cabling information, see 3168 and 3168-3.

3067 POWER AND COOLANT DISTRIBUTION UNIT MODELS 2* AND 3* FOR SYSTEM/370 MODEL 168, MODEL 168 ATTACHED PROCESSOR, AND MODEL 168 MULTIPROCESSING

SPECIFICATIONS

Dimensions:

	F	S	H
Inches	94-1/4	32	70
(cm)	(239)	(81)	(178)

Service Clearances:

	F	R	Rt	L
Inches	48	48	60	60
(cm)	(122)	(122)	(152)	(152)

Weight: 3,075 lb (1 400 kg)

Heat Output:	*3168 and 3168-3*	*3168 MP and 3168-3 MP*
Air		
BTU/hr	7,180	7,500
(kcal/hr)	(1 850)	(1 900)
Water**		
BTU/hr	35,580	38,080
(kcal/hr)	(9 000)	(9 600)

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

Power Requirements:

3168 Model	*50/60-Hz kVA*	*415/441-Hz kVA*	
		Model J-M	*Model MP1-8*
J,MP1	5.6	55.5	60.2
K,MP2	5.6	56.0	60.7
KJ,MP3	5.6	56.5	61.2
L,MP4	5.6	57.0	61.7
LJ,MP5	5.8	57.5	62.2
LK,MP6	5.8	58.0	62.7
LKJ,MP7	5.8	58.5	63.2
M,MP8	5.8	59.0	63.7

3168-3 Model	*50/60-Hz kVA*	*415/441-Hz kVA*	
		Model U31-U38 A31-A38	*Model M31-M38*
U31, A31, M31	5.6	55.5	58.0
U32, A32, M32	5.6	56.0	58.5
U33, A33, M33	5.6	56.5	59.0
U34, A34, M34	5.6	57.0	59.5
U35, A35, M35	5.8	57.5	60.0
U36, A36, M36	5.8	58.0	60.5
U37, A37, M37	5.8	58.5	61.0
U38, A38, M38	5.8	59.0	61.5

	50/60 Hz	*415/441 Hz*
Phases	3	Refer to Appendix A, Part 5
Plug	R&S, FS3760	
Connector	R&S, FS3934	
Receptacle	R&S, FS3754	
Power Cord Style	B1	

The PCDU (frame 15):

1. Requires 3-phase, 200/220/235/380/408 V + 10%, −8%, 50-Hz ± 0.5-Hz, or 200/208/230 V + 10%, −8%, 60-Hz ± 0.5-Hz customer service.
2. Receives 3-phase, 208 V, 415/441-Hz (nominal) power from the remote motor generator (hardwired) or other source. Refer to Appendix A, Part 5.

Environment, Operating:

Temperature	65°F-90°F (18°C-32°C)
Rel Humidity	20%-80%
Max Wet Bulb	72°F (22°C)***

Environment, Nonoperating:

Temperature	50°F-110°F (10°C-43°C)
Rel Humidity	8%-80%
Max Wet Bulb	80°F (27°C)***

Notes:

*Use these specifications for machines with serial numbers 61000 and above.

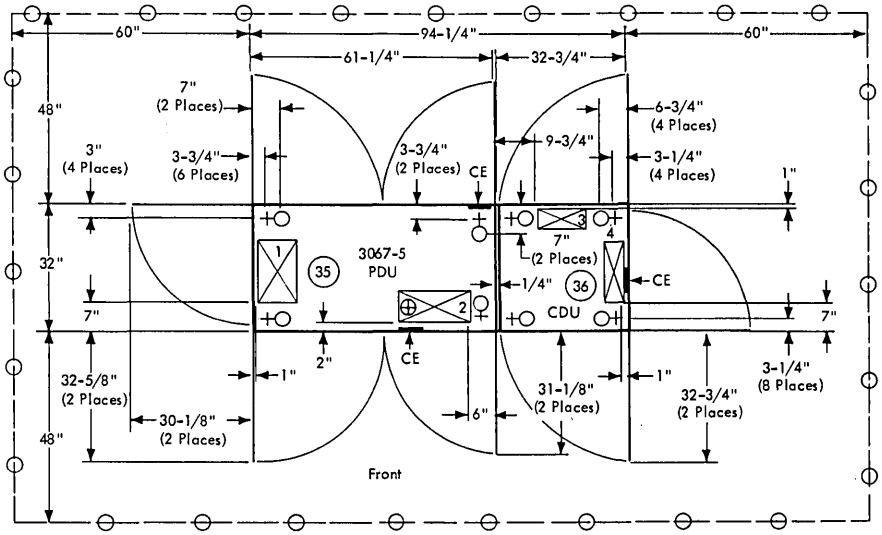
**For maximum-feature Model 168, Model 168 Attached Processor, or Model 168 Multiprocessing, add 5,780 BTU/hr (1 500 kcal/hr).

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

3067 POWER AND COOLANT DISTRIBUTION UNIT MODEL 5
FOR 3062 ATTACHED PROCESSING UNIT MODEL 1

PLAN VIEW (English Scale: 1/4 in. = 1 ft)

(Serial Numbers 61000 and Above)



Frame	Weight	
	lb	(kg)
35	2,075	(950)
36	1,000	(460)

Cable Entry/Exit Number	Dimensions (Inches)	Notes
1	10 x 16	
2	8 x 18	1
3	5 x 12	2
4	5 x'15-1/2	3

Notes:
1. See Details A and B on page 3067.9.
2. Customer chilled water supply and return.
3. IBM supply and return.
4. For cabling information, see 3062-1.

3067 POWER AND COOLANT DISTRIBUTION UNIT MODEL 5 FOR 3062 ATTACHED PROCESSING UNIT MODEL 1

SPECIFICATIONS

Dimensions:

	F	S	H
Inches	94-1/4	32	70
(cm)	(239)	(81)	(178)

Service Clearances:

	F	R	Rt	L
Inches	48	48	60	60
(cm)	(122)	(122)	(152)	(152)

Weight: 3,075 lb (1 400 kg)

Heat Output:

Air	7,500 BTU/hr (1 900 kcal/hr)
Water	38,080 BTU/hr (9 600 kcal/hr)

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

Power Requirements:

	50/60 Hz	*415/441 Hz*
kVA	4.0	43.0
Phases	3	3
Plug	R&S, FS3760	
Connector	R&S, FS3934	
Receptacle	R&S, FS3754	
Power Cord Style	B1	

The PCDU (frame 35):

1. Requires 3-phase, 200/220/235/380/408 V + 10%, –8%, 50-Hz ± 0.5-Hz, or 200/208/230 V + 10%, –8%, 60-Hz ± 0.5-Hz customer service.
2. Receives 3-phase, 208 V, 415/441-Hz (nominal) power from the remote motor generator (hardwired) or other source. See Appendix A, Part 5.

Environment, Operating:

Temperature	65°F-90°F (18°C-32°C)
Rel Humidity	20%-80%
Max Wet Bulb	72°F (22°C)*

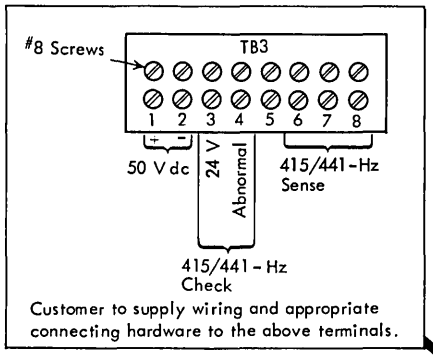
Environment, Nonoperating:

Temperature	50°F-110°F (10°C-43°C)
Rel Humidity	8%-80%
Max Wet Bulb	80°F (27°C)*

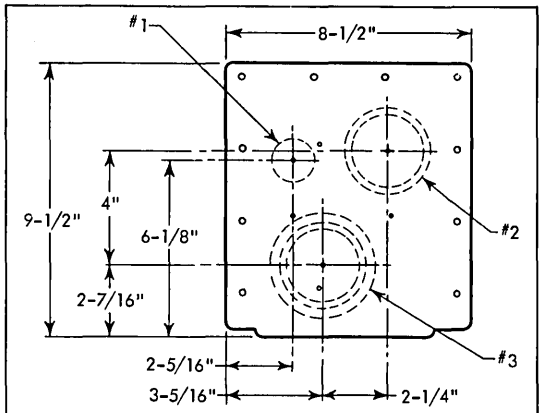
Notes:

*See "Liquid Coolant System" in Appendix A, Part 1.

3067 POWER AND COOLANT DISTRIBUTION UNIT MODELS 1 TO 3 AND 5



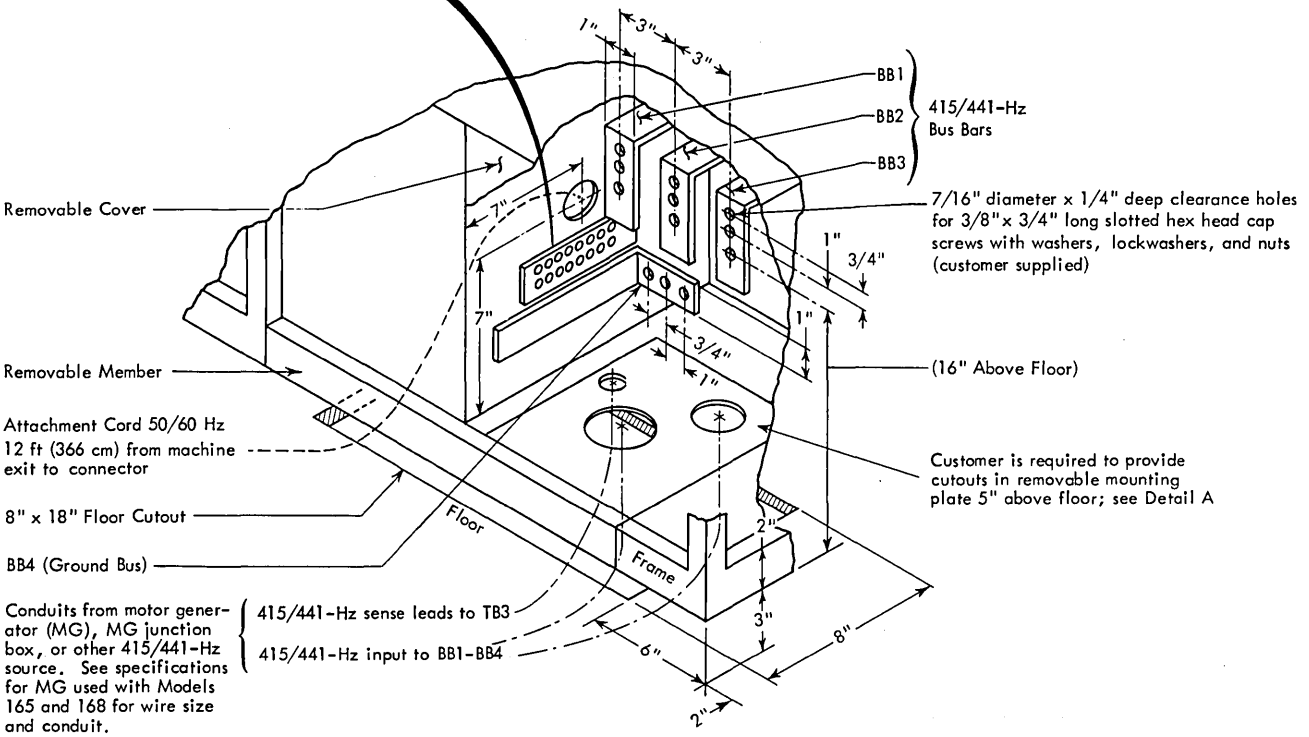
Customer to supply wiring and appropriate connecting hardware to the above terminals.



Mounting plate pilot hole locations for typical conduit cutouts. Select pilot holes and make cutouts as required.

#1: 1-3/8" diameter hole for 1" conduit.
#2: 2-1/2" or 3" diameter hole for 2" or 2-1/2" conduit, respectively.
#3: 2-1/2", 3", or 3-5/8" diameter hole for 2", 2-1/2", or 3" conduit, respectively.

Detail A



Detail B

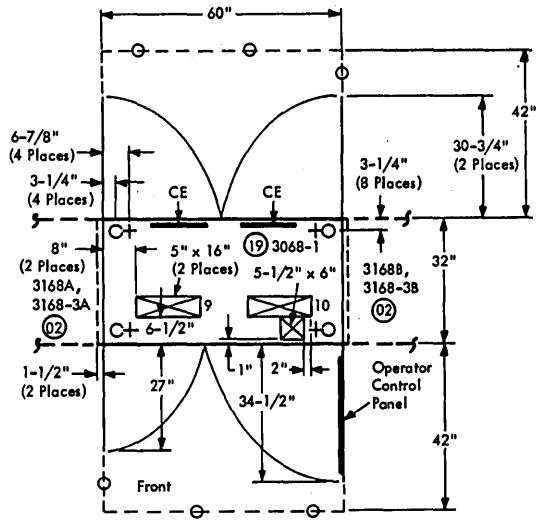
Note: If 415/441-Hz planned input source for the 3067 does not meet specifications for the MG used with Models 165 and 168 as shown in this manual, contact your local IBM Installation Planning representative.

Inches	Millimeters
1/4	6,4
3/8	9,5
7/16	11,1
3/4	19,1
1	25,4
1-3/8	34,9
2	50,8
2-1/4	57,2
2-5/16	58,7
2-7/16	61,9
2-1/2	63,5
3	76,2

Inches	Millimeters
3-5/16	84,1
3-5/8	92,1
4	101,6
5	127,0
6	152,4
6-1/8	155,6
7	177,8
8	203,2
8-1/2	215,9
9-1/2	241,3
16	406,4
18	457,2

3068 MULTISYSTEM COMMUNICATION UNIT MODEL 1

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Note: For cabling information, see 3168 and 3168-3.

SPECIFICATIONS

Dimensions:

	F	S	H
Inches	60	32	78
(cm)	(152)	(81)	(198)

Service Clearances:

	F	R	Rt	L
Inches	42	42	0*	0*
(cm)	(107)	(107)	(0*)	(0*)

Weight: 1,150 lb (520 kg)

Heat Output:**

Air	2,960 BTU/hr (750 kcal/hr)
Water	11,500 BTU/hr (2 900 kcal/hr)

Airflow: 240 cfm (7 m^3/min)

Power Requirements:

The 3068 (frame 19) receives 50/60-Hz and 415/441-Hz power from the 3067 PCDU Models 2 and 3 (frame 15).

Environment, Operating:

Temperature	60°F-90°F (18°C-32°C)
Rel Humidity	20%-80%
Max Wet Bulb	72°F (22°C)***

Environment, Nonoperating:

Temperature	50°F-110°F (10°C-43°C)
Rel Humidity	8%-80%
Max Wet Bulb	80°F (27°C)***

Notes:

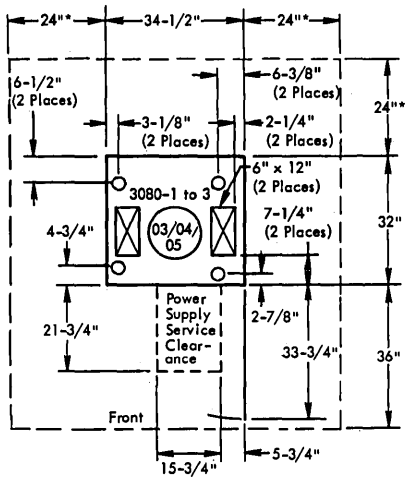
* The 3068 attaches between the Model 168 frame 02s in the Multiprocessing configuration.

** One-half of the heat output for the 3068 is associated with each Model 168 system in the Multiprocessing configuration.

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

3080 POWER UNIT MODELS 1 TO 3 FOR SYSTEM/370 MODEL 195

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



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:

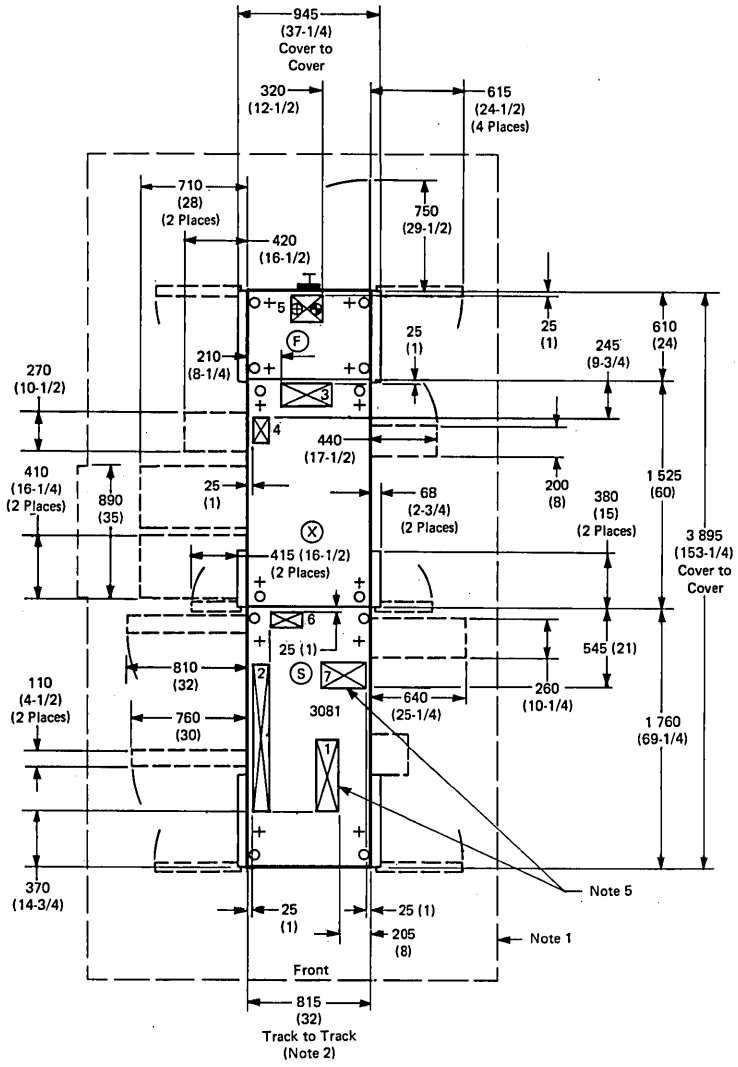
One 3195 Processing Unit requires one each of 3080 Power Unit Models 1, 2, and 3.

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.

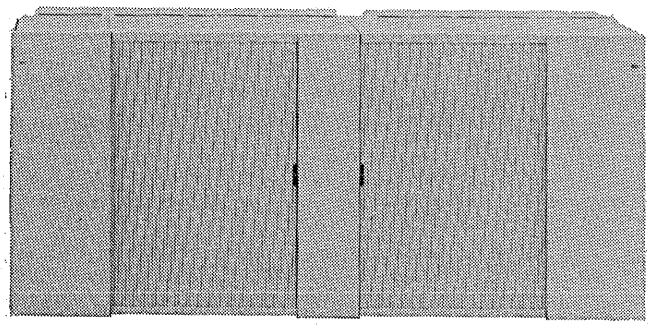
3081 PROCESSOR UNIT

PLAN VIEW (Metric Scale: 10 mm = 0.5 m)



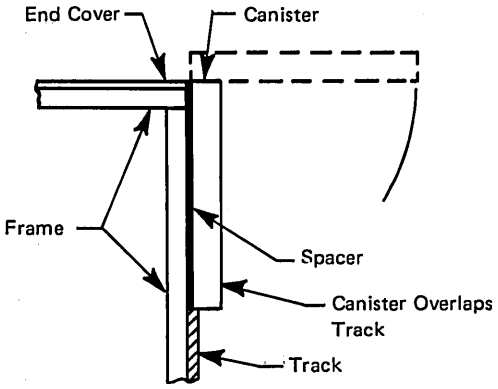
See Note 3.

Cable Entry/Exit Number	Dimension (Millimeters)	Dimension (Inches)
1	155 x 485	6 x 19
2	100 x 995	4 x 39
3	135 x 330	6 x 13
4	175 x 100	7 x 4
5	190 x 180	8 x 7
6	100 x 200	4 x 8
7	175 x 300	7 x 12



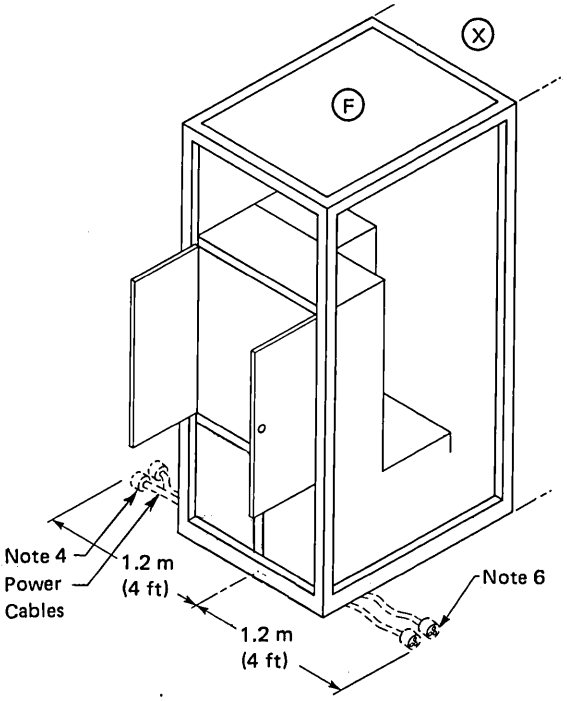
Side View

Detail of Tambour Cover (See Note 2)



Line Cord Routing for F-frame

The following figure shows the recommended locations for the receptacles:



Notes:

1. For service clearances, see page 3081.4.
2. Frame is 750 mm (29-1/2 in.) wide. Track is 32 mm (1-1/4 in.) wide, measured from frame. Canister is 100 mm (3-7/8 in.) wide, measured from frame.
3. Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame. Additional floor stanchions should be installed to support the raised floor where each leveling pad contacts the floor and wherever floor tiles are cut.
4. Line cord lengths from F-frame are both 1.8 m (6 ft).
5. For Model D16 before April 1, 1982 shipment, use cutout 1 (not 7). For all other models, use cutout 7 (not 1). For systems shipped after March 31, 1982, use cutout 7 for all models.
6. Locate 50/60-Hz and 400-Hz receptacles within 1.2 meters (4 feet) of floor cutout on either side of F-frame.

Details (By Frame)
(See Notes 1 through 3)

Model	Frame	Weight kg	Weight (lb)
D16/G16 K16	S	1 125	(2,470)
	X	1 265	(2,780)*
GX1/KX1	S	1 075	(2,370)
	X	1 265	(2,780)*
D24/G24 K24	S	1 225	(2,700)*
	X	1 300	(2,860)*
GX2/KX2	S	1 075	(2,370)
	X	1 265	(2,780)*
D32/G32 K32/G48 K48	S	1 295	(2,850)*
	X	1 330	(2,930)*
GX3/KX3	S	1 075	(2,370)
	X	1 265	(2,780)*
GX4/KX4	S	1 185	(2,600)*
	X	1 300	(2,860)*
G64/K64	S	1 295	(2,850)*
	X	1 330	(2,930)*
GX6/KX6	S	1 250	(2,750)*
	X	1 330	(2,930)*
All	F	495	(1,090)

Notes:
1. Models equal storage sizes.
2. Details shown are for 3081 only. For total processor complex, include 3082, 3087, and 3089, if used.
3. For shipping and storage, this unit must be specially packed. Consult "Chapter 4. Relocation/Removal Procedures" in the *IBM 3081/3083 Processor Complex: Installation (INST) (REMOV)* manual or your IBM representative.

SPECIFICATIONS

Dimensions:

	Front	Side	Height
mm	**	**	1 875
(inches)	(**)	(**)	(73-3/4)

Service Clearances:

	Front	Rear	Right	Left
mm	***	***	***	***
(inches)	(***)	(***)	(***)	(***)

Power Requirements:	*50/60 Hz*	*415/441 Hz*
Phases	3	See Item 2.
Plug	R&S, FS3760	R&S, JPS1534LK
Connector	R&S, FS3934	R&S, JCS1534LK
Receptacle	R&S, FS3754	R&S, JRSR/A1534LK
Power Cord Style	B1	H1
Power Cord Length	1.8 meters (6 feet)	1.8 meters (6 feet)

Items:

The power distribution frame (F-frame):

1. Requires 3-phase 200/208/220/240 V, 60-Hz ± 0.5-Hz or 200/220/380/400/415 V, 50-Hz ± 0.5-Hz customer service.
2. The IBM 3089 Power Unit provides 400-Hz power to the 3081 F-frame. Refer to "3089 Power Unit" on page 3089.2.

   As an alternative, the customer may supply power from a 400-Hz source other than the 3089 Power Unit. The customer is then responsible for ensuring that the supplied 400-Hz source complies with the 3081 specifications.

   For planning and installing customer-supplied 400-Hz power, refer to Appendix A, Part 7.
3. All 3081 three-phase receptacles must be wired for correct phase rotation. Facing the receptacle in a clockwise direction from the ground pin, the sequence is phase 1, phase 2, and phase 3.

Environment, Operating:

Temperature	16°C-29°C (60°F-85°F)
Rel Humidity	20%-80%
Max Wet Bulb	23°C (73°F)

Shipping Dimensions: See page 3081.5.

Notes:

*This frame weighs more than 1 135 kg (2,500 lb). For transport in elevators rated at 1 135 kg (2,500 lb) or less, consult the elevator manufacturer for alternatives. If this cannot be done, specify code #9581 is available to reduce frame weights to less than 1 135 kg (2,500 lb).

**See plan view.

***See "Layouts for 3081 Processor Unit and 3082 Processor Controller" on page 3081.4.

3081 PROCESSOR UNIT

Details (By Model)

Model†	*Weight kg (lb)*	*Airflow m^3/min (cfm)*	*Typical Heat Output W (BTU/hr)††*		*Typical Power Requirements kVA*	
			To Air	*To Water*	*400 Hz*	*50/60 Hz*
D16	2 875 (6,330)	24.5 (850)	2 560 (8,750)	10 900 (37,200)	16.4	0.5
D24	3 015 (6,640)	24.5 (850)	3 310 (11,300)	12 560 (42,850)	19.5	0.5
D32	3 120 (6,870)	24.5 (850)	4 100 (14,000)	14 080 (48,050)	22.3	0.5
G16/K16	2 875 (6,330)	24.5 (850)	2 560 (8,750)	11 970 (40,850)	17.9	0.5
GX1/KX1	2 830 (6,230)	24.5 (850)	2 560 (8,750)	9 850 (33,600)	15.4	0.5
G24/K24	3 015 (6,640)	24.5 (850)	3 310 (11,300)	13 670 (46,650)	20.9	0.5
GX2/KX2	2 830 (6,230)	24.5 (850)	2 560 (8,750)	9 850 (33,600)	15.4	0.5
G32/K32 G48/K48	3 120 (6,870)	24.5 (850)	4 100 (14,000)	15 280 (52,150)	23.9	0.5
GX3/KX3	2 830 (6,230)	24.5 (850)	2 560 (8,750)	9 850 (33,600)	15.4	0.5
GX4/KX4	2 970 (6,540)	24.5 (850)	3 310 (11,300)	11 800 (40,300)	18.4	0.5
G64/K64	3 120 (6,870)	24.5 (850)	4 100 (14,000)	15 280 (52,150)	23.9	0.5
GX6/KX6	3 075 (6,770)	24.5 (850)	4 100 (14,000)	12 300 (42,000)	21.4	0.5

Notes:

1. Models equal storage sizes.
2. Details shown are for 3081 only. For total processor complex, include 3082, 3087, and 3089, if used.
3. For shipping and storage, this unit must be specially packed. Consult "Chapter 4. Relocation/Removal Procedures" in the *IBM 3081/3083 Processor Complex: Installation (INST) (REMOV)* manual or your IBM representative.

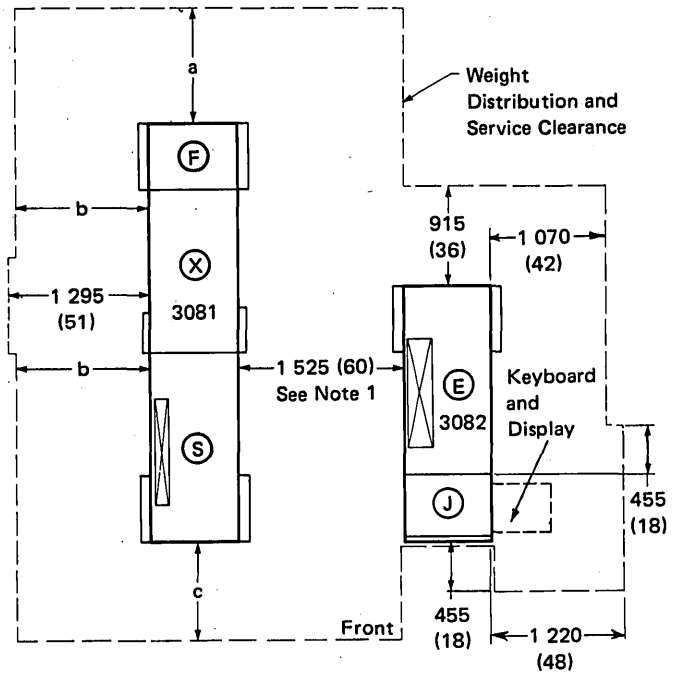
Notes:

†For channel group, additional (SF #1550), add 0.5 kVA to 400 Hz and 0.41 kW (1,400 BTU/hr) to water.

††With the CDU Model 1, for total heat load to customer water, add the processor unit's BTU-to-water requirements to the CDU's BTU-to-water requirements. For additional information, refer to Appendix A.

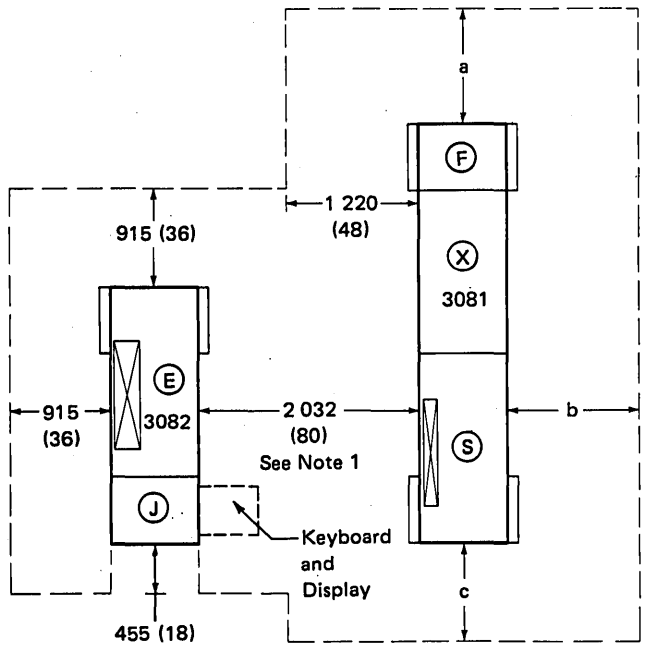
LAYOUTS FOR 3081 PROCESSOR UNIT AND 3082 PROCESSOR CONTROLLER

(Not to scale)



Notes:

1. Adjust the space between the frames so that the long floor hole cutouts under E- and S-frames are along the edge of the floor tiles.
2. These layouts are recommended for servicing and for achieving proper weight distribution for the floor space involved. Alternative layouts must meet requirements for cable lengths and service clearances to accommodate frame weight and servicing.



Required Weight Distribution and Service Clearance (See Note)

Floor Load Rating kg/m^2 (lb/ft^2)	*16M Bytes and Models GX2, KX2, GX3, and KX3* — *Dimensions for F-, S-, and X-frames mm (in.)*			*24/32/48/64M Bytes and Models GX4, KX4, GX6, and KX6* — *Dimensions for F-, S-, and X-frames mm (in.)*		
	a	*b*	*c*	*a*	*b*	*c*
366 (75)	1 070 (42)	1 220 (48)	915 (36)	1 525 (60)	1 525 (60)	1 525 (60)
390 (80)	915 (36)	1 070 (42)	460 (18)	1 525 (60)	1 525 (60)	915 (36)
415 (85)	915 (36)	1 070 (42)	460 (18)	1 070 (42)	1 525 (60)	460 (18)

Note: These dimensions are required for proper weight distribution and servicing. If the dimensions are altered, the customer should obtain the services of a qualified consultant or structural engineer to determine floor loading.

If the review of the floor loading does not require the service clearances shown in the preceding chart, the following service clearances are required:

a	*b*	*c*
915 (36)	1 070 (42)	460 (18)

3081 PROCESSOR UNIT
(Metric Scale: 10 mm = 0.25 m)

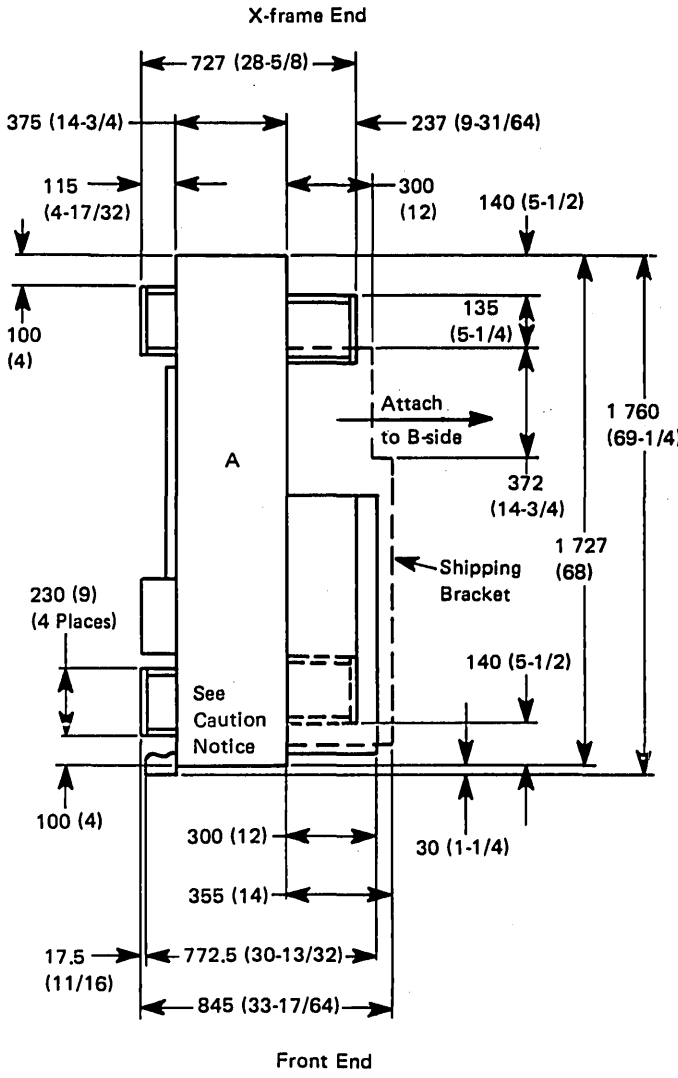


Figure 1. S-frame Split–A-side (Top View)

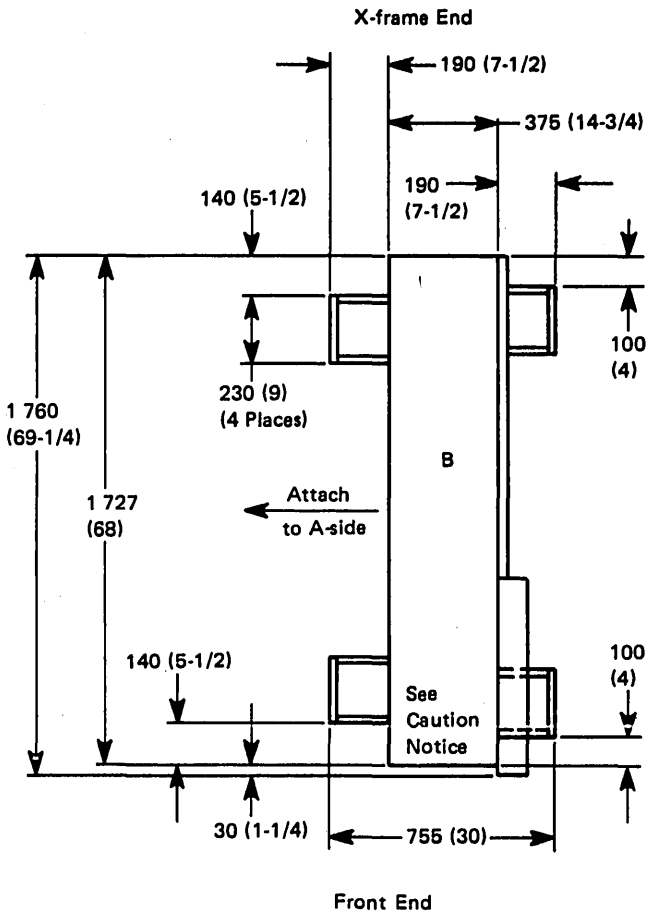


Figure 2. S-frame–B-side (Top View)

Shipping Dimensions:

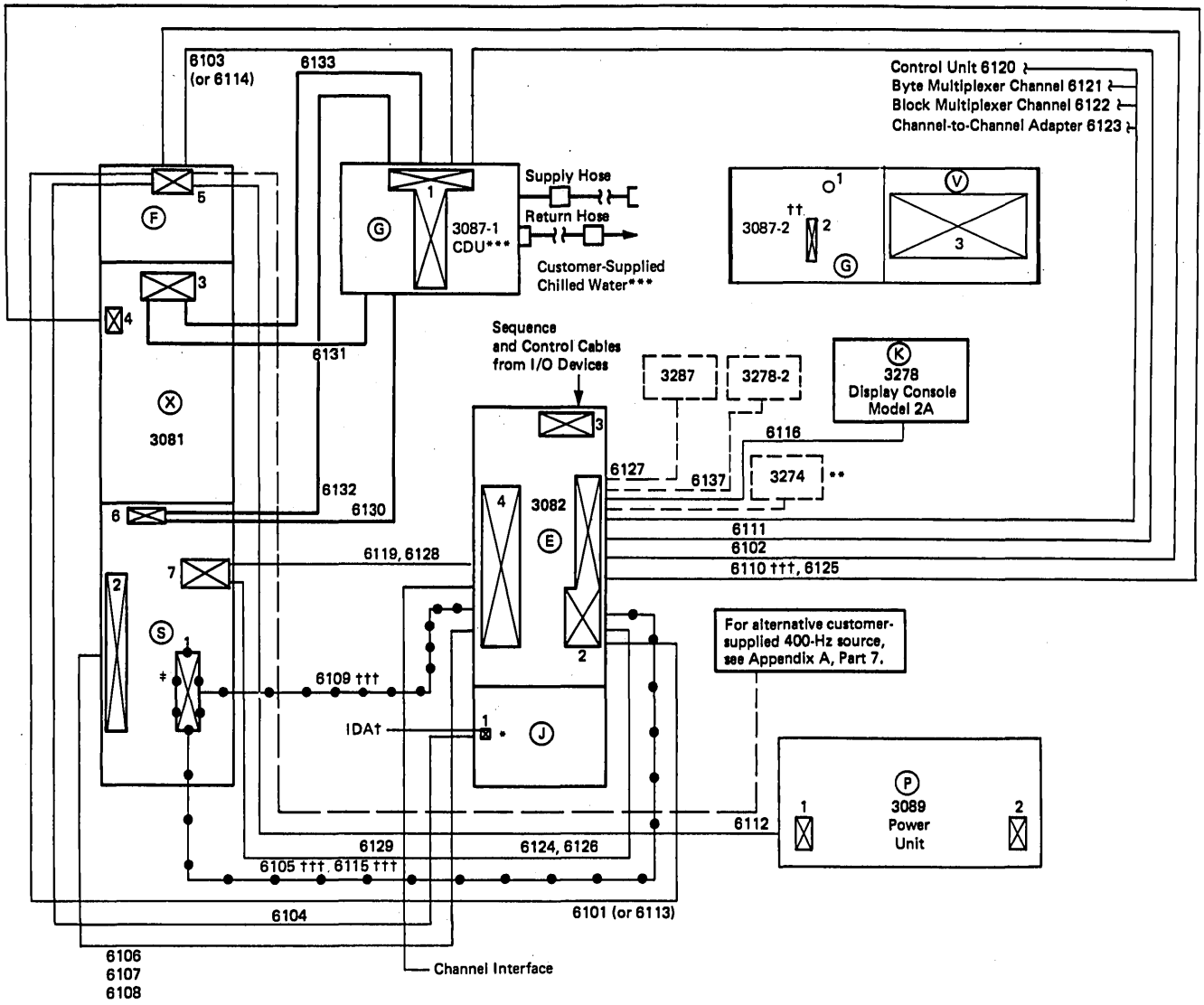
Frame	*Width x Length x Height mm (in.) with Packing Material*	*Width x Length mm (in.) without Packing Material*	*Specify Number*
S–Standard	970 (38-1/4) x 1 803 (71) x 1 870 (73-3/4)	945 (37-1/4) x 1 760 (69-1/4)	–
Side Covers Removed	900 (35-1/4) x 1 803 (71) x 1 870 (73-3/4)	860 (33-3/4) x 1 760 (69-1/4)	9571
Split A-side (Fig. 1)	870 (34-1/4) x 1 803 (71) x 1 785 (70-1/2)	845 (33-17/64) x 1 760 (69-1/4)	9572
Split B-side (Fig. 2)	755 (30) x 1 803 (71) x 1 785 (70-1/2)	755 (30) x 1 760 (69-1/4)	
X–Standard	935 (37) x 1 575 (62) x 1 870 (73-3/4)	890 (35) x 1 550 (61)	–
F–Standard	980 (38-3/4) x 760 (30) x 1 870 (73-3/4)	945 (37-1/4) x 740 (29)	–

Notes:

1. Frames may arrive with removable shipping pads of approximately 25-mm (1-in.) thickness. The dimensions of the pads are not included in the preceding chart.
2. Shipping height is the same with or without packing material.

CAUTION
Special packing B/M(s) is required to assure frame stability during move/relocation. Consult your local IBM representative for correct B/M(s).

3081 PROCESSOR COMPLEX CABLING SCHEMATIC—CABLES AND COOLANT HOSES



Legend:

Coolant hoses — — — — Optional

Cables —●—●—● Prior to April 1, 1982

*For processor complexes installed in the U.S. and Canada, the integrated data adapter (IDA) cable (provided with the processor controller) enters the cable entry in J-frame. Data access arrangement (DAA) coupler must be within 15 meters (49 feet) of the cable entry in the J-frame. If the IBM automatic operator coupler (CBS) is used, a cable is required to connect the coupler to the modem interface of the 3082. The cable is ordered by RPQ 8P0902.

**If an optional locally attached 3274 Control Unit is to be installed (for channel attachment of the integrated service support console), a customer-supplied coaxial cable is required.

*** Locate customer-supplied chilled water supply and return manifold connections (under floor) and place within 2 meters (5 feet) of the CDU center. See "Typical Connections for Customer-Supplied Chilled Water for 3087" in Appendix A, Part 1.

†A customer-provided telephone should also be supplied.

††Uses the same cables and hoses as the 3087 Model 1. Customer-supplied chilled water is not required. See 3087 Model 2 specification pages.

†††See Note 11 under "Cables" on page 3081.7 for detailed information.

‡This frame cutout is for Model D16 only on systems shipped before April 1, 1982. Use cutout 7 for all models on systems shipped after March 31, 1982.

The following fixed-length hoses are shipped automatically:

Group No.	*No. of Hoses*	*From*	*Frame No.*	*Hose Entry/ Exit No.*	*To*	*Frame No.*	*Hose Entry/ Exit No.*	*Fixed X-length m*	*(ft)*	*Notes*
6130	2	3087-1,-2	G	1, 3	3081	S	6	9.8	32	5,12
6131	2	3087-1,-2	G	1, 3	3081	X	3	9.8	32	5,12
6132	2	3081	S	6	3087-1,-2	G	1, 3	10.7	35	6,12
6133	2	3081	X	3	3087-1,-2	G	1, 3	10.7	35	6,12

3081 PROCESSOR COMPLEX CABLING SCHEMATIC—CABLES AND COOLANT HOSES

Cables

The following fixed-length cables are feature dependent and must be ordered:

Group No.	No. of Cables in Group	From	Frame No.	Cable Entry/ Exit No.	To	Frame No.	Cable Entry/ Exit No.	Fixed X-length m	(ft)	Notes
6127	1	3287	–	–	3082	E	2	15.0	49	8
6137	1	3278-2	–	–	3082	E	2	15.0	49	8

The following variable-length cables are feature dependent and must be ordered:

Group No.	No. of Cables in Group	From	Frame No.	Cable Entry/ Exit No.	To	Frame No.	Cable Entry/ Exit No.	Max X-length m	(ft)	Notes
6120	2	3082	E	2	Control Unit	–	–	–	–	9
6121	2	3082	E	2	Byte Multiplexer Channel	–	–	–	–	9
6122	2	3082	E	2	Block Multiplexer Channel	–	–	–	–	9
6123	2	3082	E	2	Channel-to-Channel Adapter	–	–	–	–	9

The following fixed-length cables are shipped automatically:

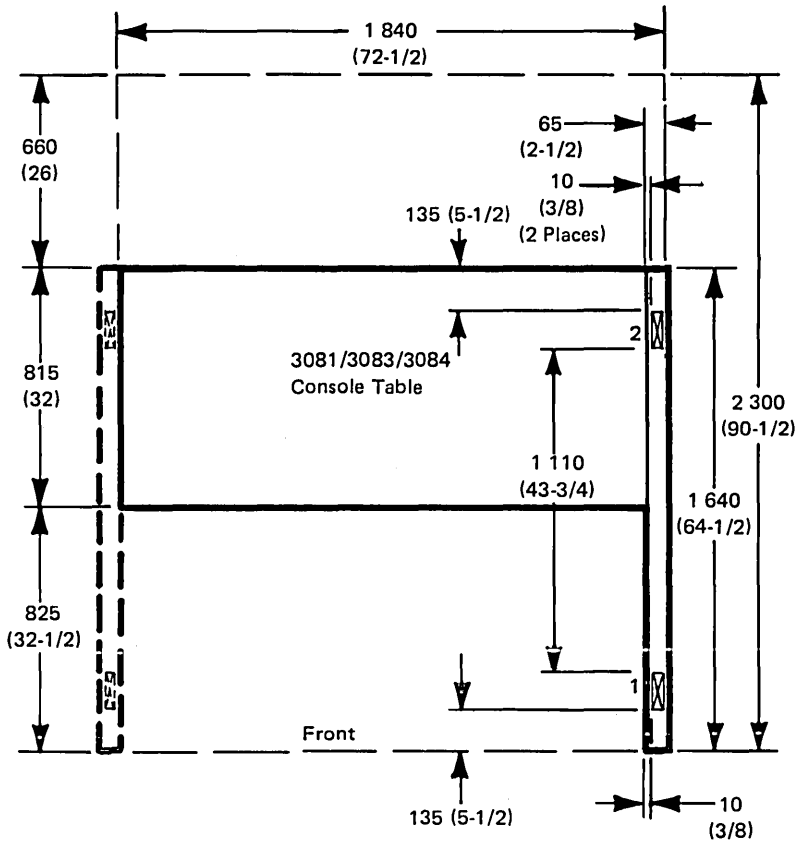
Group No.	No. of Cables in Group	From	Frame No.	Cable Entry/ Exit No.	To	Frame No.	Cable Entry/ Exit No.	Fixed X-length m	(ft)	Notes
6101 (6113)	5	3082	E	2	3081	F	5	6.7	22	1,4
6102	2	3082	E	2	3081	F	5	6.1	20	2
6103 (6114)	4	3087-1,-2	G	1	3081	F	5	15.2	50	1,2,4,12
6104	1	3082	J	1	3081	F	5	6.7	22	2
6105	3	3082	E	2	3081	S	1	4.6	15	2,11
6106	12	3082	E	4	3081	S	2	4.6	15	3
6107	12	3082	E	4	3081	S	2	4.6	15	3
6108	12	3082	E	4	3081	S	2	4.6	15	3,7
6109	1	3082	E	4	3081	S	1	5.0	16	2,11
6110	1	3082	E	2	3081	X	4	4.6	15	2,11
6111	1	3087-1-2	G	1	3082	E	2	15.2	50	2,12
6112	3	3089	P	1	3081	F	5	15.2	35	1,2
6115	4	3082	E	2	3081	S	1	5.0	16	2,11
6116	2	3082	E	2	3278-2A	K	–	15.0	49	2,8
6119	3	3082	E	4	3081	S	7	5.2	17	2
6124	3	3082	E	2	3081	S	7	5.2	17	2,10
6125	2	3082	E	2	3081	X	4	5.2	17	2,10
6126	3	3082	E	2	3081	S	7	5.0	16	2,10
6128	1	3082	E	4	3081	S	7	5.0	16	2,10
6129	3	3082	E	2	3081	S	7	5.2	17	2,10

Notes:

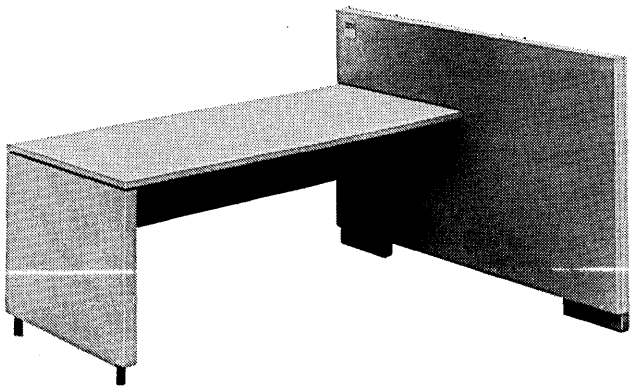
1. Power cabling.
2. Control cabling.
3. Channel interconnecting cables.
4. For 50-Hz machines, use group numbers in parentheses.
5. Coolant supply hoses.
6. Coolant return hoses.
7. Required for additional channels (16-23). SF #1550 required on 3081.
8. Required for the 3278 Display Console and 3287 Printer with a fixed length of 15 meters (49 feet). For lengths between 15 meters (49 feet) and 1 500 meters (4,921 feet), see information RPQ 8P0891. When ordering, do not order by group numbers.
9. From channel-to-channel adapter (SF #1850 or SF #1851); order two groups per feature (see Section 2). Total cable length of 61 meters (200 feet), unless modified by the general control-to-channel cabling schematic, is available to attach up to eight control units.
10. For Model D24, D32, G16, GX1, G24, GX2, G32, GX3, G48, GX4, G64, GX6, K16, KX1, K24, KX2, K32, KX3, K48, KX4, K64, or KX6 and for Model D16 with systems shipped after March 31, 1982.
11. Valid only for Model D16. These cable groups apply to systems shipped before April 1, 1982. Use cable groups with Note 10 for all systems shipped after March 31, 1982.
12. For lengths other than the indicated fixed lengths, order by RPQ. Lengths up to 30.5 meters (100 feet) are available for special applications.

CONSOLE TABLE FOR 3081/3083/3084 PROCESSOR COMPLEX

PLAN VIEW (Metric Scale: 10 mm = 0.25 m)



Cable Entry/Exit Number	Dimensions (Millimeters)	Dimensions (Inches)
1 (Communications)	50 x 130	2 x 5
2 (Peripheral)	50 x 130	2 x 5



SPECIFICATIONS

Dimensions:

	Front	Side	Height	Table Height
mm	1 840	1 640	1 085	720
(inches)	(72-1/2)	(64-1/2)	(42-3/4)	(28-1/2)

Service Clearances:

	Front	Rear	Right	Left
mm	825	660	0	0
(inches)	(32-1/2)	(26)	(0)	(0)

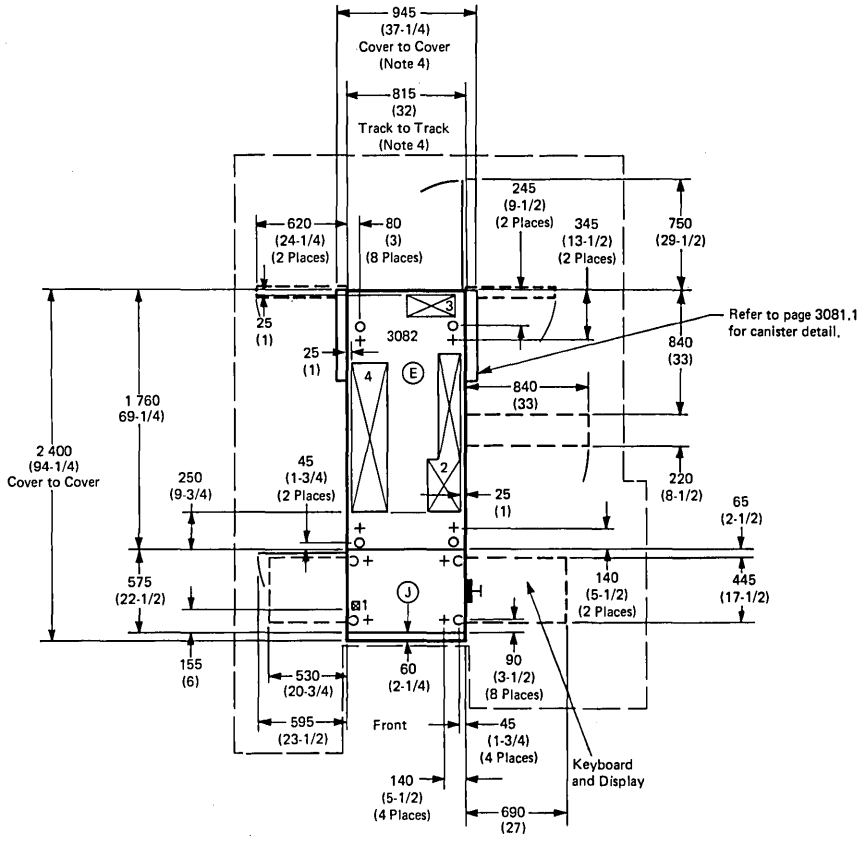
Weight: 130 kg (270 lb)

Notes:

1. Right or left ended; alternative left end shown as dashed line:
   Specify SF #9441 for right end attached,
   Specify SF #9442 for left end attached.
2. *Do not route the power cord through the console wall cutout. Drape the power cord over the back of the console table.*

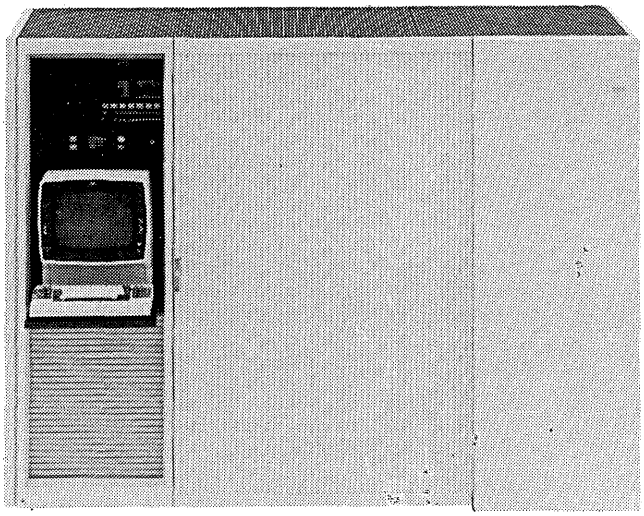
3082 PROCESSOR CONTROLLER

PLAN VIEW (Metric Scale: 10 mm = 0.5 m)



See Note 1.

Cable Entry/Exit Number	Dimension (Millimeters)	Dimension (Inches)
1	50 x 50	2 x 2
2	230 x 360, 150 x 700	9 x 14, 6 x 28
3	150 x 330	6 x 13
4	255 x 1 020	10 x 40



Side View

Notes:

1. Caster, cable hole, and leveling pad locating dimensions are measured from the edge of frame, not cover.
2. For cabling information, see the "3081 Processor Complex Cabling Schematic," the "3083 Processor Complex Cabling Schematic," or the "3084 Processor Complex Cabling Schematic."
3. For service clearances, see page 3081.4.
4. Frame is 750 mm (29-1/2 in.) wide. Track is 32 mm (1-1/4 in.) wide, measured from frame. Tambour canister is 100 mm (3-7/8 in.) wide, measured from frame.

3082 PROCESSOR CONTROLLER

Details (By Frame)

Model	Frame	Weight kg	Weight (lb)
8	E	740	(1,630)
	J	360	(790)
X08	E	740	(1,630)
	J	360	(790)
16	E	805	(1,770)
	J	360	(790)
X16	E	805	(1,770)
	J	360	(790)
24	E	870	(1,910)
	J	360	(790)
X24	E	870	(1,910)
	J	360	(790)

Details (By Model)

Model*	Weight kg (lb)	Airflow m^3/min (cfm)	Typical Heat Output W (BTU/hr) To Air	Typical Heat Output W (BTU/hr) To Water	Typical Power Requirements kVA 400 Hz	Typical Power Requirements kVA 50/60 Hz
8	1 095 (2,410)	23 (800)	1 620 (5,510)	–	1.0	0.8
X08	1 095 (2,410)	23 (800)	1 620 (5,510)	–	1.0	0.8
16	1 160 (2,550)	23 (800)	2 190 (7,460)	–	1.6	0.8
X16	1 160 (2,550)	23 (800)	2 190 (7,460)	–	1.6	0.8
24	1 225 (2,690)	23 (800)	2 660 (9,080)	–	2.1	0.8
X24	1 225 (2,690)	23 (800)	2 660 (9,080)	–	2.1	0.8

Note: 8, 16, and 24 are numbers of channels.

SPECIFICATIONS

Dimensions:

	Front	Side	Height
mm	**	**	1 785
(inches)	(**)	(**)	(70-1/2)

Service Clearances:

	Front	Rear	Right	Left
mm	***	***	***	***
(inches)	(***)	(***)	(***)	(***)

Environment, Operating:

Temperature	16°C-29°C (60°F-85°F)
Rel Humidity	20%-80%
Max Wet Bulb	23°C (73°F)

Power Requirements: Receives power from the F-frame of the 3081 or 3083.

Notes:

*For channel-to-channel adapter, add 0.33 kW (1,100 BTU/hr) to air, 0.4 kVA to 400 Hz, and 30 kg (60 lb) to E-frame.

**See plan view.

***See "Layouts for 3081 Processor Unit and 3082 Processor Controller" on page 3081.4 and "Layouts for 3083 Processor Unit and 3082 Processor Controller" on page 3083.4.

Shipping Dimensions:

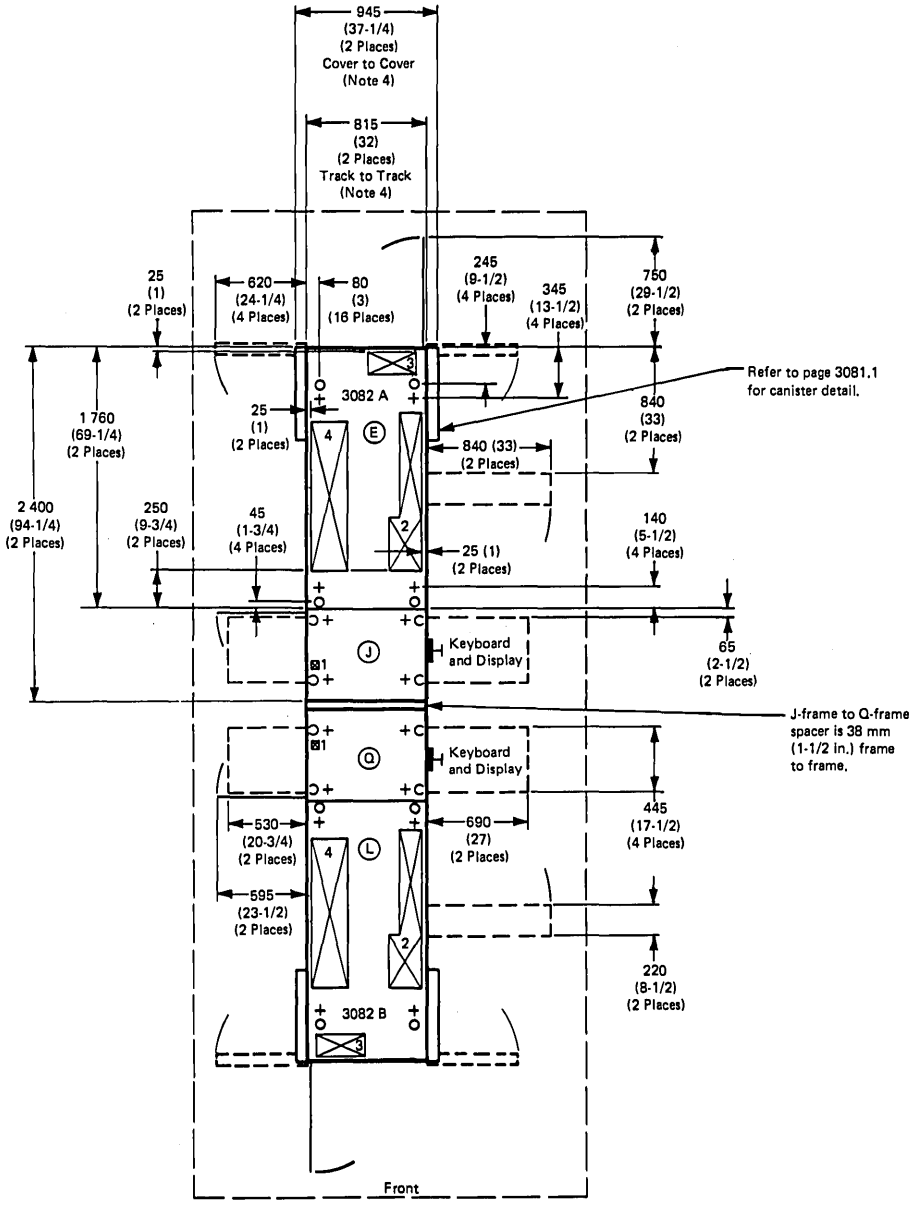
Frame	Width x Length x Height mm (in.) with Packing Material	Width x Length mm (in.) without Packing Material	Specify Number
E–Standard	970 (38-1/4) x 1 833 (72-1/4) x 1 785 (70-1/2)	945 (37-1/4) x 1 778 (70)	–
Side Covers Removed	900 (35-1/4) x 1 830 (72-1/4) x 1 785 (70-1/2)	860 (33-3/4) x 1 778 (70)	9571
E-frame with Extension and Covers Removed	900 (35-1/4) x 1 590 (62-1/2) x 1 785 (70-1/2)	860 (33-3/4) x 1 550 (61)	9573
J–Standard	860 (33-3/4) x 715 (28) x 1 785 (70-1/2)	815 (32) x 630 (24-3/4)	–

Notes:

1. Frames may arrive with removable shipping pads of approximately 25-mm (1-in.) thickness. The dimensions of the pads are not included in the preceding chart.
2. Shipping height is the same with or without packing material.
3. For shipping and storage, this unit must be specially packed. Consult "Chapter 4. Relocation/Removal Procedures" in the appropriate *Processor Complex Installation (INST) (REMOV)* manual or your IBM representative.

3082 PROCESSOR CONTROLLER–DUPLEX

PLAN VIEW (Metric Scale: 10 mm = 0.5 m)



See Note 1.

Cable Entry/Exit Number	Dimension (Millimeters)	Dimension (Inches)
1	50 x 50	2 x 2
2	230 x 360, 150 x 700	9 x 14, 6 x 28
3	150 x 330	6 x 13
4	255 x 1 020	10 x 40

Notes:

1. Caster, cable hole, and leveling pad locating dimensions are measured from the edge of frame, not cover.
2. For cabling information, see "3084 Processor Complex Cabling Schematic."
3. For service clearances, see pages 3084.4 and 3084.5.
4. Frame is 750 mm (29-1/2 in.) wide. Track is 32 mm (1-1/4 in.) wide, measured from frame. Canister is 100 mm (3-7/8 in.) wide, measured from frame.

3082 PROCESSOR CONTROLLER–DUPLEX

Details (By Frame)

Model	Frame	Weight kg	Weight (lb)
Q48	E	870	(1,910)
	L	870	(1,910)
Q48	J	360	(790)
	Q	360	(790)
X48	E	870	(1,910)
	L	870	(1,910)
X48	J	360	(790)
	Q	360	(790)

Details (By Model)

Model*	Weight kg (lb)	Airflow m^3/min (cfm)	Typical Heat Output W (BTU/hr) To Air	Typical Heat Output W (BTU/hr) To Water	Typical Power Requirements kVA 400 Hz	Typical Power Requirements kVA 50/60 Hz
Q48	2 445 (5,380)	46 (1,600)	5 320 (18,160)	–	4.2	1.6
X48	2 445 (5,380)	46 (1,600)	5 320 (18,160)	–	4.2	1.6

Note: Q48 and X48 are the number of channels.

SPECIFICATIONS

Dimensions:

	Front	Side	Height
mm	**	**	1 785
(inches)	(**)	(**)	(70-1/2)

Service Clearances:

	Front	Rear	Right	Left
mm	***	***	***	***
(inches)	(***)	(***)	(***)	(***)

Environment, Operating:

Temperature	16°C-29°C (60°F-85°F)
Rel Humidity	20%-80%
Max Wet Bulb	23°C (73°F)

Power Requirements: Receives power from the F-frame and the M-frame of the 3084.

Notes:

*For channel-to-channel adapter, add 0.33 kW (1,100 BTU/hr) to air, 0.4 kVA to 400 Hz, and 30 kg (60 lb) to E-frame or L-frame.

**See plan view.

***See "Layouts for 3084 Processor Unit and 3082 Processor Controller" on page 3084.4.

Shipping Dimensions:

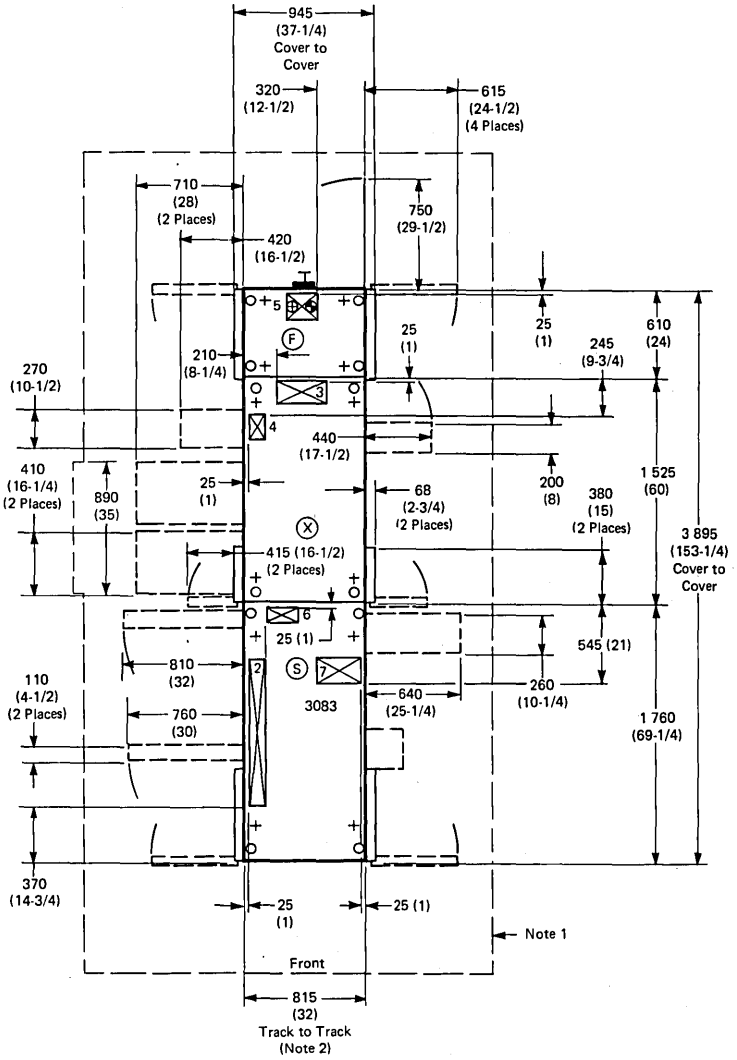
Frame	Width x Length x Height mm (in.) with Packing Material	Width x Length mm (in.) without Packing Material	Specify Number
E/L–Standard	970 (38-1/4) x 1 833 (72-1/4) x 1 785 (70-1/2)	945 (37-1/4) x 1 778 (70)	–
Side Covers Removed	900 (35-1/4) x 1 830 (72-1/4) x 1 785 (70-1/2)	860 (33-3/4) x 1 778 (70)	9571
E-frame with Extension and Covers Removed	900 (35-1/4) x 1 590 (62-1/2) x 1 785 (70-1/2)	860 (33-3/4) x 1 550 (61)	9573
J/Q–Standard	860 (33-3/4) x 715 (28) x 1 785 (70-1/2)	815 (32) x 630 (24-3/4)	–

Notes:

1. Frames may arrive with removable shipping pads of approximately 25-mm (1-in.) thickness. The dimensions of the pads are not included in the preceding chart.
2. Shipping height is the same with or without packing material.
3. For shipping and storage, this unit must be specially packed. Consult "Chapter 4. Relocation/Removal Procedures" in the appropriate *Processor Complex Installation (INST (REMOV)* manual or your IBM representative.

