

**B 700
PLANNING &
INSTALLATION**

Burroughs

FIELD ENGINEERING

**PLANNING
&
INSTALLATION
MANUAL**

SITE
PREPARATION

DETAILED
SYSTEM
INFORMATION

INSTALLATION
GUIDE

OPTIONS



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AA454488 AA547188

F.E. Dist. Code **A**

Printed in U. S. America 1-1-75

For Library Binder A
Form 1061223

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INTRODUCTION

The purpose of this manual is twofold: (1) to guide customers in effectively planning and preparing sites for the installation of a Burroughs B 700-Series Computer System, and (2) to guide and instruct installation personnel in the overall installation and checkout of a system. Information is included for the B 705, B 711, B 721, B 771 and B 772 Systems.

Because of the versatility and variations of the B 700 Systems, all possible configurations cannot be covered in detail. However, sufficient data is provided on the basic features, configurations, options, and equipment characteristics to aid in configuring and installing most installations. Typical or basic installations and configurations are presented in Sections I and II; options are fully described in Section IV.

Site planning and preparation should be in accordance with the applicable local codes. The following documents are applicable to facilities for computer systems and should be consulted as referenced herein:

NFPA No. 75 (1971)	Protection of Electronic Computer/Data Processing Equipment
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers Guide
NEC 70	National Electric Code
U. S. Bulletin 77	Static Electricity

To the most extent, the installation reference data and instructions in Section III are presented on a system level. This manual should be used on conjunction with the B 700 Processor FETM, form 1064482, B 721 Processor FETM, form 1077534, and associated I/O control (IOC/DDP) FETMS to obtain complete details and instructions to a unit level.

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Site PreparationGENERAL

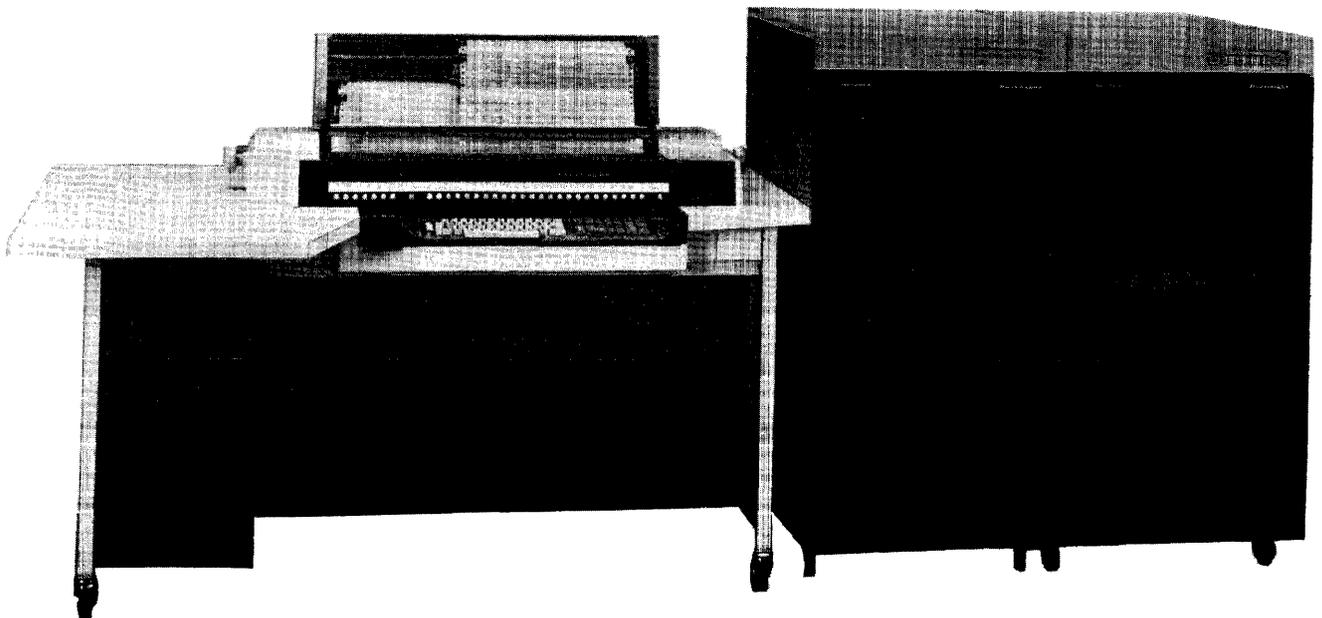
The customer must assume the responsibility for providing an appropriate location and suitable space and facilities for a Burroughs B 700-Series Computer System (B 705, B 711, B 721, B 771, or B 772). Suitable facilities may already exist at a customer's present office, or minor changes to existing facilities may provide a suitable location. However, some customers may desire or require a completely new facility. In either case, the operation should follow a planned schedule so that the facility is ready when the system is delivered.

The following paragraphs present the most important factors to be considered when planning and preparing an installation. Figure I-1 shows the configuration of typical console and SPO-based systems. Figure I-2 shows a typical B 721 System. This section and Section II provide detailed information about the B 705/B 711, B 721, and B 771/B 772 Central processing Units (CPU's) and all of the peripheral devices that may be used in the systems.

SPACE AND LAYOUT REQUIREMENTS

Space and layout requirements differ for each system and depend on the configuration ordered, the intended applications, and the physical area available.

The floor area required for the system is determined by the specific components to be installed, length-to-width ratio of the room, location of columns, provisions for future expansion, and so forth. Prepare a system (machine) layout, in accordance with the dimensions of the room under consideration and the configuration ordered, to determine the exact area or layout required. Figures I-3, I-4, and I-5 show typical system configurations and the recommended layout and area requirements for the B 705/B 711, B 771/B 772, and B 721, respectively. Table I-1 is a complete tabulation of equipment dimensions, clearances, and weights.



B 705/B 711 COMPUTER SYSTEM

Figure I-1. TYPICAL B 700 COMPUTER SYSTEM INSTALLATIONS

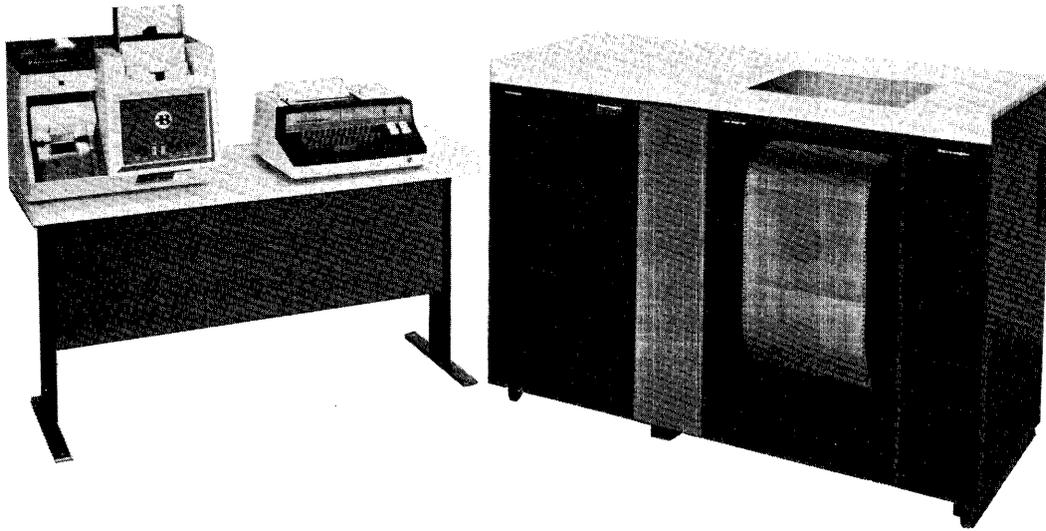
Site Preparation

Figure I-1 (CONTINUED) B 771/B 772 COMPUTER SYSTEM

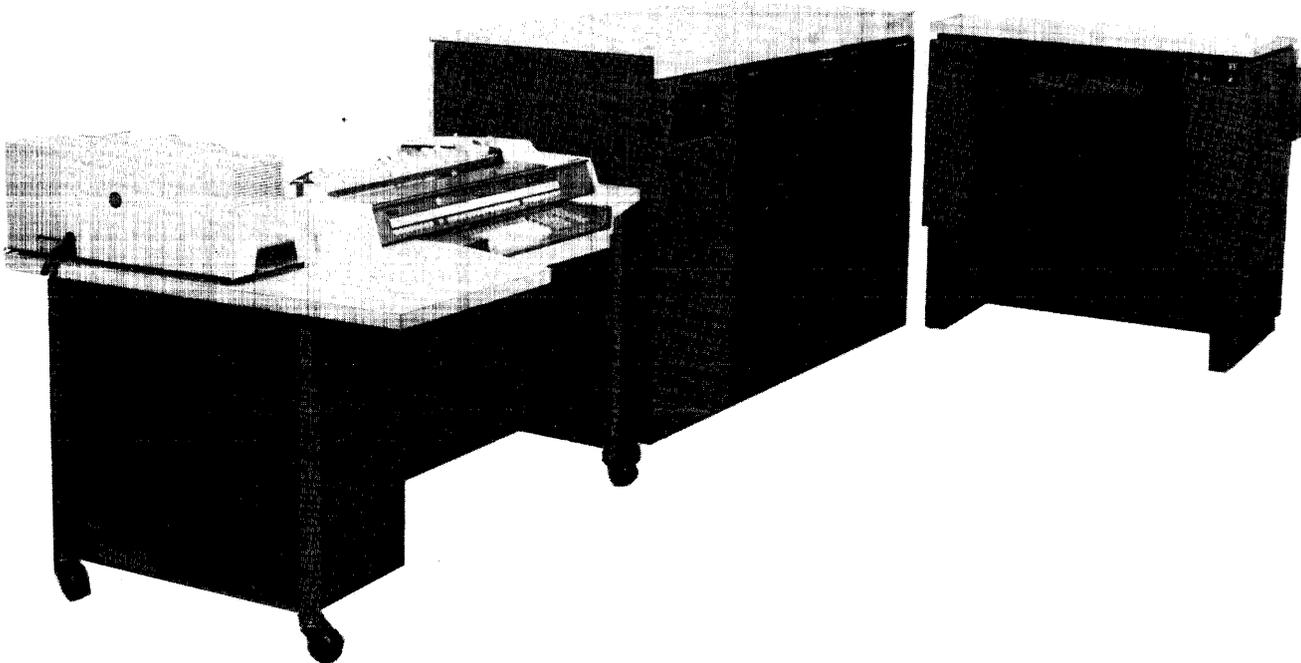


Figure I-2. TYPICAL B 721 COMPUTER SYSTEM
(CONSOLE-BASED SYSTEM)

Space should be provided for the storage of materials such as tape, tape cassettes, cards, and printed forms within the computer room. All other combustible materials, such as permanent master documents punched card records, disks, cartridges, and magnetic tape, should be stored in properly designated and protected storage areas. Consideration should be given in locating storage and maintenance areas to minimize both the amount of space required and the travel time between areas.

Site Preparation

Space must also be planned for items such as printer forms, stands, storage cabinets, card and record files, work tables, desks, and communication facilities.

The space access route to be used to move units from the unloading area to the installation room should be checked, and a determination should be made concerning any building modifications required to admit the units. A check should also be made to determine if the units can be delivered into the room without possible conflicts with movers' unions.

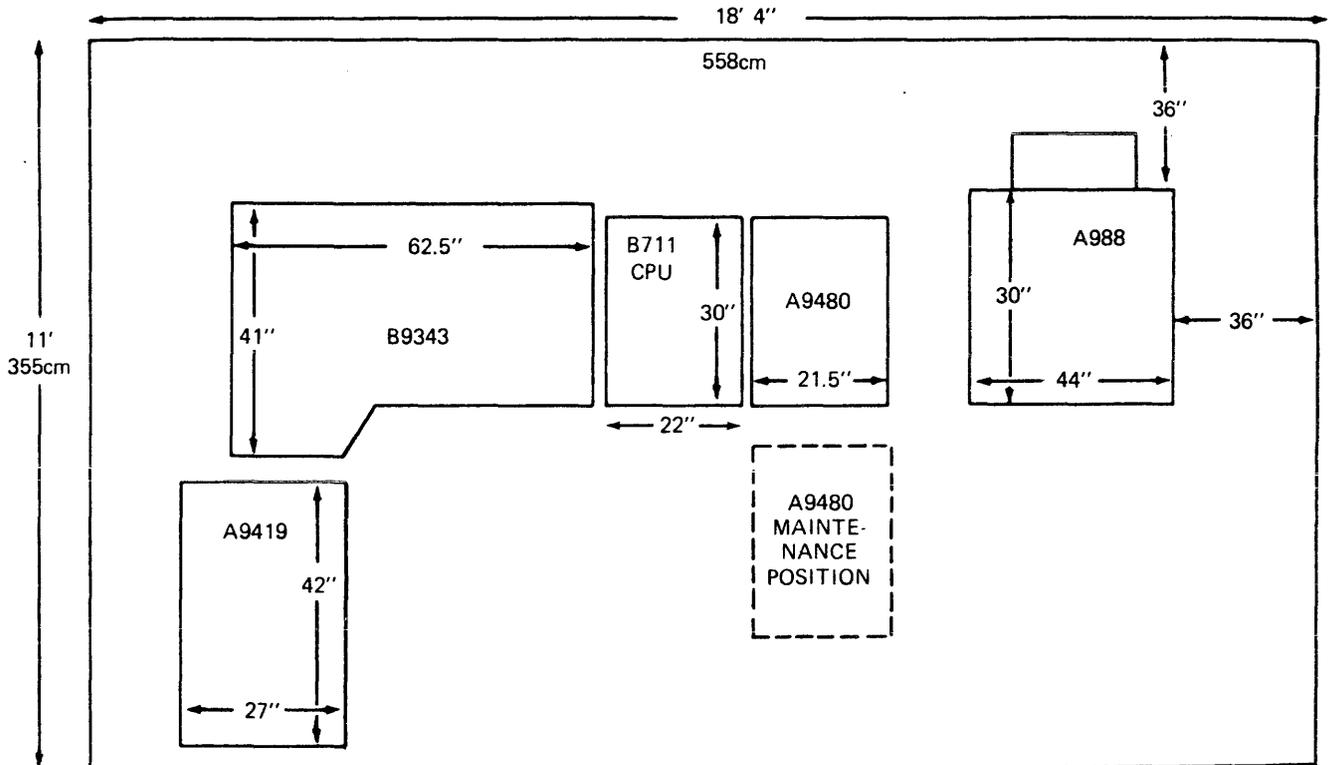


Figure I-3. TYPICAL B 705/B 711 SYSTEM MACHINE LAYOUT

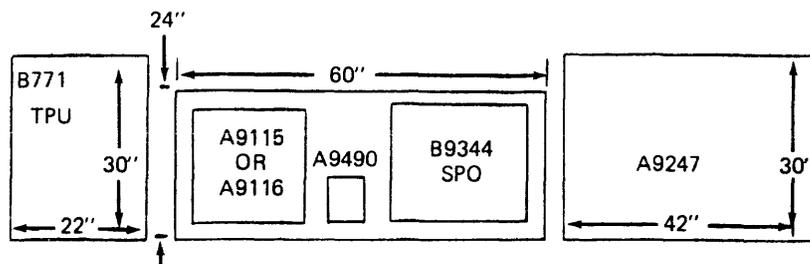


Figure I-4. TYPICAL B 771 SYSTEM MACHINE LAYOUT

Site Preparation

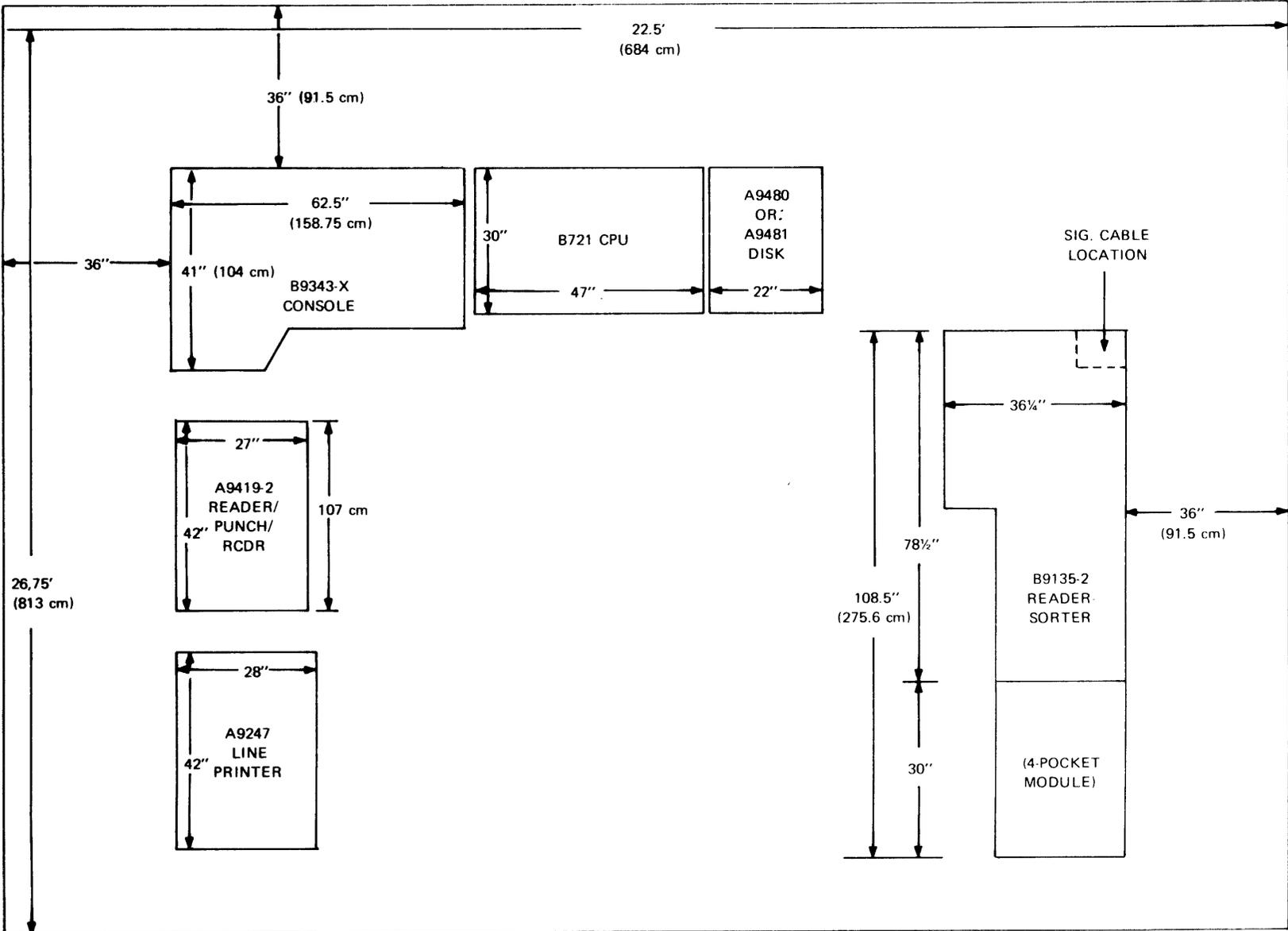


Figure I-5. TYPICAL B 721 CONSOLE-BASED SYSTEM, MACHINE LAYOUT

Site PreparationLAYOUT OF COMPONENTS

The following factors should be considered in preparing a final equipment (machine) layout:

1. Consideration should be given to working clearances, both in terms of operation and maintenance. Generally, peripheral equipment such as the card reader and line printer are located as near to the console as practicable. It is highly desirable to maintain a direct path and direct line of sight from the console to the peripheral equipment. It is also highly desirable to locate and arrange the peripheral equipment near the storage areas to permit computer operators to obtain and remove punched cards, printer paper, tapes, and so forth.
2. Service clearances are required to permit maintenance personnel to perform service functions and remove components from the equipment cabinets when necessary. Clearances are also required to permit ambient air circulation around equipment. (Equipment dimensions, weights, and clearances are listed in Table I-1.)
3. Signal and power cable access and lengths must be considered when the room is arranged. Also, cable length allowances should be made for routing within the units. Tables I-2 and I-3 list applicable system I/O (signal) cable and power cable details. Table I-2 also lists adapter cables required for certain peripheral devices to provide compatible interconnections with the processors.

Site Preparation

TABLE I-1. EQUIPMENT DIMENSIONS, WEIGHTS, AND CLEARANCES

EQUIPMENT		DIMENSIONS (IN INCHES)*				CLEARANCES (IN INCHES)*				WEIGHT (LB.)*
MODEL	NAME	WIDTH	DEPTH	HEIGHT	FRONT	REAR	LEFT SIDE	RIGHT SIDE		
B 705/711 or B 771/772	Processor	22 (56)	30 (76)	44 (112)	24 (61)	6 (15)	0	0	440 (200)	
B 721	Processor	44 (112)	30 (76)	44 (112)	36 (91.5)	36 (91.5)	0	0	490 to 565	
B 9343-X	Console	62.5 (159)	41 (104)	36 (91.5)	36 (91.5)	6 (15)	0	0	281 (127.5) or 332 (146)	
B 9344	SPO	18.5 (47)	19 (48)	9 (24)	36 (91.5)	6 (15)	0	0	55 (25)	
A 9114-1	Card Reader	25 (62)	11 (27)	10 (25.4)	0	6 (15)	6 (15)	6 (15)	45 (20.4)	
B 9115/ 9116	Card Reader	22 (60)	19.5 (50)	22 (60)	36 (91.5)	36 (91.5)	36 (91.5)	6 (15)	105 (70.8)	
A 9119-1	Card Reader	14 (35.5)	15 (38)	11 (29)	36 (91.5)	8 (20)	0	0	36 (16.3)	
A 9419-X	Card RDR/ PNCH/RCDR	42 (107)	27 (69)	35 (89)	36 (91.5)	6 (15.5)	0	0	250 (113.4)	
A 9418	Card RDR/ PNCH/RCDR	42 (107)	27 (69)	35 (89)	12 (30)	12 (30)	8 (20)	8 (20)	250 (113.4)	
A 988	Line Printer	44 (114)	30 (76)	48 (122)	36 (91.5)	36 (91.5)	36 (91.5)	36 (91.5)	540 (245)	
A/B 9247-X	Line Printer	42 (107)	28 (71)	44 (112)	36 (91.5)	36 (91.5)	36 (91.5)	36 (91.5)	600 (272)	
A/B 9249-X	Line Printer	30 (76.2)	24.5 (62)	40.5 (103)	36 (91.5)	36 (91.5)	36 (91.5)	36 (91.5)	150 (68)	
A 9480 or A 9481	Disk Cart. Drive	22 (56)	30 (76)	44 (112)	36 (91.5)	36 (91.5)	36 (91.5)	36 (91.5)	357 (162.2)	
A 9490	Mag. Tape Cassette	5 (12.7)	9 (22.8)	4.6 (12.5)	24 (61)	0	0	0	5.1(2.3)	
A 9491	Mag. Tape Unit	21.25(55)	10.5 (27)	11.75 (30.5)	32 (81.5)	32 (81.5)	0	0	30 (13.6)	
A 9122-1	PPT/EPC Reader	11 (28)	9.25 (23)	7 (17.8)	24 (61)	6 (15)	6 (15)	6 (15)	15 (6.8)	
A 9222	PPT/EPC Punch	11.6 (29.3)	15.25 (39)	6 (15)	24 (61)	6 (15)	6 (15)	6 (15)	21 (9.5)	
A 9135-X	Reader Sort. Basic	78.5 (198)	36.25 (92)	54.25 (137)	36 (91.5)	36 (91.5)	36 (91.5)	36 (91.5)	1200 (544)	
	4-Pocket Mod	30 (76)	29.25 (75)	40.25 (102)	36 (91.5)	36 (91.5)	0	36 (91.5)	150 (68)	
	8-Pocket Conf.	108.5(274)	36.25 (92)	54.25 (137)	36 (91.5)	36 (91.5)	36 (91.5)	36 (91.5)	1350 (616)	
	12-Pocket Conf.	138.5(350)	36.25 (92)	54.25 (137)	36 (91.5)	36 (91.5)	36 (91.5)	36 (91.5)	1500 (681)	

*Metric Equivalent dimensions and clearances (centimeters) and weights (kilograms) are shown within parentheses.

Site Preparation

EQUIPMENT/FUNCTION	CABLE			NOTES
	PART NO.*	*LENGTH (FT.)	** ALLOWANCE (FT.)	
B9343-X Console (Mechanical Keyboard)	1448 0834	15	2.5	
	1448 0859	15	2.5	
	1448 0842	15	2.5	
B9343-22/42 Console (Electronic Keyboard)	2601 1478	19	2.5	2602 3028 for B721 Data Comm Indicator Option.
	2601 1486	15	2.5	
	2602 3028	12	2.5	
B9344 Supervisory Printer (SPO)	1449 4918	16	2.0	Supplied with B044 Control
A9480-XX and A9481 Disk Cartridge Drives	1446 6072 (S)	25 (S)	2.5	
	2158 4826 (NS)	50 (NS)		
A988 Line Printer	1065 3079	35	2.5	Adapter Cable 1448 0412 required. ***
A9247-X Line Printer	1087 6233 (S)	25 (S)	2.5	Adapter cable 1448 0370 required. ***
	1090 1924 (NS)			
A9249-X Line Printer	2106 3524	15	2	Adapter cable 2601 1734 required. ***
A9114-1 Card Reader (80-column)	1479 8920 (S)	25 (S)	2.5	Adapter cable 1448 0354 required. ***
	1448 0354 (AD)	2 (AD)		
A9119-1 Card Reader (96-column)	2471 3059 (S)	25 (S)	2.5	Two each of selected cable required. Adapter cable 1449 1252 required. ***
	2471 3091 (NS)	50 (NS)		
B9115 and B9116 Card Readers (80-column)	2471 3059 (S)	25 (S)	2.5	Adapter cable 1449 4892 required. ***
	2471 3075 (NS)	35 (NS)		

* Where various cable lengths are available, (S) is indicated for standard cable; (NS) is indicated for non-standard.

** Allowance required for routing within equipment.

*** Adapter cables are 2 ft. long and are supplied with corresponding IOC/DDP.

TABLE I-2. EQUIPMENT INTERFACE (EXTERNAL I/O SIGNAL) CABLES

TABLE I-2. EQUIPMENT INTERFACE (EXTERNAL I/O SIGNAL) CABLES (Continued)

EQUIPMENT/FUNCTION	CABLE			NOTES
	PART NO.*	*LENGTH (FT.)	**ALLOWANCE (FT.)	
A9490-25 Magnetic Tape Cassette	2046 1992	10.5	1.5	Adapter cable 1449 0288 required. ***
A9491-2 Magnetic Tape Unit	1449 0438	15	1.5	
A9418-X Card RDR/PNCH/ Printer-Data RCDR (80-column)	2471 3059 (S) 2471 3091 (NS)	25 (S) 50 (NS)	4.5	Two each of selected cable required. Adapter cable 1449 1252 required. ***
A9419-X Card RDR/PNCH/ DATA-RCDR	1447 9497 (S) 2471 3059 (NS)	25 (S) 25 (NS)	4.5	Two each if 2471 3059 (NS) is selected. Adapter cable 1449 1252 required. ***
A9122-1 Paper Tape Reader	1479 8912	25	2.5	Adapter cable 1448 9199 required. ***
A9222-1 Paper Tape Punch	1479 8896	25	2.5	Adapter cable 1449 0304 required. ***
A9135 Reader-Sorter	2209 7489	25	3.5	Adapter cable 2601 6592 required. ***
Single-Line Data Communications Interface (B351 and B351-1)	1449 5360	25	2.0	Cable 1449 5360 supplied for data set interface; jumper-interface connector block supplied for direct connect mode.
Multiline Data Communications Interface (B721/B352)	2602 2907 (DOM) 2602 2988 (DOM) 2603 3845 (GPO) 2603 3852 (SEL) 2602 3010 (ACU)	25 50 (S) 50 50 50 (S)	2.0	One cable required for each B255 Data Comm Line Adapter and data set. All domestic and international requirements must be specified at time of order. ACU cable required in addition to data set cable if ACU is used.

* Where various cable lengths are available, (S) is indicated for standard cable; (NS) is indicated for non-standard.

** Allowance required for routing within equipment.

*** Adapter cables are 2 ft. long and are supplied with corresponding IOC/DDP.

Site Preparation

EQUIPMENT	CABLE (NOTE 1)				
	LENGTH (FT.)	PLUG TYPE (NOTE 1)	MATING RECEPTACLE (NOTE 1)	RATING (AMPS)	NOTES
B705/B711 Central Processing Unit	15	9452	9450	50	2,6
B721 Central Processing Unit	15	9452 (Nema 14-50P)	9450	50	2,6
B771/B772 Systems and Communications Processor	15	9452	9450	50	2,6
B9343-XX Console	15	(Special)	NA	—	4
B9344 Supervisory Printer (SPO)	15	5264	5261 or 5262	15	3
A9480-X and B9481-X Disk Cartridge Drives	15	5264	5261 or 5262	15	3,7
A988 Line Printer	15	3331	3330 or 3333	30	3
A9247-X Line Printer	15	5366 or 5375	5374 or 5351	20	3
A9249-X Line Printer	15	5264	5261 or 5262	15	3,7
A9114-1 Card Reader (80-Column)	—	—	—	—	4
A9119-1 Card Reader (96-column)	8	5264	5251, 5252, 5261, or 5262	15	3,7
B9115/B9116 Card Reader (80-column)	8	5264	5251, 5252, 5261, or 5262	15	3
A9490-25 Magnetic Tape Cassette	—	—	—	—	4

TABLE I-3 EQUIPMENT POWER CABLES

Site Preparation

EQUIPMENT	CABLE (NOTE 1)				
	LENGTH (FT.)	PLUG TYPE (NOTE 1)	MATING RECEPTACLE (NOTE 1)	RATING (AMPS)	NOTES
A9491-2 Magnetic Tape Unit	15	5264	5251, 5252, 5261, or 5262	15	3,7
B9418-X Card RDR/PNCH/PNTR-DATA RCDR (80-column)	15	5264 or Pass and Seymour 5874	5262 or Pass and Seymour 5871	15	3,5
A9419-X Card RDR/PNCH/PNTR-DATA RCDR (96-column)	15	Pass and Seymour 5874	Pass and Seymour 5871	15	3,5,7
A9122-1 Paper Tape Reader	—	—	—	—	4
A9222-1 Paper Tape Punch	—	—	—	—	4
A9135 Reader-Sorter		3765	3764	45	2

NOTES:

1. Unless otherwise indicated: Power cable and plugs are supplied with equipment; mating receptacles (those required in addition to the supplied processor convenience outlets) must be supplied by customer; plug and receptacle types are Hubbell. (See Figure I-6 for connector descriptions.)
2. Three-wire with ground (domestic); local requirements for international installations (normally 15 ft. 2-wire ground).
3. Two-wire with ground; three-prong plug.
4. Power is supplied to unit from processor cabinet thru I/O or power control interface cable (Table I-2). No separate power cord is used.
5. A 9-foot extension cord is shipped for B9418 and A9419 units with associated I/O control.
6. Current rating of 50 amps is nominal for maximum steady state line current in a system using 120 VAC, 60 Hz, primary power source. Refer to Table I-4 for other ratings.
7. These devices may be connected to convenience outlets on processor power distribution box.

TABLE I-3. EQUIPMENT POWER CABLES (Continued)

Site PreparationFLOOR FINISH

Burroughs recommends that the floor of the computer room be finished with 1/8-inch rubber or vinyl-asbestos tile, constructed with antistatic material. This type of floor prevents the base of the equipment from coming in contact with any metal surfaces of the building, thus providing safety for personnel while working on energized electrical circuits. It also provides an essentially static-free surface that can be readily cleaned with a vacuum cleaner or damp mop.

Antistatic floor wax should be used on the flooring. The resistance between the wearing surface of the finished floor and ground should be a minimum of 50K-ohms.

Burroughs recommends that carpeting be avoided wherever possible because of its high static potential. If carpeting is used, it should be of a special type (available from some manufacturers) that is made for computer rooms and contains wire woven into the fabric.

Additional information on static electricity may be obtained from U.S. Bulletin 77.

FURNITURE

Furniture can be a potential source of high-static charges. Precautions should be taken to ensure that furniture covering is made of materials resistant to static buildup. Many plastics permit the buildup of high-static charges. Cloth-covered chairs are normally less susceptible to static charges. Rubber or other insulating types of equipment feet should be avoided. If casters or ball bearing are used, they should be lubricated with a graphite lubricant or other conductive grease. Rubber tread casters and wheels should contain conductive material.

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

ACOUSTICAL TREATMENT

Acoustical treatment of the room may be desirable to provide more comfortable operation of the system. The principal noise sources in a system are mechanical units such as card punches, printers, reader-sorters, and blowers. The floor construction should be of a nature that will retard vibration to other areas. The walls should be constructed to prevent the transmission of noise to the adjacent area. It is important that these walls be constructed from the floor to the base ceiling and be properly sealed. Doors must also be well sealed. The use of absorptive materials reduces the average sound pressure level throughout an installation.

The greatest sound reduction is obtained by properly treating the ceiling. Best results can be expected from a suspended porous ceiling. If overhead ductwork exists, it may be possible that noise generated in the room will be transmitted to other rooms unless proper precautions are taken.

For larger rooms, the floor is the second most effective area on which to apply absorptive materials. Wall surfaces should be constructed from soft materials to prevent reverberations.

LIGHTING

Generally, there should be even light distribution throughout the equipment area, and the light should be sufficient for the comfort of operators and the performance of maintenance. A minimum of 50 foot-candles (measured 30 inches above the floor) is recommended.

Site Preparation

Direct sunlight should be avoided, because lower levels of illumination are needed to observe the various console and indicator lamps. The lights for general illumination should be sectionally controlled by switches so that a portion of the total lighting can be turned off, if desired. Lights **should not** be powered from the system power panel.

In rooms without windows, an auxiliary lighting system should be installed in the event of power failures. (This may be a requirement of some local building codes.)

FIRE PREVENTION EQUIPMENT

Portable carbon dioxide or Halon fire extinguishers of suitable size and number should be provided in the computer room. These extinguishers contain the recommended non-wetting agents for electrical equipment (Class C Hazard). Extinguishers should be overhead, marked, and readily accessible to individuals in the immediate area. Local codes govern the size and number of extinguishers required.

Where portable extinguishers are used as the primary extinguishing agents, it is advisable to locate a standpipe or hose unit within effective range of the computer area as a second extinguishing agent for a Class A Hazard.

A fire-detection system should be installed to protect the system equipment and storage areas.

POWER

GENERAL

This subsection describes the electrical power requirements, grounding, connections, and wiring methods for the B 700 Processors and associated peripheral equipment. The wiring methods described herein are in compliance with the National Electrical Code (NEC 70) and the NFPA Standard for the Protection of Electronic Computer Data Processing Equipment, Bulletin No. 75 (1971).

It is the responsibility of the customer to furnish and install the following:

1. All conduit and power wiring contained therein.
2. All necessary power receptacles for system units, convenience outlets for test equipment in adequate locations, and panelboards with circuit breakers or disconnection devices.
3. Additional EPO (Emergency Power Off) switches, if required, and associated wiring.

During the planning of the customer's power source capacity for a small system, additional power requirements should be considered for system expansion.

Power Panelboard and Electrical Interface

The customer shall provide a separate power panelboard to service only the B 700 System. This panelboard shall have a properly rated circuit breaker for each line of the B 700 Processor branch and any separate branches used for peripherals. Standard circuit breakers of the correct ratings are acceptable; no special circuit breakers are required.

The B 700 panelboard should be conveniently located in an accessible location within the room containing the B 700. The panelboard directory should clearly identify each branch circuit.

The customer shall furnish the wiring necessary for direct connection to the panelboard. Electrical connections to any Burroughs equipment shall be made under supervision of the Burroughs site engineer.

Emergency Power Off

The customer should furnish the means for disconnecting all electrical power to the system and turning off fan motor(s) in the air-conditioning system (if used) in the event of an emergency such as fire, earthquake, or discharging sprinkler system.

Site Preparation

<u>TYPE</u>	<u>CONNECTOR</u>	<u>WIRING DIAGRAM</u>
MFG HUBBELL PLUG 5264 RECEPTACLE . 5251, 5252, 5261, OR 5262		<p>PHASE WIRE NEUTRAL GROUND 2-POLE, 3-WIRE GROUNDING 125 VOLTS, 15 AMPERES</p>
MFG PASS & SEYMOUR PLUG 5874 RECEPTACLE . 5871		<p>PHASE WIRE PHASE WIRE GROUND 2-POLE, 3-WIRE 250 VOLTS, 20 AMPERES</p>
MFG HUBBELL PLUG 3331 RECEPTACLE . 3330 OR 3333		<p>PHASE WIRE Y PHASE WIRE W GROUND X 2-POLE, 3-WIRE GROUNDING 250 VOLTS, 30 AMPERES</p>
MFG HUBBELL PLUG 9452 RECEPTACLE . 9450		<p>NEUTRAL PHASE WIRE GROUND PHASE WIRE 2-POLE, 3-WIRE 115 VOLTS, 15 AMPERES</p>
STANDARD UL-APPROVED PLUG AND RECEPTACLE		<p>PHASE WIRE NEUTRAL GROUND 2-POLE, 3-WIRE 115 VOLTS, 15 AMPERES</p>

NOTE: REFER TO TABLE 1-3 FOR APPLICATION DATA.

Figure I-6. POWER CONNECTORS

Power Cabling and Receptacles

A B 700 Processor and most of the B 700 peripherals obtain primary AC power through separate power cables. Some peripherals obtain power through their I/O interface cables and do not require separate power connections. For domestic installations, Burroughs supplies fixed power cables with attached connectors of the correct ratings for each unit requiring a separate power connection. For International installations, only the power cables are supplied for the peripherals; a package of six power connectors is supplied separately for use on all units except the B9247 Line Printer and the A9135 Reader-Sorter.

Site Preparation

Six convenience receptacles are supplied on the processor to accommodate up to six peripherals of all types except the B9247 and A9135. Where required, separate power receptacles must be supplied by the customer and must mate with the Burroughs-supplied plugs. Table I-3 lists, for each unit, the types of supplied power cords and connectors and the recommended mating connectors. Figure I-6 identifies and describes the various types of connectors (Hubbell or Pass and Seymour). Equivalent connector types may be used; however, if local codes require different types of receptacles that do not mate with the plugs, the customer must furnish both the plugs and receptacles.

Receptacle outlets should be located within 5-to-10 feet of the equipment they are intended to serve. (Refer to Table I-3.) Additional service outlets should also be provided for each unit.

Refer to the information under SYSTEM POWER REQUIREMENTS and SYSTEM POWER DISTRIBUTION for complete details concerning power distribution and loading. Section III contains additional power cabling details.

SYSTEM POWER REQUIREMENTS

A B 700 System can be operated from any of the primary power sources listed in Table I-4. The domestic sources are applicable for installations in the United States and Canada. Operation from the International sources listed in Table I-4 is facilitated by optional equipment provisions that must be specified when a system is ordered.

Table I-4 also lists the maximum steady-state line current that is required from each source by a typical system configuration with sufficient reserve capacity for future expansion. Included in the specified values is the power required to operate a full complement of I/O devices capable of being serviced by the systems. Excluded from these values are the A9247-2/12 Line Printer and A9135 Reader-Sorter, which require separate branch circuits because of their high power consumption.

Table I-5 lists the maximum current requirement, under each voltage rating, for each type of peripheral available for use in the B 700 Systems. (Refer to Section II.) These ratings should be used in determining the loading requirements for processor receptacles and/or external facility receptacles. If the configuration or number of peripherals is such that, when connected to processor line A and/or B the maximum allowable current is exceeded (Table I-6), separate branch circuits other than the processor branch circuit must be provided to handle the excess load.

NOTE

All branch circuits, including the processor branch circuit, should be protected by circuit breakers suitable for motor-load applications.

The total amount of power required for a system can be calculated by summing the KVA ratings for the complete complement of system units. (Refer to Section II.) Allowances should be made for future growth.

SYSTEM POWER DISTRIBUTION

A B 700 Processor receives single-phase primary input power through its power cord directly from the facility-supplied primary source through a branch circuit breaker panelboard. The processor in turn can distribute power through its internal power distribution circuitry to all attached system peripherals except those which require separate branches (A9247-X Line Printer and A9135 Reader-Sorter).

Peripheral devices that are supplied with AC power cords and standard plugs (Hubbell Type 5264 or equivalent) must be connected directly to convenience outlets provided as part of the processor power distribution circuitry. (This provision is noted for applicable peripherals in Table I-3.) Peripherals in this category may only be connected to separate branch line receptacles, rather than processor receptacles

Site Preparation

if: (1) all processor outlets are being used, (2) the distance between a peripheral and the processor exceeds the power cable length (Table I-3), (3) the maximum allowable loading on branch lines A and B to the processor receptacles will be exceeded by connecting more peripherals, or (4) a peripheral must be isolated from the system.

Certain peripheral devices do not have separate AC power cords because they obtain AC power from branch line A of the processor power distribution circuitry through I/O interface cables (as noted in Table I-3). These devices (A9114 Card Reader, A9122 Paper Tape Reader, and A9222 Paper Tape Punch) also receive DC operating power from the processor power supply. The B9343-X Console uses a separate special power interface cable, which also contains wiring for emergency-off provisions.

PRIMARY POWER SOURCE			MAX. LINE CURRENT	
VOLTAGE (+5, -10%)	FREQUENCY (± 1%)	PHASE	50 Hz	60 Hz
<u>Domestic*</u>				
120/208V	60 Hz	Single-phase, 3-Wire plus ground	N/A	<u>25A</u> ↙
120/240V	60 Hz	<u>Single-phase, 3-Wire plus ground</u>	N/A	<u>25A</u>
<u>International</u>				
100V	50 or 60 Hz	Single Phase, 2-Wire plus ground	65A	60A
110V			60A	55A
115V			58A	53A
120V			55A	50A
127V			53A	48A
200V			32A	30A
208V			31A	29A
220V			30A	28A
230V			29A	27A
240V			27A	25A

*Installations in United States and Canada are considered Domestic installations; all others are considered International installations.

TABLE I-4. PRIMARY POWER SOURCES AND MAXIMUM ALLOWABLE STEADY-STATE LINE CURRENTS FOR B700 SYSTEMS

Site Preparation

EQUIPMENT	CURRENT (AMPS) FOR CORRESPONDING PRIMARY AC VOLTAGES (+5%, -10%)										NOTES
	100	110	115	120	127	200	208	220	230	240	
B9343-X Console	2.3	2.1	2.0	1.9	1.8	1.2	1.1	1.1	1.0	1.0	
B9344 Supervisory Printer (SPO)	6.0	5.4	5.2	5.0	4.8	3.0	2.9	2.7	2.6	2.5	1
A9480-11 or A9481-11 Disk Cartridge Drive	4.8	4.4	4.2	4.0	3.8	2.4	2.3	2.2	2.1	2.0	1
A940-12 or A9481-12 Disk Cartridge Drive	6.0	5.5	5.2	5.0	4.7	3.0	2.9	2.7	2.6	2.5	1
A988 Line Printer	17.6	16.0	15.2	14.7	13.9	8.8	8.5	8.0	7.7	7.3	1, 3
A9247-X Line Printer	17.6	16.0	15.2	14.7	13.9	8.8	8.5	8.0	7.7	7.3	1, 2, 3
A9249-X Line Printer	4.8	4.4	4.2	4.0	3.8	2.4	2.3	2.2	2.1	2.0	1
A9114-1 Card Reader	1.8	1.7	1.6	1.5	1.4	0.9	0.9	0.8	0.8	0.7	4
A9119-1 Card Reader	7.2	6.5	6.3	6.0	5.7	3.6	3.5	3.3	3.1	3.0	
A9115/B9116 Card Reader	2.9	2.6	2.5	2.4	2.3	1.5	1.4	1.3	1.2	1.21	1
A9491-2 Magnetic Tape Unit	0.7	0.7	0.8	0.8	0.8	0.4	0.4	0.4	0.4	0.4	1
A9418-X Card RDR/PNCH/RCDR	5.5	5.0	4.8	4.6	4.4	2.8	2.7	2.5	2.4	2.3	
A9419-2 Card RDR/PNCH/RCDR	3.2	3.0	2.8	2.7	2.5	1.6	1.6	1.5	1.4	1.4	1
A9122-1 Paper Tape Reader	0.6	0.6	0.5	0.5	0.5	0.3	0.3	0.3	0.3	0.3	4
A9222-1 Paper Tape Punch	0.8	0.8	0.7	0.7	0.7	0.4	0.4	0.4	0.4	0.4	4
A9135-X Reader-Sorter	-	-	-	-	-	-	31	31	31	-	2
Memory Loader	1.2	1.1	1.1	1.0	1.0	0.6	0.6	0.5	0.5	0.5	

NOTES:

1. These devices can use processor convenience outlets or separate facility outlets for primary AC power source, depending on position of unit and loading of processor outlets.
2. These devices require separate branch circuits.
3. A988 and A9247 Line Printers must be connected to line A receptacles (J3) in B705/B711 and B771/B772 processors if they use the processor branch. A 9247 **must** use a separate branch circuit in B721 Systems.
4. These devices obtain power through I/O interface cables and do not have separate power cables.

TABLE I-5. CURRENT REQUIREMENTS FOR PERIPHERAL DEVICES

Site Preparation

The A9490-21 (B721 internal installation) and A9490-25 (stand-alone) Magnetic Tape Cassettes do not require AC power inputs, but are supplied DC operating power from the processor power supply through the respective I/O interface cables.

Processor Power Distribution Box Wiring and Loading

The processor power distribution box, including the AC convenience outlets, is located at the lower-rear section of each processor cabinet. In Domestic (U. S. and Canada) installations, line A from the processor power cord (primary AC power input) is distributed to two standard receptacles (duplex receptacle designated J3) capable of servicing all applicable peripheral devices. This receptacle is a general-purpose, type USAS 50-15R duplex connector (Hubbell type 5252 or equivalent). In B721 installations, only 15-ampere peripheral loads may be connected to each receptacle.

Line B of the processor primary AC power source is distributed to a set of four vertically mounted standard receptacles, designated J1 and J2, which are also capable of servicing all applicable peripherals. In International units the line and neutral leads feed J1, J2, and J3 in parallel.

NOTE

In B705/B711 or B771/B772 Processors for Canadian installations, a special 15-ampere twist-lock receptacles is provided in place of the standard line A receptacles. In B721 Processors for Canadian installations, a special 15-ampere twist-lock receptacle is provided in place of one of the standard line B receptacles to accommodate A9480 or A9481 Disk Cartridge Drives.

The number or combination of peripherals that obtain AC power from the processor distribution box convenience outlet must be restricted to that number or combination which does not exceed the maximum current available from each line. Table I-6 lists, for each system, the maximum current load available from line A (J3) and line B (J1 and J2) for each primary voltage rating. Refer to Table I-5 for peripheral device current requirements.

LINE CONNECTION		100V	110V	115V	120V	127V	200V	208V	220V	230V	240V
A (J3)	B705/B711	20.4	18.5	17.7	17.0	16.1	10.2	9.8	9.3	8.9	8.5
	B721	20.4	18.5	17.8	17.0	16.1	10.2	9.8	9.3	8.9	
	B771/B772	22.8	20.7	19.8	19.0	17.9	10.4	10.9	10.3	9.9	9.5
B (J1/J2)	B705/B711	20.1	18.2*	17.2	16.7	15.8	10.0	9.7	9.1	8.7	8.3
	B721	18.0	16.4*	15.7	15.0	14.2	9.0	8.7	8.2	7.8	7.5
	B771/B772	22.2	20.2*	19.3	18.5	17.5	11.1	10.6	10.1	9.6	9.2

*Limited to 15 amps for systems installed in Canada.

TABLE I-6. MAXIMUM CURRENT AVAILABLE FROM PROCESSOR POWER OUTLET BOX

Site Preparation

GROUNDING REQUIREMENTS

The following grounding requirements apply to the installation of B700 System units:

- a. An insulated grounding conductor must be installed as part of the branch circuit that supplies a unit or system. (This conductor should be identical in size and insulation to the grounded and ungrounded branch-circuit conductors; except that it is green, or green with one or more yellow stripes.)
- b. The grounding conductor (item a) must be used as the ground connector for all units.
- c. The attachment-plug receptacles in the vicinity of a unit or system all must be of the grounding conductors serving these receptacles must be connected to the grounding conductor that serves the unit or system.

WARNING

Improper grounding creates a potentially hazardous situation for the Field Engineers and operator. All units in the system have a grounding type power plug, and the power receptacles in the processor have the ground terminal securely connected to the processor frame. This method ensures a positive ground connection through the main power line to building ground.

The equipment grounds for all units in the system must be connected to a common point. This requirement is met when all peripheral units receive power from a processor power distribution box.

If separate branch circuits are used for any peripheral devices, the grounding lines of all such branches must be connected to a common point at the power distribution panelboard that services the B700 System (branch panel, not main facility panel). Equipment other than B700 peripherals shall not be connected to a separate peripheral branch. A single ground line must then be connected from the B700 branch panelboard to the service ground, or building ground. Conduit must not be used in place of a separate grounding line.

VOLTAGE TRANSIENTS AND LINE NOISE

Line transients can be caused by the turnon and turnoff of heavy electrical machinery such as welders, air-conditioning motors, and elevators. In fact, even lighting can cause sizeable spikes that may exceed the transient rating of a specific system unit. Consequently, it is recommended that the system power service be independent. The voltage transient and line noise limits for B700 Systems are as follows:

- a. Line voltage transient minimum: 0.7 times nominal line supply for 0.5 second.
- b. Line voltage transient limit: 2.5 times nominal line supply for 1/2 cycle (8 ms).
- c. Line noise limit: 3 times nominal line supply voltage for 5 ms maximum.

ENVIRONMENTAL REQUIREMENTS

The basic B700 Systems are designed to operate in class B environments, which can be approximately construed as those environments within an ambient temperature range of 60 to 100 degrees Fahrenheit (15.5 to 37.8 degrees Centigrade) and a relative humidity range of 10 to 80 percent (without condensation). However, to achieve the greatest system operating reliability, media such as punch cards and magnetic tape should be stored in a class C environment. Also, if the A9135 Reader-Sorter is used, its requirements fall approximately in the class C range for humidity. Thus, it is recommended that a B700 System be provided with a class C environment, which is defined as having a temperature range of 65 to 80 degrees Fahrenheit (18.3 to 26.75 degrees Centigrade) and a relative humidity range of 40 to 60 percent.

Site Preparation**NOTE**

Raw water humidifiers should not be used to control humidity. Also, antistatic wax on vinyl floors, or computer-type carpeting is recommended to avoid static discharges.

PRE-INSTALLATION SCHEDULE AND CHECK LIST

The successful installation of a B 700 system requires close attention and supervision long before the system arrives. The following procedures are provided as a guide, but they should be followed to the greatest extent possible.

AFTER ORDER IS CONFIRMED:

1. Field Engineering (F.E.) personnel responsible for the site should review the order to determine what equipment is required.
2. This planning and installation manual should be studied.
3. The prospective location of the system should be determined. (Prepare a preliminary layout of the proposed installation.)
4. All phases of the proposed installation should be reviewed by the F. E. and customer or consultant. The discussion should cover the size of the proposed room, the physical layout of the equipment, floor loadings, and electrical power and air conditioning requirements, as applicable.
5. Burroughs should be notified about any security requirements or other restrictions.
6. The customer should study local delivery quotations on power, air conditioning, customer-supplied cables, and other equipment to determine when each item must be ordered.
7. All system cables not supplied with the equipment should be ordered. (Refer to form 2280.)

SIX MONTHS BEFORE EQUIPMENT DELIVERY:

1. The air-conditioning and power requirements, delivery date, and installation schedule should be reviewed.
2. The system configuration should be reconfirmed with the account manager.
3. The F.E. manager should determine if any additional field engineering training is required.

FOUR MONTHS BEFORE EQUIPMENT DELIVERY:

1. Site spares, tools, manuals, test equipment, materials and any other required equipment and tools should be ordered. (Review E.I.G.'s for these requirements.)
2. Ensure that district parts inventory center has ordered the parts needed for maintenance.
3. All customer-required supplies should be ordered. (Use sales-department assistance, as required.)
4. The F.E. manager should increase bulk literature distribution to include the new site.

Site Preparation

5. The final layout should be made and approved by the account manager, field engineer and the customer. Use the following guide as a check list:
 - a. Will the space allocated for the site permit a functional system configuration?
 - b. Will the layout, as initially planned, permit system expansion economically?
 - c. Has an area been set aside for field engineering use in maintaining the equipment?
 - d. Does the site location present special problems for unloading and locating units? If so, have solutions been devised? Have the necessary arrangements been implemented?
 - e. What type of flooring is to be employed?
 - f. Is the proposed layout compatible with maximum length cables?
 - g. Has the system site been checked for unusual vibrations?
 - h. Has the system site been checked for AC-power deficiencies, or problems such as interruption of power by electrical storms?
 - i. Are the full power requirements for the system and possible future expansion acknowledged?
 - j. Are the requirements for cables, circuit breakers, service outlets, emergency power off, or disconnection switches acknowledged?
 - k. Has the total heat load of the system been established?
 - l. Have the requirements for ambient temperature and relative humidity been acknowledged?
 - m. Has room cleanliness been discussed?
 - n. Have additional growth requirements been provided for future system expansion?
 - o. Have the lighting requirements for the computer room been established?
 - p. Has acoustical treatment of the computer room been discussed?
 - q. Has the arrival date of the system and peripherals been reconfirmed?
 - r. Have provisions been made to have Rol-O-Lifts or substitute equipment at the site at the time of system arrival?
 - s. If data communications is required, has the telephone company been notified?
 - t. Has the customer and sales department been notified that the delivery date only indicates the start of the installation and that the system will not be available until Field Engineering turn-over.

Site Preparation

THREE MONTHS BEFORE EQUIPMENT DELIVERY:

1. The configuration should be reconfirmed with the account manager.
2. A survey should be made to determine the progress of the site preparation.

TWO MONTHS BEFORE EQUIPMENT DELIVERY:

1. The configuration should be reconfirmed with the account manager.
2. A survey should be made to determine the progress of the site preparation.
3. The required forms should be assembled to include the following:

<u>Forms Required</u>	<u>Form Number</u>	<u>F.M.M. Reference</u>
Weekly Time and Expense Report	556	2.12.7-1
Daily Summary	591	2.12.8-1
System Log Book	1768	2.12.2-1
Personnel and Maintenance Record	2665	
System Equipment Inventory	2666	
Intershift Log for F.E.	2698	
Stop Reports for customers	1462	
RIN Record	2487	
PM Record	2557	
F.E. System Use Record	2592	
Daily Installation Reports	1565	2.12.13-1
Weekly Time Envelopes	2540	
Branch Mailing Envelopes		
F.E. Attention Reporting	14 & 18	
CARES code sheet		
Technical Problem Memorandum	2265	2.12.9-5
Library Binders	Part No. 1622 7167	

4. It should be determined if the customer supplies have arrived.

ONE MONTH BEFORE EQUIPMENT DELIVERY:

1. Site progress should be checked (include electrical and environmental aspects).
2. All non-standard cables should be checked to see if they are correct and complete.
3. The assembling of spares, tools, test equipment, and manuals should be started. (Assemble all items in the branch as received and, if possible, transport them to the computer site.)
4. Arrangements should be made to ensure that sufficient tools will be available to facilitate installation.

Site Preparation**TWO WEEKS BEFORE EQUIPMENT DELIVERY:**

1. The site preparation should be completed at least two weeks prior to the system arrival date to the following extent:
 - a. Lighting, floor ramps, painting, plastering, and decorating should be complete.
 - b. The entire area should be clean.
 - c. Power facilities should be tested and ready for connection to the system.
 - d. Arrangements should be completed for special equipment to handle the system units.

ONE WEEK BEFORE EQUIPMENT DELIVERY:

1. The Field Engineer should make a final check of all electrical power sources.
2. Spares, tools, and test equipment should be available and inventoried.
3. The system library should be complete.
4. Where possible, I/O cables should be routed before system delivery.
5. The office manager should prepare a copy of the installation information.