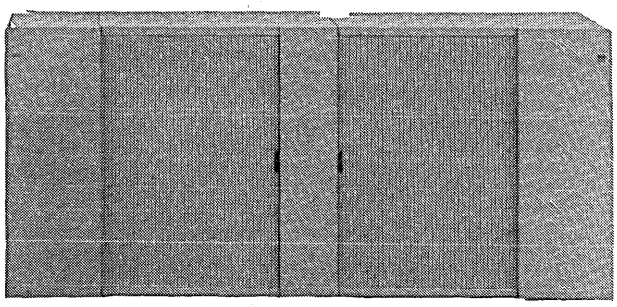
3083 PROCESSOR UNIT

PLAN VIEW (Metric Scale: 10 mm = 0.5 m)



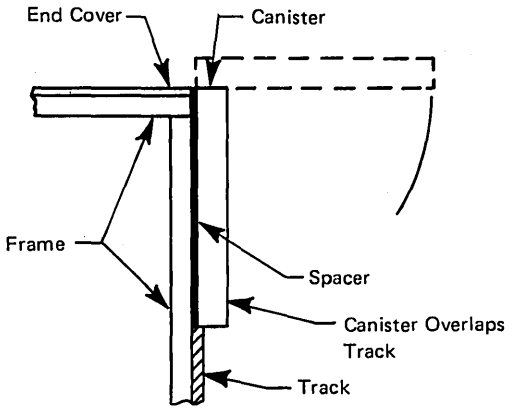
See Note 3.

Cable Entry/Exit Number	Dimension (Millimeters)	Dimension (Inches)
2	100 x 995	4 x 39
3	135 x 330	6 x 13
4	175 x 100	7 x 4
5	190 x 180	8 x 7
6	100 x 200	4 x 8
7	175 x 300	7 x 12



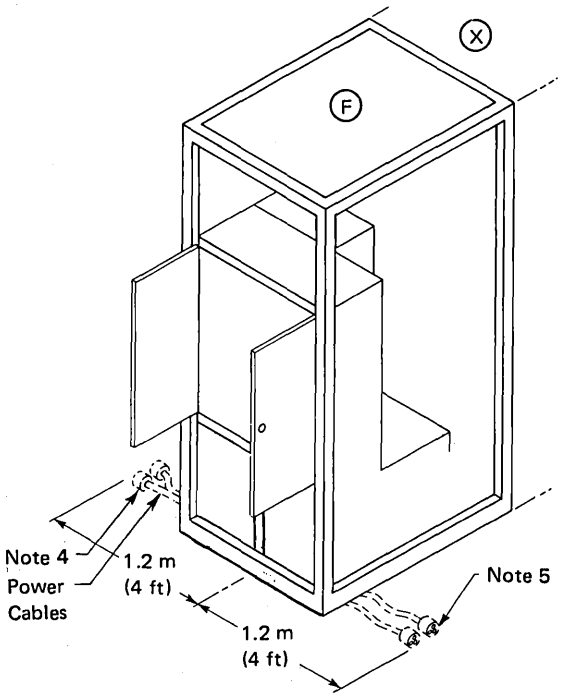
Side View

Detail of Tambour Cover (See Note 2)



Line Cord Routing for F-frame

The following figure shows the recommended locations for the receptacles:



Notes:

1. For service clearances, see page 3083.4.
2. Frame is 750 mm (29-1/2 in.) wide. Track is 32 mm (1-1/4 in.) wide, measured from frame. Canister is 100 mm (3-7/8 in.) wide, measured from frame.
3. Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame. Additional floor stanchions should be installed to support the raised floor where each leveling pad contacts the floor and wherever floor tiles are cut.
4. Line cord lengths from F-frame are both 1.8 m (6 ft).
5. Locate 50/60-Hz and 400-Hz receptacles within 1.2 meters (4 feet) of floor cutout on either side of F-frame.

3083 PROCESSOR UNIT

Details (By Frame)
(See Notes 1 through 3)

Model	*Frame*	*Weight*	
		kg	*(lb)*
E8/B8/J8	S	1 045	(2,300)
	X	1 195	(2,630)*
CX0/EX0/ BX0/JX0	S	1 000	(2,200)
	X	1 175	(2,580)*
E16/B16/ J16	S	1 080	(2,370)
	X	1 265	(2,780)*
CX1/EX1/ BX1/JX1	S	1 000	(2,200)
	X	1 175	(2,580)*
E24/B24/ J24	S	1 180	(2,600)*
	X	1 300	(2,860)*
CX2/EX2/ BX2/JX2	S	1 030	(2,270)
	X	1 175	(2,580)*
E32/B32/ J32	S	1 250	(2,750)*
	X	1 330	(2,930)*
CX3/EX3/ BX3/JX3	S	1 030	(2,270)
	X	1 175	(2,580)*
All	F	495	(1,090)

Notes:
1. Models equal storage sizes.
2. Details shown are for 3083 only. For total processor complex, include 3082, 3087, and 3089, if used.
3. For shipping and storage, this unit must be specially packed. Consult "Chapter 4. Relocation/Removal Procedures" in the *IBM 3081/3083 Processor Complex: Installation (INST) (REMOV)* manual or your IBM representative.

SPECIFICATIONS

Dimensions:

	Front	Side	Height
mm	**	**	1 875
(inches)	(**)	(**)	(73-3/4)

Service Clearances:

	Front	Rear	Right	Left
mm	***	***	***	***
(inches)	(***)	(***)	(***)	(***)

Power Requirements:	*50/60 Hz*	*415/441 Hz*
Phases	3	See Item 2.
Plug	R&S, FS3760	R&S, JPS1534LK
Connector	R&S, FS3934	R&S, JCS1534LK
Receptacle	R&S, FS3754	R&S, JRSR/A1534LK
Power Cord Style	B1	H1
Power Cord Length	1.8 meters (6 feet)	1.8 meters (6 feet)

Items:
The power distribution frame (F-frame):
1. Requires 3-phase 200/208/220/240 V, 60-Hz ± 0.5-Hz or 200/220/380/400/415 V, 50-Hz ± 0.5-Hz customer service.
2. The IBM 3089 Power Unit provides 400-Hz power to the 3083 F-frame. Refer to the "3089 Power Unit" on page 3089.2.

   As an alternative, the customer may supply power from a 400-Hz source other than the 3089 Power Unit. The customer is then responsible for ensuring that the supplied 400-Hz source complies with the 3083 specifications.

   For planning and installing customer-supplied 400-Hz power, refer to Appendix A, Part 7.
3. All 3083 three-phase receptacles must be wired for correct phase rotation. Facing the receptacle in a clockwise direction from the ground pin, the sequence is phase 1, phase 2, and phase 3.

Environment, Operating:

Temperature	16°C-29°C (60°F-85°F)
Rel Humidity	20%-80%
Max Wet Bulb	23°C (73°F)

Notes:

* This frame weighs more than 1 135 kg (2,500 lb). For transport in elevators rated at 1 135 kg (2,500 lb) or less, consult the elevator manufacturer for alternatives. If this cannot be done, specify code #9581 is available to reduce frame weights to less than 1 135 kg (2,500 lb).

** See plan view.

*** See "Layouts for 3083 Processor Unit and 3082 Processor Controller" on page 3083.4.

3083 PROCESSOR UNIT

Details (By Model)

Model†	*Weight kg (lb)*	*Airflow m^3/min (cfm)*	*Typical Heat Output W (BTU/hr)*		*Typical Power Requirements kVA*	
			To Air	*To Water*	*400 Hz*	*50/60 Hz*
E8/B8/ J8	2 690 (5,930)	24.5 (850)	2 380 (8,100)	6 280 (21,450)	10.5	0.5
CX0/EX0/ BX0/JX0	2 630 (5,780)	24.5 (850)	2 380 (8,100)	4 400 (15,000)	8.0	0.5
E16/B16/ J16	2 790 (6,150)	24.5 (850)	2 570 (8,800)	8 550 (29,150)	13.5	0.5
CX1/EX1/ BX1/JX1	2 630 (5,780)	24.5 (850)	2 380 (8,100)	4 400 (15,000)	8.0	0.5
E24/B24/ J24	2 940 (6,460)	24.5 (850)	3 330 (11,400)	10 170 (34,700)	16.5	0.5
CX2/EX2/ BX2/JX2	2 660 (5,850)	24.5 (850)	2 600 (8,800)	7 000 (22,800)	11.0	0.5
E32/B32/ J32	3 040 (6,690)	24.5 (850)	4 090 (14,000)	11 880 (40,550)	19.6	0.5
CX3/EX3/ BX3/JX3	2 660 (5,850)	24.5 (850)	2 600 (8,800)	7 000 (22,800)	11.0	0.5

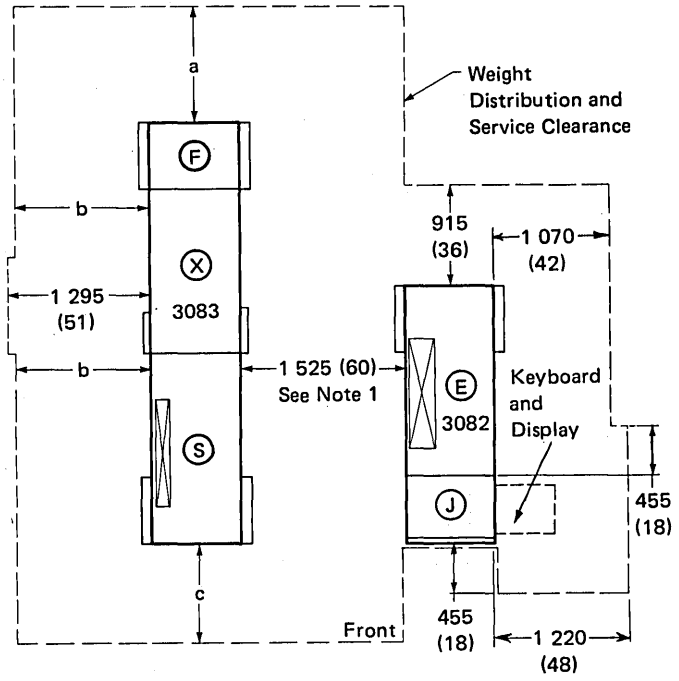
Notes:

1. Models equal storage sizes.
2. Details shown are for 3083 only. For total processor complex, include 3082, 3087, and 3089, if used.
3. For shipping and storage, this unit must be specially packed. Consult "Chapter 4. Relocation/Removal Procedures" in the *IBM 3081/3083 Processor Complex: Installation (INST) (REMOV)* manual or your IBM representative.

Notes:

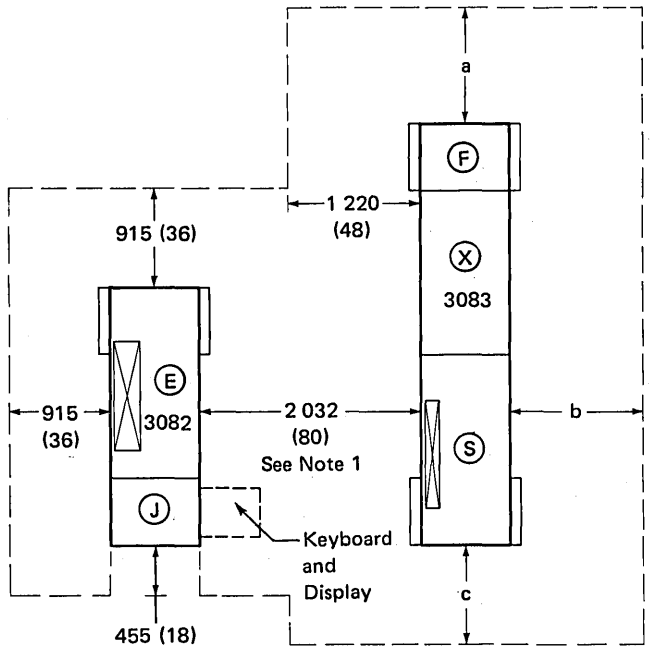
†For channel group, additional (SF #1545/1550), add 0.5 kVA to 400 Hz and 0.41 kW (1,400 BTU/hr) to water for each one.

LAYOUTS FOR 3083 PROCESSOR UNIT AND 3082 PROCESSOR CONTROLLER
(Not to scale)



Notes:

1. Adjust the space between the frames so that the long floor hole cutouts under E- and S-frames are along the edge of the floor tiles.
2. These layouts are recommended for servicing and for achieving proper weight distribution for the floor space involved. Alternative layouts must meet requirements for cable lengths and service clearances to accommodate frame weight and servicing.



Required Weight Distribution and Service Clearance (See Note)

Floor Load Rating kg/m^2 (lb/ft^2)	*16M Bytes and Models BX2, CX2, EX2, JX2, BX3, CX3, EX3, and JX3*			*24/32M Bytes*		
	Dimensions for F-, S-, and X-frames mm (in.)			*Dimensions for F-, S-, and X-frames mm (in.)*		
	a	*b*	*c*	*a*	*b*	*c*
366 (75)	1 070 (42)	1 220 (48)	915 (36)	1 525 (60)	1 525 (60)	1 525 (60)
390 (80)	915 (36)	1 070 (42)	460 (18)	1 525 (60)	1 525 (60)	915 (36)
415 (85)	915 (36)	1 070 (42)	460 (18)	1 070 (42)	1 525 (60)	460 (18)

Note: These dimensions are required for proper weight distribution and servicing. If the dimensions are altered, the customer should obtain the services of a qualified consultant or structural engineer to validate floor loading.

If the customer's review of the floor loading does not require the clearances shown in the preceding chart, the following service clearances are required:

a	*b*	*c*
915 (36)	1 070 (42)	460 (18)

3083 PROCESSOR UNIT
(Metric Scale: 10 mm = 0.25 m)

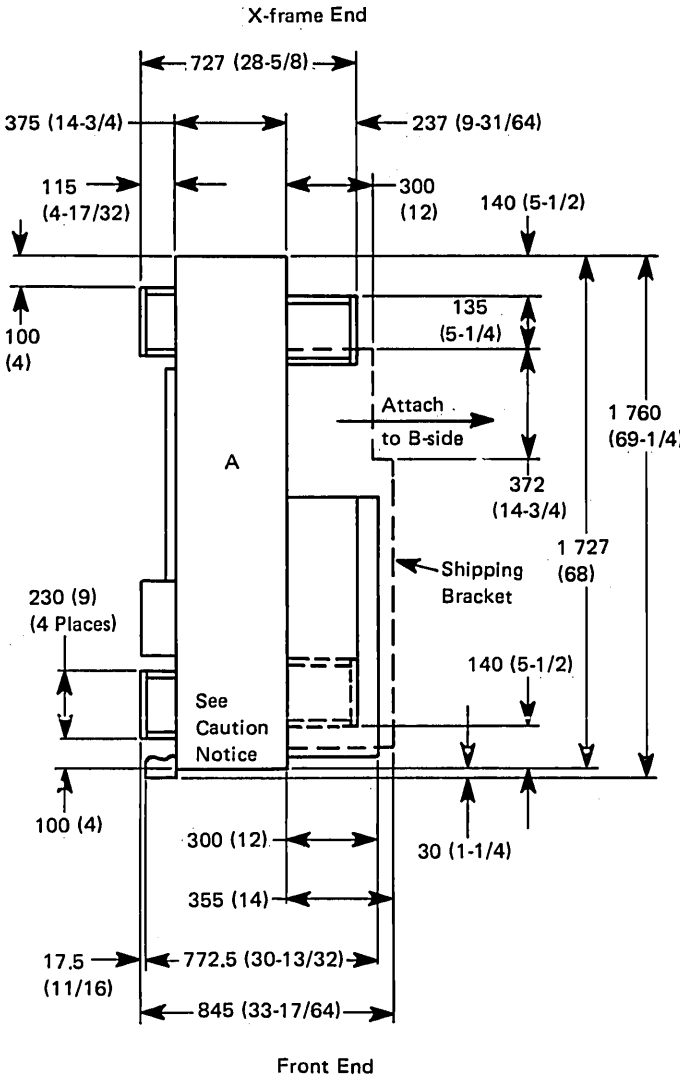


Figure 1. S-frame Split–A-side (Top View)

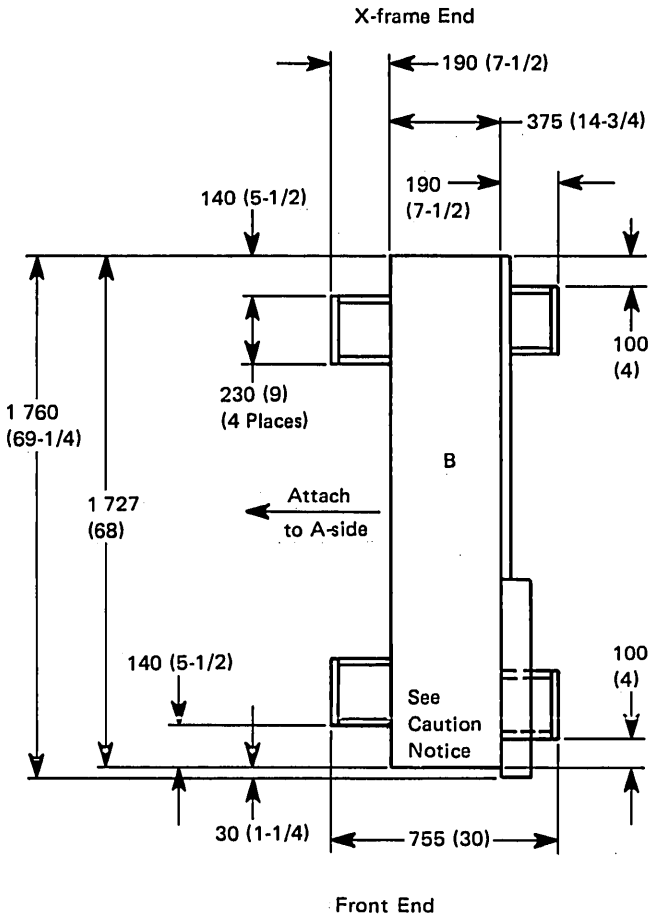


Figure 2. S-frame–B-side (Top View)

Shipping Dimensions:

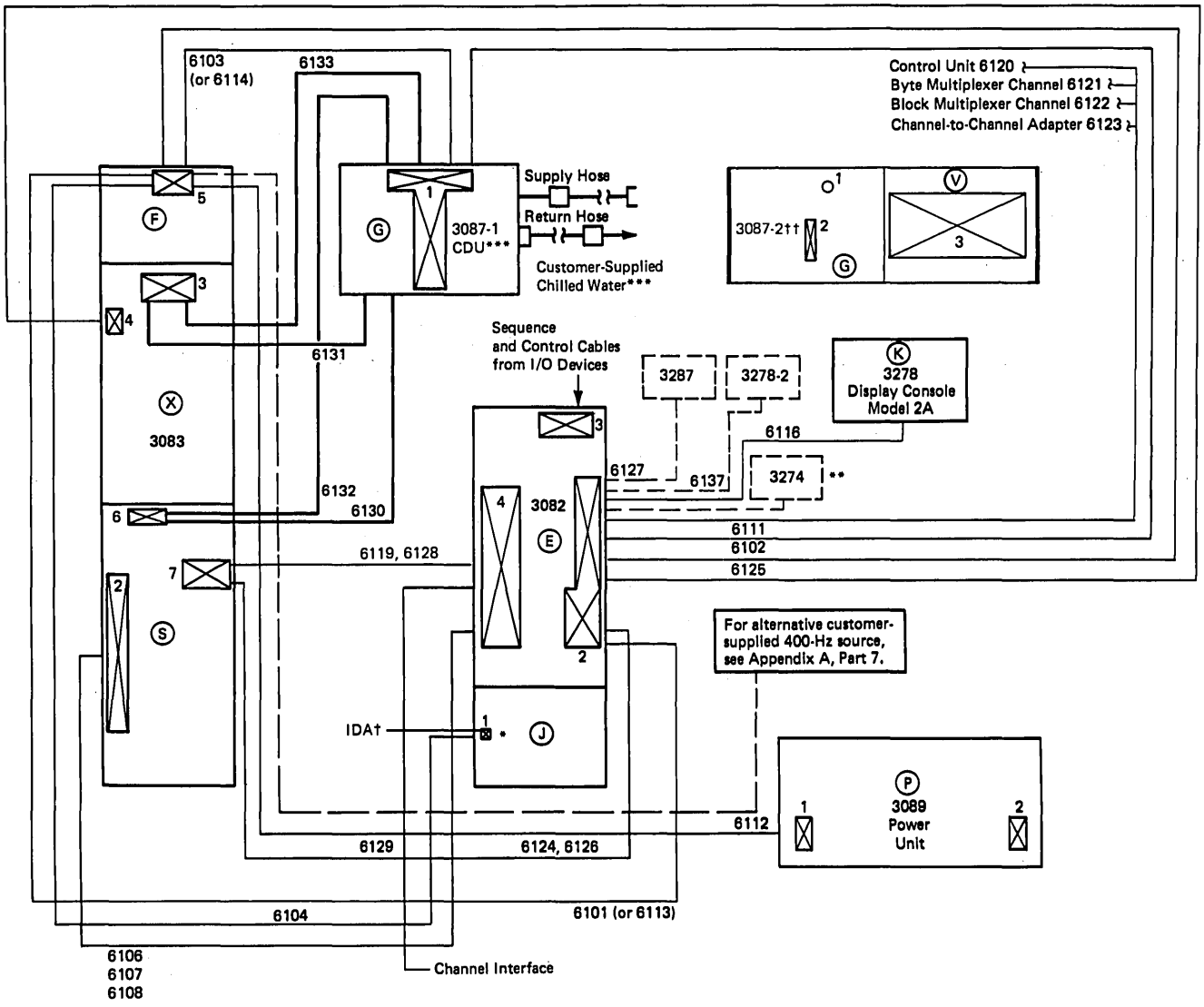
Frame	*Width x Length x Height mm (in.) with Packing Material*	*Width x Length mm (in.) without Packing Material*	*Specify Number*
S–Standard	970 (38-1/4) x 1 803 (71) x 1 870 (73-3/4)	945 (37-1/4) x 1 760 (69-1/4)	–
Side Covers Removed	900 (35-1/4) x 1 803 (71) x 1 870 (73-3/4)	860 (33-3/4) x 1 760 (69-1/4)	9571
Split A-side (Fig. 1)	870 (34-1/4) x 1 803 (71) x 1 785 (70-1/2)	845 (33-17/64) x 1 760 (69-1/4)	9572
Split B-side (Fig. 2)	755 (30) x 1 803 (71) x 1 785 (70-1/2)	755 (30) x 1 760 (69-1/4)	9572
X–Standard	935 (37) x 1 575 (62) x 1 870 (73-3/4)	890 (35) x 1 550 (61)	–
F–Standard	980 (38-3/4) x 760 (30) x 1 870 (73-3/4)	945 (37-1/4) x 740 (29)	–

Notes:

1. Frames may arrive with removable shipping pads of approximately 25-mm (1-in.) thickness. The dimensions of the pads are not included in the preceding chart.
2. Shipping height is the same with or without packing material.

CAUTION
Special packing B/M(s) is required to assure frame stability during move/relocation. Consult your local IBM representative for correct B/M(s).

3083 PROCESSOR COMPLEX CABLING SCHEMATIC—CABLES AND COOLANT HOSES



Legend:

——— Coolant hoses

——— Cables

*For processor complexes installed in the U.S. and Canada, the integrated data adapter (IDA) cable (provided with the processor controller) enters the cable entry in J-frame. Data access arrangement (DAA) coupler must be within 15 meters (49 feet) of the cable entry in the J-frame. If the IBM automatic operator coupler (CBS) is used, a cable is required to connect the coupler to the modem interface of the 3082. The cable is ordered by RPQ 8P0902.

**If an optional locally attached 3274 Control Unit is to be installed (for channel attachment of the integrated service support console), a customer-supplied coaxial cable is required.

*** Locate customer-supplied chilled water supply and return manifold connections (under floor) and place within 2 meters (5 feet) of the CDU center. See "Typical Connections for Customer-Supplied Chilled Water for 3087" in Appendix A, Part 1.

†A customer-provided telephone should also be supplied.

††Uses the same cables and hoses as the 3087 Model 1. Customer-supplied chilled water is not required. See 3087 Model 2 specification pages.

Coolant Hoses

The following fixed-length hoses are shipped automatically:

Group No.	*No. of Hoses*	*From*	*Frame No.*	*Hose Entry/ Exit No.*	*To*	*Frame No.*	*Hose Entry/ Exit No.*	*Fixed X-length m*	*(ft)*	*Notes*
6130	2	3087-1, -2	G	1, 3	3083	S	6	9.8	32	5,11
6131	2	3087-1, -2	G	1, 3	3083	X	3	9.8	32	5,11
6132	2	3083	S	6	3087-1, -2	G	1, 3	10.7	35	6,11
6133	2	3083	X	3	3087-1, -2	G	1, 3	10.7	35	6,11

3083 PROCESSOR COMPLEX CABLING SCHEMATIC—CABLES AND COOLANT HOSES

Cables

The following fixed-length cables are feature dependent and must be ordered:

Group No.	No. of Cables in Group	From	Frame No.	Cable Entry/ Exit No.	To	Frame No.	Cable Entry/ Exit No.	Fixed X-length m	(ft)	Notes
6127	1	3287	–	–	3082	E	2	15.0	49	9
6137	1	3278-2A	–	–	3082	E	2	15.0	49	9

The following variable-length cables are feature dependent and must be ordered:

Group No.	No. of Cables in Group	From	Frame No.	Cable Entry/ Exit No.	To	Frame No.	Cable Entry/ Exit No.	Max X-length m	(ft)	Notes
6120	2	3082	E	2	Control Unit	–	–	–	–	10
6121	2	3082	E	2	Byte Multiplexer Channel	–	–	–	–	10
6122	2	3082	E	2	Block Multiplexer Channel	–	–	–	–	10
6123	2	3082	E	2	Channel-to-Channel Adapter	–	–	–	–	10

The following fixed-length cables are shipped automatically:

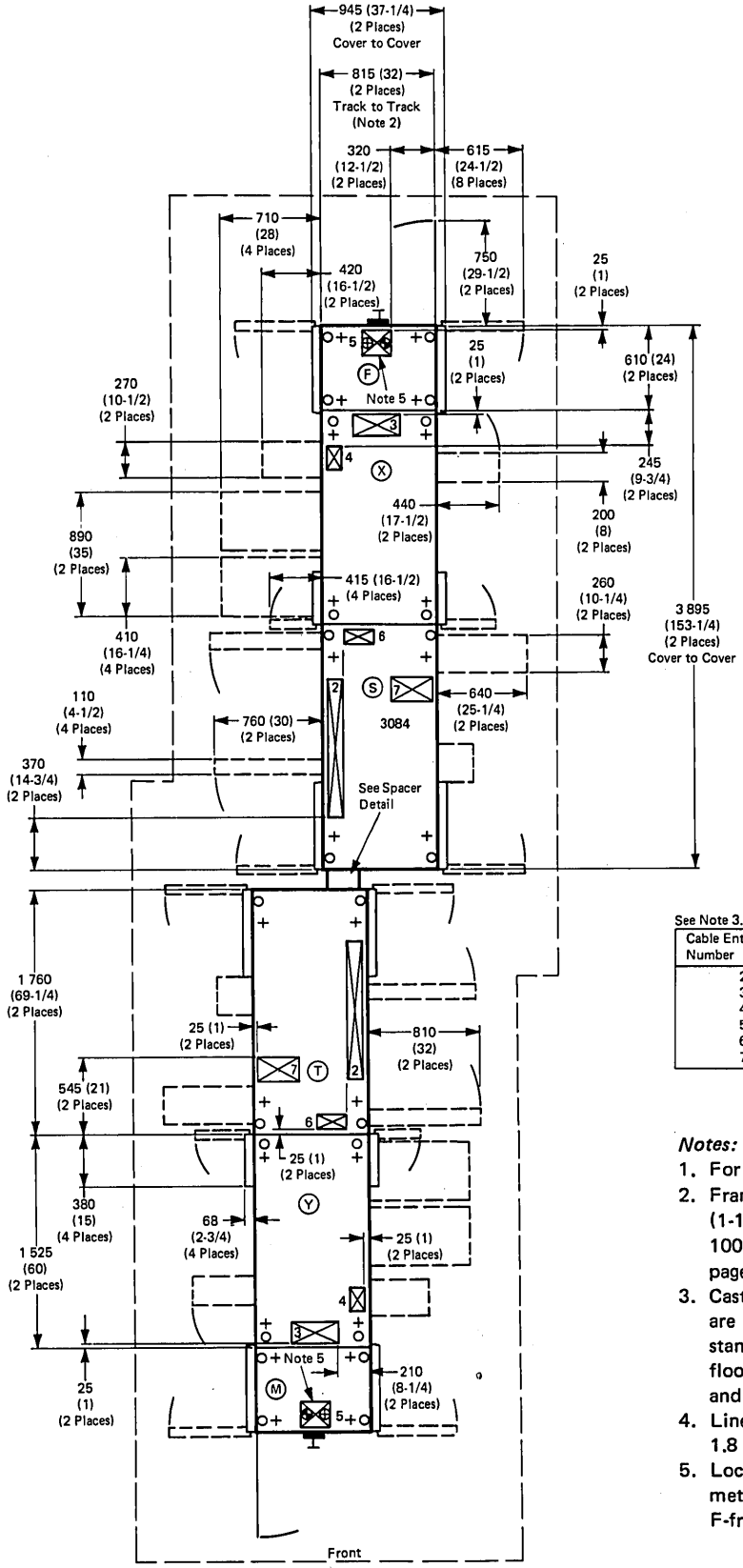
Group No.	No. of Cables in Group	From	Frame No.	Cable Entry/ Exit No.	To	Frame No.	Cable Entry/ Exit No.	Fixed X-length m	(ft)	Notes
6101 (6113)	5	3082	E	2	3083	F	5	6.7	22	1,4
6102	2	3082	E	2	3083	F	5	6.0	20	2
6103 (6114)	4	3087-1,-2	G	1,2	3083	F	5	15.2	50	1,2,4,11
6104	1	3082	J	1	3083	F	5	6.7	22	2
6106	12	3082	E	4	3083	S	2	4.6	15	3
6107	12	3082	E	4	3083	S	2	4.6	15	3,7
6108	12	3082	E	4	3083	S	2	4.6	15	3,8
6111	1	3087-1,-2	G	1,2	3082	E	2	15.2	50	2,11
6112	3	3089	P	1	3083	F	5	15.2	35	1,2
6116	2	3082	E	2	3278-2A	K	–	15.0	49	2,9
6119	3	3082	E	4	3083	S	7	5.2	17	2
6124	3	3082	E	2	3083	S	7	5.2	17	2
6125	2	3082	E	2	3083	X	4	5.2	17	2
6126	3	3082	E	2	3083	S	7	5.0	16	2
6128	1	3083	S	7	3082	E	4	5.0	16	2
6129	3	3082	E	2	3083	S	7	4.6	15	2

Notes:

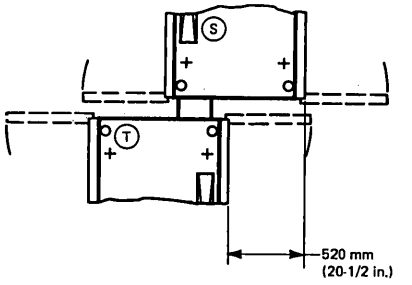
1. Power cabling.
2. Control cabling
3. Channel interconnecting cables.
4. For 50-Hz machines, use group numbers in parentheses.
5. Coolant supply hoses.
6. Coolant return hoses.
7. Required for additional channels (8-15); SF #1545 required on all 3083 models.
8. Required for additional channels (16-23). SF #1550 required on 3083 Models B, BX, J, and JX.
9. Required for the 3278 Display Console and 3287 Printer with a fixed length of 15 meters (49 feet). For lengths between 15 meters (49 feet) and 1 500 meters (4,921 feet), see information RPQ 8P0891. When ordering, do not order by group numbers.
10. From channel-to-channel adapter (SF #1850 or SF #1851); order two groups per feature (see Section 2). Total cable length of 61 meters (200 feet), unless modified by the general control-to-channel cabling schematic, is available to attach up to eight control units.
11. For lengths other than the indicated fixed lengths, order by RPQ. Lengths up to 30.5 meters (100 feet) are available for special applications.

3084 PROCESSOR UNIT

PLAN VIEW (Metric Scale: 10 mm = 0.5 m)



Spacer Detail



75 mm (3 in.) cover to cover
130 mm (5-1/2 in.) frame to frame (shipped attached to T-frame)
520 mm (20-1/2 in.) offset

See Note 3.

Cable Entry/Exit Number	Dimension (Millimeters)	Dimension (Inches)
2	100 x 995	4 x 39
3	135 x 330	6 x 13
4	175 x 100	7 x 4
5	190 x 180	8 x 7
6	100 x 200	4 x 8
7	175 x 300	7 x 12

Notes:

1. For service clearances, see page 3084.4.
2. Frame is 750 mm (29-1/2 in.) wide. Track is 32 mm (1-1/4 in.) wide, measured from frame. Canister is 100 mm (3-7/8 in.) wide, measured from frame. See page 3081.1 for canister detail.
3. Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame. Additional floor stanchions should be installed to support the raised floor where each leveling pad contacts the floor and wherever floor tiles are cut.
4. Line cord lengths from F-frame and M-frame are both 1.8 m (6 ft).
5. Locate 50/60-Hz and 400-Hz receptacles within 1.2 meters (4 feet) of floor cutout on either side of F-frame and M-frame.

3084 PROCESSOR UNIT

Details (By Frame), See Notes 1 through 4

Model	*Frame*	*Weight*	
		kg	*(lb)*
Q32	S	1 125	(2,470)
	X	1 265	(2,780)*
	T	1 145	(2,520)*
	Y	1 265	(2,780)*
QX3	S	1 125	(2,470)
	X	1 265	(2,780)*
	T	1 145	(2,520)*
	Y	1 265	(2,780)*
Q48	S	1 225	(2,700)*
	X	1 300	(2,860)*
	T	1 250	(2,750)*
	Y	1 300	(2,860)*
QX4	S	1 125	(2,470)
	X	1 265	(2,780)*
	T	1 145	(2,520)*
	Y	1 265	(2,780)*
Q64/Q96	S	1 295	(2,850)*
	X	1 330	(2,930)*
	T	1 320	(2,900)*
	Y	1 330	(2,930)*
QX6	S	1 125	(2,470)
	X	1 265	(2,780)*
	T	1 145	(2,520)*
	Y	1 265	(2,780)*
QX9	S	1 205	(2,650)*
	X	1 300	(2,860)*
	T	1 250	(2,750)*
	Y	1 300	(2,860)*
QC8	S	1 295	(2,850)*
	X	1 330	(2,930)*
	T	1 320	(2,900)*
	Y	1 330	(2,930)*
QXC	S	1 295	(2,850)*
	X	1 330	(2,930)*
	T	1 320	(2,900)*
	Y	1 330	(2,930)*
All Models	F	495	(1,090)
	M	495	(1,090)

Notes:

1. Models equal storage sizes.
2. Details shown are for 3084 only. For total processor complex, include 3082, 3087, and 3089, if used.
3. Different models of the 3087 CDU cannot be mixed in support of the 3084.
4. For shipping and storage, this unit must be specially packed. Consult "Chapter 4. Relocation/Removal Procedures" in the *IBM 3084 Processor Complex: Installation (INST) (REMOV)* manual or your IBM representative.

SPECIFICATIONS

Dimensions:

	Front	**Side**	**Height**
mm	**	**	1 875
(inches)	(**)	(**)	(73-3/4)

Service Clearances:

	Front	**Rear**	**Right**	**Left**
mm	***	***	***	***
(inches)	(***)	(***)	(***)	(***)

Power Requirements:	*50/60 Hz*	*415/441 Hz*
Phases	3	See Item 2.
Plug	R&S, FS3760	R&S, JPS1534LK
Connector	R&S, FS3934	R&S, JCS1534LK
Receptacle	R&S, FS3754	R&S, JRSR/A1534LK
Power Cord Style	B1	H1
Power Cord Length	1.8 meters (6 feet)	1.8 meters (6 feet)

Items:

The power distribution frames (F-frame and M-frame):

1. Require 3-phase 200/208/220/240 V, 60-Hz ± 0.5-Hz or 200/220/380/400/415 V, 50-Hz ± 0.5-Hz customer service.
2. The IBM 3089 Power Units provide 400-Hz power to the 3084 F-frame and M-frame. Refer to "3089 Power Unit" on page 3089.2.

   As an alternative, the customer may supply power from a 400-Hz source other than the 3089 Power Unit. The customer is then responsible for ensuring that the supplied 400-Hz source complies with the 3084 specifications.

   For planning and installing customer-supplied 400-Hz power, refer to Appendix A, Part 7.
3. All 3084 three-phase receptacles must be wired for correct phase rotation. Facing the receptacle in a clockwise direction from the ground pin, the sequence is phase 1, phase 2, and phase 3.

Notes:

*This frame weighs more than 1 135 kg (2,500 lb). For transport in elevators rated at 1 135 kg (2,500 lb) or less, consult the elevator manufacturer for alternatives. If this cannot be done, specify code #9581 is available to reduce frame weights to less than 1 135 kg (2,500 lb).

**See plan view.

***See "Layouts for 3084 Processor Unit and 3082 Processor Controller" on pages 3084.4 and 3084.5.

3084 PROCESSOR UNIT

Details (By Model)

Model	Weight kg (lb)	Airflow m^3/min (cfm)	Typical Heat Output W (BTU/hr)†		Typical Power Requirements kVA	
			To Air	To Water	400 Hz	50/60 Hz
Q32	5 765 (12,700)	49 (1,700)	5 120 (17,400)	24 350 (83,200)	36.8	1.0
QX3	5 765 (12,700)	49 (1,700)	5 120 (17,400)	24 350 (83,200)	36.8	1.0
Q48	6 045 (13,320)	49 (1,700)	6 620 (22,600)	27 750 (94,800)	42.8	1.0
QX4	5 765 (12,700)	49 (1,700)	5 120 (17,400)	24 350 (83,200)	36.8	1.0
Q64/Q96	6 255 (13,780)	49 (1,700)	8 200 (28,000)	30 970 (105,800)	48.8	1.0
QX6	5 765 (12,700)	49 (1,700)	5 120 (17,400)	24 350 (83,200)	36.8	1.0
QX9	6 045 (13,320)	49 (1,700)	6 620 (22,600)	27 750 (94,800)	42.8	1.0
QC8	6 255 (13,780)	49 (1,700)	8 200 (28,000)	30 970 (105,800)	48.8	1.0
QXC	6 255 (13,780)	49 (1,700)	8 200 (28,000)	30 970 (105,800)	48.8	1.0

Notes:

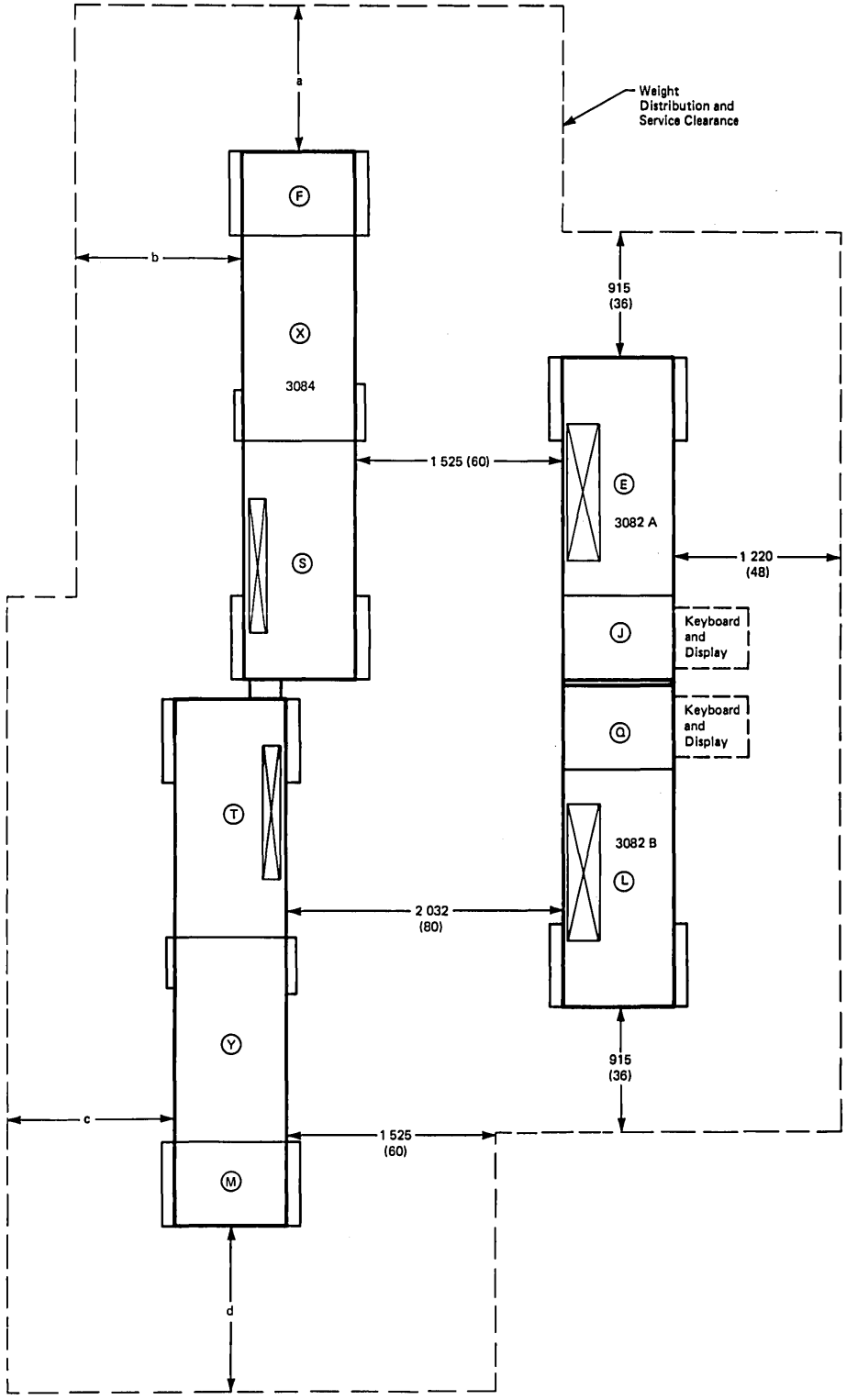
1. Models equal storage sizes.
2. Details shown are for 3084 only. For total processor complex, include 3082, 3087, and 3089, if used.
3. Different models of the 3087 CDU cannot be mixed in support of the 3084.
4. For shipping and storage, this unit must be specially packed. Consult "Chapter 4. Relocation/Removal Procedures" in the *IBM 3084 Processor Complex: Installation (INST) (REMOV)* manual or your IBM representative.

Notes:

†With the CDU Model 1, for total heat load to customer water, add the processor unit's BTU-to-water requirements to the CDU's BTU-to-water requirements. For additional information, refer to Appendix A.

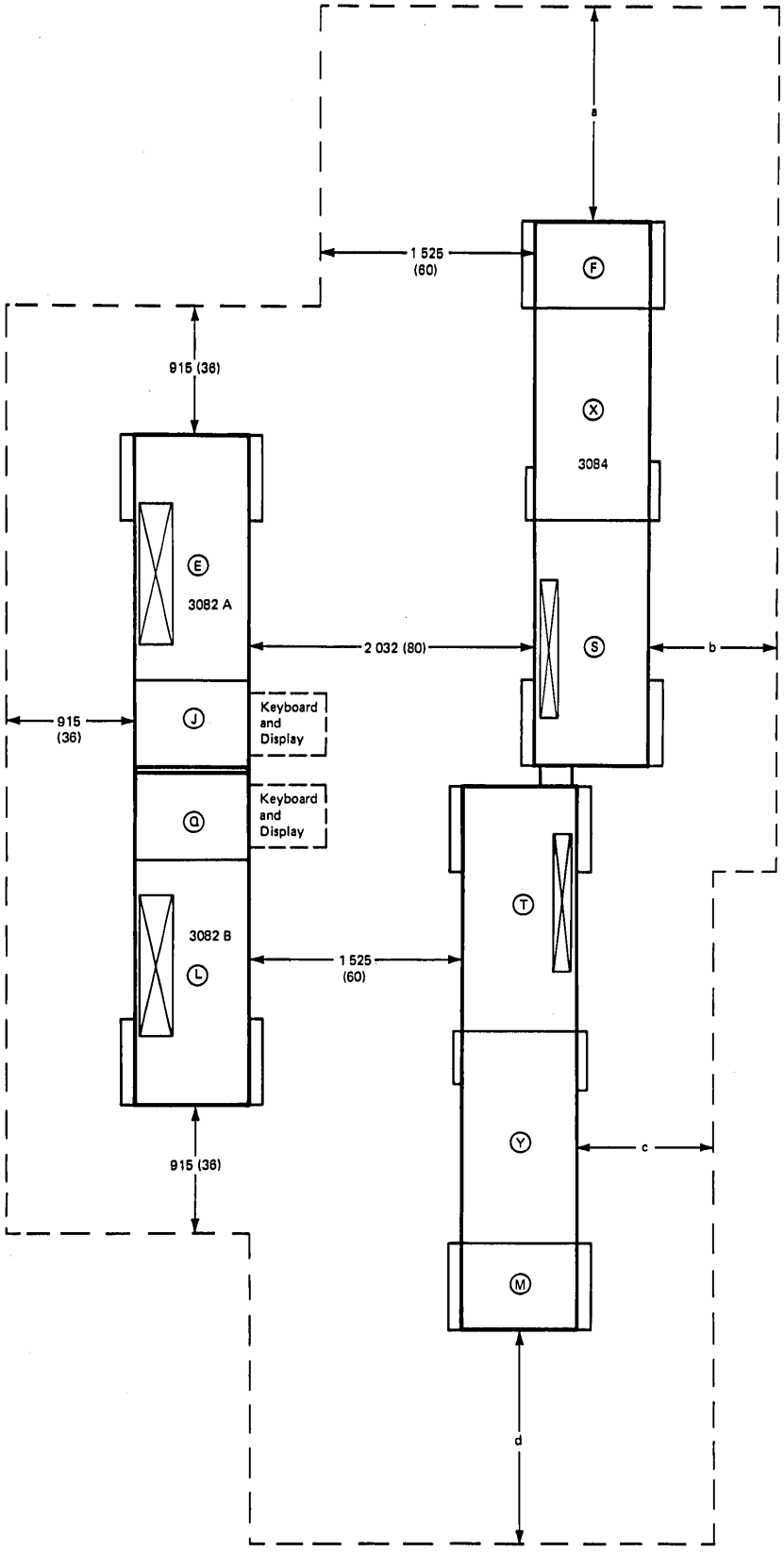
LAYOUTS FOR 3084 PROCESSOR UNIT AND 3082 PROCESSOR CONTROLLER

(Not to scale)



LAYOUTS FOR 3084 PROCESSOR UNIT AND 3082 PROCESSOR CONTROLLER

(Not to scale)



Required Weight Distribution and Service Clearance

Floor Load Rating kg/m^2 (lb/ft^2)	*32M Bytes and Models QX4 and QX6*				*48/64/96/128M Bytes and Models QX9 and QXC*			
	Dimensions mm (in.)*				*Dimensions* mm (in.)*			
	a	*b*	*c*	*d*	*a*	*b*	*c*	*d*
366 (75)	1 525 (60)	1 525 (60)	1 525 (60)	1 525 (60)	**	**	**	**
390 (80)	1 070 (42)	1 320 (52)	1 320 (52)	1 070 (42)	1 525 (60)	1 525 (60)	1 525 (60)	1 525 (60)
415 (85)	915 (36)	1 320 (52)	1 320 (52)	915 (36)	1 070 (42)	1 320 (52)	1 320 (52)	1 070 (42)

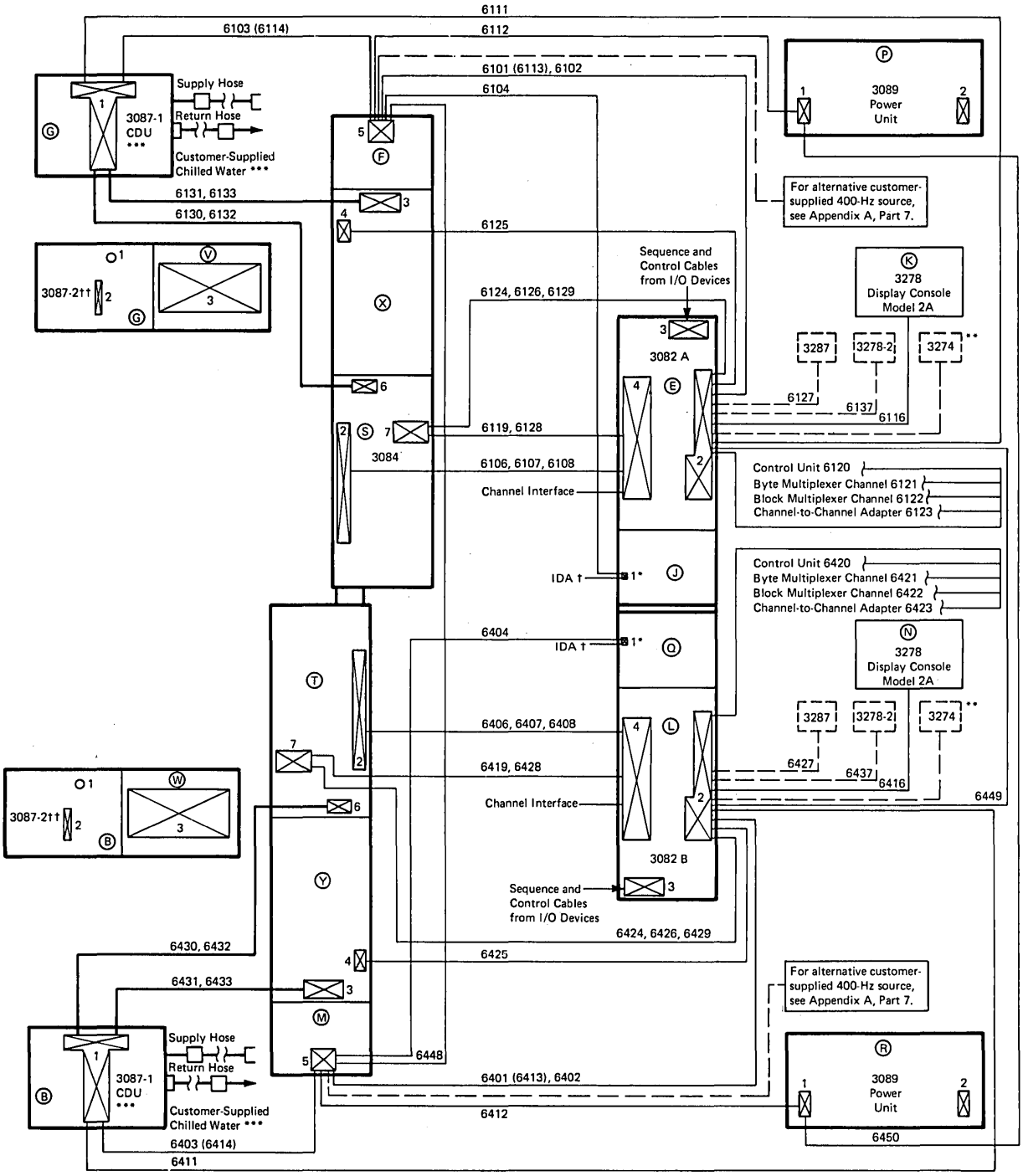
*These dimensions are required for proper weight distribution and servicing. If the dimensions are altered, the customer should obtain the services of a qualified consultant or structural engineer to determine floor loading.

If the review of the floor loading does not require the service clearances shown in the preceding chart, the following service clearances are required:

a	*b*	*c*	*d*
915 (36)	1 070 (42)	1 070 (42)	915 (36)

** Based on IBM's method of calculating floor loading, the 3084 Processor Unit Models Q48, Q64, Q96, QX9, QC8, and QXC exceed 370 kg/m^2 (75 lb/ft^2) distributed floor loading.

3084 PROCESSOR COMPLEX CABLING SCHEMATIC—CABLES AND COOLANT HOSES



Legend:

——— Coolant hoses — — — Optional

——— Cables

* For processor complexes installed in the U.S. and Canada, the integrated data adapter (IDA) cable (provided with the processor controller) enters the cable entry in the J-frame. Data access arrangement (DAA) coupler must be within 15 meters (49 feet) of the cable entry in the J-frame. If the IBM automatic operator coupler (CBS) is used, a cable is required to connect the coupler to the modem interface of the 3082. The cable is ordered by means of RPQ 8P0902.

** If an optional locally attached 3274 Control Unit is to be installed (for channel attachment of the integrated service support console), a customer-supplied coaxial cable is required.

*** Locate customer-supplied chilled water supply and return manifold connections (under floor) and place within 2 meters (5 feet) of the CDU center. See "Typical Connections for Customer-Supplied Chilled Water for 3087 Model 1" in Appendix A, Part 1.

† A customer-provided telephone should also be supplied.

†† Uses the same cables and hoses as the 3087 Model 1. Customer-supplied chilled water is not required. See 3087 Model 2 specification pages.

3084 PROCESSOR COMPLEX CABLING SCHEMATIC—CABLES AND COOLANT HOSES FOR A-SIDE

Cables

The following fixed-length cables are feature dependent and must be ordered:

Group No.	No. of Cables in Group	From	Frame No.	Cable Entry/ Exit No.	To	Frame No.	Cable Entry/ Exit No.	Fixed X-length m	(ft)	Notes
6127	1	3287	–	–	3082	E	2	15.0	49	8
6137	1	3278-2	–	–	3082	E	2	15.0	49	8

The following variable-length cables are feature dependent and must be ordered:

Group No.	No. of Cables in Group	From	Frame No.	Cable Entry/ Exit No.	To	Frame No.	Cable Entry/ Exit No.	Max X-length m	(ft)	Notes
6120	2	3082	E	2	Control Unit	–	–	–	–	9
6121	2	3082	E	2	Byte Multiplexer Channel	–	–	–	–	9
6122	2	3082	E	2	Block Multiplexer Channel	–	–	–	–	9
6123	2	3082	E	2	Channel-to-Channel Adapter	–	–	–	–	9

The following fixed-length cables are shipped automatically:

Group No.	No. of Cables in Group	From	Frame No.	Cable Entry/ Exit No.	To	Frame No.	Cable Entry/ Exit No.	Fixed X-length m	(ft)	Notes
6101 (6113)	5	3082	E	2	3084	F	5	6.7	22	1,4
6102	2	3082	E	2	3084	F	5	6.1	20	2
6103 (6114)	4	3087-1,-2	G	1	3084	F	5	15.2	50	1,2,4,10
6104	1	3082	J	1	3084	F	5	6.7	22	2
6106	12	3082	E	4	3084	S	2	4.6	15	3
6107	12	3082	E	4	3084	S	2	4.6	15	3
6108	12	3082	E	4	3084	S	2	4.6	15	3,7
6111	1	3087-1,-2	G	1	3082	E	2	15.2	50	2,10
6112	3	3089	P	1	3084	F	5	15.2	35	1,2
6116	2	3082	E	2	3278-2A	K	–	15.0	49	2,8
6119	3	3082	E	4	3084	S	7	5.2	17	2
6124	3	3082	E	2	3084	S	7	5.2	17	2
6125	2	3082	E	2	3084	X	4	5.2	17	2
6126	3	3082	E	2	3084	S	7	5.0	16	2
6128	1	3082	E	4	3084	S	7	5.0	16	2
6129	3	3082	E	2	3084	S	7	4.6	15	2

Coolant Hoses

The following fixed-length hoses are shipped automatically:

Group No.	No. of Hoses	From	Frame No.	Hose Entry/ Exit No.	To	Frame No.	Hose Entry/ Exit No.	Fixed X-length m	(ft)	Notes
6130	2	3087-1,-2	G	1	3084	S	6	9.8	32	5,10
6131	2	3087-1,-2	G	1	3084	X	3	9.8	32	5,10
6132	2	3084	S	6	3087-1,-2	G	1	10.7	35	6,10
6133	2	3084	X	3	3087-1,-2	G	1	10.7	35	6,10

3084 PROCESSOR COMPLEX CABLING SCHEMATIC—CABLES AND COOLANT HOSES FOR B-SIDE

Cables

The following fixed-length cables are feature dependent and must be ordered:

Group No.	No. of Cables in Group	From	Frame No.	Cable Entry/ Exit No.	To	Frame No.	Cable Entry/ Exit No.	Fixed X-length m	(ft)	Notes
6427	1	3287	–	–	3082	L	2	15.0	49	8
6437	1	3278-2	–	–	3082	L	2	15.0	49	8

The following variable-length cables are feature dependent and must be ordered:

Group No.	No. of Cables in Group	From	Frame No.	Cable Entry/ Exit No.	To	Frame No.	Cable Entry/ Exit No.	Max X-length m	(ft)	Notes
6420	2	3082	L	2	Control Unit	–	–	–	–	9
6421	2	3082	L	2	Byte Multiplexer Channel	–	–	–	–	9
6422	2	3082	L	2	Block Multiplexer Channel	–	–	–	–	9
6423	2	3082	L	2	Channel-to-Channel Adapter	–	–	–	–	9
6450	1	3089	R	1	3089	P	1	30.5	100	11

The following fixed-length cables are shipped automatically:

Group No.	No. of Cables in Group	From	Frame No.	Cable Entry/ Exit No.	To	Frame No.	Cable Entry/ Exit No.	Fixed X-length m	(ft)	Notes
6401 (6413)	5	3082	M	5	3084	L	2	6.7	22	1,4
6402	2	3082	M	5	3084	L	2	6.1	20	2
6403 (6414)	4	3087-1,-2	B	1	3084	M	5	15.2	50	1,2,4,10
6404	1	3082	M	5	3084	Q	1	6.7	22	2
6406	12	3082	L	4	3084	T	2	4.6	15	3
6407	12	3082	L	4	3084	T	2	4.6	15	3
6408	12	3082	L	4	3084	T	2	4.6	15	3,7
6411	1	3087-1,-2	B	1	3082	L	2	15.2	50	2,10
6412	3	3089	R	1	3084	M	5	15.2	35	1,2
6416	2	3082	L	2	3278-2A	N	–	15.0	49	2,8
6419	3	3082	L	4	3084	T	7	5.2	17	2
6424	3	3082	L	2	3084	T	7	5.2	17	2
6425	2	3082	L	2	3084	Y	4	5.2	17	2
6426	3	3082	L	2	3084	T	7	5.0	16	2
6428	1	3082	L	4	3084	T	7	5.0	16	2
6429	3	3082	L	2	3084	T	7	4.6	15	2
6448	1	3084	M	5	3084	F	5	11.9	39	1,2
6449	2	3082	L	2	3082	E	2	6.7	22	2

Coolant Hoses

The following fixed-length hoses are shipped automatically:

Group No.	No. of Hoses	From	Frame No.	Hose Entry/ Exit No.	To	Frame No.	Hose Entry/ Exit No.	Fixed X-length m	(ft)	Notes
6430	2	3087-1,-2	B	1	3084	T	6	9.8	32	5,10
6431	2	3087-1,-2	B	1	3084	Y	3	9.8	32	5,10
6432	2	3084	T	6	3087-1,-2	B	1	10.7	35	6,10
6433	2	3084	Y	3	3087-1,-2	B	1	10.7	35	6,10

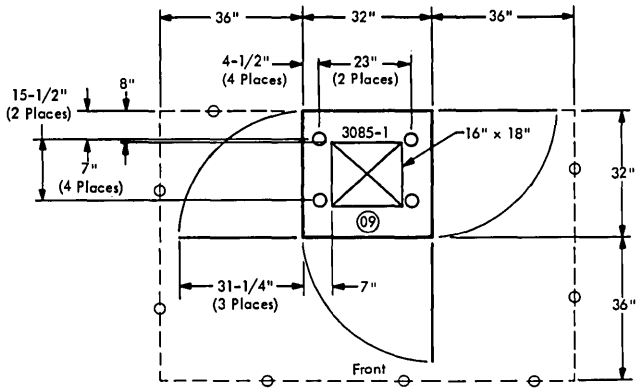
3084 PROCESSOR COMPLEX CABLING SCHEMATIC—CABLES AND COOLANT HOSES

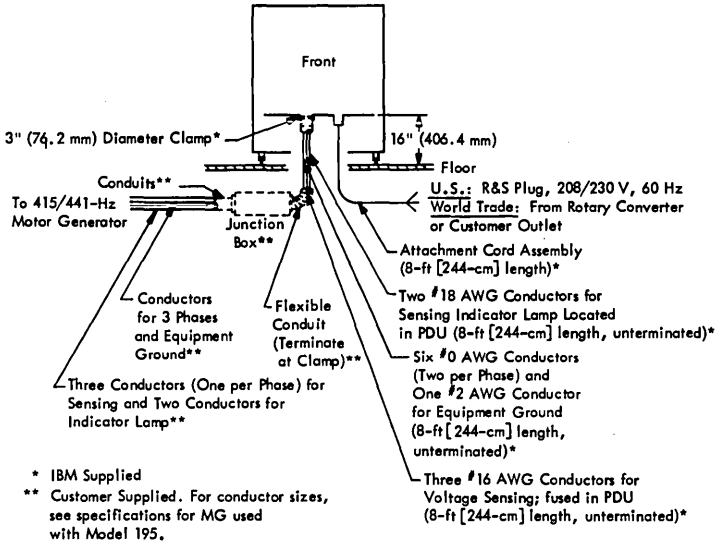
Notes:

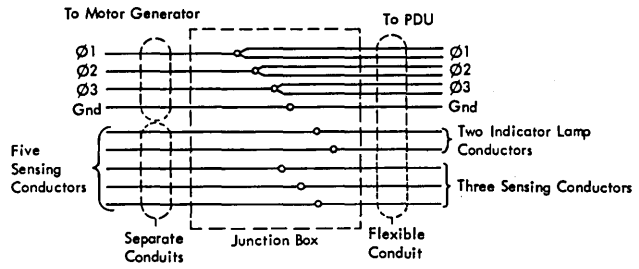
1. Power cabling.
2. Control cabling.
3. Channel interconnecting cables.
4. For 50-Hz machines, use group numbers in parentheses.
5. Coolant supply hoses.
6. Coolant return hoses.
7. Required for additional channels (16-23). SF #1550 required on 3084.
8. Required for the 3278 Display Console and 3287 Printer with a fixed length of 15 meters (49 feet). For lengths between 15 meters (49 feet) and 1 500 meters (4,921 feet), see information RPQ 8P0891. When ordering, do not order by group numbers.
9. From channel-to-channel adapter (SF #1850 or SF #1851); order two groups per feature (see Section 2). Total cable length of 61 meters (200 feet), unless modified by the general control-to-channel cabling schematic, is available to attach up to eight control units.
10. For lengths other than the indicated fixed lengths, order by RPQ. Lengths up to 30.5 meters (100 feet) are available for special applications.
11. Required for two 3089 units powering the 3084 Processor Complex.

3085 POWER DISTRIBUTION UNIT (PDU) MODEL 1 FOR SYSTEM/370 MODEL 195

PLAN VIEW (English Scale: 1/4 in. = 1 ft)







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):

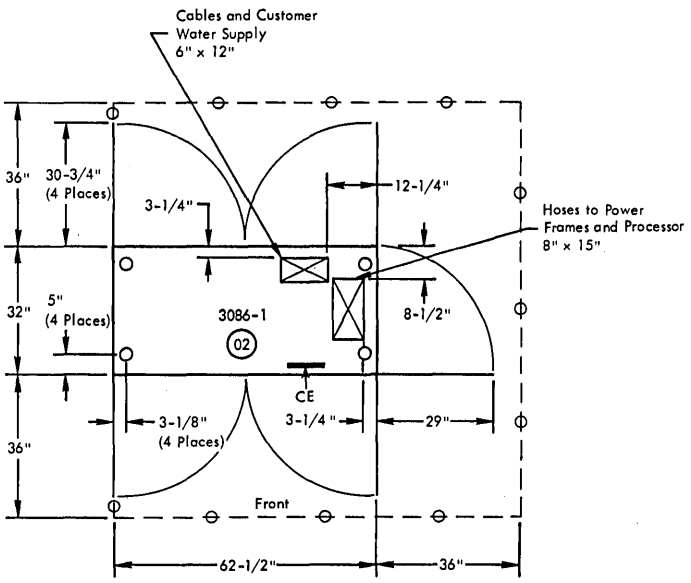
1. Receives 208 V, 415/441-Hz power from remote motor generator.
2. *U. S.*
   Requires 208 V or 230 V, 60-Hz ±0.5-Hz power from customer power panel:
   For Model J1 or K1, use 60 A service.
   For Model KJ1 or L1, use 100 A service.
   World Trade
   Receives 208 V, 60-Hz power from remote rotary converter or customer outlet.

	Model	
Requirements	*J1 and K1*	*KJ1 and L1*
Plug	R&S, SC7328	R&S, JPS1034H
Connector	R&S, SC7428	R&S, JCS1034H
Receptacle	R&S, SC7324	R&S, JRSR1034H

Model	*50/60 Hz*		*415/441 Hz*	
	kVA	*A/Phase*	*kVA*	*A/Phase*
J1	10.4	30	47.25	131
K1	16.2	45	54.25	151
KJ1	21.6	60	64.25	179
L1	27.0	75	74.25	206

3086 COOLANT DISTRIBUTION UNIT (CDU) MODEL 1 FOR SYSTEM/370 MODEL 195

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



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°F-90°F (18°C-32°C)
Rel Humidity	20%-80%
Max Wet Bulb	72°F (22°C)*

Environment, Nonoperating:

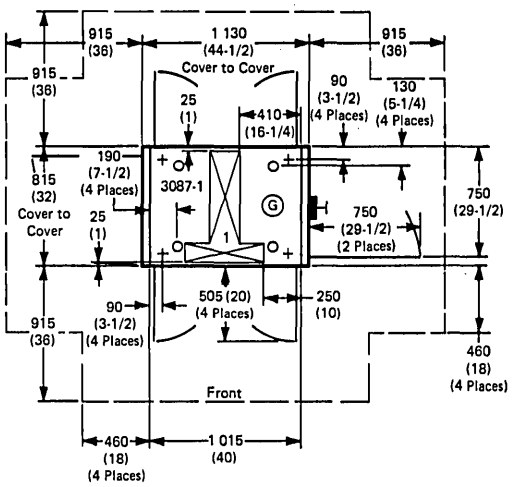
Temperature	50°F-110°F (10°C-43°C)
Rel Humidity	8%-80%
Max Wet Bulb	80°F (27°C)*

Notes:

* See "Liquid Coolant System" in Appendix A.

3087 COOLANT DISTRIBUTION UNIT MODEL 1

PLAN VIEW (Metric Scale: 10 mm = 0.5 m)

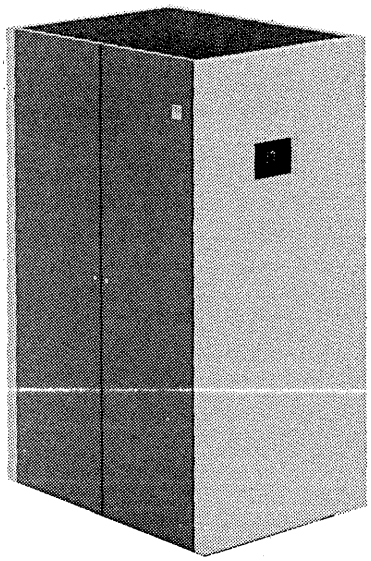


See Notes 1 through 3.

Cable Entry/Exit Number	Dimension (Millimeters)	Dimension (Inches)
1	130 x 508, 205 x 585	5 x 20, 8 x 21

Notes:

1. Caster, cable hole, and leveling pad locating dimensions are measured from the edge of frame, not cover.
2. For cabling information, see the "3081 Processor Complex Cabling Schematic," the "3083 Processor Complex Cabling Schematic," and the "3084 Processor Complex Cabling Schematic."
3. For shipping and storage, this unit must be specially packed. Consult "Chapter 4. Relocation/Removal Procedures" in the appropriate *Processor Complex Installation (INST) (REMOV)* manual or your IBM representative.



SPECIFICATIONS

Dimensions:

	Front	Side	Height
mm	1 130	815	1 790
(inches)	(44-1/2)	(32)	(70-1/2)

Service Clearances:

	Front	Rear	Right	Left
mm	915	915	915	915
(inches)	(36)	(36)	(36)	(36)

Weight: 470 kg (1,030 lb)

Typical Heat Output:

Air	400 W (1,400 BTU/hr)
Water	1 600 W (5,500 BTU/hr)

Airflow: Normal convection

Power Requirements: Receives power from the F-frame of the 3081 and 3083 and from the M- and F-frames of the 3084.