SYSTEM ARRIVAL

Refer to Section III for installation instructions to be followed when the system arrives.

Detailed System InformationSYSTEM CONFIGURATIONS

The configuration of a B 700-Series Computer System is determined by the customer application and capacity requirements. Detailed information is presented for the basic or minimum systems and complement of peripheral devices.

NOTE

The maximum configuration of peripheral units, controls, and options must be mutually agreed to by the customer and Burroughs Corporation in terms of customer requirements and equipment availability.

B 705/B 711 SYSTEM CONFIGURATION

The basic or minimum B 705/B 711 System consists of the following:

- a. B 705 (0.5 MHz) or B 711 (1.0 MHz) Central Processing Unit with a minimum main-memory capacity of 16 K-bytes.
- b. B 9343-1 or B 9343-3 Console (15-in. form-feed, 64/94 char.) or B 9343-2 or B 9343-4 Console (26-in. form feed, 64/94 char.) and Console Control.
- c. B 9480-12 or B 9481-12 Disk Cartridge Drive with two A 9985-2 Disk Cartridges.
- d. B 489-1 Disk Cartridge Drive Control.

The main-memory capacity for B 705 systems can be expanded to 40 K-bytes, while the B 711 Systems can be expanded to 48 K-bytes. Memory is expanded in 8 or 16 K-byte increments by use of B 11 memory modules. Up to eight I/O controls (IOC's/DDP's) can be installed to accommodate the basic system I/O complement and optional peripheral devices. One processor I/O location (port DDP8) is dedicated to the basic system console controls; seven interchangeable I/O locations can accommodate any combination of I/O controls (multiples of types, if desired).

Table II-1 lists the full complement of I/O devices and controls that are available for use in a B 705/B 711 System. Section IV contains complete details concerning optional features and equipment expansion capabilities.

B 721 SYSTEM CONFIGURATION

The basic or minimum B 721 System consists of the following:

- a. B 721 Central Processing Unit with minimum main-memory capacity of 32K-bytes, photo electric (paper tape) memory loader, and power supply group (Domestic unless specified).
- b. B 9343-22 Console (26 in. form-feed, 64 char.) or B 9343-42 Console (26 in. form-feed, 94 char.).
- c. B 346 (64-character) or B 346-1 (94 character) Console Control.
- d. B 9480-11/12 (single/dual drive, 100 TPI) or B 9481-11/12 (single/dual drive, 200 TPI) Disk Cartridge Drive.
- e. B 0489-2 Universal Cartridge Disk Drive (UCDD) Control (32 segment).

The main-memory capacity can be expanded to 96 K-bytes in 8 K-byte increments (total of 12 B 31-2 memory modules). Up to 11 I/O control ports (DDP's) are available in the processor to accommodate basic and optional peripheral devices or interfaces. Three of the processor IOC ports (DDP1, DDP4, and DDP12) are dedicated to basic system controls; three additional controls may be installed in interchangeable ports in the basic system. (DDP2 is reserved for future use.) Up to five additional controls may be installed by use of the optional I/O expansion module (B 312 I/O expansion feature), which provides five interchangeable DDP's.

Detailed System Information

Table II-2 lists the full complement of peripheral devices and I/O controls available for use in the B 721 System. Section IV contains complete details concerning optional features and equipment expansion capabilities.

B 771 SYSTEM CONFIGURATION

The basic or minimum non-disk B 771 System (Remote Job Entry, RJE, mode only) consists of the following:

- a. B 771/B 772 System and Communication Processor with minimum main memory capacity of 16K bytes (one B 11-2 memory module).
- b. B 9344 Supervisory Printer (SPO)
- c. B 044 SPO Control.
- d. B 9115/9116 Card Reader (80-column).
- e. B 115 Card Reader Control.
- f. B 351 Single-Line Control.

The main-memory capacity can be expanded to 48K bytes in 16 K-byte increments (total of three 16 K-byte B 11-2 modules). Up to eight I/O controls (IOC's/DDP's) can be installed in the processor to accommodate the basic system I/O complement and optional peripheral devices. Three of the processor IOC locations are dedicated to the basic system controls; the remaining five interchangeable IOC locations can be used for any combination of standard controls (multiples of types, if desired).

Table II-1 lists the full complement of peripheral devices and I/O controls available for use in a B 771 system. Section IV contains complete details concerning optional features and equipment and expansion capabilities.

B 772 SYSTEM CONFIGURATION

The basic or minimum disk-based B 772 system (RJE mode with local processing and local compiler) consists of the following:

- a. B 771/772 System and Communication Processor with a minimum memory capacity of 32 K-bytes (two B 11-2 memory modules).
- b. B 9344 Supervisory Printer (SPO)
- c. B 44 SPO Control.
- d. B 9480-11 (2.3 M-Bytes) or B 9480-12 (4.6 M-bytes) Disk Cartridge Drive.
- e. B 489-1 Disk Control.
- f. B 9115/9116 Card Reader (80-column).
- g. B 115 Card Reader Control.
- h. B 351 Single-Line Control.

The main-memory capacity can be expanded to 48 K-bytes in 16 K-byte increments (total of three B 11-2 memory modules). Up to eight I/O controls (IOC's/DDP's) may be installed in the processor to accommodate the basic system I/O complement and optional peripheral devices. Four of the processor IOC locations are dedicated to the basic system controls; the remaining four interchangeable IOC locations can be used for any combination of standard controls (multiples of types, if desired).

Table II-1 lists the full complement of peripheral devices and controls available for use in the B 772 System. Section IV contains complete details concerning optional features and equipment and expansion capabilities.

Detailed System Information

PERIPHERAL UNIT	ASSOCIATED I/O CONTROL		SYSTEM APPLICATION			
	MODEL	PART NO.	B705	B711	B771	B772
B9343-1/3 or B9343-2/4 Console	B43	—	X	X		
B9344 Supervisory Printer (SPO)	B44	1449 4884			X	X
A9114-1 Card Reader (80 col.)	B111	1448 0347	X	X		
A9119 Card Reader (96-col.)	B311	1448 0321	X	X		
A9115/9116 Card Reader	B115	1449 4876	X	X	X	X
A9122-1 Paper Tape Reader (PPT/EPC)	B121-1	1448 9181	X	X		
A9222-1 Paper Tape Punch (PPT/EPC)	B221-1	1449 0296	X	X		
A988 Line Printer	B245	1448 0404	X	X		
A/B9247-x Line Printer	B244	1448 0362	X	X	X	X
A/B9249-x Line Printer	B243	1448 0388	X	X	X	X
A9491-2 Magnetic Tape Unit	B391	1448 0420	X	X		
A/B9490-25 Magnetic Tape Cassette	B392	1448 8654	X	X	X	X
A9419-x Reader/Punch/Printer (96 col.)	B311	1448 0321	X	X		
B9418-2 Reader/Punch/Recorder	B311/ B418-2	1448 0321			X	X
A9480-12 or B9481-12 Disk Cartridge Drive	B489-1	1448 0313	X	X		X
Single-Line Data Communications Interface	B351 B351-1	1449 5709 2602 7425		X	X	X
A9481-xx Dual Disk Cartridge Drive	B489-1	1448 0313	X	X		X

TABLE II-1. B705/B711 AND B771/B772 PERIPHERAL UNIT
AND I/O CONTROL (IOC/DDP) COMPLEMENT

Detailed System Information

PERIPHERAL UNIT	ASSOCIATED MODEL	I/O CONTROL PART NO.
B9343-22 Console (26 in. FF, 64 character)	B346	2602 4836
B9343-42 Console (26 in. FF, 94 character)	B346-1	2602 5791
A9480-11/12 Disk Cartridge Drive	B489-2	2602 4844
A9481-11/12 Disk Cartridge Drive	B489-2	2602 4844
A9114-1 Card Reader (80 column)	B111	1448 0347
A9122-1 Paper Tape Reader (PPT/EPC)	B121-1	1448 9181
A9222-1 Paper Tape Punch (PPT/EPC)	B221-1	1449 0296
A9247-2 or A/B9247-12 Line Printer	B244 B244-1	1448 0362 2603 8737
A9249-1 Line Printer	B243	1448 0388
A9491-2 Magnetic Tape Unit	B391	1448 0420
A9490-21 or A/B9490-25 Magnetic Tape Cassette*	B392-1 B392	2603 6855 1448 8654
A9119-x or A9419-x 96-column Reader/Punch/Printer-Data Recorder	B311	1448 0321
A9135 Reader-Sorter**	B131	2601 6600
B9418-x 80-column Reader/Punch/Printer-Data Recorder	B311	1448 0321
Single-Line Data Communications Interface	B351-1	2602 7425
Multiline Data Communications Interface (4-Line)***	B352	2601 9810

* A9490-21 is optional cabinet-mounted unit. Installation kit 2602 4612 must be ordered when using this integral cassette.

** Requires B312 I/O expansion feature (2600 9464).

*** Installed as communications subsystems module; refer to Section IV.

TABLE II-2. B721 PERIPHERAL UNIT AND I/O CONTROL (IOC/DDP) COMPLEMENT

Detailed System InformationEQUIPMENT CHARACTERISTICS

The following data sheets describe the detailed characteristics of the B700-Series processing and peripheral units:

Data Sheet

1	B705/B711 and B771/B772 Central/Terminal Processing Units
2	B721 Central Processing Unit
3	B9343-x Console
4	B9344 Supervisory Printer (SPO)
5	A9480-11/12 and A9481-11/12 Disk Cartridge Drives
6	A988 Line Printer
7	A9247-x Line Printer
8	A9249-x Line Printer
9	A9114-1 Card Reader (80-column)
10	A9119-1 Card Reader (96-column)
11	B9115/B9116 Card Reader (80-column)
12	A9490-21 and A9490-25 Magnetic Tape Cassette
13	A9491-2 Magnetic Tape Unit
14	B9418-x Card Reader/Punch/Printer -- Data Recorder (80-column)
15	A9419-2 Card Reader/Punch/Data Recorder (96-column)
16	A9122-1 Punched Paper Tape (PPT/EPC) Reader
17	A9222-1 Punched Paper Tape (PPT/EPC) Punch
18	A9135-x Reader-Sorter

NOTE

In the following data sheets, "DOM" indicates domestic applications (United States and Canada) and "INT" indicates international (all other countries) applications. Metric equivalent specifications are given, where applicable.

Detailed System Information**CONVERSION DATA**

Metric equivalent measurements are given for specifications in the equipment data sheets and other reference data in this manual. The following is a list of applicable metric conversion formulae and conversions for the measurements most commonly used.

Dimensions:

1 inch (in.) = 2.54 Centimeters (cm)

6 in. = 15.5 cm

12 in. = 30.4 cm

24 in. = 61 cm

36 in. = 91.5 cm

42 in. = 107 cm

44 in. = 112 cm

1 foot (ft.) = 30.48 Centimeters (cm)

2 ft. = 61 cm

3 ft. = 91.5 cm

3.5 ft. = 107 cm

5 ft. = 152.4 cm

Weights:

1 pound (lb.) = 0.453 kilograms (kg)

50 lb. = 22.6 kg

100 lb. = 45.3 kg

150 lb. = 68 kg

250 lb. = 113 kg

600 lb. = 272 kg

Environmental:

Degrees (°) Centigrade (C) = Degrees (°) Farenheit (F) minus 32° x5/9

35° F = 1.67° C

50° F = 10° C

60° F = 15.5° C

72° F = 22.2° C

80° F = 25.5° C

100° F = 37.8° C

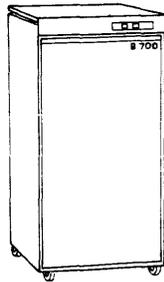
105° F = 40.55° C

120° F = 48.8° C

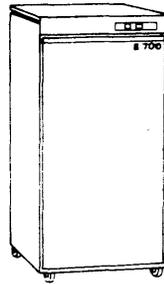
1 Cubic Foot per Centimeter (CFM) = 472 CUCM/SEC

Detailed System Information

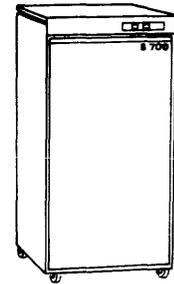
DATA SHEET 1 – B705/B711 and B771/B772 PROCESSOR UNITS



slows through hardware
B705 CENTRAL PROCESSOR
 32 TO 40KB



L console
B711 CENTRAL PROCESSOR
 32 TO 48KB

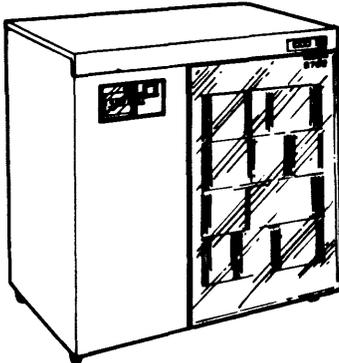


SFC console
B771/B772 SYSTEMS AND COMMUNICATIONS PROCESSOR
 16 OR 32KB TO 48KB

Dimensions:	Width	22 in. (56 cm.)
	Depth	30 in. (76 cm.)
	Height	44 in. (112 cm.)
Weight:	DOM	450 lb. (203 kg.)
	INT	475 lb. (215 kg.)
Clearances:	Front	24 in. (61 cm.)
	Rear	12 in. (30.4 cm.)
	Sides	None
Service Access:	Front, rear, sides	24 in. (61 cm.)
Power and Heat:	Frequency	60 Hz (DOM) or 50 Hz (INT), ± 1%
	Voltage	120/208 or 120/240 VAC, +5, -10% (DOM) 100 to 240 VAC, +5, -10% (INT)
	Phase	Single-phase, 3-wire (DOM) Single-phase, 2-wire (INT)
	KVA	5.4 max. (DOM), 6.0 max. (INT)
	Power	4900 max. (DOM), 5500 max. (INT)
	Circuit breakers	30 amps. each line (L1 and L2)
	Power Cord	15 ft., 3-wire plus ground (DOM) 15 ft., 2-wire plus ground (INT)
	Power plug	50 amp., 9452 Hubbell (DOM) Per local requirements for INT
	Power receptacle	50 amp., 9450 Hubbell (DOM) Per local requirements for INT
	BTU/HR	5720 max. at 60 Hz (DOM) 6230 max. at 50 Hz (INT)
	Air Flow	100 CFM
Operating Environment:	Temperature	60° to 100°F (15.5° to 37.8°C)
	Relative Humidity	10% to 80% without condensation
	Barometric pressure	9.8 to 15.7 lbs./sq. in. (20 to 32 in. mercury)

Detailed System Information

DATA SHEET 2 – B721 PROCESSOR UNIT

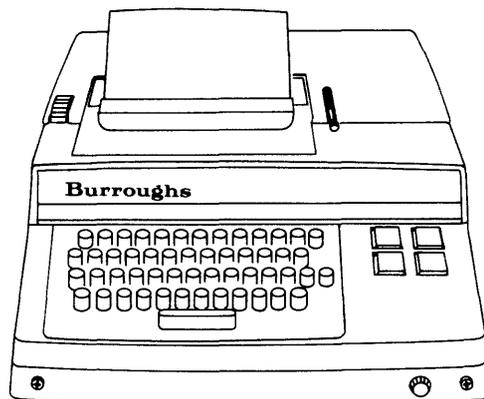


B721 CENTRAL PROCESSOR
 96 K-BYTE MAIN MEMORY
 1-MHz RATE
 UP TO 12 I/O PORTS
 INTEGRAL MEMORY LOADER

Dimensions:	Width	45 in. (114 cm.)	
	Depth	30 in. (76 cm.)	
	Height	44 in. (112 cm.)	
Weight:	DOM	490 to 540 lb. (222 to 239 kg.)	
	INT	515 to 565 lb. (238 to 258 kg.)	
Clearances:	Front	24 in. (61 cm.)	
	Rear	12 in. (30.4 cm.)	
	Sides	None	
Service Access:	Front, rear	30 in. (71 cm.)	
	Sides	24 in. (61 cm.)	
Power and Heat:	Frequency	60 Hz (DOM) or 50 Hz (INT), $\pm 1\%$	
	Voltage	120/208 or 120/240 VAC, +5, -10% (DOM) 100 to 240 VAC, +5, -10% (INT)	
	Phase	Single-phase, 3-wire (DOM) Single-phase, 2-wire (INT)	
	KVA	5.4 max. (DOM), 6.0 max. (INT)	
	Power	4900 max. (DOM), 5500 max. (INT)	
	Circuit breakers	30 amps. each line (L1 and L2)	
	Power Cord	15 ft., 3-wire plus ground (DOM) 15 ft., 2-wire plus ground (INT)	
	Power plug	50 amp., 9452 Hubbell (DOM) Per local requirements for INT	
	Power receptacle	50 amp., 9450 Hubbell (DOM) Per local requirements for INT	
	BTU/HR	5720 max. at 60 Hz (DOM) 6320 max. at 50 Hz (INT)	
	Air Flow	100 CFM	
	Operating Environment:	Temperature	60° to 100°F (15.5° to 37.8°C)
		Relative Humidity	10% to 80% without condensation
Barometric pressure		9.8 to 15.7 lbs./sq. in. (20 to 32 in. mercury)	

Detailed System Information

DATA SHEET 4 – B 9344 SUPERVISORY PRINTER (SPO)



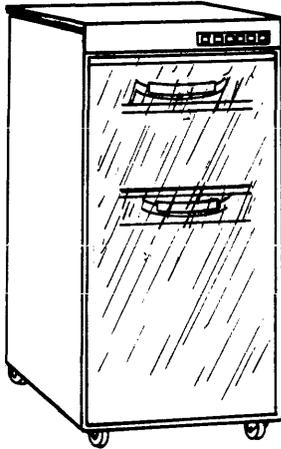
B 9344
OPERATOR PRTR/KEYBD
CONSOLE

Dimensions:	Width	18.5 in. (47 cm.)
	Depth	19 in. (48.2 cm.)
	Height	9 in. (23 cm.)
Weight:		55 lb. (24.95 kg.)
Clearances:	Front	36 in. (91 cm.)
	Rear	6 in. (15.5 cm.)
	Left/right side	3 in. (7.6 cm.)
Power and Heat:	Frequency	60/50 Hz, \pm 1%
	Voltage	120 VAC (DOM) 100 to 240 VAC (INT)
	KVA	0.6
	Line current	5.0 amps. @ 120V
	Power cord	2-wire plus ground, 15 amps
	Power plug	Hubbell 5264
	BTU/HR	800 (201 kg. CAL/hr.)
Operating Environment:	Temperature	35° to 120°F (1.67° to 48.8°C)
	Relative Humidity	5 to 95%

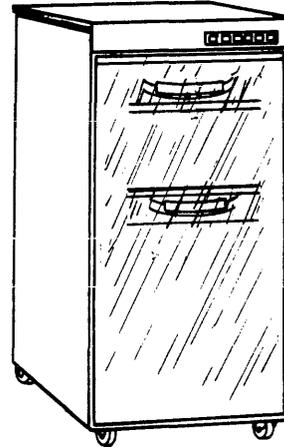
Detailed System Information

-22 disk

DATA SHEET 5 – A9480-11/12 AND A9481-11/12 DISK CARTRIDGE DRIVES



A 9481-11/12
SINGLE/DUAL DRIVE
9.2 MB CAPACITY
1.55 MB/SEC.RATE



A 9480-11/12
SINGLE/DUAL DRIVE
4.6 MB CAPACITY
1.55 MB/SEC. RATE

Dimensions:	Width	22 in. (56 cm.)
	Depth	30 in. (76 cm.)
	Height	44 in. (112 cm.)
Weight:		357 lb. (162 kg.)
Clearances:	Front and rear	3 ft. (91.5 cm.)
Power and Heat:	Frequency	60 Hz (DOM), 50 Hz (INT)
	Voltages	VAC +5, -10% (DOM)
		100 to 240 VAC +5, -10% (INT)
	KVA	0.6
	Watts	500
	Line current	5.0 amps @ 120V
	Power cord	2-wire plus ground, 15 amps
	Power plug	Hubbell 5264
	Power receptacle	Hubbell 5261 or equiv.
BTU/HR	2046	
Air flow	230 CFM	
Operating Environment:	Temperature	50° to 100°F (10° to 37.8°C)
	Relative humidity	10 to 85%

Detailed System Information

DATA SHEET 6 – A 988 LINE PRINTER



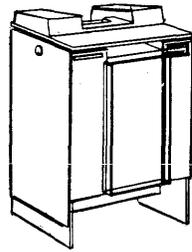
Porter

A 988
120 PRINT POSITIONS
164 LPM

Dimensions:	Width	44 in. (114 cm.)
	Depth	30 in. (80 cm.)
	Height	48 in. (122 cm.)
Weight:		540 lb. (240 kg.)
Clearances:	Front, rear, and sides	3 ft. (91.5 cm.)
Power and Heat:	Frequency	60 Hz/50 Hz
	Voltages	120 VAC (DOM) 100 to 240 VAC (INT)
	KVA	2
	Watts	2000
	Line Current	14.7 amps @ 120V
	Main CB	25 amps
	Power cord	2-Wire ground, 30 amps
	Power plug	Hubbell 3331 (DOM) or supplied with DDP (INT)
	Power receptacle	Hubbell 3330 or equivalent
	BTU/HR	7000
	Air flow	250 CFM
Operating Environment:	Temperature	60° to 105°F (15.5° to 40.55° C)
	Relative humidity	10% to 90%

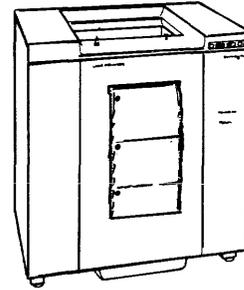
Detailed System Information

DATA SHEET 7 – A 9247-X LINE PRINTER



old

A 9247-2
120 OR 132 PRINT POSITIONS
400 LPM/48 CHAR. SET
OPTIONAL CHARACTER SETS



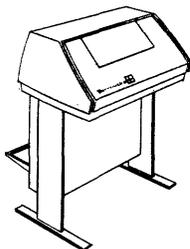
New

A 9247-12
120 OR 132 PRINT POSITIONS
400 LPM/48 CHAR. SETS
OPTIONAL CHARACTER SETS

Dimensions:	Width	42 in. (107 cm.)
	Depth	28 in. (71.5 cm.)
	Height	44 in. (112 cm.)
Weight:		600 lb. (272 kg.)
Clearances:	Front, rear, and sides.....	36 in. (91.5 cm.)
Power and Heat:	Frequency	60Hz. (DOM), 50Hz. (INT)
	Voltages	120 VAC (DOM) 100 to 240 VAC (INT)
	KVA	2.7
	Watts	1775
	Line Current	14.7 amps. @ 120V
	Circuit breaker	20 amps.
	Power Cord	2-wire plus ground, 20 amps.
	Power plug	Hubbell 5366
	Power receptacle	Hubbell 5374 or equivalent
	BTU/HR	7378
	Air flow	150 CFM
Operating Environment:	Temperature	60° to 100°F (15.5° to 37.8°C)
	Relative humidity	10 to 90%

Detailed System Information

DATA SHEET 8 – A 9249-X LINE PRINTER

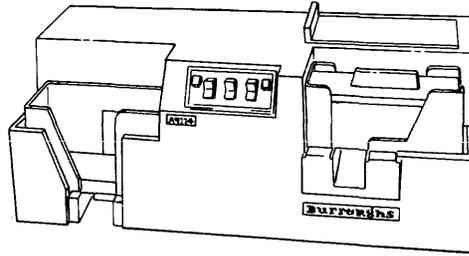


A 9249-1/2/3
 132 PRINT POSITIONS
 90 LPM/180 LPM
 48/64 CHAR. SET

Dimensions:	Width	30 in. (76.2 cm.)
	Depth	24.5 in. (62.3 cm.)
	Height	40.5 in. (103 cm.)
Weight:		150 lb. (68 kg.)
Clearances:	Front, rear, and sides.....	36 in. (91.5 cm.)
Power and Heat:	Frequency	60 Hz (DOM), 50 Hz (INT)
	Voltage	120 VAC ± 10% (DOM)
		100 to 240 VAC ± 10% (INT)
	KVA	0.4
	Watts	480
	Line current	4.0 amps @ 120V
	Power cord	2-wire plus ground, 15 amps.
	Power plug	Hubbell 5264
	Power receptacle	Hubbell 5261 or equivalent
Operating Environment:	Temperature	40° to 120°F (4.44° to 49.0°C)
	Relative humidity	0 to 95%

Detailed System Information

DATA SHEET 9 – A 9114-1 80-COLUMN CARD READER



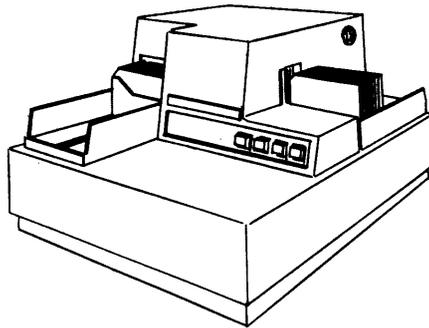
A 9114-1
80-COLUMN CARDS
200 CPM
350 – CARD HOPPER
AND STACKER CAPACITY

*200 CPM
about 150*

Dimensions:	Width	25 in. (62 cm.)
	Depth	11 in. (27 cm.)
	Height	10 in. (25.4 cm.)
Weight:		45 lb. (20.4 kg.)
Clearances:	Front	0 in.
	Rear	6 in. (15.5 cm.)
	Left Side	6 in. (15.5 cm.)
	Right Side	6 in. (15.5 cm.)
Power and Heat:	Power supplied from processor through I/O cable	
	BTU/HR	330
Operating Environment:	Temperature	60° to 105°F (15.5° to 40.55°C)
	Relative humidity	30 to 65%

Detailed System Information

DATA SHEET 10 – A 9119-1 96-COLUMN CARD READER

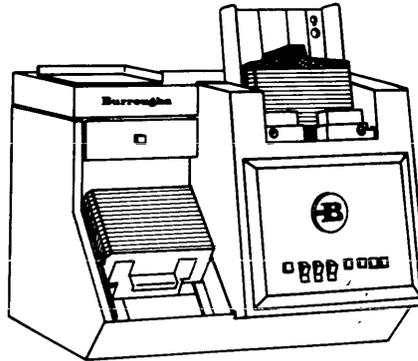


A 9119-1
96-COLUMN CARDS
300 CPM
600-CARD INPUT HOPPER
AND OUTPUT STACKER

Dimensions:	Width	14 in. (35.5 cm.)
	Depth	15 in. (38.1 cm.)
	Height	11 in. (28.9 cm.)
Weight:		36 lb. (16.3 kg.)
Clearances:	Front	36 in. (91.5 cm.)
	Rear	8 in. (20.3 cm.)
	Sides	None
Power and Heat:	Frequency	60 Hz
	Voltages	120 VAC (DOM)
	Power	200 watts
	Line current	6 amps. @ 120V
	Power cord	2-wire plus ground, 15 amps
	Power plug	Hubbell 5264
	Power receptacle	Hubbell 5251 or equivalent
	BTU/HR	300

Detailed System Information

DATA SHEET 11 – B 9115 AND B 9116 80-COLUMN CARD READERS



B 9115
300 CPM
1000-CARD
CAPACITY

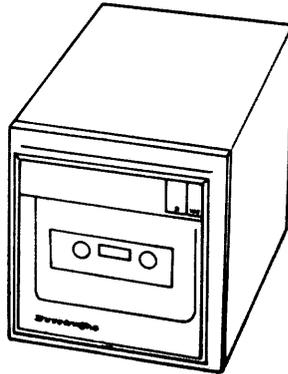
B 9116
600 CPM
1000-CARD
CAPACITY

*B9117
700 cpm*

Dimensions:	Width	22 in. (60 cm.)
	Depth	19.5 in. (50 cm.)
	Height	22 in. (60 cm.) max.
Weight:		105 lb. (48 kg.)
Clearances:	Front	36 in. (91.5 cm.)
	Rear	36 in. (91.5 cm.)
	Sides	6 in. (15 cm.)
Power and Heat:	Frequency	60 Hz (DOM), 50 Hz (INT)
	Voltage	120 VAC (DOM), 220/240 VAC (INT)
	Watts	240
	Line current	2.4 amps @ 120V
	Power cord	2-wire plus ground, 15 amps
	Power plug	Hubbell 5264
	Power receptacle	Hubbell 5251 or equivalent
	BTU/HR	820 (206 kg-CAL/HR)
	Air flow	100 CFM

Detailed System Information

DATA SHEET 12 – A 9490-21 AND A 9490-25 MAGNETIC TAPE CASSETTES

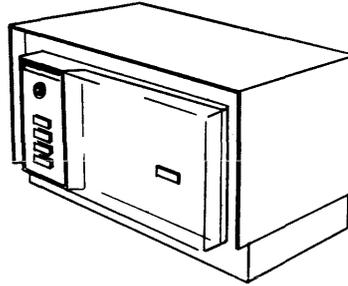


A 9490-21/25
 INPUT/OUTPUT DRIVE
 280 FT RECORD CAPACITY
 DUAL-TRACK
 NRZ-1 ENCODED/800 BPI
 10/30 IPS

Dimensions:	Width	5 in. (12.7 cm.)
	Depth	9 in. (22.8 cm.)
	Height	4-5/8 in. (12.5 cm.)
Weight:		5.1 lb. (2.3 kg.)
Clearances:	Front	24 in. (61 cm.)
	Rear and sides	0
Power and Heat:		Power supplied from processor through I/O cable
Operating Environment:	Temperature	60° to 122°F (4.44° to 51°C) (15° to 38° C)
	Relative humidity	20% to 80%
Tape-storage environment:	Temperature	40° to 122°F (4.44° to 51° C)
	Relative humidity	20% to 80%

Detailed System Information

DATA SHEET 13 – A 9491-2 MAGNETIC TAPE UNIT

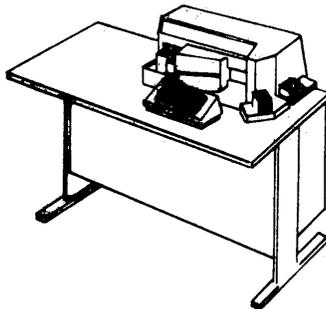


A 9491-2
 9-CHANNEL TAPE
 10 KB
 12.5 IPS READ/WRITE
 50 IPS REWIND SPEED
 800 BPI

Dimensions:	Width	21.25 in. (54 cm.)
	Depth	10.5 in. (27 cm.)
	Height	11.75 in. (30 cm.)
Weight:		30 lb. (13.6 kg.)
Clearances:	Front	32 in. (81.5 cm.)
	Rear	6 in. (15.5 cm.)
	Sides	None
	(Unit can be removed from chassis to facilitate maintenance.)	
Power and Heat:	Frequency	60 Hz (DOM), 50 Hz (INT)
	Voltage	120/240 VAC single-phase
	KVA	0.1 max.
	Watts	96
	Current	0.8 amp.
	Power cord	2-wire plus ground, 15 amps
	Power plug	Hubbell 5264
	BTU	410 (100 kg. CAL/HR)
	Air Flow	35 CFM (1 cubic MET/MIN)
Operating Environment:		
	UNIT	(CLASS B)
	Temperature	40 ° to 100° F (4° to 38° C)
	Humidity	10 to 90%
	Barometric pressure	Sea Level to 8,000 ft.
	MEDIA	(CLASS C)
	<u>Magnetic Tape Storage</u>	
	Temperature	65° to 80° (18.3° to 26.75° C)
	Relative humidity	40 to 60%
	Barometric pressure	Sea level to 8,000 ft.

Detailed System Information

DATA SHEET 14 – B 9418-2 CARD READER/PUNCH/PRINTER-DATA RECORDER (80-COL.)

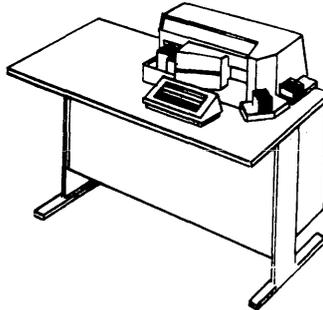


B 9418-2
 200/45/45 CPM
 80-COLUMN CARDS
 600-CARD INPUT HOPPER
 400-CARD STACKER

Dimensions:	Width	42 in. (106.5 cm.)
	Depth	27 in. (68.5 cm.)
	Height	35 in. (89 cm.)
Weight:	250 lb. (113 kg.)	
Clearances:	Front	12 in. (30.4 cm.)
	Rear	12 in. (30.4 cm.)
	Sides	8 in. (20.3 cm.)
Power and Heat:	Frequency	60 Hz (DOM)
	Voltage	120 VAC (DOM)
	KVA	5.0
	Line current	4.6 amps @ 120V
	Power cord	3-wire plus ground, 15 amps
	Power plug	Hubbell 5264
	BTU/HR	1200
Operating Environment:	Temperature	50° to 110°F (4.44° to 43°C)
	Relative humidity	15 to 95%

Detailed System Information

DATA SHEET 15 — A 9419-2 CARD READER/PUNCH/DATA RECORDER (96-COL.)

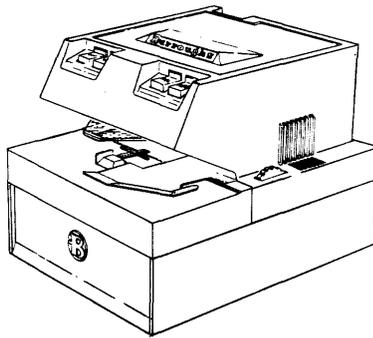


A 9419-2
 96-COLUMN CARDS
 300/60/60 CPM
 64 CHAR.
 600-CARD INPUT HOPPER
 400-CARD OUTPUT STACKERS

Dimensions:	Width	42 in. (107 cm.)
	Depth	27 in. (69 cm.)
	Height	35 in. (89 cm.)
Weight:	250 lb. (113 kg.)	
Clearances:	Front	36 in. (91.5 cm.)
	Rear	36 in. (91.5 cm.)
	Left Side	None
	Right Side	None
Power and Heat:	Frequency	60 Hz (DOM), 50 Hz (INT)
	Voltage	120 VAC (DOM)
		100 to 240 VAC (INT)
	KVA	0.33
	Watts	275
	Line current	2.7 amps. @ 120V
	Main CB	8 amps
	Power cord	2-wire plus ground, 15 amps
	Power plug	Pass & Seymour 5874
	Power receptacle	Standard 2-wire plus ground (5871)
	BTU/HR	935 max. (DOM)
1200 max. (INT)		
Operating Environment:	Temperature	50° to 110°F (4.44° to 43°C)
	Relative humidity	15 to 95%

Detailed System Information

DATA SHEET 16 – A 9122-1 PAPER TAPE AND PUNCHED CARD READER

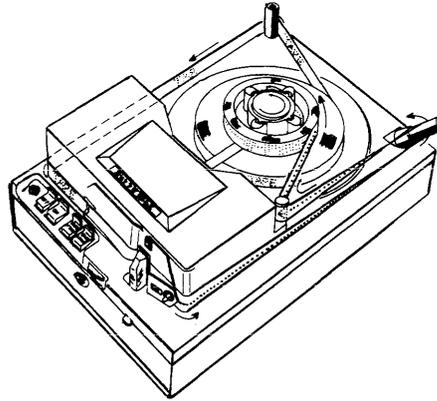


A 9122-1
 PUNCHED PAPER TAPE
 EDGE-PUNCHED CARDS
 5, 6, 7, OR 8 CH. CODE
 40 CPS

Dimensions:	Width	11 in. (28 cm.)
	Depth	9¼ in. (23.2 cm.)
	Height	7 in. (17.8 cm.)
Weight:	15 lb. (6.8 kg.)	
Clearances:	Front	24 in. (61 cm.)
	Rear	6 in. (15.2 cm.)
	Left Side	6 in. (15.2 cm.)
	Right Side	6 in. (15.2 cm.)
Power and Heat:	Power supplied by processor through I/O cable.	
	BTU/HR	372
Operating Environment:	Temperature	50° to 150°F (10° to 40.5°C)
	Relative humidity	5 to 95%

Detailed System Information

DATA SHEET 17 – A 9222-1 PPT/EPC PUNCH

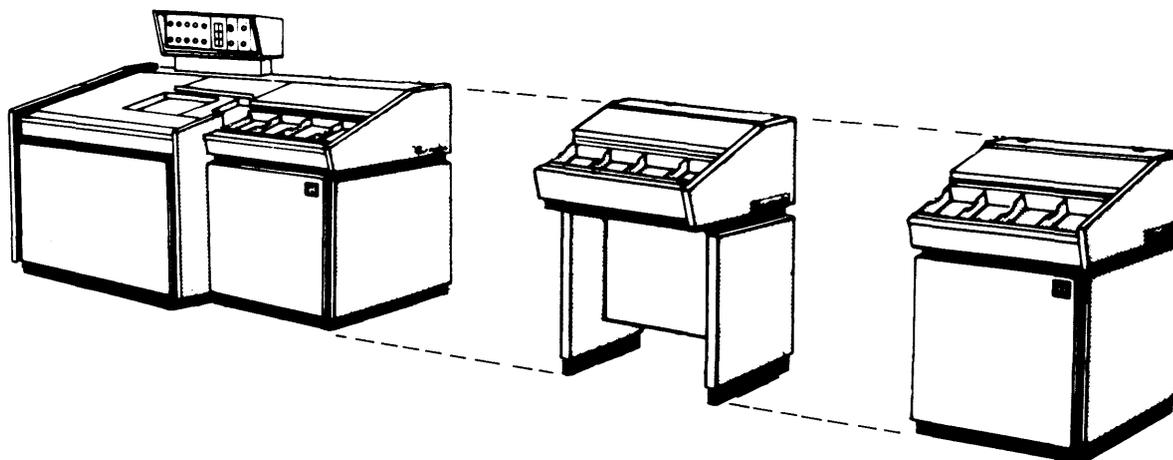


A 9222-1
PAPER TAPE
PUNCH
40 CPS

Dimensions:	Width	11-5/8 in. (29.3 cm.)
	Depth	15-1/4 in. (38.7 cm.)
	Height	6 in. (15.5 cm.)
Weight:	21 lb. (9.5 kg.)	
Clearances:	Front	24 in. (61 cm.)
	Rear	6 in. (15.2 cm.)
	Left Side	6 in. (15.2 cm.)
	Right Side	6 in. (15.2 cm.)
Power and Heat:	Power supplied by processor through I/O cable.	
	BTU/HR	276
Operating Environment:	Temperature	50° to 105° F (10° to 40.5° C)
	Relative humidity	5 to 95%

Detailed System Information

DATA SHEET 18 – A 9135-X READER-SORTER

only used on B721

A 9135-X
 MAGNETIC-INK OR OPTICAL CHAR. RECOGNITION (MICR/OCR); UP TO
 16 POCKETS IN 4-POCKET INCREMENTS; 900 DOCUMENTS PER MINUTE;
 17.5-INCH HOPPER CAPACITY; 3.5-INCH STACKERS

Dimensions:	Width	108.5 in. (274 cm.), 8-Pocket 138.5 in. (350 cm.), 12-Pocket
	Depth	36.25 in. (92 cm.)
	Height	54.25 in. (137 cm.)
Weight:	1350 lb. (616 kg.), 8-Pocket	
	1500 lb. (681 kg.), 12-Pocket	
Clearances:	Front, rear, and sides	36 in (91.5 cm.)
Power and Heat:	Frequency	50 or 60 Hz (optional)
	Voltage	208/230 VAC, single-phase
	KVA	6.9 max.
	BTU/HR	15360
	Air Flow	600 CFM
	Main CB	40 amps
	Power cord	Three-wire plus ground, 45 amps
	Power plug	Hubbell 3765
Operating Environment:	Temperature	60 to 105° F (15.5° to 40.55° C)
	Relative Humidity	30 to 65%

Installation GuideGENERAL INSTALLATION PROCEDURE

This section provides instructions and reference data to guide personnel in the overall system installation process, starting with equipment unpacking and ending with a successful operational checkout. The instructions and data in this section must be used in conjunction with the installation instructions and data given in each applicable Field Engineering Technical Manual (FETM) to ensure that all details are covered for all units and I/O controls.

The sequence of installation tasks to be performed is as follows:

1. Uncrate/unpack and position all major equipment assemblies, subassemblies/kits, and accessories.
2. Perform equipment inspections and checks and complete all required forms or reports.
3. Install all I/O control (IOC or DDP) cards and/or options/kits that are not already installed in the processor cabinet when shipped.
4. Install all I/O interface (signal) and adapter cables between processor and peripherals.
5. With primary power turned off, install or connect all power cables, extensions, or plugs, as required for the processor and each peripheral.
6. Turn on and check out processor power.
7. Turn on and check out power to each peripheral.
8. Perform operational checkout of each unit and system by use of Maintenance Test Routines (MTR'S).
9. Perform any operational check for system/customer application programs and complete final installation paperwork; then turn over system to customer.

NOTE

The above procedure is the general approach recommended to complete an entire B700 system installation system in a parallel manner. Depending on the time available and prevailing conditions, installation personnel can deviate from this approach by installing and checking each functional or peripheral unit in a serial manner.

The procedures and reference data for items 1, 2, 5, 7, and 9 are common to all B700 systems and are presented under respective headings in this section. Detailed information applicable to items 3, 4, 6, and 8 are presented in subsections for the B705/B711, B771/B772, and B721 systems, respectively.

Most of the installation tasks, especially those involving site-to-branch notifications, forms, and equipment access must be performed by field engineers.

UNCRATING AND UNPACKING

As stated in Section I, a Rol-O-Lift should be available to lift and position equipment. The procedure for uncrating each major unit is as follows:

1. Move loaded pallet to a level area.
2. Remove Avis strap that holds corrugated cover to pallet base, and remove top lid. (Avis strap may be cut with diagonal cutters or a knife.)
3. Lift corrugated cover from cabinet.
4. Lift equipment off pallet and position it in desired location. (Refer to Section I.)

Installation Guide**NOTE**

If the system is being temporarily installed at the branch site for "burn-in", all crating and packing material should be retained for repacking and shipment to the customer site.

5. Check for any damage to exterior of cabinet.
6. Unpack all accessory boxes.

When each unit and accessory box is unpacked, all cables and accessories should be assembled in one location for inspection and installation access. All supplied system documentation such as technical manuals and Field Test and Reference (FT&R) documentation should be placed next to their intended storage locations.

PREINSTALLATION INSPECTIONS AND CHECKS

After the equipment and all accessories are uncrated/unpacked, perform the following inspection/checkout procedure before attempting to complete the installation or turn on power.

1. Remove cabinet panels and check for any internal damage. Notify Branch Field Engineering Manager if any exterior or interior damage is discovered.
2. Verify that the capacity/speed of each unit matches that of the model listed on the Installation Register (Form 2406). If the capacity/speed of a unit shipped does not match that of the model shown on the Installation Register, the Field Engineer must immediately contact the Branch Field Engineering Manager, who will determine the cause of the discrepancy and decide what action should be taken.
3. Enter serial numbers and arrival date(s) on Installation Register and return original copy to branch office immediately. Two copies must be retained until the installation date can be completed.

NOTE

Standard installation time commences on the day after arrival of the equipment at the customer's site, as evidenced by signed receipt of the shipper. Such arrival date is to be inserted by the Field Engineer on the Installation Register. Standard installation times are given later in this section under the SYSTEM TURNOVER heading.

4. Complete Installation Report (Form 1565) for each day Field Engineering efforts are expended at the site, from the date of arrival of the equipment through the day that the Installation Register (Form 2406) is completed and signed by the Branch Manager.
5. Use the packing list and unit travel logs to verify that all listed items have arrived at the site.
6. Check for loose cables or cards in the cabinets. Refer to card and cable location details in this section and applicable FETM'S.
7. Check processor cabinet interior for the following:
 - a. Incorrect or loose harness connections. (See cabling diagrams.)
 - b. Improperly installed fuses. (Refer to labelled ratings.)
 - c. Loose I.C.'s, bent I.C. pins, and defective soldering on printed-circuit cards.

Installation GuideINSTALLATION OF I/O CONTROLS AND CABLES

After the basic installation operations and checks are completed and the I/O service priorities have been established (Section IV), install all I/O controls (IOC's or DDP's) and cables provided for the system. Make certain that frontplane connectors are installed as required.

NOTE

To aid in fault isolation where IOC/DDP-related malfunctions occur, it is desirable to install and check out one IOC/DDP at a time when sufficient time is available.

Refer to the corresponding subsection for details concerning I/O controls and cables in each of the B700 systems. For identification purposes, cards that comprise the various B700 I/O controls are assigned designations consisting of a two or three-letter prefix followed by a number. For example, the four-cards comprising the B111 Card Reader Control are designated CR-1, CR-2, CR-3, and CR-4. Table III-1 is a complete list of I/O control card designators for the B700 systems.

CONTROL	CARD IDENTIFIERS	
	PREFIX	TYPES
B 43 Console Control	CC-	0 through 9
B 346 Console Control	CC-	0, 1E, 2E, 3E, 4, 5E, 6E, 7E, 8E, 9, and 11E
B 346-1 Console Control	CC-	0, 1E, 2E, 3E, 4, 5E, 6EK, 7EK, 8E, 9, and 11E
B 44 SPO Control	SPO-	1, 2, and 4
B 111 Card Reader Control	CR-	1, 2, 3, and 4
B 115 Card Reader Control	CRT-	1, 2, 3, and 4
B 121-1 Paper Tape Reader Control	TPR-	1 and 2
B 221-1 Paper Tape Punch Control	TPP-	1, 2, 3, and 4
B 243 Line Printer Control	PO-	1, 2, and 3
B 244 or B 244-1 Line Printer Control	PT-	1, 2, 3, and 4
B 245 Line Printer Control	PP-	2, 3, and 4
B 311/B 418-2 Card Reader Control	RC-	1, 2, 3, and 4
B 351 or B 351-1 Single-Line Control	LC-	1, 2, 3, 4, 5, 6, 7 and 8
B 391 Magnetic Tape Unit Control	TM-	1, 2, 3, and 4
B 392 Magnetic Tape Cassette Control	TC-	1, 2, 3, and 4
B 489-1 Disk Cartridge Drive Control	DC-	1, 2, 3, and 4
B 131 Reader-Sorter Control	SR-	1, 2, 3, and 4

TABLE III-1. B 700 I/O CONTROL (IOC/DDP) CARD IDENTIFIERS

Installation GuidePERIPHERAL UNIT POWER TURNON AND CHECKOUT

Perform the following procedure to check out the power turnon operation of each peripheral device that is supplied power by a separate power cable:

1. Plug peripheral unit power cable into an isolated AC power (service) outlet having appropriate receptacle. (Refer to Table I-3.)
2. Turn on peripheral unit power and check that unit powers up properly. Refer to corresponding F.E.T.M. if power operation is abnormal.
3. If power operation is normal, turn off unit power and plug power cord into processor convenience outlet or separate branch outlet, as required. (Refer to power subsection in Section I.)
4. Repeat peripheral unit power turnon and checkout.

NOTE

For those peripherals which obtain AC/DC power through I/O interface cables, power turnon and operation can only be checked after the correct I/O cables have been installed. Check that power wiring is correct for these units before proceeding with the turnon checkout.

5. Turn off power at each peripheral and proceed with system checks.

SYSTEM TURNOVER

After all unit and system checks have been performed without resultant errors, the field engineer should request the system technical representative to run the applicable system software. When all system software executes without errors, the installation is considered complete.

The installation task is terminated by the field engineer when he enters all installation data in the installation data register. The field engineer must sign the installation register and return both copies to the branch office for further processing. The process is completed when both the branch manager and field engineering manager sign the installation register for final distribution. (One copy of the signed installation register must be immediately sent to Marketing Accounting, Equipment Order Acceptance.)

B705/B711 INSTALLATION DETAILS**B705/B711 PROCESSOR LAYOUT**

Figure III-1 shows the layout and major features of a B705/B711 Processor cabinet. Refer to Section II for a complete list of processor specifications.

B705/B711 PROCESSOR CARD AND CABLE CONNECTOR LOCATIONS

Figure III-2 shows the layout of the B705/B711 Processor logic rack and identifies the standard cards installed in the various dedicated locations. Cable connector locations are shown at the bottom of Figure III-2 and in Figure III-3, which identifies the function and/or cable used for each signal and power connector.

B705/B711 I/O CONTROL (IOC/DDP) LOCATIONS

The B705/B711 Processor can accommodate up to eight I/O controls (IOC's or DDP's) in I/O control card areas (ports) identified DDP1 through DDP8. Port DDP8 is a 12-card area dedicated to the control for the B9343 console, while DDP1 through DDP7 each are four-card interchangeable (common) ports that can accommodate any of the standard I/O controls applicable to B705/B711 systems.

Figure III-2 identifies the card location and part number for each of the console control cards (CC0 through CC9). Connector blocks PAJ89 and PAJ90 are used for the console I/O control port (DDP8).

Installation Guide

The card locations for the interchangeable I/O control ports are also shown in Figure III-2. Table III-2 lists each of the I/O ports and identifies the card type (function)-to-backplane location allocation. The corresponding I/O connector block also is listed for each port. (Refer to Table III-1 for a complete list of I/O control card types.)

An example of an interchangeable I/O control installation is the installation of the B111 Card Reader Control in port DDP1. For this application, card types CR-1, CR-2, CR-3, and CR-4 are installed in card (port) locations FW6, FW3, FW0, and FV7, respectively, and connector block PAJ97 is used for the Card Reader I/O interface. Refer to Section IV for complete details concerning I/O control-to-port/priority allocation.

An adapter panel, located near the cable entrance at the bottom of the processor, is provided to accommodate adapter cable-to-I/O cable interconnections. (See Figure III-3.)

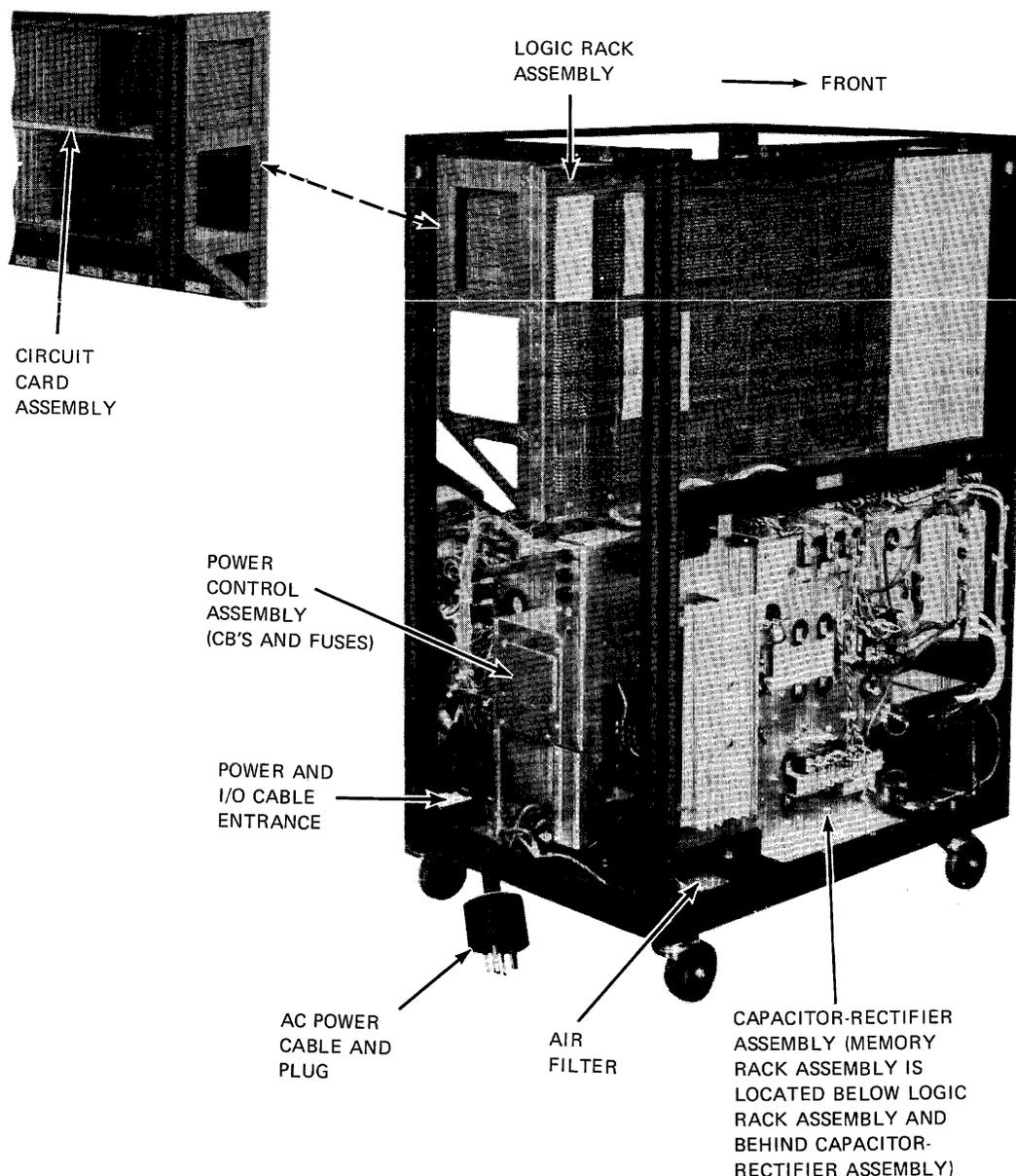
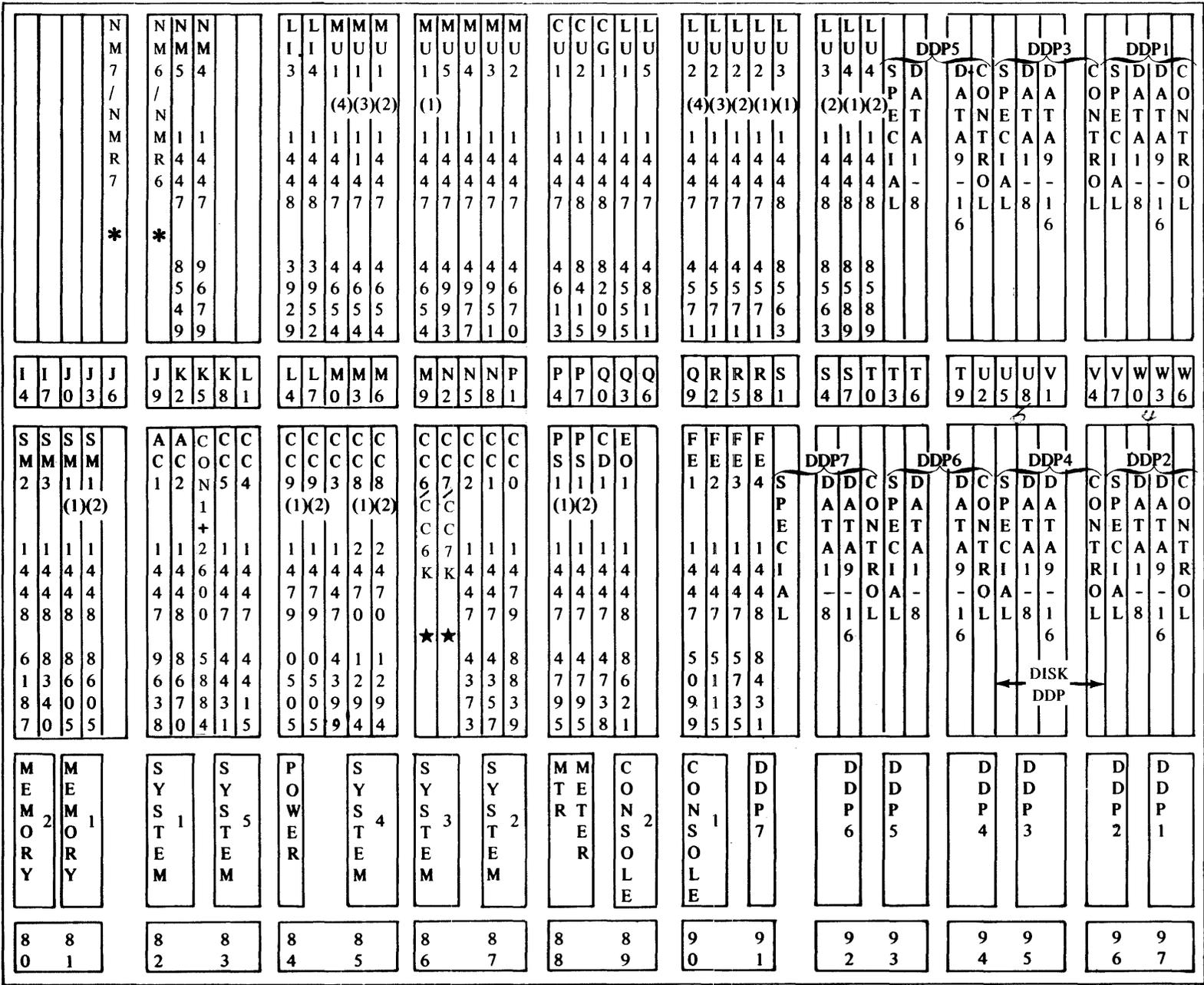