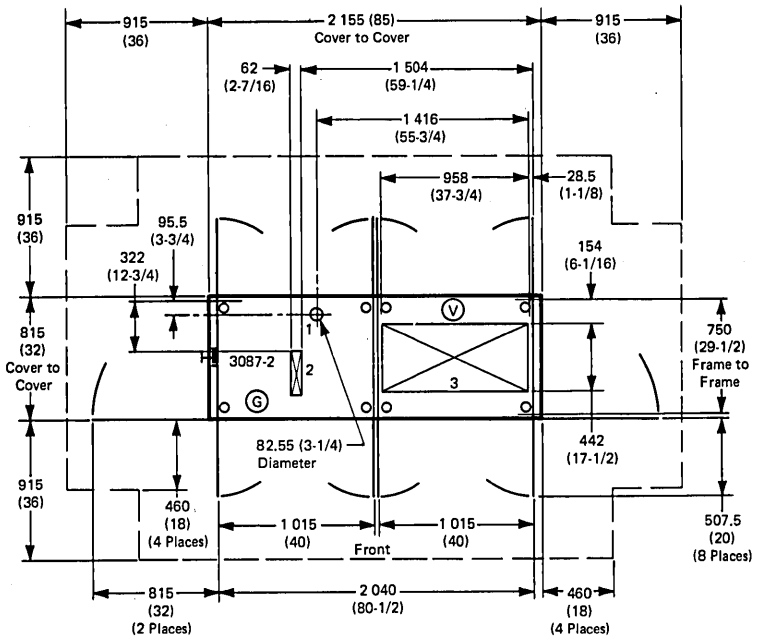
	400 Hz	*50/60 Hz*
kVA	0.1	2.2

Environment, Operating:

Temperature	16°C-29°C (60°F-85°F)
Rel Humidity	20%-80%
Max Wet Bulb	23°C (73°F)

3087 COOLANT DISTRIBUTION UNIT MODEL 2

PLAN VIEW (Metric Scale: 10 mm = 0.5 m)

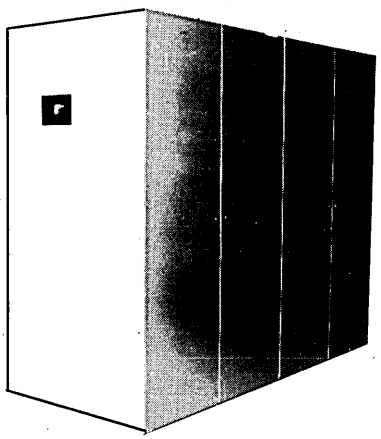


See Notes 1, 2, and 3.

Cable Entry/Exit Number	*Dimension (Millimeters)*	*Dimension (Inches)*
1 (G)	82.55 ± 6 (Diameter)	(3-1/4 ± 1/4) (Diameter)
2 (G)	282.5 ± 6 x 62 ± 6	(11-1/8 ± 1/4 x 2-7/16 ± 1/4)
3 (V)	958 ± 10 x 442 ± 10	(37-11/16 ± 3/8 x 17-3/8 ± 3/8)

Notes:

1. Caster, cable hole, and leveling pad locating dimensions are measured from the edge of frame, not cover.
2. Cable entry/exit holes are the exact size that is to be cut in the floor. Do not use moulding around edge of any holes. Grommets are supplied by IBM. To ensure exact size, a full-size template is available from IBM.
3. For cabling information, see "3081 Processor Complex Cabling Schematic," "3083 Processor Complex Cabling Schematic," and "3084 Processor Complex Cabling Schematic."



SPECIFICATIONS

Dimensions:

	Front	Side	Height
mm	*	*	1 790
(inches)	(*)	(*)	(70-1/2)

Service Clearances:

	Front	Side	Right	Left
mm	*	*	*	*
(inches)	(*)	(*)	(*)	(*)

Weight:	*G-frame*	*V-frame*
kg	470	510
(lb)	(1,030)	(1,120)

Heat Output: See "Details (By Model)."

Airflow: 110 m^3/min (3,800 cfm)

Power Requirements: Receives power from the 3081, 3083, or 3084.

	400 Hz	*60 Hz*	*50 Hz*
kVA	0.1	5.2	5.4

Environment, Operating: For mandatory underfloor air requirements at V-frame, see page 3087.3.

Temperature Range:

	3081/3084	*3083*
Minimum (all elevations)	Low limit is not temperature critical	
Maximum Elevation *m (ft)*		
0-900 (0-3,000)	16.1°C (61°F)	17.75°C (64°F)
901-2 100 (3,001-7,000)	15.0°C (59°F)	16.50°C (62°F)

Relative Humidity: 100% maximum if no condensation occurs.

Environment, Room:

Temperature	16°C-29°C (60°F-85°F)
Rel Humidity	20%-80%
Max Wet Bulb	23°C (73°F)

Notes:
*See plan view.

3087 COOLANT DISTRIBUTION UNIT MODEL 2

Details (By Model)

Processor Unit Model	*Typical Heat Output W (BTU/hr) **** *To Air*	*Processor Unit Model*	*Typical Heat Output W (BTU/hr) **** *To Air*
D16	15 100 (51,500)	CX2/EX2/BX2/ JX2**	12 200 (41,630)
D24	17 600 (60,100)	E32/B32/ J32**	16 900 (57,700)
D32	19 100 (65,200)	CX3/EX3/BX3/ JX3**	12 200 (41,630)
K16/G16	17 000 (58,000)	Q32 (Per CDU)	17 410 (59,400)
KX1/GX1	14 780 (50,400)	QX3 (Per CDU)	17 410 (59,400)
K24/G24	18 700 (63,800)	Q48 (Per CDU)	19 110 (65,200)
KX2/GX2	14 780 (50,400)	QX4 (Per CDU)	17 410 (59,410)
K32/G32 K48/G48	20 300 (69,300)	K64/G64	20 710 (70,700)
KX3/GX3	14 780 (50,400)	KX6/GX6	18 700 (63,810)
KX4/GX4	16 840 (57,450)	Q64 (Per CDU) Q96 (Per CDU)	20 710 (70,670)
E8/B8/J8**	11 300 (38,600)	QX6 (Per CDU)	17 410 (59,400)
CX0/EX0/ BX0/JX0**	9 800 (33,440)	QX9 (Per CDU)	19 110 (65,200)
E16/B16/ J16**	13 600 (46,400)	QC8 (Per CDU)	20 710 (70,670)
CX1/EX1/ BX1/JX1**	9 800 (33,440	QXC (Per (CDU)	20 710 (70,670)
E24/B24/ J24**	15 200 (51,900)		

Notes:

** All of the given heat loads are for basic models without optional channel features. For each additional set of eight channels added to the system, add 410 W (1,400 BTU/hr) to the total heat output to air for the 3087 Model 2.

*** Total heat output to air at the 3087 Model 2 includes 3081, 3083, and 3084 heat output to water.

Customer-Supplied Air Requirements for 3087 Model 2

Generally, typical underfloor air temperatures required to satisfy the room ambient temperature conditions will also satisfy the 3087-2 requirements.

The total requirements of the computer room should be reevaluated because, unlike other IBM machines, the 3087-2 pulls 100% of its rated 110 m^3/min (3,800 cfm) from the underfloor air. Therefore, the air conditioning engineer must recognize that without proper airflow planning other equipment could be deprived of cooling air.

In supplying air to the 3087-2, the air handler and air conditioner capabilities should be sized to accommodate both the required airflow and the heat load.

Before the 3087-2 is located, ensure that no underfloor restrictions exist that would restrict airflow.

It is recommended that an instrument that senses the inlet air temperature be located near the 3087-2.

It is also suggested that the 3087-2 be located as close as practical to the air supply. This will reduce the effect of changes to the airflow because of system reconfigurations or modifications to the facility (air conditioning, piping, electrical conduit, and system cables). As a example, if the underfloor temperature is 12°C (54°F), with a typical temperature rise of 6°C (10°F), a relatively low temperature of 18°C (64°F) will be emitted from the 3087-2. A short cycling of this output air to adjacent air conditioning may disrupt the original air conditioning design.

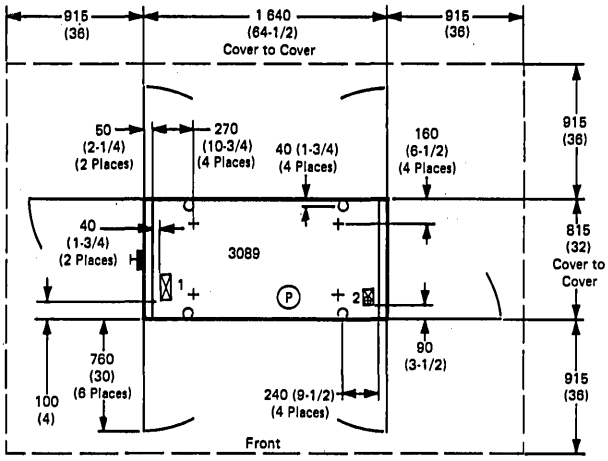
Sometimes, underfloor baffling may be required to control the airflow from an air handler to the inlet at the base of the V-frame. Consideration should be given to a backup supply if the primary supply becomes inoperative.

The V-frame of the 3087-2 contains a flange that extends down to the raised floor to ensure that inlet air is delivered only from the underfloor supply. To accommodate this flange, the raised floor cutout, or opening size, is critical. See 3087 Model 2 specification pages for details.

3089 POWER UNIT

PLAN VIEW (Metric Scale: 10 mm = 0.5 m)

Serial numbers below 41001 (or 77-00501 [E/ME/A] or 97-70001 [A/FE]):

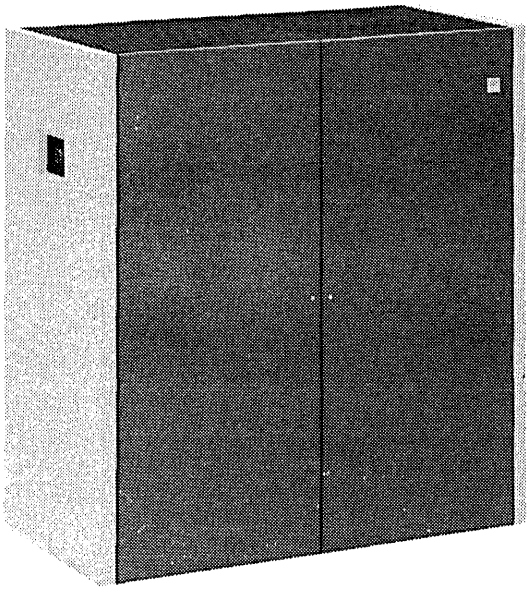


Weight:	*50 Hz*	*60 Hz*
kg	1 173	1 173 (Overweight*)
(lb)	(2,590)	(2,590)

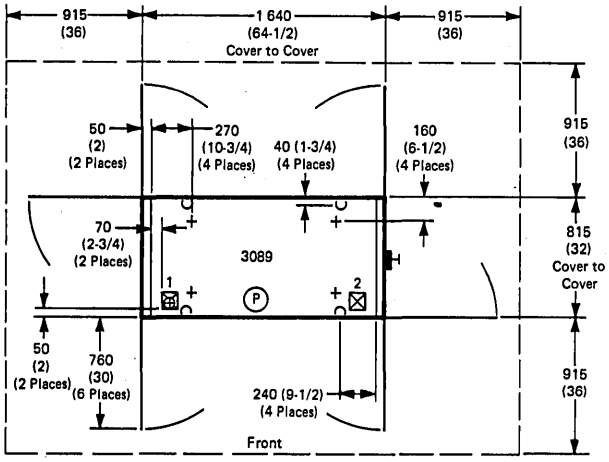
See Notes 1, 2, and 3.

Cable Entry/Exit Number	Dimensions (Millimeters)	Dimensions (Inches)
1	70 x 180	2-3/4 x 7
2	70 x 100	2-3/4 x 4

*This frame weighs more than 1 135 kg (2,500 lb). For transport in elevators, consider removing covers or altering elevator rating. Consult manufacturer of elevator.



Serial numbers above 41000 (or 77-00500 [E/ME/A] or 97-70000 [A/FE]):



Weight:	*50 Hz*	*60 Hz*
kg	1 074	1 074
(lb)	(2,370)	(2,370)

See Notes 1, 2, and 3.

Cable Entry/Exit Number	Dimensions (Millimeters)	Dimensions (Inches)
1	105 x 105	4-1/4 x 4-1/4
2	115 x 115	4-1/2 x 4-1/2

Notes:

1. Caster, cable hole, and leveling pad locating dimensions are measured from outside edge of frame.
2. For output cabling information, see the "3081 Processor Complex Cabling Schematic," the "3083 Processor Complex Cabling Schematic," and the "3084 Processor Complex Cabling Schematic."
3. For planning and installing customer-supplied 400-Hz power, refer to Appendix A, Part 7.

SPECIFICATIONS

Dimensions:

	Front	Side	Height
mm	1 640	815	1 790
(inches)	(64-1/2)	(32)	(70-1/2)

Service Clearances:

	Front	Rear	Right	Left
mm	915	915	915	915
(inches)	(36)	(36)	(36)	(36)

Typical Heat Output:

Air 6 400 W* (21,800 BTU/hr)*

Airflow: 11.5 m^3/min (400 cfm)

Power Requirements:

	50/60 Hz
Phases	3
Plug	R&S, JPS1034H
Connector	R&S, JCS1034H
Receptacle	R&S, JRSR/A1034H**
Power Cord Styles	H1, H2, and H3***

50/60-Hz Input

3-phase, 200/220/380/400/415 V 50 Hz (± 0.5 Hz), 200/208/220/240 V 60 Hz (± 0.5 Hz), 31.7 kVA.

Maximum continuous input current (rms):

Input Voltage	*200*	*208*	*220*	*240*	*380*	*400*	*415*
Current (A)	84	80	76	70	44	42	40

Use a circuit breaker with motor start characteristics. Size the service and the circuit breaker for input current. Set the trip point from the following chart for maximum inrush current.

Power-up inrush:

Input Voltage	*Inrush Current (rms)*
200 V to 240 V	240 A for 15 seconds or less
380 V to 415 V	145 A for 15 seconds or less

Environment, Operating:

Temperature	16°C-29°C (60°F-85°F)
Rel Humidity	20%-80%
Max Wet Bulb	23°C (73°F)

Notes:

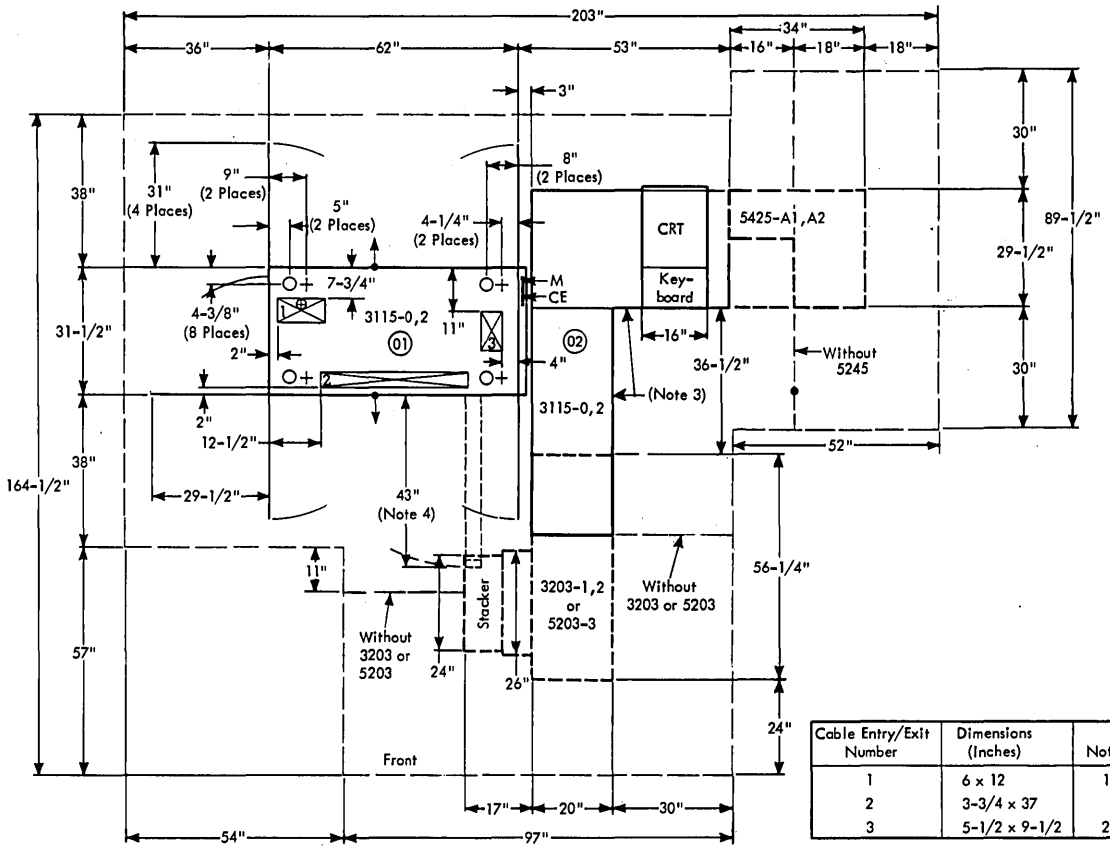
*The power is used and dissipated as heat within the 3089, but does not include power used by 3081/3083/3084, 3082, and 3087.

**The 3089 three-phase receptacles must be wired for correct phase rotation. Facing the receptacle in a clockwise direction from the ground pin, the sequence is phase 1, phase 2, and phase 3.

***For World Trade reference, see Appendix B.

SYSTEM/370 MODEL 115, 3115-0 AND 3115-2 PROCESSING UNITS

PLAN VIEW (WITH 3203, 5203, AND 5425) (English Scale: 1/4 in. = 1 ft)



Cable Entry/Exit Number	Dimensions (Inches)	Notes
1	6 x 12	1
2	3-3/4 x 37	
3	5-1/2 x 9-1/2	2

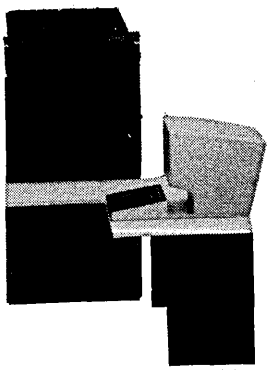
Notes:

1. The main power entry and power exit for natively attached I/O devices and EPO cables.
2. The dc power exit for natively attached I/O devices.
3. The operator console table can be disassembled for shipment.
4. The processing unit gate does not interfere with the printer stacker. The total gate length includes the handle at the top of the gate.
5. Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame, not cover.

SYSTEM/370 MODEL 115, 3115-0 AND 3115-2 PROCESSING UNITS

Details (By Frame)

System Configuration	*Frame*	*Weight lb (kg)*	*Airflow cfm (m^3/min)*	*Heat Output BTU/hr (kcal/hr)*	*kVA*
Basic	01	1,353 (620)	700 (20)	15,100 (3 850)	5.5*** –
	02	460** (210**)	–	–	–
Maximum*	01	1,765 (800)	1,830 (52)	17,800 (4 500)	6.5*** –
	02	460** (210**)	–	–	–



SPECIFICATIONS

Dimensions:

	F	S	H
Inches	†	†	60††
(cm)	(†)	(†)	(152††)

Service Clearances:

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

Power Requirements:**

Phases	3
Plug	R&S, SC7328
Connector	R&S, SC7428
Receptacle	R&S, SC7324
Power Cord Style	E7

Environment, Operating:

Temperature	50°F-90°F (10°C-32°C)
Rel Humidity	8%-80%
Max Wet Bulb	73°F (23°C)

Notes:

* The maximum configuration applies to 3115-2 only.

** Weight includes reading boards and CRT keyboard assembly.

*** The mainline power supply is routed via the 3115-0 or 3115-2 mainline power supply cord and the 3115-0 or 3115-2 to the following natively attached I/O devices:

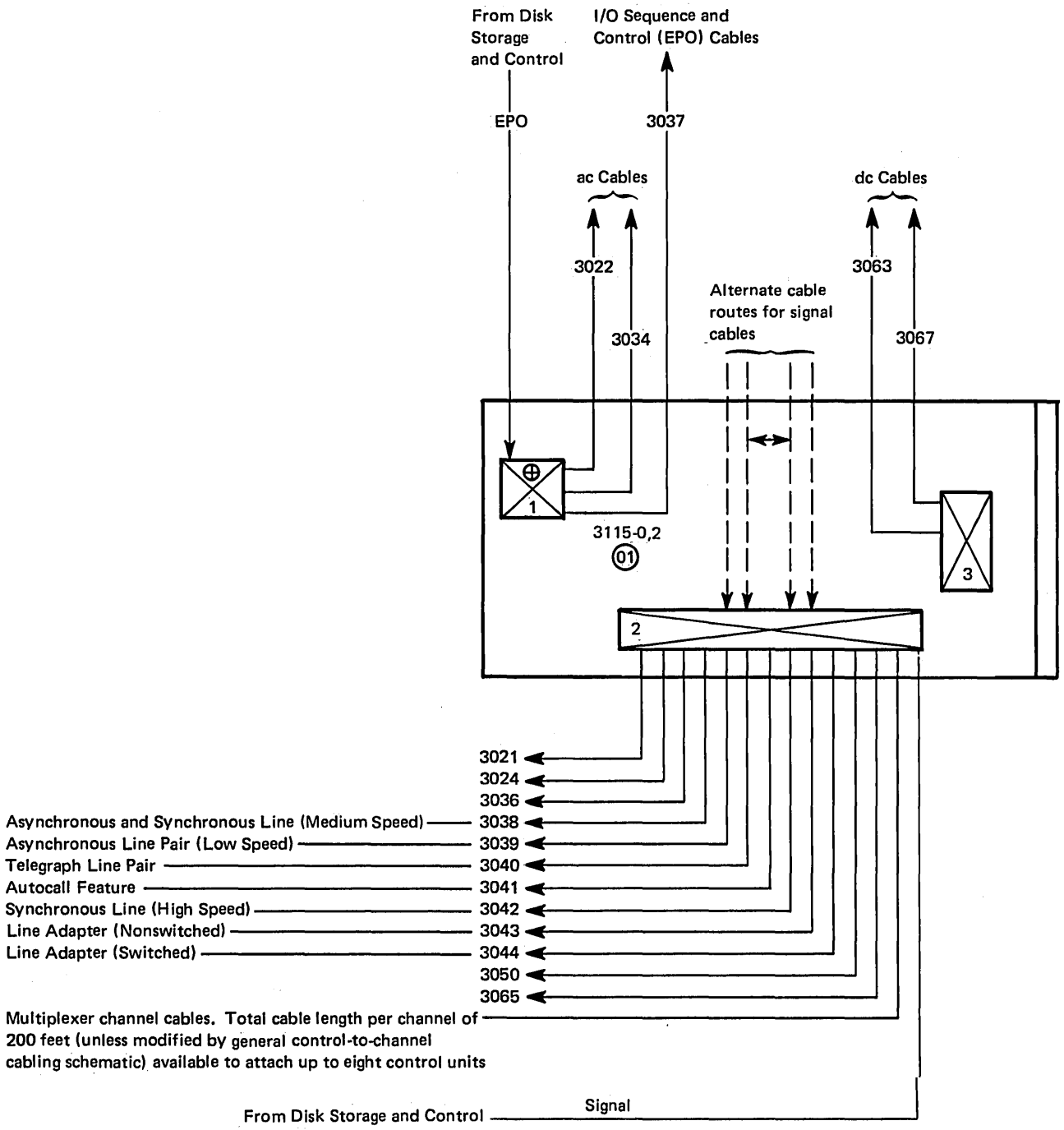
- Printer (3203-1 or 2 or 5203-3)
- Multi-function Card Machine (2560-A1 or A2)
- Multi-function Card Unit (5425-A1 or A2)
- Console Printer (5213-1).

The Details (By Frame) table does not include power for these devices. See the applicable machine specifications pages for this information.

† See plan view.

†† Height for operator console (frame 02) is 48" (122 cm) with CRT; 29" (74 cm) without CRT. Ambient lighting level should not exceed 75 footcandles (810 lumens/m^2).

SYSTEM/370 MODEL 115 CABLING SCHEMATIC



SYSTEM/370 MODEL 115 CABLING SCHEMATIC

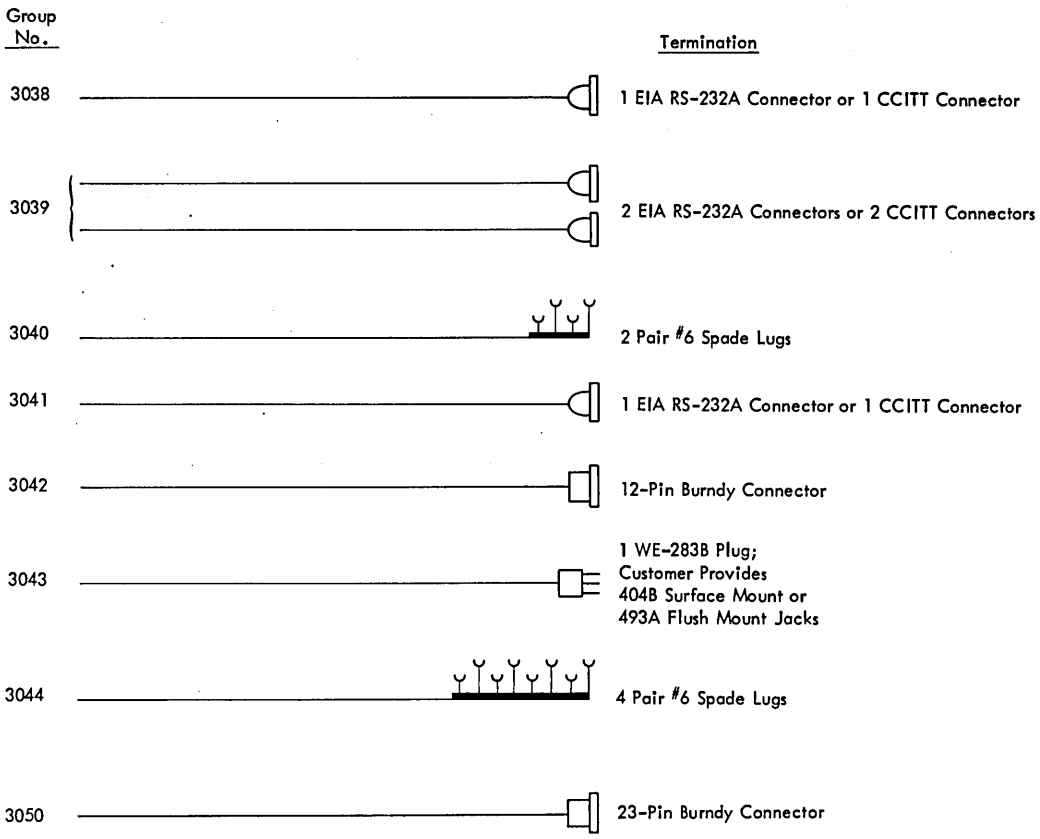
Group No.	*No. of Cables*	*From*	*To*	*Cable Exit No.*	*Max Length (ft)*	*Notes*
3021	3	3115-0, 2	2560-A1 or A2	2	18	1
3022	1	3115-0, 2	2560-A1 or A2	1	23	1
3024	1	3115-0, 2	2560-A1	2	18	2
3034	1	3115-0, 2	5213-1	1	25	3
3036	2	3115-0, 2	3411-1, 2, 3, or 3803-3	2	28	14
3037	1	3115-0, 2	3411-1, 2, 3, or 3803-3	1	35	14,15
3038	1	3115-0, 2	Data Set	2	38	4,12,13,16
3039	2	3115-0, 2	Data Set	2	38	5,12,13,16
3040	1	3115-0, 2	Telegraph Terminal Board	2	38	6,13,16
3041	1	3115-0, 2	Data Set (Autocall)	2	38	7,13,16
3042	1	3115-0, 2	Data Set	2	38	8,13,16
3043	1	3115-0, 2	Common-Carrier Facility	2	38	9,13,16
3044	1	3115-0, 2	Common-Carrier Facility	2	38	10,13,16
3050	1	3115-0, 2	External Signal	2	200	11,16
3063	1	3115-0, 2	2560-A1, or A2	3	23	1
3065	1	3115-0, 2	5213-1	2	19	3
3067	1	3115-0, 2	5213-1	3	20	3

Notes:

1. For SF #4670; order one of each cable group per feature.
2. For SF #4674.
3. For SF #4692; order one of each cable group per feature.
4. For SF #1231, #7141 through #7144, and #7151 through #7154; order one cable group per feature.
5. For SF #1241; order one cable group per feature.
6. For SF #7881; order one cable group per feature.
7. For SF #1291, #1292, #1295, and #1296; order one cable group per feature.
8. For SF #7121.
9. For SF #4743 or #4781; order one cable group per feature.
10. For SF #4782 and #4791; order one cable group per feature.
11. For SF #3898 from non-IBM devices. Applicable IBM machines are the 1255 and 1259.
12. This cable group is *not* required when the associated SF numbers are a prerequisite for attaching line adapters (SF #4743, #4781, #4782, or #4791).
13. When ordering cable groups for ICA features, the order should indicate the line position to be used: A1-A4 for asynchronous line position and S1-S5 for synchronous line position. Assignment of line positions has definite restrictions that are related to SF numbers and to particular combinations of SF numbers.
14. For SF #4675; order one of each cable group per feature.
15. Sequence and control (EPO).
16. See "Cables for IBM and Non-IBM Devices" for cable specifications.

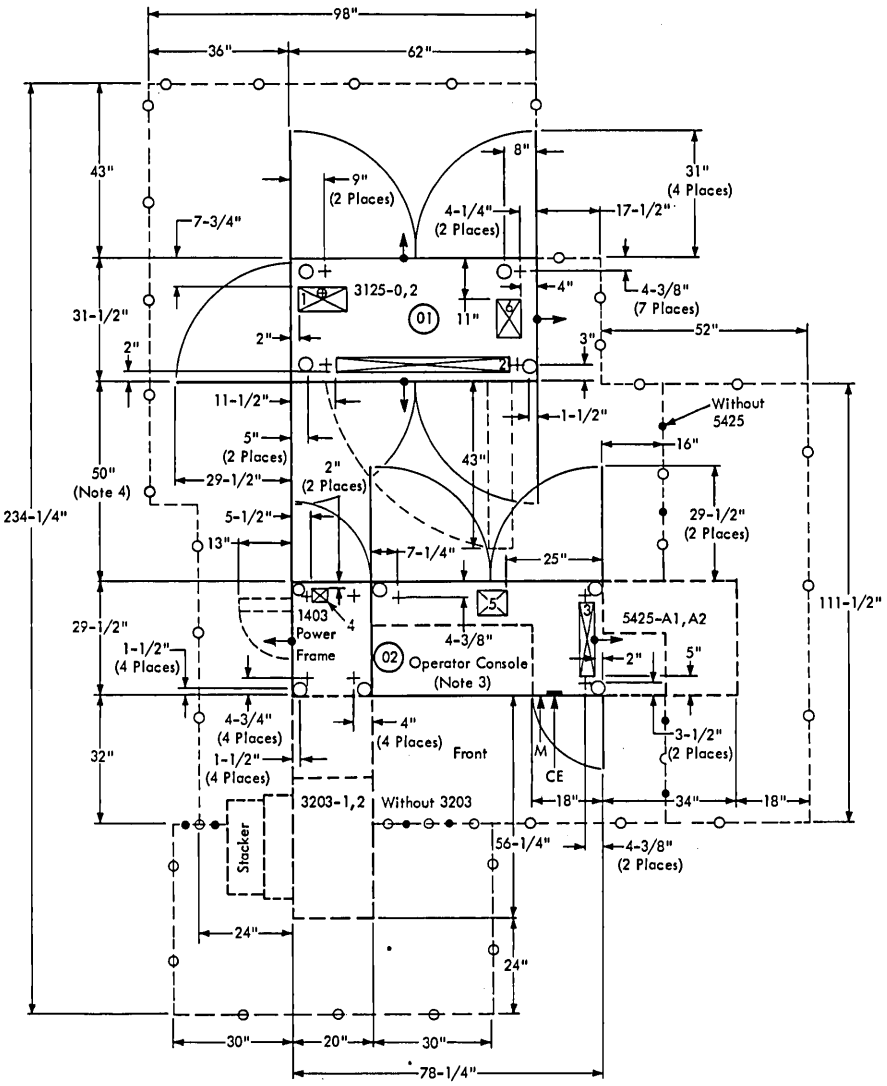
SYSTEM/370 MODEL 115 CABLING SCHEMATIC

Cables for IBM and Non-IBM Devices



SYSTEM/370 MODEL 125, 3125-0 AND 3125-2 PROCESSING UNITS

PLAN VIEW—CONFIGURATION 1 (WITH 3203 AND 5425) (English Scale: 1/4 in. = 1 ft)

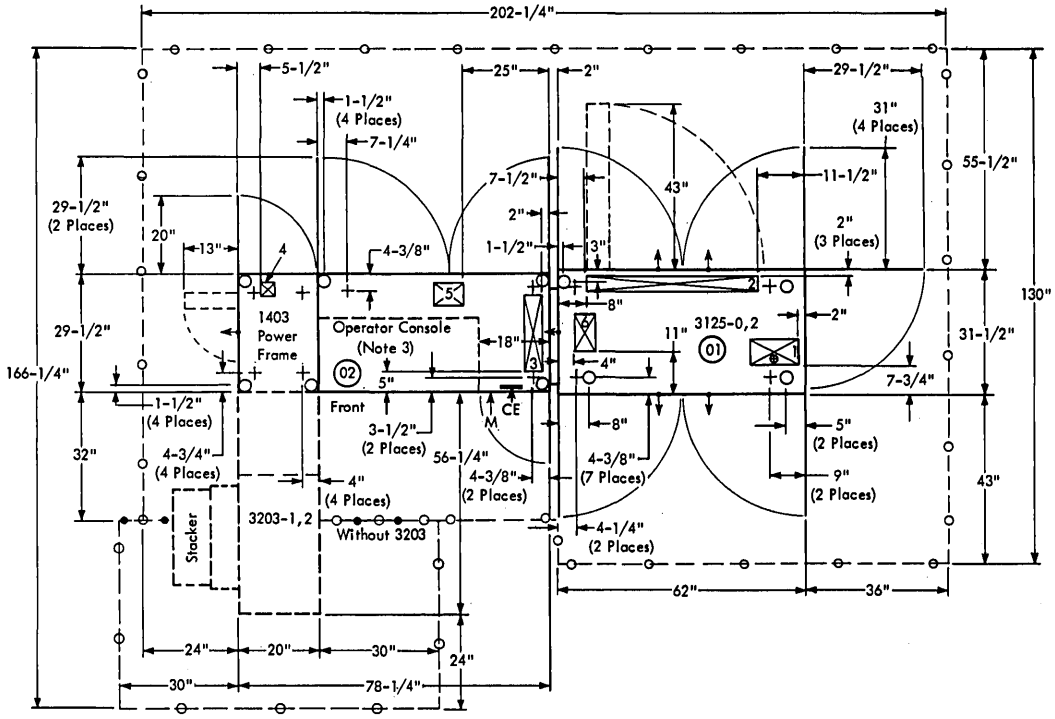


Notes:
1. Main power entry and power exit for natively attached I/O devices and EPO cables.
2. Signal cable entry and power cable entry for 1403.
3. The operator console can be separated for shipment.
4. Fixed dimension: Both frames must be parallel so that fixed-length cable (IBM supplied) is perpendicular to both cable entry holes (2 and 5). For nonraised floor installations, dimension can be extended 12" (30 cm).
5. Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame, not cover.

Cable Entry/Exit Number	Dimensions (Inches)	Notes
1	6-1/2 x 12	1
2	43 x 3-3/4	
3	19 x 4-1/2	
4	3-1/2 x 3-1/2	2
5	7-1/2 x 5-7/8	
6	9-1/2 x 5-1/2	

SYSTEM/370 MODEL 125, 3125-0 AND 3125-2 PROCESSING UNITS

PLAN VIEW—CONFIGURATION 2 (WITH 3203) (English Scale: 1/4 in. = 1 ft)



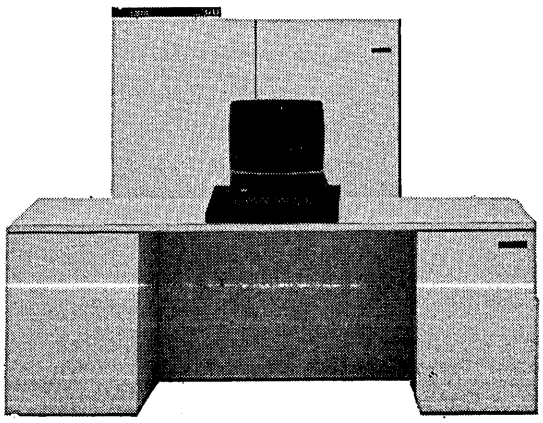
Notes:
1. Main power entry and power exit for natively attached I/O devices and EPO cables.
2. Signal cable entry and power cable entry for 1403.
3. The operator console can be separated for shipment.
4. Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame, not cover.

Cable Entry/Exit Number	Dimensions (Inches)	Notes
1	6-1/2 x 12	1
2	43 x 3-3/4	
3	19 x 4-1/2	
4	3-1/2 x 3-1/2	2
5	7-1/2 x 5-7/8	
6	9-1/2 x 5-1/2	

SYSTEM/370 MODEL 125, 3125-0 AND 3125-2 PROCESSING UNITS (CONFIGURATIONS 1 AND 2)

Details (By Frame)

System Configuration	*Frame*	*Weight lb (kg)*	*Airflow cfm (m^3/min)*	*Heat Output BTU/hr (kcal/hr)*	*kVA**
Basic	01	1,325 (600)	1,080 (31)	12,400 (3 150)	4.5
	02	320 (150)	450 (13)	2,760 (700)	1.0
Maximum	01	1,765 (800)	1,830 (52)	17,800 (4 500)	6.5
	02	355 (160)	450 (13)	6,880 (1 750)	2.5
Power Unit Feature (1403/5425)	02	320 (150)	230 (7)	4,950 (1 250)	1.8



SPECIFICATIONS

Dimensions:

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

Service Clearances:

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

Power Requirements:*

Phases	3
Plug	R&S, SC7328
Connector	R&S, SC7428
Receptacle	R&S, SC7324
Power Cord Style	E7

Environment, Operating:

Temperature	50°F-90°F (10°C-32°C)
Rel Humidity	8%-80%
Max Wet Bulb	73°F (23°C)

Notes:

* The mainline power is routed via the 3125-0 or 3125-2 mainline power cord and the 3125-0 or 3125-2 to the following natively attached I/O devices:
- Printer (1403-2, 7, or N1 or 3203-1 or 2)
- Multi-function Card Machine (2560-A1)
- Card Reader (3504-A1 or A2)
- Card Punch (3525-P1, P2, or P3)
- Console Printer (5213-1)
- Multi-function Card Unit (5425-A1 or A2).

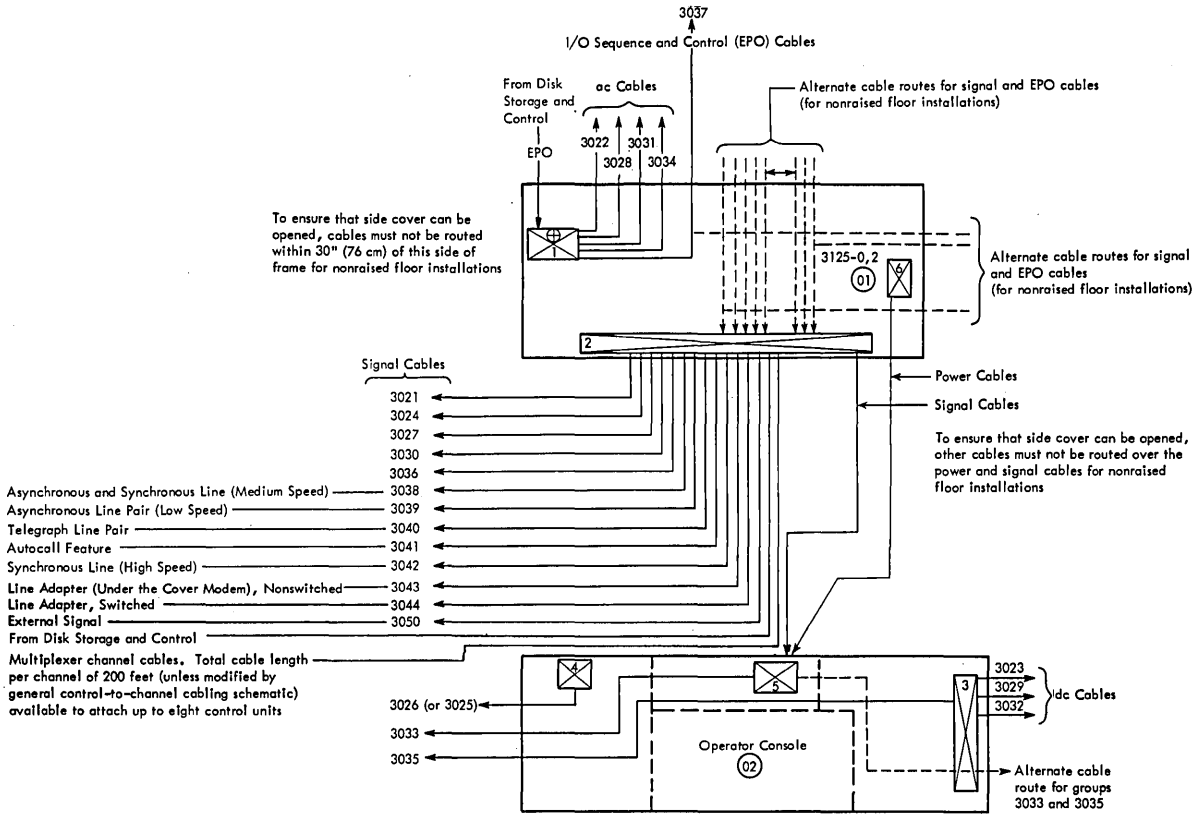
The Details (By Frame) table does not include power for these devices. See the applicable machine specifications pages for this information.

** See plan view.

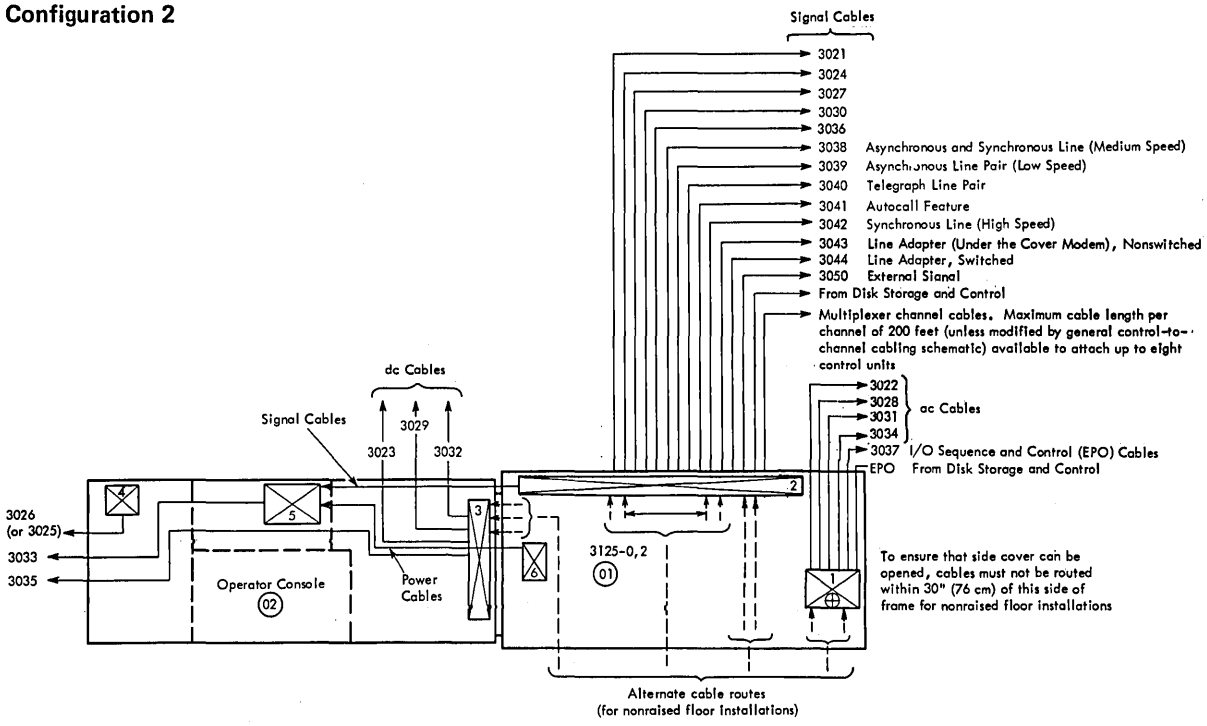
*** Height for operator console (frame 02) is 48" (122 cm) with CRT; 29" (74 cm) without CRT. Ambient lighting level should not exceed 75 footcandles (810 lumens/m^2).

SYSTEM/370 MODEL 125 CABLING SCHEMATIC

Configuration 1



Configuration 2



SYSTEM/370 MODEL 125 CABLING SCHEMATIC (CONFIGURATIONS 1 AND 2)

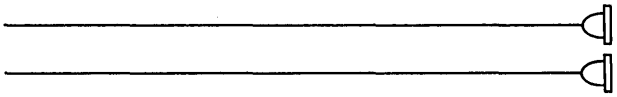
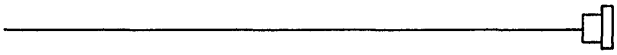
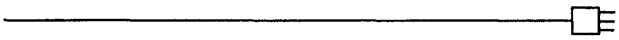
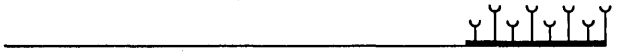
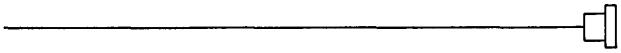
Group No.	*No. of Cables*	*From*	*To*	*Cable Exit No.*	*Max Length (ft)*	*Notes*
3021	3	3125-0, 2	2560-A1	2	18	1
3022	1	3125-0, 2	2560-A1	1	23	1
3023	1	3125-0, 2	2560-A1	3	23	1
3024	1	3125-0, 2	2560-A1	2	18	2
3026 (or 3025)	3	3125-0, 2	1403-2, 7, or N1	4	25	3
3027	2	3125-0, 2	3504-A1 or A2	2	20	4
3028	1	3125-0, 2	3504-A1 or A2	1	25	4
3029	1	3125-0, 2	3504-A1 or A2	3	20	4
3030	2	3125-0, 2	3525-P1, P2, or P3	2	20	5
3031	1	3125-0, 2	3525-P1, P2, or P3	1	25	5
3032	1	3125-0, 2	3525-P1, P2, or P3	3	20	5
3033	1	3125-0, 2	5213-1	5	10	6
3034	1	3125-0, 2	5213-1	1	20	6
3035	1	3125-0, 2	5213-1	3	25	6
3036	2	3125-0, 2	3411-1, 2, 3, or 3803-3	2	28	7
3037	1	3125-0, 2	3411-1, 2, 3, or 3803-3	1	35	7, 8
3038	1	3125-0, 2	Data Set	2	38	9, 17, 18, 19
3039	2	3125-0, 2	Data Set	2	38	10, 17, 18, 19
3040	1	3125-0, 2	Telegraph Terminal Board	2	38	11, 18, 19
3041	1	3125-0, 2	Data Set (Autocall)	2	38	12, 18, 19
3042	1	3125-0, 2	Data Set	2	38	13, 18, 19
3043	1	3125-0, 2	Common-Carrier Facility	2	38	14, 18, 19
3044	1	3125-0, 2	Common-Carrier Facility	2	38	15, 18, 19
3050	1	3125-0, 2	External Signal	2	200	16, 19

Notes:

1. For SF #4670; order one of each cable group per feature.
2. For SF #4674.
3. For SF #4662, #4667, or #4668. For 50-Hz machines, use group number in parentheses.
4. For SF #4680; order one of each cable group per feature.
5. For SF #4685; order one of each cable group per feature.
6. For SF #4692; order one of each cable group per feature.
7. For SF #4675; order one of each cable group per feature.
8. Sequence and control (EPO).
9. For SF #1231, #1232, #7131, #7132, #7141 through #7144, and #7151 through #7154; order one of each cable group per feature.
10. For SF #1241 and #1242; order one cable group per feature.
11. For SF #7881 and #7882; order one cable group per feature.
12. For SF #1291 through #1296, order one cable group per feature.
13. For SF #7121.
14. For SF #4743 or #4781; order one cable group per feature.
15. For SF #4782 or #4791; order one cable group per feature.
16. For SF #3898 from non-IBM devices. Applicable IBM machines are the 1255 and 1259.
17. This cable group is *not* required when the associated SF numbers are a prerequisite for attaching line adapters (SF #4743, #4781, #4782, or #4791).
18. When ordering cable groups for ICA features, the order should indicate the line position to be used: A1-A8 for asynchronous line position and S1-S6 for synchronous line position. Assignment of line positions has definite restrictions that are related to SF numbers and to particular combinations of SF numbers.
19. See "Cables for IBM and Non-IBM Devices" for cable specifications.

SYSTEM/370 MODEL 125 CABLING SCHEMATIC

Cables for IBM and Non-IBM Devices

Group No.		Termination
3038		1 EIA RS-232A Connector or 1 CCITT Connector
3039		2 EIA RS-232A Connectors or 2 CCITT Connectors
3040		2 Pair #6 Spade Lugs
3041		1 EIA RS-232A Connector or 1 CCITT Connector
3042		12-Pin Burndy Connector
3043		1 WE-283B Plug; Customer Provides 404B Surface Mount or 493A Flush Mount Jacks
3044		4 Pair #6 Spade Lugs
3050		23-Pin Burndy Connector

SYSTEM/370 MODEL 135, 3135 PROCESSING UNIT

2319 Integrated File Adapter

The IBM System/370 Model 135 can provide direct access storage by attachment of the IBM 2319 Disk Storage Facility Model A1 via the 2319 Integrated File Adapter (IFA) feature. The basic IBM 2319-A1 configuration of three disk storage modules can be expanded to a maximum of eight disk storage modules by attachment of either an IBM 2312-A1 (one module), a 2318-A1 (two modules), or a 2319-A3 (three modules) to the basic 2319-A1. The disk storage units associated with the 2319 IFA cannot stand alone and must be attached as shown on the plan view.

As an alternative, the IBM 2314 Direct Access Storage Facility—A Series can be attached via the channel on the I/O interface. See specification pages for 2314—A Series (includes 2312 and 2318) and for 2319.

3330 Series Integrated File Adapter

The disk storage units associated with the IBM 3330 Series Integrated File Adapter are installed on a standalone basis. See specification pages for the individual units.

Note: If both the 2319 and the 3330 IFA are to be attached to one Model 135, the IFA Conversion Feature must be installed.

Console Printer-Keyboard

Either the IBM 3210 Console Printer-Keyboard Model 1 or the IBM 3215 Console Printer-Keyboard Model 1 can be attached as the online I/O device for operator-system communication; one is required. Neither uses a control unit position; that is, they do not count as one of the eight possible control units on a standard I/O interface. The console printer-keyboard occupies the space shown on the 3135 plan view. The weights shown on the specification pages for the 3210-1 and 3215-1 include the printer, printer-keyboard, and associated covers (including the base plate). The support legs and forms carrier for the printer-keyboard are provided by the 3135 and their weight is included in the weight given for the console table. Power is provided from the 3135.

Power Requirements

The required 415/441-Hz (nominal) power for the 3135 Processing Unit is provided from the IBM 3046 Power Unit Model 1. The customer must provide branch circuit connections for the 3046-1 and the 3135. Due to the nature of the 3046-1 starting and inrush currents, it is necessary to provide branch circuit fuse or circuit breaker protection that meets specified time/current trip characteristics. These may be referred to as "motor branch circuit protection circuit breakers." Refer to 3046-1 specifications (Branch Circuit Requirements) for required circuit protection specifications

Power requirements for the System/370 Model 135 vary according to main storage capacity and the number of disk storage modules attached via the 2319 IFA feature; these requirements are listed in the 3046-1 and the 3135 specification pages.

Shipping Dimensions

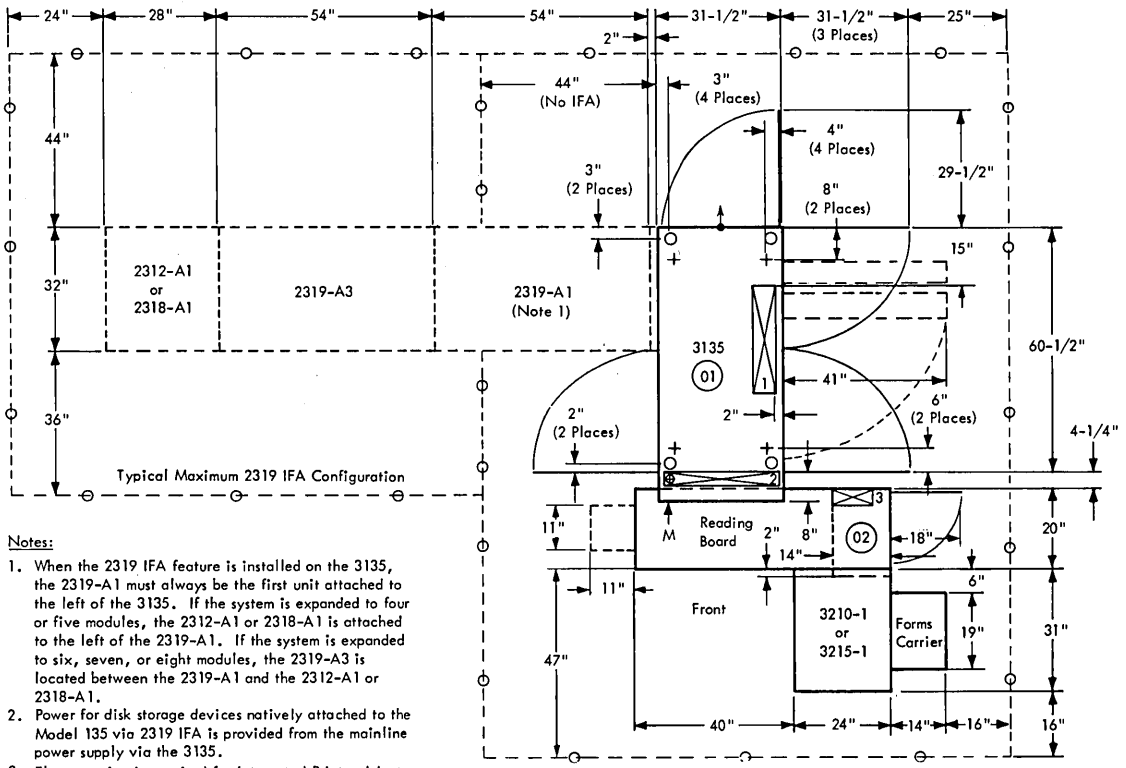
Unless otherwise specified, the shipping dimensions for the 3135 are:

Unit	*Length inches (cm)*	*Width inches (cm)*	*Height inches (cm)*
Frame 01	69 (175)	31-1/2 (80)	60 (152)
Front End	51 (130)	64 (163)	29 (74)

Removing the main frame covers reduces the main frame width to 29½ inches (75 cm). If a further reduction of the main frame dimensions is required, see your sales representative for the method of specifying on the order. The shipping dimensions then become 60 inches (152 cm) long, 29½ inches (75 cm) wide, and 59 inches (150 cm) high.

SYSTEM/370 MODEL 135, 3135 PROCESSING UNIT

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Notes:

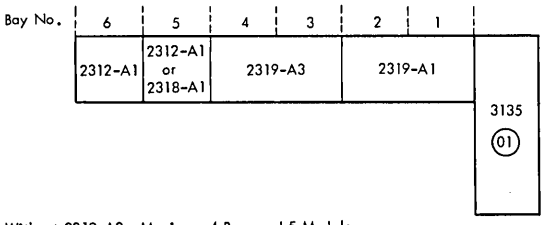
1. When the 2319 IFA feature is installed on the 3135, the 2319-A1 must always be the first unit attached to the left of the 3135. If the system is expanded to four or five modules, the 2312-A1 or 2318-A1 is attached to the left of the 2319-A1. If the system is expanded to six, seven, or eight modules, the 2319-A3 is located between the 2319-A1 and the 2312-A1 or 2318-A1.
2. Power for disk storage devices natively attached to the Model 135 via 2319 IFA is provided from the mainline power supply via the 3135.
3. Floor opening is required for Integrated Printer Adapter (IPA) feature. With this feature installed, the door swing is reversed.
4. Front dimension of each bay is 27" (69 cm). Add 1" (3 cm) to leftmost bay to allow for end cover. Allow 24" (61 cm) left service clearance for leftmost bay.

Machine	Bays per Machine	Modules per Machine
2312-A1	1	1
2318-A1	1	2
2319-A1, A3	2	3

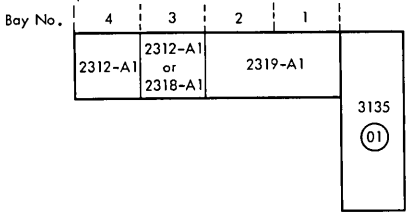
Cable Entry/Exit Number	Dimensions (Inches)	Notes
1	6 x 27	
2	4 x 29-1/2	
3	4 x 10	3

Valid Configurations for 2319 IFA Disk Storage (Note 4)

With 2319-A3: Maximum 6 Bays and 8 Modules



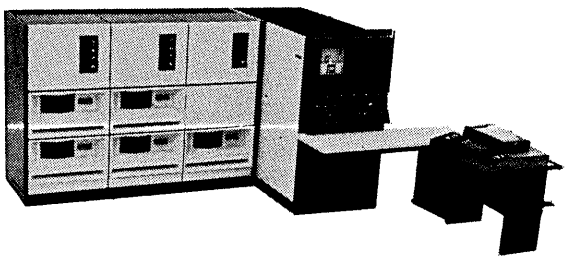
Without 2319-A3: Maximum 4 Bays and 5 Modules



SYSTEM/370 MODEL 135, 3135 PROCESSING UNIT

Details (By Frame)

System Units*		Weight** lb (kg)	Heat Output** BTU/hr (kcal/hr)	Airflow** cfm (m^3/min)	3135 kVA Power Requirements*** From Mainline Power Supply	From 3046-1†	Total
3135 Model–Frame 01 (Main Storage Size)	FE (96k)	1,950 (890)	28,880 (7 300)	1,300 (37)	2.2	7.3	9.5
	GD (144k)	1,975 (900)	29,680 (7 500)	1,280 (37)		7.5	9.7
	GF (192k)	2,075 (950)	34,280 (8 650)	1,460 (42)		8.9	11.1
	DH (240k)	2,125 (970)	35,280 (8 900)	1,440 (41)		9.4	11.6
	H (256k)	2,125 (970)	33,830 (8 550)	1,460 (42)		9.0	11.2
	HF (320k)	2,125 (970)	34,430 (8 700)	1,460 (42)		9.1	11.3
	HG (384k)	2,125 (970)	35,030 (8 850)	1,440 (41)		9.3	11.5
	I (512k)	2,125 (970)	36,100 (9 100)	1,440 (41)		9.5	11.7
For IPA Optional Feature–Frame 02		110 (50)	3,400 (860)	80 (3)	0.0	1.2	1.2



SPECIFICATIONS

Dimensions:

	F	S	H
Inches	††	††	60
(cm)	(††)	(††)	(152)

Service Clearances:

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

Power Requirements:***

Phases	3
Plug	R&S, FS3760
Connector	R&S, FS3934
Receptacle	R&S, FS3754
Power Cord Style	D2

Notes:

* A 3135 Processing Unit that has been field upgraded to a 3135-3 Processing Unit will have the same physical planning specifications as the original unit.

** Weight, airflow, and heat output include figures for the system control panel (incorporates the console file), console table, and printer-keyboard support. (Control panel weight is 65 lb [30 kg], control panel heat output is 280 BTU/hr [71 kcal/hr], and console table and printer-keyboard support total weight is 150 lb [69 kg].)

*** The mainline power is routed via the 3135 mainline power supply cord and the 3135 to the following:

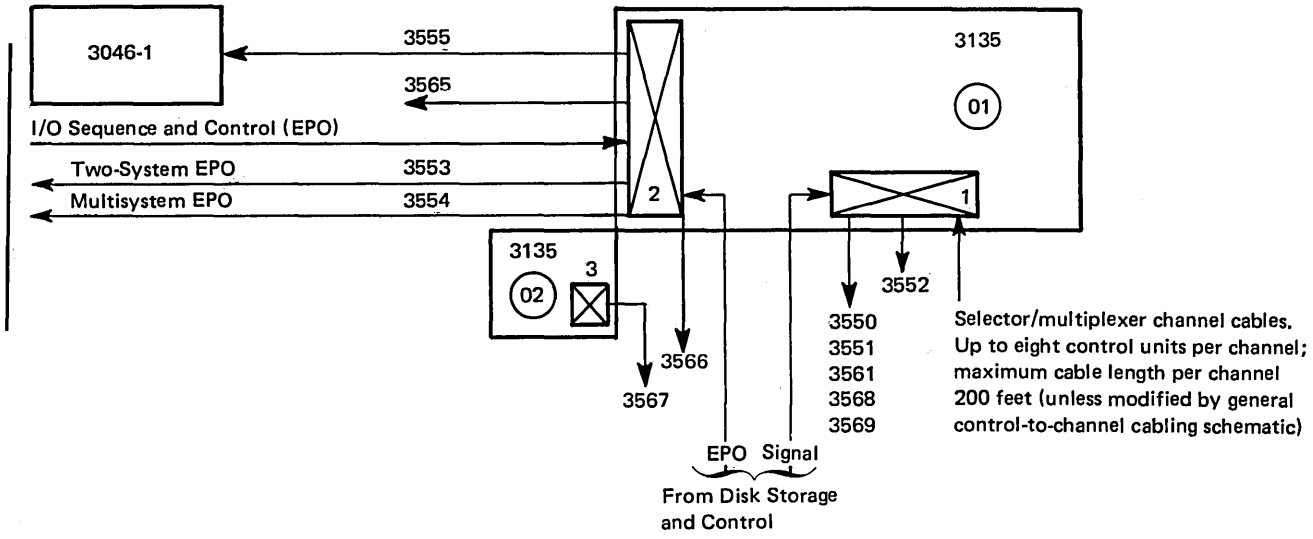
- Console printer-keyboard (3210-1 or 3215-1)
- Locally attached disk storage (2319-A1, 2319-A3, 2312-A1, or 2318-A1)
- Locally attached printer (1403-2, 7, or N1).

The Details (By Frame) table does not include power for these devices. See the applicable machine specifications pages for this information.

† The 3046-1 derives its power independently (the 3046 input power is not part of the mainline power supply to the 3135). For all 3046-1 details, see the 3046 specifications page.

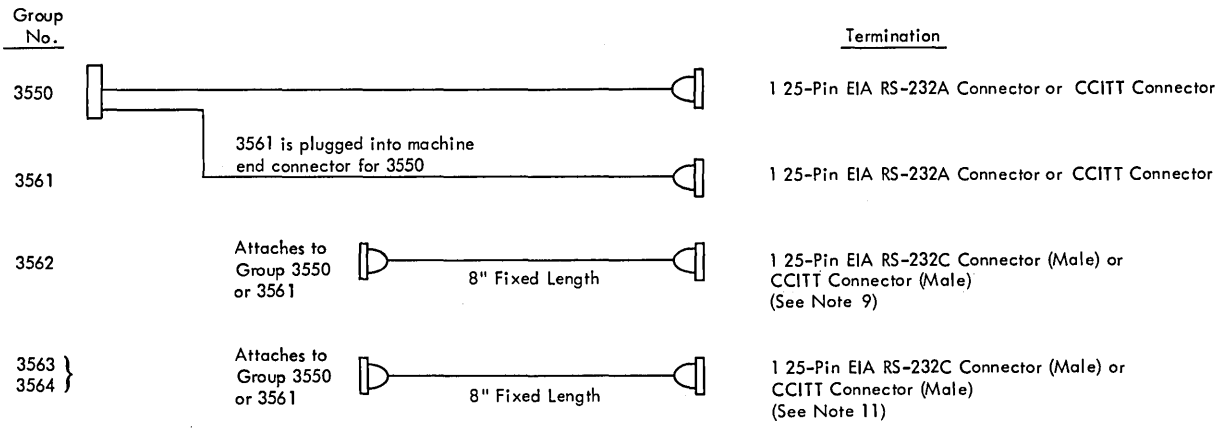
†† See plan view.

SYSTEM/370 MODEL 135 CABLING SCHEMATIC



Group No.	*No. of Cables*	*From*	*To*	*Cable Exit No.*	*Max Length (ft)*	*Notes*
3550	1	3135	Data Set, Modem, or Autocall	1	40	5,6,9,10,11,13
3551	2	3135	Direct Control	1	50	1
3552	1	3135	System/360 or System/370 Processor	1	100	2
3553	1	3135	System/360 or System/370 Processor	2	150	3
3554	1	3135	System/360 or System/370 Processor	2	150	4
3555	2	3135	3046-1	2	50	–
3561	1	3135	Data Set, Modem, or Autocall	1	40	5,8,9,10,11,13
3562	1	3135	Data Set or Modem	1	–	5,9
3563 or 3564	1	3135	Autocall	1	–	5,11
3565	1	3135	2711	2	40	12
3566	1	3135	1403-2, 7, or N1	2	25	7
3567	2	3135	1403-2, 7, or N1	3	25	7
3568	1	3135	2711	1	40	6,13
3569	1	3135	2711	1	40	8,13

Cables for IBM and Non-IBM Devices



SYSTEM/370 MODEL 135 CABLING SCHEMATIC

Notes:

1. For SF #3274 from non-IBM device.
2. For interconnection of two System/360 or System/370 processors (SF #3274); order one per feature.
3. For SF #3621, two-system EPO connection.
4. For SF #3622, multisystem EPO connection.
5. See "Cables for IBM and Non-IBM Devices" for cable specifications.
6. For SF #4640 (Modem 1)–Integrated Communication Adapter (ICA), SF #4723 (Modem 3), SF #4725 (Modem 5), SF #4727 (Modem 7), and SF #9777 (Autocall) through #9783; order one each per feature. Do not order for 2711 (see Note 10). When ordering cables, modem number should be indicated in "From" column.
7. For SF #4672 or #4677. Existing cable groups used for 1403 attachment to other machines must be replaced. Cable group numbers 3566 and 3567 are equivalent to group number 3556. Do not order 3556.
8. For SF #4722 (Modem 2), SF #4724 (Modem 4), SF #4726 (Modem 6), SF #4728 (Modem 8), and SF #9777 (Autocall) through #9783; order one each per feature. When ordering cables, modem number should be indicated in "From" column. Do not order for 2711 (see Note 10).
9. The following modems require one fixed-length (8-inch) adapter cable: 3562 to connect cable group 3550 or 3561 to Western Electric W103A Modem (U.S. and Canada) or an IBM 3976 Model 1 mandatory modems GH-2002, GH-2003, and GH-1101-HJ; NTTPC modems DT203, DT205, and DT1205 (World Trade).
10. The modem, data set, autocall, and 2711 cable requirements depend on the combination of modem and autocall special features ordered. *Note:* One autocall feature occupies one ICA line position. The use of the following chart will assist in determining the cable groups required:

ICA Line Position (Max 8)	*SF # on ICA Position (Max 8)*	*Cable Group Number (Max 8)*	
		For Use with Modems	*For Use with 2711*
1	4640	3550	3568
2		3561	3569
3		3550	3568
4		3561	3569
5		3550	3568
6		3561	3569
7		3550	3568
8		3561	3569

The special feature or sales feature numbers *on order* should be entered in the column entitled "SF # on ICA Position" in the following sequence: Modem #1–SF #4640, Modem #2–SF #4722, Modem #3–SF #4723, Modem #4–SF #4724, Modem #5–SF #4725, Modem #6–SF #4726, Modem #7–SF #4727, Modem #8–SF #4728; Autocall #1–SF #9777, Autocall #2–SF #9778, Autocall #3–SF #9779, Autocall #4–SF #9780, Autocall #5–SF #9781, Autocall #6–SF #9782, Autocall #7–SF #9783. Unused ICA positions must be at the bottom of the chart. Feature numbers for modems must be entered before feature numbers for autocall. Modem special feature numbers apply to data sets, modems, or 2711 applications. For each ICA position, order an appropriate cable group number from "Cable Group Number" column. A maximum of eight cables is permitted. When ordering cables, the modem number or line adapter machine number should be indicated in the "From" column.

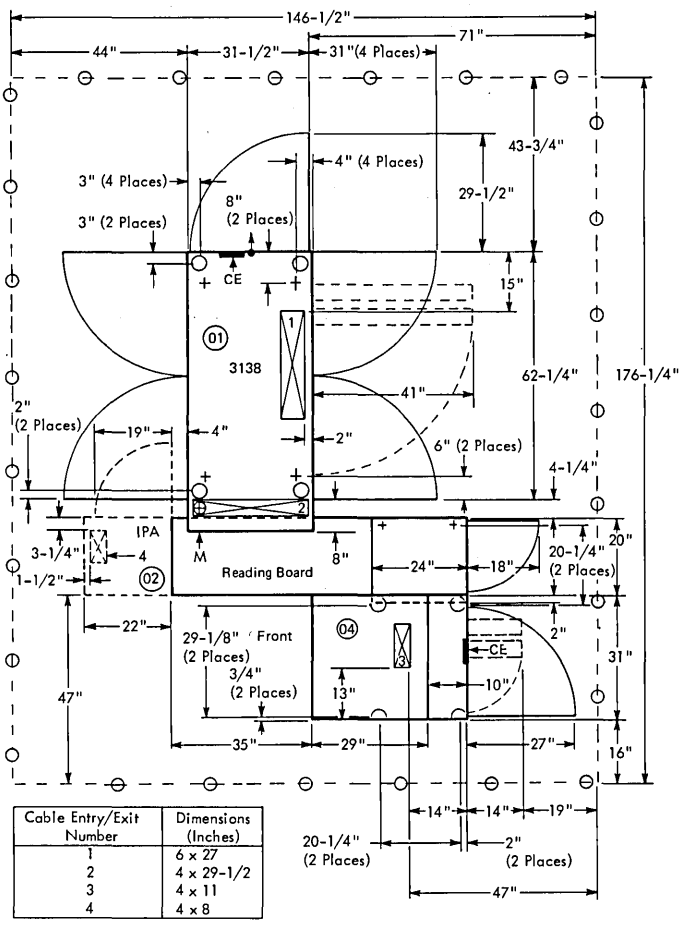
11. Order one fixed-length (8-inch) adapter cable for connection to any of the following communication facilities:

Communication Facility	*Cable Group Number*
Western Electric Data Auxiliary Set 801	3563
GPO DCE 1A	3564
Datel 600	3564
IBM 3872, 3874, or 3875	3563

12. Sequence and control (EPO).
13. Maximum of eight cable groups: 3550, 3561, 3568, and 3569.

SYSTEM/370 MODEL 138, 3138 PROCESSING UNIT

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Cable Entry/Exit Number	Dimensions (Inches)
1	6 x 27
2	4 x 29-1/2
3	4 x 11
4	4 x 8

Note: Caster, cable hole, and leveling pad locating dimensions are measured from edge of cover, not frame.