Figure III-1. B 705/711 AND B 771/772 PROCESSOR CABINET LAYOUT



* B711/705 OPTION
 ★ 64/94 CHAR. OPTION
 + B711/B705 DL CONFIG. OPTION

Fig. III-2 B705/B711 PROCESSOR, LOGIC RACK LAYOUT

Installation Guide

IOC/DDP LOCATIONS

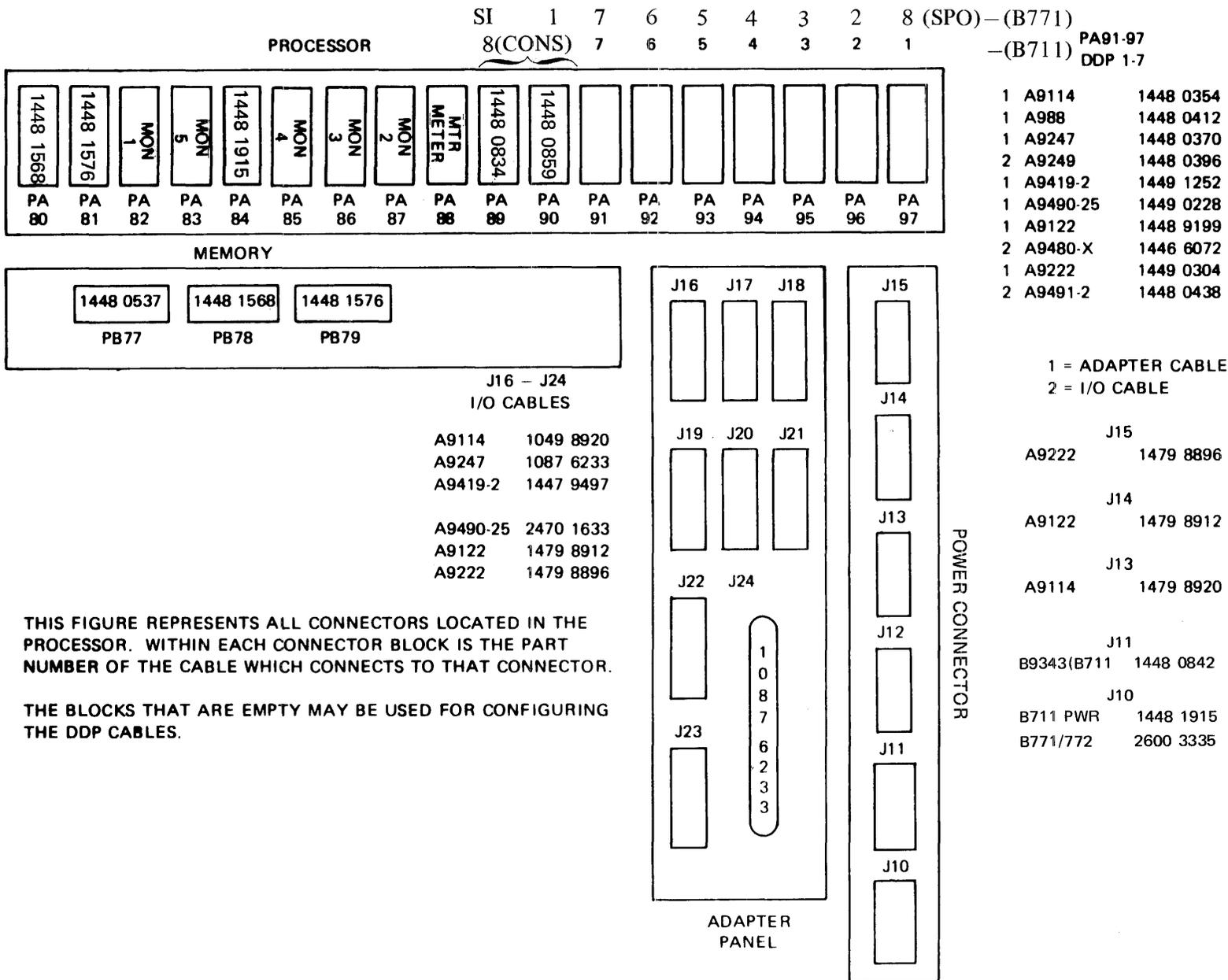


Figure III-3. B705/B711 AND B771/B772 PROCESSOR CABLE CONNECTOR LOCATIONS

Installation Guide

IOC/DDP AREA	CARD TYPE (TABLE III-1)		BACKPLANE LOCATION	CONNECTOR BLOCK
	PC NO.	FUNCTION		
1	1	Control	FW6	PAJ97
	2	Data 9-16	FW3	
	3	Data 1-8	FW0	
	4	Special	FV7	
2	1	Control	DW6	PAJ96
	2	Data 9-16	DW3	
	3	Data 1-8	DW0	
	4	Special	DV7	
3	1	Control	FV4	PAJ95
	2	Data 9-16	FV1	
	3	Data 1-8	FU8	
	4	Special	FU5	
4	1	Control	DV4	PAJ94
	2	Data 9-16	DV1	
	3	Data 1-8	DU8	
	4	Special	DU5	
5	1	Control	FU2	PAJ93
	2	Data 9-16	FT9	
	3	Data 1-8	FT6	
	4	Special	FT3	
6	1	Control	DU2	PAJ92
	2	Data 9-16	DT9	
	3	Data 1-8	DT6	
	4	Special	DT3	
7	1	Control	DT0	PAJ91
	2	Data 9-16	DT7	
	3	Data 1-8	DS4	
	4	Special	DS1	

TABLE III-2. B 705/B 711 INTERCHANGEABLE IOC/DDP LOCATIONS

Installation Guide**B705/B711 I/O CABLING**

Figure III-4 shows the interconnection of the I/O cabling for a complete B705/B711 system configuration. The functions and part numbers of the standard cables are identified, as applicable. Refer to Table I-2 for a complete list of standard and optional cables and other pertinent information.

Note that the actual cable configuration depends on the I/O options installed and the types/numbers of peripheral device and/or data communications interfaces. As shown in Figure III-4, any of the interchangeable I/O control ports (DDP1 through DDP7) can be connected to service any of the standard peripheral interfaces except the console, which is dedicated to port DDP8.

Many of the I/O controls are supplied with adapter cables that interconnect the respective I/O connectors (PAJ91 through PAJ97) on the processor logic rack with the interfacing device through an adapter panel located at the cable entrance area. (See Figure III-3). One adapter cable connector is connected to a selected I/O port connector, while the connector block at the other end is affixed to a selected slot on the adapter panel. The mating connector from an interfacing I/O device cable (Figure III-4) is then connected to the fixed connector block.

Devices such as the A9480 Disk and the A9491-2 Magnetic Tape Unit do not require adapter cables and are connected directly to the connector of the interfacing I/O port. Certain devices, such as the paper tape readers and punches are also supplied power through their I/O cables.

Data communications interfaces are provided by connections from the connector of port DDP6/DDP7 through a 25 or 50 foot standard (DOM) cable (or optional types for INT) to remote data sets (Modems). A direct-connect option is also available. Only one data comm interface may be accommodated at ports DDP6 and DDP7.

B705/B711 POWER CABLING

Figure III-5 shows the interconnection of the power cabling in a complete B705/B711 system configuration. As applicable, the part number of each cable is identified. Refer to Table III-3 for a complete list of B700 system power cables and other pertinent information. The actual system power cabling depends on the options and types/numbers of peripheral devices used.

All system power is obtained through the system circuit breaker panelboard, which distributes primary AC power to the processor and separate branch circuit outlets (if required). (The separate branches can be connected to line A or B.) The three pairs of convenience outlets (J1, J2, and J3) on the processor power control assembly can be used for supplying AC power to any of the standard peripheral devices.

Jacks J13, J14, and J15 on the power control assembly supply AC power to certain peripheral devices through branch harnesses and connectors of the respective I/O cables. (See Figure III-5.) DC power is supplied for some peripherals, such as the tape cassette, directly through the respective I/O cables.

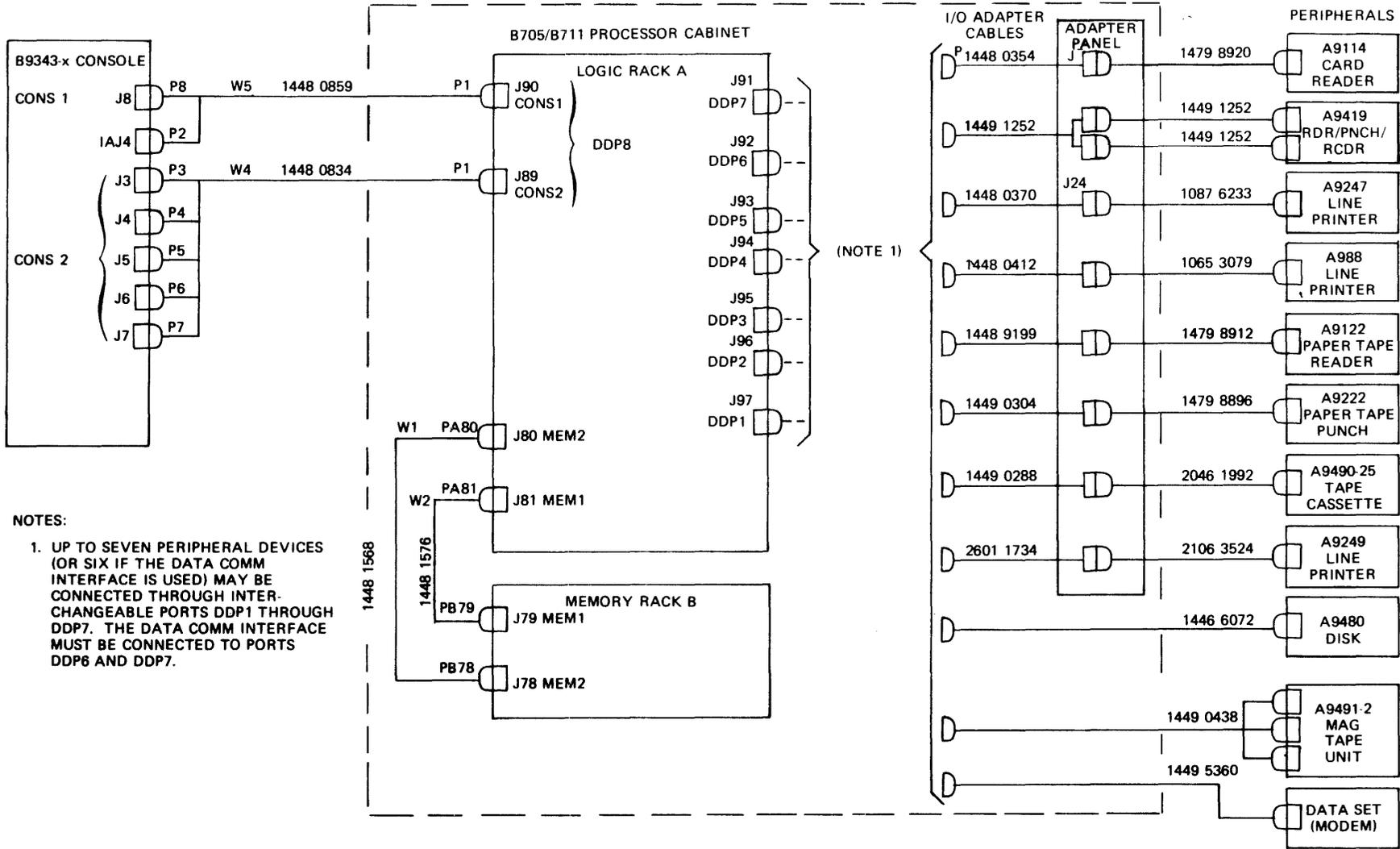


Figure III-4. B705/B711 SYSTEM I/O CABLING DIAGRAM

Installation Guide

NOTES:

1. LINE 1(A) OR 2(B) MAY BE USED FOR PERIPHERAL BRANCH CIRCUIT. ALL UNITS MUST BE CONNECTED TO COMMON GROUND.
2. PERIPHERALS WITH SEPARATE PWR CORDS SHOULD BE PLUGGED INTO PROCESSOR CONVENIENCE OUTLETS IF POSSIBLE.

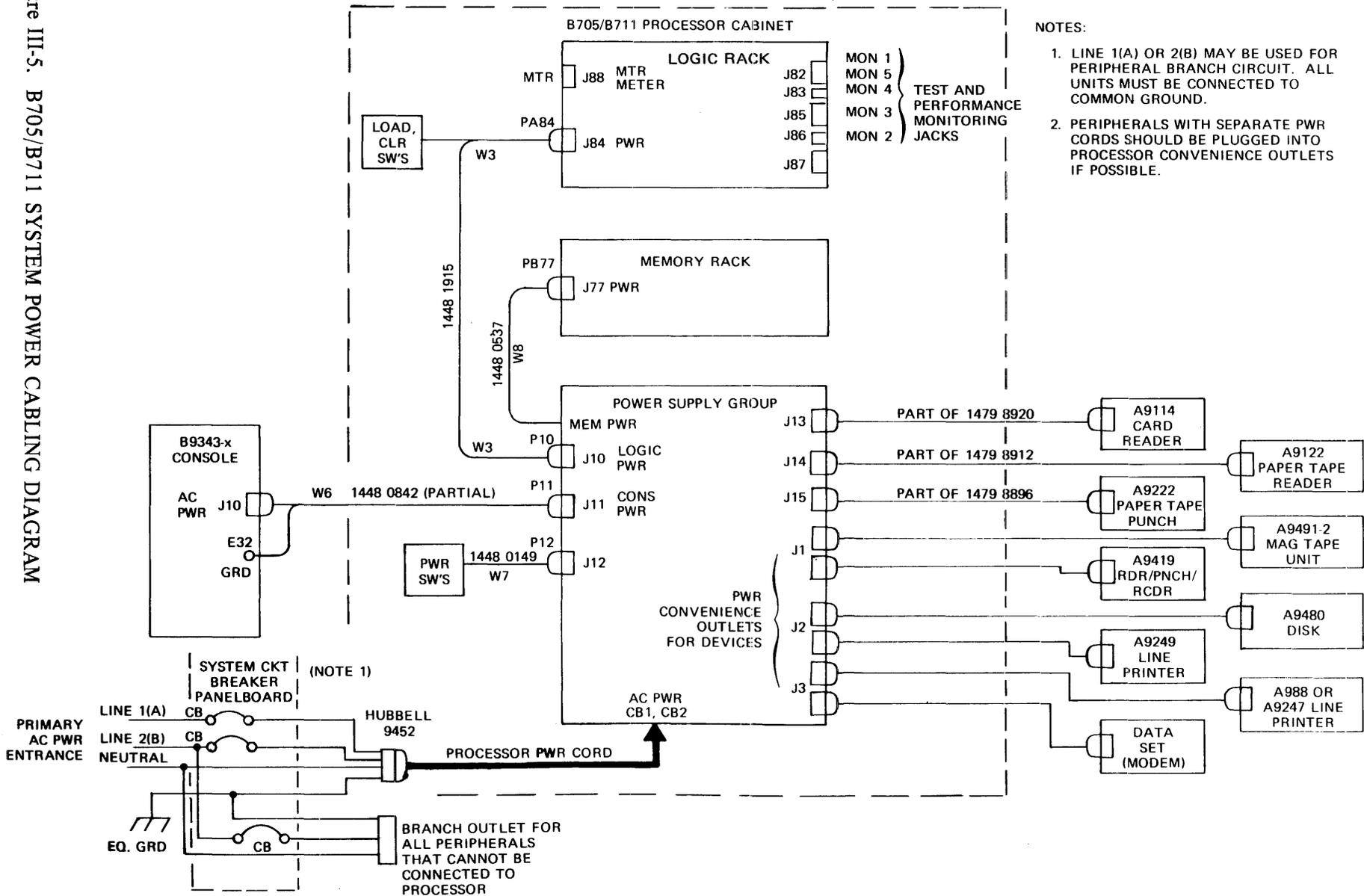


Figure III-5. B705/B711 SYSTEM POWER CABLING DIAGRAM

Installation Guide**B705/B711 PROCESSOR AC POWER TURNON AND CHECKOUT**

Figure III-6 shows the general routing of AC power wiring to the processor power control assembly, where the AC power turnon and measurement checks are made. For identification purposes, the wire color codes of the line, neutral, and ground connections are given in Figure III-6 for both Domestic and International installations.

Turnon and Checkout Procedure

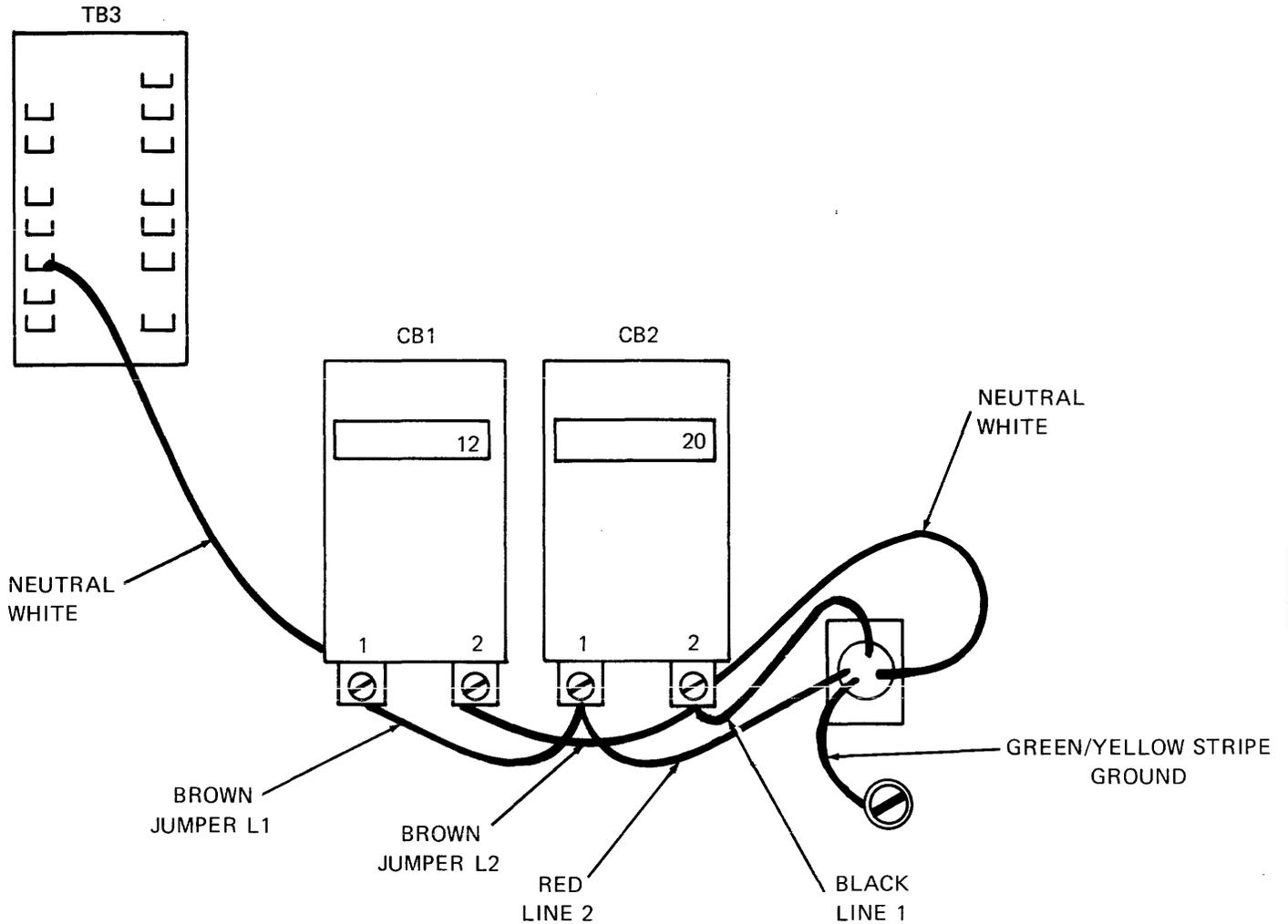
Perform the following procedure to turn on and check out processor power:

CAUTION

Local codes in some areas require that all operation/checks involving cabling and power be performed by a licensed electrician. The field engineer should supervise all actions performed by the electrician.

1. Make certain that circuit breakers on branch AC power distribution panelboard (Figure III-5) are in OFF positions.
2. Make certain that circuit breakers CB1 and CB2 (and CB3 and CB4 for International units) on processor power control assembly are in OFF position.
3. Connect processor power AC power cord to allocated branch receptacle.
4. Set all circuit breakers on branch AC power distribution panelboard to ON positions.
5. Measure primary AC input voltages (rms) at processor power control assembly (Figure III-6) as follows:
 - a. Domestic units:
 - 107 to 127 volts AC between neutral (white wire) at TB3-2 and line 1 (A) (black wire) at CB1-1.
 - 107 to 127 volts AC between neutral at TB2-2 and line 2 (B) (red wire) at CB1-2.
 - 216 to 252 volts AC between lines 1 (A) and 2 (B).
 - b. International units:
 - +5 to -10 percent of specified voltage (Table I-4) between line (CB1-1) and neutral (CB1-2).Repeat line checks at CB2 of Domestic units, or at CB2, CB3, and CB4 of International units, as required.
6. Set all circuit breakers on branch AC power distribution panelboard to OFF positions.
7. Set processor circuit breakers to ON positions.
8. Set circuit breakers on branch AC power distribution panelboard to ON positions.

Installation Guide



LINE	COLOR CODE	
	U.L. (DOM)	B.S.I./C.E.E (INT)
1	BLACK	BROWN
NEUTRAL	WHITE	BLUE
GROUND	GREEN	GREEN/YELLOW
2	RED	—

Figure III-6. B705/B711 and B771/B772 PROCESSOR AC POWER MEASUREMENT LOCATIONS AND COLOR CODES

Installation Guide**B705/B711 PROCESSOR DC POWER TURNON AND CHECKOUT**

Perform the following procedure to turn on and check out processor DC power:

NOTE

The system has emergency power-off provisions at two locations: the processor front panel (power OFF pushbutton) and the console (power ON-OFF switch). The console switch (lower-right section of console) must be left in the ON position to enable the normal power-on pushbutton on the console.

1. Power-up processor by pressing power ON/OFF pushbutton on processor panel and associated power switches on console. (Make certain that console emergency-off switch is in ON position.)
2. Check processor DC voltages in accordance with Table III-3, which lists the logic and memory backplane voltages, measurement locations, and corresponding fuses. Use a digital voltmeter for measurements.

AREA	DC VOLTAGES*	BACKPLANE LOCATION/PIN**	FUSE
Logic circuits backplane	+5.0	PADI4A	F3, 30A
	+5.0	PADV7A	F2, 30A
	+24.0	PABL5A	F9, 5A
	-24.0	PABL5F	F11, 4A
	+12.0	PABL5B	F12, 5A
	-12.0	PABL5C	F10, 3A
Core memory backplane	+5	PBBG9A	F1, 15A
	+24	PBBH1A	F4, 3A
	-24	PBBH1E	F11, 4A

* $\pm 5\%$ tolerance for +5, -12, and +12 volts.

$\pm 10\%$ tolerance for +24 and -24 volts.

** Logic backplane voltages are measured in reference to backplane power/signal ground. Memory voltages measured in reference to ground at control board pin 1EU, 1FU, or 2F4.

TABLE III-3. B705/B711 AND B771/B772 PROCESSOR DC VOLTAGE CHECKS

NOTE

Logic backplane measurements should be in relation to power/signal ground on the backplane. Memory backplane measurements should be in relation to ground at control board connector pin 1EU, 1FU, or 2F4

3. If voltages are out of tolerance, perform adjustments in accordance with Section IV of Technical Manual, form 1064482, or volume 1 of the B 700 FT&R documentation. Check corresponding fuse(s) listed in Table III-3 before proceeding with adjustment or troubleshooting.

Installation Guide**B705/B711 SYSTEM PREOPERATIONAL CHECKOUT**

After all AC and DC power is turned on and checked out at the processor, perform the following procedure to initially check out the operation of the installation:

1. Check out and turn on all peripheral unit power. (Refer to common procedure provided in this section.)
2. Install Field Engineering (FE) cards in processor logic rack (Figure III-2) as follows:

<u>Type</u>	<u>Part No.</u>	<u>Rack Location</u>
FE-1	1447 5099	DQ9
FE-2	1447 5115	DR2
FE-3	1447 5735	DR5
FE-4	1448 8431	DR8

3. Load and execute applicable Maintenance Test Routines (MTR's). Table III-5 identifies the B705/B711 MTR's and the general sequence in which they should be implemented. Refer to the B700 Processor FETM, form 1064482, Section V for complete instructions.
4. When all applicable MTR's run without error, proceed with system turnover operations.

<u>MTR NAME</u>	<u>PROGRAM/TEST TAPE PART NUMBER</u>	<u>OP. INSTRUCTIONS</u>	<u>REMARKS</u>
FEMT	—	1448 6906	Memory of 8 K-words maximum
MEMLDR	1448 8506 and 1448 8514	1448 8498	Memory Loader
PROC	1448 6948	1448 6815	Processor, General
BSW	1448 6955	1448 6823	Processor, Barrel Switch
MCU	1448 6963	1448 6831	Processor, Memory Control
CONS	1448 6997	1448 6864	B 9343 64-Char. Console and DDP
CON96	1449 0940	1448 0866	B 9343 96-Char. Console and DDP
DPM	1448 6971	1448 6849	Memory Data, up to 24K-words
I/O MTR'S (RUN AS REQUIRED)			
DISK	1448 6989	1448 6856	A 9480-x and DDP
RP96	1448 7003 and 1448 7961 (deck)	1448 6880	A 9419-x and DDP
PMTR	2602 9678	2602 9660	A 988 and DDP A 9249 and DDP A 9247 and DDP
CR80	1448 7011 and 1448 7524 (deck)	1448 6898	A 9114 and DDP
PTAP	2603 5410	2603 5402	A 9122 and DDP A 9222 and DDP
TC	1449 0916	1449 0833	A 9490-25 and DDP
TM	1449 0874	1449 0791	A 9491-2 and DDP
SLC	2601 4068	2601 4050	B351-1 SLC, Inquiry

TABLE III-5 B705/B711 MAINTENANCE TEST ROUTINES (MTR'S)

Installation GuideB721 INSTALLATION DETAILS**B721 PROCESSOR LAYOUT**

Figure III-7 shows the layout and major features of the B721 Processor cabinet, which is significantly different from the B705/B711 and B771/B772 Processors. Refer to Section II for a complete list of specifications.

B721 PROCESSOR CARD AND CABLE CONNECTOR LOCATIONS

Printed-circuit cards and I/O interface/power connectors are accommodated in the B721 Processor by two major rack assemblies: a hinged, swing-out logic/memory rack in the right-front section of the cabinet, and a fixed I/O module rack at the left-rear of the cabinet. (See Figure III-7.) All external cables enter at the bottom right-rear section of the cabinet and are secured by clamps.

Logic/Memory Rack

Figure III-8 shows the layout of the four-row, 115-card capacity logic/memory rack and identifies, by type and part number, the card installed in each dedicated location. In addition to the central processor logic and F. E. cards, this rack contains the cards used for the semiconductor (main) memory, the Universal Cartridge Disk Drive Control (I/O port DDP4), and the Console I/O control (I/O port DDP12). Rack-row B (upper) has three I/O port card areas (DDP9, DDP10, and DDP11) with common interface designs to accommodate three standard I/O controls applicable to the system.

Table III-6 lists each of the interchangeable I/O ports and identifies the card type (function)-to-backplane location allocation. The corresponding connector blocks are also listed. Refer to Table III-1 for a complete list of standard I/O control card types. Cable connector blocks are identified in Figure III-8 for each rack-row except the memory row, which is interconnected only through the rack backplane.

An example of an interchangeable I/O control installation in the B721 is the installation of the B392 Tape Cassette Control in port DDP11. In this typical application, card types TC-1, TC-2, TC-3, and TC-4 (Table III-1) are installed in card (port) locations BE5, BE2, BD9, and BD6, respectively, in the upper row of the logic/memory rack (Figure III-8). Connector block BEJ1 is used for the tape cassette I/O interface. Refer to Section IV for complete details concerning I/O control port/priority allocation.

An adapter panel (bracket) is provided at the right section of I/O row B to accommodate three adapter cable-to-I/O cable interconnections. (See Figures III-7 and III-11.)

I/O Module Rack

Figure III-7 shows the layout of the I/O module rack. The bottom row (H) is always allocated to the optional I/O expansion module, which can accommodate up to five additional standard I/O controls in interchangeable ports DDP3, DDP5, DDP6, DDP7, and DDP8.

Figure III-9 shows the card and connector layout of the I/O expansion module, which has two special cards (PS1 and CD1) in dedicated locations to accommodate the I/O expansion. (Refer to Table III-6 for the card location-to-card type allocation.)

The 25-card row (F) of the I/O module rack is allocated to the optional four-line B352 Data Communications Processor with associated options (Programmable Multiline Control) and is designated port DDP1. Figure III-10 shows the card and connector layout of this module. Refer to FETM form 1077567 for complete details concerning the Programmable Multiline Control.

Two upper rows in the I/O module rack are provided for future expansion. Adapter panels for I/O interconnections are provided on the right panels of the I/O expansion rack frame for each card row. (See Figures III-9 through III-11.)

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CARD TYPE (TABLE III-1)		CARD LOCATIONS (BY PORT) (NOTE 1)							
PC NO.	FUNCTION	DDP3 (XJ6)	DDP5 (XJ4)	DDP6 (XJ3)	DDP7 (XJ2)	DDP8 (XJ1)	DDP9 (EJ3)	DDP10 (EJ2)	DDP11 (EJ1)
-1	Control	BF1	BG3	BH8	BJ0	BK2	BG9	BF7	BE5
-2	Data 9-16	BE8	BG0	BH5	BI7	BJ9	BG5	BF4	BE2
-3	Data 1-8	BE5	BF7	BH2	BI4	BJ3	BG3	BF1	BD9
-4	Special	BE2	BF4	BG9	BI1	BJ0	BG0	BE8	BD6

NOTES:

1. Corresponding I/O connector blocks are shown within parenthesis.
2. Ports DDP3, DDP5, DDP6, DDP7 and DDP8 are in I/O expansion module (rack row).
3. Ports DDP9, DDP10, and DDP11 are in logic/memory rack.

TABLE III-6. B721 INTERCHANGEABLE IOC/DDP LOCATIONS

Installation Guide

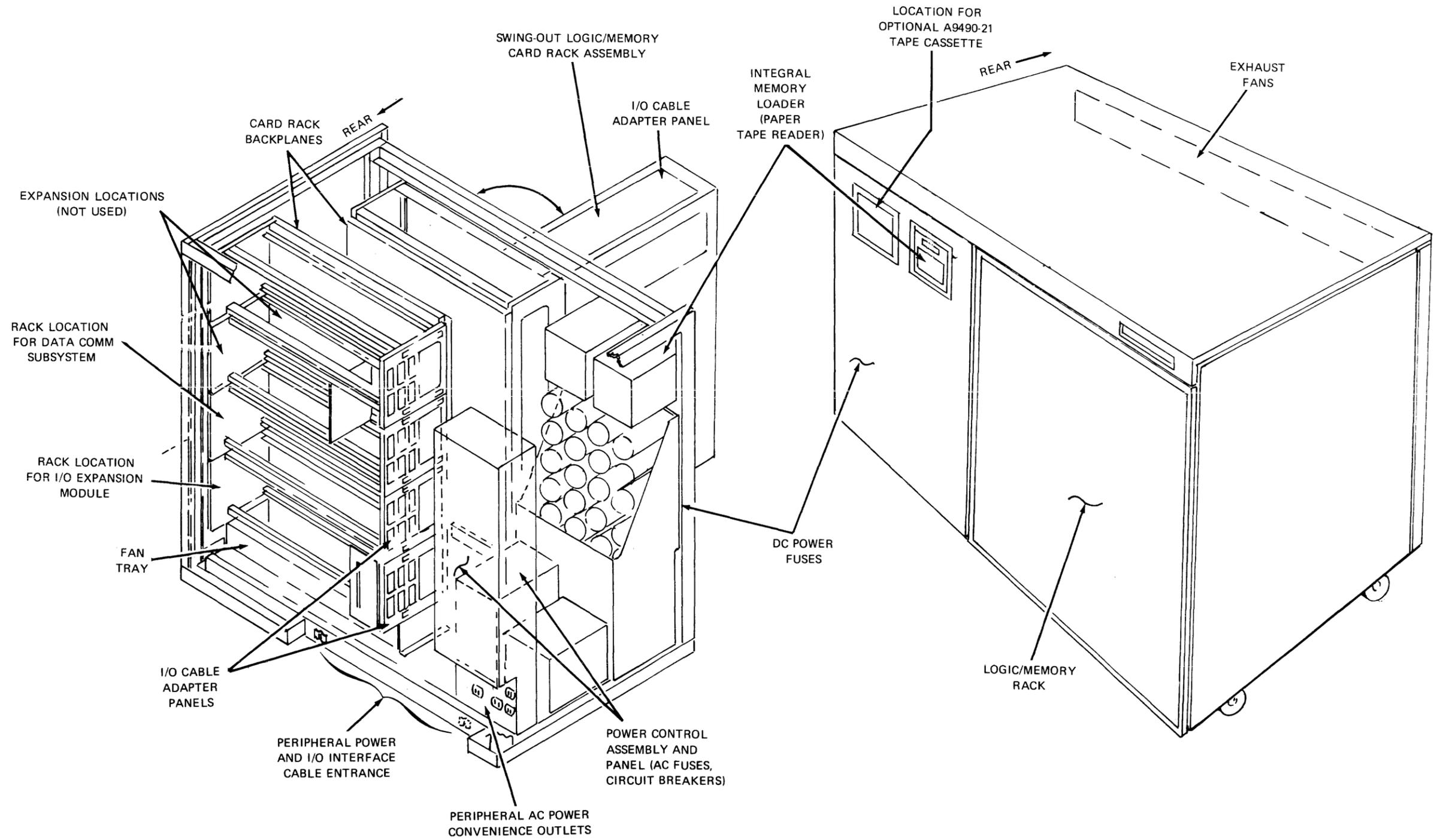
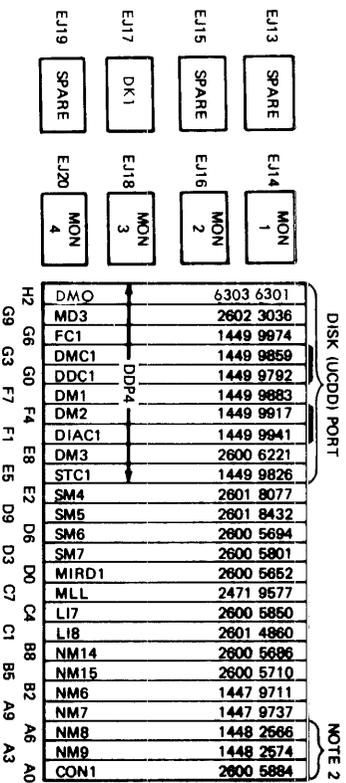
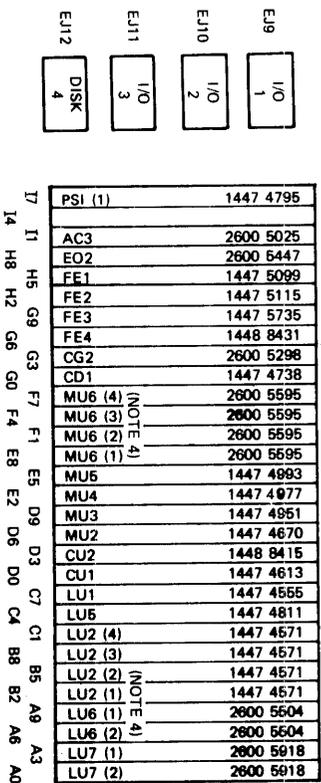
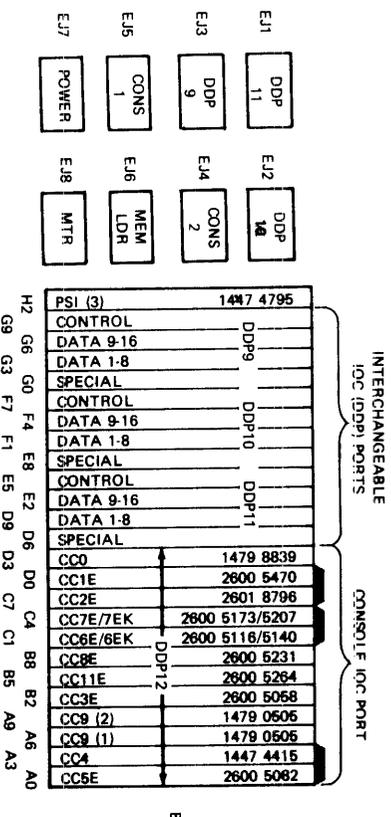


Figure III-7. B 721 PROCESSOR CABINET LAYOUT

Installation Guide



Slot	Card	Part Number
K2		
J9		
J6		
J0		
J14	MX1	2603 9636
J14	MX2	2603 9669
J14	DX	2603 97 01
H8	MOB	2601 9018
H2	MADD (2)	2600 6437
H2	MADD (1)	2600 6437
G6	MPA (12)	2601 7640
G6	MPB (12)	2601 8929
G0	MPA (11)	2601 7640
G0	MPB (11)	2601 8929
F4	MPA (10)	2601 7640
F4	MPB (10)	2601 8929
F1	MPA (9)	2601 7640
F1	MPB (9)	2601 8929
E8	MPA (8)	2601 7640
E8	MPB (8)	2601 8929
E2	MPA (7)	2601 7640
E2	MPB (7)	2601 8929
D6	MPA (6)	2601 7640
D6	MPB (6)	2601 8929
D0	MPA (6)	2601 8929
D0	MPB (6)	2601 8929
C4	MPA (5)	2601 7640
C4	MPB (5)	2601 8929
C1	MPA (4)	2601 7640
C1	MPB (4)	2601 8929
B8	MPA (4)	2601 8929
B8	MPB (4)	2601 8929
B2	MPA (3)	2601 7640
B2	MPB (3)	2601 8929
A8	MPA (2)	2601 7640
A8	MPB (2)	2601 8929
A6	MPA (1)	2601 7640
A6	MPB (1)	2601 8929
A0	MPB	2601 8929

FRONT VIEW
CARD INSERTION
SIDE

NOTES:

1. BASIC SYSTEM INCLUDES TWO EACH MPA AND MPB CARDS (16KB). EXPANSION IS IN 8KB INCREMENTS (ONE EACH MPA AND MPB).
2. MM8 AND MM9 CARDS ARE NOT INCLUDED WITH BASIC PROCESSOR. CON1 IS AN OPTIONAL CARD.
3. SYMBOL INDICATES INSTALLATION OF FRONTPLANE CONNECTOR.
4. NUMBERS IN PARENTHESIS INDICATE BACKPLANE VARIATIONS FOR CARDS (LU2-1, LU2-4, ETC.).

Figure III-8. B 721 PROCESSOR LOGIC AND MEMORY RACK, CARD AND CONNECTOR LOCATIONS

Installation Guide

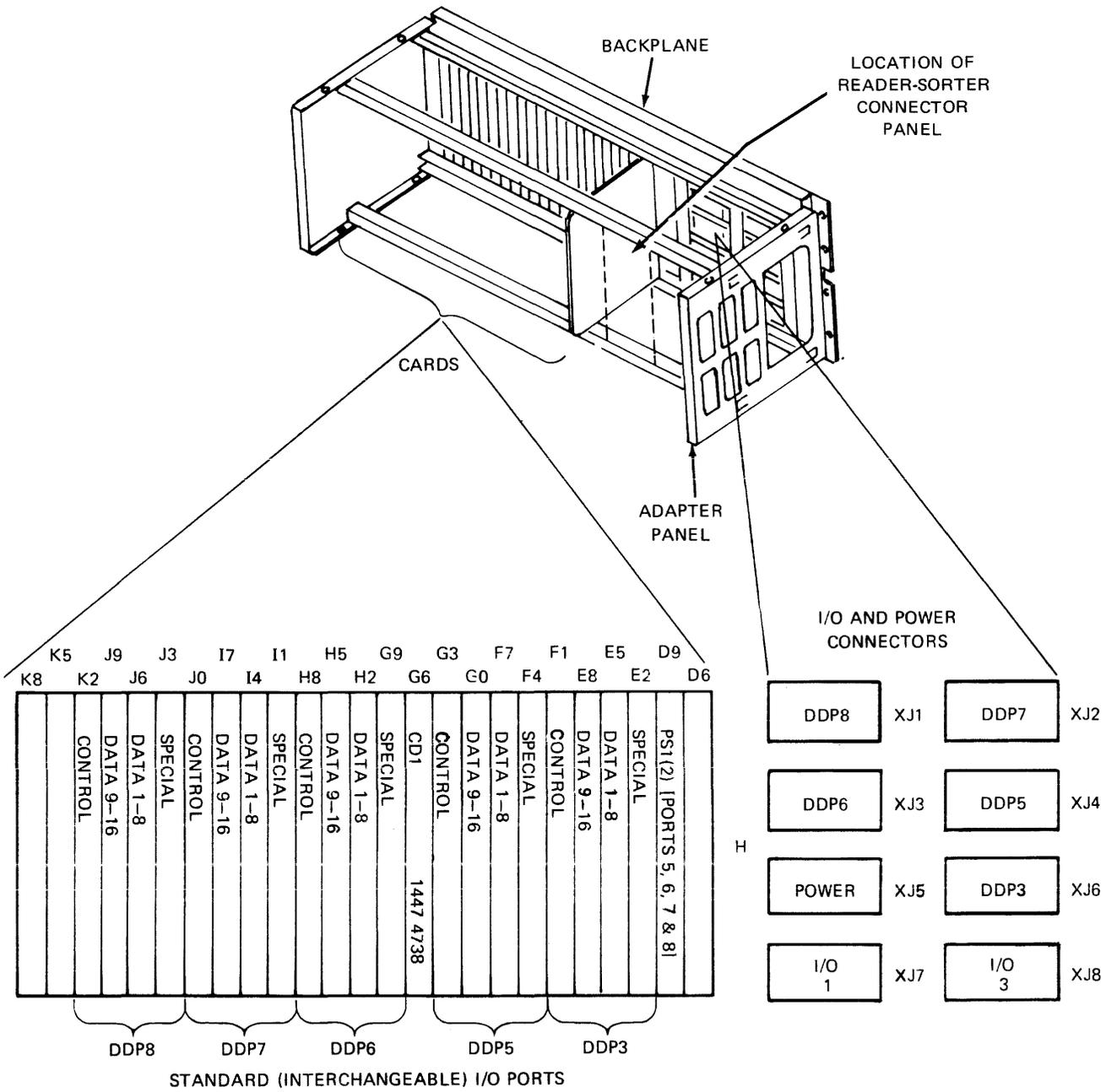


Figure III-9 I/O EXPANSION MODULE LAYOUT (CARD AND CABLE CONNECTOR LOCATIONS)

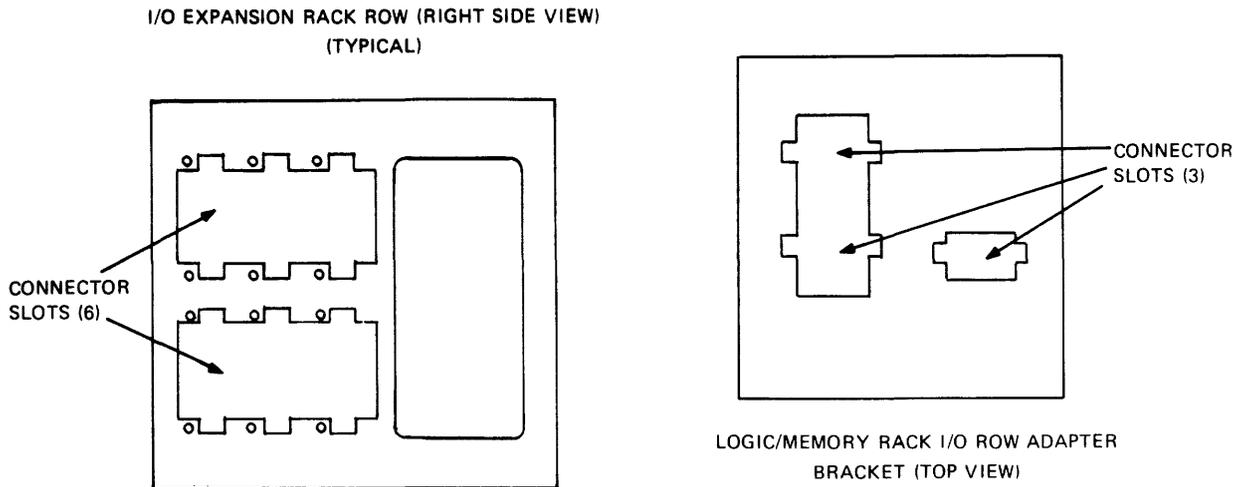
Installation Guide

Figure III-11. B 721 I/O CONNECTOR ADAPTER PANELS

B 721 I/O CABLING

Figure III-12 shows the interconnection of the I/O cabling for a complete B 721 System configuration. The functions and part numbers of the standard cables are identified, as applicable. Refer to Table I-2 for a complete list of standard and optional I/O cables and other pertinent information.

Note that the actual cable configuration depends on the I/O options installed and the types/numbers of peripheral device or data comm interfaces. There are five I/O option configurations involving the I/O expansion rack and its interconnection with the logic/memory rack. Three option configurations are established for initial factory configuration and installation, as follows:

- a. Option 1 (B 312-1, cable group 2603 8232), where only an I/O expansion module (B 312 I/O expansion feature) is installed.
- b. Option 2 (B 352-1 cable group 2603 8240), where only a Data Communications Processor Module (B 352, four-line) is installed (with associated options).
- c. Option 3 (B 352-8, cable group 2603 8257), where both an I/O expansion and Data Communications Module are installed.

For option 1, cables 2602 0131 and 2600 9563 interconnect the I/O expansion module with the logic/memory rack. For option 2, cables 2602 0131 and 2602 0164 interconnect the data communications module with the logic/memory rack. For option 3, cables 2600 9563 and 2602 0149 interconnect the logic/memory rack and I/O expansion module. Cable 2602 0149 also interconnects the I/O expansion and data communications modules, and cable 2602 0164 interconnects the data communications module with the logic/memory rack.

Two additional I/O cable option configurations are applicable to configuration changes in the field after a system is installed. These are:

- a. Option 4 (B 352-9, cable group 2603 8265) where a B 352 Data Communications Processor Module is added to an existing B 312 module.
- b. Option 5 (B 352-2, cable group 2603 8273), where a B 312 I/O expansion module is added to an existing B 352 module.

For option 4, cable 2602 0149 interconnects the logic/memory rack, B 312 module, and B 352 module. Cable 2602 0164 interconnects the B 352 with the logic/memory rack.

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For option 5, cable 2602 0149 interconnects the logic/memory rack, B 352, and B 312. Cable 2600 9563 interconnects the B 312 with the logic/memory rack.

NOTE

Power cables are also included in the aforementioned options; refer to power cabling description.

As shown in Figure III-12, any of the interchangeable I/O control ports (DDP3 and DDP5 through DDP11) can be connected to service any of the B 721 peripheral interfaces except the console, disk, and data communications interfaces. Many of the I/O controls are supplied with adapter cables that interconnect the respective I/O connectors on the logic/memory rack and/or I/O expansion module with the interfacing device through adapter panels located at the right sections of the logic/memory rack I/O row and the I/O module, as shown in Figures III-7 and III-9.

One adapter cable connector is connected to a selected I/O port connector on the logic/memory or I/O expansion module backplane, while the connector block at the other end is affixed to a selected slot on an adapter panel. The mating connector from an interfacing I/O device cable (Figure III-12), is then connected to the fixed connector block.

Devices such as the A9491-2 Magnetic Tape Unit and A9480/A9481 Disk do not require adapter cables and are connected directly to the connector of the interfacing I/O port. Certain devices, such as the Paper Tape Readers and Punches, are also supplied AC power through their I/O cables by means of separate breakout harnesses and connectors that are connected to the power control assembly.

Data communication line interfaces are provided by direct connections from data comm module jack YJ1 through YJ4 through a 25 or 50 foot standard (DOM) (or optional types for INT) to remote data sets/automatic calling units. Up to four data set lines, or two ACU lines and two data set lines, may be connected. Optional data communications line indicators on the console may also be connected through another cable to the line 2 interface. A direct-connect option is also available.

B 721 POWER CABLING

Figure III-13 shows the interconnection of the power cabling in a complete B 721 System configuration. As applicable, the part number of each cable is identified. Refer to Table I-3 for a complete list of system power cables and other pertinent information.

Note that the actual cable configuration depends on I/O options and types/numbers of peripheral devices or data comm interfaces to be connected. As described for the I/O cabling, the five I/O option configurations determine the power interconnections between the logic/memory rack, the I/O expansion rack, and the processor power circuitry. These options are identified as cable groups 2603 8232, 2603 8240, 2603 8257, 2603 8265, and 2603 8273, respectively and also involve I/O cabling. (Refer to I/O cabling description.)

For option 1 (I/O expansion module only) cables 2601 3003 and 2602 0206 connect the I/O expansion module to the logic/memory rack and capacitor/rectifier assembly, respectively. For option 2 (data communications module only) these same cables interconnect the data comm module.

For option 3 (both I/O expansion and data communications modules), cable 2601 3003 connects the logic/memory rack to the I/O expansion module. Two 2602 0206 cables connect the capacitor/rectifier assembly to the I/O expansion and data communications modules, respectively, and cable 2602 0230 interconnects the I/O expansion and data communications modules.

For option 4 (data communications module added to existing I/O expansion module), cable 2602 0206 connects +5 volts to the B 352, and cable 2602 0230 interconnects power between the B 312 and B 352 modules.

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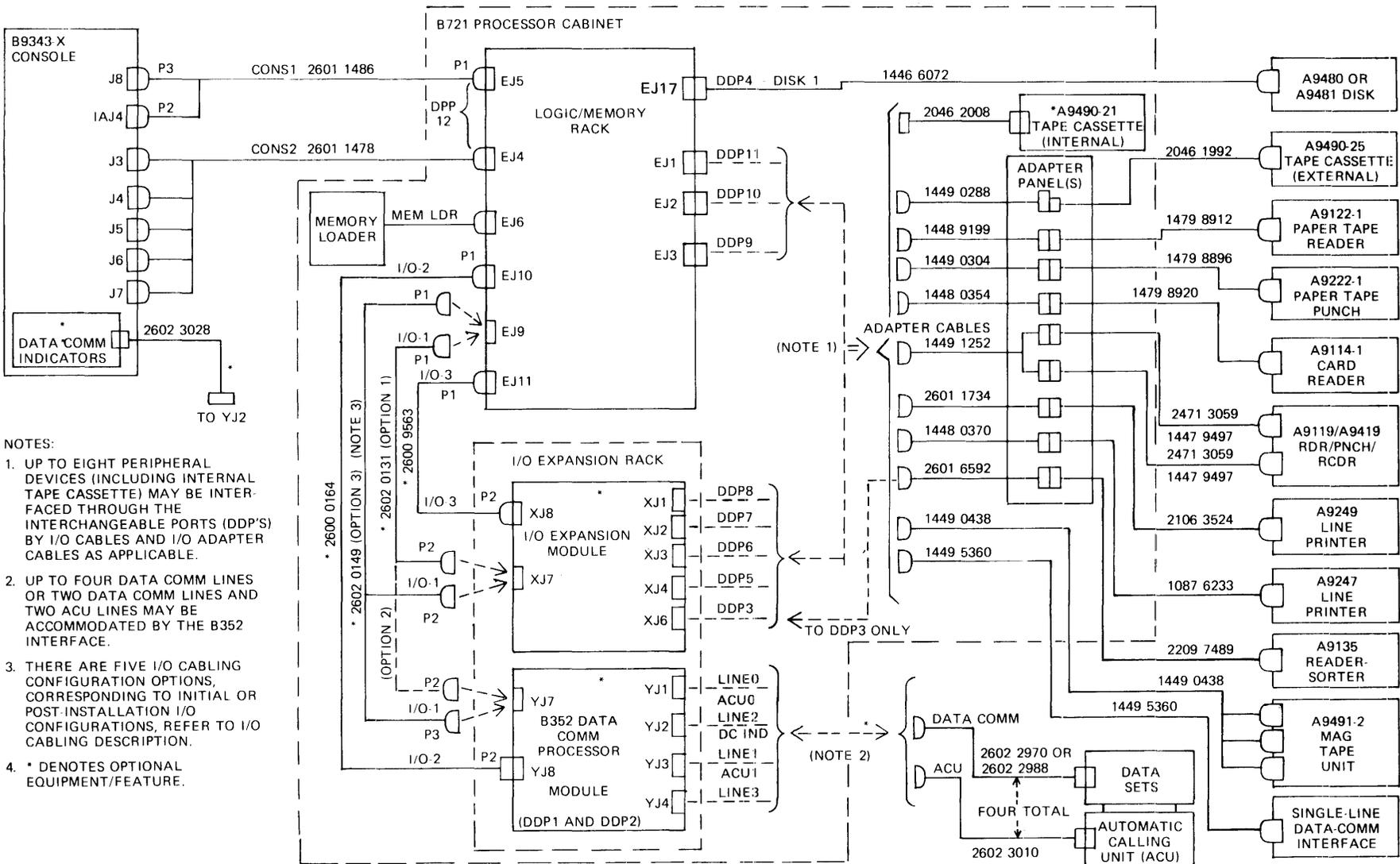
For option 5 (I/O expansion module added to existing data communications module), cable 2602 0206 connects +5 volts to the I/O expansion module, and cable 2602 0230 interconnects power between the B 312 and the B 352.

The integral memory loader unit has a direct AC power connection to jack HJ11 of the power control assembly. Jacks HJ8, HJ9, and HJ10 are used for supplying AC power to paper tape punches/readers and A9114 Card Reader through branch harnesses and connectors on the respective I/O cables.

The three pairs of AC convenience outlets (HJ1 through HJ3) can be used for supplying AC power to any of the peripheral devices except those which require separate branch circuits.

DC power is supplied for peripherals such as the internal/external tape cassette from the capacitor/rectifier assembly through the logic/memory and I/O expansion racks and interfacing I/O cables.

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- NOTES:
- UP TO EIGHT PERIPHERAL DEVICES (INCLUDING INTERNAL TAPE CASSETTE) MAY BE INTERFACED THROUGH THE INTERCHANGEABLE PORTS (DDP'S) BY I/O CABLES AND I/O ADAPTER CABLES AS APPLICABLE.
 - UP TO FOUR DATA COMM LINES OR TWO DATA COMM LINES AND TWO ACU LINES MAY BE ACCOMMODATED BY THE B352 INTERFACE.
 - THERE ARE FIVE I/O CABLING CONFIGURATION OPTIONS, CORRESPONDING TO INITIAL OR POST-INSTALLATION I/O CONFIGURATIONS, REFER TO I/O CABLING DESCRIPTION.
 - * DENOTES OPTIONAL EQUIPMENT/FEATURE.