SYSTEM/370 MODEL 138, 3138 PROCESSING UNIT

Details (By Frame)

Model	Frame	Weight lb (kg)	Airflow cfm (m^3/min)	Heat Output BTU/hr (kcal/hr)	3138 kVA Power Requirements: From Mainline Power Supply	From 3046-1	Total
I, J	01	1,750 (800)	1,350 (39)	29,000 (7 350)	1.2	6.3	7.5
	04	600 (280)	300 (9)	5,200 (1 350)	0.5	1.5	2.0
For IPA Optional Feature–Frame 02		110 (50)	80 (3)	3,400 (860)	0.1	1.2	1.3

Notes:

* Removing the main frame covers reduces the main frame width to 29-1/2 inches (75 cm). If a minimum reduction of the main frame dimensions is required, see your sales representative for the method of specifying on the order. The shipping dimensions then become 60 inches (152 cm) long, 29-1/2 inches (75 cm) wide, and 60 inches (152 cm) high.

** See plan view.

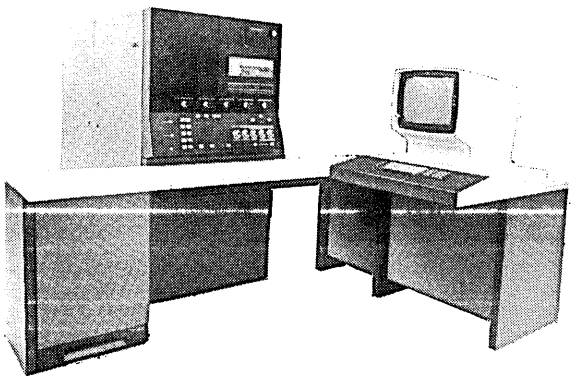
*** The customer must provide branch circuit connections for the 3046-1 and the 3138. Because of the nature of the 3046-1 starting and inrush currents, it is necessary to provide branch circuit fuse or circuit breaker protection that meets specified time/current trip characteristics. These may be referred to as "motor branch circuit protection circuit breakers." Refer to 3046-1 specifications (Branch Circuit Requirements) for required circuit protection specifications.

The mainline power is routed via the 3138 mainline power supply cord and the 3138 to the following:

- Locally attached printers (1403-2, 7, N1, or 3203-4).

The Details (By Frame) table does not include power for the natively attached printers. See the applicable machine specifications pages for this information.

The 3046-1 derives its power independently (the 3046 input power is not part of the mainline power supply to the 3138). For all 3046-1 details, see the 3046 specifications page.



SPECIFICATIONS

Dimensions:*

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

Service Clearances:

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

Total Weight: 2,350 lb (1 100 kg)

Total Heat Output: 34,200 BTU/hr (8 650 kcal/hr)

Total Airflow: 1,650 cfm (46 m^3/min)

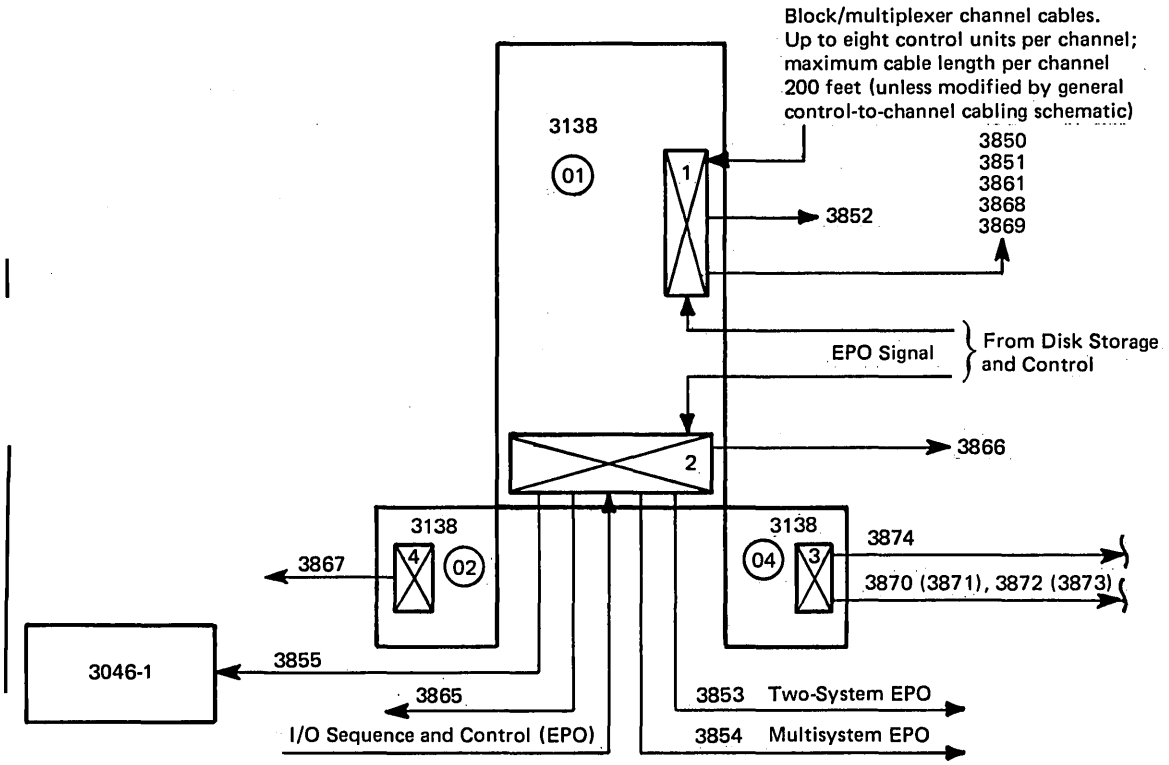
Power Requirements: ***

Phases	3
Plug	R&S, FS3760
Connector	R&S, FS3934
Receptacle	R&S, FS3754
Power Cord Style	D2

Environment, Operating:

Temperature	60°F-90°F (16°C-32°C)
Rel Humidity	20%-80%
Max Wet Bulb	73°F (23°C)

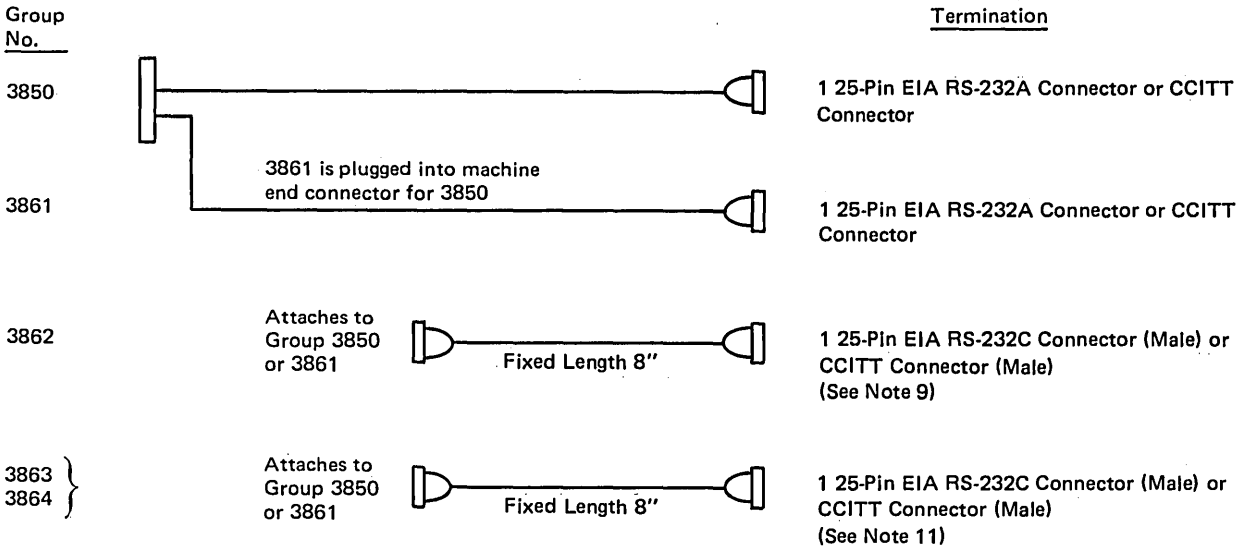
SYSTEM/370 MODEL 138 CABLING SCHEMATIC



Group No.	*No. of Cables*	*From*	*To*	*Cable Exit No.*	*Max Length (ft)*	*Notes*
3850	1	3138	Data Set, Modem, or Autocall	1	40	5,6,9,10,11,13,14
3851	2	3138	Direct Control	1	50	1,14
3852	1	3138	System/360 or System/370 Processor	1	100	2,14
3853	1	3138	System/360 or System/370 Processor	2	150	3,14
3854	1	3138	System/360 or System/370 Processor	2	150	4,14
3855	2	3138	3046-1	2	50	14
3861	1	3138	Data Set, Modem, or Autocall	1	40	5,8,9,10,11,13,14
3862	1	3138	Data Set or Modem	1	–	5,9,14
3863 or 3864	1	3138	Autocall	1	–	5,11,14
3865	1	3138	2711	2	40	12,14
3866	1	3138	1403-2, 7, or N1	2	25	7,14
3867	2	3138	1403-2, 7, or N1	4	25	7,14
3868	1	3138	2711	1	40	6,13,14
3869	1	3138	2711	1	40	8,13,14
3870 (3871)	4	3138	3203-4	3	20	15
3872 (3873)	4	3138	3203-4 (Second Printer)	3	20	15
3874	1	3138	3286-2 or 3287	3	50	16

SYSTEM/370 MODEL 138 CABLING SCHEMATIC

Cables for IBM and Non-IBM Devices



Notes:

1. For SF #3274 from non-IBM device.
2. For interconnection of two System/360 or System/370 processors (SF #3274); order one per feature.
3. For SF #3621, two-system EPO connection.
4. For SF #3622, multisystem EPO connection.
5. See "Cables for IBM and Non-IBM Devices" for cable specifications.
6. For SF #4640 (Modem 1)–Integrated Communications Adapter (ICA), SF #4723 (Modem 3), SF #4725 (Modem 5), SF #4727 (Modem 7), and SF #9777 (Autocall) through #9783; order one each per feature. Do not order for 2711 (see Note 10). When ordering cables, modem number should be indicated in "From" column.
7. For SF #4672 or #4677. Existing cable groups used for 1403 attachment to other machines must be replaced. Cable group numbers 3866 and 3867 are equivalent to group number 3556. Do not order 3556.
8. For SF #4722 (Modem 2), SF #4724 (Modem 4), SF #4726 (Modem 6), SF #4728 (Modem 8), and SF #9777 (Autocall) through #9783; order one each per feature. When ordering cables, modem number should be indicated in "From" column. Do not order for 2711 (see Note 10).
9. The following modems require one fixed-length (8-inch) adapter cable: 3862 to connect cable group 3850 or 3861 to Western Electric W103A Modem (U.S. and Canada) or an IBM 3976 Model 1 mandatory modems GH-2002, GH-2003, and GH-1101-HJ; NTTPC modems DT203, DT205, and DT1205 (World Trade).
10. See the following page.

Notes: (Continued)

10. The modem, data set, autocall, and 2711 cable requirements depend on the combination of modem and autocall special features ordered. *Note:* One autocall feature occupies one ICA line position. The use of the following chart will assist in determining the cable groups required:

ICA Line Position (Max 8)	*SF # on ICA Position (Max 8)*	*Cable Group Number (Max 8)*	
		For Use with Modems	*For Use with 2711*
1	4640	3850	3868
2		3861	3869
3		3850	3868
4		3861	3869
5		3850	3868
6		3861	3869
7		3850	3868
8		3861	3869

The special feature or sales feature numbers *on order* should be entered in the column entitled "SF # on ICA Position" in the following sequence: Modem #1–SF #4640, Modem #2–SF #4722, Modem #3–SF #4723, Modem #4–SF #4724, Modem #5–SF #4725, Modem #6–SF #4726, Modem #7–SF #4727, Modem #8–SF #4728; Autocall #1–SF #9777, Autocall #2–SF #9778, Autocall #3–SF #9779, Autocall #4–SF #9780, Autocall #5–SF #9781, Autocall #6–SF #9782, Autocall #7–SF #9783. Unused ICA positions must be at the bottom of the chart. Feature numbers for modems must be entered before feature numbers for autocall. Modem special feature numbers apply to data sets, modems, or 2711 applications. For each ICA position, order an appropriate cable group number from "Cable Group Number" column. A maximum of eight cables is permitted. When ordering cables, the modem number or line adapter machine number should be indicated in the "From" column.

11. Order one fixed-length (8-inch) adapter cable for connection to any of the following communication facilities:

Communication Facility	*Cable Group Number*
Western Electric Data Auxiliary Set 801	3863
GPO DCE 1A	3864
Datel 600	3864
IBM 3872, 3874, or 3875	3863

12. Sequence and control (EPO).
13. Maximum of eight cable groups: 3850, 3861, 3868, and 3869.
14. Whenever a 3138 is a direct replacement for a 3135, cable group numbers 3550 through 3569 can be used in place of cable group numbers 3850 through 3869, respectively.
15. For 50-Hz machines, use group number in parentheses. SF #8075 required for first printer attached, and SF #8076 required for second printer attached.
16. Cable lengths over 50 feet (maximum 2,000 feet) may be ordered through the IBM Branch Office via MES (Miscellaneous Equipment Specification). Group 3874 is identical for 3286-2 or 3287 attachment.

SYSTEM/370 MODEL 145, 3145 PROCESSING UNIT

Integrated File Adapter (FED, GE, GFD, H, HG, I)

The IBM System/370 Model 145 can provide direct access storage by attachment of the IBM 2319 Disk Storage Facility Model A1 via the Integrated File Adapter (IFA) feature. The basic IBM 2319-A1 configuration of three disk storage modules can be expanded to a maximum of eight disk storage modules by attachment of combinations of the IBM 2312, 2313, 2318 Model A1, and 2319 Model A2 to the basic 2319 Model A1. Alternately, the IBM 2314 Direct Access Storage Facility—A Series can be attached via the channel on the I/O interface. See the specifications pages for 2314—A Series (includes 2312, 2313, and 2318) and for 2319.

When the IFA feature is installed on the 3145, the 2319-A1 must always be the first machine attached to the left side of 3145 frame 03. Power for these disk storage devices is provided from the 3145; all cables are internal cables provided with the machines. Note that with the IFA feature installed, only two selector channels (channels 2 and 3) are available on the system to attach I/O devices.

Integrated Storage Controls (H2, HG2, I2, IH2, J2, JI2, K2)

The IBM System/370 Model 145 H2, HG2, I2, IH2, J2, JI2, and K2 can provide direct access storage via the Integrated Storage Controls (ISC) feature.

Console Printer-Keyboard

Either the IBM 3210 Console Printer-Keyboard Model 1 or the IBM 3215 Console Printer-Keyboard Model 1 can be attached as the online I/O device for operator-system communication; one is required. The console printer-keyboards do not use a control unit position; that is, they do not count as one of the eight possible control units on a standard I/O interface. The console printer-keyboard occupies the space shown on the 3145 plan view and may be put on either the right or left console table extension. The weights shown on the specification pages for the 3210-1 and 3215-1 include the printer, printer-keyboard, and associated covers (including the base plate). The support legs and forms carrier for the printer-keyboard are provided by the 3145 and their weight is included in the weight given for console file and table. Power is provided from 3145.

An IBM 3210 Console Printer-Keyboard Model 2 can be remotely attached at up to 75 wire feet from the processing unit. For 3210-2 World Trade machines operated at 50 Hz or at 60 Hz, 200 V, power is provided from the 3145. For machines operated at 60 Hz, 115, 208, or 230 V, a power cord is provided.

Power Requirements

The customer is required to provide branch circuit connections for the 3046-1, the 3145 frame 03, and the 3210-2 for Models FED, GE, GFD, H, HG, and I. The customer must provide branch circuit connections for the 3145 frame 03 and the 3210-2 on Models H2, HG2, I2, IH2, J2, JI2, and K2. To avoid tripping the branch circuit breaker when starting the 3145, it is necessary to provide branch circuit fuse or circuit breaker protection that meets specified time/current trip characteristics. These are referred to as "motor branch circuit protection circuit breakers." Refer to Model 145 FED to I, Model 145 H2 to K2, and 3046-1 specifications (Branch Circuit Requirements) for required circuit protection specifications.

Power requirements for the System/370 Model 145 vary according to main storage capacity and the number of disk storage modules attached via the IFA feature; these requirements are listed in the 3046-1 and the 3145 specification pages.

Shipping Dimensions

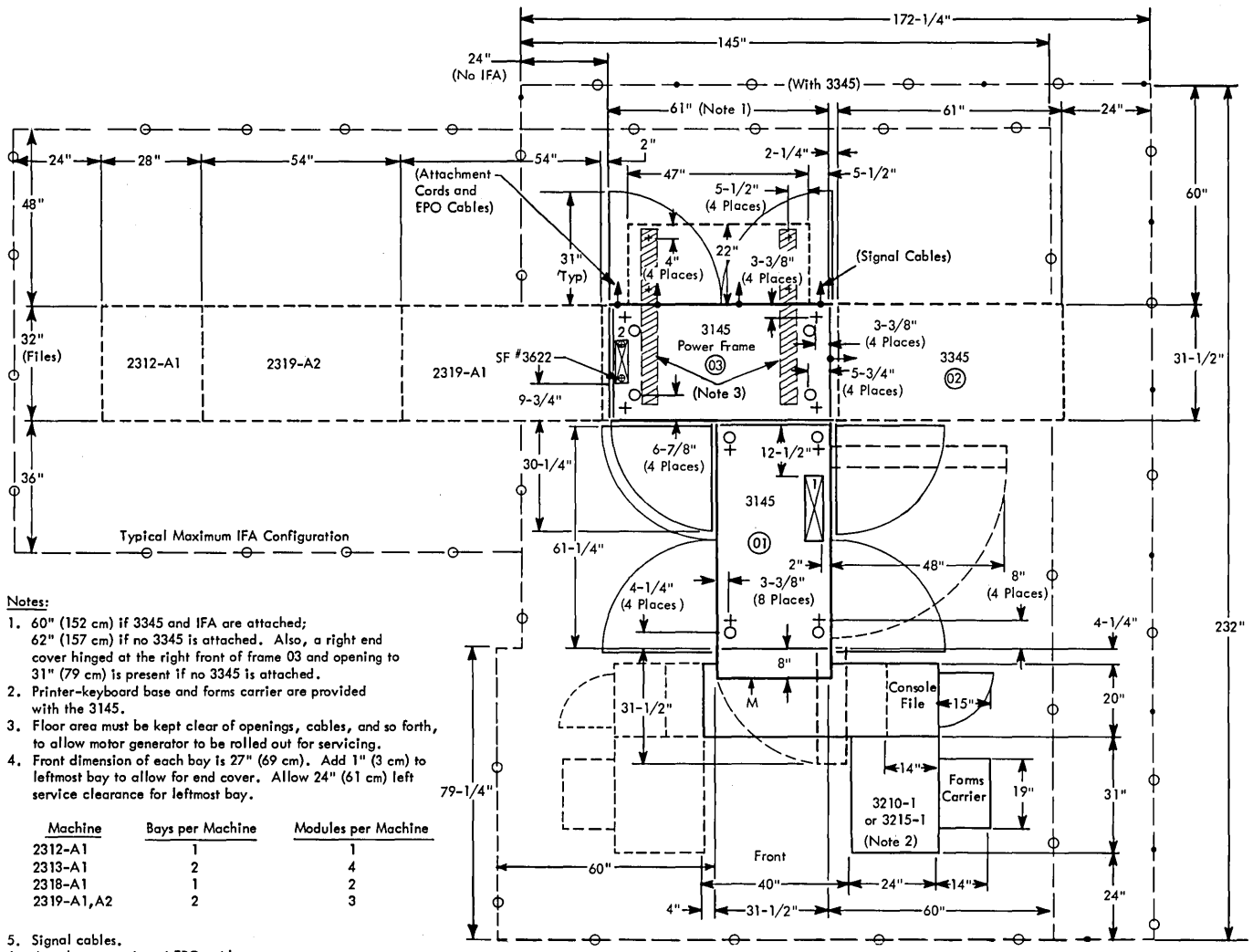
Unless otherwise specified, the shipping dimensions for the 3145 are:

Unit	*Length inches (cm)*	*Width inches (cm)*	*Height inches (cm)*
Frame 01	70 (178)	31-1/2 (80)	60 (152)
Frame 03	62 (157)	31-1/2 (80)	60 (152)
Front End	55 (140)	25 (64)	65 (165)

Removal of the side covers on frames 01 and 03 reduces the width of these units to 29½ inches (75 cm). If a reduction of frame 01 length is needed, see your sales representative for method of specifying on the order. The shipping dimensions for frame 01 then become 60 inches (152 cm) long, 29½ inches (75 cm) wide, and 69 inches (175 cm) high. Frame 03 shipping length can be reduced to 60 inches (152 cm) by removing the end and side covers.

SYSTEM/370 MODEL 145 FED, GE, GFD, H, HG, AND I
3145 PROCESSING UNIT

PLAN VIEW (Also shows integrated files and main storage frames)
(English Scale: 1/4 in. = 1 ft)



Notes:

1. 60" (152 cm) if 3345 and IFA are attached; 62" (157 cm) if no 3345 is attached. Also, a right end cover hinged at the right front of frame 03 and opening to 31" (79 cm) is present if no 3345 is attached.
2. Printer-keyboard base and forms carrier are provided with the 3145.
3. Floor area must be kept clear of openings, cables, and so forth, to allow motor generator to be rolled out for servicing.
4. Front dimension of each bay is 27" (69 cm). Add 1" (3 cm) to leftmost bay to allow for end cover. Allow 24" (61 cm) left service clearance for leftmost bay.

Machine	Bays per Machine	Modules per Machine
2312-A1	1	1
2313-A1	2	4
2318-A1	1	2
2319-A1,A2	2	3

5. Signal cables.
6. Attachment cords and EPO cables.

Valid Configurations for IFA Disk Storage (Note 4)

With 2319-A2: Maximum 5 Bays and 8 Modules

Bay No.	5	4	3	2	1
	2312-A1 or 2318-A1	2319-A2		2319-A1	3145 (03)

Without 2319-A2: Maximum 5 Bays and 8 Modules

Bay No.	5	4	3	2	1
	2312-A1, 2318-A1, or 1/2 2313-A1	2312-A1, 2318-A1, or 1/2 2313-A1	2312-A1, 2318-A1, or 1/2 2313-A1	2319-A1	3145 (03)

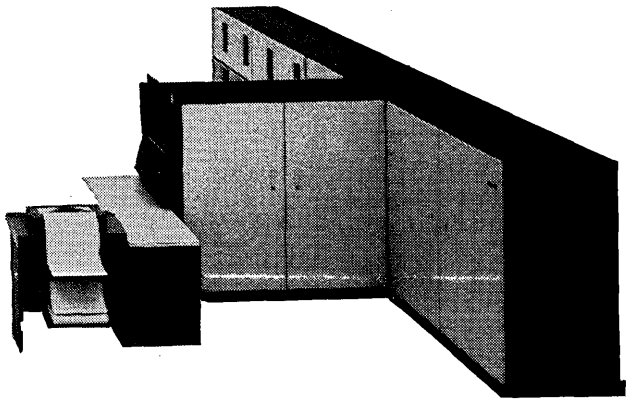
Cable Entry/Exit Number	Dimensions (Inches)	Notes
1	5 x 18	5
2	3 x 12	6

SYSTEM/370 MODEL 145 FED, GE, GFD, H, HG, AND I
3145 PROCESSING UNIT

Details (By Frame)

System Model	Frame	Weight lb (kg) 50 Hz	Weight lb (kg) 60 Hz	Airflow cfm (m^3/min)	Heat Output BTU/hr (kcal/hr)	kVA
FED	01	1,605 (730)	1,605 (730)	1,310 (38)	29,900 (7 550)	10.3
FED	03	1,740 (790)	1,615 (740)	290 (9)	12,000 (3 050)	4.2
GE	01	1,625 (740)	1,625 (740)	1,310 (38)	33,100 (8 350)	11.4
GE	03	1,740 (790)	1,615 (750)	290 (9)	13,000 (3 300)	4.5
GFD	01	1,645 (750)	1,645 (750)	1,310 (38)	36,000 (9 100)	12.5
GFD	03	1,740 (790)	1,615 (740)	290 (9)	14,300 (3 650)	4.9
H	01	1,665 (760)	1,665 (760)	1,310 (38)	38,700 (9 750)	13.4
H	03	1,740 (790)	1,615 (740)	290 (9)	14,800 (3 750)	5.1
HG	01	1,665 (760)	1,665 (760)	1,310 (38)	38,700 (9 750)	13.4
HG	03	1,740 (790)	1,615 (740)	290 (9)	14,800 (3 750)	5.1
I	01	1,665 (760)	1,665 (760)	1,310 (38)	38,700 (9 750)	13.4
I	03	1,740 (790)	1,615 (740)	290 (9)	14,800 (3 750)	5.1
All	Console File and Table	350 (160)	350 (160)	0 (0)	300 (76)	From 3145

Note: See also 2314–A Series, 2319-A1, 3046-1, 3210-1, 3210-2, 3215-1, 3345-1 to 5, and 3145 System Requirements.



SPECIFICATIONS

Dimensions:

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

Service Clearances:

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

Branch Circuit Requirements

Voltage	200**	208	220***	230	235***	380***	408***
Phases	3	3	3	3	3	3	3
Ampacity	100	100	100	100	100	60	60
Protection (Cont)	100	100	100	100	100	60	60
Protection (For 1 second) or Adjustable Trip Set for	600	600	600	600	600	400	400
	700-1000	700-900	700-900	700-800	700-800	400-500	400-500
Max Cont Load (A) for:							
3145 FED	57	55	52	49	48	33	30
3145 GE	60	59	55	53	52	35	33
3145 GFD	65	63	60	56	55	38	35
3145 H	69	66	63	60	59	40	36
3145 HG and I	71	68	65	61	60	41	37
Plug Connector Receptacle	R&S, JPS1034H R&S, JCS1034H R&S, JRSR1034H						
Power Cord Style	F4		F2		F2	F2	F2

Notes:

* See plan view.

** Applies to 50-Hz and 60-Hz World Trade machines.

*** Apply to 50-Hz World Trade machines.

SYSTEM/370 MODEL 145 FED, GE, GFD, H, HG, AND I
3145 PROCESSING UNIT

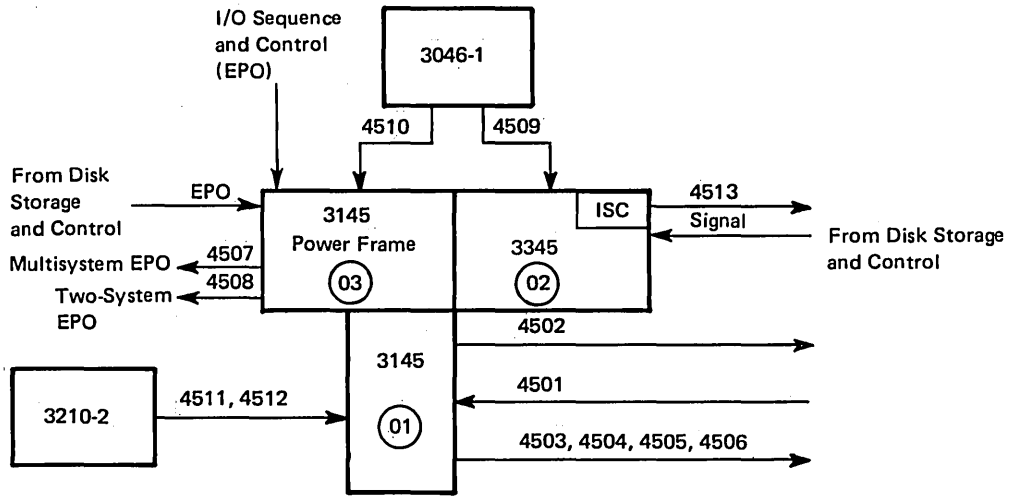
System Requirements

System Units	kVA Power Requirements by System Model							Disk Storage Attached to System					
	Supplied from 3145 Power Cord (Note 3)					Supplied from 3046-1 Power Cord (Note 4)							
	FED	GE	GFD	H	HG and I	HG	I	No. of Modules	2312-A1	2313-A1	2318-A1	2319-A1	2319-A2
3145 (Frame 01)	10.3	11.4	12.5	13.4	13.4	–	–						
3145 (Frame 03)	4.2	4.5	4.9	5.1	5.1	–	–						
3210-1 or 3215-1	Note 2	Note 2	Note 2	Note 2	Note 2	–	–						
Total (Note 1)	14.5	15.9	17.4	18.5	18.5	–	–	0					
	16.3	17.7	19.2	20.3	20.3	–	–	3				X	
	17.0	18.4	19.9	21.0	21.0	–	–	4	X			X	
	17.7	19.1	20.6	21.7	21.7	–	–	5			X	X	
	18.4	19.8	21.3	22.4	22.4	–	–	6	X		X	X	
	18.1	19.5	21.0	22.1	22.1	–	–					X	X
	19.1	20.5	22.0	23.1	23.1	–	–	7		X		X	
	18.8	20.2	21.7	22.8	22.8	–	–		X			X	X
	19.8	21.2	22.7	23.8	23.8	–	–	8	X	X		X	
	19.5	20.9	22.4	23.5	23.5	–	–				X	X	X
3046-1	–	–	–	–	–	3.6	3.8						
3345-1	–	–	–	–	0.5	6.8	–						
3345-2	–	–	–	–	0.5	–	10.0						
3345-3	1.8	1.8	1.8	1.8	–	–	–						
3345-4	–	–	–	–	3.1	6.8	–						
3345-5	–	–	–	–	3.1	–	10.0						

Notes:

1. Each "total" kVA entry in this summary is a total of the power requirements for one 3145, one 3210-1 or 3215-1, and combinations (from none to all) of natively attached disk storage. The kVA is shown for each frame and indicates the power cord source of supply. This summary does not replace individual machine specifications.
2. For 60-Hz (U.S. only) systems, power is included with 3145 frame 01. For all 50-Hz and for 60-Hz (World Trade Only), 200 V systems, add 0.1 kVA if 3210-2 is attached.
3. Total power is the sum of the appropriate total from Note 1 and from the 3345-1, 2, 3, 4, or 5.
4. Total power is the sum of the amounts shown for the 3046-1 and the 3345-1, 2, 4, or 5.

SYSTEM/370 MODEL 145 FED, GE, GFD, H, HG, AND I CABLING SCHEMATIC



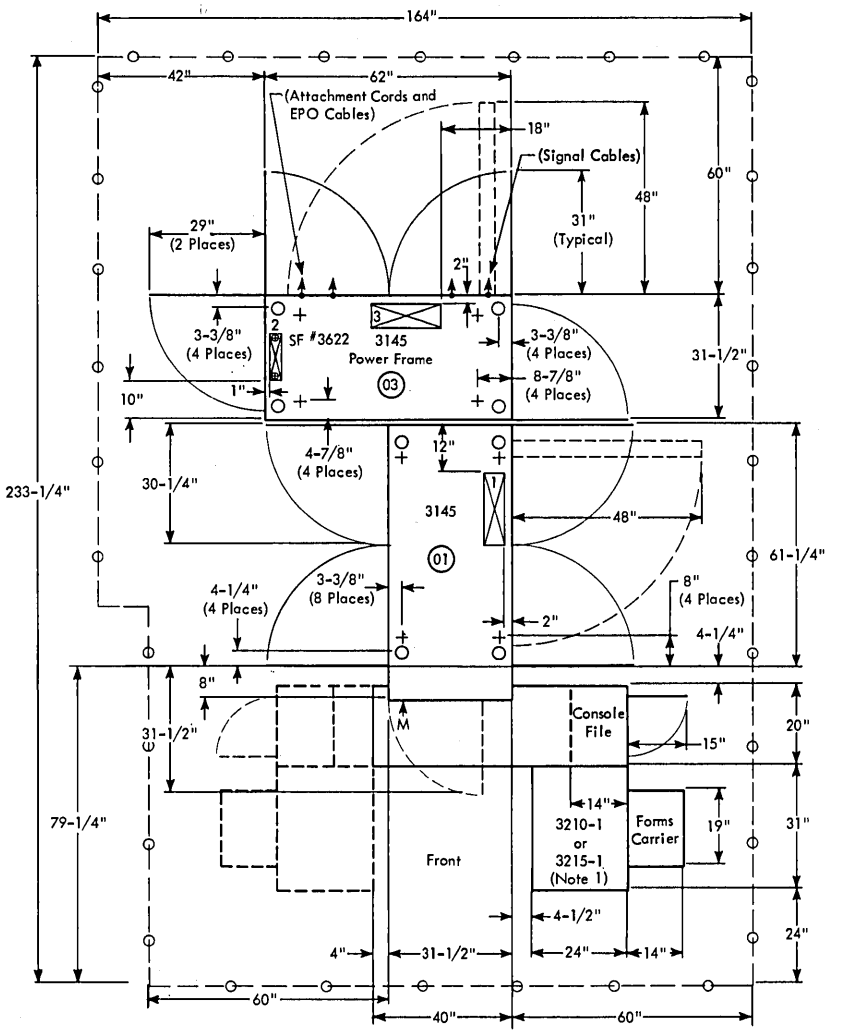
Group No.	*No. of Cables*	*From*	*To*	*Max Length (ft)*	*Notes*
4501	2	Direct Control	3145 Fr 01	50	3
4502	1	3145 Fr 01	System/360 or System/370 Processor	100	2
4503	2	3145 Fr 01	Control Unit	–	1
4504	2	3145 Fr 01	Selector or Block Multiplexer Channel	–	1
4505	2	3145 Fr 01	Byte Multiplexer Channel	–	1
4506	2	3145 Fr 01	Channel-to-Channel Adapter	–	1
4507	1	3145 Fr 03	System/360 or System/370 Processor	100	5
4508	1	3145 Fr 03	System/360 or System/370 Processor	100	4
4509	1	3046-1	3345-1, 2, 4, or 5 (Fr 02)	50	10
4510	2	3046-1	3145 Fr 03	50	10
4511	1	3210-2	3145 Fr 01	75	7
4512	1	3210-2	3145 Fr 01	75	6
4513	2	3345-3, 4, or 5	Processor, Channel, or Control Unit	150	8,9

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 six control units. This restriction applies to both connected channels (X and Y).
2. For the interconnection of two System/360 or System/370 processors (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.
6. Use for all 50-Hz and 200 V, 60-Hz World Trade machines.
7. For 3210 Model 2 adapter feature (SF #7845).
8. Used only with 3345-3, 4, or 5. Order two cable groups if 3345 has SF #8100 (two-channel switch feature).
9. ISC is cabled the same as for normal channel interface cabling.
10. The 3046-1 is *not* required for 3345-3.

SYSTEM/370 MODEL 145 H2, HG2, I2, IH2, J2, JI2, AND K2
3145 PROCESSING UNIT

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Notes:

1. Printer-keyboard base and forms carrier are provided with the 3145.
2. Signal cables.
3. Attachment cords and EPO cables.
4. ISC signal cables.

Cable Entry/Exit Number	Dimensions (Inches)	Notes
1	5 x 18	2
2	3 x 12	3
3	6 x 18	4

SYSTEM/370 MODEL 145 H2, HG2, I2, IH2, J2, JI2, AND K2
3145 PROCESSING UNIT

Details (By Frame)

System Model *	Frame	Weight lb (kg) 50 Hz	Weight lb (kg) 60 Hz	Airflow cfm (m^3/min)	Heat Output BTU/hr (kcal/hr)	kVA
H2	01	1,665 (760)	1,665 (760)	1,310 (38)	34,000 (8 600)	11.1
H2	03	930 (430)	870 (400)	1,200 (35)	11,000 (2 800)	3.9
HG2	01	1,665 (760)	1,665 (760)	1,310 (38)	34,000 (8 600)	11.1
HG2	03	1,450 (660)	1,390 (640)	1,200 (35)	13,000 (3 300)	4.7
I2	01	1,665 (760)	1,665 (760)	1,310 (38)	34,000 (8 600)	11.1
I2	03	1,455 (660)	1,395 (640)	1,200 (35)	14,700 (3 750)	5.3
IH2	01	1,665 (760)	1,665 (760)	1,310 (38)	34,000 (8 600)	11.1
IH2	03	1,475 (680)	1,415 (650)	1,200 (35)	17,100 (4 350)	6.1
J2	01	1,665 (760)	1,665 (760)	1,310 (38)	34,000 (8 600)	11.1
J2	03	1,480 (680)	1,420 (650)	1,200 (35)	18,500 (4 700)	6.7
JI2	01	1,665 (760)	1,665 (760)	1,310 (38)	34,000 (8 600)	11.1
JI2	03	1,625 (740)	1,565 (710)	1,325 (38)	24,000 (6 050)	8.0
K2	01	1,665 (760)	1,665 (760)	1,310 (38)	34,000 (8 600)	11.1
K2	03	1,630 (740)	1,570 (710)	1,325 (38)	27,400 (6 900)	9.5
All	Console File and Table	350 (160)	350 (160)	0 (0)	300 (76)	From 3145

Note: See also 3047-1, 3210-1, 3210-2, 3215-1, and 3145 System Requirements.

SPECIFICATIONS

Dimensions:

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

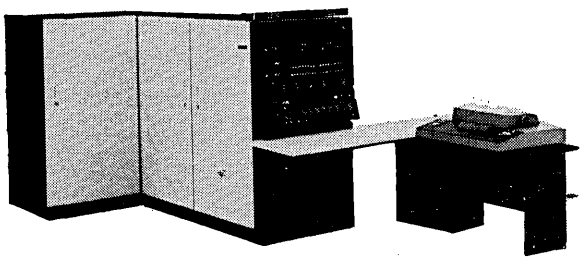
Service Clearances:

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

Notes:

* A 3145 Processing Unit that has been field upgraded to a 3145-3 Processing Unit will have the same physical planning specifications as the original unit.

** See plan view.



SYSTEM/370 MODEL 145 H2, HG2, I2, IH2, J2, JI2, AND K2
3145 PROCESSING UNIT

System Requirements

System Units	*kVA Power Requirements by Model (Supplied from 3145 Power Cord)*						
	H2	*HG2*	*I2*	*IH2*	*J2*	*JI2*	*K2*
3047-1	6.7	6.7	6.7	6.7	6.7	6.7	6.7
3145 (Frame 01)	11.1	11.1	11.1	11.1	11.1	11.1	11.1
3145 (Frame 03)	3.9	4.7	5.3	6.1	6.7	8.0	9.5
3210-1, 3210-2 (WT), or 3215-1	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2	Note 2
Total (Notes 1, 3)	21.7	22.5	23.1	23.9	24.5	25.8	27.3

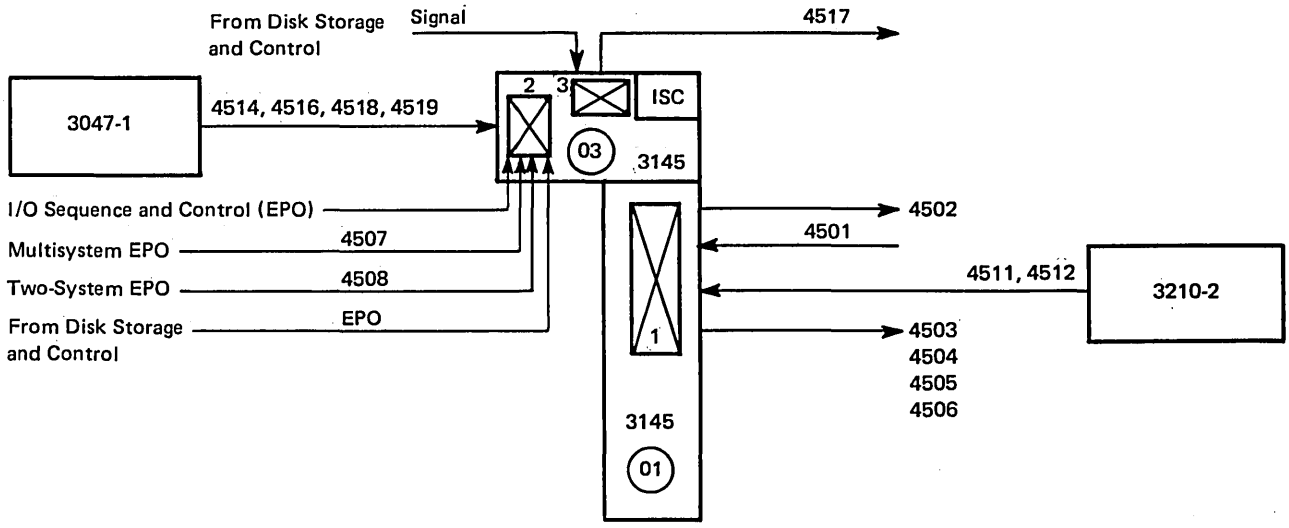
Notes:
1. Each total kVA entry in this summary is a total of the power requirements for one 3145-2, one 3210-1 or 3215-1, and one 3047-1.
2. Power is included with 3145 frame 01.
3. If SF #4660 (ISC) is not installed, these values may be reduced by 1.8 kVA.

Branch Circuit Requirements

Voltage	200*	208	220**	230	235**	380**	408**
Phases	3	3	3	3	3	3	3
Ampacity	100	100	100	100	100	60	60
Protection (Cont)	100	100	100	100	100	60	60
Protection (For 1 second) or Adjustable Trip Set for Max Cont Load (A) for:	600	600	600	600	600	400	400
	700-1000	700-900	700-900	700-800	700-800	400-500	400-500
3145 H2	63	62	57	55	54	32	31
3145 HG2	65	64	59	57	56	35	33
3145 I2	67	65	61	58	58	35	33
3145 IH2	69	67	63	60	60	36	34
3145 J2	71	69	64	62	61	37	35
3145 JI2	75	72	68	65	64	39	37
3145 K2	79	76	72	69	67	42	39
Plug Connector Receptacle	R&S, JPS1034H R&S, JCS1034H R&S, JRSR1034H						
Power Cord Style	F4		F2		F2	F2	F2

* Applies to 50-Hz and 60-Hz World Trade machines.
** Apply to 50-Hz World Trade machines.

SYSTEM/370 MODEL 145 H2, HG2, I2, IH2, J2, JI2, AND K2 CABLING SCHEMATIC



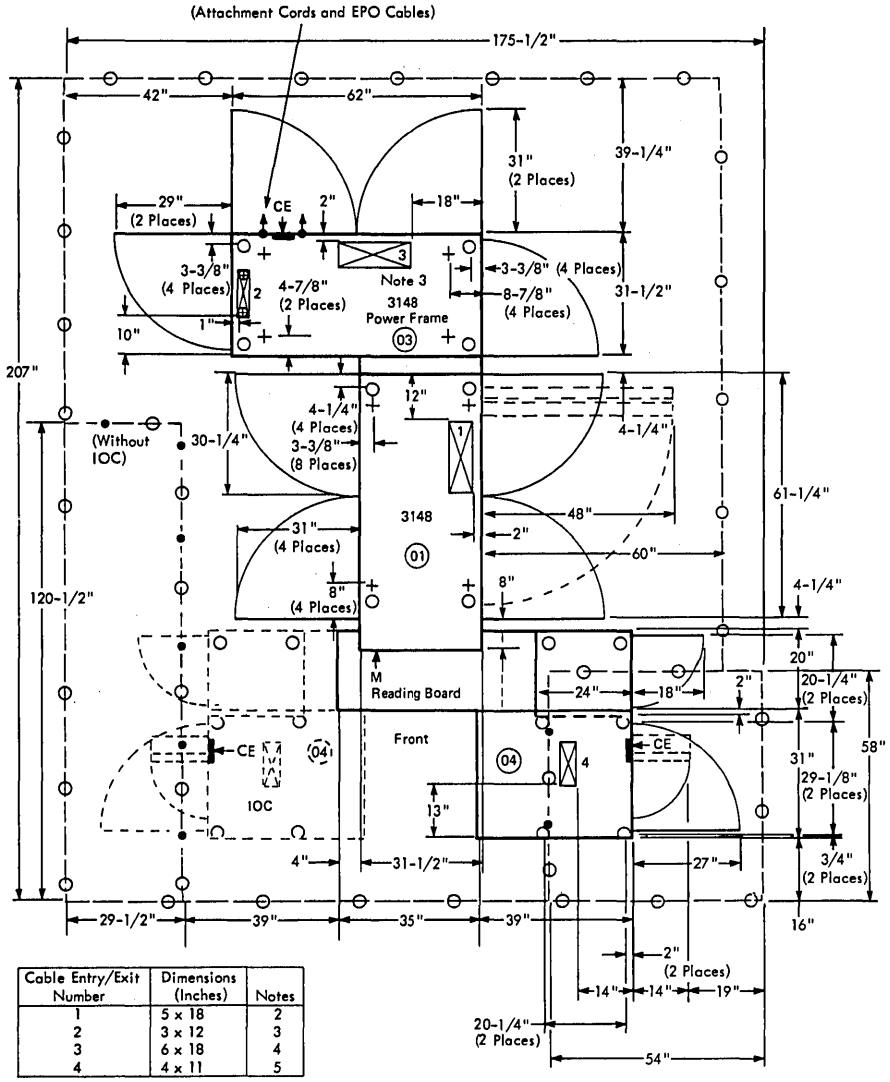
Group No.	*No. of Cables*	*From*	*To*	*Cable Entry No.*	*Max Length (ft)*	*Notes*
4501	2	Direct Control	3145	1	50	3
4502	1	3145	System/360 or System/370 Processor	1	100	2
4503	2	3145	Control Unit	1	–	1
4504	2	3145	Selector or Block Multiplexer Channel	1	–	1
4505	2	3145	Byte Multiplexer Channel	1	–	1
4506	2	3145	Channel-to-Channel Adapter	1	–	1
4507	1	3145	System/360 or System/370 Processor	2	100	5
4508	1	3145	System/360 or System/370 Processor	2	100	4
4511	1	3210-2	3145	1	75	7
4512	1	3210-2	3145	1	75	6
4514	3	3047-1	3145	2	50	10
4516	1	3047-1	3145	2	50	13
4517	2	3145	Processor, Channel, or Control Unit	3	150	8,9
4518	3	3047-1	3145	2	50	12
4519	3	3047-1	3145	2	50	11

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 six control units. This restriction applies to both connected channels (X and Y).
2. For the interconnection of two System/360 or System/370 processors (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.
6. Required for all 50-Hz and 200 V, 60-Hz World Trade machines.
7. For 3210 Model 2 adapter feature (SF #7845).
8. Order two cable groups for two-channel switch feature (SF #8100).
9. ISC is cabled the same as for normal channel interface cabling.
10. Required for 60-Hz machines.
11. Required for 200, 220, and 235 V, 50-Hz machines.
12. Required for 380 and 408 V, 50-Hz machines.
13. Required for all 50-Hz machines.

SYSTEM/370 MODEL 148, 3148 PROCESSING UNIT

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Cable Entry/Exit Number	Dimensions (Inches)	Notes
1	5 x 18	2
2	3 x 12	3
3	6 x 18	4
4	4 x 11	5

Notes:
1. Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame, not cover.
2. Signal cables.
3. Attachment cords and EPO cables.
4. ISC cables.
5. Required for 3203, 3286, or 3287 Printers.
6. Input/output controller (IOC) can be placed on either the left or right side.

Details (By Frame)

Model	*Frame*	*Weight lb (kg)* 50 Hz	60 Hz	*Airflow cfm (m^3/min)*	*Heat Output BTU/hr (kcal/hr)*	*kVA*
J, K	01	1,550 (710)	1,500 (690)	1,200 (34)	24,550 (6 200)	8.0
J, K	03	930 (430)	870 (400)	280 (8)	10,000 (2 600)	3.6
J, K	04 IOC	600 (280)	600 (280)	320 (10)	2,425 (650)	0.7

Note: See also 3047-1 and 3148 System Requirements.

SPECIFICATIONS

Dimensions:*

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

Service Clearances:

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

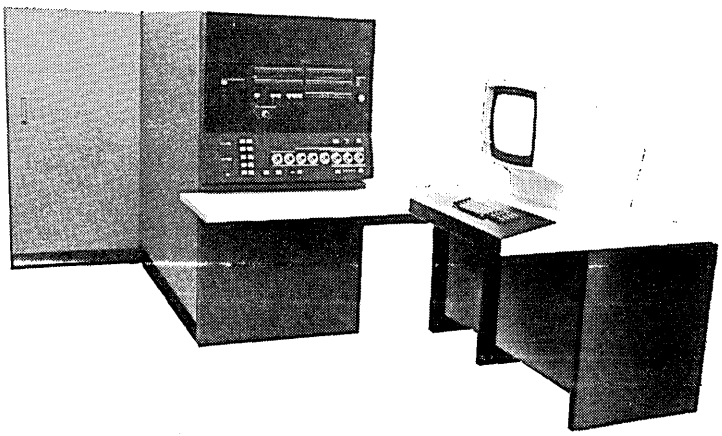
Environment, Operating:

Temperature	60°F-90°F (16°C-32°C)
Rel Humidity	20%-80%
Max Wet Bulb	73°F (23°C)

Notes:

* Removal of the side covers on frames 01 and 03 reduces the width of these units to 29-1/2 inches (75 cm). If a reduction of frame 01 length is needed, see your sales representative for method of specifying on the order. The shipping dimensions for frame 01 then become 60 inches (152 cm) long, 29-1/2 inches (75 cm) wide, and 69 inches (175 cm) high. Frame 03 shipping length can be reduced to 60 inches (152 cm) by removing the end and side covers.

** See plan view.



SYSTEM/370 MODEL 148, 3148 PROCESSING UNIT

System Requirements

kVA Power Requirements by System Unit	kVA
3047-1	6.7
3148 (Frame 01)	8.0
3148 (Frame 03)	3.6
3148 (Frame 04) IOC Only	0.7
First 3203-4 Printer	2.1
Second 3203-4 Printer	2.1
Total (Notes 1, 2)	23.2

Notes:

1. Total kVA entry is the power requirement for one 3148, one IOC, one 3047-1, and two 3203-4 Printers.
2. If SF #4660 (ISC) is not installed, these values may be reduced by 1.8 kVA.

The customer is required to provide a branch circuit connection for the 3148 frame 03. To avoid tripping the branch circuit breaker when starting the 3148, it is necessary to provide branch circuit fuse or circuit breaker protection that meets specified time/current trip characteristics. These are referred to as "motor branch circuit protection circuit breakers." Refer to Model 148 specifications (Branch Circuit Requirements) for required circuit protection specifications.

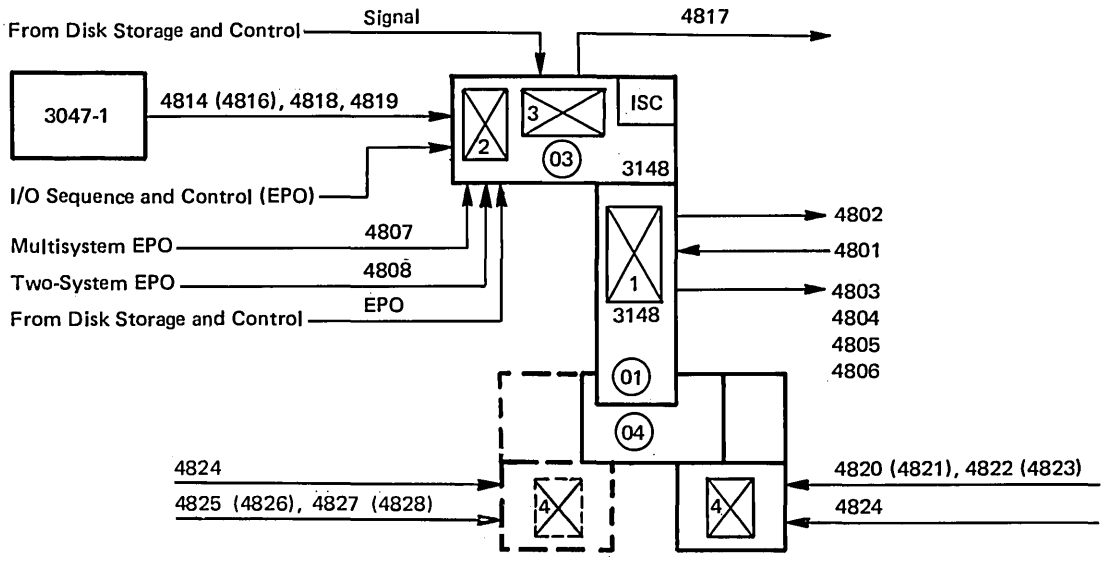
Branch Circuit Requirements

Voltage	200*	208	220**	230	235**	380**	408**
Phases	3	3	3	3	3	3	3
Ampacity	100	100	100	100	100	60	60
Protection (Cont)	100	100	100	100	100	60	60
Protection (For 1 second) or Adjustable Trip Set for Max Cont Load (A) for: 3148	600 700-1000 63	600 700-900 62	600 700-900 57	600 700-800 55	600 700-800 54	400 400-500 32	400 400-500 31
Plug Connector Receptacle	R&S, JPS1034H R&S, JCS1034H R&S, JRSR1034H						
Power Cord Style	F4		F2		F2	F2	F2

* Applies to 50-Hz and 60-Hz World Trade machines.

** Apply to 50-Hz World Trade machines.

SYSTEM/370 MODEL 148 CABLING SCHEMATIC



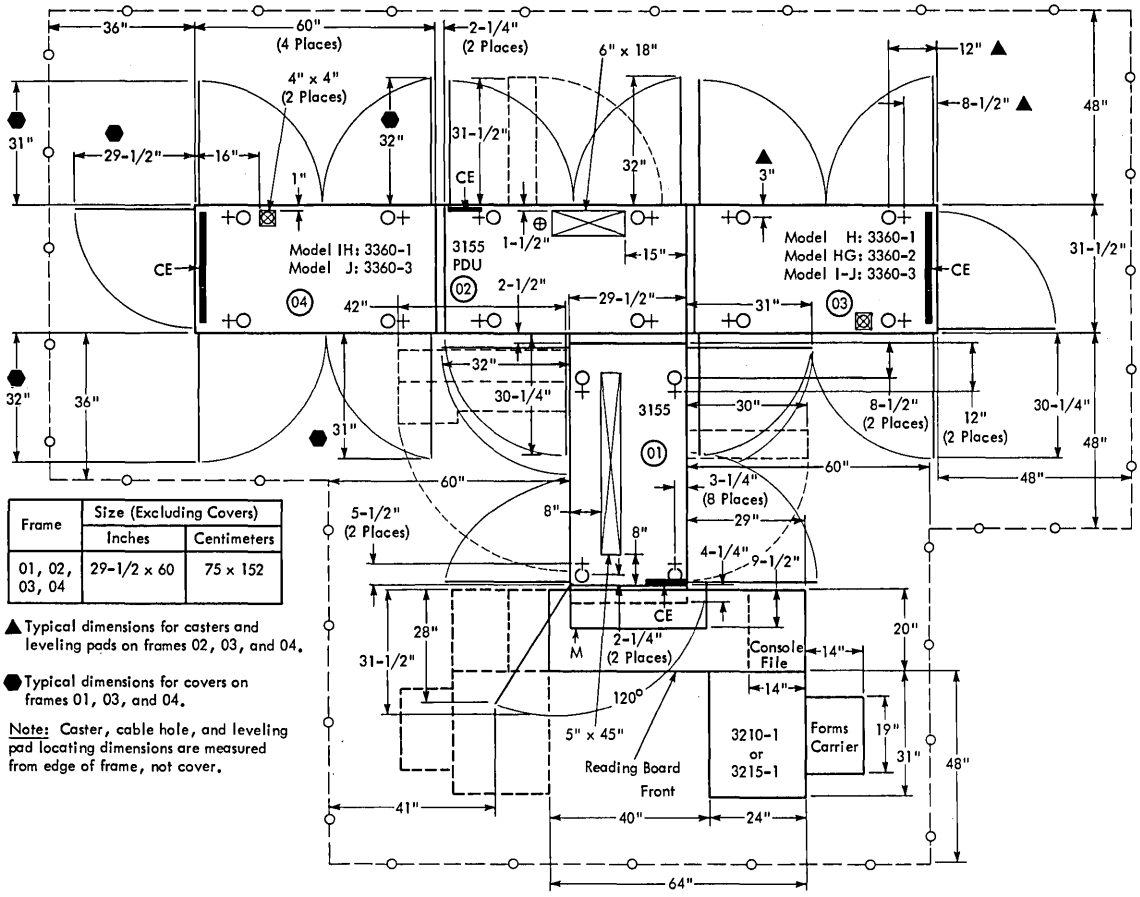
Group No.	*No. of Cables*	*From*	*To*	*Cable Entry No.*	*Max Length (ft)*	*Notes*
4801	2	Direct Control	3148	1	50	3,11
4802	1	3148	System/360 or System/370 Processor	1	100	2,11
4803	2	3148	Control Unit	1	–	1,11
4804	2	3148	Block Multiplexer Channel	1	–	1,11
4805	2	3148	Byte Multiplexer Channel	1	–	1,11
4806	2	3148	Channel-to-Channel Adapter	1	–	1,11
4807	1	3148	System/360 or System/370 Processor	2	100	5,11
4808	1	3148	System/360 or System/370 Processor	2	100	4,11
4814	3	3047-1	3148	2	50	16
(4816)	1	3047-1	3148	2	50	11,17
4817	2	3148	Processor, Channel, or Control Unit	3	150	6,7,11
4818	3	3047-1	3148	2	50	10,11
4819	3	3047-1	3148	2	50	9,11
4820 (4821)	4	3203-4	3148	4	20	8,13,15
4822 (4823)	4	3203-4 (Second Printer)	3148	4	20	8,13,15
4824	1	3286-2 or 3287	3148	4	50	12
4825 (4826)	4	3203-4	3148	4	20	8,14,15
4827 (4828)	4	3203-4 (Second Printer)	3148	4	20	8,14,15

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 six control units. This restriction applies to both connected channels (X and Y).
2. For the interconnection of two System/360 or System/370 processors (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.
6. Order two cable groups for two-channel switch feature (SF #8100).
7. ISC is cabled the same as for normal channel interface cabling.
8. For 50-Hz machines, use group number in parentheses.
9. Required for 200, 220, and 235 V, 50-Hz machines.
10. Required for 380 and 408 V, 50-Hz machines.
11. Whenever a 3148 is a direct replacement for a 3145, cable group numbers 4501 through 4519 can be used in place of cable group numbers 4801 through 4819, respectively.
12. Cable lengths over 50 feet (maximum 2,000 feet) may be ordered through the IBM Branch Office via MES (Miscellaneous Equipment Specification). Group 4824 is identical for 3286-2 or 3287 attachment.
13. Required for right-hand console.
14. Required for left-hand console.
15. SF #8075 required for first printer attached, and SF #8076 required for second printer attached.
16. For all 60-Hz machines.
17. For all 50-Hz machines.

SYSTEM/370 MODEL 155 H-J, 3155 PROCESSING UNIT

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Frame	Size (Excluding Covers)	
	Inches	Centimeters
01, 02, 03, 04	29-1/2 x 60	75 x 152

▲ Typical dimensions for casters and leveling pads on frames 02, 03, and 04.

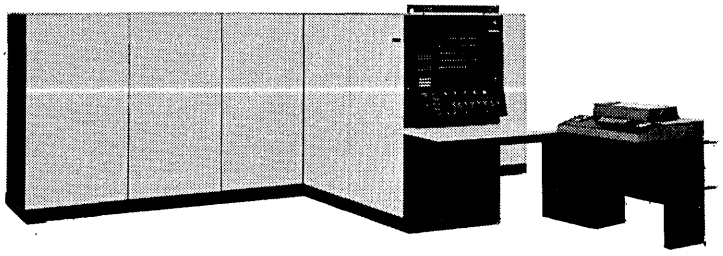
⬢ Typical dimensions for covers on frames 01, 03, and 04.

Note: Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame, not cover.

SYSTEM/370 MODEL 155 H-J, 3155 PROCESSING UNIT

Details (By Frame)

Frame	*Weight lb (kg)*	*Airflow cfm (m^3/min)*	*Heat Output BTU/hr (kcal/hr)*	*kVA*
01	1,800 (820)	1,115 (32)	11,780 (3 000)	**
02	2,810* 2,500* (1 300*)(1 150*)	1,460 (42)	32,420 (8 200)	15.0***
Console File and Table	350 (160)	0 (0)	300 (76)	**
Console Printer-Keyboard	See 3210-1 and 3215-1			**
03 04	See 3360-1, 2, and 3			†



SPECIFICATIONS

Dimensions:

	F	S	H
Inches	††	††	60
(cm)	(††)	(††)	(152)

Service Clearances:

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

Weight: 4,960 lb (2 250 kg)
4,650 lb††† (2 150 kg†††)

Heat Output: 44,500 BTU/hr (11 250 kcal/hr)

Airflow: 2,575 cfm (73 m^3/min)

Power Requirements:

kVA	15.0***
Phases	3

Frame 02 (PDU):

Plug	R&S, SC7328
Connector	R&S, SC7428
Receptacle	R&S, SC7324
Power Cord Style	E–

Notes:

* Frame 02 weight (2,810 lb [1 300 kg]) can be reduced to meet the requirements of a 2,500 lb (1 150 kg) capacity elevator.

** Receives power from 3155 frame 02.

*** For minimum-feature requirements; add 3.0 kVA for maximum-feature system.

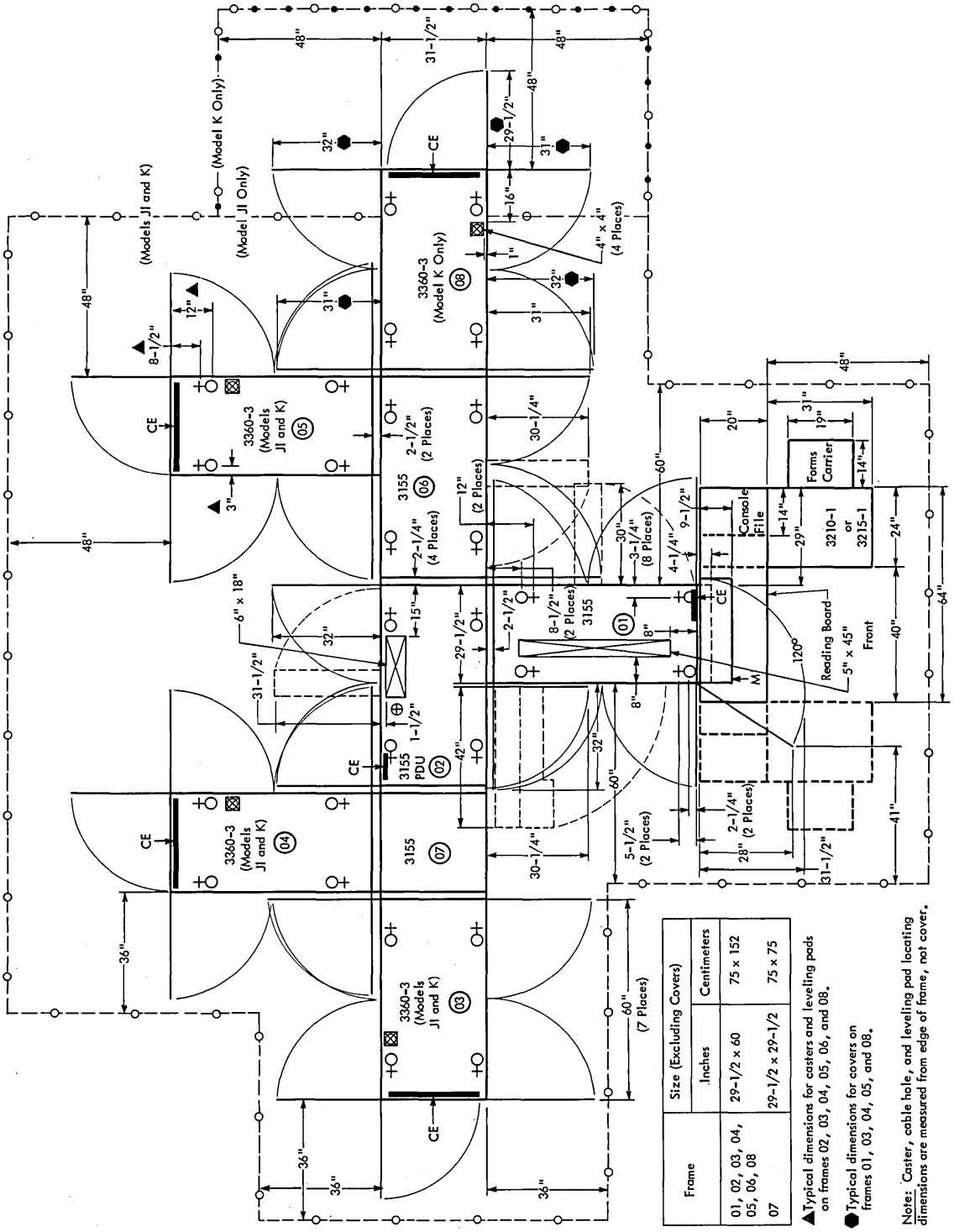
† Only one 3360 Model 1, 2, or 3 can be selected at a time. A selected machine draws 4.5 kVA; an idling (unselected) machine draws 2.5 kVA.

†† See plan view.

††† All Model H-J systems with serial numbers 10654 and above weigh approximately 4,650 lb (2 150 kg).

SYSTEM/370 MODEL 155 JI AND K, 3155 PROCESSING UNIT

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Frame	Size (Excluding Covers)	
	Inches	Centimeters
01, 02, 03, 04, 05, 06, 08	29-1/2 x 60	75 x 152
07	29-1/2 x 29-1/2	75 x 75

▲Typical dimensions for casters and leveling pads on frames 02, 03, 04, 05, 06, and 08.

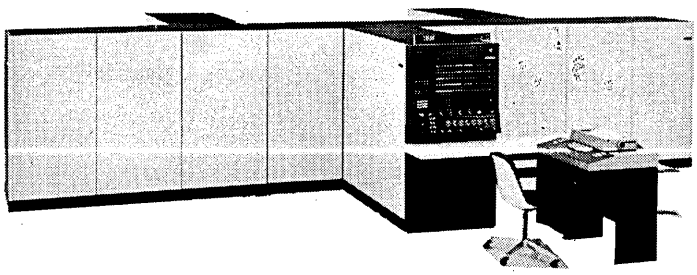
●Typical dimensions for covers on frames 01, 03, 04, 05, and 08.

Note: Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame, not cover.

SYSTEM/370 MODEL 155 JI AND K, 3155 PROCESSING UNIT

Details (By Frame)

Frame	*Weight lb (kg)*	*Airflow cfm (m^3/min)*	*Heat Output BTU/hr (kcal/hr)*	*kVA*
01	1,800 (820)	1,115 (32)	11,780 (3 000)	**
02	2,835* 2,520* (1 300*) (1 150*)	1,460 (42)	32,420 (8 200)	16.0***
Console File and Table	350 (160)	0 (0)	300 (76)	**
Console Printer-Keyboard	See 3210-1 and 3215-1			
03, 04, 05	See 3360-3			†
06	920 (420)	450 (13)	3,000 (760)	**
07	200 (91)	0 (0)	0 (0)	0
08	See 3360-3			†



SPECIFICATIONS

Dimensions:

	F	S	H
Inches	††	††	60
(cm)	(††)	(††)	(152)

Service Clearances:

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

Weight: 6,100 lb (2 800 kg)
5,800 lb††† (2 650 kg†††)

Heat Output: 47,500 BTU/hr (12 000 kcal/hr)

Airflow: 3,025 cfm (86 m^3/min)

Power Requirements:

kVA	16.0***
Phases	3

Frame 02 (PDU):

Plug	R&S, SC7328
Connector	R&S, SC7428
Receptacle	R&S, SC7324
Power Cord Style	E–

Notes:

* Frame 02 weight (2,835 lb [1 300 kg]) can be reduced to meet the requirements of a 2,500 lb (1 150 kg) capacity elevator.

** Receives power from 3155 frame 02.

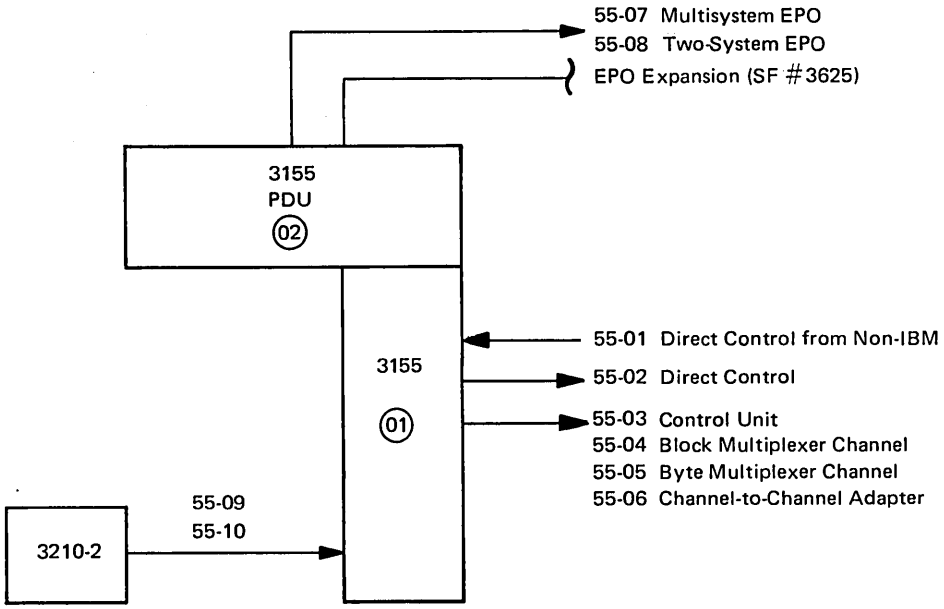
*** For minimum-feature requirements, add 3.0 kVA for maximum-feature system.

† Only one 3360 Model 1, 2, or 3 can be selected at a time. A selected machine draws 4.5 kVA; an idling (unselected) machine draws 2.5 kVA.

†† See plan view.

††† All Model JI and Model K systems with serial numbers 10654 and above weigh approximately 5,800 lb (2 650 kg).

SYSTEM/370 MODEL 155 CABLING SCHEMATIC



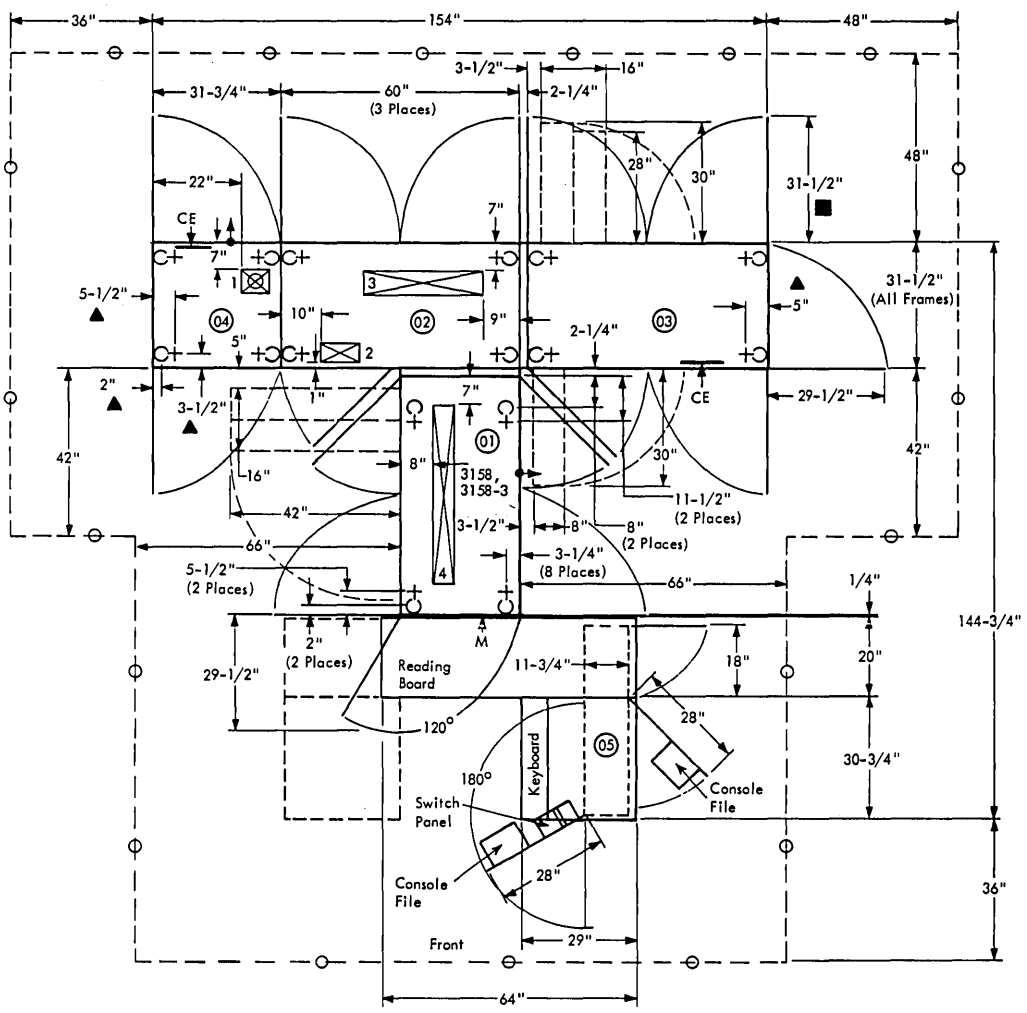
Group No.	*No. of Cables*	*From*	*To*	*Max Length (ft)*	*Notes*
55-01	2	Direct Control	3155 Fr 01	50	3
55-02	1	3155 Fr 01	System/360 or System/370 Processor	100	2
55-03	2	3155 Fr 01	Control Unit	–	1
55-04	2	3155 Fr 01	Block Multiplexer Channel	–	1
55-05	2	3155 Fr 01	Byte Multiplexer Channel	–	1
55-06	2	3155 Fr 01	Channel-to-Channel Adapter	–	1
55-07	1	3155 Fr 02	System/360 or System/370 Processor	100	5
55-08	1	3155 Fr 02	System/360 or System/370 Processor	100	4
55-09	1	3210-2	3155 Fr 01	75	7
55-10	1	3210-2	3155 Fr 01	75	6

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 or System/370 processors (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.
6. Use for all 50-Hz machines. Also required for 200 V, 60-Hz World Trade machines.
7. For 3210 Model 2 adapter feature (SF #7845).

SYSTEM/370 MODEL 158, 3158 AND 3158-3 PROCESSING UNITS

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Notes:

1. Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame, not cover.
2. EPO cables.
3. The console for the 3158 or 3158-3 Processing Unit can be placed on either the left or right side. See Model 158 Multiprocessing plan view for console configuration on left side.

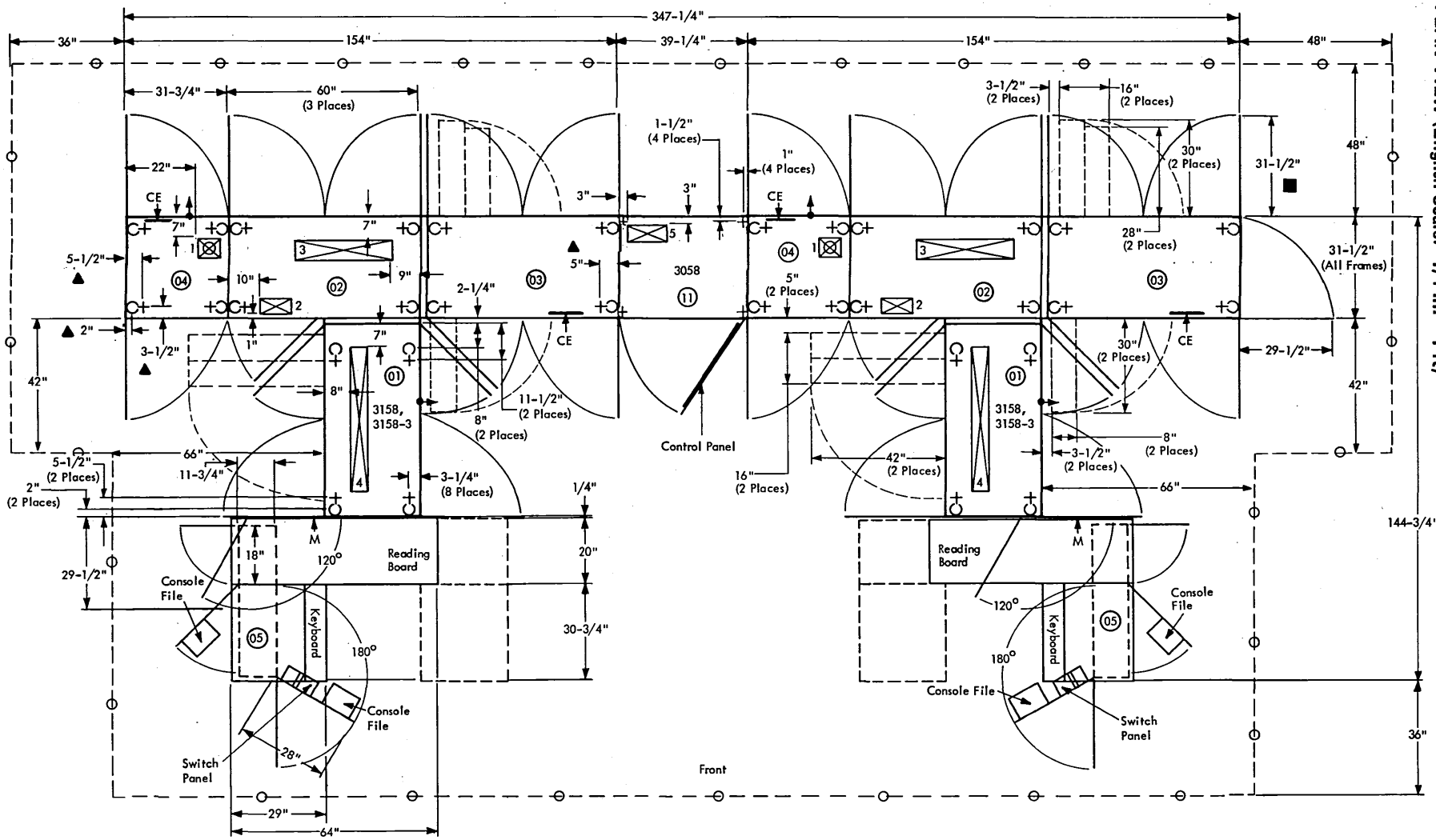
▲ Typical dimensions for casters and leveling pads on frames 02, 03, and 04.

■ Typical dimensions for covers on frames 01, 02, 03, and 04.

Cable Entry/Exit Number	Dimensions (Inches)	Notes
1	6 x 7	
2	5 x 10	2
3	6 x 30	
4	5 x 45	

SYSTEM/370 MODEL 158 MULTIPROCESSING, 3158 AND 3158-3 PROCESSING UNITS

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Notes:
1. Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame, not cover.
2. Typical dimensions for left and right 3158 or 3158-3 units.
3. EPO cables.
4. The console for the 3158 or 3158-3 Processing Unit can be placed on either the left or right side.

▲ Typical dimensions for casters and leveling pads on frames 02, 03, and 04.
■ Typical dimensions for covers on frames 01, 02, 03, and 04.

Cable Entry/Exit Number	Dimensions (Inches)	Notes
1	6 x 7	
2	5 x 10	3
3	6 x 30	
4	5 x 45	
5	5 x 12	

SYSTEM/370 MODEL 158 AND MODEL 158 MULTIPROCESSING 3158 AND 3158-3 PROCESSING UNITS

Details (By Frame)

Frame	*Model*	*Weight lb (kg)*	*Airflow cfm (m^3/min)*	*Heat Output BTU/hr (kcal/hr)*	*kVA*
01	All	1,200 (550)	900 (29)	8,500 (2 150)	*
02	All	1,150 (530)	1,300 (37)	17,600 (4 450)	*
03	I,MP1 U31,M31	1,350 (620)	1,250 (36)	11,000 (2 800)	4.0
	J,MP2 U32,M32	1,350 (620)	1,250 (36)	12,100 (3 050)	4.4
	JI,MP3 U33,M33	1,350 (620)	1,250 (36)	12,950 (3 300)	4.7
	K,MP4 U34,M34	1,350 (620)	1,250 (36)	14,050 (3 550)	5.1
	KJ,MP5 U35,M35	1,550 (710)	1,550 (44)	16,800 (4 250)	6.1
	L,MP6 U36,M36	1,550 (710)	1,550 (44)	18,150 (4 600)	6.6
	LJ U37,M37	1,550 (710)	1,550 (44)	21,000 (5 300)	7.6
	LK U38,M38	1,550 (710)	1,550 (44)	22,300 (5 650)	8.1
04	All	1,200 (550)	880 (25)	13,000 (3 300)	13.7
05	All	600 (280)	125 (4)	3,000 (760)	*
11 3058	MP Only	400 (190)	0 (0)	Negligible	Negligible
Printer: See 3213 specifications page					

Details (By Model)

Model	*Weight lb (kg)*	*Airflow cfm (m^3/min)*	*Heat Output BTU/hr (kcal/hr)***	*kVA***
I,MP1 U31,M31	5,500 (2 500)	4,455 (130)	53,100 (13 400)	17.7
J,MP2 U32,M32	5,500 (2 500)	4,455 (130)	54,200 (13 700)	18.1
JI,MP3 U33,M33	5,500 (2 500)	4,455 (130)	55,050 (13 900)	18.4
K,MP4 U34,M34	5,500 (2 500)	4,455 (130)	56,150 (14 150)	18.8
KJ,MP5 U35,M35	5,700 (2 600)	4,755 (140)	58,900 (14 850)	19.8
L,MP6 U36,M36	5,700 (2 600)	4,755 (140)	60,250 (15 200)	20.3
LJ U37,M37	5,700 (2 600)	4,755 (140)	63,100 (15 950)	21.3
LK U38,M38	5,700 (2 600)	4,755 (140)	64,400 (16 250)	21.8

SPECIFICATIONS

Dimensions:

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

Service Clearances:

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

Power Requirements:*

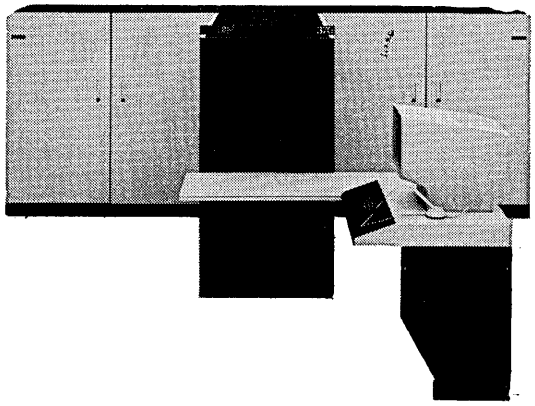
Phases	3
Plug	R&S, JPS1034H
Connector	R&S, JCS1034H
Receptacle	R&S, JRSR1034H
Power Cord Style	F2

Notes:

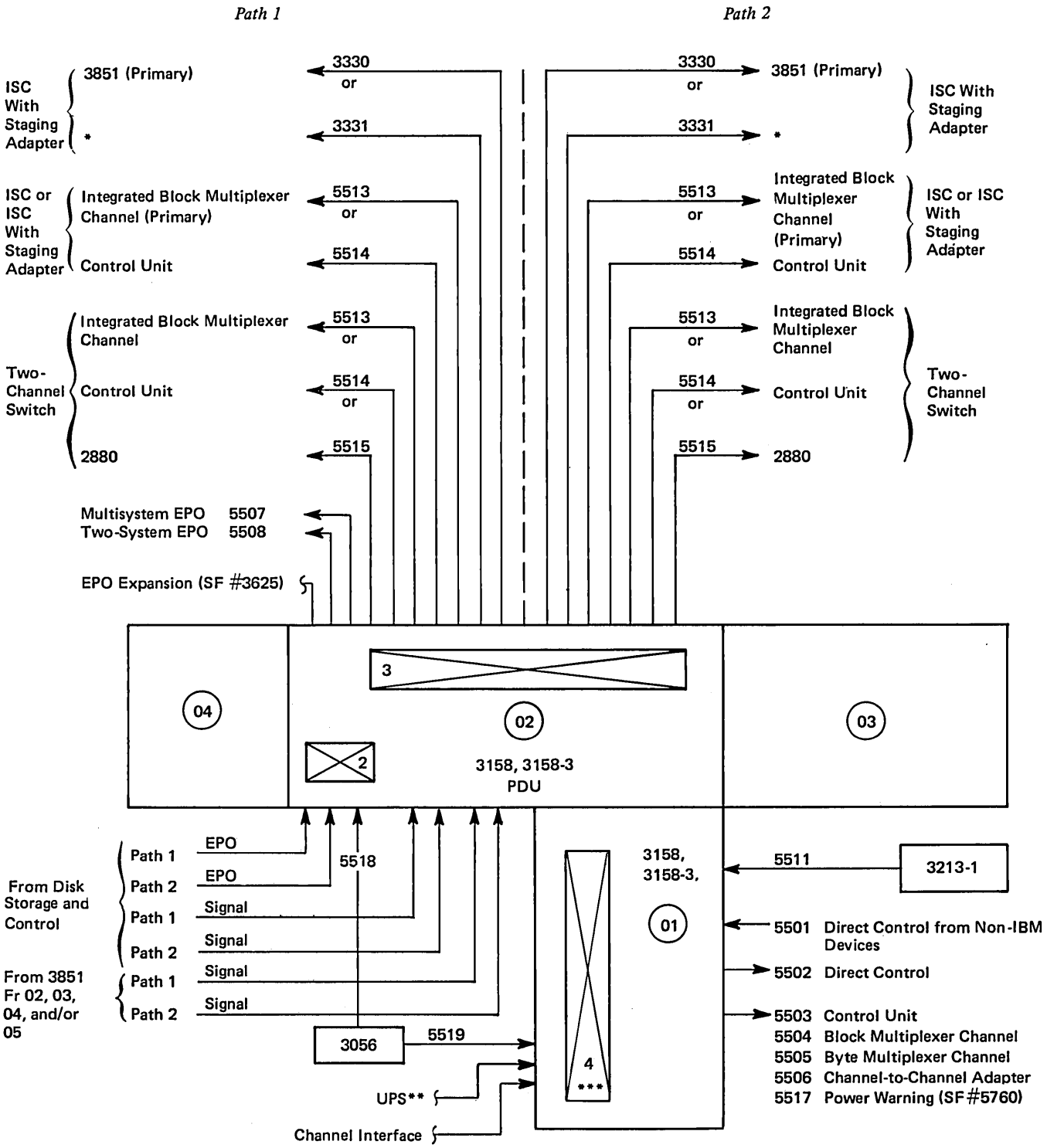
* Frames 01, 02, 03, and 05 receive power from 3158 or 3158-3 frame 04.

** Includes 3.2 kVA and 10,000 BTU/hr (2 550 kcal/hr) for ISC, SF #4650.

*** See plan view.

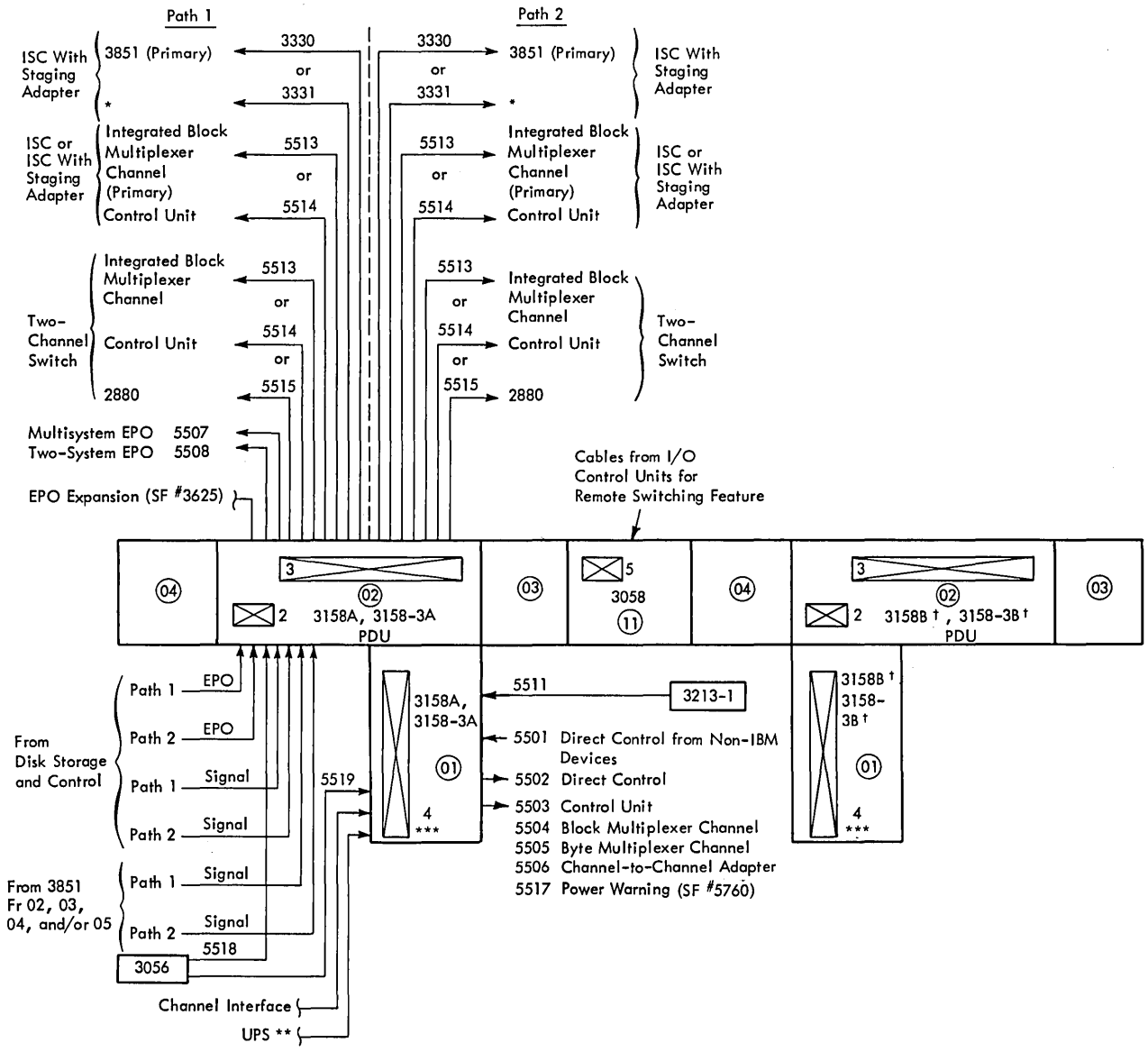


SYSTEM/370 MODEL 158 CABLING SCHEMATIC



*See 3331 in cable group listing for possible attachments.
**UPS (Uninterrupted Power Supply) detector cable is customer supplied. (See Note 10.)
***For systems installed in U.S. and Canada, integrated data adapter cable (provided with the system) enters cable entry in frame 01. Data Access Arrangement (DAA) must be within 50 feet of cable entry in frame 01.

SYSTEM/370 MODEL 158 MULTIPROCESSING CABLING SCHEMATIC



* See 3331 in cable group listing for possible attachments.

** UPS (Uninterrupted Power Supply) detector cable is customer supplied. Only one UPS connection required to either 3158A, 3158-3A, 3158B, or 3158-3B. (See Note 10.)

*** For systems installed in U.S. and Canada, integrated data adapter cable (provided with the system) enters cable entry in frame 01. Data Access Arrangement (DAA) must be within 50 feet of cable entry in frame 01.

† Cabling for 3158B or 3158-3B configuration is the same as for 3158A or 3158-3A.

SYSTEM/370 MODEL 158 AND MODEL 158 MULTIPROCESSING CABLING SCHEMATIC

Group No.	*No. of Cables*	*From*	*To*	*Cable Hole No. Entry/Exit*	*Max Length (ft)*	*Notes*
3330	2	3158 or 3158-3 Fr 02	3851 (Primary) Fr 01	–/3	–	8,13
3331	2	3158 or 3158-3 Fr 02	3158 or 3158-3 Fr 02, 3168 or 3168-3 Fr 02, 3830-3, or 3851 #2 Fr 01	–/3	–	8,13
5501	2	Direct Control	3158 or 3158-3 Fr 01	4/–	50	3
5502	1	3158 or 3158-3 Fr 01	System/360 or System/370 Processor	–/4	100	2
5503	2	3158 or 3158-3 Fr 01	Control Unit	–/4	–	1
5504	2	3158 or 3158-3 Fr 01	Block Multiplexer Channel	–/4	–	1
5505	2	3158 or 3158-3 Fr 01	Byte Multiplexer Channel	–/4	–	1
5506	2	3158 or 3158-3 Fr 01	Channel-to-Channel Adapter	–/4	–	1
5507	1	3158 or 3158-3 Fr 02	System/360 or System/370 Processor	–/2	100	5
5508	1	3158 or 3158-3 Fr 02	System/360 or System/370 Processor	–/2	100	4,7
5511	2	3213-1	3158 or 3158-3 Fr 01	4/–	50	6
5513	2	3158 or 3158-3 Fr 02	Integrated Block Multiplexer Channel	4/3	–	8,9
5514	2	3158 or 3158-3 Fr 02	Control Unit	–/3	–	8,9
5515	2	3158 or 3158-3 Fr 02	2880	–/3	–	8,9
5517	1	3158 or 3158-3 Fr 01	3158 or 3158-3 Fr 01 or 3066-2	–/4	100	10
5518	2	3056	3158 or 3158-3 Fr 02	2/–	200	11,12
5519	1	3056	3158 or 3158-3 Fr 01	4/–	200	12

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 or System/370 processors (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. Required for connection to a System/370 Model 158 Attached Processor.
6. SF #7840 is required on 3158 or 3158-3.
7. On replacement systems, check cable group numbers to frame 02 to ensure that "X" dimension is still adequate to allow for cutout relocation.
8. The following cable groups are required for SF #4650, SF #7220, and SF #7905:

Integrated Storage Controls (ISC), SF #4650		*ISC, SF #4650, With Staging Adapter, SF #7220*	
Path 1	*Path 2*	*Path 1*	*Path 2*
5513 or 5514	Additional 5513 or 5514	3330 or 3331 *and* 5513 or 5514	Additional 3330 or 3331 *and* additional 5513 or 5514
With Two-Channel Switch, SF #7905		*With Two-Channel Switch, SF #7905*	
5513, 5514, or 5515	Additional 5513, 5514, or 5515	5513, 5514, or 5515	Additional 5513, 5514, or 5515

9. The 3158 or 3158-3 frame 02 must be within a maximum length of 150 feet of the block multiplexer channel entry. With SF#9318 or #9319 installed, the maximum length is increased to 280 feet when the 3158 or 3158-3 frame 02 is attached to a 2880 and 250 feet when attached to a block multiplexer channel of a 3031, 3032, or 3033. The increased length must be reduced by 15 feet for each control unit or additional ISC connected between the ISC and the channel.

SYSTEM/370 MODEL 158 AND MODEL 158 MULTIPROCESSING CABLING SCHEMATIC

Notes: (Continued)

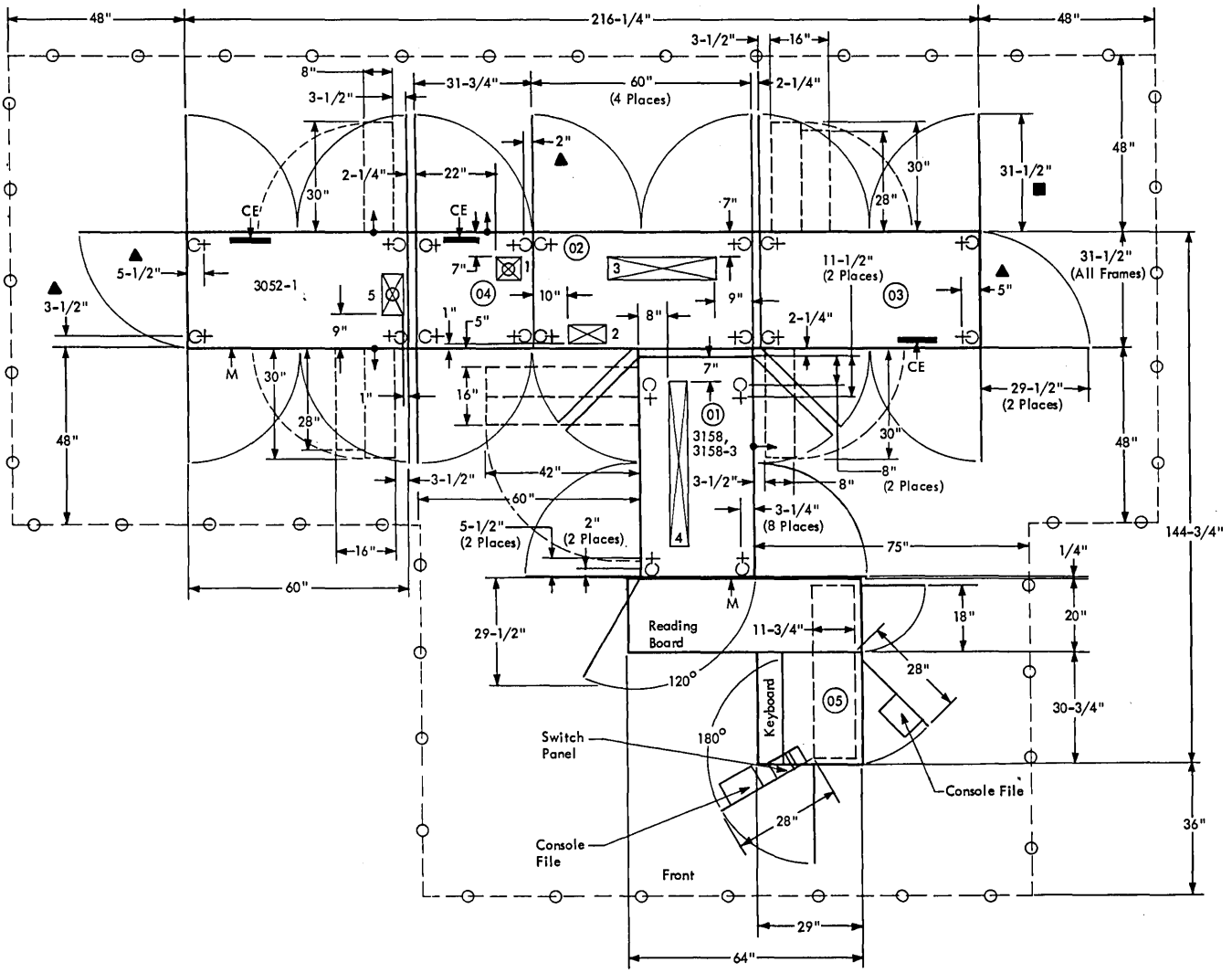
10. Required for multiple system connections when SF #5760 is installed. (See *A Guide to 60 Hertz UPS Selection*, GA27-2770, or *A Guide to 50 Hertz UPS Selection*, GA27-2771.) See the following chart for possible connections:

Configuration	*Cables Required*	*Maximum Total Cumulative Length (ft)*
One System	UPS cable (customer supplied)	500
Two Systems	UPS cable plus one group 5517 or 6590 (Model 168)	416
Three Systems	UPS cable plus two group 5517s or two group 6590s (Model 168) or one of each	388

11. Power sequence and control (EPO) for 3056.
12. For SF #7820 (3056 attachment).
13. Maximum cumulative cable length of 300 feet is available to attach seven devices to the standard port of the 3851 or eight devices to an optional port of the 3851. The most remote 3158 or 3158-3 controlling the 3333, 3330, and/or 3350 containing control information for the mass storage system must be within 150 feet. See "General Cabling Schematics" under "3850 Mass Storage System" in GC22-7064 for additional information.

SYSTEM/370 MODEL 158 ATTACHED PROCESSOR
3158 AND 3158-3 PROCESSING UNITS

PLAN VIEW (WITH 3052 ATTACHED PROCESSING UNIT MODEL 1) (English Scale: 1/4 in. = 1 ft)



Notes:
1. Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame, not cover.
2. EPO cables.
3. The console for the 3158 or 3158-3 Processing Unit can be placed on either the left or right side. See Model 158 Multiprocessing plan view for console configuration on left side.
4. For 3158 or 3158-3 cabling, see "System/370 Model 158 Cabling Schematic."

▲ Typical dimensions for casters and leveling pads on frames 02, 03, 04, and 3052.

■ Typical dimensions for covers on frames 01, 02, 03, 04, and 3052.

Cable Entry/Exit Number	Dimensions (Inches)	Notes
1	6 x 7	
2	5 x 10	2
3	6 x 30	
4	5 x 45	
5	6 x 11	

SYSTEM/370 MODEL 158 ATTACHED PROCESSOR
3158 AND 3158-3 PROCESSING UNITS

Details (By Frame)

Frame	*Model*	*Weight lb (kg)*	*Airflow cfm (m^3/min)*	*Heat Output BTU/hr (kcal/hr)*	*kVA*
01	All	1,200 (550)	900 (29)	8,500 (2 150)	*
02	All	1,150 (530)	1,300 (37)	17,600 (4 450)	*
03	AP1,A31	1,350 (620)	1,250 (36)	11,000 (2 800)	4.0
	AP2,A32	1,350 (620)	1,250 (36)	12,100 (3 050)	4.4
	AP3,A33	1,350 (620)	1,250 (36)	12,950 (3 300)	4.7
	AP4,A34	1,350 (620)	1,250 (36)	14,050 (3 550)	5.1
	AP5,A35	1,550 (710)	1,550 (44)	16,800 (4 250)	6.1
	AP6,A36	1,550 (710)	1,550 (44)	18,150 (4 600)	6.6
	AP7,A37	1,550 (710)	1,550 (44)	21,000 (5 300)	7.6
	AP8,A38	1,550 (710)	1,550 (44)	22,300 (5 650)	8.1
04	All	1,200 (550)	880 (25)	13,000 (3 300)	13.7
05	All	600 (280)	125 (4)	3,000 (760)	*
Attached Processing Unit: See 3052 specification page					
Remote System Console: See 3056 specification page					

Details (By Model)

Model	*Weight lb (kg)*	*Airflow cfm (m^3/min)*	*Heat Output BTU/hr (kcal/hr)* **	*kVA* **
AP1,A31	5,500 (2 500)	4,455 (130)	53,100 (13 400)	17.7
AP2,A32	5,500 (2 500)	4,455 (130)	54,200 (13 700)	18.1
AP3,A33	5,500 (2 500)	4,455 (130)	55,050 (13 900)	18.4
AP4,A34	5,500 (2 500)	4,455 (130)	56,150 (14 150)	18.8
AP5,A35	5,700 (2 600)	4,755 (140)	58,900 (14 850)	19.8
AP6,A36	5,700 (2 600)	4,755 (140)	60,250 (15 200)	20.3
AP7,A37	5,700 (2 600)	4,755 (140)	63,100 (15 950)	21.3
AP8,A38	5,700 (2 600)	4,755 (140)	64,400 (16 250)	21.8
Attached Processing Unit: See 3052 specification page				
Remote System Console: See 3056 specification page				

SPECIFICATIONS

Dimensions:

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

Service Clearances:

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

Power Requirements :*

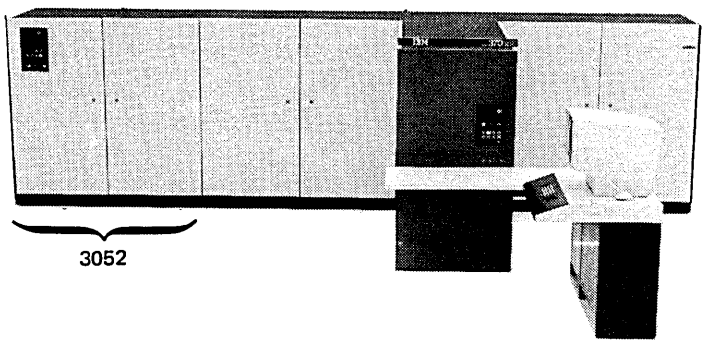
Phases	3
Plug	R&S, JPS1034H
Connector	R&S, JCS1034H
Receptacle	R&S, JRSR1034H
Power Cord Style	F2

Notes:

* Frames 01, 02, 03, and 05 receive power from 3158 or 3158-3 frame 04. See 3052 and 3056 specification pages for their respective power requirements.

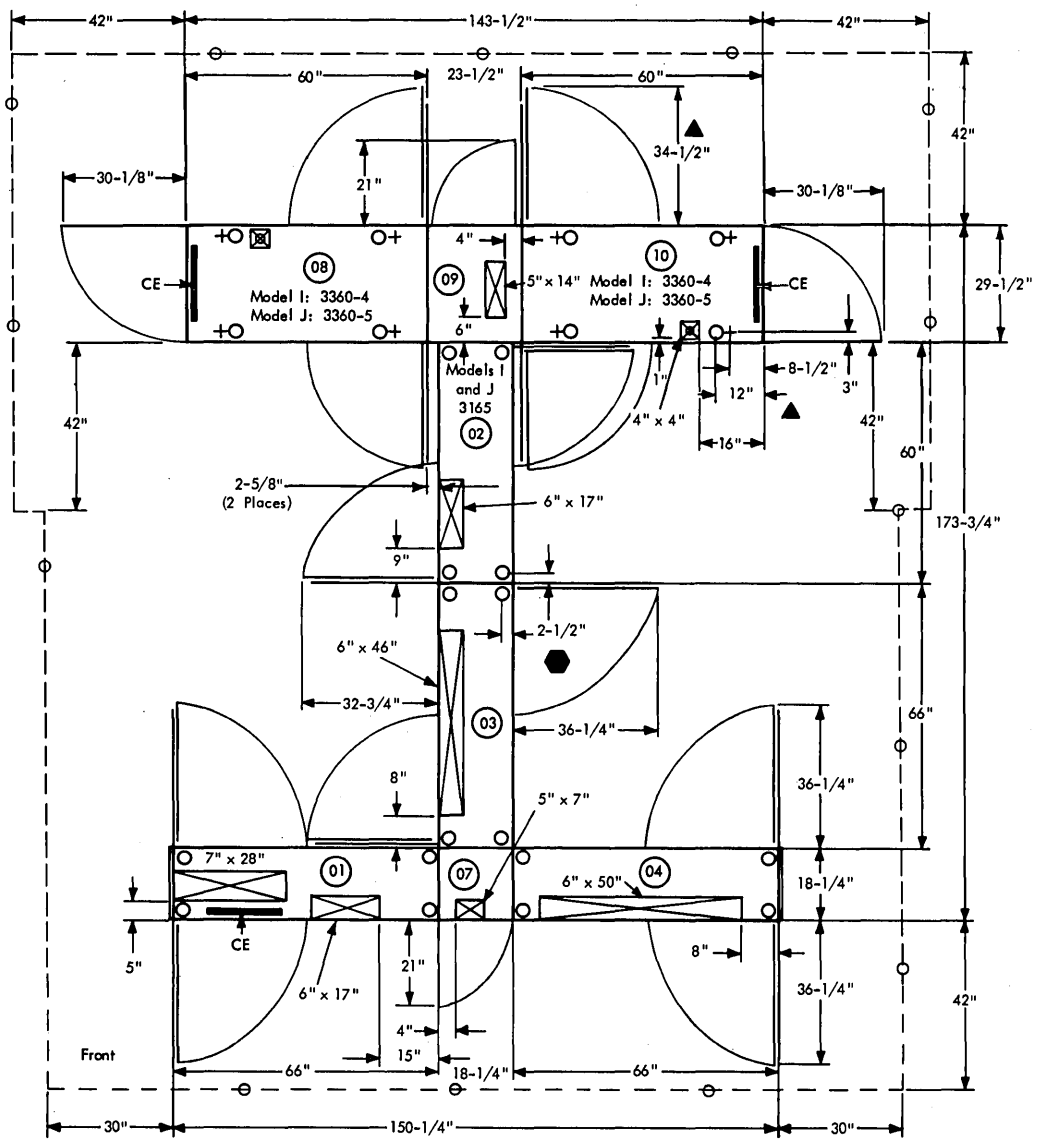
** Includes 3.2 kVA and 10,000 BTU/hr (2 550 kcal/hr) for ISC, SF #4650.

*** See plan view.



SYSTEM/370 MODEL 165 I AND J, 3165 PROCESSING UNIT

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



▲ Typical dimensions on frames 08 and 10. Width of frames is 29-1/2", with covers 32".

⬢ Typical dimensions on frames 01, 02, 03, and 04.

Note: Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame, not cover.

SYSTEM/370 MODEL 165 I AND J, 3165 PROCESSING UNIT

Details (By Frame)

Frame	Weight lb (kg)	Airflow cfm (m^3/min)	Heat Output BTU/hr (kcal/hr)	
			To Air	To Water
01	1,260 (580)	250 (8)	5,300 (1 350)	74,090 (18 700)
02	990 (450)	395 (12)	6,910 (1 750)	8,950 (2 300)
03	1,300 (590)	500 (15)	11,240 (2 850)	20,560 (5 200)
04	1,310 (600)	500 (15)	10,720 (2 750)	18,770 (4 750)
07	–	–	–	–
08	See 3360-4, 5			
09	–	–	–	–
10	See 3360-4, 5			

SPECIFICATIONS

Dimensions:

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

Service Clearances:

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

Weight: 4,860 lb (2 250 kg) (Processor only)

Heat Output:***

Air 34,170 BTU/hr (8 650 kcal/hr)
Water 122,370 BTU/hr (30 850 kcal/hr)

Airflow: 1,645 cfm (47 m^3/min)

Power Requirements:

Frames 01, 02, 03, and 04 receive power from the 3067 PCDU Model 1 (frame 15).†

Environment, Operating

Temperature 65°F-90°F (18°C-32°C)
Rel Humidity 20%-80%
Max Wet Bulb 72°F (22°C)††

Environment, Nonoperating:

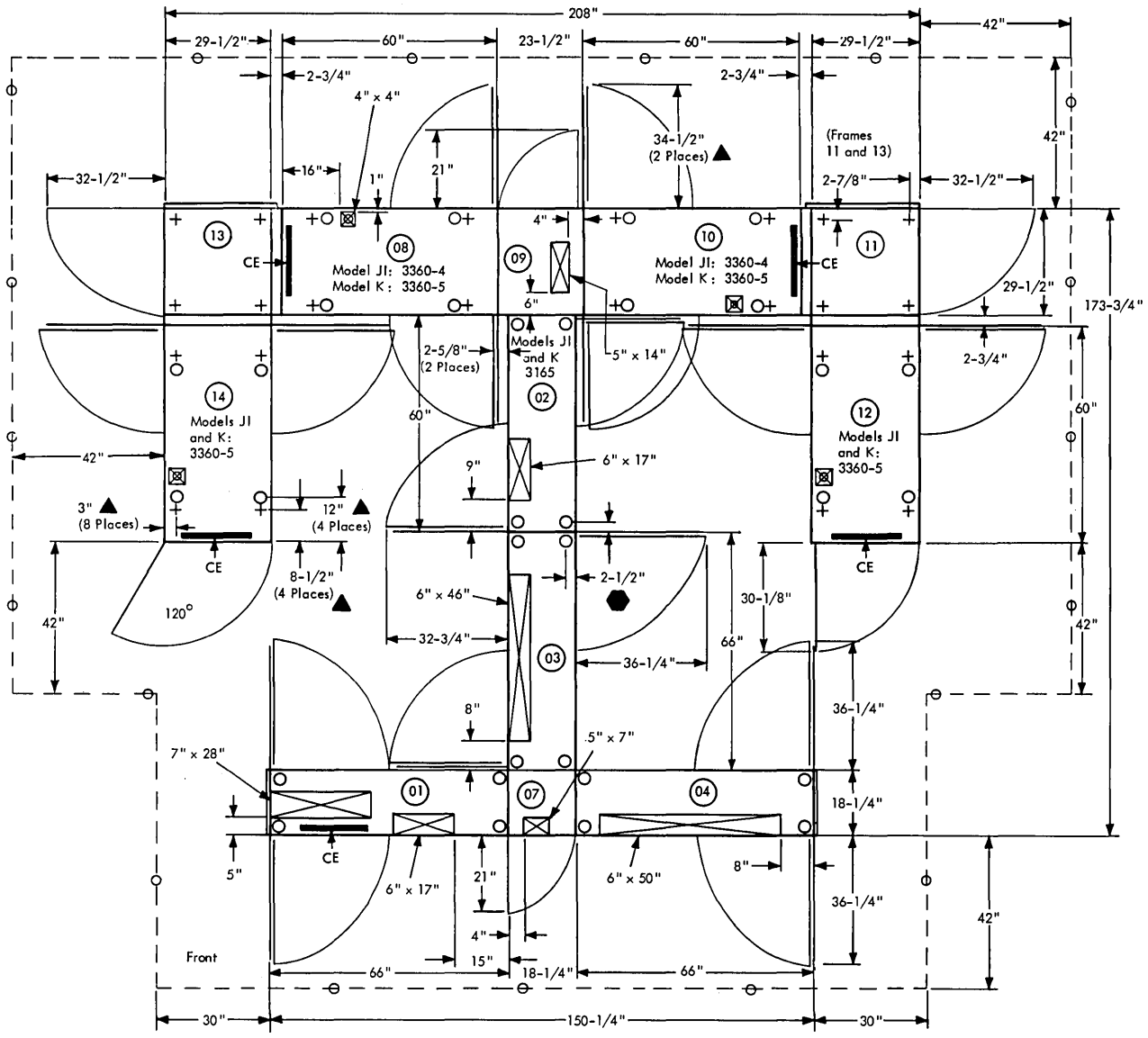
Temperature 50°F-110°F (10°C-43°C)
Rel Humidity 8%-80%
Max Wet Bulb 80°F (27°C)††

Notes:

* See plan view.
** 70 inches (178 cm) for frames 08, 09, and 10.
*** For maximum-feature system, add 5,060 BTU/hr (1 300 kcal/hr) to air and 12,530 BTU/hr (3 200 kcal/hr) to water.
† The 3360 Model 4 or 5 machines are selected two at a time (max). A selected machine draws 4.6 kVA; an idling (unselected) machine draws 2.8 kVA.
†† See "Liquid Coolant System" in Appendix A.

SYSTEM/370 MODEL 165 JI AND K, 3165 PROCESSING UNIT

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



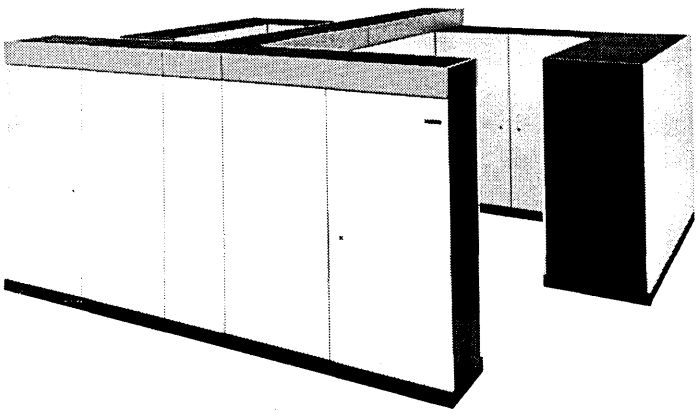
▲ Typical dimensions on frames 08, 10, 12, and 14. Width of frames is 29-1/2", with covers 32".

⬢ Typical dimensions on frames 01, 02, 03, and 04.

Note: Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame, not cover.

Details (By Frame)

Frame	Weight lb (kg)	Airflow cfm (m^3/min)	Heat Output BTU/hr (kcal/hr)	
			To Air	To Water
01	1,260 (580)	250 (8)	5,300 (1 350)	74,090 (18 700)
02	990 (450)	395 (12)	6,910 (1 750)	8,950 (2 300)
03	1,300 (590)	500 (15)	11,240 (2 850)	20,560 (5 200)
04	1,310 (600)	500 (15)	10,720 (2 750)	18,770 (4 750)
07	–	–	–	–
08	See 3360-4, 5			
09	–	–	–	–
10	See 3360-4, 5			
11	300 (140)	–	–	–
12	See 3360-5			
13	300 (140)	–	–	–
14	See 3360-5			



SPECIFICATIONS

Dimensions:

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

Service Clearances:

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

Weight: 5,460 lb (2 500 kg) (Processor only)

Heat Output:***

Air 34,170 BTU/hr (8 650 kcal/hr)
Water 122,370 BTU/hr (30 850 kcal/hr)

Airflow: 1,645 cfm (47 m^3/min)

Power Requirements:

Frames 01, 02, 03, and 04 receive power from the 3067 PCDU Model 1 (frame 15).†

Environment, Operating:

Temperature 65°F-90°F (18°C-32°C)
Rel Humidity 20%-80%
Max Wet Bulb 72°F (22°C)††

Environment, Nonoperating:

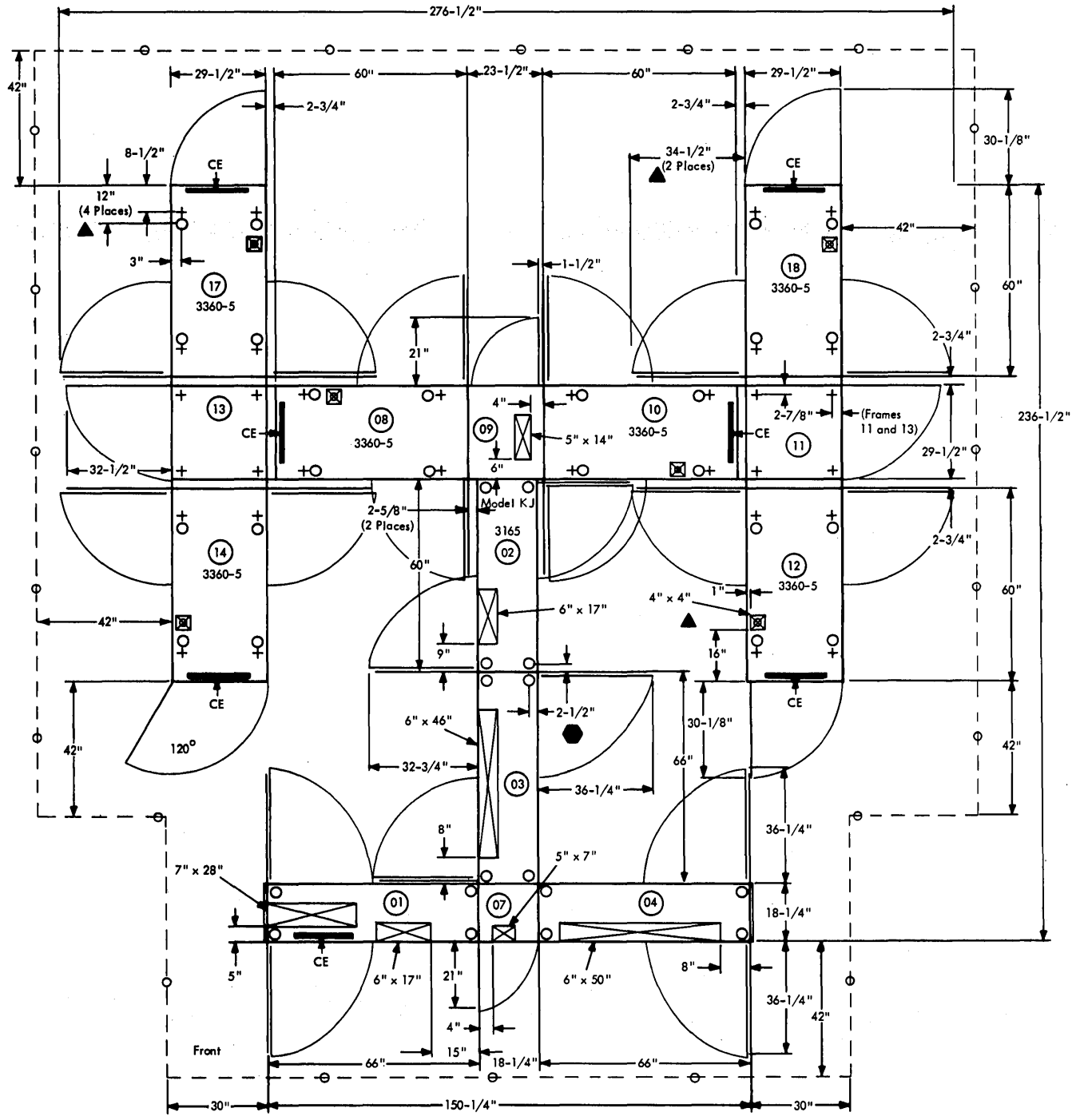
Temperature 50°F-110°F (10°C-43°C)
Rel Humidity 8%-80%
Max Wet Bulb 80°F (27°C)††

Notes:

* See plan view.
** 70 inches (178 cm) for frames 08 through 14.
*** For maximum-feature system, add 5,060 BTU/hr (1 300 kcal/hr) to air and 12,530 BTU/hr (3 200 kcal/hr) to water.
† The 3360 Model 4 or 5 machines are selected two at a time (max). A selected machine draws 4.6 kVA; an idling (unselected) machine draws 2.8 kVA.
†† See "Liquid Coolant System" in Appendix A.

SYSTEM/370 MODEL 165 KJ, 3165 PROCESSING UNIT

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



▲ Typical dimensions on frames 08, 10, 12, 14, 17, and 18. Width of frames is 29-1/2", with covers 32".

⬢ Typical dimensions on frames 01, 02, 03, and 04.

Note: Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame, not cover.

Details (By Frame)

Frame	Weight lb (kg)	Airflow cfm (m^3/min)	Heat Output BTU/hr (kcal/hr)	
			To Air	To Water
01	1,260 (580)	250 (8)	5,300 (1 350)	74,090 (18 700)
02	990 (450)	395 (12)	6,910 (1 750)	8,950 (2 300)
03	1,300 (590)	500 (15)	11,240 (2 850)	20,560 (5 200)
04	1,310 (600)	500 (15)	10,720 (2 750)	18,770 (4 750)
07	–	–	–	–
08	See 3360-5			
09	–	–	–	–
10	See 3360-5			
11	300 (140)	–	–	–
12	See 3360-5			
13	300 (140)	–	–	–
14, 17, 18	See 3360-5			

SPECIFICATIONS

Dimensions:

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

Service Clearances:

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

Weight: 5,460 lb (2 500 kg) (Processor only)

Heat Output:***

Air 34,170 BTU/hr (8 650 kcal/hr)
Water 122,370 BTU/hr (30 850 kcal/hr)

Airflow: 1,645 cfm (47 m^3/min)

Power Requirements:

Frames 01, 02, 03, and 04 receive power from the 3067 PCDU Model 1 (frame 15).†

Environment, Operating:

Temperature 65°F-90°F (18°C-32°C)
Rel Humidity 20%-80%
Max Wet Bulb 72°F (22°C)††

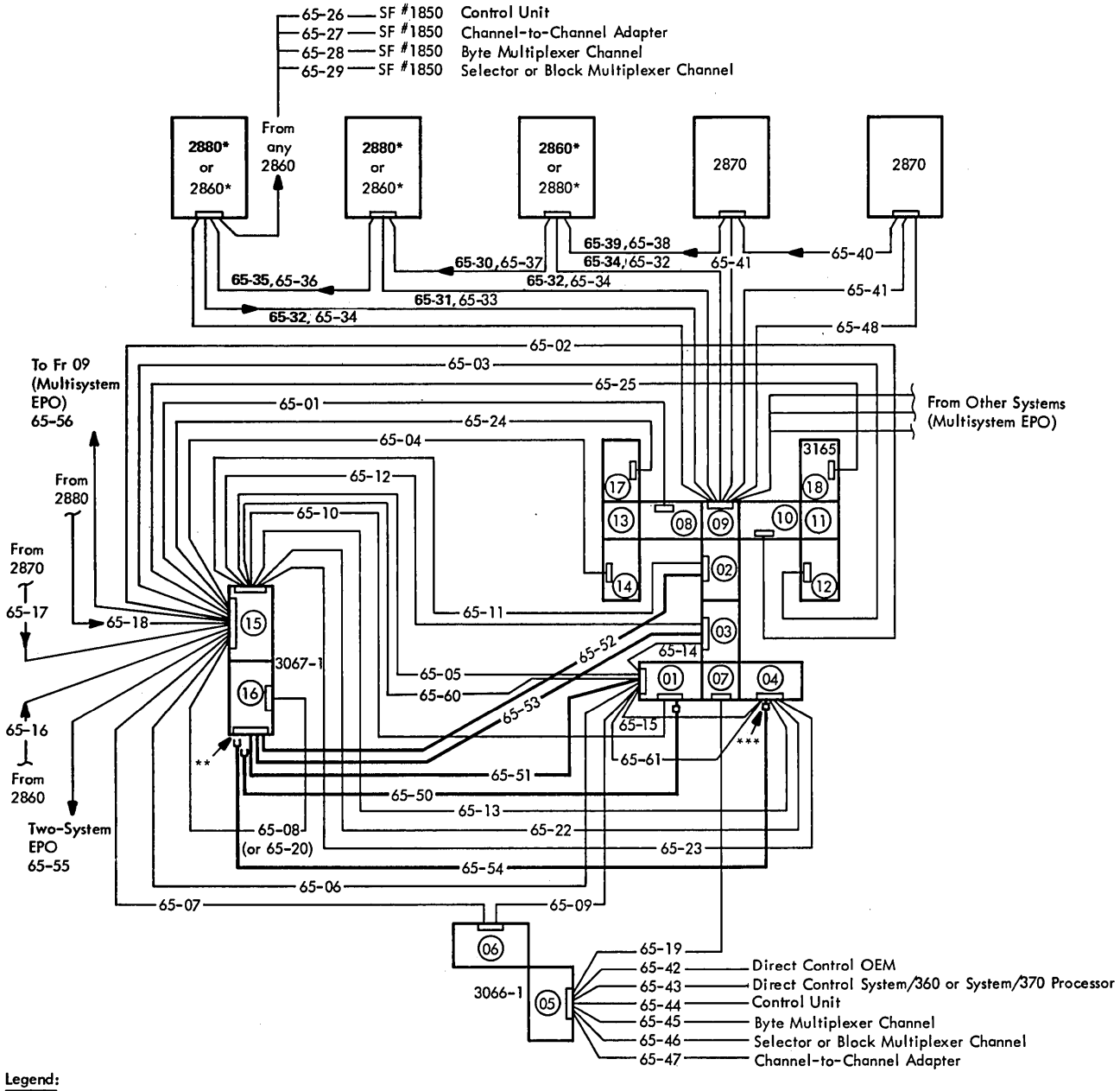
Environment, Nonoperating:

Temperature 50°F-110°F (10°C-43°C)
Rel Humidity 8%-80%
Max Wet Bulb 80°F (27°C)††

Notes:

* See plan view.
** 70 inches (178 cm) for frames 08 through 14, 17, and 18.
*** For maximum-feature system, add 5,060 BTU/hr (1 300 kcal/hr) to air and 12,530 BTU/hr (3 200 kcal/hr) to water.
† The 3360 Model 5 machines are selected two at a time (max). A selected machine draws 4.6 kVA; an idling (unselected) machine draws 2.8 kVA.
†† See "Liquid Coolant System" in Appendix A.

SYSTEM/370 MODEL 165 CABLING AND COOLANT HOSE SCHEMATIC



Legend:

——— Coolant Hoses. (Only supply hoses are shown; assume one return hose for each supply hose.)

——— Cables

*Where two machine units are represented by the same schematic block, the BOLDFACE machine designations in the top portion of the block is keyed to the BOLDFACE cable group number on the line representing the cable. The machine designation in the lower portion of the block is keyed to the second group number on the line. For example, **2880** to **2880** is associated with **65-35**; 2860 to 2860 is associated with 65-36. Note that the cabling schematic only shows the appropriate cable groups required between channel frames; the number and type of cable groups to be ordered depend on the system configuration.

**Quick-connect sockets are on supply hoses at 3067-1 CDU end. Quick-connect plugs are on return hoses at 3067-1 CDU end.

***Quick-connect plugs are on supply hoses at end away from 3067-1 CDU. Quick-connect sockets are on return hoses at end away from 3067-1 CDU.

SYSTEM/370 MODEL 165 CABLING AND COOLANT HOSE SCHEMATIC

Cables

Group No.	*No. of Cables*	*From*	*Frame No.*	*To*	*Frame No.*	*Max Length (ft)*	*Notes*
65-01	1	3067-1	15	3165	08	100	–
65-02	1	3067-1	15	3165	10	100	–
65-03	1	3067-1	15	3165	12	100	–
65-04	1	3067-1	15	3165	14	100	–
65-05	12	3067-1	15	3165	01	40	2
65-06	3	3067-1	15	3165	01	40	2
65-07	5	3067-1	15	3066-1	06	100	2
65-08 (or 65-20)	2	3067-1	15	3067-1	16	15	2, 19
65-09	1	3066-1	06	3165	01	100	–
65-10	3	3067-1	15	3165	01	40	2
65-11	2	3067-1	15	3165	02	40	2
65-12	5	3067-1	15	3165	03	40	2
65-13	4	3067-1	15	3165	04	40	2
65-14	3	3165	01	3165	03	10	2
65-15	3	3165	01	3165	04	14	2
65-16	1	2860	–	3067-1	15	150	1
65-17	1	2870	–	3067-1	15	150	1
65-18	1	2880	–	3067-1	15	150	1
65-19	14	3066-1	05	3165	07	30	–
65-22	1	3067-1	15	3165	04	40	2, 4
65-23	1	3067-1	15	3165	04	40	2, 17
65-24	1	3067-1	15	3165	17	100	–
65-25	1	3067-1	15	3165	18	100	–
65-26	2	2860	–	Control Unit		–	7, 10
65-27	2	2860	–	Channel-to-Channel Adapter		–	7, 9, 10
65-28	2	2860	–	Byte Multiplexer Channel		–	7, 10
65-29	2	2860	–	Selector or Block Multiplexer Channel		–	7, 10
65-30	13	2860	–	2880	–	20	12, 14
65-31	13	2880	–	3165	09	25	12, 14
65-32	1	2880	–	3165	09	–	6, 13, 14, 18
65-33	13	2860	–	3165	09	25	12, 14
65-34	1	2860	–	3165	09	–	6, 13, 14
65-35	13	2880	–	2880	–	20	12, 14
65-36	13	2860	–	2860	–	20	12, 14
65-37	13	2880	–	2860	–	20	12, 14
65-38	13	2870	–	2880	–	20	12, 14
65-39	13	2870	–	2860	–	20	12, 14
65-40	13	2870	–	2870	–	20	12, 14
65-41	1	2870	–	3165	09	–	13, 14
65-42	2	Direct Control		3066-1	05	50	11
65-43	1	3066-1	05	Direct Control		100	8
65-44	2	3066-1	05	Control Unit		–	10
65-45	2	3066-1	05	Byte Multiplexer Channel		–	10
65-46	2	3066-1	05	Selector or Block Multiplexer Channel		–	10
65-47	2	3066-1	05	Channel-to-Channel Adapter		–	10
65-48	13	2870	–	3165	09	25	5, 12
65-55	1	3067-1	15	System/360 or System/370 Processor		100	15
65-56	1	3067-1	15	3165	09	100	16
65-60	2	3067-1	15	3165	01	40	2, 3
65-61	2	3165	01	3165	04	14	2, 3

SYSTEM/370 MODEL 165 CABLING AND COOLANT HOSE SCHEMATIC

Coolant Hoses

Group No.	*No. of Hoses*	*From*	*Frame No.*	*To*	*Frame No.*	*Max Length (ft)*	*Notes*
65-50	2	3067-1	16	3165	01	55	–
65-51	4	3067-1	16	3165	01	55	–
65-52	2	3067-1	16	3165	02	55	–
65-53	4	3067-1	16	3165	03	55	–
65-54	4	3067-1	16	3165	04	55	–

Notes:

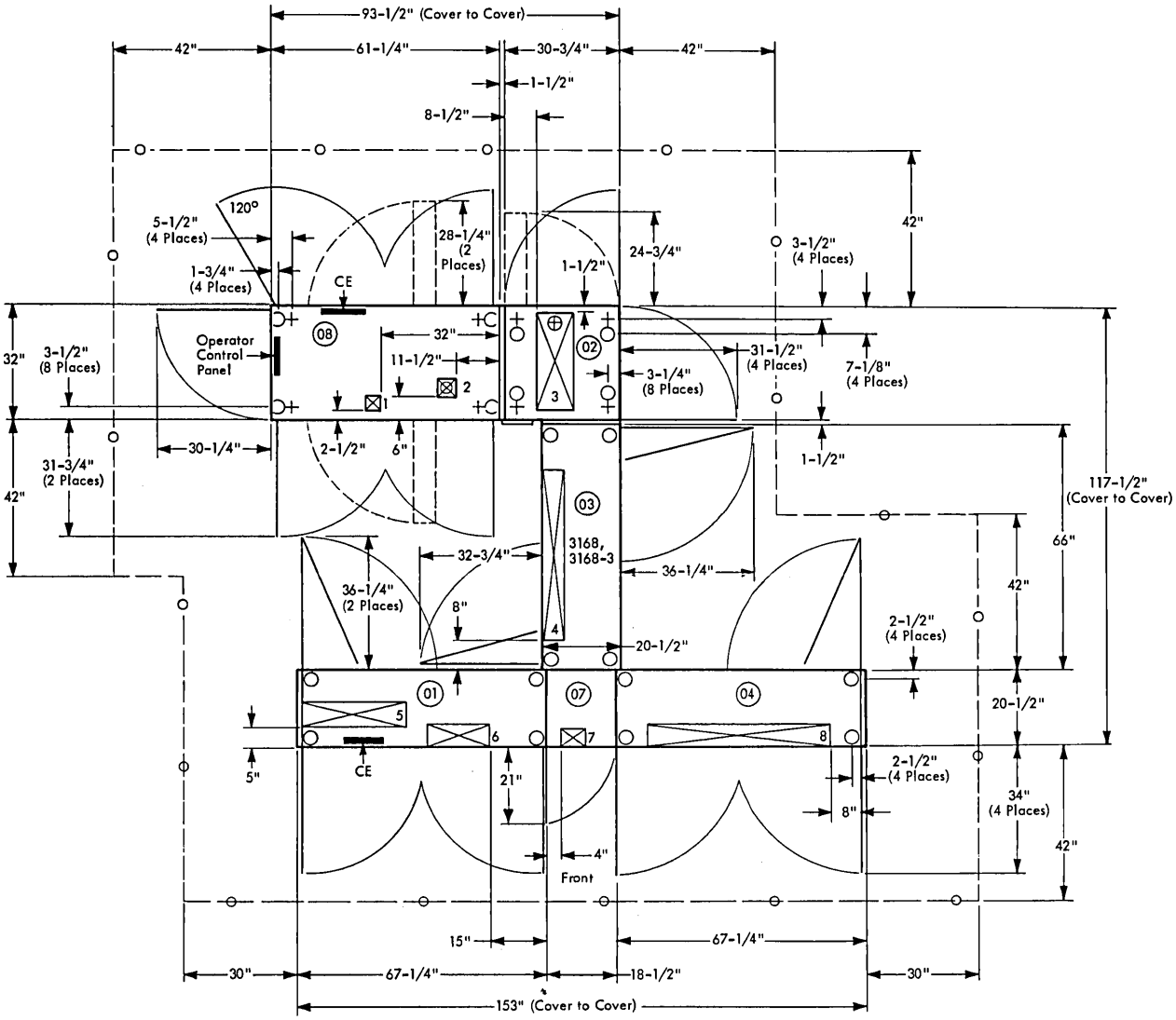
1. Sequence and control (EPO).
2. Power cabling.
3. Required for emulator feature (SF #7117, #7118, or #7119).
4. Required for high-speed multiply feature (SF #4520).
5. Use when 2870 is the only channel frame on the system (first and last).
6. One per channel.
7. Channel-to-channel adapter feature (SF #1850); installed only on 2860 and uses one control unit position on each of the two connected channels.
8. For interconnection of two System/360 or System/370 processors.
9. For the interconnection of two channel-to-channel adapter features (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 direct control to non-IBM devices.
12. One per frame.
13. The "X" length of this group (single cable simplex) from any channel frame must equal the cumulative "X" length of the multiplexer bus cables from the same channel frame to the processor. The multiplexer bus cable groups (such as 65-30 and 65-31) have 13 cables per group.
14. For cabling purposes, the 2880 or 2860 machines with high-speed devices faster than 1 megabyte/second are first in line (closest to the processor) and the 2870 machines are physically last.
15. To SF #3621, two-system EPO connection.
16. To SF #3622, multisystem EPO connection, mounted in frame 09.
17. Required for emulator feature (SF #7119).
18. If 2880 frames are placed in position 5, 6, or 7 on the multiplex string, the simplex "X" cable length to those positions is:

Position	*To the Cumulative Multiplex "X" Cable Length to That Position, Add:*
5	10 feet
6	30 feet
7	50 feet

19. For 50-Hz machines, use group number in parentheses.

SYSTEM/370 MODEL 168, 3168 AND 3168-3 PROCESSING UNITS

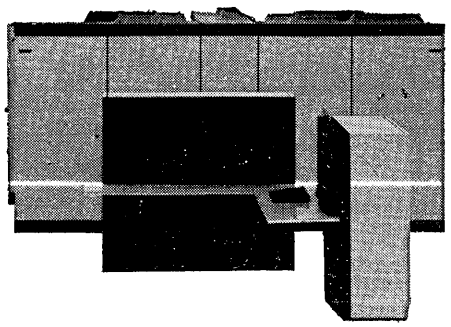
PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Notes:

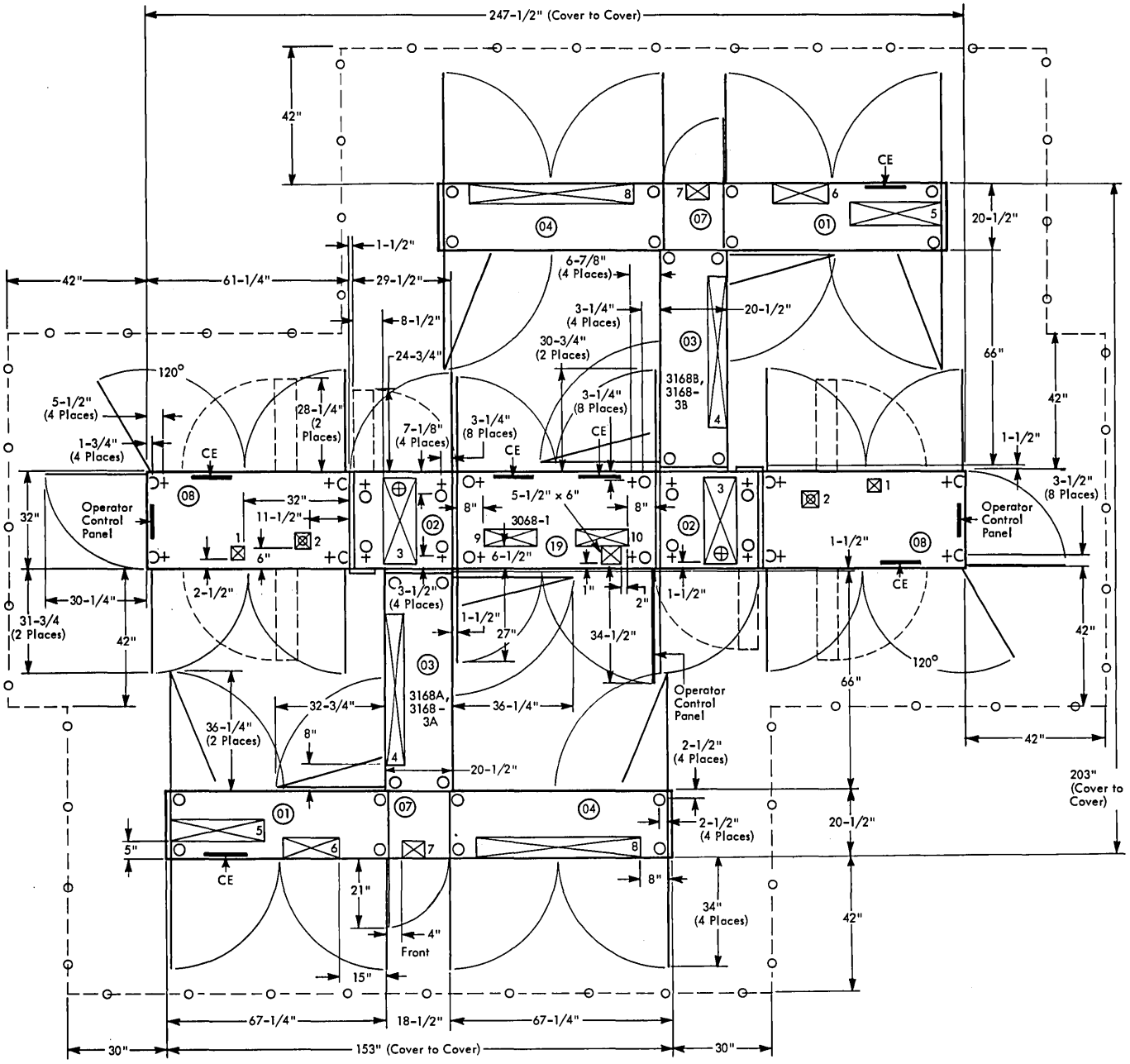
1. Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame, not cover.
2. Typical dimensions for leveling pads on frames 01, 03, and 04.
3. The operator control panel (frame 08) and the gates (frames 02 and 08) are installed with the Integrated Storage Controls (ISC) feature.
4. When power is supplied from customer service:
   a. For 50-Hz systems, use power cord exit in frame 02.
   b. For 60-Hz systems, use power cord exit in frame 08.