Figure III-12. B 721 SYSTEM I/O CABLING DIAGRAM

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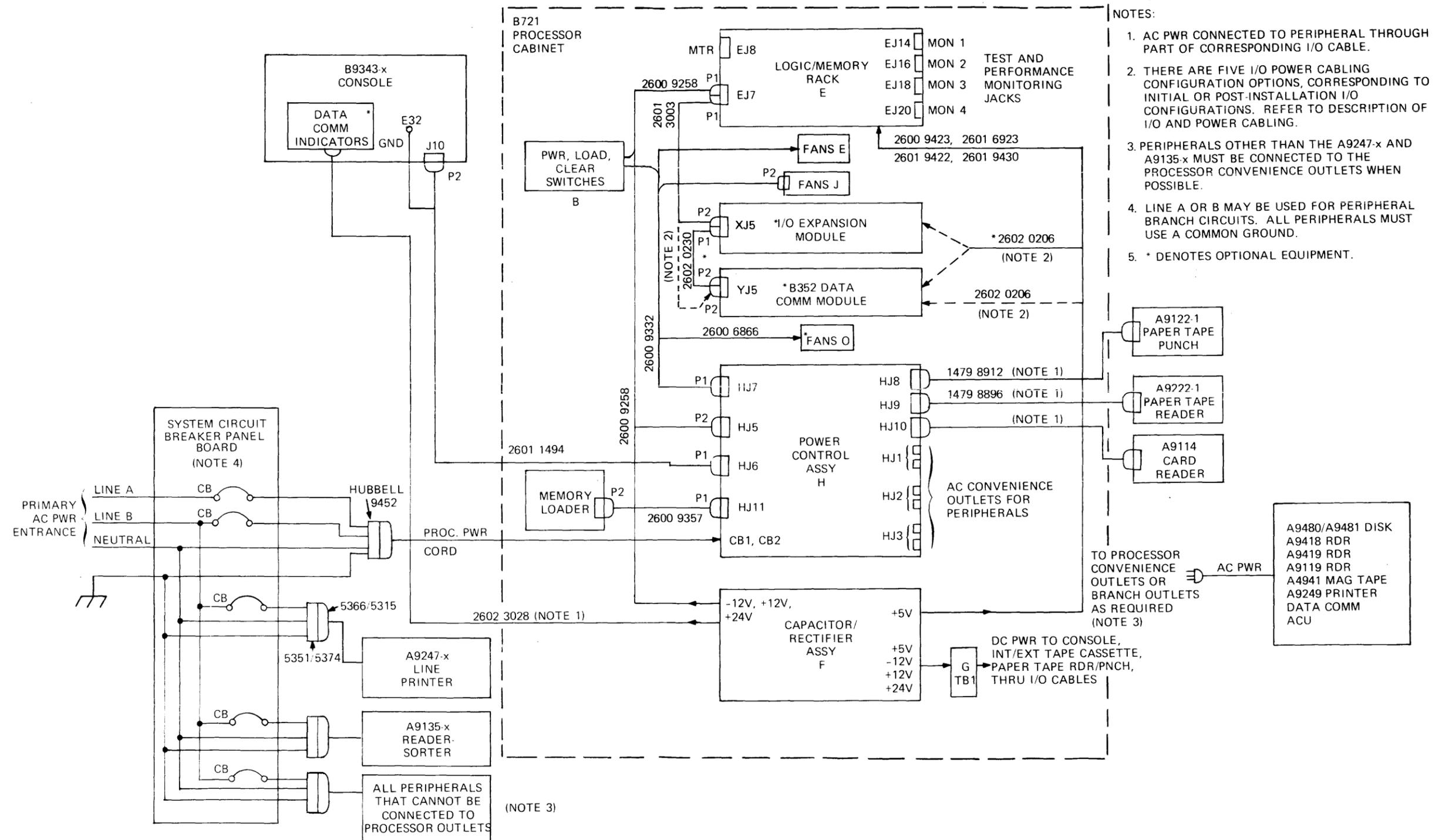


Figure III-13. B 721 SYSTEM POWER CABLING DIAGRAM

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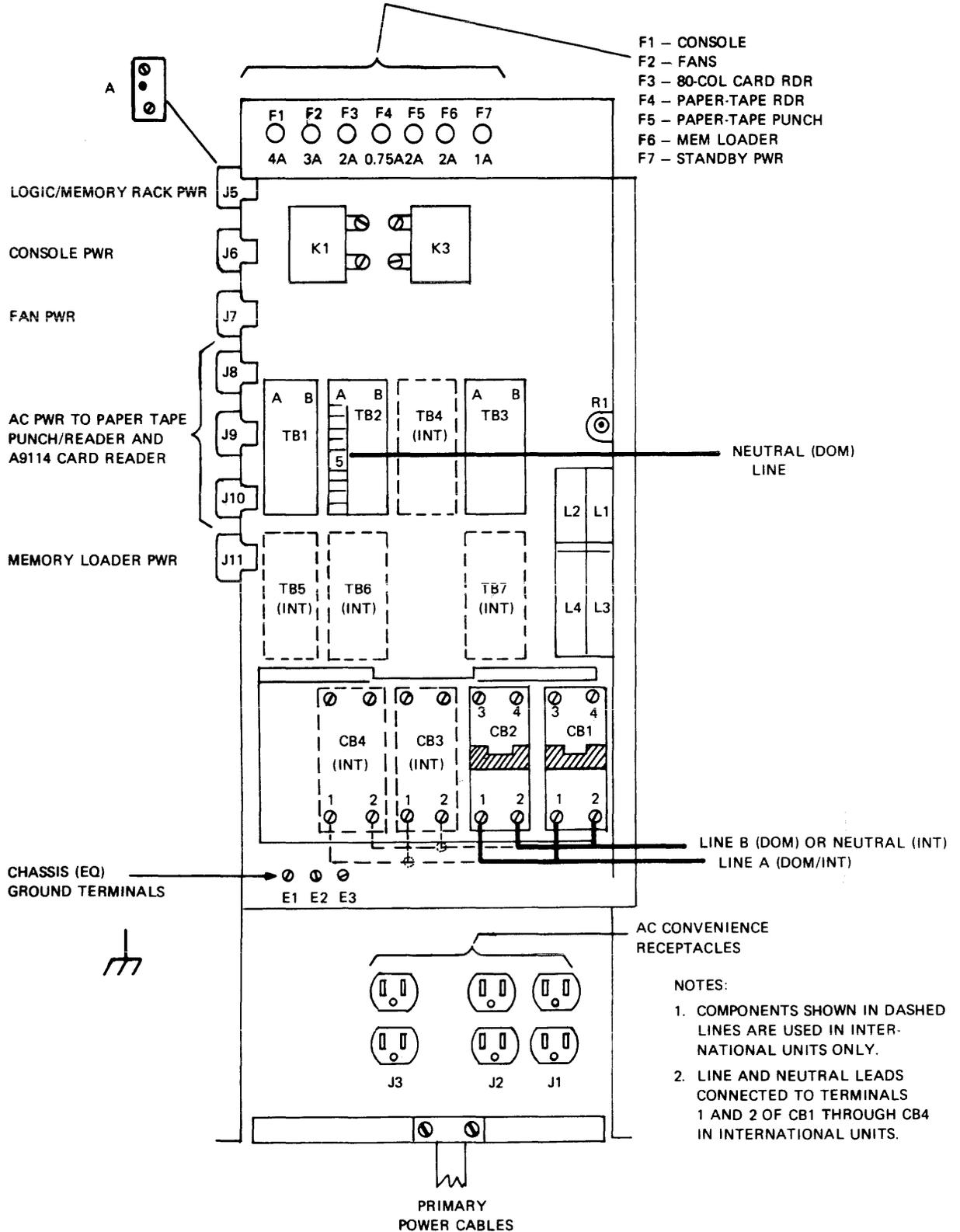


Figure III-14. B 721 PROCESSOR POWER CONTROL PANEL LAYOUT (DOMESTIC AND INTERNATIONAL)

Installation Guide**B 721 PROCESSOR AC POWER TURNON AND CHECKOUT**

Figure III-14 shows the layout of the B 721 Power Control Assembly front panel, where the primary AC power input connections are made and where the AC power turnon and measurement checks are performed. For identification purposes, the wire color codes of the line, neutral, and ground connections are as follows:

LINE	WIRE COLOR	
	U. L. (DOM)	B. S. I./C. E. E. (INT)
1 (A)	BLACK	BROWN
NEUTRAL	WHITE	BLUE
GROUND	GREEN	GREEN/YELLOW
2 (B)	RED	Not Used

Turnon and Checkout Procedure

Perform the following procedure to turn on and check out B 721 Processor AC power:

CAUTION

Local codes in some areas require that all operations and checks involving primary AC power cabling and turnon be performed by a licensed electrician. The field engineer should supervise all actions performed by the electrician.

1. Make certain that all circuit breakers on branch AC power distribution panelboard (Figure III-13) for system are in OFF position.
2. Make certain that circuit breakers CB1 and CB2 (and CB3 and CB4 for international units) on processor power control assembly are in OFF position. (See Figure III-14.)
3. Connect processor AC power cord to allocated branch receptacle.
4. Set all circuit breakers on branch AC power distribution panelboard to ON positions.
5. Measure primary AC input voltages (RMS) at Processor power control panel (Figure III-14) as follows:
 - a. Domestic units:
 - 107 to 127 volts AC between neutral (white wire) at TB2-5 and line 1 (A) (black wire) at CB1-1.
 - 107 to 127 volts AC between neutral (white wire) at TB2-5 and line 2 (B) (red wire) at CB1-2).
 - 216 to 252 volts AC between lines 1 (A) and 2 (B).
 - b. International units:
 - +5 to -10 percent of specified voltage (Table I-4) between line (CB1-1) and neutral (CB1-2).

Repeat line checks at CB2 of Domestic units or at CB2, CB3, and CB4 of International units, as required. (See Figure III-14.)
6. Set all circuit breakers on branch AC power distribution box to OFF positions.
7. Set processor circuit breakers CB1 and CB2 (and CB3 and CB4 on International units) to ON position.
8. Set circuit breakers on branch AC power distribution box to ON positions.

Installation Guide**B 721 PROCESSOR DC POWER TURNON AND CHECKOUT**

Perform the following procedure to turn on and check out B 721 Processor DC power:

NOTE

The system has emergency power-off provisions at two locations: the processor control panel (power OFF pushbutton) and the console (power ON-OFF switch). The console switch must be left in the ON position to enable normal power turnon.

1. Power-up processor by pressing power ON pushbutton on processor control panel. (Make certain that emergency off switch on lower-right section of console is set to ON position.)
2. Check processor DC voltages in accordance with Table III-7, which lists the logic/memory and I/O expansion rack backplane voltages, measurement locations, and corresponding fuses. Use a digital voltmeter for measurements.
3. If voltages are out of tolerance perform adjustments or checks in accordance with Section IV of Technical Manual, form 1077534, or volume 1 of the B 721 FT&R documentation. Check corresponding fuse(s) listed in Table III-7 before proceeding with adjustment or troubleshooting.

B 721 SYSTEM PREOPERATIONAL CHECKOUT

After AC and DC power is turned on and checked, perform the following procedure to initially check out the operation the B 721 installation:

1. Check out and turn on all peripheral unit power. (Refer to common procedure.)
2. Install the Field Engineering (FE) cards in the processor logic/memory rack (Figure III-8) as follows:

<u>Type</u>	<u>Part No.</u>	<u>Rack E Location</u>
FE-1	1447 5099	DH5
FE-2	1447 5115	DH2
FE-3	1447 5735	DG9
FE-4	1448 8431	DG6

3. Load and execute applicable Maintenance Test Routines (MTR's). Table III-8 identifies the B 721 MTR's and the general sequence in which they should be implemented. Refer to the B 721 Processor FETM, form 1077534, Section V, for complete instructions concerning the MTR's.
4. When all applicable MTR's run without error, proceed with system turnover operations.

CAUTION

When logic/memory rack is open, do not lean on rack, as it may cause processor cabinet to tilt and result in a hazardous condition.

Installation Guide

AREA	BACKPLANE LOCATION/PIN	DC VOLTAGES*	ASSOCIATED FUSE (CAP/RECT. ASSY F)
Logic/Memory Rack (E)	HA3A and HA1A (GND)	+5	F8, 4A
	DD7A and DD9A	+5	F13, 30A
	FD7A and FD9A	+5	F14, 20A
	HF2A and HF4A	+5	F15, 30A
	FB9A and FC1A	+5	F16, 30A
	BG1H and BG0A	-12	F12, 3A
	BG0P and BG0A	+12	F5, 5A
	BI8T and BI8P	+12	F10, 2A
	DI2C and DI1A	+24	F1, 1A
	BG1J and BG0A	+24	F3, 5A
I/O Expansion Module (Rack J)	BH0A and BH2A	+5	F19, 15A
	BE3H and BE2A	-12	F12, 3A
	BE2P and BE2A	+12	F10, 2A
	BE3J and BE2A	+24	F3, 5A
Data Communications Module (Rack J)	BH0A and BH2A	+5	F18 and F20, 20A
	BD7H and BD7A	-12	F12, 3A
	BD9P and BD9A	+12	F10, 2A
	BC7R and BD62	+24	F3, 5A

* $\pm 5\%$ Tolerance for +5, -12, and +12 volts

$\pm 10\%$ Tolerance for +24 volts

TABLE III-7. B 721 PROCESSOR DC VOLTAGE CHECKS

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MTR NAME	PROGRAM/TEST TAPE PART NUMBER	OP. INSTRUCTIONS	REMARKS
FEMT	—	1448 6906	Memory of 8 K-words maximum
ELDR	2602 1964 and 2602 1972	2602 1956	Photoelectric Memory Loader
PROC	1448 6948	1448 6815	Processor, general
BSW	1448 6955	1448 6823	Processor, barrel switch
SMCU	2602 9694	2602 9686	Processor, memory control
ECON	2602 9751	2602 9744	B 9343-x (64/94 char) Console and B346 DDP
DPM	1448 6971	1448 6849	Memory data, up to 24 K-words
*** I/O MTR's (RUN AS REQUIRED) ***			
UCDD	2602 9710	2602 9702	A 9480-x/A 9481 and DDP
RP96	1448 7003 and 1448 7961 (deck)	1448 6880	A 9419-x and DDP
PMTR	2602 9678	2602 9660	A 9249 and DDP A 9247 and DDP
CR80	1448 7011 and 1448 7524 (deck)	1448 6898	A 9114 and DDP
PTAP	2603 5410	2603 5402	A 9122 and DDP A 9222 and DDP
TC	1449 0916	1449 0833	A9490-25 and DDP
TM	1449 0874	1449 0791	A 9491-2 and DDP
PMLC	2602 9736	2602 9728	B 352 Multiline Data Communications
SLC	2601 4068	2601 4050	B 351-1 Single-Line Data Communications
RS	2603 3027	2603 3019	A 9135 and DDP

TABLE III-8. B 721 MAINTENANCE TEST ROUTINES (MTR's)

Installation GuideB771/B772 INSTALLATION DETAILS**B771/B772 PROCESSOR LAYOUT**

The layout and major features of the B771/B772 Processor cabinet are similar to the layout and features of the B705/B711 cabinets as shown in Figure III-1. The major difference is the arrangement of I/O control ports and connectors.

B771/B772 PROCESSOR CARD AND CABLE CONNECTOR LOCATIONS

Figure III-15 shows the layout of the B771/B772 Processor logic rack and identifies the standard cards installed in the various fixed locations. Cable connector locations are shown at the bottom of Figure III-15 and in Figure III-16, which identifies the function and application of each signal and power connector.

B771/B772 I/O CONTROL (IOC/DDP) LOCATIONS

The B771/B772 Processor can accommodate up to eight I/O controls (IOC's or DDP's) in I/O control card areas (ports) identified DDP1 through DDP6, DDP6A, DDP7, DDP7A, and DDP8. Port DDP8 is always allocated to the B044 SPO control. (B771/B772 is a SPO-based system.) Figure III-15 identifies the part numbers and port locations of the three SPO cards comprising the SPO control. Connector block PAJ97 is always used for SPO port DDP8.

Ports DDP7 and DDP7A are allocated to the B351 Single-Line Control. An additional Single-Line Control may be installed in ports DDP6 and DDP6A. Figure III-15 identifies the eight SLC cards installed in port DDP7 and DDP7A card locations.

Ports DDP1 through DDP6 and DDP7 are interchangeable (common) areas that can accommodate any of the standard four-card I/O controls applicable to the B771/B772 system. Table III-9 lists ports DDP1 through DDP7A and shows the card function (type)-to-backplane location allocation. Corresponding I/O connector blocks are also listed. Refer to Table III-1 for a complete list of card identifiers for I/O controls.

An example of an interchangeable I/O control installation in the B771/B772 is the installation of the B244 Line Printer Control in port DDP2. For this application, card types PT-1, PT-2, PT-3, and PT-4 are installed in card locations DW6, DW3, DW0, and DV7, respectively, and connector block PAJ96 is used for the I/O interface. Refer to Section IV for complete details concerning I/O control-to-port/priority allocation.

An adapter panel, located near the cable entrance at the bottom of the processor, is provided to accommodate adapter cable-to-I/O cable interconnections. (See Figure III-16.)

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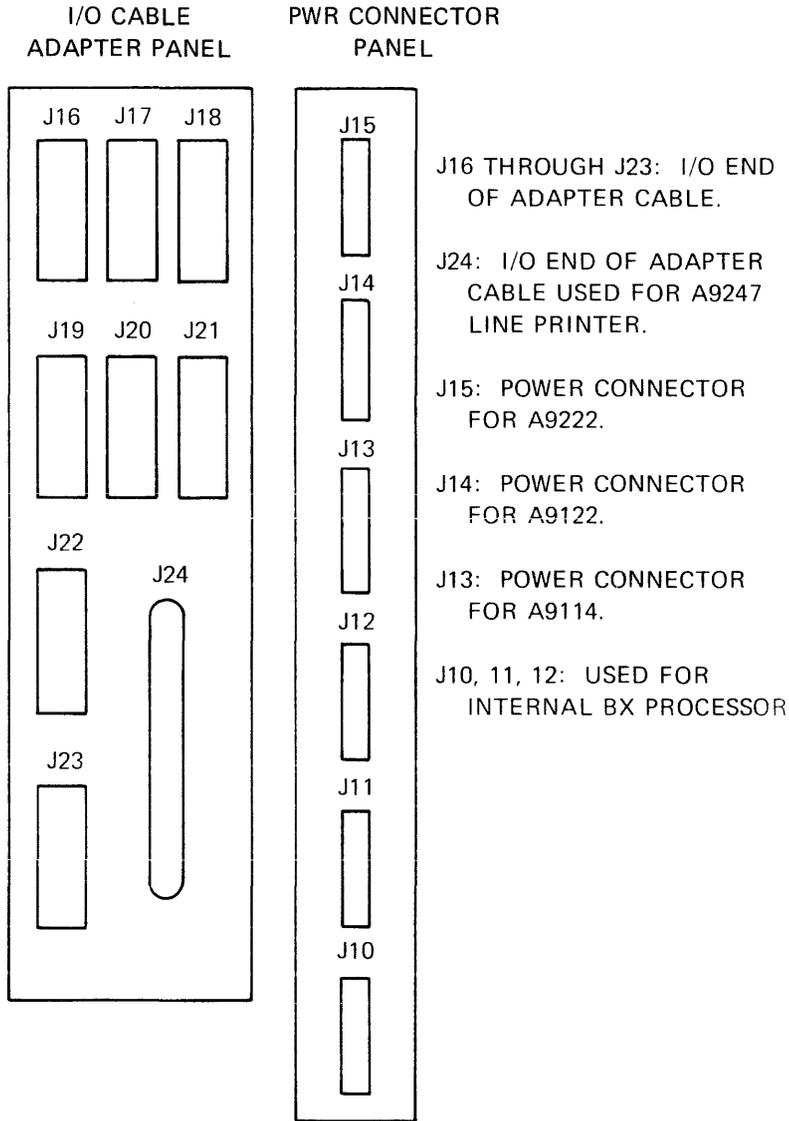


Figure III-16. B771/B772 PROCESSOR I/O ADAPTER PANEL AND POWER CABLE CONNECTOR CONNECTIONS

Installation Guide

TABLE III-9. B 771/B 772 INTERCHANGEABLE IOC/DDP LOCATIONS

IOC/DDP AREA	CARD TYPE (TABLE III-3)		BACKPLANE LOCATION	CPU CONNECTOR BLOCK
	PC NO.	FUNCTION		
1	1	Control	DL7	PAJ90
	2	Data 9-16	DL4	
	3	Data 1-8	DL1	
	4	Special	DK8	
2	1	Control	DW6	PAJ96
	2	Data 9-16	DW3	
	3	Data 1-8	DW0	
	4	Special	DV7	
3	1	Control	FV4	PAJ95
	2	Data 9-16	FV1	
	3	Data 1-8	FU8	
	4	Special	FU5	
4	1	Control	DV4	PAJ94
	2	Data 9-16	DV1	
	3	Data 1-8	DU8	
	4	Special	DU5	
5	1	Control	FU2	PAJ93
	2	Data 9-16	FT9	
	3	Data 1-8	FT6	
	4	Special	FT3	
6	1	Control	DU2	PAJ92
	2	Data 9-16	DT9	
	3	Data 1-8	DT6	
	4	Special	DT3	
6A	5	Control (Modified)	DT0	PAJ92
	6	Data 9-16	DS7	
	7	Data 1-8	DS4	
	8	Special	DS1	
7	1	Control	DP1	PAJ91
	2	Data 9-16	DN8	
	3	Data 1-8	DN5	
	4	Special	DN2	
7A	5	Control (Modified)	DM9	PAJ91
	6	Data 9-16	DM6	
	7	Data 1-8	DM3	
	8	Special	DM0	

Installation Guide**B771/B772 I/O CABLING**

Figure III-17 shows the interconnection of the I/O cabling for a complete B771/B772 system configuration. The functions and part numbers of the standard cables are identified, as applicable. Refer to Table I-2 for a complete list of standard and optional cables and other pertinent information.

Note that the actual cable configuration depends on the I/O options installed and the types/numbers of peripheral device and/or data communications interfaces. As shown in Figure III-17, any of the interchangeable I/O control ports (DDP1 through DDP6A) can be connected to service any of the standard peripheral interfaces except the console, which is dedicated to port DDP8. The Single-Line Control (data communications interface) can only be installed in ports DDP6/DDP6A and DDP7/DDP7A. Many of the I/O controls are supplied with adapter cables that interconnect the respective I/O connectors (PAJ0 through PAJ96) on the processor logic rack with the interfacing device through an adapter panel located at the cable entrance area. (See Figure III-16.) One adapter cable connector is connected to a selected I/O port connector, while the connector block at the other end is affixed to a selected slot on the adapter panel. The mating connector from an interfacing I/O device cable (Figure III-17) is then connected to the fixed connector block.

Devices such as the A9480 Disk and the A9491-2 Magnetic Tape Unit do not require adapter cables and are connected directly to the connector of the interfacing I/O port. Certain devices, such as the paper tape readers and punches are also supplied power through their I/O cables.

Data communications interfaces are provided by connections from connector J91 of port DDP7/DDP7A through a 25 or 50 foot standard (DOM) cable (or optional types for INT) to remote data sets (Modems). A direct-connect option is also available. Only one data comm interface may be accommodated at ports DDP7 and DDP7A.

B771/B772 POWER CABLING

Figure III-18 shows the interconnection of the power cabling in a complete B771/B772 system configuration. As applicable, the part number of each cable is identified. Refer to Table I-3 for a complete list of B700 system power cables and other pertinent information. The actual system power cabling depends on the options and types/numbers of peripheral devices used.

All system power is obtained through the system circuit breaker panelboard, which distributes primary AC power to the processor and separate branch circuit outlets (if required). (The separate branches can be connected to line A or B.) The three pairs of convenience outlets (J1, J2, and J3) on the processor power control assembly can be used for supplying AC power to any of the standard peripheral devices.

Jacks J13, J14, and J15 on the power control assembly are available to supply AC power to the A9114, A9122, and A9222 if they are added to the system. DC power is supplied for some peripherals, such as the tape cassette, directly through the respective I/O cables.