Cable Entry/Exit Number	Dimensions (Inches)
1	4 x 4
2	5 x 5
3	10 x 26-1/2
4	6 x 46
5	7 x 28
6	6 x 17
7	5 x 7
8	6 x 50



SYSTEM/370 MODEL 168 MULTIPROCESSING, 3168 AND 3168-3 PROCESSING UNITS

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Notes:

1. Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame, not cover.
2. Typical dimensions for leveling pads on frames 01, 03, and 04.
3. Typical dimensions for 3168A and 3168B or 3168-3A and 3168-3B.
4. The operator control panel (frame 08) and the gates (frames 02 and 08) are installed with the Integrated Storage Controls (ISC) feature.
5. When power is supplied from customer service:
   a. For 50-Hz systems, use power cord exit in frame 02.
   b. For 60-Hz systems, use power cord exit in frame 08.

Cable Entry/Exit Number	Dimensions (Inches)
1	4 x 4
2	5 x 5
3	10 x 26-1/2
4	6 x 46
5	7 x 28
6	6 x 17
7	5 x 7
8	6 x 50
9	5 x 16
10	5 x 16

SYSTEM/370 MODEL 168 AND MODEL 168 MULTIPROCESSING 3168 PROCESSING UNITS

Details (By Frame)

Frame	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	kVA
01	All	1,275 (580)	250 (8)	4,230 (1 100)	22,060 (5 600)	*
02	All	400 (190)	–	50 (13)	–	–
03	All	1,450 (660)	500 (15)	7,620 (1 950)	29,820 (7 550)	*
04	All	1,275 (580)	500 (15)	5,835 (1 500)	22,105 (5 600)	*
07	All	150 (68)	–	–	–	–
08	J,MP1	2,250 (1 050)	2,000 (57)	16,100 (4 100)		6.3 or *
08	K,MP2			18,500 (4 700)		7.2 or *
08	KJ,MP3			20,850 (5 300)		9.0 or *
08	L,MP4			23,350 (5 900)		11.0 or *
08	LJ,MP5			26,950 (6 800)		*
08	LK,MP6			29,300 (7 400)		*
08	LKJ,MP7			31,650 (8 000)		*
08	M,MP8	2,250 (1 050)	2,000 (57)	33,900 (8 550)		*
19	MP Only	See 3068 specifications page for details				

Details (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
J,MP1	6,800 (3 100)	3,250 (92)	33,850 (8 550)	73,985 (18 650)
K,MP2			36,200 (9 150)	
KJ,MP3			38,550 (9 750)	
L,MP4			41,100 (10 400)	
LJ,MP5			44,700 (11 300)	
LK,MP6			47,050 (11 900)	
LKJ,MP7			49,400 (12 450)	
M,MP8	6,800 (3 100)	3,250 (92)	51,650 (13 050)	73,985 (18 650)

SPECIFICATIONS

Dimensions:

	F	S	H
Inches	***	***	78†
(cm)	(***)	(***)	(198†)

Service Clearances:

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

Environment, Operating:

Temperature	65°F-90°F (18°C-32°C)
Rel Humidity	20%-80%
Max Wet Bulb	72°F (22°C)††

Environment, Nonoperating:

Temperature	50°C-110°F (10°C-43°C)
Rel Humidity	8%-80%
Max Wet Bulb	80°F (27°C)††

Notes:

*Receives power from the 3067 PCDU Model 2 (frame 15).

**For maximum-feature system, add 4,610 BTU/hr (1 200 kcal/hr) to air and 17,270 BTU/hr (4 400 kcal/hr) to water.

***See plan view.

†74-1/2 inches (189 cm) for frames 02 and 08.

††See "Liquid Coolant System" in Appendix A.

SYSTEM/370 MODEL 168 AND MODEL 168 MULTIPROCESSING
3168-3 PROCESSING UNITS

Details (By Frame)

Frame	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	kVA
01	All	1,275 (580)	250 (8)	4,230 (1 100)	22,060 (5 600)	*
02	All	700 (320)	–	50 (13)	–	–
03	All	1,450 (660)	500 (15)	7,620 (1 950)	29,820 (7 550)	*
04	All	1,275 (580)	500 (15)	5,835 (1 500)	22,105 (5 600)	*
07	All	150 (68)	–	–	–	–
08	U31, M31	2,250 (1 050)	2,000 (57)	16,100 (4 100)		*
08	U32, M32	↓	↓	18,500 (4 700)		*
08	U33, M33			20,850 (5 300)		*
08	U34, M34			23,350 (5 900)		*
08	U35, M35			26,950 (6 800)		*
08	U36, M36			29,300 (7 400)		*
08	U37, M37			31,650 (8 000)		*
08	U38, M38	2,250 (1 050)	2,000 (57)	33,900 (8 550)		*
19	MP Only	See 3068 specifications page for details				

Details (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
U31, M31	7,100 (3 250)	3,250 (92)	33,850 (8 550)	73,985 (18 650)
U32, M32	↓	↓	36,200 (9 150)	↓
U33, M33			38,550 (9 750)	
U34, M34			41,100 (10 400)	
U35, M35			44,700 (11 300)	
U36, M36			47,050 (11 900)	
U37, M37			49,400 (12 450)	
U38, M38	7,100 (3 250)	3,250 (92)	51,650 (13 050)	73,985 (18 650)

SPECIFICATIONS

Dimensions:

	F	S	H
Inches	***	***	78†
(cm)	(***)	(***)	(198†)

Service Clearances:

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

Environment, Operating:

Temperature	65°F-90°F (18°C-32°C)
Rel Humidity	20%-80%
Max Wet Bulb	72°F (22°C)††

Environment, Nonoperating:

Temperature	50°F-110°F (10°C-43°C)
Rel Humidity	8%-80%
Max Wet Bulb	80°F (27°C)††

Notes:

*Receives power from the 3067 PCDU Model 3 (frame 15).

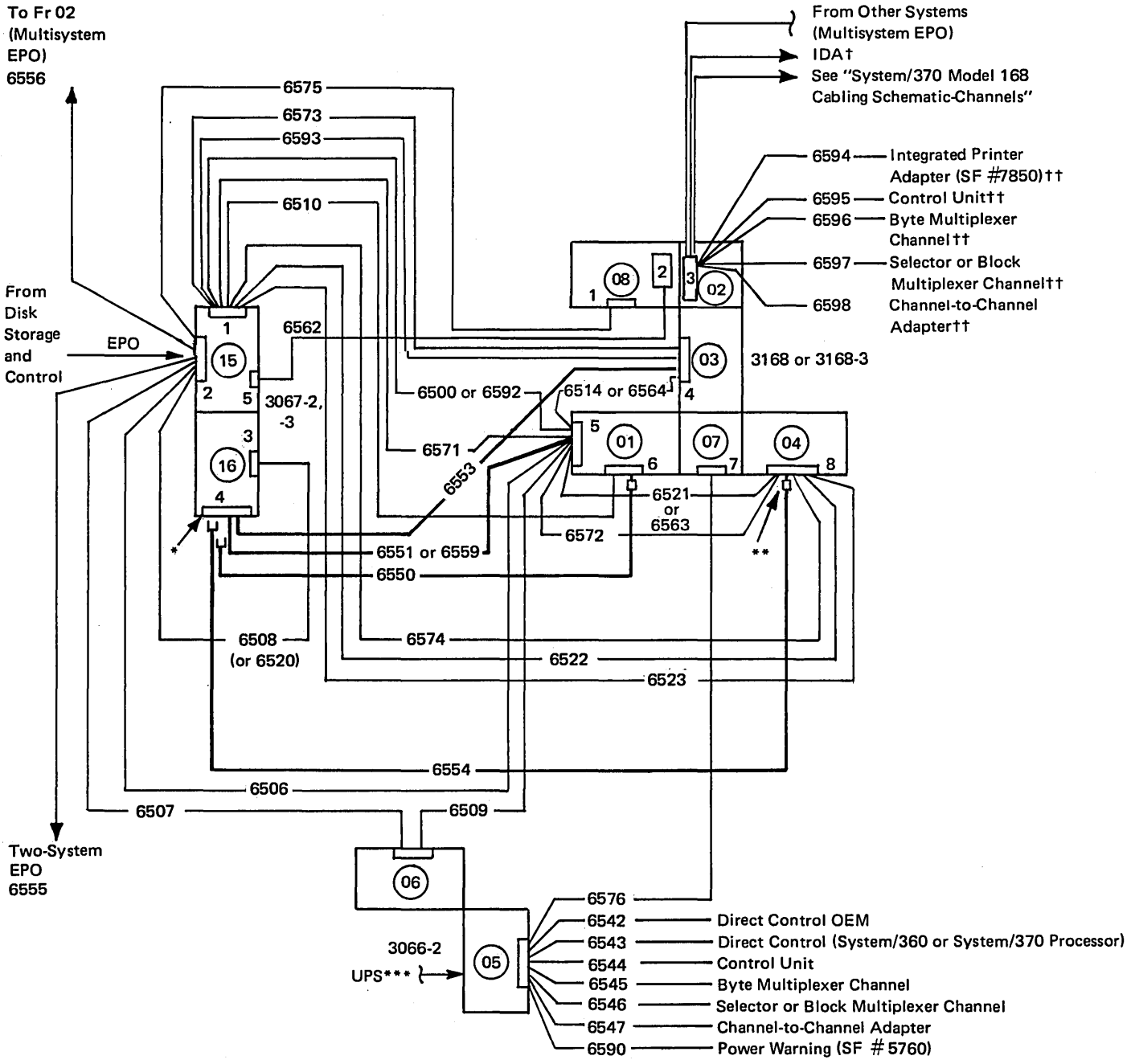
**For maximum-feature system, add 4,610 BTU/hr (1 200 kcal/hr) to air and 17,270 BTU/hr (4 400 kcal/hr) to water.

***See plan view.

†74-1/2 inches (189 cm) for frames 02 and 08.

††See "Liquid Coolant System" in Appendix A.

SYSTEM/370 MODEL 168 CABLING SCHEMATIC—CABLES AND COOLANT HOSES



Legend:

——— Coolant Hoses. (Only supply hoses are shown; assume one return hose for each supply hose.)

——— Cables

* Quick-connect sockets are on supply hoses at 3067-2,-3 CDU end. Quick-connect plugs are on return hoses at 3067-2,-3 CDU end.

** Quick-connect plugs are on supply hoses at end away from 3067-2,-3 CDU. Quick-connect sockets are on return hoses at end away from 3067-2,-3 CDU.

*** Uninterrupted Power Supply (UPS) detector cable is customer supplied. See Note 13.

† For systems installed in U.S. and Canada, integrated data adapter (IDA) cable (provided with the system) enters cable entry in frame 02. Data Access Arrangement (DAA) must be within 50 feet of cable entry in frame 02.

†† For 3168-3 only. See cable group listing.

SYSTEM/370 MODEL 168 CABLING SCHEMATIC—CABLES AND COOLANT HOSES

Cables

Group No.	*No. of Cables*	*From*	*Frame No.*	*To*	*Frame No.*	*Max Length (ft)*	*Notes*
6500 [6505]	10 [12]	3067-2	15	3168	01	40	1, 10
6506	3	3067-2, 3	15	3168 or 3168-3	01	40	1
6507	5	3067-2, 3	15	3066-2	06	100	1
6508 (or 6520)	2	3067-2, 3	15	3067-2, 3	16	13	1, 11
6509	1	3066-2	06	3168 or 3168-3	01	100	–
6510	3	3067-2, 3	15	3168 or 3168-3	01	40	1
6514	3	3168	01	3168	03	10	1
6521	2	3168	01	3168	04	10	1
6522	1	3067-2, 3	15	3168 or 3168-3	04	40	1, 3
6523	1	3067-2, 3	15	3168 or 3168-3	04	40	1, 9
6542	2	Direct Control	–	3066-2	05	50	6
6543	1	3066-2	05	Direct Control		100	4
6544	2	3066-2	05	Control Unit		–	5
6545	2	3066-2	05	Byte Multiplexer Channel		–	5
6546	2	3066-2	05	Selector or Block Multiplexer Channel		–	5
6547	2	3066-2	05	Channel-to-Channel Adapter		–	5
6555	1	3067-2, 3	15	System/360 or System/370 Processor		150	7
6556	1	3067-2, 3	15	3168 or 3168-3	02	150	8
6562	2	3067-2, 3	15	3168 or 3168-3	08	60	12
6563 [6521]	1 [2]	3168-3	01	3168-3	04	10	1, 14
6564 [6514]	1 [3]	3168-3	01	3168-3	03	10	1, 14
6571 [6560]	1 [2]	3067-2	15	3168	01	40	1, 2, 10
6572 [6561]	1 [2]	3168	01	3168	04	10	1, 2, 10
6573	6	3067-2, 3	15	3168 or 3168-3	03	40	1
6574	5	3067-2, 3	15	3168 or 3168-3	04	40	1
6575	1	3067-2, 3	15	3168 or 3168-3	08	100	1
6576	15	3066-2	05	3168 or 3168-3	07	30	–
6590	1	3066-2	05	3066-2, 3158, or 3158-3	05 or 01	100	13
6592 [6500/6505]	8 [10/12]	3067-3	15	3168-3	01	40	1, 14
6593	1	3067-3	15	3168-3	03	40	1
6594	2	3213		3168-3	02	50	15
6595	2	3168-3	02	Control Unit		–	16
6596	2	3168-3	02	Byte Multiplexer Channel		–	16
6597	2	3168-3	02	Selector or Block Multiplexer Channel		–	16
6598	2	3168-3	02	Channel-to-Channel Adapter		–	16

Coolant Hoses

Group No.	*No. of Hoses*	*From*	*Frame No.*	*To*	*Frame No.*	*Max Length (ft)*	*Notes*
6550	2	3067-2, 3	16	3168 or 3168-3	01	55	–
6551	4	3067-2	16	3168	01	55	–
6553	4	3067-2, 3	16	3168 or 3168-3	03	55	–
6554	4	3067-2, 3	16	3168 or 3168-3	04	55	–
6559 [6551]	2 [4]	3067-3	16	3168-3	01	55	14

Notes:

1. Power cabling.
2. Required for emulator feature (SF #7127, #7128, or #7129).
3. Required for high-speed multiply feature (SF #4525).
4. Direct control (standard feature) to other processors (excluding 3195); order one per feature.
5. Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) available to attach up to eight control units.

SYSTEM/370 MODEL 168 CABLING SCHEMATIC—CABLES AND COOLANT HOSES

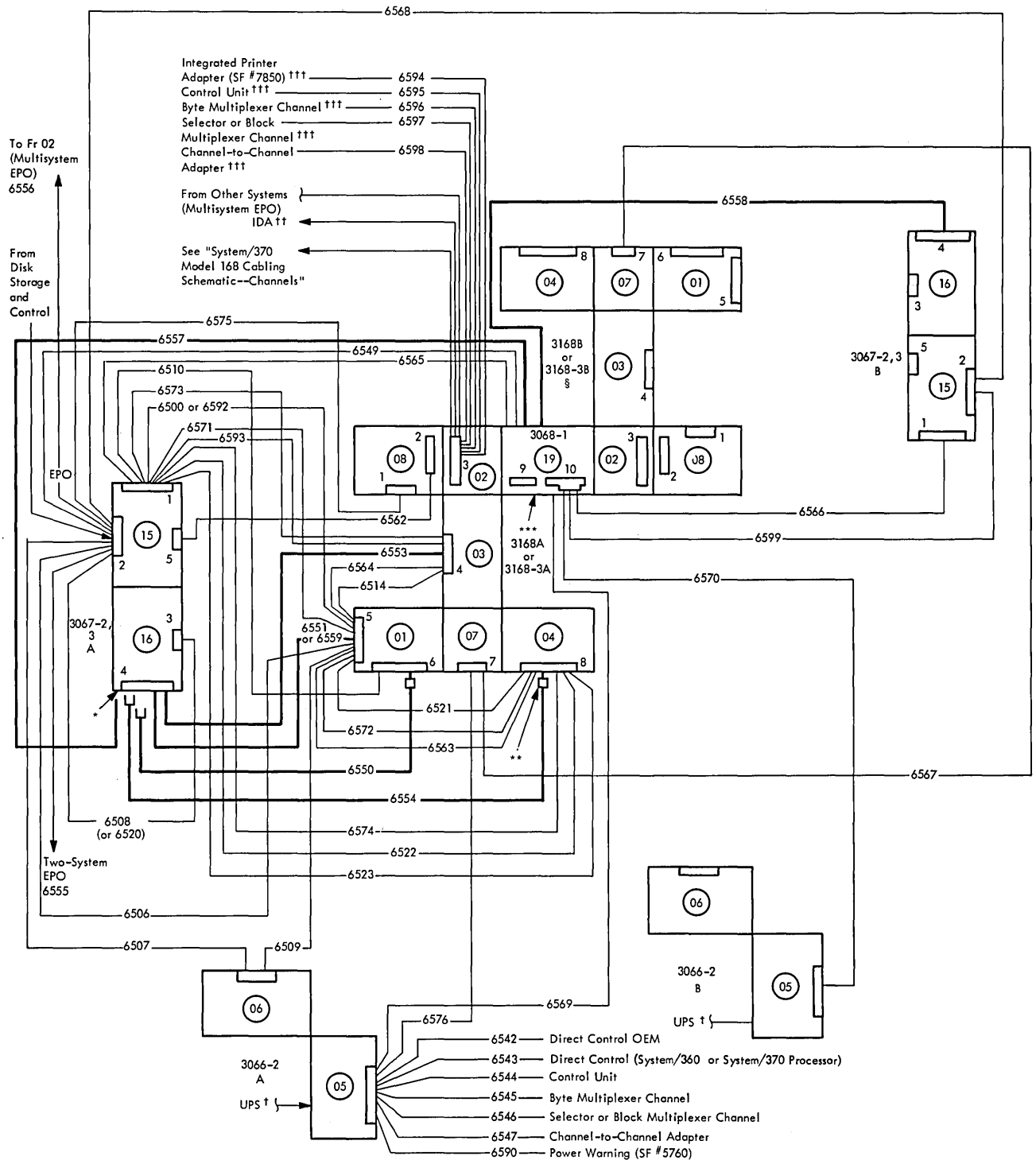
Notes: (Continued)

6. For direct control (standard feature) to non-IBM devices.
7. To SF #3623, two-system EPO connection.
8. To SF #3624, multisystem EPO connection, mounted in frame 02.
9. Required for emulator feature (SF #7129).
10. When replacing a Model 165 system with a Model 168 (3168 Processing Unit) system, group numbers in brackets may be used by removing the unused cable(s) from the group.
11. For 50-Hz machines, use group number in parentheses.
12. Order this cable group for 3168 or 3168-3 Processing Unit using 415/441-Hz frame 08.
13. Required for multiple system connections when SF #5760 is installed. (See *A Guide to 60 Hertz UPS Selection*, GA27-2770, or *A Guide to 50 Hertz UPS Selection*, GA27-2771.) See the following chart for possible connections:

Configuration	*Cables Required*	*Maximum Total Cumulative Length (ft)*
One System	UPS cable (customer supplied)	500
Two Systems	UPS cable plus one group 6590 or 5517 (Model 158)	416
Three Systems	UPS cable plus two group 6590s or two group 5517s (Model 158) or one of each	388

14. When replacing a Model 165 or a Model 168 (3168 Processing Unit) system with a Model 168 (3168-3 Processing Unit) system, group numbers in brackets may be used by removing the unused cable(s) or hose(s) from the group.
15. Required for integrated printer adapter (SF #7850) on 3168-3.
16. Required for the service processor (SVP) function in the 3168-3. Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) available to attach up to eight control units.

SYSTEM/370 MODEL 168 MULTIPROCESSING
CABLING SCHEMATIC–CABLES AND COOLANT HOSES



Legend:

——— Coolant Hoses. (Only supply hoses are shown; assume one return hose for each supply hose.)
——— Cables

* Quick-connect sockets are on supply hoses at 3067-2, 3 CDU end. Quick-connect plugs are on return hoses at 3067-2,3 CDU end.
** Quick-connect plugs are on supply hoses at end away from 3067-2,3 CDU end. Quick-connect sockets are on return hoses at end away from 3067-2,3 CDU.
*** Cables from I/O control unit for remote switching feature.
† Uninterrupted Power Supply (UPS) detector cable is customer supplied. Only one UPS connection is required to either 3066-2A or 3066-2B. See Note 14.
†† For systems installed in U.S. and Canada, integrated data adapter (IDA) cable (provided with the system) enters cable entry in frame 02. Data Access Arrangement (DAA) must be within 50 feet of cable entry in frame 02.
††† For 3168-3 only. See cable group listing.
§ Cabling for 3168B or 3168-3B is the same as that for 3168A or 3168-3A. Interconnecting cables and hoses are shown.

SYSTEM/370 MODEL 168 MULTIPROCESSING
CABLING SCHEMATIC–CABLES AND COOLANT HOSES

Cables

Group No.	*No. of Cables*	*From*	*Frame No.*	*To*	*Frame No.*	*Max Length (ft)*	*Notes*
6500 [6505]	10 [12]	3067-2	15	3168	01	40	1, 11
6506	3	3067-2, 3	15	3168 or 3168-3	01	40	1
6507	5	3067-2, 3	15	3066-2	06	100	1
6508 (or 6520)	2	3067-2, 3	15	3067-2, 3	16	15	1, 12
6509	1	3066-2	06	3168 or 3168-3	01	100	–
6510	3	3067-2, 3	15	3168 or 3168-3	01	40	1
6514	3	3168	01	3168	03	10	1
6521	2	3168	01	3168	04	10	1
6522	1	3067-2, 3	15	3168 or 3168-3	04	40	1, 3
6523	1	3067-2, 3	15	3168 or 3168-3	04	40	1, 9
6542	2	Direct Control	–	3066-2	05	50	6
6543	1	3066-2	05	Direct Control		100	4
6544	2	3066-2	05	Control Unit		–	5
6545	2	3066-2	05	Byte Multiplexer Channel		–	5
6546	2	3066-2	05	Selector or Block Multiplexer Channel		–	5
6547	2	3066-2	05	Channel-to-Channel Adapter		–	5
6549	1	3067-2A, 3A	15	3068	19	40	10
6555	1	3067-2, 3	15	System/360 or System/370 Processor		150	7
6556	1	3067-2, 3	15	3168 or 3168-3	02	150	8
6562	2	3067-2, 3	15	3168 or 3168-3	08	60	13
6563 [6521]	1 [2]	3168-3	01	3168-3	04	10	1, 16
6564 [6514]	1 [3]	3168-3	01	3168-3	03	10	1, 16
6565	2	3067-2A, 3A	15	3068	19	40	10
6566	2	3067-2B, 3B	15	3068	19	40	10
6567	2	3168A or 3168-3A	07	3168B or 3168-3B	07	28	10, 15
6568	1	3067-2A, 3A	15	3067-2B, 3B	15	75	10
6569	1	3066-2A	05	3068	19	50	10
6570	1	3066-2B	05	3068	19	50	10
6571 [6560]	1 [2]	3067-2	15	3168	01	40	1, 2, 11
6572 [6561]	1 [2]	3168	01	3168	04	10	1, 2, 11
6573	6	3067-2, 3	15	3168 or 3168-3	03	40	1
6574	5	3067-2, 3	15	3168 or 3168-3	04	40	1
6575	1	3067-2, 3	15	3168 or 3168-3	08	100	1
6576	15	3066-2	05	3168 or 3168-3	07	30	–
6590	1	3066-2	05	3066-2, 3158, or 3158-3	05 or 01	100	14
6592 [6500/6505]	8 [10/12]	3067-3	15	3168-3	01	40	1, 16
6593	1	3067-3	15	3168-3	03	40	1
6594	2	3213		3168-3	02	50	17
6595	2	3168-3	02	Control Unit		–	18
6596	2	3168-3	02	Byte Multiplexer Channel		–	18
6597	2	3168-3	02	Selector or Block Multiplexer Channel		–	18
6598	2	3168-3	02	Channel-to-Channel Adapter		–	18
6599	1	3067-2B, 3B	15	3068	19	40	10

Coolant Hoses

Group No.	*No. of Hoses*	*From*	*Frame No.*	*To*	*Frame No.*	*Max Length (ft)*	*Notes*
6550	2	3067-2, 3	16	3168 or 3168-3	01	55	–
6551	4	3067-2	16	3168	01	55	–
6553	4	3067-2, 3	16	3168 or 3168-3	03	55	–
6554	4	3067-2, 3	16	3168 or 3168-3	04	55	–
6557	2	3067-2A, 3A	16	3068	19	55	10
6558	2	3067-2B, 3B	16	3068	19	55	10
6559 [6551]	2 [4]	3067 3	16	3168-3	01	55	16

SYSTEM/370 MODEL 168 MULTIPROCESSING
CABLING SCHEMATIC—CABLES AND COOLANT HOSES

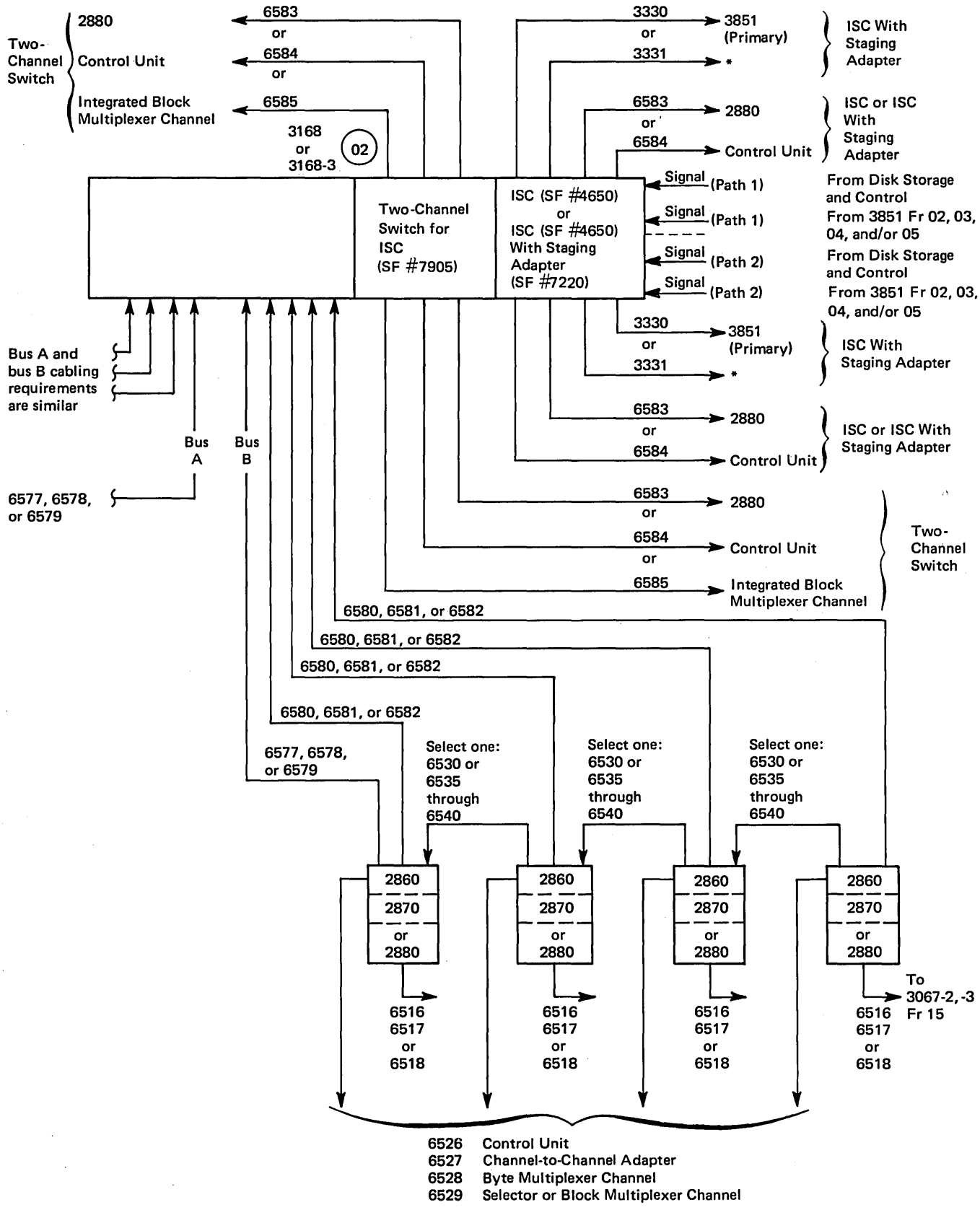
Notes:

1. Power cabling.
2. Required for emulator feature (SF #7127, #7128, or #7129).
3. Required for high-speed multiply feature (SF #4525).
4. Direct control (standard feature) to other processors (excluding 3195); order one per feature.
5. Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) available to attach up to eight control units.
6. For direct control (standard feature) to non-IBM devices.
7. To SF #3623, two-system EPO connection.
8. To SF #3624, multisystem EPO connection, mounted in frame 02.
9. Required for emulator feature (SF #7129).
10. Required for Model 168 Multiprocessing system.
11. When replacing a Model 165 system with a Model 168 (3168 Processing Unit) system, group numbers in brackets may be used by removing the unused cable(s) from the group.
12. For 50-Hz machines, use group number in parentheses.
13. Order this cable group for 3168 or 3168-3 Processing Unit using 415/441-Hz frame 08.
14. Required for multiple system connections when SF #5760 is installed. (See *A Guide to 60 Hertz UPS Selection*, GA27-2770, or *A Guide to 50 Hertz UPS Selection*, GA27-2771.) See the following chart for possible connections:

Configuration	*Cables Required*	*Maximum Total Cumulative Length (ft)*
One System	UPS cable (customer supplied)	500
Two Systems	UPS cable plus one group 6590 or 5517 (Model 158)	416
Three Systems	UPS cable plus two group 6590s or two group 5517s (Model 158) or one of each	388

15. Fixed-length cable.
16. When replacing a Model 165 or a Model 168 (3168 Processing Unit) system with a Model 168 (3168-3 Processing Unit) system, group numbers in brackets may be used by removing the unused cable(s) or hose(s) from the group.
17. Required for integrated printer adapter (SF #7850) on 3168-3.
18. Required for the service processor (SVP) function in the 3168-3. Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) available to attach up to eight control units.

SYSTEM/370 MODEL 168 CABLING SCHEMATIC—CHANNELS



*See 3331 in cable group listing for possible attachments.

SYSTEM/370 MODEL 168 CABLING SCHEMATIC—CHANNELS

Cable Function	*Group No.*	*No. of Cables*	*From*	*To*	*Max Length (ft)*	*Notes*
Mass Storage	3330	2	3168 or 3168-3 Fr 02	3851 (Primary) Fr 01	–	11,12
Control	3331	2	3168 or 3168-3 Fr 02	3158 or 3158-3 Fr 02, 3168 or 3168-3 Fr 02, 3830-3, or 3851 #2 Fr 01	–	11,12
Control	6516	1	2860	3067-2, 3 Fr 15	150	7
	6517	1	2870	3067-2, 3 Fr 15	150	7
	6518	1	2880	3067-2, 3 Fr 15	150	7
Channel-to-	6526	2	2860	Control Unit	–	4,5
Channel	6527	2	2860	Channel-to-Channel Adapter	–	4,5,6
Adapter	6528	2	2860	Byte Multiplexer Channel	–	4,5
	6529	2	2860	Selector or Block Multiplexer Channel	–	4,5
Multiplex	6530	13	2860	2880	–	3,8
	6535	13	2880	2880	–	3,8
	6536	13	2860	2860	–	3,8
	6537	13	2880	2860	–	3,8
	6538	13	2870	2880	–	3,8
	6539	13	2870	2860	–	3,8
	6540	13	2870	2870	–	3,8
	6577	13	2860	3168 or 3168-3 Fr 02	–	3,8,9
	6578	13	2870	3168 or 3168-3 Fr 02	–	3,8,9
	6579	13	2880	3168 or 3168-3 Fr 02	–	3,8,9
Simplex	6580	1	2860	3168 or 3168-3 Fr 02	–	1,2,8
	6581	1	2870	3168 or 3168-3 Fr 02	–	1,2,8
	6582	1	2880	3168 or 3168-3 Fr 02	–	1,2,8
ISC and	6583	2	3168 or 3168-3 Fr 02	2880	–	10,11
Two-Channel	6584	2	3168 or 3168-3 Fr 02	Control Unit	–	10,11
Switch	6585	2	3168 or 3168-3 Fr 02	Integrated Block Multiplexer Channel	–	10,11

Notes:

1. The "X" length of this cable group (single cable simplex) from any channel frame must equal the cumulative "X" length of the multiplexer bus cables from the same channel frame to the processor. For the third channel frame on the same bus, add 10 feet to the simplex cable. For the fourth channel frame on the same bus, add 20 feet to the simplex cable.
2. One group per logical channel.

   Basic System: Maximum of three channel frames or three logical channels on bus A; maximum of four channel frames or four logical channels on bus B.

   With Extended Channels Feature (SF #3855): Maximum of four channel frames or six logical channels per bus. Maximum of seven channel frames per system.
3. Total cumulative "X" length of the multiplexer bus cables must not exceed 125 feet.
4. Channel-to-channel adapter feature (SF #1850); installed only on 2860 and uses one control unit position on each of the two connected channels.
5. Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) available to attach up to eight control units.
6. For the interconnection of two channel-to-channel adapter features (SF #1850).
7. Sequence and control (EPO).
8. For cabling purposes, the 2860 or 2880 devices with high-speed devices faster than 1 megabyte/second are first in line (closest to the processor) and the 2870 devices are physically last.
9. Required when channel frame is physically first on the channel bus.
10. The 3168 or 3168-3 frame 02 must be within a maximum length of 150 feet of the block multiplexer channel entry. With SF #9318 or #9319 installed, the maximum length is increased to 280 feet when the 3168 or 3168-3 frame 02 is attached to a 2880 and 250 feet when attached to a block multiplexer channel of a 3031, 3032, or 3033. This increased length must be reduced by 15 feet for each additional ISC or control unit connected between the ISC and the channel.
11. See the following page.

Notes: (Continued)

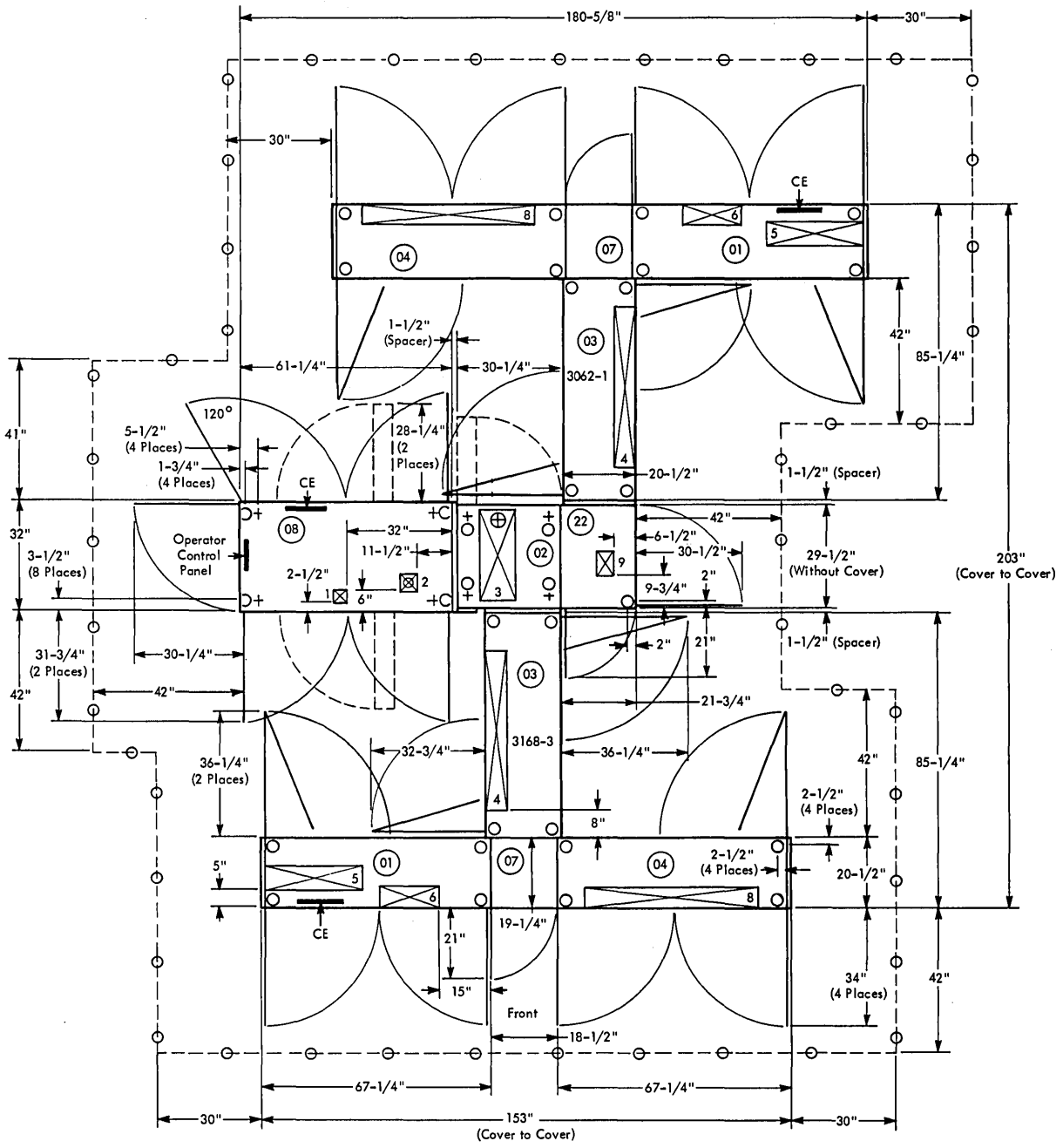
11. The following cable groups are required for SF #4650, SF #7220, and SF #7905:

Integrated Storage Controls (ISC), SF #4650		*ISC, SF #4650, With Staging Adapter, SF #7220*	
Path 1	*Path 2*	*Path 1*	*Path 2*
6583 or 6584	Additional 6583 or 6584	3330 or 3331 *and* 6583 or 6584	Additional 3330 or 3331 *and* additional 6583 or 6584
With Two-Channel Switch, SF #7905		*With Two-Channel Switch, SF #7905*	
6583, 6584, or 6585	Additional 6583, 6584, or 6585	6583, 6584, or 6585	Additional 6583, 6584, or 6585

12. Maximum cumulative cable length of 300 feet is available to attach seven devices to the standard port of the 3851 or eight devices to an optional port of the 3851. The most remote 3168 or 3168-3 controlling the 3333, 3330, and/or 3350 containing control information for the mass storage system must be within 150 feet. See "General Cabling Schematics" under "3850 Mass Storage System" in GC22-7064 for additional information.

SYSTEM/370 MODEL 168 ATTACHED PROCESSOR, 3168-3 PROCESSING UNIT

PLAN VIEW (WITH 3062 ATTACHED PROCESSING UNIT MODEL 1) (English Scale: 1/4 in. = 1 ft)



Notes:

1. Caster, cable hole, and leveling pad locating dimensions are measured from edge of frame, not cover.
2. Typical dimensions for leveling pads on frames 01, 03, and 04.
3. The operator control panel (frame 08) and the gates (frames 02 and 08) are installed with the Integrated Storage Controls (ISC) feature.
4. When power is supplied from customer service:
   a. For 50-Hz systems, use power cord exit in frame 02.
   b. For 60-Hz systems, use power cord exit in frame 08.
5. Frames 01, 03, 04, and 07 on 3062-1 are identical to frames 01, 03, 04, and 07 on 3168-3.

Cable Entry/Exit Number	Dimensions (Inches)
1	4 x 4
2	5 x 5
3	10 x 26-1/2
4	6 x 46
5	7 x 28
6	6 x 17
8	6 x 50
9	5 x 7

SYSTEM/370 MODEL 168 ATTACHED PROCESSOR, 3168-3 PROCESSING UNIT

Details (By Frame)

Frame	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	kVA
01	All	1,275 (580)	250 (8)	4,230 (1 100)	22,060 (5 600)	*
02	All	700 (320)	–	50 (13)	–	–
03	All	1,450 (660)	500 (15)	7,620 (1 950)	29,820 (7 550)	*
04	All	1,275 (580)	500 (15)	5,835 (1 500)	22,105 (5 600)	*
07	All	150 (68)	–	–	–	–
08	A31	2,250 (1 050)	2,000 (57)	16,100 (4 100)		*
08	A32	↓	↓	18,500 (4 700)		*
08	A33			20,850 (5 300)		*
08	A34			23,350 (5 900)		*
08	A35			26,950 (6 800)		*
08	A36			29,300 (7 400)		*
08	A37			31,650 (8 000)		*
08	A38	2,250 (1 050)	2,000 (57)	33,900 (8 550)		*
22	See 3062 specifications page for details					

Details (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
A31	7,100 (3 250)	3,250 (92)	33,850 (8 550)	73,985 (18 650)
A32	↓	↓	36,200 (9 150)	↓
A33			38,550 (9 750)	
A34			41,100 (10 400)	
A35			44,700 (11 300)	
A36			47,050 (11 900)	
A37			49,400 (12 450)	
A38	7,100 (3 250)	3,250 (92)	51,650 (13 050)	73,985 (18 650)

SPECIFICATIONS

Dimensions:

	F	S	H
Inches	***	***	78†
(cm)	(***)	(***)	(198†)

Service Clearances:

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

Environment, Operating:

Temperature	65°F-90°F (18°C-32°C)
Rel Humidity	20%-80%
Max Wet Bulb	72°F (22°C)††

Environment, Nonoperating:

Temperature	50°F-110°F (10°C-43°C)
Rel Humidity	8%-80%
Max Wet Bulb	80°F (27°C)††

Notes:

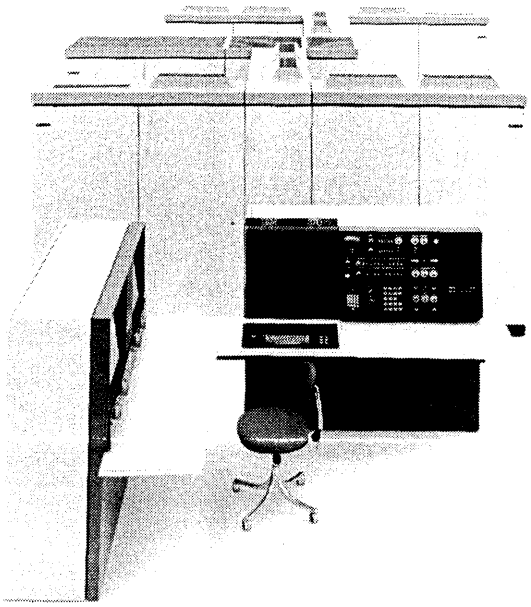
*Receives power from the 3067 PCDU Model 3 (frame 15).

**For maximum-feature system, add 4,610 BTU/hr (1 200 kcal/hr) to air and 17,270 BTU/hr (4 400 kcal/hr) to water.

***See plan view.

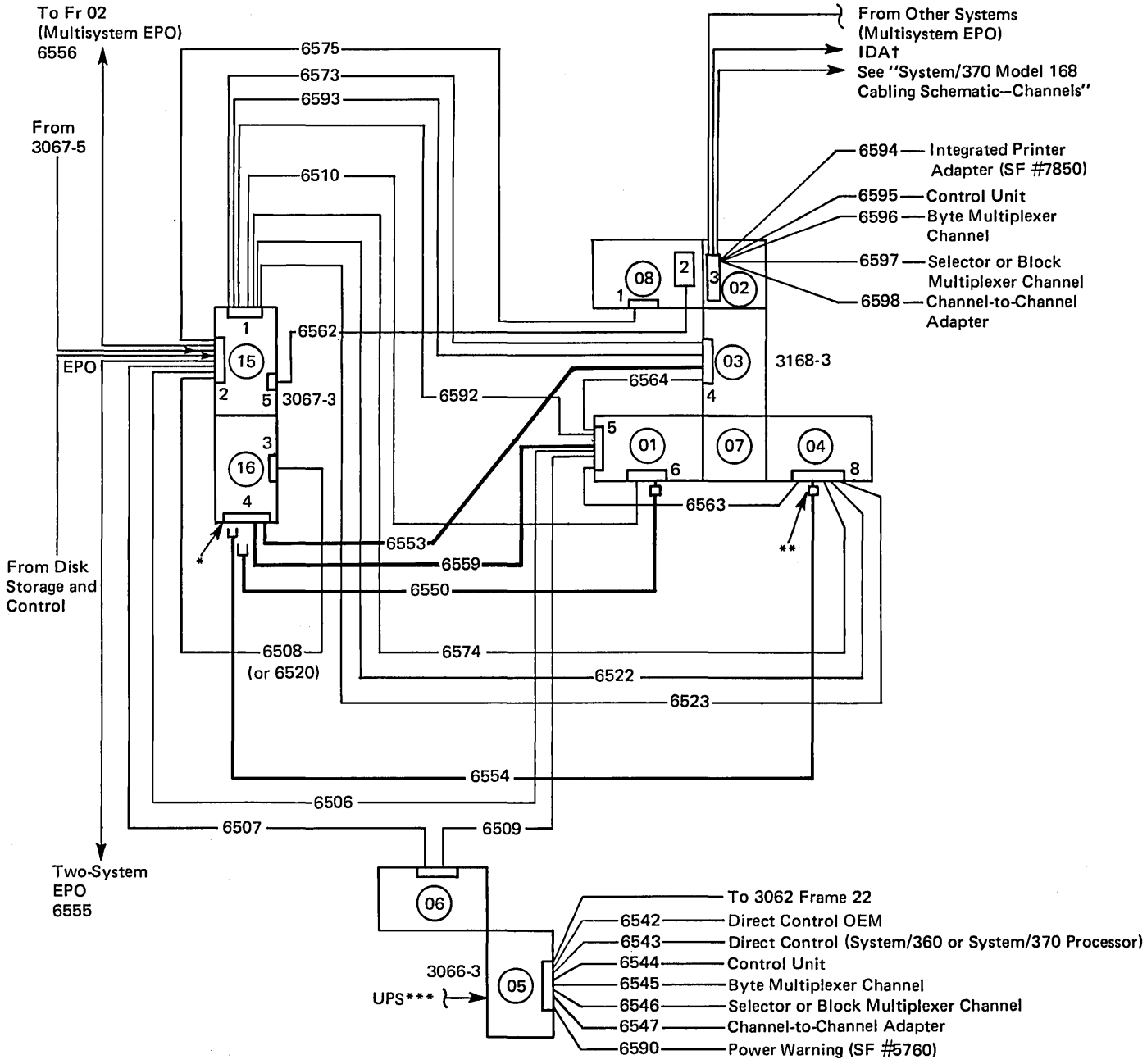
†74-1/2 inches (189 cm) for frames 02 and 08.

††See "Liquid Coolant System" in Appendix A.



SYSTEM/370 MODEL 168 ATTACHED PROCESSOR CABLING SCHEMATIC–CABLES AND COOLANT HOSES

Note: See "3062 Attached Processing Unit Model 1 Cabling Schematic–Cables and Coolant Hoses" for information on 3062 cabling.



Legend:

——— Coolant Hoses. (Only supply hoses are shown; assume one return hose for each supply hose.)

——— Cables

*Quick-connect sockets are on supply hoses at 3067-3 CDU end. Quick-connect plugs are on return hoses at 3067-3 CDU end.

**Quick-connect plugs are on supply hoses at end away from 3067-3 CDU. Quick-connect sockets are on return hoses at end away from 3067-3 CDU.

***Uninterrupted Power Supply (UPS) detector cable is customer supplied. See Note 2.

†For systems installed in U.S. and Canada, integrated data adapter (IDA) cable (provided with the system) enters cable entry in frame 02. Data Access Arrangement (DAA) must be within 50 feet of cable entry in frame 02.

SYSTEM/370 MODEL 168 ATTACHED PROCESSOR CABLING SCHEMATIC–CABLES AND COOLANT HOSES

Cables

Group No.	*No. of Cables*	*From*	*Frame No.*	*To*	*Frame No.*	*Max Length (ft)*	*Notes*
6506	3	3067-3	15	3168-3	01	40	1
6507	5	3067-3	15	3066-3	06	100	1
6508 (or 6520)	2	3067-3	15	3067-3	16	15	1, 9
6509	1	3066-3	06	3168-3	01	100	–
6510	3	3067-3	15	3168-3	01	40	1
6522	1	3067-3	15	3168-3	04	40	1, 2
6523	1	3067-3	15	3168-3	04	40	1, 8
6542	2	Direct Control	–	3066-3	05	50	5
6543	1	3066-3	05	Direct Control		100	3
6544	2	3066-3	05	Control Unit		–	4
6545	2	3066-3	05	Byte Multiplexer Channel		–	4
6546	2	3066-3	05	Selector or Block Multiplexer Channel		–	4
6547	2	3066-3	05	Channel-to-Channel Adapter		–	4
6555	1	3067-3	15	System/360 or System/370 Processor		100	6
6556	1	3067-3	15	3168-3	02	100	7
6562	2	3067-3	15	3168-3	08	60	1
6563	1	3168-3	01	3168-3	04	10	1
6564	1	3168-3	01	3168-3	03	10	1
6573	6	3067-3	15	3168-3	03	40	1
6574	5	3067-3	15	3168-3	04	40	1
6575	1	3067-3	15	3168-3	08	100	1
6590	1	3066-3	05	3066-3, 3158, or 3158-3	05 or 01	100	10
6592	8	3067-3	15	3168-3	01	40	1
6593	1	3067-3	15	3168-3	03	40	1
6594	2	3213		3168-3	02	50	11
6595	2	3168-3	02	Control Unit		–	12
6596	2	3168-3	02	Byte Multiplexer Channel		–	12
6597	2	3168-3	02	Selector or Block Multiplexer Channel		–	12
6598	2	3168-3	02	Channel-to-Channel Adapter		–	12

Coolant Hoses

Group No.	*No. of Hoses*	*From*	*Frame No.*	*To*	*Frame No.*	*Max Length (ft)*	*Notes*
6550	2	3067-3	16	3168-3	01	55	–
6553	4	3067-3	16	3168-3	03	55	–
6554	4	3067-3	16	3168-3	04	55	–
6559	2	3067-3	16	3168-3	01	55	–

Notes:

1. Power cabling.
2. Required for high-speed multiply feature (SF #4525).
3. Direct control (standard feature) to other processors (excluding 3195); order one per feature.
4. Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) available to attach up to eight control units.
5. See the following page.

Notes: (Continued)

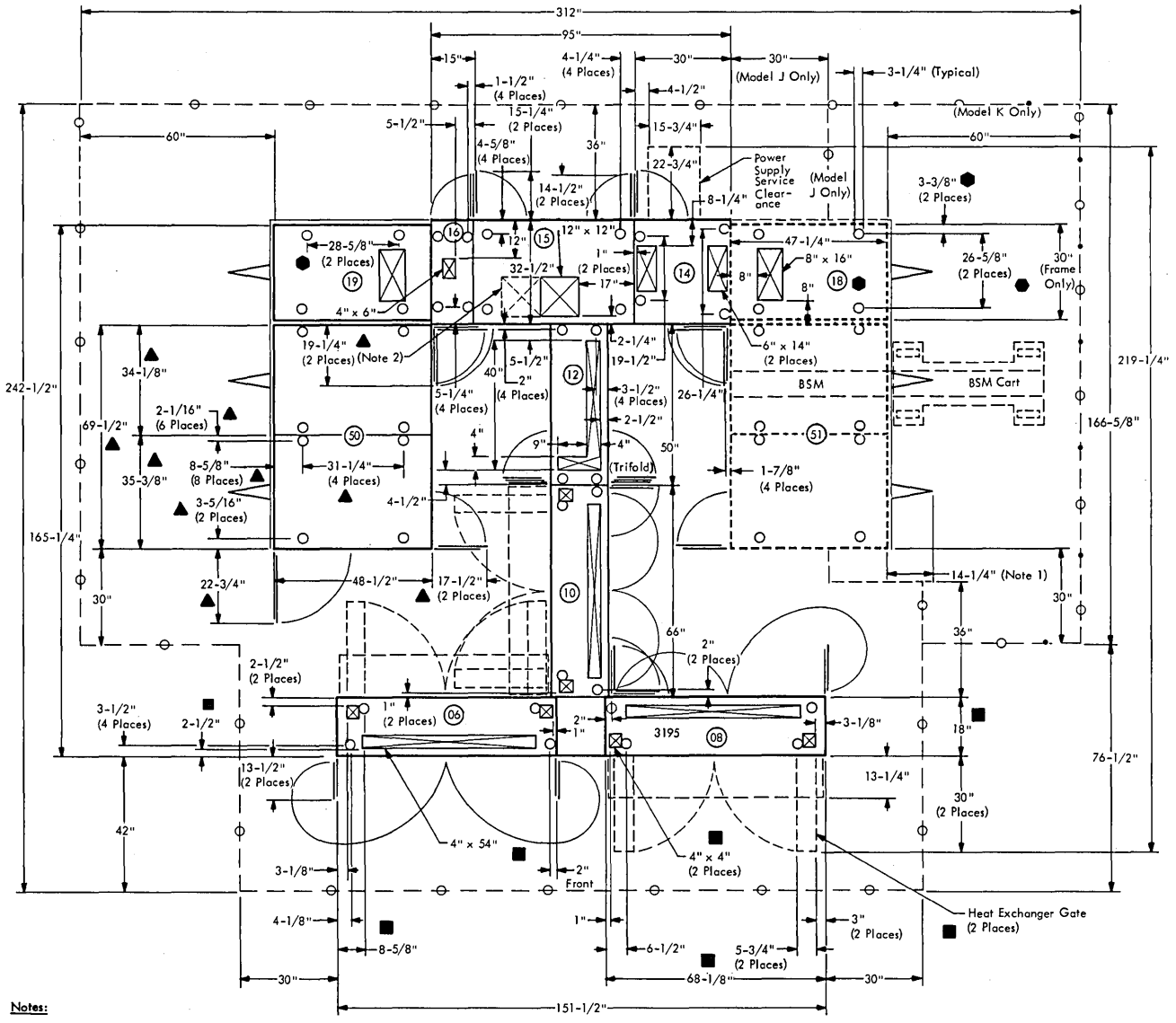
5. For direct control (standard feature) to non-IBM devices.
6. To SF #3623, two-system EPO connection.
7. To SF #3624, multisystem EPO connection, mounted in frame 02.
8. Required for emulator feature (SF #7129).
9. For 50-Hz machines, use group number in parentheses.
10. Required for multiple system connections when SF #5760 is installed. (See *A Guide to 60 Hertz UPS Selection,* GA27-2770, or *A Guide to 50 Hertz UPS Selection,* GA27-2771.) See the following chart for possible connections:

Configuration	*Cables Required*	*Maximum Total Cumulative Length (ft)*
One System	UPS cable (customer supplied)	500
Two Systems	UPS cable plus one group 6590 or 5517 (Model 158)	416
Three Systems	UPS cable plus two group 6590s or two group 5517s (Model 158) or one of each	388

11. Required for integrated printer adapter (SF #7850) on 3168-3.
12. Required for the service processor (SVP) function in the 3168-3. Total cable length of 200 feet (unless modified by general control-to-channel cabling schematic) available to attach up to eight control units.

SYSTEM/370 MODEL 195 J1 AND K1—3195 PROCESSING UNIT AND STORAGE

PLAN VIEW (Not to 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/370 MODEL 195 J1 AND K1–3195 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)	5,100 (1 300)	5,100 (1 300)
10	15 x 66 x 70 (38 x 168 x 178)	1,400 (640)	400 (12)	6,600 (1 700)	6,600 (1 700)
12	15 x 50 x 70 (38 x 127 x 178)	1,000 (460)	250 (8)	8,050 (2 050)	2,750 (700)
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)

Details (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
J1	13,450 (6 150)	4,700 (140)	56,750 (14 350)	62,450 (15 750)	Omit frames 18 and 51.
K1	18,750 (8 550)	7,500 (220)	81,750 (20 650)	82,450 (20 800)	

SPECIFICATIONS

Dimensions:

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

Service Clearances:

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

Power Requirements:

The Model 195 J1 and K1 receive 50/60-Hz and 415/441-Hz power from 3080 Models 1, 2, and 3 and 3085 PDU.

Environment, Operating:

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

Notes:

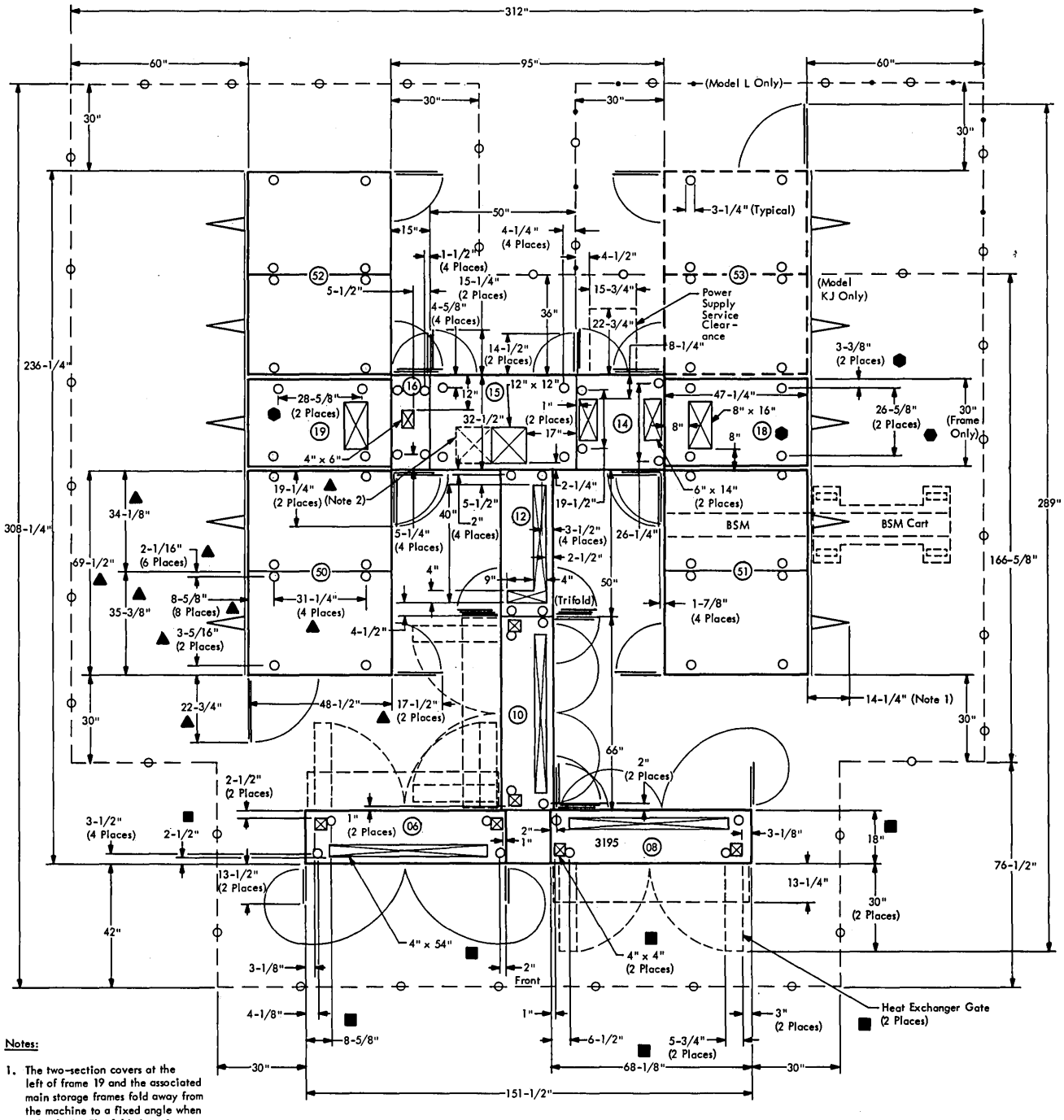
* The 68 inches (173 cm) represents width of two 34-inch (86-cm) wide subframes, each weighing 1,750 lb (800 kg).

** See plan view.

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

SYSTEM/370 MODEL 195 KJ1 AND L1–3195 PROCESSING UNIT AND STORAGE

PLAN VIEW (Not to 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.

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)	5,100 (1 300)	5,100 (1 300)
10	15 x 66 x 70 (38 x 168 x 178)	1,400 (640)	400 (12)	6,600 (1 700)	6,600 (1 700)
12	15 x 50 x 70 (38 x 127 x 178)	1,000 (460)	250 (8)	8,050 (2 050)	2,750 (700)
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)

Details (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
KJ1	24,850 (11 300)	10,300 (300)	106,750 (26 950)	102,450 (25 850)	Omit frame 53
L1	28,350 (12 900)	13,100 (380)	131,750 (33 250)	122,450 (30 900)	

SPECIFICATIONS

Dimensions:

	F	S	H
Inches	†	†	70
(cm)	(†)	(†)	(178)

Service Clearances:

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

Power Requirements:

The Model 195 KJ1 and L1 receive 50/60-Hz and 415/441-Hz power from 3080 Models 1, 2, and 3 and 3085 PDU.

Environment, Operating:

Temperature	65°F-80°F (18°C-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 L1.

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

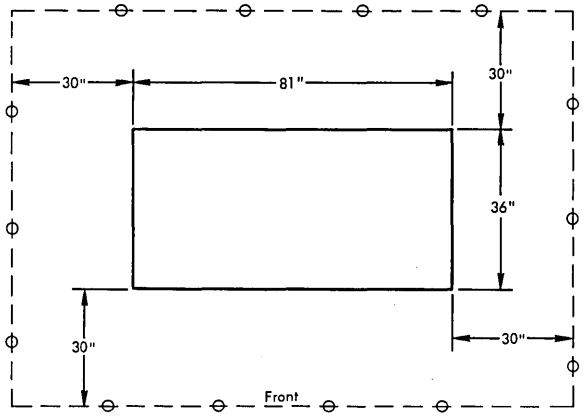
*** Based on IBM's method of calculating floor loading, the Model 195 exceeds 75 pounds per square foot (370 kg/m^2) distributed floor loading. The installation site, therefore, should be reviewed by a qualified consultant.

† See plan view.

†† See "Liquid Coolant System" in Appendix A.

MOTOR GENERATOR (REMOTE) FOR SYSTEM/370 MODEL 195 (50-HZ INPUT)

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Distribution Guide for Motor-Generator Output to 3085 PDU

Information in this guide accommodates a 208 A 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.

Copper Wire Size	Conduit Quantity	Conduit Size (inches)	3195 Model	Maximum Run Lengths by Conduit Type--ft (meters†) Ferrous	Nonferrous	Nonmetallic††
250 MCM*	1	3	L1	105** (32**)	130** (40**)	155*** (47***)
			KJ1	130** (40**)	155** (47**)	180*** (55***)
			K1	145** (44**)	170** (52**)	195*** (59***)
			J1	160** (49**)	185** (59**)	210*** (64***)
2/0 AWG	2	2	L1	190 (58)	230 (70)	265 (81)
			KJ1	230 (70)	270 (82)	305 (93)
			K1	255 (78)	295 (90)	330 (101)
			J1	280 (85)	320 (98)	355 (108)
250 MCM	1 1	2-1/2 3	L1	210 (64)	260 (79)	310 (94)
			KJ1	250 (76)	300 (91)	350 (107)
			K1	275 (84)	325 (99)	375 (114)
			J1	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/370 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; 220/240 V or 380/408 V, 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, 208 V ± 2%, 441 Hz ± 6%

Notes:

* Starter circuitry is included in the generator.

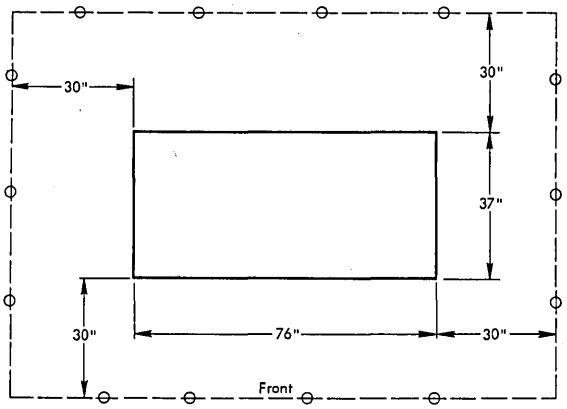
The installation and maintenance of the motor-generator (including starter) unit will be the responsibility of the customer. Consult motor-generator manufacturer's instruction manual for further installation procedures and maintenance.

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/370 MODEL 195 (60-HZ INPUT)

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Distribution Guide for Motor-Generator Output to 3085 PDU

Information in this guide accommodates a 208 A 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.

Copper Wire Size	Conduit Quantity	Conduit Size (inches)	3195 Model	Maximum Run Lengths by Conduit Type--ft (meters†) Ferrous	Nonferrous	Nonmetallic††
250 MCM*	1	3	L1	105** (32**)	130** (40**)	155*** (47***)
			KJ1	130** (40**)	155** (47**)	180*** (55***)
			K1	145** (44**)	170** (52**)	195*** (59***)
			J1	160** (49**)	185** (59**)	210*** (64***)
2/0 AWG	2	2	L1	190 (58)	230 (70)	265 (81)
			KJ1	230 (70)	270 (82)	305 (93)
			K1	255 (78)	295 (90)	330 (101)
			J1	280 (85)	320 (98)	355 (108)
250 MCM	1 1	2-1/2 3	L1	210 (64)	260 (79)	310 (94)
			KJ1	250 (76)	300 (91)	350 (107)
			K1	275 (84)	325 (99)	375 (114)
			J1	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/370 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, 208/230 V or 440 V ± 10%, 60 Hz ± 5%, 40°C maximum ambient

Starting Inrush Current:
208 V–460 A
230 V–424 A
440 V–200 A

Running Current at Full Load:
208 V–235 A
230 V–212 A
440 V–106 A

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

Notes:

* Starter circuitry is included in the generator.

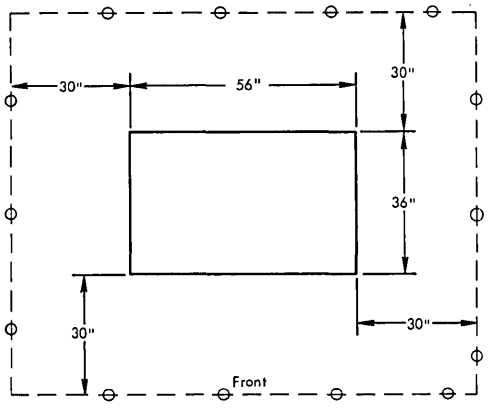
The installation and maintenance of the motor-generator (including starter) unit will be the responsibility of the customer. Consult motor-generator manufacturer's instruction manual for further installation procedures and maintenance.

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/370 MODEL 195 (50 HZ ONLY)

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



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:

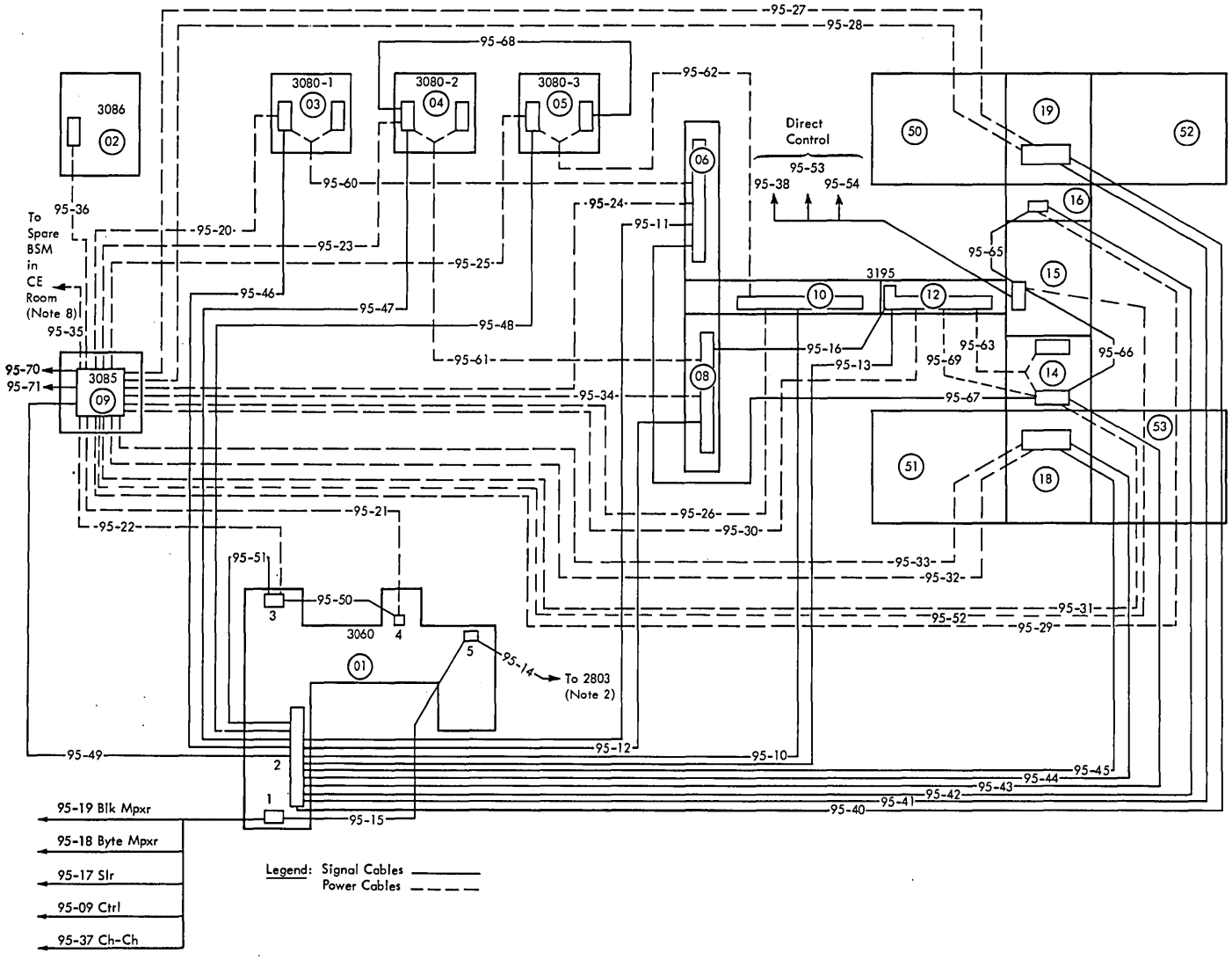
Induction Motor—50 hp, 220/240 V or 380/408 V, 50 Hz ±0.5 Hz

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, 208 V, 60 Hz, 37.5 kVA

SYSTEM/370 MODEL 195 CABLING SCHEMATIC—PROCESSOR



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	–

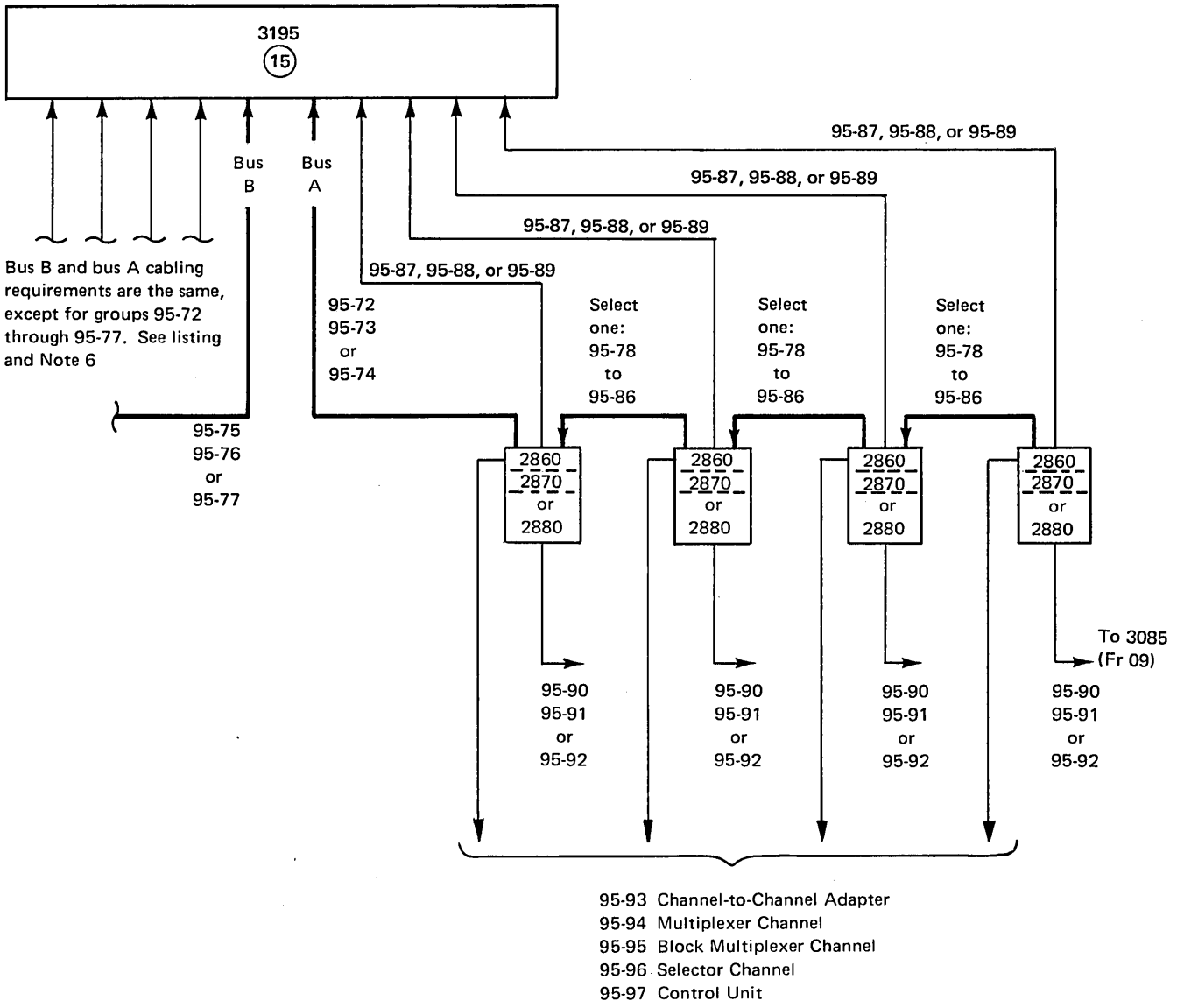
SYSTEM/370 MODEL 195 CABLING SCHEMATIC—PROCESSOR

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	–
95-69	1	3195 Fr 14	3195 Fr 12	10	3
95-70	1	3085 Fr 09	System/360 or System/370 Processor	100	12
95-71	1	3085 Fr 09	System/360 or System/370 Processor	100	13

Notes:

1. Direct control to other System/360 or System/370 processors (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 L1 configuration only.
5. For 3195 Model KJ1 and L1 configurations only.
6. For 3195 Model K1, KJ1, and L1 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.

SYSTEM/370 MODEL 195 CABLING SCHEMATIC—CHANNELS



SYSTEM/370 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

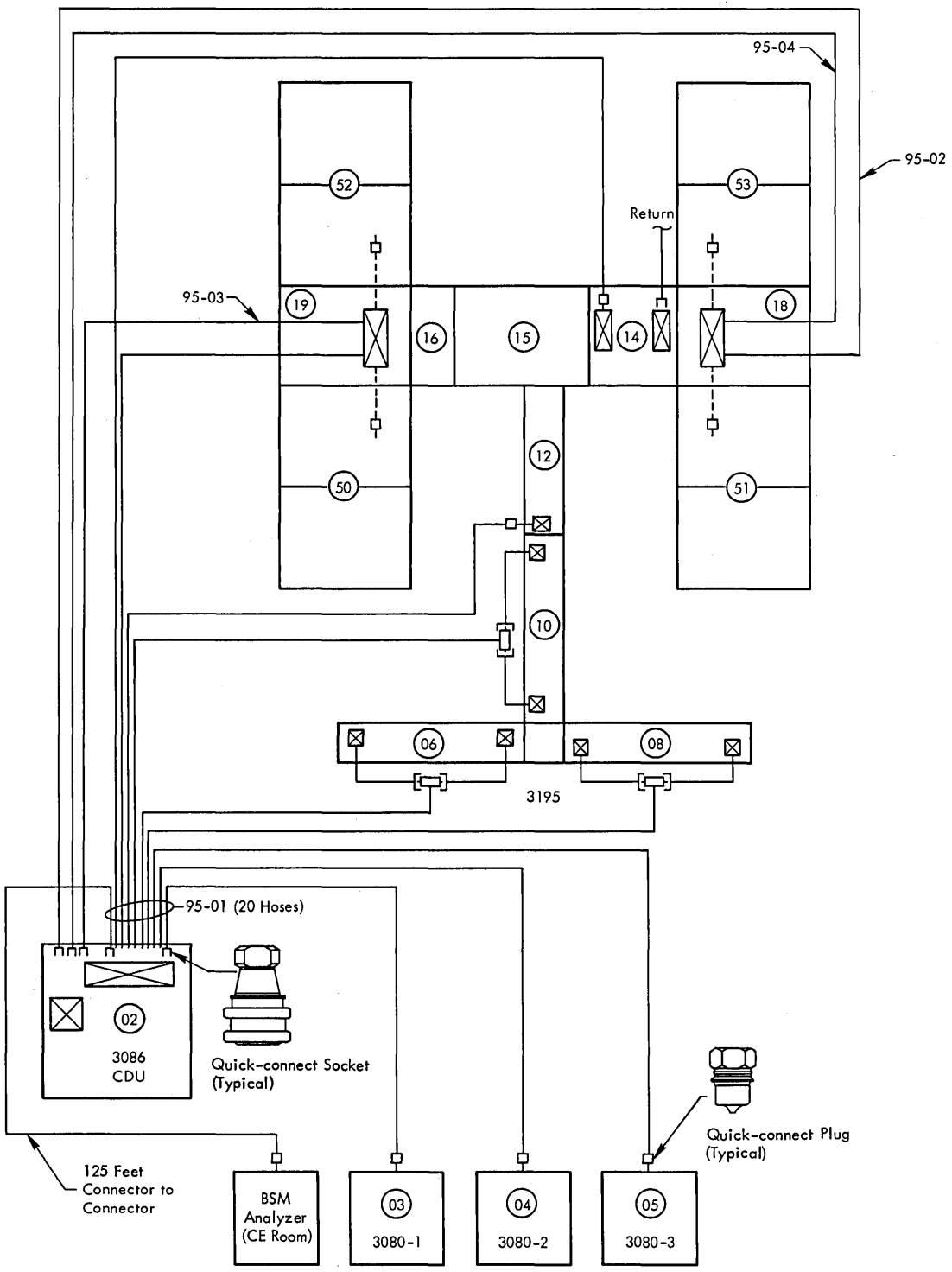
Notes:

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/370 MODEL 195 CABLING SCHEMATIC—COOLANT HOSES



SYSTEM/370 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

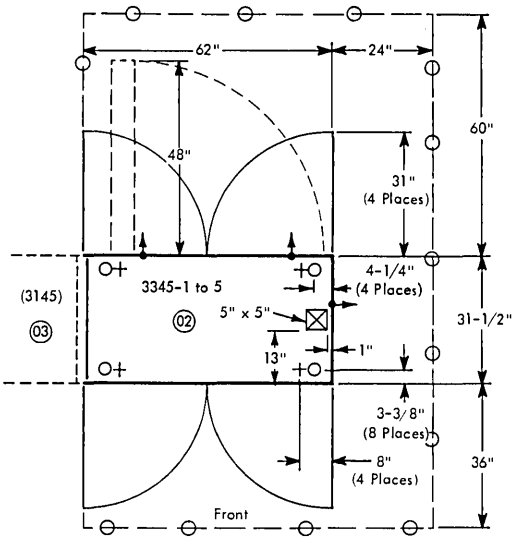
Notes:

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 J1
   Group numbers 95-01 and 95-02 for Model K1
   Group numbers 95-01, 95-02, and 95-03 for Model KJ1
   Group numbers 95-01, 95-02, 95-03, and 95-04 for Model L1.

For 3270 system units: 3271, 3272, 3274, 3275, 3276, 3277, 3278, 3284/3286, 3287, 3288, and 3289, refer to the *IBM 3270 Information Display System Installation Manual–Physical Planning*, GA27-2787.

3345 STORAGE AND CONTROL FRAME MODELS 1 TO 5

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



Notes:

1. The 48" gate is *not* on the 3345 Model 3.
2. For cabling information, see 3145.

SPECIFICATIONS

Dimensions:

	F	S	H
Inches	62*	31-1/2*	60
(cm)	(157*)	(80*)	(152)

Service Clearances:

	F	R	Rt	L
Inches	36	60	24	0**
(cm)	(91)	(152)	(61)	(0**)

Weight:	*Model 1*	*Model 2*	*Model 3*	*Model 4*	*Model 5*
lb	1,050	1,250	1,000	1,500	1,700
(kg)	(480)	(570)	(460)	(690)	(780)

Heat Output:					
BTU/hr	19, 750	28, 500	5, 000	26, 800	35, 500
(kcal/hr)	(5 000)	(7 200)	(1 300)	(6 800)	(8 950)

Airflow:					
cfm	620	760	280	900	1,040
(m^3/min)	(18)	(22)	(8)	(26)	(31)

Power Requirements:***					
kVA	7.3	10.5	1.8	9.9	13.1

Notes:

*Removal of side and end covers reduces the machine to 29-1/2" x 60" (75 cm x 152 cm).

**The 3345 is bolted to the right end of the 3145 power frame.

***Powered from 3046-1 and/or 3145:

Model 1: 6.8 kVA from 3046-1 and 0.5 kVA from 3145.

Model 2: 10.0 kVA from 3046-1 and 0.5 kVA from 3145.

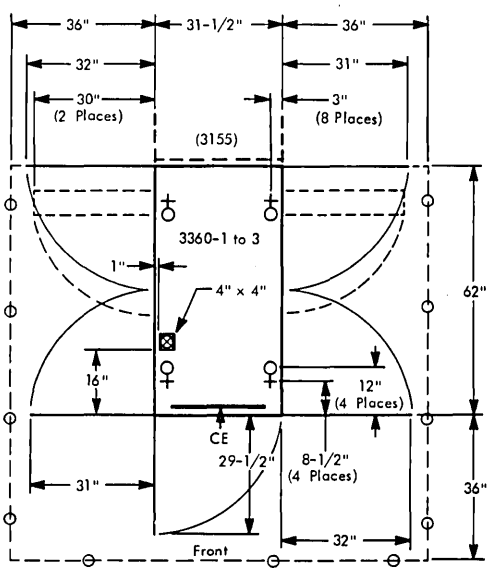
Model 3: 1.8 kVA from 3145 only.

Model 4: 6.8 kVA from 3046-1 and 3.1 kVA from 3145.

Model 5: 10.0 kVA from 3046-1 and 3.1 kVA from 3145.

3360 PROCESSOR STORAGE MODELS 1, 2, AND 3

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



SPECIFICATIONS

Dimensions:

	F	S	H
Inches	31-1/2	62	60
(cm)	(80)	(157)	(152)

Service Clearances:

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

Weight: 1,800 lb (820 kg)

Heat Output:	*Selected*	*Idling*
BTU/hr	13,500	7,500
(kcal/hr)	(3 450)	(1 900)

Airflow:

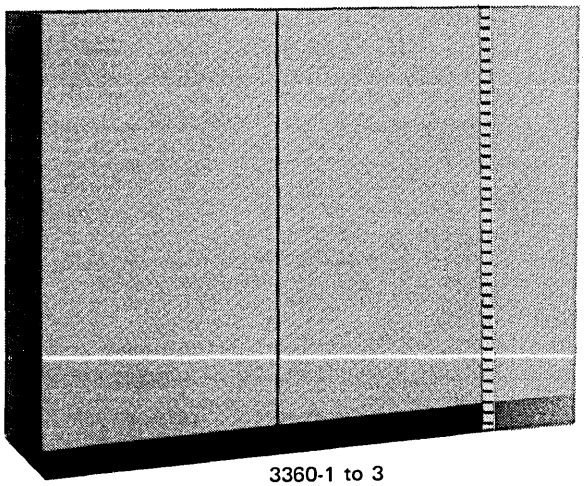
cfm	835	835
(m^3/min)	(24)	(24)

Power Requirements: *

kVA	4.5	2.5
Phases	3	3
Plug	R&S, FS3760	
Connector	R&S, FS3934	
Receptacle	R&S, FS3754	
Power Cord Style	D1	

Notes:

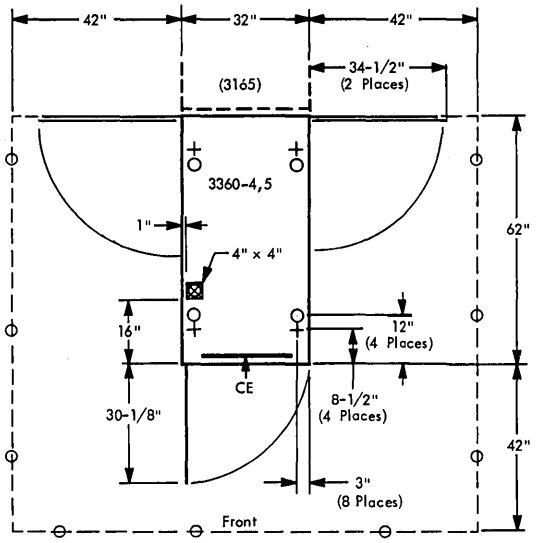
* See also host processor specifications.



3360-1 to 3

3360 PROCESSOR STORAGE MODELS 4 AND 5

PLAN VIEW (English Scale: 1/4 in. = 1 ft)



SPECIFICATIONS

Dimensions:

	F	S	H
Inches	32	62	70
(cm)	(81)	(157)	(178)

Service Clearances:

	F	R	Rt	L
Inches	42	0	42	42
(cm)	(107)	(0)	(107)	(107)

Weight: 2,000 lb (910 kg)

Heat Output:	*Selected*	*Idling*
BTU/hr	13,652	8,533
(kcal/hr)	(3 450)	(2 200)

Airflow:

cfm	835	835
(m^3/min)	(24)	(24)

Power Requirements: *

kVA	4.6	2.8
Phases	3	3
Plug	R&S, FS3760	
Connector	R&S, FS3934	
Receptacle	R&S, FS3754	
Power Cord Style	D1	

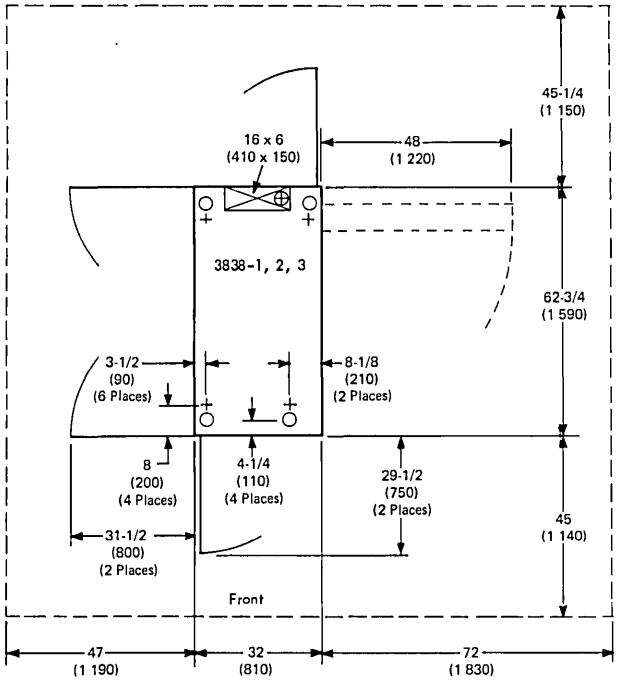
Notes:

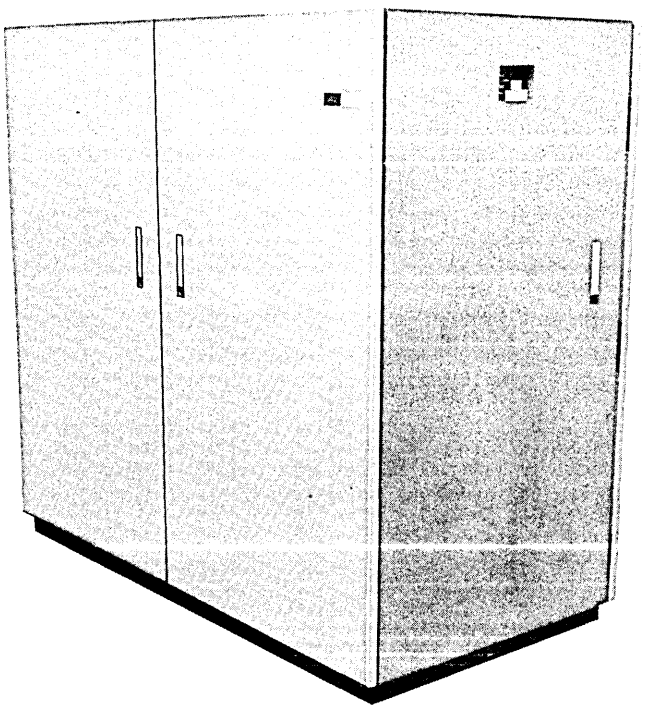
* See also host processor specifications.

3838 ARRAY PROCESSOR MODELS 1, 2, AND 3

PLAN VIEW (English Scale: 1/4 in. = 1 ft)

Metric measurements are shown in parentheses.





SPECIFICATIONS

Dimensions:

	F	S	H
mm	810	1 590	1 520
(Inches)	(32)	(62-3/4)	(60)

Service Clearances:

	F	R	Rt	L
mm	1 140	1 150	1 830	1 190
(Inches)	(45)	(45-1/4)	(72)	(47)

Weight: 750 kg (1,650 lb)

Heat Output:	*Model 1*	*Model 2*	*Model 3*
W	5 430	5 850	6 600
(BTU/hr)	(18,500)	(19,950)	(22,500)

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

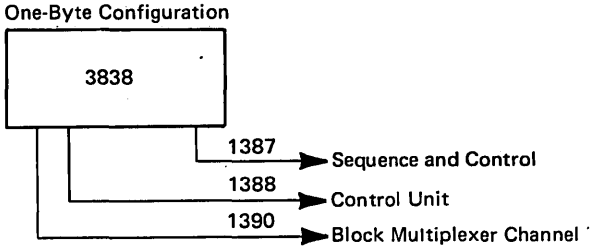
Power Requirements:	*Model 1*	*Model 2*	*Model 3*
kVA	6.3	6.8	7.7
Phases	3	3	3
Plug	R&S, SC7328		
Connector	R&S, SC7428		
Receptacle	R&S, SC7324		

Environment, Operating:

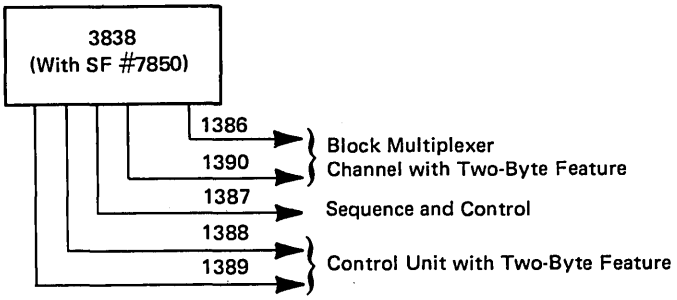
Temperature	16°C-29°C (60°F-85°F)
Rel Humidity	20%-80%
Max Wet Bulb	23°C (73°F)

3838 ARRAY PROCESSOR CABLING SCHEMATIC

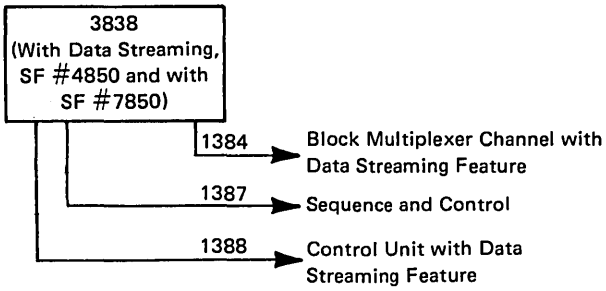
One-Byte Configuration



Two-Byte Configuration



Data Streaming Configuration with Two-Byte Feature Prerequisite



Group No.	*No. of Cables*	*From*	*To*	*Max Length m*	*(feet)*	*Notes*
1384	2	3838	Channel	121.9	(400)	4, 5, 7
1386	1	3838	Channel	35	(115)	1
1387	1	3838	Channel	–	–	6
1388	2	3838	Control Unit	–	–	2, 5, 7
1389	1	3838	Control Unit	35	(115)	2, 3
1390	2	3838	Channel	35	(115)	1

Cable Length Effect on 3838 Data Rates (Without Data Streaming Feature Installed)

The following chart shows the effect on data rate as a function of 3838 to channel cable length. Add 6.1 meters (20 feet) for each intervening control unit to determine the effective cable length. Add 12.2 meters (40 feet) for an intervening 2914.

Effective Cable Length		*% Degradation from Published Data Rate*
15.2 meters or less	(50 feet or less)	0
15.5 meters to 24.4 meters	(51 feet to 80 feet)	5
24.7 meters to 35 meters	(81 feet to 115 feet)	16.7

Cable Length Effect on 3838 Data Rates (With Data Streaming Feature Installed)

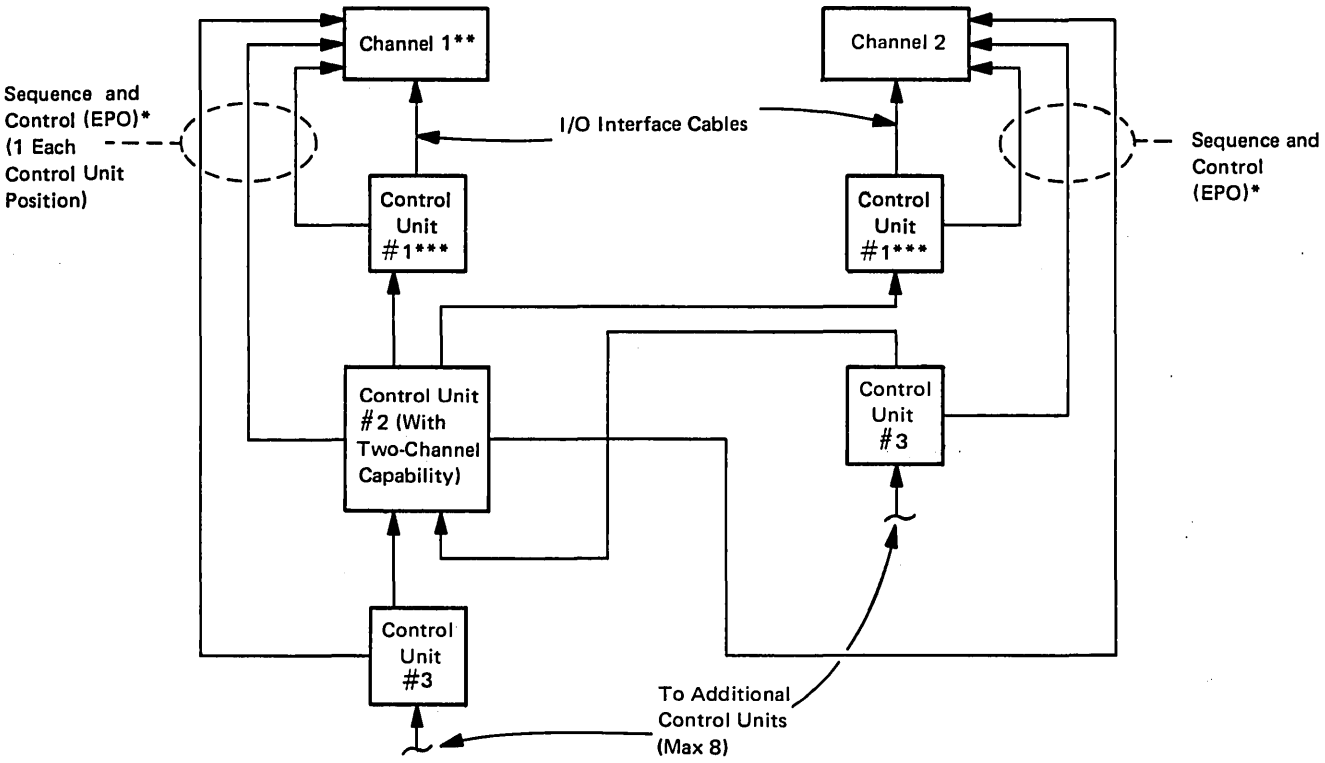
No degradation for cable length with the data streaming feature installed.

Notes:

1. The 3838 attaches only to block multiplexer channels.
2. For one-byte and two-byte configurations, when there is an intervening control unit between the 3838 and the channel, the effective cable length must not exceed 35 meters (115 feet). See "Cable Length Effect on 3838 Data Rates (Without Data Streaming Feature Installed)."
3. Can only be used if two-byte feature is installed on the intervening control unit(s).
4. Only used when two-byte feature and data streaming feature are installed.
5. With the data streaming feature installed, when there is an intervening control unit between the 3838 and the channel, the effective cable length must not exceed 121.9 meters (400 feet).
6. The maximum length of cable group 1387 is 45.7 meters (150 feet) in a one-byte or two-byte configuration; 121.9 meters (400 feet) in a data streaming configuration.
7. For any intervening 3838, add 12.2 meters (40 feet) effective cable length.

GENERAL CONTROL-TO-CHANNEL CABLING

Generally, the cable available to connect up to eight control units to a channel is limited to 200 feet. Exceptions to this are noted on the cabling schematics for the individual control units. (See also "System/370 Model 145 Cabling Schematic.") All control units are connected to the channels serially.



*On the 3032 and 3033, the sequence and control cables (no EPO) go to the PDU.
On the 3031, the sequence and control cables (no EPO) go to the 3031 Processor (frame 02).
**The channel may be a separate machine (such as the IBM 2860) or integral to the system processor.
***Machines with two-byte interface feature must be installed first on the channel.

CHANNEL-TO-CHANNEL ADAPTER CABLING

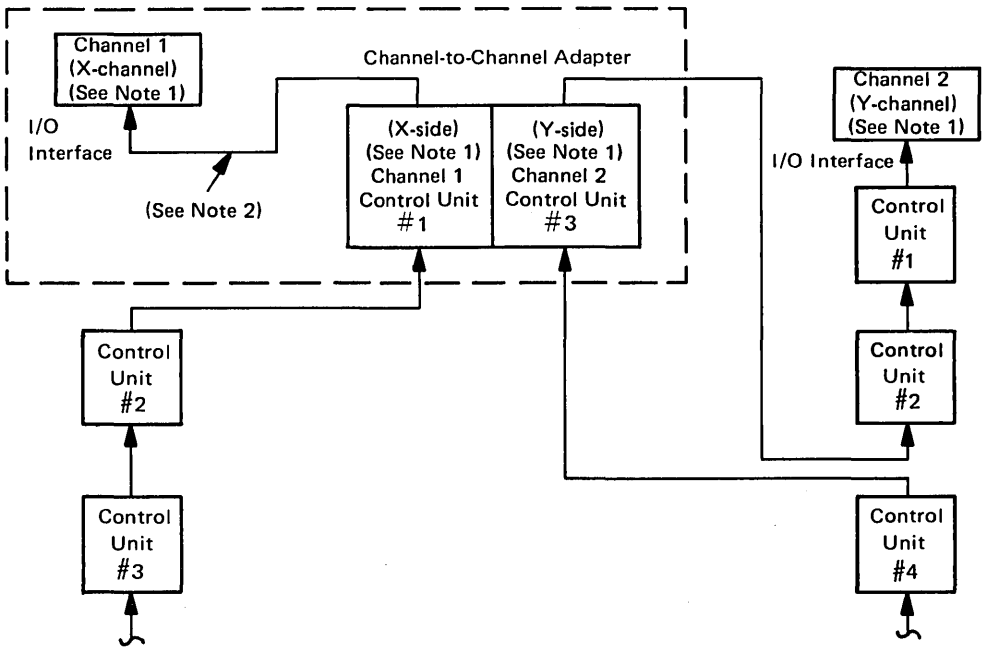
The channel-to-channel adapter (CTCA), SF #1850 and SF #1851, is considered as if it were a control unit on each of the channels affected, except when the Model 145 is the host system. The adapter then requires two control unit positions on both X- (host) and Y- (guest) interfaces. For the IBM 3081/3083/3084 Processor Complex, the adapter reduces the maximum external I/O interface cable length for the Y- (guest) channel with the CTCA by 9.1 meters (30 feet). The adapter requires external cables to both the host and guest channels, except the IBM 2860 Selector Channel.

The channel-to-channel adapter can be installed as follows:

1. *IBM 2860 Selector Channel:* The host side is physically wired internally, first on the channel and then to the select out line (highest priority). The guest side may be cabled in any control unit physical position and any priority position on the select out or select in line.
2. *IBM System/370 Models 145, 155, 158, IBM 3031 and 3032 Processors (with Director 1), and 3081, 3083, and 3084 Processors:* The CTCA is in the same frame as the channel connectors and may be assigned to any control unit position(s) or any priority on the host or guest channel. When the CTCA is physically the first control unit on the host channel, specify 1.2 meters (4 feet) of cable to connect the CTCA to channel connectors.
3. *IBM 3032 Processor (with Director 2) and IBM 3033 Processors:* The CTCA is in a different frame than the channels and can be assigned any control unit position or priority on the host or guest channel. When the CTCA is physically the first control unit on the host channel, specify 3 meters (10 feet) of cable for the 3032 and 1.8 meters (6 feet) of cable for the 3033.

In each of the preceding steps, the guest-side (Y) cabling should be specified as required.

Channel-to-Channel Adapter in First Control Unit Position

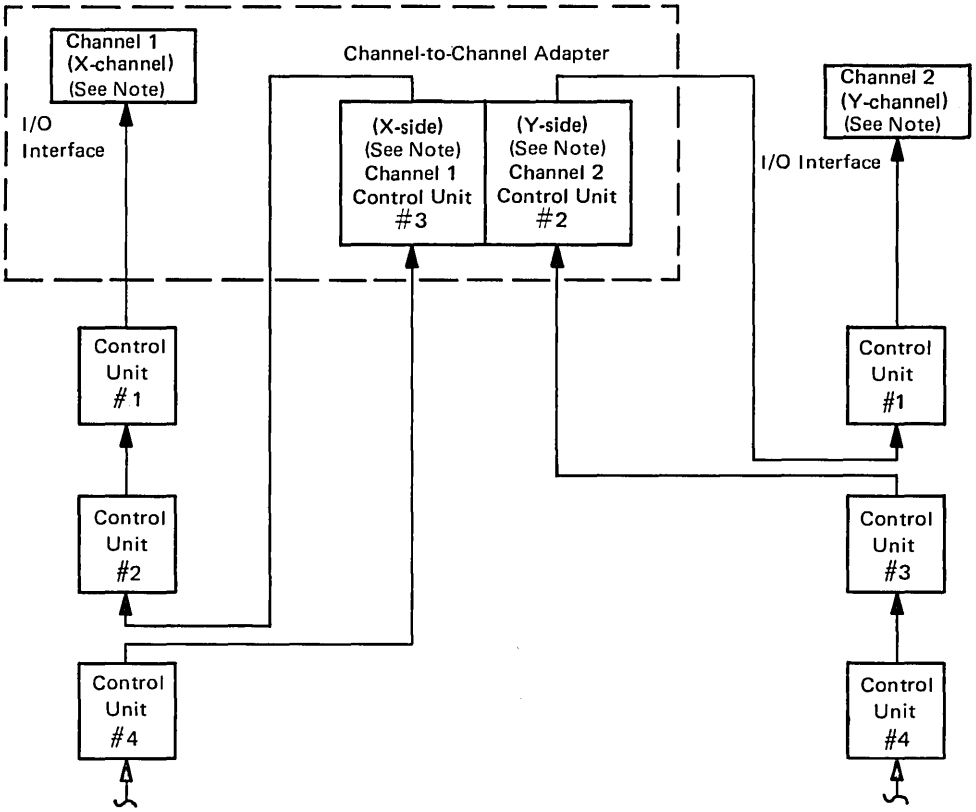


Notes:

1. X refers to the host channel; Y refers to the guest channel.
2. X-side; internal machine wiring (IBM 2860 Selector Channel).

CHANNEL-TO-CHANNEL ADAPTER CABLING

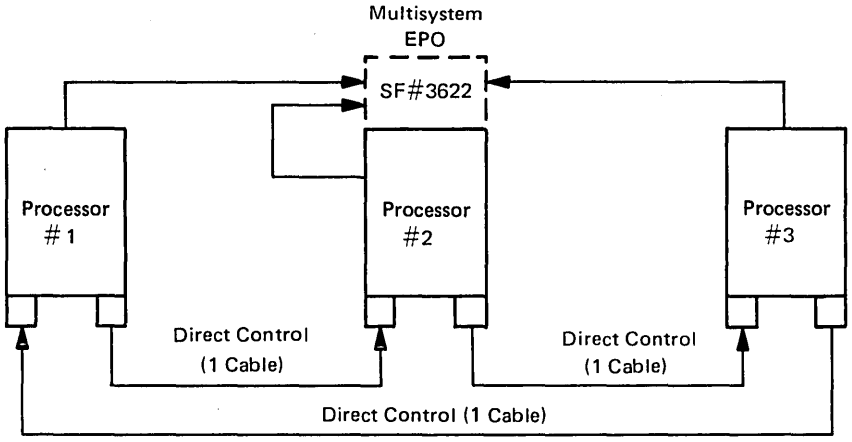
Channel-to-Channel Adapter in Any Control Unit Position



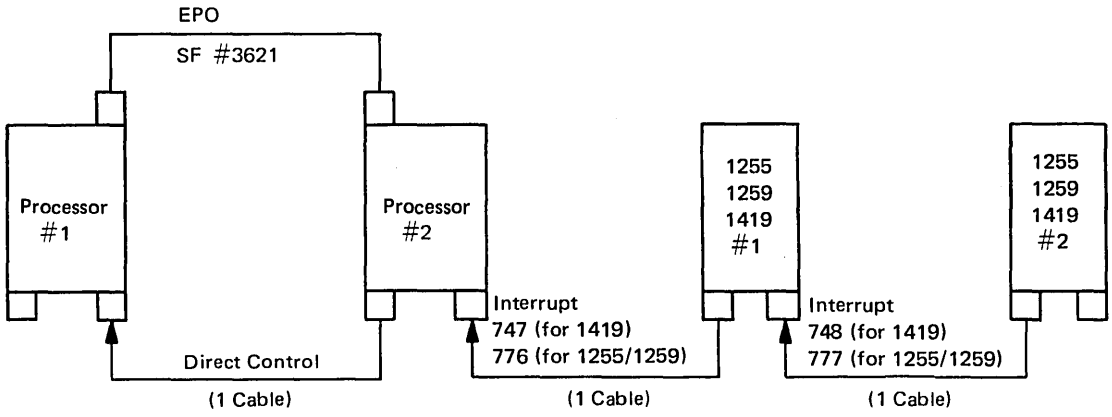
Note: X refers to the host channel; Y refers to the guest channel.

DIRECT CONTROL CABLING

Multiple Processors (Notes 1 and 2)



Two Processors with External Devices (Notes 1, 2, and 3)



Notes:
1. Cabling shown above is in addition to basic channel requirements.
2. Processor may be System/360 or System/370.
3. The total length of 747 or 776 plus 748 or 777 must not exceed 200 feet.

Appendix A. Additional Cooling Requirements and 400-Hz Power Requirements

PART 1. COOLING REQUIREMENTS

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 specification 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 for 3027, 3037, 3067, 3086, and 3087 Model 1

Note: When the computer system is planned to be inoperative (power off) for more than eight hours, there should 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. If the customer provides separate chilled water pumping for the CDU, it is recommended that an automatic bypass be provided by the customer in the chilled water loop to prevent damage to his pump.

Hardness of water shall not exceed 200 ppm calcium and magnesium. Water pH shall be between 7 and 9. Turbidity should be less than 10 jackson units. A copper corrosion inhibitor that is specified by the inhibitor supplier should be added to the water system. When ethylene glycol is used in the customer-chilled water system, only pure ethylene glycol is acceptable. Automotive-type antifreeze must not be used.

Supply and return lines should be terminated as shown on pages A.1.2 and A.1.3. Fittings should be horizontal. Nine-inch (228.6-mm) long insulators are provided by IBM to cover these fittings.

When the customer's chilled water pressure is above 75 psig (5.3 kg/cm^2), a manually operated drain valve (pressure release) could be installed between the customer's shut-off valve and the Hansen plugs. This will allow the pressure to be reduced on the Hansen plugs, so that they may be easily connnected or disconnected.

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) for 3067 CDUs (Model 165) with serial numbers below 60151 and for all 3086 CDUs (Model 195). On 3067 CDUs starting with serial number 60151, 3027 CDUs, 3037 CDUs, and 3087 CDUs, the maximum pressure on customer-supplied, chilled-water lines should not exceed 150 psig (10.5 kg/cm^2).

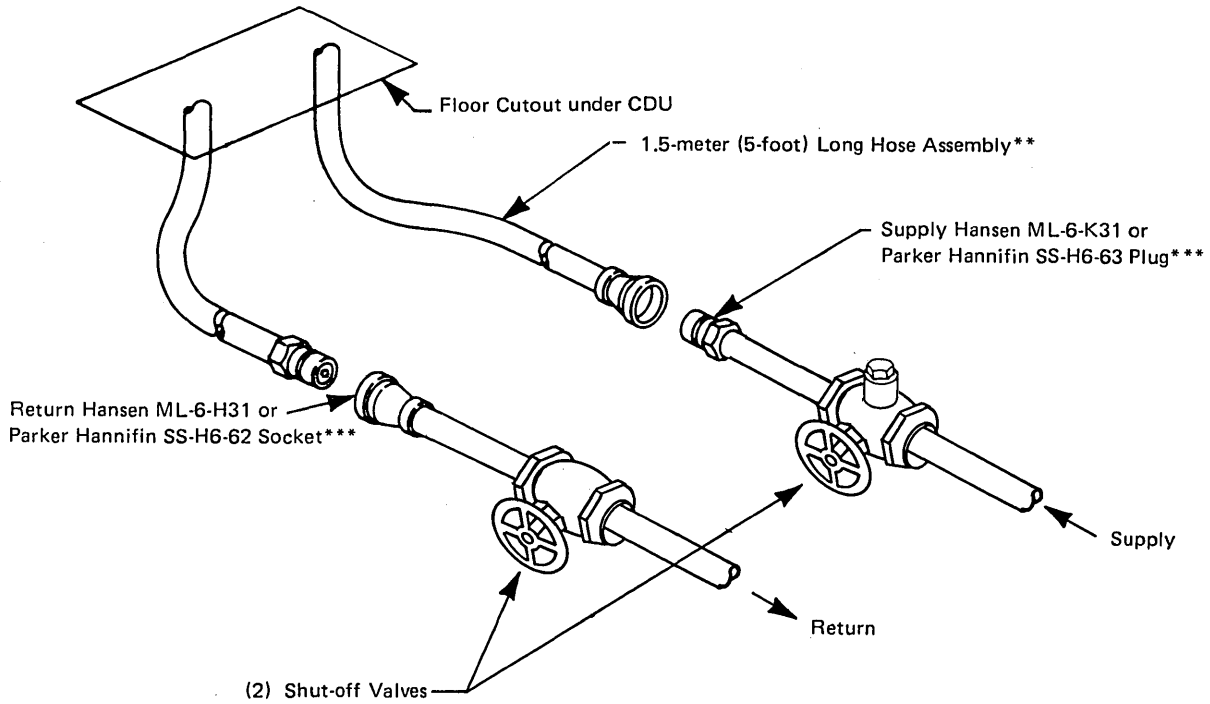
Customer-Supplied Chilled Water Requirements for the 3081/3083/3084 Processor Unit

Customer-supplied chilled-water temperature must not exceed 15°C (59°F). For temperatures below 15°C (59°F), IBM recommends that the customer provide a flow rate of 38 lpm (10 gpm) for the 3083 and 56 lpm (15 gpm) for the 3081 and 3084, which provides a time buffer to allow repairs and orderly power-down operations. The maximum flow rate should not exceed 75 lpm (20 gpm). For guidelines, see the Flow/Temperature Requirements Chart for 3087 Model 1 on page A.1.2, which is provided to assist the customer in designing a chilled-water supply.

If these requirements cannot be met, the customer should choose a flow rate based on the temperature of the water from the Flow/Temperature Requirements Chart for 3087 Model 1.

See connection diagram on pages A.1.2 and A.1.3 for customer-supplied equipment.

Typical Connections for Customer-Supplied Chilled Water for 3087 Model 1*



* Customer should install one supply connection and one return connection for each 3087 Model 1.

** IBM supplied:
Two on 3087 Model 1.

*** Customer supplied:
One of each.
Plug and socket types are interchangeable.

Flow/Temperature Requirement Charts for 3087 Model 1 (See Notes)

Chart A

Water Temperature °C	(°F)	*Models*	*Flow Rate* lpm	(gpm)	*Pressure Drop* kPa	(psi)
3-7	(37-45)	3081 G/KX1, 2, 3	19.0	(5.0)	11.1	(1.6)
		3083 X0, X1	13.5	(3.5)	5.5	(0.8)
		3081 G/KX4	21.0	(5.5)	13.5	(2.0)
		3081 G/KX6	25.0	(6.5)	18.5	(2.7)
		3083 X2, X3	17.0	(4.5)	8.9	(1.3)
8-12	(46-54)	3081 G/KX1, 2, 3	23.0	(6.0)	15.9	(2.3)
		3083 X0, X1	17.0	(4.5)	8.9	(1.3)
		3081 G/KX4	27.0	(7.0)	21.3	(3.1)
		3081 G/KX6	30.0	(8.0)	27.2	(3.9)
		3083 X2, X3	21.0	(5.5)	13.5	(2.0)
13-14	(55-57)	3081 G/KX1, 2, 3	28.0	(7.5)	24.2	(3.5)
		3083 X0, X1	21.0	(5.5)	13.5	(2.0)
		3081 G/KX4	32.0	(8.5)	30.3	(4.4)
		3081 G/KX6	36.0	(9.5)	37.1	(5.4)
		3083 X2, X3	27.0	(7.0)	21.3	(3.1)
15	(59)	3081 G/KX1, 2, 3	32.0	(8.5)	30.3	(4.4)
		3083 X0, X1	25.0	(6.5)	18.5	(2.7)
		3081 G/KX4	38.0	(10.0)	40.6	(5.9)
		3081 G/KX6	42.0	(11.0)	48.2	(7.0)
		3083 X2, X3	30.0	(8.0)	27.2	(3.9)

Notes:
1. The preceding chart is used for sea level to 2 150-meter (7,000-foot) altitude.
2. Use the 3081 requirements for both the 3084 A-side and B-side.
3. For models shipped before February 23, 1984, use Flow/Temperature Requirement Chart B for 3087 Model 1.

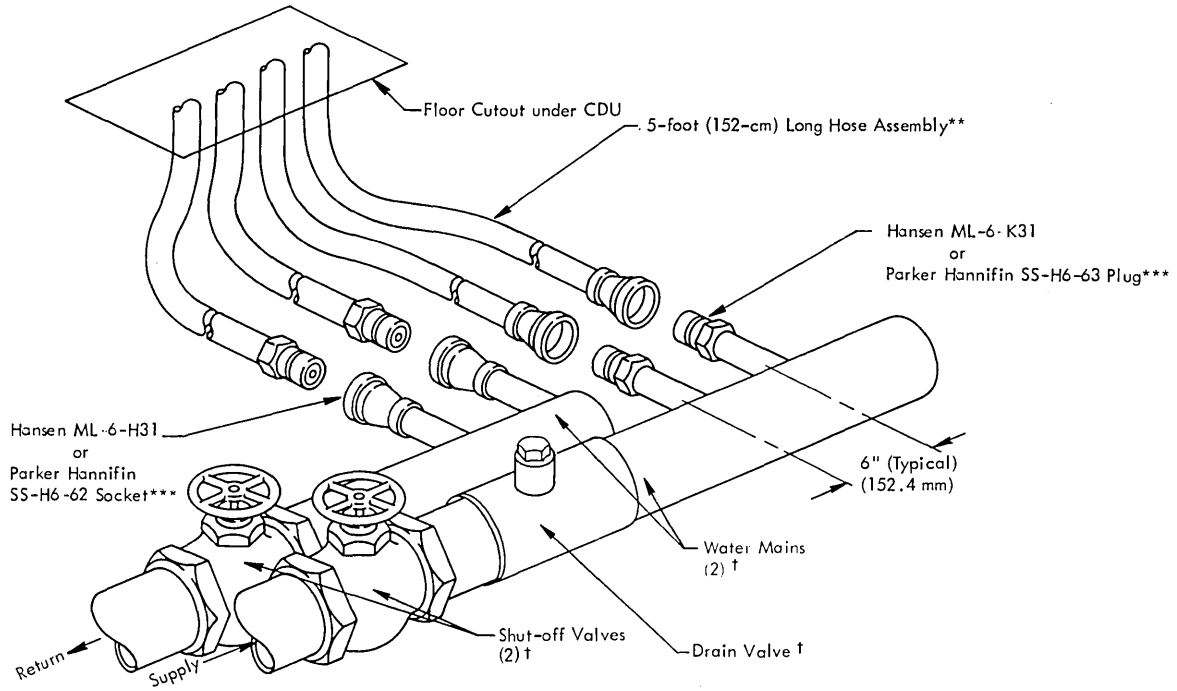
Chart B

Water Temperature °C	(°F)	*M/T*	*Flow Rate* lpm	(gpm)	*Pressure Drop* kPa	(psi)
3-7	(37-45)	3083	21.0	(5.5)	13.5	(2.0)
		3081	25.0	(6.5)	18.5	(2.7)
8-12	(46-54)	3083	27.0	(7.0)	21.3	(3.1)
		3081	34.0	(9.0)	33.6	(4.9)
13-14	(55-57)	3083	32.0	(8.5)	30.3	(4.4)
		3081	42.0	(11.0)	48.2	(7.0)
15	(59)	3083	38.0	(10.0)	40.6	(5.9)
		3081	51.0	(13.5)	69.5	(10.1)

Legend:

gpm	Gallons per minute
kPa	Kilopascal
lpm	Liters per minute
M/T	Machine type
psi	Pounds per square inch

Typical Connections for Customer-Supplied Chilled Water for 3027, 3037, 3067, and 3086*



*For connections, the customer should install two supply and two return connections to his water mains, and he should supply applicable flow rate. CDUs delivered with three supply and three return hoses can use two of each, provided that the applicable flow rate is supplied.

** IBM supplied:
Six on 3067s with serial number below 60140.
Four on 3027s, 3037s, and 3067s with serial number 60140 and higher.

*** Customer supplied:
Three of each when six hoses are used.
Two of each when four hoses are used.
Plug and socket types are interchangeable.

† Customer supplied.

Parameter	Model 165--3067-1 Model 168--3067-2,3*		Model 168--3067-2,3** 3062-1--3067-5		Model 195--3086		3032 Processor Complex --3027	3033 Complexes --3037--	3042-1, -2 Attached Processor --3037--
	Min Unit ***	Max Unit ***	Min Unit ***	Max Unit ***	Min Unit ***	Max Unit ***			
Max Temp °F (°C)	60 (16)	60 (16)	60 (16)	60 (16)	60 (16)	60 (16)	60 (16)	60 (16)	60 (16)
Min Temp °F (°C)	45 (7)	45 (7)	45 (7)	45 (7)	45 (7)	45 (7)	45 (7)	45 (7)	45 (7)
Pressure Drop psig (kg/cm^2)									
6-hose CDU	10 (0.7)	20 (1.4)	--	--	10 (0.7)	25 (1.8)	--	--	--
4-hose CDU	14 (1.0)	24 (1.7)	16 (1.1)	21 (1.5)	13 (0.9)	35 (2.5)	13 (0.9)	10 (0.7)	5 (0.4)
Flow Rate gpm (liters/min)									
6-hose CDU	25 (95)	35 (133)	--	--	25 (95)	40 (151)	--	--	--
4-hose CDU	28 (106)	38 (144)	28 (106)	32 (121)	25 (95)	40 (151)	25 (95)	22 (83)	16 (60)

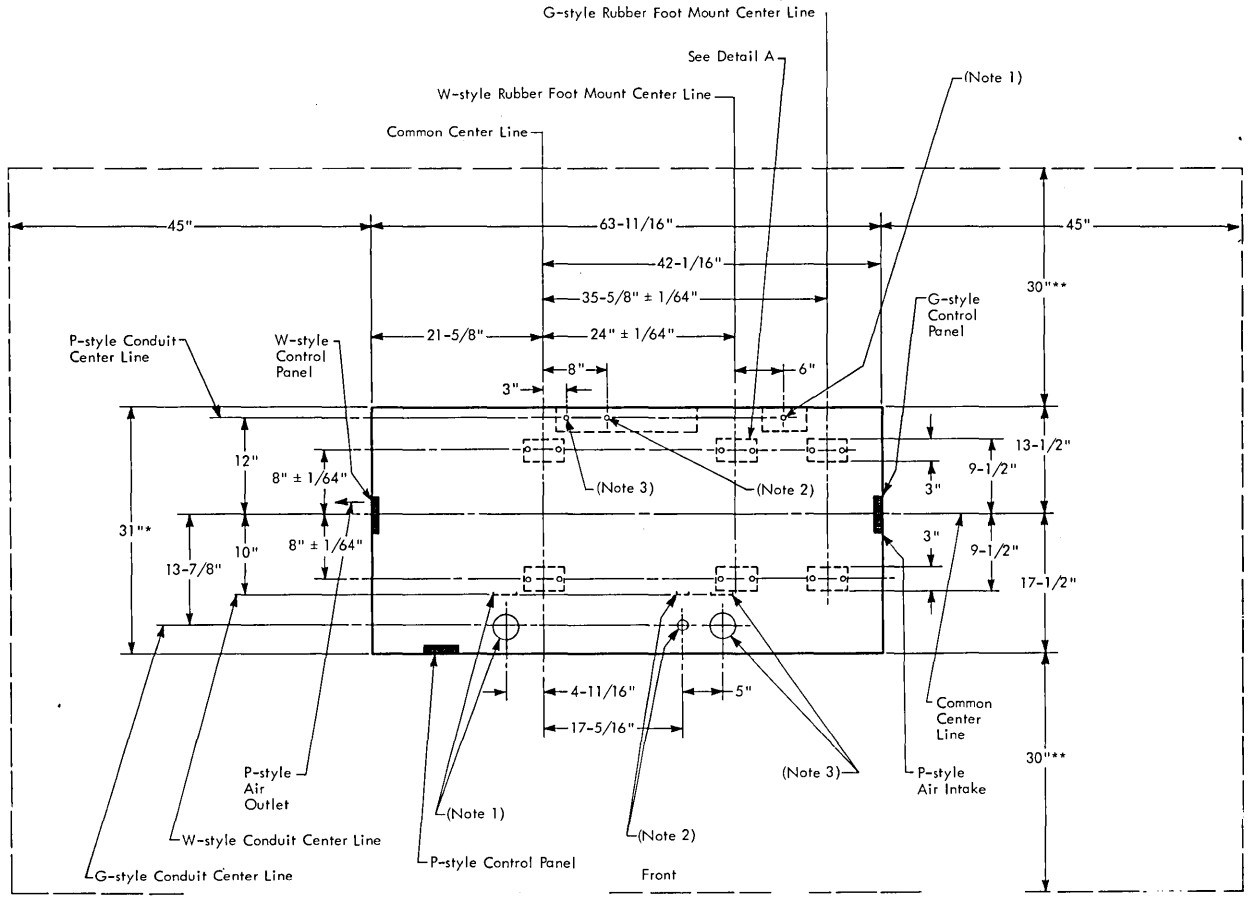
* 3067-2 and -3 (serial numbers below 61000).

** 3067-2, -3, and -5 (serial numbers 61000 and above).

*** Minimum and maximum refer to the smallest and the largest configuration of processor complexes and installed features.

PART 2. MOTOR GENERATORS
MOTOR GENERATOR (REMOTE) FOR SYSTEM/370
MODELS 165, 168 AND 3032, 3033 PROCESSORS (50-HZ INPUT)

PLAN VIEW (English Scale is 1/2 in. = 1 ft.)

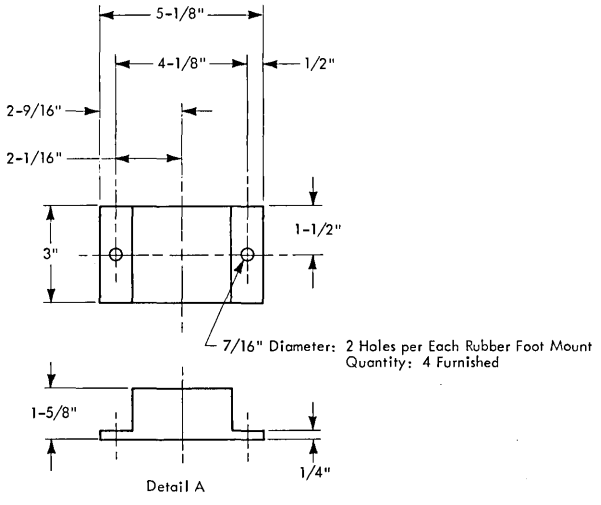


Notes:

1. Generator Output: 3-1/8" diameter
   W-style: Hole in vertical plane with center line 24-3/8" above generator mounting surface.***
   G-style: Hole in horizontal plane with center line 20-3/8" above generator mounting surface.***
   P-style: 3-1/8" x 5-5/8" opening
   Hole in horizontal plane with center line 22-3/8" above generator mounting surface.***

2. Control Leads: 1-3/8" diameter
   W-style: Hole in vertical plane with center line 24-3/8" above generator mounting surface.***
   G-style: Hole in horizontal plane with center line 20-3/8" above generator mounting surface.***
   P-style: 3-1/8" x 14-3/4" common opening for control and motor input leads.
   Hole in horizontal plane with center line 22-3/8" above generator mounting surface.***

3. Motor Input: 3-1/8" diameter
   W-style: Hole in vertical plane with center line 24-3/8" above generator mounting surface.***
   G-style: Hole in horizontal plane with center line 20-3/8" above generator mounting surface.***
   P-style: 3-1/8" x 14-3/4" common opening for control and motor input leads.
   Hole in horizontal plane with center line 22-3/8" above generator mounting surface.***



Inches	Millimeters
1/4	6.4
7/16	11.1
1/2	12.7
1-3/8	34.9
1-1/2	38.1
1-5/8	41.3
2-1/16	52.4
2-9/16	65.1
3	76.2
3-1/8	79.4
4-1/8	104.8
4-11/16	119.0
5	127.0
5-1/8	130.2
5-5/8	142.9
6	152.4
8 ± 1/64	203.2 ± 0.4
9-1/2	241.3

Inches	Millimeters
10	254.0
12	304.8
13-1/2	342.9
13-7/8	352.4
14-3/4	374.6
17-5/16	439.7
17-1/2	444.5
20-3/8	517.5
21-5/8	549.3
22-3/8	568.3
24 ± 1/64	609.6 ± 0.4
24-3/8	619.1
30	762.0
31	787.4
35-5/8 ± 1/64	904.9 ± 0.4
42-1/16	1 068.4
45	1 143.0
63-11/16	1 617.6

MOTOR GENERATOR (REMOTE) FOR SYSTEM/370 MODELS 165, 168 AND 3032, 3033 PROCESSORS (50-HZ INPUT)

Notes:

The installation 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.

The G-style, P-style, and W-style motor generators have the same functional characteristics but differ slightly in physical dimensions. The dimensions on the plan view allow for the installation of either style. If the installation must be planned and the style is unknown, use the plan view to make provisions for six rubber foot mounts instead of four.

* Planning dimension allows G-, P-, or W- style to be installed about common center line.

** Add 12 inches (304.8 mm) for voltages to ground (earth) over 150 V.

*** Add 1-5/8 inches (41.3 mm) for rubber foot mounts.

† See plan view.

†† Height clearance required for top cover swing on G-style and W-style.

Customer to supply the following wiring and appropriate connecting hardware:

1. Input feeders to the motor and ground wire to the MG frame.
2. Output feeders, ground wire, and conduit from generator to the 3027, 3037, or 3067 PCDU.
3. Five remote leads for the 3027 and 3037 or seven remote leads for the 3067 from generator to PCDU.
   a. Three AWG #14 leads where the run does not exceed 275 feet (84 m). For a run longer than 275 feet (84 m), use three AWG #10 leads in a continuous run. These are the sense leads.
   b. Two AWG #16 leads for the abnormal indicator light.
   c. One AWG #16 twisted pair, shielded, jacketed cable for the 50 V monitoring jacks. Shield to be grounded *only* at the motor generator. This cable not required for connection to 3027 or 3037 PCDU.
4. Two AWG #14 leads for the emergency power-off pushbutton in the computer room. These leads should remotely cut off the power output from the generator. Shunt trips for emergency turn-off are provided in both input and output circuit breakers.

Maintain 12-inch (30-cm) spacing between the control conduit and the generator output feeder conduit or, alternatively, run the control wiring in ferrous conduit.

SPECIFICATIONS

Dimensions:

	F	S	H
Inches	†	†	48***
(cm)	(†)	(†)	(122***)

Service Clearances:

	F	R	Rt	L	H
Inches	30**	30**	45	45	30††
(cm)	(76**)	(76**)	(114)	(114)	(76††)

Weight:	*G- or W-style*	*P-style*
208/220/235/380/408 V	2,600 lb (1 200 kg)	2,400 lb (1 100 kg)

Heat Output (Max):		
	50,000 BTU/hr (12 600 kcal/hr)	44,000 BTU/hr (11 100 kcal/hr)

Power Requirements:

Input:

Induction Motor—100 hp, 200/220/235/380/408 V, 50 Hz, 3 phase, 100 kVA full load, 40°C maximum ambient, dripproof enclosure

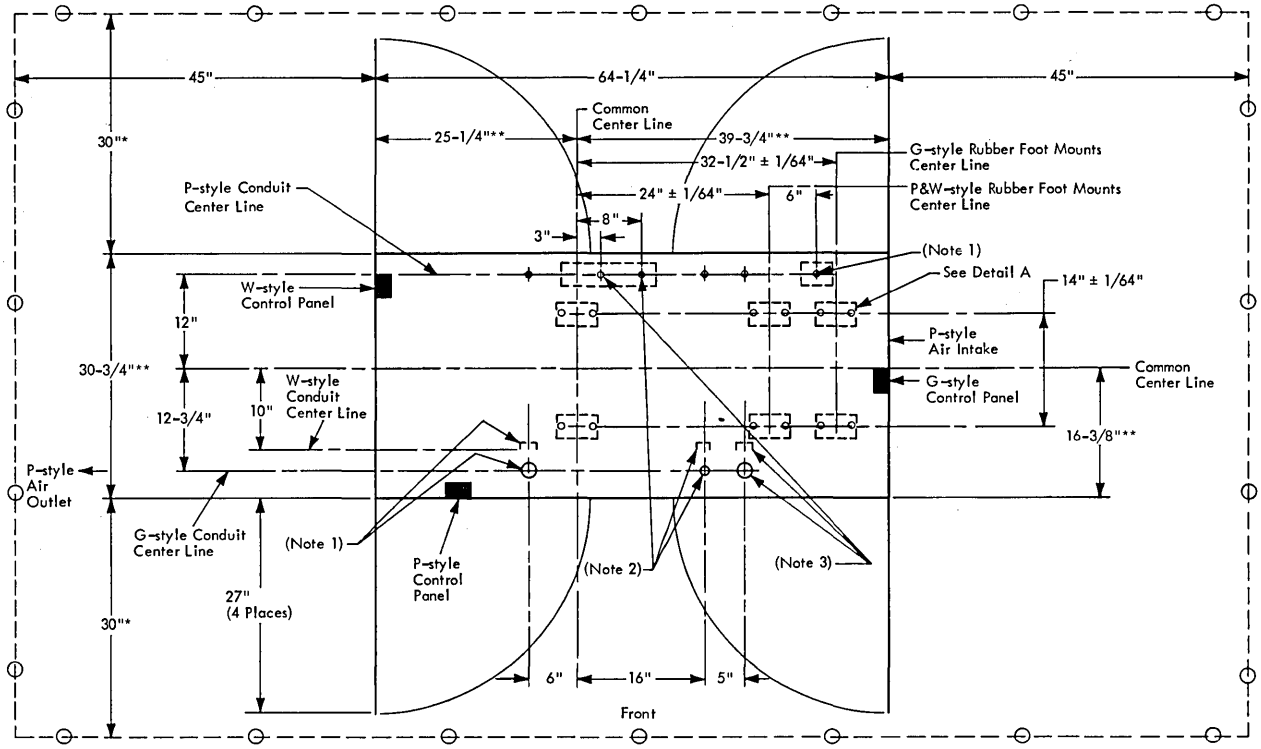
Input (V)	*Approximate Full Load (A)*
200	272
220	245
235	235
380	142
408	134

Output:

Synchronous Generator—75 kVA, 67 kW, 3 phase, 208 V, 441 Hz, 208 A full load, 70°C temperature rise, dripproof enclosure

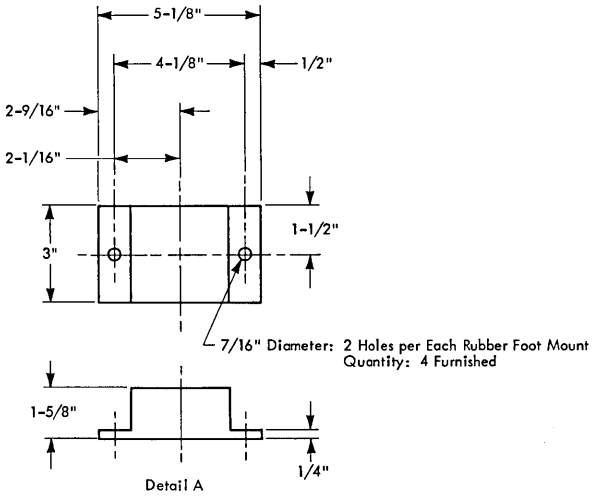
MOTOR GENERATOR (REMOTE) FOR SYSTEM/370 MODELS 165, 168 AND 3032, 3033 PROCESSORS (60-HZ INPUT)

PLAN VIEW (English Scale is 1/2 in. = 1 ft.)