Installation Guide

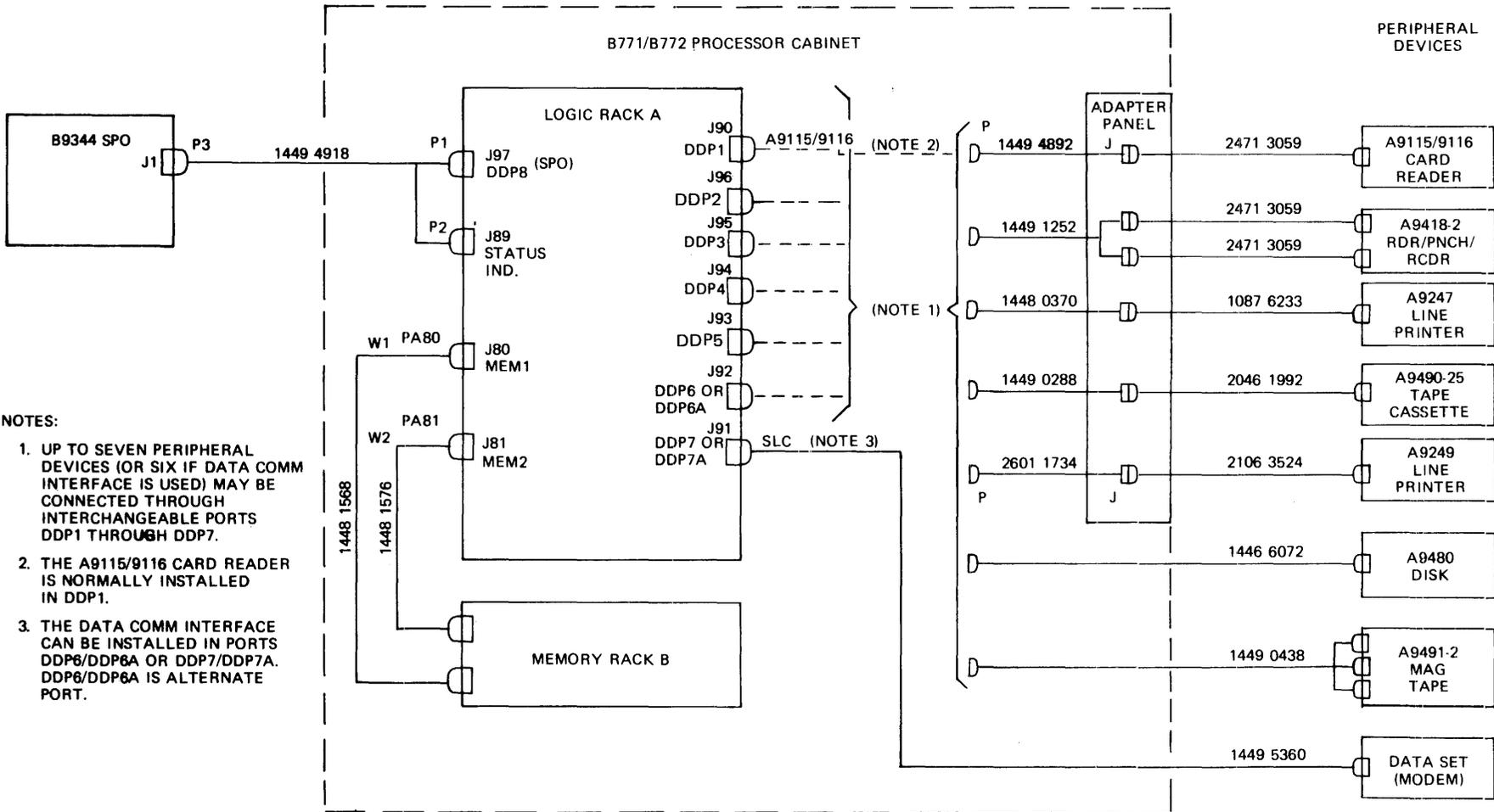
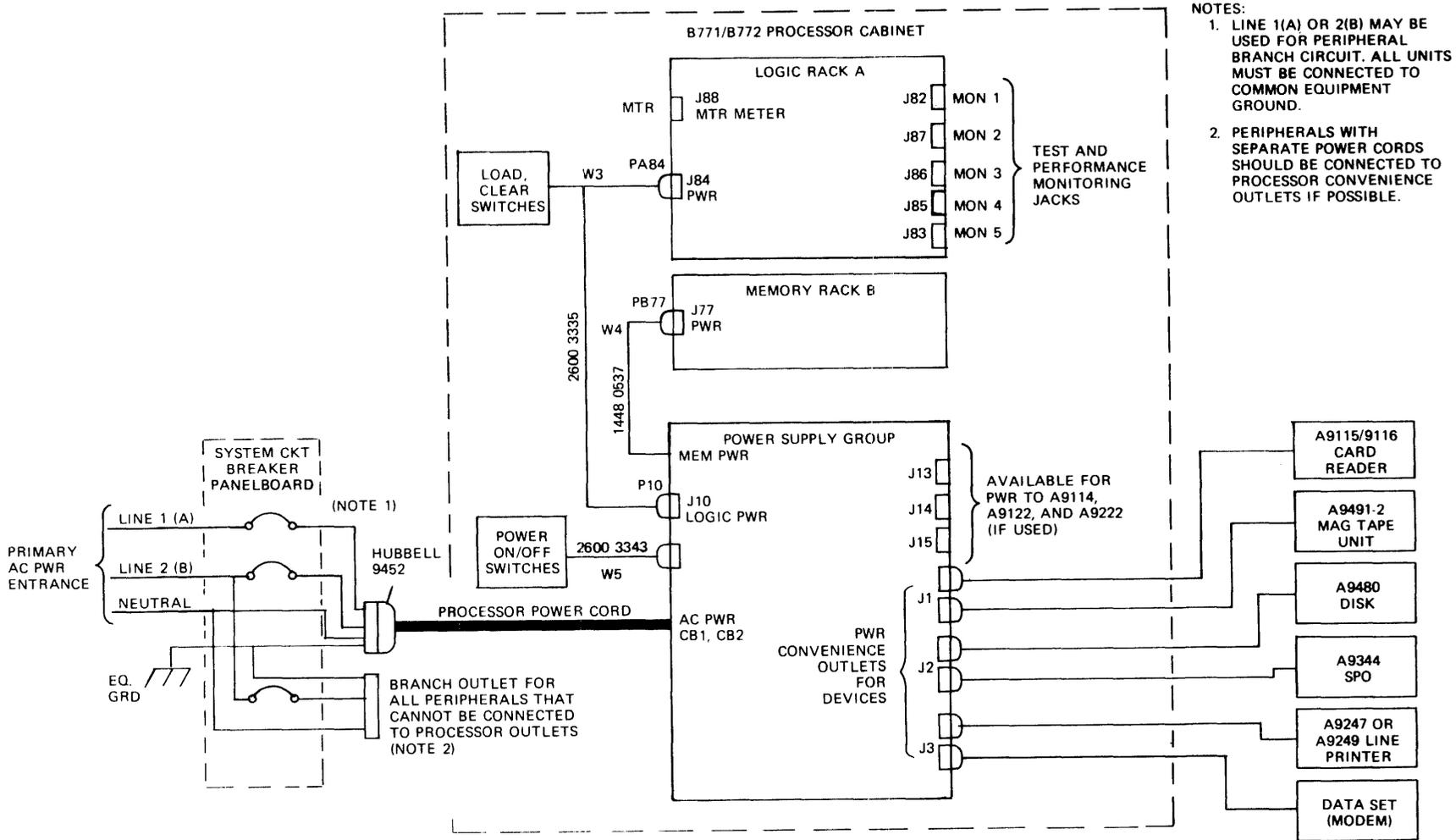


Figure III-17. B771/B772 SYSTEM I/O CABLING DIAGRAM

Figure III-18. B 771/B 772 SYSTEM POWER CABLING DIAGRAM



Installation Guide**B771/B772 PROCESSOR AC POWER TURNON AND CHECKOUT**

Figure III-6 shows the general routing of AC power wiring to the processor power control assembly, where the AC power turnon and measurement checks are made. For identification purposes the wire color codes of the line, neutral, and ground connections are given in Figure III-6 for both Domestic and International installations.

Turnon and Checkout Procedure

Perform the following procedure to turn on and check out processor power:

CAUTION

Local codes in some areas require that all operation/checks involving cabling and power be performed by a licensed electrician. The field engineer should supervise all actions performed by the electrician.

1. Make certain that circuit breakers on branch AC power distribution panelboard (Figure III-18) are in OFF positions.
2. Make certain that circuit breakers CB1 and CB2 (and CB3 and CB4 for International units) on processor power control assembly are in OFF position.
3. Connect processor power AC power cord to allocated branch receptacle.
4. Set all circuit breakers on branch AC power distribution panelboard to ON positions.
5. Measure primary AC input voltages (rms) at processor power control assembly (Figure III-6) as follows:
 - a. Domestic units:
 - 107 to 127 volts AC between neutral (white wire) at TB3-2 and line 1 (A) (black wire) at CB1-1.
 - 107 to 127 volts AC between neutral at TB2-2 and line 2 (B) (red wire) at CB1-2.
 - 216 to 252 volts AC between lines 1 (A) and 2 (B).
 - b. International units:
 - +5 to -10 percent of specified voltage (Table I-4) between line (CB1-1) and neutral (CB1-2).

Repeat line checks at CB2 of Domestic units, or at CB2, CB3, and CB4 of International units, as required.
6. Set all circuit breakers on branch AC power distribution panelboard to OFF positions.
7. Set processor circuit breakers to ON positions.
8. Set circuit breakers on branch AC power distribution panelboard to ON positions.

B771/B772 PROCESSOR DC POWER TURNON AND CHECKOUT

Perform the following procedure to turn on and check out processor DC power:

1. Power-up processor by pressing power ON pushbutton on processor panel.
2. Check processor DC voltages in accordance with Table III-3, which lists the logic and memory backplane voltages, measurement locations, and corresponding fuses. Use a digital voltmeter for measurements.

NOTE

Logic backplane measurements should be in relation to power/signal ground on the backplane. Memory backplane measurements should be in relation to ground at control board connector pin 1EU, 1FU, or 2F4.

Installation Guide

- If voltages are out of tolerance, perform adjustments in accordance with Section IV of Technical Manual, form 1064482, or volume 1 of the B700 FT&R documentation. Check corresponding fuse(s) listed in Table III-3 before proceeding with adjustment or troubleshooting.

B771/B772 SYSTEM PREOPERATIONAL CHECKOUT

After all AC and DC power is turned on and checked out at the processor, perform the following procedure to initially check out the operation of the installation:

- Check out and turn on all peripheral unit power. (Refer to common procedure provided in this section.)
- Install Field Engineering (FE) cards in processor logic rack (Figure III-15) as follows:

<u>Type</u>	<u>Part No.</u>	<u>Rack Location</u>
FE-1	1447 5099	DQ9
FE-2	1447 5115	DR2
FE-3	1447 5735	DR5
FE-4	1448 8431	DR8

- Load and execute applicable Maintenance Test Routines (MTR's). Table III-10 identifies the B771/B772 MTR's and the general sequence in which they should be implemented. Refer to the B700 Processor FETM, form 1064482, Section V for complete instructions.
- When all applicable MTR's run without error, proceed with system turnover operations.

<u>MTR NAME</u>	<u>PROGRAM/TEST TAPE PART NUMBER</u>	<u>OP. INSTRUCTIONS</u>	<u>REMARKS</u>
FEMT	—	1448 6906F	Memory of 8 K-words maximum
CMLDR	2601 4043	2601 4035	Memory Loader
PROC	1448 6948C	1448 6815C	Processor, general
BSW	1448 6955	1448 6823C	Processor, barrel switch
MCU	1448 6963	1448 6831D	Processor, Memory Control
SPO	1449 0908	1449 0825	B9344 and DDP
DPM	1448 6971B	1448 6849B	Memory, data
*** I/O MTR'S (RUN AS REQUIRED) ***			
DISK	1448 6989C	2602 9660	A 9481 and DDP
PMTR	2602 9678	1449 0817B	A 9247 and DDP A 9249 and DDP
CR91	2601 4274 and 2601 7608 (deck)	2601 4266	A/B 9115/9116 and DDP
TC	1449 0916A	1449 0833B	A9490-25 Cassette and DDP
RP96	1448 7003B and 1448 7691A (deck)	1448 6880B	A 9418 and DDP
SLC	2601 4068	2601 4050	B351 SLC, Data Comm

NOTE: Do not use any version earlier than revision indicated (A, B, C, etc.) for B771/B772.

TABLE III-10 B771/B772 MAINTENANCE TEST ROUTINES (MTR's)

OptionsB705/B711 SYSTEM OPTION/EXPANSION FEATURES

In addition to the basic or minimum B705/B711 System described in Section II, several major optional or expansion features are available as described in the following paragraphs.

MEMORY EXPANSION

The basic B705/B711 Processor has a core memory capacity of 24K bytes (12K-words). Additional memory capacity (up to 40 KB for B705; 48 KB for B711) is obtained by configuring memory modules as follows:

MEMORY MODULE	CONFIGURATION (QTY) REQUIREMENT			
	<u>24KB</u>	<u>32KB</u>	<u>40KB</u>	<u>48KB</u>
B0011 (16KB)	1*	1*	1*	1*
B0011-1 (8KB)	1*	0	1	0
B0011-2 (16KB)	—	1	1	2

* Supplied with basic (minimum) system.

Note that only one B0011-1 storage module may be included in a system.

INTERCHANGEABLE I/O CONTROLS AND PORTS

Up to eight I/O controls (IOC's/DDP's) can be installed in the B705/B711 system to accommodate the basic system I/O complement and optional peripheral devices. Port DDP8 is dedicated to the basic system console control, while DDP4 is normally allocated to the disk control. The remaining six ports can be used to accommodate any of the interchangeable (standard four-card) controls. Any combination (multiples of types, if desired) may be used in accordance with system requirements. One control must be used for each device.

The eight-card Single-Line Control used in file inquiry applications may be installed in ports DDP6 and DDP7, or alternate ports DDP4 and DDP6. The following controls are classified as interchangeable (standard) IOC's for use in the B705/B711 system:

<u>Model</u>	<u>Name</u>
B111	Card Reader (80-col.) Control
B311	Card Reader (96-col.) Control
B121	Paper Tape Reader Control
B222	Paper Tape Punch Control
B245	Line Printer Control (A988)
B244 or B244-1	Line Printer Control (A9247)
B243	Line Printer Control (A9249)
B392	Magnetic Tape Cassette Control
B489-1	Disk Control

Refer to Section II for complete details concerning I/O controls and devices.

Options

HARDWARE MEMORY ADDRESS LIMIT WIRING

The hardware memory address limit may be hard-wired from 8K bytes to 24K bytes in 2K-byte increments. An address error is generated when a memory address exceeds the set limit.

Whenever the memory address limit is to be increased or decreased from the prewired setting, hard-wiring changes must be made at the processor logic backplane. Refer to the B700 Field Engineering Technical Manual, form 1064482, and FT&R documentation for detailed instructions.

B276 CONFIGURATION CARD OPTION

The Configuration Card (CON-1, in backplane location DK-5) of design-level 2 (DL2) processors provide configuration information to the system. This card must be wired during installation in accordance with the specific site configuration. Refer to the B700 Field Engineering Technical Manual, form 1064482, and FT&R documentation for detailed instructions.

Currently, there are two basic design levels of B 700 Processors: DL1 and DL2. The design level of a processor can be identified by referring to the processor identification plate and the unit travel log. The differences between DL1 and DL2 are effected in the logic backplane, where locations DK5 and DK6 are wired to accept the B 276 Configuration Card. All unused wires are removed. If it becomes necessary to replace a DL1 backplane (1448 0461), DL2 backplane (1449 9362) must be ordered, along with DL2 backplane circuit list 1449 9412.

UPGRADING/DOWNGRADING PROCESSORS

A B705 Processor (0.5MHz) may be upgraded to a B711 Processor (1MHz) by ordering and installing field kit 1449 6095 in the B705. A B711 Processor may be downgraded to a B705 Processor by ordering and installing field kit 1449 6087. Each kit includes the hardware items, diagrams, decals, and instructions required to perform the conversion.

B721 SYSTEM OPTION/EXPANSION FEATURES

In addition to the basic or minimum B721 system described in Section II, several major optional or expansion features are available for the B721 as described in the following paragraphs.

MEMORY EXPANSION

The B721 memory capacity may be expanded to 96K bytes, in 8K-byte increments, by adding B31-2 (8-KB) Memory Modules (2601 3425). A total of 12 B31-2 modules may be used. the basic system processor backplane is prewired to accommodate all modules.

CONFIGURATION CONTROL CARD

The optional B276 Configuration Card (CON-1, 2602 1642) may be installed in the Processor to permit a choice of system capabilities at the time of manufacture or at a later date by field modification. Refer to the B721 Processor FETM, form 1077534, for details.

I/O EXPANSION

The B312 I/O Expansion feature (2600 9464) enables the B721 to accommodate up to five additional standard IOC/DDP ports (or special IOC's such as the Reader-Sorter IOC) in addition to the three basic ports. This feature consists of a backplane module that is installed in the processor I/O expansion rack.

Only one B312 expansion module is allowed per system, and is required if the system is to accommodate more than three interchangeable IOC's or the B131 Reader-Sorter control (2601 6600).

If an I/O expansion module is installed, additional cabling and cooling options are also required. (Refer to I/O cable options and fan tray/plenum options.)

Options**INTERCHANGEABLE I/O CONTROLS AND PORTS**

Up to three interchangeable (standard four-card) I/O controls (IOC's/DDP's) may be installed in the basic system processor logic/memory rack. Up to five additional interchangeable IOC's may be accommodated by use of the B312 I/O expansion feature. When multiple devices of the same type (such as B9249 or A9490-25) are used, a separate IOC is required for each device. The following IOC's are classified as interchangeable (standard) IOC's for use in the B721 system:

<u>Model</u>	<u>Name</u>
B111	Card Reader (80-col.) Control
B121-1	Paper Tape Reader Control
B221	Paper Tape Punch Control
B243	Line Printer Control
B244 or B244-1	Line Printer Control
B311	Reader/Punch/Recorder (80/96-col.) Control
B351-1	Single Line Control (Data Comm)
B391	Magnetic Tape Control
B392/B392-1	Magnetic Tape Cassette Control (External/Internal)
*B 131	Reader-Sorter Control

*If the B131 Reader-Sorter Control is to be used, it must be installed in the I/O expansion module (normally DDP3). It is excluded from installation in any of the three basic system ports.

Refer to Section II for complete details concerning I/O controls and interfacing devices.

FILE INQUIRY OPERATION

File Inquiry operation in the B721 is implemented by use of the B351-1 Single-Line Control (2602 7425) and modified TD700 or TD800 Terminals. Connector kit 2601 8002 must be specified with the factory order to install this option. Refer to the field installation instructions for the B351-1 SLC.

INTERNAL/EXTERNAL MAGNETIC TAPE CASSETTE

Either or both an internal Magnetic Tape Cassette (A9490-21) and an external Magnetic Tape Cassette (A9490-25) may be used in a B721 system. The A9490-21 is installed in the Processor cabinet (Figure III-7) as an integral unit by use of Installation Kit 2602 4612, which must be factory-ordered when specifying this option. The A9490-21 must be interfaced by a separate B392-1 I/O control. Any external A9490-25 Tape Cassette must be interfaced by an additional B392 which includes cassette brackets.

DATA COMMUNICATIONS SUBSYSTEM

The data communications subsystem available for the B721 can service up to four communications lines in the half-duplex or full-duplex modes. This subsystem consists of the following basic and optional items:

- a. A B352 Data Communications Processor (Programmable Multiline Control, PMLC), part number 2601 9810. Only one B352 is allowed per system and consists of an I/O expansion rack module wired to accept four B651 line adapters. The I/O cabling and fan tray/harness options are required when the B352 is installed.

Options

- b. A B353-1 four-line half-duplex option (2603 3886), or a B353-2 four-line full-duplex option. These options provide a scratch-pad memory (SPM) for the B352 Data Communications Processor; one must be specified by factory order. (An SPM is not supplied with the basic B352.) The selected option applies to all four lines.
- c. Up to four B651 Line Adapters (2601 5685). (One B651 is required for each line to be used.) The basic B651 does not include data set interface cables, which must be specified by factory order for domestic or international applications. The following data sets may be connected to a B651: TA713, TA714, TA733 (full duplex), TA734, TA783, Bell 103A, Bell 201A/201B, and Bell 202C/202D. Direct-connect interfaces may also be used. (Refer to Direct-Connect kit.)
- d. One data set interface cable is required for each line adapter-data set interface. One of the following cables must be specified by factory order:

<u>Part No.</u>	<u>Application</u>	<u>Length</u>
2602 2970	Domestic	25 ft.
2602 2988	Domestic	50 ft.
2603 3845	International (GPO)	50 ft.
2603 3852	International (SEL)	50 ft.

- e. An optional B352-6 Data Communications Console Indicator Assembly (2602 4547), which provides one transmit and one receive indicator for each data communications line. This option includes the IL1 (2602 3200) card (installed with B352 in data comm module rack), an indicator assembly (installed in system console), and an interface cable assembly.
- f. A B652 ACU (Automatic Calling Unit) option (2601 5693) may be added to provide the capability of automatic dialing on lines 1 and 2 of the B352 data communications interface. This option is restricted to lines 1 and 2, and must be ordered with a 50-foot ACU cable (2602 3010) for each ACU. The B353-3 memory upgrade option must be specified for ACU.
- g. A Direct-Connect kit (2603 3852) is required for each interface to be directly connected to a terminal (TDI interface). Number AWG-22 twisted-pair wire should be used; the length should not exceed 1000 feet.

I/O OPTION CABLE REQUIREMENTS

The B721 I/O configuration (Figure III-12) has five option variations:

- a. I/O-1 (B312-1) where the basic processor I/O configuration and the B312 I/O expansion module are used.
- b. I/O-2 (B352-1), where the basic processor I/O configuration and the data communications subsystem are used.
- c. I/O-3 (B352-8), where both the B312 I/O expansion module and the data communications subsystem are used with the basic processor I/O configuration.
- d. I/O-4 (B352-9), where a B352 data communications subsystem is added to an existing I/O expansion module after installation.
- e. I/O-5 (B352-2), where a B312 I/O expansion module is added to an existing B352 module after installation.

Options

Section III contains a complete description of the I/O cabling option configurations. When these options are installed, the following requirements apply:

- a. The B312 expansion module must be installed in the lowest row of the I/O expansion rack.
- b. The correct cable group must be specified. (Refer to Section III.)
- c. When a system is expanded in the field, only those that are different should be ordered. Existing cables should be used when possible.

FAN TRAY AND PLENUM ASSEMBLY

When any optional backplane modules are ordered for installation in the I/O expansion rack, the optional fan tray and plenum assembly (2602 4802) must also be ordered. Only one assembly is required, regardless of the number of modules used in the I/O expansion rack.

FIELD MAINTENANCE OPTIONS

The following field-maintenance options are available:

- a. Field Engineering (F.E.) Card Kit with memory test and display facilities (1448 2525).
- b. Extender kit 1448 7102, which consists of an extender card assembly (EXT1) and extender cable assembly for frontplane connectors.
- c. Test Block 2603 1666, which is required to run the Data Communications Subsystem Maintenance Test Routine.

B771/B772 SYSTEM OPTION/EXPANSION FEATURES

In addition to the basic or minimum B771 or B772 System described in Section II, several major optional or expansion features are available as described in the following paragraphs.

MEMORY EXPANSION

The basic system processor has a minimum core memory (main) capacity of 16K bytes (B771) or 32K bytes (B772) but can be expanded to a maximum of 48K bytes in 16K-byte increments by adding B011-2 core memory modules (1672 6382). The processor backplane is prewired to accommodate the expansion.

INTERCHANGEABLE I/O CONTROLS AND PORTS

Up to eight I/O controls (IOC's/DDP's) can be installed in the B771/B772 system to accommodate the basic system I/O complement and optional peripheral devices. Port DDP8 is dedicated to the basic system SPO control. The remaining seven ports can be used to accommodate any of the interchangeable (standard four-card) controls. Any combination (multiples of types if desired) may be used in accordance with configuration requirements. One control must be used for each device.

Ports DDP6 and DDP6A or DDP1 and DDP7A must be used for the eight-card Single-Line Control; Port DDP4 is normally used for the disk control in B772 systems.

The following controls are classified as interchangeable (standard) IOC's for use in the B771/B772 system:

<u>Model</u>	<u>Name</u>
B115	Card Reader Control
B244 or B244-1	Line Printer Control (A9247)
B243	Line Printer Control (A9249)
B392	Magnetic Tape Cassette Control
B311/B418-2	Rdr/Punch/Rcdr Control
B489-1	Disk Control

Options

Refer to Section II for complete details concerning I/O controls and devices.

SINGLE-LINE CONTROL OPTIONS

Applications of the B351 Single-Line Control (SLC) in the B771/B772 System involve a number of operational options or variations that can be implemented as follow:

- a. Synchronous data set operation.
- b. Asynchronous data set operation.
- c. Direct-connect operation.
- d. Data set and access arrangement configuration variations.

Refer to FETM form 1064482, and SLC FT&R documentation for detailed instructions concerning the installation wiring requirements.

The following are required or optional items used with the B351:

- a. A 50-foot I/O cable is (1449 5360) required to interface a remote data set in domestic installations (synchronous or asynchronous mode).
- b. Direct-connect jumper/interface block 2601 8002 is required for the direct-connect data transmission mode.
- c. CCITT-rate select kit 2602 4448 is used for either synchronous or asynchronous operation in CCITT applications. Adapter cable 2602 3556 must be used with this kit in conjunction with one of the following cables for the CCITT interface:

<u>Cable Length</u>	<u>U. S. Data Sets</u>	<u>SEL Data Sets</u>	<u>GPO Data Sets</u>
15 ft.	1696 4975	1696 8893	1696 8810
25 ft.	1696 4983	1696 8885	1696 8802
50 ft.	1696 4991	1696 8877	1696 8794
100 ft.	1696 2946	1696 8869	1696 8786

- d. The following data sets may be used: TA713, TA714 (full-duplex), TA733, TA734, Bell 201A/201B, and Bell 202C/202D.

MEMORY ADDRESS LIMIT WIRING AND CONFIGURATION CARD

The same memory address limit wiring and configuration card options described for the B705/B711 apply to the B771/B772. Refer to B700 F.E.T.M., form 1064482, for complete details.

B700 IOC/DDP PRIORITY CLASSIFICATIONS

Each B700 IOC/DDP backplane location has an I/O service priority classifications, starting with the highest priority allocated to DDP/IOC location 8 in the B705/B711 and B771/B772, or location 12 in the B721. This priority allocation is in relation to the system firmware and the classification of the interfacing peripheral devices into the following four groups:

<u>Group</u>	<u>Device Type</u>	<u>Priority</u>
1	Character	Highest
2	Dedicated	Intermediate
3	Buffered	Lowest
4	Direct-memory access	As-required

Options

Table IV-1 lists the classifications of the various peripheral devices and IOC/DDP's (by model number) under the priority groups 1, 2, and 3. The B721 disk (B489-2) and data comm subsystems (B352) are the only current group-4 classifications.

Table IV-2 shows typical examples of priority configurations for both the B705/B711 and B771/B772 systems.

Table IV-3 shows typical priority assignments in a B721 system.

Group 1 (Highest)		Group 2 (Intermediate)		Group 3 (Lowest)	
Peripheral	DDP/IOC	Peripheral	DDP/IOC	Peripheral	DDP/IOC
B9343	B9342 or B346/B346-1	A9480 A9135	B489-1 B131	A9114 A9418	B111 B311/418-2
B9344	B44			B9115/9116	B115
SLC	B351/B351-1			A9419	B311
A9490-21/25	B392			A988	B245
A9491-2	B391			A/B9247	B244
A9122	B121			A/B9249	B243
A9222	B221				

TABLE IV-1. PERIPHERAL DEVICE AND IOC/DDP PRIORITY CLASSIFICATIONS

B705/B711 System			Device Address Code	B 771/B772 System		
Peripheral	DDP/IOC	Location (priority)		Peripheral	DDP/IOC	Location (priority)
B9343	B9343	8*	7	B9344	B44	8*
A9490-25	B392	7	6	SLC	B351	7 and 7A or 6 and 6A
A9122	B121	6	5	—	—	—
A9222	B221	5	4	—	—	5
A9480	B489-1	4	3	—	—	4
A9249	B243	3	2	—	—	3
A9419	B311	2	1	B9247	B244	2
A9114	B111	1	0	B9115	B115	1

* Dedicated ports.

TABLE IV-2. TYPICAL (RECOMMENDED) PERIPHERAL IOC/DDP PRIORITY CONFIGURATIONS IN B705/B711 AND B771/B772 SYSTEMS

Options

PREPARING AN IOC/DDP CONFIGURATION

When installing a system, list all peripherals in groups as classified in Table IV-1. Starting with Group 1 peripherals and location 7 (B705/B711 or B771/B772), or 11 (B721), assign the IOC/DDP locations.

After Group 1 peripherals are assigned, assign the Group 2 peripherals and DDP/IOC's to the next highest locations. If no Group 2 peripherals are to be configured (as in the basic B771 system) proceed with Group 3.

After Group 2 peripherals are assigned, proceed with Group 3 and assign the next highest DDP locations.

In the B721 System, the following rules apply in determining priority assignments:

- a. Ports DDP12 (console), DDP4 (Disk), and DDP1 (Data Comm) are hard-wired (dedicated) ports and cannot be reassigned. Port DDP2 is unassigned and is for future use.
- b. In a basic system, only three ports (DDP9, DDP10, and DDP11) are available. Most configurations require a line printer, thus leaving only two available interchangeable ports.
- c. The I/O expansion feature provides five additional ports (DDP3 and DDP5 through DDP8) and may be assigned those devices shown in Table IV-3.
- d. The eight-card B351-1 Single-Line Control requires two DDP locations. When the B351-1 is included in a basic I/O configuration, ports DDP9 and DDP10 are recommended. When the I/O expansion feature is used, ports DDP7 and DDP8 or DDP9 and DDP10 are recommended.

<u>Device Address Code</u>	<u>IOC/DDP Location*</u>	<u>Peripheral Device</u>	<u>IOC/DDP</u>
11	12	B9343-22/42	B346 or B346-1
10	11	A9490-25	B392
9	10	A9491-2	B391
8	9	A9122-1	B121-1
** { 7 6 5 4	** { 8 7 6 5	A9222	B221
		A9114-1	B111
		A9135	B131
		A9247-2/12 A9249-2	B244 or B243
		A9480-11/12 or A9481-11/12	B489-2
** 2	** 3	A9419-2	B311
1	2	(unassigned)	—
0	1	Data Comm Subsystem	B 352

* Highest (12) to lowest (1) order.

** Used only when I/O expansion module is installed.

TABLE IV-3. TYPICAL (RECOMMENDED) PERIPHERAL IOC/DDP PRIORITY CONFIGURATION IN B721 SYSTEM

NOTES

NOTES

BURROUGHS CORPORATION
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REMARKS FORM

TITLE: B 700 PLANNING & INSTALLATION
MANUAL

FORM: 1061223

DATE: 1-1-75

CHECK TYPE OF SUGGESTION:

ADDITION

DELETION

REVISION

ERROR

GENERAL COMMENTS AND/OR SUGGESTIONS FOR IMPROVEMENT OF PUBLICATION:

FROM: NAME _____
TITLE _____
COMPANY _____
ADDRESS _____

DATE _____

cut along dotted line

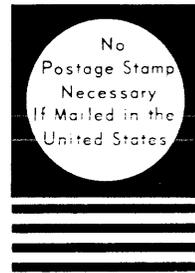
cut along dotted line

STAPLE

FOLD DOWN

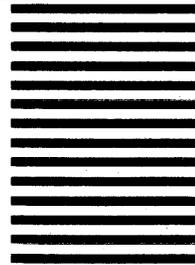
SECOND

FOLD DOWN



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