Notes:

1. Generator Output: 3-1/8" diameter
   W-style: Hole in vertical plane with center line 22-3/8" above generator mounting surface.***
   G-style: Hole in horizontal plane with center line 18-3/8" above generator mounting surface.***
   P-style: 3-1/8" x 5-5/8" opening
   Hole in horizontal plane with center line 22-3/8" above generator mounting surface.***
2. Control Leads: 1-3/8" diameter
   W-style: Hole in vertical plane with center line 20-3/8" above generator mounting surface.***
   G-style: Hole in horizontal plane with center line 18-3/8" above generator mounting surface.***
   P-style: 3-1/8" x 14-3/4" common opening for control and motor input leads.
   Hole in horizontal plane with center line 22-3/8" above generator mounting surface.***
3. Motor Input: 3-1/8" diameter
   W-style: Hole in vertical plane with center line 22-3/8" above generator mounting surface.***
   G-style: Hole in horizontal plane with center line 18-3/8" above generator mounting surface.***
   P-style: 3-1/8" x 14-3/4" common opening for control and motor input leads.
   Hole in horizontal plane with center line 22-3/8" above generator mounting surface.***



Inches	Millimeters
1/4	6.4
7/16	11.1
1/2	12.7
1-3/8	34.9
1-1/2	38.1
1-5/8	41.3
2-1/16	52.4
2-9/16	65.1
3	76.2
3-1/8	79.4
4-1/8	104.8
5	127.0
5-1/8	130.2
6	152.4
10	254.0
12	304.8
12-3/4	323.9

Inches	Millimeters
14 ± 1/64	355.6 ± 0.4
14-3/4	374.6
16	406.4
16-3/8	415.9
18-3/8	466.7
20-3/8	517.5
22-3/8	568.3
24 ± 1/64	609.6 ± 0.4
25-1/4	641.4
27	685.8
30	762.0
30-3/4	781.1
32-1/2 ± 1/64	825.5 ± 0.4
39-3/4	1 009.7
45	1 143.0
64-1/4	1 632.0

MOTOR GENERATOR (REMOTE) FOR SYSTEM/370 MODELS 165, 168 AND 3032, 3033 PROCESSORS (60-HZ INPUT)

Notes:

The installation 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.

The G-style, P-style, and W-style motor generators have the same functional characteristics but differ slightly in physical dimensions. The dimensions on the plan view allow for the installation of either style. If the installation must be planned and the style is unknown, use the plan view to make provisions for six rubber foot mounts instead of four.

* Add 12 inches (304.8 mm) for voltages to ground (earth) over 150 V.

** Planning dimension allows G-, P-, or W-style to be installed about common center line.

*** Add 1-5/8 inches (41.3 mm) for rubber foot mounts.

† See plan view.

†† Height clearance required for top cover swing on G-style and W-style.

Customer to supply the following wiring and appropriate connecting hardware:

1. Input feeders to the motor and ground wire to the MG frame.
2. Output feeders, ground wire, and conduit from generator to 3027, 3037, or 3067 PCDU.
3. Five remote leads for the 3027 and 3037 or seven remote leads for the 3067 from generator to PCDU.
   a. Three AWG #14 leads where the run does not exceed 275 feet (84 m). For a run longer than 275 feet (84 m), use three AWG #10 leads in a continuous run. These are the sense leads.
   b. Two AWG #16 leads for the abnormal indicator light.
   c. One AWG #16 twisted pair, shielded, jacketed cable for the 50 V monitoring jacks. Shield to be grounded *only* at the motor generator. This cable not required for connection to 3027 or 3037 PCDU.
4. Two AWG #14 leads for the emergency power-off push-button in the computer room. These leads should remotely cut off the power output from the generator. Shunt trips for emergency turn-off are provided in both input and output circuit breakers.

Maintain 12-inch (30-cm) spacing between the control conduit and the generator output feeder conduit or, alternatively, run the control wiring in ferrous conduit.

SPECIFICATIONS

Dimensions:**

	F	S	H
Inches	†	†	44-1/2***
(cm)	(†)	(†)	(113***)

Service Clearances:

	F	R	Rt	L	H
Inches	30*	30*	45	45	30††
(cm)	(76*)	(76*)	(114)	(114)	(76††)

Weight:	*G- or W-style*	*P-style*
208/230 V:	2,100 lb (960 kg)	2,160 lb (980 kg)
460 V:	1,910 lb (870 kg)	2,160 lb (980 kg)

Heat Output (Max):		
	50,000 BTU/hr (12 600 kcal/hr)	44,000 BTU/hr (11 100 kcal/hr)

Power Requirements:

Input:

Induction Motor—100 hp, 208/230 V or 460 V, 3 phase, 60 Hz, 100 kVA full load, NEMA design B, 40°C maximum ambient, dripproof enclosure, maximum starting current 250 A at 208 V, 220 A at 230 V, or 125 A at 460 V

Output:

Synchronous Generator—75 kVA, 67 kW, 3 phase, 208 V, 415 Hz, 208 A full load, 70°C temperature rise, dripproof enclosure

This portion of the appendix is intended for use by customers and their contractors/consultants who require information on the planning and installation of 400-Hz power supplies to meet defined power requirements.

This appendix defines the 400-Hz input power requirements for the 3165, 3168, 3032, 3033, 3081, 3083, and 3084 processors that receive power from external sources. This appendix also describes tolerances for 400-Hz input power, and the load characteristics, control provisions, and circuit protection of these processors.

This information is contained in the following five parts:

Part 3, "General Requirements for 400-Hz Power"
Part 4, "Paralleling Requirements for 400-Hz Power"
Part 5, "Equipment Specifications for 3165 and 3168 Processing Units"
Part 6, "Equipment Specifications for 3032 and 3033 Processors"
Part 7, "Equipment Specifications for the 3081/3083/3084 Processor Unit"

Note: The 400-Hz value represents 415 Hz for 60-Hz inputs to the source and 441 Hz for 50-Hz inputs to the source.

PART 3. GENERAL REQUIREMENTS FOR 400-HZ POWER

The topics discussed in this part provide general information for 400-Hz power supply and distribution. Individual processor specifications, contained in other parts of this appendix, are of critical importance and must be followed.

PARAMETERS FOR 400-HZ POWER

Data for the 400-Hz input voltage and general power parameters are discussed in following text.

Input Voltage — 208 Vac (Nominal) 3-Phase, 400 Hz

The nominal value is valid with pure sine wave. The actual voltage varies from the nominal value as the result of load variations, source impedance, and feeder characteristics. All further references to 400-Hz voltage levels relate to the output of the 50-Vdc reference supply measured at the input to the IBM equipment. Refer to individual processor specifications in this appendix for additional information.

50-Vdc Reference Supply

The output of the 50-Vdc reference supply reflects variations in the 400-Hz input in the same manner as do the typical dc supplies in the processor. The reference supply is calibrated to read 50 volts when the 400-Hz input is a 208-volt root-mean-square (rms) sine wave.

When the processor is powered up, the 400-Hz source should be adjusted so that the 50-volt reference supply output is 50 volts regardless of the rms value of the 400-Hz voltage.

Under normal operating conditions, the 50-Vdc reference supply should never be less than 49 volts nor greater than 51 volts steady-state.

Steady-State Voltage

The steady-state voltage is that voltage level, measured in terms of the output of the 50-Vdc reference supply, that must be maintained at the input to the IBM equipment. Refer to equipment specifications in this appendix for allowable tolerances.

Voltage Transients

Voltage transients are voltage excursions which exceed steady-state tolerances observed or measured at the 50-Vdc reference supply.

Recovery to steady-state tolerances must occur within time limits specified for individual equipment.

The 400-Hz source and distribution network must tolerate inrush currents specified in the load characteristics of individual equipment. During the power-on sequence, the transient specification must not be exceeded. The impedance of the source and distribution network has a significant effect on its ability to handle inrush currents.

Voltage Modulation

Any voltage modulation (VM) of the output of the 400-Hz source is expressed by the following formula:

$$VM(\%) = \frac{Ep\ max - Ep\ min\ X\ 100}{Ep\ max + Ep\ min}$$

where: EP max = maximum phase voltage (peak to peak)
Ep min = minimum phase voltage (peak to peak)

Phase Voltage Imbalance

Phase voltage imbalance (PVI) is a measurement of the difference in phase-to-phase voltages across a balanced resistive load as expressed in the following manner:

$$PVI(\%) = \frac{3\ (E\ max - E\ min)\ X\ 100}{E\O A + E\O B + E\O C}$$

where: E max = highest phase-to-phase voltage
E min = lowest phase-to-phase voltage

EØA, EØB, and EØC are the three phase-to-phase voltages.

Short-Circuit Protection

The available short-circuit current at the power and coolant distribution unit (PCDU) must not exceed 5,000 asymmetrical amperes. In addition to normal circuit protection, the placement of appropriate current-limiting fuses in the equipment feeder is one means of providing this protection.

Overvoltage Protection

Overvoltage protection, with adjustable limits, must be provided at the 400-Hz source. The overvoltage (OV) control is set to prevent the voltage from exceeding the values stated in Parts 5, 6, and 7 of this appendix. The OV control reacts upon sensing an output voltage at the source that exceeds the preset limit. The control causes the voltage to drop and remain below 200 V and opens the source output disconnect within 0.5 second. The overvoltage control must not react when the load is turned on or off with the overvoltage trip point set according to the equipment specifications.

Room Disconnecting Means

The output of the 400-Hz source must be controlled by the room emergency disconnect means.

Deviation Factor

The deviation factor is a measurement of the maximum difference of each voltage envelope at no load when it is superimposed over a sine wave and aligned with it to minimize the differences to a true sine wave. Specific requirements are in this appendix.

Harmonic Distortion

Harmonic distortion is the distortion of the fundamental 400-Hz voltage waveshape under load caused by multiples or submultiples of the fundamental frequency.

Energy Storage of 400-Hz Power Source

The 400-Hz source must be able to maintain output specifications during a 0.5-second interruption of input power to the 400-Hz source. Consult with the source vendor to ensure that this capability exists.

PART 4. PARALLELING REQUIREMENTS FOR 400-HZ POWER

Topics discussed in this part provide general information about 400-Hz power source and distribution in a parallel network. Figure A-1 shows a typical configuration. Compliance with the individual processor specifications contained in Parts 5, 6, and 7 of this appendix is essential.

A failure of the parallel network can result in loss of power to all processors. If redundancy of processors is critical, consideration should be given to separate power sources for critical units. A disconnect should be provided on each feeder, from bus to load, to provide a safe service environment.

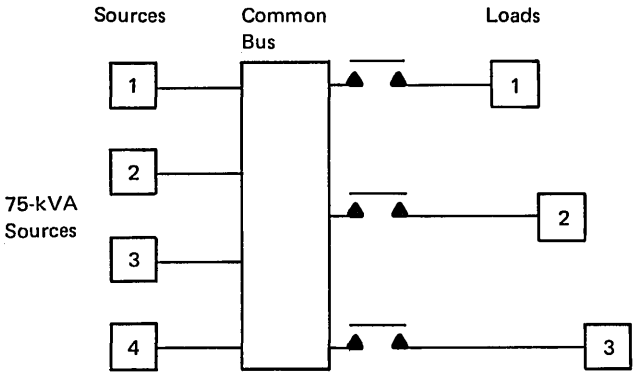


Figure A-1. Typical Parallel Network Using One Redundant Source

DISTRIBUTION SYSTEM CONSIDERATIONS

To optimize steady-state voltages at the individual loads, consideration must be given to feeder impedances, voltage sensing and feedback, and load/source switching.

Feeder Impedances

The impedance of connecting feeders plays an important role in the capability of the parallel network to provide 400-Hz power within the proper specifications to each load.

When multiple loads are fed from the bus, the impedance differences between the bus-to-load feeders should be minimized. This minimizes the voltage differences between loads, which simplifies setting and regulating the bus voltage to maintain all loads within specified limits.

The impedance from the bus to any load should be low enough to ensure a maximum difference of 4% between bus voltage and load voltage. With this 4% difference and the bus set at 51 V, the load does not drop below 49 V under steady-state conditions. When the load is powered down, the voltage at the load end of the feeder does not rise above 51 V. The IBM 400-Hz, 50-Vdc reference tool, part 345833, together with a/c cable, part 345831, is available to measure the various 400-Hz junction points for 50-V reference. For assistance, contact your IBM representative.

Other methods are available to ensure that the voltage delivered to the load stays within this range. Refer to "Voltage Sensing and Feedback" in this part for more information.

When multiple sources feed the bus, the impedance of each feeder between source and bus should be equal. This reduces possible imbalance in load sharing among the sources.

These requirements may be met by locating the bus as close as possible to the loads and by careful selection of cable/conductor types, size, and length, and conduit types (ferrous, nonferrous, or nonmetallic).

Current demands may be obtained by requesting a Power Profile Report for each IBM processor from the installation planning representative. This information should be forwarded to the vendor or consultant.

Information in Figure A-2 is useful for sizing feeders. Other types of cable may afford lower impedance, thereby allowing longer runs. The use of line drop compensators may also be considered. Ferrous conduit should be avoided because it results in high losses at 400 Hz. Check with the 400-Hz source vendor or consultant for recommendations regarding feeder sizing.

Copper Wire Size	Conduit		Maximum Run Lengths by Conduit Type in Meters (feet)	
	Quantity	Size mm (inches)	Nonferrous	Nonmetallic[d]
250 MCM[a]	1	80 (3)	69[b] (225[b])	79[e] (260[e])
2/0 AWG	2	50 (2)	122 (400)	142 (465)
250 MCM	1 1	60 (2-1/2) 80 (3)	137 (450)	158 (520)

[a] 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 0.0254 mm (0.001") diameter wire (5.067, 10^{-4}, mm^2 or 7.854, 10^{-7}, in^2).

[b] 90°C (194°F) insulation required.

[c] Lengths are rounded to the nearest unit meter.

[d] Or cabled in air, where codes allow.

[e] 75°C (167°F) insulation required.

Figure A-2. Distribution Guide for 400-Hz Source Output to 3027, 3037, or 3067 PCDU

Information in Figure A-2 accommodates a 200-A full-load rating. Note that the conduit quantity column refers to the number of conduits recommended; each conduit contains all three phases in the wire size shown (three conductors for each conduit) and one insulated copper conductor for equipment grounding. Local and national wiring codes must be followed.

Voltage Sensing and Feedback

Voltage levels delivered to all processors connected to the 400-Hz distribution bus must comply with the individual equipment specifications. (See Parts 5, 6, and 7.) This compliance requires that some method of voltage/current sensing and feedback be provided to regulate the sources. Suggested methods of accomplishing this are:

- Sensing at the common bus electrical center (Figure A-3)
- Remote sensing and averaging of all loads (Figure A-4)

DANGER
When remote averaging sensing is used, a disconnect means must be provided for the sense leads to eliminate a hazard caused by voltage entering the PDU by means of the sense leads.

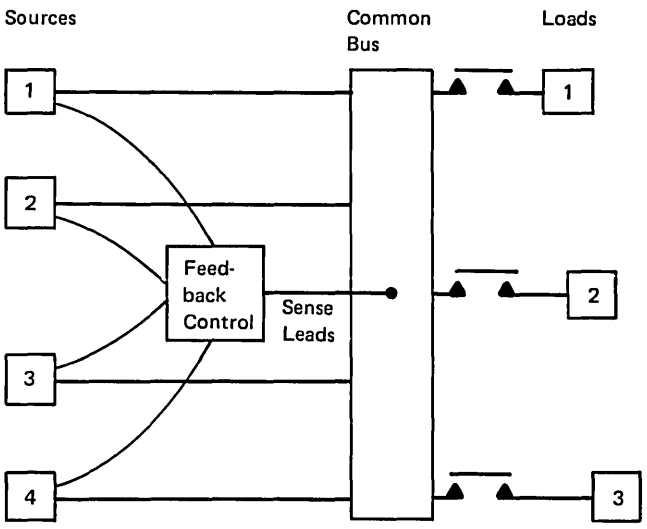


Figure A-3. Sensing at the Common Bus

Alternative methods of regulation may exist. Consult the 400-Hz source supplier regarding requirements for sensing and feedback.

Load/Source Switching

Transients are generated when loads or sources are switched online or offline. These transients must not exceed the specifications given in Parts 5, 6, and 7 of this appendix.

While all loads cause switch transients, the 3168 has significant inrush current. Refer to the 3168 specifications given in Part 5 of this appendix.

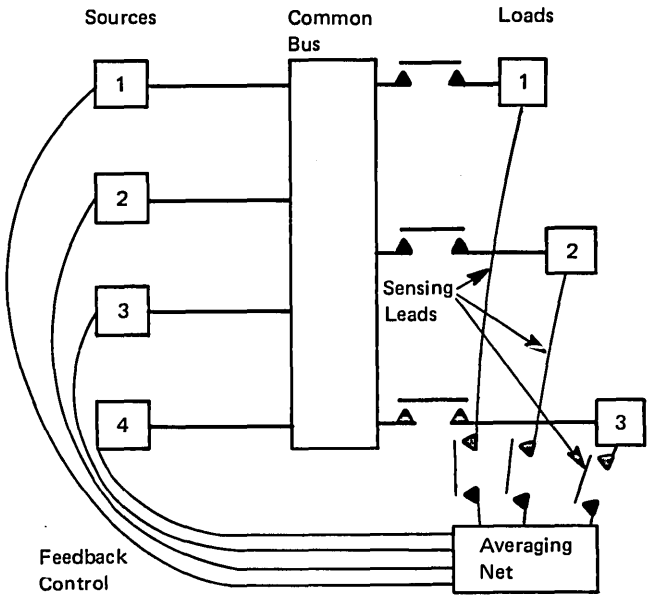


Figure A-4. Remote Sensing and Averaging of All Loads

PART 5. EQUIPMENT SPECIFICATIONS FOR 3165 AND 3168 PROCESSING UNITS

This part contains equipment specifications and mandatory data for the IBM 3165 and 3168 Processing Units that receive 400-Hz power from an external source. The 400-Hz input power requirements are described.

Compliance with the stated specifications and tolerances is required to ensure proper machine operation and prevent system outages and possible component damage.

Power feeders and control wires from the 400-Hz power source are connected to the IBM 3067 Power and Coolant Distribution (PCDU), which serves as the power termination and distribution control point for these systems.

400-HZ POWER REQUIREMENTS

The 400-Hz power source must be able to provide 400-Hz input power that meets the following ratings and tolerances:

Nominal ratings
Phase: 3-phase (neutral unused)
Voltage: 208 V (rms) with sine wave
Power: 67 kW, 75 kVA continuous maximum

Steady-State Voltage

The 400-Hz input voltage to the 3067 PCDU input is to be regulated so that the output of the 50-Vdc reference supply measured at the PCDU does not vary more than ±2%, and that any superimposed ripple voltage does not exceed 15 V peak to peak at the 50-V reference supply output. This 50-Vdc reference supply should be located in the source. Where the reference supply is not provided, an RPQ is available for the 3165/3168. Contact the IBM DP marketing representative.

Voltage Transient and Recovery

During transient conditions, the voltage at the input to the 3067 PCDU may fluctuate so that the variance of the 50-Vdc reference supply measured at the PCDU exceeds ±2%. However, the maximum variation from the nominal 50 Vdc must not exceed +8%, −15%, with a maximum recovery time to the ±2% limits within 0.5 second.

Voltage Modulation

Modulation of the 400-Hz voltage waveform must be less than 1% at no load.

Phase Voltage Imbalance

The phase-to-phase voltage imbalance, with balanced resistive load, must not exceed 1%.

Frequency Variation

Frequency may vary between 385 Hz and 455 Hz under steady-state load conditions. The frequency may drop as low as 340 Hz if it returns to steady-state limits within 0.5 second.

Deviation Factor

The deviation factor of waveform must not exceed 5% at no load.

Energy Storage of 400-Hz Power Source

For a 0.5-second interruption of 50-Hz or 60-Hz input power to the 400-Hz source, the ± 2% steady-state 400-Hz voltage tolerance of the 50-Vdc reference supply must be maintained. During such interruption, the frequency must not fall below 340 Hz.

LOAD CHARACTERISTICS

Several dc power supplies use 400-Hz power. Each dc supply comprises a 3-phase transformer, a full-wave rectifier, and a capacitor filter.

Power Factor

The power factor of the load is between 0.9 lagging and unity (1.0).

Inrush Current

The maximum inrush current surge is created mainly by the excitation of the transformers. The inrush current is dependent on points of voltage waveform where the transformer is de-energized and re-energized. Maximum surge does not exceed a peak of 1,100 A for one-half cycle, with a source impedance (including the 400-Hz converters and interconnecting power feeders) of 0.11 ohm. This surge occurs in four steps of asymmetrical current transients, each lasting several cycles. (See Figure A-5.)

Note: If the 400-Hz source cannot tolerate this inrush, an RPQ is available to limit the inrush current. Contact the IBM DP marketing representative.

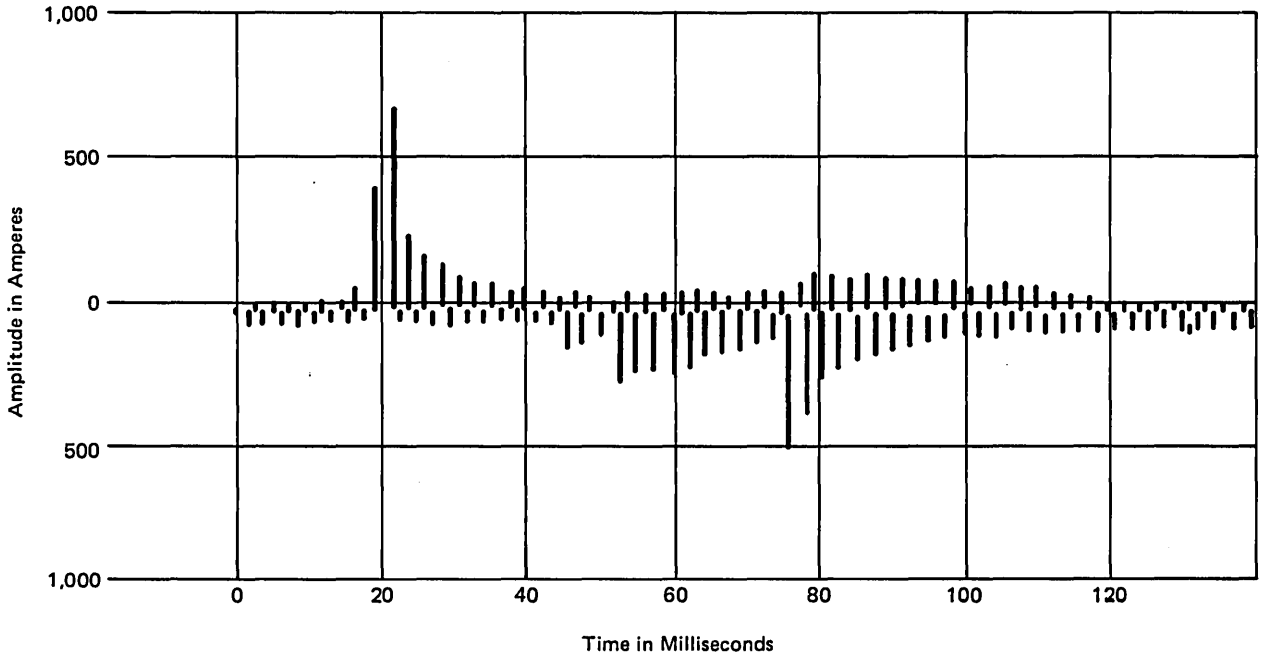


Figure A-5. Typical 3168 Inrush Current

Load Change

After the power-on cycle, the 3067 PCDU does not present a single-step load change during normal processing in excess of 10% of full load.

System Power Turnoff

Normal power turnoff of the 3067 PCDU is attained in four steps of approximately 25% load shedding for each step.

CONTROL PROVISIONS

Control provisions for the 3067 PCDU are discussed in the following text.

Remote Voltage Sense

Three terminals provided at the 3067 PCDU for remote voltage sensing may be used for voltage regulation of the 400-Hz source. The terminals are protected by a 3-A nominal, 3-pole protector of approximately 0.3 ohm per pole.

Abnormal Indicator (MG Check)

The 3067 PCDU has two terminals and an indicator lamp. A contact closure may be provided in the 400-Hz source for the indicator lamp. The abnormal circuit is completed when an overvoltage condition exists in the 400-Hz source or when the source is operating in local sense mode. Transfer to Abnormal Indicator lamp is by means of a contact in the power source at 20 Vdc to 28 Vdc and 500 mA minimum. Use of this circuit is not mandatory. Consult the 400-Hz source vendor for recommendations.

Note: The 20-Vdc to 28-Vdc power supply is in the 3067 PCDU.

Control Leads

For selection of remote conductor leads and installation recommendations, refer to Part 2 of this appendix.

Overvoltage Protection

The overvoltage control must be set to prevent the voltage from rising more than 10% above the nominal voltage at the PCDU.

400-Hz Adjustment Procedure

With the system powered up, the 400-Hz source should be adjusted so that the 50-Vdc reference supply output, measured with a digital voltmeter or equivalent, reads between 49 Vdc and 51 Vdc. Where possible, a mid-range setting should be obtained. This provides optimum protection for processor operation during any transient condition. See "Steady-State Voltage" in this part.

Grounding

The equipment grounding conductor must be connected to the 3067 PCDU grounding bus. For the size and routing of the grounding connector, refer to the *General Information Manual IM–PP* and the appropriate codes and standards.

The 400-Hz source neutral point must be grounded. This point must be carried back to service ground or suitable building ground. Conduit must not be used as the only grounding means.

CAUTION

In countries using impedance-grounded systems, ensure that the ground-detection circuits are operable.

PART 6. EQUIPMENT SPECIFICATIONS FOR 3032 AND 3033 PROCESSORS

This part contains equipment specifications and mandatory data for the IBM 3032 and 3033 Processors that receive 400-Hz power from an external source. The 400-Hz input power requirements are described.

Compliance with the stated specifications and tolerances is required to ensure proper machine operation and prevent system outages and possible component damage.

Power feeders from the 400-Hz power source are connected to the 3027 Power and Coolant Distribution Unit (PCDU) for the 3032 Processor and to the 3037 Power and Coolant Distribution Unit (PCDU) for the 3033 Processor. Each PCDU serves as the power termination and distribution control point for its processor complex.

400-HZ POWER REQUIREMENTS

The 400-Hz power source must be able to provide 400-Hz input power that meets the following ratings and tolerances:

Nominal ratings
Phase: 3-phase (neutral unused)
Voltage: 208 V (rms) with sine wave
Power: 67 kW, 75 kVA continuous maximum

Steady-State Voltage

The 400-Hz input voltage to the 3027 and 3037 PCDU must be regulated so that the output of the 50-Vdc reference supply measured at the PCDU does not vary more than ± 2%, and so that any superimposed ripple voltage does not exceed 15 V peak to peak for any steady-state load from 1 kW to full system load.

A 50-Vdc reference supply is integral to the 3027 and 3037 PCDUs.

Voltage Transient and Recovery

The 3032 and 3033 Processors are designed to operate with the 50-V reference supply constantly maintained within ± 2%. However, these processors can tolerate peak voltage transients not in excess of +8%, −10% from the nominal 50 V, with a maximum recovery time to the ± 2% limits within 0.5 second.

Voltage Modulation

Modulation of the 400-Hz ac voltage waveform must be less than 1% at no load.

Phase Voltage Imbalance

The phase-to-phase voltage imbalance, with balanced resistive load, must not exceed 1%.

Frequency Variation

Frequency may vary between 385 Hz and 455 Hz under steady-state load conditions. The frequency may drop as low as 340 Hz provided the frequency is back within steady-state limits within 0.5 second.

Deviation Factor

The deviation factor of waveform must not exceed 5% at no load.

Harmonic Content under Load

When the 400-Hz voltage waveform passes through zero amplitude, ringing may occur, resulting in multiple zero crossings. For this type of transient (with multiple zero crossings), the following limits apply:

1. The frequency must be less than 5 kHz.
2. The amplitude must not exceed ± 15 V.
3. The transient must be damped to zero after a time equal to 5% of a half-cycle, starting at the normal zero crossing of the 400-Hz voltage waveform.

Energy Storage of 400-Hz Power Source

For a 0.5-second interruption of 50-Hz or 60-Hz input power to the 400-Hz converter, the ± 2% steady-state 400-Hz voltage tolerance must be maintained, and frequency must not fall below 340 Hz.

LOAD CHARACTERISTICS

The 3032 and 3033 Processors use 400-Hz power for dc power supplies.

Power Factor

The power factor of the load is between 0.8 lagging and unity (1.0).

Inrush Current and Peak Current Demands

In Figure A-6, a conceptual curve of the envelope of the peak shows positive alteration of the 400-Hz current while the machine is being turned on. The main concept shown in Figure A-6 is that inrush current occurs at various times during the turnon cycle. The peak inrush current is 60 A or less. Assuming that the 400-Hz source is fully used, the maximum commutative peak current required by the 3032 or 3033 is 346 A or less. The amount of current actually drawn and the timing of the inrush vary with the features installed in the 3032 or 3033.

Maximum duration of the inrush spike is 200 ms before the return to steady-state values. The inrush current is a typical inrush into an unloaded transformer with the first peak curent less than 60 A and the succeeding peak smaller until steady-state value is reached.

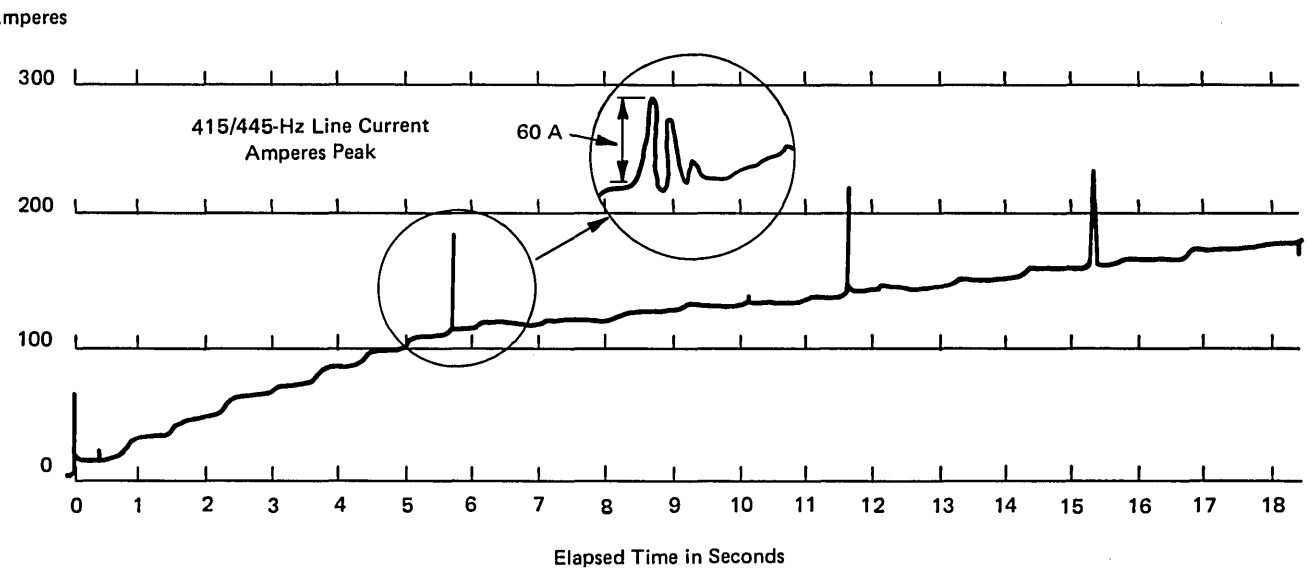


Figure A-6. Typical 3033 Inrush Current

Load Change

After the power-on cycle, the source does not detect a single-step load change in excess of 10% of full load during normal processing.

Processor Power Turnoff

Normal power off on the 3032 and 3033 is attained by sequencing off dc supplies. The resultant current change to the 400-Hz source appears as a linear decay that takes approximately 5 seconds.

CONTROL PROVISIONS

Control provisions for the 3032 and 3033 Processors are discussed in following text.

Remote Voltage Sense

Three terminals provided at the 3027 and 3037 PCDUs for remote voltage sensing may be used for voltage regulation of the 400-Hz source. The terminals are protected by a 3-A, 3-pole circuit protector. Consult with the 400-Hz source vendor for recommendations concerning the use of this function.

Abnormal Indication (MG Check)

An event-logging circuit in the 3027 and 3037 PCDUs indicates abnormal conditions in the 400-Hz source. Two terminals are provided at the PCDU for connection to a contact closure in the 400-Hz source. The closure completes the abnormal indicator circuit when an overvoltage condition exists in the 400-Hz source or when the source is operating in local sense mode. Use of this circuit is not mandatory. Consult with the 400-Hz source vendor for recommendations concerning the use of this function.

Note: The contacts should be rated at 20 Vdc to 28 Vdc, be operational at 20 mA, and have at least a 500-mA current-carrying capacity. The 20-Vdc to 28-Vdc source is in both the 3027 and 3037 PCDUs.

50-Vdc Reference Supply

A 50-Vdc supply is integral to the 3027 and 3037 PCDUs to monitor the effective voltage of the 400-Hz source as received at the PCDU input. Refer to Part 3 of this appendix for detailed information.

Control Leads

For selection of remote conductor leads and installation recommendations, refer to Part 2 of this appendix.

Overvoltage Protection

The overvoltage control must be set to prevent a voltage rise of more than 10% above the nominal voltage at the PCDU.

400-Hz Adjustment Procedure (3032 and 3033 Processors)

With the processor complex powered up, the 400-Hz source should be adjusted so that the 50-V reference supply output measured with a digital voltmeter reads between 49 Vdc and 51 Vdc. Where possible, a mid-range setting should be obtained. This provides optimum protection for processor operation during any transient conditions.

Grounding

The equipment-grounding conductor must be connected to the grounding bus on the 3027 and 3037 PCDUs. For the size and routing of the grounding conductor, refer to the *General Information Manual IM–PP* and appropriate codes and standards.

The 400-Hz source neutral point must be grounded. This point must be carried back to service ground or suitable building ground. Conduit must not be used as the only grounding means.

CAUTION
In countries using impedance-grounded systems, ensure that the ground-detection circuits are operable.

PART 7. EQUIPMENT SPECIFICATIONS FOR THE 3081/3083/3084 PROCESSOR UNIT

This part contains 400-Hz power equipment specifications and mandatory data for the IBM 3081/3083/3084 Processor Unit. The 400-Hz input power requirements are described.

Compliance with the stated specifications and tolerances is required to ensure proper machine operation and to prevent system outages and possible component damage.

The 400-Hz power to the 3081/3083/3084 Processor Unit can be provided in one of two ways at the customer's option.

1. From IBM 3089 Power Unit
2. From an external, customer-supplied, source

IBM 3089 POWER UNIT

The IBM 3089 Power Unit is a self-contained 400-Hz power source for the 3081/3083/3084 Processor Unit. The 3089 is connected to the 3081/3083/3084 by means of flexible cable and connector sets.

The customer must be able to provide 50/60-Hz power to the 3089. Refer to "3089 Power Unit", Section 2, in this manual for this information.

400-HZ POWER REQUIREMENTS (EXTERNAL CUSTOMER-SUPPLIED SOURCE)

The following topic describes 400-Hz input power requirements for the IBM 3081/3083/3084 Processor Unit when this power is provided from an external, customer-supplied source.

The power feeder and control conductors from the 400-Hz power source must be brought to within 1.2 meters (4 feet) of the power distribution frame (PDF).

IBM provides a Russell & Stoll JPS1534LK plug for 400-Hz input to PDF. The customer must provide the mating connectors.

The 400-Hz input power source for each PDF must be able to provide 400-Hz power meeting the following ratings and tolerances:

Nominal Ratings

Phase: 3-phase (neutral unused)

Voltage: 208 Vac (rms) with sine wave

Power: 21.5 kW, 26.9 kVA continuous maximum

Steady-State Voltage

The 400-Hz input voltage to the PDF must be regulated so that the 50-Vdc reference supply, measured at the PDF, remains 50 Vdc ± 2%. Any superimposed ripple voltage must not exceed 15 V peak to peak for any steady-state load from 0 to full load.

A 50-Vdc reference supply is integral to the PDF.

Voltage Transient and Recovery

The 3081/3083/3084 Processor Unit operates with the 50-Vdc reference supply maintained to within ±2%. Voltage transients, not exceeding +8%, −10% from the nominal, may be tolerated if recovery to the ± 2% limits occurs within 0.5 second.

Voltage Modulation

Modulation of the 400-Hz ac voltage waveform must be less than 1% at no load.

Phase Voltage Imbalance

The phase-to-phase voltage imbalance, with a balanced resistive load, must not exceed 1%.

Frequency Variation

Frequency may vary between 385 Hz and 455 Hz under steady-state load conditions. The frequency may drop to as low as 340 Hz if recovery to steady-state limits occurs within 0.5 second.

Harmonic Content under Load

When the 400-Hz voltage waveform passes through 0 amplitude, ringing may occur resulting in multiple 0 crossings. For this type of transient (with multiple 0 crossings), the following limits apply:

1. The frequency must be less than 5 kHz.
2. The amplitude must not exceed ± 15 V.
3. The transient must be damped to 0 after a time equal to 5% of a half-cycle starting at the normal 0 crossing of the 400-Hz voltage waveform.

Energy Storage of 400-Hz Power Source

For a 0.5-second interruption of 50-Hz or 60-Hz input power to the 400-Hz source, the ±2% steady-state 400-Hz voltage tolerance must be maintained. The frequency must not fall below 340 Hz.

LOAD CHARACTERISTICS

The 3081/3083/3084 Processor Unit uses 400-Hz power for dc power supplies.

Power Factor

The power factor of the load is between 0.75 lagging and unity (1.0).

Inrush Current and Peak Current Demands

The peak inrush current occurs during the turnon cycle, as shown in Figures A-7 and A-8. The peak inrush current does not exceed 175 A above the base current. Inrush timing and magnitude are feature dependent.

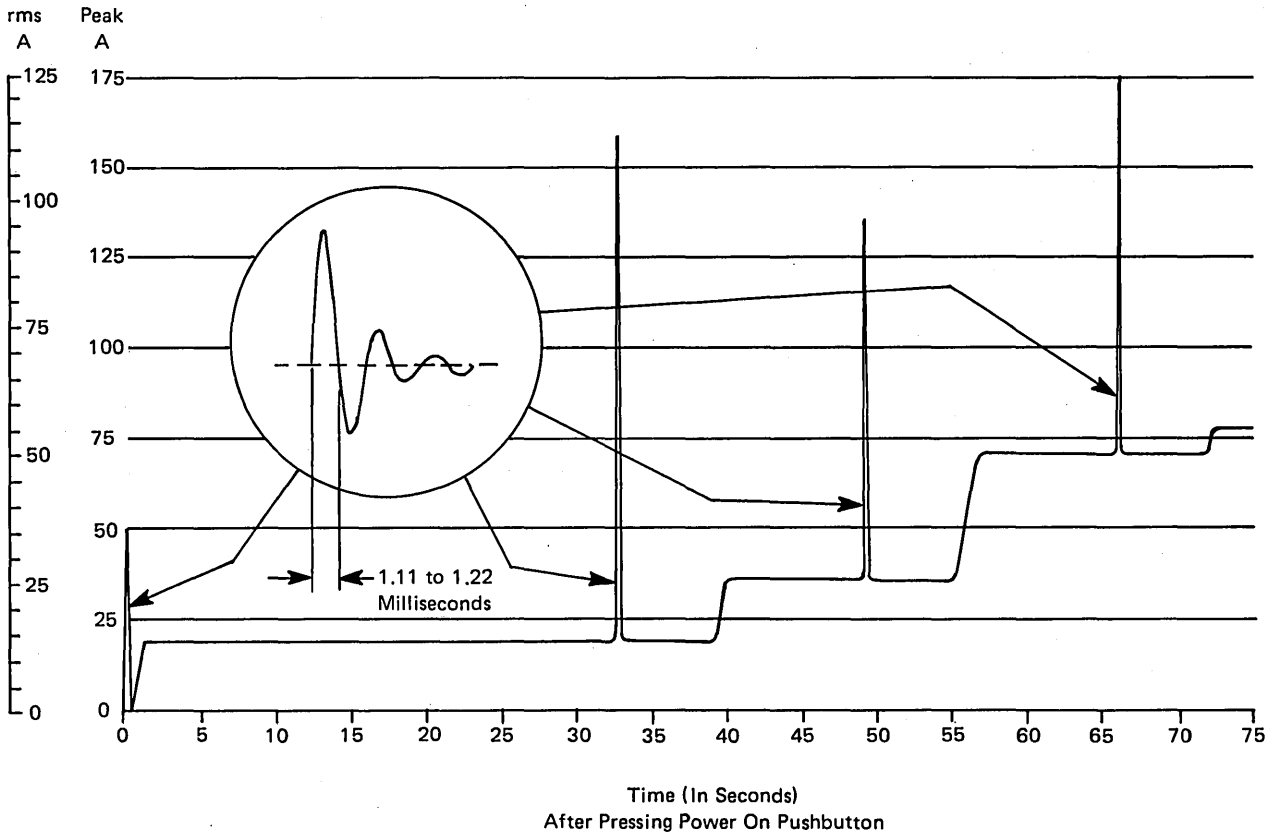


Figure A-7. Typical 3081/3083 (16M Bytes) and 3084 (32M Bytes) Inrush Current

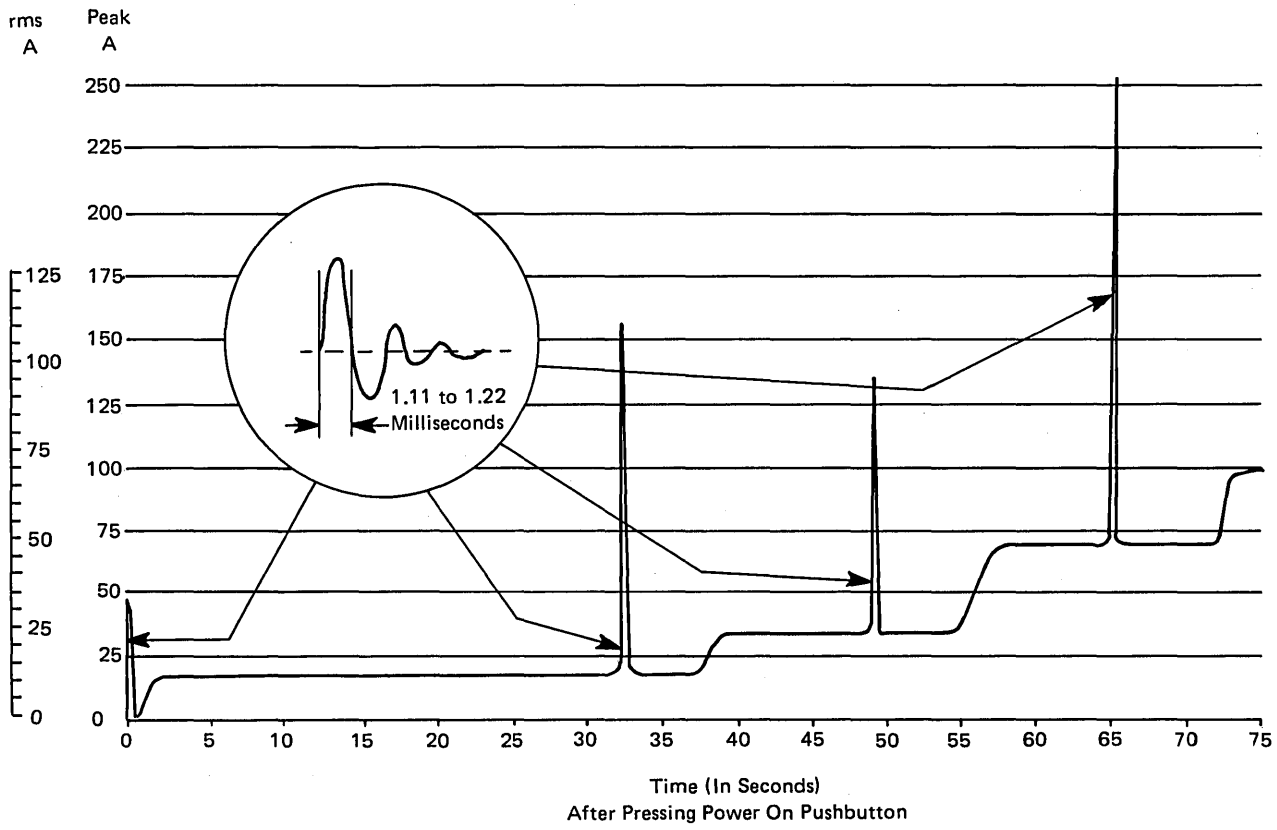


Figure A-8. Typical 3081/3083/Each Side of 3084 (32M to 64M Bytes) Inrush Current

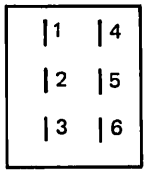
Load Change

After the power-on cycle, the load does not present a step load change in excess of 10% of full load during normal processor complex operation.

CONTROL PROVISIONS

Control provisions for the 3081/3083/3084 Processor Unit are discussed in the following text.

J15 AMP Connector



Pin 1	–	Phase 1
Pin 2	–	Phase 2
Pin 3	–	Phase 3
Pin 5	–	Ground
Pins 4 and 6	–	Unused

Wire color code for remote sense cable is as follows:

Ground: Green/Yellow
Phase 1: Black
Phase 2: Blue
Phase 3: Red
Shield: #32 AWG

Remote Voltage Sense

A six-contact AMP connector (J15) is provided at the 3081/3083/3084 in the PDF for remote voltage sensing for voltage regulation of the 400-Hz source. The customer must supply the mating connector and wiring if the 400-Hz source requires remote sensing.

Connector:	AMP #350715-1
Strain Relief:	AMP #640715-1
Four Pins:	AMP #350538-6 (Group of 1000)
or	
Four Pins:	AMP #350552-2 (Single Pins)
Cable:	Shielded
	Three #14 AWG wires
	One #14 AWG green/yellow ground
	#32 AWG braided shield

Figure A-9 shows the connections.

Cable is run from the AMP connector, which plugs into the PDF, to the point near the PDF where the customer-supplied, 400-Hz source sense leads terminate. The cable may be connected to the sense leads in an under-floor junction box. Local and national wiring codes must be followed.

A 3-meter (10-foot) length of cable with connector, strain relief, and pins assembled will be shipped automatically with specify code 9491 (IBM part 4447189).

The customer should consult with the 400-Hz source vendor for recommendations concerning the use of this function, method of connecting, and size of wire and conduit.

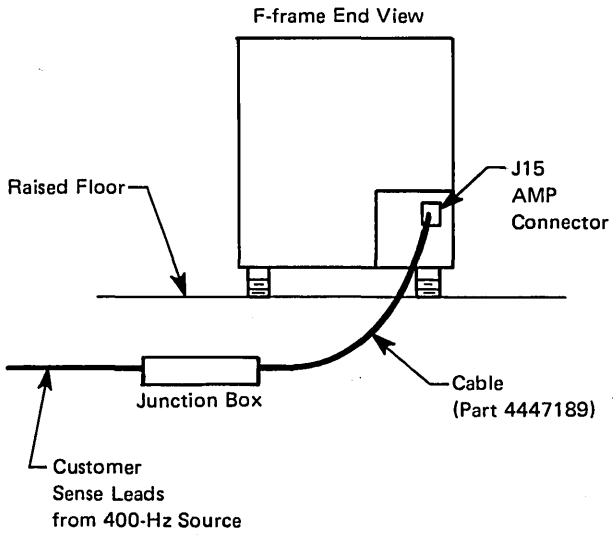


Figure A-9. Remote Voltage Sense

50-Vdc Reference Supply

A 50-Vdc reference supply is integral to the PDF to monitor the effective voltage of the 400-Hz source received at the PDF input. This voltage reference supply output must remain between 49 Vdc and 51 Vdc.

Overvoltage Protection

The overvoltage control on the 400-Hz source must be set to prevent a voltage rise of more than 10% above the nominal voltage at the PDF.

400-Hz Adjustment Procedure

With the processor complex powered up, the 400-Hz source must be adjusted so that the 50-Vdc reference supply output (measured with a digital voltmeter) reads between 49 Vdc and 51 Vdc. Where possible, a mid-range setting should be obtained. This provides optimum protection from processor malfunction during power transient conditions.

Grounding

The equipment grounding conductor must be connected to the grounding terminal of the Russell & Stoll receptacle. The neutral point of the 400-Hz source must be grounded at the customer's service entrance or at a suitable building ground. Conduit must not be used as the only grounding means.

CAUTION
In countries using impedance-grounded systems, ensure that the ground-detection circuits are operable.

Phase Rotation

The phase-rotation sequence, viewed from the front of the Russell & Stoll receptacle, must read clockwise from the ground: phase, 1, phase 2, and phase 3.

DISTRIBUTION GUIDE FOR CUSTOMER-SUPPLIED 400-HZ SOURCE

Figure A-10 shows typical feeder sizes. Other types of cable may have less impedance, allowing for longer runs. The use of line drop compensators may also be considered. Ferrous conduit should be avoided because of high losses at 400 Hz.

The 400-Hz source supplier should be consulted for his recommendations on feeder sizing.

See Part 4 of this appendix for paralleling considerations.

Copper Wire Size[1,4]	Conduit		Maximum Run Lengths[3] for Rigid Aluminum Conduit in Meters (feet)[5]
	Quantity[2]	Size mm (inches)	
2 AWG	1	40 (1-1/2)	42 (139)
1/0 AWG	1	50 (2)	49 (164)
2/0 AWG	1	50 (2)	53 (177)
2 Parallel AWG	2	40 (1-1/2)	85 (279)
1/0 Parallel AWG	2	50 (2)	100 (329)
2/0 Parallel AWG	2	50 (2)	107 (351)

[1] Single runs with conductors smaller than #2 AWG should not be used. Three-conductor jacketed cable, with ground conductor, is acceptable.

[2] Conduit Quantity refers to the number of conduits recommended, each conduit containing all three phase conductors and an insulated equipment-grounding conductor in the wire size shown.

[3] Maximum run lengths assume maximum voltage drops at 4% with full load and a power factor of 0.766 lagging.

[4] Feeders using other than single #2-AWG conductors require that each phase and ground conductor (or parallel conductor) be terminated in a junction box in a single #2-AWG conductor for connection to the Russell & Stoll receptacle. (The Russell & Stoll receptacle does not accommodate conductors larger than #1 AWG).

[5] Lengths are rounded to the nearest meter.

[6] Local and national wiring codes must be followed.

Figure A-10. Distribution Guide for Customer-Supplied 400-Hz Source for the 3081/3083/3084

Appendix B. Power Cord Style Specifications and Plug Installation (World Trade Reference)

CABLE SPECIFICATIONS

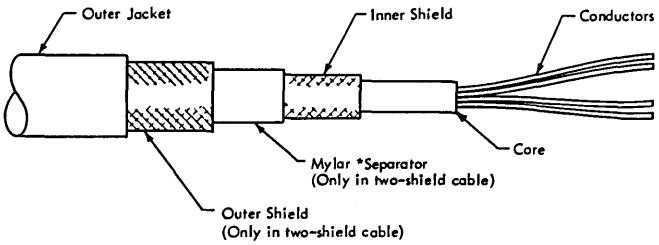
Power Cord Style	*Cable Nominal OD inches (mm)*	*Number of Shields*	*Conductors*		
			Quantity	*Nominal OD* inches (mm)*	*AWG No.*
A1	0.520 (13.2)	1	3	0.064 (1.6)	14
A2	0.510 (13.0)	1	3	0.081 (2.1)	12
A3	0.570 (14.5)	1	3	0.102 (2.6)	10
A4	0.375 (9.5)	1	3	0.051 (1.3)	16
A5	0.390 (9.9)	0	3	0.051 (1.3)	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
D4	0.855 (19.1)	1	5	0.102 (2.6)	10
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
H1	1.525 (38.7)	1	3	0.292 (7.4)	2
			1	0.232 (5.9)	4
H2	1.494 (37.9)	1	4	0.292 (7.4)	2
H3	1.240 (31.5)	1	5	0.184 (4.7)	6

* 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



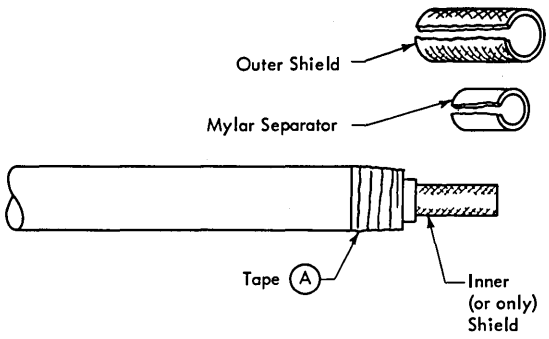
Preparing Bulk Cable End for the Plug

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 15 A-30 A cables or 2-3/4 inches (70 mm) from end for 45 A-60 A 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).)

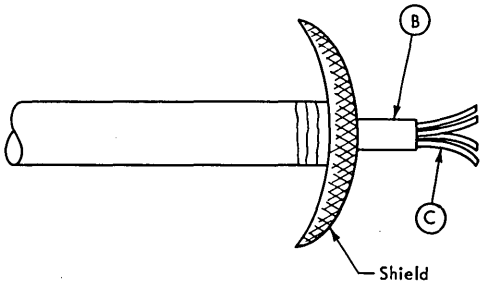
* Trademark of E.I. du Pont de Nemours & Co. (Inc.)



Step 3: (For two-shield cables only). Remove Mylar separator for 1 inch (25 mm) from end for 15 A-30 A cables or 2-1/4 inches (57 mm) from end for 45 A-60 A 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 15 A-30 A cables or 2-1/4 inches (57 mm) from end for 45 A-60 A 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).)

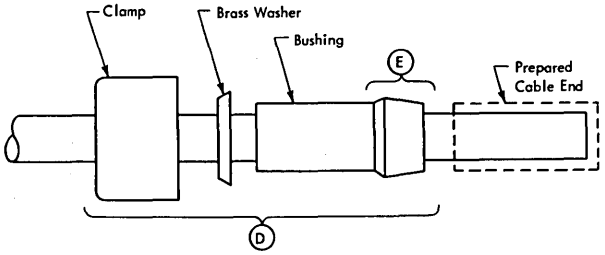


Step 6: Carefully lay the shield back over the cable outer jacket; wrap tape around the shield for temporary protection. Note that on two-shield cables, the outer shield must be insulated from the plug cap, equipment ground (earth) wire, conduit, and so on; the outer shield is grounded at the machine 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

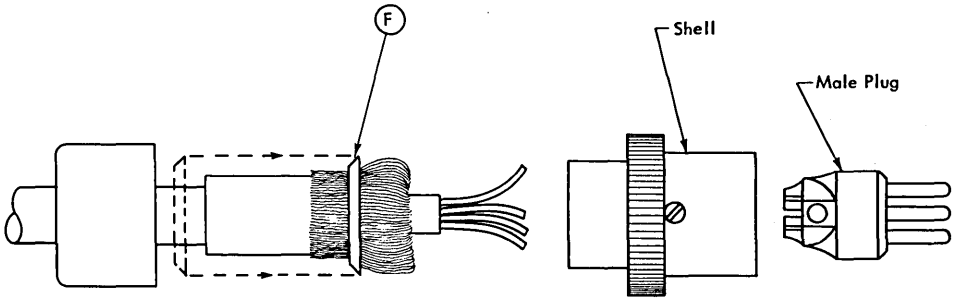
These steps show the attachment of one type of plug; modifications will be needed to allow for the different physical designs of plugs used in various countries.

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 C. Plugs and Receptacles

60-Hz Power Receptacles and Plugs									400-Hz Power Receptacles and Plugs
Plug Type	A[4]	A1[4]	A2[4]	B[4]	C[4]	D[4]	E[4]	F[4]	G[4]
Plug [1,2]	(R&S) 3720	(R&S) 3720U-1	(R&S) 3720U-2	(R&S) 3730	(R&S) 3750	(R&S) 3760	(R&S) 7328	(R&S)J JPS-1034H	(R&S) JPS-1534LK
Receptacle: NEMA or [2] R&S	(R&S) 3743	(R&S) 3743U-1	(R&S) 3743U-2	(R&S) 3744	(R&S) 3753	(R&S) 3754	(R&S) 7324	(R&S) JRSR-1034H (R&S) JRSA-1034H[8]	(R&S) JRSR-1534LK (R&S) JRSA-1534LK[8]
Inline[7]	(R&S) 3913	(R&S) 3913U-1	(R&S) 3913U-2	(R&S) 3914	(R&S) 3933	(R&S) 3934	(R&S) 7428	(R&S) JCS-1034H	(R&S) JCS-1534LK Inline[7]
Schematic: Face of Receptacle				 [5]		 [5]		 [5]	
Service Rating: Amperes Nominal Voltage	20 208/240	20 120	15 208/240	15 208/240	30 208/240	30 208/240	60 208/240	100 208/240	150 208/240
Phases	1	1	1	3	1	3	3	3	3
Wires[3]	3	3	3	4	3	4	4	4	4

60-Hz Power Receptacles and Plugs						
H	J[6]	K	L[6]	M	N[6]	R
NEMA 5-15P	NEMA L5-15P	NEMA 6-15P	NEMA L6-15P	NEMA 5-20P	NEMA L5-20P	NEMA 5-30P
NEMA 5-15R	NEMA L5-15R	NEMA 6-15R	NEMA L6-15R	NEMA 5-20R	NEMA L5-20R	NEMA 5-30R
NEMA 5-15R	NEMA L5-15R	NEMA 6-15R	NEMA L6-15R	NEMA 5-20R	NEMA L5-20R	NEMA 5-30R
						
15 120	15 120	15 208/240	15 208/240	20 120	20 120	30 120
1	1	1	1	1	1	1
3	3	3	3	3	3	3

[1] These plug types (or equivalent) are supplied with the machines. Customer provides matching receptacles.

[2] For U.S. and Canada, NEMA = National Electrical Manufacturer's Association; R&S = Russell & Stoll.

[3] Number of wires includes one insulated equipment grounding conductor green or green and yellow.

[4] Plug types A, B, C, D, E, F, and G are watertight.

[5] The 3-phase receptacle must be wired for correct phase rotation; looking at the face of the receptacle and a clockwise direction from the ground pin, the sequence will be phase 1, phase 2, and phase 3.

[6] Plug types J, L, and N are locking style.

[7] When an R&S inline connector is used with flexible metal conduit or liquid tight flexible metal conduit, an R&S FSA or JPA adapter is required.

[8] Includes angular adapter.

English Scale: 1/4 in. = 1 ft (1:48)

Type	Model	Order Number
360 and 370	Field Engineering Furniture and Test Equipment	GX22-6925-1
2860	1-3	GX22-6985-1
2870	1	GX22-6985-1
2880	1, 2	GX22-6985-1
3017	1 (With 3031 Processor Complex)	GX22-7026-3
3017	1 (With 3031 AP Complex)	GX22-7061-1
3027	1 (With 3032 Processor Complex)	GX22-7025-5
3031		GX22-7026-3
3031	AP	GX22-7061-1
3032	See Note 1	GX22-7025-5
3033	UP (See Note 2)	GX22-7024-6
3033	MP	GX22-7062-8
3033	AP	GX22-7075-5
3036	1 (With 3031 Processor Complex)	GX22-7026-3
3036	1 (With 3031 AP Complex)	GX22-7061-1
3036	1 (With 3032 Processor Complex)	GX22-7025-5
3036	1 (With 3033 Processor Complex and 3033 Processor Complex Model Groups N and S)	GX22-7024-6
3036	1 (With 3033 MP Complex)	GX22-7062-8
3036	1 (With 3033 AP Complex)	GX22-7075-5
3037	1 (With 3033 Processor Complex and 3033 Processor Complex Model Groups N and S)	GX22-7024-6
3037	1 (With 3033 MP Complex)	GX22-7062-8
3037	1 (With 3033 AP Complex)	GX22-7075-5
3038	1 (With 3033 MP Complex)	GX22-7062-8
3038	1 (With 3033 AP Complex)	GX22-7075-5
3041	1 (With 3031 AP Complex)	GX22-7061-1
3042	1 (With 3033 AP Complex)	GX22-7075-5
3046	1 (With Model 135)	GX22-7008-1
3046	1 (With Model 138)	GX22-7058-1
3046	1 (With Model 145)	GX22-7005-1
3047	1 (With Model 145)	GX22-7005-1
3047	1 (With Model 148)	GX22-7059-1
3052	1 (With Model 158)	GX22-7023-5
3056	(With Model 158)	GX22-7023-5
3060	1 (With Model 195)	GX22-6981-0
3062	1 (With Model 168)	GX22-7022-6
3066	1 (With Model 165)	GX22-7007-2
3066	2, 3 (With Model 168)	GX22-7022-6
3067	1 (With Model 165)	GX22-7007-2
3067	2, 3 (Serial numbers below 61000 with Model 168)	GX22-7022-6
3067	2, 3, 5 (Serial numbers 61000 and above with Model 168)	GX22-7022-6
3068	1 (With Model 168 MP)	GX22-7022-6
3080	1-3 (With Model 195)	GX22-6981-0
3081		GX22-7095-3

Type	Model	Order Number
3082	With 3081/3083	GX22-7095-3
3082	With 3084	GX22-7099-1
3083		GX22-7095-3
3084		GX22-7099-1
3085	1 (With Model 195)	GX22-6981-0
3086	1 (With Model 195)	GX22-6981-0
3087	1, 2 (With 3081/3083)	GX22-7095-3
3087	1, 2 (With 3084)	GX22-7099-1
3089	With 3081/3083	GX22-7095-3
3089	With 3084	GX22-7099-1
3115-0, 3115-2		GX22-7028-2
3125-0, 3125-2		GX22-7021-2
3135		GX22-7008-1
3138		GX22-7058-1
3145	FED, GE, GFD, H, HG, I	GX22-7005-1
3145	H2, HG2, I2, IH2, J2, JI2, K2	GX22-7005-1
3148		GX22-7059-1
3155	H-J	GX22-7006-1
3155	JI, K	GX22-7006-1
3158, 3158-3		GX22-7023-5
3158, 3158-3	AP	GX22-7023-5
3158, 3158-3	MP	GX22-7023-5
3165	I, J	GX22-7007-2
3165	JI, K	GX22-7007-2
3165	KJ	GX22-7007-2
3168, 3168-3		GX22-7022-6
3168, 3168-3	MP	GX22-7022-6
3168-3	AP	GX22-7022-6
3195	J1, K1	GX22-6981-0
3345	1-5 (With Model 145)	GX22-7005-1
3195	KJ1, L1	GX22-6981-0
3360	1-3 (With Model 155)	GX22-7006-1
3360	4, 5 (With Model 165)	GX22-7007-2
3838	1-3	GX22-6987-0

Notes:
1. IBM 3032 Processor Floor Cutout Aid, GC22-7068, is available.
2. IBM 3033 Processor Floor Cutout Aid, GC22-7067, is available.

Legend:

T = World Trade Template
K = World Trade Adhesive Template

Metric Scale: 10 mm = 0.5 m (1:50)

WT templates are available only from:

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CE Information Dept. 7902
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West Germany

Type	Model	Order Number
2860	1-3	T 57 275 K 57 195
2870	1	T 57 275 K 57 195
2880	1, 2	T 57 504 K 57 508
3046	1 (With Model 135)	T 57 512 K 57 513
3046	1 (With Model 145)	T 57 286 K 57 388
3047	1 (With Model 145)	T 57 476 K 57 479
3066	1	T 57 334 K 57 368
3067	1	T 57 335 K 57 369
3067	2, 3 (Serial Numbers below 61000)	T 57 335 K 57 369
3067	2, 3 (Serial Numbers 61000 and above)	T 57 335 K 57 475
3068	1 (With Model 168 MP)	T 57 474 K 57 475
3081		GX22-7087-4
3082	With 3081/3083	GX22-7087-4
3082	With 3084	GX22-7098-1
3083		GX22-7087-4
3084		GX22-7098-1
3087	1, 2 (With 3081/3083)	GX22-7087-4
3087	1, 2 (With 3084)	GX22-7098-1
3089	With 3081/3083	GX22-7087-4
3089	With 3084	GX22-7098-1
3115		T 57 484 K 57 485
3125		T 57 468 K 57 469
3135		T 57 512 K 57 513
3145	FED, GE, FFD, H HG, I	T 57 276 K 57 387
3145	With 3345/3210 and 3046	T 57 286 K 57 388
3145	H2, HG2, I2, IH2	T 57 478 K 57 479
3155	H-J	T 57 303 K 57 358
3155	JI, K	T 57 304 K 57 359
3158, 3158-3		T 57 458 K 47 459
3158, 3158-3	MP	T 57 476 K 57 477
3165	I, J	T 57 305 K 57 360
3165	JI, K	T 57 306 K 57 361
3165	KJ	T 57 361 K 57 307
3168, 3168-3		T 57 456 K 57 457
3168, 3168-3	MP	T 57 474 K 57 475
3345	1-5 (With Model 145)	T 57 286 K 57 388
3360	1-3	T 57 303, 57 304 K 57 358, 57 359
3360	4, 5	T 57 305, 57 306, 57 361 K 57 360, 57 361, 57 307

Appendix E. Procedure for Measuring Floor Resistance

The following equipment is required for measuring high resistance:

1. A test instrument having a resistance range up to 10^{12} ohms when using 500 volts, such as General Radio 1644 megohm bridge or General Radio 1362-C3-3 megohmmeter or equivalent.
2. A pair of test electrodes having the following characteristics:

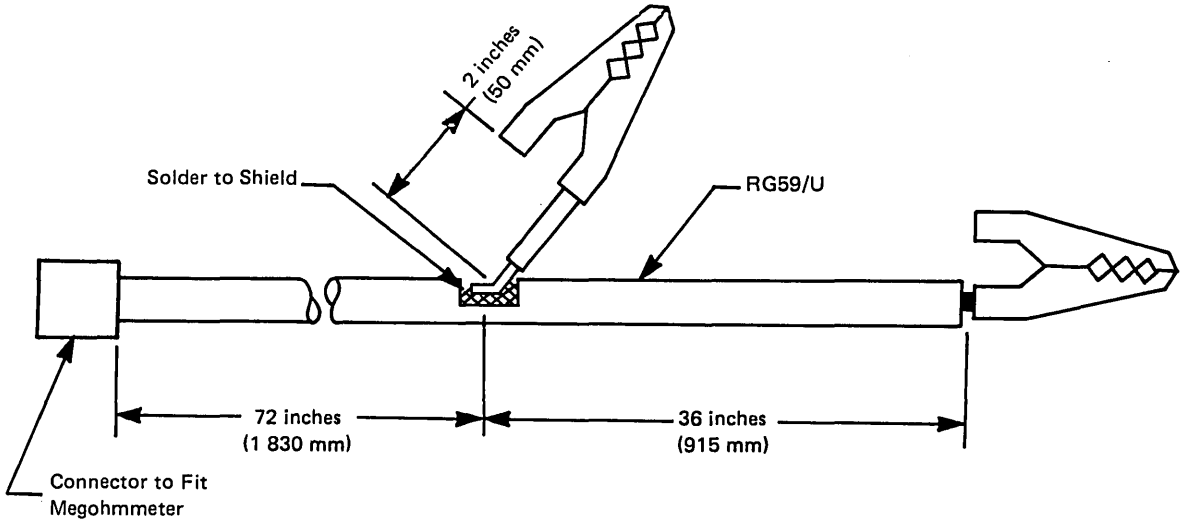
   Five-pound steel weight, 2.5 inches in diameter, with a 0.25-inch pad; between 40- and 60-durometer rubber facing, covered with 5-millimeter thickness aluminum foil (James R. Biddle Company # 21056-5 or equivalent).
3. Shielded cable test leads as shown.

The following tests are performed when high-resistance measuring is required.

Test 1: Measure from one electrode on the top surface of the floor to the ground grid of the floor substructure. Repeat this test several times to check the consistency of the readings. The maximum reading should not exceed 2×10^{10} ohms.

Test 2: Measure between the two electrodes that are placed on the top surface of the floor and that are separated by 3 feet (1 meter). This measurement can be two times higher than test 1 except when unusual top-floor surface continuity exists.

Repeat this test several times at various locations to check the consistency of the readings. The minimum reading should not be less than 150,000 ohms.



Appendix F. 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
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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
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45-1/2	116	96	244	146	371	196	498	246	625	296	752	346	879	396	1.006
46	117	96-1/2	245	146-1/2	372	196-1/2	499	246-1/2	626	296-1/2	753	346-1/2	880	396-1/2	1.007
46-1/2	118	97	246	147	373	197	500	247	627	297	754	347	881	397	1.008
47	119	97-1/2	248	147-1/2	375	197-1/2	502	247-1/2	629	297-1/2	756	347-1/2	883	397-1/2	1.010
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